

# INDEPENDENT TECHNICAL REPORT

MIKWAM GOLD PROPERTY

Noseworthy Township, Ontario, Canada

# GALENA INTERNATIONAL RESOURCES LTD.

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Date: Dec. 8, 2016

Prepared By:

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- Appendix 3 Representative Cross Sections of the 2006 Drill Holes



# 1.0 SUMMARY

Caracle Creek International Consulting Inc. ("Caracle Creek") of Toronto, Ontario, Canada was contracted by Galena International Resources Ltd. ("Galena International") of Vancouver, British Columbia, Canada, to review and update the Independent Technical Report for the Mikwam Gold Property (the "Property"), originally issued October 16, 2013. The updated Independent Technical Report (the "Report"), compliant with National Instrument 43-101 ("NI 43-101"), companion policy NI 43-101CP and Form 43-101F1, includes a review of the Mineral Resource Estimate also issued in the October 16, 2013 report.

The purpose of this Report is to support Galena International's intention to move from the NEX to the TSX Venture Exchange (TSX-V) using the Mikwan Gold Property as its Qualifying Property. Pursuant to an Option Agreement, dated November 29, 2016 Galena International acquired an option to acquire (the "Option") the Property from ALX Uranium Corp.'s ("ALX"), wholly-owned subsidiary, Alpha Exploration Inc. in consideration of a cash payment of CAD\$25,000 and the issuance of 2,000,000 common shares of Galena International to ALX. In order to exercise the Option, Galena must make additional cash payments totalling CAD \$225,000, or, at Galena's option, issue an aggregate of 2,000,000 additional shares, on or before the third anniversary of the Option Agreement. In addition, on closing of the Acquisition, Galena International will grant ALX a net smelter return royalty (the "NSR Royalty") equal to 0.5% of Net Smelter Returns from the Property. Galena International has the right, at any time, to acquire the NSR from ALX in consideration of a cash payment of C\$1,000,000.

The most recent site visit was completed by Dr. Luc Harnois, Ph.D., P.Geo., from March 7 to 23, 2013. During the 2013 site visit, Dr. Harnois supervised the diamond drilling program, logged drill core and implemented a quality control program. As no additional work (material or otherwise) has been done on the Property since the original report was released in 2013, it was determined that no site visit is required at this time.

The Property is located about 105 km east-northeast of Cochrane, 150 km north-northeast of Kirkland Lake and 160 km northeast of Timmins, and lies within the Noseworthy Township, Larder Lake Mining Division, District of Cochrane, Ontario, Canada.



The Mikwam Gold Property currently consists of nine (9) contiguous claims, totaling 944 ha, located in the Larder Lake Mining Division and held 100% Alpha Exploration Inc. The claims, subject to a recent LOI with Galena International, will be transferred 100% to Galena International upon completion of the Acquisition. The principle target area and subject of the Mineral Resource Estimate, referred to as the A8 3200 vein system area, is situated within the eastern portion of mining claim 3019086 and within mining claim 4246490.

The Property lies in the northern portion of the Precambrian Abitibi Sub-province (Abitibi Greenstone Belt) of the Superior Province of the Canadian Shield. The specific subdivision of the Abitibi Sub-province in which the Property is situated is the Harricana-Turgeon Belt. The Harricana-Turgeon Belt hosts polymetallic deposits and several well-known gold deposits such as the Agnico Eagle mine, the Casa-Berardi mine and the Detour mine.

The Harricana-Turgeon Belt consists of the granitic intrusions, surrounded by felsic to mafic metavolcanic rocks, metasedimentary rocks and minor mafic to ultramafic intrusions. The metavolcanic and metasedimentary rocks have undergone low pressure, contact and regional metamorphism of greenschist-and lower amphibolite-facies. The metamorphic event occurred between 2.6 and 2.7 Ga.

The Casa Berardi Deformation Zone ("CBDZ") is a major, subvertical regional structure 4 to 6 km wide and at least 60 km in length. The CBDZ is crosscut at a low angle by the Casa Berardi fault which is a brittle, schistose zone 0.5 to 5.0 m thick. The position of the CBDZ appears to be controlled by contrasts in regional competence (Pilote et al., 1990).

The area of the Mikwam Property is underlain primarily by mafic metavolcanic, felsic metavolcanic, metasedimentary and felsic intrusive rocks. Pressacco (1994) and Jensen (2002) have divided the geological units in the area into the three domains, separated by two major faults that are most likely part of the CBDZ fault system: Northern Domain, A8 Domain and Southern Domain.

All three domains trend in an east-northeast direction across the Property. Their geometry is complicated by a series of northwest trending transverse structures. The A8 Domain contains the 3200 Vein area which has been the focus of past and present drilling campaigns. This area is a zone of quartz flooding and sulphidization (mainly pyrite and arsenopyrite) at or near the contact of chloritic iron formation and either argillite (hanging wall) or conglomerate (footwall).



Gold mineralization on the Property is associated with quartz-carbonate veins, but the highest gold values occur in highly sulphidized zones, consisting of 5 to 50% pyrite and 1 to 5% arsenopyrite within a highly sericitized, quartz flooded matrix.

In March 2006, ESO Uranium Corp. (subsequently Alpha Minerals Inc. and now ALX Uranium Corp.) completed 18 diamond drill holes totaling 6,383 m on claim 3019086. A mineral resource was also estimated.

In 2013, Alpha Minerals Inc. International completed five diamond drill holes totalling 1,189 m on the Mikwam Property. The drill holes tested the plunge of a high grade mineralized zone and two drill holes tested the A8 zone along strike to the northwest. The drill holes intersected mostly strongly foliated and folded clastic sediments. Gold mineralization is hosted in quartz veins surrounded by silicified and sericitized sedimentary rocks. Minor amounts of pyrite and rare arsenopyrite occur in mineralized intervals. The highest gold values include 5.92 g/t Au over 1.82 m, including 13.7 g/t Au over 0.32 m, in hole AL-13-01 and 11.67 g/t Au over 1.83 m in hole AL-13-02. In addition, parts of five drill holes originally drilled by ESO Uranium in 2006 but not sampled in 2006 were sampled in 2013, to test whether these zones are mineralized. Some intervals in drill hole ESO-06-12 were weakly mineralized but most of the zones did not contain significant mineralization.

Subsequently, the 2006 mineral resource estimate was updated using the 2013 drilling data completed by Alpha Minerals Inc. The Mineral Resource Estimate, presented below, has an effective date of September 19, 2013.

Resource Category	Quantity (Tonnes) <sup>1</sup>	Grade Au (g/t)	Contained Au (Ounces) <sup>2</sup>
Inferred	1,810,000	2.34	136,000

Reported cut-off grade of 1.00 g/t Au. Mineral resources are not mineral reserves and do not have demonstrated economic viability.

On the basis of the current review of the exploration work completed to date and on the current Mineral Resource Estimate, Caracle Creek concludes that there is potential to expand the current mineral resources and that further exploration on the Property is warranted.

 $<sup>^{1}</sup>$ Tonnes have been rounded to the nearest 10,000. Grade has been rounded to two (2) significant digits.

<sup>&</sup>lt;sup>2</sup>Rounded to the nearest 1,000.



Because of the strong structural control of the mineralized zone Caracle Creek recommends a structural interpretation on existing drill core be completed. The structural interpretation will help with selecting drill hole locations. Caracle Creek recommends further drilling contingent on the outcome of the structural interpretation.

# 2.0 Introduction

#### 2.1 Introduction

Caracle Creek International Consulting Inc. ("Caracle Creek") of Toronto, Ontario, Canada was contracted by Galena International Resources Ltd. ("Galena International") of Vancouver, British Columbia, Canada, to review and update the Independent Technical Report for the Mikwam Gold Property (the "Property"), originally issued October 16, 2013. The updated Independent Technical Report (the "Report"), compliant with National Instrument 43-101 ("NI 43-101"), companion policy NI 43-101CP and Form 43-101F1 includes a review of the Mineral Resource Estimate also issued in the October 16, 2013 report.

The purpose of this Report is to support Galena International's intention to move from the NEX to the TSX Venture Exchange (TSX-V) using the Mikwan Gold Property as its Qualifying Property. Pursuant to an Option Agreement, dated November 29, 2016, Galena International acquired an option to acquire (the "Option") the Property from ALX Uranium Corp.'s ("ALX") wholly-owed subsidiary, Alpha Exploration Inc. in consideration of a cash payment of CAD\$25,000 and the issuance of 2,000,000 common shares of Galena International to ALX. In order to exercise the Option Agreement, Galena must make additional cash payments totalling CAD \$225,000, or, at Galena's option, issue an aggregate of 2,000,000 additional shares, on or before the third anniversary of the Option Agreement. In addition, on closing of the Acquisition, Galena International will grant ALX a net smelter return royalty (the "NSR Royalty") equal to 0.5% of Net Smelter Returns from the Property. Galena International has the right, at any time, to acquire the NSR from ALX in consideration of a cash payment of C\$1,000,000.

The most recent site visit was completed by Dr. Luc Harnois, Ph.D., P.Geo., from March 7 to 23, 2013. During the 2013 site visit, Dr. Harnois supervised the diamond drilling program, logged drill core and implemented a quality control program. As no additional work (material or otherwise) has been done on

Independent Technical Report Mikwam Gold Property, Noseworthy Township, Ontario Galena International Resources Ltd.

Caracle Creek

the Property since the original report was released in 2013, it was determined that no site visit is required

at this time.

Main sources of information used for the preparation of this Report include text from three previous

Technical Reports (Kelso and Harnois, 2006; Kelso and Harnois, 2013; Baker et al., 2013) and literature

and reports quoted in the reference section of this Report.

2.2 **Terminology** 

**Alteration:** Alteration is a mineralogical change at low pressures due to invading fluids or the influence of

oxygen (http://geology.about.com).

Atomic absorption spectroscopy (AAS): AAS is a spectro-analytical procedure for the quantitative

determination of chemical elements, employing the absorption of optical radiation (light) by free atoms in

the gaseous state (http://en.wikipedia.org).

**DGPS**: Differential GPS, enhancement to Global Positioning System providing sub-metre accuracy.

QA/QC: Quality Assurance/Quality Control.

2.3 Units

The Metric System is the primary system of measure and length used in this Report and is generally

expressed in kilometres (km), metres (m) and centimetres (cm); volume is expressed as cubic metres (m<sup>3</sup>),

mass is expressed as metric tonnes (t), area as hectares (ha), and gold and silver concentrations as grams

per tonne (g/t). Conversions from the Metric System to the Imperial System are provided below and quoted

where practical. Many of the geologic publications and more recent documents now use the Metric System

but older documents almost exclusively refer to the Imperial System. Metals and minerals acronyms in this

report conform to mineral industry accepted usage and the reader is directed to

www.maden.hacettepe.edu.tr/dmmrt/index.html for a glossary.

Conversion factors utilized in this report include:

1 troy ounce/ton = 34.285714 grams/tonne

Dec. 8, 2016



- 1 gram/tonne = 0.029167 troy ounces/ton
- 1 troy ounce = 31.103477 grams
- 1 gram = 0.032151 troy ounces

The term gram/tonne or g/t is expressed as "gram per tonne" where 1 gram/tonne = 1 ppm (part per million) = 1000 ppb (part per billion). The mineral industry accepted terms Au g/t and g/t Au are substituted for "grams gold per metric tonne" or "g Au/t". Other abbreviations include ppb = parts per billion; ppm = parts per million; oz/t = troy ounce per short ton; Moz = million ounces; Mt = million tonne; t = tonne (1000 kilograms); SG = specific gravity; lb/t = pound/ton; and, st = short ton (2000 pounds).

Where quoted, Universal Transverse Mercator (UTM) coordinates are provided in the datum of Canada, NAD 83, Zone 17U North.

## 2.4 Caracle Creek Qualifications

Caracle Creek International Consulting Inc. is an international consulting company with the head office of Canadian operations based in Sudbury, Ontario, Canada. Caracle Creek provides a wide range of geological and geophysical services to the mineral industry. With locations in Canada (Sudbury and Toronto, Ontario and Vancouver, British Columbia) and South Africa (Johannesburg), Caracle Creek is well positioned to service its international client base.

Caracle Creek's mandate is to provide professional geological and geophysical services to the mineral exploration and development industry at competitive rates and without compromise. Caracle Creek's professionals have international experience in a variety of disciplines with services that include:

- Exploration Project Generation, Design and Management.
- Data Compilation and Exploration Target Generation.
- Property Evaluation, Valuation and Due Diligence Studies.
- Independent Technical Reports (43-101)/Competent Person Reports.
- Mineral Resource/Reserve Modelling, Estimation, Audit; Conditional Simulation.
- 3D Geological Modelling, Visualization and Database Management.



In addition, Caracle Creek has access to the most current software for data management, interpretation and viewing, manipulation and target generation.

The primary Qualified Person and co-author of this Report is Dr. Scott Jobin-Bevans (Ph.D., P.Geo.). Dr. Jobin-Bevans is a Director and President & CEO of Caracle Creek, and a geologist in good standing with the Association of Professional Geoscientists of Ontario (APGO #0183). He has over 25 years of experience in the mineral exploration industry and in academia and has authored/co-authored numerous Independent Technical Reports (NI 43-101). Dr. Jobin-Bevans is responsible for the entire Report, except Section 12.1 (Caracle Creek Site Visit; Luc Harnois) and Section 14.0 (Mineral Resource Estimates; Jason Baker). Dr. Jobin-Bevans did not visit the Property.

The second Qualified Person and co-author of this Report is Dr. Luc Harnois (Ph.D., P.Geo.). Dr. Harnois is a Senior Associate Geologist for Caracle Creek and a geologist in good standing with the Ordre des Géologues du Québec (OGQ #478). He has several years of experience in the mineral exploration industry and in academia and has authored/co-authored several Independent Technical Reports (NI 43-101). Dr. Harnois is responsible for Section 12.1 (Caracle Creek Site Visit) of this Report. Dr. Harnois visited the Property on January 18, 2013 and supervised the most recent diamond drilling program on the Property between March 7 and 23, 2013.

The third Qualified Person and co-author for this Report is Mr. Jason Baker (B.Eng., P.Eng.). Mr. Baker is a Geological Engineer (Associate) with Caracle Creek and an engineer in good standing with the Association of Professional Engineers of Nova Scotia (APENS#9627). Mr. Baker has over 12 years of experience in geological modelling and resource calculations in both exploration (gold, lead & zinc, potash) and operations (coal, gypsum, lead and zinc). Jason Baker is responsible for Section 14.0 (Mineral Resource Estimates) of this Report. Mr. Baker did not visit the Property.

Certificates of Qualifications are provided in Appendix I.

# 3.0 RELIANCE ON OTHER EXPERTS

Caracle Creek has completed this Report in accordance with the methodology and format outlined in National Instrument 43-101, companion policy NI 43-101CP and Form 43-101F1. This Report was



prepared by competent and professional individuals from Caracle Creek on behalf of Galena International and is directed solely for the development and presentation of data with recommendations to allow Galena International and current or potential partners to reach informed decisions.

The information, conclusions and recommendations contained herein are based on a review of digital and hard copy data and information supplied to Caracle Creek by Galena International, as well as various published geological reports, and discussions with representatives from Galena International who are familiar with the Property and the area in general. Caracle Creek has assumed that the reports and other data listed in the "References" section of this report are substantially accurate and complete.

Caracle Creek has relied on information in the public domain regarding land tenure and underlying agreements (Jensen, 2003 and Beta Minerals Inc. News Release, March 19, 2003; as quoted below). The non-public source of information regarding land tenure was provided to the authors by Galena International and reviewed by Caracle Creek. The public source of information regarding land tenure is the Ministry of Northern Development and Mines ("MNDM") and their mining claims information website (<a href="https://www.mci.mndm.gov.on.ca/claims/clm\_mmen.cfm">https://www.mci.mndm.gov.on.ca/claims/clm\_mmen.cfm</a>). Caracle Creek did not conduct an in-depth review of mineral title and ownership and the title ownership and status of claims as outlined in this Report was obtained from Galena International. While title documents and option/purchase agreements were reviewed for this study as provided by Galena International, it does not constitute, nor is it intended to represent, a legal, or any other opinion as to title.

The dates, titles and authors of all reports that were used as a source of information for this Technical Report are listed in the "References" section of this report. The dates and authors of these reports also appear in the text of this Report where relevant, indicating the extent of the reliance on these reports.

# 4.0 Property Description and Location

## 4.1 Location

The Mikwam Gold Property is located about 105 km east-northeast of Cochrane, 150 km north-northeast of Kirkland Lake and 160 km northeast of Timmins, and lies within Noseworthy Township, Larder Lake Mining Division, District of Cochrane, Ontario, Canada (Figure 4-1). The Mikwam Property is centered at



approximately 592722m E, 5482692m N, and lies within map sheets 32E/05 and 32E/12 of the National Topographic System ("NTS").

# 4.2 Description and Ownership

The Mikwam Gold Property currently consists of nine (9) contiguous claims, totaling 944 ha, located in the Larder Lake Mining Division and held 100% Alpha Exploration Inc. The principle target area and subject of the Mineral Resource Estimate, referred to as the A8 3200 vein system area, is situated within the eastern portion of mining claim 3019086 and within mining claim 4246490.

The Mikwam Gold Property currently consists of nine (9) contiguous claims, totaling 944 ha, located in the Larder Lake Mining Division and held 100% Alpha Exploration Inc. On November 2, 2012, ESO Uranium changed its name to Alpha Minerals Inc. (Alpha Minerals Inc. News Release, October 31, 2012).

Pursuant to an arrangement with Fission Uranium Corp. in December, 2013, the claims were transferred by Alpha Minerals Inc. to Alpha Exploration Inc. (Alpha Minerals Inc. New Release, December 2, 2013). Pursuant to a business combination between Alpha Minerals Inc. and Lakeland Resources Inc., in September, 2015, Alpha Exploration Inc. became a wholly-owned subsidiary of ALX Uranium Corp. (formerly Lakeland Resources Inc.) (Alpha Exploration Inc. News Release, September 23, 2015).

Pursuant to an Option Agreement dated November 29, 2016, between ALX Uranium Corp. and Galena International Resources Ltd., Galena acquired an option (the "Option") to acquire a 100% interest (subject to certain NSR interests disclosed below) in the nine claims comprising the Mikwam Gold Property from ALX in consideration of a Cash Payment of CAD \$25,000 and the issuance of 2,000,000 common shares. Under the terms of the Option Agreement, in order to exercise the Option and acquire the Mikwam Gold Property (the "Acquisition"), Galena must make aggregate cash payments totalling CAD \$225,000 or, at Galena's option, issue an aggregate of 2,000,000 common share to ALX, on or before the 3rd anniversary of the Option Agreement.

The current status of the claims is summarized in Table 4-1 and shown in Figure 4-2. The principle target area and subject of the Mineral Resource Estimate, referred to as the A8 3200 vein system area, is situated within the eastern portion of mining claim 3019086 and the western portion of claim 4246490.



In Ontario, to retain a mining claim, companies must submit an assessment file to MNDM's Geoscience Assessment Office showing that they have spent a minimum of \$400/per claim unit on exploration per year. One claim unit is equal to 16 hectares.

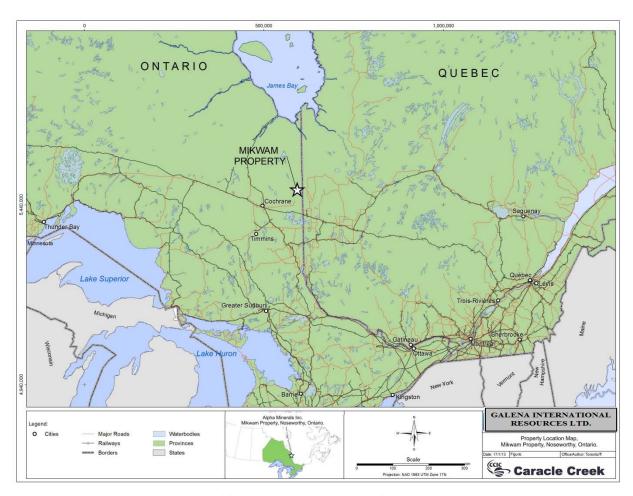


Figure 4-1. Location of the Mikwam Gold Property in Ontario, Canada.

Table 4-1. List of mining claims on the Mikwam Gold Property, Ontario, Canada.

Claim#	Township	Claim Holder*	Claim Due	Reserve (\$)	#Units	Area (ha)
3017411	Noseworthy	Alpha Exploration Inc.	2018-Mar-16	\$0	1	16
3019086	Noseworthy	Alpha Exploration Inc.	2018-Feb-01	\$1,585,679	14	224
4219736	Noseworthy	Alpha Exploration Inc.	2018-Apr-24	\$6,652	11	176
4246490	Noseworthy	Alpha Exploration Inc.	2018-Jan-13	\$126,780	1	16
4249335	Noseworthy	Alpha Exploration Inc.	2018-Nov-17	\$0	9	144
4249336	Noseworthy	Alpha Exploration Inc.	2018-Nov-17	\$0	7	112
4249337	Noseworthy	Alpha Exploration Inc.	2018-Nov-17	\$0	7	112



				Total:	59	944
4255969	Noseworthy	Alpha Exploration Inc.	2018-Nov-15	\$0	3	48
4249339	Noseworthy	Alpha Exploration Inc.	2018-Nov-17	\$0	6	96

<sup>\*100%</sup> owned by Alpha Minerals Inc.

The original claims comprising the Mikwam Property acquired by Essendon Solutions Inc. (Alpha Minerals Inc.) were subject to an aggregate 0.804% net smelter royalty and aggregate secured payments of \$402,000 payable to Freewest Resurces Inc. ("Freewest") and Newmont Mining Corporation ("Newmont") and to aggregate 18.62% net profit interests payable to Newmont and Golden Shield Resources.

The surface rights are owned by the Crown.

Legal access to the Property is by helicopter or on trails by snowmobile during the winter months.

Caracle Creek is not aware of any other royalties, back-in rights, payments or other agreements and encumbrances to which the Property is subject, other than the ones mentioned above.

Caracle Creek is not aware of any environmental liabilities to which the Property is subject.

As of April 1, 2013, exploration permits are required for drilling in Ontario. Permit applications are to be submitted to the Ontario Ministry of Northern Development and Mines Exploration and Development Office at least 55 days prior to the start of drilling or any other exploration activity that requires permitting.

Caracle Creek is not aware of any other significant factors and risks that may affect access, title or the right or ability to perform work on the Property.



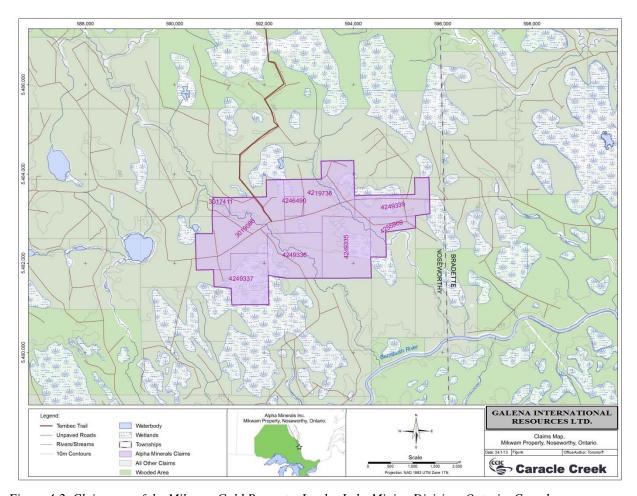


Figure 4-2. Claim map of the Mikwam Gold Property, Larder Lake Mining Division, Ontario, Canada.

# 5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY

#### 5.1 Access

The Mikwam Gold Property lies within Noseworthy Township, Larder Lake Mining Division, and District of Cochrane, Ontario. A northeast-southwest running gravel road is located 18 km north of the Property. The gravel road connects to the north-south running, paved Road 652 that is located west of the Property.



The gravel road leads to an old logging camp that used to be operated by Tembec ("Tembec camp"). The camp is located ~20 km north of the Property.

Access to the Property during the winter months is by skidoo on an approximately 22 km long logging trail ("Tembec trail") from the Tembec camp. The trail connects to the gravel road at 580269E 5498978N (UTM NAD83) and runs southeast to the drilling area (Figure 12-1). It may not be possible to use this trail in spring, summer and fall when the Property is only accessible by helicopter.

# 5.2 Climate and Vegetation

The mean monthly temperature ranges from -18.2°C in January to 16.9°C in July in La Sarre, the closest weather station, located 85 km southeast of the Property (http://climate.weatheroffice.gc.ca). Precipitation is up to 50 cm per month of snow in the winter and up to 110 mm per month of rain in the summer. Snow cover, which can accumulate to 65 cm, generally appears in October and disappears in April. Daylight hours range from a minimum of 8 h at the winter solstice to a maximum of 16 h at the summer solstice (http://www.theweathernetwork.ca).

The Property lies within the Boreal Forest Region and is subdivided into two subsections; the Northern Clay and the Hudson Bay Lowlands. The Northern Clay Subsection has large stretches of black spruce, which cover the gently rising ground as well as the lowland flats, where the trees alternate with extensive sedge and sphagnum moss swamps. Better drained areas contain mixed stands of white birch, poplar and white and black spruce. Stands of jack pine are found on outwash deposits, old beaches and eskers.

Drilling in swamps is best performed in the winter time, when water is frozen. Geological mapping and outcrop sampling can be conducted May to November when there is no snow on the ground.

# 5.3 Physiography

The Property area is flat and swampy with an average elevation of 275 m ASL (ranging from 260 m to 300 m). The thickness of Pleistocene glacial deposits is approximately 25 to 40 m and up to 65 m. Eskers form south- to southeast-trending ridges which rise slightly above the surrounding ground. Drainage in the area is generally poor as evidenced by the abundance of muskeg swamps. The majority of the Burntbush area, where the Property is located, is drained by the Burntbush-Turgeon river system which flows into James



Bay (Figure 4-2). Water for diamond drilling is available from several lakes, ponds and perennial creeks on the Property.

The general area of the Property is blanketed by a thick overburden (up to 65 m) consisting of Pleistocene glacio-lacustrine deposits formed during the retreat of the Wisconsin glaciation and subsequent readvancement of the Cochrane lobe. This cycle of deposition come to an end approximately 8,000 years before present at the beginning of the Holocene (Johns, 1982).

#### 5.4 Infrastructure and Local Resources

The nearest cities in Ontario are Cochrane, Iroquois Falls, Kirkland Lake, and Timmins, and the nearest city in Quebec is La Sarre (Figure 5-1).

- Timmins is 160 km southwest and has a population of 43,165 (Statistics Canada, 2011 census: http://www12.statcan.gc.ca). Mining of gold and other commodities such as silver, zinc, copper, and nickel is the primary industry in the area. Timmins is a regional government and commercial service centre for much of north-eastern Ontario and can provide all of the necessary infrastructure and technical support for mineral exploration.
- Cochrane is 105 km southwest is situated on Highway 11 and has a population of 5,340 (Statistics Canada, 2011 census: http://www12.statcan.gc.ca). The main industries in Cochrane are railway maintenance, tourism, and forestry.
- Iroquois Falls is 105 km southwest and has a population of 4,595 (Statistics Canada, 2011 census: http://www12.statcan.gc.ca). The town is supported by forestry.
- Kirkland Lake is 150 km south has a population of 8,133 (Statistics Canada, 2011 census: http://www12.statcan.gc.ca). Kirkland Lake Gold Inc. operates five major gold mines and is based in Kirkland Lake. These operations include the Macassa, Kirkland Minerals, Teck-Hughes, Lake Shore and Wright Hargreaves mines, which have produced 22 million ounces (684,000 kg) of gold. The population of Kirkland Lake has been in steady decline since peaking in the 1970s.
- La Sarre, Quebec is 85 km southeast and has a population of 7,719 (Statistics Canada, 2011 census: http://www12.statcan.gc.ca). La Sarre is the economic hub of Abitibi-Ouest. Agriculture and forestry are the main industrial sectors. Other types of activity, including tourism, contribute to the economy. La Sarre is the closest town to the Casa Berardi gold mine.



Access to these population centres is on Highway 652 (as described in Section 5.1) and Highways 11 and 578 (Cochrane), Highways 101 (Timmins), Highways 11 and 66 (Kirkland Lake) and Highways 101, 388 and 393 (La Sarre).

The two nearest hydroelectric stations include the Abitibi Station, located 113 km north of Cochrane, and the Lower Sturgeon Station, located 48 km northwest of Timmins (ww.opg.com/power/hydro). There is no power line going through or near the Property.

There is a northwest-southeast creek less than 500 m from the 2006 drilling area which can provide enough water for the drill rig(s). There are also several small lakes (150-500 m in diameter) scattered throughout the Property. The surface rights of the Property are owned by the Crown.

Galena International's Mikwam Project is in the exploration stage, therefore discussion on potential tailings storage areas, potential waste disposal areas, heap pad leach pad areas and potential processing tailings storage area for mining operations is not relevant.



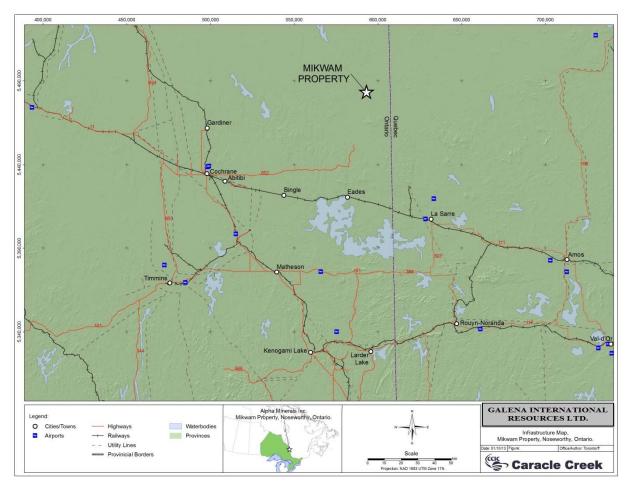


Figure 5-1. Infrastructure map of the Mikwam Gold Property.

# 6.0 HISTORY

The Geological Survey of Canada ("GSC") and the Ontario Geological Survey ("OGS") surveyed the Burntbush River and surrounding areas during the 20th century (Tanton, 1914; Hopkins, 1918; Thomson, 1934; Lumbers 1959, 1960; Bennett, 1966; Wilson, 1979; Johns, 1982).

In 1913 gold was reported to have been found near the mouth of the Patten River, about 3.2 km west of the Ontario provincial boundary near the Bradette and St. Laurent Township boundary. The rock in the vicinity



was reported to be an altered quartz gabbro with narrow quartz veins containing pyrite, calcite and some visible gold (Johns, 1982).

In 1931-1933 gold was found on the east side of the Burntbush River, at the second long rapid about 6 km above the Kabika River in Noseworthy Township. The exposed rock was reported to consist largely of acid (felsic) lava with quartz and quartz-carbonate veins and veinlets. The highest assay result obtained was 2 g/t Au. Pyrite was the only metallic mineral reported and no visible gold was observed (Johns, 1982).

The original Mikwam Property consisted of 588 unpatented contiguous single mining claims units totaling 9,518 ha. The history of exploration on the current claims of Galena International is summarized in Table 6-1. The list of most of the historical drill holes is included in Appendix 2 of this Report.

Table 6-1 History of exploration on the Mikwam Property

Year	Company	Assessment file/work report number	Work done
1959	Tazin Mines Ltd.	20000004917	3 drill holes totalling 305 m.
1965	Rio Tinto	32E12SE0064	magnetic, EM and gravity surveys
1973	Dome Exploration Canada Ltd.	32E12SE0092	mag and EM survey
1978	Ontario Geological Survey		Regional geological mapping. OGS Report 199.
1981	Newmont		Staked Mikwam Property.
1983	Newmont	32E12SE0047	EM and mag survey
1983	Newmont	32E12SE0087	IP survey
1983	Newmont	32E12SE0088	5 drill holes totaling 925.98 m (262 holes)
1983	Noranda	32E12SE0089	ground mag and Horizontal Loop EM survey
1984	Newmont	32E12SE0068	overburden drilling, 44 holes totaling 644.04 m
1984	Newmont	32E12SE0042	9 drill holes totaling 2205.23 m
1985	Newmont	32E12SE0083	overburden drilling, 28 holes totaling 977.19 m
1985	Newmont	32E12SE0029	spheroidal gold study in till concentrates
1985	Newmont	32E05NW0016	26 drill holes totaling 3542.39 m
1985	Newmont	32E12SE0084	mag survey
1985	Newmont	32E12SE0981	IP/resistivity survey 9.65 line km, max-min, VLF-resistivity (25 km)
1986	Newmont	32E05NE0036	2 drill holes totaling 579 m
1986	Newmont	32E12SE0080	14 drill holes totaling 4455 m
1986	Newmont	32E12SE0081	ground mag survey
1987	Newmont	32E05NE0033	7 drill holes totaling 2030.88 m
1987	Noranda	32E05NW9316	airborne mag and VLF survey
1990	Mikwam J.V. (Pamorex, Noranda, Freewest)	32E12SE0014, 32E12SE0072, 32E12SE0020	8 drill holes totaling 2326.3 m (MK 90)
1990	Noranda	32E12SE0071	IP survey



Year	Company	Assessment file/work report number	Work done
1992	Mikwam J.V. (Trader Resources, Hemlo, Royal Oak)	32E12SE0002	9 drill holes totalling 2,597 m done by Royal Oak.
1994	Mikwam J.V. (Trader Resources, Hemlo, Royal Oak)	32E05NE0024, 32E12SE0004	9 drill holes totalling 2,893 m done by Royal Oak.
1997	Mikwam J.V. (Highwood, Battle Mountain, Royal Oak)	32E12SE0003	11 drill holes totalling 3,670 m done by Royal Oak.
1998	Mikwam J.V. (Highwood, Battle Mountain, Royal Oak)	32E05NE2001	Line cutting and soil geochemical survey.
1999	HRL Mikwam J.V.		Airborne magnetic and EM survey.
2005	ESO Uranium Corp.	20000000614	AeroTEM survey
2008	ESO Uranium Corp.		VLF-EM survey
2009	ESO Uranium Corp.		Stream sediment sampling

## 6.1 Tazin Mines Ltd.

In 1959, Tazin Mines Ltd. completed a drill program consisting of 3 drill holes totaling 305 m (Work report number: 20000004917). The drill holes intersected altered sediments, with minor graphite, talc schist and minor disseminated to massive sulphides consisting of pyrite and pyrrhotite. The best interval returned 0.31 g/t Au gold and 3.42 g/t Ag over 0.3 m.

## 6.2 Rio Tinto

In1964 and 1965, Rio Tinto completed several geophysical surveys on the area of the Galena International' claims. The survey consisted of ground electromagnetic, magnetic and gravimetric surveys (Assessment file number: 32E12SE0064). The line spacing was 100 feet with 400 feet cross lines. The purpose of the surveys was to locate conductors and obtain their magnetic susceptibility and specific gravity in order to explore for base metal sulphide bodies. The survey identified two well defined conductors striking west-southwest and four more less distinct conductors striking southwest. No major magnetic anomaly was located. The conclusion was that there is no further base metal interest in these conductors and was not followed up with drilling.



# 6.3 Dome Exploration Canada Ltd.

In 1973, Dome completed Turam electromagnetic and magnetic surveys, performed by Geosearch Consultants Ltd. (Assessment file number: 32E12SE0092). The purpose of the survey was to locate conductors and asses them with a magnetometer survey in order to locate base metal ore bodies. A zone of multiple conductors was identified that corresponds to a band of metasedimentary rocks on the geological map. Little magnetic relief was found in the area. No follow up drilling was completed on the Galena International' claims.

# 6.4 Newmont

In 1981 Newmont staked the area of the current Mikwam Property.

During January to March, 1982, Rayan Exploration Limited of North Bay, Ontario, was contracted to complete a total field magnetic with a Scintex MP-2 proton precession magnetometer and a Barrington base station magnetometer and Apex Parametrics Max Min II (HLEM) surveys, with frequencies 444hz, 888hz and 1777hz at a coil spacing of 150 m, on 625.8 km of cut grid lines in Hoblitzell, Noseworthy and Bradette Townships (Assessment file number: 32E12SE0047). The purpose of the survey was to detect zones of disseminated sulphide mineralization that thought to be potentially gold bearing. Data interpretation was by completed by R.A. Markov, Newmont personnel, between December 1982 and February 1983. Normal data reduction and magnetic correction were completed and the interpretation identified numerous conductors (Markov, 1983).

In 1982 Newmont also completed an IP survey to identify disseminated sulphide zones that may host gold mineralization (Assessment file number: 32E12SE0087). Several high chargeability zones were identified and later drill tested.

In 1984 and 1985, Newmont completed two overburden drilling programs consisting of 72 holes totaling 1621.23 m (Assessment file numbers: 32E12SE0068, 32E12SE0083). Gold assays from the 1984 program returned values up to 54,910 ppb. Diamond drilling and additional overburden drilling was proposed to follow up the anomalies. The 1985 program consisted of 17 holes and tested the anomalous zones identified with the earlier survey with more detailed overburden drilling. The highest gold value was 29,705 ppb (29.71 g/t Au).



In 1985, Newmont contracted W. Mueller to perform an examination of spheroidal gold in glacial till concentrates from the Mikwam Property (Assessment file number: 32E12SE0029). The purpose of the work was to determine the composition and the origin of the samples. No significant results were concluded from the study.

In 1985, Newmont completed a magnetic survey covering newly staked claims in 1984 (Assessment file number: 32E12SE0084). No significant results were reported.

During June and July, 1985, a Max Min II (HLEM) survey using an Apex Parametrics unit was completed with frequencies 444hz and 1777hz at a coil spacing of 150 m on 200 metre line spacing and an Induced Polarization (IP) survey with a Chrone IP receiver and a Phoenix IPT-1 transmitter with a dipole-dipole array using an electrode spacing of 25 m (Assessment file number: 32E12SE0981). The spacing was increased to 50 m to allow for penetration of the thicker overburden (Limion, 1985).

In 1985 and 1986, Newmont completed line cutting and a major ground magnetic survey on the Property (Assessment file number: 32E12SE0081). The survey identified a large high magnetic feature trending west-northwest (100°). The zone is approximately 1 km wide and other parallel trends are associated with it.

Between 1983 and 1987, Newmont completed six drill programs consisting of 63 drill holes totaling 13,738.48 m, several of which fall on the Galena International' claims (Table 6-2) (Assessment file numbers: 32E12SE0088, 32E12SE0042, 32E05NW0016, 32E05NE0036, 32E12SE0080 and 32E05NE0033). Best results include 2.24 g/t Au over 1.5 m in hole 260-85-A-6 and 15.26 g/t Au over 0.3 m in hole 260-85-A-8, 17.18 g/t Au over 1 m in hole MK-84-2, 1.1 g/t Au over 0.6 m in hole 262-86-4, and 3.02 g/t Au over 2.3 m, and 2.82 g/t Au over 1.2 m in drill hole 262-86-8.

## 6.5 Noranda

In 1983, Noranda completed ground magnetometer and Horizontal Loop Electromagnetic (HLEM) surveys on several areas in the Noseworthy and Bradette townships (Assessment file number: 32E12SE0089). The survey identified several conductors, most of which were believed to be caused by graphite and pyrite bearing rocks. Two conductive anomalies were coincident with or in close proximity to high magnetic zones, which were concluded to be caused by iron formations.



In 1986, Noranda completed a helicopter borne magnetometer and Very Low Frequency (VLF) EM survey performed by Dighem Surveys and Processing Inc. of Mississauga (Assessment file number: 32E05NW9316). The survey identified a major magnetic linear feature trending northeast and several crosscutting dikes and faults. The VLF survey failed to produce any significant results.

## 6.6 Mikwam Joint Venture (Pamorex, Noranda, Freewest)

In December 1990, Noranda conducted an IP survey on their properties in the Noseworthy Township, which included the Mikwam Property (Assessment file number: 32E12SE0071). The recorded holder of the claims is Newmont. The survey was performed by Exsics Exploration Ltd. of Timmins. The purpose of the survey was to test several lines previously surveyed with conventional EM techniques. The survey identified two significant anomalies; the main feature strikes across the entire survey area and a weaker zone, which may represent a stringer type response striking south-west off the main zone. Drilling was recommended.

In September of 1990, Noranda drilled eight holes totaling 2,623.3 m (Assessment file numbers: 32E12SE0014, 32E12SE0072, 32E12SE0020). The claims were under a joint venture agreement between Noranda, Freewest and Pamorex. The drill holes intersected felsic to intermediate volcanic rocks, minor mafic volcanic rocks and metasedimentary rocks with disseminated to massive sulphides consisting of pyrite and pyrrhotite. The alteration minerals include carbonate, sericite and chlorite. The best interval returned 0.74 g/t Au over 1.7 m in hole MK-90-2.

# 6.7 Mikwam Joint Venture (Trader, Hemlo, Freewest)

In June and July of 1992, Trader Resource Corporation completed a drill program that consisted of nine drill holes totaling 2,597 m (Assessment file number: 32E12SE0002). The drill holes intersected volcanic rocks, metasedimentary rocks and iron formation. Alteration minerals include albite, hematite and chlorite. The best interval yielded 5.61 g/t Au over 7.2 m, including 8.157 g/t Au over 4.3 m at a vertical depth of 160 m. The most significant assays are hosted within semi-massive pyrite and associated pyrrhotite, which may represent an iron formation.



# 6.8 Mikwam Joint Venture (Trader, Hemlo, Royal Oak, Newmont)

In 1994, Trader Resources completed a drill program consisting of nine drill holes totaling 2,893 m (Assessment file numbers: 32E05NE0024, 32E12SE0004). The drill program was successful in tracing the 3200 vein over a strike length of over 200 m. The vein has an east-west trend and dips approximately 75° to the north. The drill holes intersected mostly metasedimentary rocks and iron formation. The best intersection returned 1.44 g/t Au over 1.5 m in drill hole MK-94-13.

# 6.9 Mikwam Joint Venture (Highwood, Battle Mountain, Royal Oak)

In 1997, Royal Oak completed a drill program that consisted of eleven drill holes totaling 3,670.4 m (Assessment file number: 32E12SE0003). Three of the drill holes tested the 3200 vein, the other holes tested geophysical and geochemical targets. Two holes were successful at intersecting mineralization in the 3200 vein area. Drills that tested geophysical targets intersected graphitic sediments and disseminated pyrrhotite and pyrite. No significant gold values were reported.

In July and August of 1998, New Millenium Consulting, on behalf of Highwood and Battle Mountain, completed an exploration program consisting of line cutting and soil sampling on the Mikwam Property (Assessment file number: 32E05NE2001). Several northwest and northeast trending base metal anomalies were identified. Samples over known gold mineralized zones gave elevated, but not anomalous gold values. Strong gold anomalies were located in other areas and were coincident with As, Zn, Cu, Pb or Ni anomalies. The program recommended IP surveys over the anomalies and reinterpretation of the existing geophysical data in order to locate drill targets for future drilling.

During August and September 1999, High Sense Geophysics Ltd. of Toronto was contracted by the Mikwam Joint Venture to complete an airborne total field magnetic and electromagnetic survey of approximately 70 mining claims in the vicinity of the A8 Domain, Noseworthy Township. The survey successfully identified 6 potential targets from moderate to strong in a general northeast direction. It was recommended that these targets should be followed up by ground geophysics and diamond drilling (Jensen, 2002).



#### 6.10 ESO Uranium

6.10.1 AeroTEM -- 2005

On September 1, 2005, helicopter-borne AeroTEM II electromagnetic and magnetic surveys were completed over the Property by Aeroquest Ltd., on behalf ESO Uranium. In the reported interpretation, several low to highly conductive bedrock sources were identified. The majority of EM anomalies were reported to correlate spatially with the magnetic anomalies. Little direct correlation of the EM responses with individual magnetic highs was observed. The strongest anomalies were identified in the north central and north western portion of the survey area and these tended to be relatively continuous suggesting a lithologic source. Several more conductive anomalies of shorter strike length and more variability along strike were denoted as higher priority targets. Numerical modelling of the highest priority targets was recommended prior to drill testing to determine the dip, depth, and probably geometry of the sources (Aeroquest, 2005).

6.10.2 VLF-EM - 2008

In August 2008, Alpha Minerals (formerly ESO Uranium) contracted Terraquest Ltd. of Markham, Ontario to complete a High Resolution Tri-Sensor Magnetic and XDS VLF-EM Airborne Survey on the Mikwam Property. The main purpose of the survey was to identify anomalous magnetic and conductive responses.

The survey covered an irregular shaped area over a maximum distance of 3.3 km in north-south direction and 6.4 km in east-west direction for a total of 283 line-km (Barrie, 2008). The direction of the flight path was 045 and the line spacing was 100 metres.

The data were monitored throughout the acquisition period for quality control and tolerances on all channels by an infield Terraquest geophysicist (Barrie, 2008). It included corrections to the flight path, making flight plots, importing the base station data, creating a database on a flight-by-flight basis and posting the data. The entire dataset was checked for continuity and integrity and any errors, omissions or data beyond tolerances were flagged for re-flight the next day.

The data were subjected to processing by Terraquest and some of the results are shown in Figure 6-1, Figure 6-2 and Figure 6-3. The data has not been interpreted, but there are several anomalies on the Property. The



Total Magnetic Intensity map is dominated by a large northeast trending magnetic anomaly located along the northwestern boundary of the Property, coincident with the metasedimentary geology in this region. The A8-3200 mineralized system is located within this trend, adjacent to a zone of very high total magnetic intensity (greater than 60 000 nT), and within the highest intensity region of the northeast trend highlighted by the first vertical derivative. In contrast, the electromagnetic features exhibit a southeasterly trend with the most conductive features predominantly coinciding with the surficially mapped wetlands. Iron formation and graphitic sediments, both present in the area, may account for some of the EM anomalies.

It is recommended that Galena International interprets the geophysical data taking into consideration the geology of the area that is mostly known from drill holes and previous geophysical surveys.

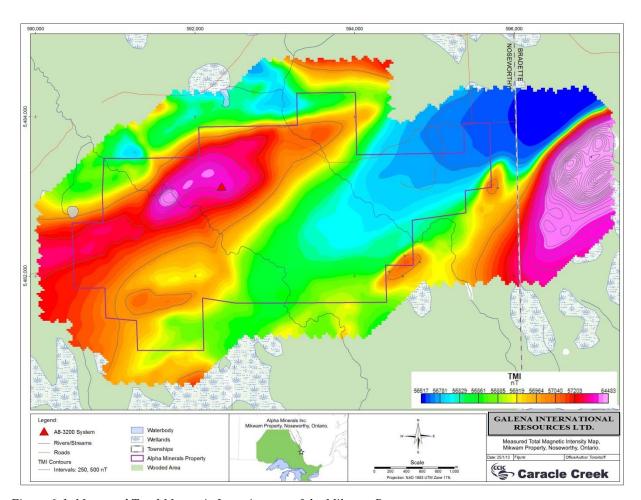


Figure 6-1. Measured Total Magnetic Intensity map of the Mikwam Property.



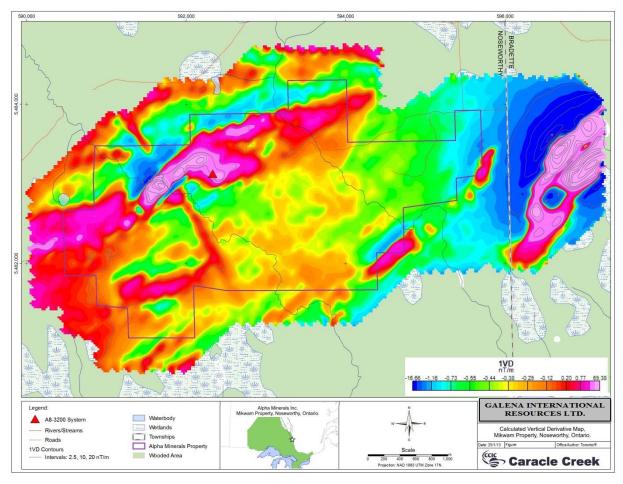


Figure 6-2. Vertical Magnetic Gradient map of the Mikwam Property .



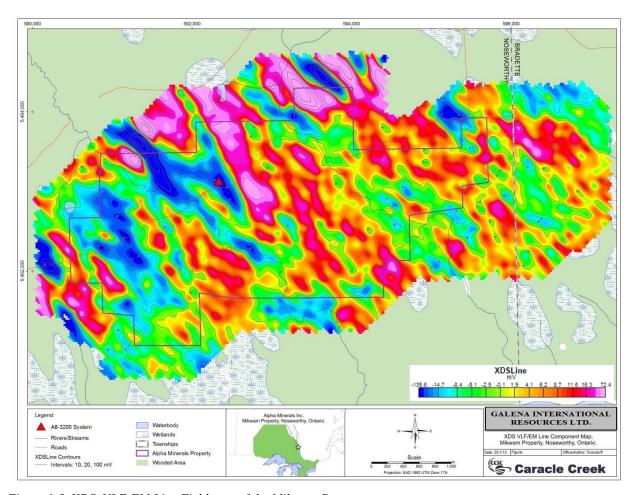


Figure 6-3. XDS, VLF-EM Line Field map of the Mikwam Property.

# 6.10.3 Sampling -- 2009

In September 2009, MPH Consulting Ltd., on behalf of Alpha Minerals Inc. (formerly ESO Uranium and now ALX Uranium Corp.), completed reconnaissance stream sediment sampling and surficial deposit examination on the Mikwam Property (Coates, 2010).

The entire Property is covered by Pleistocene glacio-lacustrine sediments that range from 25 to 65 metres in thickness suggested by drilling (Coates, 2010). The sediments consist of light grey clays and silts with occasional erratic glacial boulders that are probably "drop stones" from ice bergs. Holocene silt deposits are associated with current streams that generally flow southeasterly to the Burntbush River.



A total of four stream sediment samples were collected: two alluvial samples from banks of a stream and two samples from another, boggy stream (Table 6-2; Table 6-3). The samples were delivered to ALS Chemex Laboratories in Timmins, Ontario. Gold, arsenic and mercury values were all below the detection limit, one sample contained elevated silver and three samples contained somewhat anomalous copper values (Table 6-3).

The conclusion of the exploration program was that there is very limited practical application for stream sediment geochemistry on the Property (Coates, 2010).

*Table 6-2. Location of stream sediment samples.* 

Sample number	Claim number	Easting	Northing	Elevation
G-54851	3019086	592064	5482808	278
G-54852	3019086	592149	5482683	275
G-54856	4219736	593686	5483348	277
G-54857	4219736	593935	5483150	278

Table 6-3. Selected geochemical analyses of the stream sediment samples.

Sample	Au	Ag	As	Cu	Hg	Mn	Mo	Pb	Zn
number	(ppb)	(ppm)							
G-54851	< 0.005	< 0.2	<2	5	<1	757	1	12	50
G-54852	< 0.005	< 0.2	<2	59	<1	395	<1	8	67
G-54856	< 0.005	0.4	<2	18	<1	138	<1	10	31
G-54857	< 0.005	< 0.2	<2	17	<1	138	<1	9	35

#### 6.11 Historical Resource Estimates

This historical resource estimate does not use the categories outlined in sections 1.2 and 1.3 of National Instrument 43-101: Standards of Disclosure for Mineral Projects. This historical resource is not NI 43-101 compliant and thus the estimate cannot be relied upon. The historical estimate is only relevant as a rough estimate of the potential resource on the properties. The key assumptions, parameters and methods used to prepare the historical estimate are unknown. The Qualified Persons ("QP") for the Report have not done sufficient work to classify the historical estimate as current mineral resource and Galena International is not treating the historic estimate as current resource.



Promotional materials (1990s) from Trader Resource Corp. cite a "Geological Resource" for the A8 3200 vein system of 578,000 tons grading 0.112 opt Au (524,350 grading 3.83 g/t Au).

An internal report dated February 2, 2000, by H. Miree, Exploration Manager of Highwood Resources Ltd., notes that the area of the A8 3200 vein system was insufficiently delineated to determine a proven or probable ore reserve calculation. The report indicated that a "geologically inferred resource estimated for the zone is 1,504,300 tonnes grading 3.21 g/t (Au), thus the contained gold totals 155,827 oz" (Jensen, 2003).

In 2006, ESO estimated a mineral resource on the Property based on historic drilling and on ESO's drilling in that year. The results are shown in Table 6-4.

Table 6-4: Results of the ESO Uranium 2006 resource statement.

Category	Tonnes	Au (g/t)	Au contained ounces
Indicated	238,000	3.23	25,000
Inferred	879,000	2.42	68,000

This estimate is a historical estimate and cannot be relied upon. The key assumptions of the estimate are described in Kelso and Harnois (2006). The estimate used the categories defined by the CIM. A more recent estimate is presented in Section 14. The Qualified Person has not done sufficient work to classify the historical estimate as current and Galena International is not using the historic estimate as a current estimate.

## 7.0 GEOLOGICAL SETTING AND MINERALIZATION

# 7.1 Regional and Local Geology

The Mikwam Gold Property lies in the northern portion of the Precambrian Abitibi Sub-province (Abitibi Greenstone Belt) of the Superior Province of the Canadian Shield. The specific subdivision of the Abitibi Sub-province in which the Property is situated is the Harricana-Turgeon Belt (Figure 7-1). The Harricana-Turgeon Belt hosts polymetallic deposits and several well-known gold deposits such as the Agnico Eagle mine, the Casa-Berardi mine and the Detour mine.



Although the widespread occurrences of thick overburden and the lack of outcrop exposures on both sides of the provincial boundary present an obstacle to geologic mapping, the small number of outcrops combined with intensive exploration activities during the past three decades (mostly on the Quebec side) have provided sufficient information for a regional synthesis. The geology of the Harricana-Turgeon Belt in Quebec has been summarized by Lacroix et al. (1990) and the Ontario side of the belt has been mapped by Thomson (1937) and Johns (1982). The Harricana-Turgeon Belt consists of the granitic intrusions, surrounded by felsic to mafic metavolcanic rocks, metasedimentary rocks and minor mafic to ultramafic intrusions (Figure 7-2). The Mistawak Batholith (unit 12 on Figure 7-2) is the largest of the granitic intrusions and is composed of quartz monzonite and granodiorite. Johns (1982) has summarized the regional geology of the Harricana-Turgeon Belt in the Mikwam area north of the Mistawak Pluton as follows:

"North of the Mistawak Batholith, the base of the E-W striking metavolcanic sequence is a thick section of mafic to intermediate flows with minor interbedded felsic to intermediate tuffs. Overlying these units are felsic to intermediate metavolcanic rocks with minor interbedded mafic to intermediate metavolcanic rocks and clastic metasedimentary rocks. These metavolcanic rocks are thin and disappear to the west. The overlying clastic sediments are conformable with the metavolcanic rocks. These clastic metasedimentary rocks contain iron-rich chemical metasedimentary rocks. The metavolcanic rocks and metasedimentary rocks were intruded by felsic to intermediate plutons and minor mafic intrusions. The last magmatic event was the emplacement of Early Proterozoic diabase dikes which intrude all rock types and cross major structures."

The metavolcanic and metasedimentary rocks have undergone low pressure, contact and regional metamorphism of greenschist- and lower amphibolite-facies. The metamorphic event occurred between 2.6 and 2.7 Ga.

The Casa Berardi Deformation Zone (CBDZ) is a major, subvertical regional structure 4 to 6 km wide and at least 60 km in length. The CBDZ is crosscut at low angle by the Casa Berardi fault which is a brittle, schistose zone 0.5 to 5 m thick. The position of the CBDZ seems to be controlled by contrasts in regional competence (Pilote et al., 1990).

The main characteristics of the CBDZ, summarized by Pilote et al. 1990, are as follows: a generally high level of deformation, with bands of strongly deformed rock juxtaposed with lens that are only weakly



deformed; the repetition of lithologies at all scales by asymmetric folds; the occurrence of numerous spaced shears of variable intensity; a foliation characterized by preferential orientation of phyllosilicates and flattened fragments and commonly exhibits a mylonitic aspect; the occurrence of ankerite rich bands; a stretching lineation (defined mainly by elongated fragments in brecciated units) which plunges from 70° to 80° toward the WSW.

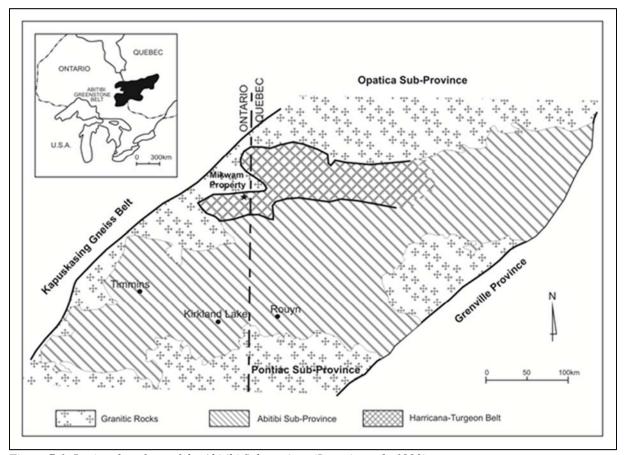


Figure 7-1. Regional geology of the Abitibi Subprovince (Lacroix et al., 1990).



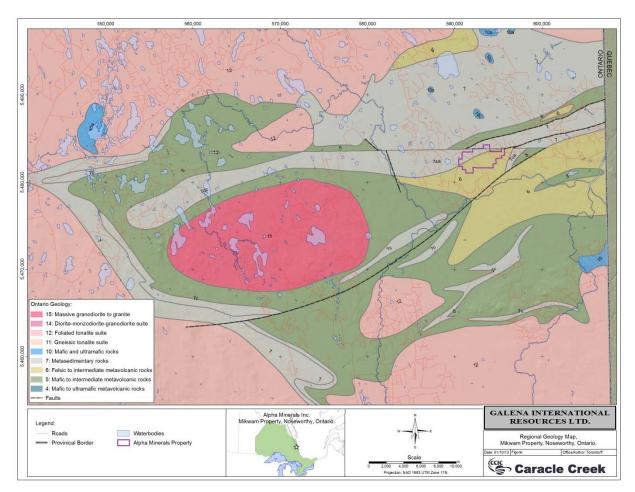


Figure 7-2. Local geology of the Mikwam Gold Property.

# 7.2 Property Geology

Information on the local geological setting has been derived mainly from widespread diamond drilling and overburden chips, with some information being provided by outcrop exposures in the vicinity of the Burntbush River. The area of the Property is underlain primarily by mafic metavolcanic, felsic metavolcanic, metasedimentary and felsic intrusive rocks. Pressacco (1994) and Jensen (2002) have divided the geological units into the following three domains, separated by two major faults that are most likely part of the CBDZ fault system (Figure 7-3):



- 1. <u>Northern Domain</u>: consists of thick sequences of mafic to intermediate flows and pyroclastic rocks and turbiditic sedimentary rocks separated by prominent unit of oxide iron formation. The metamorphic grade is more elevated than units to south, generally being in the amphibolite facies. The Northern Domain lies mostly just north of the Property boundary (Figure 7-3).
- 2. A8 Domain: consists of a diverse assemblage of interbedded turbiditic sediments (greywacke, argillite, and conglomerate), intermediate to felsic pyroclastic rocks with minor flows, chert, intrusive porphyry, and minor oxide-sulphide iron formation. This assemblage strikes in northeast-southwest direction and dips generally sub-vertically. Drill core evidence demonstrates that the entire area has been subjected to a strongly developed folding event. Fold noses are observed in the fine clastic sediments throughout the A8 Area, and may be small-scale parasitic folds on larger scale folds (Figure 7-4). Zones of extremely blocky core, poor recoveries, fault gouge, and shear intervals hint at the presence of multi-stage deformation. The most well defined and continuous zone of alteration and mineralization is developed within central portion of the A8 Domain. A broad zone of ankerite alteration, strong schistosities and abundant brittle-ductile faulting, greater than 200m in width, has been defined by drilling along a strike length of 7km. Gold mineralization occurs in quartz-carbonate veins and silicified zones which carry significant amounts of pyrite and arsenopyrite (Figure 7-3).
- 3. <u>Southern Domain</u>: consists primarily of mafic volcanic with minor ultramafic rocks and intercalations of graphitic and sulphidic argillite. The northern limit of the domain is marked by the Southern iron formation. The iron formation is best developed in Bradette Township, east of the Property, where it occurs as a distinctive jasper-magnetite Iron Formation (Pressacco, 1994; Figure 7-3).

All three domains trend in an east-northeast direction across the Property. Their geometry is complicated by a series of northwest trending transverse structures. The A8 Domain contains the 3200 Vein area which has been the focus of past and present drill campaigns (Figure 7-4). This area is a zone of quartz flooding and sulphidization (mainly pyrite and arsenopyrite) at or near the contact of chloritic iron formation and either argillite (hanging wall) or conglomerate (footwall).



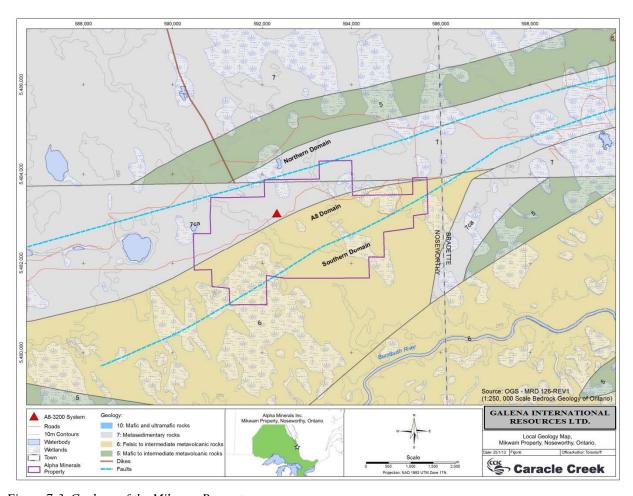


Figure 7-3. Geology of the Mikwam Property.



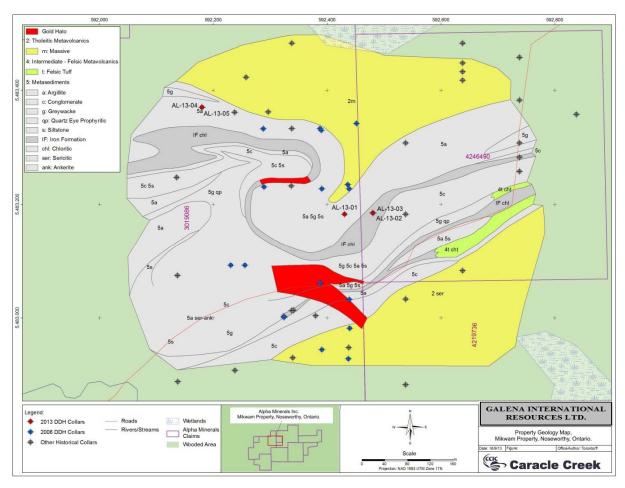


Figure 7-4. Geological map of the 3200 Vein area located in the A8 Domain.

#### 7.3 Mineralization

Recent exploration on the Mikwam Property concentrated on the A8 3200 vein system that consists of a zone of quartz flooding, silicification, and sulphidization which lies at or near the contact of chloritic iron formation and either argillite or conglomerate (Figure 7-4). The zone is observed to locally crosscut lithological boundaries. Discrete quartz veins do occur in this zone, but assay results indicate these are lower in grade than the highly sulphidized sections. Five to 50% medium to coarse grained cubic pyrite and 1 to 5% coarse grained arsenopyrite within a highly sericitized, quartz flooded matrix comprises the bulk of the zone that tends to carry higher gold grades. Pressacco (1994) reported the best gold values tend



to be associated with pyrite containing vugs (Figure 7-5). In other instances, however, pyrite has been reported as an indicator of lower gold values (<3 g/t). The A8 3200 vein system strikes approximately eastwest, and dips steeply north but appears to change direction to strike approximately 115° to 145° near the middle of the zones due to folding. A steep moderate westerly plunge is indicated for the zone.

Several additional styles of mineralization are present also across the Property. Minor to 1% fine grained disseminated pyrite is ubiquitous in most lithologies. Quartz-carbonate and quartz-ankerite stringers and veinlets, parallel to or cutting foliation are also common. Minor amounts of brown or black tourmaline are commonly observed in these stringers and veinlets. At least two generations of veining appear to be present: some sets exhibit boudinage texture and folding while others are significantly less deformed.

Coarse-grained cubic and nodular pyrite is common in the graphitic argillite units. Locally, the nodular pyrite forms semi-massive sections. Semi-massive bedded pyrite up to 30cm thick also occurs in the graphitic argillite and carries gold values up to 1.573 g/t Au over 0.3 m (Barber, 1997).

Wide sections of fine grained stringer and disseminated pyrite and pyrrhotite within felsic lapilli-tuffs have been observed. Sections of semi-massive to massive pyrite-pyrrhotite veins also occur. While the pyrite has a vuggy texture similar to that observed in the A8 3200 vein system, samples were reported to return insignificant gold values.

The mineralized zone is approximately 330 m long (east-west), 330 m wide (north-south) and 500 m deep and consists of eight lenses.





Figure 7-5. Quartz-carbonate veining and vuggy pyrite mineralization in core from drill hole ESO-06-03.

# 8.0 DEPOSIT TYPES

Current and historical exploration of the area is based on the potential for the Mikwam Property to host major quartz-carbonate vein gold systems analogous to those found at Casa-Berardi (Quebec), Dome and Hollinger-McIntyre (Timmins district, Ontario), Macassa and Kerr Addison (Kirkland Lake district, Ontario), and Silidor and Pierre Beauchemin (Noranda district, Quebec). The distribution of these and other major quartz-carbonate vein gold deposits in Canada is illustrated in Figure 8-1. The Aurizon Mines Ltd. Casa Berardi Project is located approximately 35 km east of the A8 3200 Vein system in Casa-Berardi Township, Quebec. The Casa-Berardi type gold deposits and the Mikwam Property lie within the Casa-



Berardi Deformation Zone; both areas are characterized by similar lithologies, similar alteration mineral assemblages, and similar structural deformations.

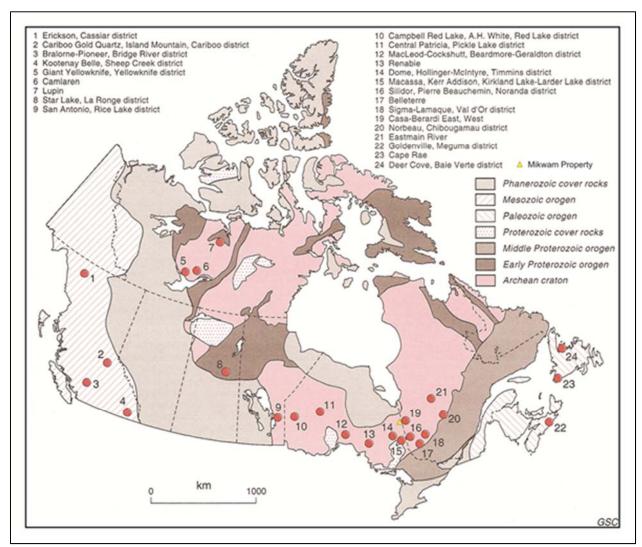


Figure 8-1. Distribution of selected Canadian quartz-carbonate vein gold deposits and districts (modified from Robert, 1996).

The Archaean Casa-Berardi gold deposits in Quebec occur as mesothermal auriferous quartz veins and disseminated gold-rich sulphides along fractures. These deposits are contained within steeply dipping reverse shear zones, located near or within major east-west striking shears or regional breaks. The economic auriferous mineralization occurs as within quartz-dolomite-ankerite-pyrite-arsenopyrite banded veins

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hosted in shear zones, quartz-vein stockworks with highly silicified host rocks, and disseminated sulphides (arsenopyrite and pyrite) within schistose and fractured host rocks (quartz-filled fractures).

These mineralized assemblages generally occur in metavolcanic-pyroclastic units near the contact with

metasedimentary rocks. The mineralized veins vary from a few centimetres to greater than 3 metres in

thickness and may be several tens of meters in length. The banded texture exhibited by the veins and the

incorporated host-rock fragments are likely the result of multiple breaching and fluid injection along the

host contact during Regional shearing. The lithologies hosting the mineralized veins are strongly

carbonatized, silicified, chloritized and sericitized (Pilote et al., 1990).

Gold mineralization of the Casa-Berardi gold deposits is understood to be synchronous with the progressive

development of late movement within the CBDZ. CO<sub>2</sub> activity contributed greatly to the development of

specific carbonate alteration facies and to the settling of gold mineralization (Pilote et al., 1990).

An important characteristic of a large number of vein deposits, especially in volcano-plutonic terranes, is

their significant vertical extent, which exceeds 1 km in several deposits (Robert, 1996).

9.0 EXPLORATION

No recent exploration, other than a 2013 diamond drilling program (see Section 10.0 Drilling), has been

completed on the Property. This was verified through discussions with Mark Ashcroft, President & CEO

of Galena International and through a search on the MNDMF website for assessment work applied to the

claims since September 2013.

10.0 DRILLING

10.1 2006 Drilling Program

In early 2006, Caracle Creek was retained by Alpha Mineral (formerly ESO Uranium Corporation and now

ALX Uranium Corp.) to assist in the execution of a diamond drill program being conducted on the Mikwam

Property. All drill holes completed by Galena International during the 2006 drilling program were located



within claim 3019086 of the Noseworthy Township and focused on testing the A8 3200 vein system. Eighteen BQ diameter holes were drilled from surface during the program (Table 10-1 and Figure 10-1).

The objectives of the drill program were to check the continuity of mineralization outlined by historical drill holes completed by Mikwam Joint Venture in 1992 and drill test an area with several strongly anomalous till samples collected by Newmont, located approximately 6 km west of the 3200 Vein area (ESO Uranium News Release, February 7, 2006).

Drilling commenced March 3, 2006 (ESO-06-01) and ended June 29, 2006 (ESO-06-17). The drilling was carried out by Heath and Sherwood Drilling Inc. using a single drilling rig, two crews working 12-hour shifts, and under the supervision of a foreman. Helicopter support was utilized to transport the crews for each shift and to move the drill rig between setups. The total amount of drilling completed was 6,383 meters. All of the drill collars (casing) from the 2006 drilling program were left in the ground.

All drill hole collars were originally located on the local grid coordinate system. The UTM position of the collars was also determined using a hand held GPS (Garmin 76) unit the field. In October 2006, most of the collar locations were surveyed using a differential GPS unit. Dip and azimuth tests on all drill holes were completed using the Reflex EZ-Shot instrument. Drill logs and all of the necessary drill hole information, including location, bearing, dip, down-hole surveys were documented on site using DHLogger software. In March 2013, Luc Harnois measured the coordinates of some of the ESO drill holes with a DGPS (see details in section 10.5). The coordinates for the rest of the drill holes were adjusted accordingly. Table 10-1 contains the adjusted coordinates for all 2006 drill holes.

Table 10-1. List of drill holes completed by Alpha Minerals Inc. in 2006.

Drill Hole No.	Easting	Northing	Elevation (m)	Azimuth (°)	Dip (°)	Length (m)	Date Completed	Samples
ESO-06-01	592332	5483017	268	360	-45	347	March 8, 2006	147
ESO-06-02	592332	5483016	268	360	-60	326	March 12, 2006	139
ESO-06-03	592254	5483092	269	90	-45	351	March 17, 2006	140
ESO-06-04	592438	5483032	271	270	-55	350	March 21, 2006	83
ESO-06-05	592432	5482982	271	270	-55	338	March 24, 2006	46
ESO-06-06	592438	5482928	270	270	-55	350	March 30, 2006	56
ESO-06-07	592228	5483091	267	90	-45	375	April 3, 2006	100
ESO-06-08	592436	5483233	272	180	-60	241	April 29, 2006	72
ESO-06-09	592436	5483233	272	180	-45	306	May 3, 2006	130
ESO-06-10	592387	5483332	271	180	-65	402	May 10, 2006	77
ESO-06-11	592379	5483339	272	180	-70	242	May 15, 2006	68



Drill Hole No.	Easting	Northing	Elevation (m)	Azimuth (°)	Dip (°)	Length (m)	Date Completed	Samples
ESO-06-11A	592381	5483336	272	180	-70	350	May 19, 2006	60
ESO-06-12	592382	5483233	272	180	-65	602	May 28, 2006	225
ESO-06-13	592382	5483233	272	180	-50	609	June 1, 2005	188
ESO-06-14	592281	5483237	272	180	-60	221	June 14, 2006	82
ESO-06-15	592279	5483338	272	180	-60	351	June 19, 2006	141
ESO-06-16	592379	5483067	270	360	-50	221	June 23, 2006	56
ESO-06-17	592383	5482950	268	360	-50	401	June 29, 2006	102
					Total:	6,383		

The 2006 drill program was successful in intersecting several high grade gold mineralized zones. Results of the drill program are generally consistent with historical results of historical drilling on the Property. Table 10-2 summarizes the best intersections of the drill program. The intervals represent the drill thickness of mineralization, not the true thickness. Appendix 3 contains representative drill hole cross sections.

Table 10-2. Diamond drilling highlights from the 2006 drilling program.

Drill Hole No.	To (m)	From (m)	Interval (m)	Au (g/t)
ESO 06-01	125	128	3	1.4
ESO 06-01	322	326	4	2.1
ESO 06-02	274	293	19	4.1
ESO 06-03	140	156	16	4.8
	169	176	7	5
ESO 06-07	73.6	78.6	5	5.42
including	74.6	75.6	1	22.5
	227.4	233	5.6	6.32
ESO 06-13	428.75	432	3.25	1.93
ESO 06-14	138	154	16	3.65
including	152	154	1	18.02
ESO 06-15	175	177	2	4.49
	259	277	18	4.37
ESO 06-17	246	259	13	4.99



# 10.2 2013 Drilling Program

In February 2013, Caracle Creek was retained by Alpha Minerals Inc. to assist in the execution of a diamond drill program on the Mikwam Property. Five NQ drill holes totaling 1,189 m were completed on mining claims 3019086 and 4246490.

Drilling started on March 7, 2013 and ended on March 23, 2013. The geologist on site was Dr. Luc Harnois (Ph.D., P.Geo.), of Caracle Creek. Drilling was performed by Denis Crites Drilling Ltd. of Porcupine, Ontario, with one diamond drill rig. A camp was set up on site. The logistics of the drill program was supervised by Peter Roberts who was directly contracted by Alpha Minerals Inc.

The drill locations were measured with a Trimble GPS unit by Luc Harnois. All drill hole casings were left in the ground and capped. Dip and azimuth tests on all drill holes were completed with a Reflex EZ-Shot instrument. All drilling information was documented on site by Luc Harnois with Geotic software. All drill core was transported after logging to Timmins for storage. Cutting of the core started on site and was later finished in Timmins under the supervision of Peter Roberts.

Drilling focused on the A8 3200 vein system. The purpose of holes AL-13-01 to AL-13-03 was to test a plunge of the A8 high-grade ore zone. The purpose of holes AL-13-04 and AL-13-05 was to test the A8 zone along strike to the northwest.

Table 10-3. List of drill holes completed by Alpha Minerals Inc. in 2013.

Drill Hole No.	Easting	Northing	Elevation (MSL*)	Azimuth	Dip	Length (m)	Claim No.
AL-13-01	592430.95	5483183.0	281.44	180	-45	200	3019086
AL-13-02	592480.75	5483185.0	281.56	180	-45	200	4246490
AL-13-03	592480.75	5483185.3	281.56	180	-55	245	4246490
AL-13-04	592180.41	5483370.4	281.50	180	-45	263	3019086
AL-13-05	592180.41	5483370.7	281.50	180	-55	281	3019086
					Total:	1,189	

<sup>\*</sup>MSL=elevation above Mean Sea Level



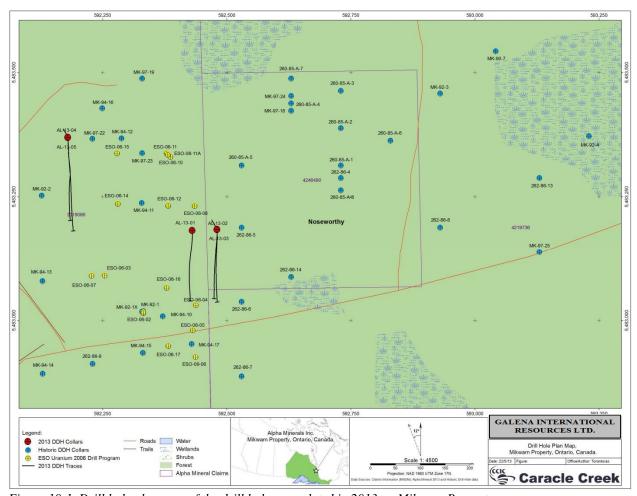


Figure 10-1. Drill hole plan map of the drill holes completed in 2013 on Mikwam Property.

# 10.2.1 Rock types and mineralogy

The drill holes intersected mostly clastic sediments, banded iron formation and a mafic dike. The rock types included argillite, sandstone, conglomerate, banded iron formation, siltstone and mafic dike. Cross sections of the drill holes are shown in Figures 10-12 to 10-14.

Argillite is typically light to dark grey to black in colour, fine grained, locally weakly magnetic, probably due to the presence of fine grained pyrrhotite. Graphite and pyrite may also be present. It may display soft sediment deformation (Figure 10-2).



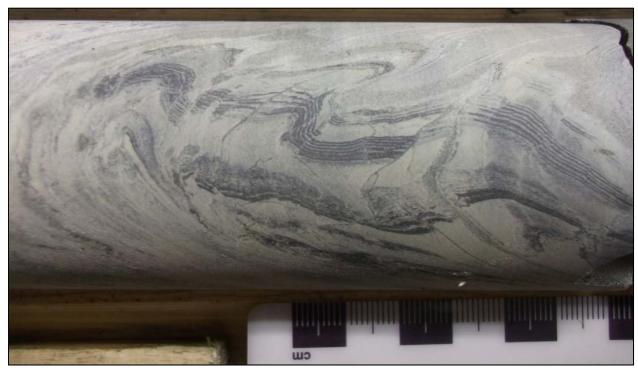


Figure 10-2. Soft sediment deformation in argillite in drill core.

Sandstone is white and light to dark grey in colour and ranges in composition from wacke to quartz arenite and may contain layers of argillite and conglomerate. Sandstone may locally contain biotite. It may also be weakly magnetic due to the presence of fine grained pyrrhotite. Arsenopyrite in sandstone was noted in hole AL-13-05.

**Conglomerate** is polymictic, and matrix or clast supported. The clasts are sedimentary origin consisting of siltstone, sandstone and argillite and ranging in colour from white, light and dark grey, to black. The matrix is sandstone. The clasts are typically flattened to various degrees by deformation throughout the drill holes (Figure 10-3). The conglomerate is also locally weakly magnetic.





Figure 10-3. Folded conglomerate in core from drill hole AL-13-05.

**Banded iron formation ("BIF")** occurs in four out of five drill holes. It consists of alternating black (magnetite and/or hematite) and white siliceous layers that range in thickness between 1 and 10 mm (Figure 10-4). Pyrite is often present in both layers. BIF is often interlayered with argillite. Argillitic BIF is up to ~90 meters thick (drill thickness, not true thickness) in hole AL-13-05.





Figure 10-4. Banded iron formation cut by micro-faults in core from drill hole AL-13-05.

A possible **mafic dike** was intersected in hole AL-13-01 and consists of green to black, weakly magnetic, chlorite-rich rock. It is massive with one layered interval and weakly magnetic.

**Sulphide minerals** observed in the drill holes include pyrite, pyrrhotite and arsenopyrite, in decreasing order of abundance. The amount of pyrite is up to 35%, but it is typically less than 5%. Some of the pyrite is associated with the veins or faults/fractures (Figure 10-5), but most of the pyrite occurs as disseminated fine to coarse grains (Figure 10-6). Pyrite-containing veins cut the foliation and appear to be associated with gold mineralization (hole AL-13-01). Pyrrhotite also occurs disseminated and it is up 3%. Pyrrhotite and pyrite commonly occur together. Arsenopyrite occurs with pyrite as fine grained disseminated grains. The amount of arsenopyrite is less than 1%.





Figure 10-5. Fracture controlled pyrite in core from drill hole AL-13-03.

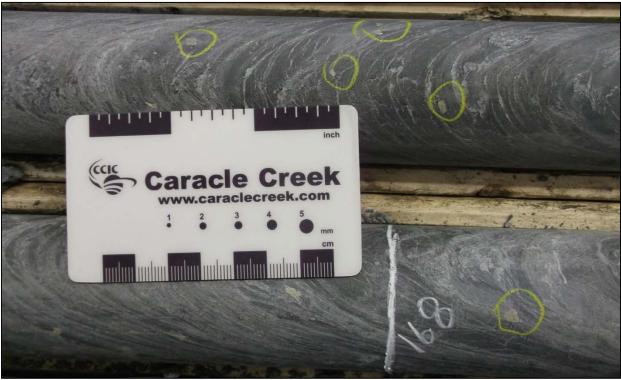


Figure 10-6. Disseminated pyrite in core from drill hole AL-13-03.



#### 10.2.2 Veins

Quartz veins are fairly common. The width of the quartz veins is up to 20 cm, but most of them are typically 1 to 2 cm wide. There are at least two generations of quartz veins. The first generation is folded suggesting that the veins formed prior to foliation and folding (Figure 10-7) and the second generation cuts the foliation suggesting that it formed post-foliation (Figure 10-8). Pyrite is common in the veins, pyrrhotite has been observed, but less common. Yellow, rusty (iron oxide) alteration is locally associated with the veins.



Figure 10-7. Folded quartz veins and pods in core from drill hole AL-13-04.





Figure 10-8. Two generations of quartz veins in core from drill hole AL-13-05.

Quartz-carbonate veins are fairly common as well. The maximum width of the quartz-carbonate veins is 25 cm, but they are typically 1-2 cm wide. The timing of theses veins is not known, but at least one of them was folded, suggesting a possible pre-folding origin. The amount of carbonate in the veins is up to 50%. One vein contained only carbonate. The pyrite content is typically 1 to 5%, but in one vein in hole AL-13-04 it is 20%.

#### 10.2.3 Alteration

The types of alteration include silicification, iron oxide (goethite/limonite) alteration, sericitization and carbonatization, in decreasing order of frequency.

**Silicification** is represented as pods and quartz flooded areas, and quartz veins. It is locally pervasive. The degree of silicification ranges from 3% to 70%. Silicification may be associated with sericitization, iron oxide alteration and carbonatization. Flooded quartz in hole AL-13-02 cuts foliation, suggesting that some silicification postdates the foliation.

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**Sericitization** is yellowish to greenish white and typically pervasive. The amount of sericite is up to 20%. It may be associated with silicification.

**Iron oxide alteration** is represented by goethite and/or limonite and yellow to brown to reddish brown in colour. It is typically fracture- and/or foliation-controlled, locally associated with sulphides and with dissolution cavities. The amount of iron oxides is up to 6%.

**Carbonatization**, characterized by carbonate in veinlet and filling fractures, is not common. The amount of carbonate is up to 15%. It may be associated with silicification.

10.2.4 Structures

Primary bedding was observed in the BIF and some of the sediments. Almost all rocks are moderately to strongly foliated. The angle of foliation is very variable, ranges from 1 to 72° to the core axis, suggesting the presence of folding. The nose of the fold was observed in hole AL-13-03, where the folds appear isoclinal (Figure 10-9). Minor folds were also observed (Figure 10-10). In drill hole AL-13-02 open folds have been observed, which may represent another generation of folding.

Faulting and fault zones have been observed in three out of five drill holes. Drill core is brecciated and broken up in the fault zones. The angles of the fault, where it was possible to estimate, were between 3° and 20° to the core axis.





Figure 10-9. Isoclinal folding in core from drill hole AL-13-03.





Figure 10-10. Minor folds in core from drill hole AL-13-03.

#### 10.2.5 Mineralization

Table 10-2 summarizes the drill highlights from the five drill holes completed in March, 2013. Gold mineralization appears to be controlled by structures (faults, fracture zones, along foliation) and alteration, rather than lithology. Some elevated gold values are located along the contact of lithologic units, which is probably due to the more permeable nature of the contact zones.

In the 2013 drill holes the types of alteration associated with higher gold values include, in order of decreasing abundance, silicification (up to 40%) represented by quartz veins and pods, pervasive sericitic alteration (up to 15%), iron-oxide and hydroxide (limonite-goethite) alteration (up to 5%) along fractures and after sulphides, and less common carbonate alteration (up to 3%) as quartz-carbonate veins and fracture



filling. The pyrite content in mineralized intervals is typically less than 5%. Up to 1% arsenopyrite may also be associated with gold mineralization, but not as common. Higher gold values are associated with quartz veins and pods or fracture zones. Silicification and/or sericitization are the most common alteration types around the mineralized zones. Iron oxide-hydroxide alteration is associated with gold in fracture zones, rather than veins and may have occurred later than the mineralization. One sample in hole AL-13-02 contain 64.3 ppm silver hosted in argillite containing stockworks of pyrite (40%) and quartz veins (40%) and voids/dissolution features, possibly after carbonate.

Gold was likely transported by hydrothermal fluids that altered the rocks in more permeable areas: along fault and fracture zones, foliation planes and lithology contacts. The rocks have been affected by several deformational events. The relative timing of gold mineralization has not yet been determined. Cross-sections of the drill holes are provided in Figures 10-11 to 10-14; sample intervals represent the drill thickness of mineralization and are not true thickness.

*Table 10-4. Drill core assay highlights from the 2013 drill program.* 

Drill Hole No.	From (m)	To (m)	Interval (m)	Au (ppm)	Ag (ppm)
AL-13-01	121.68	123.5	1.82	5.919	
including	121.68	122	0.32	13.700	
and	122	122.9	0.9	6.890	
AL-13-01	147	148	1	0.148	
AL-13-01	169	170.39	1.39	0.953	
AL-13-01	176	177	1	0.109	
AL-13-01	180	182.8	2.8	0.176	
AL-13-02	85.17	87	1.83	11.762	
AL-13-02	112.5	114	1.5	0.267	
AL-13-02	141.74	144.9	3.16	0.149	
AL-13-02	196.57	196.83	0.26	0.012	64.300
AL-13-03	119	122	3	0.184	
AL-13-03	154	158	4	0.764	
AL-13-04	59	61	2	0.140	
AL-13-04	68.16	68.94	0.78	0.407	
AL-13-04	71	74	3	0.182	
AL-13-04	81	84	3	0.244	
AL-13-04	90	91	1	0.152	
AL-13-04	95	96	1	0.140	
AL-13-04	100	101	1	0.139	
AL-13-04	117	118.57	1.57	0.860	
AL-13-04	151	152	1	0.175	
AL-13-05	53.91	56	2.09	0.178	
AL-13-05	233	234	1	0.105	



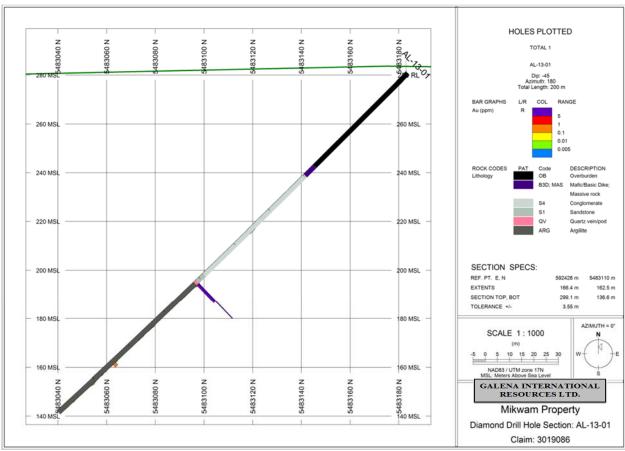


Figure 10-11. Cross section of drill hole AL-13-01.



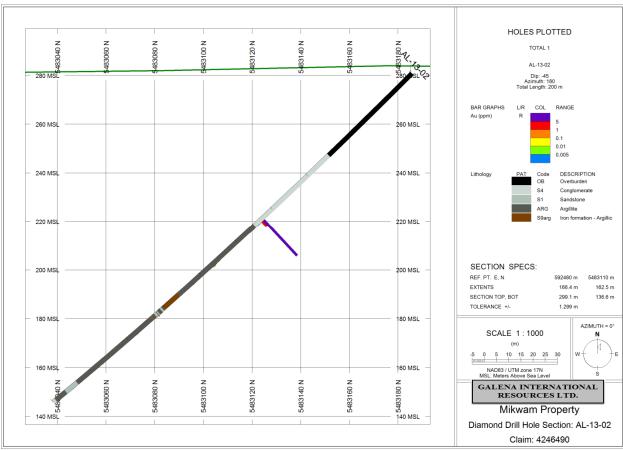


Figure 10-12. Cross section of drill hole AL-13-02.



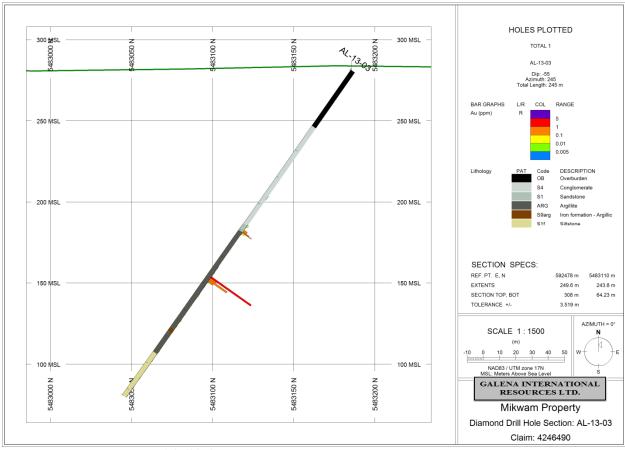


Figure 10-13. Cross section of drill hole AL-13-03.



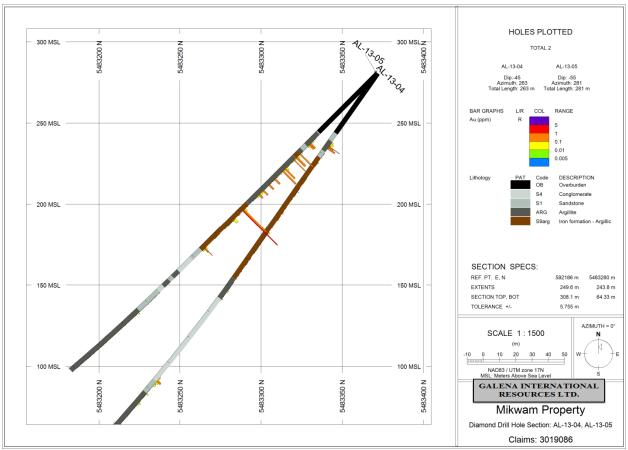


Figure 10-14. Cross section of drill holes AL-13-04 and AL-13-05.

## 10.3 Resampling

In 2013, at the request of Alpha Minerals Inc., Caracle Creek completed a resampling program of the core from the 2006 drill holes; resampling took place between March 28 and 31, 2013. In 2006 only the geologically favourable intervals were sampled, which was decided by the logging geologist. Alpha's concern was that some gold mineralization may have been missed during the 2006 drill program, because some of the 2006 drill holes are located in areas where gold mineralization was expected because the hole was located either between two mineralized holes or at predicted extensions of mineralized zones.

The resampled holes included ESO-06-08, ESO-06-09, ESO-06-11A, ESO-06-12 and ESO-06-16 (Table 10-5). All historical drill holes were imported into Gemcom and these drill holes were chosen based on



their location relative to the known gold mineralization. The resampling was completed in Timmins by Luc Harnois (Ph.D., P.Geo.). Samples were transported to Actlabs by Peter Roberts.

*Table 10-5. List of resampled drill holes from the 2006 drilling program.* 

Drill Hole No.	Easting	Northing	Elevation (m)	Azimuth (°)	Dip (°)	Length (m)
ESO-06-08	592435.72	5483232.61	279.2	180	-60	241
ESO-06-09	592435.72	5483232.61	279.2	180	-45	306
ESO-06-11A	592381.47	5483336.09	271.5	180	-70	350
ESO-06-12	592382.46	5483233.09	272.2	180	-65	602
ESO-06-16	592379.45	5483066.89	270.3	360	-50	221
					Total:	1,720

A total of 591 samples were collected from the five 2006 drill holes, including 30 blanks, 29 standards and 26 quarter core duplicates.

The best results are summarized in Table 10-6. A few intervals were sampled with weakly elevated gold values in hole ESO-06-12, but the rest of the resampled holes did not contain any significant gold mineralization, suggesting that the lack of mineralization in these holes was not due to insufficient sampling of the drill holes, but rather due to the variable nature of gold mineralization on the Property.

Table 10-6. Best results from the core re-sampling of 2006 drill holes.

Drill Hole No.	From (m)	To (m)	Interval (m)	Au (ppm)
ESO-06-12	255	256	1.0	0.167
ESO-06-12	276	277	1.0	0.234
ESO-06-12	277	278	1.0	0.205
ESO-06-12	298	299	1.0	0.105

#### 10.4 UTM coordinate corrections of the 2006 drill holes

During a site visit completed by Caracle Creek geologist Luc Harnois on January 18, 2013, a discrepancy was noticed between the UTM coordinates measured in the field and the UTM coordinates recorded in 2006. The difference between the two values was consistently ~16 m in easting and ~9 m in northing. This



was possibly due to the several NAD27 projection systems used and the inability of the computer programs and GPS units to deal with the different projection systems.

On March 27, 2013, Luc Harnois located eight (8) of the 2006 drill holes and measured the coordinates with a Trimble DGPS unit (Table 10-7). The rest of the drill holes were not found probably due to the snow cover that was in excess of 1 m at that time. The UTM coordinates for the rest of the drill holes were then calculated based on the difference between the coordinates as recorded by the DGPS (Trimble unit) and original coordinates of the holes. Appendix 2 contains the UTM coordinates (NAD83) for all historical drill holes and the 2006 drill holes completed by ESO Uranium.

Table 10-7. UTM NAD83 coordinates of 2006 drill hole collars (located March 2013).

Drill Hole No.	Easting	Northing	Elevation (m)	Comments
ESO-06-01, 02	_	_	_	Not found, no tripod.
ESO-06-03	592254.31	5483091.88	275.44	Tripod OK, metal tag OK
ESO-06-04	592438.1	5483032.12	280.13	Tripod OK, metal tag OK
ESO-06-05	592432	5482981.67	280.42	Tripod OK, metal tag OK
ESO-06-06	592437.7	5482927.78	278.58	Tripod OK, metal tag OK
ESO-06-07	592228.06	5483091.13	274.88	Tripod OK, metal tag OK
ESO-06-08, 09	592435.72	5483232.61	279.15	Tripod OK, cannot read metal tag
ESO-06-10	592386.99	5483331.54	280.88	switched with ESO-06-11 in the 2006 report
ESO-06-11	_	_	_	Not found/no tripod, switched with ESO-06-11 in 2006 report
ESO-06-14	_	_	_	Not found, no tripod
ESO-06-15	_	_	_	Area not accessible.
ESO-06-16	_	_	_	Not found, no tripod
ESO-06-17	_	_	_	Not found, no tripod



# 11.0 SAMPLE PREPARATION, ANALYSES AND SECURITY

#### 11.1 Sample Security

#### 11.1.1 2006 Program

As the core became available, it was transported by helicopter to an on-site core shack for logging by a professional geologist and sampling under the supervision of the geologist. Drill core intervals to be sampled were selected and marked by the geologist, prior to cutting of the core, at the time of logging. The geologist typically sampled 1.0 metre intervals (98% of the intervals sampled are within the 0.75-1.75 m length range) but collected smaller intervals (~0.2 metre minimum) on the basis of unique geology and/or sulphide mineralization, and to adhere to major lithologic boundaries. The recovery factor was generally very good. Larger intervals up to 1.5 metres were permitted for intervals considered barren or uninteresting, and for bracketing of the main mineralized zone into the hanging wall and/or footwall rocks. Core samples were split in half using a diamond saw, following the reference line and other markings defined by the geologist. One half of the core was then sent to a laboratory for assaying while the remaining half was retained for future reference. The core was cross piled and organized on site.

A total of 1710 core samples and 191 standards and blanks were transported by helicopter and assayed by Techni-Lab (184 Rue Principale, Ste-Germaine Boulé, QC, J0Z 1M0) for Au, Ag, Cu, Pb, Zn, and As. One in ten sample instances sent for analysis was a geochemical standard. Duplicates of 100 samples were sent to a secondary laboratory (ALS Chemex Chimitec ["ALS"], 1322 Harricana Street, Val-d'Or, QC, J9P 3X6) for additional control on the assay results.

All core of the 2006 drilling program is stored on the Property site, near the logging facilities. Coarse reject and pulp material from drill core analyses are stored at the Techni-Lab (184 Rue Principale, Ste-Germaine Boulé, QC, J0Z 1M0) and the ALS Chemex Chimitec laboratory (1322 Harricana Street, Val-d'Or, QC, J9P 3X6). There is no relationship between Galena International and Techni-Lab and ALS and there was not relationship between ESO and Techni-Lab and ALS other than that ESO submitted samples to Techni-Lab and ALS.



## 11.1.2 2013 Program

The core was logged on site by Luc Harnois (Ph.D., P.Geo.) Caracle Creek geologist. Core from two drill holes was cut on site. The core was transported to Timmins by Peter Roberts for storage. The rest of the core was cut in Timmins. The geologist selected the samples to be cut and sent to the laboratory for analysis based on the lithology, alteration, mineralogy and structures. The length of most of the samples is 1 m, the maximum sample length is 1.5 m, the minimum sample length is 0.2 m, and the average is 0.94 m. Core samples were split in half using a diamond saw, following the reference line and other markings defined by the geologist. One half of the core was then sent to a laboratory for assaying while the remaining half was retained for future reference.

A total of 701 samples, including 35 blanks, 35 standards, and 34 quarter core duplicates were sent to the laboratory for analysis from the 2013 drill holes. A total of 591 core samples, including 30 blanks, 29 standards and 26 quarter core duplicates were sent to Actlabs from the resampling program. The samples were put in a plastic bag, then in a rice bag. Luc Harnois transported the first two batches of samples to Activation Laboratories ("Actlabs") in Timmins (1752 Riverside Drive, Timmins, Ontario, P4R 1N1). Peter Roberts transported the rest of the samples to Actlabs. Actlabs quality system is accredited to international quality standards through the International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) 17025. There is no relationship between Galena International and Actlabs other than that Actlabs submitted drill core samples for analysis to Actlabs.

All drill core, pulps and rejects from the 2013 drill program are stored in Timmins, Ontario, Canada.

# 11.2 Sample Preparation

#### 11.2.1 2006 Program

The samples were analyzed for Au, Ag, Cu, Pb, Zn and As by Techni-Lab. The samples were crushed and then pulverized prior to analyses. Au was analyzed by fire assay and atomic absorption spectroscopy (AAS) on 30 g pulps and the samples containing more than 1000 ppb Au were the analyzed by standard fire assay technique and a gravimetric finish.

A total of 191 standards and blanks, approximately 10% of all samples, were inserted in the sample stream.



Both the Techni-Lab facility in Ste-Germaine-Boulé, QC and the ALS Chemex laboratory in Val-d'Or are accredited with ISO/IEC 17025:2005 certification (<a href="http://www.techni-lab.com">http://www.alsglobal.com</a>).

11.2.2 2013 Program

The samples were analyzed for a total of 37 elements including gold and silver. Specific gravity measurements were also taken on each sample. The samples were crushed to a nominal minus 10 mesh (1.7 mm), mechanically split (riffle) to obtain a representative sample and then pulverized to at least 95% minus 150 mesh (105 microns) (Actlabs website: http://www.actlabs.com).

Gold was analyzed with fire assay and AA finish (1A2-30). The sample is mixed with fire assay fluxes and placed in fire clay crucibles (Actlabs website: <a href="http://www.actlabs.com">http://www.actlabs.com</a>). It is heated to 1060°C, removed from the furnace and poured into a mould, leaving a lead button at the base of the mould. The lead is then absorbed in a preheated cupel to recover the gold and silver. This is dissolved in aqua regia and the gold content is determined by AA (Atomic Absorption). AA determines the concentration of the element by introducing it in its atomic form to a light beam causing the atom to absorb light. The detection limit for gold is between 5 ppb and 3,000 ppb. Samples exceeding the upper limit are analyzed with gravimetric method (1A3-Au, Ag). Gold is separated with nitric acid following fire assay, annealed using a torch and the remaining gold flake is weighed on a microbalance.

The rest of the elements were analyzed with total digestion and ICP (1F2). Samples are digested in four acids (hydrofluoric, nitric, perchloric and aqua regia) (Actlabs website: <a href="http://www.actlabs.com">http://www.actlabs.com</a>). The samples are then analyzed with an Agilent 735 ICP. Quality control samples are inserted during this process.

Specific gravity measurements were taken on the pulps using the relative volumes of solids to water and air in a given volume that pass the 4.75 mm sieve using a pycnometer (calibrated volumetric flask) (Actlabs website: <a href="http://www.actlabs.com">http://www.actlabs.com</a>).

The sample preparation, security and analytical procedures for the 2006 and 2013 programs were adequate.



# 12.0 DATA VERIFICATION

#### 12.1 Caracle Creek Site Visit

The most recent site visit was completed by Luc Harnois, Ph.D., P.Geo., from March 7 to 23, 2013. As no additional work (material or otherwise) has been done on the Property since the original report was released in 2013, it was determined that no site visit is required at this time.

Two site visits were completed in 2013. The first site visit began on the morning of January 18<sup>th</sup> and lasted a little more than four hours (on site). The helicopter used to get there was a Bell 206B (Jet Ranger; the pilot was Bruno Prieur) provided by Expedition Helicopters (Cochrane). Prospector Peter Roberts from Timmins, Ontario was also a passenger on this flight. The Mikwam Property is located 160 km northeast of Timmins, and travel time is about one hour. The weather was sunny, cold (-21°C) and windy.

Access to the Property is by helicopter only. There is only one road going through this area. It is a northeast-southwest gravel road located 18 km north of the Property. This gravel road runs north of North Chabbie Lake and connects to the north-south 652 paved road to the west. The gravel road was not plowed on the site visit day.

A Tember logging camp (580187E, 5499052N) is located on the north side of the gravel road. On January 18<sup>th</sup> this camp was uninhabited and the access to the camp as well as the camp area itself was not plowed. There was no evidence of recent activities. The Tember camp is composed of five gigantic trailers that seemed in good condition (not vandalized, windows not broken).

There is a 22 km logging trail going from the Tembec Camp to the 2006 Mikwam drilling area (Figure 4-2 and Figure 12-1). The trail was flown over using the helicopter and was surveyed using a Garmin 76CSx GPS. The trail doesn't appear to cross any river or creek and should be explored in more details with snowmobiles (winter time) or ATVs (summer time), as it could potentially be used to bring in heavy machinery and save on future drilling costs. The trail connects to the gravel road at 580269E, 5498978N and runs southeast to the drilling area where it connects (592093E, 5483056N) to an east-west logging trail.

There is no power line going through the Property and no power lines were seen in that area.



There is a northwest-southeast creek less than 500 m from the 2006 drilling area which can provide enough water for the drill(s). There is also a number of small lakes (150-500 m in diameter) scattered throughout the Property. All lakes and creeks were frozen solid on the site visit day (January 18<sup>th</sup>). There was approximately one metre of snow on the ground and no outcrops were seen anywhere.

A building or shack (591942E, 5482835N) which seems to have been used for miscellaneous storage is mostly destroyed (Figure 12-2). The core logging shack is also mostly gone. These two buildings seem to have been destroyed by the weather (wind, rain, storm, snow, etc.) rather than having been vandalized by humans.

The core boxes are stored on a small bump (591938E, 5482794N and 591957E, 5482837N), near the miscellaneous storage building, on both sides of an east-west trail going through the 2006 drilling area (Figure 12-3). The core boxes are all nicely cross piled and closed with wire. None of the core boxes have been moved and there was no evidence that they have been opened or tempered with. All core boxes are in remarkably good condition. The core boxes of the following ESO-06 holes are accounted for: 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 11A, 12, 13, 14, 15, 16 and 17. Hole ESO-06-04 core boxes were not found and were most probably under the snow.

Most core boxes were frozen together. Nevertheless, several core boxes were opened and looked at (Figure 12-4). The entire core (BQ) was frozen and stuck to the core boxes, and various tools were used to free the core. The main lithologies observed are metasandstone, chlorite schist, and quartz veins (>1 m thick) with minor sulphides. Where the core was sampled, half of it was removed and bagged. The sampler stapled a flag tape with the sample number and the start and end of the sample. There was no paper sample tag in the observed boxes. Some sample numbers ending with "5" are not present in the observed core boxes and are most probably standards or blanks.

The casing of two historical holes and three ESO holes from 2006 were located (Table 12-1 and Figure 12-5). All observed ESO 2006 casings were properly labelled.

Several claim posts were also found (Table 12-1 and Figure 12-6). The observed claim posts were all standing up right and they all had the appropriate provincial metal tag.



One east-west baseline (pickets BL20S 33+25E) was also observed (Table 12-1). The pickets were properly labelled on metallic tags and standing up right. Another line was observed; however the pickets on this north-south line were not labelled at all and were several years old.

Some discrepancies were found between the UTM values measured in the field during the site visit (using a Garmin 76CSx) and the UTM coordinates in the NI43-101 report from 2006 (Table 12-2). For the drill hole collars, the difference between the measured UTM values and the ones I got by email from CCIC office is fairly constant (approximately easting= 16m; northing= 9m), therefore the coordinates of all drill holes in the current report, except the Mineral Resource section, were shifted accordingly. The old coordinates were originally measured in NAD27 system. The discrepancies may be due to conversions from different NAD27 projection systems. The discrepancies for the claim posts are larger and not consistent.

Due to the discrepancies in UTM coordinates, it is recommended that all drill holes and claim posts are surveyed with a Trimble GPS unit.

Table 12-1. Coordinates of points measured (UTM NAD83, Zone 17).

Location	Easting	Northing	Azimuth (°)	Dip (°)
Tembec Logging Camp	580187	5499052		
trail connecting to gravel road	580269	5498978		
start of logging trail	592093	5483056		
building/core shack	591942	5482835		
core boxes 1	591938	5482794		
core boxes 2	591957	5482837		
2 historical drill holes (no number)	592339	5483012	3	53 and 60
ESO-06-04	592440	5483032	270	63
ESO-06-05	592439	5482982	275	65
ESO-06-06	592438	5482929	280	54
Claim 4246490, post #1	592845	5483489		
Claim 4246490, post #2	592881	5483066		
Claim 4246490, post #3	592446	5482996		
pickets BL20S 33+25E	592460	5483432		
picket (not labeled)	592727	5483060		

Table 12-2. Discrepancies in UTM coordinates.

Location	Site visit (Garmin 76CSx)		2006	report	Difference (m)	
Location	Easting	Northing	Easting	Northing	Easting	Northing
ESO-06-04	592440	5483032	592423.3	5483023.3	16.7	8.7
ESO-06-05	592439	5482982	592423.7	5482973	15.3	9



ESO-06-06	592438	5482929	592421.7	5482919.4	16.3	9.6
Claim 4246490, Post #1	592845	5483489	592883	5483507	-38	-18
Claim 4246490, Post #2	592881	5483066	592893	5483070	-12	-4
Claim 4246490, Post #3	592446	5482996	592462	5483064	-16	-68

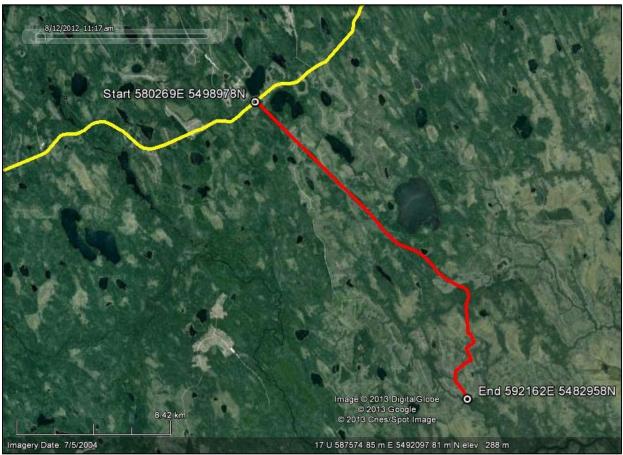


Figure 12-1. Gravel road (yellow) and logging trail (red) leading to the Mikwam Property.





Figure 12-2. Remnants of the core shack, looking east.



Figure 12-3. Core shack (left of the trail) and core storage (centre) looking east.





Figure 12-4. Drill core from ESO-06-15, sample 30724 (284 to 285 m), quartz vein.



Figure 12-5. Location of drill hole collar ESO-06-04.





Figure 12-6. Claim post #2 of mining claim 4246490.

Luc Harnois was also present during the entire drilling program which he supervised. In addition to core logging, Dr. Harnois recorded the coordinates of several of ESO's 2006 drill holes with a differential GPS (*see* Section 10.4).

#### 12.2 Historical Drill Hole Data

As outlined in Section 6.0, a number of previous drill campaigns have been undertaken on the Property. A total of 36 holes that previously targeted the A8 3200 vein system were compiled into a digital database for use in the current mineral resource estimate. As far as the authors are aware, drill core, rejects, and pulps from previous exploration campaigns are not available for inspection or re-assay.

Several comparisons of historical drill holes to 2006 drill holes are presented in Table 12-3, Figure 12-7, Figure 12-8 and Figure 12-9. As a result of down-hole deflection, ESO-06-01 parallels MK-92-1 at an average separation of 7.5 m. These two holes present the most disparate example of correlation between historical and current drill results (Figure 12-7). The difference may be due to the use of acid down-hole



tests for historical holes and reflex surveys for the current program, which could place these samples incorrectly proximal. The comparison of ESO-06-15 and MK-94-12 presents the typical example of correlation between historical and current drill results (Figure 12-8). ESO-06-03 and MK-94-10 drill through the same body of mineralization at normal directions; a strong correlation is evident where the holes are most proximal (Figure 12-9). The correlation between the historic drill holes and holes drilled by ESO in 2006 is satisfactory.

Table 12-3. Summary of diamond drill hole collar locations utilized for comparison.

Drill Hole No.	Easting	Northing	Elevation	Azimuth (°)	Dip (°)	Figure
ESO-06-01	592322.89	5482788.32	267.7	360	-45	14-1
MK-92-1	592322.91	5482790.47	268.25	360	-50	14-1
ESO-06-15	592269.97	5483109.37	271.9	180	-60	14-2
MK-94-12	592278.68	5483139.06	272.1	180	-50	14-2
ESO-06-03	592237.96	5482869.15	268.5	90	-45	14-3
MK-94-10	592362.02	5482780.40	269	360	-50	14-3

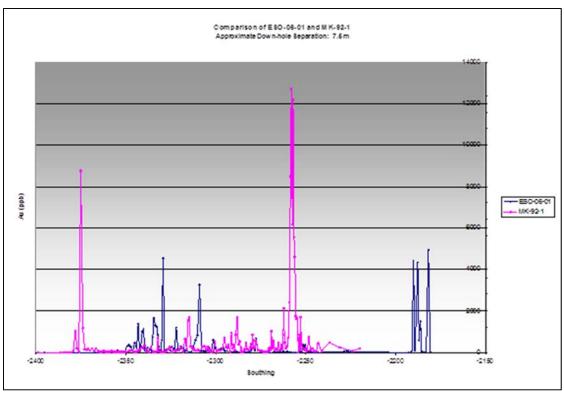


Figure 12-7. Sample Au grade comparison of ESO-06-01 and MK-92-1.



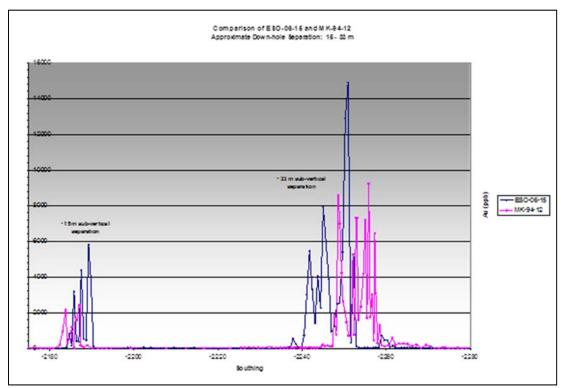


Figure 12-8. Sample Au grade comparison of ESO-06-15 and MK-94-12.



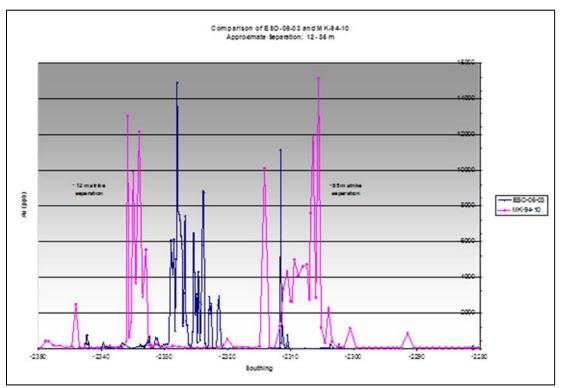


Figure 12-9. Sample Au grade comparison of ESO-06-03 and MK-94-10.

### 12.3 Quality Control

### 12.3.1 2006 Program

A quality control regime was consistently followed by Caracle Creek on behalf of ESO Uranium Corp. during the course of core sampling. One out of ten sample instances sent to the Techni-Lab laboratory for analysis was one of two blind gold standards (Au-47 or Au-Q2) or a blind blank. The 191 standards and blanks submitted along with the core samples returned acceptable values.

Duplicates of 100 core samples were also sent to secondary laboratory (ALS Chemex Chimitec, 1322 Harricana Street, Val-d'Or, QC, J9P 3X6) for additional control on the results. The duplicate samples were selected to cover broad temporal and Au-grade ranges. In general, ALS Chemex returned lower values, particularly in the range below 1 g/t Au. The value of correlation is 0.82; however, the correlation strengthens in the higher grade range (Figure 12-10).



The QP's opinion is that the quality control review indicates that the standards, blanks and duplicates from the 2006 drill program are of good quality and can be used in 3D modelling for the purpose of resource estimations. The quality control review also indicates that there were no sample mix ups in the core shack and only one sample mix up during lab processing.

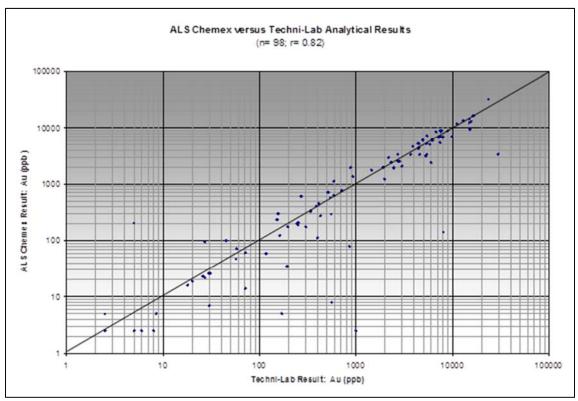


Figure 12-10. Comparison of Techni-Lab versus ALS Chemex Au results.

#### 12.3.2 2013 Program

A total of 1292 sample were sent to Actlabs for analysis, including 65 blanks, 64 standards and 60 core duplicates. Actlabs analyzed 110 pulp duplicates and 28 preparation duplicates with the samples. The number of external and internal standards complies with mining industry standards.

## Blanks and standards



Two external standards were used. Table 12-4 summarizes the characteristics of the external standards.

Table 12-4. Standard characteristics of external standards.

Standard	Prepared By	Value (ppm)	Standard Deviation	Analytical Method
OREAS 201	Ore Research and Exploration	0.514	0.017	fire assay/AAS or ICP-OES
OREAS 204	Ore Research and Exploration	1.043	0.039	fire assay/AAS or ICP-OES

Standards are used to check the accuracy of the analysis. The rules for the standards and blank samples include:

- 1. The standard is considered a failure when it returns a value that falls outside ±3 standard deviation.
- 2. The standard is marked as a "warning" when it returns a value between ±2 and ±3 standard deviation. If three or more adjacent standards are on the same side of the Au mean value and fall between ±2 and ±3 standard deviation, then all standards are classified as failure. This may indicate a bias in the laboratory.
- A blank sample greater than the maximum acceptable value, which is typically three times the
  detection limit, is a failure. A failure in the blanks indicates a contamination during sample
  preparation in the laboratory.

The results of the blanks and standard analysis are shown in Figure 12-11 through Figure 12-13. All standards and blanks passed. Three OREAS 201 standard analysis fall in the "warning" zone (between 2 and 3 standard deviation), which is acceptable.



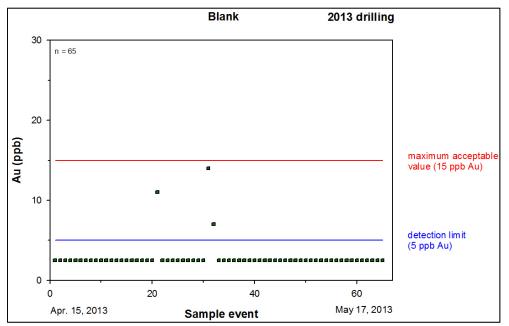


Figure 12-11. Plot of blanks analysis.

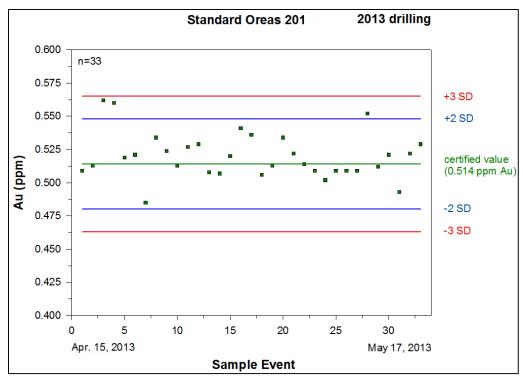


Figure 12-12.Control chart for standard OREAS 201.



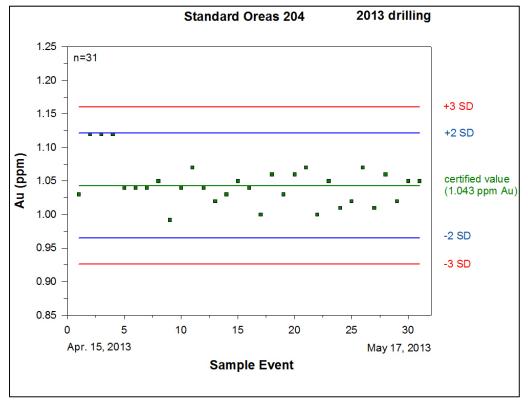


Figure 12-13. Control chart for OREAS 204.

### **Duplicates**

Duplicates are used to check the precision of the analysis: analytical errors, sample preparation errors and nugget effect. The original values versus the duplicate values are plotted and compared. If the R<sup>2</sup> value of the correlation line is greater than 0.95%, all the duplicates pass. A duplicate is considered a failure when there is a large difference between the original and duplicate analyses and the value of the analysis falls outside the 0.95% confidence interval.

Actlabs inserted 110 pulp duplicates and 28 prep duplicates into the sample stream. The results are shown in Figure 12-14 and Figure 12-15. The R<sup>2</sup> value is 0.9998 for the pulp duplicates and 0.9927 for the prep duplicates, suggesting that the precision of the analysis is very good.



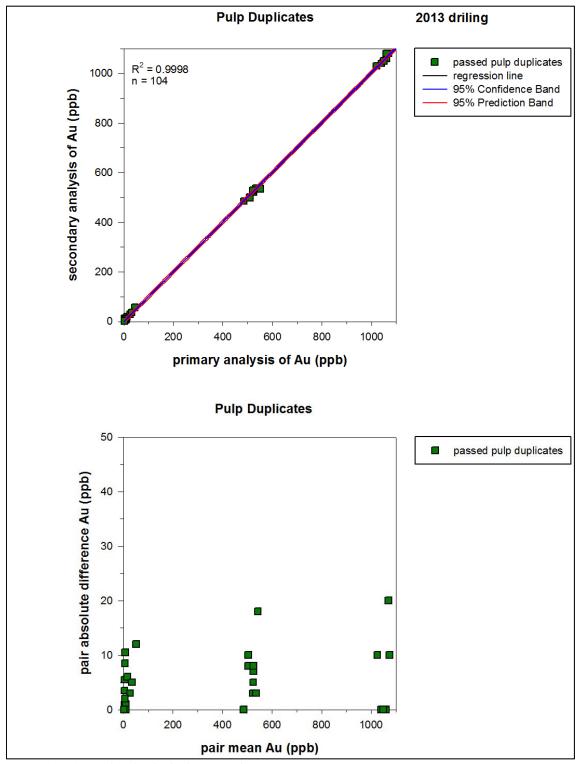


Figure 12-14. Results of pulp duplicate analysis.



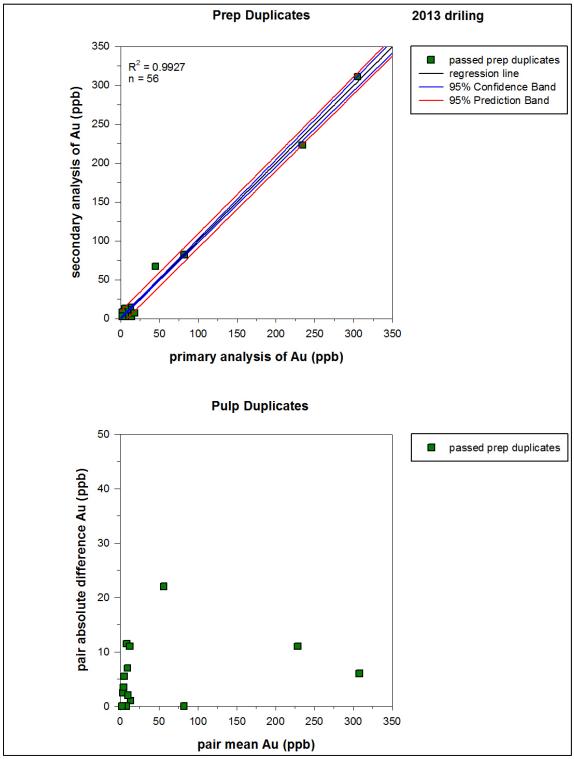


Figure 12-15. Results of prep duplicate analysis.



Results of the 60 core duplicates are shown in Figure 12-16. The R<sup>2</sup> value is 0.8106, which is slightly low, but this is probably due to a "nugget effect". At this stage of exploration this is acceptable, but it is recommended that in the future samples with gold grades above 5 ppm are analyzed with pulp metallic method to check for the "nugget effect".

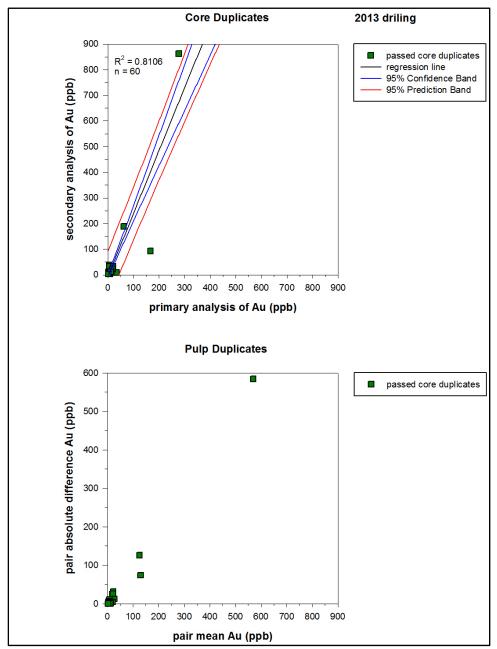


Figure 12-16. Core duplicate analysis.



### **QC** Summary

The QC procedures and results for the 2013 drilling and resampling program on the Mikwam Property are of excellent quality and adequate for the purpose of this report. The R<sup>2</sup> value of the core duplicates is slightly low, but this is due to the nature of mineralization rather than the quality of analytical data. No sample mixup was observed.

## 13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

Galena International has not completed any mineral processing or metallurgical testing.

## 14.0 MINERAL RESOURCE ESTIMATES

In 2013, Caracle Creek was retained by Alpha Minerals Inc. to complete a mineral resource estimate update for their Mikwam Gold Project located in Ontario, Canada. The mineral resource reported herein is based on drilling information as of September 1<sup>st</sup> 2013 and supersedes the mineral resource completed by Caracle Creek dated November 13<sup>th</sup> 2006. All of the drill hole data, including collars, assays, survey and lithology, were compiled into a database which links directly to the geological modelling and resource estimation software. The mineral resource estimation was evaluated using geostatistical block modeling methods constrained by a mineralised wireframe. GEMCOM's GEMS resource modeling software V.6.5 was used to generate the block model and perform the grade estimation. Grades for Au were estimated using the Inverse Distance method of interpolation. The mineral resources have been estimated in conformity with the CIM "Mineral Resource and Mineral Reserves Estimation Best Practices" guidelines and were classified according to the CIM Standard Definition for Mineral Resources and Mineral Reserves (November 2010) guidelines. The mineral resources are reported in accordance with the Canadian Securities Administrators National Instrument 43-101.

Independent, NI 43-101 compliant resources at the Mikwam Property were estimated by Jason Baker (P.Eng.), an Associate Geological Engineer with Caracle Creek. QA/QC was completed by Caracle Creek on the assays prior to incorporation in the 3D model (Section 12, Data Verification). Because of his education, project experience and affiliation to a recognized professional association, Mr. Baker is a



"Qualified Person" independent of Galena International (and at the time Alpha Minerals Inc.) in accordance with NI 43-101 guidelines. Mineral resources were calculated for the Mikwam Project by the methods described above. The Mineral Resource Statement reported for the Mikwam Project is presented in Table 14-1using a 1.00 g/t Au cut-off grade. The effective date is September 19, 2013.

Table 14-1. Mineral resource statement (Caracle Creek, effective date is September 19, 2013).

Resource Category	Quantity (Tonnes) <sup>2</sup>	Grade Au (g/t)	Contained Au (Ounces) <sup>3</sup>	
Inferred	1,810,000	2.34	136,000	

 $<sup>^{1}</sup>$  Reported at a cut-off grade of 1.00 g/t Au. Mineral resources are not mineral reserves and do not have demonstrated economic viability.

This report summarizes the methodology, data and validation techniques used by Caracle Creek in estimating the mineral resources for the Mikwam Project.

### 14.1 Database Generation

The Independent Mineral Resource Estimate presented herein, is based on historical data provided by Alpha Minerals Inc., as well as data from a 2013 drilling program conducted by Alpha Minerals Inc. Classification of the Mineral Resource complies with "Canadian Institute of Mining, Metallurgy and Petroleum Standards on Mineral Resources and Mineral Reserves Definitions Guidelines". The historical data were provided to Caracle Creek in hard-copy format in early 2006. The data was manually captured, re-formatted into GEMS compatible spreadsheets, and validated.

Table 14-2. Summary of diamond drill hole data.

No	oranda	Trader	/ Highwood	ESO Ur	anium Corp.	Alpha Mir	nerals Inc.	,	Total
Data	Records	Data	Records	Data	Records	Data	Records	Data	Records
Collar	16	Collar	20	Collar	18	Collar	5	Collar	59
Assay	730	Assay	2653	Assay	2216	Assay	597	Assay	6196

<sup>&</sup>lt;sup>2</sup> Tonnes have been rounded to the nearest 10,000. Grade has been rounded to two (2) significant digits.

<sup>&</sup>lt;sup>3</sup>Rounded to the nearest 1.000.



## 14.1.1 Digital Elevation Model

The Digital Elevation Model (DEM) for the Property area, which was utilized estimate overburden thickness, was created using the collar elevations.

## 14.2 Wireframe Modelling

The final wireframe models represent a threshold above which zones of >1.0 g/t Au (1000 ppb Au) could be consistently followed and modelled. In most instances, the significant intersections were reconciled from section to section without the inclusion of low-grade intervals (Figure 14-1).

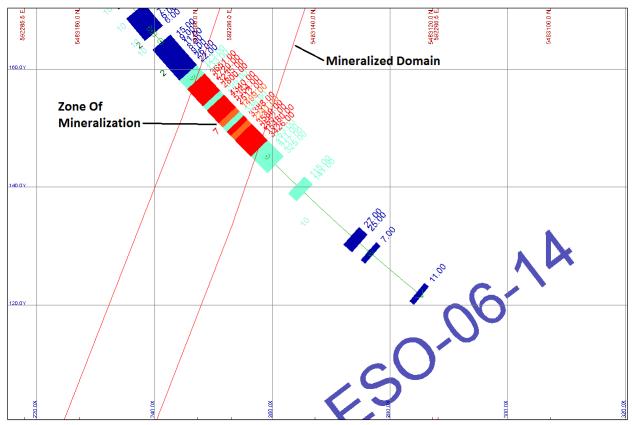


Figure 14-1. Example of mineralized zone and 1.0 g/t Au cut-of used to mineralized zone.

A threshold of 1.0 g/t Au was used as modelling trials at higher gold grade steps did not serve to significantly increase the average grade within the principal zones of mineralization without excessively narrowing them. Lower grade steps did not serve to significantly increase average width.



The A8 3200 Vein system was modelled as 8 discrete zones across a strike length of approximately 330 metres. The zones strike at azimuths of 90° to 104° and dip sub vertically (Figure 14-2). The sizes of the zones vary depending upon the samples they are represented by; the average true thickness is approximately 10 metres.

This interpreted continuity suggests that the Au mineralized zones at Mikwam are favorable with respect to selectivity and other factors when considering mining options. As a result, the stated mineral resource is considered to have reasonable prospect for economic extraction.

As modelled, the zones did not reach above the bedrock surface, which lies at an average elevation of 230 m ASL (~50m below the overburden surface). An orthographic east facing image of the model is presented in Figure 14-2. A plan view image is presented in Figure 14-3.

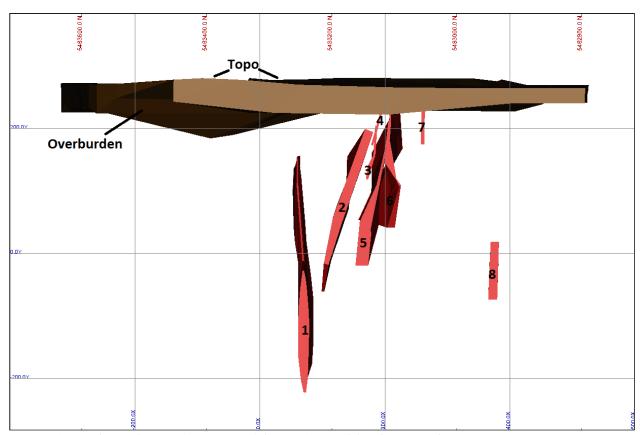


Figure 14-2. Orthographic east facing view of the A8 3200 model and zone numbers.



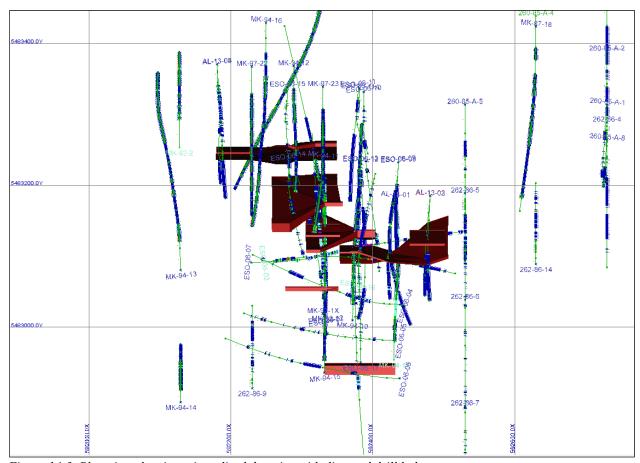


Figure 14-3. Plan view showing mineralized domains with diamond drill holes.

## 14.3 Specific Gravity

The specific gravity (SG) value utilized in the current Mineral Resource Estimate is 2700 kg/m<sup>3</sup>. The value was inherited from that utilized in the 1998 (NI43-101 non-compliant) Resource Evaluation completed by Highwood Resources (Jensen, 2002). Specific gravity measurements were completed on all samples collected and analyzed in 2013 (including the resampled 2006 core); however, insufficient samples were from the mineralized zone. Therefore, the value used is considered practical given the geologic setting of the mineralization; however, for future revision of the Mineral Resource estimate, additional specific gravity measurements should be carried out during any future work programs.



# 14.4 Adjustments to Sample Database

The samples contained within the wireframe models were extracted to a new database. Probability and log probability histograms were generated for Au in order to identify outliers and distributions in the sample population.

## 14.4.1 Sample Capping

To avoid over-estimation, samples identified as high-grade statistical outliers can be capped or top-cut. A capping analysis was performed on the composited data based on the charted distribution of grade within each mineralized domain (Figure 14-4). Several top-cuts were tested to ascertain the influence of the high-grade samples on each population mean, which ultimately was found to be negligible. Therefore no capping of the Au grade was performed.

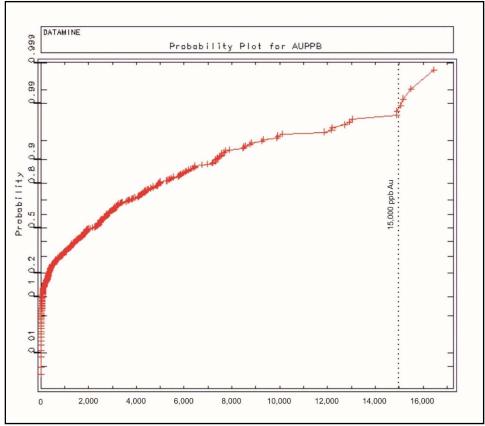


Figure 14-4. Au log-probability plot for un-capped samples within the A8 3200 model.



## 14.4.2 Sample Composites

The average length of all samples is 1.47 metres with a median of 1.01 metres. There were two large samples populations of 1.0 and 1.5 meters (Figure 14-5). Based on this, assays were composited to 2m composites.

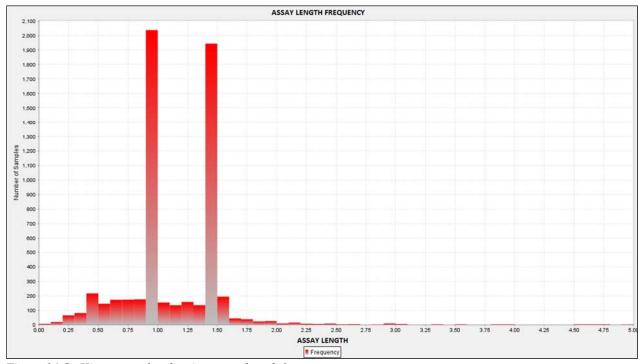


Figure 14-5. Histogram plot showing assay length frequency.

## 14.5 Variography

Due to the lack of data within each mineralized domain, 3D variography to demonstrate spatial continuity was not possible. However, a down hole variogram was constructed (Figure 14-6). The down hole variogram shows the nugget to be 30%.



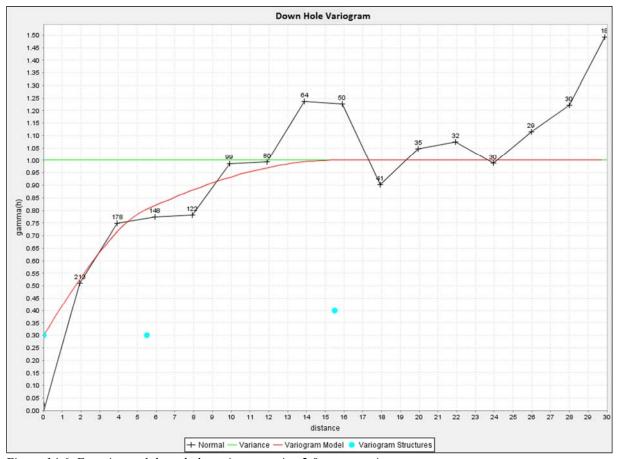


Figure 14-6. Experimental down hole variogram using 2.0 m composites.

### 14.6 Block Model

A summary of parameters used to generate the block model is presented in Table 14-3. The block sizes were chosen to reflect the drill hole spacing, sample spacing and yield the best fill of the wireframe model.

Table 14-3. Block model definitions for the Mikwam Project.

	Y (m)	X (m)	<b>Z</b> (m)
Origin Coordinates (m)	5482850	592100	300
Block Size	10	10	10
Rotation	0	0	0
Number Of Blocks	55	50	55



## 14.7 Grade Estimation Strategy

The A8 3200 system was modelled utilizing all available and validated sample data. A total of 460 samples from 19 drill holes have contributed to the Estimate.

Grade estimation was based on Inverse Distance using one pass. The search ellipse radius and orientation were chosen to reflect drill hole spacing and sample spacing. Table 14-4 summarizes the parameters used in the grade estimation.

Table 14-4. Parameters used in the grade definition.

	Pass 1
Method of Interpolation	Inverse Distance Squared
Search Radius	100m in all directions
Search Type	Ellipsoidal
Min # of Samples	2
Max # of Samples	20
Min # of Holes	1
Max # of Samples per Hole	20

### 14.8 Block Model Validation

The validity of the block model was evaluated using four techniques. 1) Caracle Creek constructed a parallel estimation model for Au using an Ordinary Kriging method of estimation. The results were within 5% deviation in total tonnes and Au grade to that of the original model. 2) Statistical comparisons were made between the interpolated blocks from both the ordinary kriging and inverse distance models and the raw assay data. 3) The reported total block model tonnage and grade were also compared to a sectional volume method of estimation, which does not involve block modeling. A weighted average of all Au assays within the mineralized domain was calculated along with the volume of the mineralized domain. The results were within 5% to that of the original block grade estimation. 4) The interpolated block grades were visually checked on section and level plans and compared to the raw assay data.



#### 14.9 Mineral Resource Classification

Based on the study reported herein, delineated mineralization at Mikwam is classified in part as **mineral resource** according to the following NI 43-101 definitions:

"In this Instrument, the terms "mineral resource", "inferred mineral resource", "indicated mineral resource" and "measured mineral resource" have the meanings ascribed to those terms by the Canadian Institute of Mining, Metallurgy and Petroleum, as the CIM Standards on Mineral Resources and Reserves Definitions and Guidelines adopted by CIM Council on November 27, 2010, as those definitions may be amended from time to time by the Canadian Institute of Mining, Metallurgy, and Petroleum."

"A Mineral Resource is a concentration or occurrence of diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge."

Mineral resources are not mineral reserves as economic viability of resources has not yet been shown. The terms Measured, Indicated and Inferred are defined in NI 43-101 as follows:

"A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity."

"An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from



locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed."

"An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes."

The estimated tonnages for the mineralized domain at the Mikwam Gold Property are classified Inferred resources.

#### 14.10 Mineral Resource Statement

Mineral resources for Mikwam are reported and classified by Mr. Jason Baker, P.Eng, an appropriate independent Qualified Person. Classification was done in accordance with the CIM Standard Definition for Mineral Resources and Mineral Reserves (November 2010) guidelines. The Mineral Resource Statement for the Mikwam Project is summarized in Table 14-5. The effective date is September 19, 2013).

Table 14-5. Mineral resource statement (Caracle Creek, effective date is September 19, 2013).

Resource Category	Quantity (Tonnes) <sup>2</sup>	Grade Au (g/t)	Contained Au (Ounces)3	
Inferred	1,810,000	2.34	136,000	
	•		-	

<sup>&</sup>lt;sup>1</sup>Reported at a cut-off grade of 1.00 g/t Au. Mineral resources are not mineral reserves and do not have demonstrated economic viability.

The block model tonnage and grade were calculated at various cut-off grades in order to demonstrate the sensitivity of the resource estimate with respect to reporting cut-off grade. The results are shown in Table 14-6. It should be stressed to the reader that the figures presented in Table 14-6 are not to be misconstrued as a mineral resource as they are intended for the sole purpose of demonstrating the sensitivity of the resource estimate with respect to reporting cut-off grade.

<sup>&</sup>lt;sup>2</sup> Tonnes have been rounded to the nearest 10,000. Grade has been rounded to two (2) significant digits.

<sup>&</sup>lt;sup>3</sup>Rounded to the nearest 1,000.



Table 14-6. Block model quantities and grades reported at various cut-off grades.

Cut-Off (g/t)	Tonnage (tonnes)	Grade Au (g/t)
0.25	2,370,000	1.97
0.5	2,330,000	2.00
0.75	2,200,000	2.08
1	1,810,000	2.34
1.25	1,700,000	2.41
1.5	1,620,000	2.47
1.75	1,410,000	2.58
2	1,060,000	2.82
	-	

All figures were rounded to the nearest 10,000.

Mineral resources are not mineral reserves and do not have demonstrated economic viability.

There are no known factors related to permitting, legal, title, taxation, socio-economic, environmental, and marketing or political issues which could materially affect the mineral resource at the time of reporting.

The mineral resource estimate for the Mikwam Property presented in this Report is effective of September 19, 2013 (Table 14-5).

# 15.0 ADJACENT PROPERTIES

Figure 15-1 is a tenure map of claims of adjacent properties. In this Report, adjacent properties are defined as exploration Property within 10 km of the Mikwam Property. Below is a description of recent exploration on the adjacent properties from publicly available data.

The Qualified Person has been unable to verify the information presented below and the mineralization on adjacent properties is not indicative of mineralization on the Property that is subject of this Technical Report.

#### 15.1 Nebu Resources Inc.

The property of Nebu Resources is located approximately 2 km south of the Mikwam Property. It consists of 45 claim units covering 10,500 hectares (<a href="http://www.neburesources.com">http://www.neburesources.com</a>). According to Nebu Resources,



recent airborne geophysical surveys combined with new geological observations and interpretations suggest that the western extension of the CBDZ is located within the Nebu claims.

Nebu Resources was planning an exploration program consisting of 65 hole reverse circulation (RC) drilling to allow the collection of overburden samples of till near the bedrock interface (http://www.neburesources.com). No results of the exploration program are available to the public.

# 15.2 Tri Origin Exploration Ltd.

The property of Tri Origin is located approximately 9 km to the west of the Mikwam Property. The North American Exploration Ltd. claims to the south of Tri origin's claims are under an option agreement between Tri Origin and North American Exploration Ltd. (<a href="http://www.triorigin.com">http://www.triorigin.com</a>).

Tri Origin completed a high resolution heliborne electromagnetic and magnetic survey in 2008, which resulted in numerous drill targets.

The property contains the Road Gold Zone, which was discovered by Newmont in the 1980's and has been intersected in drilling by Tri Origin returning values of up to 17.8 g/t gold over 1.6 metres at a depth of 212 metres.

In 2011, surface trenching and sampling by Tri Origin was successful in exposing the Road Gold Zone at surface. Five out of fourteen samples returned values greater than 1 g/t. The best values included 43 g/t, 25 g/t and 21 g/t. Gold mineralization is hosted in parallel, west striking quartz-carbonate veins hosted in hematite altered felsic rocks.

Tri Origin also completed a compilation of all historical and current drill holes on the property, which includes 106 holes drilled by Newmont, Cogema Canada and Tri Origin (<a href="http://www.triorigin.com">http://www.triorigin.com</a>). Twenty-one of the 80 historical drill holes contain at least one sample with greater than 2 g/t gold across a one metre interval.

## 15.3 Tiger Gold Exploration Corp.

No public information was found on the claims held by Tiger Gold Exploration Corp., located approximately 10 km northeast of the Mikwam Property.



# 15.4 Lake Shore Gold Corp.

The Mikwam Property is surrounded by claims of Lake Shore Gold, but there is no publicly available data on the claims at the present time.

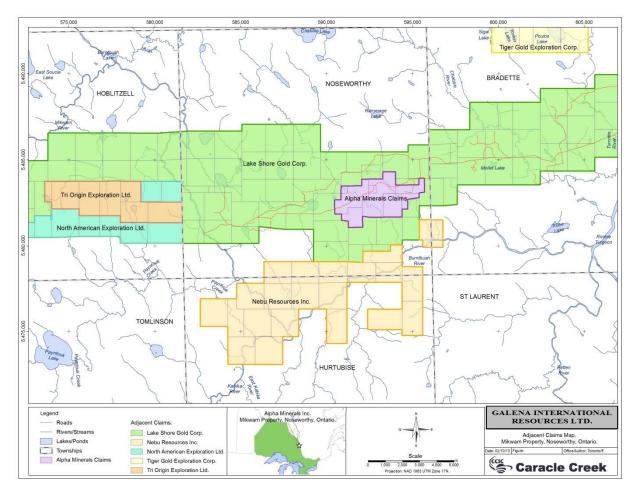


Figure 15-1. Land tenure map showing locations of adjacent properties to the Mikwam Gold Property.

## 16.0 OTHER RELEVANT DATA AND INFORMATION

No additional information or explanation is necessary to make this technical report more understandable.



### 17.0 Interpretation and Conclusions

The Mikwam Property is located approximately 105 km east-northeast of Cochrane, Ontario, 150 km north-northeast of Kirkland Lake, Ontario, and lies within map sheets 32E/05 and 32E/12 of the National Topographic System. This Report was prepared to support the resource update on the Mikwam Property.

The Mikwam Property currently consists of nine (9) contiguous claims, totaling 944 ha, that are held by Alpha Minerals Inc. and subject to a recent Option Agreement with Galena International. The principle target area and subject of the current Mineral Resource Estimate, referred to as the A8 3200 vein system area, is situated within the eastern portion of mining claim 3019086 and within mining claim 4246490.

In early 2006, Caracle Creek was contracted to assist in the execution of a diamond drill program being conducted by ESO (now Galena International). Drilling commenced March 3<sup>rd</sup>, 2006 and ended June 29<sup>th</sup>, 2006; a total of 6383 metres were completed. All drill holes completed by ESO during the 2006 drilling program were located within claim 3019086 of the Noseworthy Township and focused on testing the A8 3200 Vein.

Caracle Creek was thereafter retained by ESO (subsequently Alpha Minerals Inc.) to conduct an independent estimation of the Mineral Resources located on the Mikwam Property.

In 2013, Alpha drilled five diamond drill holes totalling 1,189 m on the Mikwam Property. The purpose of the drilling program was to test the continuity of the A8 3200 mineralized zone. Gold mineralization appears to be controlled by structures and alteration rather than rock type. The highest Au grade in the 2013 drill holes is 5.9 g/t Au over 1.82 m in drill hole AL-13-02.

In addition, parts of five drill holes originally drilled by ESO I 2006 that were not sampled in 2006 were sampled in 2013 to test whether these zones are mineralized. Some intervals in drill hole ESO-06-12 were weakly mineralized but most of the zones did not contain significant mineralization. This result suggests that the lack of mineralization in these holes is not due to insufficient sampling but rather to the variable nature of the mineralization.

Caracle Creek updated the 2006 resource estimate with the 2013 drilling and the re-assay data. The current resource is shown in Table 17-1. The effective date of the mineral resource is September 19, 2013.



*Table 17-1. Mineral Resource Estimate statement*<sup>1</sup> (effective September 19, 2013).

Resource Category	Quantity (Tonnes) <sup>2</sup>	Grade Au (g/t)	Contained Au (Ounces) <sup>3</sup>	
Inferred	Inferred 1,810,000		136,000	
			•	

 $<sup>^{1}</sup>$  Reported at a cut-off grade of 1.00 g/t Au. Mineral resources are not mineral reserves and do not have demonstrated economic viability.

The mineralized zone consists of eight, approximately east-west striking lenses (Figure 14-2). The extent of the entire mineralized zone is  $330 \text{ m} \times 330 \text{ m} \times 500 \text{ m}$ . The mineralized zone is open in various directions, including both to the east and to the west of drill hole ESO-06-13 and between this hole and the surface.

The QP's are not aware of any significant risks and uncertainties that could reasonably be expected to affect reliability or confidence in the exploration data, mineral resource estimates, or projected economic outcomes.

The QP's believe that the objectives of the report, to prepare an Independent Technical Report in order to comply with listing requirements and provide an update of exploration activities on the Mikwam Property, were met.

Based on the historic and current drilling and the current resource update, Caracle Creek concludes that the Property has the potential to expand the current resource and that further exploration on the Property is warranted.

#### 18.0 RECOMMENDATIONS

The core logging data and the updated geological model of the mineralized zones indicate that the mineralization at Mikwam is strongly structurally controlled. Caracle Creek recommends a detailed structural review of the existing core with particular attention to structures of all scales and rock types followed by a structural interpretation. The structural interpretation should help in the selection of further drill hole locations.

<sup>&</sup>lt;sup>2</sup> Tonnes have been rounded to the nearest 10,000. Grade has been rounded to two (2) significant digits.

<sup>&</sup>lt;sup>3</sup>Rounded to the nearest 1.000.



In addition, further drilling at Mikwam is recommended in order to test undrilled zones as identified by the 2013 geological model. The drill holes recommended at this stage are listed in Table 18-1, Figure 18-1, Figure 18-2 and Figure 18-3 show the locations of the proposed drill holes.

Table 18-1. Details of the recommended diamond drill holes.

Hole ID	Easting (m)	Northing (m)	Elevation (m)	Length (m)	Azimuth (°)	Dip (°)	Comments
Proposed-1	592331	5482983	270	425	0.00	-50.00	Verification of Lithology and
							Mineralization domains
Proposed-2	592380	5483038	270	300	0.00	-50.00	Verification of Lithology and
							Mineralization domains
Proposed-3	592290	5483300	270	250	180.00	-50.00	Verification of Lithology and
							Mineralization domains
Proposed-4	592282	5483195	270	150	180.00	-50.00	Verification of Lithology and
							Mineralization domains
				1,125			

Specific gravity measurements should be made on all historical samples available. In addition, Caracle Creek recommends analyzing all existing core for SG in order to increase the confidence in a mineral resource. Table 18-2 shows the anticipated cost (approx. CAD\$222,000) to complete the recommended exploration work.

*Table 18-2. Estimated cost to complete the recommended exploration program.* 

Item	Unit	No. of Units	Cost/Unit	Total (CAD\$)
Structural interpretation	ea.	1	\$15,000	\$15,000
Drilling	m	1,125	\$90	\$101,250
Camp	month	1	\$30,000	\$30,000
Geologist	hours	200	\$100	\$20,000
Geotech	hours	200	\$50	\$10,000
Vehicle	month	1	\$1,500	\$1,500
Supplies/Consumables	ea.	1	\$5,000	\$5,000
Assaying	sample	250	\$50	\$12,500
SG samples	sample	200	\$10	\$2,000
Resource Update	hour	80	\$120	\$9,600
NI 43-101 reporting	hour	35	\$100	\$3,500
GIS map generation	hour	16	\$75	\$1,200
Contingency (5%)	ea.	1		\$10,578
			TOTAL:	\$222,128



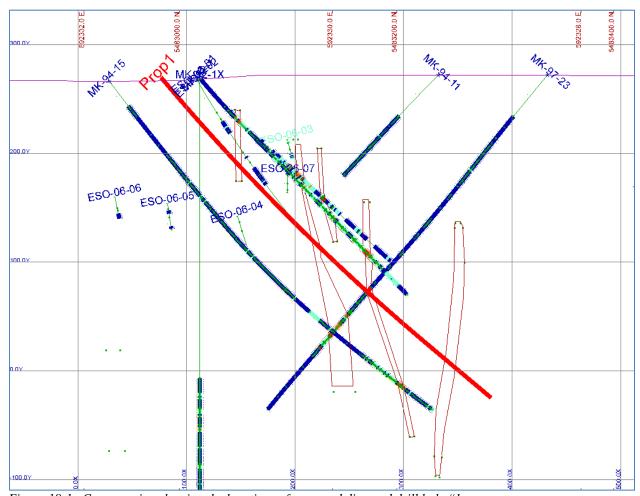


Figure 18-1. Cross-section showing the locations of proposed diamond drill hole #1.



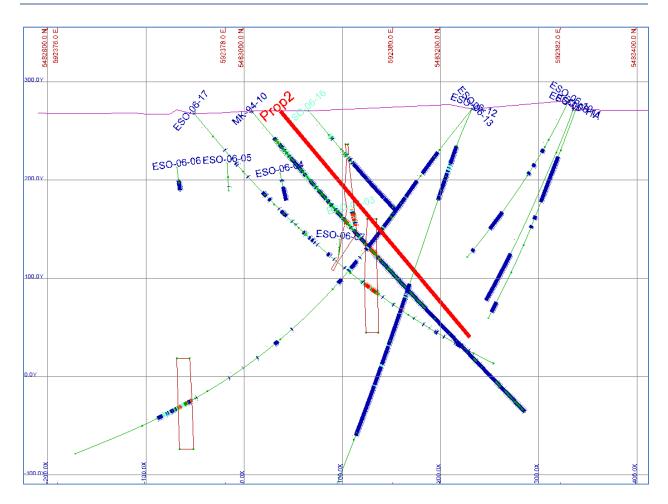


Figure 18-2. Cross-section showing the location of proposed diamond drill hole #2.



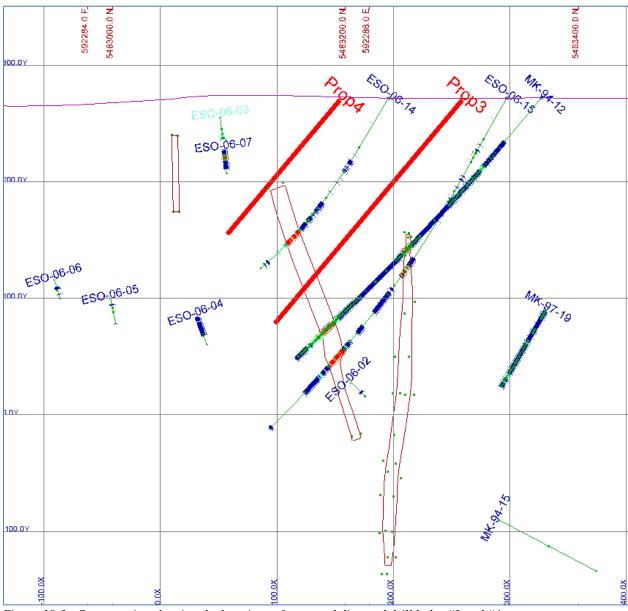


Figure 18-3. Cross-section showing the locations of proposed diamond drill holes #3 and #4.



# 19.0 REFERENCES

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## 20.0 STATEMENT OF AUTHORSHIP

This Report, titled "Independent Technical Report, Mikwam Gold Property, Noseworthy Township, Ontario, Canada", and dated Dec. 8, 2016, was prepared and signed by the following authors:

"Signed and sealed"

Scott Jobin-Bevans, Ph.D., P.Geo. Dec. 8, 2016 Toronto, Ontario

"Signed and sealed"

Luc Harnois, Ph.D., P.Geo. Dec. 8, 2016 Montreal, Quebec

"Signed and sealed"

Jason Baker, B.Eng., P.Eng. Dec. 8, 2016 Fall River, Nova Scotia



# Appendix 1

**Certificates of Qualified Persons** 



#### **Scott Jobin-Bevans**

1545 Maley Drive, Suite 2018 Sudbury, Ontario, Canada, P3A 4R7 Telephone: 705-671-1801 Email: scott.jb@caraclecreek.com

#### CERTIFICATE OF QUALIFIED PERSON

### I, Scott Jobin-Bevans, do hereby certify that:

- 1. I am a Geologist and President & CEO (Director) with the geological consulting firm Caracle Creek International Consulting Inc.
- 2. I am responsible for the overall preparation of the Technical Report, except for Section 12.1 (Caracle Creek Site Visit) and Section 14.0 (Mineral Resource Estimates), titled "Independent Technical Report, Mikwam Gold Property, Noseworthy Township, Ontario, Canada", dated Dec. 8, 2016, and prepared for Galena International Resources Ltd.
- 3. I am a Ph.D. graduate of the University of Western Ontario, London, Ontario (2004) and I completed my M.Sc. at the University of Manitoba, Winnipeg, Manitoba (1997), and B.Sc. (hons.) at the University of Manitoba, Winnipeg, Manitoba (1995).
- 4. I am a member in good standing with the Association of Professional Geoscientists of Ontario (APGO #0183).
- 5. I have been employed in the mineral exploration field world-wide for more than 25 years, mostly in gold and base metal exploration, in positions ranging from junior exploration geologist to project manager. I have read the definition of "Qualified Person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements as a Qualified Person for the purposes of NI 43-101.
- 6. I have not visited the Property.
- 7. I have no direct or indirect interest in the Property, nor do I expect to receive any direct or indirect interest in the Property. I am independent of the Issuer of this Report applying all the tests in section 1.5 of National Instrument 43-101, other than providing consulting services.
- 8. I have read the NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
- 9. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public.
- 10. As of the date of this Certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Dated this Dec. 8, 2016

Scott Jobin-Bevans, Ph.D., P.Geo. (#0183)

President & CEO (Director)

Caracle Creek, Canada



#### Luc Harnois

1545 Maley Drive, Suite 2018 Sudbury, Ontario, Canada, P3A 4R7 Telephone: 705-671-1801 Email: harnois@caraclecreek.com

## CERTIFICATE OF QUALIFIED PERSON

### I, Luc Harnois, do hereby certify that:

- 1. I am an Associate Senior Consulting Geologist for the geological consulting firm of Caracle Creek International Consulting Inc.
- 2. I am responsible for Section 12.1 (Caracle Creek Site Visit) of the Technical Report titled "Independent Technical Report, Mikwam Gold Property, Noseworthy Township, Ontario, Canada", dated Dec. 8, 2016, and prepared for Galena International Resources Ltd.
- 3. I am a graduate of Université du Québec à Montréal, Department of Earth Sciences, Montréal, 1980. I completed a M.Sc. (Université du Québec à Montréal, Department of Earth Sciences, Montréal, 1983) and a Ph.D. (Carleton University, Department of Geology, Ottawa, 1987).
- 4. I am a member in good standing of Ordre des Géologues du Québec (OGQ: member #478).
- 5. I have been employed in the mineral exploration field world-wide for an aggregate total of 11 years, mostly in gold and base metal exploration, in positions ranging from junior geologist to project manager. I have read the definition of "Qualified Person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements as a Qualified Person for the purposes of NI 43-101.
- 6. I visited the Property on January 18<sup>th</sup>, 2013 and from March 7 to 31<sup>st</sup>, 2013. I also worked on the Mikwam Property, as a geologist, from June 6<sup>th</sup> to June 30<sup>th</sup>, 2006.
- 7. I have no direct or indirect interest in the Property, nor do I expect to receive any direct or indirect interest in the Property. I am independent of the Issuer of this Report applying all the tests in section 1.5 of National Instrument 43-101, other than providing consulting services.
- 8. I have read the NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
- 9. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public.
- 10. As of the date of this Certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Dated this Dec. 8, 2016

Luc Harnois, Ph.D., P.Geo.

Associate Senior Consulting Geologist

Luc Harnois

Caracle Creek, Canada





#### Jason Baker

5 Short Lane Fall River, Nova Scotia, Canada, B2T 1H7 Telephone: 902-209-2037 Email: jbaker@caraclecreek.com

## CERTIFICATE OF QUALIFIED PERSON

### I, Jason Baker, do hereby certify that:

- 1. I am an Associate Consulting Geological Engineer for the geological consulting firm of Caracle Creek International Consulting Inc..
- 2. I am responsible for Section 14.0 (Mineral Resource Estimates) of the Technical Report titled "Independent Technical Report, Mikwam Gold Property, Noseworthy Township, Ontario, Canada", dated Dec. 8, 2016, and prepared for Galena International Resources Ltd.
- 3. I hold the following academic qualifications: B.Eng. (2000) Dalhousie University (TUNS), Halifax, Nova Scotia.
- 4. I am a member of the Association of Professional Engineers of Nova Scotia (APENS#9627). I am a member of the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC#37720).
- 5. I have worked over 13 years in geological modelling and resource calculations in both exploration (gold, lead, zinc, potash) and operations (coal, gypsum, lead and zinc). I am a Qualified Person for the purpose of the National Instrument 43-101.
- 6. I have not visited the Property.
- 7. I am independent of the issuer of this report applying all the tests in section 1.5 of National Instrument 43-101.
- 8. I have no prior involvement with the Property that forms the subject of this Technical Report.
- 9. I have read the NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
- 10. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public.
- 11. As of the date of this certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Dated this Dec. 8, 2016

Jason Baker, B. Eng., P. Eng. Associate Geological Engineer

Caracle Creek, Canada





# Appendix 2

**Coordinates of Historic Diamond Drill Holes (NAD83)** 



Drill Hole Number	Company	Year	Easting	Northing	Elevation (m)	Azimuth (°)	Dip (°)	Length (m)
260-85-A-1	Newmont/Noranda	1985	592730	5483314	268.7	184.0	-47	146.30
260-85-A-2	Newmont/Noranda	1985	592730	5483389	269.4	180.0	-45	181.97
260-85-A-3	Newmont/Noranda	1985	592730	5483464	269.9	180.0	-49	202.39
260-85-A-4	Newmont/Noranda	1985	592630	5483439	269.0	180.0	-45	79.25
260-85-A-5	Newmont/Noranda	1985	592530	5483314	269.7	180.0	-45	286.21
260-85-A-6	Newmont/Noranda	1985	592830	5483364	271.2	180.0	-46	171.60
260-85-A-7	Newmont/Noranda	1985	592630	5483489	269.1	0.0	-45	411.18
260-85-A-8	Newmont/Noranda	1985	592730	5483264	268.0	184.0	-46	92.05
262-86-13	Newmont/Noranda	1986	593130	5483289	272.1	0.0	-50	192.00
262-86-14	Newmont/Noranda	1986	592630	5483089	268.1	0.0	-45	150.00
262-86-4	Newmont/Noranda	1986	592730	5483289	268.3	180.0	-51	279.00
262-86-5	Newmont/Noranda	1986	592530	5483189	270.1	180.0	-46	300.00
262-86-6	Newmont/Noranda	1986	592530	5483039	270.9	180.0	-48	294.00
262-86-7	Newmont/Noranda	1986	592530	5482889	270.1	180.0	-48	285.00
262-86-8	Newmont/Noranda	1986	592930	5483189	270.7	0.0	-49	243.00
262-86-9	Newmont/Noranda	1986	592230	5482914	264.0	0.0	-48	159.00
MK-90-7	Mikwam JV (Noranda, Freewest, Pamorex)	1990	593042	5483544	272.5	UK	UK	357.20
MK-92-1	Mikwam JV (Trader, Hemlo, Freewest)	1992	592332	5483020	268.3	360.0	-50	275.00
MK-92-1X	Mikwam JV (Trader, Hemlo, Freewest)	1992	592330	5483019	268.3	3.0	-44	455.00
MK-92-2	Mikwam JV (Trader, Hemlo, Freewest)	1992	592127	5483253	270.4	360.0	-50	200.00
MK-92-3	Mikwam JV (Trader, Hemlo, Freewest)	1992	592930	5483459	272.8	180.0	-60	280.00
MK-92-4	Mikwam JV (Trader, Hemlo, Freewest)	1992	593230	5483373	273.0	188.0	-56	195.00
MK-94-10	Mikwam JV (Trader, Hemlo, Royal Oak)	1994	592371	5483009	269.0	1.0	-50	412.00
MK-94-11	Mikwam JV (Trader, Hemlo, Royal Oak)	1994	592329	5483238	271.9	180.0	-45 •••	152.00
MK-94-12	Mikwam JV (Trader, Hemlo, Royal Oak)	1994	592288	5483368	272.1	180.0	-50 -55	305.00
MK-94-13 MK-94-14	Mikwam JV (Trader, Hemlo, Royal Oak)	1994 1994	592129 592129	5483080 5482894	265.5 264.7	360.0 360.0	-55 55	434.00 101.00
MK-94-14	Mikwam JV (Trader, Hemlo, Royal Oak) Mikwam JV (Trader, Hemlo,	1994	592331	5482936	266.0	360.0	-55 -53	500.00
MK-94-16	Royal Oak) Mikwam JV (Trader, Hemlo,	1994	592249	5483429	271.6	180.0	-50	440.00
MK-94-17	Royal Oak) Mikwam JV (Trader, Hemlo,	1994	592430	5482954	269.9	360.0	-50	320.00
MK-97-18	Royal Oak) Mikwam JV (Highwood, Battle	1997	592630	5483424	268.6	180.0	-50	388.00
MK-97-19	Mountain, Royal Oak) Mikwam JV (Highwood, Battle	1997	592330	5483489	270.9	177.0	-57	551.00
MK-97-22	Mountain, Royal Oak) Mikwam JV (Highwood, Battle	1997	592229	5483367	272.2	180.0	-51	319.00
MK-97-23	Mountain, Royal Oak) Mikwam JV (Highwood, Battle	1997	592330	5483339	271.9	180.0	-51 -50	401.00
1411X- <i>)</i>   <b>-</b> 23	Mountain, Royal Oak)	1771	372330	J70JJJ/	2/1.7	100.0	-50	401.00



Drill Hole Number	Company	Year	Easting	Northing	Elevation (m)	Azimuth (°)	Dip (°)	Length (m)
MK-97-24	Mikwam JV (Highwood, Battle Mountain, Royal Oak)	1997	592630	5483454	269.0	180.0	-50	139.00
MK-97-25	Mikwam JV (Highwood, Battle Mountain, Royal Oak)	1997	593130	5483139	271.1	180.0	-50	201.00
ESO-06-01	ESO Uranium	2006	592332	5483017	267.7	360.0	-45	347.00
ESO-06-02	ESO Uranium	2006	592332	5483016	267.7	360.0	-60	326.00
ESO-06-03	ESO Uranium	2006	592254	5483092	275.4	90.0	-45	351.00
ESO-06-04	ESO Uranium	2006	592438	5483032	280.1	270.0	-55	350.00
ESO-06-05	ESO Uranium	2006	592432	5482982	280.4	270.0	-55	338.00
ESO-06-06	ESO Uranium	2006	592438	5482928	278.6	270.0	-55	350.00
ESO-06-07	ESO Uranium	2006	592228	5483091	274.9	90.0	-45	375.00
ESO-06-08	ESO Uranium	2006	592436	5483233	279.2	180.0	-60	241.00
ESO-06-09	ESO Uranium	2006	592436	5483233	279.2	180.0	-45	306.00
ESO-06-10	ESO Uranium	2006	592387	5483332	280.9	180.0	-65	402.00
ESO-06-11	ESO Uranium	2006	592379	5483339	271.5	180.0	-70	242.00
ESO-06-11A	ESO Uranium	2006	592381	5483336	271.5	180.0	-70	350.00
ESO-06-12	ESO Uranium	2006	592382	5483233	272.2	180.0	-65	602.00
ESO-06-13	ESO Uranium	2006	592382	5483233	272.2	180.0	-50	609.00
ESO-06-14	ESO Uranium	2006	592281	5483237	271.8	180.0	-60	221.00
ESO-06-15	ESO Uranium	2006	592279	5483338	271.9	180.0	-60	351.00
ESO-06-16	ESO Uranium	2006	592379	5483067	270.3	360.0	-50	221.00
ESO-06-17	ESO Uranium	2006	592383	5482950	267.6	360.0	-50	401.00
AL-13-01	Alpha Minerals	2013	592431	5483183	281.4	180.0	-45	200.00
AL-13-02	Alpha Minerals	2013	592481	5483185	281.6	180.0	-45	200.00
AL-13-03	Alpha Minerals	2013	592481	5483185	281.6	180.0	-55	245.00
AL-13-04	Alpha Minerals	2013	592180	5483370	281.5	180.0	-45	263.00
AL-13-05	Alpha Minerals	2013	592180	5483371	281.5	180.0	-55	281.00



# Appendix 3

Representative drill cross sections of the 2006 drilling program

