GEOPHYSICAL REPORT
ON THE
CORTEZ CLAIM GROUP

Location
Texada Island, east of Blubber Bay
Nanaimo Mining District, British Columbia

Author
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Holders of Claims
Edwin T. Johanson
John C. Pargeon

Field Work Done
- October 1-4, 7-11, 14-18, 21-25, 28-31; 1974
- November 1, 4-8, 12-16; 1974
- March 3-7, 10-14, 24-28, 31; 1975
- April 1-4, 7-11, 21, 23, 28, 30; 1975
- June 17, 18, 22, 23, 25, 26, 30; 1975
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- August 7, 8, 11, 12; 1975
- September 23, 24, 25, 26, 29, 30; 1975

Report Completed December, 1975
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ASSESSMENT REPORT SUMMARY

An extensive reconnaissance survey has been completed on the Cortez Claim Group on Texada Island using 300 foot line spacing for the most part. This survey involved VLF-EM and Magnetometer surveys, with a certain amount of geological information also being obtained.

It would appear that several magnetite deposits occur on the map area, and the VLF-EM results indicate other types of mineralization may also be present.

For the most part, the mineralization seems to occur at the contact of the diorite intrusive stocks and the limestone, controlled perhaps where dykes intersect the diorite stock. This pattern seems to apply around the old Paris showings, the extreme north end of the map area, and to the east of the old Loyal Showings, around what has been named the "Loyal Intrusive".

It also appears that some mineralization may have travelled along certain dykes in the area. This latter type of occurrence could explain the mineralization of the old Loyal and old Canada Showings.

A number of possible test diamond drill holes are suggested, along with other recommendations in Section VIII.
I. PROPERTY LOCATION, ACCESS, AND DESCRIPTION

The Cortez Claim Group is located on the northeast end of Texada Island, as shown in Figures 1 and 2.

The general area of the claim may be reached by taking the ferry from Westview Terminal (Powell River) on the mainland, to Blubber Bay on Texada Island. The main paved highway is followed south and, as can be seen from Figure 2, cuts across the Cortez Claim Group, which includes the Ed and Cortez Claims. To reach the area where most of the present surveys were carried out (Cortez 11, 12, 13, and 14 Claims), one turns east about 2500 feet from the ferry terminal at Blubber Bay, and enters these claims by the secondary road along the south end of Blubber Bay and the logging roads shown on Figure 2.

The property is covered with a mixture of large and small trees, underbush, and some shallow swamps. The surface is fairly rocky with only a thin soil cover in most parts. Considerable logging activity is and has taken place in this area.
Fig. 1: BRITISH COLUMBIA
100 miles to 1 inch
II. OWNERSHIP

The claims included in the Cortez Claim Group are:

Cortez 1-16 Record Numbers 37611 to 37626
Ed 1-4 Record Numbers 37734 to 37736 and 37760
Ed 5-13 Record Numbers 37761 to 37769
Ed 14-17 Record Numbers 37940-37943
Ed Fraction No.1 Record Number 37959

All claims are owned by Longbar Minerals Limited.
A considerable amount of previous work has been done on parts of the Cortez Claim Group, in particular the Paris, Loyal and Canada showings. These have been discussed by Leroy (1908), McConnell (1914), in a number of the Minister of Mines reports, and by a number of private surveys.

The Loyal claims were discovered in 1900, and a total of six shafts (over a distance of 500') were subsequently sunk between that date and 1906. Work was undertaken on two levels (100 and 200'). Several shipments of high grade ore were made but no tonnage or grade figures are available. The Loyal outcroppings are traceable for 900 feet along the surface, and considerable surface trenching has been done. Mr. K. Hughes is reported (personal communication) to have mapped the Loyal area geologically. The property was also reportedly examined by Mr. J. Boissoneault (personal communication) in 1970, who concluded that there was some potential for a small, but high grade ore deposit and recommended combined magnetic and electromagnetic surveys. A turam electromagnetic survey was carried out in 1970, but no targets were identified (personal communication, R.G. Paterson). The magnetometer survey gave anomalous readings to the east of the most northerly part of the Loyal showings. No magnetic anomalies were found right over the Loyal outcroppings, indicating little or no magnetite was associated with this type of mineralization. A certain amount of diamond drilling was done by some of the previous owners but no interesting intersections were obtained.

The Paris showings were also examined by underground and surface work. Three shafts were sunk, the most southerly of which is connected to the surface
by a tunnel 250 feet in length. These workings intersected a number of magnetite lenses containing other mineralization including chalcopyrite. R.G. Paterson (personal communication) also reported magnetic anomalous readings over this area.

The Canada showings were trenched extensively in 1912, and a 50-foot shaft was reportedly sunk at the northwest end of the old Canada Claim Group. Leroy (1908) reports that "rich copper ore was encountered thirty feet from the surface, having a width of seven feet".
Since there are numerous mineral showings on the claim group, only some of which may be economical, proper interpretation of the geophysical results will require a good understanding of the geology.

(i) General Geology

The geology of this particular portion of Texada Island is different from that one finds to the southwest of the main Texada Island Highway, in that there is little evidence of large masses of volcanic rocks; instead, limestone (the Marble Bay Formation) predominates with certain diorite stocks outcropping in several places. Mathews' (1947) map of the northern end of Texada Island is typical. It shows a broad portion of limestone in what appears to approximate a syncline with dolomite predominating in the outer limbs of the syncline, and calcium limestone in the central portion. The "syncline" appears to strike to the northwest along the major structural direction. Diorite-gabbro outcrops several places along the coast, and around the Paris Mine. A quartz porphyry dyke runs almost east-west across the Island and seems to be the latest (post-ore) geological feature in this area. A large number of diorite-andesite dykes, while not shown on Mathews' maps, are known from recent work to strike northwest through the limestone.

Some of the mineralization is evidently associated with these dykes, some with the diorite intrusive stocks. At the intrusive contacts skarn zones occur, containing epidote, garnet, as well as magnetite mineralization and sulfides of iron, copper, lead and zinc similar in nature to the old mined-
(ii) **Canada Showings**

The mineralization of the old Canada Claim Group is reported by McConnell (1914) to "consist of the usual assemblage of contact metamorphic metallic and non-metallic minerals developed along a line of diorite-porphyrite dykes intruding the Marble Bay limestones".

(iii) **Paris Showings**

The Paris mineralization is apparently related to dykes and to two (?) small diorite intrusions into the limestone. Magnetite is present on certain contacts, with scattered sulfides of copper, iron, and zinc.

(iv) **Loyal Showings**

The Loyal mineralization appears closer to the Canada mineralization in nature, being associated with diorite-andesite dykes, although some small diorite stocks occur on the coast, about 1000 feet from the Loyal workings. Bornite, chalcopyrite, galena, pyrite, and sphalerite are present with some magnetite. One small lense of massive copper ore was found; no large magnetite lenses have been reported (in general, the area right around the Loyal showings is not anomalous, magnetically). Up to 20 oz./ton of silver is also reported (McConnell, 1914). Argentiferous tetrahedrite is also reported (R.G. Patterson, personal communication).

The Loyal zone is assumed to strike directly into the Canada showings. The 2000 feet separating the Canada and Loyal showings is covered with overburden.
Some drill hole results were available prior to the present work. Two of these holes were drilled by Texada Mines Limited in 1971, at about 50° dip to the west and east, to a length of about 600'. The holes were located to the west of the main Loyal shaft. For the most part the drill core dipping to the west consisted of limestone, but a number of faults were noted as well as seven andesite dykes, two aplite dykes and several occurrences of disseminated pyrite. The east dipping hole again consists of limestone, eleven andesite dykes, a number of zones with disseminated pyrite (with a small amount of chalcopyrite), and some pyrite stringers. The dykes seem to follow the bedding observed.

Another hole was drilled by Longbar Minerals Limited. The hole is located at the south end of the Loyal showings (at about 1550E on Line 2100S on Figure 5). These drill hole results were reported earlier. The hole was drilled at a dip of 70° to the southeast, with a total length of about 203 feet. A similar pattern to the 1971 drill hole results was observed. The country rock is limestone, and a number of andesite dykes were intersected. Considerably more metallic mineralization seems to have been observed, consisting of mainly pyrite, chalcopyrite and magnetite. The mineralization was reported to be both in the form of stringers and as disseminated zones up to 35 feet in length. Mineralization was also associated closely with some of the (altered) andesite dykes.

Some preliminary geology has been obtained and is plotted on Figure 7. Note that this data was obtained by field workers and from the maps given by Mathews (1947), scaled down to 200' = 1". Note that the field data has not been checked closely by a geologist, and may contain errors; it is, however, very useful even if somewhat uncertain. The main features
are the intrusives to the east of the old Loyal Showings and around the Paris, the swarms of NS trending dykes, and the strong east-west quartz porphyry dyke running through the Paris Intrusive. This last feature appears to have been the latest geological event and does not seem to be important in assessing the location of the mineralization.

In examining Figure 7, it is important to stress the following:

i) Most of the diorite outcrops were plotted off of the earlier map by Mathews (1947) and are thus only approximate. The same applies to the east-west quartz porphyry dyke.

ii) The dykes shown have not been checked by a geologist and the indications are that some of them are diorite outcrops rather than dykes. In addition the exact strikes of the dykes was not recorded.

iii) The shafts are accurately located in the present survey and were not taken from previous maps.

The inferred diorite outline, linear VLF-EM and magnetic features will be discussed in later sections.
V. INSTRUMENTS USED

(a) Magnetometer

A McPhar M700 vertical component fluxgate magnetometer was used, which is capable of a precision of ±5 gammas, and a reproducibility of about ±10 gammas. The base station was set at 0 gammas, on a marked stump located east of the office at the main camp. All surveys were tied into this base station at the beginning and end of each day. Drift corrections were made when necessary.

(b) VLF-EM Units

The instruments used for this portion of the work were the Scintrex Scopas SE-80 and the Crone Radem. Both make use of the magnetic part of the electromagnetic waves emitted by the U.S. submarine radio stations. The station used in this survey for both instruments was Jim Creek, Washington (near Seattle) at 18.6 KHz. The code for this station is NPG.

The Crone RADEM and the SE-80 both measure the tilt angle to ±1° in most readings.

The first derivative of the tilt angle (the slope of the tilt angle plot, which is found by subtracting one station's tilt angle value from that of the next station and dividing by the distance between stations) was calculated and used in the interpretation since it is less influenced by topography. The values of the first derivative are in degrees per foot (°/ft.), and have an uncertainty of perhaps ±0.04°/ft.

Interpretation is based on methods discussed by Whittles (1969) and Frazer (1969).
VI. GEOPHYSICAL SURVEYS

A base line was established, which runs true north-south. Survey lines were then run perpendicular to the base line at 300-foot intervals with the 00 line being located on the Cortez No.14 Claim as shown in Figure 3.

(a) Magnetic Survey Results

The data is plotted on Figure 3, and all values over 1000\(\mu\) have been contoured (Figure 4). There are five main areas of interest magnetically, two being of major interest with the data so far available.

One small anomalous magnetic zone is to the NE of the old Canada Group showings in the southeastern part of the map. This zone is not a major one but may be, in part, related to the Canada showings. It has the features of a small diorite stock.

Another, somewhat larger zone, is at the north end of the map, on Cortez 14 Claim. It, too, is not of major interest apart from the small but intense (17,000\(\mu\)) anomaly shown. This must be magnetite but it would appear quite localized.

A third zone of interest is that to the extreme southwest of the map area, line 3600S, to the west of the base line. This zone has just been intersected by 3600S and lies all along it. It may be a continuation of the old Paris showings. On the other hand, it may represent a major new zone to the south of line 3600S.

The fourth zone of interest is a major one, being only second to that around the Paris showings. This zone is labelled the "Loyal Intrusive
Zone" and lies to the east of the old Loyal Showings. It contains two fairly strong anomalies, the most northerly reaching a maximum of 50,000\(\gamma\) and extending for at least 600 feet at a +1500\(\gamma\) level. It is the largest magnetic zone on the map area and must, in part, consist of magnetite. It appears to be a contact metamorphic deposit between the diorite intrusive rock outcropping nearby on the coast, and the limestone. As such, it is a most interesting zone.

The Paris Zone (around the old Paris showings) is of similar interest to the Loyal Intrusive Zone. Here the pattern is not as consistent as the Loyal Intrusive Zone but rather appears as a number of magnetic highs scattered perhaps near the west contact of the diorite intrusive east of the old Paris workings (refer to the preliminary geology on Figure 7). The most easterly three anomalies (two 2000 \(\gamma\) and one 25,000 \(\gamma\)) appear to be contact metamorphic deposits containing magnetite, tight along the western contact of the diorite and limestone. This will be called the Paris No.1 Zone. There is some suggestion that the northwesterly trending dykes play a role in the location and shape of these contact deposits. The largest zone is quite linear and in line with two 1500 \(\gamma\) anomalies to the north. It may be that the mineralization finds these dykes favorable for deposition; a similar situation is found to the south around Gillies Bay (see Whittles, 1975, discussion of the geology in that area). If so, the intersection of the dykes and the intrusive would provide the most favorable location for deposition of minerals. One might also expect that mineral bearing solutions would travel some distance up and along the dykes away from the intrusive.
The remaining 2000 + θ anomaly to the west appears to be related to a linear feature extending about 1000 feet almost due north. This will be called the Paris No.2 Zone.

The two 1500 + θ anomalies farther east also appear linearly related in a north/south direction.

Two other strong features occur at about 3200S on the base line (+18,000θ) and at 2400S, 300E (7700θ). These must also be magnetite deposits. These appear to be linearly related to nearby anomalies to the northwest and southeast. It is quite possible that the eastern edge of the Paris diorite intrusive extends this far, but since the area is covered, this cannot be checked. If so, these anomalies could be similar to those of the Paris No.1 Zone.

The remainder of the Paris Zone stretching to the northeast (up to about 900S on the Base Line) seems to indicate the possible presence of under-lying diorite (the "LOW" areas enclosed by the 1000θ contour lines). Diorite does outcrop on the Base Line at 1100S (see Figure 1). The +1000θ readings including the "LOW" regions may represent some mineralization along the contacts. If so, either the mineralization is fairly deep (perhaps in the order of 100+ feet) or it is rather disseminated.

The remaining spotty high magnetic values seem to be almost entirely related to the swarms of dykes observed in this area. These have been interpreted on Figures 7 and 8 using the geological, magnetic and VLF-FM data. These results suggest the old Loyal and old Canada Group showings
are not likely to be of major importance in terms of large magnetite or sulfide mineral bodies. No special magnetic features are noted in these areas, and it may be that these two mineralized showings resulted from the alteration and relatively minor mineralization of the dykes by the diorite intrusives lying nearby to the east, and probably underneath the immediate area.

The magnetic contour map also indicates a magnetic depression along about 3450S, west of the Base Line. A look at the 750X levels on Figure 3 suggests this depression then angles over to the west (at about 15°N of W). The reason for this feature is not clear at this time, and does not appear to be important in terms of the mineralization in the area.

(b) VLF-EM Survey Results

The VLF-EM tilt angles have been plotted on Figure 5, and from these profiles the first derivative has been calculated and plotted on Figure 5.

To get a preliminary interpretation of the data the main VLF-EM anomalies (first derivative of -0.12°/ft. or greater) have been plotted on Figure 6. A large number of anomalies are evident with many strong ones around the old Paris showings, and some of medium intensity near the old Loyal showings. A few good anomalies are present along the old Canada showings. The remainder medium size anomalies are scattered over the map area.

Numerous small anomalies (0.12°/ft.) are also scattered randomly over the map area.

The interpretation of these results is discussed in the following section.
VII. INTERPRETATION

There are a number of ways to interpret the anomalies displayed on Figures 4, 5, and 6. Two such interpretations are given on Figure 7 (Interpretation I) and on Figure 8 (Interpretation II). Interpretation II is the most probable one in the present writer's mind at this time; however, the geological information is not complete enough to determine which one is closest to the true situation.

Interpretation I (Figure 7)

The "proposed diorite outline close to the surface" is based on a fairly uniform magnetic contour often surrounded by VLF-EM and magnetic highs. All these "outlines" enclose the known diorite outcroppings. On some of the field notes "diorite dykes" are reported over the areas enclosed; it is not known if the "diorite" reported is actually a dyke, float, or a diorite stock outcropping mostly covered with overburden.

Another possible problem may be that the texture of the dykes grades from diorite to andesite depending upon how quickly the dyke material cooled. This would obviously depend upon the nearness of the dyke to its source and its size.

In any case, the boundary inferred magnetically and from the VLF-EM results is unlikely to match the surface outcropping of the diorite even if it were not covered with overburden; rather, the "proposed diorite outline" should represent the diorite stock boundary near to the surface (probably within 100' or less from the surface).

The main difficulty in interpretation does not lie in the location of either the magnetic or the VLF-EM anomalies but in the assumed strike of the dykes;
that is, how does one join up the VLF-EM and magnetic trends with the 300 foot line spacing? In this interpretation (Figure 7), it was assumed that the main strike would closely parallel that between the Loyal and Canada Showings; e.g., almost north-south; the best continuous trends were then joined assuming most of the linear features are dykes having a higher conductivity than the surrounding limestone, and variable magnetism. As can be seen on Figure 7, the pattern is rather discontinuous for the most part. There is no strong evidence for a continuous strike from the Loyal to the Canada showing and virtually nothing to distinguish them from most of the map area. Hence, an alternative interpretation was devised.

**Interpretation II**

This interpretation is shown on Figure 8 and is based on the knowledge that the major structural trend of Texada Island is NW-SE, and on obtaining the most continuous connections of VLF-EM and magnetic anomalies. (Note that the VLF-EM will emphasize NW-SE trends since these strike toward the VLF station used; it will not respond well to NE-SW trends. Such trends, however, do not seem to be of major importance judging from the linear magnetic features.)

The pattern resulting from the foregoing assumptions is much more continuous, in the opinion of the present writer, and probably corresponds more closely to the real situation.

It is very interesting that many of the long continuous trends stop along the proposed diorite boundary as inferred from both magnetic and VLF data.

It is proposed as a working hypothesis that most of the mineral deposits on the map area are the result of mineralization "blossoming out" where the
diorite intersected the dykes (this assumes the fractures the dykes followed, or the dykes themselves, are somewhat "older" than the mineralization). To some extent, and particularly on the Paris showings, some of the mineralization is assumed to have percolated up along the dykes for some distance from the source, perhaps completely altering the dykes and some of the surrounding limestone to make up fairly wide mineral deposits.

The composition of the limestone is probably important in this process and may account for the Loyal and Canada Showings, and perhaps even the Paris mineralization. As noted earlier under Section IV, dolomite (which tends to precipitate minerals more readily than limestone) is common near the Paris and Loyal Showings according to Mathews (1947).
VIII. RECOMMENDATIONS

1. Since there is some indication that the location of the dykes may control the location of mineralization, particularly where they are near the boundaries of diorite stocks, it is essential to get a good geological map of this area, and a good knowledge of the strikes of the dykes.

2. Lines with a closer spacing (100' or 150') should be set up around the "South Paris Intrusive" and the "Loyal Intrusive", and VLF-EM and magnetic surveys carried out. S.P. should also be tested in those areas since the VLF-EM does not respond to trends in a SW-NE direction nor to smaller lenses of mineralization.

3. It is not recommended that much work be done on the Loyal Showing or the north end of the Canada. These do not hold as much promise as the two areas mentioned in 2, preceding, although some small (perhaps high grade) deposits may exist in these regions. If time and money permits at a later stage a detailed S.P. or I.P. survey over that area may be considered. The mineralization in these areas appears quite different from the rest of the map area and consequently, the VLF-EM and magnetics are not good exploration techniques.

4. The third most important area (after (a) the "South Paris Intrusive" and (b) the "Loyal Intrusive") is probably the south end of the old Canada showings at the extreme southeast end of the map area. The 300' reconnaissance lines should be extended south into that region.
5. The fourth most interesting area is to the south of the "South Paris Intrusive" where 300' reconnaissance lines should be extended (to the west of the Base Line and south of line 3300S).

6. The "North Paris Intrusive" and the "North Texada Intrusive" seem lesser targets at the present time.

7. The claim boundaries involved should be examined carefully to make sure the most important zones are covered.

8. If drilling is to be considered the "possible drillhole targets" on Figure 8 should be used as a guide. These have been labelled SPI-1 (South Paris Intrusive 1), SPI-2, LI-1 (Loyal Intrusive 1), etc., to give an idea of local priority (SPI-1 would have top priority, etc.). These decisions are based on the strongest VLF-EM and magnetic anomalies.

SPI-1, -2, -6, -7, and -8 will test the proposed contact area round the Paris showings, as will NPI-1, -2, and -4, LI-1 and -2 around the Loyal Intrusive, and NTI-1 and -2 around the "North Texada Intrusive".

SPI-3, -4, -5, -9, -10, -11, NPI-3 will test areas along assumed dykes on anomalous readings.

C-1, -2, -3, and L-1, -2 will test anomalies near the old Canada and Loyal showings, presumably along altered dykes.

While it is realized that practical considerations may determine which holes are drilled when, the following priority list is offered as a guide.
<table>
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<th>Location</th>
<th>Likely Dip of Mineralized BODY</th>
<th>Anomaly Type and Intensity</th>
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<td>Magnetic</td>
</tr>
<tr>
<td>SPI-1</td>
<td>(2850S, 1100W)</td>
<td>north</td>
<td>large</td>
</tr>
<tr>
<td>SPI-2</td>
<td>(2700S, 950W)</td>
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<td>large</td>
</tr>
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<td>(2850S, 1400W)</td>
<td>west</td>
<td>large</td>
</tr>
<tr>
<td>SPI-4</td>
<td>(3000S, 1350W)</td>
<td>west</td>
<td>moderate</td>
</tr>
<tr>
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<td>(3150S, 1350W)</td>
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<td>small</td>
</tr>
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<td>moderate</td>
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<tr>
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<tr>
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<td>moderate</td>
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<td>(2400S, 350E)</td>
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<td>(1800S, 860W)</td>
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<td>C-2</td>
<td>(4200S, 1650E)</td>
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<td>small</td>
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<td>NPI-1</td>
<td>(2400S, 300W)</td>
<td>south</td>
<td>small</td>
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<td>SPI-10</td>
<td>(2550S, 1400W)</td>
<td>?</td>
<td>small</td>
</tr>
<tr>
<td>SPI-11</td>
<td>(3000S, 1650W)</td>
<td>?</td>
<td>none</td>
</tr>
<tr>
<td>L-1</td>
<td>(900S, 1375E)</td>
<td>west</td>
<td>none</td>
</tr>
<tr>
<td>L-2</td>
<td>(1800S, 1200E)</td>
<td>west</td>
<td>small</td>
</tr>
<tr>
<td>NPI-4</td>
<td>(1200S, 50W)</td>
<td>south east</td>
<td>none</td>
</tr>
<tr>
<td>C-3</td>
<td>(900S, 1375E)</td>
<td>west</td>
<td>none</td>
</tr>
</tbody>
</table>
IX. REFERENCES


1947; Mathews, W.H. "Calcareous Deposits of the Georgia Strait Area", B.C. Department of Mines.


X. APPENDICES

(a) Cost Analysis

Ground Transportation

68 days @ $25.00 per day

Labor Costs

Field Superintendent
Jon A. Stewart  68 days @ $80.00

Bushmen/Geophysical Crews
(92,800 lineal feet of cut line)

<table>
<thead>
<tr>
<th>Worker</th>
<th>Hours</th>
<th>Rate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>D. Murphy</td>
<td>560</td>
<td>5.88</td>
<td>3292.80</td>
</tr>
<tr>
<td>G. Beyko</td>
<td>512</td>
<td>5.35</td>
<td>2739.20</td>
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<td>L. Ouellett</td>
<td>24</td>
<td>5.35</td>
<td>128.40</td>
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<tr>
<td>W. Gardner</td>
<td>120</td>
<td>7.57</td>
<td>908.40</td>
</tr>
<tr>
<td>M. Lee</td>
<td>176</td>
<td>7.57</td>
<td>1332.32</td>
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<tr>
<td>D. Lyons</td>
<td>56</td>
<td>5.49</td>
<td>307.44</td>
</tr>
<tr>
<td>W. Kennedy</td>
<td>40</td>
<td>4.82</td>
<td>192.80</td>
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<tr>
<td>G. White</td>
<td>24</td>
<td>5.88</td>
<td>141.82</td>
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</table>

Food and Accommodation Costs

Food - 267 man days @ $15.00 per day

Camp Costs - 68 days @ $25.00
(Trailer rentals and costs, Diesel Plant)

Professional Services

Dr. K. Warren Geiger
Consulting Geologist  10 days @ 150.00 per day

Dr. A.B.L. Whittles
Consulting Geophysicist 3 days @ 100.00 per day

TOTAL EXPLORATION COSTS

$23692.18
(b) **Resumé of Experience of Dr. W. Geiger**

Dr. Geiger acted as field supervisor of the field crew although the crew was trained earlier in the summer by Dr. Whittles.

Dr. Geiger is a consulting geologist with a B.Sc. in Mining Engineering from the University of Alberta, Edmonton, and M.S. and Ph.D. degrees in geology from Cornell University, Ithaca, New York. He also possesses the B.C. P.Eng. certification, as well as certification as a P.Geol. in Alberta.

Dr. Geiger has 19 years of experience in the fields of mineral exploration, mining and groundwater geology which includes extensive field experience.

(c) **Resumé of Technical and Field Work Experience of Dr. A.B.L. Whittles, Ph.D.**

1. University training at University of B.C. and University of Toronto, with the completion of a Ph.D. in Physics (Geophysics section) in 1964, from U.B.C.

2. Prior experience (two summers) with geophysical section, Imperial Oil Limited, in Alberta.

3. Surveying experience, Buttle Lake Power Project.

4. Four years at the B.C. Institute of Technology, teaching geophysical prospecting courses to day and evening students.

5. Consulting experience during the past eight years with companies in B.C. and Alberta, including field supervision and interpretation.
(6) In charge of the Geological Technology, Malaspina College, Nanaimo and including the teaching of courses on geophysical prospecting, for the past six years.


Dr. A.B.L. Whittles, Ph.D.

December, 1975