

PROPERTY FILE

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THE NEW MOON PROSPECT

MORICE LAKE, B.C.

C.F. Kowall

February 26/79

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PROPERTY FILE

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31 July 1979

Mr. W. St.C. Dunn  
Silver Standard Mines Ltd.  
9th Floor - 1199 West Hastings Street  
Vancouver, B.C.  
V6E 3T5

Dear Bill:

Enclosed are the reports on the Moon prospect which I visited with Al Potter. The mineralisation is impressive, however I feel that the setting is not sufficiently attractive to warrant tackling the rather difficult task of locating the source of the high grade boulders.

Regarding the Ham property, I would concur with Dick Woodcock's assessment that the mineralisation appears to be deuteric.

Thank you for the opportunity to examine these prospects and I hope we may get together on something in the future.

Best regards,

*John Baker*

John Baker  
Exploration Manager Northern B.C.  
/lb

Enclosures

A CRITICAL APPRAISAL OF WORK PROGRAMS CONDUCTED  
TO DATE ON THE NEW MOON PROSPECT, MORICE LAKE, B.C.

C.F. Kowall  
February 26, 1979

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## I. INTRODUCTION

This report is a critical appraisal of the work programs which have been conducted on the New Moon property to date, with recommendations directed towards future exploration. The author, as owner of the property, has a financial interest in its successful development.

The geologic map which accompanies this report was compiled because the wide variety of work styles of the various people who have been associated with the property made it very difficult to correlate data from one map to the next. Small scale maps, crowded data, diverging north arrows, scales in meters as well as feet, and unusual mapping criteria resulted in utter confusion for someone attempting to reach intelligent conclusions concerning the property, even for one who was familiar with it.

## II. EXPLORATION SUMMARY

A brief chronological summary of past exploration can be found in Table One which is appended to this report.

### 1. Phelps Dodge Corporation

The property was first explored by Phelps Dodge during 1967-68. A work program of trenching and geologic mapping disclosed a broad silicified zone trending northerly and dipping at 65 degrees or more to the east. This zone was 100 to 200 feet in width and at least 600 feet in length. It was found to be mineralized with sphalerite and galena with minor chalcopryrite,

gold and silver. The zone appears to be a silicified fault replacement of Hazelton rocks and associated porphyries which dip gently to the north.

This wide zone contains bands of better grade (5% to 15% combined lead-zinc) over widths of from 10 to 45 feet. Eight trenches were sampled disclosing fairly consistent mineralization that averaged 3.66% zinc, 6.60% lead, 0.24% copper, 2.0 oz. silver over a sampled average width of 15 feet.

The showings occur on a high rolling plateau at about 6500 feet elevation. This area of about one square mile was geologically mapped by Phelps Dodge. The mapping disclosed a bedded sequence of rhyolites overlying andesites which are intruded by bodies of rhyolite porphyry, as dikes and small intrusions, all of which are cut by basalt and rhyolite dikes of various attitudes. Phelps Dodge dropped their claims after the initial preliminary work.

## 2. Silver Standard Mines Limited

The writer prospected the area adjoining to the south for Silver Standard immediately after the Phelps Dodge program. Several boulder trains were located which carried interesting mineralization composed of chalcopyrite, bornite, sphalerite, galena, specularite, magnetite, and pyrite. The mineralization occurred as blebs, bands and breccia fillings within highly

altered cherty tuffs, andesites, and limestones. The source of these boulders was not located at the time, but the writer did discover a banded zone composed of pyrite and chalcopyrite which was about 40 feet in width while prospecting the last day of camp. This zone has not been relocated despite a concerted effort by the author last season.

The author staked claims but no further work was conducted on the property by Silver Standard and these claims also were allowed to lapse.

### 3. Aggressive Mining Ltd.

When the Phelps Dodge claims expired in 1968 the trenched zone on the plateau was restaked by Fred Jowsey interests, Aggressive Mining Ltd. This company took grab samples for assay to verify the previous trenching results, and when the results were favorable conducted a Crone geophysical survey over the mineralized zone. This survey reportedly was hampered by wind and bad weather, and only one shallow lens-shaped conductor was located near the center of the trenching. In spite of the poor geophysical results, a diamond drill was brought up to the property and five holes were drilled which totaled 1025 feet. The first hole was drilled parallel to the dip and did not intersect the main mineralized zone. The next four holes intersected the mineralized zone below the trenches. A zone about 550 feet long and averaging 35 feet in width was tested

to depths of about 250 feet. The drill hole intersections averaged about 8% combined lead-zinc with silver values of about 0.5 oz.

A Norcen engineer later used the drill data to arrive at an estimate of the possible tons of mineralization that could be present surrounding the trenched and drilled area. If one gave the deposit 600 feet of strike length, 35 feet of width, and assumed that it extended to 500 feet in depth, it would contain in excess of one million tons. Recent work conducted by the author in 1978 indicates a strong possibility that this tonnage could be expanded into the 5 million-ton range, as there is evidence the deposit continues for some distance on strike. This recent work will be discussed later on in this report.

The Jowsey interests dropped their claims shortly after this work was completed, primarily because the mineralized zone where drilled carried only low values in silver.

#### 4. Silver Standard Mines - Norcen Energy Resources

The property lay dormant until 1977 when the author restaked the property while working under a B.C. prospector's grant. The property was optioned to Silver Standard during January of 1978. Silver Standard in turn optioned the property to Norcen Energy Resources Ltd., who then formed a partnership with Aquitaine Ltd. of Calgary. These companies had the



financial resources and personnel with which to conduct a preliminary exploration program on the property during the summer of 1978. The Norcen program consisted of prospecting, detailed mapping, Max-Min and magnetometer geophysical surveys, and limited soil sampling. The author was hired to prospect the claim group, and a 6-man crew was engaged in work on the property for a period of about one month at a total cost of approximately \$35,000.

The results of this work program were discouraging to the Norcen people and they dropped their option on the property.

### III. DISCUSSION OF NORCEN WORK

The author's conclusions differ in many respects with those of Norcen, which are well documented in their final 1978 report. Several aspects of the Norcen work will be discussed below:

#### 1. Geological Mapping

The detailed mapping (see Norcen maps 1978) was conducted over approximately one and one-half units of the total of 52 units which comprise the property. This gives a figure of less than 3% of the total area that is covered by adequate mapping. If one assumes that only 50% of the property is accessible by foot traverse, the rest being covered by ice and snow, one still comes up with a rather paltry figure of

less than 6% of the property being mapped adequately. The author considers the property to be virtually unmapped. The original mapping on the upper showings by Phelps Dodge is on a very small scale and needs to be checked for accuracy, if not totally remapped.

Many mineralized occurrences were noted while prospecting. However, the Norcen personnel were not interested in anything without massive sulfide connotations. In fact, Mr. Garratt, the project manager, disclosed that he was working with parameters of expectation of 30 to 50 million tons of massive sulfide mineralization. Apparently, a 5 to 10 million ton deposit was of no interest to Norcen.

## 2. Max-Min Geophysical Survey

The Max-Min survey was conducted in a highly proficient manner by Aquitaine personnel. This reportedly very powerful and sensitive instrument failed to give a response over any of the known mineralized zones, nor did it delineate any possible new ones.

The conclusion of the author is that concentrations of 10% to 30% economic sulfide minerals would not have been detected by this instrument, particularly if the mineralization consisted of sphalerite and if the minerals occurred as disconnected blebs, as is the case with some of the

mineralization on the property. The Aquitaine supervisor stated that they had just used the instrument on another prospect on which known lenses of massive mineralization carrying 50% sulfides had not given an electrical response. Geophysical methods which are more suitable for picking up the type of mineralization found on the property might produce a much different picture than that obtained with the Max-Min survey. Aquitaine personnel suggested a high frequency EM system (VLF) or possibly a high resolution I.P. survey.

### 3. Magnetometer Survey

The magnetic survey was flat except for an elongate anomaly about 1500 meters long and three to five times background which was found under the valley floor and along the strike of the known mineralization. This anomaly does not outcrop. It may represent a magnetic dike or a possible mineralized zone. Many of the boulders in the valley floor contain magnetite and are slightly to moderately magnetic. A few small dike outcrops also contain minor magnetite.

In the case of both the Max-Min survey and the magnetometer survey, only the readily accessible portions of the property were surveyed. Of a total area of 52 units, approximately

six units were covered by geophysical exploration, less than 9% of the total area of the property.

#### 4. Geochemical Survey

Two small areas were soil sampled, the first near the main camp, and the second over the mineralized Plateau Zone. The first area sampled consisted of a small grid covering about 200 by 400 meters near the base camp. Here, locally derived banded chert and tuff float occurs which is well mineralized with chalcopyrite. The overburden is quite deep, possibly ten meters or more, with a spongy organic cover. Much of the material is glacially transported. The low results of this survey probably can be attributed to the diluting effect of transported material. It is recommended that some soil samples be taken along the main stream bank where small mineralized outcrops occur covered by 5 to 15 meters of transported overburden. These samples should be taken just above the bedrock and may give higher results.

The second geochemical survey was conducted by the author, who thought a few samples taken over the mineralized lead-zinc zone and along its strike could indicate possible extensions of the zone which was trenched and drilled. This survey was most successful, and extremely anomalous lead-zinc values as well as copper, gold and silver were found for a distance of

1,000 feet to the south of the known zone, indicating probable important extensions of the mineralization. The fault gully in the vicinity of the anomaly carries considerable leached talus which is silicified and vuggy, with the apparent removal of the sulfide minerals over widths of 50 to 200 feet.

Norcen personnel concluded that the sampling was of "juvenile" soil and that the results were inconclusive. The author does not see the relevancy of discounting the values taken from "juvenile" soil. Granted the soils are probably largely of "C" horizon, but the surface rock and talus is almost completely leached of economic minerals, with only stained, silicified voids remaining. The fact that strongly anomalous values were obtained indicates mineralization is present at depth (below oxidation) for a considerable strike length away from the known mineralization. These anomalous results greatly enhance the previously drilled structure by indicating important extensions along strike.

It should also be mentioned that large areas of the property are unsuited for soil sampling due to deep glacial overburden, ice, and snow cover. There exist however, areas which may be favorable for rock chip sampling or water sampling.

#### IV. MINERALIZATION

##### 1. Plateau Zone

The author believes that the Plateau Zone is a silicified fault replacement deposit and it should not be confused with vein-type occurrences of the Smithers area. The broad mineralized zone is up to 200 feet in width, with good values to 45 feet in width. While values to date run mostly to lead and zinc, some samples are strongly anomalous in gold ( to 5300 ppb) and silver (up to 20 ppm). Also, samples from the Phelps Dodge trench #3A averaged almost 10 oz. of silver over a 10-foot width, indicating that mineralization higher in precious metals is present, perhaps peripheral to the main zone.

##### 2. Mineralized Boulder Trains

Boulder trains contain boulders which exhibit four types of mineralization. The first type is angular and consists of locally derived copper-bearing boulders which occur in the vicinity of the main camp along the strike of the Plateau Zone. These boulders are usually composed of banded argillaceous to cherty limestones as well as tuff breccias which are mineralized with chalcopyrite. Chlorite is present in appreciable amounts.

The second type of mineralized boulders are composed of cherty tuffs which are found as slightly to moderately rounded boulders up to six feet in diameter. These mineralized boulders occur

below the camp and along the north side of the main creek over a considerable distance. These boulders may have been pushed ahead of the main glacier as it cut across the valley floor and may have been eroded from a mineralized zone underneath the overburden-covered valley floor. These boulders commonly contain from 10% to 30% economic sulfides. This type of mineralization would not have been picked up by the Max-Min survey, since it is not massive enough in nature to make a good conductor. Some of this mineralization is magnetic and the long magnetic anomaly is in the immediate vicinity of the mineralized boulder trains. Norcen concluded that since the Max-Min survey was negative the valley source was discredited.

The third kind of boulders contain massive to near massive mineralization. They are semi-rounded with the predominant minerals being hematite, chalcopryrite, and magnetite, with minor sphalerite. These boulders occur in lineal trains at right angles to the second boulder train, but only on the south side of the main creek. The boulders are present in lateral moraines which are coming off of the twin-lobed glacier to the south. A source high up under the ice is indicated, as boulders were traced up on to the glacier. Most outcrops above the boulder

trains were examined and no indication of this type of mineralization was found. Norcen concluded that the source area is probably ice covered, and if it extends down to the valley floor it would be covered by deep glacial overburden.

A fourth type of boulder train float is composed of galena-sphalerite mineralization which occurs in silicified, chloritic limestone and andesite. A boulder train containing this type of mineralization also has a source indicated to be under the glacier. This mineralization resembles the Plateau Zone.

### 3. Other Mineralization

Porphyry copper mineralization occurs on the Copper Cliff Claim in association with a possibly Eocene porphyry laccolith. None of this mineralization was mapped by Norcen, as their sole interest was in massive sulfide mineralization. Sporadic chalcopyrite and bornite are widespread along the contacts of the lamprophere dikes with the surrounding country rock. These occurrences indicate some remobilization of mineralization along the dike systems.

## V. GEOLOGIC MODEL

By comparing the known showings, the various kinds of mineralized float, and the rock types with the known geology, one can postulate a model to explain the origin of the mineralization.



A volcanogenic massive sulfide deposit may have formed in a series of rhyolites and andesites interbedded with cherty argillites, limestones and tuffs, some of which were in part chemical precipitates. This original deposit was then partly remobilized by regional metamorphism, causing the minerals to migrate along zones of weakness and resulting in fault replacement deposits such as the Plateau Zone. Lead and zinc mineralization would occur farthest from the massive sulfide source, while an increase in copper, hematite, and magnetite could indicate increasing temperature as one approaches the possible center of mineralization towards the middle of the property. Many of the mineralized boulders are obviously metamorphosed and brecciated sulfide fragments are common.

The presence of banded argillaceous cherts together with much chlorite and epidote indicates a marine volcanogenic environment. The wide variety of volcanics also indicates the existence of a nearby volcanic center. Thus the geologic ingredients are present to have formed a marine volcanogenic model capable of generating economic sulfide mineralization.

#### VI. SUMMARY

It is obvious to the reader that there is a wide difference of opinion between the author and the Norcen staff. In forming his own judgement, the reader should consider the following

criteria that have influenced the author's outlook for future exploration of the property.

1. Mineralized boulders of economic grade are widespread and they occur in an interesting geologic environment favorable for massive sulfide development.
2. The Plateau Zone was not investigated extensively by Norcen because it did not fit their model of a massive sulfide deposit. Strong geochemical values indicate important extensions for the Plateau Zone and suggest the possibility of a multi-million-ton lead-zinc deposit.
3. The Max-Min survey was negative over known mineralization. Much of the float indicates a mineralized source that is too low in sulfide content to cause an anomaly with this instrument. In particular, a zone from which locally derived boulders carrying 7% to 10% copper occurs near the main camp and was not picked up by the Max-Min. Also, the Max-Min did not pick up the lead-zinc mineralization of the Plateau Zone.
4. Detailed geological mapping was conducted over about 3% of the total claim group and about 6% of the accessible ground.

5. Magnetometer and Max-Min surveys were conducted over less than 8% of the claim group. Proposed airborne surveys were not carried out. Geochemical coverage was less than 1% of the claim group. Much of the area is not favorable for sampling.
6. Massive sulfide mineralization does not outcrop on the property, other than the 40-foot wide outcrop of pyrite and chalcopyrite which Kowall failed to re-discover in 1978.
7. Although the topography is rough, at least 50% of the known favorable mineralized trend can be walked on.
8. Exploratory recon work along the perimeter of the claims as well as the surrounding region was not conducted, so we still do not know how the prospect fits in to the regional picture. There may be other mineralized occurrences in the vicinity.

In summary the author feels that the property merits further exploration. Persistent, systematic exploration (something that is often sadly lacking in many projects) along the favorable mineralized trend by geological mapping, appropriate geophysical surveys and by diamond drilling could result in the discovery of a multi-million-ton zoned copper-lead-zinc

deposit. The property awaits a company that is capable of doing the required work without wavering until the question of whether there is a mine here is answered.

Charles F. Kowall

C.F. Kowall

TABLE 1

WORK HISTORY

- 1967-68 Phelps Dodge Corporation of Canada Ltd.  
Geologist: P.G. Curtis  
PC Claims 1-36  
Geology and chip samples  
9 trenches - 692 feet  
6 men employed for 6 weeks
- 1969 Silver Standard Mines  
Geologist: Charles Kowall  
Prospecting and staking of claims southeast of  
PC claims.
- 1970 JOW 1-20 claims staked by P. Dunsford for Aggressive  
Mining Ltd.
- 1971 August 18-21 R.W. Phendler (Cannon-Hicks Associates  
Ltd.) mapped geology (1"=400') while P.P. Neilson  
(Atled Exploration Management Ltd.) ran a Crone  
J.E.M. two-frequency survey for Aggressive Mining  
Ltd. (6 lines totalling 5,000' were surveyed at  
50-foot intervals, coil separation 200 feet)  
Assessment Report 3251, 3252.
- 1972 Aggressive Mining Ltd.  
JOW 1-20 claims  
Mag, EM survey, geochem survey - 101 samples, 150 feet  
trenching, surface diamond drilling totalling 1,025  
feet in 5 holes on JOW 4.
- 1977 Charles Kowall  
Prospecting, staking of:  
Misty Day 12 units  
Copper Cliff 12 units  
New Moon 12 units
- 1978 Norcen Energy Resources and Aquitaine Company of  
Canada Ltd., joint venture.  
Prospecting - Scale 1:5,000  
Detailed Mapping - Scale 1:2,000  
EM MaxMin III survey - 17 kilometers  
Fluxgate Magnetometer Survey - 16 kilometers  
Secanting of lines: topographical survey - (Scale  
1:2,000)  
Staking of:  
Half Moon 8 units