GEOLOGICAL AND INDUCED POLARIZATION - RESISTIVITY REPORT

of the

ROLLS RESOURCES LTD. PROPERTY

in

Pic Township, Ontario

RECEIVED
SEP 12 1985
MINING LANDS SECTION

by

Nadia Caira, B.Sc.

Robert S. Middleton Exploration Services Inc.
P.O. Box 1637 - Timmins, Ontario - P4N 7W8
July 31, 1985
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INTRODUCTION

The geological mapping survey was conducted between June 24, 1985 and July 8, 1985 and the Induced Polarization-Resistivity (IP) survey was conducted between June 24, 1985 and July 13, 1985. Both surveys were performed on ground held by Rolls Resources Ltd. of Edmonton, Alberta. The property consists of 17 whole, and 4 fractional contiguous, unpatented mining claims, located approximately 4 km northwest of Heron Bay, on the northeast shore of Lake Superior, in northern Ontario.

It is the purpose of this report to discuss the findings of both the geological and IP surveys, and to correlate these findings with data obtained from earlier geophysical surveys. Recommendations are included and follow discussion of this material.

LOCATION AND ACCESS

The Rolls Resources Ltd. property is situated on the northeast shore of Lake Superior, approximately 4 km northwest of the town of Heron Bay, 5 km southeast of Marathon, and 32 km west of the Hemlo gold mines. The claims cover all of the land portion of Lot 19 and the southern part of Lots 16, 17 and 18, Concession VI, in Pic Township.

Access to the claims is via the C.P.R. railway line, from either Heron Bay or Marathon, which crosses the property in a
north-northwesterly direction. Boat access is excellent to the western edge of the claims from roads which end at Lake Superior in Marathon and Heron Bay.

PROPERTY

The 21 contiguous, unpatented mining claims included in the Rolls Resources Ltd. property, encompass approximately 800 acres of mining land. These claims are registered with the Ministry of Natural Resources, Recording office, Thunder Bay, Ontario, and are listed below:

<table>
<thead>
<tr>
<th>Claim Numbers</th>
<th>Claim Numbers</th>
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<tbody>
<tr>
<td>656558 to 656565</td>
<td>8 claims</td>
</tr>
<tr>
<td>656566</td>
<td>1 claim</td>
</tr>
<tr>
<td>656567</td>
<td>1 claim</td>
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<tr>
<td>674490 to 674495</td>
<td>6 claims</td>
</tr>
<tr>
<td>676803 to 676806</td>
<td>4 claims</td>
</tr>
<tr>
<td>852764 (previously 676807)</td>
<td>1 claim</td>
</tr>
</tbody>
</table>

Total 21 Claims

TOPOGRAPHY AND VEGETATION

Terrain on the Rolls Resources Ltd. property varies from very rugged rocky bluffs extending from the shoreline over to the southcentral part of the property, to relatively flat extensive overburden cover over the remainder of the property. Vertical relief in the area is less than 400 feet. Outcrop comprises approximately 25% of the property, with the majority of the outcrop exposure being found along the shoreline, and in the western and southern parts of the property. Overburden cover, as
interpreted from the resistivity survey data, probably reaches a maximum depth of 30-50m in the sand plain, east of the railway line. A thick forest of spruce, birch, poplar, and alder covers all of the property, except in areas of extensive outcrop along the shoreline of Lake Superior.

PREVIOUS WORK

Sporadic exploration activity has been conducted in the Heron Bay-Pic River area from the late 1800's and early 1900's, until as recently as 1975, prior to the Hemlo gold camp staking rush.

"Most of the early work was done in the late 1920's and early 1930's. The majority of the work was undertaken in the mid 1950's with some later work occurring in the mid 1960's. During the field season of 1977, some staking was done in the vicinity of Heron Bay and north-northeast of Heron Bay. Initial activity in the area was undertaken in search of gold and silver."

Various programs have been conducted to evaluate several prospects in the area including:

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1. Copper sulphide zones within the Port Coldwell alkalic complex.

2. Gold and silver mineralization within quartz-carbonate veins within sediments.

3. Gold and silver mineralization within sheared felsic volcanics.

The following is a partial list of exploration activity taken from T.L. Muir, Geology of the Heron Bay Area, O.G.S. Report 218:

1. Ambrose Cyrette (1890)
   On the Heron Bay property on the Pic River, a shaft was sunk to 55 feet. There is gold assaying $5,332/ton equivalent to 207 oz/ton at today's gold prices. Quartz veins contain both native gold and silver within blue slate.

2. Heron Bay Cove Prospect (1872)
   (Ontario Department of Mines Annual Report, Vol. XL, Part 2, 1931):
   Property is at Heron Bay Station where three pits have been sunk on a shear zone within felsic volcanics. The dump is composed of chlorite-sericite schist with quartz and ankerite veins. Traces of pyrite and chalcopryite were seen. Assay results gave 0.06 ounces gold per ton and 7.03 ounces silver per ton.

3. R.A. Schiralli (1930)
   Prior to 1930, 28 claims were staked east of Playter Harbour. The claims included a large vein of quartz; maximum 11m, containing minor pyrite, galena and chalcopryite.

4. Consolidated Mining and Smelting Company Limited (1930)
   Acquired ground and trenched and bulk sampled quartz vein.
5. Thompson (1931)  
Reported traces of pyrite and chalcopyrite.

Thompson (1931)  
Reported that a quartz vein on claim SSM 6302 about 1.8 km east of Playter Harbour was stripped for 43 meters. Its width is 11.5 meters. Channel samples gave negative results.

Thompson (1931)  
Reported; an island of fine-grained amphibolite in Pulpwood Harbour with thin quartz veins with traces of pyrite, galena, chalcopyrite; a nearby island of pyroxenite and gabbro gave 0.02% Cu, 0.02% Mo with traces of gold and silver.

Held 13 claim property straddling contact between syenite and gabbro of the Port Coldwell Complex and intermediate and mafic volcanic rocks.

Twelve diamond drill holes totalling 1467m found disseminated pyrrhotite, pyrite, chalcopyrite and magnetite.

7. Mentor Exploration and Development Company Limited (1956)  
Held an option (Lun-Echo) on nine claims centered about 1km east of Pen Lake.

An electrical resistivity and magnetometer survey of the claims outlined on anomalous zone.

Two diamond drill holes were sunk totalling 315m discovering traces of sulphide minerals within gabbro and monzonite.

8. Kinasco Exploration and Mining Limited (1956)  
Held 18 claims on contact of gabbro of Port Coldwell and altered sedimentary and pyroclastic rocks.

An SP survey was undertaken over contact zone.

9. J.J. Cosgrove (1957)  
Held a 3 claim property about 2.4 km southeast of Pen Lake.

A dip needle survey was conducted to test continuation of copper sulphide-bearing gabbro.

Drilling was conducted and confirmed the presence of copper sulphide bearing gabbro.

   Restaked W.B. Dunlop lapsed claims that straddle highway 17 and are underlain by gabbro and contact metamorphosed pyroclastic rocks.

   Mineralization included chalcopyrite and pyrite in an area 61m x 15m.

   A gravimetric survey was conducted.

11. **Conwest Exploration Company Limited (1962)**

   Sank two diamond drill holes totalling 306m.

   Assays gave nil for gold, 0.03 oz silver/ton, 0.59% copper over 3m.

12. **Keevil Mining Group Limited (Barrett Option) (1965)**

   Completed a combined electromagnetic and magnetometer airborne survey over 29 claims in the Mussy Lake Area.


   Six claims centered north-northeast of Heron Bay conducted geological, geophysical surveys (electromagnetic, magnetic, induced polarization and self potential) and soil geochemical surveys.


   Held a block of 80 contiguous claims situated east of Playter Harbour over a molybdenite prospect.

   In 1965 sulphide occurrence was discovered on Claim SSM103322 about 2.4km east of the molybdenite prospect.

   Trenching exposed a highly sheared graphitic tuff with minor pyrite, pyrrhotite and traces of chalcopyrite values returned 0.95% Zn, 0.06% Cu and 0.05% Nickel.

15. **K.T. McCuaig (1977)**

   Held twelve claims in the area of the town of Heron Bay.

   Property is underlain by schistose intermediate to felsic pyroclastic breccia and tuff-breccia.

   Diamond drilling revealed minor disseminated pyrite and traces of chalcopyrite.
Held two claims 2.4 km northeast of the town of Heron Bay within mafic pyroclastic rocks.

17. L. Stenlund (1977)  
Held five claims which straddle highway 627 about 2.4 km north-northwest of the town of Heron Bay. Outcrops of intermediate tuff and lapilli tuff.

18. R. E. Stenlund (1977)  
Held six claims in the area around the town of Heron Bay. The claims are covered with clay silt.

19. V. Stenlund (1979)  
Staked and held thirty-four claims in the Heron Bay Area under option by Lytton Minerals. Drilled several diamond drill holes collared near old trenches and shafts. The core was not systematically logged and assayed, at the time of drilling.

20. Ontario Paper Company  
Held twenty-seven freehold parcels under option to Lytton Minerals. These sixty-one claims combined with a remaining ten claims optioned from four separate parties to Lytton Minerals comprise the present day seventy-one claim "Peekongay Property" located in Heron Bay.

Conducted a line cutting, reconnaissance geological mapping, geophysical and rock geochemical surveys program on O.P.C. Block H39 400m west of the west boundary of the Stenlund Property. A rusty pyritic sericitic schist unit was outlined with rock geochemical results from the sericite schist returned values between 100 ppb - 400 ppb gold.

In the fall of 1983 extensive mapping and trenching work was carried out followed by two diamond drilling programs totalling 3,300m (27,000 ft.) outlined that the main zone of alteration extended to 450m (150 off) with gold and molybdenum values.

Through extensive drilling program discovered the 'C' zone with a 17' section grading 0.19 oz/ton.
23. Lytton Minerals (1985)

Proposed an extensive drilling program of 60,000 feet to test strike length and depth potential of the "C" zone - results not available - drilling commenced June, 1985.

REGIONAL GEOLOGY

The general geology of the Rolls Resources Ltd. property is located within the Schrieber-Marathon greenstone belt in the Superior Province of the Canadian Shield. More specifically, the property lies within an Archean metasedimentary - metavolcanic belt trending easterly from the Heron Bay area on Lake Superior. Plutonic rocks constitute a major portion of the map area. The Hemlo gold camp is also located within a portion of the Schrieber-Marathon greenstone belt, and lies approximately 32 km to the east of the Rolls Resources Ltd. property.

The general geology of the Rolls Resources Ltd. property is shown on the Heron Bay Sheet, Map 2439 (see Figure 3), which was mapped by and reported on by T.L. Muir, and associates for the Ontario Department of Mines, 1981.

The oldest rocks in the area, with the exception of the Pukaskwa Gneissic Complex (Bennett et al, 1969) are the felsic, intermediate, and mafic volcanic rocks. Two suites of volcanic rocks are present: a tholeiitic suite consisting of iron-rich basalt and minor andesite, which lies in the southern part of the regional map area which is termed the Pulpwood-Playter Harbour

2 Muir, T.L. Ibid 1982
sequence; and a calc-alkalic suite consisting of dacite to rhyolite pyroclastic breccia, tuff breccia, lapilli tuff and crystal tuff as well as lesser andesite and basalt which lies in the northern part of the map area termed the Heron Bay Sequence. Iron formation and thin intercalated tuff and sediment units are present in the tholeiitic rocks to the south (T.L. Muir, 1982, O.G.S. Report 218). Siltstone, wacke, and shale units are present within or adjacent to the intermediate to felsic pyroclastic rocks of the Heron Bay sequence. Minor andesite and basalt also occurs within this sequence. The Rolls Resources Ltd. property is thought by the author to lie wholly within the Heron Bay Sequence. This portion of intermediate pyroclastic rocks and intercalated metasediments is sandwiched between two massive plutons. The Gowan Lake Pluton, which lies to the north, covers the northeastern corner of the property and is a porphyritic biotite-hornblende quartz monzonite. The Heron Bay Pluton, to the south, consists of a porphyritic (plagioclase) biotite-hornblende granodiorite.

All of the above mentioned volcanic and sedimentary rock suites are intruded by Late Precambrian felsic dikes and sills, and all previously mentioned rocks except those of the Alkalic complex are intruded by more extensive diabase dikes. A common orientation of the diabase dikes is northerly.
PROPERTY GEOLOGY

The volcanic succession which underlies the Rolls Resources Ltd. property, forms part of the Heron Bay Sequence and is at least 1800 metres wide on the property (Figure 4). These rocks can be subdivided into four major sequences:

a) A northern sequence of mafic, pillowed flows that is pervasively silicified and carbonatized giving outcrops a more "felsic" appearance. It is thought by the author that these are probably "bleached" magnesium tholeiitic basalts.

b) A central zone of 1300 meters thick consisting of a succession of interbedded fine to medium-grained tuffs of intermediate composition with local interbedded volcaniclastic horizons.

c) A southern sequence of finer intermediate pyroclastics with interbedded fine grained mafic flows and tuffs associated volcaniclastic metasediments.

d) A southwestern sequence occurs best exposed along the lakeshore on the southwestern portion of the property with interbedded felsic aphanitic light green flows and spherulitic flows.
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#### Alkaline Intrusive Rocks

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<td>Diatreme</td>
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<tr>
<td>13g</td>
<td>Carbonatite</td>
</tr>
<tr>
<td>13f</td>
<td>Porphyritic Syenite</td>
</tr>
<tr>
<td>13c</td>
<td>Gabbroic Lamprophyre</td>
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#### Mafic Intrusive Rocks

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<td>Equigranular Diabase</td>
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#### Intrusive Contact

- **METAMORPHOSED MAFIC INTRUSIVE ROCKS**
  
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<td>Schistose Gabbro Dike</td>
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<tr>
<td>5a</td>
<td>Gabbro (Massive)</td>
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#### Intrusive Contact

- **CLASTIC METASEDIMENTS**
  
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<tr>
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<td>Tuffite Sequence</td>
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<tr>
<td>3c</td>
<td>Massive Argillite</td>
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<tr>
<td>3b</td>
<td>Finely Laminated mudstone, siltstone, wacke</td>
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- **METAVOLCANICS**

  **Intermediate to Felsic**
  
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<td>Coarse Ash Tuff</td>
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<td>2g2</td>
<td>Crystal Tuff</td>
</tr>
<tr>
<td>2g1</td>
<td>Fine Ash Tuff</td>
</tr>
<tr>
<td>2c</td>
<td>Spherulitic Flows</td>
</tr>
<tr>
<td>2a</td>
<td>Light Green Aphanitic Flows (?)</td>
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  **Mafic Metavolcanics**
  
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<td>1m</td>
<td>Mafic Tuff</td>
</tr>
<tr>
<td>1c</td>
<td>Light Green Pillowed Flow (Magnesium Tholeiites)</td>
</tr>
<tr>
<td>1a</td>
<td>Dark Green Flow</td>
</tr>
</tbody>
</table>
TABLE OF LITHOLOGIES

Unit 13h  Diatreme Dike

This unit was seen intruding the intermediate to felsic pyroclastic rocks on the property. The dikes are a dark brown - black colour on fresh and weathered surfaces. The dikes are 1m wide, have an aphanitic matrix and contains rimmed calcite and quartz amygdules and vugs with occasional angular glassy fragments. A weak hematization of country rock is often associated with dikes' silicified, chilled contacts.

Unit 13g  Carbonatite Plug - Diatreme

This unusual unit was seen in a single locality on Line 1W at 900N. The upper portion of the plug is strongly metasomatically altered (fenitized) to a reddish orange feldspathoid (hematized feldspars).

The carbonatite plug or diatreme is 3 meters wide and consists of angular to subrounded fragments of varying lithologies in a granular yellow brown carbonate rich matrix with rimmed calcite and quartz amygdules and empty vesicles. Fragments constitute up to 70% of the rock. Fragment types include:
(a) dark grey intermediate ash tuff  
(b) quartz feldspar porphyritic rhyolite  
(c) biotite mafic fragments  
(d) light grey green sericitized - speckled black + white diorite  
(e) grey aphanitic, fissile, soft sedimentary fragments

The fragments greatly ranged in size and shape from 2cm to 15cm and from angular to subrounded. The matrix contains glassy pieces of quartz and calcite.

Originally it was thought by the author that this unit could be a small vent. The diatreme contained a somewhat horizontal zoning, from top to bottom:

(i) red strongly hematitic (fenitised) with glassy amygdules of quartz and calcite or empty vesicles, occasional fragment.

(ii) slightly less hematitic (less fenitised) - 30% fragments.

(iii) strong yellow-brown carbonate matrix around fragments (50% fragment : 50% matrix ratio)

(iv) weak yellow carbonate matrix (70% fragment: 30% matrix ratio)

Unit 13f  Porphyritic Syenite

This unit was seen in several localities on the property and is particularly well exposed along the shoreline of Lake Superior. The dominant trends of the dikes are between 340-360°. The dikes range from 30cm to 2 meters in thickness and are often vertically dipping. The weathered surface is brick red to
reddish brown with irregular clusters of feldspar from 3 to 10mm forming a glomeroporphyritic texture. The dike also contains amphibole phenocrysts (1 to 4 percent) from 3mm to 8mm in length. The dikes are variably magnetic, and on fresh surfaces shows a blood red to brown colour, with an aphanitic matrix. This unit was seen intruding metavolcanic, metasedimentary rocks and diabase dikes on the property.

**Unit 13c  Gabbroic Lamprophyre**

This unit intrudes most of the units described below and for classification purposes Unit 13c contains coarse biotite phenocrysts whereas the others do not. The dike varies in textures depending on amount and sizes of phenocrysts. The dikes commonly range from 10cm to 200cm in width, and repeatedly change thickness or terminate by pinching out (readily seen on the shoreline of Lake Superior).

In hand specimen, the dikes are weathered dark grey to black to rust colour and are mottled with from 10-15% coarse (2mm to 1.5cm) black biotite phenocrysts. On fresh surfaces the rock is dark grey and fine grained and essentially comprised of fine plagioclase, olivine, and pyroxene with minor amounts of carbonate, chlorite, biotite, and fine pyrite. The dikes also display pinch and swell structures similar to that found in the diabase dikes.
Unit 11d  Equigranular Diabase

This unit is seen intruding all of the metavolcanic and metasedimentary rocks on the Rolls Resources Ltd. property. Outcrops are massive and weather rusty brown. The dike trends on the property vary greatly as was originally indicated from the magnetic survey. Principal trends are northwest-southeast and north-south, however WNW, EW and ENE trending dikes are also present. Maximum thickness attained is 70 meters.

Compositionally the dike contains from 40-55% saussuritized light green plagioclase and 40-45% clinopyroxene. The dikes are variably magnetic and contain varying amounts of disseminated pyrite.

Unit 5c  Schistose Gabbro Dike

This unit may in fact be part of Unit 5a, the massive gabbro, differing only in that it is strongly schistose. The unit was seen crosscutting the metavolcanics and metasediments on lines 6W/800N, L6W at 25N and south of TL2N at 125N. The dikes commonly parallel stratigraphy but appear to dip less steeply. Like the lamprophyres, the dikes display pinch and swell structures.

The rock weathers light brown and have a pocketed, weathered surface. From hand specimen the rock is a black to dark grey colour, strongly foliated with 20% black biotite along foliation planes. The dikes are commonly from 1-2 meters in thickness and
contain varying amounts of pyrite and carbonate.

Unit 5a   Gabbro (Massive)

This unit was seen as a continuous 400 meter long dike on lines 10E, 11E, 12E, 13E at approximately 0+75 north. The rock weathers a rusty brown to dark brown colour. The dike is characterized by peculiar coarse cubic sulfide blebs and medium to coarse grained biotite phenocrysts. The plagioclase crystals within the matrix are commonly hematized. Fresh surfaces are dark grey to black with 1mm pyroxene crystals observable in hand specimen. Approximate thickness of the dike is three meters. A red colouration of plagioclase crystals and fracture fillings was common near dike contacts.

Unit 3e   Tuffite Sequence

This unit was named "tuffite" due to its repetitive "sedimentary" sequence of finely laminated tuffs and metasediments. The rocks were most commonly seen along the western boundary of the property along the lake. The rocks are finely laminated (2mm-2cm) and show excellent examples of primary sedimentary structures such as cross bedding, slumping, convolute bedding, load casts, flame structures and graded bedding. The sedimentary part within this sequence is mostly grey mud-size shales and beige coarser sandier size beds. The rocks are medium green to greenish grey, are very fine grained, and show no laminations on fresh surfaces. According to Muir, a similar
sediment-tuff lens was seen 500 meters south of the property and according to chemical analyses of the rocks, the rocks are chemically equivalent to a calc-alkaline basalt and is interpreted to represent distal and shallow water deposits of mafic tuff and mud. This is in agreement with the distal interpretation from the fine ash, coarse ash, and crystal tuffs.

**Unit 3c  Massive Argillite**

This unit was seen associated with the more laminated sediments around L1E, L2E, L6E just north of the baseline. The rock is massive, weathers blocky and has a conchoidal fracture. On fresh surfaces the rock is a dark grey to black colour and commonly occurs stratigraphically above the more laminated sediments. Occasionally wisps of pyrite and pyrrhotite occur within this unit.

**Unit 3b  Finely Laminated Mudstone, Siltstone, Wacke**

Most of the clastic metasediments on the Rolls Resources Ltd. property are siltstone and mudstone with an occasional wacke portion with or without a tuffaceous component. The sediments occur as irregular lenses within the intermediate to felsic pyroclastic rocks and are intimately associated with the mafic volcanics. The maximum interpreted thickness of these lenses is 75 meters while minimum thickness is 10 meters. Where seen, these sediments are finely laminated with bedding thickness ranging from 0.5 cm to 10 cm. Some beds, particularly those seen
along the shoreline of Lake Superior contain plagioclase crystals. It is uncertain as to whether these are intermittent crystal tuff horizons or porphyroblastic wacke beds. As was discussed in the Unit 3e discussion, Tuffite sequence, the "metasediments" are difficult to distinguish from the intermediate to felsic crystal tuffs.

The similarity of the tuffs and the metasediments and the lack of potassium feldspar may indicate that the "volcaniclastic" metasediments were partly or wholly derived from the intermediate to felsic pyroclastic rocks.

The laminated sediments are mostly biotitic siltstones and fine grained shales. On weathered surfaces the rock is a light brown colour and fissile. On fresh surfaces the rock is a dark brown colour composed mostly of brown biotite (up to 30%) that imparts a strong foliation. The remainder of the rock is composed of plagioclase and quartz. The sediments are strongly carbonatized. The clastic metasediments seem to be indirectly associated with the minor horizons of mafic metavolcanics on the property. In two instances the sediments occur stratigraphically interbedded with the basaltic flows and tuffs.

Unit 2g4 Lapilli Tuff

This unit was only seen in a few localities on the property and occurred intimately interbedded with the Crystal tuff (Unit 2g2) and sedimentary rocks part of the tuffite sequence (Unit
The tuff is comprised of intermediate to felsic lithic fragments which contain crystals of plagioclase and quartz which are visible on the weathered surfaces. The lapilli range in size from 2cm to 4cm in size and are subrounded to rounded. On fresh surfaces the matrix is grey to dark blue-grey in colour and is brown-grey to beige on weathered surfaces.

**Unit 2g3 Coarse Ash Tuff**

This unit is seen interbedded with the finer ash tuff and the coarser crystal tuff throughout the property. The coarse ash tuff is common throughout the property and is very similar to Unit 2g2, the Crystal Tuff. The matrix is aphanitic, grey to dark grey and occasionally contains ash size <2mm crystals of plagioclase and quartz. Adjacent to diabase dike contacts, this unit is pervasively hematized and carbonatized.

**Unit 2g2 Crystal Tuff**

This unit is seen interbedded with the Finer Ash Tuff (Unit 2g1) and the Coarser Ash Tuff (Unit 2g3) and the Lapilli Tuff (Unit 2g4). The crystal tuff is fairly common in the map area particularly in the southern part of the map area. Most of the crystal tuff is poorly bedded, however, near the western edge of the property the rocks are seen interbedded with metasediments (Tuffite Sequence Unit 3e).

The matrix is usually very fine-grained, grey to blue grey and contains pieces of plagioclase crystals from 2mm to 1cm (from
20-40%), and occasional quartz crystals (1-2mm). The plagioclase crystals are often saussuritized to a light green colour or they are a pink colour due to hematization adjacent to dike contacts. The bedded variety can best be seen on weathered surfaces.

Adjacent to diabase dike contacts the rocks are weakly to moderately pervasively hematized and fine hornblende needles develop. These are commonly biotized and/or chloritized. These needles are 1mm to 5mm in length and locally comprise up to 20% of the rock.

Unit 2g1 Fine Ash Tuff

This unit was one of the most common rock types on the property and occurred most commonly interbedded with Unit 2g2, Crystal Tuff and Unit 2g3, Coarse Ash Tuff. Throughout the property the finer ash tuff predominates. The rock is massive, aphanitic, dark grey to light grey colour, and on weathered surfaces does look somewhat tuffaceous. Occasional feldspar crystals were also noted (less than 1mm.) This unit contained varying proportions of finely disseminated pyrite (trace to 1/2%).

Unit 2c Spherulitic Flows

Spherulitic flows of intermediate to felsic composition outcrop along most of the southwest boundary. The flows are usually massive, siliceous, aphanitic, and greenish in colour
with aphanitic, beige, ellipsoidal spherules. The rock varies from massive to medium bedded over short distances. The weathered surface is light grey to dark grey with patches of oval to irregular shaped hematized or sericitized spherules. Fresh surfaces are light grey to dark grey with lighter beige spherules composed of immiscible felsic portions within the dominantly intermediate flow. In hand specimen the spherules are composed of feldspar and quartz with minor carbonate. The flows are intimately associated with Unit 2a, the massive light green flows, and the tuffite sequence Unit 3e. In some places along the shoreline of Lake Superior the beige spherules have coalesced locally to form 'beige' beds separated by 'grey' beds. The rocks are classified as 'volcanic' in origin due to the intimate association with the massive, aphanitic variety. North of these rocks, very fine grained flows with irregularly shape patches of poorly defined beige spherules occur.

**Unit 2a  Light Green Aphanitic Flows (?)**

This unit was seen mostly along the southwestern part of the property on the shoreline of Lake Superior. The flows (?) are massive, aphanitic, light green or sometimes beige, siliceous rocks. The flows are virtually structureless and are more siliceous (dacitic to rhyolitic) than the other intermediate pyroclastic rocks on the property. The matrix is somewhat pasty textured, weakly sericitized and is strongly carbonatized. These
rocks may, in fact, be chemical sedimentary rocks.

Unit 1m Mafic Crystal Tuff

This unit occurs adjacent to the fine grained medium green flows (Unit 1a). The unit extends from L2E to L3E at around 4+00 north. Weathering surfaces are rounded, light brown and knobby with more resistant quartz crystals and plagioclase crystals. On fresh surfaces the rock is dark grey in colour with coarse biotite wisps comprising from 10-15% of the rock. The matrix is fine to medium grained and contains angular clear quartz crystals (1-4mm) up to 5% and plagioclase crystals (2-3mm) up to 10-15%. A certain percentage of the plagioclase crystals may be due to recrystallization, however, they do impart a strong tuffaceous appearance on weathered surfaces. Alteration includes strong carbonatization and chloritization of biotite wisps.

Unit 1e Light Green Pillowed Flows

This unit was seen in a single locality on the railway tracks around TL15N/L1W. The pillows are light green, elliptical, and vary from 30cm to 70cm in length, and are rimmed by thick, light green to medium green weathering selvages. These rocks contain up to 20% feldspar (plagioclase) phenocrysts which are thought to be formed primarily from recrystallization during the intrusion of the Coldwell Complex. The rocks also are partly altered to epidote and carbonate. Top determinations, from pillow shapes, indicates tops to be towards the south, however,
other evidence indicates north facing tops. This unit is thought by the author to be a silicified, carbonatized magnesium tholeiitic basalt.

**Unit 1a  Dark Green Flows (Amygdaloidal?)**

This unit outcrops throughout the southcentral portion of the property and occurs intimately associated with the few metasediment lenses on the property. The flow extends in a southeasterly direction from L10E at 2+75N to L13E at 0+75N. The rock is a dark green to medium green colour, aphanitic and massive. Weathered surfaces are a light brown colour with occasional biotite patches importing a speckled surface. Minor carbonate, chlorite and manganese stain are also present. Unusual 1-2mm vague patches or amygdules (?) filled with quartz also are present. Mafic volcanism on the property is associated with a period of quiescence where sediments were deposited before and/or after deposition of the mafic metavolcanics. Minor amounts of mafic tuff were deposited at about the same time as the dark green mafic flows.

**STRUCTURAL GEOLOGY**

Although exposure was relatively good, little indication of major structures was discovered. Most structural information involving stratigraphic tops was obtained from bedded sedimentary and tuffite sequences and minor information was obtained from
pillowed lavas in the northwestern portion of the property. Bedding ranged from roughly east-southeast to southeast and dips varied from steeply to the north to vertical. Suspect tops determinations were obtained from good sedimentary structures such as graded bedding, crossbedding, slump structures, flame structures and contorted bedding.

No major faults were identified in the area, however, there may be minor indications of a small fault near Line 10E at 1+25 north where a highly foliated mafic unit terminates abruptly along a north-northeast trending break. Minor shearing occurs on lines 12E and 13E at 1+25N and 0+65N respectively. This shear zone is indicated by strongly foliated, strongly carbonatized rocks along the mafic volcanic felsic pyroclastic contact. Other areas, primarily along contacts appear to have been sheared and occasionally injected by quartz. Several quartz veins, sweats and gashes occur on the Rolls Resources Ltd. property and commonly contain brown calcite, tourmaline chlorite, biotite and pyrite as accessory minerals.

Dikes on the property, primarily the diabase, gabbros, lamprophyres and syenites show varying amounts of hematization, silicification, carbonatization and sericitization of the country rocks along their contacts. Several of the more major diabase dikes may occupy pre-existing faults.

One major structural feature occurs in the western portion
of the property as is indicated by changes in bedding attitudes. A minor syncline is thought to occur with the axis forming a tight nose through the bay towards line 6W at 5+00N. Bedding attitudes change abruptly from 120° to 0° following the axis of the fold.

**METAMORPHISM**

The highest grade of metamorphism on the Rolls Resources Ltd. property appears to be lower amphibolite facies.

The metavolcanics and metasediments on the property have been altered due to the nearby intrusion of the Port Coldwell Complex. The intermediate to felsic pyroclastic rocks have been weakly carbonatized while the mafic metavolcanics have been moderately carbonatized and consist of mineral assemblages including chlorite + plagioclase + quartz + epidote + carbonate. Other characteristics of both the mafic and intermediate to felsic rocks are varying proportions of 1-3mm plagioclase phenocrysts and hornblende phenocrysts caused by recrystallization during the nearby Port Coldwell Intrusion. Feldspar and quartz porphyroblasts are common throughout the pyroclastic rocks and at times are difficult to distinguish from feldspar and quartz crystals ejecta.
ECONOMIC GEOLOGY

A total of 39 rock grab samples were taken on the Rolls Resources Ltd. property and were analyzed for gold, silver, copper, lead, zinc, arsenic, antimony, barium, molybdenum (The results were not available at the time of writing this report).

The following is a summary of the more mineralized and/or altered areas on the Rolls Resources Ltd. property:

1.) Several quartz veins, sweats and gashes occur on the property. They are often highly fractured (hairline fractures) and contain carbonate and trace amounts of pyrite. Fine to coarse tourmaline needles occur along the vein selvages associated with coarse brown carbonate.

2.) The sedimentary rocks - primarily the argillites, often contained trace to 1% fine pyrite and pyrrhotite wisps causing a rusty brown weathering surface.

3.) A three meter wide southeast trending shear zone occurs on L13E at 1+25N and on L12E at 0+70N. The zone is indicated by strongly foliated, strongly carbonatized, weakly sericitized rocks with trace amounts of pyrite. The shearing has occurred along the mafic metavolcanic and intermediate to felsic pyroclastics contact and can be traced for 100 meters.

4.) Several hematized, silicified, carbonatized, pyritic zones occur within the intermediate to felsic tuffs. Trace amounts of pyrite and magnetite occur within these zones and are often associated with intermediate - mafic contacts and/or with dike contacts. Hairline chalcedonic silica flooding; manganese staining; vuggy quartz flooding, and disseminations of pyrite and pyrrhotite often accompany these zones.

5.) An unusual carbonatite-plug system occurs on Line
1W/9+00N. The plug looks identical to a small volcanic vent in the intermediate tuffs. A strong metasomatic alteration - fenitisation occurs along the top portion of the plug - causing a bright red feldspar alteration.

6.) On Line 10E a roughly ENE trending geologically interpreted fault extends from 50 north to 300 north indicated by a strongly foliated, carbonatized mafic flow abruptly ending along strike against an intermediate tuff. Alteration includes:

a) strong hematization
b) silicification
c) carbonatization
d) sericitization
e) pyritization

Mineralization included disseminated pyrite throughout matrix and along fracture surfaces. There is an ENE lineament indicated on the regional geology map that roughly corresponds with the geologically interpreted fault on L10E.
<table>
<thead>
<tr>
<th>Sample #</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>59731</td>
<td>L7W/700N on lake</td>
<td>1cm - 6cm quartz vein with trace pyrite.</td>
</tr>
<tr>
<td>59732</td>
<td>6+50W/800N</td>
<td>6cm wide quartz vein with tourmaline; trace pyrite.</td>
</tr>
<tr>
<td>59733</td>
<td>L23W/035N</td>
<td>Hematized Unit 2g; sericitic along foliation; strong Mn-stain; trace magnetite.</td>
</tr>
<tr>
<td>59734</td>
<td>L24W/075N</td>
<td>Unit 2g; trace to 1/2% pyrite; weakly sericitized and silicified.</td>
</tr>
<tr>
<td>59735</td>
<td>RLO/2375E</td>
<td>Carbonatized Unit 2g; 1-3% pyrite blebs; weak silica-sericite</td>
</tr>
<tr>
<td>59736</td>
<td>L19E/4+20N</td>
<td>Unit 2g3; moderately hematized; weakly sericitized; trace pyrite</td>
</tr>
<tr>
<td>59737</td>
<td>L19E/15m.W of 4+20N</td>
<td>Unit 2g1; carbonatized along fractures.</td>
</tr>
<tr>
<td>59738</td>
<td>L5W/800N</td>
<td>Unit 2g; weakly silicified, carbonate along fractures; trace pyrite.</td>
</tr>
<tr>
<td>59739</td>
<td>L5W/780N</td>
<td>As above.</td>
</tr>
<tr>
<td>59740</td>
<td>30m S.W. of TL2N on coast</td>
<td>Outcrop? quartz-tourmaline-calcite vein with coarse sericite.</td>
</tr>
<tr>
<td>59741</td>
<td>L14E/20m. E of 100N</td>
<td>Spotted dike (?); Strongly hematized.</td>
</tr>
<tr>
<td>59742</td>
<td>L14E/15m W. of 950N</td>
<td>Unit 2g3; Strongly silicified (associated quartz gashes); trace to 1/2% pyrite.</td>
</tr>
<tr>
<td>59743</td>
<td>L14E/940N</td>
<td>Quartz vein pod in Unit 2g; near Unit 5c.</td>
</tr>
<tr>
<td>59744</td>
<td>L14E/955N</td>
<td>Subcrop-quartz vein, strong Mn-stain.</td>
</tr>
<tr>
<td>59745</td>
<td>L14E/450N</td>
<td>Quartz-tourmaline-calcite vein (subcrop)</td>
</tr>
<tr>
<td>59746</td>
<td>L14E/12m E. of 125N</td>
<td>Intensely hematized Unit 2g(?); 5% magnetite, 1% coarse pyrite.</td>
</tr>
<tr>
<td>59747</td>
<td>L14E/12m E. of 100N</td>
<td>As above, also silicified.</td>
</tr>
<tr>
<td>59748</td>
<td>L5W/725N</td>
<td>Intensely hematized, carbonatized Unit 2g; trace pyrite.</td>
</tr>
<tr>
<td>59749</td>
<td>L5W/715N</td>
<td>Carbonatized, weakly silicified tuff (?); trace pyrite; much limonite.</td>
</tr>
<tr>
<td>59750</td>
<td>75m N.W. of L7W/100N on coast</td>
<td>Pyritic mafic dike with hematized envelopes.</td>
</tr>
<tr>
<td>67551</td>
<td>0-1W/930N</td>
<td>Carbonatite plug (Diatreme) (Unit 13g); oxidized upper part with 4-5% matrix pyrite.</td>
</tr>
<tr>
<td>67552</td>
<td>L2W/675N</td>
<td>Quartz &quot;sweat&quot; vein with trace pyrite within Unit 2</td>
</tr>
</tbody>
</table>
### Description of Rock Samples

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>67553</td>
<td>L2W/640N</td>
<td>Strongly hematized; weak sericite, carbonate along fractures; trace pyrite.</td>
</tr>
<tr>
<td>67554</td>
<td>L2W/75N</td>
<td>Hematized 2g3; trace to 1/2% pyrite (near diabase contact).</td>
</tr>
<tr>
<td>67555</td>
<td>HLO/165W</td>
<td>Strongly hematized; carbonatized Unit 2g; trace to 1/2% disseminated pyrite.</td>
</tr>
<tr>
<td>67556</td>
<td>L2E/460N</td>
<td>Silicified and carbonatized Unit 2g; trace pyrrhotite.</td>
</tr>
<tr>
<td>67557</td>
<td>L3E/225N</td>
<td>Dark grey argillite with trace to 1/2% very fine pyrite.</td>
</tr>
<tr>
<td>67558</td>
<td>L13E/80N</td>
<td>Strongly silicified, carbonatized &quot;felsics&quot; at mafic contact; trace pyrite.</td>
</tr>
<tr>
<td>67559</td>
<td>L13E/70N</td>
<td>Shear? Strongly foliated and carbonatized &quot;felsics&quot; along mafic contact.</td>
</tr>
<tr>
<td>67560</td>
<td>L12E/5m E of 140N</td>
<td>Sheared carbonate zone along mafic-felsic contact; silicified basalt.</td>
</tr>
<tr>
<td>67561</td>
<td>L3W/20m W of 775N</td>
<td>Strongly hematized, and Mn-stained brecciated 2g.</td>
</tr>
<tr>
<td>67562</td>
<td>L4W/1080N</td>
<td>Strongly hematized and recrystallized Unit 2g2; wisps of carbonate; trace to 1/2% pyrite.</td>
</tr>
<tr>
<td>67563</td>
<td>L4W/745N</td>
<td>As above; and with hairline silica flooding; trace pyrite and magnetite.</td>
</tr>
<tr>
<td>67564</td>
<td>L4W/217N</td>
<td>Strongly hematized and Mn-stained Unit 2g3 (near dike?)</td>
</tr>
<tr>
<td>67565</td>
<td>L6E/@ R.R.cut</td>
<td>8&quot; wide coarsely crystalline quartz vein; trace to 1/2% pyrite.</td>
</tr>
<tr>
<td>67566</td>
<td>L6E/@ R.R.cut</td>
<td>3&quot; wide coarsely crystalline and vuggy quartz-carbonate vein; 1% pyrite.</td>
</tr>
<tr>
<td>67567</td>
<td>L10E/8m E of 250N</td>
<td>1% pyrite disseminated as blebs and smears in well foliated Unit 1a.</td>
</tr>
<tr>
<td>67568</td>
<td>L10E/20m E of 250N</td>
<td>Unit 2g2, pervasively silicified and flooded with vuggy quartz veinlets; 1% pyrite in country rock and quartz.</td>
</tr>
<tr>
<td>67569</td>
<td>L10E/217N</td>
<td>Subcrop; cherty sediment; silicified with vuggy ribbon quartz stringers; trace pyrite.</td>
</tr>
</tbody>
</table>
DISCUSSION OF GEOLOGICAL FINDINGS AS COMPARED TO PREVIOUS MAGNETOMETER AND VLF SURVEY RESULTS

During the geological mapping survey, several north-south, north-west, and roughly east-west diabase dikes were mapped together with gabbroic, syenitic and lamprophyric dikes. The magnetic map of the Rolls Resources Ltd. property seems to be dominated by these features with similar trends. Directions of WNW and ENE are also evident. As discussed by T.R. Gledhill "It should be noted that inverse magnetic polarization is prevalent in the area and many of the dikes display only negative anomalies". Some features vary along strike so that magnetic highs must be correlated with magnetic lows. This is evident within the dikes as the colour, textures and mineralogy including the percentage of magnetite changes drastically along strike such that different names could almost be given to the same dike.

Anomalies obtained from the EM-16 equipment during the previously run VLF-EM survey are Type B. Those in which the quadrature follows the in-phase (positive quadrature) and indicates a poorly conductive source such as overburden, faults or shears."

Anomalies H, C, D, G as shown by the geological mapping program are caused by swamps or by weakly mineralized zones containing varying amounts of sulfides.


4. Ibid
Anomaly H - 100 meter wide ENE trending diabase dike with 2-5% disseminated pyrite and magnetite.

Anomaly C, D and G are thought to be caused by swamps.

The remainder of the anomalies are mantled by overburden cover.

DISCUSSION OF INDUCED-POLARIZATION-RESISTIVITY SURVEY

Survey Dates and Statistics

The Induced-Polarization and Resistivity (IP) survey was conducted from June 24, 1985 to July 13, 1985 by Robert S. Middleton Exploration Services Inc. over the Rolls Resources Ltd. property. A total of 2437 readings were taken over 15,800 meters of line. The lines were spaced 200 meters apart, with stations established every 25 meters. A pole-dipole array was used with an "a" spacing of 25 meters and readings were taken at n=1, 2, 3, 4 and 2, 3, 4, 5 where overburden was thought to be deeper. The data is presented as contoured pseudosections for chargeabilities (mv/v) and resistivities (ohm/m).

SURVEY PROCEDURE AND INSTRUMENTATION

The IP survey was done using a Scintrex IPR-11 receiver and TSQ-3 square wave transmitter (3.0 kwatt). An "a" spacing of 25 meters was used with n = 1, 2, 3, 4 and n = 2, 3, 4, 5 where
overburden was deeper. A pole-dipole array configuration was used. This gave theoretical survey depths up to 60 meters which should have been sufficient to explore to bedrock in most areas of the property, as overburden is thought to be shallow throughout the area.

A 2 second "on" 2 second "off" square wave pulse was transmitted into the ground via stainless steel stake electrodes and the voltage readings were taken using porous pots filled with copper sulphate solution. A series of 10 time windows were recorded after the shut off of the pulse and the 7th time window was plotted on the pseudo sections which accompany this report.

Specifications for the IPR-11 receiver is given at the back of this report.

INTERPRETATION OF THE INDUCED POLARIZATION-RESISTIVITY SURVEY

Detailed profiles were run in order to outline anomalous chargeability zones that may reflect the presence of pyrite-gold mineralization such as that at the Hemlo Gold Deposit. Several areas of weak, somewhat poorly defined anomalies were defined that suggest possible areas of mineralization. The resistivity profiles are best interpreted as being indicators of overburden thickness. The resistivities were moderate to very high over the majority of the property indicating shallow overburden. The most eastern portion of the property had relatively lower
resistivities indicating slightly deeper overburden. The western portion of the property was an area of extensive outcrop.

I  A poorly defined broad anomaly was detected on line 19E at 4+00N to 5+25N. This anomaly is associated with chargeabilities of roughly two times background and is associated with moderate resistivities. This area corresponds with moderately carbonatized, weakly silicified, pyrite bearing felsic to intermediate tuffs.

II Two areas of moderately high chargeability in an area of high resistivity occur on Line 9E and Line 11E at 225N-300N and at 925N - 975N respectively. These are interpreted as "topographic" effects.

III A poorly defined anomaly was detected on Line 11E at 0+75N to 1+00N. This weakly anomalous chargeability zone corresponds with an east-west trending pyritic gabbroic dike.

IV A rather well defined anomaly occurs on Lines 13E and 15E at 50N to 90N and from 25N to 50N respectively. The anomaly is associated with moderately high resistivity values and has chargeabilities
of roughly four times background on L15E and weak chargeabilities on Line 13E and corresponds to a narrow roughly ENE trending shear zone along the metasediment-felsic contact. Trace to 2% disseminated pyrite occurs within a silicified, carbonatized intermediate to felsic tuff and within a carbonatized mafic flow. A zone of high chargeability and high resistivity occurs on Line 17E from 0+25N to 0+50N that may be the extension of the southeast trending shear zone located on L13E and L15E near the baseline.

V A fairly well defined anomaly occurs on Line 7E from 0+25N to 0+50N. The anomaly is associated with moderate to high resistivities and as chargeability values of roughly 2-3 times background and may correspond with pyritic or graphitic material within cherty argillite which was identified in the area.

VI A poorly defined anomaly was detected on Line 5E at 6+50N to 7+00N. The anomaly is associated with chargeabilities of roughly 2 times background in slightly higher than background resistivities. Due to a lack of outcrop in this area, diamond drilling is recommended to test this near surface anomaly.
VIIa Two areas of moderately high chargeability occur on Line 3E from 3+80N to 4+75N in moderately higher resistivity and from 75N to 1+25N in slightly lower than background resistivity. The latter anomaly is associated with chargeabilities of roughly two times background and corresponds with a felsic-sediment contact with minor pyrite mineralization.

b) Higher than background chargeabilities occur from the baseline to 4+00N within an area of high resistivity values on Line 3E.

VIII A broad zone of high background chargeabilities and high background resistivities occurs on Line 0 from 0+25N to 5+00N. Felsic to Intermediate tuffs with trace amounts of pyrite correspond with this zone.

IX A narrow zone of higher than background chargeabilities occur in an area of higher than background resistivities on Line 3W at 7+75N to 8+00N.
CONCLUSIONS

1. The Rolls Resources Ltd. property is located within a dominantly intermediate to felsic pyroclastic sequence termed the Heron Bay Sequence.

2. The pyroclastic-metasedimentary rocks were deposited into a shallow water submarine basin environment indicated by the abundant sedimentary structures within the tuff-sediment (tuffite) sequence including:

   (a) graded bedding
   (b) cross bedding
   (c) ripple marks
   (d) slump structures
   (e) flame structures

3. Some of the diabase dikes on the property may occupy preexisting faults as evidenced by the intense alteration in and around the contacts. Alteration noted included:

   (a) hematization
   (b) silicification
   (c) sericitization
   (d) carbonatization
   (e) pyritization

4. An intimate association exists between the volcanioclastic sedimentary rocks and the tuffaceous rocks on the property, i.e. the sediments possess a tuffaceous component (crystals) and the tuffs possess a sedimentary component (bedding). For this reason the interbedded tuff-sediment units was termed "tuffite" sequence.
5. Mineralization within the Rolls Resources Ltd. property appears to be associated to:

(a) Pyritic quartz-carbonate-(tourmaline) gashes, veins or sweats.
(b) pyritic carbonatized, silicified, sericitic, hematized tuffs along dike or mafic-sediment and felsic-sediment contact.

6. Stratigraphic units seem to be dipping steeply to the north however pillowed volcanics were determined to be south facing.

7. A period of deformation has produced a tight syncline with the nose of the fold towards NNW in the western part of the property.

8. Two mafic - volcaniclastic bands occur on the property. These narrow, irregular lenses of mafic volcanics are thought to have accumulated within time lapses between the intermediate to felsic volcanism where volcaniclastic metasediments were deposited.

9. Several other narrow volcaniclastic metasediment horizons occur throughout the property.

10. The spatial distribution of the generally finer intermediate to felsic ash tuffs, crystal tuffs, and tuffite sequences with respect to the generally coarser tuff breccia around Heron Bay indicate a distal deposit from vent source.
The Detailed Induced Polarization Resistivity survey outlined several weakly anomalous chargeability zones that may coincide with sulphides at depth. A track mounted backhoe should be employed to carry out power stripping to bedrock and detailed mapping and sampling of the newly exposed outcrops (in area No.3 see Economic Geology section) to better expose the shear zone on L12E and L13E at 1+25N along strike and to provide sufficient exposure for more complete sampling of the mineralized zone. Further power stripping to bedrock could also be also carried out on line 10E along an ENE fault zone (No.6 see Economic Geology) where the felsic tuffs are foliated, carbonatized an pyritized. Detailed mapping and sampling of newly exposed outcrops should be carried out.

**BUDGET**

- Mobilization, demobilization: $2,000.00
- 7 days at $1000/day: $7,000.00
- Supervision 7 days @ $300/day: $2,100.00
- Assays - 50 samples @ $15/sample: $750.00
- Report, drafting: $2,000.00

Total: $13,850.00

Respectfully Submitted,

Nadia Caira, B.Sc.
REFERENCES

Colvine, A.C. editor  

Coster, J., and Caira, N.  

Gledhill, T.R., P.Eng., Consulting Geologist  
Report on the Magnetic and VLF-EM Surveys Royce Resources Limited, Pic Township property, Thunder Bay Mining Division.

G.S.C. - O.D.M.  
Aeromagnetic Map, 2156G

Milne, V.G.  

Moore, John  
1982 Physical Volcanology Applied to Meta-Volcanic Rocks, Department of Geology, Carlton University.

Morton, Roger D.  

Muir, T.L.  

Muir, T.L.  

Thomson, J.E.  
1931 Geology of the Heron Bay Area, District of Thunder Bay, Ontario Department of Mines, Ann. Rept., Vol. XL, part II.
CERTIFICATION

1. Nadia M. Caira, B.Sc., of Timmins, Ontario, certify that:

1. I am a graduate of the University of British Columbia, Vancouver, B.C., with a B.Sc. degree in Geology obtained in 1981.

2. I have been practising my profession in Canada since 1981.

3. I have no direct or indirect interest in the properties, leases or securities of Rolls Resources Ltd., Pic Township property, nor do I expect to receive any.

Dated this July 31, 1985, Timmins, Ontario.

Nadia M. Caira, B.Sc.
**INDUCED POLARIZATION**

**TIME DOMAIN**

**POLE-DIPOLE ARRAY**

\[ a = 25m \quad n = 1-4 \]

**Tx:** Scintrex TSQ-3 (3 Kw)  
**Rx:** Scintrex IPR-11  
*Pulse Scheme*  
*off T = 2 seconds*

**Total Line** 1000 m  
**Total Readings** 150

**Chargeability**  
0.5, 10, 15, 20  
1, 2, 3, 4, 6, 7, 8, 9  
**Resistivity**  
100, 1000, 10,000  
200, 300, 400  
50, 500, 5000

**REVISIONS**

ROBERT S. MIDDLETON  
EXPLORATION SERVICES INC.

for  
ROLLS RESOURCES LTD.

**Title** HEMLO PROPERTY  
PIC TOWNSHIP, ONTARIO  
THUNDER BAY MINING DIVISION

**Date:** JULY 1985  
**Scale:** 1:2500  
**N.T.S.:** 42 D/9

**Drawn:** WP / CG  
**Approved:** File: M-104
**INDUCED POLARIZATION**

**TIME DOMAIN**

**POLE-DIPOLE ARRAY**

\[ a = 25\text{m} \quad n = 1-4 \]

- **Survey Direction**
  - \( \text{survey direction} \)
  - \( n_1, n_2, n_3, n_4, n_5, n_6 \)

- **Tx**: Scintrex TSQ-3 (3 Kw)
- **Rx**: Scintrex IPR-11

- **Pulse Scheme**
  - **T**
  - **T**
  - **T**
  - **off**
  - **T**: 2 seconds

- **Plotting 7th slice** (mid pt. 870 msec.)
- **Integration time**: 30 msec

**Total Line**: 1000 m

**Total Readings**: 157

**Contour Interval**

<table>
<thead>
<tr>
<th>Chargeability</th>
<th>Resistivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0, 5, 10, 15, 20</td>
<td>100,000, 10,000</td>
</tr>
<tr>
<td>1, 2, 3, 4, 6, 7, 8, 9</td>
<td>200, 300, 400</td>
</tr>
<tr>
<td>Depression contour</td>
<td>50, 500, 5000</td>
</tr>
</tbody>
</table>

**Revisions**

- **ROBERT S. MIDDLETON**
  - **EXPLORATION SERVICES INC.**
  - **for**
  - **ROLLS RESOURCES LTD.**

**Title**: HEMLO PROPERTY

**Pic Township, Ontario**

**Thunder Bay Mining Division**

**L 21E**: 0 + 25 N - 10 + 00N

**Date**: JULY 1985

**Scale**: 1:2500

**N.T.S.**: 42 D/9

**Drawn**: DS/WP/CG

**Approved**: File: M-104

**Fig. 7**
**Induced Polarization**

**Time Domain**

**Pole-Dipole Array**

![Diagram](image)

\[ a = 25m \quad n = 1-4 \]

**TX:** Scintrex TSQ-3 (3 Kw)

**Rx:** Scintrex IPR-11

Plotting 7th slice (mid pt. 870 msec)

Integration time = 30 msec

**Total Line:** 1000 m

**Total Readings:** 152

**Contour Interval**

- Chargeability
  - 0.5, 10, 15, 20
  - 1, 2, 3, 4, 6, 7, 8, 9
  - Depression contour

- Resistivity
  - 100, 1000, 10000
  - 200, 300, 400
  - 50, 500, 5000

**Revisions**

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

for

ROLLS RESOURCES LTD.

**Title:** HEMLO PROPERTY
**Pic Township, Ontario**
**Thunder Bay Mining Division**

**Date:** JULY 1985
**Scale:** 1:2500
**N.T.S.:** 42 D/9

**Drawn:** DS/CJ/GG
**Approved:** File: M-104
INDUCED POLARIZATION
TIME DOMAIN
POLE - DIPOLE ARRAY

\[ a = 25 \text{m} \quad n = 1 - 4 \]

**Survey Direction**

**Tx**: Scintrex TSQ-3 (3 Kw)

**Rx**: Scintrex IPR-11 plotting 7th slice (mid pt. 870 m sec.)
Integration time = 30 msec

**Total Line**: 1000 m
**Total Readings**: 151

**Chargeability**

- 0,5,10,15,20
- 1,2,3,4,6,7,8,9

**Resistivity**

- 100,1000,10000
- 200,300,400
- 50,500,5000

**contour interval**

**Revisions**

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

for

ROLLS RESOURCES LTD.

**Title**: HEMLO PROPERTY
**Pic Township, Ontario**
**Thunder Bay Mining Division**

**L15 E G+25N — 9+75N**

**Date**: JULY 1985 **Scale**: 1:2500 **N.T.S.**: 42 D/9

**Drawn**: JS/CJ/CG **Approved**: File: M-104
INDUCED POLARIZATION
TIME DOMAIN
POLE - DIPOLE ARRAY

\[ \alpha = 25 \text{m} \quad n = 1 - 4 \]

\[ \text{Tx} : \text{Scintrex TSQ-3 (3Kw)} \]

\[ \text{Rx} : \text{Scintrex IPR-II} \]

\[ \text{Pulse} \]

\[ \text{Scheme} \]

\[ \text{Chargeability} \]

\[ \text{Resistivity} \]

\[ \text{CONTOUR INTERVAL} \]

\[ \text{Chargeability} \]

\[ 0, 5, 10, 15, 20 \]

\[ 1, 2, 3, 4, 6, 7, 8, 9 \]

\[ \text{Resistivity} \]

\[ 100,000,10,000 \]

\[ 200,000,400 \]

\[ 50,500,50,000 \]

TOTAL LINE 975 m
TOTAL READINGS 143

REVISIONS
ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.
for
ROLLS RESOURCES LTD.

Title HEMLO PROPERTY
PIC TOWNSHIP, ONTARIO
THUNDER BAY MINING DIVISION

L 13 E 0+25N -- 9+50N

Date: JULY 1985 Scale: 1:2500 N.T.S.: 42 D/9

Drawn: JS/CJ/CG Approved: File: M-104
RESISTIVITY (ohm-m)

CHARGEABILITY (mv/v)
INDUCED POLARIZATION

TIME DOMAIN
POLE - DIPOLE ARRAY

\[ a = 25m \quad n = 1-4 \]

Tx: Scintrex TSQ-3 (3 Kw)
Rx: Scintrex IPR-11 plotting 7th slice (mid pt. 870 msec.)
Integration time = 30msec

TOTAL LINE 1050 m
TOTAL READINGS 158

CONTOUR INTERVAL
Chargeability
Resistivity
0,5,10,15,20
100,1000,10000
1,2,3,4,6,7,8,9
200,300,400
Depression contour
50,500,9000

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

for

ROLLS RESOURCES LTD.

Title HEMLO PROPERTY
PIC TOWNSHIP, ONTARIO
THUNDER BAY MINING DIVISION

L I I E 0+25N — 10+50N

Date: JULY 1985 Scale: 1:2500 N.T.S.: 42 D/9
Drawn: WP/CJ/CG Approved: File: M - 104
INDUCED POLARIZATION

TIME DOMAIN

POLE - DIPOLE ARRAY

survey direction

\[ a = 25 \text{m} \quad n = 1-4 \]

**Tx**: Scintrex TSQ-3 (3 Kw)

**Rx**: Scintrex IPR-II plotting 7th slice (mid pt. 870 msec.)

Integration time = 30 msec

**TOTAL LINE**: 1025 m

**TOTAL READINGS**: 158

**CONTOUR INTERVAL**

<table>
<thead>
<tr>
<th>Chargeability</th>
<th>Resistivity</th>
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<tbody>
<tr>
<td>0,5,10,15,20</td>
<td>100,1000,10000</td>
</tr>
<tr>
<td>1,2,3,4,5,7,8,9</td>
<td>200,500,400</td>
</tr>
<tr>
<td>depression contour</td>
<td>50,500,5000</td>
</tr>
</tbody>
</table>

**REVISIONS**

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

for

ROLLS RESOURCES LTD.

Title HEMLO PROPERTY
PIC TOWNSHIP, ONTARIO
THUNDER BAY MINING DIVISION

L 9 E BLO — 10+00 N

**Fig. 13**

Date: JULY 1985 Scale: 1:2500 N.T.S.: 42 D/9

Drawn: DS/WP/CN Approved:

File: M-104
INDUCED POLARIZATION
TIME DOMAIN
POLE - DIPOLE ARRAY

Survey direction

\[ a = 25 \text{m} \quad n = 1-4 \]

Tx: Scintrex TSQ-3 (3 Kw)
Rx: Scintrex IPR-11

Pulse Scheme

Integration time = 30 msec

Chargeability

Resistivity

Contour Interval

TOTAL LINE 950 m
TOTAL READINGS 151

CONTOUR INTERVAL

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

ROLLS RESOURCES LTD.

for

HEMLO PROPERTY
PIC TOWNSHIP, ONTARIO
THUNDER BAY MINING DIVISION

Date: JULY 1985
Scale: 1:2500
N.T.S.: 42 D/9

Drawn: DS / CG
Approved: File: M-104
INDUCED POLARIZATION
TIME DOMAIN
POLE - DIPOLE ARRAY

a = 25m n = 1-4

Tx : Scintrex TSQ-3 (3 Kw)
Rx : Scintrex IPR-II plotting 7th slice (mid pt. 870 msec.)
Integration time = 30msec

TOTAL LINE 675m TOTAL READINGS 104

CONTOUR INTERVAL
Chargeability Resistivity
0,5,10,15,20 100,000,10000
1,2,3,4,6,7,8,9 200,300,400
Depression contour 50,500,5000

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

for
ROLLS RESOURCES LTD.

Title HEMLO PROPERTY
PIC TOWNSHIP, ONTARIO
THUNDER BAY MINING DIVISION

Date: JULY 1985 Scale: 1:2500 N.T.S.: 42 D/9
Drawn: Approved: File: M-104
INDUCED POLARIZATION
TIME DOMAIN
POLE - DIPOLE ARRAY

survey direction

\[ a = 25 \text{ m} \quad n = 1 - 4 \]

Tx: Scintrex TSQ-3 (3 Kw)
Rx: Scintrex IPR-II
plotting 7th slice (mid pt. 870 msec.)
Integration time = 30 msec

TOTAL LINE 725 m
TOTAL READINGS 117

CONTOUR INTERVAL

<table>
<thead>
<tr>
<th>Chargeability</th>
<th>Resistivity</th>
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</thead>
<tbody>
<tr>
<td>0.5,10,15,20</td>
<td>100,000,10,000</td>
</tr>
<tr>
<td>1,2,3,4,5,6,7,8,9</td>
<td>200,500,400</td>
</tr>
<tr>
<td>depression contour</td>
<td>50,500,5000</td>
</tr>
</tbody>
</table>

REVISIONS
ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.
for
ROLLS RESOURCES LTD.

Title HEMLO PROPERTY
PIC TOWNSHIP, ONTARIO
THUNDER BAY MINING DIVISION
L 3 E BLO - 7+5ON

Date: JULY 1985 Scale: 1:2500 N.T.S.: 42 D/9
Drawn: Approved: File: M-104
INDUCED POLARIZATION

TIME DOMAIN
POLE-DIPOLE ARRAY

\[ a = 25\text{m} \quad n = 1-4 \]

\[ \text{Pulse Scheme} \]

Tx: Scintrex TSQ-3 (3 Kw)
Rx: Scintrex IPR-11 plotting 7th slice (mid pt. 870 msec.)
Integration time = 30 msec

TOTAL LINE 775 m
TOTAL READINGS 105

CONTOUR INTERVAL

Chargeability Resistivity

<table>
<thead>
<tr>
<th>Chargeability</th>
<th>Resistivity</th>
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<tbody>
<tr>
<td>0,5,10,15,20</td>
<td>100,1000,10000</td>
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<tr>
<td>1,2,3,4,6,7,8,9</td>
<td>200,300,400</td>
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<tr>
<td>depression contour</td>
<td>50,500,5000</td>
</tr>
</tbody>
</table>

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

for

ROLLS RESOURCES LTD.

Title HEMLO PROPERTY
PIC TOWNSHIP, ONTARIO
THUNDER BAY MINING DIVISION

LIE 0+25N—8+00N

Date: JULY 1985 Scale: 1:2500 N.T.S.: 42 D/9
Drawn: Approved: File: M-104
RESISTIVITY (ohm-m)

CHARGEABILITY (mv/v)
INDUCED POLARIZATION

TIME DOMAIN

POLE - DIPOLE ARRAY

\[ a = 25 \text{ m} \quad n = 1-4 \]

survey direction

\[ T \text{X: Scintrex TSQ-3 (3 Kw)} \]

\[ R \text{x: Scintrex IPR-II plotting 7th slice (mid pt. 870 ms) } \]

\[ \text{Integration time = 30msec} \]

TOTAL LINE 1400 m

TOTAL READINGS 214

CONTOUR INTERVAL

Chargeability

<table>
<thead>
<tr>
<th>Interval</th>
<th>Contour</th>
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<tbody>
<tr>
<td>0,5,10,15,20</td>
<td>-</td>
</tr>
<tr>
<td>1,2,3,4,6,7,8,9</td>
<td>-</td>
</tr>
</tbody>
</table>

Resistivity

<table>
<thead>
<tr>
<th>Interval</th>
<th>Contour</th>
</tr>
</thead>
<tbody>
<tr>
<td>100,1000,10000</td>
<td>-</td>
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<tr>
<td>200,300,400</td>
<td>-</td>
</tr>
<tr>
<td>50,800,5000</td>
<td>-</td>
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</tbody>
</table>

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

for

ROLLS RESOURCES LTD.

Title HEMLO PROPERTY
PIC TOWNSHIP, ONTARIO
THUNDER BAY MINING DIVISION

LO 0*25N - 14*25N

Fig. 18

Date: JULY 1985  Scale: 1:2500  N.T.S.: 42 D/9

Drawn: DS/CN  Approved: File: M-104
INDUCED POLARIZATION
TIME DOMAIN
POLE - DIPOLE ARRAY

survey direction

\[ a = 25m \ qquad n = 1-4 \]

\[ T_\text{Tx} : \text{Scintrex TSQ-3 (3 Kw)} \]
\[ T_\text{Rx} : \text{Scintrex IPR-II plotting 7th slice (mid pt. 870 msec.)} \]
\[ \text{Integration time} = 30\text{msec} \]

TOTAL LINE 1450 m TOTAL READINGS 192

CONTOUR INTERVAL

<table>
<thead>
<tr>
<th>Chargeability</th>
<th>Resistivity</th>
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<td>0,5,10,15,20</td>
<td>100,000,10,000</td>
</tr>
<tr>
<td>1,2,3,4,6,7,8,9</td>
<td>200,300,400</td>
</tr>
<tr>
<td>depression contour</td>
<td>50,500,5000</td>
</tr>
</tbody>
</table>

REVISIONS

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

for

ROLLS RESOURCES LTD.

Title: HEMLO PROPERTY
PIC TOWNSHIP, ONTARIO
THUNDER BAY MINING DIVISION
L 3 W 0+25N — 14+50N

Date: JULY 1965 Scale: 1:2500 N.T.S.: 42 D/9

Drawn: WP/CG Approved: File: M-104
INDUCED POLARIZATION

TIME DOMAIN

POLE-DIPOLE ARRAY

\[ \alpha = 25 \text{m} \quad n = 1-4 \]

**Survey Direction**

**Tx**: Scintrex TSQ-3 (3kW)

**Rx**: Scintrex IPR-II

**Pulse Scheme**

**Chargeability**

| 0, 5, 10, 15, 20 | 100, 1000, 10,000 |
| 1, 2, 3, 4, 6, 7, 8, 9 | 200, 300, 400 |
| depression contour | 50, 500, 5000 |

**Contour Interval**

**Total Line**: 650 m.

**Total Readings**: 119

**Total UNE**: 650 m.

**Total Readings**: 119

**Contribution Interval**

**Resistivity**

**Revisions**

ROBERT S. MIDDLETON
EXPLORATION SERVICES INC.

for

ROLLS RESOURCES LTD.

**Title**: HEMLO PROPERTY

**PIC TOWNSHIP, ONTARIO**

**THUNDER BAY MINING DIVISION**

**L6 W**

**0+75N — 1+75N, 5+25N — 13+75N**

**Fig. 21**

Date: JULY 1985

Scale: 1:2500

N.T.S.: 42 D/9

Drawn: Approved:

File: M-104
**Ministry of Natural Resources**

**Report of Work**

(Geophysical, Geological, Geochemical and Expenditures)

---

**Geological and Geophysical Survey**

**Claim Holder:**

659258 Ontario Ltd.

**Address:**

Box 10, 101 North Syndicate Avenue, Thunder Bay, Ontario P7C 3V5

**Survey Company:**

Robert S. Middleton Exploration Services Inc.

**Prospector License No.:** T 1687

---

**Type of Survey(s):**

<table>
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<tr>
<th>Geophysical</th>
<th>Days per Claim</th>
<th>Mining Claim</th>
<th>Expended Days Cr.</th>
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<td>TB 674 490*</td>
<td>20</td>
</tr>
<tr>
<td>EM</td>
<td></td>
<td>674 491*</td>
<td>20</td>
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<tr>
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<td>674 492*</td>
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---

**Special Provisions:**

- For first survey:
  - Enter 40 days. (This includes line cutting)
- For each additional survey:
  - Using the same grid:
    - Enter 20 days (for each)

**Total Miles of line Cut:**

---

**Name and Address of Author of Geo-Technical report:**

Nadia Caira, c/o Middleton Exploration Services Inc. P.O. Box 1637, Timmins, Ont. P4N 7W8

---

**Expenditures (excludes power stripping):**

**Total Expenditures:**

**Total Days Credits:**

---

**Certification Verifying Report of Work:**

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Nadia Caira,

Robert S. Middleton Exploration Services Inc.

P.O. Box 1637, Timmins, Ont. P4N 7W8

Date Certified: July 15, 1985

---

**For Office Use Only:**

Date Recorded: Aug. 19, 1985

Date Approved and Signed: By: [Signature]

---

**Received:**

[Stamp]
Man Days are based on eight (8) hour Technical or Line-cutting days. Technical days include work performed by consultants, draftsmen, etc.

<table>
<thead>
<tr>
<th>Type of Survey</th>
<th>Technical Days</th>
<th>Technical Days Credits</th>
<th>Line-cutting Days</th>
<th>Total Credits</th>
<th>No. of Claims</th>
<th>Days per Claim</th>
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<tbody>
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<td>Induced Polarization-Resistivity (I.P.)</td>
<td>$\times 7$</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<table>
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<tr>
<th>Type of Survey</th>
<th>Technical Days</th>
<th>Technical Days Credits</th>
<th>Line-cutting Days</th>
<th>Total Credits</th>
<th>No. of Claims</th>
<th>Days per Claim</th>
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<td>$84 \times 7$</td>
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<td>$21$</td>
<td>$28$</td>
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<table>
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<th>Technical Days</th>
<th>Technical Days Credits</th>
<th>Line-cutting Days</th>
<th>Total Credits</th>
<th>No. of Claims</th>
<th>Days per Claim</th>
</tr>
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</table>

THUNDER DAY
MINING DIVISION
RECEIVED
AUG 19 1965
Ministry of
Northern Affairs
and Mines

Technical Assessment
Work Credits

Ontario

Date
1985 10 25

File
2.8436

Mining Recorder's Report of
Work No. 355

Recorded Holder
539258 ONTARIO LTD

Township or Area
PIC TOWNSHIP

<table>
<thead>
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<th>Type of survey and number of Assessment days credit per claim</th>
<th>Mining Claims Assessed</th>
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<td>Radiometric</td>
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<tr>
<td>Induced polarization</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
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</table>

Geophysical credits have been reduced because of partial coverage of claims.

Section 77 (19) See “Mining Claims Assessed” column

Geological 20 days

Geochemical days

Man days [ ] Airborne [ ]

Special provision [X] Ground [X]

[ ] Credits have been reduced because of partial coverage of claims.

[ ] Credits have been reduced because of corrections to work dates and figures of applicant.

Special credits under section 77 (16) for the following mining claims

TB 674490 to 495 inclusive
656558 to 565 inclusive
676803 to 806 inclusive
656566-67
852764

No credits have been allowed for the following mining claims

[ ] not sufficiently covered by the survey

[ ] insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19) - 60.
## Technical Assessment Work Credits

**Recorded Holder:** 539258 ONTARIO LTD

**Township or Area:** PIC TOWNSHIP

<table>
<thead>
<tr>
<th>Type of survey and number of Assessment days credit per claim</th>
<th>Mining Claims Assessed</th>
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</thead>
<tbody>
<tr>
<td>Geophysical</td>
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<tr>
<td>Electromagnetic</td>
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<tr>
<td>Magnetometer</td>
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<tr>
<td>Radiometric</td>
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<tr>
<td>Induced polarization</td>
<td>29 days</td>
</tr>
<tr>
<td>Other</td>
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<tr>
<td>Section 77 (19) See “Mining Claims Assessed” column</td>
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<tr>
<td>Geological</td>
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<tr>
<td>Geochemical</td>
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<tr>
<td>Man days [X] Airborne [X]</td>
<td></td>
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<tr>
<td>Special provision [ ] Ground [ ]</td>
<td></td>
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</tbody>
</table>

☐ Credits have been reduced because of partial coverage of claims.
☐ Credits have been reduced because of corrections to work dates and figures of applicant.

**Special credits under section 77 (16) for the following mining claims**

☐ No credits have been allowed for the following mining claims

[ ] not sufficiently covered by the survey
☐ insufficient technical data filed

TB 852764

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19) - 60.
1985 10 25

Ministry of
Natural Resources

Your File: 355
Our File: 2.8436

1985 10 25

Ministry of Northern Affairs and Mines
P.O. Box 5000
Thunder Bay, Ontario
P7C 5G6

Dear Madam:

Enclosed are two copies of a Notice of Intent with statements listing a reduced rate of assessment work credits to be allowed for a technical survey. Please forward one copy to the recorded holder of the claims and retain the other. In approximately fifteen days from the above date, a final letter of approval of these credits will be sent to you. On receipt of the approval letter, you may then change the work entries on the claim record sheets.

For further information, if required, please contact Mr. R.J. Pichette at 416/965-4888.

Yours sincerely,

S.E. Yundt
Director
Land Management Branch
Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3

SH/mc

Encls.

cc: 539258 Ontario Ltd
Box 10
101 North Syndicate Avenue
Thunder Bay, Ontario
P7C 3V5

Mr. G.H. Ferguson
Mining & Lands Commissioner
Toronto, Ontario

Nadia Caira
Robert S. Middleton Exploration Services Inc
P.O. Box 1637
Timmins, Ontario
P4N 7W8

845
An examination of your survey report indicates that the requirements of The Ontario Mining Act have not been fully met to warrant maximum assessment work credits. This notice is merely a warning that you will not be allowed the number of assessment work days credits that you expected and also that in approximately 15 days from the above date, the mining recorder will be authorized to change the entries on his record sheets to agree with the enclosed statement. Please note that until such time as the recorder actually changes the entry on the record sheet, the status of the claim remains unchanged.

If you are of the opinion that these changes by the mining recorder will jeopardize your claims, you may during the next fifteen days apply to the Mining and Lands Commissioner for an extension of time. Abstracts should be sent with your application.

If the reduced rate of credits does not jeopardize the status of the claims then you need not seek relief from the Mining and Lands Commissioner and this Notice of Intent may be disregarded.

If your survey was submitted and assessed under the “Special Provision-Performance and Coverage” method and you are of the opinion that a re-appraisal under the “Man-days” method would result in the approval of a greater number of days credit per claim, you may, within the said fifteen day period, submit assessment work breakdowns listing the employees names, addresses and the dates and hours they worked. The new work breakdowns should be submitted direct to the Land Management Branch, Toronto. The report will be re-assessed and a new statement of credits based on actual days worked will be issued.
**Ontario Ministry of Natural Resources**

**GEOPHYSICAL - GEOLOGICAL - GEOCHEMICAL TECHNICAL DATA STATEMENT**

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

<table>
<thead>
<tr>
<th>Type of Survey(s)</th>
<th>Township or Area</th>
<th>Claim Holder(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geophysical, Induced Polarization</td>
<td>Pic-Twp</td>
<td>Rolls Resource Ltd.</td>
</tr>
</tbody>
</table>


Author of Report: Nadia M. Cairns

Address of Author: 120 Box 1637, Timmins, Ont. P4N 2W8

Covering Dates of Survey: June 24/85 - July 13/85

Total Miles of Line Cut: ________ (line cutting to office)

### SPECIAL PROVISIONS

CREDITS REQUESTED

- Geophysical
  - Electromagnetic
  - Magnetometer
  - Radiometric
  - Other

- Geological
- Geochemical

### AIRBORNE CREDITS

(Special provision credits do not apply to airborne surveys)

- Magnetometer
- Electromagnetic
- Radiometric

**DATE:** SEPT 6/85

**SIGNATURE:** [Signature]

Author of Report or Agent

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<table>
<thead>
<tr>
<th>MINING CLAIMS TRAVERSED</th>
<th>List numerically</th>
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<tr>
<td>TB. 656.558 (prefix) (number)</td>
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<td>&quot; 560</td>
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<td>676 803</td>
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<td>&quot; 805</td>
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<td>852 764</td>
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TOTAL CLAIMS: 21

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Res. Geol. Qualifications

Previous Surveys

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<tr>
<th>File No.</th>
<th>Type</th>
<th>Date</th>
<th>Claim Holder</th>
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837 (5/79)
GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS - If more than one survey, specify data for each type of survey

Number of Stations 600 Number of Readings 2437
Station interval 2.5 m Line spacing 100 m
Profile scale 1:2500
Contour interval sec pseudosuctions

Instrument

Accuracy - Scale constant
Diurnal correction method
Base Station check-in interval (hours)
Base Station location and value

Instrument

Coil configuration
Coil separation
Accuracy

Method: □ Fixed transmitter □ Shoot back □ In line □ Parallel line
Frequency (specify V.L.F. station)

Parameters measured

Instrument

Scale constant
Corrections made

Base station value and location

Elevation accuracy

Instrument Rx→scintrex IR-11 Tx→scintrex TSQ-3
Method □ Time Domain □ Frequency Domain
Parameters - On time 2 sec
- Off time 2 sec
- Delay time plotting 7th slice (midpoint 870 msec.)
- Integration time 30 msec.
Power 3.0 kWatt

Electrode array: Pole-Dipole; "a" = 2.5 meters "n" = 1, 2, 3, 4 or 2, 3, 4, 5
Electrode spacing 2.5 meters
Type of electrode porous pots filled with copper sulphate solution
SELF POTENTIAL

Instrument________________________________________ Range ____________________________
Survey Method________________________________________

Corrections made________________________________________

RADIOMETRIC

Instrument________________________________________
Values measured________________________________________
Energy windows (levels)____________________________
Height of instrument_____________________________Background Count
Size of detector________________________________________
Overburden________________________________________

( type, depth – include outcrop map)

OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)

Type of survey________________________________________
Instrument________________________________________
Accuracy________________________________________
Parameters measured________________________________________

Additional information (for understanding results)____________________________

AIRBORNE SURVEYS

Type of survey(s)________________________________________
Instrument(s)________________________________________

(specific for each type of survey)

Accuracy________________________________________

(specific for each type of survey)

Aircraft used________________________________________
Sensor altitude________________________________________
Navigation and flight path recovery method________________________________________

Aircraft altitude________________________________________ Line Spacing____________________________
Miles flown over total area_____________________________Over claims only____________________________
<table>
<thead>
<tr>
<th>Numbers of claims from which samples taken</th>
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<table>
<thead>
<tr>
<th>Total Number of Samples</th>
<th>Type of Sample (Nature of Material)</th>
<th>Average Sample Weight</th>
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<th>Method of Collection</th>
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<th>Soil Horizon Sampled</th>
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<th>Drainage Development</th>
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<tr>
<th>Estimated Range of Overburden Thickness</th>
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**ANALYTICAL METHODS**

Values expressed in:  
- per cent  
- p. p. m.  
- p. p. b.

<table>
<thead>
<tr>
<th>Cu, Pb, Zn, Ni, Co, Ag, Mo, As, (circle)</th>
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<th>Field Analysis (tests)</th>
<th>Extraction Method</th>
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<td>Analytical Method</td>
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<td>Reagents Used</td>
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<th>Field Laboratory Analysis</th>
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<tr>
<td>No. (tests)</td>
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<tr>
<td>Extraction Method</td>
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<td>Analytical Method</td>
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<td>Reagents Used</td>
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<th>Commercial Laboratory (tests)</th>
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<tr>
<td>Name of Laboratory</td>
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<td>Extraction Method</td>
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<td>Analytical Method</td>
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<td>Reagents Used</td>
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**SAMPLE PREPARATION**  
(Includes drying, screening, crushing, ashing)

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<th>Mesh size of fraction used for analysis</th>
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Dear Madam:

RE: Notice of Intent dated October 25, 1985
Geological and Geophysical (Induced Polarization) Surveys on Mining Claims TB 674490, et al, in Pic Township

The assessment work credits, as listed with the above-mentioned Notice of Intent, have been approved as of the above date.

Please inform the recorded holder of these mining claims and so indicate on your records.

Yours sincerely,

S.E. Yundt
Director
Land Management Branch

Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3
Phone: (416) 965-4888

SH/mc

cc: 539258 Ontario Ltd
Box 10
101 North Syndicate Avenue
Thunder Bay, Ontario
P7C 3V5

Mr. G.H. Ferguson
Mining & Lands Commissioner
Toronto, Ontario

Encl.
Mining Lands Section

File No: 28436

Control Sheet

TYPE OF SURVEY

[ ] GEOPHYSICAL
[ ] GEOLOGICAL
[ ] GEOCHEMICAL
[ ] EXPENDITURE

MINING LANDS COMMENTS:

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Signature of Assessor: J. Hurst
Date: Sept 30, 85
<table>
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