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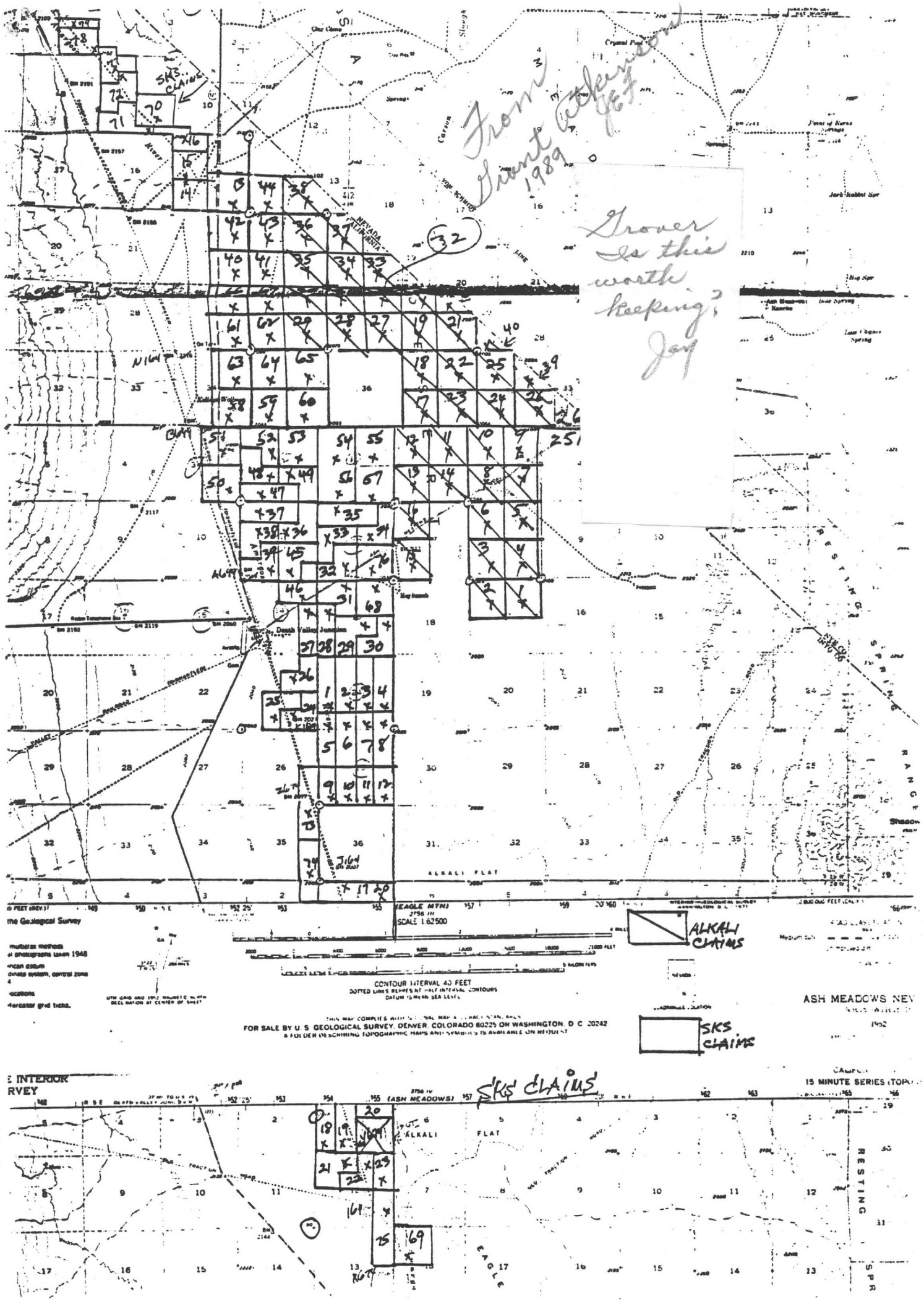
From Grant Atkinson 1989 JEF
Grover Is this worth keeping? Jay
SKS CLAIMS
NEVADA
CALIFORNIA
Death Valley Junction
ALKALI FLAT
RESTING SPRING RANGE
SCALE 1:62500
CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT HALF-INTERVAL CONTOURS
DATUM IS MEAN SEA LEVEL
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225 OR WASHINGTON, D.C. 20242
ALKALI CLAIMS
SKS CLAIMS
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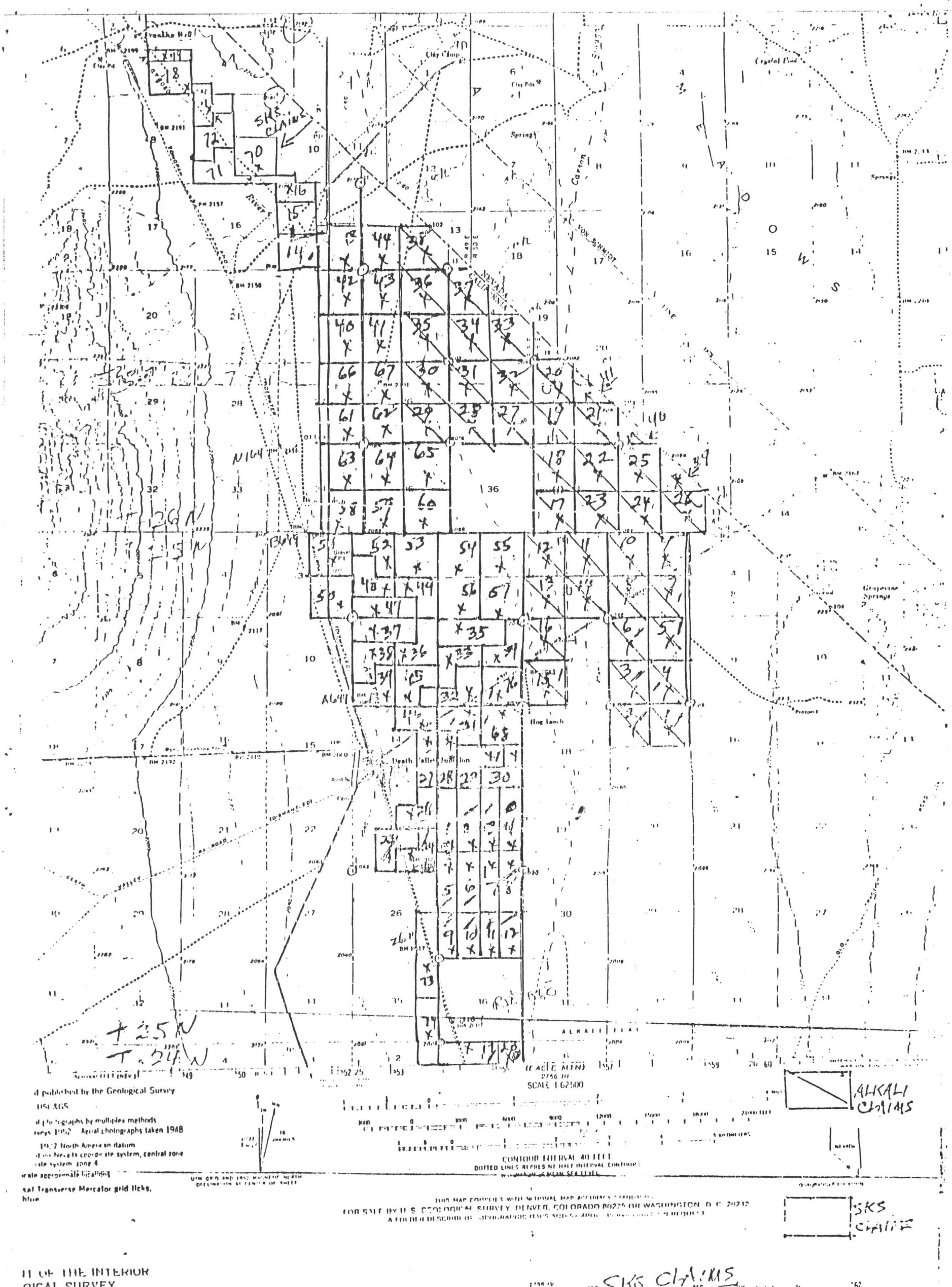
RESTING SPR


SKS CLAIMS
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EAGLE MTNS
SCALE 1:62500
CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT HALF INTERVAL CONTOURS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225 OR WASHINGTON, D.C. 20242
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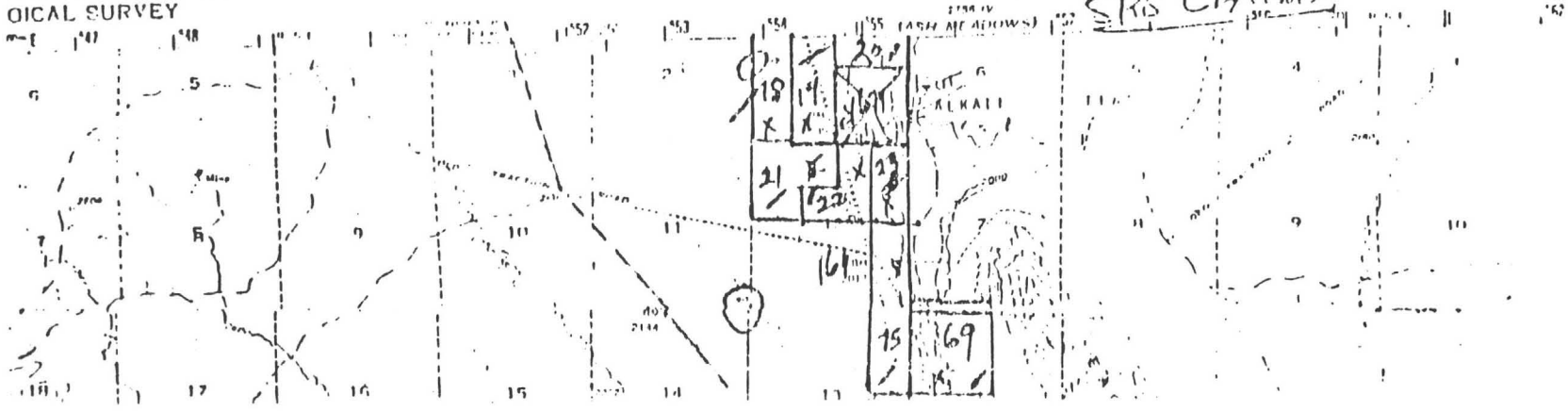

SKS CLAIMS
ALKALI

HEWLETT MINERAL MANAGEMENT

R. F. HEWLETT
Phone (619) 242-8277
242-5737

15110 Mandan
Apple Valley
California 92307

DEATH VALLEY JUNCTION SUMMARY:

THERE ARE THREE IMPORTANT PRECIOUS METAL OCCURRENCES IN THE DEATH VALLEY AREA, AS FOLLOWS:

1). GOLD AND SILVER PRECIPITATES IN THE BRINE.

2). PRECIOUS METALS IN THE PLAYA.

3). PRECIOUS METALS IN THE PLACER DEPOSITS AROUND THE PLAYA.

THE WATER TABLE IS ABOUT 10-FEET BELOW THE PLAYA SURFACE AND WOULD OBVIOUSLY BE USED FOR THE PRECIOUS METAL RECOVERY SYSTEM.

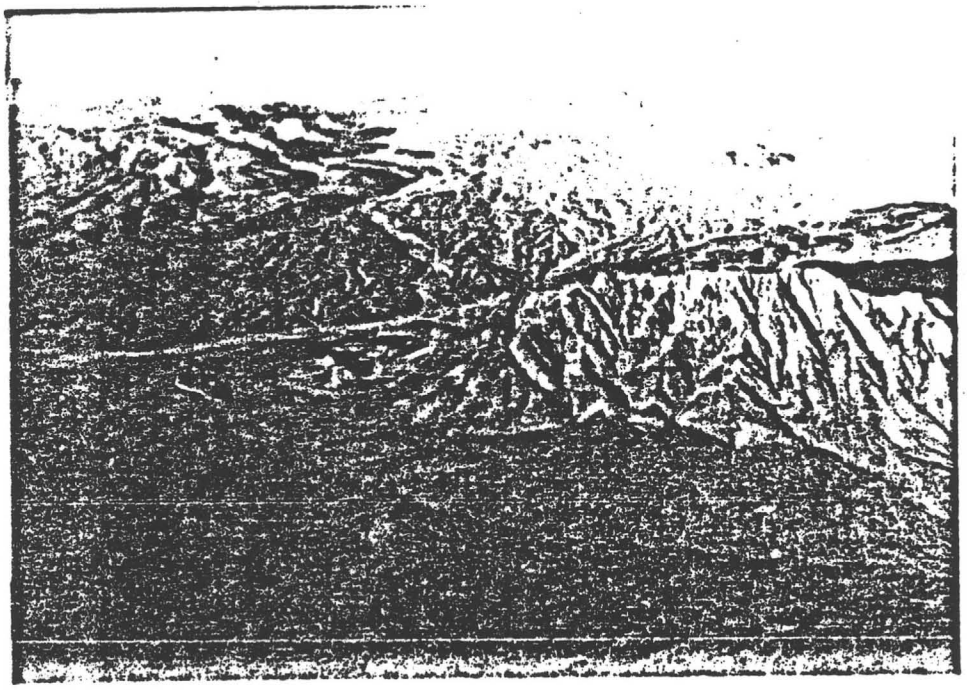
THE GOLD/SILVER IN THE BRINES WOULD BE RECOVERED FIRST IN THE SYSTEM(HYDROCYCLONES AND "REICHERT CONE").

THE "BARREN PRECIOUS METAL BRINE" WOULD THEN BE USED FOR RECOVERY OF THE COARSE GOLD IN "REICHERT SPIRALS" AND THE FINER GOLD/SILVER WOULD BE RECOVERED BY A "REICHERT CONE"(-20 MESH +200 MESH).

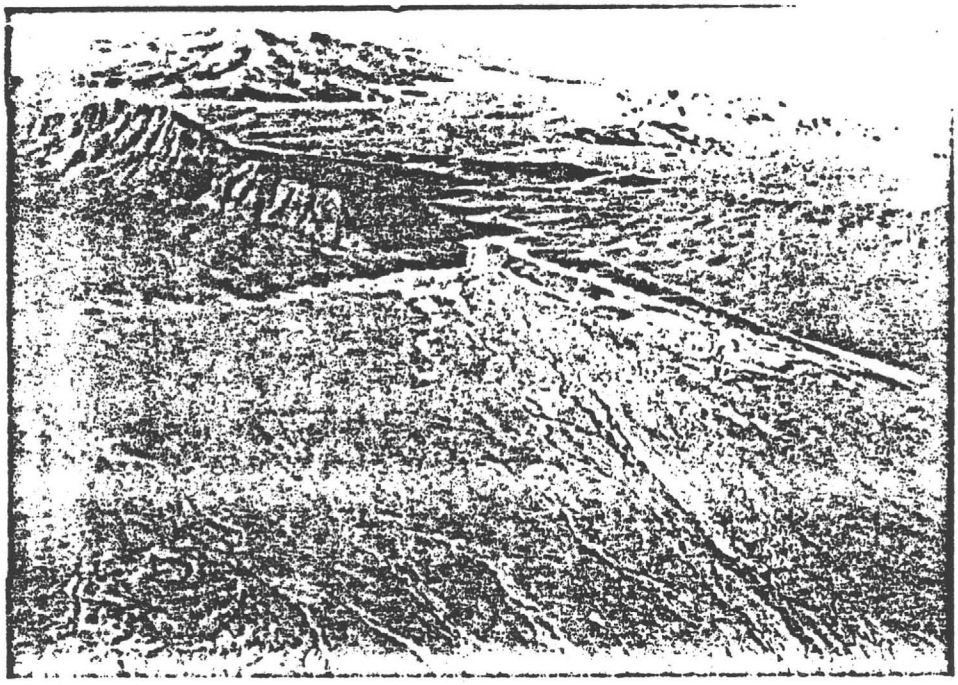
GOLD/SILVER BELOW 200 MESH WOULD BE RECOVERED BY THE "NEFF CONCENTRATOR".

GRADE CONTROL WOULD RESULT IN A "HEAD ORE" GROSS VALUE OF $12/TON AND THE UNIT OPERATING COSTS WOULD BE $2/TON FOR A 250 TPH OPERATION. THIS WOULD RESULT IN A NET OPERATING PROFIT OF $50,000/DAY PER 250 TON/HOUR MODULAR UNIT.

THE S.K.S. CLAIM GROUP IS NORTH IF EAGLE MOUNTAIN. THE FOLLOWING SUMMARY COVERS BOTH THE NORTH EAGLE CLAIMS AND THE S.K.S. CLAIMS BECAUSE THE EXPLORATION/DEVELOPMENT WORK WAS DONE ON BOTH TOGETHER.



Eagle Mtn.



"Alkali Lake-Franklin Lake"; playa lake.

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LAS VEGAS,
NEVADA 89126

KNOWN ECONOMIC MINERAL RESOURCES IN PLAYA LAKES ARE:

A). PRECIOUS METALS;

1. GOLD
2. SILVER
3. REPORTED PLATINUM GROUP;

B). LITHIUM.

C). TUNGSTEN.

D). URANIUM, THORIUM, RADIUM, AND STRONTIUM.

E). NITRATES.

F). BORATES.

G). SODIUM/POTASSIUM SALINE MINERALS.

H). HALIDES(CHLORIDES, FLUORIDES, AND BROMIDES).

I). ZEOLITES.

J). CLAY MINERALS- BENTONITE, HECTORITE, ETC.

RESUME OF NORTH EAGLE - S.K.S. CLAIMS

DEATH VALLEY JUNCTION, CALIFORNIA

CONTAINING ENGINEERING NOTES

BY

L. DEE KIRBY

AND

GEOLOGY REPORT

BY

MORRIS J. GUDAL

(Copied from original engineering notes and geology report June 16, 1975)

RESUME OF NORTH EAGLE - S.K.S. CLAIMS
(Death Valley Junction)

Geology Report

By

Morris J. Gadal

To Whom It May Concern:

The topography and drainage of the Death Valley Junction area are characteristic of the basin and range province, having closed basins separated by ranges, hills, mesas and internal drainage into enclosed basins.

The drainage appears to be mainly by subsurface flow of ground water. The water apparently flows through the alluvium and along solution cavities and fractures in Paleozoic carbonate rocks that underlie the basins and intervening highlands.

The Armargosa desert contains the discharge areas of ground water that have moved south and west from Ralston Valley, Mud Lake Valley, Stonewall Flat, Cactus Flat, Gold Flat, Reveille Valley, Karwich Valley, Oasis Valley, Yucca Flat and Frenchman Flat. It is estimated that 1.4 million acre feet of ground water is stored in the upper 100 feet of saturated alluvium in the Southern Armargosa, north of Eagle Peak.

Alluvial fans cover most of the desert basins, but playa deposits and basalt flows and coves are locally prominent. At Ash Meadows, sizable areas are covered by spring and alluvial deposits consisting of firmly cemented, pale gray or brown sand and silt with many casts and molds of plant stems.

The playa lake occupies low areas in the basin. The playa deposit consists of sand, silt and clay strata, white or pale gray and brown to green, with a few lenses of fine gravel. Tuffaceous beds of evaporites also are present.

Several prospects in upper areas are in Tuff and carry ore-grade values. Inasmuch as the lavas of intermediate composition are the principal ore bearers in adjacent areas, especially Tonopah, Beatty-Ryalite, Goldfield and Silver Horn where they also underlie the Tuff, the possibility exists that these lavas may be mineralized at depth. The possibility is strong in the fact that the atomic blasts on the north may have disturbed the area so much as to cause upheavals and distribute minerals into crevices and fractures, then through new water courses. These streams empty into the basin in the area of S.K.S claims. In fact, some of the minerals found in the area are known to have come from the north and were carried along through water flows.

Experiments and Testing

Several wells were drilled on S.K.S. and adjoining areas. Pumps were placed in wells and produced water sediments into settling tanks. These were assayed for silver and gold. Depending on which flow the materials came from, the assays were variable. However, the best results came from 25 feet to 35 feet flow. Bentonite layers are horizontal and tough. Several wells produced

The silver occurs as cerargyite (silver chloride), ruby silver and stephanite disseminated in pads of cemented gravels. Limonite is abundant due to oxidation of primary pyrite. Attached are photographs of 30X to 7X ¼ sec. to 1/16 sec. rating 3000 to 15000 on a powerful camera placed over sample. The assays ran from 13 oz. to 188 oz. per ton of sediment (silver). The tests indicated a profitable venture as extraction was simple.

A noted metallurgist produced platinum metals from the salts and water sediments by the chemical and electrolytic methods, a process of his own, and at this writing unknown to me. Serious consideration must be placed on these previous tests. In my opinion, I believe several wells must be drilled in several areas systematically and sampled. This can be done at very little cost.

Location

Properties of S.K.S. Mining Enterprises
T-24-N, T-25-N, T-26-N, R-5-E, R-6-E
Inyo County, California
The property consists of more than 10,000 acres (See attached map)

Conclusion

An economic study would provide more accurate estimates for operation. It is my belief that this can be accurately predicted only after drilling a series of holes into the major system at a depth no more than 40 feet, which is just below the second strata of bentonite into the second known flow of water sediments, to establish an assured tonnage flow of water.

It is vitally necessary to block out the flow by drilling to any other major undertaking on the property. It is quite possible that enriched silver zones, containing 100 oz. of silver per ton of sediments can be repeated over an area 6 miles in length along the old Armargosa River channel.

A specific program, with the objective of fully investigating an expected return on investment, would include the following:

1) Benefication tests on multiple samples taken from water flow in the major system. Results would determine whether or not specifications could be met and the cost per unit of product.

2) Contract drilling into and through the major system at a depth of no more than 40 feet to provide assured reserves over an operating life in excess of 15 years.

3) Measurement and calculation of those reserves available for low cost mining.

4) Detailed study of all costs, both operating and capital, which would be involved in operations sized over a range of daily production scheduled to fit predicted requirements.

5) Economic summary.

My recommendation at this time is to initiate Step No. 1 of this project.

If premium grade can be produced in the laboratory under favorable conditions, on all the representative samples of the major system of flow, the project should move into the development stage of perhaps 100 tons of water sediments per hour pumped. At the September, 1973, EMJ price of 2.99 per oz., this should be a profitable venture.

Respectfully submitted.

Morris J. Gudal

ASSAY INFORMATION

June 21, 1972	Assayed by Eisenhauer Laboratories. 1110 Edna Place, Covina, California. One sample, marked "No mark" Kirby Vein Gold: 0.016 oz. per ton Silver: 45.0 per ton
November 13, 1972	Assayed by Ledoux and Company, 359 Alfred Avenue, Teaneck, New Jersey. Sample, 1-B S.K.S. Claims Gold: 0.069 oz. Silver: 12.99 oz.
May 10, 1972	Assayed by Silver State Testing Laboratories, 3500 East Charleston Blvd., Las Vegas Nevada. One sample, marked "Bottom Well #1." Gold: Nil Silver: 188 oz. per ton
April 18, 1972	Assayed by Silver State Testing Laboratories, above address. Sample #1 Gold: 0.12 oz. Silver: 68.7 oz. ton of sediment Sample #4 Gold: Trace Silver: 18.2 oz. per ton of water
April 7, 1972	Assayed by Silver State Testing Laboratory, above address. Sample #1, bearing notation "Well where tanks are. This was taken before agitation of well." Gold: 0.46 oz. per ton Silver: 760 oz. per ton
May 4, 1972	Assayed by Silver State Testing Laboratory, above address. Sample, not numbered Gold: Trace Silver: 0.26 oz. per ton (Note: Soil sample ½ mile west of tank)

Sample, 1-B
Gold: 0.04 oz. per ton
Silver: 17.57 oz. per ton
(Note: East of tanks ½ mile)

Sample, 1-C
Gold: 0.08 oz. per ton
Silver: 39.92 oz. per ton
(Note: Artesian Well 8")

Sample 1-A
Gold: 0.08 oz. per ton
Silver: 44.09 oz. per ton
(Note: Tanks, ASR)

June 21, 1972 Assayed by Silver State Testing Laboratory, above address.
Sample, Red Well #25'
Gold: 0.062 oz. per ton
Silver: 13.75 oz. per ton

Sample, Red Well, 25'-30' depth
Gold: Nil
Silver: 0.62 oz. per ton

November 16, 1972 Assayed by American Analytical and Research Laboratory, 2226 East 40th Street, Tucson, Arizona.
Sample, marked S.K.S. 1-A
Gold: 0.106 oz. per ton
Silver: 42.13 oz. per ton

ANALYSIS BY SPECTROGRAPHIC MEANS RESULTS
(Note should be made that these results are in percentages on the water)

Salt Water		Rock		Fresh Water	
Sodium	37.0%	Silicon	13.0%	Silicon	14.94%
Potassium	1.8	Calcium	11.0	Lead	5.12
Silicon	.19	Potassium	9.5	Copper	4.40
Boron	.14	Alumina	7.8	Iron	2.30
Iron	.101	Magnesium	4.3	Boron	2.05
Calcium (Illegible)		Sodium	5.1	Calcium	1.9
Chromium	.032	Iron	2.0	Magnesium	1.5
Magnesium	.024	Titanium	.40	Sodium	1.5
Silver	.014	Strontium	.055	Alumina	1.12
Alumina	.012	Boron	.026	Potassium	.72
Copper	.0064	Lead	.025	Silver	26.8
Manganese	.0029	Chromium	.0089		

3226 East 46th Street

Phone 624-0049

AMERICAN ANALYTICAL and RESEARCH LABORATORIES

ASSAYERS · CHEMISTS · METALLURGISTS

TUCSON, ARIZONA 85713

SAMPLE SUBMITTED BY American Smelting & Refining Company

DATE November 14, 1972

SAMPLE MARKED	GOLD OZ./TON	SILVER OZ./TON	PER CENT COPPER	PERCENT LEAD	PERCENT ZINC	PERCENT MOLYBDENUM	PERCENT IRON	
SKS- 1-A	.106	42.13						

A. D. C.
NOV 16 1972

REGISTERED ASSAYER
ARIZONA U.S.
11/14/72

Invoice # 8557

CHARGES $ 4.00

ASSAYER - CHEMIST

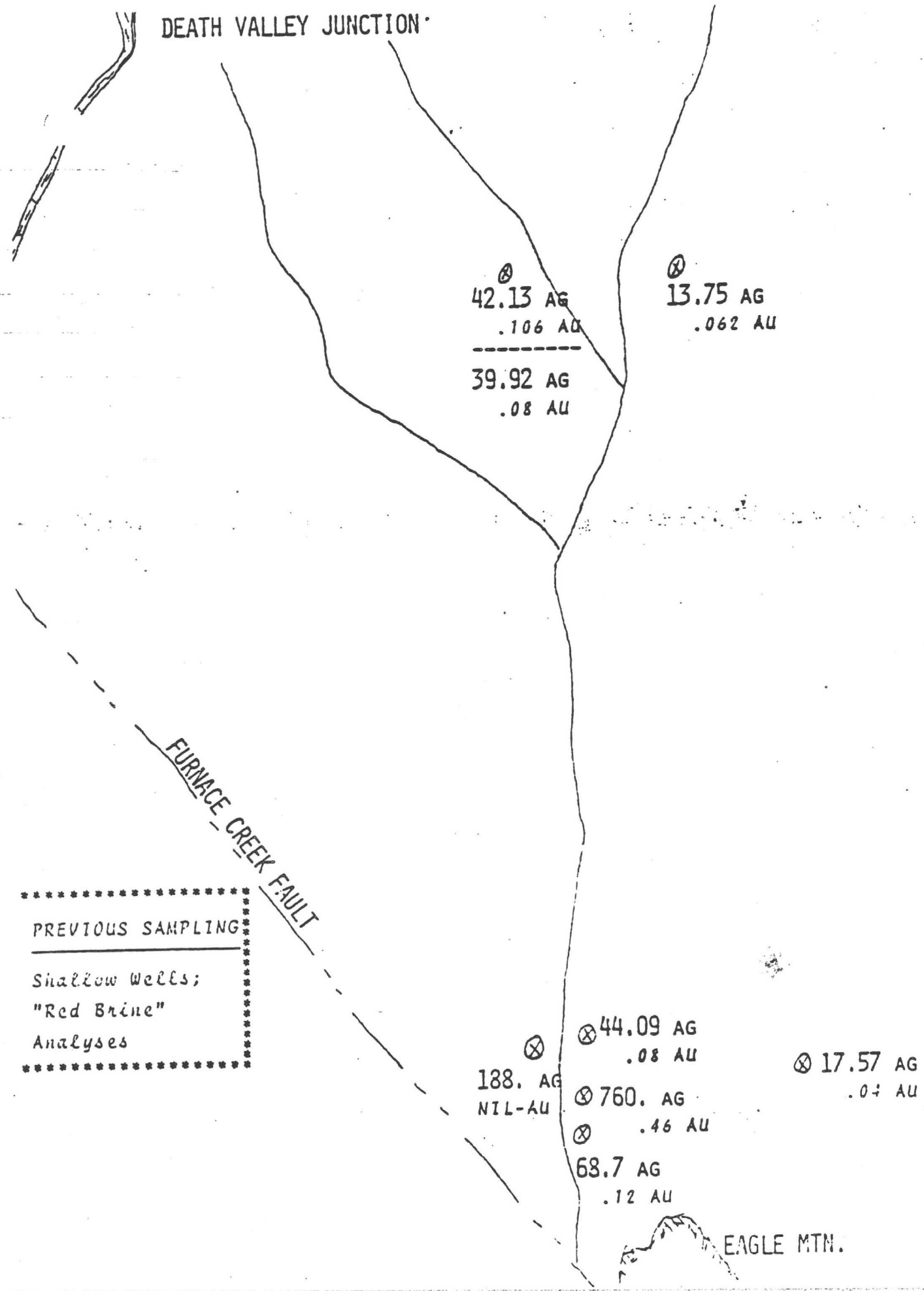
HEWLETT MINERAL MANAGEMENT

R. F. HEWLETT
PHONE (714) 242-8259

P. O. BOX 1058
LUCERNE VALLEY,
CALIFORNIA 92356

PREVIOUS SAMPLING

COMPANY	YEAR	REMARKS	TROY OUNCES/TON GOLD	SILVER
AMERICAN SMELTING AND REFINING	1972	ARTESIAN BRINES SECT. 19- ARTESIAN	.106	42.13
KIRBY	1972	MUCK-WATER WELL- SECTION 6-SW 1/4 . BOTTOM WELL #1- 24' LEVEL	NIL	188.
KIRBY	1972	WATER SEDIMENTS; SECTION 23-NE	.12	.63.7
		SAME(SAMPLE 4)	TR	18.2
KRIBY	1972	WATER SEDIMENTS; SECTION 6-NORTH	.46	760.
KIRBY	1972	WATER SEDIMENTS; SECTION 6	.04	17.57
KIRBY	1972	SOIL-NORTH SECT. 6	---	.26
KIRBY	1972	ARTESIAN WELL/SECT.19	.08	39.92
KIRBY	1972	WELL/SECT. 6(A)SW¼	.08	44.09
KIRBY	1972	ARTESIAN WELL/SECT.19	.062	13.75
"	"	SAME-LEDOUX CHECK	.069	12.99


DEATH VALLEY JUNCTION
42.13 AG
.106 AU
39.92 AG
.08 AU
13.75 AG
.062 AU
FURNACE CREEK FAULT
PREVIOUS SAMPLING
Shallow Wells;
"Red Brine"
Analyses
188. AG
NIL-AU
44.09 AG
.08 AU
760. AG
.46 AU
68.7 AG
.12 AU
17.57 AG
EAGLE MTN.

HEWLETT MINERAL MANAGEMENT

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NORTH EAGLE VENTURES

SUMMARY

PRECIOUS METAL RECOVERY FROM THE NORTH EAGLE CLAIMS REPRESENT AN INVESTMENT WITH SOME RISK BUT AT THE SAME TIME PRESENTS AN OPPORTUNITY FOR A VERY HIGH RETURN ON INVESTMENT.

PHILOSOPHY

PRESENT ECONOMIC FACTORS IN THE UNITED STATES(AND THE WORLD) MAKE NECESSARY THE DEVELOPMENT OF SMALLER PROJECTS; THOSE THAT HAVE A MINIMUM OF RISK AND CAPITAL INVESTMENT. THE CLOSING OF LARGE BASE AND PRECIOUS METAL MINES ARE RELATED TO LOWER METAL PRICES AND VERY HIGH INTEREST RATES.

NUMEROUS MINING COMPANIES AND MINERAL INVESTMENT GROUPS HAVE VERY RECENTLY STATED THAT THEY ARE INTERESTED IN VENTURES THAT MEET THE FOLLOWING CRITERION:

1). RELATIVELY SMALL PROJECTS/MINERAL DEPOSITS
2). VENTURES WHERE THE RISKS CAN INEXPENSIVELY BE ASSESSED
3). THE DEVELOPMENT COSTS ARE PART OF THE PRE-PRODUCTION
4). THE CAPITAL INVESTMENT FOR THE PROJECT IS A MINIMUM
5). OPERATIONAL EXPANSIONS CAN BE FINANCED FROM PROFITS.

IN SUMMARY, MINING COMPANIES ARE NOW SHIFTING FROM THE "HUGE" PROJECT CONCEPT TO THAT OF MANY SMALL PROJECTS-WITH LOWER RISK.

THE NORTH EAGLE VENTURE MEETS THE ABOVE CRITERION.

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NORTH EAGLE CLAIM EVALUATION

MR. CLYDE CREE WORKED THE NORTH EAGLE CLAIMS OVER A DECADE AGO. HE LOCATED OVER 10,000 ACRES AND RECOVERED GOLD AND SILVER UNTILL HIS ILLNESS PREVENTED HIM FROM FURTHER ACTIVITIES. AT THIS TIME, MR. L. D. KIRBY BECAME ACTIVELY INVOLVED PUMPING BRINES AND RECOVERING GOLD AND SILVER FROM OVER 100 SHALLOW WELLS. A DETAILED DESCRIPTION OF THE WELLS FROM MR. L. DEE KIRBY'S REPORT FOLLOWS(SEE REPORT):

0---- SURFACE

---- 13" DRY LAKE(PLAYA) SILT

---- 9 FEET FROM SURFACE: VERY HARD SANDSTONE (8" TO 2' THICK)

---- 13 FEET FROM THE SURFACE: DRY MONZONITIC SAND/GRAVEL (2' THICK)

---- 15 FEET FROM THE SURFACE: VERY FINE SAND-HEAVILY SATURATED

PAY ZONE

---- 31/35 FEET FROM THE SURFACE

---- 80' ON SOUTH(EAGLE MTN.) END OF PLAYA LAKE

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PUMPING OF THE PRECIOUS METAL BRINES FROM THE NORTH EAGLE CLAIMS BY MR. KIRBY RESULTED IN THE FOLLOWING:

DATE	GOLD	SILVER	PRECIOUS METALS IN SEDIMENTS (TROY OUNCES/TON)
JUNE 21, '72	.016	45.0	
NOV. 13, '72	.069	12.99	
MAY 10, '72	---	188.00	
APR. 18, '72	.120	68.7	
APR. 18, '72	----	18.2	
APR. 7, '72	.460	76.0	
MAY 4, '72	.040	17.57	
MAY 4, '72	.080	39.92	
MAY 4, '72	.080	44.09	
JUNE 21, '72	.062	13.75	
NOV. 16, '72	.106	42.13	
AVERAGE	.094	42.13	

MR. KIRBY REPORTED THAT THE SEDIMENTS IN THE BRINES THAT HE PUMPED ARE WORTH (IN PRECIOUS METAL VALUES) $ 52/TON SEDIMENT FOR FRESH WATER BRINES AND $ 160/TON SEDIMENT FOR SALINE BRINES.

NOTE THAT THE ABOVE AVERAGE (.094 AU/ 42.13 AG) AT $300 AU/$ ¢ AG IS $ 710.76/TON SEDIMENT.

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IN 1980 THE GEOLOGICAL SURVEY OF THE UNITED STATES DEPARMENT OF INTERIOR DRILLED A REVERSE-CIRCULATION WELL ON MR. CHARLES LAVINE'S NORTH EAGLE CLAIMS. THEIR RESULTS ARE SUMMARIZED AS FOLLOWS:

DRILL-HOLE DEPTH = 340 FEET BELOW THE SURFACE
NUMBER OF 5-FOOT VERTICAL SAMPLE INTERVALS = 68

SOLID PHASE:

ELEMENT	DEPTH	RANGE	AVERAGE
LITHIUM	0-340'	58-1100 PPM	387 PPM
SILVER	250'		220 PPM = 6.4 T.OZ/TON
CESIUM	250'		55 PPM
COBALT	250'		13 PPM
COPPER	250'		+ 2200 PPM(GREATER THAN)
MOLYBDENUM	250'		2.1 PPM
NICKEL	250'		34 PPM
LEAD	250'		120 PPM
TIN	250'		31 PPM
VANADIUM	250'		60 PPM
ZINC	250'		9000 PPM

BRINES:

BORON	135'	48,000 PPM
BORON	335'	60,000 PPM

THE VALUE OF THE NON-METALLIC MINERALS HAS BEEN STATED BY THE UNITED STATES GOVERNMENT AS OVER $52,000,000. THIS DOES NOT CONSIDER THE DRILL HOLE THAT ENCOUNTERED LITHIUM AND BORON TO THE BOTTOM OF THE DRILL HOLE, WHICH INCREASES THE VALUE TO OVER $ 1 BILLION.

RESUME OF NORTH EAGLE - S.K.S. CLAIMS
(Death Valley Junction)

Engineering Notes

By

L. Dee Kirby

This is a short resume of my knowledge of the silver-containing property comprising some 4,000 acres in the Death Valley Junction area. A geological report by Morris J. Gudal accompanies this resume.

The property consists of a dry lake bed, the age having been determined to be about 160,000,000 years and is the remainder of a prehistoric sea bed after the area was uplifted. There is a tremendous salt dome covering a portion of this lake bed. This entire lake bed lies to the north of the Eagle Mountain uplift, which was supposedly the reason for the lake's existence. Eagle Mountain itself has no relation to other mountains in the area.

Exploration by drilling has proven bedrock to be at a depth of eighty-seven feet, six inches, in two places. No doubt depth to bedrock will vary in other places. From thirty-five feet to bedrock was a consistent montmorillonite, which is a bentonitic clay. No silver values were found. However, the montmorillonite itself is of commercial quality and has commercial value.

Eighteen inches of dry lake silt comprise the surface material. Directly below this, a commerical quality bentonite persists to a depth of eighty feet.

There is evidently a barrier, or reef, which shows on geological maps, that splits the lake bed in two, running due north from Eagle Mountain. East of this barrier, subsurface waters are artesian and potable and very cold. West of the barrier, the subsurface waters are not artesian and are very strongly saline. The structure is similar to the east side to a depth of 35 feet, but the water table is 12 to 18 feet below surface, with a large volume of salt water. (About 37% soda ash is contained in the water solids, i.e., not in solution, and is highly commercial.) Spectographic analysis of the water shows the presence of 32 minerals.

Starting at a nine-foot depth, there appears to be a very hard sandstone, varying from eight inches to two feet in thickness. After this sandstone is penetrated, a comparatively dry monzonitic sand and gravel is encountered, about two feet thick.

Immediately below the monzonitic sand and gravel, a loose, heavily saturated and very fine sand is encountered. This sand contains small amounts of clay, and the pay zone starts at this point, about fourteen feet below the surface, and persists to a depth of about 31 to 35 feet. The artesian water mentioned above comes in at about 14½ feet and is under considerable pressure.

Several wells, or holes, have been drilled on the fresh water side of the barrier. Assays obtained while drilling ran from 13.75 to a high of 42 ounces of silver per ton. The gold content varied from .040 to .129 ounces per ton of water sediments.

When the water is pumped from the ground, I have obtained a tremendous amount of gold and silver ranging from 47 to 760 ounces of silver, and .10 to .46 ounces of gold to a ton of water sediments. I have pumped as high as 140 grams of solid water sediments per gallon of water from these holes. The above assays were obtained by fire assay.

I have determined that ten thousand gallons of water will contain 3,125 pounds of sediments, and the average pay from them will be:

Fresh water side of barrier . . . . . $52.00 per ton
Salt water side of barrier . . . . . .$160.00 per ton

A mining operation on this property would be concerned only with pumping the water from the wells, then processing it to remove the solids and sediments from the water which contain the values. I have utilized electrolysis, ozone type oxidation, and chemicals successfully to recover the gold and silver contained in the water sediments. I personally prefer the electrolysis method as a larger volume of material can be processed. Then if other materials are to be extracted, a chemical process could be used.

PROPOSAL:

I would propose that a pilot plant be constructed prior to considering large scale production. This pilot plant can be built for less than ten thousand dollars. Mobilization and testing operations should not exceed a cost of $10,000.00. A production size electrolytic process unit. capable of processing a minimum of 100,000 gallons of water per day, can be expected to cost an estimated $65,000.00. An ultrasonic transducer ozone gas unit would cost about $75,000.00, and a chemical processing plant would cost a minimum of $75,000.00. If increased production was desired on either the electrolytic or ultrasound transducer ozone gas processes. separate plants could be constructed.

I would consider any proposition that would enable this property to be brought into production. I would consider joint venture. advisory capacity, or an outright lease, but I do not contemplate sale of said property.

I have spent many years and a considerable amount of my own money in the development and testing of this property, and I can now recommend it as being ready to go into production. I have been a professional mining engineer for forty-seven years and I have never seen anything as amazing as this property, both in size and production potential. I have drilled a total of 122 wells on the property and extracted commercial pay from each of them.

Respectfully yours,

L. Dee Kirby
Mining Engineer

SECTION 19

"Artesian Well"

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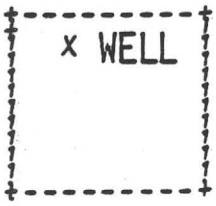
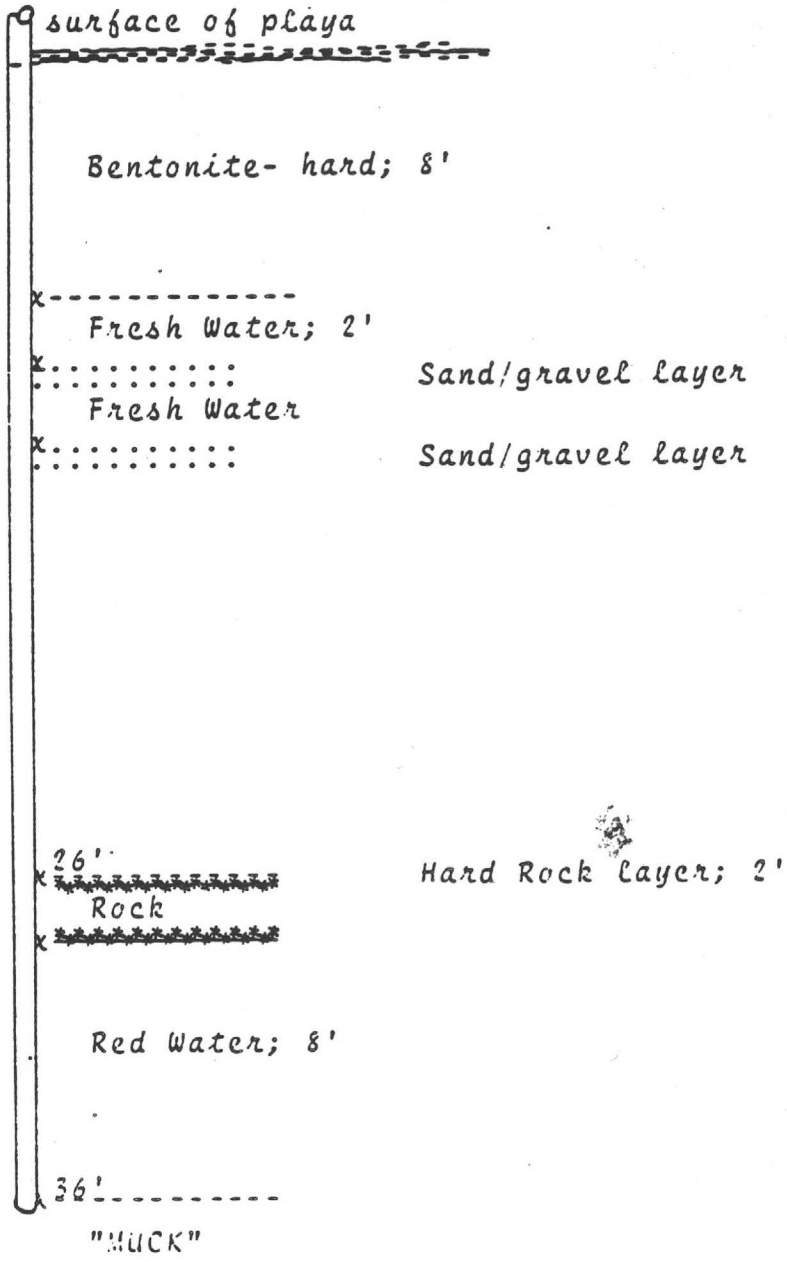
Section 19



DRILL-HOLE LOG::



SECTION 6

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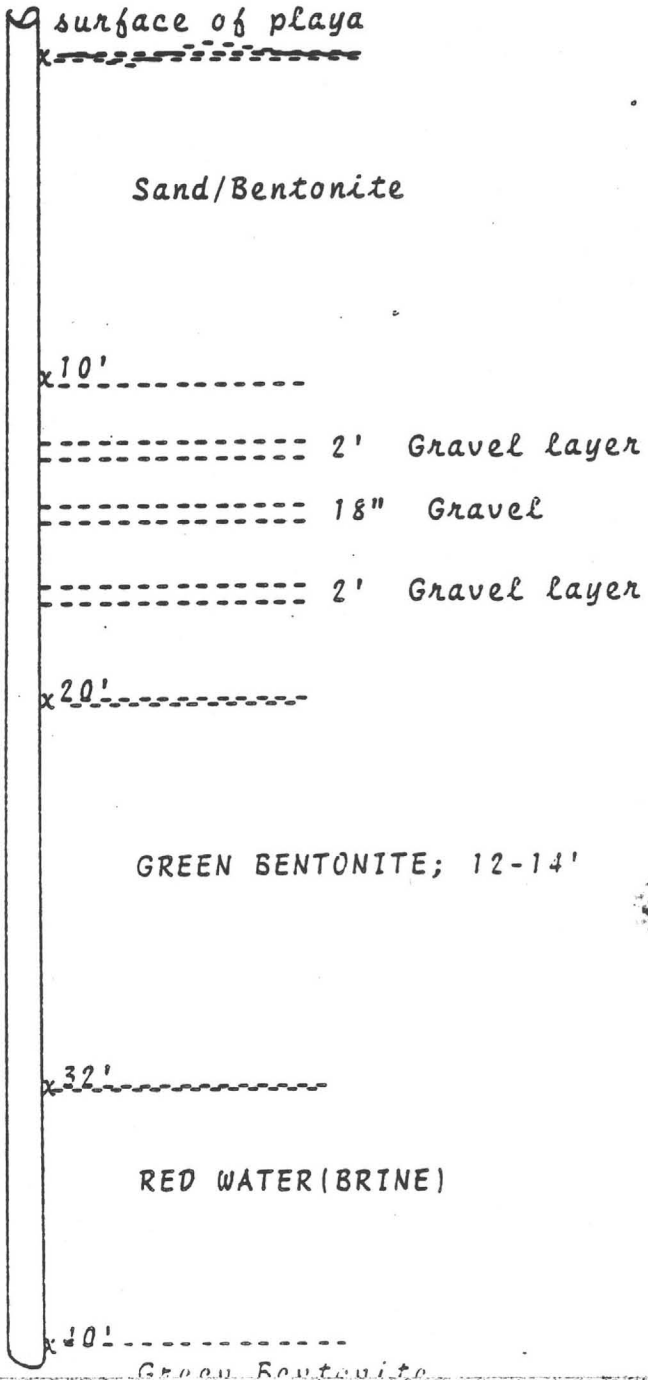
Section 6

DRILL-HOLE LOG::



SECTION 6

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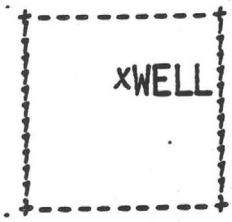
Section 6



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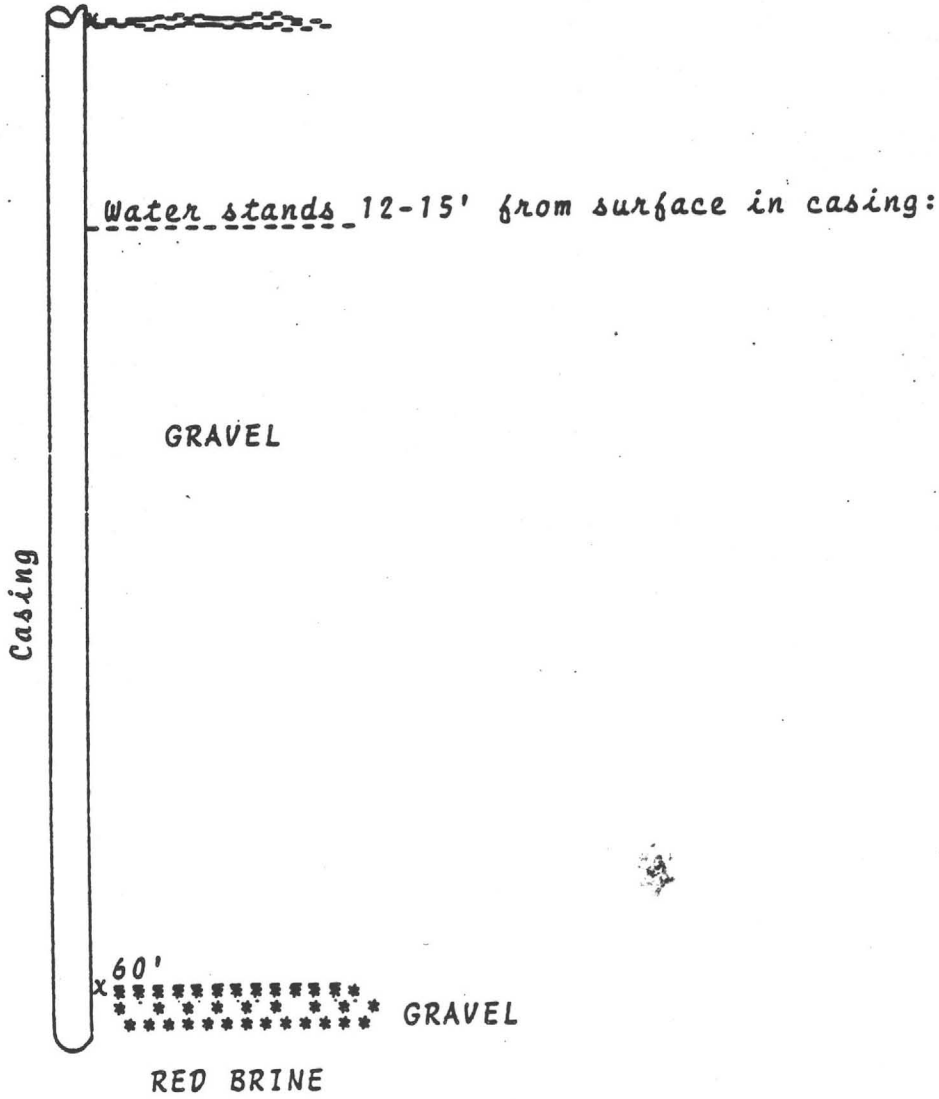
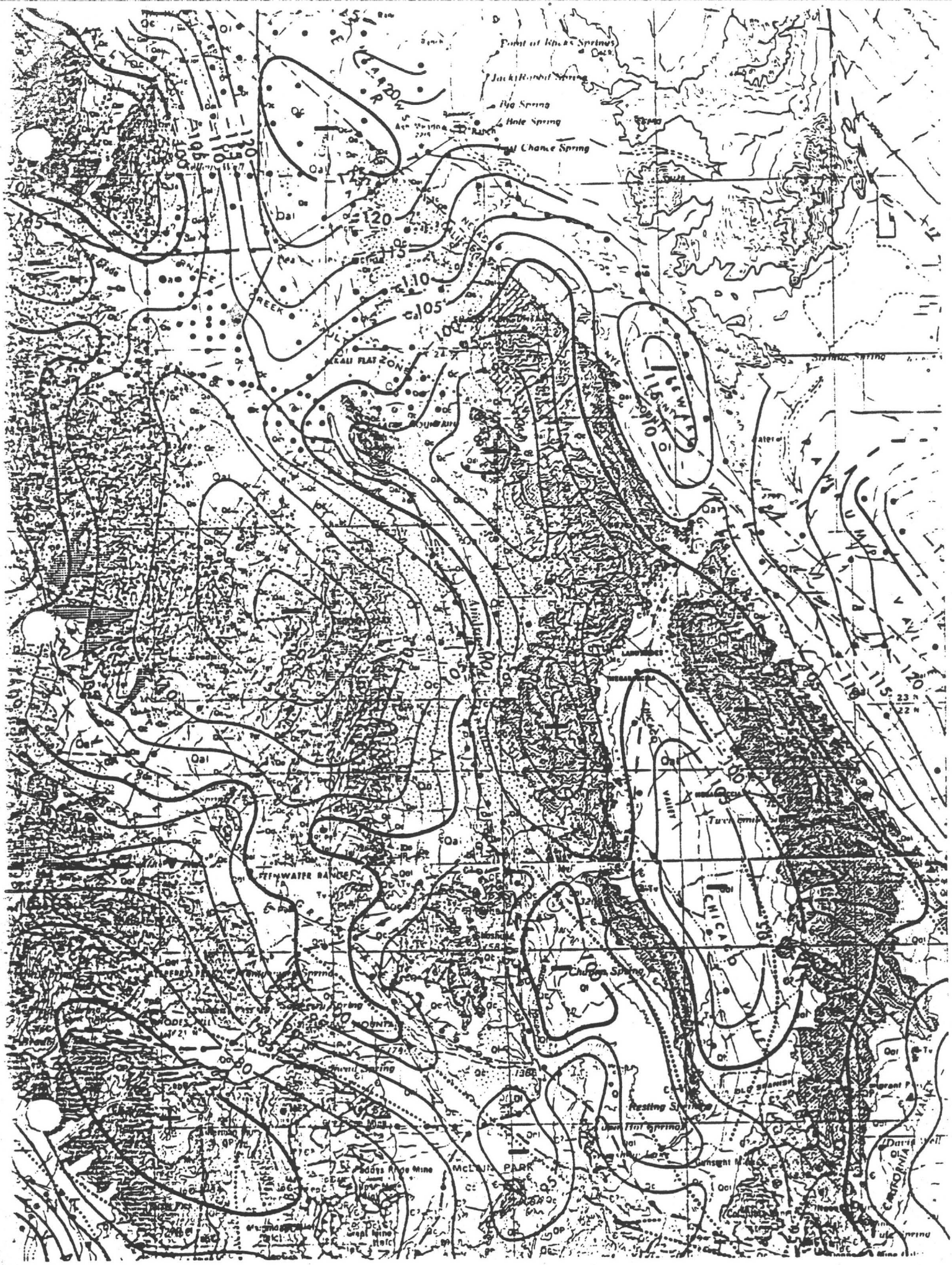
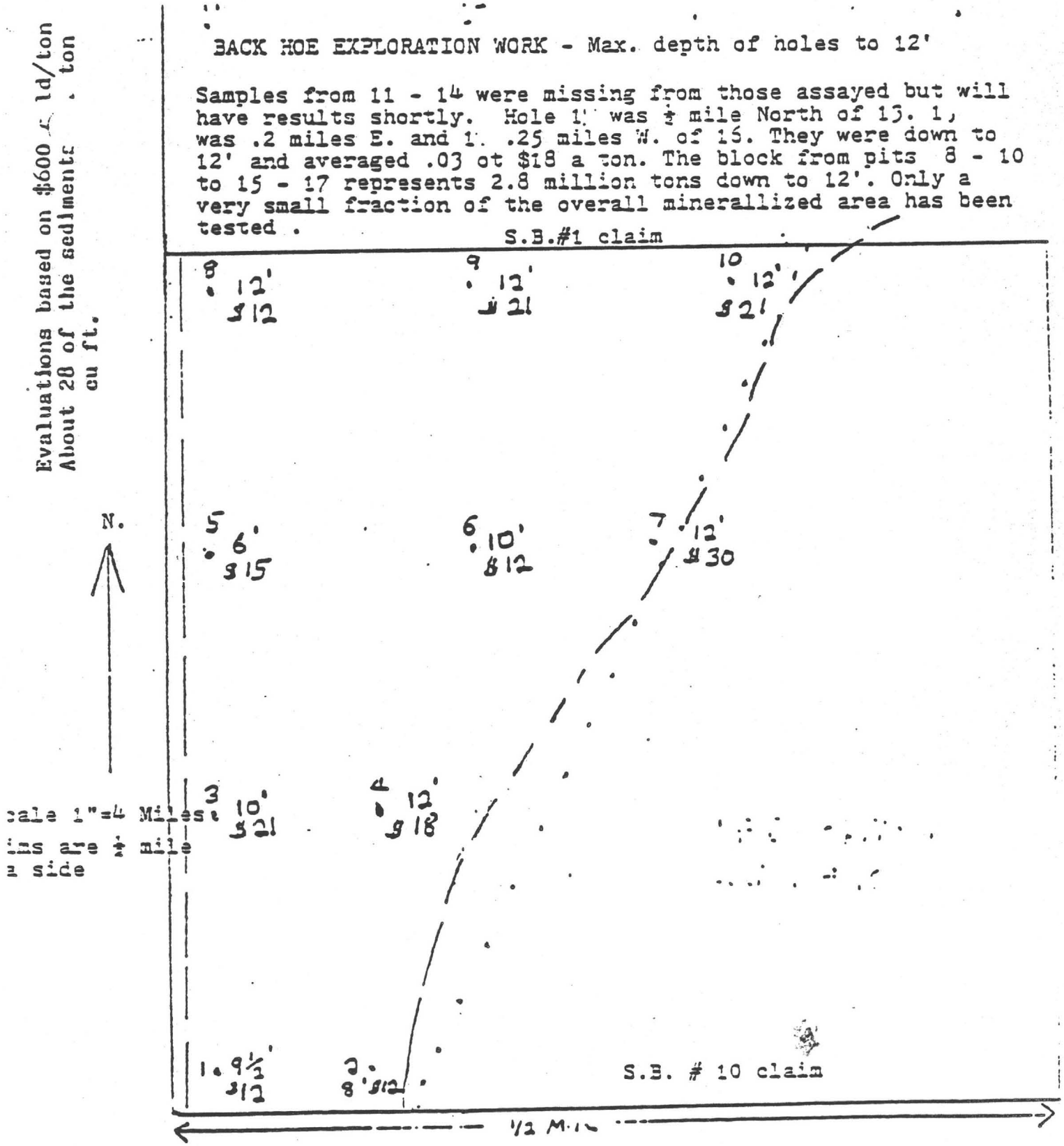



Point of Rocks Springs
Jackrabbit Spring
Pyle Spring
Hole Spring
Ranch
Last Chance Spring
Qal
Qoi
Qoa
Qoc
Qop
Qoi
Qal
Qoa
Qoi
Qoi
Qoi

BACK HOE EXPLORATION WORK - Max. depth of holes to 12'

Samples from 11 - 14 were missing from those assayed but will have results shortly. Hole 1' was ½ mile North of 13. 1, was .2 miles E. and 1. .25 miles W. of 16. They were down to 12' and averaged .03 ot $18 a ton. The block from pits 8 - 10 to 15 - 17 represents 2.8 million tons down to 12'. Only a very small fraction of the overall minerallized area has been tested .

Evaluations based on $600 / ld/ton
About 28 of the sediments . ton
cu ft.



cale 1"=4 Miles
ims are ½ mile
a side

Pits #1 - 10 were put down by backhoe to roughly determine amount of placer ore availlable down to 12'. Pits represent an area 2,640' long, 650' wide on the lower end and 1,900' on the upper end with average depth of 10.35'. This calculates out at 1.7 million tons of placer ore containing $17.4 of gold per ton

by Wm. Moore, geologist, M.A. 12/26/80

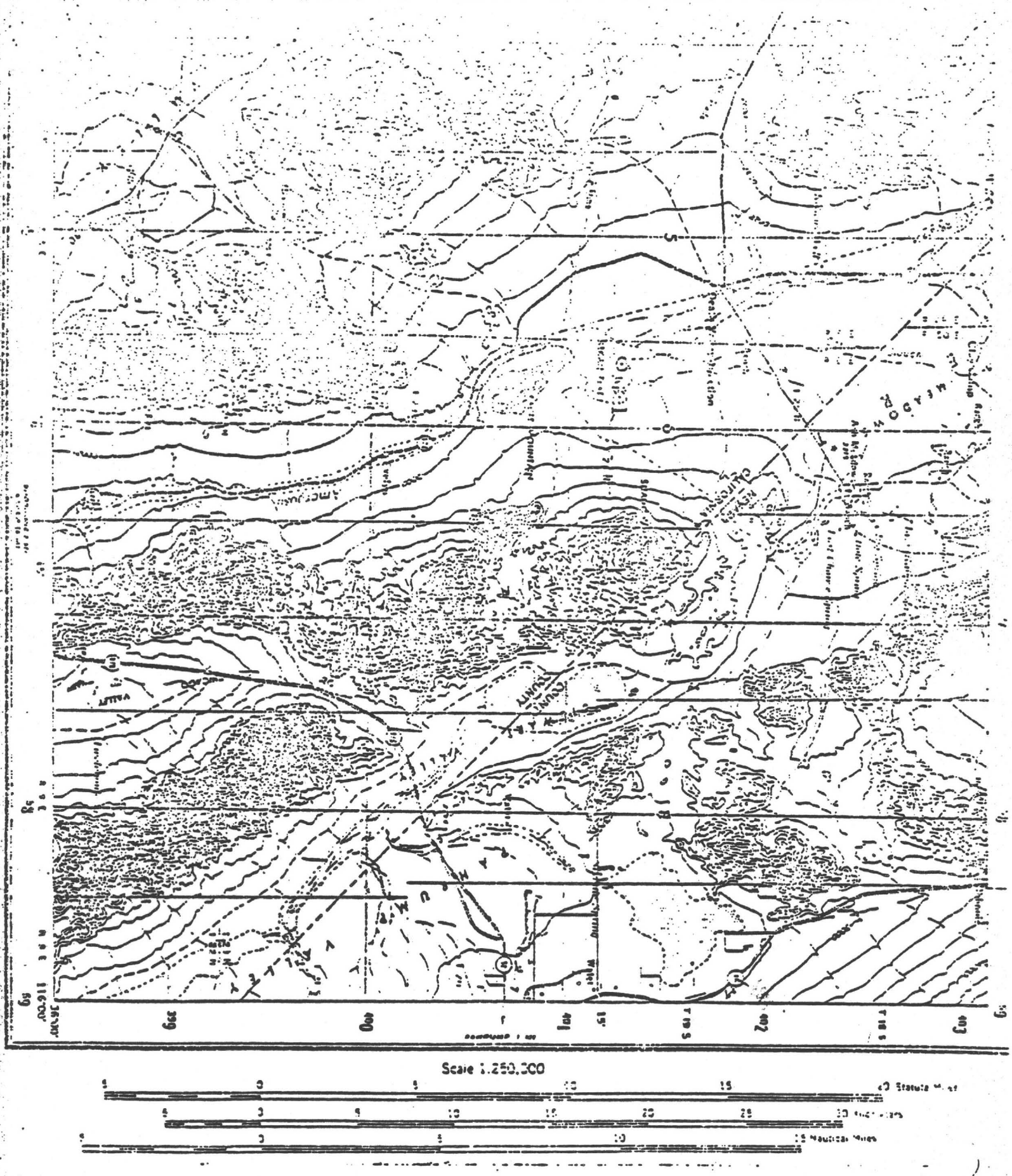
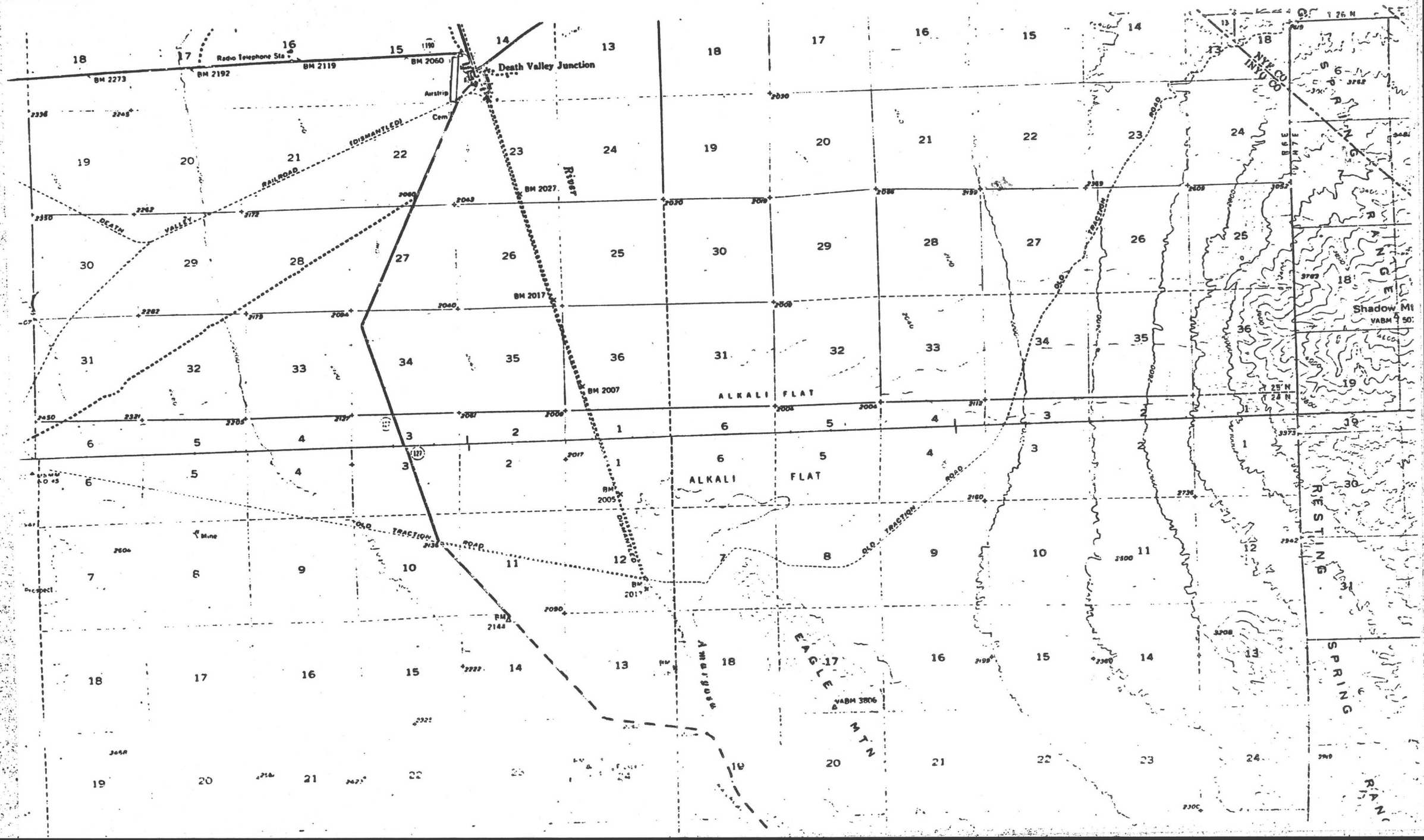


Figure 1.--Map showing location of drill site AF-1.



Death Valley Junction
Radio Telephone Sta
BM 2273
BM 2192
BM 2119
BM 2060
Airstrip
Cem
DEATH VALLEY RAILROAD (DISMANTLED)
River
BM 2027
BM 2017
BM 2007
BM 2005
BM 2144
ALKALI FLAT
ALKALI FLAT
OLD TRACTION ROAD
OLD TRACTION ROAD
Mine
Prospect
Amargosa
EAGLE MTN
VABM 3806
NYE CO
INYO CO
Shadow Mt
RESTING SPRING RANGE

Death Valley Junction
(Death Valley P.O.)
Amargosa
River
Hog Ranch
DESERT
ALKALI FLAT
(DISMANTLED)
RAILROAD
BM 2027
BM 2017
BM 2007
BM 2060
BM 2119
BM 2043
BM 3101
Qal
Qrg
Qgs
Qgv
Qp
Qd
Tsc
QTf
Tuc
Tuf

LITHOLOGY AND LITHIUM CONTENT OF SEDIMENTS DRILLED IN A TEST HOLE ON ALKALI FLAT (FRANKLIN LAKE), INYO COUNTY, CALIFORNIA

By

Michael P. Pantea

ABSTRACT

The U.S. Geological Survey drilled test holes on several playas in the California Desert Conservation Area to make an appraisal of leasable mineral resources. Data from Franklin Lake were obtained for critical evaluation of various hypotheses concerning the occurrence and distribution of lithium and for the possible identification of other nonpegmatic lithium resources.

Franklin Lake and Alkali Flat (AF-1) refer to the same locality. For uniformity, AF-1 is used to designate this hole and the accompanying samples. This report describes the lithology and lithium content of the sediments that were penetrated.

ACKNOWLEDGMENTS

Drilling was completed by a reverse-circulation rotary drilling rig contracted by the U.S. Geological Survey, Menlo Park, California, under the supervision of J. Calzia (Calzia and others, 1978). Sample collection and field identification were done by Alan Wanek. Emission spectrographic analyses and atomic absorption spectrographic analyses for lithium were performed by Fred Lichte and B. F. Arbogast, respectively. Whole-rock and clay-mineral identification were determined by X-ray powder diffraction by J. D. Morgan and M. P. Pantea. Water analyses were performed by the U.S. Geological Survey laboratory in Denver, Colorado.

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

LITHOLOGY AND LITHIUM CONTENT OF SEDIMENTS DRILLED IN A TEST HOLE ON ALKALI FLAT (FRANKLIN LAKE), INYO COUNTY, CALIFORNIA

By

Michael P. Pantea

Open-File Report 80-1164

1980

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

INTRODUCTION

Alkali Flat (Franklin Lake) is a small playa about two miles (3.2 km) in diameter occupying the lowest point in the California-Nevada Ash Meadows Quadrangle (fig. 1). The playa is four miles (6.4 km) south-southeast of Death Valley Junction in Inyo County, California. The drill site (AF-1) is in the north-central part of the playa in the SW¼SE¼ sec. 31, T. 25 N., R. 6 E., San Bernardino meridian. The geology of the Ash Meadows 7½ Minute Quadrangle are described by Denny and Drewes (1965).

Drilling was done with a reverse circulation technique to minimize contamination of sediments and water samples. Lithology was described in the field and was supplemented with laboratory examination. Color classification was done on damp-to-wet samples using a rock-color chart (Goddard and others, 1948). Water samples were collected at the first aquifer having a significant flow, and at total depth. Temperature, pH of untreated samples, and specific gravity of filtered samples were recorded in the field.

Sixty-eight samples, one taken every five feet (1.5 m), were submitted for analysis of lithium. Samples were calcareous mud and mudstone with detrital quartz and feldspar, having calcitic or dolomitic cements (fig. 2). Samples from strata in the lower half of the hole have a greater proportion of clay, as indicated by the increased intensities of the 7 Å, 10 Å, and 14 Å peaks in the X-ray analysis.

All samples were analyzed for lithium by atomic absorption spectroscopy (fig. 2). Lithium values ranged from 58 to 810 parts per million (ppm) and have an average value of 387 ppm Li. Clay-mineral separations were done on 11 samples having 500 ppm Li or greater; all have expanding clay minerals in them (fig. 3). Samples AF1-140 (Alkali Flat) and AF1-210 contain a hectorite-like trioctahedral smectite (H. C. Starky, oral commun., 1980), these samples have 810 ppm Li and 580 ppm Li, respectively. Specific clay mineralogy of the other samples was not determined.

Four of the 11 samples were then analyzed by emission spectrographic methods (table 1). These samples contain 600-620 ppm Li. Samples AF1-250 was considerably higher in concentrations of Cu, Pb, and Zn than the other three.

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IN 1980 THE GEOLOGICAL SURVEY OF THE UNITED STATES DEPARMENT OF INTERIOR DRILLED A REVERSE-CIRCULATION WELL ON MR. CHARLES LAVINE'S NORTH EAGLE CLAIMS. THEIR RESULTS ARE SUMMARIZED AS FOLLOWS:

DRILL-HOLE DEPTH = 340 FEET BELOW THE SURFACE
NUMBER OF 5-FOOT VERTICAL SAMPLE INTERVALS = 68

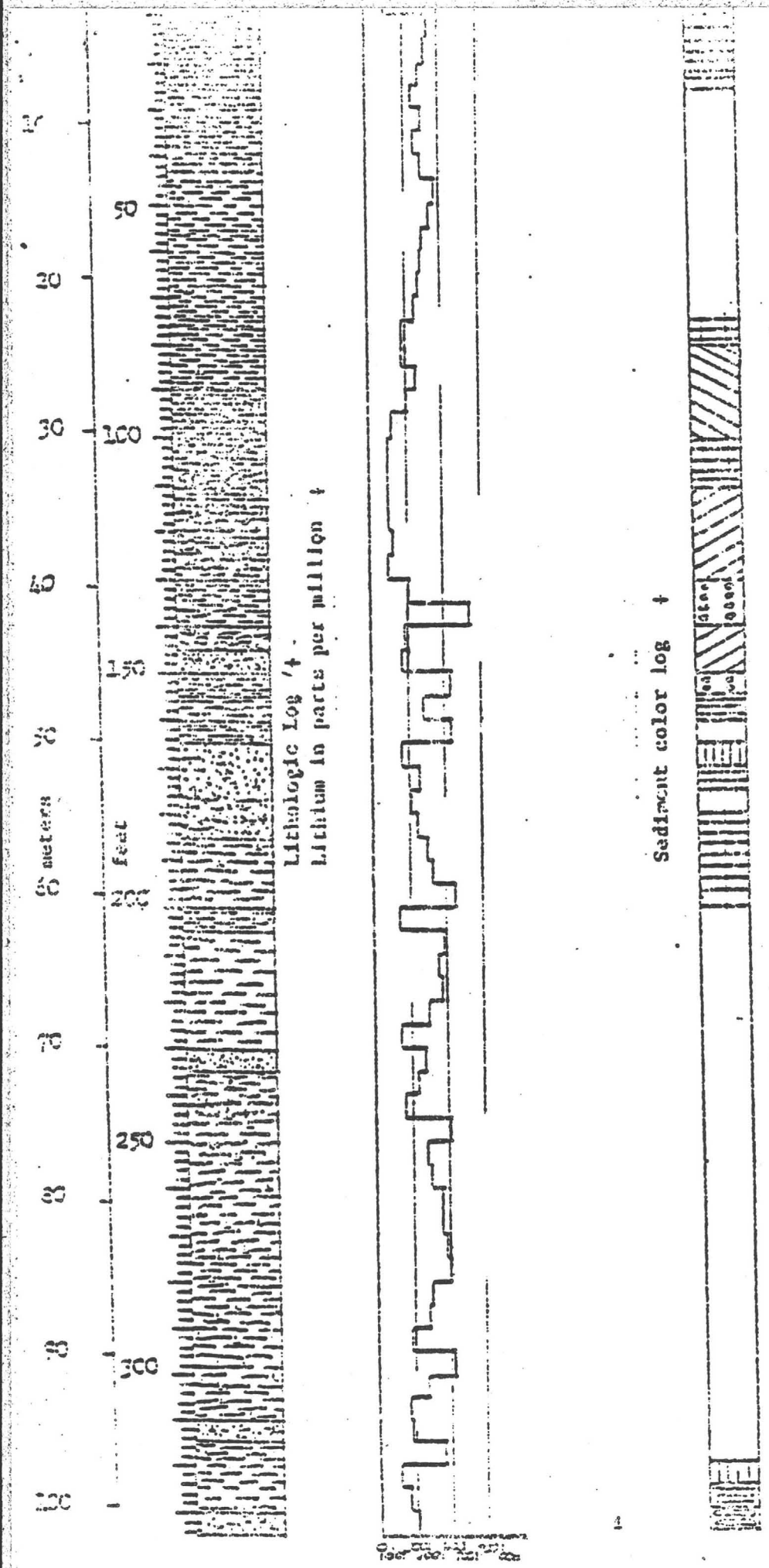
SOLID PHASE:

ELEMENT	DEPTH	RANGE	AVERAGE
LITHIUM	0-340'	58-1100 PPM	387 PPM
SILVER	250'		220 PPM = 6.4 T.OZ/TON
CESIUM	250'		55 PPM
COBALT	250'		13 PPM
COPPER	250'		+ 2200 PPM(GREATER THAN)
MOLYBDENUM	250'		2.1 PPM
NICKEL	250'		34 PPM
LEAD	250'		120 PPM
TIN	250'		31 PPM
VANADIUM	250'		60 PPM
ZINC	250'		9000 PPM

BRINES:

BORON	135'	48,000 PPM
BORON	335'	60,000 PPM

THE VALUE OF THE NON-METALLIC MINERALS HAS BEEN STATED BY THE UNITED STATES GOVERNMENT AS OVER $52,000,000. THIS DOES NOT CONSIDER THE DRILL HOLE THAT ENCOUNTERED LITHIUM AND BORON TO THE BOTTOM OF THE DRILL HOLE, WHICH INCREASES THE VALUE TO OVER $ 1 BILLION.



LITHOLOGIC SYMBOLS

MUD
MUDSTONE
SANDSTONE
TUFFACEOUS SANDSTONE
SAND
GRAVEL
CALCAREOUS

COLOR SYMBOLS

PALE OLIVE
PALE GREENISH YELLOW
PALE YELLOWISH BROWN
LIGHT OLIVE GRAY
GREENISH GRAY
GRAYISH GREEN
DUSKY YELLOW
PALE YELLOW
LIGHT OLIVE BROWN
MODERATE GREENISH YELLOW

Figure 2.--Lithologic log, lithium concentration, and sediment color log of sediments penetrated in AF-1.

--Conventional uses for lithium

1. In heat resistant glass and ceramics--The use of lithium compounds makes possible the production of glass and ceramic materials that exhibit little or no thermal expansion.

2.--In the manufacture of temperature-and water-resistant lubricating greases--When lithium hydroxide is combined with oil to make a lithium-based soap and the soap is combined with various weight petroleum products the result is a superior grade of lubricating grease.

3.--In air purification for life-support systems--Anhydrous lithium hydroxide is an especially effective adsorbant of carbon dioxide, and thus an essential ingredient in submarine and spacecraft air-purification systems.

4.--In the reduction of aluminum ore--When lithium carbonate is added to the electrolytic cells used in the reduction of aluminum ore, the melting temperature is lowered, producing a significant savings in electrical power requirements.

5.--In primary batteries--Lithium batteries of several types have found wide application where long shelf life, or high voltage for size and weight, justify a slightly higher cost.

6.--In absorption refrigeration systems--The low vapor pressure of lithium bromide makes it an ideal refrigerant in large absorption refrigeration systems. Because this type of system is more energy efficient than conventional systems, it is regarded as an energy saving system.

7.--In pharmacology--Lithium carbonate has been widely used in the last 10 years in the treatment of manic-depressive symptoms and it is beginning to be used in the treatment of alcoholism.

8.--In swimming pool sanitation--Lithium hypochlorite is preferred by many people for use in controlling pH and in reducing bacteria count in swimming pools.

9.--In cosmetics, paints, and fermentation--The lithium clay mineral, hectorite is highly prized as a base in certain kinds of cosmetics, where it serves as an effective adsorbant of oils and other organic compounds. It is also used as a thickener in paints and as a clarifier in the brewing and fermenting industry. Synthetic hectorite and related compounds are used to produce hydrophillic gels with specific physical and chemical properties.

Table 1.--Emission spectrographic analysis by Fred Lichte of selected samples from Alkali Flat (Franklin Lake).

FIELD #	AFI-200	AFL-250	AFI 290	AFI 300
SAMPLE	D-214399	D-214400	D-214401	D-214402
SPECTRUM	19	1	21	22
SI %	19	19	18	22
AL %	2.7	1.9	3.1	4.3
FE %	1.4	2.0	1.6	2.5
MG %	4.0	5.1	2.7	3.9
CA %	0.69	1.8	0.44	0.62
NA %	1.4	> 0.46	0.53	0.51
K %	3.6	2.3	3.6	4.3
TI %	0.11	0.092	0.13	0.22
P %	< 0.46	< 0.46	< 0.46	< 0.46
MN %	0.026	0.023	0.023	0.028
AG PPM		220		
AU PPM	< 4.6	< 4.6	< 4.6	< 4.6
B PPM	290	460	300	430
BA PPM	78	69	76	150
BE PPM	1.3	1.3	1.4	2.0
BI PPM	< 10	< 10	< 10	< 10
CD PPM	< 10	< 10	< 10	15
CE PPM	< 46	33	< 46	71
CO PPM	7.9	13	3.5	14
CR PPM	19	22	25	43
CU PPM	43	> 2200	62	40
DY PPM	< 10	< 10	< 10	< 10
ER PPM	< 4.6	< 4.6	< 4.6	< 4.6
EU PPM	< 1.0	< 1.0	< 1.0	< 1.0
GA PPM	10	6.6	15	23
GD PPM	< 10	< 10	< 10	< 10
GE PPM	3.4	2.1	2.8	6.0
HF PPM	< 100	< 100	< 100	< 100
HO PPM	< 10	< 10	< 10	< 10
IN PPM	< 30	< 30	< 30	< 30
IR PPM	< 46	< 46	< 46	< 46
LA PPM	12	33	17	30
LI PPM	1100	1100	890	1100
LU PPM	< 10	< 10	< 10	< 10

Table 1.--Emission spectrographic analysis by Fred Lichte of selected samples from Alkali Flat (Franklin Lake).--Continued

FIELD #	AFI-200	AFL-250	AFI 290	AFI 300
SAMPLE	D-214379	D-214400	D-214401	D-214402
SPECTRUM	17	1	21	22
MN PPM	260	230	230	280
MO PPM	1.6	2.1	1.3	2.6
NB PPM	5.7	7.0	8.0	14
ND PPM	< 46	< 46	< 46	< 46
NI PPM	19	34	21	30
OS PPM	< 22	< 22	< 22	< 22
PB PPM	24	120	37	56
PD PPM	< 1.0	< 1.0	< 1.0	< 1.0
PR PPM	< 68	< 68	< 68	< 60
PT PPM	< 10	< 10	< 10	< 10
RE PPM	< 46	< 46	< 46	< 46
RH PPM	< 2.2	< 2.2	< 2.2	< 2.2
RU PPM	< 10	< 10	< 10	< 10
SB PPM	< 46	< 46	< 46	< 46
SC PPM	4.7	5.6	4.8	7.9
SM PPM	< 46	< 46	< 46	< 46
SN PPM	7.3	31	28	16
SR PPM	96	82	34	50
TA PPM	< 500	< 500	< 500	< 500
TB PPM	< 46	< 46	< 46	< 46
TH PPM	< 220	< 220	< 220	< 220
TL PPM	< 4.6	< 4.6	< 4.6	< 4.6
TM PPM	< 4.6	< 4.6	< 4.6	< 4.6
U PPM	< 320	< 320	< 320	< 320
V PPM	42	60	43	65
W PPM	< 46	< 46	< 46	< 46
Y PPM	9.8	11	9.3	12
YB PPM	0.62	1.0	0.65	1.2
ZN PPM	220	9.0000	240	410
ZR PPM	51	64	58	79
MAJORS RECALCULATED AS OXIDES				
SIO2 %	41	41	39	47
AL2O3 %	5.1	3.6	5.9	8.1
FE2O3 %	2.0	2.9	2.3	3.6
MGO %	6.6	8.5	4.5	6.5
CAO %	0.97	2.5	0.62	0.87
NA2O %	1.9	> 0.62	0.71	0.69
K2O %	4.3	2.8	4.3	5.2
TIO2 %	0.19	0.15	0.22	0.37
P2O5 %	< 1.1	< 1.1	< 1.1	< 1.1
MNO %	0.034	0.030	0.030	0.036

Table 2.--Analyses of water samples from Alkali Flat, (Franklin Lake), Inyo County, California. California desert conservation area.

Test Well number	Date of collection	Depth of water sample (ft)	Water temperature (°C)	pH lab	pH field	Specific gravity	Specific conductance (microhmps/cm at 25°C)	Percent sodium	SAR (sodium absorption rate)
FL-1-1	6/11/78	135	27	9.0	9.2	1.020	12,600	95	203
FL-1-2	6/11/78	335	23	9.4	--	1.015	8,578	97	247

Results in mg/L

Test Well number	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Phosphorus (P)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Total Nitrate (NO_2,NO_3)	Iodide (I)
FL-1-1	13	4.3	2.8	2,200	160	0.53	1,300	1,400	20	.00	.25
FL-1-2	15	2.4	2.2	2,200	91	1.20	1,300	920	25	.05	.40

Results in mg/L

Test Well number	Bicarbonate (HCO_3)	Manganese (Mn)	Iron (Fe)	Boron (B)	Lithium (Li)	Strontium (Sr)	Uranium (U)	Solids, residue on evaporation at 180°C (TDS)	Total Alkalinity Calcium Carbonate ($CaCO_3$)	Total hardness	Percent Difference
FL-1-1	2,240	.010	.050	48.000	.110	.240	.046	6,380	1,820	23	-1.83
FL-1-2	2,457	.020	.350	60.000	.150	.200	.029	6,040	2,080	15	+1.25

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