Report on the 840519
S. J. Claims
Winter Harbour Area, British Columbia
for
British Newfoundland Exploration Ltd.
by
Stokes Exploration Management Co. Ltd.
November 1, 1974

D. H. Loighton

REPORT ON THE

S. J. CLAIMS

WINTER HARBOUR AREA BRITISH COLUMBIA

FOR

BRITISH NEWFOUNDLAND EXPLORATION LTD.

BY

D. G. LEIGHTON Geophysicist/Geologist

STOKES EXPLORATION MANAGEMENT CO. LTD.

November 1, 1974

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REPORT ON THE S. J. CLAIMS WINTER HARBOUR AREA, BRITISH COLUMBIA

SUMMARY

- 1. The S. J. is an arsenic (mercury) prospect located near San Joseph on northern Vancouver Island, British Columbia.
- Claims covering the prospect are owned by Sgt.
 G. Garrett, but Brinex has the first right to any purchase or option agreement.
- 3. The property has excellent potential for gold and/or copper mineralization. It is a new discovery which has never been explored.
- 4. It is recommended that an agreement be made with Garrett and the property be evaluated.
- 5. Initially, more claims should be staked, then the area should be mapped geologically, and tested geochemically. Overburden depths should be determined along grid lines with a hammer seismic unit and a magnetic survey should be run. Fifteen thousand (\$15,000.00) dollars should be allocated for this first phase of exploration on the property.
- 6. Any follow-up work will be contingent upon the results of the above work.

Respectfully submitted:

STOKES EXPLORATION MANAGEMENT CO. LTD.

D. G. Leighton

Geophysicist/Geologist

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November 1, 1974.

S. J. CLAIMS WINTER HARBOUR AREA, BRITISH COLUMBIA

INTRODUCTION

In the course of exploration work in the Holberg-Winter Harbour area, Sergeant Garrett from the airforce base at San Joseph, brought the author's attention to a 'peculiar' rock he had found. The rock turned out to be composed mostly of orpiment (As2S3, 61% As) and realgar (AsS, 70% As) with possibly some cinnabar (HgS). This was a new discovery for northern Vancouver Island. Therefore, in view of a possible relationship of this rock to either gold or copper mineralization, it was decided to attempt to track down the source. It was agreed that if a source area were found, claims would be staked for Garrett and that Brinex would have the first right to any option or purchase agreement. One source was soon discovered and four S.J. claims were staked. Follow-up work is merited.

LOCATION AND ACCESS

The S. J. property is located near Holberg on the northern end of Vancouver Island. The claims can be reached by road from Port Hardy, although permission is required from logging companies at times when active logging is in progress. A permit also is required to pass through the airforce base.

The position of the S. J. claims relative to the key geographical features is shown on a geological map following page three. Their geographical position is 50°39! North latitude, 128°05! West longitude. The maximum elevation on the four claims is about 400 feet above sea level.

CLAIMS AND OWNERSHIP

The S. J. claims were staked along the San Joseph River to cover the source area of the arsenic mineralization. The claims were staked by R. J. Bilquist as agent for G. Garrett whose address is c/o P.O. Box 93, C.F.S., Holberg, San Joseph, B.C. The relative position of the S.J. olaims is shown on a sketch map following this page. These claims are in the Nanaimo Mining Division.

SPECIAL CONSIDERATIONS

Special precautions will be necessary during the course of any exploration work done on the S.J. property to minimize environmental damage. The San Joseph River is the domestic water supply to the airforce base and it has important recreational value as a fishing stream.

GEOLOGY

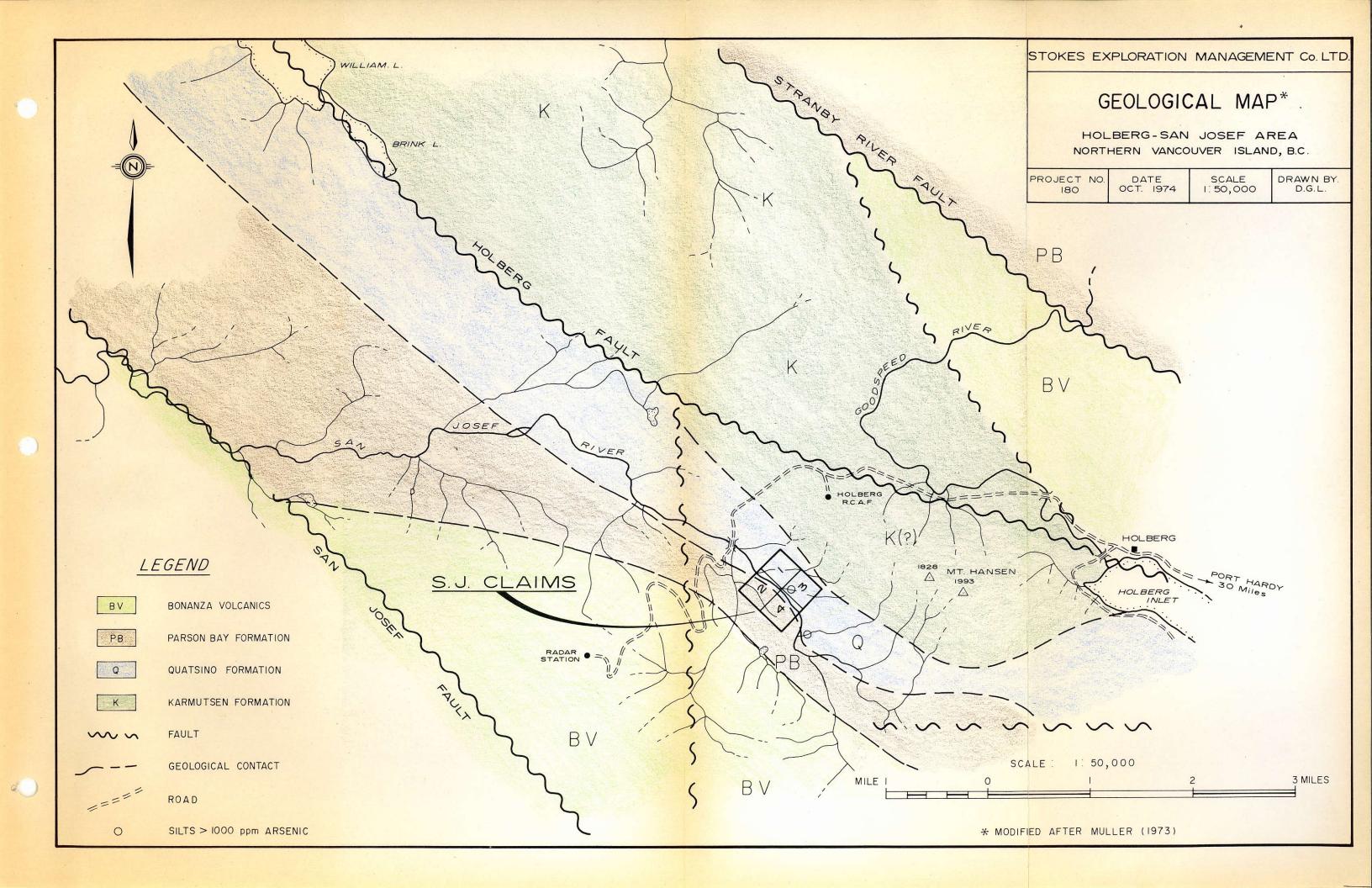
The general geology of the San Joseph area is shown on an accompanying map following this page (after Muller, 1973). Members of the Vancouver Group represented include the Karmutsen, Quatsino and Parson Bay formations and rocks of the Bonanza sub-group. The general characteristics of these rocks have been described in various other reports and will not be repeated here.

Special note should be made of the various faults shown. Several of these are major structures with large displacements which undoubtedly penetrate deep into the earth's crust. The arsenic mineralization may well be related to one of these structures.

(a) Holberg Fault

This lineament runs across Vancouver Island between Cape Scott and Port McNeill, part of its length coinciding with Holberg Inlet. Dip slip movement has lifted formations in the north several





Geology (Cont! d)

thousand feet relative to those in the south, at least north of Holberg. The extent of any strike slip movement along this structure is unknown. It may be that a branch of the Holberg fault runs down the San Joseph River though no direct evidence for this was seen.

(b) Stranby River Fault

A steeply dipping fault runs from the mouth of Laura Creek and parallel to part of the Stranby River to the southeast. The southern part of this structure is uncertain but it probably intersects the Holberg fault near Holberg. Dip slip movement on this structure is at least several thousand feet; rocks to the north have moved down relative to those in the south. Only the southern extension of the Stranby River fault is shown on the accompanying map.

(c) San Joseph Fault

The San Joseph fault is another major northwesterly trending structure which probably extends to become part of the Mahatta River fault in the south. Little is known about relative movement on this structure which may well include substantial strike slip displacement.

No detailed geological work was attempted on the S.J. claims, however, a few general observations were made. Almost continuous bedrock exposure was encountered in the first mile up the San Joseph River from the airforce base-radar station road bridge. The rock exposed was dominately Parson Bay formation sediment; that is, limestone, shale and siltstone. The rocks are relatively flat lying but undulating. In some places, stratigraphically lower Quatsino limestone is exposed and in others, volcanic rock, presumably of the overlying Bonanza volcanic sequence, occurs in the river bed. Some of the rock is badly sheared so that fault displacements may play a role in bringing the various lithologies into their respective positions.

Geology (Contid)

Bedrock exposed on the hillsides to the northeast (Mt. Hansen) and southwest of the arsenic showing consist of predominately dark green basic volcanic flows. Muller has mapped the bedrock comprising Mt. Hansen as Karmutsen. Although the author feels these rocks are part of the Bonanza volcanic sub-group, Muller's interpretation will be followed. (See geological map following page 3).

A light pinkish brown feldspar porphyry dike (?) rock is exposed in the bed of the small creek containing the arsenic showing. The phenocrysts in this rock are salmon coloured, subhedral and average about 5mm in size. They may be albite. A sample of the porphyry was stained with sodium cobaltinitrite which showed the groundmass to contain abundant potassium, probably admixed with fine granular quartz. Similar rock is exposed near the top of the hill to the southwest near the airforce radar station.

Abundant pebbles of bright yellow rock composed almost entirely of orpiment and realgar (possibly containing cinnabar) were found near the mouth of a small creek running into the San Joseph River from the east. This creek is located 3440 feet southeast of the bridge on the road between the Holberg airforce base and the radar station (which is located 3 miles southwest of the base). Bedrock in this area is dominately light grey bioclastic limestone, presumably of the Quatsino formation. Most of the area of economic potential appears to be covered by a mantle of overburden less than 20 feet thick.

ECONOMIC POTENTIAL

To assess the economic potential of the arsenic (realgar, orpiment) showing on the San Joseph River, it is useful to make an analogy with other deposits containing these minerals.

The only known mineral deposit containing mercury on Vancouver Island is Sechart. This showing on Alberni Inlet contains cinnabar, native mercury, pyrite, hematite and limonite in andesite, limestone and diorite within breccia zones. Silica and

Economic Potential Cont'd)

carbonate are associated with these minerals. The deposit is probably Tertiary in age.

Besides the S.J. prospect, two other occurrences of realgar-orpiment are known on Vancouver Island. Each of these is also probably Tertiary in age. In every case associated alteration minerals include silica and carbonate. The two are Mt. Washington Copper and the Wolf Prospect. The main features of each of the above is given on Table 1 (Carson, 1969) following this page.

Besides the other arsenic showings on Vancouver Island, it may be useful to make analogy with Carlin (Dodson, personal communication). The famous Carlin gold deposits in Nevada together with the Bootstrap and Getchell deposits in Utah and others appear to comprise a genetically similar type (Hansen, 1968). In these deposits, there is normally closely related mercury and arsenic, especially the minerals cinnabar, realgar and orpiment. Gold mineralization of the Carlin type is interpreted to be a low temperature, near surface precipitant. Carbonate sediment is the usual host. There is generally a close spacial relationship to major fault structures. Finally, Carlin type ones also seem to be intimately related to acid dikes, especially quartz porphyry types.

The general features described above are in common with what has been seen to date on the S.J. prospect. Therefore, the possibility of finding a Carlin type of ore deposit should be considered when evaluating the San Joseph area.

ARSENIC VEINS

Two arsenic-carbonate veins, the Grizzly and Wolf deposits, occur on Vancouver Island (Figure 1). Neither has been mined, but the Grizzly has yielded some native arsenic samples for mineralogical collections. Their main characteristics are given in Table I.

Both arsenic deposits are in steeply dipping brecciated fault zones and have close spatial relationships with Tertiary dacite porphyry sills or laccoliths intruding sedimentary rocks of the late Cretaceous Nanaimo Group. Grizzly is Tertiary, because it occurs in argillites assigned to the Nanaimo Group (Muller, 1964). Wolf (Figure 2) is probably Tertiary (Gunning, 1931) because of its spatial relationship to Tertiary dacite porphyry and its proximity to Mt. Washington, which is the locus of much Tertiary mineralization (Carson 1960; 1968).

COPPER-ARSENIC DEPOSITS

Three distinguishing features of the two known members of this class, Mt. Washington Copper and Macmillan (Table I), are the copper-arsenic content, the exotic mineralogy and their occurrence near the unconformity between the Triassic Karmutsen basalts and late Cretaceous sedimentary rocks of the Nanaimo Group.

The Mt. Washington Copper orebody is a gently dipping tabular body of quartz and sulphides deposited in a fault or sheeted zone. It partly follows the contact between Upper Cretaceous sedimentary rocks and a Tertiary dacite porphyry sill. Chalcopyrite is the most important constituent of the ore, but the deposit contains numerous other minerals including chalcostibite and the rare bismuth telluride, wehrlite (Table I). The copper-arsenic orebody is stratigraphically a few hundred feet above the Karmutsen-Nanaimo un-

Deposits	Metals, Tenor	Mineralogy, Textures (important newly- reported minerals in bold face)	Textures, Physical Forms	Host Rocks, Associated Rocks	Alteration	Structural Controls	Main References
ARSENIC VEINS Grizzly	As; negligible Au, Ag.	Native As, arseno- pyrite, carbonate, quartz.	Arsenopyrite stringers, disseminations and native As "kidneys" in veins up to 2' wide, 50' — 50' long.	Argillites of the Nanaimo Gp., Tertiary dacite porphyry sills nearby.	Limited carbon- atization and si- licification of wallrocks.	Vertical fracture or fault with brecciated wall- rocks.	Laanela (1964) Muller (1964)
Wolf	As	Realgar, arseno- pyrite; minor na- tive As; calcite, quartz.	Realgar masses up to 4' x 9", lenses of calcite up to 6' wide, stringers of arsenopyrite, all in steeply dipping veins 2'-12' wide and 250' long.	Andesite of Karmutsen Fm. Nanaimo Gp. sediments and Tertiary dacite porphyry sill nearby.	as for Grizzly	Steeply-dipping brecciated fault.	Hurst (1927) Gunning (1931)
COPPER- ARSENIC VEIN, BRECCIA ZONE, Mt. Washington Copper	Cu 1.40%; As apprec. Au 0.015 oz/ton Ag 1.20 oz/ton	Abundant quartz and minor calcite, dolomite with main ore minerals chalcopyrite, pyrrhotite, pyrite, arsenopyrite, realgar. Minor orpiment, bornite, tetrahedrite, molybdenite, marcasite, sphalerite, magnetite, galena, chalcocite, covellite, native arsenic, malachite. Rare hessite, wehrlite, native Au, chalcostibite, molybdite, Cu.	Nearly-horizon- tal quartz-filled vein or sheeted zone 250' x 600' x 7'—15'. Sul- phides are in quartz and also replace wallrocks. Banded, crusti- form, vuggy, brecciated.	Argillite and quartzite of Nanaimo Gp. and Tertiary dacite porphyry sills, and dykes near border of quartz diorite stock.	Intense silicifica- tion of wallrocks.	Nearly flat-lying fracture or sheeted zone, possibly a fault. Located near Nanaimo-Karmutsen unconformity, a zone of weakness. Nanaimo sediments and dacite sills may have been impermeable cappings.	Carson (1960) deVoogd(1964) McKechnie (1961b) Carson(1968)
Macmillan	Cu < 1% As < 1% Au and Ag = trace	Abundant calcite, quartz, with bornite, tetrahedrite, covellite, chalcocite, corynite. Very minor chalcopyrite, hematite, native As (?)	Breccia zone 335' x 60' surface area but unknown depth or origin. Ore minerals dissem, or in veinlets in the breccia. Bornite intergrown with tetrahedrite. Chalcopyrite blades in bornite.	Siliceous calca- reous breccia zone in Karmut sen andesite Con- tains porphyritic fragments (Ter- tiary dacite?) in sheared crushed rock, Nanaimo sediments nearby.	Intense silication- tion and carbon- atization of brec- cia.	Breccia zone formed near Na- naimo-Karmut- sen unconformity. May be a tec- tonic breccia.	Laanela (1964) Carson (1968)

GEOCHEMISTRY

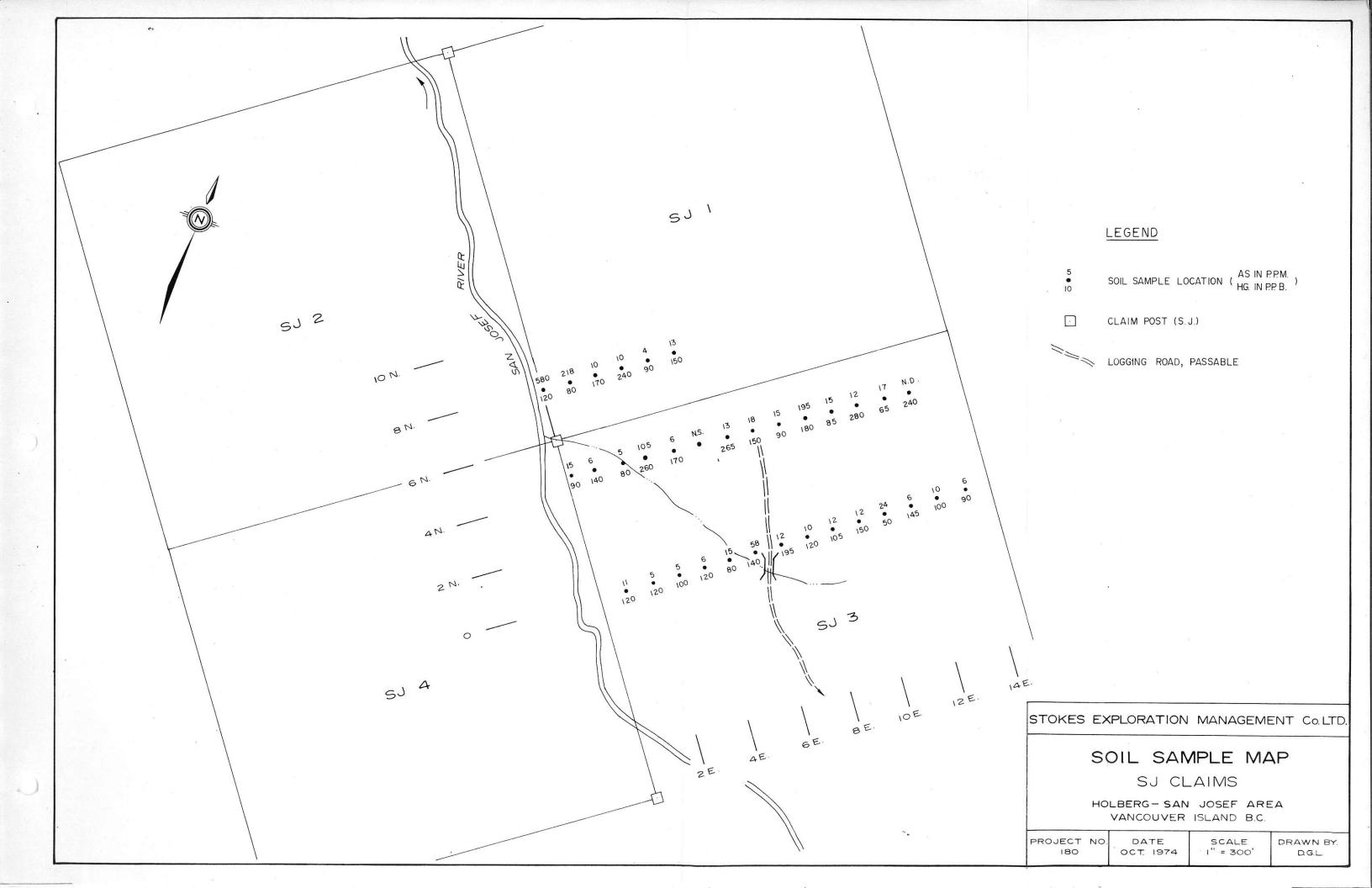
Some reconnaissance geochemical work was done in the San Joseph area. In the survey, both soil and silt samples were collected and these were tested for arsenic and mercury. This work should be extended. Thirty-four soil samples were collected along three lines running across a source area to arsenic mineralization. Twenty-five silt samples were collected from creeks in the vicinity of the S.J. property. In both cases, anomalous results were obtained.

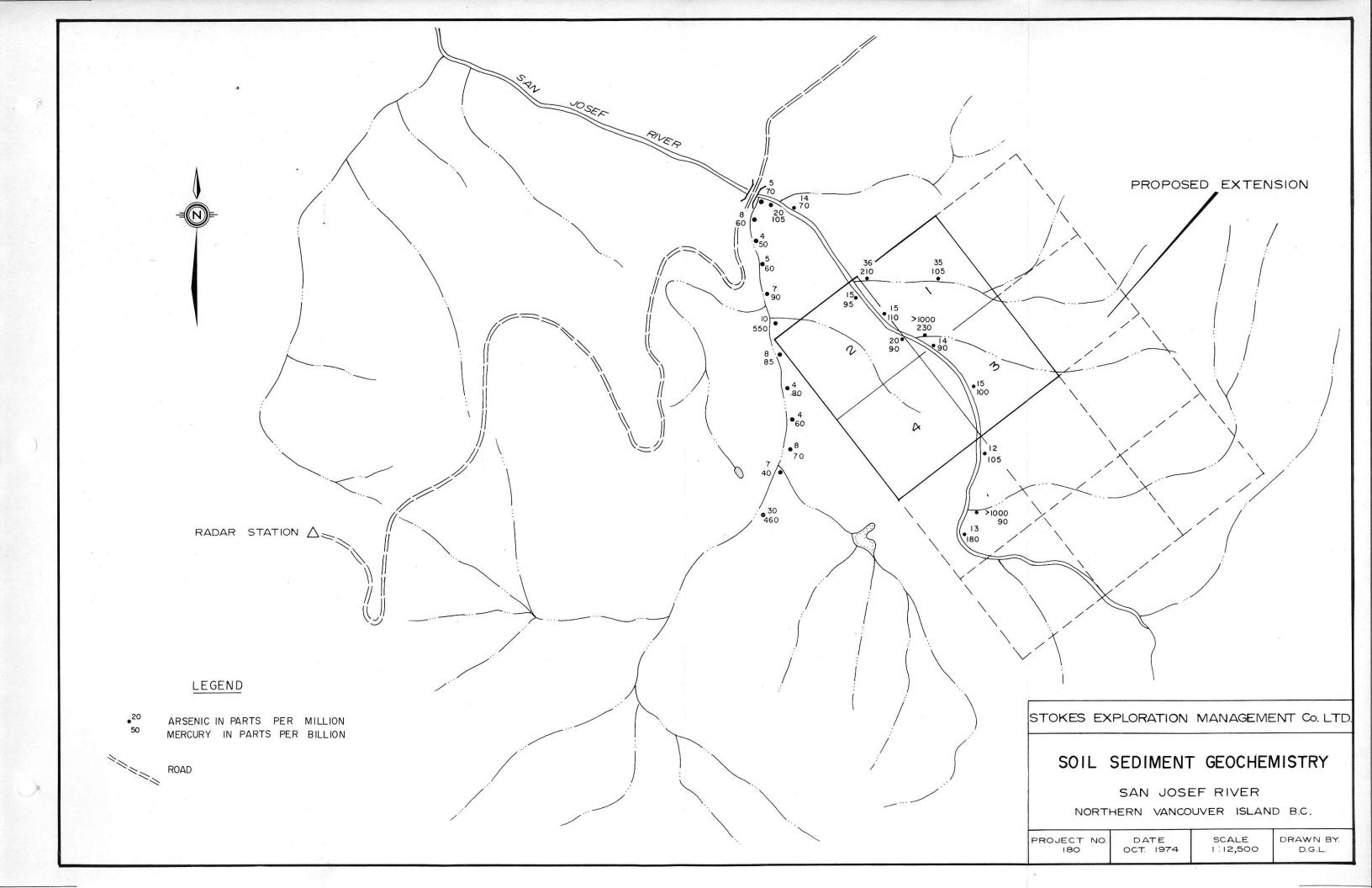
(1) Soil Sampling

The soil sample results are shown on a sketch map following this page. Values exceeding 40 ppm As can be considered anomalous and those greater than 100 ppm are probably related in some way to realgar-orpiment mineralization. The mercury is difficult to interpret, however, the average assays for this element are roughly double normal background values. Therefore, while these results do not suggest the presence of an actual mercury deposit, they may well indicate proximity to a major mercury exhaling fracture system.

(2) Silt Sampling

Silt sample locations and assay results are shown on a sketch map following this page. Values shown are arsenic in parts per million and mercury in parts per billion. Samples RH8 and RH 12 with arsenic values greater than 1000 ppm are extremely anomalous. RH8 comes from the creek known to be the source of realgar and orpiment and is, therefore, not surprising. RH12, however, should definitely be followed up. Again the mercury results are difficult to interpret. Those values greater than 100 parts per billion are larger than would normally be expected in this terrain.





CONCLUSIONS

A showing containing realgar and orpiment has been discovered on the San Joseph River. Information collected to date suggests that these minerals, and possibly mercury, have been precipitated in or near a major crustal break, possibly on a branch of the Holberg fault. Since there is an excellent chance of discovering gold and/or copper associated with the arsenic mineralization, follow-up work is warranted. The recommended program with estimated costs follows:

PROPOSED PROGRAM FOR THE S. J. PROPERTY WITH ESTIMATED COST

The following program is proposed to evaluate the S. J. property. Estimated costs assume that all work is carried out concurrently.

1. STAKING

A minimum of four claims should be added to the present block on the southeast side. These would cover the creek containing silt anomaly RH 12. Naturally, more claims would be required if the expanded silt sampling work revealed additional anomalies. The staking could be done in the course of linecutting.

2. SOIL SAMPLING

An enlarged block containing 8 claims should be soil sampled with samples collected at 200 foot intervals on lines spaced 400 feet apart. Approximately 20 line miles of grid would be required to do this. Samples tested for As and Hq.

	4
Grid	4,700.
Sampling	1,500.
Assays (Hg, As)	2,300.

Carried forward 8,500.

Proposed Fromam (Contid)

Brought forward

8,500.

3. SILT SAMPLING

The previous slits should be checked and the area sampled greatly expanded. About 100 samples should be collected and tested for As, Zn and Copper.

Sampling Analysis

300. 500.

4. GEOLOGY

The enlarged 8 claim block should be mapped in detail using the soil grid for control. An airphoto study should be carried out in conjunction with the mapping to help identify possibly controlling lineaments as part of the geological evaluation

Geological work

1.500.

5. MAGNETIC SURVEY

A magnetometer survey should be made over all grid lines to help define geological contacts in areas covered by overburden which may also help delineate any major fault structures if present.

Magnetic survey

1,200.

6. SEISMIC SURVEY

Prior to any trenching or diamond drilling that might be carried out, a hammer seismic survey should be carried out to establish overburden profiles at least over a few areas.

Seismic survey

1,200.

PHASE I-TOTAL ESTIMATED COST Contingency - 163

13,200. 1,300.

\$14,500.

Proposed Program (Contl d)

Any additional work on the S. J. property would, of course, be contingent on the results of the above.

Respectfully submitted:

STOKES EXPLORATION MANAGEMENT CO. LTD.

DI Leighton

D. G. Leighton
Geophysicist/Geologist

November 1, 1974.

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- Hansen, D.M. and Kerr, P.F. (1968)

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- Dodson, E.D. (1974)

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- Muller, J.E., Northcote, K.E. and Carlisle, D. (1973)
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 -- Cape Scott Map-Area (92L-1021) Vancouver
 Island, British Columbia, G.S.C. Open File
 Report 170, p 83.



STOKES EXPLORATION MANAGEMENT CO. LTD./STE. 713 - 744 W. HASTINGS ST., VANCOUVER, B.C. V6C 1A5, TEL: 688-8541

November 27, 1974.

BRINEX, Dr. Neil Westoll, #704 - 602 West Hastings Street, Vancouver, B.C.

Dear Sirs:

Re: Report on S.J. Claim dated November 1, 1974.

This letter (and attached maps) is meant to form an Appendix to the Report on the San Joseph (S.J.) claims by me dated November 1, 1974. It includes soil sample results for copper and gold which were not available when the original report was prepared. Also, mercury and arsenic values have been included on separate maps for comparative purposes.

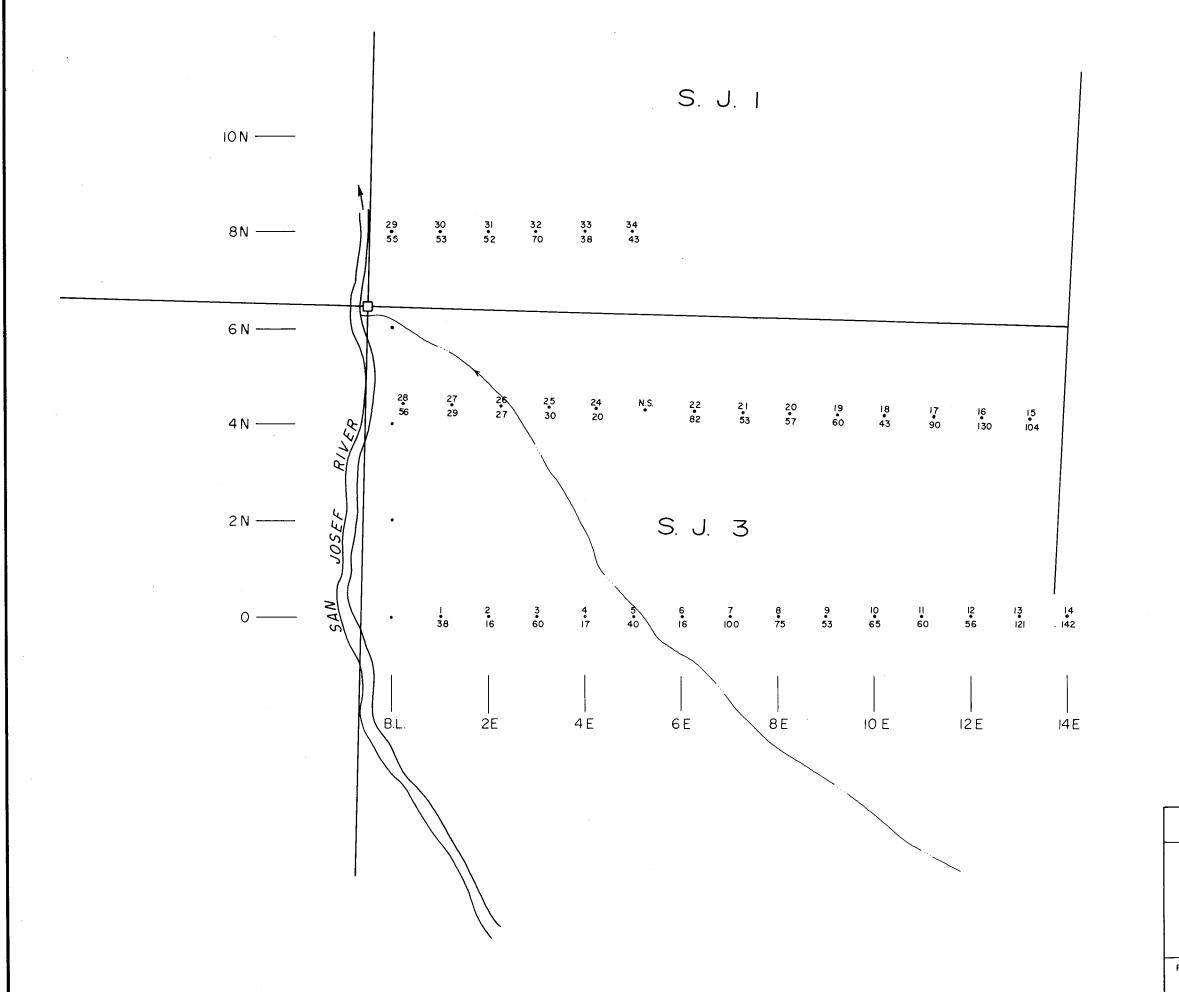
It should be noted that anomalous values in both gold and copper (as well as mercury and arsenic) are indicated. The fact that there is not a one to one relationship between anomalous results among the different metals at sample sites indicates that the results are truly anomalous but vary with various dispersive mechanisms and are not due to contamination.

Yours very truly, STOKES EXPLORATION MANAGEMENT CO. LTD.

D. M. Leighton

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Geophysicist/Geologist

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LEGEND

12 SOIL SAMPLE NUMBER
SOIL SAMPLE LOCATION
COPPER IN P.P.M.

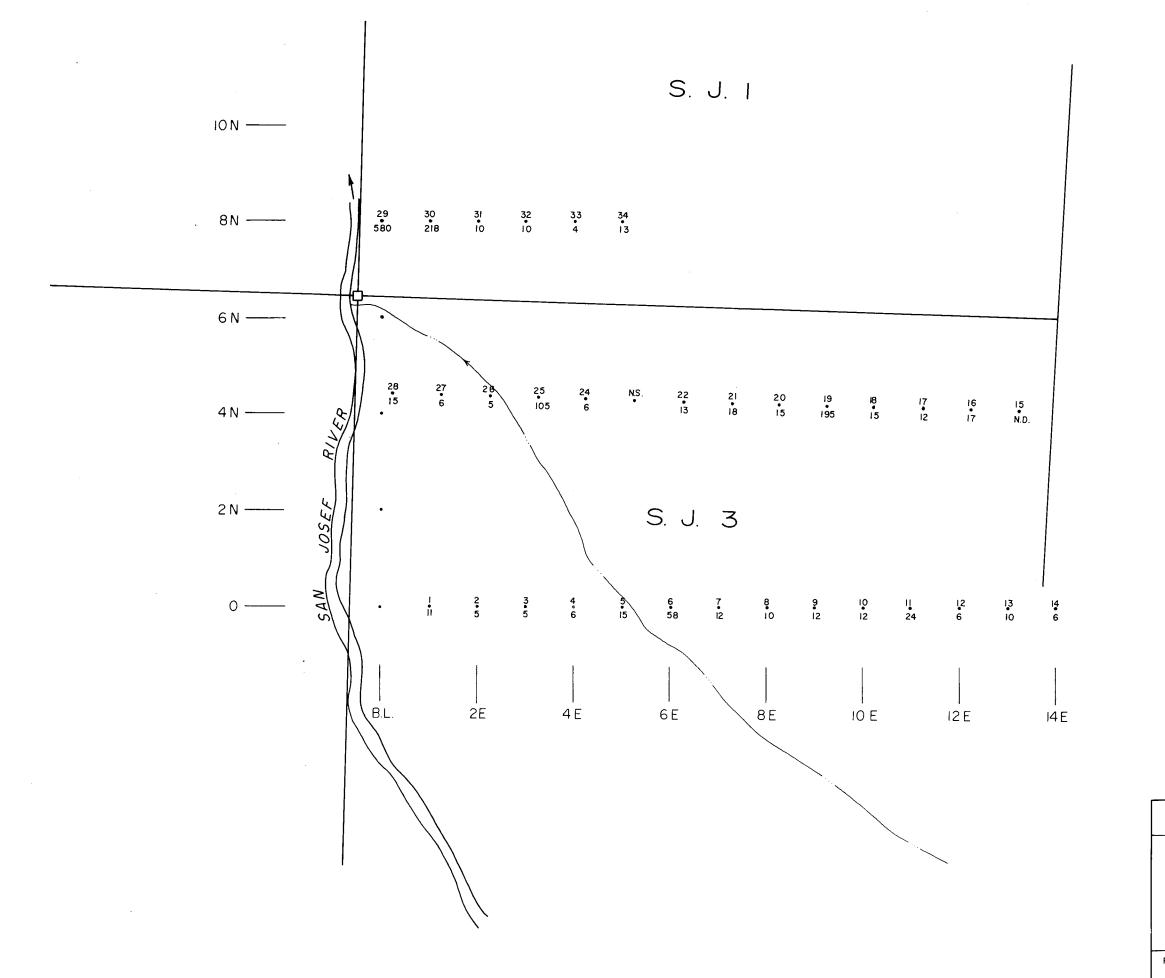
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SOIL SAMPLE RESULTS

SAN JOSEF CLAIMS

NORTHERN VANCOUVER ISLAND, B., C.

PROJECT No.	DATE	SCALE	DRAWN BY
180	OCT. 23	ı"= 2000'	D. G. L.





LEGEND

12 SOIL SAMPLE NUMBER
SOIL SAMPLE LOCATION
ARSENIC IN P.P.M.

STOKES EXPLORATION MANAGEMENT Co. LTD.

SOIL SAMPLE RESULTS

SAN JOSEF CLAIMS

NORTHERN VANCOUVER ISLAND, B. C.

PROJECT No.	DATE	SCALE	DRAWN BY
180	OCT. 23	1"= 2000'	D. G. L.

