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Y

MINES INCORPORATED
11 West 42nd Street
New York 10, N. Y.

August 25th, 1947.

Mr. W. M. Archibald,
Room 1403, 302 Bay Street,
Toronto, Canada.

Dear Mr. Archibald:

Your letter of August 16th with a copy of Prof. Harry E. Wheeler's report of July 30th on the Spruce Mtn. District was received and I have studied it over carefully and am returning it to you herewith.

Wheeler's report was a good one, considering the short time he spent on the property. I projected a couple of hypothetical sections across his rough geological map that helped me visualize the problem on the basis of the additional information.

Wheeler mapped 7000 ft. of sediments compared to Schrader's 2500' and voluntarily submitted a geological map which is very valuable. He shows sediments of Ordovician and Mississippian age with quite distinct differentiation to help us in mapping and tells us where we can log a better section to the north. He calls our attention to an ancient thrust or reverse fault which has been faulted in turn by north-south and northwesterly normal faults, all of which have in turn been intruded by a granite porphyry dike. This dike heated and intruded sediments sufficiently to cause contact metamorphism as much as 30 feet from the dike, and in the Spruce Standard 500 feet from the surface outcrop of the dike (according to Schrader) which indicates to me sub-jacent porph. under the Spruce Standard Mine.

Apparently the bedded ore in the Spruce Standard, Bingo, Keystone, and Killie Mines was in the massive Mississippian limestone of the D Formation. The ore in the Spence, Black Forest and Ada H appears to have been associated with fracturing and faulting rather than stratigraphic horizons in the interbedded limestone and primary dolomite of the Ordovician A Formation. There appears to have been no ore in the cherty Mississippian B Formation, or in the Argillite and quartzite conglomerate of C Formation.

Since all known ore was predominantly oxidized in nature, I am wondering why he thought we could get results by geophysical methods so I wrote to him and asked him. So far, no commercial ore of a sulphide nature has been mined in the district, but that does not mean that there might not be sizeable sulphide orebodies in the district.

Following is a brief summary of facts disclosed by Wheeler and Schrader. 1. Practically all the faulting of whatever nature, is pre-mineral. 2. The known ore appears to have followed fractures, transverse and bedding faults rather than to have been confirmed to specific stratigraphic horizons. 3. Most of the ore seems to have been found near the porphyry but some of it was found some distant from the porphyry. The ore may not be related to the porph. but only have followed the fracturing near the porphyry. 4. The small spotty orebodies that have characterized this district in the past, may be the result of overflow from some large orebody in the Pre-Cambrian below. There might be a sizeable orebody entrapped under the Sprucemont thrust fault to the south of the granite porphyry dike.

I think your idea of drilling a 1500 foot hole from the lower tunnel of the Black Forest Mine, which is in the A formation south of the dike, would tell us a great deal about the location of the base of A Formation, the location of the Sprucemont thrust fault, and is the neareat you can get to a potential sulphide orebody. Furthermore, this hole would be just about in the center of the most productive mines in the district, and therefore if there is an orebody below you ought to hit it.

Both Boyle Bros. and McClintock are reliable. I prefer the McClintock people on general principles, and in this particular case prefer the businesslike way McClintock submits his proposal. I have found that McClintock's men are more conscientious about getting the maximum core recovery for the customer, and take great care in preserving their records.

If you have an extra copy of Wheeler's report I would be glad to have one for reference. If you do not, don't bother. I am returning this report to you so you will have it pronto in case it is your only copy.

Best regards and good luck,

Sincerely yours,

" GEORGE C. HEIKES "

cc - T.L.

Copied:AJ
Toronto
Aug.27/47

(77)
Item 17

RECONNAISSANCE REPORT

on the

STRATIGRAPHY AND STRUCTURE

of the

SPRUCE MOUNTAIN MINING DISTRICT

ELKO COUNTY, NEVADA

by

Harry E. Wheeler
Reno, Nevada

CONTENTS

c o p y

INTRODUCTION

General Statement. - The Spruce Mountain mining district is located on the north and west slopes of Spruce Mountain in southeastern Elko County, Nevada.

The present report, prepared for the Nevada Monarch Consolidated Mines Company, is based upon field studies conducted between July 18-27, 1947, together with a geological map of the immediate vicinity of the Black Forest Mine, reportedly prepared by "Mr. Wilson" in 1937. The base map for the accompanying reconnaissance geologic map is taken from the published report of F. C. Schrader (1931, fig. 1).

Purpose. - The original purpose of this report was to correlate the stratigraphic horizons of the Black Forest, Missouri Monarch, and Spruce Standard Mine workings, and to evaluate a proposed drilling site in the canyon east of the Black Forest Mine. However, it became obvious almost at the outset that an understanding of the stratigraphy could be derived only through structural studies and mapping the areal distribution of "formations". Consequently, the writer has taken the liberty to go beyond the original purpose in order to best accomplish that purpose, and to contribute a geologic map of the district.

The reader is requested to bear in mind, however, that the accompanying geologic map is of a reconnaissance nature and shows only the major faults and geologic units, although most features in areas of good exposure are shown within 100 or 200 feet of their true positions. In other words, sufficient time was saved by quickly estimating positions in order to cover virtually the entire district.

The fact should also be made clear that, as a consequence of the general presence of alluvial cover and prevalence of small-magnitude, internal faulting, the stratigraphy must remain generalized at the present stage of investigations. In fact, it is the writer's opinion that a knowledge of the detailed sedimentary sequence can best be derived in nearby areas with less obscuring cover and faulting. On the basis of distant observation such an area may be found several miles northward in the low, northerly trending spur of Spruce Mountain, where good exposures of somewhat more steeply inclined, easterly dipping strata appear to be less disturbed by faulting.

STRATIGRAPHY

On the basis of the present cursory examination of the Spruce Mountain District, five sedimentary map units may be designated. These are designated simply as units A, B, C, D, and E. Until a reasonably detailed knowledge of the Paleozoic sequence involved in the entire range is gained, it is deemed inadvisable to attempt to name formations or otherwise designate cartographic units, except in a tentative manner. Moreover, as more becomes known of the detailed stratigraphy, perhaps the present units may be effectively subdivided in order to illustrate better the structural relationships of the district, particularly those involving minor faulting.

The combined, estimated, minimum thickness of all the exposed sedimentary strata of the district exceeds 7,000 feet which is appreciably greater than the 2,500 feet estimated by Schrader (1931). The five units employed in the preparation of the accompanying geologic map are briefly defined in ascending order, as follows:

Unit A, limestone and dolomite. - The oldest rocks exposed in the area constitute a series of interbedded limestones and dolomites with an estimated minimum thickness of about 1000 feet. These strata consist of light to dark gray, mostly thickbedded to massive limestones, and light buff to off-white primary or syngenetic dolomites. Neither the top nor the bottom of this unit is exposed in the map area. Consequently its true thickness and relationships to overlying and underlying strata are not determinable at present.

Unit A is tentatively regarded as of Ordovician age on the following evidence.

(a) Structural evidence indicates that the rocks of Unit A are the oldest in the area.

(b) The presence of abundant primary dolomite suggests an early Paleozoic age (Cambrian or Ordovician).

(c) The almost general absence of fossils also suggests early Paleozoic.

(d) Ordovician fossils (Maclurea and calcareous sponges) are tentatively identified from this unit.

Unit B, limestone. - Next in sequence of the exposed strata is a series of thin-to-thick-bedded, light to medium gray limestone with some interbedded chert and irregular chert nodules. The thickness of unit B is unknown, since its base is not exposed in the map area. This unit appears to grade into and is regarded as conformable with the overlying argillites and quartzites of unit C. The age of unit B has not been determined. However, since it is part of a conformable sequence, the upper portion of which (unit, D) is believed to belong to the Mississippian system, unit B is likewise tentatively assigned to the Mississippian.

Unit C, argillite, quartzite, and quartzitic conglomerate. - Lying above the unit B limestone with apparent conformity, and bearing the same relationship to the overlying limestones of unit D, is an estimated 1500 feet of gray to black and reddish brown argillites, shale, quartzite, quartzite conglomerate, and chert. This is in some respects the most distinctive unit in the entire Spruce Mountain area, although it is often difficult to detect because of its habit of yielding a thick alluvial cover.

Of probable value is the observation that where the quartzites of this unit are present at depth or have been present prior to their erosion, and where they bear the proper relationship to fault movement, such presence may be frequently inferred by the occurrence of quartzite breccia "blowouts" along such faults. This feature is discussed further in a later paragraph.

The age of unit C is regarded as Mississippian for the same reason that unit B is assigned to that period.

Unit D, limestone. - Stratigraphically above the unit C argillites and quartzites, and with gradational conformity to them lie the limestones of unit D. These strata are mostly light to medium gray in color, are mostly thick-to-massive-bedded, and contain frequent horzons with chert lenses and irregular nodules. A few thin shale beds are present, especially near the base. The thickness of this unit is not known because the top has not been determined. However, a migimum estimate of its exposed thickness on the northwest slope of Spruce Mountain is about 3000 feet.

On the basis of the presence of numerous crinoid fragments, fenestellid briszoans, and brachiopods of the genera Stristifera, Spirifer, and Dictyoclostus, these beds are definitely assignable to the Carboniferous, and are tentatively regarded as of Mississippian age.

Unit E, limestone. - The youngest strata thus far recognized in the district are the limestones exposed on the ridge trending westerly from Banner Hill, north west of the Killie Mine. These limestones are mostly medium gray in color, but weather light buff to almost white. Numerous thin, somewhat ferruginous sandy limestones are present, and a 200 foot sandstone member occurs about 1000 feet above the basal beds exposed. An estimated 1600 feet of this unit is exposed in the area, though neither the top nor the bottom are seen.

The uppermost exposures of this unit are clearly Lower Permian in age as indicated by the numerous foramenifera of the genus Pseudoschwagerina. The lower beds also carry fusulinid foramenifera, but somewhat more primitive types. On this basis unit E is tentatively assigned to the Upper Pennsylvanian and Lower Permian.

IGNEOUS ROCKS

Granite Porphyry. - The large granite porphyry dike that trends east-north-easterly across the entire district has been described in appreciable detail by Schrader (1931), which description will not be repeated here. Nevertheless, in view of its apparent genetic relationship to mineralization within the Spruce Mountain district, the ultimate mapping of all exposures of this intrusive is regarded as highly desirable.

These intrusives may be significant, not only because of their proximity to the lead, silver, zinc, and copper mineralization. Throughout the district, in areas where the porphyry lies in contact with calcareous rocks, tactites are frequently developed. Scheelite is reported locally in these metamorphic rocks, and the possibility of appreciable tungsten mineralization should not be overlooked.

Under the heading of "contact metamorphism" as induced by the granite porphyry, Schrader (1931), mentions the "iron-stained knoblike bodies of quartz breccia" southeast of the Spruce Standard Mine. Other, though smaller masses of this quartzite breccia occur elsewhere in the district, such as near the Y of the Monarch and Killie roads (about a mile northeast of the old townsite of Sprucemont); on the Bronco fault immediately south of the point where it crosses the switchback on the Killie Pass road; near the junction of the Sprucemont and Index faults; and along the Spence fault.

In order that these quartzite breccias may be employed in structural interpretation, their true character needs mention. They are fault breccias derived from the quartzite and quartzite conglomerate of "formation" C. Because they represent material dragged into fault zones, they will serve materially as an aid in determining the directions of fault displacements.

STRUCTURE

The major structure of the Spruce Mountain block appears to involve faulting along its western margin, and consequent easterly tilting of its rocks. However, the general easterly dip of the strata is locally altered as the result of variant movement along the major north-south and east-west-trending faults within the main range block.

The most significant and perhaps the earliest of these intra-range displacements is the Sprucemont thrust that trends E.S.E. from Sprucemont to Killie Pass and thence easterly down the back slope of the mountain, along the north side of Black Forest Canyon. This fault is now to be classed as a medium-angle thrust or reverse fault. Although if it antedates the faulting at the range margin (which it almost certainly does), it doubtless would have been classed as a low-angle thrust at the time of its movement. In other words, its surface has probably been steepened appreciably by the Range tilting. The Sprucemont thrust and its sympathetic or parallel fractures appear to have provided passage-way for the greater portion of the major granite porphyry dike. The actual intrusion of porphyry bodies, however, appears to have followed the development of all the major northerly and northwesterly-trending faults, the movement of at least two of which are definitely post Sprucemont. This relationship is indicated by the fact that the northerly-trending Extension and Monarch faults cut and offset the Sprucemont fault, but do not displace the dike. Thus all of the major faulting of the district (with the probable exception of the burried Basin-Range fault at the west margin) appears to be pre-mineral.

These major northerly- and northwesterly-trending faults are designated as the Extension, Monarch, Bronco, Index and Spence.

Since major faulting appears to be entirely pre-mineral, the same will probably be found to hold true for most of the minor displacements.

STRATIGRAPHIC CORRELATIONS

On the basis of the present reconnaissance stratigraphic study and areal geologic mapping it is clearly evident that no single "horizon" amenable to mineralization is represented at the various mining properties. A glance at the accompanying geologic map will illustrate that, except by otherwise strange coincidence, a genetic relationship exists between the granite porphyry and the ore deposits. Virtually all of the mines with significant production are located in a belt that closely trends with the large porphyry dike. Moreover, most of the promising prospects are similarly situated.

The dike and its apophyses either transect or closely approach each of the sedimentary map units herein designated, and varying degrees and types of mineralization are found in each.

Estimation of relative stratigraphic position of the beds exposed in the workings of the principal properties is as follows:

Black Forest.- Map Unit A, exact position unknown, since neither the top nor bottom of the unit are known.

Killie.- Map unit D, exact position unknown, but quite certainly above that of the Monarch.

Monarch.- Vein in map unit D, 500 ± feet above base.

Ida H.- Map unit A, exact position unknown.

Spruce Standard.- Map unit D, probably near base as evidenced by the volume of quartzite breccia dragged up along the fault contact there between units D and A.

PROPOSED DRILLING PROGRAM

The writer was requested to examine a proposed site for a diamond drill hole in Black Forest Canyon near the east sideline of the Chance claim. This proposed drilling site is situated in the zone of the Spence fault where it forms the contact between the argillites and the quartzites of Unit C and the limestones and dolomites of unit A. The location is regarded as unfavorable, not only because of the probable difficulties in drilling within the breccia zone, but also because of the improbability of a large ore body being developed within or immediately adjacent to the quartzite. (Witness the disappearance of the ore body in the Monarch vein as it approaches the Monarch fault contact with the argillites and quartzites of unit C.)

The writer is of the opinion that any drilling on the basis of present scant knowledge of the detailed relationships is to an appreciable degree "blind". In lieu of other indications or evidence, it is recommended that test holes be spotted within the

areas of known ore deposition. If this factor is combined with a desire to prospect stratigraphic depth, it would seem wise to spot holes to gain depth in the area of the Black Forest ore bodies (in map unit A) not too close to the porphyry dike, since the mineralization appears to decrease generally in the immediate proximity of the dike.

However, if the present management intends to inaugurate an extensive drilling program, the writer cannot avoid the suggestion that modern geophysical methods have been remarkably successful in locating certain types of sulphide bodies at depths of several hundred feet. Such investigations, though somewhat costly, might remove much of the guesswork from drilling, which otherwise must be based upon the meagre data presently available.

REFERENCE CITED

Schrader, F.C. (1931), Spruce Mountain District, Elko County, Nevada. Univ. Nev. Bull., vol. 25, No. 7, 24 pp., maps.

Submitted 30 July, 1947.

" HARRY E. WHEELER "
Geological Engineer.

Copied:AJ
Toronto
Aug.18/47

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Property Nevada Monarch Cosolidated

(17)

DIAMOND DRILL RECORD

Hole No. 1 Sheet No. 1 Lat. Total Depth

Section Dep. Elev. Collar

Date begun Bearing Approx. S 63 W (true) Elev. Bottom

Date finished Angle -70

DEPTH FEET	FORMATION	SAMPLE NO.	WIDTH OF SAMPLE	GOLD $	SLUDGE GOLD, $
0-10	Very light gray, probably thick to massive bedded coarsely crystalline (epigenetic) dolomite, mostly highly fractured and with iron oxide staining.				
10-20(?)	Light to med. gray, fine grained to dense, highly fractured and brecciated, primary dolomite.				
	Probable fault.				
20-25/4	Same but less fractured and iron-stained.				
25/4-30/1	Same but more frac. and brec. than above, and less broken than 10-20.				
30/1-33	Same dolomite.				
33-65	Med. to light gray, fine grained to dense, massive dolomite (good core).				
65-68	Light gray, mostly med. grained, massively bedded, crystalline dolomite.				
68-78	Med. to light gray, fine grained to dense, massive dolomite. Fracture intersection angle, 20 deg.				
78-108	Same dolomite, but mostly med. gray and dense. Disseminated pyrite at about 85.				
108-109	Same dolomite, but slightly arenaceous.				
109-148	Very light gray, med. to coarse grained, crystalline (epigenetic) dolomite.				

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DIAMOND DRILL RECORD

Hole No. 1 Sheet No. 2 Lat. Total Depth

Section Dep. Elev. Collar

Date begun Bearing Elev. Bottom

Date finished Angle

DEPTH FEET	FORMATION	SAMPLE NO.	WIDTH OF SAMPLE	GOLD $	SLUDGE GOLD, $
148-156/5	Light gray, fine grained to dense, massive dolomite. Core broken at 156.				
156/5-180	Very light gray, med. to coarse grained, crystalline dolomite; badly fractured and brecciated.				
180	Fault. Iron oxide with lead carbonate. Sludge assays as follows:				
	Dep. Au Ag Pb Zn				
1.	165-170 None 0.9 None None				
2.	170-175 None 1,3 None 0.1				
3.	175-180 Trace 4.0 0.5 0.8				
4.	180-185 Trace 8.3 3.8 1.5				
5.	185-190 None 1.2 None None				
180-214	Med. gray fine grained, massive dolomite (poor recovery).				
214-218	Interlaminated, light to med. gray, dolomite and limestone.				
218 263	Mostly med. gray, fine to med. grained dolomite (some coarsely crystalline. Poor recovery.				
263-275	Light and med. gray mottled dolomite; med. to coarse grained and massive.				
275-294/8	Med. dark gray to med. gray, fine grained dolomite, somewhat fractured and brecciated.				

Property Nevada Monarch Consolidated

DIAMOND DRILL RECORD

Hole No. 1 Sheet No. 3 Lat. Total Depth
Section Dep. Elev. Collar
Date begun Bearing Elev. Bottom
Date finished Angle

DEPTH FEET	FORMATION	SAMPLE NO.	WIDTH OF SAMPLE	GOLD $	SLUDGE GOLD, $
275-294/8(continued)	Probable fault zone. Sludge assays as follows:				
	Sample Depth Au Ag Pb Zn				
	6. 275-280 None 0.3 None None				
	7. 280-285 None 0.3 None None				
294/8-320	Med. gray, fine grained to dense dolomite.				
320-402	Med. dark to med. gray, fined grained to dense dolomite; appreciably fractured and brecciated (poor core recovery); probable faulting.				
402-408	Med. to light gray dolomite with calcite stringers.				
408-413	Light to med. gray, coarse to fine grained, highly fractured dolomite				
413-415	Med. and light gray mottled, fine to med. grained dolomite with few calcite stringers.				
415-416	Same, brecciated and recemented /// with calcite and iron oxide				
416-443	Med. dark gray, fine to med. grained dolomite with dolomite and calcite stringers. Core appreciably fractured at about 426-28, 433-34 and 438-43.				

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DIAMOND DRILL RECORD

Hole No. 1 Sheet No. 4 Lat. Total Depth
Section Dep. Elev. Collar
Date begun Bearing Elev. Bottom
Date finished Angle

DEPTH FEET	FORMATION	SAMPLE NO.	WIDTH OF SAMPLE	GOLD $	SLUDGE GOLD, $
443-473	Light to med. gray, fine to med. grained dolomite, with few dolomite and fewer calcite stringers. Core appreciably broken at about 460-61, 467-68, and 469-469/5.				
473-479/6	Light gray, massive, coarsely crystalline, epigenetic (secondary) dolomite.				
479/6-482	Dark gray, fine to med. grained, carbonaceous dolomite with few white calcite and dolomite stringers. (Core fractured).				
482-483	Light gray, fine to med grained, massive dol.				
483-503	Light, med. and dark gray, brecciated dolomite. Fault.				
503	One-fourth inch seam of finely divided, disseminated pyrite in light to med. gray, somewhat brecciated, massive dolomite. Intersection angle of seam is 22 degrees.				
503-507/6	Same dolomite (fractured).				
507/6-531	Same dolomite, mostly coarsely crystalline. Fractured at 511 and 519-21.				
531-547	Light gray, fine, med., and coarse grained, massive dolomite. Disseminated pyrite at 529/6, 538, and 541. Crinoid stem sections at 534/6.				

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DIAMOND DRILL RECORD

Hole No. 1 Sheet No. 5 Lat. Total Depth

Section Dep. Elev. Collar

Date begun Bearing Elev. Bottom

Date finished Angle

DEPTH FEET	FORMATION	SAMPLE NO.	WIDTH OF SAMPLE	GOLD $	SLUDGE GOLD. $
547-554/7	Light and med gray, brecciated dolomite.				
554/7-602	Mostly light gray, fine to coarse grained, massive dolomite, appreciably fractured at (565/6-567/8), ~~§§7/~~ (597-99), and(601-602).				
602-612	*** Sulfides. Sphalerite, pyrite, arsenopyrite, and galena. Included dolomite fragments and bordering seams make intersection angles with core axis of 45 degrees or more, suggesting that this sulfide body may have minimum width of about 7 feet.				
	Core and sludge samples for assay as follows:				
	Depth Au Ag Pb Zn As Sb				
Core	sample #1, 602-612				
Sludge	sample #8, 600-605				
"	" 9, 605-610				
"	" 10, 610-615				

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DIAMOND DRILL RECORD

Hole No. 1 Sheet No. 6 Lat. Total Depth

Section Dep. Elev. Collar

Date begun Bearing Elev. Bottom

Date finished Angle

DEPTH FEET	FORMATION	SAMPLE NO.	WIDTH OF SAMPLE	GOLD $	SLUDGE GOLD. $
612-642	Mostly light gray, med. to coarse grained, crystalline dolomite, with some dolomitic limestone. few inches of drab-gray, argillaceous limestone at about 630. Finely divided and thinly disseminated pyrite occurs occasionally. Appreciably fractured at 616, 622, 632, 635, and 642. Bedding massive.				
642-724	Same but mostly fine to med. grained.				
724-788	Rock similar in appearance to above, but mostly dolomitic limestone, and with more frequent and abundant disseminated pyrite. Small amount of rock is of med. gray color.				

Property Nevada Monarch Consolidated

DIAMOND DRILL RECORD

Hole No. 1 Sheet No. 7 Lat. Total Depth

Section Dep. Elev. Collar

Date begun 788 to 974 Bearing Elev. Bottom

Date finished Angle

DEPTH FEET	FORMATION	SAMPLE NO.	WIDTH OF SAMPLE	GOLD $	SLUDGE GOLD. $
788-833	Dark gray, med. grained, massive, crystalline dolomite. Calcite stringers and mottling from 808 to 833.				
833-846	Med. to dark gray, fine to med. grained, somewhat argillaceous dolomite. This zone is slickensided and with calcite stringers. Calcite with disseminated pyrite at about 833, and some disseminated pyrite elsewhere.				
846-863	Like 833-846, but with fewer calcite seams. Disseminated pyrite, partially oxidized to limonite at 852. One-eighth inch pyrite seam in breccia at about 846.				
863-974	Mostly dense to fine grained, light to med. gray, massive dolomite with some massive pyrite-galena-sphalerite at about 897 and 908. Breccia at 925.				

	Depth	Au	Ag	Pb	Zn
Core sample #2	893 (3")				
Sludge sample #11	895-900				

PROPERTY Nevada Monarch Consolidated

HOLE NUMBER 1

SHEET NUMBER 8

SECTION FROM 974 TO 1066

DIAMOND DRILL RECORD

LOCATION: LAT. .....
DEP. .....

ELEVATION OF COLLAR .....

DATUM .....

DIRECTION AT START: BEARING .....
DIP .....

STARTED .....

COMPLETED .....

ULTIMATE DEPTH .....

PROPOSED DEPTH .....

DEPTH FEET	FORMATION	SAMPLE No.	WIDTH OF SAMPLE	GOLD $	SLUDGE GOLD $		
974-1030	Mostly med. gray, fine to med. grained, dolomite with appreciable disseminated pyrite from 974 to about 980, at 994-996, 1016, 1024, and 1028. Thinly disseminated pyrite elsewhere in this zone.						
	Depth Au Ag Pb Zn						
	Sludge sample #12, 980-985						
1030-1031	Med. gray, fine grained dolomite with small amount of disseminated pyrite. Declination of beddinf from core axis: 55 degrees.						
1031-1032/6	Very light gray, fine grained, massive limestone with finely disseminated pyrite.						
1032/6-1045	Mostly light to med. gray, fine grained dolomite.						
1045-1063	Med. gray, fine grained dolomite, with occasional disseminated pyrite.						
1063-1066	Mostly very light gray, med. to fine grained limestone. Core fractures (bedding?) normal to the axis.						

NORTHERN MINER PRESS LIMITED, TORONTO—STOCK FORM No. 501 REV. 9/44

DRILLED BY .....

SIGNED .....

PROPERTY Nevada Monarch Consolidated

HOLE NUMBER 1

SHEET NUMBER 9

SECTION FROM 1066 TO 1136

DIAMOND DRILL RECORD

LOCATION: LAT. .....
DEP. .....

ELEVATION OF COLLAR .....

DATUM .....

DIRECTION AT START: BEARING .....
DIP .....

STARTED .....

COMPLETED .....

ULTIMATE DEPTH .....

PROPOSED DEPTH .....

DEPTH FEET	FORMATION	SAMPLE No.	WIDTH OF SAMPLE	GOLD $	SLUDGE GOLD $		
1066-1077	Light gray, fine grained limestone; some dolomitic with small amount of disseminated pyrite. Fractur zone with pyritic gouge at about 1071. Fault at 1077.						
	Depth Au Ag Pb Zn						
	Core sample #3, 1070-1072						
1077-1095	Mostly med. gray, fine grained dolomite and dolomitic limestone.						
1095-1130	Med. to dark gray, fine grained to dense dolomite and dolomitic limestone, apparently both carbonaceous and argillaceous. Disseminated pyrite at 1112-1113.						
1130-1136	Mostly light to med. gray, mottled and fractured limestone with some seams and small irregular masses of pyrite and a little galena.						
	Depth Au Ag Pb Zn						
	Core sample #4, 1135 (6")						

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SIGNED .....

PROPERTY Nevada Monarch Consolidated

HOLE NUMBER 1

SHEET NUMBER 10

SECTION FROM 1136 TO 1250

DIAMOND DRILL RECORD

LOCATION: LAT. .....
DEP. .....

ELEVATION OF COLLAR .....

DATUM .....

DIRECTION AT START: BEARING .....
DIP .....

STARTED .....

COMPLETED .....

ULTIMATE DEPTH .....

PROPOSED DEPTH .....

DEPTH FEET	FORMATION	SAMPLE No.	WIDTH OF SAMPLE	GOLD $	SLUDGE GOLD $		
1136-1140	Similar to 1130-1136, except with more carbonaceous (graphitic) material and very little sulfide.						
1140-1250	Medium to dark gray, fine grained, carbonaceous dolomite with occasional finely disseminated pyrite. Also some dolomitic limestone. This section is fractured and brecciated from 1237 to 1250.						

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DRILLED BY .....

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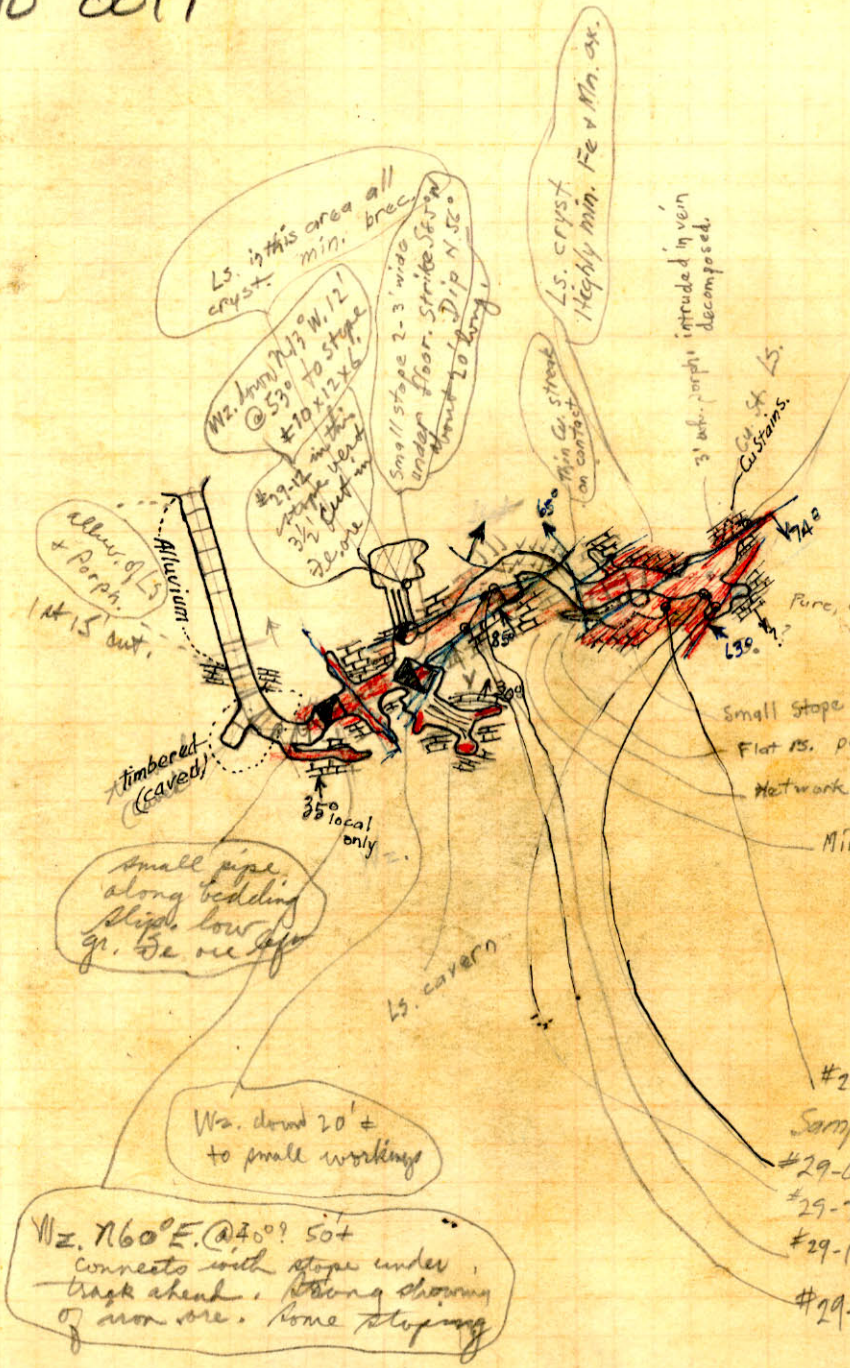
CONTACT TUN.

9/6/29

Scale 50'

K Lewis Hlpr



#29-8 - 2½' pipe Ox. ore in Ls. cavity

Note. The extent of workings, both above and below this tunnel, indicates that several hundred tons of ore have been extracted.

Small stope about 8 x 8'
Flat Ls. porph. in top
Network of fissures not mapped.

Min. breccia of Ls & porph.

#29-9 - 2' streak red iron ore

Samples.-

#29-6 Grab of fines from pile.

#29-7 5½' vert. cut - Ox. ore.

#29-10 6' vert cut. - shows Cu

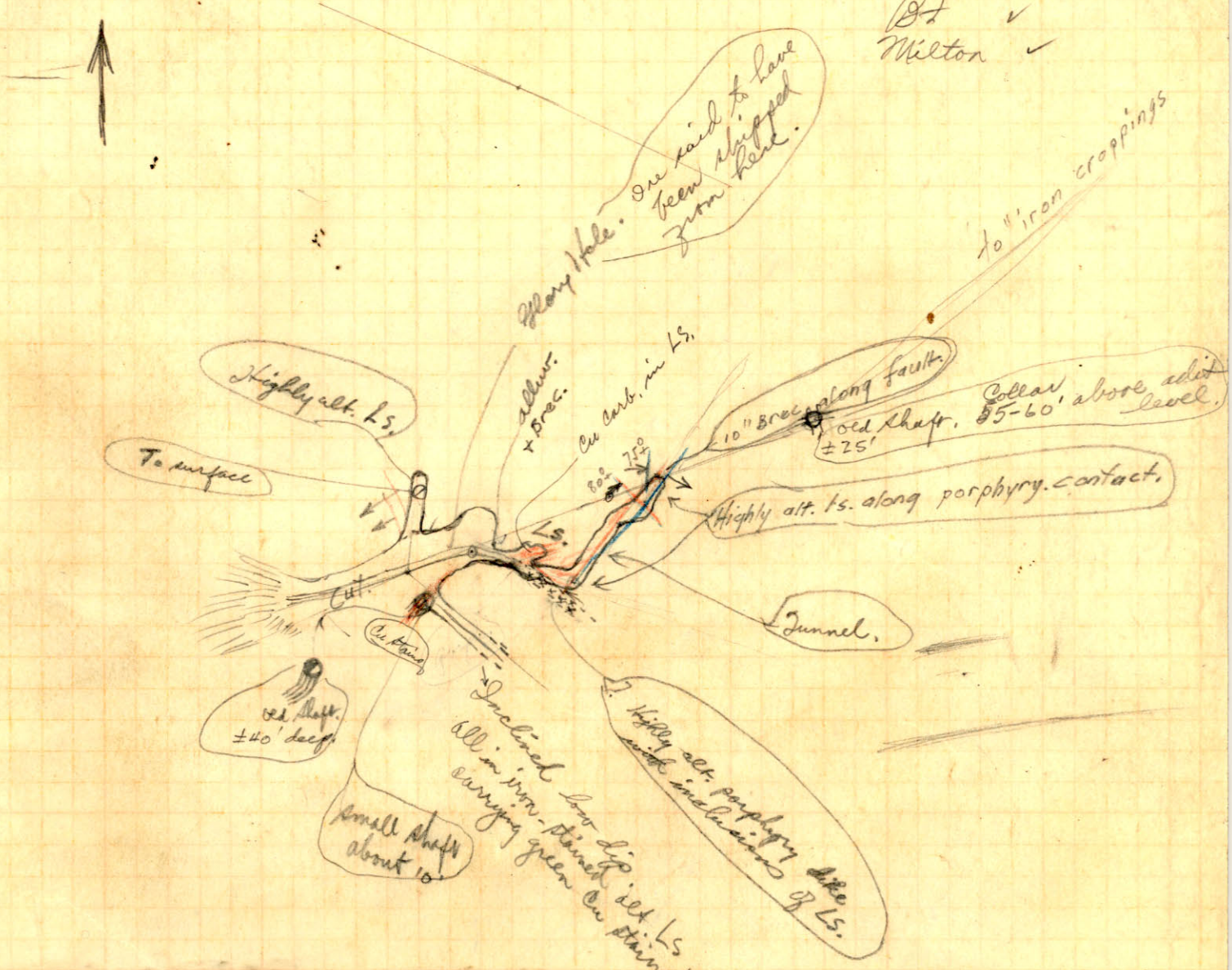
#29-11 2' bunch, malachite ore Ls.

4590 0017

77

Bingo Consolidated Mining Co. (Hartley Estate)
Spruce Mt. Nev.

3/20/28
C S Woodward
BZ
Milton



4590 0017

(77) Item 17 (77)

Upper O'Neill Workings. 3/27/28

Driven northerly on a N-S fiss. cutting lime-stone beddings dipping S.E. about 25°. Some porphyry intruded into ~~Heavy~~ Cross fiss. & also along bedding plane. The bedding wherein the ore was found seems to be a white sugary cryst bed, upwards of 6 ft thick, overlying a dense dark bluish limestone of considerable thickness. The workings are shallow and of no particular importance excepting as they display the habit of the mineralization. These workings lie at least 300 ft to the west of a big fissured and probably faulted zone marked by hard outcrops of silicious hematite-stained lime-stone along which there is probably a little igneous intrusion at least in the West contact.

There are at least three prominent fissures to the west of the said silicious zone, parallel to it in strike, nearly vert. in dip, and within a distance of 500 ft from the westerly contact of the zone.

Utah Lead Company

MARYSVALE, UTAH

DAILY DISTRIBUTION OF LABOR—ALL DEPARTMENTS

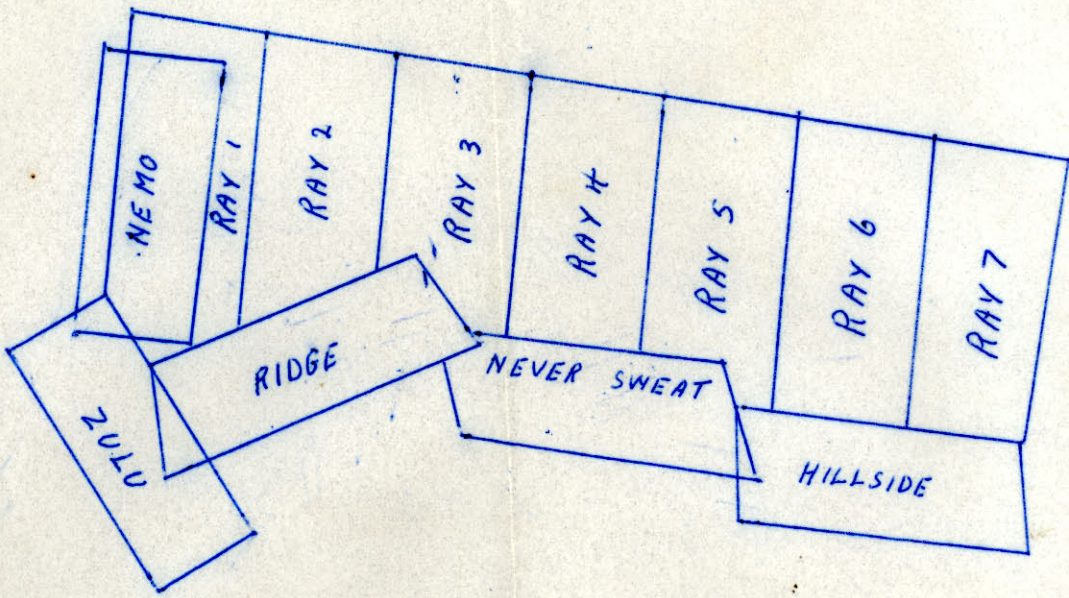
Date .....

NAME	RATE	SHIFT	MINE	MILL	POWER HOUSE	SURFACE	POWER LINE	TRAM	BLACKSMITH SHOP	OFFICE	DRIVING TEAMS	BOARDING HOUSE	COMMISSARY	MIS'C.	U. L. EXT.	DE WITT EXT.	DALTON EXT.	DESERET EXT.

4590 0017

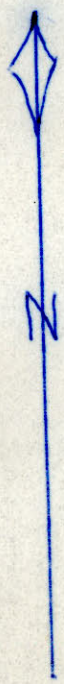
77

Item 17



Ray #1 Located Jan. 2/58
" #2 " "
" #3 " "
" #7 " Jan. 5/58
" #6 " "
" #5 " "
" #4 " "

"Scale: 1" = 1000'

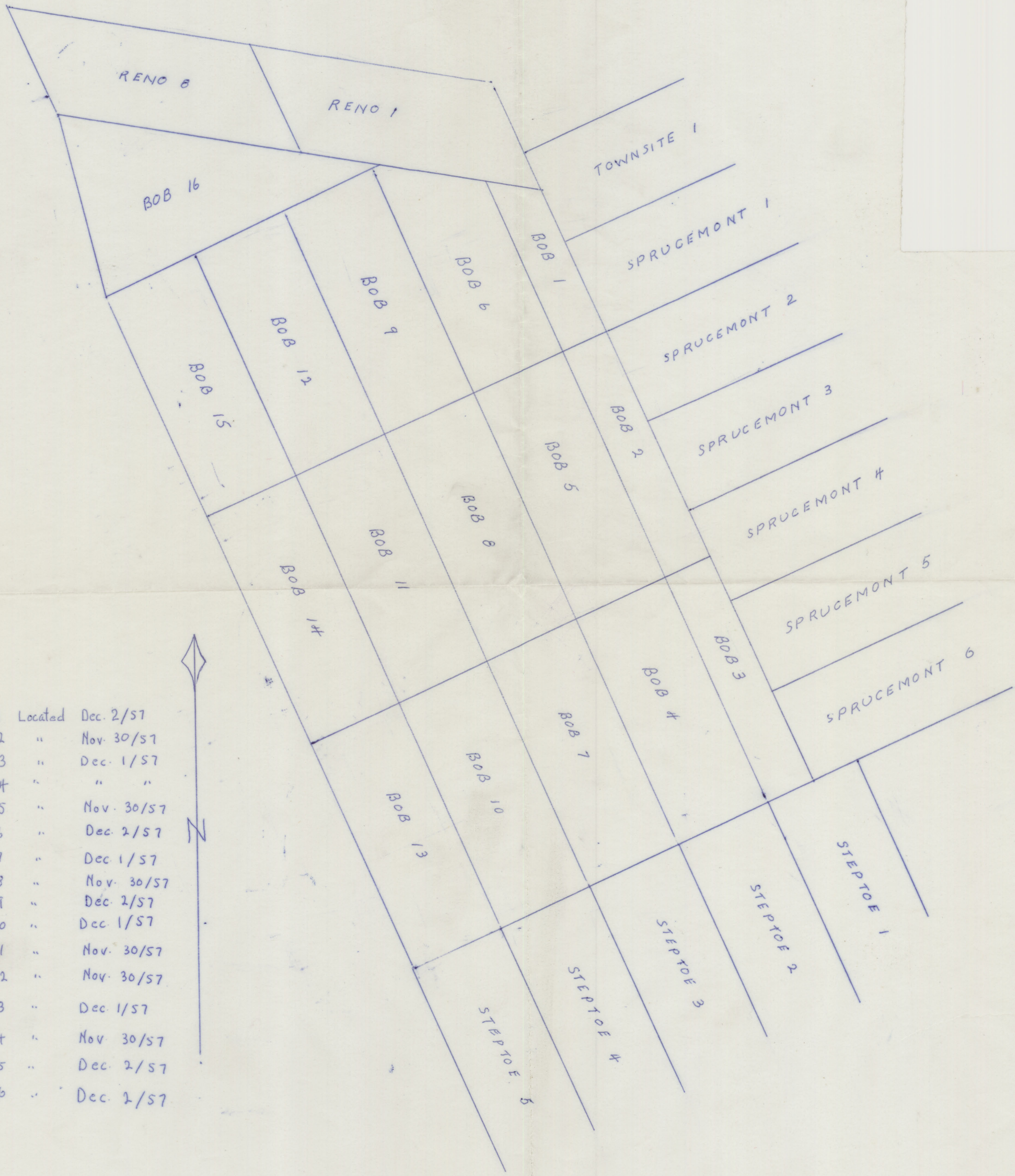


(77) Item 17

Scale 1" = 500'

Bruce	#1	Located	Jan. 1/58
Bruce	#2	Located	Dec. 31/57
"	#3	"	Jan. 1/58
"	#4	"	Dec. 31/57
"	#5	"	Jan. 2/58
"	#6	"	" "

4590 0007



Bob #1 Located Dec. 2/57
" #2 " Nov. 30/57
" #3 " Dec. 1/57
#4 " " "
#5 " Nov. 30/57
#6 " Dec. 2/57
#7 " Dec 1/57
#8 " Nov. 30/57
#9 " Dec. 2/57
#10 " Dec 1/57
#11 " Nov. 30/57
#12 " Nov. 30/57
#13 " Dec. 1/57
#14 " Nov 30/57
#15 " Dec. 2/57
#16 " Dec. 2/57

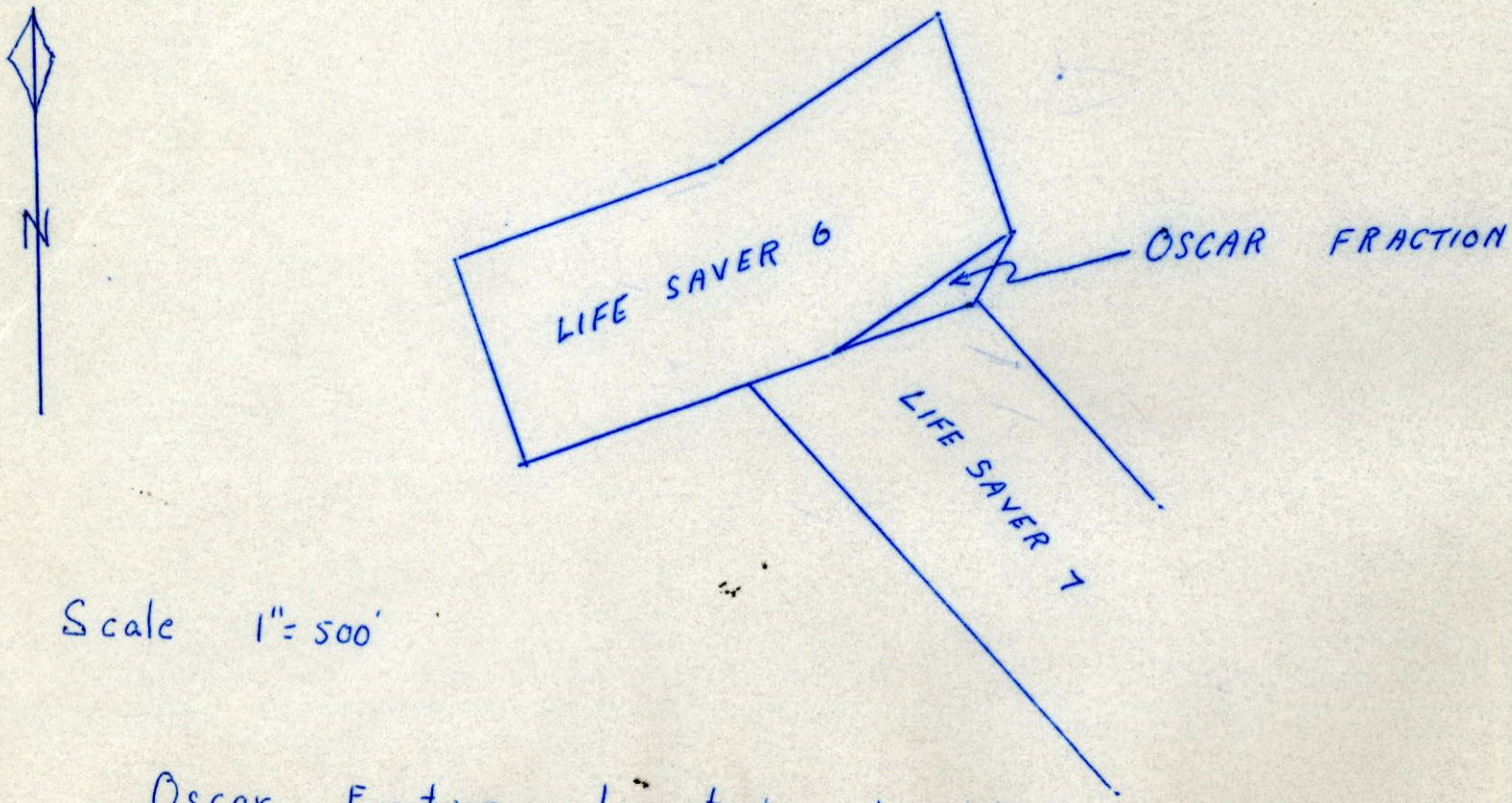
Scale 1" = 500'

7100 0024

(77)
Item 17

(17)

Item 17



Scale 1" = 500'

Oscar Fraction Located : Jan. 18/58

4590 0017