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RICHMOND MINERALS INC.

REPORT ON SPECTRAL INDUCED POLARIZATION/RESISTIVITY SURVEY PHASE II

AGAURA EAST GRID RIDLEY (SWAYZE) PROPERTY.

ROLLO TOWNSHIP, PORCUPINE MINING DIVISION, DISTRICT OF SUDBURY, ONTARIO

NTS 41 O/15

MINERAL CLAIMS

4275237 and 4275238

Savaria Geophysics Inc. Francis L. Jagodits, P. Eng., Consulting Geophysicist February, 2017

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1. INTRODUCTION

In July of 2015, Richmond Minerals Inc. retained ClearView Geophysics Inc. of Brampton, Ontario to conduct Spectral IP/Resistivity and Ground Magnetic Surveys over the Agaura East Grid of the Ridley Lake Project, situated in Rollo Township, Ontario. The survey took place during the period of July 7th to July 15th, 2015 (Jagodits F. L., 2016). In order to explore to greater depth, ClearView Geophysics was contracted in November 2016to conduct a Spectral IP/Resistivity survey covering western part of the Agaura East Grid, employing increased electrode separations. The surveyed lines are: 0E, 75E, 150E, 225E, 300E and 375E and they are illustrated on Figure 3. The survey took place during the period of November 8th to November 16th., 2016.

The operational report of ClearView Geophysics Inc. is included in the digital format of this report.

2. LOCATION AND ACCESS

The Ridley Lake property is located in Rollo and Raney Townships, Porcupine Mining Division, and lies within NTS 41 O/15 (Figure 1). The property is located 40 km south-southwest of the Town of Foleyet, and approximately 120 km west-southwest of Timmins, Ontario. The grid that was prepared for the geophysical surveys is illustrated on Figure 2. Personnel employed are listed in Table I, found in the Appendix.

Originally, the access to the property has been by float equipped aircraft landing on Ridley Lake. Presently, logging roads leading from Hwy. 101 to the property provide access.

3. **PROPERTY DESCRIPTION** (from F. L. Jagodits, 2016)

The geophysical survey covers two (2) contiguous, unpatented mining claims. They are located in Rollo Township, Porcupine Mining Division, District of Sudbury, in northwestern Ontario. The following claims were surveyed: 4275237 and 4275238. The claims covering the entire grid are illustrated on Figure 2. The figure shows the claims that were obtained from the government data base and also shows the claim posts and claim boundaries resulted from the re-staking that took place in 2015.

4. **PREVIOUS WORK** (from Hillier, D., 1989)

"Two gold showings exist on the Carson/Black Gregor (now the Ridley) property. The showings are known as the Cyril Knight and Agaura prospects. During 1932, the two



Figure 1 Location Map showings were controlled by two separate mining companies; the Cyril Knight Prospecting Company Limited and the Agaura Exploration Company Ltd.

The Cyril Knight prospect was trenched and in 1932 described as a gold bearing quartz vein hosted by schisted andesite lavas with an indicated length of approximately 800 feet striking N65°E and dipping 80°SE. The vein was exposed in a trench for 430 feet, with a maximum width of 10 feet and pinched out sharply to the west and narrowed to a series of stringers to the east. The quartz was described to be of the white glassy variety and was highly fractured in a direction parallel to the strike of the vein. The vein reportedly carried a small amount of pyrite and minor native gold (Rickaby 1935).



Figure 2 Claim Map and Geophysical Grid

Previous Carlson geologists interpreted this zone to be a cherty exhalative horizon within a series of schisted, carbonatized, mafic volcanics (Rio, 1983). No drilling was carried out on this zone during the recent drill program.

The Agaura prospect was also trenched during the 1930's and was described as consisting of two similar-striking zones of gold mineralization hosted in quartz-pyrite veins. The "south' zone contained three quartz-pyrite-ankerite +/- Au veins cutting arkosic rock. The centre vein, which was the largest, had a maximum width of 13 inches and a length of



Showing the Surveyed Lines

approximately 80 feet. One isolated assay reported 0.7 oz/ton Au over 8 inches. Approximately 500 feet north, a highly schistose zone up to 12 feet in width with coarsegrained pyrite and lenses of quartz was located within a greenstone band. Only low gold values were obtained from this zone, which was traced for 500 feet on a strike of N80°E. Approximately 50 feet south and parallel to the sheared zone was a rusty, carbonatized quartz feldspar porphyry dike up to 15 feet wide (Rickaby 1935).

No further work was done on the properties until 1982 when Carlson Mines Ltd. staked a group of 20 claims covering both showings. The property was inspected, for Carlson by Phendler (1982) who reported several anomalous Au values obtained from the 1932/33 trench which exposed the northern volcanic-hosted carbonatized chlorite-pyrite-quartz vein shear zone. At the same time, Newmont Exploration of Canada Ltd. visited the property and collected several samples which generally confirmed Phendler's values. Both showings were IP tested and results indicated that a dipole-dipole array could be used to trace the known mineralized zones.

During the summer of 1983, systematic geological and geophysical surveys were carried out over a 20 claim area of the property. The results of the geological mapping are presented in a report by Rio (1983) which includes a 1"-200' scale map. Geophysical work included a magnetometer survey at 25 ft. 50 ft. and 100 ft. stations; a VLF-EM survey at 100 ft. stations and a time-domain IP survey using a dipole-dipole array with a=50'. Results indicated that both showings displayed coincident magnetometer and IP anomalies of approximately 3x and 4x background respectively.

A major IP anomaly was outlined immediately south of the Agaura showing corresponding to a strong VLF-EM conductor; in addition to other significant, isolated IP and VLF-EM anomalies. Magnetics generally appeared to reflect the distribution of massive mafic volcanic flows containing up to 5% magnetite and outlined a probable diabase dike (Hill, 1986).

During the summer of 1985, a stripping, blasting and systematic sampling program was carried out in the area of the Agaura showing. Results from this program are presented in a report by Hill (1986). Hill distinguished several significant units within the stripped area and his results are included with the present data in this report".

The results of the ground geophysical surveys were once again examined and their interpretation, conclusions and recommendations are included in a memorandum entitled "Compilation of Geophysical and Geological Data, Ridley Lake (Swayze) Property, Raney and Rollo Townships, District of Sudbury, Porcupine Mining Division Ontario (Jagodits, F. L., March, 2014). The memorandum and a page-size copy of the interpretation map are included in the Appendix and on the Archive DVD.

The primary conclusion of the investigation is that the Agaura type gold mineralization provided distinguishable IP/resistivity signatures. The correlation between IP/resistivity and Cyril Knight Showing is not as exemplary because of lack of data; however, a signature would probably be obtained by properly conducted survey (Jagodits, F.L, March, 2014).

The IP/resistivity survey also detected two targets (Targets 4 and 7) where the apparent IP responses are anomalous but correlated with low apparent resistivities. In both cases the IP

trends are associated with or in direct correlation with VLF-EM conductors that may show conductive structures. Possible sources of the IP/resistivity responses include non-magnetic sulphides and graphite (Jagodits, F. L., March, 2014).

During 2014 and 2015 Richmond Minerals Inc. conducted prospecting work over the property and reported in: Nitescu, B., Hawkins W. and Carter, G., 2014; Nitescu, B., Hawkins, W. and Currah, L., 2015a and Nitescu, B., Hawkins, W. and Currah, 2015b.

In 2015, Richmond Minerals Inc. retained ClearView Geophysics Inc. of Brampton Ontario, to conduct Spectral IP/Resistivity and ground Magnetic Surveys covering the Agaura East Grid (Jagodits, F. L., 2016). Based on the survey results two drilling programs were completed (Nitescu, B. and Hawkins, W, 2016. Report on Diamond Drilling conducted on Claims 4275237 and 4275238 of the Ridley Lake (Swayze) Property, Rollo and Raney Townships, NTS Sheet 0410/15, Work Period: July 06 – July 26, 2016; and Nitescu, B. and Hawkins, W. 2016. Report on diamond drilling conducted on claims 4275237, 4275238 and 4275274 of the Ridley Lake (Swayze) Property, Rollo and Raney Townships. (Submitted to the Ontario Ministry of Northern Development and Mines on behalf of Richmond Minerals Inc.)

5. **GEOLOGY (from Hillier, D., 1989)**

For the sake of completeness, the regional and local geology from Hillier are included.

"The Carlson/Black Gregor property is underlain by part of a major sequence of early Precambrian volcanics and sediments referred to as the Swayze volcanic complex (Goodwin and Ridler, 1970) or the Swayze-Deloro metavolcanic-metasedimentary belt (Thurston et al., 1977).

The Swayze volcanic complex is an E-trending belt composed, from the margins inward, of mafic metavolcanics succeeded by metasediments with several centres of felsic volcanism along its length. To the north, the Deloro volcanic complex underlying Horwood Lake and Reeves-Penhorwood Townships consists predominantly of mafic metavolcanics with only minor metasediments. Together the two complexes form the Swayze Deloro belt (Thurston et al., 1977 from Hill, 1986).

Mapping of the Swayze complex by Rickaby (1934) defined a "basement" greenstone assemblage of mafic to felsic flows and pyroclastics overlain by younger, essentially sedimentary but also felsic volcanic rocks known as the Ridout and Swayze series. Donovan (1965, 1968) defined a more continuous sequence of cyclical mafic-felsic volcanism with intermixed volcanic sedimentation south of Rollo Township. Age relationships among mafic metavolcanics, felsic metavolcanics and metasediments were found to be variable (Hill, 1986).

Thurston et al. (1977) summarized the lithologic descriptions of the Swayze-Detoro belt rocks. Mafic to intermediate metavolcanics are predominant throughout the area and

include massive, pillowed, foliated, fragmental (breccia plus tuffs) and porphyritic types. Intermediate to felsic metavolcanic rocks are less common. A major linear zone of massive to porphyritic dacite with associated fragmental and epiclastic sediments extend through the central portion of the Swayze complex just south of Ridley Lake. Elsewhere, felsic metavolcanic flows and tuffs form relatively thin bands within intermediate to mafic metavolcanics. All volcanics have been metamorphosed largely under greenschist conditions and locally under almandine-amphibolite conditions (Hill, 1986).

The metasediments, in order of importance, include greywacke, arkose, conglomerates, quartzite and argillite. Also, intercalated with mafic metavolcanic are thin bands of iron formation or ferruginous metasediments of silicate carbonate or sulphide association. Much of the rock originally mapped as sediments by Rickaby (1935) has been re-interpreted as felsic pyroclastic material. It is apparent that metasediments make up no more than 10/% of exposed Swayze-Deloro belt rocks. The most extensive band of metasediments (originally named Ridout series) extends through the southern portion of the Swayze belt and, together with a smaller band in Halcrow and Denyes Townships (previously called the Swayze series) are referred to collectively as the Ridout metasediments (Hill. 1986).

The Swayze-Deloro metavolcanic-metasedimentary belt has been tightly folded into a series of synforms and antiforms which, due to the lack of geological and structural control, are not well defined. Bell (1964) implied that a major east-west synclinal structure south of Rollo Township was overturned with a north-dipping axial plane. Stratigraphic top indicators on the north limb of the syncline faced south, but beds dipped steeply north. Mapping carried out in 1985 on the Carson/Black Gregor property appears to confirm his interpretation (Hill, 1986).

The most common felsic intrusives have been emplaced as dikes and sills of quartzfeldspar porphyry with occasional granitoid stocks. Mafic to ultramafic rocks have intruded the metasedimentary-metavolcanic sequence as diorite to gabbroic sills and stocks of early Precambrian age and, more recently, as three distinct diabase dike sets (Hill. 1986)".

6. GEOLOGY OF THE AGAURA SHOWING

The following section has been taken from a report by Hill for Carlson Mines Ltd. and Ridley Lake Minerals Corp., Detailed Geological Mapping and Sampling of the Agaura Showing, Ridley Lake Property (1986).

"The general stratigraphic sequence in the area consists of a lower mafic pyroclastic unit (in the north) conformably overlain by approximately 300 feet of massive, rarely pillowed mafic flows, which host the chlorite + pyrite + quartz + J- gold shear zones; overlain by an 800 foot thick series of highly altered and deformed felsic pyroclastics which are host to apparently auriferous quartz veins (the 'south zone" of Rickaby, 1935). A quartz feldspar porphyritic intrusion cuts the middle mafic flow unit at its upper contact and appears to have been intruded as a slightly discordant sill-like body. Uppermost in the section, south

of the area of defined mineralization, is a thick sequence of intermediate to felsic flows cut by a narrow diabase dyke."

7. SPECTRAL INDUCED POLARIZATION/RESISTIVITY SURVEY

7.1 Survey Specification

The following lines were covered from 4+50S to 4+00N: 0E, 75E, 150E, 225E, 300E and 375E. Altogether 5100 m of surveying was completed.

The survey was conducted employing the dipole-dipole array; the electrode separation was 50 m for observations at dipole separations of n=1 to 6 and the electrode separation was increased to 100 m for dipole separations of 7 and 8.

The instrumentation consisted of a Scintrex IPR12, time domain receiver and a Phoenix IPT-1B 3kW transmitter. Additional details of the instrumentation may be found in the Appendix.

7.2 Data Processing and Presentation (modified from Mihelcic, J., 2016)

The Scintrex IPR12 receiver was preset to record the Mx chargeability gate between 690 ms and 1050 ms. This is the standard "M7" or "slice 8" from the predecessor Scintrex IPR11 receiver. The IP Survey data were downloaded to a laptop computer at the completion of each field day. The Scintrex format data were renamed to <**E.i12> and edited. Repeat readings were removed and the best readings were kept. The transmitter currents were verified and corrected where necessary using the transmitter field notes. The edited <**E.i12> data were then processed using in-house software, which converts the Scintrex format data to Geosoft and UBC inversion input formats. This in- house software also strips out user-selected dipoles that can be used to make plan maps. For this survey, the n=2 dipole was stripped out and plotted each day or every other day so that the general trends and quality of the chargeability and apparent resistivity data could be prepared and viewed quickly. Pseudo-sections were prepared and plotted for the Mx Chargeability and Apparent Resistivity data and sent out of camp by Iridium Mail in a condensed PDF format.

In the final plots the 2015 results are merged with the results of this survey and presented on Maps 1 to 6. The scale of the plots is 1:2 500. The plots contain the stacked pseudo-sections of Mx, Apparent Resistivity, Spectral *MIP*, *Tau*, and *c*. Spectral is discussed below. The UBC2d inversions are included in these plots. The UBC2d inversion parameters used a "chi factor" of 1.0 for the apparent resistivity data and a "chi factor" of 0.6 for the Mx chargeability data. The parameters used for the UBC3D inversion were: "chi factor" = 1.0 for the resistivity data and "chi factor" = 48 for the chargeability data. These parameters provided stable inversion depths to almost 200 m. The 3d inversions are included in the digital data but not presented in these report.

Stacked pseudo-sections of the merged 2015 and 2016 Mx Chargeability, Apparent Resistivity and Normalized Apparent Chargeability (Metal Factor) are presented as Map 7, Map 8 and Map 9 at the scale of 1:5000. The Metal factor is calculated using the formula below:

Mx Chargeability/Aparent Resisitivity * 1000

Spectral IP

Spectral data for *Tau*, *M-IP* and 'c' were calculated and presented for the surface IP data. They are calculated from a modified version of *Scintrex' Spectrum* software. This software matches the IP data to a suite of master curves. Readings with poor matches are screened and not plotted.

Detailed information about Spectral IP can be found in the following technical paper: *Geophysics, Vol. 49, No. 11, (November 1984), P. 1993-2003 "Spectral induced polarization parameters as determined through time-domain measurements"*. A brief description of Spectral IP follows:

The spectral parameters calculated from the IPR12 data provide an increased dimension to IP interpretation. The time constant *Tau* and exponent *c* are measurable physical properties which describe the shape of the decay curve. *Tau* can be used to discriminate between fine and coarse-grained polarizable mineralization. For a 2-second pulse, it ranges between 0.01 s for fine-grained sulphides, to 100 s for coarse-grained sulphides.

Tau is important in gold exploration as gold is often associated with finegrained sulphide mineralization. In rare cases, gold can be associated with coarse-grained mineralization, and therefore medium to long *Tau*.

Spectral *Tau* is a useful signature parameter for helping to correlate anomalies that likely originate from the same geologic source. For example, anomalies with different *Tau* values likely belong to separate zones.

Exponent c is diagnostic of the uniformity of the grain size of the target. It ranges from 0.1 for non-uniform grain size to 0.8 for uniform grain size and 1.0 for inductive coupling effects. Low c means that there is less certainty to the calculated *M-IP* and *Tau* values because there are likely multiple chargeable sources contributing to the response. The Cole-Cole models are based on theoretical decay curves for a uniform source.

The *M-IP* is the relative residual voltage that would be seen immediately after the shut- off of the transmitted pulse. It is expressed as mV/V and its amplitude relates to the quantity of the polarizable mineralization.

M-IP parameter is very useful because theoretically it is not affected by ground resistivity. Normally, low resistivity tends to suppress the measured (apparent) chargeability decreasing its amplitude. A problem in areas of very high resistivity is that the apparent chargeability moves sympathetically with high resistivities. Therefore, when a high chargeability anomaly correlates with a resistivity high, it is impossible to know when the anomaly is solely

caused by sulphides unless the *M-IP* parameter is used.

The *M-IP* parameter allows for the selection of chargeability anomalies associated with resistivities that have a high probability to be associated with sulphides. In gold exploration this is very important because highly silicified areas are usually associated with gold mineralization. However, sulphide zones are the most favourable gold exploration targets within the zone of silicification.

The procedure for determining the spectral parameters plotted on the pseudosections is the result of Cole-Cole model curve matching. Matches that have a poor RMS standard deviation fit are not plotted. Poor fits to the model curves can result from inductive coupling, which is usually seen in the early decay slices, lack of significantly chargeable response, or noisy readings.

8. DISCUSSION OF THE RESULTS

For the sake of easy referencing the discussion of the results of 2016 Report (Jagodits F. L., 2016) is included in the Appendix.

The interpretation of combined data is added to the Interpretation Map of the 2015 survey and included in this report and in the digital file.

The data obtained by the present survey, employing increased electrode spacing, confirmed the findings of the earlier survey, in addition to providing information about possible deeper sources. The "chargeability models" deduced from the combined data sets reveal that the sources may have greater depth extent than it was suggested by the earlier survey. The models also refined the possible locations of the centres of the chargeable sources. The locations of the anomalous trends derived from the combined data set, not surprisingly, are somewhat displaced the earlier locations. Because of larger electrode separation, the earlier anomalous trends are combined with nearby anomalous trends e.g. along L-300E, the signatures of Anomalous Trends RIP-1A and RIP-1D are combined.

Anomalous Trend R1P-1A remains the main target as it was confirmed by the subsequent drilling. The modeling implies a steeply dipping source with depth extent. Anomalous Trends RIP-3 and RIP-1D remain ill defined; suggested depth to centre of the source of RIP-1D is 40 m along L-375E.

The locations of the long strike length chargeable horizons, indicated by Anomalous Trends RIP-4 and RIP-5 are somewhat modified; the most probable sources are believed to be formational (graphitic?) horizons.

Two possible, questionable, deeper sources are suggested that are associated with RIP-4 and RIP-5. The ill-defined Anomalous Trend RIP-6 is about 150 m north of and sub-parallel to RIP-4 and implied on Line 0E, 75E, 150E, 225E, 300E and 375E.



Figure 4 Interpretation Map The possible questionable Anomalous Trend RIP-7 is associated with RIP-5; it is about 100 m south of RIP-5 and is hinted on Lines 0E and 75E.

It is most important to recognize that it is very difficult to separate these chargeability indications from the main the signatures of RIP-4 and RIP-5 hence their validity is questionable.

9. CONCLUSIOS AND RECOMMENDATIONS

The increased electrode separation afforded a deeper depth of exploration. The modeling of the combined data sets revealed that the sources may have larger depth extent than was inferred earlier. The survey using the larger electrode separations also suggests two, possible, but questionable, sources. These sources RIP-6 and RPI-7 are closely associated with Trends RIP-43 and RIP-5 which are believed to represent formational sources.

Based on the present results, drill holes located along Lines 0E and 75E collared north of the completed drill holes would explore the possible depth extension implied by the modeling.

Drill holes collared at 2+25E/0+75N and 3+00E/1+50N (azimuth: south; dip: -45°) would explore the targets indicated by the combined data sets. Drill Hole collared at 2+25E/1+35N (azimuth: south; dip: -45°) could detect a possible, deeper part of the source that is to be explored by the hole located at 2+25E/0+75N.

Respectfully submitted

Savaria Geophysics Inc.



Francis L. Jagodits, P.Eng. Consulting Geophysicist

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11. APPENDIX

Table I - List of Personnel

Writer's Qualification

Discussion of the Results of the 2016 Spectral IP/Resistivity From Jagodits, F. L., 2016

Compilation of Geophysical and Geological Data, Ridley Lake (Swayze) Property, Raney and Rollo Townships, District of Sudbury, Porcupine Mining Division, Ontario. (Jagodits, F.L., 2014).

Instrument Documentation

Maps

TABLE I

List of Personnel

Name	Address	Activity		
<u>ClearView Geophysics Inc.</u> November 8, 2016 – November18, 2016	12 Twisted Oak Street, Brampton ON L6R 1T1 surve	IP/Resistivity and magnetic surveys. ey surveys		
Geophysicist/Party Chief: Geophysics Technician: Field Assistant: Field Assistant:	Joe Mihelcic Michael Tremblay Kevin Guillemette Marc Robert			
Drafting	J. Meek 25 twigs Road, Gravenhur	st, ON P1P 1Z2		
F. L. Jagodits, P. Eng., October, November, 2015 and January and February, 2017. (intermittent)	Savaria Geophysics Inc., 353 Berkeley Street, Toronto, ON M5A 2XA	Geophysical consulting, interpretation and reporting.		

WRITER'S QUALIFICATIONS Francis L. Jagodits, Dipl. Eng., P.Eng.

This is to certify that I, Francis L. Jagodits,

- 1. am a Canadian citizen, residing at 353 Berkeley Street in the City of Toronto, Province of Ontario,
- 2. maintain a consulting office at 353 Berkeley Street, in Toronto, Ontario,
- 3. graduated with a degree of Diploma Engineer in geophysical engineering from the Technical University of Sopron, Hungary in 1956,
- 4. am working as professional geoscientist for the past fifty- seven years and as an independent consulting geophysicist for the past thirty years,
- 5. am registered as a Professional Engineer in the Province of Ontario,
- 6. am registered as a Retired Professional Engineer and Professional Geoscientist in good standing, in the Province of Newfoundland.
- 7. am a member of the Society of Exploration Geophysicists, the Canadian Exploration Geophysical Society and the Prospectors and Developers Association of Canada.

Dated at Toronto

This 7th day of February, 2017.

FLJAGONITS

Francis L. Jagodits, Dipl. Eng., P.Eng.

Discussion of the Results of the 2016 Spectral IP/Resistivity Survey (Jagodits, F. L. 2016)

The four IP anomalous horizons discovered by the survey are sub-parallel and confirm with the northeast trending geology. Based on the line to line correlation of the apparent resistivity and chargeability data, above mentioned trends were outlined. These are identified as Trends RIP-1A, RIP-1B, RIP-1C, RIP-1D RIP-2, RIP-3, RIP-4 and RIP-5 and shown on the Interpretation Map (Figure 3).

The approximate surface expressions of the sources are indicated on the Interpretation Map. The range of chargeabilities is given on the Interpretation Maps as multiples of the background chargeability in the vicinity of the anomaly. The numerical values are further discussed in Table I.

The major, prominent features are the centrally located RIP-1A and RIP-1B. It is of outmost significance that Trend RIP-1A is the easterly continuation of an IP trend of an earlier survey that covers the Agaura Showing (Jagodits, F.L., 2014, in the Appendix). Hence, the anomalies of Trend RIP-1A are prime, first priority drill targets.

The IP anomalies of RIP-1A are well defined; in fact, some are classic examples of IP responses over vertical sources (L75E). The sources are shallow seated, and associated with magnetic responses that may describe intermediate to basic composition volcanics. The location of the sources at the eastern end of RIP-1A are dubious, the line to line correlation not as clear as at western end. Subsidiary Trend RIP-1D is the attempt for the separation of the sources.

Trend RP-1B is interpreted to be the faulted–off easterly extension of RIP-1A. At the eastern of the trend, the IP and resistivity expressions become complex describing a wider, multi-sourced anomalous horizon. Subsidiary trends RIP1-C and RIP-2 are attempts to separate the sources. The eastern end of RIP-1B is associated with a magnetic anomaly trend (Lines 600E to 750E) that may indicate intermediate to basic composition volcanic rocks.

The 825 m long RIP-4 is characterized by high chargeabilities in conjunction with low apparent resistivities. The anomalies are open to the south from L0 to L225E. Magnetic expressions are absent. This formational source, on the whole, is graphitic source. As it stands, there is no further interest in RIP-4.

RIP-5, in the northwest of the grid (Lines 0E to 375E) is similar to RIP-4, but not as well developed. It is interpreted to be a part of another formational source. It is of no further interest.



TABLE I Agaura East Grid Spectral IP/Resistivity and Magnetometer Surveys Ridley Lake Project Anomalous IP/Resistivity Trends

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Anomalous Trend	Start	End	IP In terms of background	Resistivity (ohm-m x 1000)	Magnetic Association	Strike	Length (m)	Notes
RIP-1A	LOE	L300E	2xBG and 3xBG	2.0 to 10.	The association is partial.	E-W, NE	300	This is the premier feature of the survey. It is the westerly continuation of the IP anomalies discovered by an earlier survey. The earlier IP anomalies cover the auriferous Agaura Showing. The anomalous apparent chargeabilities range from 6 to 13.5 mV/V. Classic IP response over a near vertical source is displayed along line L75E. The responses are more complex along L300E. An interpreted north-northeast structure appears to have moved the IP trend to the north where it is recognized as RIP-1B. The recommended drill holes are in Table II
RIP-1B	L375E	L825E	2xBG and 3xBG	6.0 to 12.0	The association is partial.	E-W, NE	450	RIP-1B is the easterly continuation of the IP trend associated with the Agaura Showing. The anomalous responses become more complex from west to east. Trends RIP-1B, RIP-1C and RIP-2 form a wide anomalous zone along lines 600E, 675E, 750E and 825E. Because of the complexity it is difficult to establish the line to line correlation of the responses, excepting western end of RIP-1B (lines 375E, 450E and 525), where the line to line correlation is more certain. Because of the complexity of the responses selection of optimum drill locations is a more difficult task. The recommended drill hole locations are in Table II.
RIP-1C	L600E	L825E	2xBG and 3xBG	2.0 and 9.0	It is non-magnetic.	NE	225	The trend is the central member of the complex zone of RIP-1B, RIP-1C. The sources may be deeper as implied by the observations at the larger dipole separations.
RIP-1D	L300E	L375E	2xBG	2.0 and 3.0	It is non-magnetic.	NE	75	The vaguely defined complex trend is indicated on lines 300E and 375E. Alternate interpretation: the anomaly on line 375E is the easternmost anomaly of RIP1A. The source may be shallower along line 300E.
RIP-2	L600E	L750E	2xBG	.4.0	It is non-magnetic.	NE	300	The ill defined trend is observed on lines 600E, 675E and 750E, forming the southernmost member of the complex anomalous zone mentioned above. The source may be shallower on the western end.

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Anomalous Trend	Start	End	IP In terms of background	Resistivity (ohm-m x 1000)	Magnetic Association	Strike	Length (m)	Notes
RIP-3	L150E	L225E	2xBG	5.0 and 9.0	It is non-magnetic.	ENE	150	The trend is observed along two lines: L150E and L225 and it is subparallel and north of the main trend RIP-1A. It is observed at the larger dipole separations (n = 5 and 6) which may indicate a deeper source. Its significance will depend on the drill testing of trend RIP-1A
RIP-4	LOE	L825E	3x BD to 10xBG	0.2 to 0.6	It is non-magnetic.	E, ENE	825	The IP responses are open ended from L0 to Line 300E. The high chargeabilities are associated with low resistivities. The source is a formational horizon, that is more than likely composed of mostly graphitic members.
RIP-5	LOE	L375E	2xBG to 5xBG	0.3 to 0.6	It is essentially non-magnetic.	ENE	375	The anomalies are open ended on Lines 225E,300E and 375E. The character of RIP-5 is similar to the character of RIP-4.

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Memo to:	W. Hawkins, Vice-President Exploration, Richmond Minerals Inc.
Memo from:	F. L. Jagodits, Savaria Geophysics Inc.
Subject:	Compilation of Geophysical and Geological Data,
-	Ridley Lake (Swayze) Property, Raney and Rollo Townships, District of Sudbury,
	Porcupine Mining Division Ontario
Date:	March 18, 2014

1. Preamble

In 1983, ground geophysical surveys were conducted covering the claims of Carlson Mining Ltd. in the Ridley Lake area. The purpose of the present investigation was to define the geophysical signatures of the Cyril Knight and Agaura Showings and to locate similar signatures from the available data.

The investigated Ridley Lake Property lies within NTS 41 O/15 and centred about UTM co-ordinates (NAD 83, Zone 17) 371500E and 5303500N or 17° 52' 29"N latitude and 82° 43' 06" W longitude. It comprises 20 unpatented single mining claims in one contiguous block.

The property is located approximately 50 km east of Chapleau, Ontario and is120 km southwest of Timmins, Ontario.

The original 20 unpatented single mining claim block was extended. In the following it will be referred to as the Expanded Claim Block

The selected targets, that are based on the IP/resistivity data are listed and discussed in the attached Table 1.

The result of the compilation is on the Compilation Map, at a scale of 1 inch = 200 ft.

2. Geophysical and Geological Data Base

The Ground Geophysical Survey Maps are from:

Mark Bowman, 1983. Geophysical Report on the Carlson Mines Ltd. Ridley Lake Property, Rollo Township, Sudbury Mining Division and they are:

Postings and contours of total magnetic field; Line interval: 400 ft.; Station interval: 100 ft.

Posting and profiles of in-phase and quadrature components, VLF-EM; Line interval: 400 ft.; Station interval: 100 ft. Posting and contours of IP observations; n =1 and 2, Line interval: 100 ft.; Station interval: 50 ft. incomplete coverage.

Postings of apparent resistivities; n = 1 and 2. Line interval: 100 ft.; Station interval: 50 ft. Incomplete coverage.

The Geology Map is from,

J. K. Filo; Geological Report on the Ridley Lake Prospect in Rollo Township, Sudbury Mining Division for Carlson Mines Ltd. 1983.

The scale of all the maps is 1inch = 200 ft.

The Airborne Geophysical Survey Maps are from:

Ontario Geological Survey, INPUT/magnetometer survey, 1981 (Swayze)

3. The Surveys

3.1 Magnetic Survey

The posted magnetic data were contoured at a basic contour interval of 100 nT. There are isolated locations where steep gradients were observed that may be due erroneous observations. A general magnetic low correlates with the mapped diorite in the southwest corner of the claims. The diorite is cut by a northwest-southeast dyke. Another possible northwest-southeast dyke is detected in the northwest of the claims. Most of the claim area is shown to be underlain by mafic volcanics. The magnetic data suggest that the magnetic properties of the mafic volcanics are variable as expressed by the distinct magnetic feature in the east central claim area.

Closer contouring of the data would reveal far more detailed information; however, the recommended magnetic surveys will provide far improved magnetic maps.

3.2 VLF-EM Survey

The collected data are of good quality. Numerous, nearly east striking conductor were determined. They vary in length from 100 ft. to 2000 ft. They are most likely caused by conductive contacts, shears and faults. The axes of the conductors are shown on the compilation map. Correlations with magnetic and IP features are noted in the attached table.

3.3 Induced Polarization/Resistivity Survey

As noted above the survey was incomplete. The survey covered the northeast corner, the general area of the Cyril Knight Showing and the approximate southeast corner of the claim group that includes the Agaura Showing

The dipole-dipole array was utilized using an electrode separation of 50 ft. Observations were made at dipole separations of 1 and 2.

The electrode separation of 50 ft., and the dipole separations of 50 ft. and 100 ft. afforded an approximate 35 ft. of effective depth of investigation. Consequently, only the near surface sources were detected.

In Table I, the amplitudes of the IP responses are noted in terms of the local background. The average or the spread of the apparent resistivities associated with the IP targets are given in 1000's of ohm-m.

Excellent correlation is recognized between the Agaura Showing and IP Target 1 (up to 6xBG) which is associated with apparent resistivities >10 000 ohm-m. The target is open to the east. Unfortunately, IP/resistivity survey coverage is incomplete and it is difficult to establish correlation between the Cyril Knight Showing and the geophysical data. It is noteworthy that IP Target 2b is on strike with the showing, at its northeastern end.

4. Conclusions and Recommendations

The primary conclusion of the investigation is that the Agaura type gold mineralization provided distinguishable IP/resistivity signatures. The correlation between IP/resistivity and Cyril Knight Showing not as exemplary because of lack of data; however, The correlation between IP/resistivity and Cyril Knight Showing is not as exemplary because of lack of data; however, a signature would probably be obtained by properly conducted survey (Jagodits, F.L, March , 2014).

The IP/resistivity survey also detected two targets (Targets 4 and 7) where the apparent IP responses are anomalous but correlated with low apparent resistivities. In both cases the IP trends are associated with or in direct correlation with VLF-EM conductors that may show conductive structures. Possible sources of the IP/resistivity responses include non-magnetic sulphides and graphite.

It is recommended:

- the preparation of a new base map at a scale of 1:10 000, covering the expanded claim block, showing claims, claim numbers and topographic details,

- incorporation of the base map of the present compilation and the compilation of available exploration data covering the new claim block

- recover the drill hole locations at Agaura Showing,
- drill testing Of the showing,
- establish a grid covering the original claims extending to the east to cover possible extension; line direction: N S; line interval:75 m; station interval: 25 m,

- ground magnetic total field/gradient survey, if possible with VLF-EM; station interval: 12.5 m,

- Induced Polarization/resistivity survey, initially using gradient array to locate the anomalies, with subsequent detailing using dipole-dipole array,
- geological mapping of the original claims,
- prospecting of the Expanded Claim Block.

Preparation of solid colour and black contour magnetic map, with INPUT anomalies, covering the claim block using the OGS INPUT/magnetometer survey, and the above map with overlain with geology.



INDUCED POLARIZATION/RESISTIVITY TARGETS

RIDLEY LAKE(SWAYZE) PROPERTY RAYNEY AND ROLLO TOWNSHIPS, OMTARIO

Target	(P (mV/V)	Resistivity (ohm-m) × 1000	Magnetic Description	VLF-EM	Geology	Strike	Length (ft)	NOTES
ΤI	6xBG 2xBG	>10	Association	nil	volcanics	E-W	800?	The 300 ft. long eastern end of the IP anomaly colncident with the Aguara Showing, that was reportedly drilled. The amplitude of IP response diminishes to the west. The IP anomaly is open to the east. The apparent resistivity reaches 15 000 ohm-m at the showing.
								A distinct magnetic anomaly is 200ft. to the south. The available magnetic data does not allow closer correlation between the IP/Resisitivity and magnetic responses.
								As it stands, it is a first priority drill target.
T2								Target 2 consists of several subsiduary targets that will be discussed individually. Targets 2a, 2b, 2c, and 2d form a cluster in the northeast of the claim group. Targets 2a, 2b, and 2c,are open to the east. Target 2d tereminates at shore of Ridley Lake. Northeast striking, 700 ft. long Cyril Knight Showing is in the general area of the "2" targets. Based on the available partial IP data, direct correlation between the showing and IP is not apparent. Significantly, the distinct Target 2b is on strike, comencing about 100 ft. northeast of the end of the showing.
								The magnetic data are incomplete in this region.
T2a	2xBG	>10	7	nil	volcanics	E-W	`400?	As noted earlier, the taget is open to the east. Because of the missing data points the target is ill defined.
T2b	5xBG	7, 8	7	nil	volcanics	E-W	500?	The apparent resitivites are somewhat lower, but still above background. The on-strike proximity of Cyril Knight Showing improves the target importance.
T2c	<2xBG	4, 5	7	nil	volcanics	E - W	300?	Because of the lower IP responses and lower apparent resistivies 2c is a less attractive target.
T2d	5x8G	7, 8 : 5, 7	?	nil	volcanics	E - W (2d1, 2d2) NE - SW	200, 200 200	The three parts of 2d is based on partial data. Parts 2d1 and 2d2 are nearly perpendicular to the Cyril Knight Showing, while 2d3 is subparallel to it. Although there is no apparent direct corrrelation with the showing, it lies in an anomalous region. New IP/resistivity survey will define the target,
73a, T3b	up to 4xBG	1,5 ; 3	7	artial cori	voicanics	E - W (3a) NE - SE 3b)	600 (3a) 350 (3b)	Target 3a is indirect correlation with a VLF-EM conductor. IP alpmlitudes of 3a are diminishing to the east, but the anomaly open to the east.The IP amplitudes improve along Target 3a. The magnetic data are non-descript
Т4	10xBG	<1	?	lirect corr	volanics	NE -SW	1000	The large amplitude, well defined anomaly is associated with low apparent resitivities. The VLF-EM conducor may indicate a shear zone. It appears to be associated with a magnetic low.

Target	IP (mV/V)	Resistivity (ohm-m) x 1000	Magnetic Description	VLF-EM	Geology	Strike	Length (ft)	NOTES
T5	2xBG	3	association	nil	volcanics	NE -SW	600?	This poor IP anomaly is subparailel to and 200 ft north of Target T4. It is on the sothrn flank of a narrow, large magnetic amplitude anomaly. Basic volcanic flow?
T6	>2XBG	2	?	nil	volcanics	NE -= SW	600 ?	The target is 400 ft. north of and subparallel to Target 1. iP responses are very poor. The magnetic anomaly Intersects the IP trend at an oblique angle.
17	<8xBG	<1	association	artial con	volcanics	E - W	800 ?	The target is open to the east. The large IP amplitudes are associated with low apparent resistivities. It lies within a general magnetic low.

Instrument Documentation

SCINTREX **IPR-12 Time Domain Induced Polarization/Resistivity Receiver**

Brief Description The IPR-12 Time Domain IP/Resistivity Receiver is principally used in exploration for precious and base metal mineral deposits. In addition, it is used in geoelectrical surveying for groundwater or geothermal resources, often to great depths. For these latter targets, the induced polarization measurements may be as useful as the high accuracy resistivity results since it often happens that geological materials have IP contrasts when resistivity differences are absent.

Due to its integrated, lightweight, micro-processor based design and its large, 16 line display screen, the IPR-12 is a remarkably powerful, yet easy to use instrument. A wide variety of alphanumeric and graphical information can be viewed by the operator during and after the taking of readings. Signals from up to eight potential dipoles can be meas-ured simultaneously and recorded in solid-state memory along with automatically calculated parameters. Later, data can be output to a printer or a PC (direct or via modem) for processing into profiles and maps.

The IPR-12 is compatible with Scintrex IPC, TSQ and VERSA Transmitters, or others which output square waves with equal on and off periods and polarity changes each half cycle. The IPR-12 measures the primary voltage (Vp), self potential (SP) and time domain induced polarization (Mi) characteristics of the received waveform. Resistivity, statistical and Cole-Cole parameters are calculated and recorded in memory with the measured data, time and location

Scintrex has been active in induced polarization research, development, manufacturing, consulting and surveying for over thirty years. We offer a full range of instrumentation, accessories and training.



The IPR-12 Receiver measures eight dipoles simultaneously then records measured and calculated ters in memory

BENEFITS

Speed Up Surveys The IPR-12 saves you time and money in carrying out field surveys. Its capacity to measure up to eight dipoles simultaneously is far more efficient than older receivers measuring a single dipole. This advantage is particularly valuable in drillhole logging where electrode movement time is minimal

The built-in, solid-state memory records all information associated with a reading, dispensing with the need for any hand written notes. PC compatibility means rapid electronic transfer of data from the receiver to a computer for rapid data processing.

Taking a reading is simple and fast. Only a few keystrokes are needed since the IPR-12 features automatic circuit resistance checks, SP buckout and gain setting.

High Quality Data

One of the most important features of the IPR-12 in permitting high quality data to be acquired, is the large display screen which allows the operator easy real time access to graphic and

alphanumeric displays of instrument status and measured data. The IPR-12 ensures that the operator obtains accurate data from field work. The number and relative widths of the IP decay curve windows have been carefully chosen to yield the transient information required for proper interpretation of spectral IP data. Timings are selectable to permit a very wide range of responses to be measured.

The IPR-12 stacks the information for each cycle and calculates a running average for Vp, SP and each transient window. This enhancement is equivalent to a noise decrease of VN or a transmitter power increase of N where N is the number of values averaged. Since values are measured each few seconds, it does not take long for this signal enhancement technique to have great effect.

The automatic SP program bucks out and corrects completely for linear SP drift. Data are also kept noise free by: radio-frequency (RF) filters, low pass filters and statistical spheric noise spike rejection.

To prevent mistriggering, the IPR-12 does not accept trigger-line signals at inappropriate times.



Keyboard

Solid State Memory

Memory Recall

on the display.

PC Compatibility

Spectral Quality IP

Seventeen large keys control the instrument and permit entry of alphanumeric information.

All instrument parameters as well as; entered

notes, measured and calculated quantities are

stored in the large capacity, fail-safe memory.

Any observation recorded in memory can be

The IPR-12 uses an RS-232C, 7 or 8 bit ASCII

high baud rate interface, compatible with most

on a line by line basis or all at once from the receiver's memory for archiving or processing.

Depending on receive time, 10 to 14 windows are measured simultaneously for each dipole.

Selectable total receive times are 1, 2, 4, 8, 16

and 32 seconds. After the current is shut off,

there is a delay of t milliseconds. Then, the

width of each window in the seven following

pairs of windows is, respectively: t, 2t, 4t, 8t,

lap-tops or PC's. This permits data to be dumped

recalled, by simple keypad entry, for inspection

The IPR-12 is fully portable and easy to use.

FEATURES

Eight Dipoles Simultaneously

The analog input section of the IPR-12 contains eight identical differential inputs to accept signals from up to eight individual potential dipoles. Any dipole can be disabled. The amplified analog signals are converted to digital form by a high resolution A/D converter and recorded with other pertinent information identifying each group of dipoles.

Large Backlit Display

The 16 line by 40 character backlit SuperTwist Liquid Crystal Display (LCD) enhances the operator's understanding of the status and the accuracy of the measured data. Any one of thirteen different display screens are used for entering information, monitoring the progress of a reading and checking data before and after recording. An LCD heater is provided for low temperature operation.

Programmable Windows

The user has the option to use the default window width's in the IPR-12 or you may set up custom slice width's to suit your application.

additional, summed transient window. This value, Mx, is recorded in memory along with the value for each of the measured transient windows. Summing can be done for

the purpose of obtaining a parameter close to that measured with earlier receivers. The width of the Mx window ranges upwards from 10 milliseconds in 10 millisecond steps.

14t, 23t and 36t. This format provides a high density of information at early times where the decay of the curve is steepest. Variable Chargeability Summing By keyboard selection, you can choose an

Signal Enhancement

Primary voltage, self potential and individual transient windows are continuously averaged and the display is updated every cycle so the operator is fully aware of signal improvement.

Calculates Cole-Cole Parameters

The IPR-12 calculates the Cole-Cole parameters; true chargeability (M) and time constant (Tau) for a fixed C of 0.25. These parameters, which are recorded in memory may be used to assist interpretation by distinguishing between different chargeable sources, based mainly on textural differences. This feature is not available if programmable windows are selected.



Noise Rejection



MAPS

2016 Interpretation Map (Showing the Surveyed Lines)

Stacked Pseudo-sections Mx Chargeability Stacked Pseudo-sections of Apparent Resistivity Stacked Pseudo-sections of "Metal Factor"

Stacked Pseudo-sections of IPR12 'c', IPR12 Tau, IPR12 MIP, Mx Chargeability, Apparent Resistivity, Model Mx Chargeability and Model Apparent Resistivity

Lines 0E, 75E, 150E, 225E, 300E and 375E,

Interpretation Map (2017)

































