

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

CHEMISTRY OF GROUND WATER FROM TEST HOLES DRILLED IN
ESMERALDA AND NYE COUNTIES, NEVADA

By

Sigrid Asher-Bolinder¹, James D. Vine²,
Richard K. Glanzman³, and Joseph R. Davis⁴

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This report is preliminary and has not
been edited or reviewed for conformity
with U.S. Geological Survey standards.

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INTRODUCTION

The following pages list chemical analyses of ground water samples pumped from test holes drilled by the U.S. Geological Survey in September, 1979. The drilling was done in support of the lithium resource investigations to test the lithium content of several valleys near the lithium brine-field at Clayton Valley, Esmeralda County, Nevada. The drill sites are shown on figures 1 to 7. No commercial lithium brines were encountered, although some of the waters show a high ratio of lithium to chloride comparable to the ratio of the commercial lithium brines in Clayton Valley. Other samples may be of interest because of their high concentrations of other constituents, including uranium.

These analyses were performed under the supervision of Earl L. Skinner in the U.S. Geological Survey's National Water Quality Laboratory, Denver Central Laboratory.

The association of lithium-bearing clays with uranium minerals has previously been reported in a number of uranium districts (Glanzman, Rytuba, and Otton, 1979), but to our knowledge this is the first reported association of these elements in ground waters.

The drilling was performed under the terms of an interagency cooperative agreement with the Division of Energy Storage Systems and the Division of Uranium Resources and Enrichment of the U.S. Department of Energy.

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Note that most of the analytical values are listed either as milligrams per liter (MG/L = mg/L) which is approximately equivalent to parts per million, or as micrograms per liter (UG/L = μ g/L) which is approximately equivalent to parts per billion.

Other abbreviations are as follows:

ALK, TOT (CACO3) - is total alkalinity, as CaCO_3 , and includes carbonate and bicarbonate.

PHOS ORTHO DIS AS P - is elemental phosphorous.

PHOS DIS ORTHO - is phosphorous reported as P_2O_4 .

POTASSIUM DISS - is elemental potassium.

POTASSIUM 40 D, PCI/L - is a measure of the radioactive isotope, ^{40}K .

RESIDUE DIS CALC SUM - is a measure of total dissolved solids calculated from the sum of the analyzed cations and anions.

RESIDUE DIS TON/AFT - is the residue calculated in tons per acre feet of water

RESIDUE DIS 180C - is the measured residue after drying at 180°C.

SAR - is sodium absorption ratio.

SODIUM PERCENT - is the percent of total cations represented by sodium.

SP. CONDUCTANCE LAB - is an electrical measure reported as total dissolved solids.

REFERENCES CITED

Glanzman, R. K., Rytuba, J. J., and Otton, J. K., 1979, Lithium and boron association with uranium mineralization: Geological Society of America Abstracts with Programs, v. 11, no. 7, p. 433.

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GEOLOGICAL SURVEY
CENTRAL LABORATORY, DENVER, COLORADO

WATER QUALITY ANALYSIS
LAB ID # 291607 RECORD # 33882

SAMPLE LOCATION: FISH LAKE N011-155
STATION ID: 291607 LAT.LONG.SEQ.: 374941 1175849
DATE OF COLLECTION: BEGIN--790912 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS: UNIQUE-#: RERUN: NA DISS=11 MG DISS=1.7 NA DISS=210 GL DISS=140

ALK+TOT(CAC03)	MG/L	260	PH FIELD		8.9
ALUMINUM DISSOLVED	UG/L	120	PH LAB		8.1
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.20
BORON DISSOLVED	UG/L	1700	PHOSPHATE DIS ORTHO	MG/L	0.61
CALCIUM DISS	MG/L	12	POTASSIUM DISS	MG/L	14
CHLORIDE DISS	MG/L	130	POTASSIUM 40+D.PCI/L		10
DENSITY AT 20 C	DETR. DELETED		RESIDUE DIS CALC SUM	MG/L	719
DEPTH(FT.FR.SURFACE)		155	RESIDUE DIS TON/AFT		0.99
FLUORIDE DISS	MG/L	3.3	RESIDUE DIS 180C	MG/L	731
HARDNESS NONCARB	MG/L	0	SAR		15
HARDNESS TOTAL	MG/L	37	SILICA DISSOLVED	MG/L	58
IRON DISSOLVED	UG/L	180	SODIUM + POTASSIUM	MG/L	220
LITHIUM DISSOLVED	UG/L	30	SODIUM DISS	MG/L	210
MAGNESIUM DISS	MG/L	1.8	SODIUM PERCENT		89
MANGANESE DISSOLVED	UG/L	20	SP. CONDUCTANCE LAB		1198
NO2+NO3 AS N DISS	MG/L	0.44	SULFATE DISS	MG/L	130
			WATER TEMP (DEG C)		16.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	12	0.599	CHLORIDE DISS	130	3.667
MAGNESIUM DISS	1.8	0.148	FLUORIDE DISS	3.3	0.174
POTASSIUM DISS	14	0.358	SULFATE DISS	130	2.707
SODIUM DISS	210	9.135	ALK+TOT(CAC03)	260	5.195
			NO2+NO3 AS N D	0.44	0.031
TOTAL		10.240	TOTAL		11.774

PERCENT DIFFERENCE = -6.97

ANALYZING AGENCY	80020	PH FIELD		8.9
DEPTH(FT.FR.SURFACE)	155	URANIUM TOTAL	UG/L	42.0
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		16.0

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WATER QUALITY ANALYSIS
LAB ID # 291603 RECORD # 33870

SAMPLE LOCATION: FISH LAKE N011A-55
STATION ID: 291603 LAT.LONG.SEQ.: 374943 1175858
DATE OF COLLECTION: BEGIN--790912 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943091093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS: UNIQUE-#:

ALK.TOT(CAC03)	MG/L	310	PH FIELD		7.8
ALUMINUM DISSOLVED	UG/L	140	PH LAB		7.7
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.04
BORON DISSOLVED	UG/L	10000	PHOSPHATE DIS ORTHO	MG/L	0.12
CALCIUM DISS	MG/L	290	POTASSIUM DISS	MG/L	240
CHLORIDE DISS	MG/L	7900	POTASSIUM 40.D.PCI/L		180
DENSITY AT 20 C		DETR. DELETED	RESIDUE DIS CALC SUM	MG/L	13900
DEPTH(FT.FR.SURFACE)		55.0	RESIDUE DIS TON/AFT		19.0
FLUORIDE DISS	MG/L	4.0	RESIDUE DIS 180C	MG/L	14000
HARDNESS NONCARB	MG/L	830	SAR		61
HARDNESS TOTAL	MG/L	1190	SILICA DISSOLVED	MG/L	38
IRON DISSOLVED	UG/L	190	SODIUM + POTASSIUM	MG/L	4900
LITHIUM DISSOLVED	UG/L	21000	SODIUM DISS	MG/L	4700
MAGNESIUM DISS	MG/L	100	SODIUM PERCENT		88
MANGANESE DISSOLVED	UG/L	1200	SP. CONDUCTANCE LAB		21000
NO2+NO3 AS N DISS	MG/L	0.29	SULFATE DISS	MG/L	400
			WATER TEMP (DEG C)		18.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	290	14.471	CHLORIDE DISS	7900	222.859
MAGNESIUM DISS	100	8.226	FLUORIDE DISS	4.0	0.211
POTASSIUM DISS	240	6.137	SULFATE DISS	400	8.328
SODIUM DISS	4700	204.450	ALK.TOT(CAC03)	310	6.194
			NO2+NO3 AS N D	0.29	0.021
TOTAL		233.284	TOTAL		237.612

PERCENT DIFFERENCE = -0.92

ANALYZING AGENCY	80020	PH FIELD		7.8
DEPTH(FT.FR.SURFACE)	55.0	URANIUM TOTAL	UG/L	336
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		18.0

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WATER QUALITY ANALYSIS
LAB ID # 291609 RECORD # 33888

SAMPLE LOCATION: FISH LAKE NO11A-115
STATION ID: 291609 LAT.LONG.SEQ.: 374923 1175844
DATE OF COLLECTION: BEGIN--790912 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS:

ALK.TOT(CACO3)	MG/L	180	PH FIELD		8.9
ALUMINUM DISSOLVED	UG/L	160	PH LAB		7.8
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.04
BORON DISSOLVED	UG/L	4900	PHOSPHATE DIS ORTHO	MG/L	0.12
CALCIUM DISS	MG/L	130	POTASSIUM DISS	MG/L	85
CHLORIDE DISS	MG/L	1600	POTASSIUM 40+D.PCI/L		63
DENSITY AT 20 C		1.000	RESIDUE DIS CALC SUM	MG/L	3050
DEPTH(FT.FR.SURFACE)		115	RESIDUE DIS TON/AFT		4.35
FLUORIDE DISS	MG/L	2.0	RESIDUE DIS 180C	MG/L	3200
HARDNESS NONCARB	MG/L	280	SAR		18
HARDNESS TOTAL	MG/L	460	SILICA DISSOLVED	MG/L	49
IRON DISSOLVED	UG/L	200	SODIUM + POTASSIUM	MG/L	990
LITHIUM DISSOLVED	UG/L	4500	SODIUM DISS	MG/L	900
MAGNESIUM DISS	MG/L	34	SODIUM PERCENT		77
MANGANESE DISSOLVED	UG/L	560	SP. CONDUCTANCE LAB		5601
NO2+NO3 AS N DISS	MG/L	0.10	SULFATE DISS	MG/L	130
			WATER TEMP (DEG C)		17.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	130	6.487	CHLORIDE DISS	1600	45.136
MAGNESIUM DISS	34	2.797	FLUORIDE DISS	2.0	0.105
POTASSIUM DISS	85	2.173	SULFATE DISS	130	2.707
SODIUM DISS	900	39.150	ALK,TOT(CACO3)	180	3.596
			NO2+NO3 AS N D	0.10	0.007
TOTAL		50.607	TOTAL		51.551

PERCENT DIFFERENCE = -0.92

ANALYZING AGENCY	80020	PH FIELD		8.9
DEPTH(FT.FR.SURFACE)	115	URANIUM TOTAL	UG/L	380
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		17.0

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WATER QUALITY ANALYSIS
LAB ID # 291608 RECORD # 33885

SAMPLE LOCATION: FISH LAKE N011A-335
STATION ID: 291608 LAT.LONG.SEQ.: 374943 1175858
DATE OF COLLECTION: BEGIN--790915 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS: UNIQUE-#: VALUES WILL BE UPDATED IF ANY CHANGE IS NOTED IN RERUNS.

ALK,TOT(CAC03)	MG/L	170	PH FIELD		9.1
ALUMINUM DISSOLVED	UG/L	140	PH LAB		7.9
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.07
BORON DISSOLVED	UG/L	1600	PHOSPHATE DIS ORTHO	MG/L	0.21
CALCIUM DISS	MG/L	61	POTASSIUM DISS	MG/L	30
CHLORIDE DISS	MG/L	420	POTASSIUM 40.D.PCI/L		22
DENSITY AT 20 C		0.999	RESIDUE DIS CALC SUM	MG/L	1060
DEPTH(FT.FR.SURFACE)		335	RESIDUE DIS TON/AFT		1.37
FLUORIDE DISS	MG/L	1.3	RESIDUE DIS 180C	MG/L	1010
HARDNESS NONCARB	MG/L	32	SAR		9.2
HARDNESS TOTAL	MG/L	200	SILICA DISSOLVED	MG/L	58
IRON DISSOLVED	UG/L	120	SODIUM + POTASSIUM	MG/L	330
LITHIUM DISSOLVED	UG/L	940	SODIUM DISS	MG/L	300
MAGNESIUM DISS	MG/L	12	SODIUM PERCENT		73
MANGANESE DISSOLVED	UG/L	140	SP. CONDUCTANCE LAB		1782
N02+N03 AS N DISS	MG/L	0.49	SULFATE DISS	MG/L	70
			WATER TEMP (DEG C)		19.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	61	3.044	CHLORIDE DISS	420	11.848
MAGNESIUM DISS	12	0.987	FLUORIDE DISS	1.3	0.068
POTASSIUM DISS	30	0.767	SULFATE DISS	70	1.457
SODIUM DISS	300	13.050	ALK,TOT(CAC03)	170	3.397
			N02+N03 AS N D	0.49	0.035
TOTAL		17.848	TOTAL		16.806

PERCENT DIFFERENCE = 3.01

ANALYZING AGENCY	80020	PH FIELD		9.1
DEPTH(FT.FR.SURFACE)	335	URANIUM TOTAL	UG/L	150
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		19.0

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WATER QUALITY ANALYSIS
LAB ID # 291616 RECORD # 33909

SAMPLE LOCATION: FISH LAKE N011A-435
STATION ID: 291616 LAT.LONG.SEQ.: 374943 1175858
DATE OF COLLECTION: BEGIN--790916 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION:
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS: UNIQUE-#:
RERUN: NA DISS=220 ALK TOT.=380

ALK,TOT(CAC03)	MG/L	380	PH FIELD		8.8
ALUMINUM DISSOLVED	UG/L	5600	PH LAB		8.3
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.21
BORON DISSOLVED	UG/L	3300	PHOSPHATE DIS ORTHO	MG/L	0.64
CALCIUM DISS	MG/L	12	POTASSIUM DISS	MG/L	14
CHLORIDE DISS	MG/L	52	POTASSIUM 40,D.PCI/L		10
DENSITY AT 20 C	DETR. DELETED		RESIDUE DIS CALC SUM	MG/L	676
DEPTH(FT.FR.SURFACE)		435	RESIDUE DIS TON/AFT		0.87
FLUORIDE DISS	MG/L	3.6	RESIDUE DIS 180C	MG/L	643
HARDNESS NONCARB	MG/L	0	SAR		13
HARDNESS TOTAL	MG/L	58	SILICA DISSOLVED	MG/L	72
IRON DISSOLVED	UG/L	7400	SODIUM + POTASSIUM	MG/L	230
LITHIUM DISSOLVED	UG/L	160	SODIUM DISS	MG/L	220
MAGNESIUM DISS	MG/L	6.7	SODIUM PERCENT		86
MANGANESE DISSOLVED	UG/L	220	SP. CONDUCTANCE LAB		963
NO2+NO3 AS N DISS	MG/L	0.01	SULFATE DISS	MG/L	51
			WATER TEMP (DEG C)		19.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	12	0.599	CHLORIDE DISS	52	1.467
MAGNESIUM DISS	6.7	0.551	FLUORIDE DISS	3.6	0.190
POTASSIUM DISS	14	0.358	SULFATE DISS	51	1.062
SODIUM DISS	220	9.570	ALK,TOT(CAC03)	380	7.592
			NO2+NO3 AS N D	0.01	0.001
TOTAL		11.078	TOTAL		10.311

PERCENT DIFFERENCE = 3.58

ANALYZING AGENCY	80020	PH FIELD		8.8
DEPTH(FT.FR.SURFACE)	435	URANIUM TOTAL	UG/L	186
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		19.0

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WATER QUALITY ANALYSIS
LAB ID # 291606 RECORD # 33879

SAMPLE LOCATION: FISH LAKE N012-115
STATION ID: 291606 LAT.LONG.SEQ.: 375223 1175649
DATE OF COLLECTION: BEGIN--790912 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS:

ALK,TOT(CAC03)	MG/L	140	PH FIELD		7.9
ALUMINUM DISSOLVED	UG/L	60	PH LAB		7.7
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.04
BORON DISSOLVED	UG/L	4500	PHOSPHATE DIS ORTHO	MG/L	0.12
CALCIUM DISS	MG/L	230	POTASSIUM DISS	MG/L	100
CHLORIDE DISS	MG/L	2200	POTASSIUM 40,D.PCI/L		75
DENSITY AT 20 C		1.001	RESIDUE DIS CALC SUM	MG/L	4110
DEPTH(FT.FR.SURFACE)		115	RESIDUE DIS TON/AFT		5.08
FLUORIDE DISS	MG/L	0.7	RESIDUE DIS 180C	MG/L	4320
HARDNESS NONCARB	MG/L	640	SAR		19
HARDNESS TOTAL	MG/L	780	SILICA DISSOLVED	MG/L	58
IRON DISSOLVED	UG/L	60	SODIUM + POTASSIUM	MG/L	1300
LITHIUM DISSOLVED	UG/L	5700	SODIUM DISS	MG/L	1200
MAGNESIUM DISS	MG/L	50	SODIUM PERCENT		74
MANGANESE DISSOLVED	UG/L	1600	SP. CONDUCTANCE LAB		7174
NO2+N03 AS N DISS	MG/L	0.04	SULFATE DISS	MG/L	170
			WATER TEMP (DEG C)		18.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	230	11.477	CHLORIDE DISS	2200	62.062
MAGNESIUM DISS	50	4.113	FLUORIDE DISS	0.7	0.037
POTASSIUM DISS	100	2.557	SULFATE DISS	170	3.539
SODIUM DISS	1200	52.200	ALK,TOT(CAC03)	140	2.797
			NO2+N03 AS N D	0.04	0.003
TOTAL		70.347	TOTAL		68.438

PERCENT DIFFERENCE = 1.38

ANALYZING AGENCY	80020	PH FIELD		7.9
DEPTH(FT.FR.SURFACE)	115	URANIUM TOTAL	UG/L	46.0
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		18.0

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WATER QUALITY ANALYSIS
LAB ID # 291604 RECORD # 33873

SAMPLE LOCATION: FISH LAKE NO12A-135
STATION ID: 291604 LAT.LONG.SEQ.: 375223 1175649
DATE OF COLLECTION: BEGIN--790917 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS: JNIQUE-#:

ALK,TOT(CACO3)	MG/L	170	PH FIELD		8.0
ALUMINUM DISSOLVED	UG/L	40	PH LAB		8.1
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.05
BORON DISSOLVED	UG/L	6000	PHOSPHATE DIS ORTHO	MG/L	0.15
CALCIUM DISS	MG/L	79	POTASSIUM DISS	MG/L	31
CHLORIDE DISS	MG/L	340	POTASSIUM 40.D.PCI/L		23
DENSITY AT 20 C	DETR. DELETED		RESIDUE DIS CALC SUM	MG/L	896
DEPTH(FT.FR.SURFACE)		135	RESIDUE DIS TON/AFT		1.14
FLUORIDE DISS	MG/L	0.8	RESIDUE DIS 180C	MG/L	836
HARDNESS NONCARB	MG/L	89	SAR		4.9
HARDNESS TOTAL	MG/L	250	SILICA DISSOLVED	MG/L	65
IRON DISSOLVED	UG/L	40	SODIUM + POTASSIUM	MG/L	210
LITHIUM DISSOLVED	UG/L	890	SODIUM DISS	MG/L	180
MAGNESIUM DISS	MG/L	15	SODIUM PERCENT		57
MANGANESE DISSOLVED	UG/L	220	SP. CONDUCTANCE LAB		1528
NO2+NO3 AS N DISS	MG/L	0.02	SULFATE DISS	MG/L	76
			WATER TEMP (DEG C)		19.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	79	3.942	CHLORIDE DISS	340	9.591
MAGNESIUM DISS	15	1.234	FLUORIDE DISS	0.8	0.042
POTASSIUM DISS	31	0.793	SULFATE DISS	76	1.582
SODIUM DISS	180	7.830	ALK,TOT(CACO3)	170	3.397
			NO2+NO3 AS N D	0.02	0.001
TOTAL		13.799	TOTAL		14.614

PERCENT DIFFERENCE = -2.87

ANALYZING AGENCY	80020	PH FIELD		8.0
DEPTH(FT.FR.SURFACE)	135	URANIUM TOTAL	UG/L	10.5
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		19.0

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WATER QUALITY ANALYSIS
LAB ID # 291605 RECORD # 33876

SAMPLE LOCATION: FISH LAKE N012A-155
STATION ID: 291605 LAT.LONG.SEQ.: 375223 1175649
DATE OF COLLECTION: BEGIN--790915 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS: UNIQUE-#:
RERUN: CA DISS=63 MG DISS=11 NA DISS=120 CL DISS=350 SO4 DISS=110

ALK,TOT(CAC03)	MG/L	110	PH FIELD		8.0
ALUMINUM DISSOLVED	UG/L	240	PH LAB		7.8
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.04
BORON DISSOLVED	UG/L	4000	PHOSPHATE DIS ORTHO	MG/L	0.12
CALCIUM DISS	MG/L	65	POTASSIUM DISS	MG/L	21
CHLORIDE DISS	MG/L	330	POTASSIUM 40,D.PCI/L		16
DENSITY AT 20 C		DETR. DELETED	RESIDUE DIS CALC SUM	MG/L	786
DEPTH(FT.FR.SURFACE)		155	RESIDUE DIS TON/AFT		1.19
FLUORIDE DISS	MG/L	0.4	RESIDUE DIS 180C	MG/L	878
HARDNESS NONCARB	MG/L	98	SAR		3.6
HARDNESS TOTAL	MG/L	210	SILICA DISSOLVED	MG/L	69
IRON DISSOLVED	UG/L	280	SODIUM + POTASSIUM	MG/L	140
LITHIUM DISSOLVED	UG/L	420	SODIUM DISS	MG/L	120
MAGNESIUM DISS	MG/L	11	SODIUM PERCENT		53
MANGANESE DISSOLVED	UG/L	60	SP. CONDUCTANCE LAB		1485
NO2+NO3 AS N DISS	MG/L	0.01	SULFATE DISS	MG/L	98
			WATER TEMP (DEG C)		18.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	65	3.244	CHLORIDE DISS	330	9.309
MAGNESIUM DISS	11	0.905	FLUORIDE DISS	0.4	0.021
POTASSIUM DISS	21	0.537	SULFATE DISS	98	2.040
SODIUM DISS	120	5.220	ALK,TOT(CAC03)	110	2.198
			NO2+NO3 AS N D	0.01	0.001
TOTAL		9.905	TOTAL		13.569

PERCENT DIFFERENCE = -15.61

ANALYZING AGENCY	80020	PH FIELD		8.0
DEPTH(FT.FR.SURFACE)	155	URANIUM TOTAL	UG/L	10.0
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		18.0

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WATER QUALITY ANALYSIS
LAB ID # 291001 RECORD # 33940

SAMPLE LOCATION: FISH LAKE N012A-275
STATION ID: 291001 LAI.LONG.SEQ.: 375223 1175649
DATE OF COLLECTION: BEGIN--790915 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS: UNIQUE-#:

ALK.TOT(CACO3)	MG/L	160	PH FIELD	8.1
ALUMINUM DISSOLVED	UG/L	30	PH LAB	7.9
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L 0.01
BORON DISSOLVED	UG/L	4700	PHOSPHATE DIS ORTHO	MG/L 0.03
CALCIUM DISS	MG/L	100	POTASSIUM DISS	MG/L 25
CHLORIDE DISS	MG/L	280	POTASSIUM 40.D.PCI/L	19
DENSITY AT 20 C		0.999	RESIDUE DIS CALC SUM	MG/L 863
DEPTH(FT.FR.SURFACE)		275	RESIDUE DIS TON/AFT	1.13
FLUORIDE DISS	MG/L	0.5	RESIDUE DIS 180C	MG/L 830
HARDNESS NONCARB	MG/L	180	SAR	3.3
HARDNESS TOTAL	MG/L	340	SILICA DISSOLVED	MG/L 63
IRON DISSOLVED	UG/L	20	SODIUM + POTASSIUM	MG/L 170
LITHIUM DISSOLVED	UG/L	450	SODIUM DISS	MG/L 140
MAGNESIUM DISS	MG/L	23	SODIUM PERCENT	52
MANGANESE DISSOLVED	UG/L	30	SP. CONDUCTANCE LAB	1415
NO2+NO3 AS N DISS	MG/L	0.03	SULFATE DISS	MG/L 130
			WATER TEMP (DEG C)	20.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	100	4.990	CHLORIDE DISS	280	7.899
MAGNESIUM DISS	23	1.892	FLUORIDE DISS	0.5	0.026
POTASSIUM DISS	25	0.639	SULFATE DISS	130	2.707
SODIUM DISS	140	6.090	ALK.TOT(CACO3)	160	3.197
			NO2+NO3 AS N D	0.03	0.002
TOTAL		13.611	TOTAL		13.831

PERCENT DIFFERENCE = -0.80

ANALYZING AGENCY	80020	PH FIELD	8.1
DEPTH(FT.FR.SURFACE)	275	GRANIUM TOTAL	UG/L 7.4
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)	20.0

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WATER QUALITY ANALYSIS
LAB ID # 291519 RECORD # 33918

SAMPLE LOCATION: BIG SMOKEY N013-245
STATION ID: 291519 LAT.LONG.SEQ.: 380226 1173821
DATE OF COLLECTION: BEGIN--790912 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS:

ALK.TOT(CACO3)	MG/L	190	PH FIELD	8.5
ALUMINUM DISSOLVED	UG/L	220	PH LAB	8.0
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L 0.05
BORON DISSOLVED	UG/L	500	PHOSPHATE DIS ORTHO	MG/L 0.15
CALCIUM DISS	MG/L	10	POTASSIUM DISS	MG/L 15
CHLORIDE DISS	MG/L	210	POTASSIUM 40+D.PCI/L	11
DENSITY AT 20 C		0.999	RESIDUE DIS CALC SUM	MG/L 744
DEPTH(FT.FR.SURFACE)		245	RESIDUE DIS TON/AFT	1.01
FLUORIDE DISS	MG/L	2.7	RESIDUE DIS 1000	MG/L 741
HARDNESS NONCARB	MG/L	0	SAR	19
HARDNESS TOTAL	MG/L	33	SILICA DISSOLVED	MG/L 74
IRON DISSOLVED	UG/L	620	SODIUM + POTASSIUM	MG/L 260
LITHIUM DISSOLVED	UG/L	150	SODIUM DISS	MG/L 240
MAGNESIUM DISS	MG/L	2.0	SODIUM PERCENT	91
MANGANESE DISSOLVED	UG/L	10	SP. CONDUCTANCE LAB	1217
NO2+NO3 AS N DISS	MG/L	0.09	SULFATE DISS	MG/L 74
			WATER TEMP (DEG C)	9.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	10	0.499	CHLORIDE DISS	210	5.924
MAGNESIUM DISS	2.0	0.165	FLUORIDE DISS	2.7	0.142
POTASSIUM DISS	15	0.384	SULFATE DISS	74	1.541
SODIUM DISS	240	10.440	ALK.TOT(CACO3)	190	3.796
			NO2+NO3 AS N D	0.09	0.006
TOTAL		11.487	TOTAL		11.410

PERCENT DIFFERENCE = 0.34

ANALYZING AGENCY	80020	PH FIELD	8.5
DEPTH(FT.FR.SURFACE)	245	URANIUM TOTAL	UG/L 8.5
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)	9.0

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WATER QUALITY ANALYSIS
LAB ID # 291601 RECORD # 33864

SAMPLE LOCATION: BIG SMOKEY NO13-395
STATION ID: 291601 LAT.LONG.SEQ.: 380226 1173821
DATE OF COLLECTION: BEGIN--790913 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS: UNIQUE-#:

ALK,TOT(CAC03)	MG/L	190	PH FIELD		8.3
ALUMINUM DISSOLVED	UG/L	150	PH LAB		7.7
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.07
BORON DISSOLVED	UG/L	2000	PHOSPHATE DIS ORTHO	MG/L	0.21
CALCIUM DISS	MG/L	26	POTASSIUM DISS	MG/L	39
CHLORIDE DISS	MG/L	640	POTASSIUM 40.D.PCI/L		29
DENSITY AT 20 C		0.999	RESIDUE DIS CALC SUM	MG/L	1430
DEPTH(FT.FR.SURFACE)		395	RESIDUE DIS TON/AFT		1.93
FLUORIDE DISS	MG/L	2.4	RESIDUE DIS 180C	MG/L	1420
HARDNESS NONCARB	MG/L	0	SAR		21
HARDNESS TOTAL	MG/L	91	SILICA DISSOLVED	MG/L	71
IRON DISSOLVED	UG/L	170	SODIUM + POTASSIUM	MG/L	490
LITHIUM DISSOLVED	UG/L	1700	SODIUM DISS	MG/L	450
MAGNESIUM DISS	MG/L	6.3	SODIUM PERCENT		90
MANGANESE DISSOLVED	UG/L	50	SP. CONDUCTANCE LAB		2524
NO2+NO3 AS N DISS	MG/L	0.10	SULFATE DISS	MG/L	77
			WATER TEMP (DEG. C)		21.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	26	1.297	CHLORIDE DISS	640	18.054
MAGNESIUM DISS	6.3	0.518	FLUORIDE DISS	2.4	0.126
POTASSIUM DISS	39	0.997	SULFATE DISS	77	1.603
SODIUM DISS	450	19.575	ALK.TOT(CAC03)	190	3.796
			NO2+NO3 AS N D	0.10	0.007
TOTAL		22.388	TOTAL		23.587

PERCENT DIFFERENCE = -2.61

ANALYZING AGENCY	80020	PH FIELD		8.3
DEPTH(FT.FR.SURFACE)	395	URANIUM TOTAL	UG/L	14.0
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		21.0

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WATER QUALITY ANALYSIS
LAB ID # 291602 RECORD # 33867

SAMPLE LOCATION: BIG SMOKEY N013-495
STATION ID: 291602 LAT.LONG.SEQ.: 380226 1173821
DATE OF COLLECTION: BEGIN--790915 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS:

ALK,TOT(CAC03)	MG/L	320	PH FIELD		8.9
ALUMINUM DISSOLVED	UG/L	1200	PH LAB		8.1
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.16
BORON DISSOLVED	UG/L	2800	PHOSPHATE DIS ORTHO	MG/L	0.49
CALCIUM DISS	MG/L	7.6	POTASSIUM DISS	MG/L	7.2
CHLORIDE DISS	MG/L	26	POTASSIUM 40.D.PCI/L		5.4
DENSITY AT 20 C	DETR. DELETED		RESIDUE DIS CALC SUM	MG/L	586
DEPTH(FT.FR.SURFACE)		495	RESIDUE DIS TON/AFT		0.83
FLUORIDE DISS	MG/L	9.7	RESIDUE DIS 180C	MG/L	611
HARDNESS NONCARB	MG/L	0	SAR		17
HARDNESS TOTAL	MG/L	23	SILICA DISSOLVED	MG/L	85
IRON DISSOLVED	UG/L	1000	SODIUM + POTASSIUM	MG/L	200
LITHIUM DISSOLVED	UG/L	100	SODIUM DISS	MG/L	190
MAGNESIUM DISS	MG/L	1.0	SODIUM PERCENT		93
MANGANESE DISSOLVED	UG/L	20	SP. CONDUCTANCE LAB		823
NO2+NO3 AS N DISS	MG/L	1.0	SULFATE DISS	MG/L	58
			WATER TEMP (DEG C)		22.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	7.6	0.379	CHLORIDE DISS	26	0.733
MAGNESIUM DISS	1.0	0.082	FLUORIDE DISS	9.7	0.511
POTASSIUM DISS	7.2	0.184	SULFATE DISS	58	1.208
SODIUM DISS	190	8.265	ALK,TOT(CAC03)	320	6.394
			NO2+N03 AS N D	1.0	0.071
TOTAL		8.911	TOTAL		8.917

PERCENT DIFFERENCE = -0.03

ANALYZING AGENCY	80020	PH FIELD		8.9
DEPTH(FT.FR.SURFACE)	495	URANIUM TOTAL	UG/L	19.3
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		22.0

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WATER QUALITY ANALYSIS
LAB ID # 291620 RECORD # 33921

SAMPLE LOCATION: BIG SMOKEY NO13-620
STATION ID: 291620 LAT.LONG.SEQ.: 380226 1173821
DATE OF COLLECTION: BEGIN--790912 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS: UNIQUE-#:

ALK,TOT(CACO3)	MG/L	270	PH FIELD		8.8
ALUMINUM DISSOLVED	UG/L	20	PH LAB		8.1
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.16
BORON DISSOLVED	UG/L	4000	PHOSPHATE DIS ORTHO	MG/L	0.49
CALCIUM DISS	MG/L	3.0	POTASSIUM DISS	MG/L	10
CHLORIDE DISS	MG/L	300	POTASSIUM 40,0.PCI/L		7.5
DENSITY AT 20 C	DETR. DELETED		RESIDUE DIS CALC SUM	MG/L	1020
DEPTH(FT.FR.SURFACE)		620	RESIDUE DIS TON/AFT		1.43
FLUORIDE DISS	MG/L	11	RESIDUE DIS 180C	MG/L	1050
HARDNESS NONCARB	MG/L	0	SAR		54
HARDNESS TOTAL	MG/L	8	SILICA DISSOLVED	MG/L	86
IRON DISSOLVED	UG/L	100	SODIUM + POTASSIUM	MG/L	360
LITHIUM DISSOLVED	UG/L	170	SODIUM DISS	MG/L	350
MAGNESIUM DISS	MG/L	0.1	SODIUM PERCENT		97
MANGANESE DISSOLVED	UG/L	4	SP. CONDUCTANCE LAB		1680
NO2+NO3 AS N DISS	MG/L	0.04	SULFATE DISS	MG/L	97
			WATER TEMP (DEG C)		24.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	3.0	0.150	CHLORIDE DISS	300	8.463
MAGNESIUM DISS	0.1	0.008	FLUORIDE DISS	11	0.579
POTASSIUM DISS	10	0.250	SULFATE DISS	97	2.020
SODIUM DISS	350	15.225	ALK,TOT(CACO3)	270	5.395
			NO2+NO3 AS N D	0.04	0.003
TOTAL		15.639	TOTAL		16.459

PERCENT DIFFERENCE = -2.56

ANALYZING AGENCY	80020	PH FIELD		8.8
DEPTH(FT.FR.SURFACE)	620	URANIUM TOTAL	UG/L	9.4
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		24.0

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WATER QUALITY ANALYSIS
LAB ID # 291615 RECORD # 33906

SAMPLE LOCATION: BIG SMOKEY NO14-135
STATION ID: 291615 LAT.LONG.SEQ.: 375720 1174143
DATE OF COLLECTION: BEGIN--790912 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS:

ALK.TOT(CACO3)	MG/L	590	PH FIELD		8.3
ALUMINUM DISSOLVED	UG/L	170	PH LAB		8.4
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.07
BORON DISSOLVED	UG/L	11000	PHOSPHATE DIS ORTHO	MG/L	0.21
CALCIUM DISS	MG/L	13	POTASSIUM DISS	MG/L	58
CHLORIDE DISS	MG/L	420	POTASSIUM 40.D.PCI/L		43
DENSITY AT 20 C		1.000	RESIDUE DIS CALC SUM	MG/L	1750
DEPTH(FT.FR.SURFACE)		135	RESIQUE DIS TON/AFT		2.31
FLUORIDE DISS	MG/L	1.9	RESIQUE DIS 180C	MG/L	1700
HARDNESS NONCARB	MG/L	0	SAR		34
HARDNESS TOTAL	MG/L	60	SILICA DISSOLVED	MG/L	82
IRON DISSOLVED	UG/L	350	SODIUM + POTASSIUM	MG/L	660
LITHIUM DISSOLVED	UG/L	1300	SODIUM DISS	MG/L	600
MAGNESIUM DISS	MG/L	6.7	SODIUM PERCENT		91
MANGANESE DISSOLVED	UG/L	30	SP. CONDUCTANCE LAB		2750
NO2+NO3 AS N DISS	MG/L	0.09	SULFATE DISS	MG/L	200
			WATER TEMP (DEG C)		18.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	13	0.649	CHLORIDE DISS	420	11.848
MAGNESIUM DISS	6.7	0.551	FLUORIDE DISS	1.9	0.100
POTASSIUM DISS	58	1.483	SULFATE DISS	200	4.164
SODIUM DISS	600	26.100	ALK.TOT(CACO3)	590	11.788
			NO2+NO3 AS N D	0.09	0.006
TOTAL		28.783	TOTAL		27.907

PERCENT DIFFERENCE = 1.55

ANALYZING AGENCY	80020	PH FIELD		8.3
DEPTH(FT.FR.SURFACE)	135	URANIUM TOTAL	UG/L	39.0
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		18.0

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WATER QUALITY ANALYSIS
LAB ID # 291617 RECORD # 33912

SAMPLE LOCATION: BIG SMOKEY NO14-195
STATION ID: 291617 LAT.LONG.SEQ.: 375720 1174143
DATE OF COLLECTION: BEGIN--790912 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS:

ALK.TOT(CAC03)	MG/L	640	PH FIELD		8.3
ALUMINUM DISSOLVED	UG/L	80	PH LAB		8.4
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.07
BORON DISSOLVED	UG/L	14000	PHOSPHATE DIS ORTHO	MG/L	0.21
CALCIUM DISS	MG/L	12	POTASSIUM DISS	MG/L	58
CHLORIDE DISS	MG/L	490	POTASSIUM 40.D.PCI/L		43
DENSITY AT 20 C		1.000	RESIDUE DIS CALC SUM	MG/L	1920
DEPTH(FT.FR.SURFACE)		195	RESIDUE DIS TON/AFT		2.58
FLUORIDE DISS	MG/L	2.7	RESIDUE DIS 180C	MG/L	1900
HARDNESS NONCARB	MG/L	0	SAR		37
HARDNESS TOTAL	MG/L	60	SILICA DISSOLVED	MG/L	78
IRON DISSOLVED	UG/L	880	SODIUM + POTASSIUM	MG/L	710
LITHIUM DISSOLVED	UG/L	820	SODIUM DISS	MG/L	650
MAGNESIUM DISS	MG/L	7.3	SODIUM PERCENT		91
MANGANESE DISSOLVED	UG/L	50	SP. CONDUCTANCE LAB		3107
NO2+NO3 AS N DISS	MG/L	0.07	SULFATE DISS	MG/L	220
			WATER TEMP (DEG C)		21.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	12	0.599	CHLORIDE DISS	490	13.823
MAGNESIUM DISS	7.3	0.601	FLUORIDE DISS	2.7	0.142
POTASSIUM DISS	58	1.483	SULFATE DISS	220	4.580
SODIUM DISS	650	28.275	ALK.TOT(CAC03)	640	12.787
			NO2+NO3 AS N D	0.07	0.005
TOTAL		30.957	TOTAL		31.338

PERCENT DIFFERENCE = -0.61

ANALYZING AGENCY	80020	PH FIELD		8.3
DEPTH(FT.FR.SURFACE)	195	URANIUM TOTAL	UG/L	32.0
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		21.0

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WATER QUALITY ANALYSIS
LAB ID # 291610 RECORD # 33891

SAMPLE LOCATION: ALKALI FLAT N015-435
STATION ID: 291610 LAT.LONG.SEQ.: 375113 1172345
DATE OF COLLECTION: BEGIN--790929 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS:

ALK,TOT(CACO3)	MG/L	390	PH FIELD		8.8
ALUMINUM DISSOLVED	UG/L	630	PH LAB		8.2
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.14
BORON DISSOLVED	UG/L	3300	PHOSPHATE DIS ORTHO	MG/L	0.43
CALCIUM DISS	MG/L	2.4	POTASSIUM DISS	MG/L	16
CHLORIDE DISS	MG/L	310	POTASSIUM 40.D.PCI/L		12
DENSITY AT 20 C	DETR. DELETED		RESIDUE DIS CALC SUM	MG/L	1380
DEPTH(FT.FR.SURFACE)		435	RESIDUE DIS TON/AFT		1.89
FLUORIDE DISS	MG/L	3.5	RESIDUE DIS 180C	MG/L	1390
HARDNESS NONCARB	MG/L	0	SAR		60
HARDNESS TOTAL	MG/L	13	SILICA DISSOLVED	MG/L	44
IRON DISSOLVED	UG/L	610	SODIUM + POTASSIUM	MG/L	520
LITHIUM DISSOLVED	UG/L	380	SODIUM DISS	MG/L	500
MAGNESIUM DISS	MG/L	1.7	SODIUM PERCENT		97
MANGANESE DISSOLVED	UG/L	20	SP. CONDUCTANCE LAB		2256
NO2+NO3 AS N DISS	MG/L	1.1	SULFATE DISS	MG/L	260
			WATER TEMP (DEG C)		21.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	2.4	0.120	CHLORIDE DISS	310	8.745
MAGNESIUM DISS	1.7	0.140	FLUORIDE DISS	3.5	0.184
POTASSIUM DISS	16	0.409	SULFATE DISS	260	5.413
SODIUM DISS	500	21.750	ALK,TOT(CACO3)	390	7.792
			NO2+NO3 AS N D	1.1	0.079
TOTAL		22.419	TOTAL		22.213

PERCENT DIFFERENCE = 0.46

ANALYZING AGENCY	80020	PH FIELD		8.8
DEPTH(FT.FR.SURFACE)	435	URANIUM TOTAL	UG/L	64.0
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		21.0

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WATER QUALITY ANALYSIS
LAB ID # 291614 RECORD # 33903

SAMPLE LOCATION: ALKALI FLAT N015-675
STATION ID: 291614 LAT.LONG.SEQ.: 375113 1172345
DATE OF COLLECTION: BEGIN--790917 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS: JN1QUE-#:

ALK,TOT(CACO3)	MG/L	300	PH FIELD		8.6
ALUMINUM DISSOLVED	UG/L	80	PH LAB		8.3
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.07
BORON DISSOLVED	UG/L	1900	PHOSPHATE DIS ORTHO	MG/L	0.21
CALCIUM DISS	MG/L	4.0	POTASSIUM DISS	MG/L	15
CHLORIDE DISS	MG/L	160	POTASSIUM 40,D.PCI/L		11
DENSITY AT 20 C		1.001	RESIDUE DIS CALC SUM	MG/L	1200
DEPTH(FT.FR.SURFACE)		675	RESIDUE DIS TON/AFT		1.62
FLUORIDE DISS	MG/L	2.7	RESIDUE DIS 180C	MG/L	1190
HARDNESS NONCARB.	MG/L	0	SAR		40
HARDNESS TOTAL	MG/L	18	SILICA DISSOLVED	MG/L	57
IRON DISSOLVED	UG/L	80	SODIUM + POTASSIUM	MG/L	410
LITHIUM DISSOLVED	UG/L	290	SODIUM DISS	MG/L	390
MAGNESIUM DISS	MG/L	1.9	SODIUM PERCENT		96
MANGANESE DISSOLVED	UG/L	4	SP. CONDUCTANCE LAB		1847
NO2+NO3 AS N DISS	MG/L	0.34	SULFATE DISS	MG/L	390
			WATER TEMP (DEG C)		23.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	4.0	0.200	CHLORIDE DISS	160	4.514
MAGNESIUM DISS	1.9	0.156	FLUORIDE DISS	2.7	0.142
POTASSIUM DISS	15	0.384	SULFATE DISS	390	8.120
SODIUM DISS	390	16.965	ALK,TOT(CACO3)	300	5.994
			NO2+NO3 AS N D	0.34	0.024
TOTAL		17.704	TOTAL		18.794

PERCENT DIFFERENCE = -2.98

ANALYZING AGENCY	80020	PH FIELD		8.6
DEPTH(FT.FR.SURFACE)	675	URANIUM TOTAL	UG/L	8.2
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		23.0

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WATER QUALITY ANALYSIS
LAB ID # 291611 RECORD # 33894

SAMPLE LOCATION: ALKALI FLAT N016-100
STATION ID: 291611 LAT.LONG.SEQ.: 375433 1172503
DATE OF COLLECTION: BEGIN--790929 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS:

ALK,TOT(CAC03)	MG/L	180	PH FIELD		8.2
ALUMINUM DISSOLVED	UG/L	180	PH LAB		7.8
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.05
BORON DISSOLVED	UG/L	5200	PHOSPHATE DIS ORTHO	MG/L	0.15
CALCIUM DISS	MG/L	49	POTASSIUM DISS	MG/L	32
CHLORIDE DISS	MG/L	220	POTASSIUM 40.D.PCI/L		24
DENSITY AT 20 C		DETR. DELETED	RESIDUE DIS CALC SUM	MG/L	1030
DEPTH(FT.FR.SURFACE)		100	RESIDUE DIS TON/AFT		1.40
FLUORIDE DISS	MG/L	2.7	RESIDUE DIS 180C	MG/L	1030
HARDNESS NONCARB	MG/L	0	SAR		9.7
HARDNESS TOTAL	MG/L	160	SILICA DISSOLVED	MG/L	31
IRON DISSOLVED	UG/L	120	SODIUM + POTASSIUM	MG/L	310
LITHIUM DISSOLVED	UG/L	180	SODIUM DISS	MG/L	280
MAGNESIUM DISS	MG/L	8.6	SODIUM PERCENT		75
MANGANESE DISSOLVED	UG/L	240	SP. CONDUCTANCE LAB		1627
N02+N03 AS N DISS	MG/L	0.44	SULFATE DISS	MG/L	290
			WATER TEMP (DEG C)		20.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	49	2.445	CHLORIDE DISS	220	6.206
MAGNESIUM DISS	8.6	0.707	FLUORIDE DISS	2.7	0.142
POTASSIUM DISS	32	0.818	SULFATE DISS	290	6.038
SODIUM DISS	280	12.180	ALK,TOT(CAC03)	180	3.596
			N02+N03 AS N D	0.44	0.031
TOTAL		16.151	TOTAL		16.014

PERCENT DIFFERENCE = 0.43

ANALYZING AGENCY	80020	PH FIELD		8.2
DEPTH(FT.FR.SURFACE)	100	URANIUM TOTAL	UG/L	15.0
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		20.0

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WATER QUALITY ANALYSIS
LAB ID # 291613 RECORD # 33900

SAMPLE LOCATION: ALKALI FLAT NO16-315
STATION ID: 291613 LAT.LONG.SEQ.: 375433 1172503
DATE OF COLLECTION: BEGIN--790929 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS:

ALK,TOT(CAC03)	MG/L	200	PH FIELD		8.3
ALUMINUM DISSOLVED	UG/L	260	PH LAB		8.1
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.05
BORON DISSOLVED	UG/L	1900	PHOSPHATE DIS ORTHO	MG/L	0.15
CALCIUM DISS	MG/L	14	POTASSIUM DISS	MG/L	19
CHLORIDE DISS	MG/L	61	POTASSIUM 40,D.PCI/L		14
DENSITY AT 20 C	DETR. DELETED		RESIDUE DIS CALC SUM	MG/L	648
DEPTH(FT.FR.SURFACE)		315	RESIDUE DIS TON/AFT		0.85
FLUORIDE DISS	MG/L	2.1	RESIDUE DIS 180C	MG/L	624
HARDNESS NONCARB	MG/L	0	SAR		11
HARDNESS TOTAL	MG/L	51	SILICA DISSOLVED	MG/L	73
IRON DISSOLVED	UG/L	220	SODIUM + POTASSIUM	MG/L	200
LITHIUM DISSOLVED	UG/L	250	SODIUM DISS	MG/L	180
MAGNESIUM DISS	MG/L	3.8	SODIUM PERCENT		84
MANGANESE DISSOLVED	UG/L	10	SP. CONDUCTANCE LAB		947
NO2+NO3 AS N DISS	MG/L	0.56	SULFATE DISS	MG/L	170
			WATER TEMP (DEG C)		21.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	14	0.699	CHLORIDE DISS	61	1.721
MAGNESIUM DISS	3.8	0.313	FLUORIDE DISS	2.1	0.111
POTASSIUM DISS	19	0.486	SULFATE DISS	170	3.539
SODIUM DISS	180	7.830	ALK,TOT(CAC03)	200	3.996
			NO2+NO3 AS N D	0.56	0.040
TOTAL		9.327	TOTAL		9.407

PERCENT DIFFERENCE = -0.43

ANALYZING AGENCY	80020	PH FIELD		8.3
DEPTH(FT.FR.SURFACE)	315	URANIUM TOTAL	UG/L	59.0
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		21.0

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WATER QUALITY ANALYSIS
LAB ID # 291612 RECORD # 33897

SAMPLE LOCATION: ALKALI FLAT NO16-515
STATION ID: 291612 LAT.LONG.SEQ.: 375433 1172503
DATE OF COLLECTION: BEGIN--790929 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS:

ALK,TOT(CACO3)	MG/L	230	PH FIELD		8.4
ALUMINUM DISSOLVED	UG/L	250	PH LAB		8.3
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.05
BORON DISSOLVED	UG/L	2700	PHOSPHATE DIS ORTHO	MG/L	0.15
CALCIUM DISS	MG/L	12	POTASSIUM DISS	MG/L	20
CHLORIDE DISS	MG/L	65	POTASSIUM 40,D.PCI/L		15
DENSITY AT 20 C	DETR. DELETED		RESIDUE DIS CALC SUM	MG/L	781
DEPTH(FT.FR.SURFACE)		515	RESIDUE DIS TON/AFT		1.04
FLUORIDE DISS	MG/L	4.2	RESIDUE DIS 180C	MG/L	761
HARDNESS NONCARB	MG/L	0	SAR		15
HARDNESS TOTAL	MG/L	43	SILICA DISSOLVED	MG/L	84
IRON DISSOLVED	UG/L	320	SODIUM + POTASSIUM	MG/L	240
LITHIUM DISSOLVED	UG/L	490	SODIUM DISS	MG/L	220
MAGNESIUM DISS	MG/L	3.1	SODIUM PERCENT		88
MANGANESE DISSOLVED	UG/L	20	SP. CONDUCTANCE LAB		1133
NO2+NO3 AS N DISS	MG/L	0.08	SULFATE DISS	MG/L	230
			WATER TEMP (DEG C)		22.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	12	0.599	CHLORIDE DISS	65	1.834
MAGNESIUM DISS	3.1	0.255	FLUORIDE DISS	4.2	0.221
POTASSIUM DISS	20	0.511	SULFATE DISS	230	4.789
SODIUM DISS	220	9.570	ALK,TOT(CACO3)	230	4.595
			NO2+NO3 AS N D	0.08	0.006
TOTAL		10.935	TOTAL		11.444

PERCENT DIFFERENCE = -2.28

ANALYZING AGENCY	80020	PH FIELD		8.4
DEPTH(FT.FR.SURFACE)	515	URANIUM TOTAL	UG/L	19.0
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		22.0

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WATER QUALITY ANALYSIS
LAB ID # 291618 RECORD # 33915

SAMPLE LOCATION: STONEWALL FLAT NO18-455
STATION ID: 291618 LAT.LONG.SEQ.: 373231 1170730
DATE OF COLLECTION: BEGIN--790912 END-- TIME--
STATE CODE: 32 COUNTY CODE: PROJECT IDENTIFICATION: 943031093
DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
COMMENTS: UNIQUE-#:

ALK.TOT(CAC03)	MG/L	160	PH FIELD		8.4
ALUMINUM DISSOLVED	UG/L	50	PH LAB		8.2
ANALYZING AGENCY		80020	PHOS ORTHO DIS AS P	MG/L	0.04
BORON DISSOLVED	UG/L	790	PHOSPHATE DIS ORTHO	MG/L	0.12
CALCIUM DISS	MG/L	28	POTASSIUM DISS	MG/L	15
CHLORIDE DISS	MG/L	50	POTASSIUM 40.D.PCI/L		11
DENSITY AT 20 C	DETR. DELETED		RESIDUE DIS CALC SUM	MG/L	558
DEPTH(FT.FR.SURFACE)		455	RESIDUE DIS TON/AFT		0.71
FLUORIDE DISS	MG/L	3.3	RESIDUE DIS 180C	MG/L	521
HARDNESS NONCARB	MG/L	0	SAR		6.7
HARDNESS TOTAL	MG/L	84	SILICA DISSOLVED	MG/L	57
IRON DISSOLVED	UG/L	90	SODIUM + POTASSIUM	MG/L	160
LITHIUM DISSOLVED	UG/L	160	SODIUM DISS	MG/L	140
MAGNESIUM DISS	MG/L	3.4	SODIUM PERCENT		77
MANGANESE DISSOLVED	UG/L	50	SP. CONDUCTANCE LAB		791
NO2+NO3 AS N DISS	MG/L	0.81	SULFATE DISS	MG/L	160
			WATER TEMP (DEG C)		24.0

CATIONS			ANIONS		
	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	28	1.397	CHLORIDE DISS	50	1.411
MAGNESIUM DISS	3.4	0.280	FLUORIDE DISS	3.3	0.174
POTASSIUM DISS	15	0.384	SULFATE DISS	160	3.331
SODIUM DISS	140	6.090	ALK.TOT(CAC03)	160	3.197
			NO2+NO3 AS N D	0.81	0.058
TOTAL		8.150	TOTAL		8.170

PERCENT DIFFERENCE = -0.12

ANALYZING AGENCY	80020	PH FIELD		8.4
DEPTH(FT.FR.SURFACE)	455	URANIUM TOTAL	UG/L	5.4
LITHIUM-7/LITHIUM-6	DETR. DELETED	WATER TEMP (DEG C)		24.0

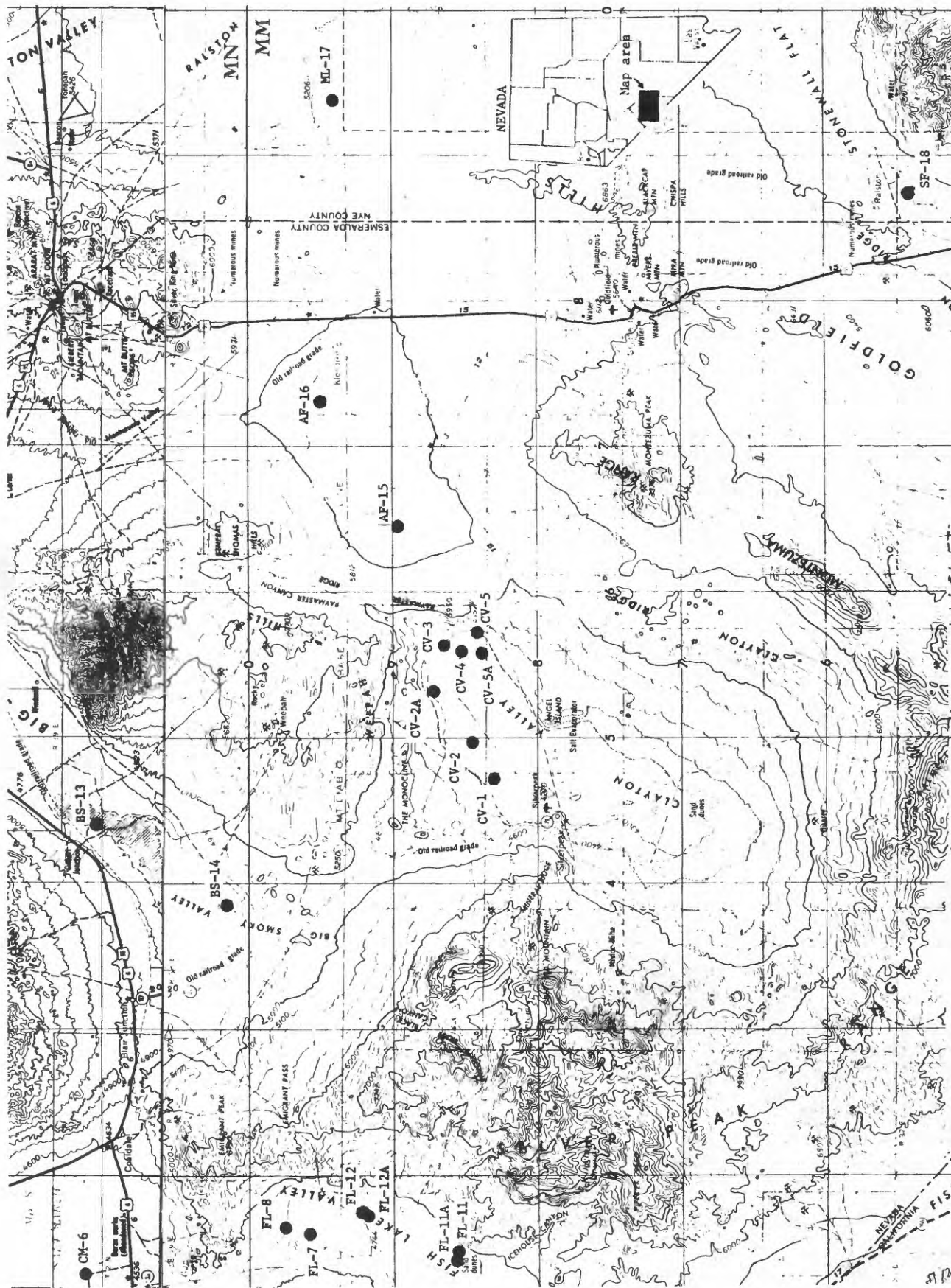


FIGURE 1.--Index map of a part of Esmeralda and Nye Counties, Nevada, showing location of drill sites.
Base from the Goldfield and Tonopah 250,000 scale maps.

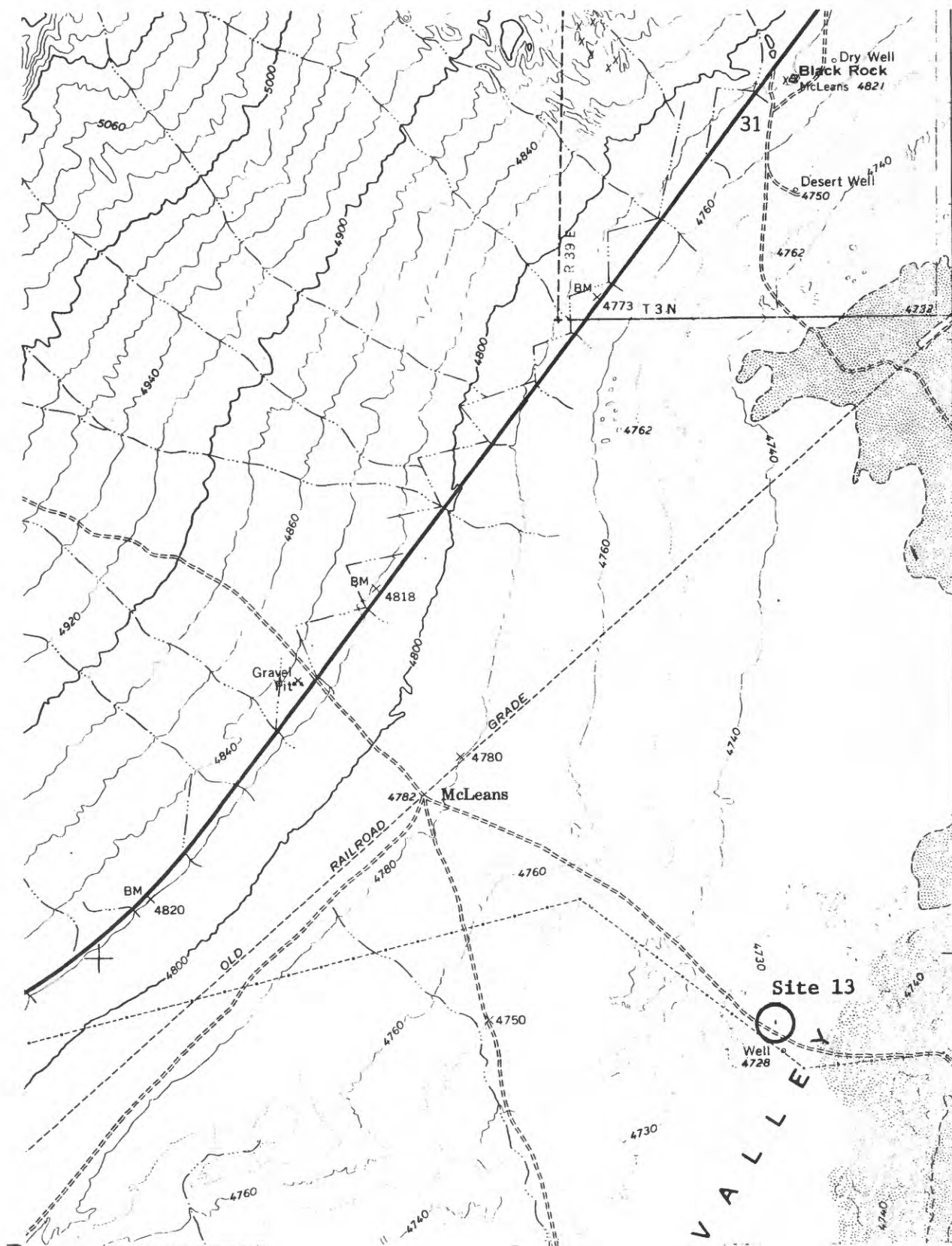


FIGURE 3.--Map of a part of the Devils Gate Quadrangle, Esmeralda County, Nevada, showing location of drill site 13. Scale: 1:24,000.

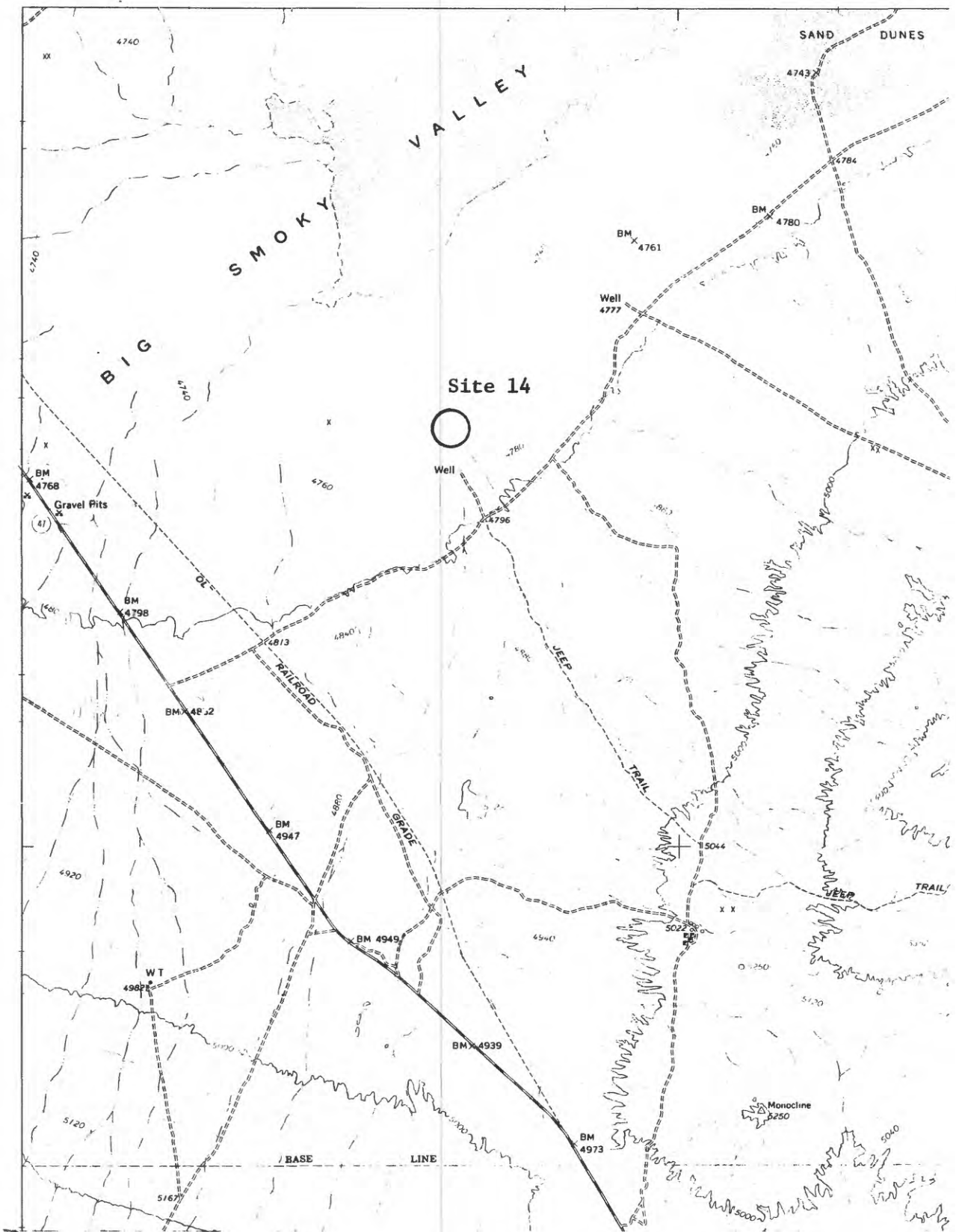


FIGURE 4.--Map of a part of the Silverpeak Quadrangle, Esmeralda County, Nevada, showing location of drill site 14. Scale: 1:62,500.

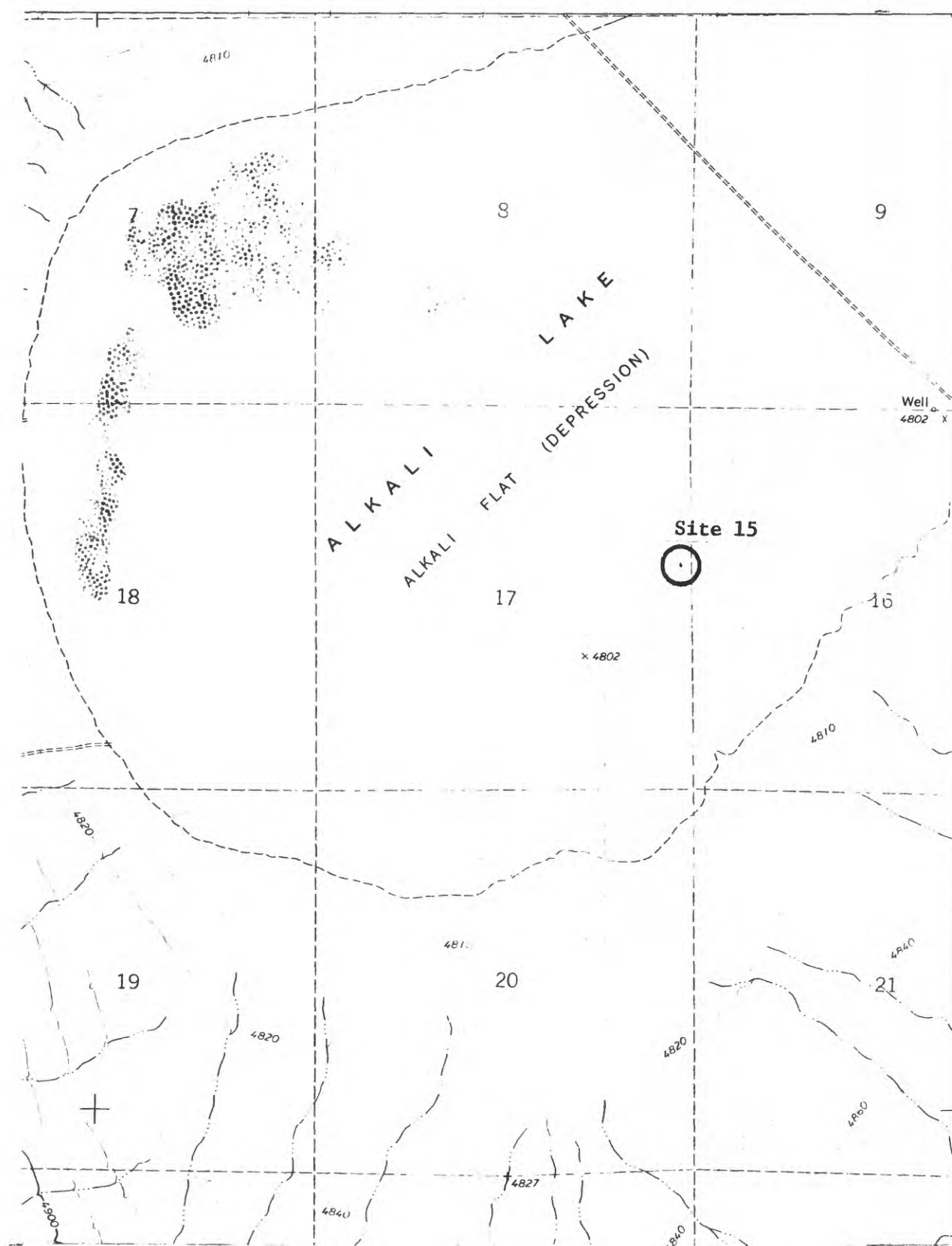


FIGURE 5.--Map of a part of Paymaster Ridge Quadrangle, Esmeralda County, Nevada showing location of drill site 15. Scale: 1:24,000.

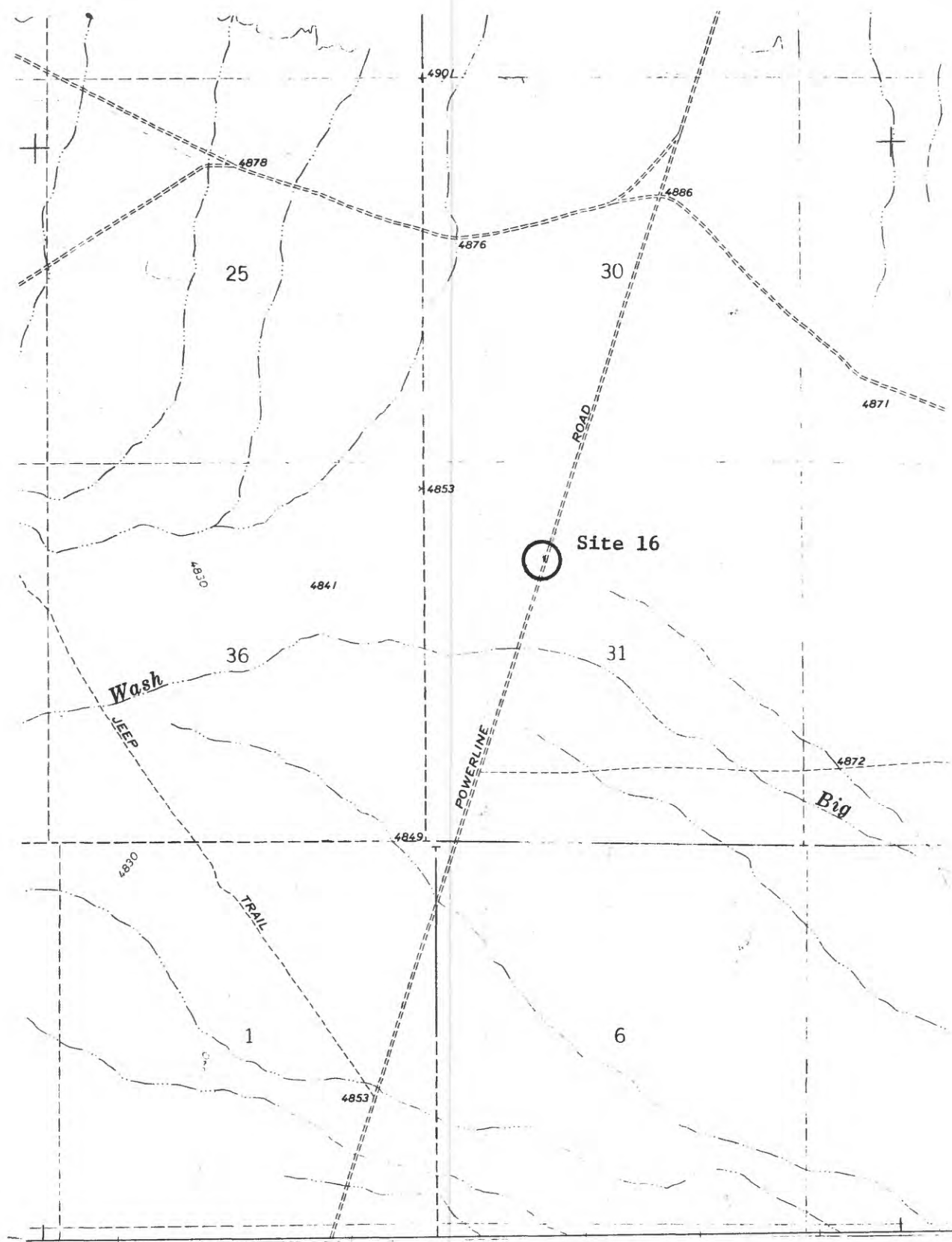


FIGURE 6.--Map of a part of the Klondike Quadrangle, Esmeralda County, Nevada showing location of drill site 16. Scale 1:24,000.

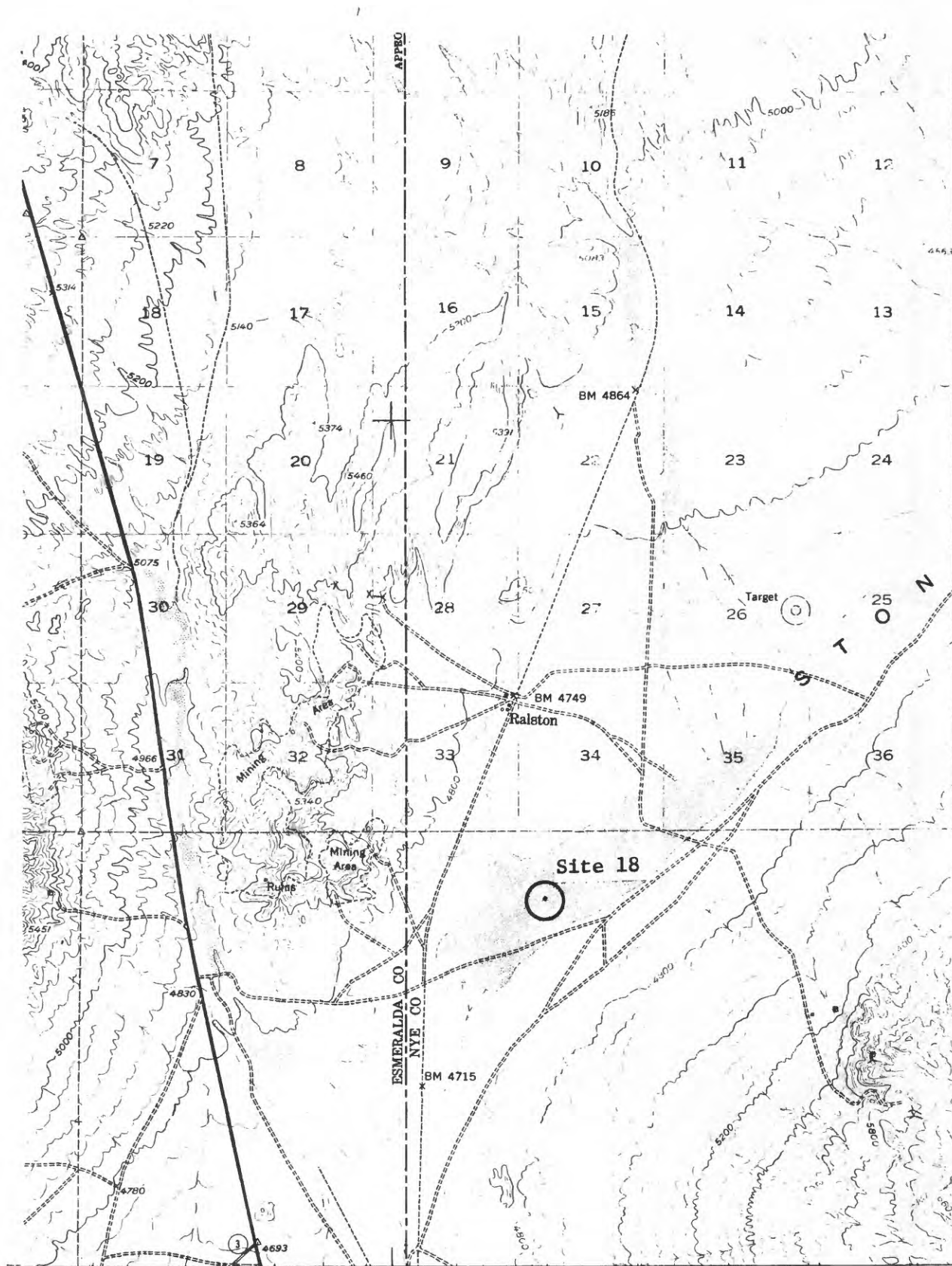


FIGURE 7.-- Map of a part of the Goldfield Quadrangle, Nye County, Nevada,
Showing location of drill site 18. Scale: 1:62,500.