Report on Photogrammetric and Magnetic Interpretation (July 2015) on the Mount Logano Property

Shaw, Whitney, Cody and Carman Townships
Porcupine Mining Division
Ontario, Canada
Latitude 48° 27’ North, Longitude 81° 25’ West
NTS Map Sheet 42 A/6

July 27, 2015

Prepared for

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Table of Contents

Table of Figures 3
List of Tables 3
1.0 Summary 1
2.0 Introduction and Terms of Reference 2
3.0 Property Description and Location 2
4.0 Accessibility, Physiography, Climate, Local Resources & Infrastructure 5
5.0 History 6
5.1 Adjacent Properties 7
6.0 Geological Setting 8
6.1 Introduction 8
6.2 Regional Geology 8
6.3 Property Geology 13
7.0 Deposit Types 16
8.0 Current Exploration 17
8.1 Introduction 17
8.2 Survey Methodology 17
8.2.1 Survey Instruments 17
8.2.2 Survey Planning 19
8.2.3 Flight Line Planning 20
8.2.4 Flying height and GSD 21
8.2.5 Image Overlap 22
8.2.6 Survey Details 24
8.2.7 Ground Control Points 24
8.2.8 eBee UAV Survey Data 26
8.2.9 UAV Data Processing 28
8.2.10 Field Crew, Geo Science Consultants and Accommodations 29
8.3 Interpretation of UAV Survey 30
8.3 Voxi Magnetic Inversion from 2010 Aeroquest Airborne Survey 32
9.0 Conclusions 36
10.0 Recommendations 36
11.0 Statement of Qualifications 37
12.0 References 40

Appendix A: Hyper V GNSS Receiver 42
Appendix B: eBee User Manual 42
Appendix C: CRSC-PPP Files 42
Appendix D: Photos and corresponding Claims List 42
Appendix E: Post Flight Terra 3D Processing Procedure 42
Appendix F: Mt Logano Postflight Terra 3D Processing Report 42
Appendix G: Saga GIS Processing 42
Appendix H: High Resolution Images 42

Table of Figures

Figure 1: Mt Logano Claims and Property Location 4
Figure 2- Regional Geology, Timmins Ontario 13
Figure 3- Property Geology Legend 14
Figure 4- Mt Logano Property Geology 15
Figure 5 - eBee UAV schematic 18
Figure 6- Planned Survey screen capture from e-Motion Software 19
Figure 7 - Geometry of Flight Planning 20
Figure 8 - - Illustration of overlapping images from the UAV 22
Figure 9 - Ideal flight plan for Postflight Terra Plus 3D 23
Figure 10 Mt. Logano Property with Airphoto and GCPs 25
Figure 11 - UAV flight Path over the Mt. Logano Property Locations 26
Figure 12 - . Mt. Logano with UAV Photos takne over the Property. Locations. 27
Figure 13- Final DTM produced by SAGA GIS 29
Figure 14- DTM colour images from the UAV (Right) and from an Aeroquest Airborne (Left) 30
Figure 15- Mt. Logano Property 2015 UAV Survey Interpretation 31
Figure 16 - Mt. Logano 2010 Aeroquest Airborne Magnetic Survey showing Voxi Areas. 32
Figure 17 - Mt. Logano Geology with Voxi Magnetic Inversion Areas 33
Figure 18 - Area 1 Magnetic Voxi 34
Figure 19- Magnetic Inversion Iso Shells created with the updated DTM data 35

List of Tables

Table 1: Mt Logano Property and Claim Status 2
Table 2- Field Production Report 17
Table 3- Planned flight details 19
Table 4- Recommended overlap in Postflight (Postflight Support [1] 2013) 23
Table 5 - Ground Control Points (GCPs) 24
Table 6 - Summary of PostFlight Terra 3D Results 28

1.0 Summary

The Mount Logano Property is located approximately 18 kilometres east of Timmins, Ontario within Shaw, Whitney, Cody and Carman Townships in the Porcupine Mining Division. An outcrop sampling program, historic core reappraisal and XRF analyses have been undertaken in August-September of 2014 in order to determine the potential for gold mineralization on the property.

With new high resolution aerial images and a significantly more detail DTM collected from the eBee UAV, interpretation of historical magnetic data was completed. New faults, lineation's and outcrops were able to be identified with the updated information collected from this survey.

A comparison of previously flown DTM data was done with the new UAV DTM created from the survey, showing that the UAV was able to produce a significantly more detailed DTM. The DTM produced by the eBee UAV was more detailed than the 2010 Aeroquest airborne data. This detailed DTM help produced more accurate magnetic inversion models, with a total of 18 models being completed over the property. The success of the survey will help to provide constrained drill targets.

The air photos were used to help delineate magnetic features from the 2010 Aeroquest Airborne survey. Outcrops, logging roads and other man made features were able to be removed from previous magnetic lineation interpretations. Outcrops were able to be identified in the survey as well, which were also used for the magnetic linear interpretation. The eBee UAV data is a cost effective and highly useful tool for exploration. Both the high resolution aerial photos and DTM help produce more accurate interpretations of previously collected data and can be used in the future for further interpretations and exploration planning.

Due to some small gaps in the eBee UAV survey, portions of the property could be re flown. This will complete a full coverage of the DTM and aerial photo's which could help with future interpretations of data on the property. Possible further interpretation of the historical geophysical data could be undertaken to determine if the higher detail DTM and aerial photo's can help to re- interpret the data.

2.0 Introduction and Terms of Reference

The previous work program completed and reported on Red Pine Exploration's Mt. Logano Property last fall (2104) had identified Geophysical Surveys as the recommended follow up program in order to better develop future drill targets. The lack of outcrop on the property limits other survey options. As such, the current work program performed in 2015 and being reported here included a photogammetry survey of the property utilizing an Unmanned Aeronautical Vehicle (UAV) to acquire an aerial photo of the property along with a sub-centimeter Digital Terrain Model (DTM). This aerial photo and DTM were then used for a detailed magnetic interpretation in order to provide data for structural interpretation and target identification. The company has experience with this type of survey on other projects and the data produced has successfully contributed to their further development. With the information collected and interpreted with this survey, it is the company's objective to gain insight into the strike length and width of the mineralization present as well as the continuity and grade of the mineralization

The field work was carried out under approved Plan # PL-14-10322 from July 11th, 2015 through July 16th, 2015 by a 2 person field crew. One of the authors was also present on the Mount Logano property during which time he flew the UAV and collected control point locations for further office processing.

Supporting and referenced information contained in this report is drawn from publicly available sources and from company records.

3.0 Property Description and Location

The Mount Logano Property is located approximately 18 kilometres east of Timmins, Ontario within Shaw, Whitney, Cody and Carman Townships in the Porcupine Mining Division (Fig. 1). The centre of the property is approximately latitude N 48° 27' and longitude W 81° 27' within 1:50,000 NTS map sheet 42 A/6.

The property consists of 16 contiguous mining claims comprising 162 claim units totalling 2592 hectares (Table 1, Fig. 2). All claims are 100% owned by Red Pine Exploration.

Table 1: Mt Logano Property and Claim Status

Claim Number	Township/Area	Units	Recorded Holder	Due Date
4206304	WHITNEY	16	Red Pine Exploration (100%)	15-Aug-15
4206305	WHITNEY	16	Red Pine Exploration (100%)	15-Aug-15
4206306	WHITNEY	8	Red Pine Exploration (100%)	15-Aug-15
4206307	CODY	16	Red Pine Exploration (100%)	15-Aug-15

4206357	WHITNEY	4	Red Pine Exploration (100%)	15-Aug-15
4206358	WHITNEY	16	Red Pine Exploration (100%)	15-Aug-15
4207027	SHAW	8	Red Pine Exploration (100%)	15-Aug-15
4207028	CARMAN	16	Red Pine Exploration (100%)	15-Aug-15
4207024	CARMAN	8	Red Pine Exploration (100%)	15-Aug-15
3019063	CODY	12	Red Pine Exploration (100%)	15-Aug-15
4207026	SHAW	16	Red Pine Exploration (100%)	15-Aug-15
4207025	SHAW	10	Red Pine Exploration (100%)	15-Aug-15
4223279	SHAW	3	Red Pine Exploration (100%)	22-Oct-15
4219540	SHAW	8	Red Pine Exploration (100%)	02-Jan-16
4215562	SHAW	2	Red Pine Exploration (100%)	04-Jun-16
4215557	WHITNEY	3	Red Pine Exploration (100%)	11-Jun-16
Total Units		**162**		
Total Area (ha)		**2592**		
Information from Ministry of Northern Development and Mines website www.mndm.gov.on.ca July 1. 2015				

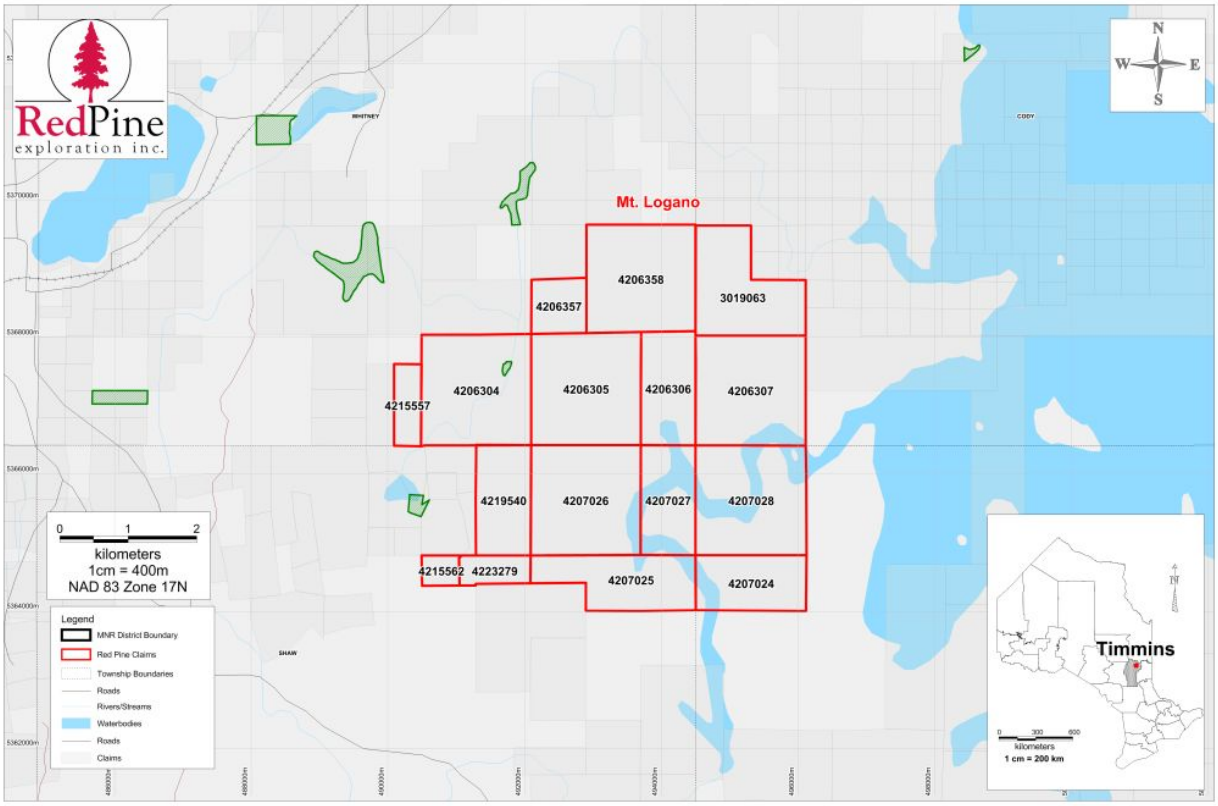

Figure 1: Mt Logano Claims and Property Location

4.0 Accessibility, Physiography, Climate, Local Resources & Infrastructure

Access to the Mount Logano Property is via paved Highway 101 eastward from Timmins to the towns of South Porcupine and Porcupine (Fig. 1). From South Porcupine, Tisdale Road (also known as Langmuir Road and Stringer Mine Road) gives access to the southern portion of the property. From Porcupine, Gervais Street (also known as 6th Ave) gives access to the northwestern portion, and a privately-owned haul road gives access to the northern portion.

The topography of the area is typical of the Canadian Shield and consists of an irregular surface with moderate relief. The topographic highs, which are the result of bedrock outcrops, are surrounded by low-lying areas of poorly drained wetlands. The property area is low-lying and marshy with topographic elevations between 280 and 300 metres. Nighthawk Lake to the east is the principal body of water in the immediate area. The property is drained north easterly to Nighthawk Lake by the Redstone River and Goose Creek.

The area has a continental climate that is characterized by warm, moderately humid summers and cold, dry winters. Temperatures range from -45°C in winter to +30°C in summer. Mean rainfall is 600 millimetres and mean snowfall is 300 centimetres.

The property is located within the coniferous forest zone where black spruce, white spruce, jack pine, poplar, white birch, white pine, balsam and yellow birch are the most commercially important species. Bedrock exposure within the property is limited; much of the property comprises alder swamp and muskeg.

Timmins and the surrounding communities have a long history of mining and exploration. The economy is largely based on resource extraction, and the local population is generally in favour of economic development. Valuable commodities include gold, silver, nickel, copper, cadmium, indium, zinc, sulphur, selenium, serpentine, stone, talc, silica, and platinum group metals. Non-metal mining includes granite, marble, hedmanite and magnetite.

Services and manpower related to exploration and mining activities are readily available in the Timmins area. The Timmins area is served by scheduled airlines, railways and numerous truck transportation companies.

The Mount Logano property is of sufficient size to accommodate all facilities required to allow mining activities if economic mineralization in sufficient quantities is discovered on the property. Numerous milling operations nearby may be able to process ore on a contract basis.

5.0 History

Gold mineralization in the Timmins area was reported as early as 1896, and in 1908, A.G. Hunter staked claims on an occurrence of gold in a silicified shear zone on the east shore of Porcupine Lake (Carlson, 1967).

With the discovery of the Dome Mine in 1909 by Jack Wilson, a member of the Harry Preston crew, the area became known as an important gold camp. Benny Hollinger and his partner Alex Gillies were not far behind the Wilson party; they were to discover the Hollinger Gold Mine. The McIntyre Mine, discovered by Alexander Olifant (alias Sandy McIntyre), completed the string of important gold discoveries in the Camp. Many other gold mines would open up in the area around the Porcupine Camp in the next 60 years, but no gold mine discovered to date has equalled the importance of these three mines known as the "Big Three" (Timmins Community Portal - http://portal.timmins.ca Sept 3, 2008).

Mining in the Timmins area diversified beyond gold in 1964 with the announcement by Texas Gulf Sulphur Company of the discovery of a major copper-zinc-silver ore body in Kidd township, about 20 km north of Timmins (Carlson, 1967).

Historical exploration dating back to the 1940s within the boundaries of the present Mount Logano claim group are documented on the MNDM website (Geology Ontario - www.geologyontario.mndm.gov.on.ca/). The author has not extensively researched the records contained therein, but a cursory examination reveals that the geological trends identified in the present exploration program have attracted attention in the past.

In particular, the Timmins Data Series maps may contain useful information for further exploration of the Mount Logano property:

- Hunt, D.S. and Maharaj, Deosaran, 1980: Shaw Township, District of Cochrane; Ontario Geological Survey Preliminary Map P. 2091, Timmins Data Series. Scale 1:15840 or 1 inch to ¼ mile. Data compiled 1980.

- Hunt, D. S., MacRae, B. A., and Maharaj, Deosaran, 1981: Whitney Township, District of Cochrane; Ontario Geological Survey Preliminary Map P. 2123, Timmins Data Series. Scale 1:15840 or 1 inch to ¼ mile. Data compiled 1979.
- Hunt, O.S. and Maharaj, Deosaran, 1980: Cody Township, District of Cochrane; Ontario Geological Survey Preliminary Map P.2090, Timmins Data Series. Scale 1:15840 or 1 inch to ¼ mile. Data compiled 1980.
- Hunt, D.S. and Maharaj, Deosaran, 1980: Carman Township, District of Cochrane; Ontario Geological Survey Preliminary Map P.2092, Timmins Data Series. Scale 1:15840 or 1 inch to ¼ mile.

The Geology Ontario database also includes numerous drill holes, with cross references to assessment reports, within and adjacent to the present claims. Carlson (1967) gives a comprehensive description of the gold-bearing deposits, veins and showings of Ogden, Deloro and Shaw Townships.

5.1 Adjacent Properties

According to Canadian Mining Expo (canadianminingexpo.com, Sept 3, 2008), five major mining companies, Xstrata Plc, Goldcorp Inc., Rio Tinto Minerals-Luzenac Inc., Kinross Gold Corporation and Agrium Inc. have operations in and around Timmins:

Xstrata is the newcomer to the local mining scene as it acquired the Kidd Creek and Montcalm base metal mines and metallurgical site of Falconbridge Ltd. in November 2006. Swiss-based Xstrata has a number of divisions and the Kidd Creek Mine and metallurgical operations were put into Xstrata Copper while the Montcalm nickel mine is part of Xstrata Nickel, as are the Falconbridge Sudbury operations.

The Porcupine Joint Venture (PJV) was a partnership between Goldcorp (51 per cent) and Kinross (49 per cent) with the former as the operator of three gold mines: the Dome, Hoyle Pond and Pamour. All ore is trucked to the 15,000 tonnes per day mill at the Dome Mine (http://canadianminingexpo.com, Sept. 3, 2008). In September 2007, Goldcorp entered into a binding agreement with Kinross Gold Corporation to acquire Kinross' 49% share of the Porcupine gold mines. Porcupine is now 100% owned and operated by Goldcorp.

Rio Tinto-Luzenac operate the Penhorwood talc mine in Penhorwood Township 75 km west of Timmins but process the ore at their concentrator and micronizing mill in the former Hollinger Gold Mine buildings in the centre of the city.

Locally, there are several smaller mining operations, the newest owned by Liberty Mines Inc, which has a nickel operation at the Redstone Mine in Eldorado Township about 25 km southeast of Timmins. St Andrews Goldfields Ltd. has three gold mines, the Stock, Clavos and Hislop, and a 1,000 tonnes per day mill at the Stock. It also has a closed operation east of Matheson, the Holloway-Holt Gold Mine and two development projects, the Aquarius and Taylor. The company reported May 30, 2008 that it was suspending operations at the Clavos and Stock Gold Complex to concentrate on the development of the Hollaway-Holt Gold Mine. The company said it was continuing the Taylor Advanced Exploration Project and the Hislop Project.

6.0 Geological Setting

6.1 Introduction

The Timmins-Porcupine gold camp lies within the Abitibi Subprovince of the Archean-aged Superior Craton. The gold deposits of the Abitibi subprovince comprise one of the largest concentrations of gold on Earth, and have been continuously mined for almost 100 years. Over 60 million ounces of gold have been mined from over 60 operations in the Timmins area, which represents about 45% of all gold mined in Ontario (Pressacco, 1999).

The Porcupine-Destor deformation zone and the Larder Lake–Cadillac deformation zone are the most important deformation zones within the Abitibi Subprovince in terms of both structural effect and gold production. In addition to the major mines (Dome, Pamour and HollingerMcIntyre), there are numerous other deposits over 35 km of strike including Hoyle Pond and Aunor-Delnite mines, which have produced nearly 140 tonnes or 4.5 M oz of gold (Bateman et al, 2005).

Geologically, the gold deposits of the Timmins-Porcupine camp can be divided into several categories according to relationships between vein parageneses, metal inventory, proximity to the Porcupine–Destor deformation zone, host rock (Timiskaming sediments, Tisdale basalts, felsic porphyry intrusive stocks), geometry and kinematics of vein opening, and chronology of the mineralization relative to the different phases or increments of deformations (Bateman et al, 2005).

According to Pyke, 1982, "virtually all the production from the area has been from the metavolcanics north of the Destor-Porcupine Fault. Most of the auriferous quartz veins tend to be along anticlinal axes, and most are in close proximity to stocks of quartz-feldspar porphyry."

6.2 Regional Geology

The regional geology map (Fig. 3) is from Atkinson, 2002. According to the Timmins District Resident Geologist webpage

(MNDM website –www.mndm.gov.on.ca/mines/ogs/resgeol/geology/tim_e.asp Sept. 3, 2008):

> *In the immediate Timmins area, the Abitibi subprovince is subdivided into 9 assemblages with ages ranging from the youngest, the Timiskaming assemblage sedimentary rocks that range in age from 2676 to 2670 Ma to Deloro assemblage rocks dated at 2730 to 2724 Ma. Timiskaming sediments were deposited unconformably on deep water turbidite sediments of the Porcupine assemblage. Coeval with the Porcupine sediments are the "Krist" felsic fragmental rocks dated at 2687 Ma. The Krist is considered to be the extrusive equivalent to the quartz feldspar porphyries in the Timmins area of similar age. Underlying Tisdale assemblage rocks have an age of 2710 to 2706 Ma and consist predominantly of mafic to felsic volcanic rocks and are further subdivided into a series of mine sequence formations. The Tisdale assemblage rocks, particularly mafic volcanic rocks with high iron tholeiitic affinity are the most productive for gold mineralization. Variolitic lavas of the Vipond Formation in the Tisdale assemblage provide useful*

volcanostratigraphic marker horizons. Deloro assemblage rocks immediately underlie the Tisdale assemblage and consist of mafic to felsic volcanic rocks with minor banded iron formation and clastic sediments near the top of the sequence.

The Shaw dome is a structural feature south of Timmins that juxtaposes iron formation and Deloro assemblage rocks against Tisdale assemblage komatiitic rocks, yielding deposits of magmatic massive sulphide and nickel mineralization. Coincident with the north boundary of the Shaw dome, the Porcupine Destor Fault is a major structural feature that is spatially related to many of the Timmins gold deposits.

According to Pressacco, 1999:

The Tisdale Group consists of: i) a lower portion consisting of mixed ultramafic and Mg-tholeiite mafic metavolcanic rocks that have returned an age date of 2707 Ma, ii) a middle sequence dominated by Fe-tholeiitic basalts capped by two distinctive variolitic units, and iii) an upper sequence consisting dominantly of calc-alkaline felsic pyroclastic rocks (Krist Assemblage, 2698 Ma) with minor amounts of carbonaceous argillite.

The Tisdale Group is in fault contact in southern Tisdale Township with the older Deloro Group (2727 Ma) located to the south across the Destor-Porcupine fault zone. The rock types in the Deloro Group are dominantly calc-alkaline basalts, andesites, rhyolitic and dacitic tuffs, chemical sediments (Eldorado Assemblage), and lapilli tuffs.

A sequence of clastic sediments (Porcupine Assemblage) conformably overlie the Tisdale Group units, and are in turn unconformably overlain by younger clastic sediments of the Timiskaming Assemblage that are at least 2679 Ma in age.

All of these units have been affected by at least two periods of folding which have resulted in the formation of basinal structures such as the Porcupine Syncline and minor folds such as the South Tisdale Anticline. The regional scale fold patterns have been disrupted by a number of fault structures such as the Destor-Porcupine Fault, the Dome Fault, and the Burrows-Benedict Fault.

The Destor-Porcupine Fault is the most significant structure in the area and it consists of a number of zones of shearing and ductile deformation focussed mainly within ultramafic flows and intrusions. The fault is either vertical, or dips steeply to the north, has been traced continuously eastwards to the Duparquet, Quebec area where it splits into the east-trending Manneville Tectonic Zone and the southeasttrending Parforu Lake Fault. The Destor-Porcupine Fault has an apparent sinistral sense of movement in the Timmins area. A set of brittle faults oriented in a general northwesterly direction is present throughout the region. An example of these brittle faults is the north trending Burrows-Benedict fault in the vicinity of the

Dome Mine. These brittle faults are the youngest structural features in the area and offset all stratigraphic units and older structures.

According to Bateman et al (2005):

A variety of division names have been used for the supracrustal assemblages of the Timmins district.

The oldest assemblage within the camp is the Deloro assemblage. It consists predominantly of pillowed calc-alkaline mafic volcanic rocks with lesser amounts of intermediate to felsic volcanics and iron formations. It occurs within the central part of the Shaw antiformal structure, south of the Porcupine–Destor deformation zone.

The Tisdale assemblage overlies the Deloro assemblage with a disconformity which may locally be an angular unconformity. It occurs around the margin of the Shaw antiformal structure and north of the Porcupine-Destor Deformation Zone, where the lowermost horizon of the Tisdale assemblage consists of komatiites and basaltic komatiites of the Hersey Lake formation (~600 m thick). These are dark green to black rocks in flows 1-4 m thick, massive, with chilled margins, spinifex textures in upper parts, and common polysuturing. They comprise serpentine, tremolite, chlorite, talc, carbonate, and some relict olivine, plus chromite and magnetite. Tisdale komatiites are mostly Al-undepleted komatiites derived late in an evolving mantle plume, with minor crustal contamination. The upper Tisdale assemblage consists of the Central formation (450 m thick), the Vipond formation (200-300 m) and the Gold Centre formation (800 m). These formations are comprised of a variety of essentially tholeiitic lavas together with subordinate ultramafic lavas, and minor carbonaceous shale interflow sediments. Basalts are variously pillowed (1-2<5 m), massive or hyaloclastic in flows 10-150 m thick. Petrographically, they consist of actinolite-tremolite, plagioclase, trace quartz, and titanite. The more Fe-rich tholeiites are darker in colour, contain magnetite and more pleochroic actinolite and higher contents of quartz. Some Vipond formation Fe-rich lavas are very distinctive in their intensely variolitic texture (<3cm), and these serve as marker horizons, and are a feature of well-mineralized rocks.

The base of the Porcupine assemblage varies from disconformable to an angular disconformity. At the base is a discontinuous horizon of carbonaceous sedimentary rocks (up to 100 m), separating the underlying Tisdale assemblage mafic lavas from the Krist formation. The Krist formation is a calc-alkaline pyroclastic deposit, locally up to 500 m in thickness, with an age ranging from 2690 to 2688 Ma. It is poorly sorted and bedded, with angular clasts of 1 to 25 cm across, consisting of feldspar (± sparse quartz)-phyric rhyodacite, chert, and minor but ubiquitous fuchsite-bearing chips of ultramafic rock. The fine-grained matrix to the clasts is also feldspar-bearing. Greywackes, siltstone and mudstone (~1000 m) overlie the Krist pyroclastic formation, in places unconformably. Elsewhere the Krist formation is absent and the greywackes of the Beatty formation (Porcupine assemblage) directly overlie Tisdale assemblage lavas with an unconformable or faulted contact. The

sediments are fine- to medium-grained, well-bedded or laminated arkosic-lithic turbidites with scour and flute marks and crossbedding. Lithic fragments are principally volcanics in an extremely fine-grained quartz-feldspar-sericite matrix.

The Hoyle formation is an extensive part of the Porcupine assemblage lying to the east, north and west of the Timmins camp.

The Beatty formation is located in the core of the Porcupine syncline. The combined geochronological data from the Porcupine sandstone samples indicates that the Hoyle and Beatty formations are correlative and that detritus constituting these sedimentary units was derived from a source region (or regions) of diverse ages, and included material derived from all older Abitibi assemblages and/or their intrusive equivalents. The results thus confirm a period of significant uplift, erosion and unconformity occurred leading up to deposition of the Porcupine assemblage.

Overlying the Porcupine assemblage with angular unconformity is the Timiskaming assemblage (~ 900 m thick), which includes the Dome Formation and the Three Nations Formation. In the Dome formation, basal conglomerate of up to 50 m contains abundant angular mafic and ultramafic rock clasts, among other rock types, from the underlying Tisdale rocks. The Dome formation contains 2 other cobble conglomerate horizons. Greywacke consist of alternating shale (5-20 cm) and sandstone (10-50 cm). P. Born interprets the lower Dome formation as a sequence of turbiditic fan sediments.

Stratigraphically overlying the Dome formation, the Three Nations formation consist of quartz-lithic sandstones, with angular grains, in festoon-crossbedded beds on the scale of 25-100 cm. Conglomerate beds contain rounded clasts (1 to 25 cm) of siltstone, felsic volcanics, ultramafic rock, and vein quartz. The Three Nations formation is interpreted as deltaic-fluvial deposits with mixed felsic - lesser mafic provenance. Detrital zircons from the upper part of the Three Nations formation provide a maximum depositional age of 2669 Ma. As-yet unassigned Timiskaming assemblage-aged sedimentary units with maximum depositional ages of 2674 Ma occur as tectonically interleaved slivers within Tisdale assemblage volcanics proximal to the Porcupine–Destor deformation zone at the Buffalo Ankerite and Naybob mines. In addition, recent diamond drilling by the Porcupine Joint Venture has indicated the presence of more extensive Timiskaming assemblage units further to the west in Ogden Township consisting of jasper-bearing conglomerate, sandstone and siltstone in faulted contact with ultramafic volcanics to the south.

Timiskaming-aged units also occur south of where they have been previously indicated in Whitney Township. For example, a sample of sandstone interbedded with conglomerate from a unit previously considered to be part of the Porcupine assemblage contains detrital zircons with ID-TIMS ages of 2726 Ma, 2723 Ma, 2692 Ma, 2689.9 ± 1.2 Ma and 2690 Ma. SHRIMP data from a larger population of detrital zircons from the same sample show that the zircons define a spectrum of ages between approximately 2750 and 2670 Ma. The younger ages indicate that

the unit is likely part of the Timiskaming assemblage and thus extends the known distribution of this assemblage further to the south in Whitney Township.

Porphyry stocks (up to 1200 by 400 m) and dyke swarms intrude the Tisdale assemblage lavas, but are not known to intrude Porcupine or Timiskaming assemblage sediments: dykes are truncated at the Timiskaming unconformity surface; porphyry clasts occur in the overlying conglomerates; and so these porphyry bodies are typically older (2691-2687 Ma) than the ages given for the overlying sediments. The porphyries consist of plagioclase (30-60%, 1-5 mm) and quartz (5%, 1-5 mm) phenocrysts in a fine groundmass of feldspar and quartz with sericite and chlorite in foliation, plus carbonate, leucoxene, apatite and actinolite. Geochemically, the porphyries are identical to the Krist pyroclastics. On the basis of geochronological data, the unit is best interpreted as a quartz porphyritic intrusion emplaced into the Tisdale assemblage volcanic units. The other quartzfeldspar porphyry is trachytic in texture, composed of quartz and albite phenocrysts with a preferential alignment in a groundmass of microlites.

Post-Archaean rocks in the Timmins area include the Proterozoic diabase dyke suites. The Matachewan dykes strike north-northwest while the Abitibi dyke set strikes east-northeast. The north or north-northwest dykes consist of quartz and olivine-bearing variants with plagioclase phenocrysts, dated at 2454 ± 2 Ma. The east-northeast Abitibi set consist of 2 large olivine diabase dykes dated at 1140.6 ± 2 Ma: these are very similar to another set of less common northwest-trending dykes.

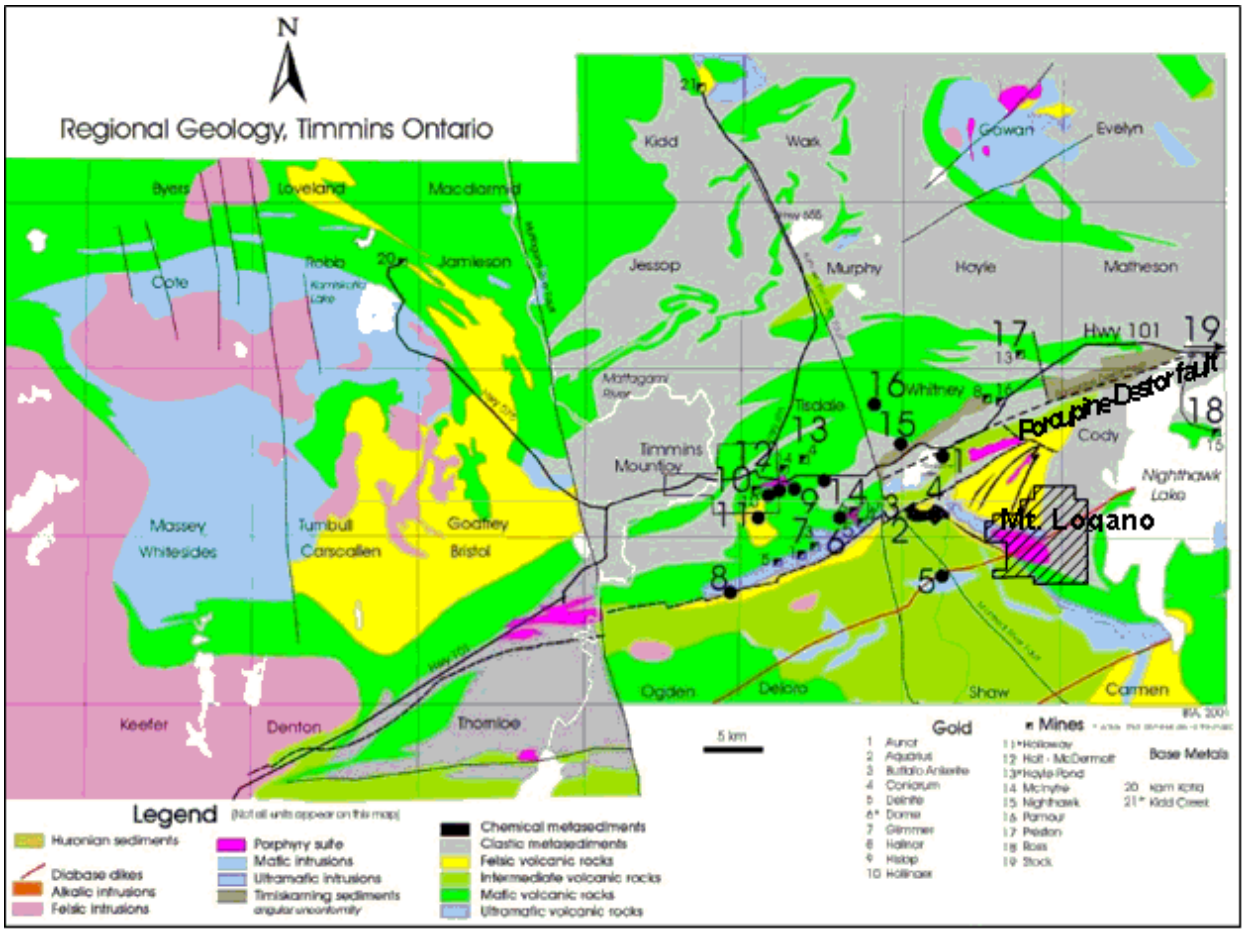

Figure 2- Regional Geology, Timmins Ontario

6.3 Property Geology

No extensive mapping has taken place but prospecting was completed to better understand rock chemistry as historic samples from the property were generally only assayed for gold values and samples were often constrained to 'typical' gold rocks of the Timmins/Porcupine camp. The property geology map (Figs. 3 and 4) is taken from Pyke, 1982.

The claim group is underlain by similar-aged rocks to those that host the prolific Timmins area gold deposits which have produced in excess of 65 million ounces. The Nighthawk Lake gold deposit (Goldcorp Inc.) lies to the east while the Pamour, Hallnor and Hoyle Pond Mines (Goldcorp Inc.) lie to the north. The prolific Dome Mine as well as a host of other significant past producing gold deposits are situated to the west of the Mt. Logano Property.

The Mount Logano quartz-feldspar porphyry (Shaw Dome) was coeval with the Pearl Lake porphyry, which played an important role in gold mineralization at two of the largest gold producers in the Porcupine gold camp; the McIntyre and Hollinger gold mines. In addition to both porphyry intrusions occurring during the same time period, both porphyry bodies have intruded Tisdale age mafic and ultramafic rocks, which host much of the gold mineralization on the McIntyre and Hollinger properties. Also, there is geological evidence that the Mount Logano

porphyry has undergone considerable deformation and fracturing similar to that observed within the Pearl Lake porphyry.

Exploration of the Mount Logano property focussed on the contact of the Mount Logano porphyry intrusion with Tisdale age mafic/ultramafic rocks and related faults and fractures. The contact between felsic porphyries and ultramafic/mafic volcanic rocks presents a significant gold environment target. According to the Ontario Geological Survey (OGS), gold bearing fractures within porphyry bodies in the Porcupine camp are generally not stand alone ore deposits. The gold tenor and deposit size is greater in the contact mafic/ultramafics where quartz veining appears to 'blow out'.

As part of this phase of exploration, sampling was completed in the north east portion of the property to determine whether similar rocks to that of the St Andrews Goldfields Aquarius deposit can be found on the Mt Logano property.

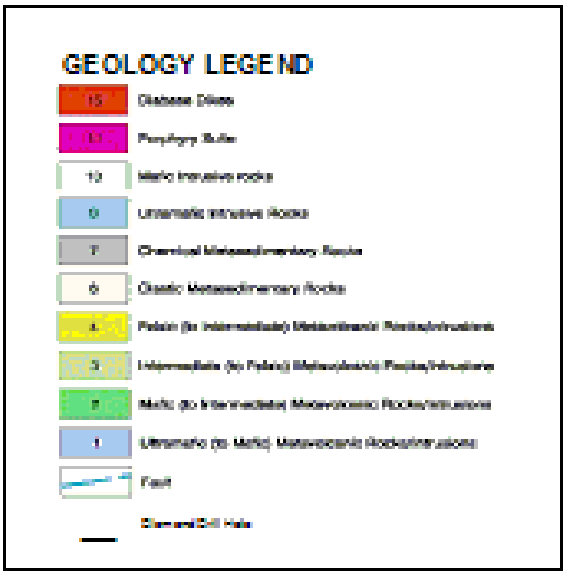

Figure 3- Property Geology Legend

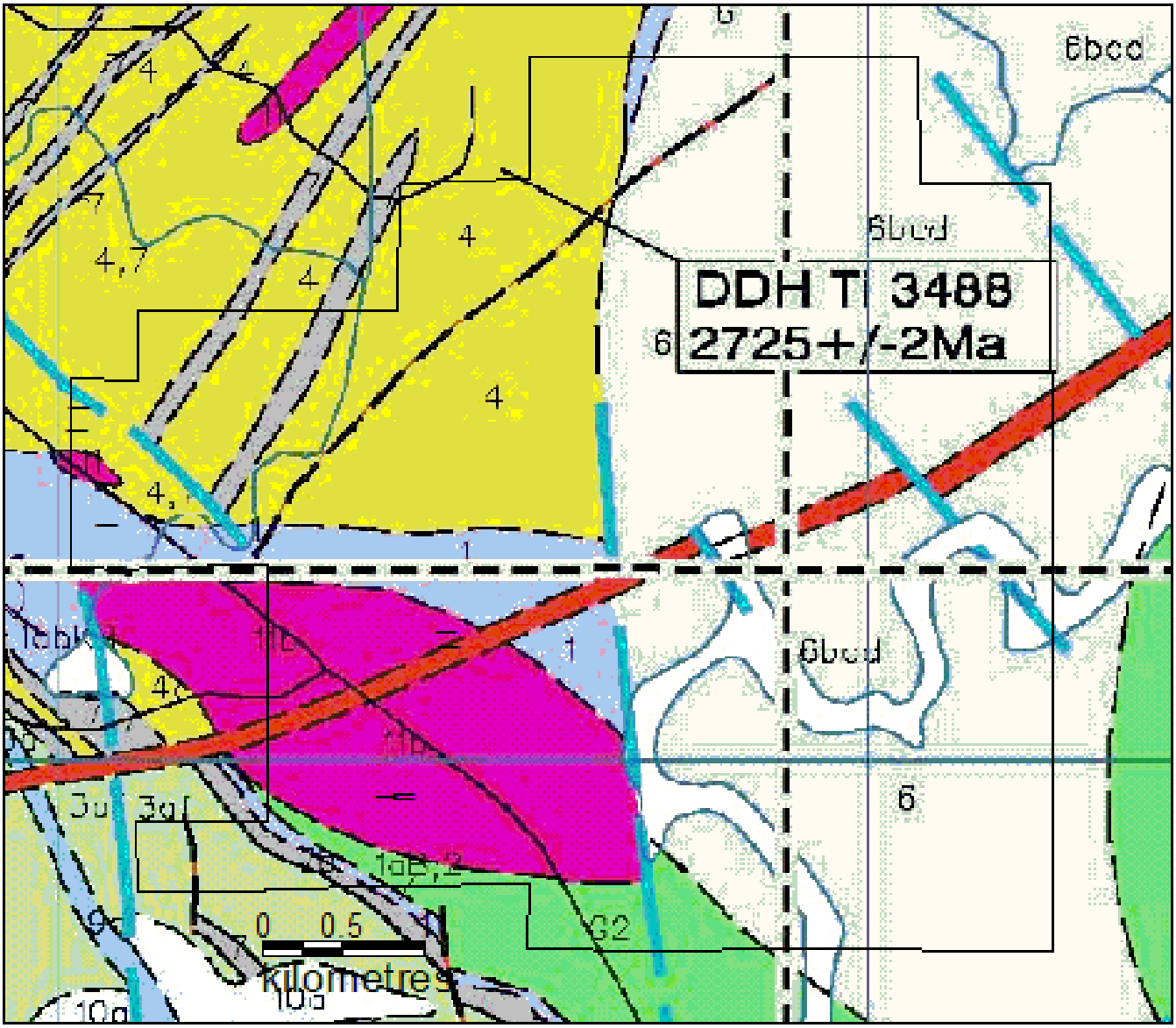

Figure 4- Mt Logano Property Geology

7.0 Deposit Types

According to Dubé et al (2007):

Greenstone-hosted quartz-carbonate vein deposits typically occur in deformed greenstone belts of all ages, especially those with variolitic tholeiitic basalts and ultramafic komatiitic flows intruded by intermediate to felsic porphyry intrusions, and sometimes with swarms of albitite or lamprophyre dyke. They are distributed along major compressional to transtensional crustal-scale fault zones in deformed greenstone terranes commonly marking the convergent margins between major lithological boundaries, such as volcano-plutonic and sedimentary domains. The large greenstone hosted quartz-carbonate vein deposits are commonly spatially associated with fluvio-alluvial conglomerate (e.g. Timiskaming conglomerate) distributed along major crustal fault zones (e.g. Destor Porcupine Fault). This association suggests an empirical time and space relationship between large-scale deposits and regional unconformities.

These types of deposits are most abundant and significant, in terms of total gold content, in Archean terranes. However, a significant number of world-class deposits are also found in Proterozoic and Paleozoic terranes. In Canada, they represent the main source of gold and are mainly located in the Archean greenstone belts of the Superior and Slave provinces. They also occur in the Paleozoic greenstone terranes of the Appalachian orogen and in the oceanic terranes of the Cordillera.

The greenstone-hosted quartz-carbonate vein deposits correspond to structurally controlled complex epigenetic deposits characterized by simple to complex networks of gold-bearing, laminated quartz-carbonate fault-fill veins. These veins are hosted by moderately to steeply dipping, compressional brittle-ductile shear zones and faults with locally associated shallow-dipping extensional veins and hydrothermal breccias. The deposits are hosted by greenschist to locally amphibolite-facies metamorphic rocks of dominantly mafic composition and formed at intermediate depth (5-10 km). The mineralization is syn- to late-deformation and typically post-peak greenschist-facies or syn-peak amphibolite-facies metamorphism. They are typically associated with iron-carbonate alteration. Gold is largely confined to the quartz-carbonate vein network but may also be present in significant amounts within iron-rich sulphidized wall-rock selvages or within silicified and arsenopyrite-rich replacement zones.

There is a general consensus that the greenstone-hosted quartz-carbonate vein deposits are related to metamorphic fluids from accretionary processes and generated by prograde metamorphism and thermal re-equilibration of subducted volcano-sedimentary terranes. The deep-seated, Au-transporting metamorphic fluid has been channelled to higher crustal levels through major crustal faults or deformation zones. Along its pathway, the fluid has dissolved various components - notably gold - from the volcano-sedimentary packages, including a potential goldrich precursor. The fluid then precipitated as vein material or wall-rock replacement in second and third order structures at higher crustal levels through fluid-pressure cycling processes and temperature, PH and other physio-chemical variations.

8.0 Current Exploration

8.1 Introduction

The exploration program in the field ran July 12th until July 16th (see Table 2) and was designed to gain a more detailed DTM and aeronautical photo of the Mt Logano property and to assist in processing an in-depth magnetic interpretation.

A total of 18 flights were planned to cover the entire property with images to create a full property scale aeronautical image and DTM. However, a total of 31 were actually flown. One truck as well as a 6 x 6 ATV was utilized in order to access the more remote areas of the property.

Table 2- Field Production Report

Date	UAV Flights	Personelle	Comments
10-Jul-15	n/a	Eric Steffler (ES	Mob to Property – drive from Toronto to Gravenhurst
11-Jul-15	n/a	(ES)	Mob to Property – drive from Gravenhurst to cochrane to Timmins, set up equipment in field, transportation of ATV to property
12-Jul-15	n/a	Blake McLaughlin (BM), ES	Mob to property – flight from Toronto to Timmins, assess property for Control Point Locations
13-Jul-15	1 to 10	BM, ES	ATV into property, create control point, fly UAV from field in middle of property
14-Jul-15	11 to 22	BM, ES	Setup two control points, flying from old logging roads, two separate locations were used for flying the UAV
15-Jul-15	23 to 31	BM, ES	ATV into old quarry just south of property, set-up control points for flying, fly UAV
16-Jul-15	n/a	BM, ES	De-mob – drive from Timmins to Toronto

8.2 Survey Methodology

8.2.1 Survey Instruments

A SenseFly eBee UAV was utilized for this survey along with a Top Con Hyper V GNSS Receiver. The specifications of the eBee UAV are as follows:

a) eBee Manufacturer:
Manufacturer of the planes: eBee www.sensefly.com
The eBee is controlled by eMotion software.

b) eBee Technical Specifications:
Size Wingspan: 96 cm
Wing area: 0.25 m2
Weight 800 g Styrofoam Plane

	Load: several different cameras included in weight.
Battery	3-cell Lithium-Polymer, Capacity: 2100 mAh
Endurance	up to approx. 50 minutes
Propulsion	Electric brushless motor
Nominal static thrust:	670 gf
Flight speed	Normal cruise speed about: 27 knots - 31 knots
	The eBee is equipped with a ground sensor and reverse engine technology for
Launch	Hand launch/Auto pilot
Landing	Landing speed is about 2 - 17 knots, straight in and circular landing option
Camera/Sensor Control	Preprogramed and controlled by autopilot, no manual controller option electronic intergrated
Telemetry link	2.4 GHz USB radio data link modem
Radio link Remote control: (two com links)	MULTIPLEX – Modem Microhard N2420 backup manual control

c) eBee View and Drawing

Figure 5 - eBee UAV schematic

More information on the eBee and TopCon GNSS Receiver can be found in the *Appendix A - Hyper V GNSS Receiver* and *Appendix B - eBee User Manual*.

8.2.2 Survey Planning

A total of 18 flights were planned on the property, including at least 3 ground control points (GCPs) are need for these flights. The control points are used to get a sub-centimetre x,y,z accuracy from the survey (Figure 6).

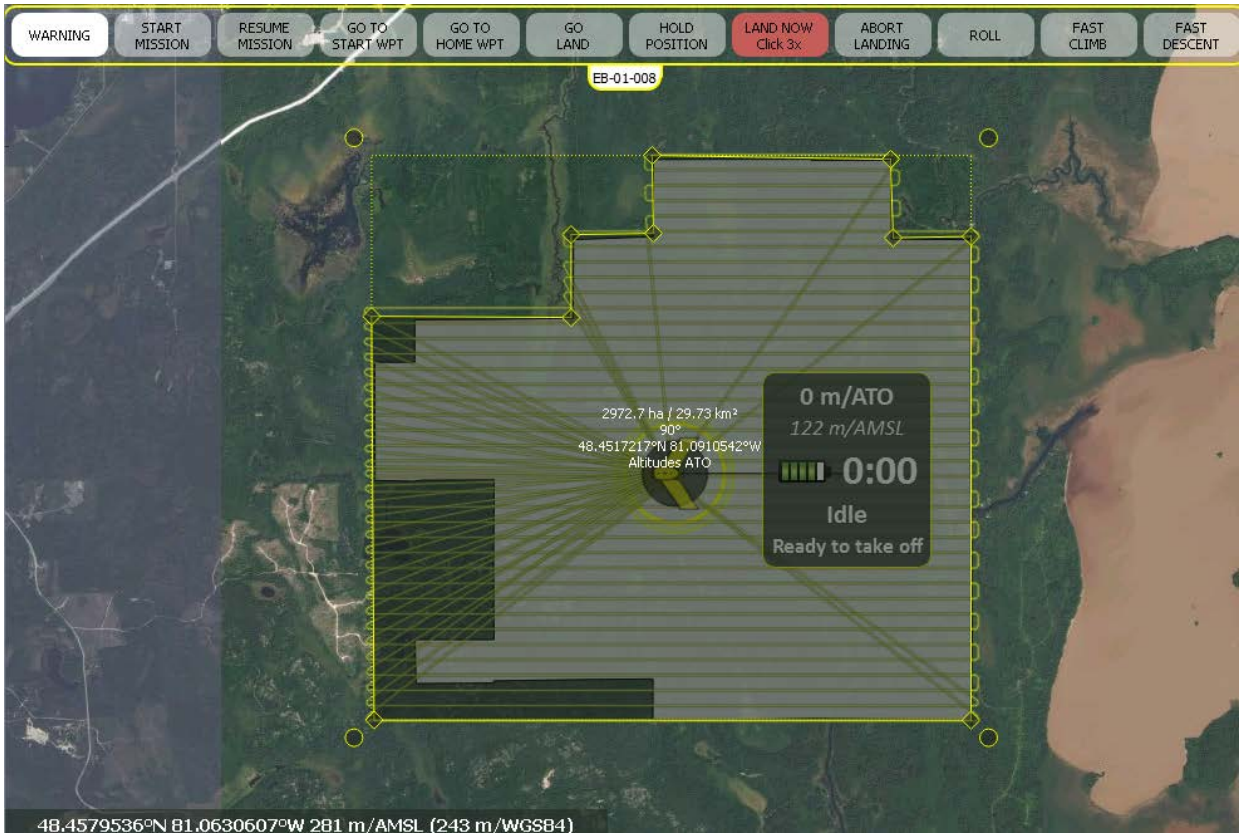

Figure 6- Planned Survey screen capture from e-Motion Software

The survey was flown at a height of 317.8 meters above the observed altitude of the terrain at take-off. The elevation of the eBee is determined by the built in barometric pressure sensor on the UAV. Full survey details are below:

Table 3- Planned flight details

Planned Flight Details	
Number of Flights	18
Minutes per Flight	31:55:00
Flight Lines	38
Flight Line Spacing	154.2 meters
Linear Distance between Photos	81.2
Total Ground Coverage Area	2972.7 Hectares

8.2.3 Flight Line Planning

(Extracted and updated from the "Terrain Modelling DTm Generation using UAVs" by Aalborg University, Department of Development and Planning, Surveying and Mapping, 3rd Semster, 2014).

This section is about the flight planning necessary before doing the actual flight. Considerations and calculations regarding overlap and resolution is presented, together with a description of the flight planning (and control) software eMotion 2 included with the eBee drone.

Flight overlap is important for the final stitching of all images in Postflight Terra 3D. The same features are automatically located in overlapped images and this is what allows the software to stitch together the othrophoto (Aerial Image) and create a DSM. In order to have complete coverage of a property, images must also be taken outside the property boundary to make the resolution of the final image uniform. This idea also holds true for the control points; as more images are captured over the control points, a better ground accuracy of the orthophoto and DSM can be computed by Postflight Terra 3D.

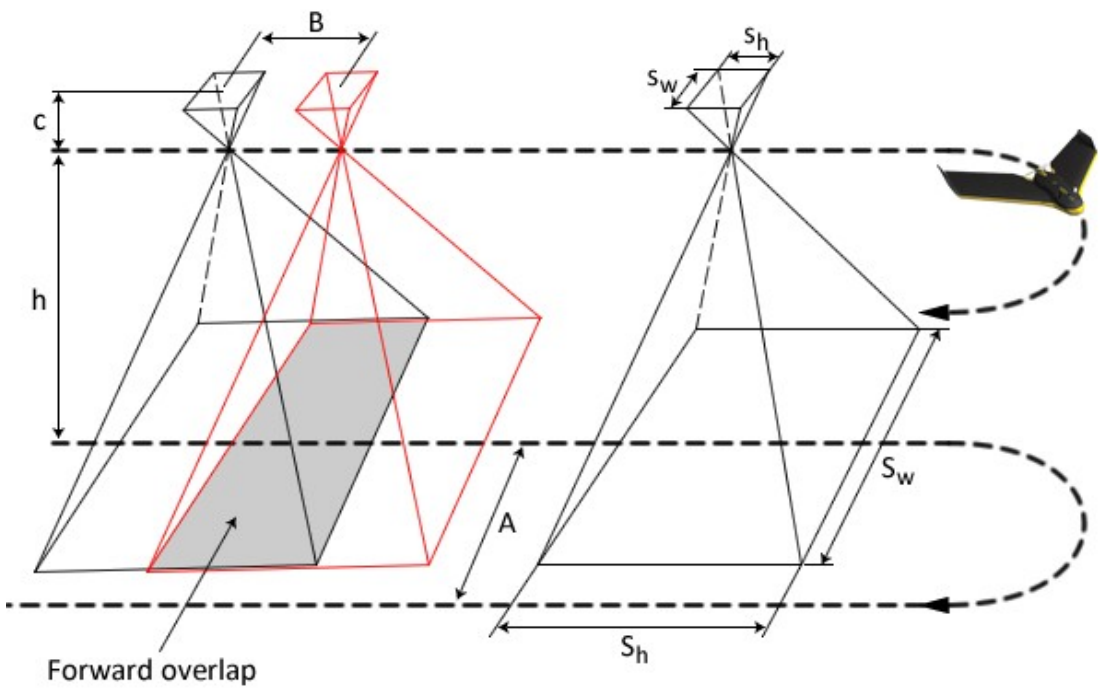

Figure 7 - Geometry of Flight Planning

The symbols in the figure above have the following meaning and are used throughout this section:

A is the distance between flight lines
B is the baselength
c is the principal distance
h is the flying height
s_h is the image sensors height
s_w is the image sensors width
S_h is the image height in ground units
S_w is the image width in ground units

8.2.4 Flying height and GSD

In order to cover as big an area as possible with the eBee drone, we would use the maximum flying height allowed by the SFOC (Special Flight Operations Certificate). The maximum allowed flying height is 400 feet, but for this example we will use 100 meters for simplification.:

$$h=100 \text{ m}$$

The eBee drone uses a Canon IXUS 125 HS camera. The principal distance is approx. c=4.386 mmaccording to one of the reports from a self-calibrating bundle block adjustment shown on senseFly's webpage (senseFly [3] n.d.). The exact value can change over time, since the Canon IXUS is a cheap consumer camera. Based on the principal distance, it is possible to calculate the photo scale number (Kraus [1] 2007, 133):

$$m_b = h/c \text{ where } m_b = 100\text{m}/0.00386\text{m} = 22800$$

The used Canon IXUS's image sensor dimension is 6.17 x 4.63 mm (senseFly [3] n.d.). When theimage width is Sw=6.17mm, it is possible to calculate the image width in ground units (Kraus[1] 2007, 133):

$$S_w = s_w * m_b \text{ where } S_w = 0.00617 * 22800 \approx 140\text{m}$$

In a similar way, the image height in ground units can be calculated:

$$S_{h=0.00617m * 22800} \approx 105\text{m}$$

The pixel resolution of the images is 4608 x 3456 pixels. The expected ground sample distance (GSD) can therefore be calculated as:

GSD = Sw/4608pixels where GSD=140m/4608pixel = 3.0cm/pixels

8.2.5 Image Overlap

When doing aerial photogrammetry from a manned airplane, a forward overlap of l = 60 % and a side overlap of q = 25-30 % is typically used. The overlap is bigger than needed because of unaccounted factors like rotation of the airplane (roll, pitch, yaw), variation of flying height, and deviations from the planned route. (Kraus [1] 2007, 134).

Since a small UAV is quite sensitive to wind compared to a manned airplane, it is assessed that the overlap between the images should be bigger than for traditional aerial photogrammetry.

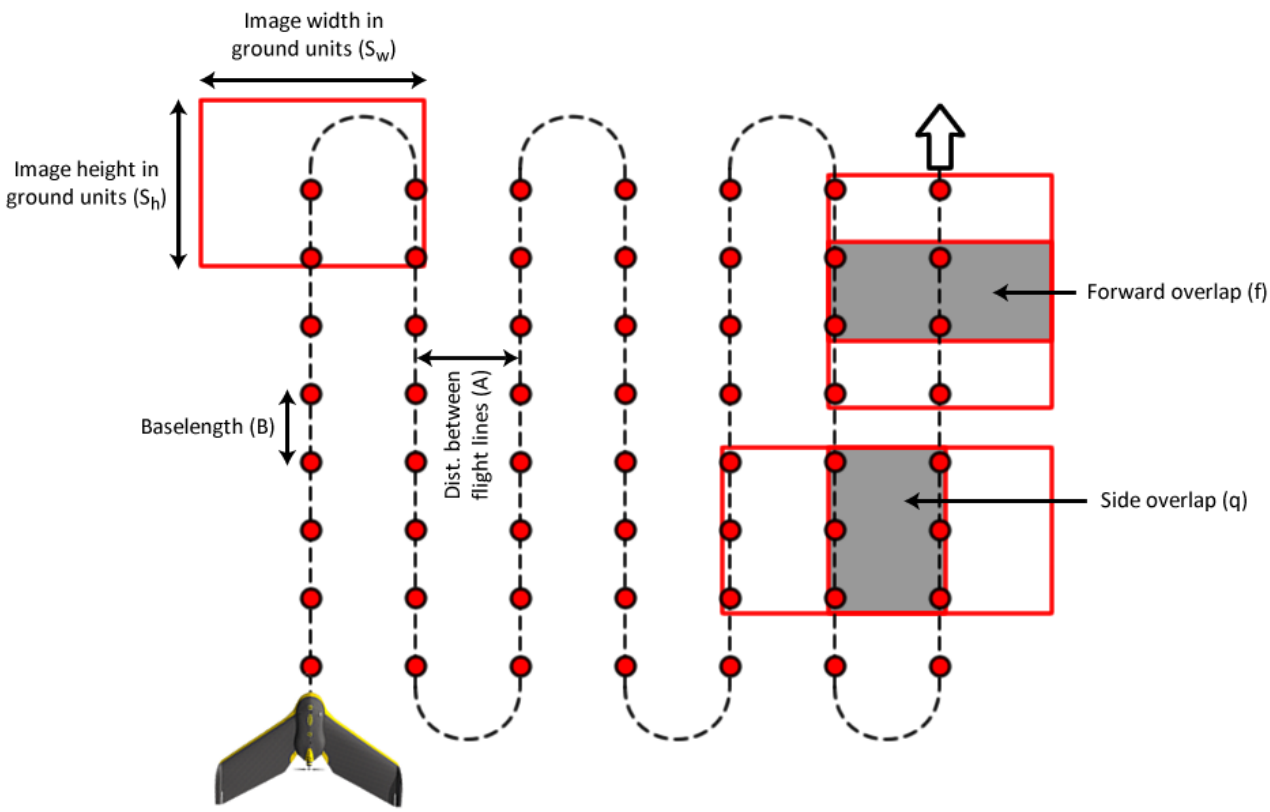

Figure 8 - - Illustration of overlapping images from the UAV

The images are to be processed the supplied Postflight Terra 3D- EB (powered by Pix4D). The software package relies on auto-correlation between the images. To get a successful correlation of high quality, quite a big overlap is needed, especially in difficult terrains like forests and snow. The recommended overlap when using the software package can be seen in the table below.

Table 4- Recommended overlap in Postflight (Postflight Support [1] 2013)

	Postflight
Forward overlap, l	75 %
Difficult terrain (forest, snow)	Min. 85 %
Side overlap, q	50 %
Difficult terrain (forest, snow)	Min. 60 %

As shown in Table 4, the overlap depends on the type of terrain which is mapped. The ideal flight plan when using Pix4D looks like this:

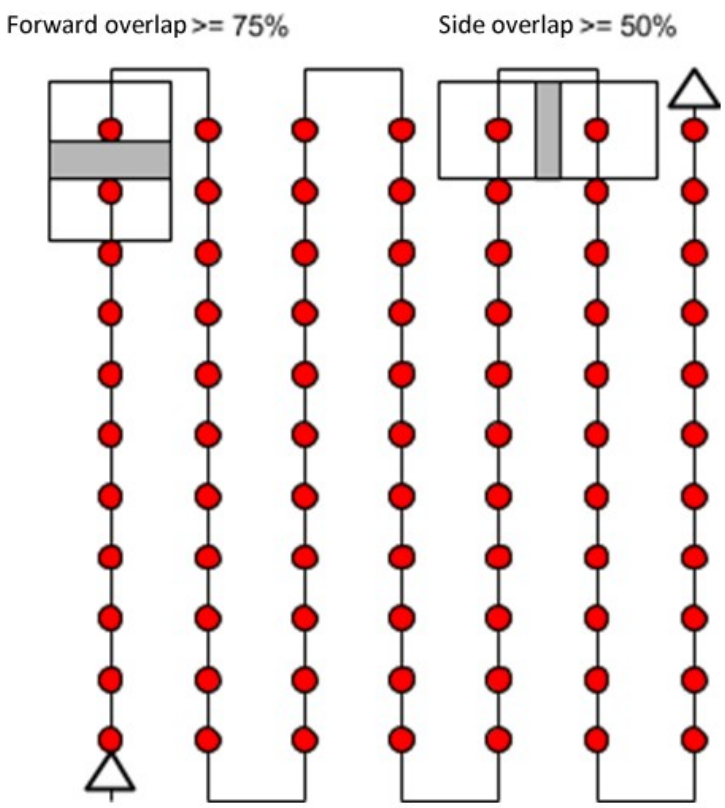

Figure 9 - Ideal flight plan for Postflight Terra Plus 3D

In the past sections, it has been described how to plan the flight lines using some simple formulas, but in fact almost all the planning of a flight with the eBee drone is done in the supplied software called eMotion 2, which can be found in Appendix B.

8.2.6 Survey Details

During July 12th to 15th, 2015 a total of 31 flights were flown (see table 3) and 5 GCP's were collected. 4 different locations were utilized for take offs and landings of the UAV; one from the center of the property and 3 from outside the property on logging roads and in an old quarry. These take-off and landing locations were also utilized as the ground control point locations which are used in the final processing of the data for accuracy. Figure 7 shows the location of the ground control points.

8.2.7 Ground Control Points

A TopCon Hyper V receiver was used for collecting the GCPs for this survey. A total of 5 GCP's were collected on the property of which 4 were used for processing the final aeronuatical image and DTM database (Table 5).

Table 5 - Ground Control Points (GCPs)

Name	X	Y	Z	Description of location
Control 1	492320.902	5365811.389	289.853	On property
Control 2	492733.973	5366584.762	286.47	On property
Control 3	489434.519	5366318.669	295.321	Logging road
Control 4	490001.66	5364779.594	301.087	Logging road
Control 5	491789.472	5363345.203	323.121	Old Quarry

All GCP's were collected using the Static Correction Method (SCM). During each day of surveying the TopCon Hyper V receiver was set-up as a base station, collecting static point data for at least 3.5 hours. As most of the Mt. Logano property is covered with shrubs, small brush and trees make it difficult to find locations to fly the UAV from within the property boundary. The UAV utilizes a linear take-off and landing and requires a large open area of open space to be flown. Since numerous public lands such as roads were easily accessible outside of the Mt. Logano Property; these locations outside the property were used as take-off and landing locations. These same locations were utilized for collecting the GCP's as the pilots would be stationed at each location of flying for over 3.5 hours. At the end of the day this data was sent to the Canadian Spatial Reference System (CSRS) Precise Point Positioning (PPP) website (http://www.nrcan.gc.ca/earth-sciences/geomatics/geodetic-reference-systems/tools-applications/10925#ppp) for correction. The process is automated and requires the collected static RINEX (Receiver Independent Exchange Format) be uploaded. The data is then corrected and sent back via email in a PDF file. All of the corrected GCP files can be found in Appendix C - *CRSC-PPP files*. Corrected GCP locations are shown in Figure 10.

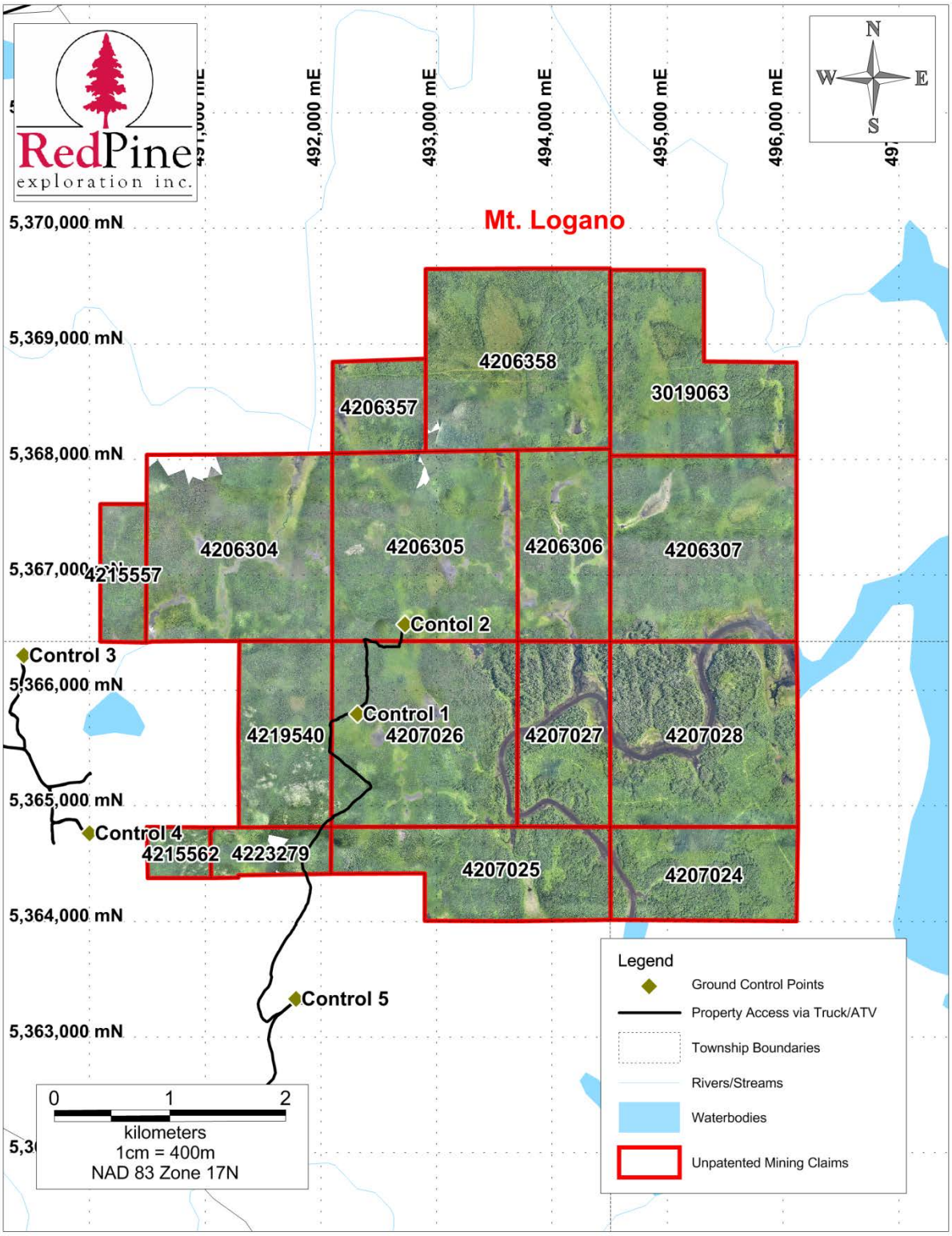

Figure 10 Mt. Logano Property with Airphoto and GCPs

8.2.8 eBee UAV Survey Data

From July 12th to July 14th, 2015 a total of 31 flights were completed from 4 different locations. Although only 18 flights were planned, more flights with shorter planned times were needed to complete the property due to wind speeds and weather conditions. Due to mechanical errors with the onboard camera and GPS accuracy, extra flights were necessary to complete the full coverage of the property. Figure 11 shows the flights lines and landing/take-off locations. The survey was flown from 4 different locations, Control Points 2, 3, 4 and 5.

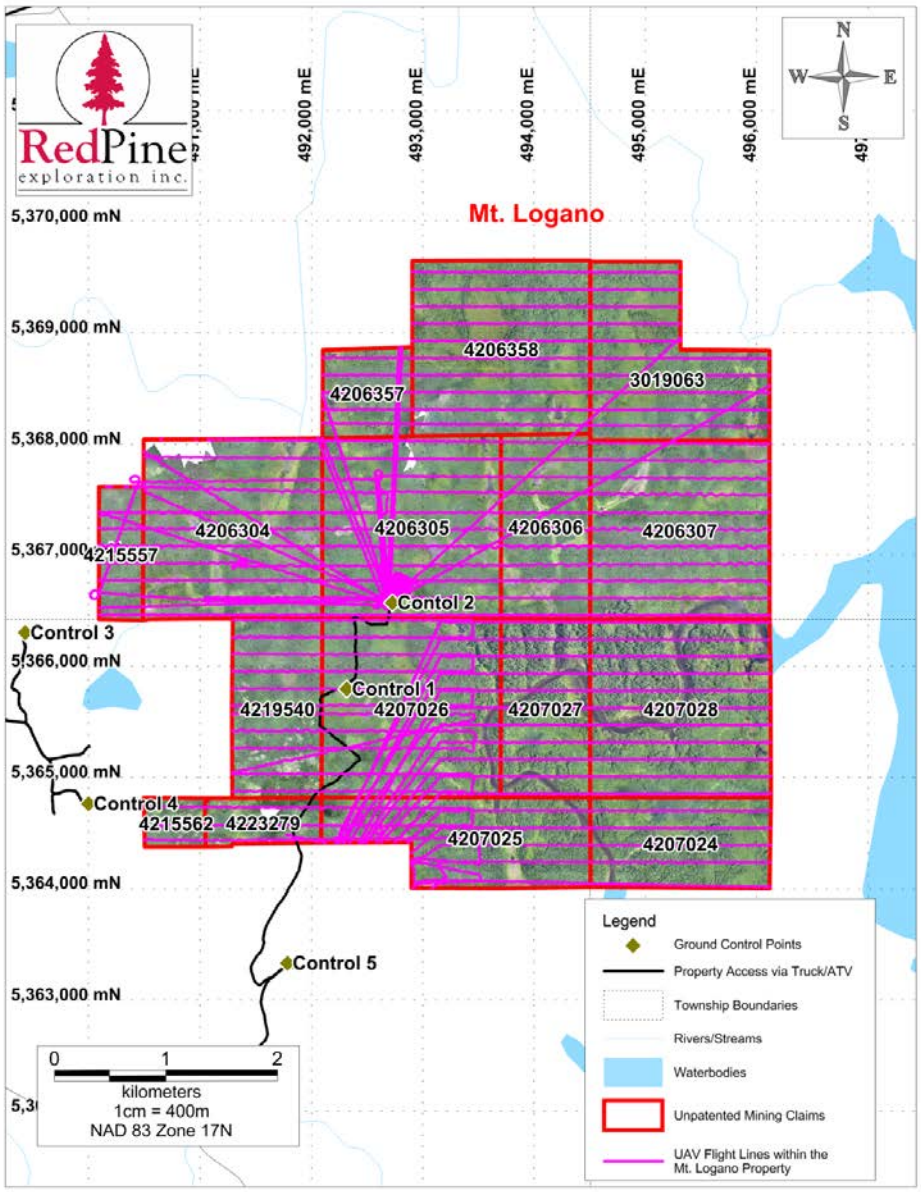

Figure 11 - UAV flight Path over the Mt. Logano Property Locations

A total of 1940 photos were taken over the property (Figure 12) and used for the photogrammetric processing to create the aeronautical photo and DTM.

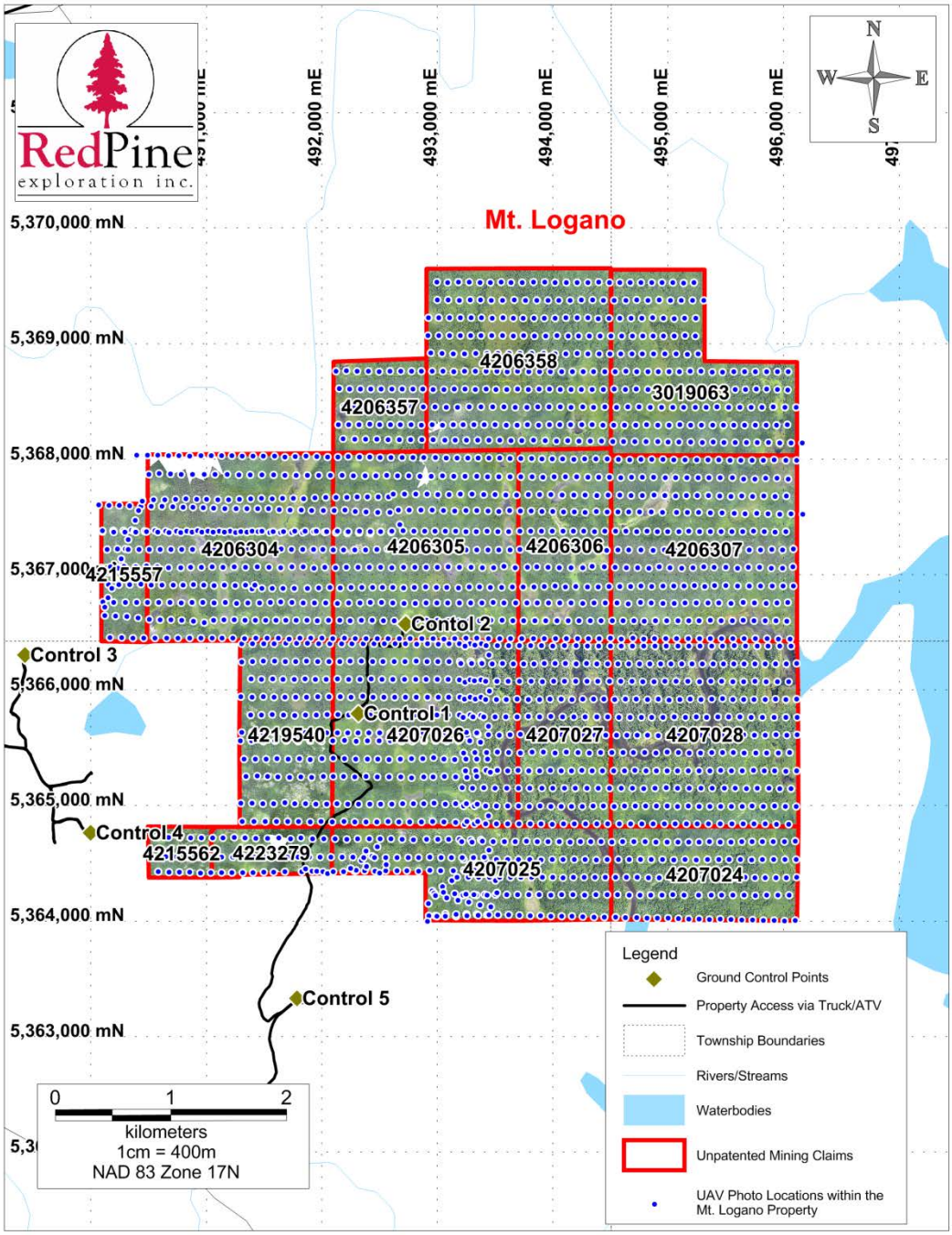

Figure 12 - . Mt. Logano with UAV Photos takne over the Property. Locations.

A full list of the photo locations and the corresponding unpatented mining claims over which they were taken can be found in Appendix D - *Photos and Claims*.

8.2.9 UAV Data Processing

UAV data process for the eBee was completed with eMotion 2 (developed by Sensefly Ltd.) and Postflight Terra 3D Powered by Pix4D. The processing procedure is automated and only requires the input of the recorded flight line/GPS location of the pictures taken during the flight and the pictures to imported into eMotion 2. The pictures are automatically geo-referenced, once this is completed eMotion 2 creates a new Postflight Terra 3D project and opens the images a new project. For full details of this processing procedure please refer to Appendix E - PostFlight Terra 3D Processing Procedure.

Postflight Terra 3D automatically creates a processing report with the details of the processing. Below is a summary of the processing results, for full results please see Appendix F – *Mt Logano Postflight Terra 3D Processing Report.*

Table 6 - Summary of PostFlight Terra 3D Results

Project	mtlogano
Processed	2015-Jul-17 10:57:36
Camera Model Name	CanonIXUS127HS_4.3_4608x3456 (RGB)
Average Ground Sampling Distance (GSD)	10.31 cm / 4.06 in
Area Covered	44.1411 km^2 / 4414.11 ha / 17.0518 sq. mi. / 10913.1 acres
Image Coordinate System	WGS84
Ground Control Point (GCP) Coordinate System	WGS 84 / UTM zone 17N
Output Coordinate System	WGS 84 / UTM zone 17N
Processing Type	full Aerial nadir
Feature Extraction Image Scale	0.5
Camera Model Parameter Optimization	optimize externals and all internals
Time for Initial Processing (without report)	02h:27m:28s

Quality Check

Images	median of 23680 keypoints per image	✓
Dataset	2114 out of 2249 images calibrated (93%), all images enabled, 8 blocks	⚠
Camera Optimization	0.1% relative difference between initial and final focal length	✓
Matching	median of 1652.15 matches per calibrated image	✓
Georeferencing	4 GCPs (4 3D), mean error = 0.014 m	✓

PostFlight Terra 3D automatically stitches together an aeronautical photo and creates a Digital Surface Model (DSM) of the elevation data

Once the DSM is created, system for Automated Geoscientific Analyses (SAGA) GIS is used to compute a DTM. SAGA GIS is an open source software developed by a small team in of researchers from the Department of Physical Geography, Gottingen. SAGA GIS is used to remove all trees, buildings and other natural and manmade features from the DSM to get a true

DTM model. Figure 13 shows the final DTM model produced by SAGA GIS; the full processing procedure for SAGA GIS can be found in Appendix G - *Saga GIS Processing.*

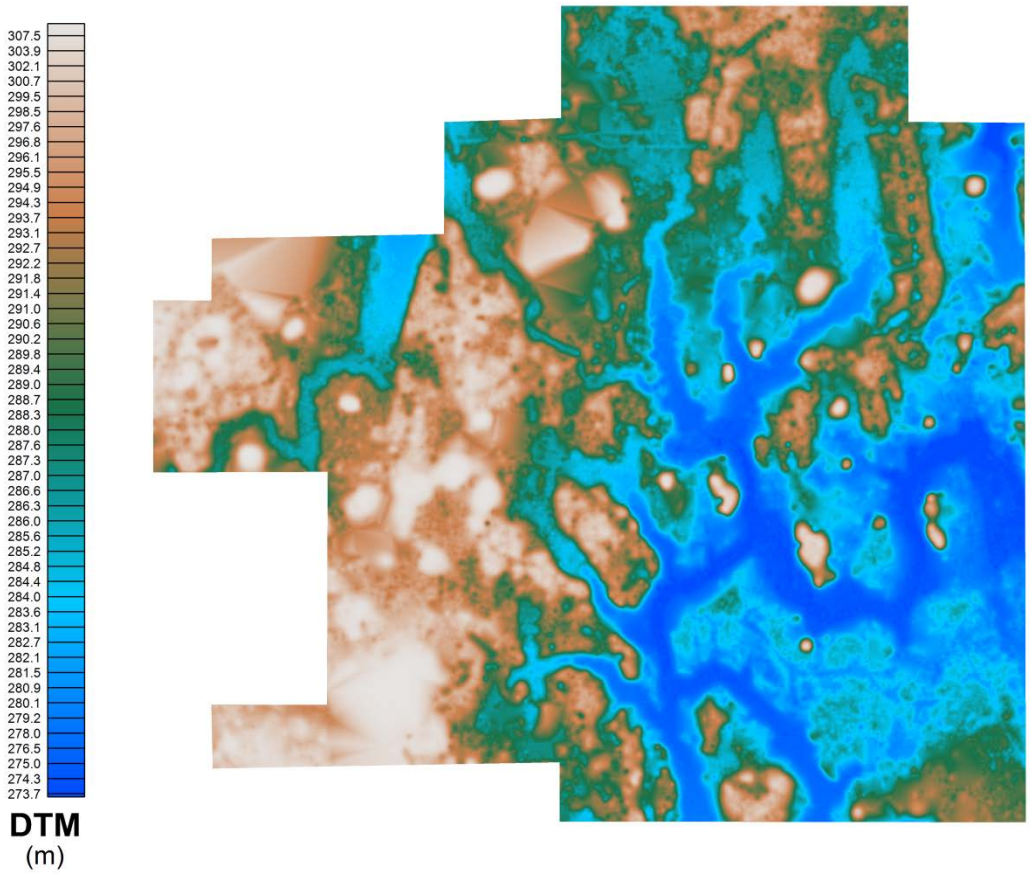

Figure 13- Final DTM produced by SAGA GIS

8.2.10 Field Crew, Geo Science Consultants and Accommodations

For the duration of the field work (5 days) the 2 man team stayed at the Bon Air motel in Timmins. Additional geophysical and geochemical consultation was provided by Martin St. Pierre and Quentin Yarie who have extensive experience with this type of work.

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8.3 Interpretation of UAV Survey

The eBee UAV survey flown over the Mount Logano Property acquired high precision Digital Terrain Model (DTM) data and high resolution colour images. These data were interpreted to extract structural information in the form of topographic lineaments possibly related to faulting, and help to located possible basement rock outcrops using the high resolution colour images. In the future high precision topographic data will be useful in planning and designing drill holes.

Historical DTEM data is available from an Aeroquest magnetic and VLF airborne survey flown in 2010 and can be found in assessment filing AFRI File: 20000001584. Figure 14 presents the two DTM colour images side by side with Aeroquest to the Left and UAV to the right. The significant increase in precision and detail provided the UAV survey is evident. Two areas in the UAV DTM did have less detail then the Aeroquest DTM, which was caused by poor image overlap and cloud cover on the day of the survey. The UAV DTM as a whole still provides significantly more detail then the Aeroquest DTM.

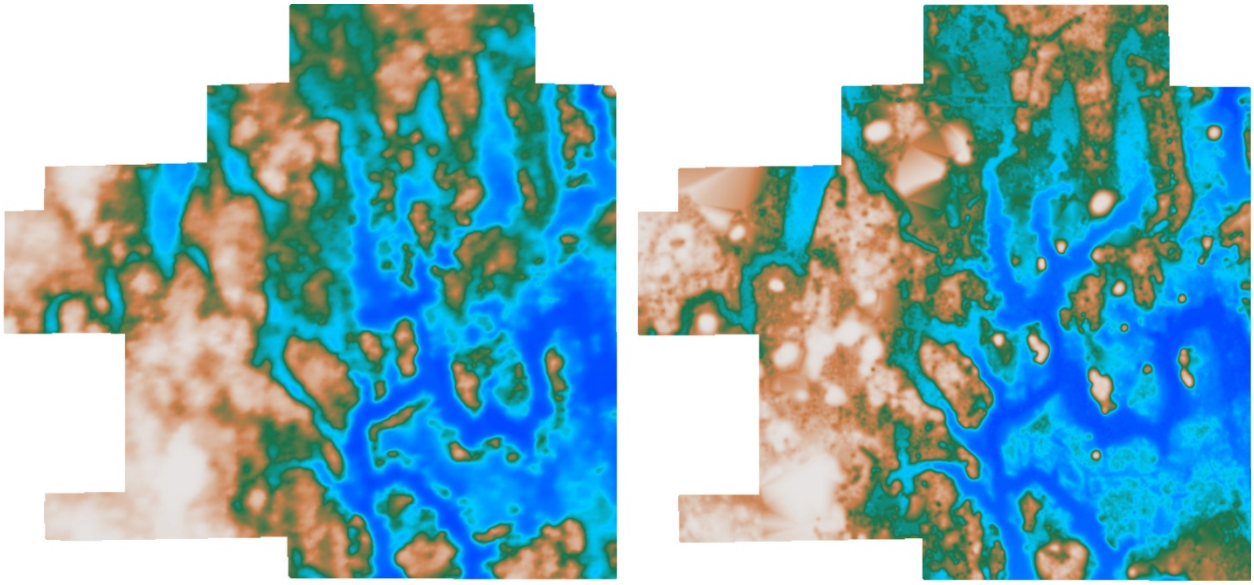

Figure 14- DTM colour images from the UAV (Right) and from an Aeroquest Airborne (Left)

Results of the UAV survey interpretation are presented in Figure 15. The topographic lineaments are dominated by northwest and north-northwest trending faults. Some of these are coincident with access roads, which may be following narrow valleys associated to faults. Historical exploration on the property has been hampered by the scarcity of basement rock outcrops. This fact is reflected in the interpretation, where the majority of outcrops are clustered in the southwest corner of the property and two other smaller clusters can be seen centered at 490230E, 5367300N and 492430E, and 5367450N. The high resolution colour images were carefully examined using 200m X 200m across the entire property in order to define the presented location.

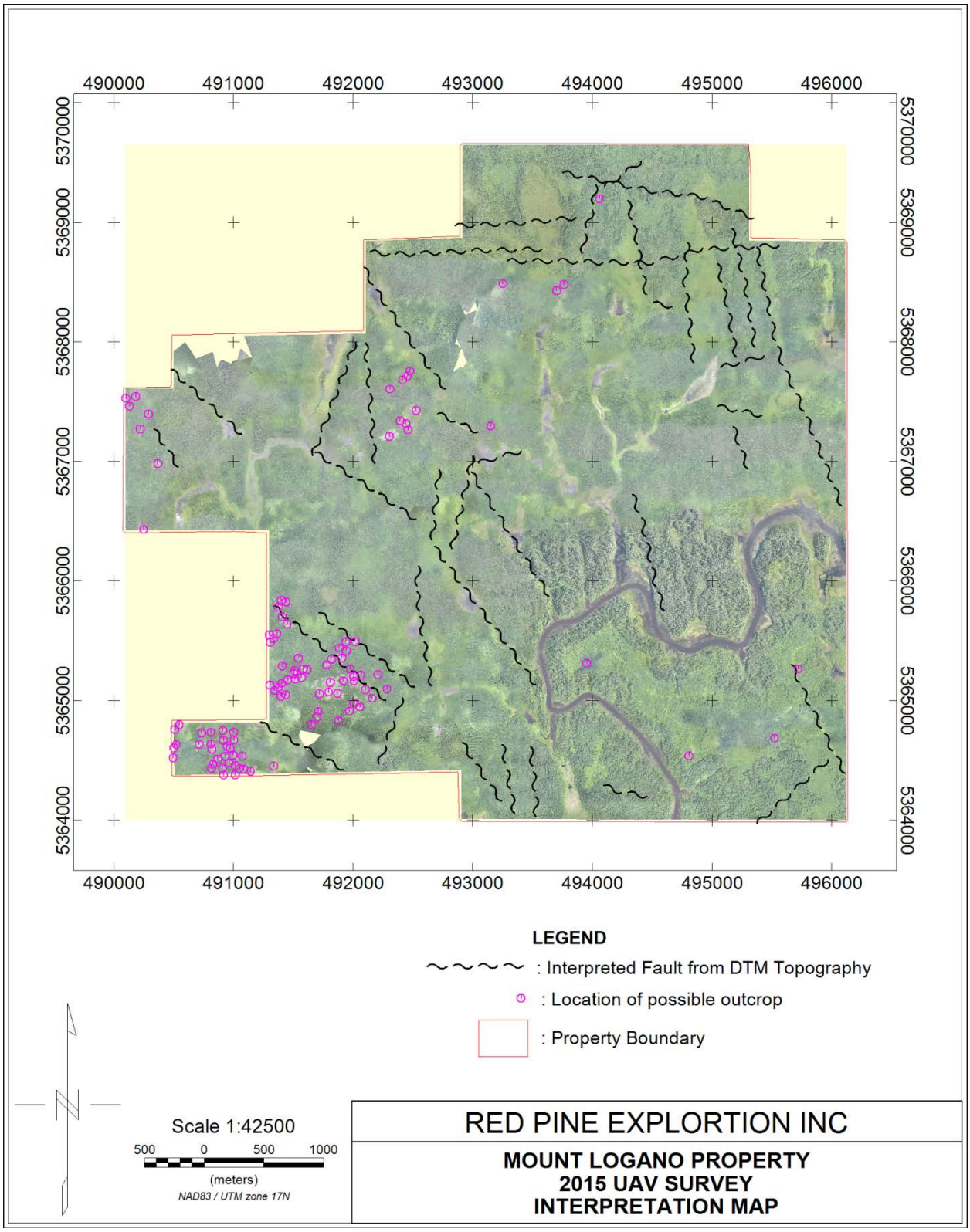

Figure 15- Mt. Logano Property 2015 UAV Survey Interpretation

8.3 Voxi Magnetic Inversion from 2010 Aeroquest Airborne Survey

The 2010 Aeroquest airborne magnetic data (AFRI File: 20000001584) is presented as a colour image with areas subjected to Voxi magnetic inversion Figure 16. The results of these inversions are shown in Figure 18 and 19, as well as in Appedix H. The Voxi magnetic inversion software is part of the Geosoft Oasis Montaj software package, which uses an internet data cloud scheme to provided uses with a powerful inversion package on a pay as you go basis. The inversions were carried out on 18 magnetically active areas in order to better understand the geology and to provide constrained drill targets.

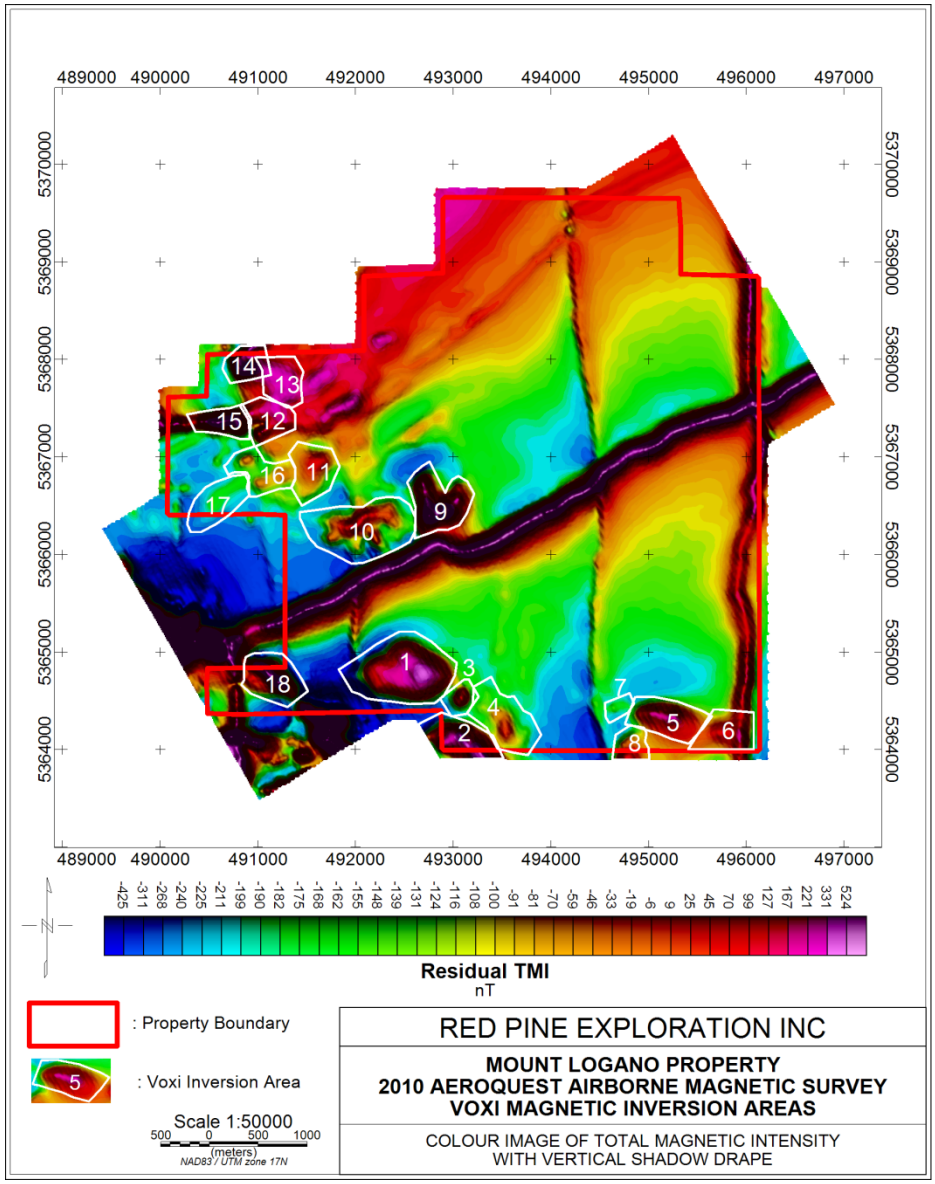

Figure 16 - Mt. Logano 2010 Aeroquest Airborne Magnetic Survey showing Voxi Areas.

A property geology map is presented in Figure 17. Within this map Voxi areas 1 and 2 are located within the porphyry suite close to its southeastern limit, whereas Voxi 4 straddles its border and Voxi 2 is located immediately to the south. The areas of elevated magnetic susceptibility are more probably related to the Mafic (to intermediate) Metavolcanic rocks/intrusions mapped to the southeast of the intrusion.

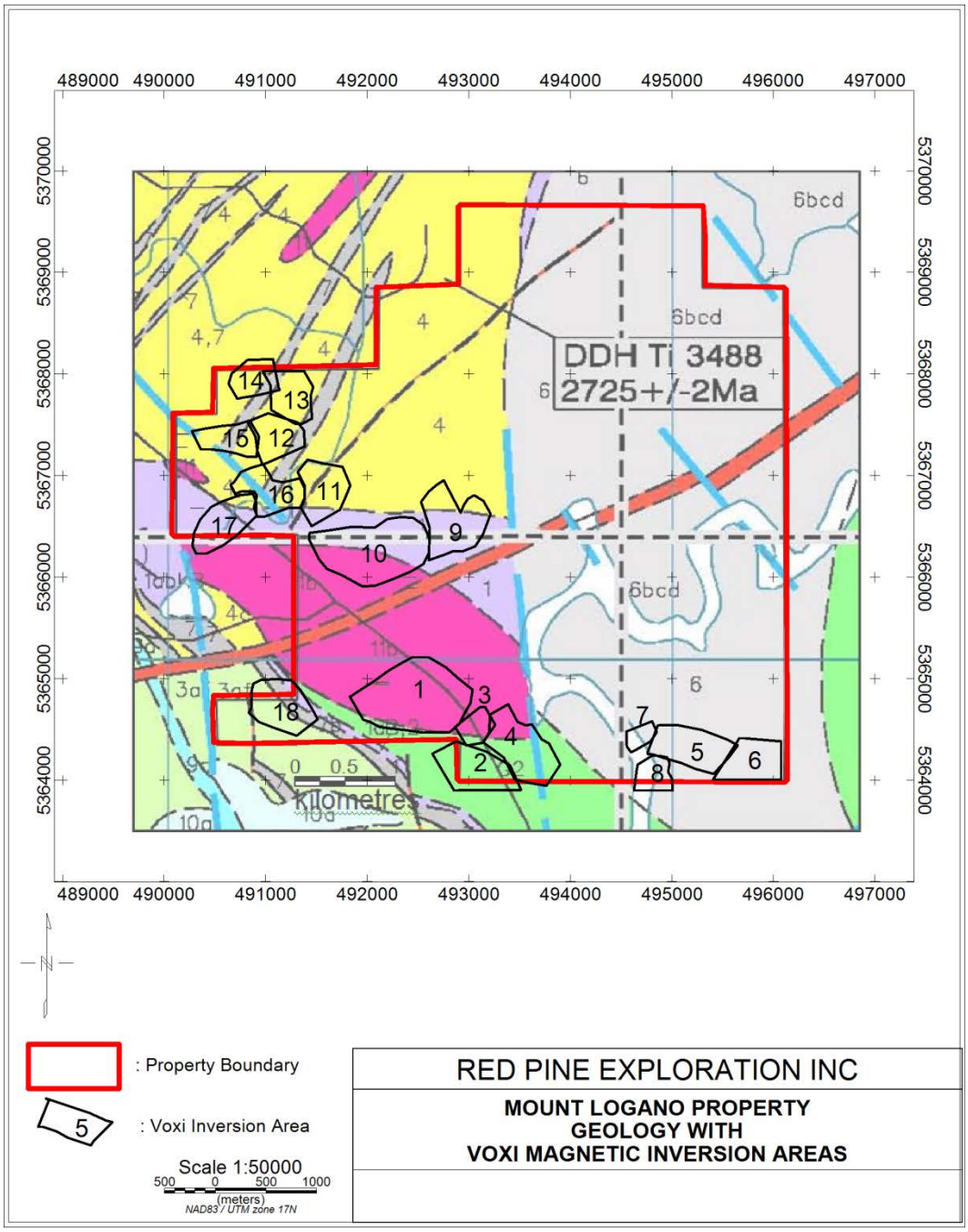

Figure 17 - Mt. Logano Geology with Voxi Magnetic Inversion Areas

Voxi areas 5, 6, 7 and 8 are within the mapped clastic metasedimentary rocks. However these types of rock tend to be weakly magnetic so the areas of elevated magnetic susceptibility are more likely to represent Mafic (to intermediate) Metavolcanic rocks/intrusions. The east side of the area 6 Voxi contains a north-south trending diabase dyke. Voxi areas 9 and 17 are located within mapped ultramfic (to Mafic) Metavolcanic/Intrusions. Area 9 has very high magnetic susceptibility and probably represents the ultramafic rocks, whereas area 17 is weakly magnetic and trends away from the mapped ultramafic and as such is more likely to be related to the Felsic (to intermediate) Metavolcanics Rocks/Intrusives located to the north. Voxi area 10 is moderately magnetic trends roughly East-West and is located within the mapped ultramfic (to Mafic) Metavolcanic/Intrusions. Xoxi areas 11, 12, 13, 14, 15 and 16 are all contained within the mapped Felsic (to intermediate) Metavolcanics Rocks/Intrusives, with a complex magnetic pattern indicative of folding. The Voxi inversion displays these folds convincingly. Finally in the southwest portion of the property is Voxi 18, which is located very close to parallel southeast trending mapped Chemical Metasedimentary Rocks.

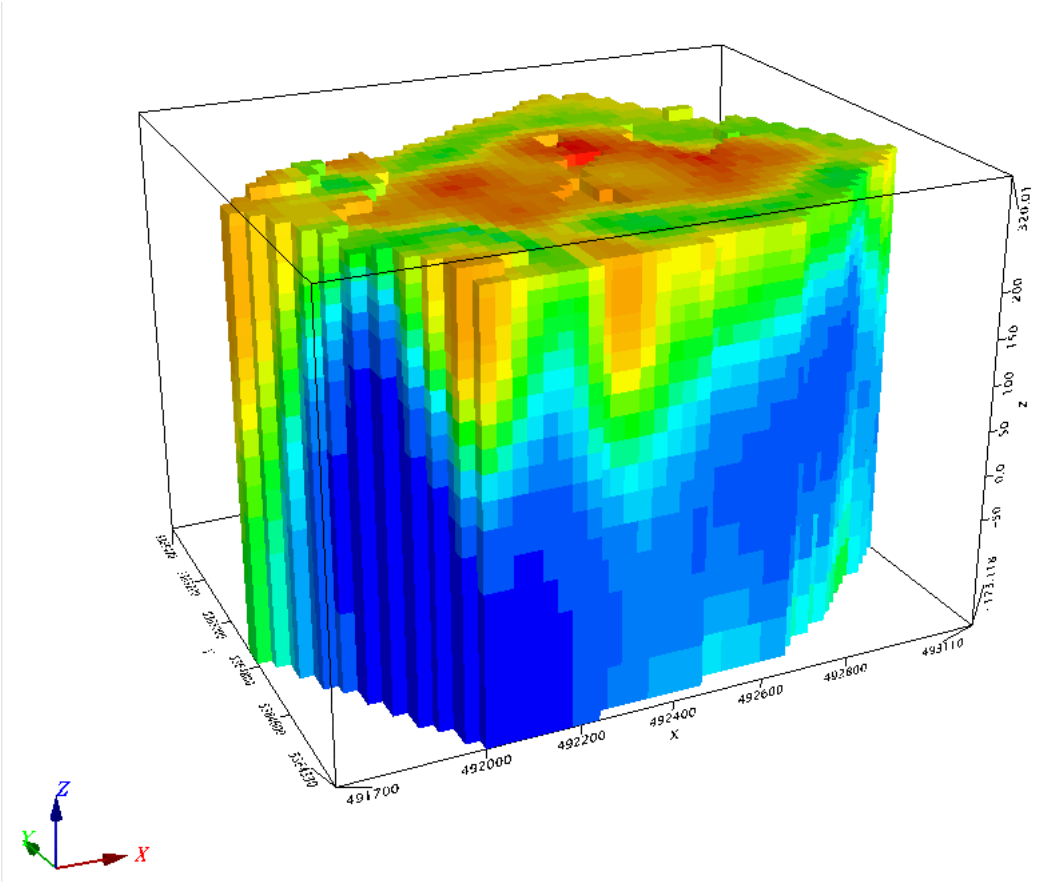

Figure 18 - Area 1 Magnetic Voxi

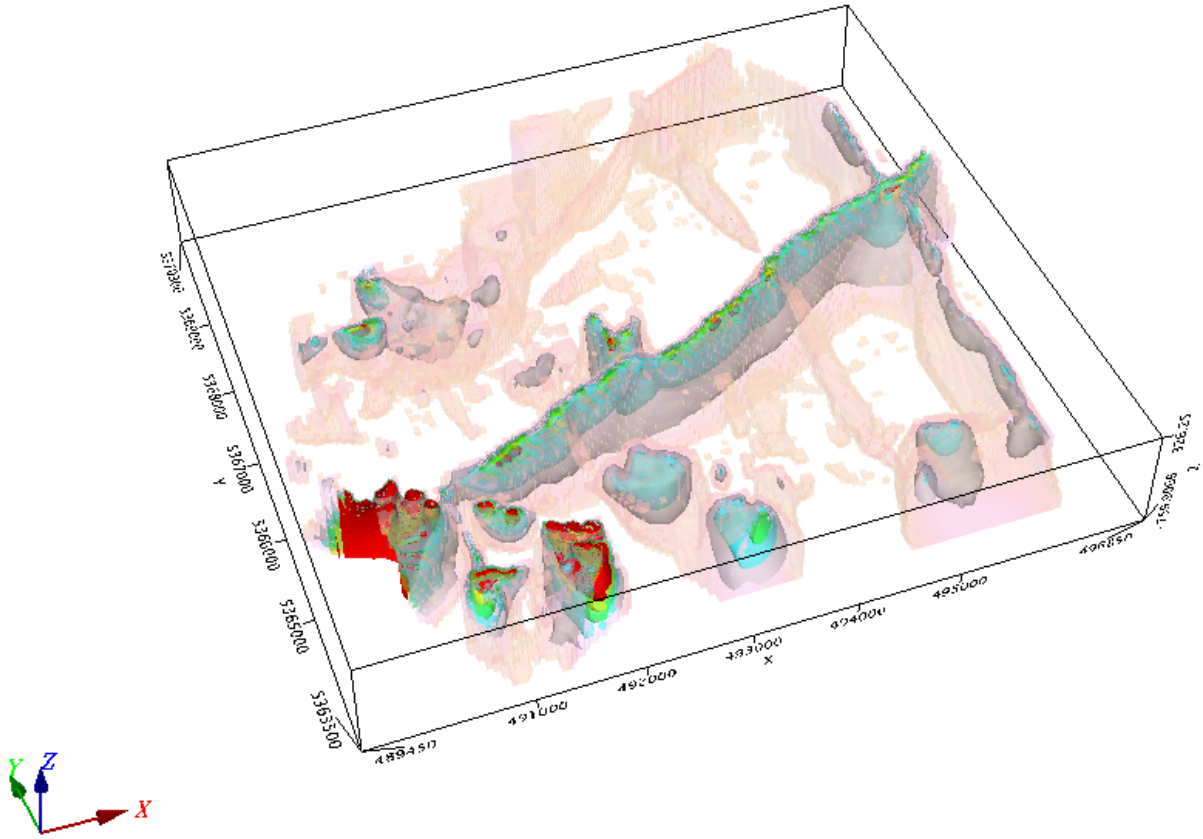

Figure 19- Magnetic Inversion Iso Shells created with the updated DTM data

9.0 Conclusions

The Mt Logano property has very limited outcrop exposure and is comprised mostly of low lying areas of glacial overburden and swamp. The property is difficult to access due to the terrain and therefore hard to explore. Using the eBee UAV to explore the property from the air and gather both high resolution air photos and DTM proved to be very useful.

The air photos were used to help delineate magnetic features from the 2010 Aeroquest Airborne survey. Outcrops, logging roads and other man made features were able to be removed from previous magnetic lineation interpretations. Outcrops were able to be identified in the survey as well, which were also used for the magnetic linear interpretation. The DTM produced by the eBee UAV was more detailed than the 2010 Aeroquest airborne data. This detailed DTM help produced more accurate magnetic inversion models, with a total of 18 models being completed over the property.

The eBee UAV data is a cost effective and highly useful tool for exploration. Both the high resolution aerial photos and DTM help produce more accurate interpretations of previously collected data and can be used in the future for further interpretations and exploration planning.

10.0 Recommendations

The Mt Logano property is in close proximity to several large scale gold producers as well as many more gold projects in the Timmins/Porcupine camp. The property contains the main geologic units which have been shown to be host to world class gold deposits.

Due to some small gaps in the eBee UAV survey, it is recommended that portions of the property be re flown. This will complete a full coverage of the DTM and aerial photos which could help with future interpretations of data on the property. Possible further interpretation of the historical geophysical data could be undertaken to determine if the higher detail DTM and aerial photos can help to re- interpret the data. Using the more detailed DTM may change the depths of historical anomalies and furthermore, drilling of these anomalies.

11.0 Statement of Qualifications

I, Martin St-Pierre, P. Geophysicist of 1382 Deeridge Lane, Coquitlam, BC, V3E 1Y7, do hereby certify that:

- I am a member of the Association of Professional Engineers and Geoscientist of Northwest Territories and Nunavut.
- I have practices my profession in excess of 30 years.
- I certify that by reason of my education and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purpose of this Assessment Report.
- I've worked as an exploration geophysicist for major and junior mining companies.
- Since 2004 I've offered my services as a consultant through my company ST PIERRE Geoconsultant Inc.
- I am the author of several Technical Reports.

Dated in Coquitlam, BC, this 13th day of August, 2015

I, Eric John Steffler of 184 Combe Ave, North York Ontario, Canada, do hereby certify that:

- I have completed an Honors Bachelor of Environmental Studies and Diploma of Excellence in Geographic Information Systems at the University of Waterloo.

- I have practiced my profession for eight years

- I spent 4 years reporting and planning survey information for Airborne Geophysics companies Aeroquest and Geotech

- I spent the 2 years working as a consulting Geomatics technician, involving the collection, modeling and management of Diamond Drilling, Prospecting, Assay, Technical, Geophysical, and UAV Data from a variety of locations within Canada and Madagascar

- I am currently employed as a staff Geomatics Manager involved in a variety of aspects of data collection, modeling and management of mining data

Dated at Toronto, Ontario, this 13th day of August, 2015

I, Quentin Dale Yarie, P. Geo. of 196 McAllister Road, Toronto, Ontario, M3H 2N9, do hereby certify that:

- I am a member of the Association of Professional Geoscientists of Ontario since 2010 (License 1778). I am also a member of the Society of Exploration Geophysicists (144385).
- I have practiced my profession in excess of 25 years
- I certify that by reason of my education and past relevant work experience, I fulfill with the requirements to be a "Qualified Person" for the purpose of this Assessment Report. My relevant work experience for the purpose of my activities identified in this report are:
    - Experience with junior resource companies as a Director of Red Pine Resources (CNDX) and Red Pine Exploration (CNDX). Experience with junior resource companies as Vice President of Exploration of Red Pine Exploration Ltd., Red Pine Exploration Ltd., and Honey Badger Exploration Inc.
    - Continuous work in the mineral exploration and mining industry since 1983. I ran my own geophysical consulting firm from 1990 through 2002. Work has included supervision of grassroots to advanced stage programs which have included airborne and ground geophysics, mapping, geochemical sampling, trenching and drilling. I have reviewed numerous gold, silver, base metals and diamond projects in a wide range of geological environments both in Canada, Mexico, Chile, China, Turkey, Jordan, Italy, and other international destinations.
    - I am the author of several Technical Reports.

Dated at Toronto, Ontario, this _____13th_____ day of ___August_____, 2015

Quentin D. Yarie, P. Geo. (ON)

PROFESSIONAL GEOSCIENTIST
QUENTIN D. YARIE
PRACTISING MEMBER
1778
ONTARIO

12.0 References

Aalborg University, Terrain Modelling DTM Generation using UAVs" by Department of Development and Planning, Surveying and Mapping, 3rd Semester, 2014. http://projekter.aau.dk/projekter/files/198676072/SM4_report_DTM_generation.pdf

Atkinson, B. 2002. A virtual field trip to the geology of Timmins, Ontario. Ontario Geological Survey, Ministry of Northern Development and Mines.

Ayer, J.A. and Trowell, N.F. 1998. Geological Compilation of the Timmins area, Abitibi greenstone belt, Ontario Geological Survey, Preliminary Map P.3379, scale 1:100,000

Bateman, R., Ayer, J.A., Dubé, B. and Hamilton, M.A. 2005. The Timmins–Porcupine gold camp, northern Ontario: the anatomy of an Archaean greenstone belt and its gold mineralization: Discover Abitibi Initiative; Ontario Geological Survey, Open File Report 6158, 90p.

Carlson, H.D. 1967. The Geology of Ogden, Deloro and Shaw Townships, District of Cochrane, Ontario; Ontario Department of Mines Geological Branch, Open File Report 5012, 117p.

Dubé, B., Gosselin, P., 2007. Greenstone-hosted quartz-carbonate vein deposits, in Goodfellow, W.D., ed., Mineral Deposits of Canada: A Synthesis of Major Deposit-Types, District Metallogeny, the Evolution of Geological Provinces, and Exploration Methods: Geological Association of Canada, Mineral Deposits Division, Special Publication No. 5, p. 49-73.

Hunt, D.S. and Maharaj, Deosaran, 1980: Shaw Township, District of Cochrane; Ontario Geological Survey Preliminary Map P. 2091. Timmins Data Series. Scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1980.

Hunt, D. S., MacRae, B. A., and Maharaj, Deosaran, 1981: Whitney Township, District of Cochrane; Ontario Geological Survey Preliminary Map P. 2123, Timmins Data Series. Scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1979.

Hunt, O.S. and Maharaj, Deosaran, 1980: Cody Township, District of Cochrane; Ontario Geological Survey Preliminary Map P.2090, Timmins Data Series. Scale 1:15 840 or 1 inch to ¼ mile. Data compiled 1980.

Hunt, D.S. and Maharaj, Deosaran, 1980: Carman Township, District of Cochrane; Ontario Geological Survey Preliminary Map P.2092, Timmins Data Series. Scale 1:15 840 or 1 inch to ¼ mile.

Pressacco, R., ed. 1999. Special project: Timmins ore deposit descriptions; Ontario Geological Survey, Open File Report 5985, 189p.

Pyke, D. R., 1982: Timmins Area, Ontario Geological Survey Map 2455, Synoptic Series scale 1:50000. Geology and compilation, 1973.

Salo, R.W., 2008

Websites

Northern Mines & Exploration Expo 2009: Timmins & the Porcupine Mining Camp http://canadianminingexpo.com

Geology Ontario: www.geologyontario.mndm.gov.on.ca/

Goldcorp Inc: www.goldcorp.com/operations/porcupine

Mining-technology.com: www.mining-technology.com/projects/kidd_creek/

Ontario Ministry of Northern Development and Mines: www.mndm.gov.on.ca

Timmins Resident Geologist: www.mndm.gov.on.ca/mines/ogs/resgeol/geology/tim_e.asp

Timmins Community Portal: http://portal.timmins.ca

Appendix A: Hyper V GNSS Receiver
Included as separate files

Appendix B: eBee User Manual
Included as separate files

Appendix C: CRSC-PPP Files
Included as separate files

Appendix D: Photos and corresponding Claims List
Included as separate files

Appendix E: Post Flight Terra 3D Processing Procedure
Included as separate files

Appendix F: Mt Logano Postflight Terra 3D Processing Report
Included as separate files

Appendix G: Saga GIS Processing
Included as separate files

Appendix H: High Resolution Images
Included as separate files