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Report on the Ontario 2014 Claim Staking Program and Soil Gas Hydrocarbon Survey, Doon Township, Matachewan Area

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December 18th, 2014

Table of Contents

1 Summary

This report documents the claim staking and soil sampling exploration program conducted by KGHM International Ltd. during the late winter and spring of 2014. The claim group is located along the southern Abitibi greenstone belt, a sub-province of the Archaean age Superior Craton of the Canadian Shield.

In March of 2014, KGHM International Ltd. staked 7 mining claims in Doon Township, Matachewan area along an inferred structure known as the Cadillac-Larder Lake Deformation Zone (CLLDZ), a large east-west trending regional structure associated with gold mineralization. The CCLDZ is an approximately east-trending, steeply to moderately south-dipping shear zone that is continuous up to 250 km from Malartic, Quebec to Matachewan, Ontario, and hosts several world class deposits, including the Kirkland Lake camp.

Following the claim staking program, KGHM undertook a soil gas hydrocarbon (SGH) survey across the claim group to determine the prospectivity of gold mineralization hidden beneath the Proterozoic age sediments of the Gowganda Formation. In total, 206 samples were collected from 195 sample sites over a period of five days.

The results of the survey yielded a gold signature rating of “4.5 out of 6.0”, indicating a sufficient level of confidence to warrant future follow up exploration programs.

2 Property Location and Access

The Matachewan Claim Block is located in Doon Township, and is approximately 15 km west of the town of Matachewan, ON, Canada. The property is accessed by traveling west from Matachewan on highway 566 for approximately 2.7 km, and turning south onto Asbestos Mine Road. From here, follow the road for approximately 14 km towards the west. A map of the claim units, as well as access to the property can be seen in Figure 1.

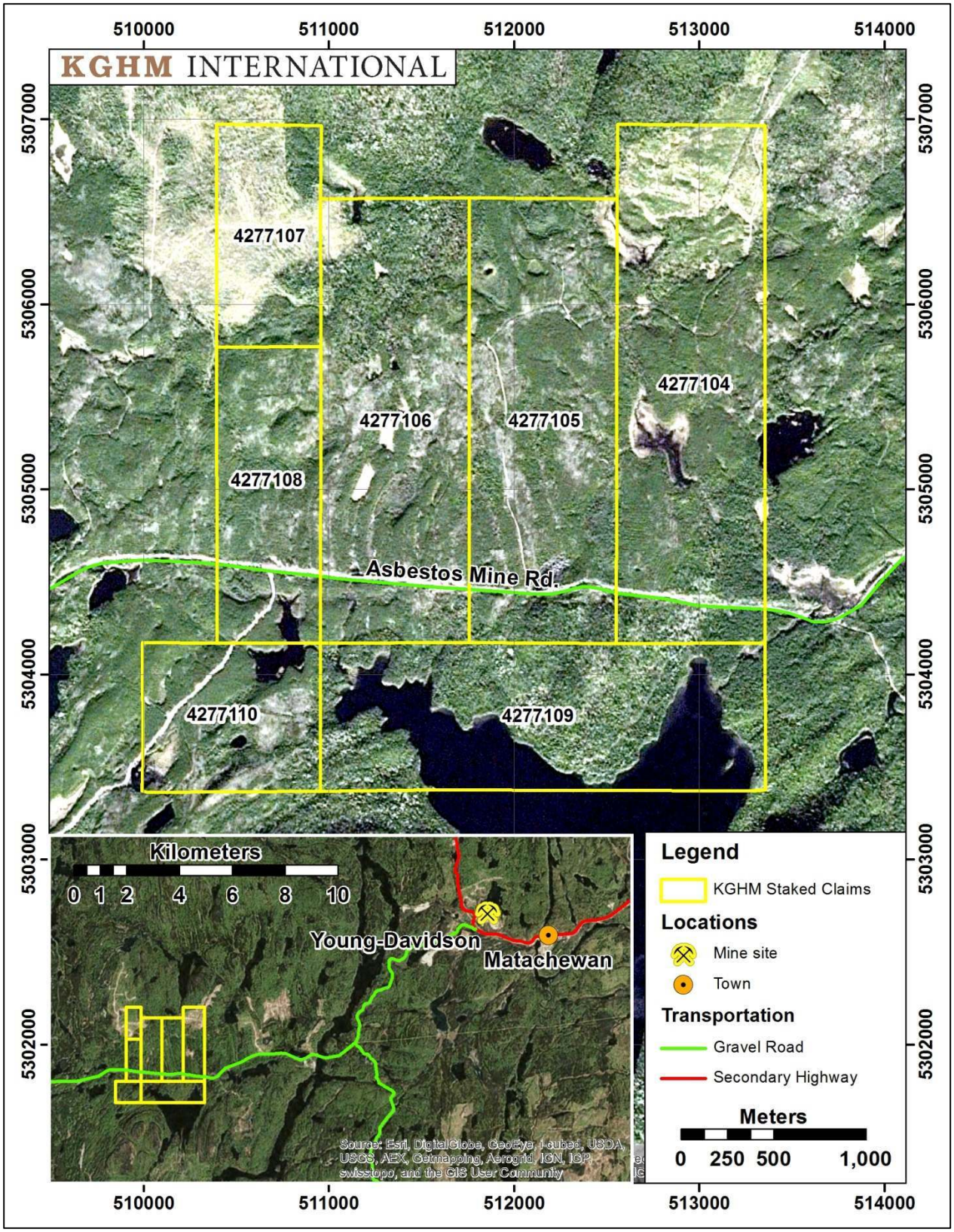

Figure 1: Location of Claim Group

3 Claim Status

The Matachewan Claim Block is composed of 7 contiguous units totaling approximately 1,034 ha (10.3 km^2), which are 100% owned by FNX Mining Company Inc., a subsidiary of KGHM International Ltd. The claim block was staked by KGHM International personnel between March 17th and April 3rd 2014, and was recorded on April 8th, 2014. A summary of these claims is shown in Table 1.

Table 1: Summary of Individual Claim Units

Claim Number	# of Claim Units	Area (km^2)
4277104	14	2.24
4277105	12	1.91
4277106	12	1.93
4277107	5	0.67
4277108	6	0.90
4277109	12	1.91
4277110	5	0.77

4 Regional Geology

The KGHM International claim group near Matachewan is situated within the southern Abitibi greenstone belt of the Superior Province. The Abitibi Subprovince is an 800 by 300 km Archaean age greenstone belt located along the southern margin of the Superior Province. It is dominated by supracrustals and granitoid rocks having ages between 2.75 to 2.67 Ga. The Abitibi is unique among greenstone belts in that it has a high ratio of supracrustal to intrusive rocks, has a generally low metamorphic grade, and has a long history of base and precious metal mining (Jackson and Fyon, 1991).

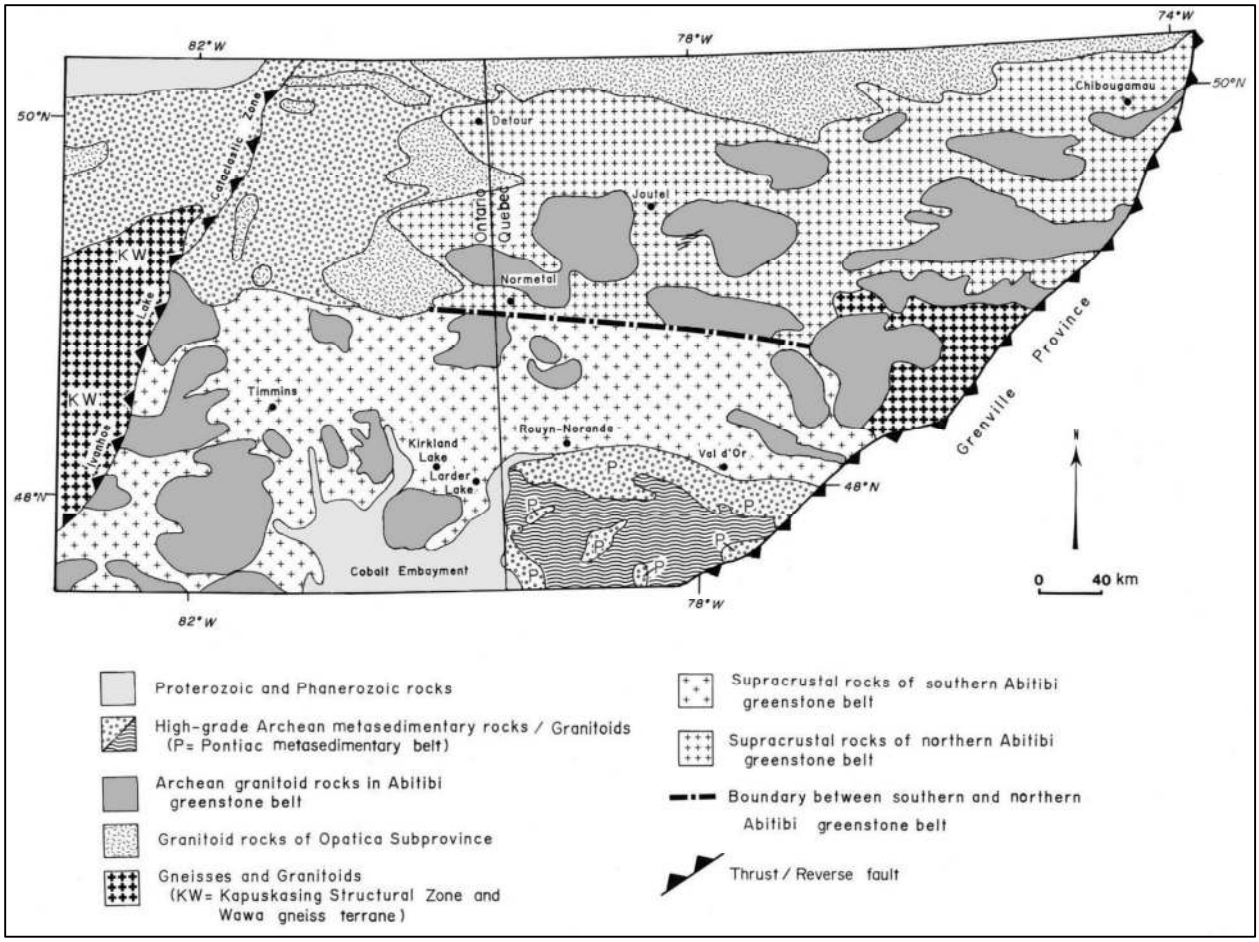

Figure 2: Simplified Geology of the Abitibi Greenstone Belt (Jackson and Fyon, 1991).

The southern Abitibi greenstone belt is primarily composed of metavolcanic and metasedimentary units, and synvolcanic peridotitic to granodioritic intrusions formed between 2.75 to 2.70 Ga. From 2.70 to 2.68 Ga large volumes of foliated tonalite-granodiorite batholiths were emplaced, followed by more massive granodiorite, granite, feldspar porphyry and syenite bodies (Jackson and Fyon, 1991). These rocks are unconformably overlain by belts of clastic sedimentary and volcanic rocks (Timiskaming assemblage) formed during syn- to late-orogenic extension at around 2.68 Ga; during this period the major “breaks” (ie. the Cadillac-Larder Lake Deformation Zone and the Porcupine-Destor Deformation Zone) were formed as deep-seated listric faults. By 2.67 Ga these faults were reactivated as thick-skinned thrusts; the mineral deposits forming proximal to the large breaks were preserved in the footwall, while the hanging walls provided material filling the Timiskaming basins. From 2.65 Ga onwards, continued N-S shortening and thrusting degenerated to strike-slip deformation, resulting in lateral displacement of deposits having approximately ~10-100 km net offsets (Bleeker, W., 2012). Metamorphic grade within the supracrustal rocks is generally sub-greenschist to greenschist facies, and rises to amphibolite facies near some intrusions (Jackson and Fyon, 1991). See Figure 3 below for a geological and structural summary of the southern Abitibi region.

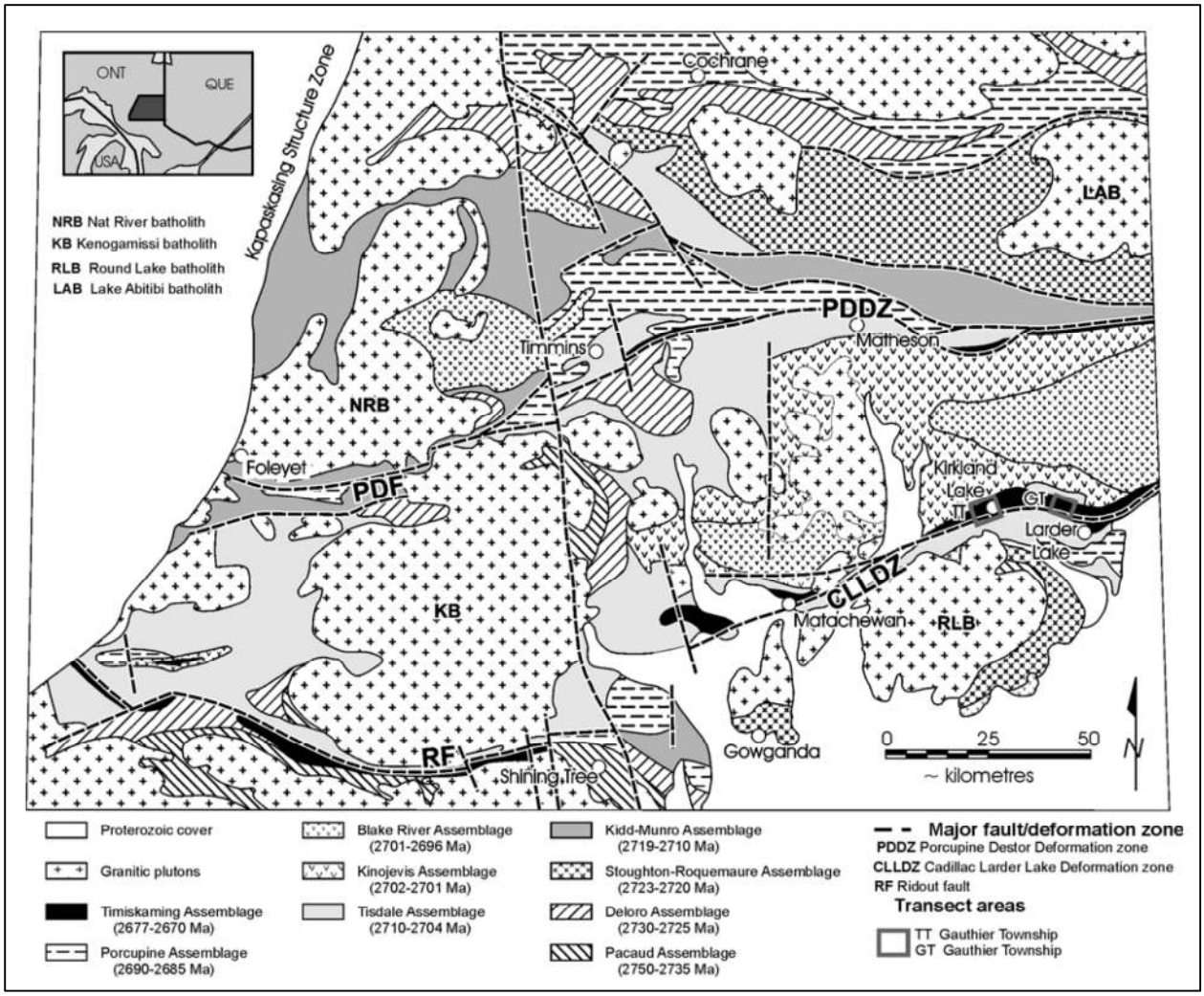

Figure 3: Regional Geology and Structure of the Southern Abitibi (Ispolatov, V. et al, 2005).

The Timiskaming assemblage is one of the best studied assemblages of the southern Abitibi greenstone belt. It hosts some of the largest Archaean orogenic gold deposits in the world, it is the youngest Archaean supracrustal unit of the Abitibi, and it is uniquely set between one phase of regional deformation and is followed by another. The assemblage is composed of clastic metasedimentary rocks and alkalic metavolcanic rocks. The metasedimentary rocks of the assemblage consist mainly of conglomerate containing distinctive red chert clasts, alkalic metavolcanic and intrusion clasts, and "green carbonate" clasts, along with cross-bedded sandstone. The alkalic rocks are commonly amygdaloidal and include pseudoleucite-bearing flows, and trachyte flows, tuffs and agglomerates. In places, Calc-alkalic metavolcanic rocks are reported to occur near the base of the assemblage (Jackson and Fyon, 1991).

The most prominent regional structure is the Cadillac-Larder Lake Deformation Zone ("CLLDZ"), an unconformity which marks the boundary between the Timiskaming (and "Timiskaming-like") assemblages and the older supracrustal Archaean units. It is an approximately east-trending, steeply to moderately south-dipping shear zone that is continuous up to 250 km from Malartic, Quebec to

Matachewan, Ontario. It has been proposed that the break extends even further to the west, through the Shining Tree and Swayze areas to the Ivanhoe Lake cataclastic zone, making the entire structure up to 350 km long (Jackson and Fyon, 1991).

Gold is spatially associated with the Timiskaming assemblage (and Timiskaming-like rocks) proximal to the CLLDZ, and is typically hosted in shear zones, quartz veins and carbonate-altered rocks.

The Abitibi is one of the most productive mining districts in Canada and contains 81% of the total gold produced domestically, including several world-class (<100 Mt Au) deposits (Dubé and Gosselin, 2007). In the southern Abitibi, mineralization occurs primarily along the major structural breaks, most notably the Porcupine-Destor Deformation Zone and the Cadillac-Larder Lake Deformation Zone (Figure 4).

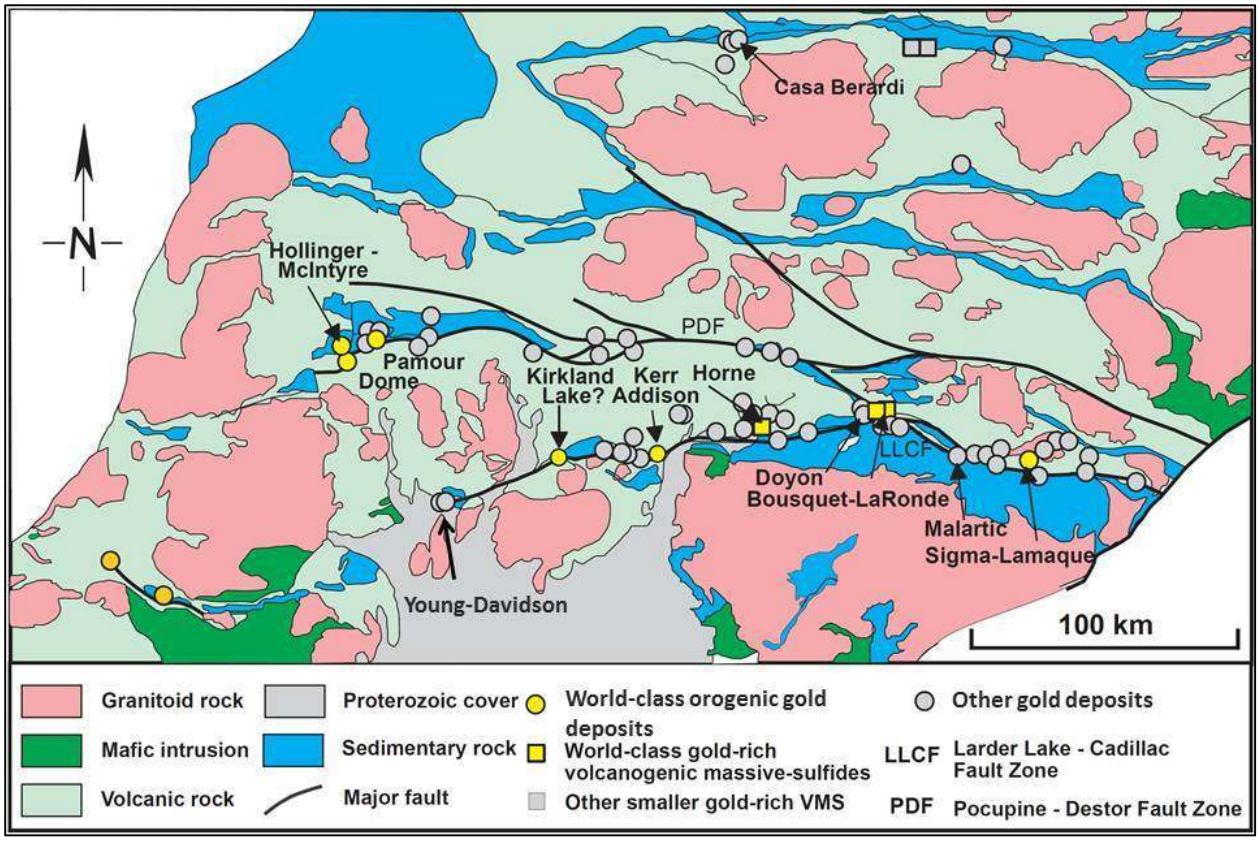

Figure 4: Distribution of Ore Deposits in the Southern Abitibi (Dubé and Gosselin, 2007)

4.1 Ore Distribution in Greenstone Belts

There has been some recent work regarding the occurrence of orogenic gold deposits in Archaean greenstone belts and their spatial relationships (Figure 5). It has been proposed that there is a mechanism of self-organization resulting in regular spacing of gold-deposit clusters along major tectonic structures ("breaks"). It has been observed that in districts such as the Yilgarn craton (Australia) and the Abitibi region of the Superior craton deposits occur with a semi-regular spacing within an interval of relatively high statistical confidence. Along the CLLDZ, the mean spacing between known deposits is

approximately 17 kilometers. The mechanism of self-organization proposed in this research is not well understood, but self-organization has been observed in several geologic processes, including fractal clustering within ore deposits and the organization of black smokers into periodic convection cells in hydrothermal systems. Periodic spacing of ore deposits along major breaks can be considered, along with other geophysical, geochemical or geological evidence when targeting for orogenic gold deposits (Doutre, R. et al, 2014). Taking this into account, it is worth noting that the KGHM claim group is located approximately 15 km to the west of the Young-Davidson mine, a deposit containing 5.5 million ounces Au at a grade of 2.66 g/t.

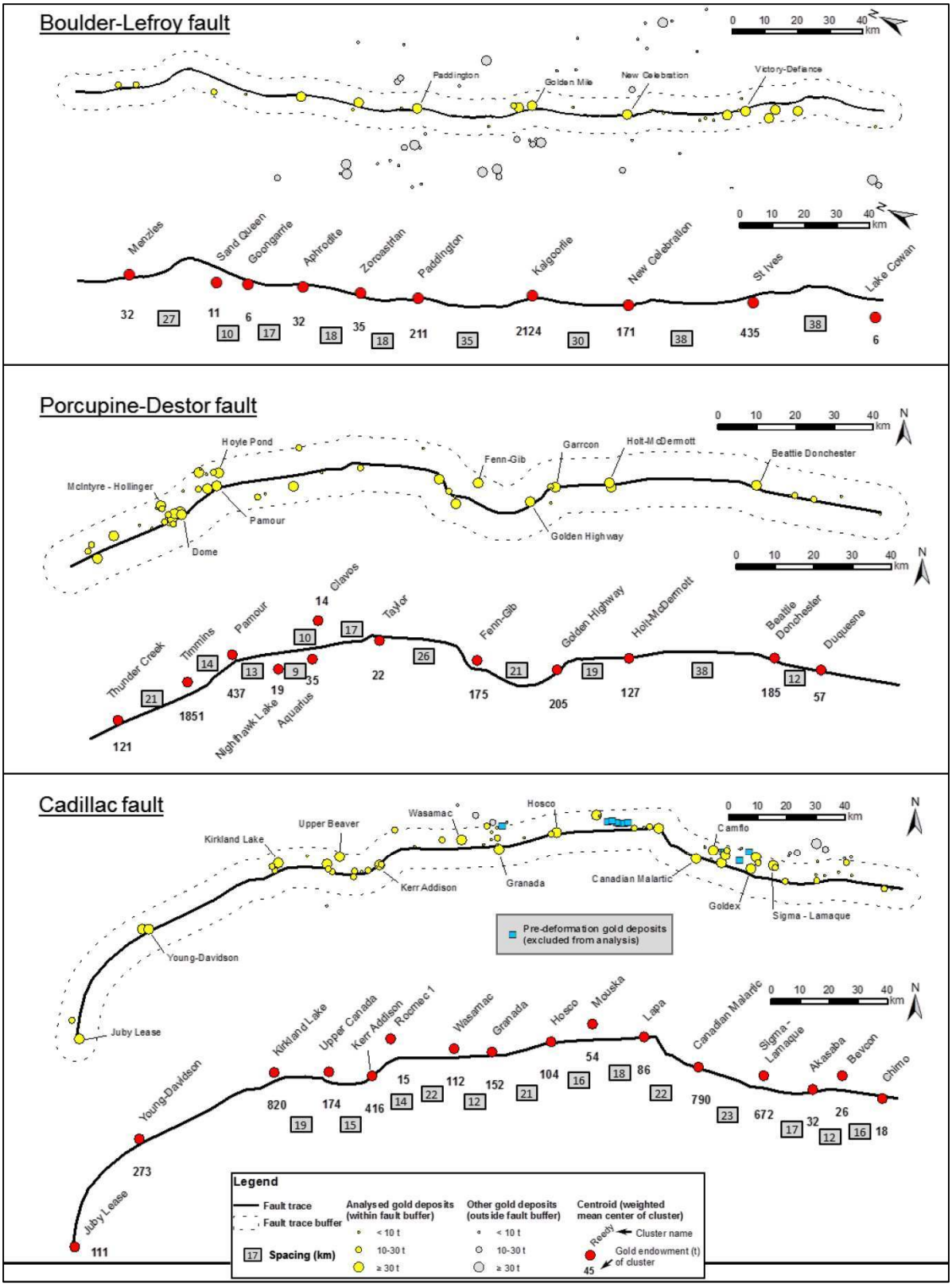

Figure 5: Spatial Distribution of Orogenic Gold Deposits in Archaean Greenstone Belts (Doutre, R. et al, 2014)

5 Property Geology

The KGHM claim group is located west of the Young-Davidson Mine along the inferred contact of the Cadillac-Larder Lake Deformation Zone (CLLDZ) within the southwestern region of the Abitibi greenstone belt. Dense foliage covers the majority of the property, and the bedrock has been interpreted to consist entirely of Proterozoic age sedimentary rocks of the Gowganda Formation, a part of the Huronian Supergroup (Jackson and Fyon, 1991). See Figure 6 for a map of the property geology.

The Gowganda Formation consists of distinct, diverse sequences of clast- and matrix-supported conglomerate, pebbly wacke, wacke, siltstone, mudstone and arenite (Jackson and Fyon, 1991). The Gowganda unconformably overlies Archaean age supracrustal and intrusive units, and in the project area is not known to be mineralized.

Archaean age supracrustal rocks in the project consist of intermediate and mafic metavolcanic rocks. In the surrounding area, these greenstones range in composition from rhyolitic to komatiitic, and commonly occur as mafic to felsic volcanic cycles. These units are interbedded with both clastic and chemical metasedimentary rocks. Late Archaean "Timiskaming-type" sediments unconformably overly the earlier sequences; it is primarily this interface along which the CLLDZ occurs throughout the belt (Jackson and Fyon, 1991).

In the Matachewan locality, the "Timiskaming-type" sediments have been referred to as the Midlothian Assemblage. These consist of interbedded turbidite, arkose, conglomerate, locally cross-bedded sandstone, and lesser argillite. Clasts within the conglomerate members include dacite, rhyolite, quartz-feldspar porphyry, "greenstone" and white quartz. This assemblage has been observed as a lateral equivalent to the Timiskaming assemblage of the Kirkland-Larder Lakes area. The Midlothian assemblage in the project area is unconformably overlain by rocks of the Gowganda Formation (Jackson and Fyon, 1991).

Underlying the Midlothian assemblage are older supracrustal rocks of the Halliday-Boston assemblages (Jackson and Fyon, 1991). Correlation of units across the southern Abitibi has variably grouped these assemblages with other formations such as the Larder Lake Assemblage (Jensen and Langford, 1985) and the Tisdale Assemblage (Ayer et al., 2005). It consists predominantly of mafic volcanic rocks with localized komatiite, intermediate to felsic calc-alkaline volcanic rocks, and iron formation. The basal contact of this unit is marked by iron formation and chert clast conglomerates (Ayer et al., 2005).

In the vicinity of the Matachewan area near the Young-Davidson Mine, the Archaean supracrustal rocks display a metamorphic overprint associated with the Cairo stock, a syn-Timiskaming intrusion of alkalic monzonite, syenite and albitite with more mafic phases consisting of diorite, gabbro, clinopyroxenite, hornblendite and lamprophyre (Ayer et al., 2005). In Doon Township, to the west of the claim group, subgreenschist to greenschist facies metamorphic grades were observed within a pillowed basalt unit (Powell, 1991).

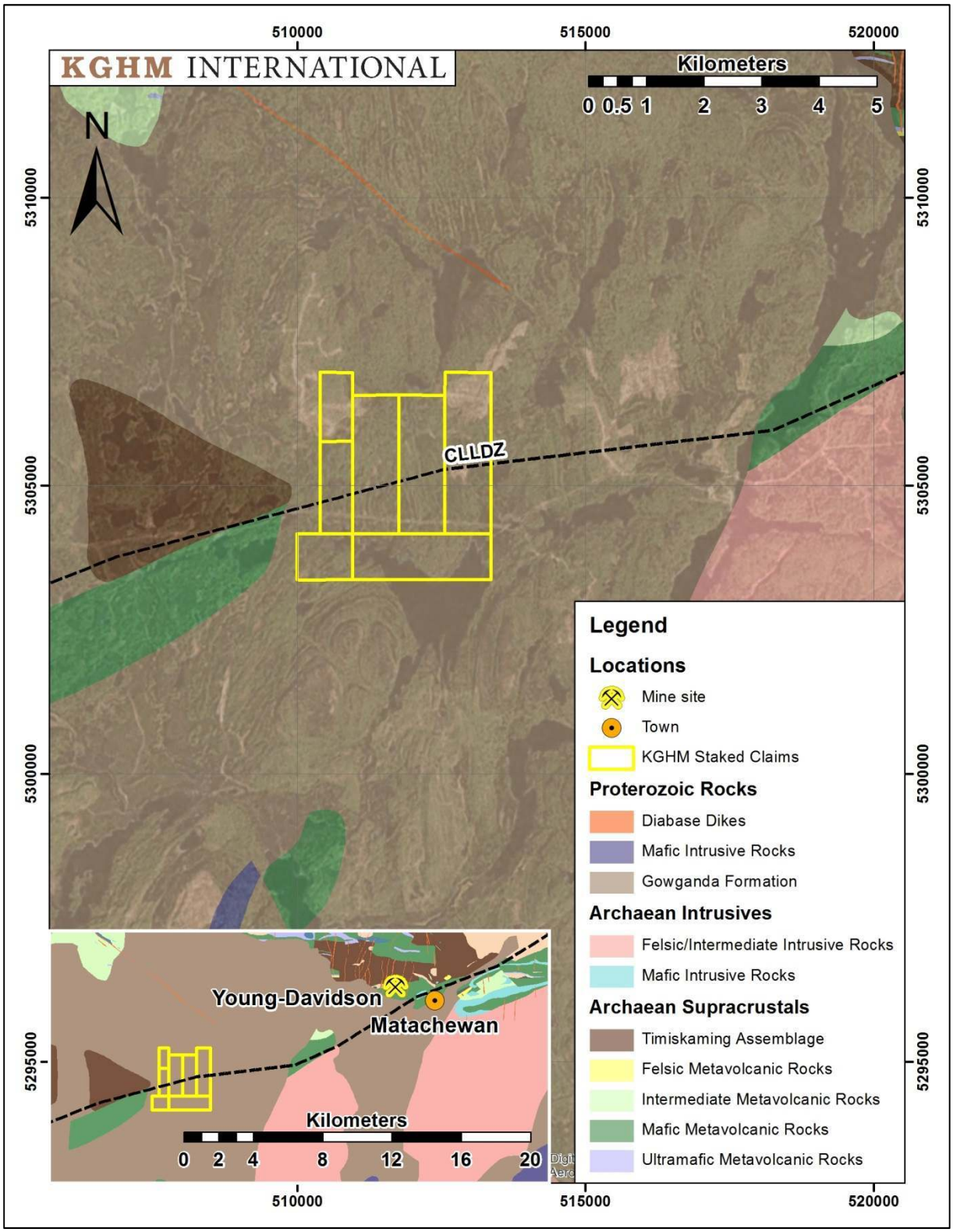

Figure 6: Property Geology

The CLLDZ strikes approximately east-west, and is dipping sub-vertically southwards in the project area; the hanging wall lies to the south while the footwall lies to the north. Uplift and erosion have removed the unconformity in most places south of the break; it is typically in the footwall of the break that mineralized bodies have been discovered (Bleeker, W., 2012).

6 Exploration History

Work has been conducted in the vicinity of the Doon Township claim group on and off since the 1960's under the direction of several operators. As the central Doon Township area (the location of the KGHM claim group) was observed to be covered in considerable overburden and till, most of the ground work was conducted in the areas immediately to the west and east of the KGHM claims. Below is a summary of work completed in or near the claim group staked by KGHM International:

- 1945 (Coniagas Mines Limited)
  - Magnetic survey; prospecting. Strong negative magnetic anomaly trending ENE confirmed to be iron carbonate alteration in shear zones with quartz veining.
- 1963 (Canadian Aero Mineral Surveys Limited)
  - Airborne magnetic and EM survey; found two EM anomalies, 1 of which associated with "bog iron", formed from breakdown of sulphides.
- 1964 (Laroma Midlothian Mines Limited)
  - Airborne geophysical survey
  - 401 ft diamond drill hole, intersecting pyrite-mineralized graphitic tuff / syenite porphyry rocks
- 1979 (Bagdad Exploration Association Inc.)
  - Soil sampling near "east nose of Archaean window", returned Au values < 5ppb.
- 1987-1990 (Ontario Geological Survey)
  - Mapping of Doon and Yarrow townships, focusing on Huronian Supergroup.
- 1995-1997 (WMC International)
  - Mapping and sampling of exposed Archaean window in central west Doon Township (just west of KGHM claims).
  - Stripping of the CLLDZ around the exposed Archaean window (1995)
  - Till sampling program (1995-1996); heavy mineral concentrate returned anomalous gold values.
  - Quantum Geophysics contracted in 1996 to complete Schlumberger resistivity soundings east and west of the Archaean window to determine potentially mappable electrical contrast between Proterozoic cover and Archaean basement.
  - JVX Geophysics Ltd contracted in 1997 to complete additional infill IP/resistivity surveying in central Doon Township.
  - Diamond drilling program (1997); 7 holes (1372 meters) were drilled south of Asbestos Mine Rd, west of KGHM claim group, targeting 2 IP anomalies. Most significant result

was 610 ppb Au over 15.4 meters (including 2.1 g/t over 2 meters) in bleached, quartz/ankerite (fuchsite) zone in mafic volcanics.

- 2008 (Golden Chalice Resources Inc.)
  - Magnetometer / VLF EM Survey on western edge of claim area
- 2011-2012 (Transition Metals Corp.)
  - Prospecting and mapping, examining older showings and localities drilled by WMC in 1997.

7 Claim Staking Program

In early 2014, 4 KGHMI personnel traveled to Matachewan, Ontario to complete claim staking in an un-staked area along the Larder Lake-Cadillac Fault Zone. The staking program was completed in two field periods, from March 17th - 21st, and from March 30th - April 3rd.

The application for staking was recorded with the MNDM on Tuesday April 8th.

8 SGH Field Program

During the week of May 11th, 4 KGHMI personnel from Sudbury traveled to Matachewan, Ontario to complete a Soil Gas Hydrocarbon (SGH) sampling program. The program involved extracting soil samples from within a newly staked block of mining claims to the west of the town of Matachewan. The following subsections outline the procedures used for soil sampling for SGH analysis, and the results of the program.

8.1 Description of Soil Horizons

In order to properly sample soils using a chosen method, it is important to understand the composition of soils so that samples may be taken from the correct horizon. Figure 7 below shows two idealized soil profiles.

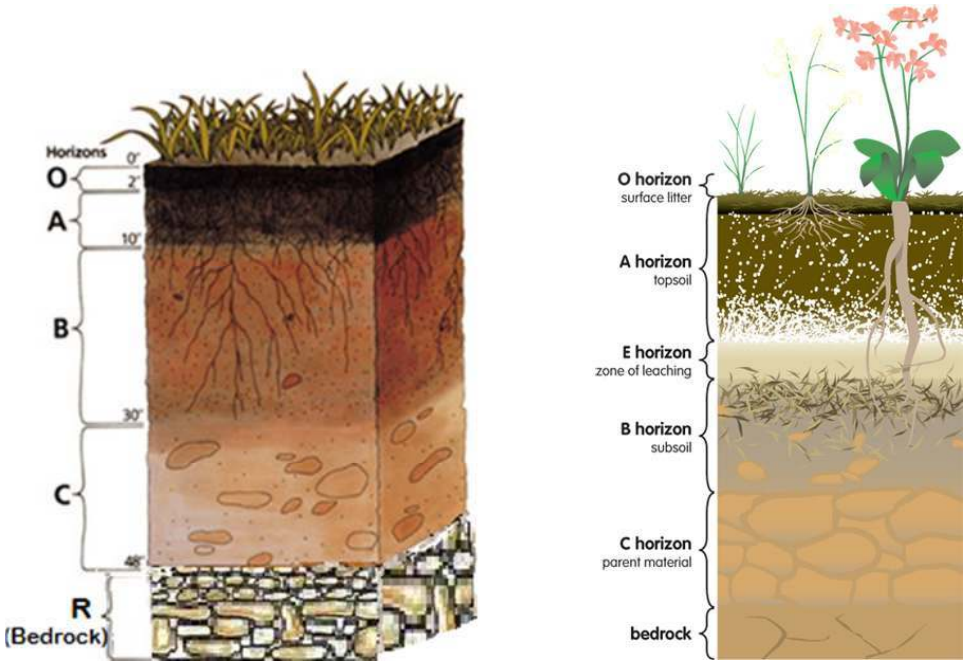

Figure 7: Typical Soil Profiles

Soil generally consists of visually and texturally distinct layers, also called profiles. These profiles are summarized in Table 2.

Table 2: Description of Soil Horizons

Horizon	Name	Description
O	Organic Matter	Surficial organic deposit with litter layer of plant residues in relatively non-decomposed form.
A	Surface Soil	Organics mixed with mineral matter. This is the layer with the most organic matter accumulation and soil life. This layer is often depleted of iron, clay, aluminum, organic compounds and other soluble material.
E	Eluvial Zone	The eluvial zone may not be present in all soils, and is the created when there is excessive leeching of materials to lower levels through precipitation of water through horizons. This zone occurs at the base of the A-horizon, and is typically lighter in colour. Eluviation occurs when precipitation exceeds evaporation.
B	Subsoil	Subsurface layer reflecting chemical or physical alteration of parent material. This layer accumulates iron, clay, aluminum, organic compounds and other soluble material. The term for this accumulation is illuviation, the inverse of eluviation.
C	Parent Rock	The parent material in sedimentary deposits. This layer is typically composed of a large layer of unbroken rocks, and may accumulate the more soluble materials present in the soil.
R	Bedrock	The parent material in bedrock landscapes. This layer typically occurs as partially weathered at the base of the soil profile.

8.2 Soil Gas Hydrocarbon Sampling

Soil gas hydrocarbon sampling is a geochemical analysis that has been researched since 1996. Rather than sampling for particular elements of interest (ie. Cu, Ni, Pt, Pd, Au, etc…), this method examines the composition and distribution of hydrocarbons found in the soil. The hydrocarbons of interest are produced through the decomposition of bacteria and microbes that feed on metallic mineralization. This form of hydrocarbon production is an ongoing process that will form a flux or plume which extends upwards from the mineralization and can be sampled from a variety of surficial materials including soil, peat, humus, rock, till, snow, and even lake or sea sediments.

A SGH survey can be used to identify mineralization at a range of depths between 5 – 950 meters, and is typically used in difficult terrain where other analytical methods have not been effective. SGH analysis has been successful at identifying a wide range of deposits, including gold, nickel, copper, uranium, SEDEX, VMS, polymetallic, REE, kimberlite. Mineralization may be detected regardless of the host lithologies present, and in a variety of different settings and climates. In all cases, the hydrocarbon plume rises upwards from the mineralization and adheres to soil particles directly above the mineralization provided that there has been no significant ground movement. . Ground conditions, whether soil or snow, must be constant for at least 3 weeks before an SGH sampling program is conducted.

8.3 Methodology for SGH Sampling

In order to ensure consistency among samples taken during the field program, the soil sampling was completed in one field period rather than sampling in periods separated by weeks or more. This ensured that ground conditions for all samples taken were relatively similar and were thereby not affected by extreme changes in meteorological and/or seasonal conditions.

8.3.1 List of Equipment Used

Each sampling group was required to have the proper equipment on hand before sampling:

- Uncoated steel shovel (plastic or coated varieties are not suitable for this kind of survey)
- Smaller steel/aluminum scoop
- Sealable plastic Ziplock bags
- Standard plastic sample bags (6 mil plastic)
- Flagging tape
- Tape measure
- Permanent markers
- Pens
- Sample booklets
- Field camera
- Handheld GPS unit, pre-loaded with waypoints (Garmin GPSMap 62st)
- Clipboard with sample description sheets
- Orthophotos/maps of the area depicting sampling grid, access, and other geographic features and boundaries
- Clean water (for cleaning shovels and scoops)
- Paper towels (for cleaning shovels and scoops)

8.3.2 Sample Extraction

Once arriving at a pre-determined sample site, it is time to take a sample. The following steps should be followed for all sample sites to ensure consistency across the sample survey.

1. Before extracting a sample, the shovel and scoop were cleaned, ensuring cleanliness before taking each new sample.

2. Using the steel shovel, a hole was dug approximately 30-50 cm deep, allowing the contrasts between the soil horizons to be visible and to ensure the samples were taken at a sufficient (and consistent) depth. Given the time of year and the lingering presence of frost in the ground at some locations, the A-horizon was selected for all samples taken.

3. The smaller steel scoop was to extract a sample from the A-horizon, placing it into a sealable Ziplock bag. A fist-sized sample was required, so 2 scoops were typically taken.

4. Information regarding the sample and site was recorded on a "Soil Gas Hydrocarbon Sample Details" sheet in order to ensure that all parameters were filled out. Sample numbers were pre-determined; these were written on the sealable bag using pen or permanent marker.

5. Before sealing the bag, a picture of the material in the bag was taken using the field camera, and the correct picture number was noted on the sample details sheet.

6. GPS locations were recorded for each position, both in the handheld units and on each of the "Soil Gas Hydrocarbon Sample Details" sheets.

7. Collected samples were then placed into a standard poly sample bag. Using a provided sample booklet, a sample tag was filled out and inserted into the poly sample bag. The unique sample tag number was also noted on the Sample Details Sheet (ie. W898521). Once the sample and tag were placed in the poly bag, it was sealed up using flagging tape to ensure the sample was secure.

8. The field camera was used to take a picture of the pit the sample was extracted from.

9. Once the sample was collected and all details were recorded, the shovel and scoop were cleaned so that no soil particles were present before breaking ground at the next site.

8.4 QA/QC Procedures

To ensure the integrity of the samples and data collected, field duplicates at selected sample sites were taken. These duplicates were used to ensure consistency between samples from the same site, and to check for any possible switched samples at the lab.

Before sampling in the field, sites for field duplicates were selected to ensure that a sufficient number of field duplicates are taken. Field duplicates were extracted in the same way as regular samples by definition, but were given a unique identifier when recording sample data. Field duplicate data was

filled in as a separate sample on the Sample Details sheet, reflecting its unique sample site number and sample tag number.

Field duplicates were assigned for every 20 regular samples taken. An example of sample numbers and duplicates is shown in Table 3.

Table 3: Example of Field Duplicate Assignments

Sample Taken	Sample Number	Tag Number	Sample Type
1	1-1A	N505001	Field Duplicate A
2	1-1B	N505002	Field Duplicate B
3	1-2	N505003	
4	1-3	N505004	
5	1-4	N505005	
…	…	…	
19	1-18	N505019	
20	1-19	N505020	
21	1-20A	N505021	Field Duplicate A
22	1-20B	N505022	Field Duplicate B
23	1-21	N505023	
24	1-22	N505024	

Itwas important for each sampling team to have a list of sample types available before reaching the field (similar to above). Field duplicates were assigned beforehand to sample sites, while sample tag numbers were assigned in the field as each sample was taken. Since terrain types encountered may vary, it may not be practical to visit sample sites in the order of their assigned site number, so tag numbers may not appear in numerical order in the above table.

8.5 Personnel and Timetable

The claim staking and field program phases were overseen by Brad McKinley, Area Geologist for North America Exploration at KGHM International Ltd. The field personnel involved in each phase of the project can be seen Table 4 (Field Personnel during Claim Staking Phase) and Table 5 (Field Personnel during Soil Sampling Phase) below.

Table 4: Field Personnel during Claim Staking Phase

Name	Position	Time Period
Steven Gregory	Senior Project Geologist	March 17-21, March 31-April 3 (9 days)
Chris Verzyden	Project Geologist	March 17-21, March 31-April 3 (9 days)
Leigh Allen	Geologist	March 17-21, March 31-April 3 (5 days)
Gerry Shields	Senior Technician	March 17-21, March 31-April 3 (9 days)
Bill Spicer	Geophysicist	March 31-April 3 (4 days)

Table 5: Field Personnel during Soil Sampling Phase

Name	Position	Time Period
Steven Gregory	Senior Project Geologist	May 11-15 (5 days)
Chris Verzyden	Project Geologist	May 11-15 (5 days)
Bill Spicer	Geophysicist	May 11-15 (5 days)
Gerry Shields	Senior Technician	May 11-15 (5 days)

8.6 Sampling Grid

The sampling grid was designed according to recommended specifications set out by Actlabs. Different deposit styles require different grid spacing, and this survey was designed with a lode gold deposit in mind. For this survey, a sample spacing of 100m was selected, with a spacing of 400m between sample lines. To adequately cover the project area, 7 survey lines with 27-30 samples along each line were laid out, for a total of 195 sample sites.

In order to avoid certain topographic features such as lakes or rivers, certain designed sample points had to be moved or omitted from the originally designed layout. For a finalized layout of the survey area, refer to Figure 8.

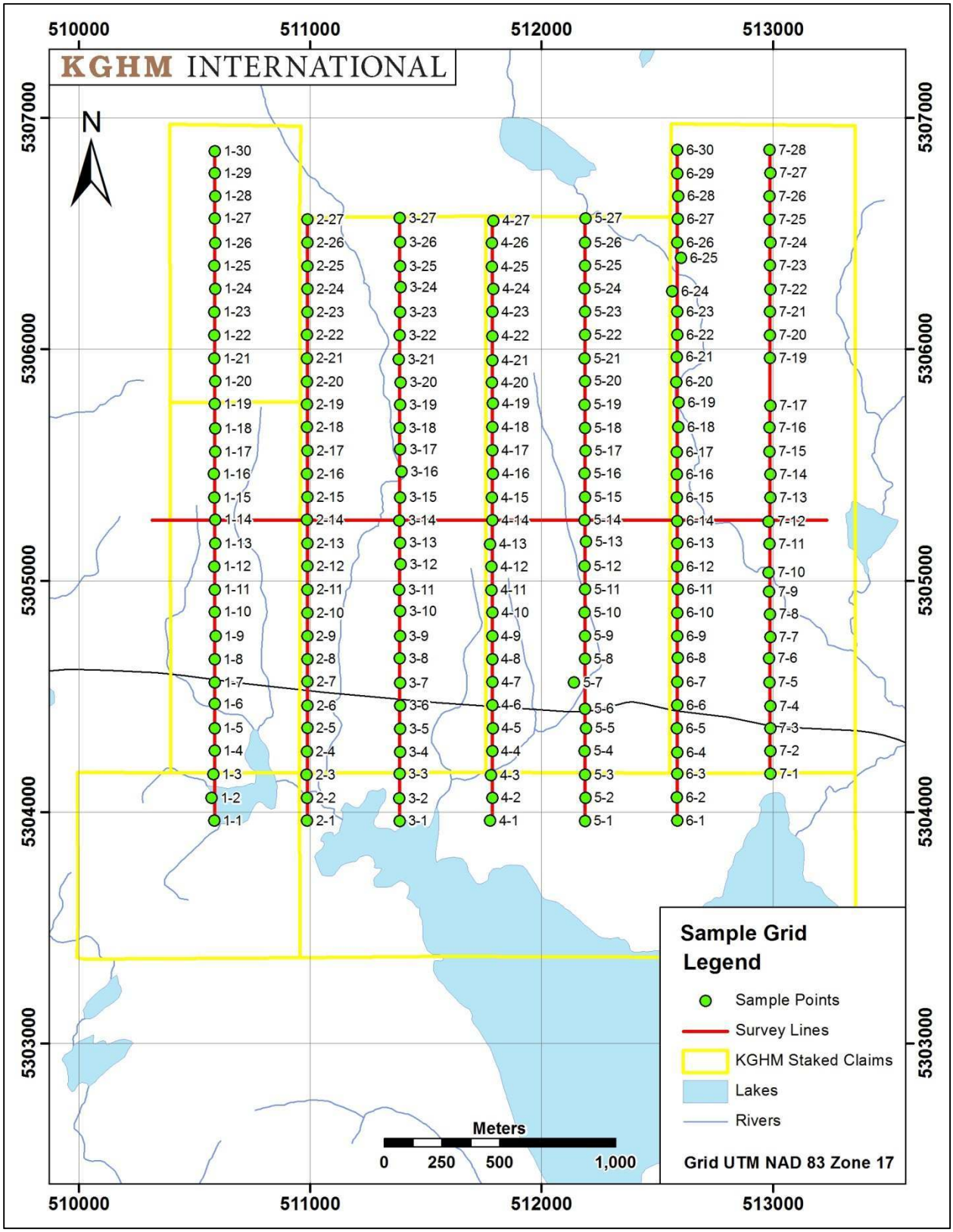

Figure 8: SGH Sample Grid

8.7 Results

For a detailed report outlining the results of the survey, refer to section "13 Appendix C: SGH Analytical Report (Activation Laboratories Ltd.)".

The collected samples were received by Actlabs on May 27th, and prepared at Actlabs' Global Headquarters in Ancaster, Ontario, Canada. Based on the report provided by Actlabs, the overall precision of the samples collected was considered to be excellent. This was determined based on the consistency of the sample material collected at each sample site, and the accuracy observed between the field duplicates collected. A total of 206 samples were collected at 195 sample sites, which included 11 field duplicates.

A template or group of SGH Pathfinder Classes that are associated with buried gold targets were used as the basis for interpretation of the SGH survey. A gold template for SGH Pathfinder Classes uses primarily low and medium molecular weight classes of hydrocarbon compounds. Based on an analysis of a minimum of 3 Pathfinder Class maps, a rating is assigned from 0.0-6.0 indicating the prospectivity of the target. A rating of 6.0 is best; a rating of 4.0 indicates that the signature starts to have good identification relative to that type of mineralization. A 2.0 or 3.0 may indicate that there is some evidence of a redox cell having developed in the overburden; however the confidence in this case is low.

The analysis of the samples collected for the SGH survey yielded a gold signature rating of 4.5 out of 6.0. The Pathfinder Classes illustrated a wide central segmented halo anomaly; furthermore the correlation of the classes observed indicates that the mineralization may be quite deep. A diagram excerpted from the complete report received from Actlabs in "13 Appendix C: SGH Analytical Report (Activation Laboratories Ltd.)" is shown below in Figure 9.

When assigning a rating out of 6.0 for the prospectivity of a target, values are deducted based on a number of criteria. For the samples collected by KGHM, a value of 1.0 was subtracted due to the apparent depth of mineralization; a deeper signature generally has a lower level of confidence. An additional value of 0.5 was subtracted due to apparent "elevated" values collected along Line 3. The source of the anomalous values could not be determined with confidence; it has been suggested that field sampling techniques may be the source, however there was nothing recorded that could immediately explain the discrepancy.

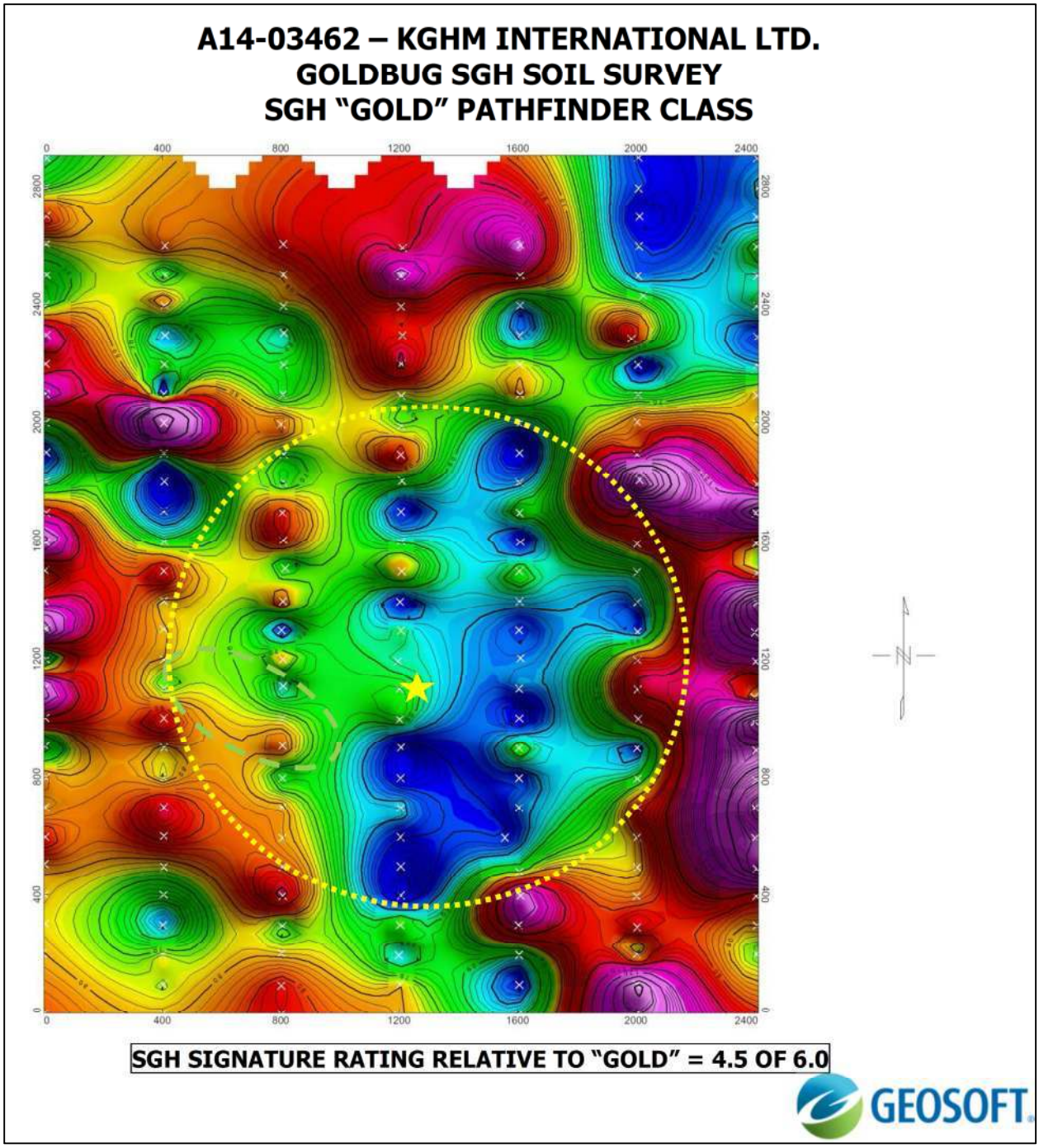

Figure 9: Outline of "Gold Signature" Interpreted by Actlabs

8.8 Recommendations for Future Field Work

Having received a Pathfinder Class signature for gold rating of 4.5 out of 6.0, the identified target is considered prospective for follow-up work. The chosen survey design (400 meters between transects with 100 meter spacing between samples) is considered appropriate for deep targets, however gold-bearing structures <50 meters deep would be difficult to interpret. Infill sampling with associated data interpretation to determine the presence of possible shallow targets may be warranted.

A rating of 4.5 out of 6.0 also indicates that the target is prospective enough for a follow up diamond drilling program. It is recommended that any follow up drilling program take into account historical showings to the west of the claim group, along with the interpreted contact of the CLLDZ and the SGH anomaly. Though the SGH results can indicate the presence of potential gold mineralization, the results are not able to indicate the size of any such deposit; this can only be accomplished through exploratory drilling programs.

8.9 Expenditures

A summary of expenditures for the SGH survey phase on the Matachewan area claim group is shown below in **Error! Reference source not found.**:

Table 6: Summary of Expenditures for SGH Survey

Category	Description	Amount
Salaries	Area Geologist ($500/day, 2 days) *Project Planning, Supervision*	$ 1,000.00
	Senior Project Geologist ($450/day, 5 days) *Field Work, Supervision*	$ 2,250.00
	Project Geologist ($400/day, 5 days) *Field Work, Supervision*	$ 2,000.00
	Project Geologist ($400/day, 2 days) *Reporting*	$ 800.00
	Geophysicist ($400/day, 5 days) *Field Work*	$ 2,000.00
	Geophysicist ($400/day, 1 day) *Data Processing*	$ 400.00
	Senior Technician ($400/day, 5 days) *Field Work*	$ 2,000.00
	GIS Technician ($350/day, 2 days) *Project Planning, Validation*	$ 700.00
Accommodation	Hotel + meals May 11-15	$ 2,787.35
Field Supplies	Shovels, scoops, sample bags	$ 125.93
	Bins for sample collection	$ 40.63
	Flagging tape, compass	$ 83.34
Vehicles	Trucks (2 vehicles, gas, maintenance; 5 days)	$ 1,000.00
	ATVs (2 vehicles, gas, 5 days)	$ 500.00
Analytical	SGH Analysis (Activation Laboratories Ltd.)	$ 11,091.97
	TOTAL	**$ 26,779.22**

A breakdown of total expenditures by work completed on each mining claim is shown below in Table 7:

Table 7: Expenditure Breakdown by Claim

Claim Number	# of Sample Stations	% of Sample Stations	Attributed Work Value
4277104	53	27.18%	$ 7,278.45
4277105	48	24.61%	$ 6,591.81
4277106	48	24.61%	$ 6,591.81
4277107	11	5.64%	$ 1,510.62
4277108	16	8.21%	$ 2,197.27
4277109	16	8.21%	$ 2,197.27
4277110	3	1.54%	$ 411.99
TOTAL	**195**	**100%**	**$ 26,779.22**

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10 Statement of Qualification

I, Christopher Verzyden of the City of Greater Sudbury, Province of Ontario, do hereby certify that:

1. I am a geologist residing at 249 Pine St. Sudbury Ontario, P3C1X6.

2. I am a graduate of Carleton University (Ottawa, Ontario) having received a Bachelor of Science (Honours) in Earth Sciences in 2009.

3. I have been practicing in my profession as a geologist continuously since July 6th, 2009.

4. I have been an employee of KGHM International Ltd. (formerly FNX Mining Company Inc.) since July 6th, 2009.

5. The information presented in this document is true and accurate to the best of my knowledge. This information was gathered from such various sources as assessment files, publications and contractor-provided reports.

6. I performed the preparation and field work covered in this report.

7. I have no personal interest in the property covered by this report.

Dated in Sudbury, Ontario, this 18th day of December, 2014.

Respectfully Submitted,

Christopher Verzyden, B.Sc.
Project Geologist
December 18, 2014

11 Appendix A: Field Data Collected

Data collected in the field was gathered using a predetermined list of parameters. The format for this can be seen in Figure 10. Data for all samples collected is summarized in the following pages.

KGHM INTERNATIONAL

Soil Gas Hydrocarbon Sample Details

Project:	**Date:**
Team Members:	
Weather Conditions:	

Sample Number: **Time:**

Location: *NAD83 Zone*______	**Sample Texture:**	**Drainage (Moisture Content):**	**Terrain:**
X: E	☐ Clay (>50%)	☐ None (Saturated)	☐ Swamp/Bog
Y: N	☐ Silt (>50%)	☐ Poor (Wet)	☐ Field
Elev: m	☐ Sand (>50%)	☐ Moderate (Moist)	☐ Hilly
Depth (cm):	☐ Loam (equal parts)	☐ Well (Dry)	☐ Steeply Inclined
Colour:	**Photos** *Material:*______	**Vegetation:**	☐ Pioneer/Grassy
Comments:		☐ None	☐ Young Growth
	*Site:*______	☐ Decay/Flooded	☐ Older Growth

Sample Number: **Time:**

Location: *NAD83 Zone*______	**Sample Texture:**	**Drainage (Moisture Content):**	**Terrain:**
X: E	☐ Clay (>50%)	☐ None (Saturated)	☐ Swamp/Bog
Y: N	☐ Silt (>50%)	☐ Poor (Wet)	☐ Field
Elev: m	☐ Sand (>50%)	☐ Moderate (Moist)	☐ Hilly
Depth (cm):	☐ Loam (equal parts)	☐ Well (Dry)	☐ Steeply Inclined
Colour:	**Photos** *Material:*______	**Vegetation:**	☐ Pioneer/Grassy
Comments:		☐ None	☐ Young Growth
	*Site:*______	☐ Decay/Flooded	☐ Older Growth

Sample Number: **Time:**

Location: *NAD83 Zone*______	**Sample Texture:**	**Drainage (Moisture Content):**	**Terrain:**
X: E	☐ Clay (>50%)	☐ None (Saturated)	☐ Swamp/Bog
Y: N	☐ Silt (>50%)	☐ Poor (Wet)	☐ Field
Elev: m	☐ Sand (>50%)	☐ Moderate (Moist)	☐ Hilly
Depth (cm):	☐ Loam (equal parts)	☐ Well (Dry)	☐ Steeply Inclined
Colour:	**Photos** *Material:*______	**Vegetation:**	☐ Pioneer/Grassy
Comments:		☐ None	☐ Young Growth
	*Site:*______	☐ Decay/Flooded	☐ Older Growth

Figure 10: Soil Sample Data Collection Template

Station	Sample Type	Line Number	Easting	Northing	Elevation (m)	UTM Zone	Date	Time	Team	Weather	Depth (cm)	Texture	Moisture	Terrain	Vegetation	Colour	Comments
1-1A	Field Duplicate A	Line 1	510584.4	5303963.7	355.5	17	2014-05-12	10:08	BS, GS	Sunny, cool	20	Clay	Wet	Swamp / Bog	Young Growth	Beige	Next to lake, broke the shovel
1-1B	Field Duplicate B	Line 1	510584.4	5303963.7	355.5	17	2014-05-12	10:08	BS, GS	Sunny, cool	20	Clay	Wet	Swamp / Bog	Young Growth	Beige	Next to lake, broke the shovel
1-2	Single	Line 1	510572.6	5304061.9	356.0	17	2014-05-12	10:00	BS, GS	Sunny, cool	20	Clay	Moist	Hilly	Young Growth	Beige	Next to lake
1-3	Single	Line 1	510580.2	5304163.9	360.4	17	2014-05-12	9:45	BS, GS	Sunny, cool	20	Clay	Moist	Hilly	Young Growth	Beige	First sample for team
1-4	Single	Line 1	510586.3	5304266.4	368.6	17	2014-05-12	9:30	SG, CV, BS, GS	Sunny, cool	15	Sand	Saturated	Flat	Young Growth	Grey brown	First sample for group
1-5	Single	Line 1	510585.9	5304363.2	363.3	17	2014-05-12	9:41	SG, CV	Sunny, cool	20	Clay	Wet	Hilly	Young Growth	Grey	First sample for team, red organics
1-6	Single	Line 1	510585.9	5304468.9	357.2	17	2014-05-12	10:00	SG, CV	Sunny, cool	25	Silt	Saturated	Swamp / Bog	Young Growth	Red brown	Very organic rich
1-7	Single	Line 1	510587.4	5304560.4	363.3	17	2014-05-12	10:15	SG, CV	Sunny, clear, nc wind	15	Loam	Moist	Flat	Young Growth	Orange grey	By side of road
1-8	Single	Line 1	510586.5	5304661.2	368.0	17	2014-05-12	15:49	BS, GS	Overcast, cool wind	15	Sand	Dry	Flat	Older Growth	Brown	GPS@ 6m
1-9	Single	Line 1	510590.0	5304761.2	372.6	17	2014-05-12	15:41	BS, GS	Overcast, cool wind	10	Sand	Dry	Flat	Older Growth	Brown	GPS@ 4m
1-10	Single	Line 1	510586.4	5304865.6	374.7	17	2014-05-12	15:30	BS, GS	Overcast, cool wind	10	Sand	Moist	Flat	Older Growth	Brown	Close to bedrock or boulder, no deeper soil available
1-11	Single	Line 1	510586.1	5304961.7	374.1	17	2014-05-12	15:20	BS, GS	Overcast, cool wind	20	Sand	Saturated	Flat	Older Growth	Red brown	GPS@ 6m
1-12	Single	Line 1	510583.9	5305062.0	367.2	17	2014-05-12	15:07	BS, GS	Overcast, cool wind	30	Loam	Saturated	Flat	Older Growth	Black	GPS@ 7m, some frost, saturated below frost
1-13	Single	Line 1	510589.1	5305160.8	368.6	17	2014-05-12	14:58	BS, GS	Overcast, cool wind	10	Sand	Moist	Flat	Older Growth	Beige grey	GPS@ 8m
1-14	Single	Line 1	510587.9	5305264.4	374.3	17	2014-05-12	14:50	BS, GS	Overcast, light breeze	10	Sand	Dry	Flat	Older Growth	Brown	GPS@ 6m
1-15	Single	Line 1	510584.2	5305358.8	383.0	17	2014-05-12	14:40	BS, GS	Overcast, light breeze	10	Sand	Moist	Flat	Older Growth	Brown	GPS@ 10m
1-16	Single	Line 1	510583.3	5305462.3	387.5	17	2014-05-12	14:31	BS, GS	Overcast, light breeze	10	Sand	Moist	Hilly	Older Growth	Brown grey	GPS@ 10m
1-17	Single	Line 1	510588.0	5305557.9	387.2	17	2014-05-12	14:22	BS, GS	Sunny/hazy, light breeze	10	Sand	Moist	Flat	Young Growth	Brown	GPS@ 8m
1-18	Single	Line 1	510588.8	5305657.7	392.0	17	2014-05-12	14:15	BS, GS	Sunny/hazy, light breeze	10	Sand	Moist	Flat	Older Growth	Brown	GPS@ 10m
1-19	Single	Line 1	510587.8	5305763.7	389.6	17	2014-05-12	13:58	BS, GS	Sunny/hazy, light breeze	20	Loam	Moist	Flat	Older Growth	Black grey	Near snow
1-20A	Field Duplicate A	Line 1	510588.1	5305861.6	388.6	17	2014-05-12	13:45	BS, GS	Sunny, light breeze	25	Silt	Moist	Hilly	Young Growth	Grey black	Field Duplicate, lots of rock, very little soil, next to river, snowy
1-20B	Field Duplicate B	Line 1	510588.1	5305861.6	388.6	17	2014-05-12	13:45	BS, GS	Sunny, light breeze	25	Silt	Moist	Hilly	Young Growth	Grey black	Field Duplicate, lots of rock, very little soil, next to river, snowy
1-21	Single	Line 1	510585.7	5305961.1	389.6	17	2014-05-12	13:30	BS, GS	Sunny, light breeze	15	Silt	Moist	Flat	Young Growth	Dark brown	GPS@ 7m
1-22	Single	Line 1	510585.3	5306060.9	390.3	17	2014-05-12	13:19	BS, GS	Sunny, light breeze	10	Sand	Dry	Flat	Young Growth	Brown	
1-23	Single	Line 1	510585.6	5306161.6	393.6	17	2014-05-12	13:12	BS, GS	Sunny, light breeze	10	Sand	Dry	Flat	Young Growth	Brown	GPS@ 5m

Station	Sample Type	Line Number	Easting	Northing	Elevation (m)	UTM Zone	Date	Time	Team	Weather	Depth (cm)	Texture	Moisture	Terrain	Vegetation	Colour	Comments
1-24	Single	Line 1	510588.0	5306262.0	393.6	17	2014-05-12	13:03	BS, GS	Sunny, light breeze	10	Sand	Dry	Flat	Young Growth	Brown	GPS@ 7m
1-25	Single	Line 1	510585.1	5306361.1	396.4	17	2014-05-12	12:51	BS, GS	Sunny, light breeze	10	Clay	Wet	Flat	Young Growth	Brown	GPS@ 7m
1-26	Single	Line 1	510588.8	5306459.9	395.2	17	2014-05-12	11:12	BS, GS	Sunny, clear, no wind	10	Sand	Saturated	Swamp / Bog	Young Growth	Brown	GPS@ 5m
1-27	Single	Line 1	510587.2	5306566.6	398.7	17	2014-05-12	11:22	BS, GS	Sunny, no wind	10	Sand	Moist	Flat	Young Growth	Brown	GPS@ 5m, rock in soil
1-28	Single	Line 1	510588.6	5306662.4	400.5	17	2014-05-12	11:38	BS, GS	Sunny, no wind	10	Sand	Moist	Flat	Young Growth	Brown	GPS@ 5m
1-29	Single	Line 1	510586.1	5306761.7	403.4	17	2014-05-12	11:55	BS, GS	Sunny, light breeze	10	Clay	Moist	Flat	Young Growth	Grey	GPS@ 8m
1-30	Single	Line 1	510587.4	5306856.9	404.9	17	2014-05-12	12:07	BS, GS	Sunny, light breeze	10	Clay	Dry	Flat	Young Growth	Grey brown	GPS@ 6m
2-1	Single	Line 2	510986.4	5303962.8	356.7	17	2014-05-12	16:28	SG, CV	Overcast, cool wind	10	Sand	Wet	Swamp / Bog	Young Growth	Grey brown	Frozen soil
2-2	Single	Line 2	510986.4	5304061.0	356.8	17	2014-05-12	16:36	SG, CV	Overcast, cool wind	15	Sand	Moist	Hilly	Older Growth	Light grey black	
2-3	Single	Line 2	510984.5	5304161.1	361.8	17	2014-05-12	16:46	SG, CV	Overcast, cool	10	Silt	Moist	Hilly	Young Growth	Light brown	
2-4	Single	Line 2	510985.1	5304262.4	366.8	17	2014-05-12	16:53	SG, CV	Overcast, cool	10	Silt	Wet	Hilly	Young Growth	Light grey	
2-5	Single	Line 2	510987.0	5304363.4	366.1	17	2014-05-12	17:00	SG, CV	Overcast, cool	20	Clay	Moist	Hilly	Young Growth	Light grey brown	Camera batteries depleted
2-6	Single	Line 2	510987.8	5304460.2	368.0	17	2014-05-12	17:08	SG, CV	Overcast, cool, light breeze	10	Silt	Moist	Hilly	Young Growth	Brown orange	
2-7	Single	Line 2	510987.9	5304564.1	364.4	17	2014-05-12	10:56	SG, CV	Sunny, clear, no wind	10	Silt	Moist	Flat	Young Growth	Orange brown	
2-8	Single	Line 2	510987.0	5304661.7	367.6	17	2014-05-12	11:06	SG, CV	Sunny, clear, no wind	10	Loam	Moist	Hilly	Young Growth	Orange brown	
2-9A	Field Duplicate A	Line 2	510986.6	5304761.2	371.5	17	2014-05-12	11:15	SG, CV	Sunny, no wind	15	Loam	Dry	Hilly	Young Growth	Orange	Field Duplicate
2-9B	Field Duplicate B	Line 2	510986.6	5304761.2	371.5	17	2014-05-12	11:15	SG, CV	Sunny, no wind	15	Loam	Dry	Hilly	Young Growth	Orange	Field Duplicate
2-10	Single	Line 2	510987.6	5304860.7	375.6	17	2014-05-12	11:28	SG, CV	Sunny, no wind	25	Clay	Saturated	Hilly	Young Growth	Grey brown	
2-11	Single	Line 2	510986.7	5304962.0	383.0	17	2014-05-12	11:40	SG, CV	Sunny, no wind	20	Silt	Dry	Hilly	Young Growth	Orange grey	
2-12	Single	Line 2	510987.6	5305062.9	384.1	17	2014-05-12	11:53	SG, CV	Sunny, light breeze	10	Silt	Moist	Hilly	Young Growth	Grey brown	
2-13	Single	Line 2	510986.6	5305161.2	385.3	17	2014-05-12	12:03	SG, CV	Sunny, light breeze	15	Silt	Dry	Hilly	Young Growth	Orange brown	
2-14	Single	Line 2	510985.5	5305262.9	373.2	17	2014-05-12	12:46	SG, CV	Sunny, light breeze	20	Silt	Saturated	Swamp / Bog	Decay/Flooded	Brown	
2-15	Single	Line 2	510986.7	5305362.1	376.9	17	2014-05-12	12:55	SG, CV	Sunny, light breeze	15	Silt	Dry	Hilly	Young Growth	Grey orange brown	
2-16	Single	Line 2	510986.5	5305462.3	383.7	17	2014-05-12	13:05	SG, CV	Sunny, light breeze	10	Silt	Moist	Hilly	Young Growth	Orange grey	
2-17	Single	Line 2	510987.4	5305562.1	389.2	17	2014-05-12	13:14	SG, CV	Sunny, light breeze	20	Clay	Saturated	Hilly	Decay/Flooded	Grey brown	

Station	Sample Type	Line Number	Easting	Northing	Elevation (m)	UTM Zone	Date	Time	Team	Weather	Depth (cm)	Texture	Moisture	Terrain	Vegetation	Colour	Comments
2-18	Single	Line 2	510986.1	5305663.8	332.8	17	2014-05-12	13:23	SG, CV	Sunny, light breeze	15	Sand	Dry	Hilly	Young Growth	Orange brown	
2-19	Single	Line 2	510986.4	5305762.5	355.5	17	2014-05-12	13:31	SG, CV	Sunny, light breeze	15	Silt	Dry	Hilly	Young Growth	Dark orange brown	
2-20	Single	Line 2	510985.7	5305859.6	370.7	17	2014-05-12	13:41	SG, CV	Sunny, light breeze	10	Clay	Moist	Hilly	Young Growth	Grey brown	
2-21	Single	Line 2	510984.5	5305961.5	369.5	17	2014-05-12	13:55	SG, CV	Sunny/hazy, light breeze	10	Silt	Wet	Swamp / Bog	Pioneer/Grassy	Dark brown	
2-22	Single	Line 2	510985.2	5306062.1	378.4	17	2014-05-12	14:07	SG, CV	Sunny/hazy, light breeze	15	Silt	Moist	Swamp / Bog	Pioneer/Grassy	Dark grey brown	
2-23	Single	Line 2	510986.7	5306160.9	384.7	17	2014-05-12	14:16	SG, CV	Sunny/hazy, light breeze	15	Silt	Wet	Flat	Pioneer/Grassy	Grey brown	
2-24	Single	Line 2	510988.4	5306261.2	392.0	17	2014-05-12	14:32	SG, CV	Overcast, light breeze	10	Clay	Dry	Flat	Pioneer/Grassy	Light grey brown	
2-25	Single	Line 2	510986.5	5306359.9	397.3	17	2014-05-12	14:37	SG, CV	Overcast, light breeze	10	Silt	Dry	Hilly	Pioneer/Grassy	Light grey orange	
2-26	Single	Line 2	510986.9	5306460.7	403.0	17	2014-05-12	14:48	SG, CV	Overcast, light breeze	10	Sand	Dry	Flat	Pioneer/Grassy	Red brown	
2-27	Single	Line 2	510986.8	5306561.9	402.6	17	2014-05-12	14:58	SG, CV	Overcast, cool wind	10	Sand	Dry	Flat	Pioneer/Grassy	Orange brown	
3-1A	Field Duplicate A	Line 3	511385.2	5303962.2	351.7	17	2014-05-12	16:38	BS, GS	Overcast, cool wind	20	Sand	Moist	Hilly	Older Growth	Grey brown	Field Duplicate, GPS@ 7m
3-1B	Field Duplicate B	Line 3	511385.2	5303962.2	351.7	17	2014-05-12	16:38	BS, GS	Overcast, cool wind	20	Sand	Moist	Hilly	Older Growth	Grey brown	Field Duplicate, GPS@ 7m
3-2	Single	Line 3	511384.8	5304058.8	358.1	17	2014-05-12	16:41	BS, GS	Overcast, cool wind	15	Sand	Moist	Hilly	Older Growth	Brown	GPS@ 7m
3-3	Single	Line 3	511385.4	5304165.2	362.3	17	2014-05-12	16:51	BS, GS	Overcast, cool	25	Sand	Moist	Hilly	Older Growth	Brown	GPS@ 7m
3-4	Single	Line 3	511387.7	5304259.4	361.3	17	2014-05-12	17:00	BS, GS	Overcast, cool	20	Sand	Moist	Hilly	Older Growth	Dark grey	GPS@ 10m
3-5	Single	Line 3	511389.1	5304360.4	362.3	17	2014-05-12	17:10	BS, GS	Overcast, cool, light breeze	10	Sand	Moist	Flat	Older Growth	Light brown	GPS@ 8m
3-6	Single	Line 3	511388.4	5304461.2	368.0	17	2014-05-12	17:18	BS, GS	Overcast, cool, light breeze	10	Sand	Dry	Steeply Inclined	Older Growth	Brown	
3-7	Single	Line 3	511387.4	5304558.2	380.8	17	2014-05-13	9:38	BS, GS	Overcast, cool, light breeze	15	Sand	Moist	Flat	Young Growth	Beige grey brown	GPS@ 5m
3-8	Single	Line 3	511386.6	5304664.9	381.3	17	2014-05-13	9:46	BS, GS	Overcast, cool, light breeze	10	Sand	Moist	Flat	Older Growth	Brown	GPS@ 7m
3-9	Single	Line 3	511387.4	5304760.5	383.5	17	2014-05-13	9:55	BS, GS	Overcast, cool, light breeze	15	Sand	Moist	Flat	Young Growth	Beige brown	GPS@ 7m
3-10	Single	Line 3	511387.2	5304868.4	375.9	17	2014-05-13	10:03	BS, GS	Overcast, cool, light breeze	20	Sand	Moist	Steeply Inclined	Young Growth	Brown	GPS@ 6m
3-11	Single	Line 3	511385.0	5304961.0	372.6	17	2014-05-13	10:14	BS, GS	Overcast, cool, light breeze	25	Loam	Saturated	Swamp / Bog	Young Growth	Black	Very wet, ground frozen below water, boggy
3-12	Single	Line 3	511389.4	5305070.4	372.5	17	2014-05-13	10:29	BS, GS	Overcast, cool, light breeze	25	Loam	Saturated	Swamp / Bog	Young Growth	Black	Still very boggy
3-13	Single	Line 3	511388.3	5305164.1	378.6	17	2014-05-13	10:40	BS, GS	Overcast, cool, light breeze	10	Sand	Moist	Flat	Older Growth	Brown	GPS@ 5m
3-14	Single	Line 3	511383.8	5305260.5	381.4	17	2014-05-13	10:48	BS, GS	Overcast, cool, light breeze	10	Sand	Moist	Hilly	Older Growth	Beige	Some boulders and rock in soil

Station	Sample Type	Line Number	Easting	Northing	Elevation (m)	UTM Zone	Date	Time	Team	Weather	Depth (cm)	Texture	Moisture	Terrain	Vegetation	Colour	Comments
3-15	Single	Line 3	511387.7	5305360.8	383.5	17	2014-05-13	11:00	BS, GS	Overcast, cool, light breeze	10	Sand	Moist	Flat	Young Growth	Brown	GPS@ 6m
3-16	Single	Line 3	511395.0	5305471.7	377.1	17	2014-05-13	11:14	BS, GS	Overcast, cool, light breeze	10	Loam	Saturated	Swamp / Bog	Decay/Flooded	Black	River/bog, relocated to avoid crossing a large river
3-17	Single	Line 3	511389.1	5305567.8	381.9	17	2014-05-13	11:22	BS, GS	Overcast, cool, light breeze	10	Sand	Moist	Hilly	Older Growth	Brown	GPS@ 8m
3-18	Single	Line 3	511385.2	5305659.4	383.1	17	2014-05-13	11:31	BS, GS	Overcast, cool, moderate wind	10	Sand	Moist	Hilly	Older Growth	Brown	Next to river
3-19	Single	Line 3	511388.5	5305760.0	389.0	17	2014-05-13	11:41	BS, GS	Overcast, cool, moderate wind	15	Sand	Moist	Hilly	Older Growth	Beige	GPS@ 5m
3-20A	Field Duplicate A	Line 3	511389.6	5305857.3	388.1	17	2014-05-13	11:51	BS, GS	Overcast, cool, moderate wind	10	Sand	Moist	Flat	Young Growth	Brown beige	Field Duplicate, GPS@ 7m
3-20B	Field Duplicate B	Line 3	511389.6	5305857.3	388.1	17	2014-05-13	11:51	BS, GS	Overcast, cool, moderate wind	10	Sand	Moist	Flat	Young Growth	Brown beige	Field Duplicate, GPS@ 7m
3-21	Single	Line 3	511381.2	5305957.2	385.1	17	2014-05-13	12:03	BS, GS	Overcast, cool, moderate wind	20	Sand	Moist	Hilly	Older Growth	Brown	GPS@ 10m, relocated due to thick vegetation
3-22	Single	Line 3	511386.4	5306060.6	389.9	17	2014-05-13	12:10	BS, GS	Overcast, cool, moderate wind	10	Loam	Saturated	Swamp / Bog	Young Growth	Black	GPS@ 10m, raining
3-23	Single	Line 3	511388.9	5306160.3	400.0	17	2014-05-14	9:27	BS, GS	Sunny, clear skies	15	Sand	Moist	Flat	Older Growth	Beige brown	GPS@ 6m
3-24	Single	Line 3	511389.5	5306269.5	402.5	17	2014-05-14	9:38	BS, GS	Sunny, clear skies	15	Clay	Saturated	Hilly	Older Growth	Beige	GPS@ 6m
3-25	Single	Line 3	511387.6	5306359.1	404.3	17	2014-05-14	9:47	BS, GS	Sunny, clear skies	15	Sand	Moist	Flat	Older Growth	Brown	GPS@ 5m, frost in ground
3-26	Single	Line 3	511387.5	5306462.7	407.6	17	2014-05-14	9:54	BS, GS	Sunny, clear skies	10	Sand	Moist	Flat	Older Growth	Brown	GPS@ 5m
3-27	Single	Line 3	511386.8	5306567.8	402.3	17	2014-05-14	10:07	BS, GS	Sunny, clear skies	10	Sand	Moist	Flat	Older Growth	Brown	GPS@ 5m, some gravel
4-1	Single	Line 4	511777.1	5303963.6	358.0	17	2014-05-14	10:21	SG, CV	Sunny, clear skies	20	Loam	Wet	Swamp / Bog	Decay/Flooded	Dark brown	Relocated due to flooding
4-2	Single	Line 4	511785.8	5304062.5	359.0	17	2014-05-14	10:10	SG, CV	Sunny, clear skies	10	Silt	Wet	Swamp / Bog	Decay/Flooded	Dark brown	
4-3	Single	Line 4	511781.6	5304159.7	360.6	17	2014-05-14	9:59	SG, CV	Sunny, clear skies	10	Clay	Saturated	Flat	Young Growth	Dark brown	2ft snow cover
4-4	Single	Line 4	511786.2	5304263.7	360.7	17	2014-05-14	9:46	SG, CV	Sunny, clear skies	10	Silt	Saturated	Flat	Older Growth	Dark brown	
4-5	Single	Line 4	511788.2	5304362.9	361.2	17	2014-05-14	9:38	SG, CV	Sunny, clear skies	10	Silt	Moist	Flat	Older Growth	Dark brown/grey	
4-6	Single	Line 4	511787.4	5304463.2	361.6	17	2014-05-13	12:04	SG, CV	Overcast, cool, moderate wind	10	Sand	Moist	Hilly	Young Growth	Medium brown	
4-7	Single	Line 4	511786.6	5304561.6	368.4	17	2014-05-13	11:55	SG, CV	Overcast, cool, moderate wind	15	Silt	Moist	Hilly	Young Growth	Grey reddish-brown	
4-8	Single	Line 4	511785.9	5304661.4	371.3	17	2014-05-13	11:45	SG, CV	Overcast, cool, moderate wind	10	Sand	Moist	Hilly	Young Growth	Dark reddish brown	
4-9	Single	Line 4	511785.8	5304761.2	373.7	17	2014-05-13	11:37	SG, CV	Overcast, cool, moderate wind	10	Sand	Moist	Flat	Young Growth	Dark reddish brown	Replant area
4-10	Single	Line 4	511787.4	5304862.8	377.7	17	2014-05-13	11:30	SG, CV	Overcast, cool, moderate wind	10	Loam	Moist	Flat	Young Growth	Dark brown	
4-11	Single	Line 4	511783.0	5304959.9	377.4	17	2014-05-13	11:20	SG, CV	Overcast, cool, light breeze	15	Silt	Saturated	Swamp / Bog	Young Growth	Dark brown	Partially frozen

Station	Sample Type	Line Number	Easting	Northing	Elevation (m)	UTM Zone	Date	Time	Team	Weather	Depth (cm)	Texture	Moisture	Terrain	Vegetation	Colour	Comments
4-12A	Field Duplicate B	Line 4	511782.7	5305061.6	378.4	17	2014-05-13	11:04	SG, CV	Overcast, cool, light breeze	15	Silt	Saturated	Swamp / Bog	Decay/Flooded	Dark brown	Field Duplicate
4-12B	Field Duplicate A	Line 4	511782.7	5305061.6	378.4	17	2014-05-13	11:04	SG, CV	Overcast, cool, light breeze	15	Silt	Saturated	Swamp / Bog	Decay/Flooded	Dark brown	Field Duplicate
4-13	Single	Line 4	511777.2	5305158.3	379.2	17	2014-05-13	10:53	SG, CV	Overcast, cool, light breeze	10	Silt	Moist	Swamp / Bog	Young Growth	Dark brown	Frozen, no E-horizon, relocated due to swamp
4-14	Single	Line 4	511786.6	5305260.7	382.3	17	2014-05-13	10:32	SG, CV	Overcast, cool, light breeze	10	Loam	Saturated	Swamp / Bog	Pioneer/Grassy	Dark brown	
4-15	Single	Line 4	511783.9	5305360.0	385.7	17	2014-05-13	10:24	SG, CV	Overcast, cool, light breeze	10	Silt	Saturated	Swamp / Bog	Decay/Flooded	Dark brown	
4-16	Single	Line 4	511789.2	5305462.5	390.6	17	2014-05-13	10:15	SG, CV	Overcast, cool, light breeze	15	Loam	Moist	Swamp / Bog	Young Growth	Dark brown	Frozen, no E-horizon
4-17	Single	Line 4	511787.1	5305563.2	393.6	17	2014-05-13	10:05	SG, CV	Overcast, cool, light breeze	10	Clay	Wet	Flat	Young Growth	Light grey black	
4-18	Single	Line 4	511786.4	5305663.9	394.1	17	2014-05-13	9:56	SG, CV	Overcast, cool, light breeze	20	Loam	Moist	Flat	Young Growth	Grey dark-brown	
4-19	Single	Line 4	511788.9	5305766.2	399.7	17	2014-05-13	9:49	SG, CV	Overcast, cool, light breeze	10	Silt	Dry	Hilly	Young Growth	Brown	
4-20	Single	Line 4	511784.9	5305856.2	400.6	17	2014-05-14	11:41	BS, GS	Sun/cloud, light breeze	15	Sand	Moist	Hilly	Older Growth	Red brown	GPS@ 10m, next to river
4-21	Single	Line 4	511786.1	5305952.6	398.5	17	2014-05-14	11:27	BS, GS	Sun/cloud, light breeze	10	Silt	Wet	Swamp / Bog	Young Growth	Beige brown	GPS@ 10m, relocated due to swamp
4-22	Single	Line 4	511786.1	5306057.6	399.8	17	2014-05-14	11:18	BS, GS	Sun/cloud, light breeze	15	Sand	Moist	Flat	Older Growth	Brown	GPS@ 15m, out of swamp
4-23	Single	Line 4	511786.1	5306163.4	399.2	17	2014-05-14	11:08	BS, GS	Sun/cloud, no wind	20	Loam	Saturated	Swamp / Bog	Young Growth	Black	In swamp, getting more dry
4-24	Single	Line 4	511790.2	5306262.1	398.6	17	2014-05-14	11:00	BS, GS	Sun/cloud, no wind	30	Loam	Saturated	Swamp / Bog	Young Growth	Black	GPS@7m, in swamp, some frost
4-25	Single	Line 4	511785.3	5306357.6	398.0	17	2014-05-14	10:50	BS, GS	Sun/cloud, no wind	25	Loam	Saturated	Swamp / Bog	Young Growth	Black	GPS@ 5m, swampy
4-26	Single	Line 4	511785.0	5306460.0	399.5	17	2014-05-14	10:41	BS, GS	Sunny, clear skies	20	Loam	Saturated	Swamp / Bog	Young Growth	Black brown	Cedar swamp still, getting less flooded
4-27	Single	Line 4	511790.1	5306556.6	400.0	17	2014-05-14	10:26	BS, GS	Sunny, clear skies	20	Loam	Saturated	Swamp / Bog	Young Growth	Black	Cedar swamp, some frozen ground
5-1	Single	Line 5	512186.6	5303961.9	372.0	17	2014-05-14	10:38	SG, CV	Sunny, clear skies	10	Clay	Moist	Hilly	Young Growth	Orange brown	
5-2	Single	Line 5	512188.5	5304062.3	374.5	17	2014-05-14	10:48	SG, CV	Sun/cloud, no wind	10	Sand	Moist	Hilly	Young Growth	Orange brown grey	Frozen ground
5-3	Single	Line 5	512187.3	5304161.9	380.7	17	2014-05-14	10:57	SG, CV	Sun/cloud, no wind	15	Silt	Moist	Hilly	Young Growth	Grey brown	Frozen ground
5-4A	Field Duplicate A	Line 5	512186.1	5304264.8	384.7	17	2014-05-14	11:07	SG, CV	Sun/cloud, no wind	15	Loam	Moist	Steeply Inclined	Older Growth	Dark brown	Field Duplicate, frozen ground
5-4B	Field Duplicate B	Line 5	512186.1	5304264.8	384.7	17	2014-05-14	11:07	SG, CV	Sun/cloud, no wind	15	Loam	Moist	Steeply Inclined	Older Growth	Dark brown	Field Duplicate, frozen ground
5-5	Single	Line 5	512192.2	5304363.1	374.6	17	2014-05-14	11:17	SG, CV	Sun/cloud, light breeze	15	Sand	Saturated	Swamp / Bog	Decay/Flooded	Dark brown	Frozen ground
5-6	Single	Line 5	512187.9	5304447.0	371.6	17	2014-05-14	11:31	SG, CV	Sun/cloud, light breeze	10	Clay	Saturated	Swamp / Bog	Decay/Flooded	Orange brown	Relocated due to swamp
5-7	Single	Line 5	512139.1	5304560.6	373.2	17	2014-05-14	11:48	SG, CV	Sun/cloud, light breeze	25	Clay	Wet	Swamp / Bog	Decay/Flooded	Dark brown	Relocated due to swamp

Station	Sample Type	Line Number	Easting	Northing	Elevation (m)	UTM Zone	Date	Time	Team	Weather	Depth (cm)	Texture	Moisture	Terrain	Vegetation	Colour	Comments
5-8	Singe	Line 5	512186.7	5304662.3	377.5	17	2014-05-14	11:58	SG, CV	Overcast, light wind	10	Loam	Moist	Flat	Young Growth	Dark brown	
5-9	Singe	Line 5	512187.0	5304761.4	380.4	17	2014-05-14	12:04	SG, CV	Overcast, light wind	10	Sand	Saturated	Flat	Older Growth	Orange brown	
5-10	Singe	Line 5	512186.1	5304862.1	387.4	17	2014-05-14	12:43	SG, CV	Overcast, light wind	10	Silt	Wet	Flat	Young Growth	Orange brown	
5-11	Singe	Line 5	512186.8	5304963.0	389.5	17	2014-05-14	12:51	SG, CV	Sun/cloud, light breeze	10	Sand	Saturated	Flat	Young Growth	Dark brown	Replant area
5-12	Singe	Line 5	512186.0	5305062.7	391.1	17	2014-05-14	12:58	SG, CV	Sun/cloud, light breeze	10	Sand	Saturated	Flat	Young Growth	Grey brown	Replant area
5-13	Singe	Line 5	512191.3	5305168.7	391.3	17	2014-05-14	13:07	SG, CV	Sun/cloud, light breeze	15	Silt	Wet	Flat	Young Growth	Orange brown	Frozen ground
5-14	Singe	Line 5	512185.8	5305262.2	391.7	17	2014-05-14	13:17	SG, CV	Sunny, clear skies, light breeze	15	Loam	Moist	Flat	Young Growth	Grey brown	Replant area
5-15	Singe	Line 5	512186.6	5305361.8	393.8	17	2014-05-14	13:27	SG, CV	Sunny, clear skies, light breeze	10	Silt	Wet	Flat	Young Growth	Grey brown	Replant area
5-16	Singe	Line 5	512186.2	5305463.2	392.9	17	2014-05-14	13:36	SG, CV	Sunny, clear skies, light breeze	10	Loam	Moist	Flat	Young Growth	Grey brown	Replant area
5-17	Singe	Line 5	512189.0	5305561.9	395.8	17	2014-05-14	13:44	SG, CV	Sunny, light breeze	10	Sand	Dry	Flat	Young Growth	Orange	
5-18	Singe	Line 5	512186.4	5305660.1	393.3	17	2014-05-14	14:15	SG, CV	Sunny, light breeze	15	Loam	Dry	Flat	Young Growth	Grey orange	
5-19	Singe	Line 5	512185.4	5305761.2	394.9	17	2014-05-14	14:22	SG, CV	Sunny, light breeze	10	Silt	Dry	Hilly	Young Growth	Orange brown	
5-20	Singe	Line 5	512186.6	5305863.1	396.3	17	2014-05-14	14:30	SG, CV	Sunny, warm	10	Sand	Dry	Hilly	Young Growth	Grey orange	
5-21	Singe	Line 5	512185.3	5305960.6	396.9	17	2014-05-14	14:40	SG, CV	Sunny, warm	10	Clay	Moist	Hilly	Young Growth	Grey orange	
5-22	Singe	Line 5	512186.8	5306062.5	398.1	17	2014-05-14	14:48	SG, CV	Sunny, warm	10	Clay	Saturated	Flat	Young Growth	Light grey brown	
5-23A	Field Duplicate A	Line 5	512186.5	5306162.2	400.5	17	2014-05-14	14:55	SG, CV	Sunny, warm, light wind	10	Silt	Dry	Hilly	Young Growth	Grey brown	Field Duplicate
5-23B	Field Duplicate B	Line 5	512186.5	5306162.2	400.5	17	2014-05-14	14:55	SG, CV	Sunny, warm, light wind	10	Silt	Dry	Hilly	Young Growth	Grey brown	Field Duplicate
5-24	Singe	Line 5	512185.7	5306162.3	399.2	17	2014-05-14	15:06	SG, CV	Sunny, warm, light wind	15	Sand	Dry	Hilly	Young Growth	Orange brown	
5-25	Singe	Line 5	512186.9	5306162.0	398.8	17	2014-05-14	15:12	SG, CV	Sunny, warm, light wind	10	Loam	Dry	Hilly	Young Growth	Orange light-grey	
5-26	Singe	Line 5	512187.6	5306461.3	396.5	17	2014-05-14	15:21	SG, CV	Sunny, warm, light breeze	10	Loam	Saturated	Swamp / Bog	Decay/flooded	Dark brown	Peat bog, little soil
5-27	Singe	Line 5	512188.5	5306566.1	397.4	17	2014-05-14	15:30	SG, CV	Sunny, warm, light breeze	10	Loam	Saturated	Swamp / Bog	Decay/flooded	Dark orange brown	
6-1	Singe	Line 6	512585.2	5303964.0	301.9	17	2014-05-14	17:01	BS, GS	Sunny, warm, clear, light breeze	15	Sand	Moist	Hilly	Older Growth	Brown	GPS@ 5m
6-2	Singe	Line 6	512584.5	5304064.1	306.0	17	2014-05-14	16:54	BS, GS	Sunny, warm, clear, light breeze	15	Sand	Moist	Hilly	Older Growth	Dark brown	GPS@ 6m
6-3	Singe	Line 6	512585.2	5304165.4	316.5	17	2014-05-14	16:43	BS, GS	Sunny, warm, clear, light breeze	10	Silt	Moist	Flat	Young Growth	Beige	Grey layer above rock
6-4	Singe	Line 6	512586.1	5304257.6	316.2	17	2014-05-14	16:35	BS, GS	Sunny, warm, clear, light breeze	10	Sand	Moist	Hilly	Young Growth	Brown	GPS@ 5m

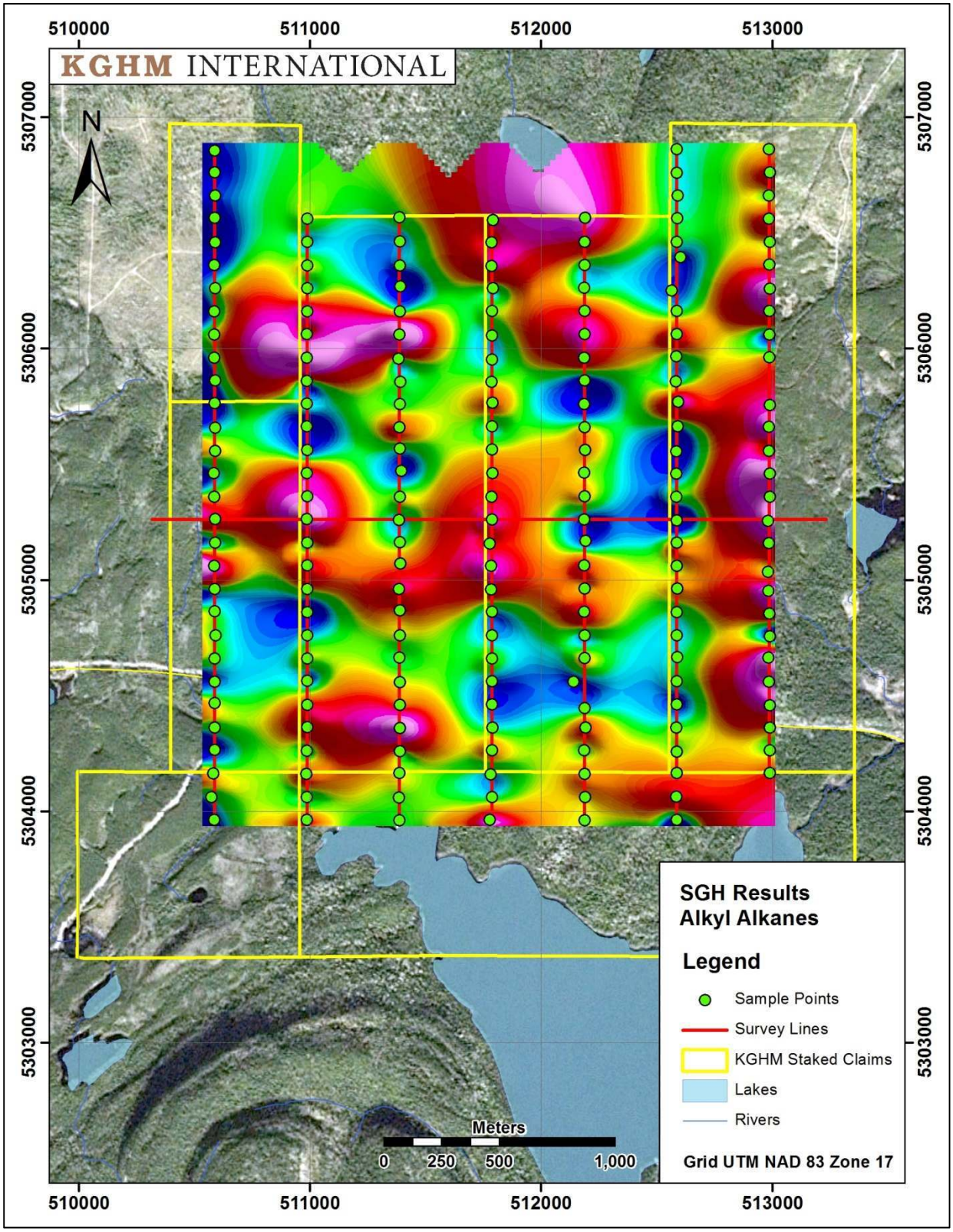
Station	Sample Type	Line Number	Easting	Northing	Elevation (m)	UTM Zone	Date	Time	Team	Weather	Depth (cm)	Texture	Moisture	Terrain	Vegetation	Colour	Comments
6-5	Single	Line 6	512583.9	5304361.8	307.8	17	2014-05-14	16:23	BS, GS	Sunny, warm, light breeze	15	Sand	Moist	Flat	Young Growth	Brown	
6-6	Single	Line 6	512586.0	5304461.5	307.3	17	2014-05-14	15:56	BS, GS	Sunny, warm, light breeze	10	Sand	Moist	Flat	Young Growth	Brown	GPS@ 5m
6-7	Single	Line 6	512585.8	5304561.8	304.4	17	2014-05-14	15:47	BS, GS	Sunny, warm, light breeze	10	Sand	Moist	Flat	Older Growth	Beige tan	GPS@ 5m
6-8	Single	Line 6	512587.5	5304665.9	305.4	17	2014-05-14	15:39	BS, GS	Sunny, warm, light breeze	15	Sand	Wet	Flat	Older Growth	Brown	GPS@ 8m, top of ground frozen
6-9	Single	Line 6	512586.0	5304760.8	304.5	17	2014-05-14	15:26	BS, GS	Sunny, warm, light breeze	15	Sand	Saturated	Swamp / Bog	Young Growth	Brown	Frosty and wet ground
6-10	Single	Line 6	512585.5	5304862.0	304.1	17	2014-05-14	15:16	BS, GS	Sunny, warm, light wind	10	Sand	Saturated	Flat	Young Growth	Beige black	Frozen ground with rocks
6-11	Single	Line 6	512587.8	5304962.7	303.6	17	2014-05-14	15:08	BS, GS	Sunny, warm, light wind	15	Loam	Moist	Flat	Young Growth	Beige grey	GPS@ 5m
6-12	Single	Line 6	512586.1	5305061.6	302.0	17	2014-05-14	15:00	BS, GS	Sunny, warm, light wind	10	Sand	Moist	Flat	Young Growth	Brown	GPS@ 7m
6-13	Single	Line 6	512585.2	5305162.3	300.9	17	2014-05-14	14:52	BS, GS	Sunny, warm	10	Sand	Moist	Flat	Older Growth	Brown	GPS@ 5m, finally a nice spot
6-14	Single	Line 6	512586.4	5305258.4	298.2	17	2014-05-14	14:45	BS, GS	Sunny, warm	10	Loam	Wet	Swamp / Bog	Young Growth	Black grey	Large cobbles below surface, west of large lake
6-15A	Field Duplicate A	Line 6	512584.3	5305360.2	297.3	17	2014-05-14	14:32	BS, GS	Sunny, light breeze	10	Loam	Moist	Flat	Young Growth	Black peat	Field duplicate, rocky ground (old river bed?), very hard to find soil, had to sample humus
6-15B	Field Duplicate B	Line 6	512584.3	5305360.2	297.3	17	2014-05-14	14:32	BS, GS	Sunny, light breeze	10	Loam	Moist	Flat	Young Growth	Black peat	Field duplicate, rocky ground (old river bed?), very hard to find soil, had to sample humus
6-16	Single	Line 6	512584.3	5305460.4	298.9	17	2014-05-14	14:17	BS, GS	Sunny, light breeze	15	Sand	Wet	Swamp / Bog	Young Growth	Grey black	GPS@ 7m, frozen ground, some rocks
6-17	Single	Line 6	512583.7	5305556.1	295.5	17	2014-05-14	14:09	BS, GS	Sunny, light breeze	15	Sand	Saturated	Swamp / Bog	Young Growth	Brown	GPS@ 10m
6-18	Single	Line 6	512589.7	5305663.7	397.9	17	2014-05-14	13:40	BS, GS	Sunny, clear skies, light breeze	25	Sand	Moist	Flat	Young Growth	Brown	GPS ran out of batteries just after recording waypoint
6-19	Single	Line 6	512591.1	5305770.6	378.4	17	2014-05-14	13:08	BS, GS	Sun/cloud, light breeze	20	Sand	Saturated	Swamp / Bog	Young Growth	Black brown	GPS@ 7m
6-20	Single	Line 6	512582.8	5305859.1	383.0	17	2014-05-14	12:52	BS, GS	Sun/cloud, light breeze	10	Sand	Saturated	Swamp / Bog	Young Growth	Dark brown	Middle of river
6-21	Single	Line 6	512583.3	5305967.5	386.7	17	2014-05-14	12:38	BS, GS	Overcast, light wind	30	Sand	Moist	Flat	Older Growth	Beige brown	Middle of river
6-22	Single	Line 6	512586.4	5306062.4	381.6	17	2014-05-14	17:31	SG, CV	Sunny, warm, still	10	Silt	Wet	Swamp / Bog	Young Growth	Dark brown	
6-23	Single	Line 6	512586.4	5306162.2	384.3	17	2014-05-14	17:25	SG, CV	Sunny, warm, still	20	Loam	Moist	Hilly	Older Growth	Dark brown	
6-24	Single	Line 6	512563.5	5306251.3	385.5	17	2014-05-14	17:11	SG, CV	Sunny, warm, clear, light breeze	15	Silt	Moist	Swamp / Bog	Pioneer/Grassy	Grey brown	
6-25	Single	Line 6	512602.9	5306395.1	386.7	17	2014-05-14	16:44	SG, CV	Sunny, warm, clear, light breeze	10	Silt	Wet	Steeply Inclined	Older Growth	Orange brown	Relocated due to lake, frozen ground
6-26	Single	Line 6	512585.7	5306461.5	394.0	17	2014-05-14	16:36	SG, CV	Sunny, warm, clear, light breeze	15	Sand	Dry	Hilly	Young Growth	Orange brown	
6-27	Single	Line 6	512588.5	5306563.2	391.1	17	2014-05-14	16:25	SG, CV	Sunny, warm, light breeze	10	Sand	Dry	Hilly	Young Growth	Orange brown	Very thin A-horizon
6-28	Single	Line 6	512589.7	5306662.8	388.4	17	2014-05-14	16:14	SG, CV	Sunny, warm, light breeze	10	Loam	Wet	Hilly	Young Growth	Grey brown	On a trail

Station	Sample Type	Line Number	Easting	Northing	Elevation (m)	UTM Zone	Date	Time	Team	Weather	Depth (cm)	Texture	Moisture	Terrain	Vegetation	Colour	Comments
6-29	Single	Line 6	512585.9	5306760.3	392.7	17	2014-05-14	16:05	SG, CV	Sunny, warm, light breeze	10	Loam	Moist	Hilly	Young Growth	Grey dark-brown	
6-30	Single	Line 6	512585.6	5306862.3	405.0	17	2014-05-14	15:54	SG, CV	Sunny, warm, light breeze	10	Loam	Moist	Hilly	Older Growth	Dark brown	
7-1	Single	Line 7	512988.7	5304165.8	281.1	17	2014-05-14	17:24	BS, GS	Sunny, warm, still	15	Sand	Wet	Flat	Older Growth	Tan	GPS@ 5m, near a camp area with some buildings
7-2	Single	Line 7	512989.2	5304264.4	289.7	17	2014-05-14	17:36	BS, GS	Sunny, warm, still	10	Sand	Moist	Flat	Young Growth	Beige	GPS@ 6m
7-3	Single	Line 7	512987.9	5304363.2	298.9	17	2014-05-14	17:46	BS, GS	Sunny, warm, still	10	Sand	Moist	Flat	Young Growth	Brown	Side of main road
7-4A	Field Duplicate A	Line 7	512989.6	5304458.0	382.6	17	2014-05-15	12:33	BS, GS	Rain, cold	10	Sand	Wet	Flat	Young Growth	Brown	
7-4B	Field Duplicate B	Line 7	512989.6	5304458.0	382.6	17	2014-05-15	12:33	BS, GS	Rain, cold	10	Sand	Wet	Flat	Young Growth	Brown	
7-5	Single	Line 7	512983.8	5304561.0	387.2	17	2014-05-15	12:24	BS, GS	Rain, cold	10	Sand	Wet	Flat	Young Growth	Dark brown	
7-6	Single	Line 7	512981.8	5304665.0	387.4	17	2014-05-15	12:13	BS, GS	Rain, cold	10	Sand	Wet	Flat	Young Growth	Tan	
7-7	Single	Line 7	512987.8	5304756.4	388.1	17	2014-05-15	12:05	BS, GS	Rain, cold	10	Sand	Wet	Flat	Young Growth	Brown	
7-8	Single	Line 7	512986.5	5304855.6	380.4	17	2014-05-15	11:55	BS, GS	Rain, cold	10	Sand	Wet	Flat	Young Growth	Brown	
7-9	Single	Line 7	512982.7	5304952.9	376.0	17	2014-05-15	11:44	BS, GS	Rain, cold	15	Sand	Wet	Flat	Young Growth	Brown	
7-10	Single	Line 7	512980.8	5305036.2	374.7	17	2014-05-15	11:33	BS, GS	Rain, cold	15	Sand	Saturated	Swamp / Bog	Young Growth	Black	
7-11	Single	Line 7	512985.3	5305159.4	376.4	17	2014-05-15	11:18	BS, GS	Rain, cold	20	Sand	Wet	Flat	Young Growth	White tan	
7-12	Single	Line 7	512981.4	5305256.4	378.6	17	2014-05-15	11:11	BS, GS	Rain, cold	20	Sand	Wet	Flat	Young Growth	Brown	
7-13	Single	Line 7	512988.5	5305359.6	376.2	17	2014-05-15	11:04	BS, GS	Rain, cold	10	Sand	Wet	Flat	Young Growth	Brown	
7-14	Single	Line 7	512988.8	5305459.8	376.7	17	2014-05-15	10:56	BS, GS	Rain, cold	20	Loam	Saturated	Swamp / Bog	Young Growth	Black	
7-15	Single	Line 7	512985.3	5305558.5	380.3	17	2014-05-15	10:47	BS, GS	Rain, cold	20	Loam	Saturated	Swamp / Bog	Young Growth	Black	
7-16	Single	Line 7	512984.4	5305661.6	384.5	17	2014-05-15	10:36	BS, GS	Rain, cold	10	Sand	Wet	Flat	Young Growth	Brown	
7-17	Single	Line 7	512987.7	5305756.7	390.3	17	2014-05-15	10:26	BS, GS	Rain, cold	10	Sand	Wet	Flat	Young Growth	Brown	
7-19	Single	Line 7	512986.7	5305962.0	394.8	17	2014-05-15	11:50	SG, CV	Rain, cold	10	Sand	Dry	Flat	Young Growth		
7-20	Single	Line 7	512986.0	5306061.4	399.5	17	2014-05-15	11:41	SG, CV	Rain, cold	10	Silt	Dry	Flat	Young Growth		
7-21	Single	Line 7	512987.3	5306162.4	396.4	17	2014-05-15	11:33	SG, CV	Rain, cold	10	Sand	Dry	Hilly	Young Growth		
7-22	Single	Line 7	512987.8	5306258.8	395.3	17	2014-05-15	11:24	SG, CV	Rain, cold	10	Clay	Saturated	Hilly	Young Growth		
7-23A	Field Duplicate A	Line 7	512985.7	5306362.4	395.8	17	2014-05-15	11:11	SG, CV	Rain, cold	10	Silt	Wet	Hilly	Young Growth		Field Duplicate

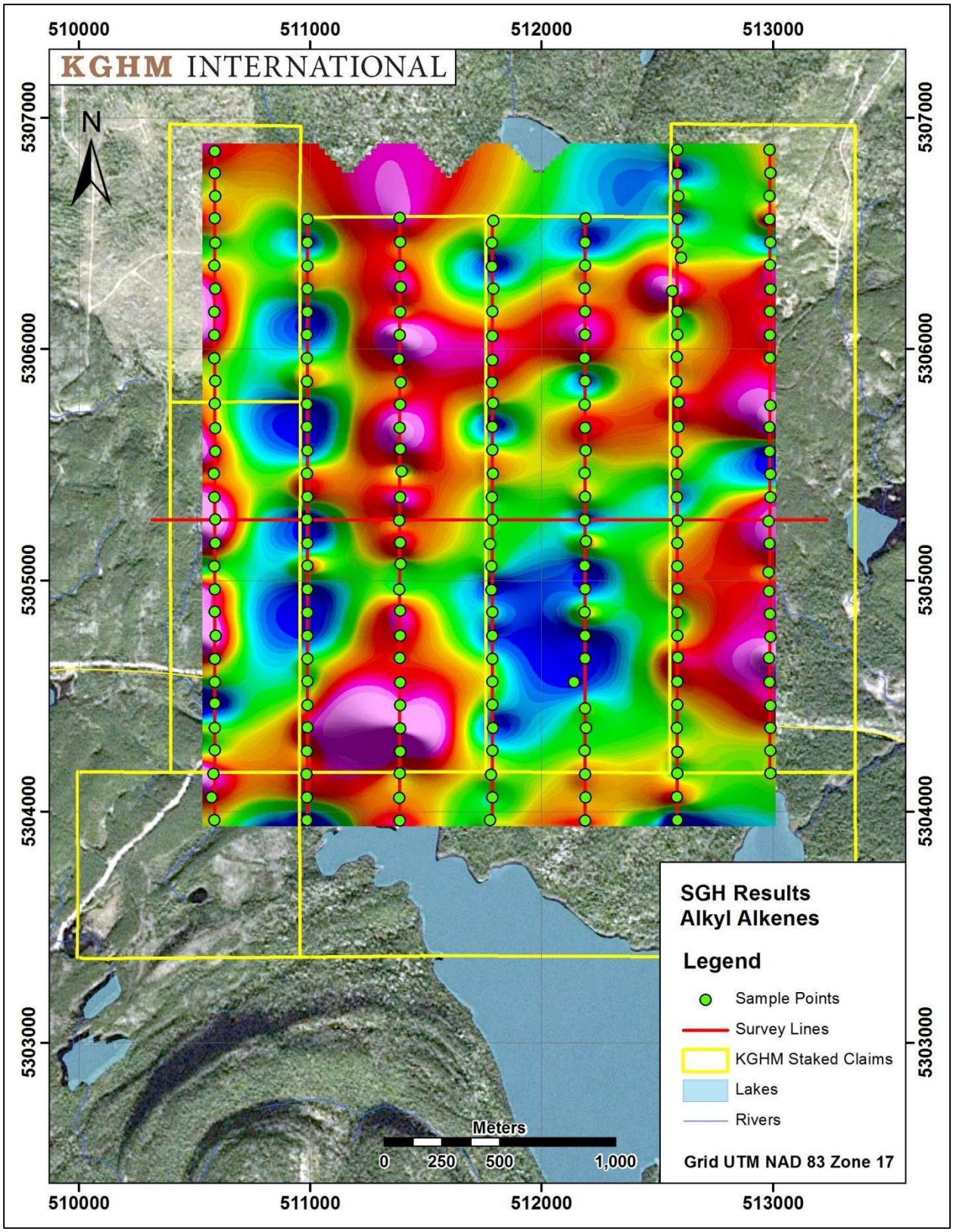
Station	Sample Type	Line Number	Easting	Northing	Elevation (m)	UTM Zone	Date	Time	Team	Weather	Depth (cm)	Texture	Moisture	Terrain	Vegetation	Colour	Comments
7-23B	Field Duplicate B	Line 7	512985.7	5306362.4	395.8	17	2014-05-15	11:11	SG, CV	Rain, cold	10	Silt	Wet	Hilly	Young Growth		Field Duplicate
7-24	Single	Line 7	512987.7	5306461.6	389.5	17	2014-05-15	11:00	SG, CV	Rain, cold	10	Silt	Dry	Flat	Young Growth		
7-25	Single	Line 7	512985.2	5306561.3	396.9	17	2014-05-15	10:52	SG, CV	Rain, cold	10	Silt	Moist	Hilly	Young Growth		
7-26	Single	Line 7	512985.4	5306661.8	414.5	17	2014-05-15	10:43	SG, CV	Rain, cold	10	Loam	Dry	Steeply Inclined	Young Growth	Grey brown	
7-27	Single	Line 7	512988.2	5306762.4	436.6	17	2014-05-15	10:32	SG, CV	Rain, cold	10	Loam	Wet	Hilly	Young Growth	Creamy grey brown	
7-28	Single	Line 7	512985.2	5306861.4	437.2	17	2014-05-15	10:24	SG, CV	Rain, cold	10	Sand	Dry	Hilly	Young Growth	Light grey orange	

12 Appendix B: Maps of Geochemical Results

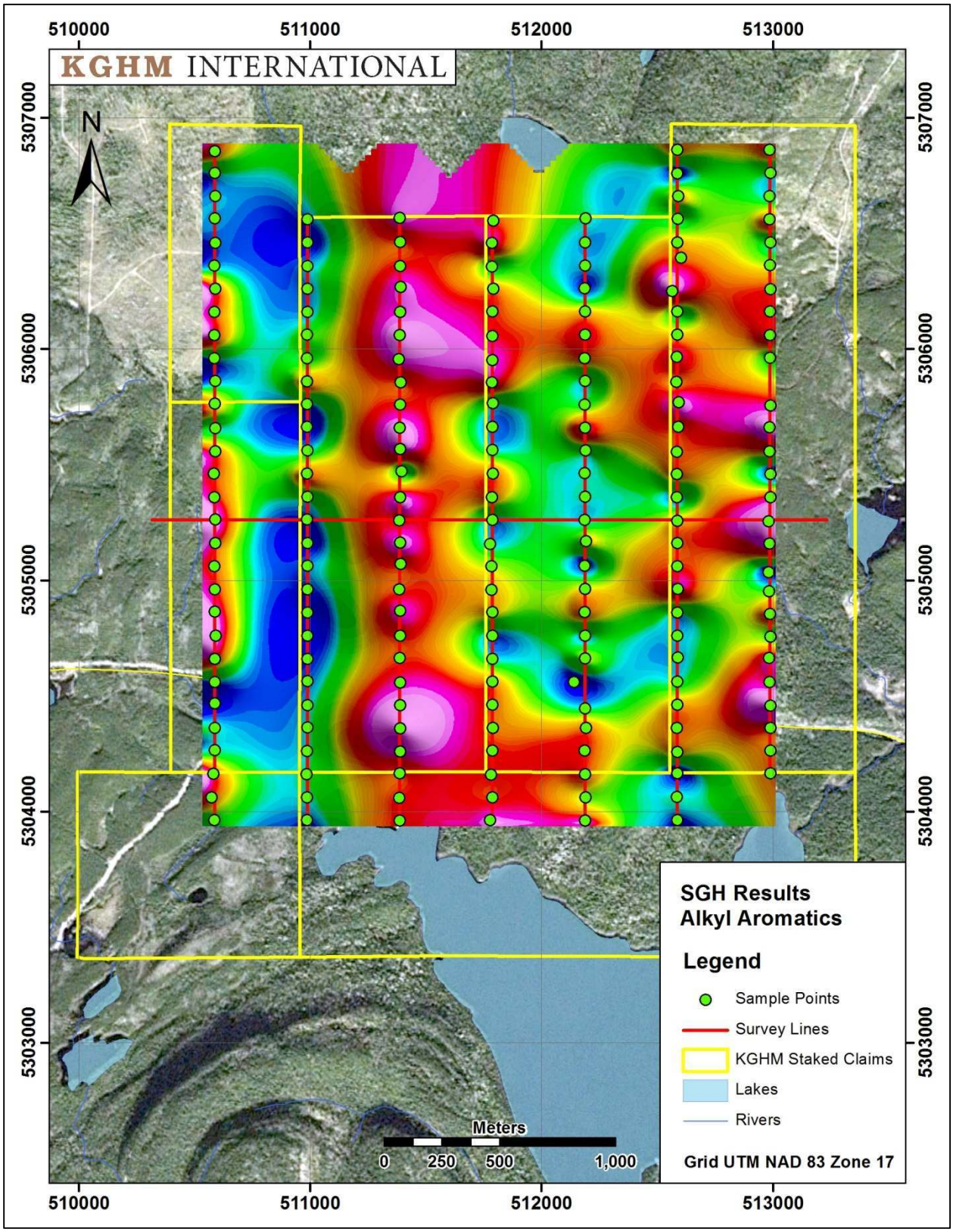
12.1 Alkyl Alkanes



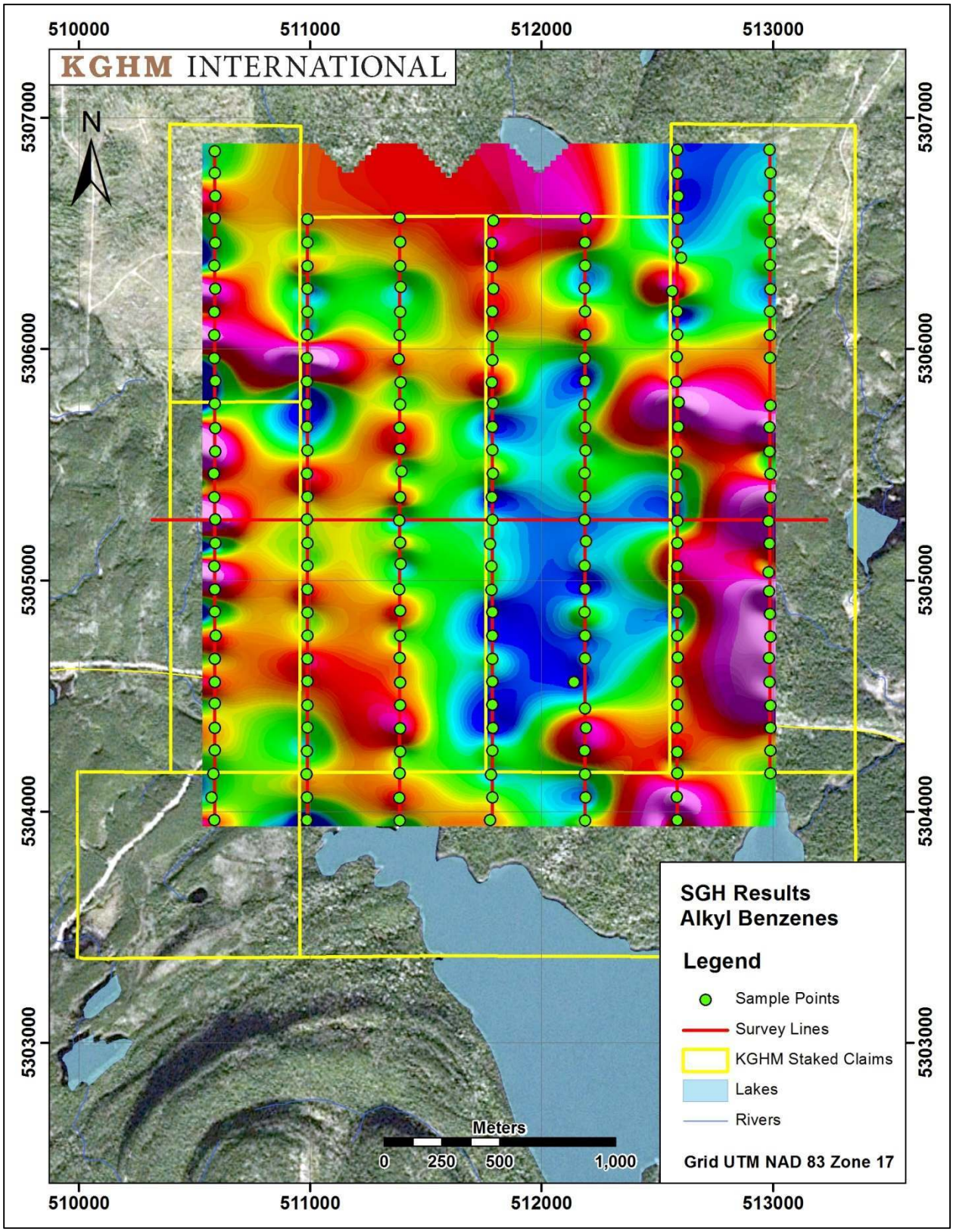
12.2 Alkyl Alkenes



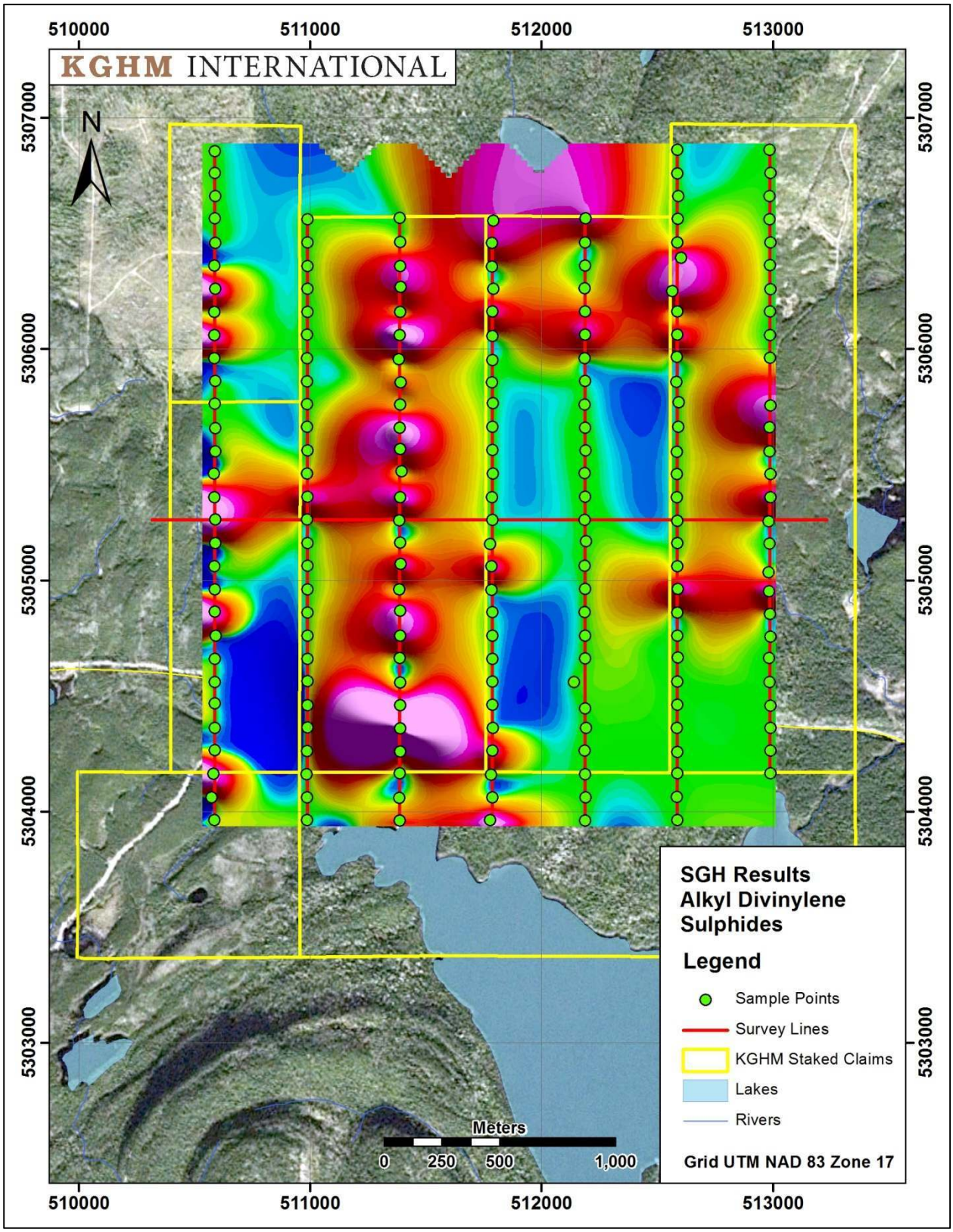
12.3 Alkyl Aromatics



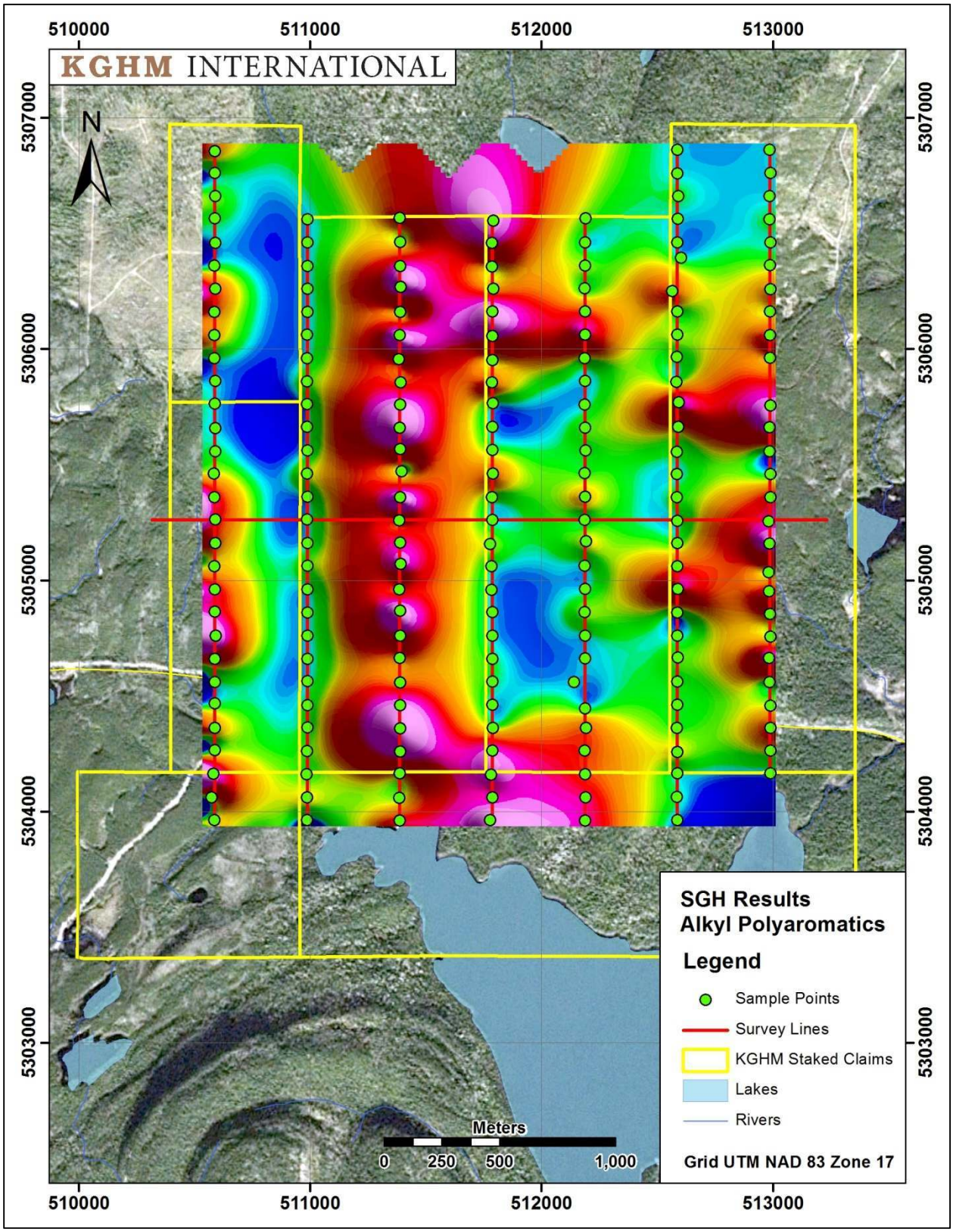
12.4 Alkyl Benzenes



12.5 Alkyl Divinylene Sulphides



12.6 Alkyl Polyaromatics



13 Appendix C: SGH Analytical Report (Activation Laboratories Ltd.)

The following pages include the final report, in full, provided to KGHM International Ltd. by Activation Laboratories Ltd. ("Actlabs").

3D - SGH

"A SPATIOTEMPORAL GEOCHEMICAL HYDROCARBON INTERPRETATION"

KGHM INTERNATIONAL LTD.
GOLDBUG SGH SOIL SURVEY

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SGH – SOIL GAS HYDROCARBON
Predictive Geochemistry

for

KGHM INTERNATIONAL LTD.

GOLDBUG SGH SOIL SURVEY

June 10, 2014

** Dale Sutherland,*

Activation Laboratories Ltd

(- author, originator)*

EVALUATION OF SAMPLE DATA - EXPLORATION FOR: "GOLD" TARGETS

THE SGH GOLD INTERPRETATION TEMPLATE IS USED FOR THIS REPORT

Workorder: A14-03462

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Table of Contents

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PREFACE

THIS "STANDARD" SGH INTERPRETATION REPORT:

The purpose of this Soil Gas Hydrocarbon (SGH) interpretation "Standard Report" is to ensure that clients and other potential reviewers of the results have a good understanding of this organic, deep penetrating geochemistry. As SGH provides such a large data set and is not interpreted in the same way as an inorganic geochemical method, this interpretation and report enables the user to realize the results in a timely fashion and capitalizes on years of research and development since the inception of SGH in 1976 combined with the knowledge obtained by Activation Laboratories through the interpretation of SGH data from over hundreds of surveys for a wide variety of target types in various lithologies from many geographical locations. Although referenced today as a "nano-technology", the analysis of SGH has not changed since inception. The report is compulsory as it is the only known organic geochemistry that, in spite of the name, uses non-gaseous semi-volatile organic compounds interpreted using a forensic signature approach It is based solely on SGH data and does not include the consideration or interpretation from any other geochemistry (inorganic), geology, or geophysics that may exist related to this survey area(s). This report can also provide evidence of project maintenance. To keep the price to a minimum and to provide as short a turnaround time as practically possible, usually only one SGH Pathfinder Class map is illustrated in a "Standard Report" with an applied interpretation although several other SGH Pathfinder Class maps are used and referenced. Definitions of certain terms or phrases used in this report can be found in Appendix A. A Supplemental Report and/or interpretations for other target types are available. A GIS package of georeferenced images is also available. (See Appendix H)

The interpretation in this report has used the results from some of the research with SGH in recent years which has focused on the potential that the SGH data might be able to further dissect and understand the relationships between the chemical Redox conditions in the overburden the development of an electrochemical cell and its affect in shaping geochemical anomalies. This research has resulted in the development by Activation Laboratories of a new enhanced model of the Electrochemical/ Redox Cell theory originated by Govett (1976) that was further developed to the model by Hamilton (2004, 2009). The new enhanced model developed by Sutherland (2011) takes the general anomalies expected by the Hamilton model to a higher level of detail and specificity. This has resulted in a more confident level of interpretation which has been referenced as 3D-SGH or **3D-"Spatiotemporal Geochemical Hydrocarbons**. This model has been formally introduced at the International Applied Geochemistry Symposium (IAGS) organized by The Association of Applied Geochemists that took place in Rovaniemi, Finland, in August 2011. This new level of understanding of the expected anomaly types that can be observed with SGH provides a new level of quality control in the interpretation process as the symmetry of SGH anomalies can assure the interpreter which anomalies are as a result of a buried target. With the enhanced 3D-SGH interpretation that was introduced in 2012, we also mark the beginning of the ability to make some statements regarding the possible depth to mineralization for some projects as we dissect the Redox cell relative to the new Electrochemical Cell theory. The cover of this report is an artist's rendering of the pathways of different classes of Spatiotemporal Geochemical Hydrocarbons which migrate through the overburden. This model is used as the new 3D-SGH interpretation approach.

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DISCLAIMER

This "SGH Interpretation Report" has been prepared to assist the user in understanding the development and capabilities of this Organic based Geochemistry. The interpretation of the Soil Gas Hydrocarbon (SGH) data is in reference to a template or group of SGH classes of compounds specific to a type of mineralization or target that is chosen by the client (i.e. the template for gold, copper, VMS, uranium, etc.). The various templates of SGH Pathfinder Classes that together define the forensic identification signature for a wide range of commodity target types; Gold, Nickel, VMS, SEDEX, Uranium, Cu-Ni-PGE, IOCG, Base Metal, Tungsten, Lithium, Polymetallic, and Copper, as well as for Kimberlites, Coal Seam, Wet Gas and Oil Play, have been developed through years of research and have been further refined from review of case studies and orientation studies has proven to be able to also address a wide range of lithologies. Even with 15+ years of development and experience with SGH, Activation Laboratories Ltd. cannot guarantee that the templates used are applicable to every type of target in every type of environment. The interpretation in this report attempts to identify an anomaly that has the best SGH signature in the survey for the type of mineralization or target chosen by the client. However, this interpretation is not exhaustive and there may be additional SGH anomalies that may warrant interest. It should not be viewed due to the generation of this SGH report, that Activation Laboratories Ltd. has the expertise or is in the business of interpreting any type of geochemical data as a general service. As the author is the originator of the SGH geochemistry, has researched and developed this exploration tool since 1996, and has produced similar interpretations using SGH data for close to 1,000 surveys, he is perhaps the best qualified to prepare this interpretation as assistance to clients wishing to use this SGH geochemistry. Activation Laboratories Ltd. can offer assistance in general suggestions for sampling protocols and in sample grid design; however we accept no responsibility to the appropriateness of the samples taken. Activation Laboratories Ltd. has made every attempt to ensure the accuracy and reliability of the information provided in this report. Activation Laboratories Ltd. or its employees do not accept any responsibility or liability for the accuracy, content, completeness, legality, or reliability of the information or description of processes contained in this report. The information is provided "as is" without a guarantee of any kind in the interpretation or use of the results of the SGH geochemistry. The client or user accepts all risks and responsibility for losses, damages, costs and other consequences resulting directly or indirectly from using any information or material contained in this report or using data from the associated spreadsheet of results.

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Cautionary Note Regarding Assumptions and Forward Looking Statements

The statements and target rating made in the Soil Gas Hydrocarbon (SGH) interpretive report or in other communications may contain or imply certain forward-looking information related to the quality of a target or SGH anomaly.

Statements related to the rating of a target are based on comparison of the SGH signatures derived by Activation Laboratories Ltd. through previous research on known case studies. The rating is not derived from any statistics or other formula. The rating is a subjective value on a scale of 0 to 6 relative to the similarity of the SGH signature reviewed compared to the results of previous scientific research and case studies based on the analysis of surficial samples over known ore bodies. No information on the results from other geochemical methods, geophysics, or geology is usually available as additional information for the interpretation and assignment of a rating value unless otherwise stated. The rating does not imply ore grade and is not to be used in mineral resource estimate calculations. References to the rating should be viewed as forward-looking statements to the extent that it involves a subjective comparison to known SGH case studies. As with other geochemical methods, an implied rating and associated anticipated target characteristics may be different than that actually encountered if the target is drilled tested or the property developed.

Activation Laboratories Ltd. may also make a scientifically based reference in this interpretive report to an area that might be used as a drill target. Usually the nearest sample is identified as an approximation to a "possible drill target" location. This is based only on SGH results and is to be regarded as a guide based on the current state of this science.

Unless otherwise stated, Activation Laboratories Ltd. has not physically observed the exploration site and has no prior knowledge of any site description or details or previous test results. Actlabs makes general recommendations for sampling and shipping of samples. Unless stated, the laboratory does not witness sampling, does not take into consideration the specific sampling procedures used, or factors such as the season of sampling, samples handling, packaging, or shipping methods. The majority of the time, Activation Laboratories Ltd. has had no input into sampling survey design. Where specified Activation Laboratories Ltd. may not have conducted sample preparation procedures as it may have been conducted at the client's assigned laboratory external to Actlabs. Although Actlabs has attempted to identify important factors that could cause actual actions, events or results to differ scientifically which may impact the associated interpretation and target rating from those described in forward-looking statements, there may be other factors that cause actions, events or results that are not anticipated, estimated or intended.

In general, any statements that express or involve discussions with respect to predictions, expectations, beliefs, plans, projections, objectives, assumptions, future events or performance are not statements of historical fact. These "scientifically based educated theories" should be viewed as "forward-looking statements".

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Readers of this interpretive report are cautioned not to place undue reliance on forward-looking information. Forward looking statements are made based on scientific beliefs, estimates and opinions on the date the statements are made and the interpretive report issued. The Company undertakes no obligation to update forward-looking statements or otherwise revise previous reports if these beliefs, estimates and opinions, future scientific developments, other new information, or other circumstances should change that may affect the analytical results, rating, or interpretation.

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SOIL GAS HYDROCARBON (SGH) GEOCHEMISTRY – OVERVIEW

In the search for minerals and elements, geology requires tools to assess the location and potential quantity of minerals and ores. In the past people looked at the landscape to find the deposit. Similar landscapes indicate similar mineral and metal deposits. This is searching on a macro level, while geochemistry is searching on a micro level. Organic material requires many minerals and elements, so organic materials can be biomarker of the present of the minerals and elements.

SGH is a deep penetrating geochemistry that involves the analysis of surficial samples from over potential mineral or petroleum targets. The analysis involves the testing for 162 hydrocarbon compounds in the C5-C17 carbon series range applicable to a wide variety of sample types. The hydrocarbons are residues from the decomposition of bacteria and microbe that feed on the target commodity as they require inorganic metallic's to catalyze the reactions necessary to develop hydrocarbons and grow in their life cycle. Specific classes of hydrocarbons (SGH) have been successful for delineating targets found at over 900 metres in depth. Samples of various media have been successfully analyzed such as soil (any horizon), sand, till, drill core, rock, peat, humus, lake-bottom sediments and even snow. After preparation in the laboratory, the SGH analysis incorporates a very weak leach, essentially aqueous, that only extracts the surficial bound hydrocarbon compounds and those compounds in interstitial spaces around the sample particles. These are the hydrocarbons that have been mobilized from the target depth. SGH is unique and should not be confused with other hydrocarbon tests or traditional analyses that measure C1 (Methane) to C5 (Pentane) or other gases. Thus, in spite of the name, SGH does not analyze for any hydrocarbons that are actually gaseous at room temperature and can be used to analyze for hydrocarbons in sample types other than soil. SGH is also different from soil hydrocarbon tests that thermally extracts or desorbs all of the hydrocarbons from the whole soil sample. This test is less specific as it does not separate the hydrocarbons and thus does not identify or measure the responses as precisely. These tests also do not use a forensic approach to identification. The hydrocarbons in the SGH extract are separated by high resolution capillary column gas chromatography and then detected by mass spectrometry to isolate, confirm, and measure the presence of only the individual hydrocarbons that have been found to be of interest from initial research and development and from performance testing especially from the two Canadian Mining Industry Research Organization (CAMIRO) projects (97E04 and 01E02).

Over the past 15+ years of research, Activation Laboratories Ltd. has developed an in-depth understanding of the unique SGH signatures associated with different commodity targets. Using a forensic approach we have developed target signatures or templates for identification, and the understanding of the expected geochromatography that is exhibited by each class of SGH compounds. In 2004 we began to include an SGH interpretation report delivered with the data to enable our clients to realize the complete value and understanding of the SGH results in the shortest time frame and provide the benefit from past research sponsored by Actlabs, CAMIRO, OMET and other industrial sponsors. In 2011, a new model of Electrochemical/Redox Cell theory was proposed and the new 3D-SGH interpretation approach based on this theory was incorporated in 2012 on a routine basis for SGH interpretation reports.

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SGH has attracted the attention of a large number of Exploration companies. In the above mentioned research projects the sponsors have included (in no order): Western Mining Corporation, BHP-Billiton, Inco, Noranda, Outokumpu, Xstrata, Cameco, Cominco, Rio Algom, Alberta Geological Survey, Ontario Geological Survey, Manitoba Geological Survey and OMET. Further, beyond this research, Activation Laboratories Ltd. has interpreted the SGH data for over 700 targets from clients since January of 2004. In both CAMIRO research projects over known mineralization and in exploration projects over unknown targets, SGH has performed exceptionally well. As an example, in the first CAMIRO research project that commenced in 1997 (Project 97E04), there were 10 study areas that were submitted blindly to Actlabs. These study sites were selected since other inorganic geochemical methods were unsuccessful at illustrating anomalies related to the target.

Although Actlabs was only provided with the samples and their coordinates, SGH was able to locate the blind mineralization with exceptional accuracy in 9 of the 10 surveys. In 2007, SGH has recently been very successful in exploration and discovery of unknown targets e.g. Golden Band Resources drilled an SGH anomaly and discovered a significant vein containing "visible" gold. (www.goldenbandresources.com)

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SOIL GAS HYDROCARBON SURVEY DESIGN AND SAMPLING

Summary: See Appendix C for more details

In summary, the best conditions for the sample type and survey design include:

- Fist sized samples are usually retrieved from a shallow dug hole in the 15 to 40 cm range of depth.
- Different sample types can be taken even "within" the same survey or transect, data leveling is rarely ever required. SGH is highly effective in areas of very difficult terrain. The Golden Rule is to always take a sample.
- Samples should be evenly spaced in a grid or a series of transects with sample lines spaced at a ratio of up to 4:1 (line spacing: sample spacing).
- A minimum of 50 sample "locations" is recommended with one-third over the target and one-third on each side of the target into background if this can be predicted. This provides the opportunity of optimal data contrast.
- If very wet, samples can be drip dried in the field. No special preservation is required for shipping.
- Relative or UTM sample location coordinates are required to allow interpretation.

SAMPLE PREPARATION AND SGH ANALYSIS

Summary: See Appendix D for more details

Upon receipt at Activation Laboratories:

- The samples are air-dried at a relatively low temperature of 40°C.
- The samples are then sieved and the -60 mesh sieve fraction (<250 microns, although different mesh sizes can be used at the preference of the exploration geologist) is collected.
- The collected "pulp" is packaged in a Kraft paper envelope and transported from our sample preparation department to our analytical building also located in the industrial park in Ancaster Ontario.
- Each sample is then extracted, compounds separated by gas chromatography and detected by mass spectrometry at a *Reporting Limit* of one part-per-trillion (ppt).
- The results of the SGH analysis is reported in raw data form in an Excel spreadsheet as "semi-quantitative" concentrations without any additional statistical modification.

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SGH DATA QUALITY

Summary: See Appendix E for more details

Reporting Limit:

- The Excel spreadsheet of concentrations for each of the 162 compounds monitored is in units of ppt as "parts-per-trillion" which is equivalent to nanograms/kilogram (ng/Kg). The reporting limit of 1 ppt represents a value of approximately 5 times the standard deviation of low level analysis. Essentially all background noise has already been eliminated. All data reported should be used in geochemical mapping. Actual detectable levels can be significantly < 1 ppt.

Laboratory Replicate Analysis:

- An equal aliquot of a random sample is analyzed as a laboratory replicate.
- Due to the large amount of data, the estimate of method variability is reported as the percent coefficient of Variation (%CV).
- A laboratory replicate analysis is reported at a frequency of 1 for every 15 samples analyzed.
- The variability of field duplicate samples are similarly reported if identified.

Historical SGH Precision:

- Although the SGH analysis reports results at such trace ppt concentration levels, the average %CV for laboratory replicates is 8% within a range of ±4%.
- Field duplicates have historically been 5% higher than laboratory replicates.

Laboratory Materials Blank (LMB-QA):

- The LMB-QA values are only an early warning as a quality assurance procedure to indicate the relative cleanliness of laboratory glassware, vials, caps, and the laboratory water supply at the ppt concentration level.
- The LMB-QA values should not be subtracted from any SGH data as any background or noise characteristics have already been removed through the use of a Reporting Limit.

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SGH DATA INTERPRETATION

Summary: See Appendix F for more details

SGH Interpretation and Report:

- Due to the very large data set provided by the SGH analysis, this interpretation report is provide to offer guidance in regard to the results of this geochemistry for their survey.
- In our interpretation procedure, we separate the 162 compound results into 19 SGH sub-classes. These classes include specific alkanes, alkenes, Thiophenes, aromatic, and polyaromatic compounds. The concentrations of the individual hydrocarbons within a class are simply summed. None of these compounds are gaseous at room temperature.
- At this time the magnitude of the hydrocarbon class data has not been proven to imply a higher grade or quantity of the mineralization if present.
- A "geochemical anomaly threshold value" should not be calculated for SGH data as any background or noise has already been filtered out through the use of a Reporting Limit instead of some type of detection limit.
- SGH hydrocarbons data should never be interpreted individually. Interpretation must always be by compound class.
- Multiple SGH Classes are compared. Multiple SGH Classes that have been associated with the presence of specific mineralization are called SGH Pathfinder Classes that together represent the forensic signature or fingerprint identification for a specific type of mineralization or petroleum play.
- The anomalies of each class are compared as to their geochromatographic dispersion and ability to vector to a common location that may be referenced as a potential drill target.
- The agreement and behaviour between SGH Pathfinder Classes for a type of target, as a template of Classes, is compared against SGH research and orientation studies. The quality of agreement is expressed as an SGH Rating of confidence that the SGH anomalies of the survey being interpreted are similar to the behaviour of these classes over known mineralization.
- The interpretation is customized for the project survey by the Author. The SGH Rating and Interpretation is thus subjective and based on the experience of close to 1,000 SGH survey interpretations. The interpretation is not conducted by any computerized process.

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SGH CHARACTERISTICS

Summary: See Appendix G for more details

SGH Characteristics:

- The pattern of SGH anomalies are usually of high contrast and easily observed.
- SGH is able to illustrate exceptionally symmetrical anomalies in spite of exotic overburden and barriers such as permafrost, shale and basalt caps, previously thought to be impenetrable.
- Inorganic geochemistry can illustrate anomalies of metals that have been mobilized by surficial physical processes. As SGH is essentially "blind" to the inorganic content of a sample, SGH anomalies illustrate the true source of mineralization.
- AS SGH hydrocarbons are essentially non-polar, highly symmetrical anomalies are observed. As such symmetry is rare this provides a quality control to the interpretation resulting in higher confidence that is reflected by a higher SGH Rating Score in comparison to known case studies.
- SGH can be analyzed on samples collected in different seasons or adjacent years. The combined data rarely require any data leveling.

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INTERPRETATION OF SGH RESULTS
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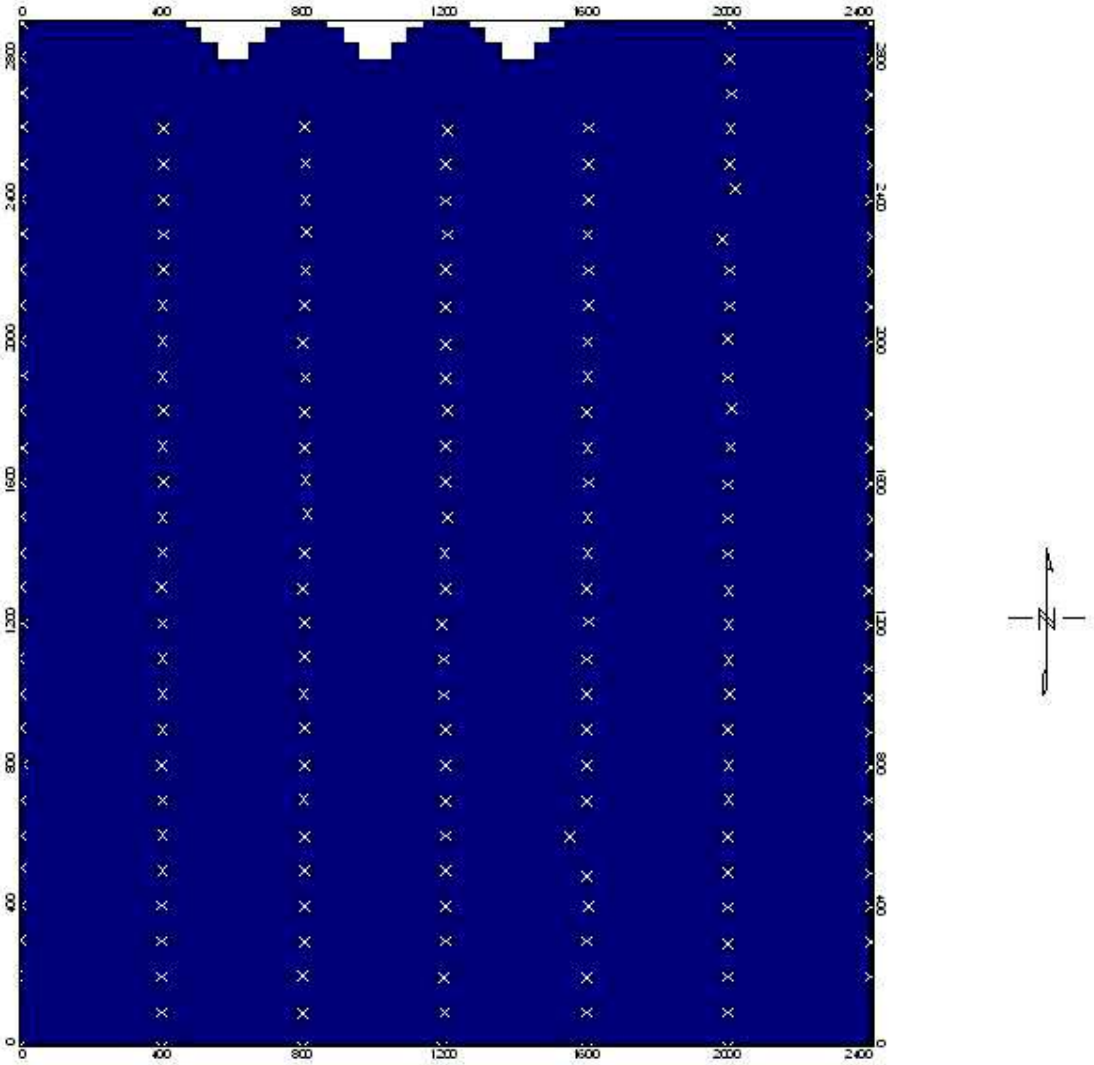
GOLDBUG SGH SOIL SURVEY

This report is based on the SGH results from the analysis of a total of 206 samples. The Goldbug SGH Soil Survey Area is described by a series of seven North-South trending transects spaced at 400 metres with samples spaced at 100 metres along each transect. Sampling was conducted in May of 2014. These samples were received on May 27th and prepared at Actlabs Global Headquarter in Ancaster, Ontario, Canada. Sample coordinates were provided for mapping of the SGH results for these samples as relative coordinates. A sample location map is shown below.

GOLDBUG SGH SOIL SURVEY - SAMPLE LOCATION MAP



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SGH SURVEY INTERPRETATION
A14-03462 – KGHM INTERNATIONAL LTD.
QUALITY ASSURANCE - GOLDBUG SGH SOIL SURVEY

Note that the associated SGH results are presented in a separate Excel spreadsheet. This data is semi-quantitative and is presented in units of pg/g or *parts-per-trillion* (ppt) as the concentration of specific hydrocarbons in the sample. The number of samples submitted for this survey is adequate to use SGH as an exploration tool. As SGH is an organic geochemistry it is essentially "blind" to the elemental presence of any inorganic species as actual VMS, gold, silver, uranium, etc. content in the each sample analyzed. SGH has been proven to discriminate between false or mobilized soil anomalies and is able to actually locate the source target deposition. SGH is a deep-penetrating geochemistry and has been proven to locate Copper, Gold, VMS, and other types of mineralization at several hundred metres below the surface irrespective of the type of overburden. Note that the SGH data is only reviewed for the particular target deposit type requested, in this case for the presence of a Gold target. It is assumed that there is only one potential target. If known, in surveys with several complex geophysical targets, to obtain the best interpretation the client should indicate that there are possibly multiple targets. The possibility of multiple geophysical targets should be known due to potential overlap and increased complexity of the resulting geochromatographic anomalies, which could alter the interpretation as to which targets are mineralized or not.

The overall precision of the SGH analysis for the samples at the Goldbug SGH Soil Survey was excellent as demonstrated by 14 different samples taken from this survey which were used for laboratory replicate analysis and were randomized within the analytical run list. The average Coefficient of Variation (%CV) of the replicate results for the survey samples in this submission was **6.9%** which represents an excellent level of analytical performance especially at such low parts-per-trillion concentrations. **The overall precision of the SGH analysis for 10 Field Duplicate samples identified from the Goldbug SGH Soil Survey was also excellent.** The average Coefficient of Variation (%CV) of the Field Duplicate results for the survey samples in this submission was **6.5**%. These field duplicate samples were not randomized in the analytical run and were thus analyzed one after the other. It is typically observed that the variability of field duplicates are 5% to 8% CV higher than for laboratory duplicates of random samples taken from the survey. As the field duplicate precision illustrated an excellent level of performance in comparison to laboratory replicates, this would usually imply that very careful sampling protocols were used. The fact that the %CV was quite low for these field duplicates is also due to the very high specificity of the SGH geochemical method that only targets relatively rare hydrocarbons that have been proven to be associated with the decomposition of bacterial that have been in proximity to the target mineralization at depth. Note that the SGH geochemistry does not detect all organic hydrocarbons present in the samples. No other statistics were used on the data for this report for mapping or interpretation purposes aside from the use of a Kriging trending algorithm in the GeoSoft Oasis Montaj mapping software. **This interpretation is based only on the SGH results from this submission for the Goldbug SGH Soil Survey.** A template or group of SGH Pathfinder Classes that have been found to be associated with buried Gold targets are used as the basis for the interpretation of the Goldbug SGH Soil Survey. The final interpretation is customized and conducted by the author. Although the term "template" or "signature" often appears in an SGH Interpretation Report, a computerized interpretation is not used.

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A14-03462 – KGHM INTERNATIONAL LTD.
GOLDBUG SGH SOIL SURVEY - SGH INTERPRETATION
"GOLD" PATHFINDER CLASS MAPS

The maps shown in plan and in 3D views in this report are SGH "Pathfinder Class maps" for targeting various hydrocarbon flux signatures related to Redox conditions, and Gold type targets. These maps represent the simple summation of several individual hydrocarbon compound concentrations that are grouped from within the same organic chemical class. SGH Pathfinder Class maps have been shown to be robust as they are each described using from 4 to 14 chemically related SGH compounds (unless otherwise stated) which are simply summed to create each chemical class map. Thus each map has a higher level of confidence as it is not illustrating just one compound measurement. A legend of the compound classes appears at the bottom of the SGH data spreadsheet.

The Gold template of SGH Pathfinder Classes uses primarily low and medium molecular weight classes of hydrocarbon compounds. At least three Pathfinder Class maps, associated with the SGH signature developed for Gold must be present to begin to be considered for assignment of a good rating relative to the SGH performance in case studies over known Gold type mineralization. These SGH classes must also concur and support a consistent interpretation in relation to the expected geochromatographic characteristics of the Pathfinder Class. The *overall* SGH interpretation Rating has even a higher level of confidence as it further implies the consensus between at least two additional pathfinder classes. A combination of these SGH Pathfinder Classes potentially defines the signature of a target at depth if present. Each of the SGH Pathfinder Class maps shown in this report is a specific *portion* of the SGH signature relative to the presence of Gold. Each pathfinder class map is still just one of the Pathfinder Class maps used in each of the interpretation templates (other SGH Pathfinder Class maps are usually not shown at this price point and report turnaround time except at the discretion of the Author). Additional interpretation information which may contain additional SGH Pathfinder Class maps is available as a Supplementary Report at an additional price (see Appendix H).

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GOLDBUG SGH SOIL SURVEY - SGH INTERPRETATION
SGH "GOLD" PATHFINDER CLASS MAPS

Note that any concentration value in the accompanying Excel spreadsheet greater than the "Reporting Limit" of 1 ppt is important data and has been able to depict mineralization at depth. The majority of the variability or noise has already been eliminated; additional filtering will adversely affect any interpretation. Note again that a Kriging trending algorithm has been applied to the mapping routine in the Geosoft Oasis Montaj software in the development of the SGH Class maps. SGH concentrations are in some way probably related to the amount of mineralization present and the grade of mineralization, which probably defines the characteristics of the biofilm(s) in contact with the deposit, as well as being related to the depth to mineralization. SGH results have also been shown to correlate well with geophysical anomalies such as magnetic anomalies and those of CSAMT.

The SGH Class maps are the plot of the sums of the particular hydrocarbon class in parts-per-trillion concentration. The dark blue represents non-detect values. For plotting purposes the values are plotted as one-half of the lowered filtering, or one-half of 0.5 ppt. The hotter colours represent higher concentrations of the sum of the class with the highest values being purple in colour.

SGH is a "deep penetrating" geochemistry but also works well for relatively shallow targets. Targets shallower than about 3 to 5 metres will have a reduced SGH signal due to interaction with atmospheric conditions and samples taken right at surface outcrops will have even weaker signals due to a higher degree of weathering from various processes on these volatile and semi-volatile organic hydrocarbons.

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A14-03462 – KGHM INTERNATIONAL LTD.
GOLDBUG SGH SOIL SURVEY
SGH INTERPRETATION RATING AND CLARIFICATION

Often the use of a geochemistry such as SGH is used as an economical exploration investigation tool to provide more information on an exploration target as some geological body or geophysical target. Such occurrences are in general expected to change the chemistry of the immediate overburden which in turn is expected to result in a chemical anomaly as detected in surficial samples. The author believes that it is important to convey to the client of an anomaly even if it is only a part of the mineral signature or template requested. The anomaly illustrated in the report may not be representative of the mineralization sought as only a part of the SGH signature is present, but the anomaly may confirm the presence of the geological or geophysical target which may be valuable to the client. In addition it would confirm the ability and sensitivity of SGH to show geological or geophysical occurrences. Example: A well defined rabbit-ear anomaly on the SGH Pathfinder Class map in a report, even though it may have a lower rating of 2.0 or 3.0, may illustrate to the exploration geologist that SGH does agree that there is some geological body at depth that is changing the chemistry and forming a Redox cell in the overburden. However the SGH forensic signature Rating indicates that there is a lower confidence that the "identification" of that body is likely to be say Gold (if the SGH Gold template is requested). This information would provide a confirmation that a target does exist, however if the SGH Rating indicates that the target has a lower level of confidence then the target does not have the forensic signature of the mineralization sought. SGH would thus provide a savings to the exploration program and divert focus to potentially other targets having a higher confidence in the identification Rating.

Thus, the SGH rating must always be considered in conjunction with the SGH Pathfinder Class map shown in the report. It is this rating that provides an insight into the authors' complete interpretation and is a measure of the confidence and to what degree the complete SGH signature compares with the SGH results from over case studies of similar known deposits. Unfortunately, the interpretation of a visual, as the SGH map provided, is so ingrained in humans that the reader may erroneously disregard the author's subjective rating to a large degree. As of November 25, 2011, the author now highlights the rating directly on the page having the plan view of the SGH Pathfinder Class map chosen to be illustrated. Thus to the reader of the report, the authors Rating is actually **MORE IMPORTANT** than the readers instinctive interpretation of just the one map provided. Again, SGH should not be used in isolation from other site information, and that a Rating of 4.0 is when, in the authors' estimation, a signature only starts to have a good identification relative to that type of mineralization, and that the survey may warrant further study although it is not a specific recommendation to drill test the anomaly. As the SGH interpretation is represented by a signature, the SGH Pathfinder Class map(s) illustrated in reports is always only "PART" of the specific SGH signature or template that the client requests (i.e. for Gold, etc.). No one SGH map can represent the complete signature due to the different amounts of spatial dispersion expected for the variety of SGH chemical classes within each signature. Thus the author selects the one SGH Class Map relative to the mineralization requested that best represents an anomaly that estimates the overall signature found in the survey.

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A14-03462 – KGHM INTERNATIONAL LTD.
GOLDBUG SGH SOIL SURVEY - SGH "REDOX" INTERPRETATION

As a general comment in regard to the SGH results at this Goldbug SGH Soil Survey, the SGH response indicates a wide low SGH response area in the middle of the survey area. The SGH anomalies detected were of moderate strength and contrast for most of the SGH Class maps which in turn enabled good comparison of those SGH hydrocarbon classes that have been proven to be pathfinders relative to the presence of "buried or blind" Gold targets from years of previous research, case studies and orientation studies. One of the first steps in the interpretation of SGH data is to locate potential Redox conditions in the overburden. Redox conditions have been well known to be related to blind mineral targets; however, Redox conditions can also be attributed to other geological bodies that are of no particular interest. SGH signatures are able to differentiate between these targets. SGH has been described by the Ontario Geological Survey of Canada (OGS) as a "Redox Cell locator". Redox Cells can be related to the presence of bacteriological activity and also to the presence of geological bodies such as Granite Gneiss, Dunite, etc. Recently SGH has been shown to be far more sensitive to depicting Redox conditions than even measurements using pH or ORP tests. It is important to understand that; not only is SGH a Redox cell locator, but due to the forensic signature of mineralization used in the interpretation process, SGH can discriminate mineral targets and other target types from geological bodies and other magnetically detected targets, mineralized versus non-mineralized conductors, cultural effects, etc. even in surveys over highly difficult or exotic terrain that often requires the collection of multiple sample types.

Many SGH surveys for Gold and other mineral targets can result in multiple types of anomalies, depending on the class of SGH compounds, even over the same target and in the same set of samples. Thus "Apical", "Segmented-Nested-Halo", and "Rabbit-Ear" or "Segmented Halo" type anomalies are all typically observed within the SGH data set from the effect of Redox cells that have developed over mineralization and their interaction with Redox conditions and the electromotive forces produced by the subsequent Electrochemical Cell. Different types of anomalies have also been associated with the depth to the target. The types of anomalies developed have been recently explained by the use of the 3D-SGH model of interpretation. The highly symmetrical anomalies illustrated by SGH data closely follow the expected self-organizing patterns of neutral species within an electrochemical cell in recent experiments in physics laboratories. The simple fact that the SGH anomalies are geometrically symmetrical and not random further improves the confidence of SGH interpretations.

The SGH Class map illustrated in plan view on page 22 and in 3D view on page 23 are diagnostic and illustrate a wide segmented-nested-halo response that is typical for a large Redox Zone at the Goldbug survey. The apical anomalies, aside from the central anomaly with the yellow star, are not expected to be mineral targets. This dispersion anomaly for this SGH class is described by the dotted yellow oval interpretation as placed on the plan view map on page 22. This yellow oval is placed just inside the anomalies of the segmented-nested-halo in order to not hide the anomalies from view. The symmetry of the segments of this halo anomaly is not particularly well defined for this SGH Class, thus a 3D-SGH interpretation is not enhancing the confidence in the result but does not detract from it. The 3D view of this map appears on page 23 and also illustrates this segmented halo anomaly.

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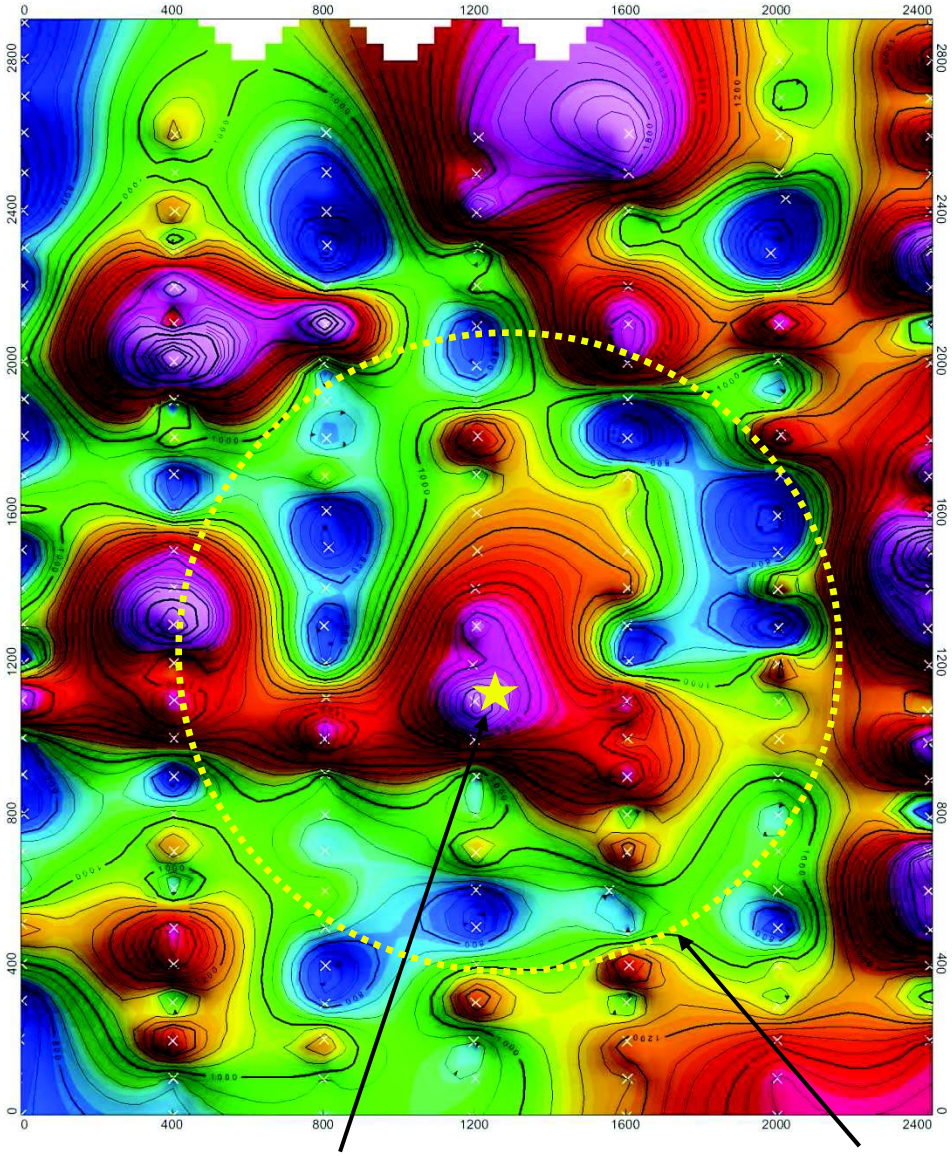
GOLDBUG SGH SOIL SURVEY
SGH "GOLD" PATHFINDER SUPPORT CLASS



SEGMENTED NESTED HALO ANOMALY - POTENTIAL REDOX ZONE

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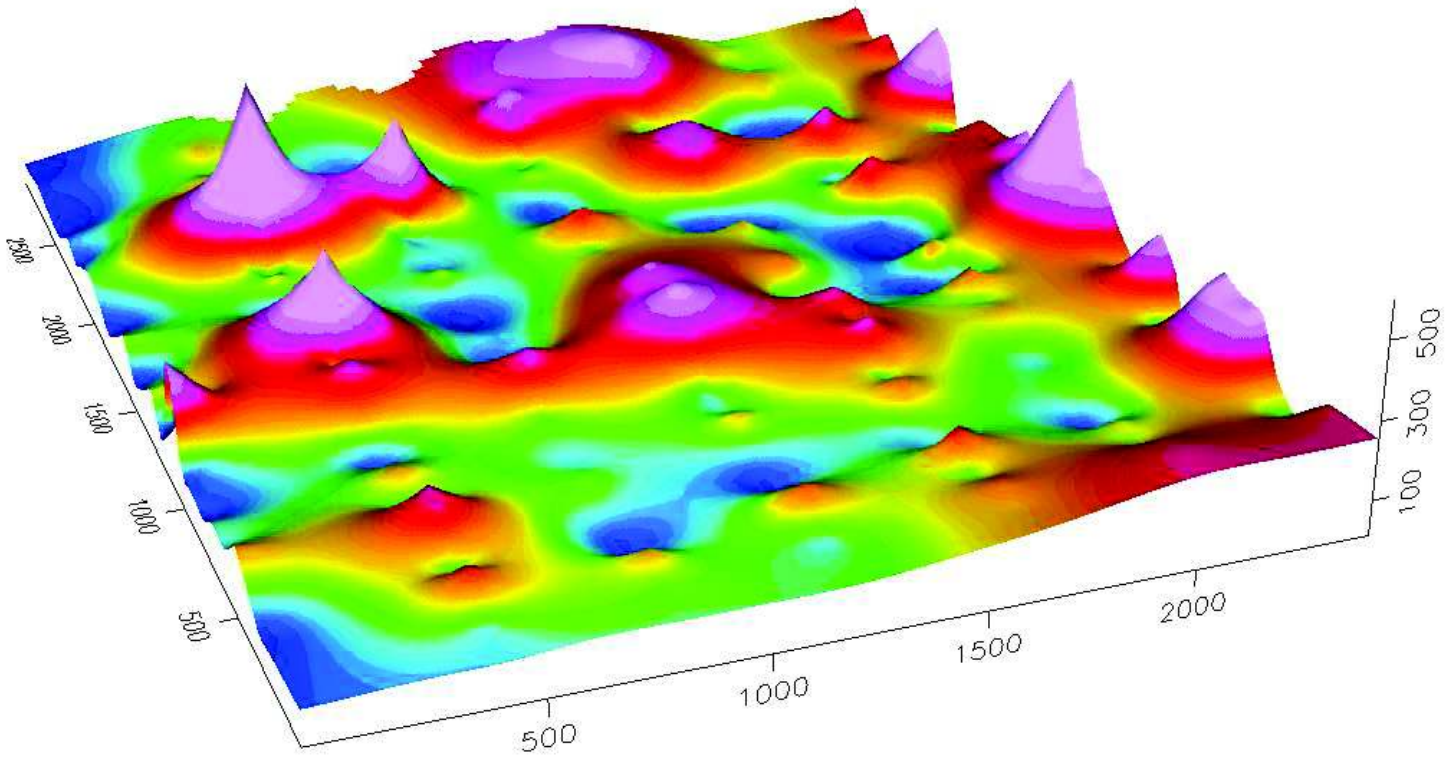
SGH "GOLD" PATHFINDER SUPPORT CLASS



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GOLDBUG SGH SOIL SURVEY - SGH "GOLD" INTERPRETATION

This report also illustrates an SGH Gold Pathfinder Class map on page 25 in plan view and on page 26 in 3D view that has been reliable in its association with the presence of Gold mineralization. This SGH Class map is only a portion of the SGH Gold signature used in the interpretation. There is not any one SGH Class map that can, as a single map, be reliably used to interpret the presence of Gold or any other type of mineralization. It should also be noted that some SGH Classes can be used as a portion of multiple mineral signatures, i.e. some portions of SGH signatures overlap in their use.

The SGH Redox cell interpretation, as the dotted yellow oval, that was identified on page 22 has been applied to the map on page 25. It is not coincidence that the anomalies of the SGH Gold Pathfinder Class map on page 25, as a portion of the SGH Gold signature, illustrate the same segmented-halo anomaly although without the central nested anomaly. Based on the agreement with these two SGH Classes related to Gold mineralization, as well as other SGH Class maps, the area within the dotted yellow oval is said to have an SGH signature associated with the presence of Gold mineralization at depth. This is based on the observation of this class of compounds (and other classes) that has been reliably associated with the presence of Gold mineralization from previous research, case studies, orientation studies, independent studies, etc. and has been successfully drill tested many times, for Gold, in grassroots exploration.

The SGH Gold Pathfinder Class is often expected to illustrate an apical response as a vertical projection over Gold mineralization of the shallowest part of the structure is within approx. 150 metres of surface. The response for these SGH Pathfinder Classes for Gold illustrates a wide central segmented halo anomaly. The excellent agreement of the SGH Class related to Redox conditions and the SGH Pathfinder Class for Gold implies that mineralization may be present but due to the types of anomalies observed the prediction is that mineralization may be quite deep. It is further interpreted that the nested apical anomaly at the centre of the Redox cell on page 22 potentially indicates the strongest area of microbial activity at depth and thus the centre of most Gold mineralization or the location of the shallowest structure of a deposit containing Gold. The width of the dotted yellow oval interpretation does not imply the extent of mineralization when it is predicted that mineralization may be quite deep. This SGH hydrocarbon signature zonation is predicted to be associated with Gold targets as the detection of those hydrocarbon residues produced by the decomposition of microbes and bacteria that have been feeding on Gold containing mineralization, from the life cycle death phase. These residues have subsequently migrated to the surface as a flux of different classes of hydrocarbons. During migration to the surface, dispersion away from the mineralization is expected. The distance of dispersion is dependent on geochromatography as a variable generally based on the average molecular weight of the class. It has been found that the complexity of the overburden does not affect the geochromatographic dispersion of the SGH classes, unless a situation is encountered such as that of a "major" fault that may result is a very slight deflection of this path. This is the basis of the 3D-SGH interpretation as the relatively neutral hydrocarbons that SGH detects are spatially observed as very symmetrical anomalies (as presented by the author at the IAGS conference in Finland in 2011 and further at the IAGS conference in New Zealand in November of 2013).

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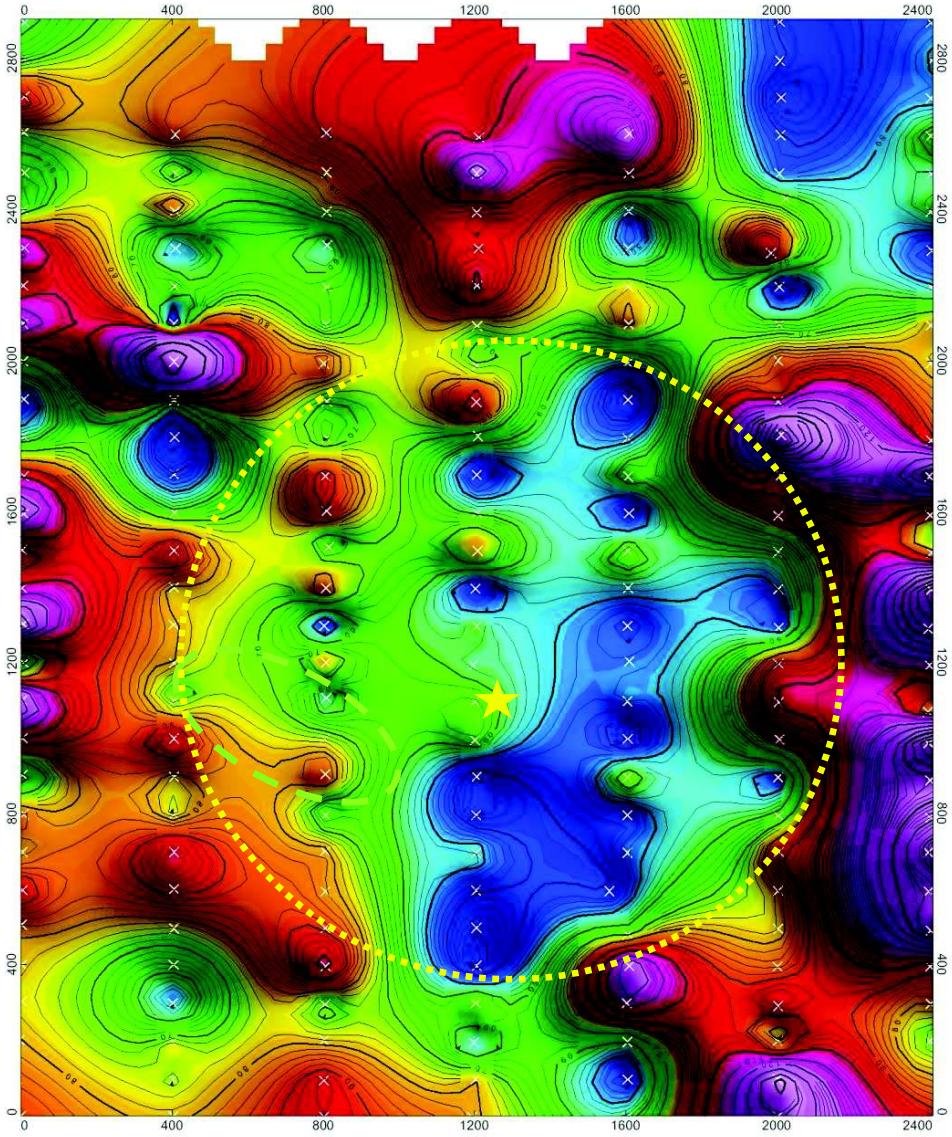
GOLDBUG SGH SOIL SURVEY
SGH "GOLD" PATHFINDER CLASS



SGH SIGNATURE RATING RELATIVE TO "GOLD" = 4.5 OF 6.0

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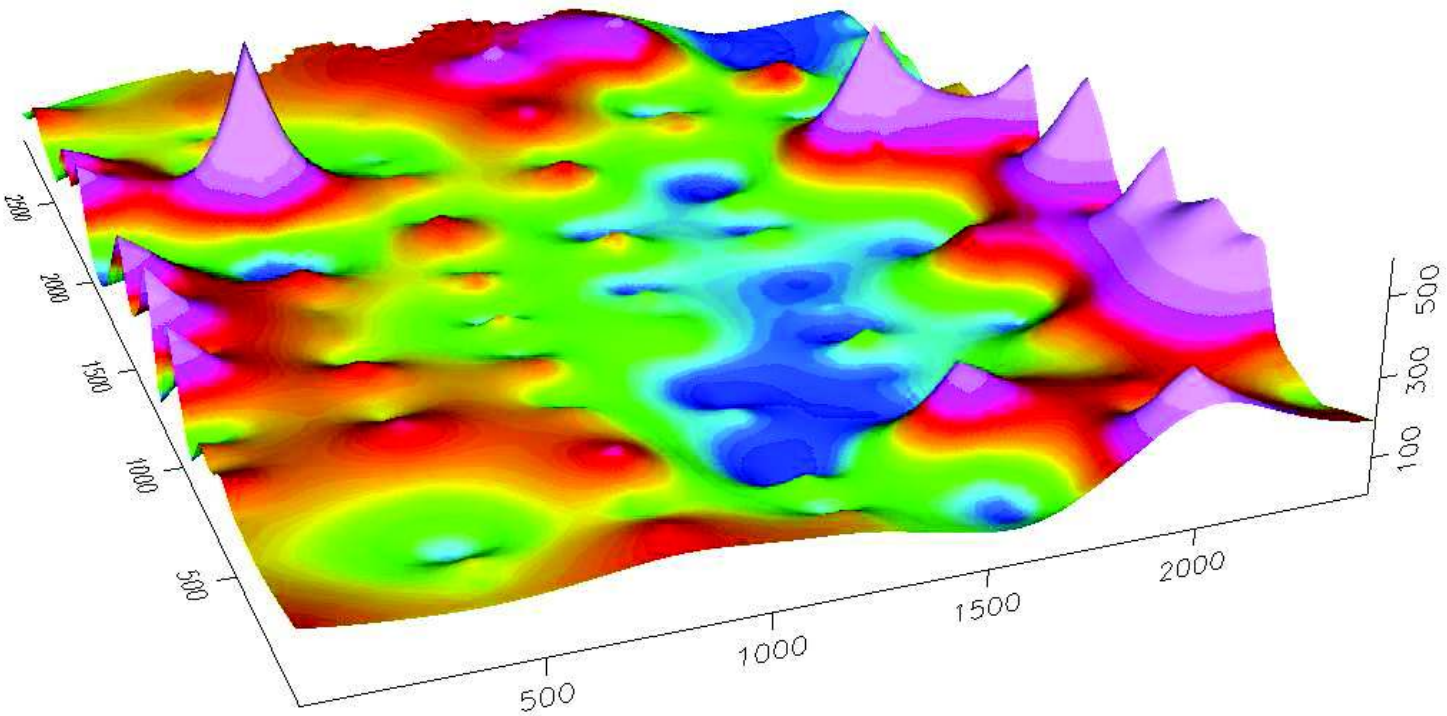
GOLDBUG SGH SOIL SURVEY
SGH "GOLD" PATHFINDER CLASS



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A14-03462 – KGHM INTERNATIONAL LTD. GOLDBUG SGH SOIL SURVEY - SGH INTERPRETATION FOR "GOLD" MINERALIZATION

The interpretation of the SGH data relative to the presence of Gold at the KGHM International Ltd. Goldbug SGH Soil Survey is described by what appears to be the presence of a wide segmented halo anomaly central to this survey as shown by the dotted yellow ova on page 25. When this is combined with the agreement with the segmented nested-halo Redox response on page 22, and other SGH Pathfinder Class, there appears to be an indication of quite deep (approx. >500 metres) Gold mineralization within the dotted yellow oval on page 25. It is further suggested that the central nested anomaly, as the yellow star, be considered as potentially the shallowest portion of the mineralized structure and be considered as a potential drill target.

NOTE: The depths to mineralization estimates are very approximate and are a result of the development of the 3D-SGH interpretation process that recognizes the importance of symmetrical anomalies. Such estimates cannot be calibrated except from the responses of those SGH clients that have offered feedback from actual drilling results or prior site knowledge. The feedback obtained since the use of 3D-SGH has been quite encouraging. SGH is the only geochemistry to our knowledge that is able to make some statement with regards to the depth to blind mineralization.

After review of all of the SGH Class maps (not only the ones shown in this report), the results from the Goldbug Soil Survey suggest a **"rating of 4.5"** out of a possible 6.0 (6.0 being the best) for the zone described by the dotted yellow oval, as the confidence in predicting that a Gold target may be present. The rating shown in this and all SGH reports are based on a scale of 6.0, in 0.5 increments, with a value of 6.0 being the best. The rating discussed in relation to Gold targets represents the similarity of these SGH results with other SGH case studies over known Gold targets. Theses SGH signatures or templates have been constantly refined and enhanced since inception and has been proven effective from the interpretation over many other surveys in many different geographical regions and for a wide variety of lithologies especially for Gold targets. The degree of confidence in the rating only starts to be "good" at a level of 4.0. A Rating of 4.0 is an indication that the SGH geochemistry predicts that the zone described may warrant more work or more consideration.

The following points have reduced the SGH rating from a possible maximum of 6.0 in the confidence of predicting a Gold target: although there is very good confirmation and support of the SGH signature for Gold, a value of 1.0 was subtracted as the results indicated that Gold mineralization, if present, is expected to be quite deep. The prediction of deeper mineralization naturally reduces the level of confidence, and the SGH Rating, of the interpretation of the results to the possible presence of Gold mineralization. An additional 0.5 was subtracted as other SGH Maps appeared to display elevated responses along Line 3. This abnormality was investigated as potentially from the analytical procedure and/or sample preparation procedure. Nothing was able to be attributed to laboratory handling in explaining the elevated results. The sampling log provided by KGHM also did not explain the elevated results based on personnel or sampling conditions. (see Recommendations on page 29)

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GOLDBUG SGH SOIL SURVEY - SGH INTERPRETATION FOR "GOLD" MINERALIZATION

The mineralization is expected to be centrally located within the dotted yellow oval interpretation with the location of the yellow star as a possible drill target to intersect potentially the shallowest point of the mineralization. From client feedback in recent years, a few grass roots exploration surveys that have been interpreted with an SGH Confidence Rating of 4.0 (±0.5) have been drill tested and have had successful Gold intersections. However the frequency of success is much more prevalent for those targets that have associated SGH Rating Scores of ≥5.0.

The identification of a drill targets is not an explicit recommendation by Activation Laboratories Ltd. to drill test the associated location or SGH anomaly. A drill target is implied to ensure that the reader is aware of the location having the highest confidence of being the location of the vertical projection of possibly the shallowest mineralization, based only on SGH data. This is also not a recommendation for vertical drilling. Vertical drilling may not be the best approach to test the SGH anomaly in this area. Activation Laboratories Ltd. has no experience in actual exploration drilling techniques. Other geological, geochemical and/or geophysical information should also be considered.

It must be remembered that other SGH Class maps not shown in this report have also been reviewed to support the interpretation shown. To deduce the most scientifically sound interpretation of the Goldbug survey, the client should use a combination of the SGH results shown in this report with additional geochemical, geophysical, and geological information to possibly obtain a more confident and precise target location. This is not a statement to convey some lower level of confidence in SGH results. This statement is made to recognize the proper use and interpretation of any scientific data. Whenever possible, multiple methods should always be employed so that any decisions do not rely on any one technique.

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A14-03462 – KGHM INTERNATIONAL LTD.
GOLDBUG SGH SOIL SURVEY - SGH SURVEY RECOMMENDATIONS

The possible contamination noted for survey Line 3 may indicate trace amounts of gasoline or diesel fuel was present. This may have been due to the handling of gasoline/diesel fuel as the SGH Geochemistry is very sensitive with a reporting limit of 1 part-per-trillion. Fortunately this potential contamination did not taint the SGH Class associated with most of the SGH signature related to Gold mineralization.

The sample survey design having 400 metres between transects with 100 metre sample spacing is appropriate for relatively deep Gold targets. Thus shallower potentially gold bearing structures would possibly be more difficult to interpret as this spacing is a bit wide for targets that may be < 50 metres deep. Perhaps more subtle anomalies are also difficult to interpret due to the normalization produced by the more significant Redox Cell related anomalies.

Any additional infill sampling may be added to the current SGH data and interpretation, even if sampled at a later time, and may provide information to observe possible shallow targets and may provide more detail that may lead to the observation of more symmetry of the a Redox Cell related system in a 3D-SGH interpretation process. This would further improve confidence in the interpretation. Should additional sampling be considered, please refer to the general recommendations for additional or in-fill sampling for SGH in the next section of this report.

GENERAL RECOMMENDATIONS FOR ADDITIONAL OR IN-FILL SAMPLING FOR SGH ANALYSIS

Based on the results of this report and/or other information, the client may decide that in-fill sampling may be warranted. To obtain the best results from additional sampling for SGH it is recommended that sample locations from the original survey within, or bordering, the area of interest be re-sampled rather than just combining new sample results with the sample data from the initial survey. Although several SGH surveys have previously been easily and directly, combined without data leveling, it cannot be guaranteed that data leveling will not be required. It has been found that data leveling is more apt to be required should the new samples be collected under significantly different environmental conditions than during the initial sample survey, i.e. summer collection versus winter collection. The process of data leveling adds a minimum of 3 to 5 days of work to conduct the additional data evaluation, develop additional plots of the results, conduct new interpretations, and in additional report descriptions. Results from data leveling is also always considered "an approximation", thus the confidence in a combined interpretation will be lower that the interpretation from samples collected during one excursion to the field and submitted as one survey. An additional cost will be invoiced should data leveling operations be required if the client requests that two SGH data sets be interpreted and reported together. Thus re-sampling a few of the original sample locations will provide a faster turnaround time for results and provide more accurate and confident surveys for evaluation and aid in deciding specific drill targets.

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Date Received at Actlabs Ancaster: May 27, 2014

Date Analyzed: June 2 -4, 2014

Interpretation Report: June 10, 2014

KGHM INTERNATIONAL LTD.

1300 Kelly Lake Rd.

Sudbuy, Ontario, Canada

P3E 5P4

Attention: Mr. Brad McKinley, M.Sc., P.Geo., Area Geologist, Exploration, North America

RE: Your Reference: GOLDBUG SGH SOIL SURVEY

Activation Laboratories Workorder: A14-03462

CERTIFICATE OF ANALYSIS

This Certificate applies to the associated Excel Spreadsheet of Hydrocarbon results combined with the discussion and SGH Pathfinder Class maps of the data shown in this report.

206 Samples were analyzed for this submission.

Sample preparation –Actlabs Ancaster Code S4:Drying at 40°C and Sieving with -80 mesh collected

Interpretation relative to Gold targets was requested.

The following analytical package was requested and analyzed at Actlabs Ancaster Canada:

Analysis Code SGH – Soil Gas Hydrocarbon Geochemistry using High Resolution Gas Chromatography/Mass Spectrometry (HRGC/MS)

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REPORT/WORKORDER: A14-03462

This report may be reproduced without our consent. If only selected portions of the report are reproduced, permission must be obtained. If no instructions were given at the time of sample submittal regarding excess material, it will be discarded within 90 days of this report. Our liability is limited solely to the analytical cost of these analyses. Test results are representative only of the material submitted for analysis.

Notes: The SGH – Soil Gas Hydrocarbon Geochemistry is a semi-quantitative analytical procedure to detect and measure 162 hydrocarbon compounds as the organic signature in the sample material collected from a survey area. It is not an assay of mineralization but is a predictive geochemical tool used for exploration. This certificate pertains only to the SGH data presented in the associated Microsoft Excel spreadsheet of results.

The author of this SGH Interpretation Report, Mr. Dale Sutherland, is the creator of the SGH and OSG organic geochemical methods. He is a Chartered Chemist (C.Chem.) and Forensic Scientist specializing in organic chemistry. He is a member of the Association of the Chemical Profession of Ontario, the Association of Applied Geochemists, the International Association of GeoChemistry, the Ontario Prospectors Association, the Association for Mineral Exploration British Columbia, the Geochemical Society Association, the Ontario Petroleum institute, the Chemical Institute of Canada, and the Canadian Society for Chemistry, as well as having memberships in several national and international Forensic associations. He is not a professional geologist.

CERTIFIED BY:

Dale Sutherland, B.Sc.,B.Sc.,B.Ed.,C.Chem.,MCIC
Forensic Scientist, Organics Manager,
Director of Research
Activation Laboratories Ltd.

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APPENDIX "A"

List of terms

1. **SGH** – "SOIL GAS HYDROCARBON" GEOCHEMISTRY – a Predictive Geochemistry, used for delineate buried inorganic mineral deposits and organic petroleum plays. This is the original name used to describe this geochemistry since inception in 1996. Code SGH is still used when submitting samples.
2. **3D-SGH**- "3D- SPATIAL TEMPORAL GEOCHEMICAL HYDROCARBONS - the method of interpreting SGH and OSG results based on the Redox/Electrochemical Cell model developed by Activation Laboratories Ltd. in 2011.
3. **Redox cell**- an area of oxidation-reduction reactions or exchange of electrons that is produced over geological bodies, mineralization and petroleum based plays.
4. **Electrochemical cell**- the effect of adjacent chemically reduced areas and chemically oxidized areas as a Redox cell produces a electrical gradient that obeys the physics of a typical Electrochemical cell.
5. **Anthropogenic contamination-** the introduction of impurities/compounds of the same type as those that are being analyzed by human actions that could lead to erroneous results.
6. **Background areas**- the area around a mineral deposit that is beyond the effect of the Redox cell formed over geological bodies or exploration targets. Sampling is required into background areas to produce data that has sufficient contrast to illustrate and differentiate anomalies associated with exploration targets.
7. **Background subtracted**- A sample taken some distances away as to not contain any elements of the target being analyzed.
8. **Biofilm**- a layer of microorganisms and microbe and their related secretions and decomposition products, in this case found to inhabit mineral deposits .
9. **Biomarker**- a compound used as an indicator of a biological state. In this case a biological substance used to indicate the presence of a mineral deposit.
10. **Blind mineralization** – buried mineralization that shows no physical indication of its existence at the surface
11. **Compound** – used synonymously with the term hydrocarbon in this report
12. **Compound chemical class** – a group of hydrocarbons that are similar in size, structure, and molecular weight such that their chemical characteristics, such as water solubility, partition coefficients, vapour pressures, etc. are similar
13. **Cultural activities** – human initiated processes that may affect the physical and chemical characteristics at the earth's surface
14. **Delineating targets**- indicate the position or outlines of an exploration target as a vertical projection of the target at depth.
15. **Geochemical anomalies** – inorganic element or organic hydrocarbon measurements that are significantly different than the average low level measurements or background in a survey i.e. the needle in a haystack is an anomaly

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16. **Dispersion patterns** – the movement/ spreading of something. In this context the spatial arrangements of hydrocarbons caused by their movements to the surface from some depth.
17. **Exploration tool** – a geological, geophysical or geochemical method that attempts to illustrate data in exploration activities that may indicate the presence of mineralization or petroleum plays.
18. **Fit for purpose**- this method is ideal for its intended use.
19. **Forensic signature**- a grouping or pattern found to identify a substance having multiple characteristics with a high degree of specificity.
20. **High specificity**- as in being very specific to the mineralization.
21. **Anomalies**- this is the spatial representation of data that illustrates a high or low response as well as the combined spatial shape of anomalous data from several neighbouring samples in a survey that can form anomalies described as Rabbit-Ear, Halo, Segmented-halo, nested-halo, etc.
22. **Inorganic geochemistry** – the measurement of inorganic elements in a survey of near surface samples as a tool for exploration
23. **Data leveling** – a technique that attempts to normalize the data sets obtained between two or more sampling programs. The results of data leveling is always considered as an approximation.
24. **Lithologies-** the characteristics and classifications of rock.
25. **Locations-** the physical/ geographical position or coordinates of samples in a survey.
26. **Noise-** interference in a measurement which is independent of the data signal.
27. **Nugget effect-** Anomalously high precious metal assays resulting from the analysis of samples that may not adequately represent the composition of the bulk material tested due to non-uniform distribution of high-grade nuggets in the material to be sampled. (Webster's online dictionary)
28. **Organic geochemistry-** the Soil Gas Hydrocarbon geochemistry (SGH), or now more accurately named as Spatiotemporal Geochemical Hydrocarbons, is the analysis to detect specific organic, or carbon based, hydrocarbon compounds in a sample. The Organo-Sulphur Geochemistry (OSG) is the analysis to detect specific organic compounds that have sulphur joined to carbon in its molecular structure.
29. **Percent Coefficient of Variation (%CV)** – a measure of data variability
30. **Project maintenance** – an activity where the associated cost is applied to the exploration, advancement, and/or operation of activities associated with a particular claim
31. **Rating-** a value given to the overall confidence in the SGH results
32. **Real (in relation to data)-** any rational or irrational number
33. **Reporting Limit –** minimum concentration of an analyte that can be accurately measured for a given analytical method.
34. **Sample matrix-** the components of a sample other than the analyte.
35. **Sample type** – soil, till, humus, lake bottom sediment, sand, snow, etc.
36. **Semi-quantitative-** yielding an approximation of the quantity or amount of a substance
37. **SGH anomalies** ("Apical", "Nested-Halo", and "Rabbit-Ear" or "Halo")
38. **SGH Pathfinder** (class map/compounds)

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39. **SGH template** – a set of hydrocarbon classes that together form a geochemical signature that has been associated with the presence of a particular type of mineralization the majority of the time
40. **Surficial bound hydrocarbons** –
41. **Surficial samples-** a sample from near the earth's surface.
42. **Survey-** the area, position, or boundaries of a region to be analyzed, as set out by the client.
43. **Project-** a planned undertaking
44. **Transect-** A straight line or narrow section through an object or across a section of land.
45. **Target-** Target refers to the ore body of interest

    Target signature: the unique characteristics that identify the target.

    Target type:

    i.e. Gold, Nickel, Copper, Uranium, SEDEX, VMS, Lithium Pegmatites, IOCG, Silver, Ni-Cu-PGE, Tungsten, Polymetallic, Kimberlite as well as Coal, Oil and Gas.
46. **Threshold-** level or point at which data is accepted as significant or true.
47. **Total measurement error-** An estimate of the error in a measurement. Based on either limitation of the measuring instruments or from statistical fluctuations in the quantity being measured.
48. **Visible (in terms of signature**)- the portion shown in a chart or map

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APPENDIX "B"

EXAMPLE OF AN SGH FORENSIC GEOCHEMICAL SIGNATURE EXAMPLE SHOWN FOR A VMS TARGET

The following analyses examine the Volcanic Massive Sulphide (VMS) deposit in various known locations. These analyses show how the gas chromatography indicates the reality of deposits. For all the profiles in this section, the red arrows indicate the signature of the VMS, which have all been found by organic geochemistry. These forensic geochemical signatures are shown to be consistent for similar target areas; therefore, the analyses are reliable indicators for the presence of VMS.

One of the first experiments in 1996 in the development of the SGH analysis was to observe if an SGH response could be obtained directly from an ore sample. From office shelf specimens, small rock chips were obtained which were then crushed and milled. The fine pulp obtained was then subjected to the SGH analysis. These shelf specimen samples were from well known VMS deposits of the Mattabi deposit from the Archean Sturgeon Lake Camp in Northwestern Ontario and from the Kidd Creek Archean volcanic-hosted copper-zinc deposit. Even these specimen samples contain a geochemical record of the hydrocarbons produced by the bacteria that had been feeding on these deposits at depth. As a comparison, SGH analysis were similarly conducted on modern-day VMS ore samples taken from a "black smoker" hydrothermal volcanic vent from the deep sea bed of the Juan de Fuca Ridge where high concentrations of microbial growth was also known to exist. The raw data profiles as GC/MS Total Ion Chromatograms are shown below to illustrate the *"visible"* portion of the VMS

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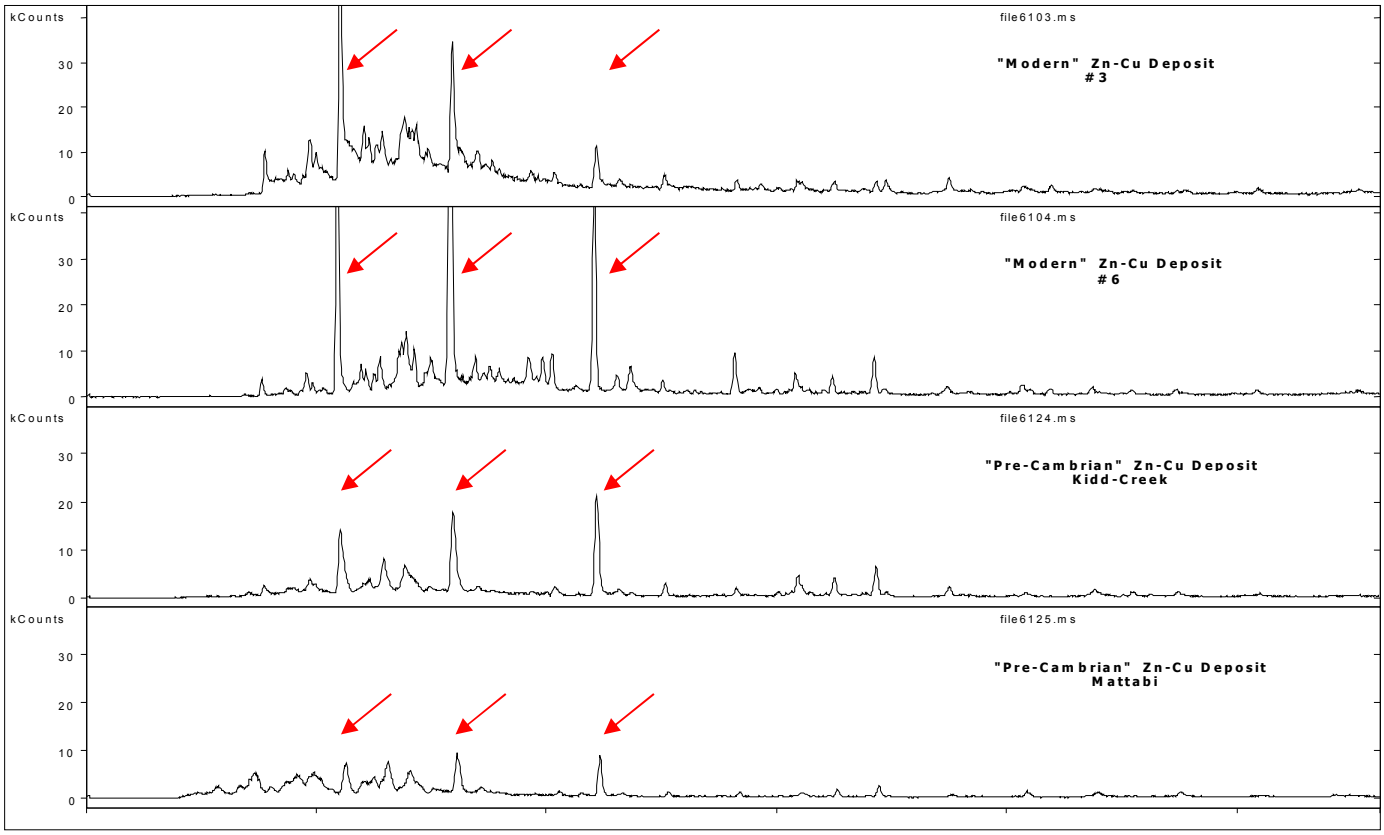
signature obtained from the SGH analysis.



The above profiles are:

- First profile: Samples from modern day "black smokers"
- Second profile: Samples from modern day "black smokers"
- Third profile: Samples from Pre-Cambrian Zn-Cu Kidd Creek deposit
- Fourth profile: Samples from Mattabi deposit

The red arrows point to three compounds that are a *portion* of the SGH signature for VMS type deposits. This visible portion of the VMS signature of hydrocarbons can easily be seen in the analysis of each of these four samples.

The next question in our early objectives was to see if this SGH signature could also be observed in *surficial soil samples* that had been taken over VMS deposits. Through our research projects, soil samples were obtained from over the Ruttan Cu-Zn VMS deposit near Leaf Rapids, Manitoba and

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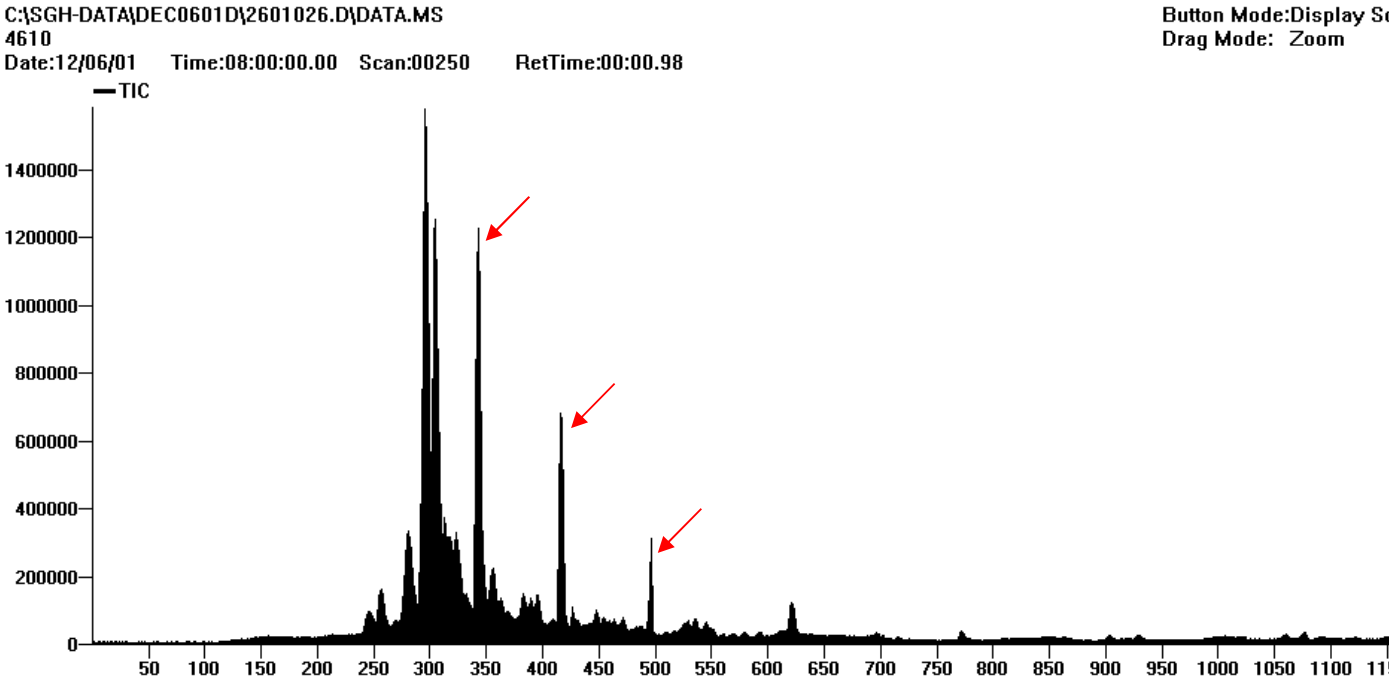
located in the Paleoproterozoic Rusty Lake greenstone belt. The profile obtained, as observed in the raw GC/MS chromatogram, is shown in this next image below:



The three compounds indicated by the red arrows represent the same *visible portion* of the VMS signature observed from the modern day black smoker samples and the ore samples taken from the Mattabi and Kidd Creek, even though this soil was taken from over a different VMS deposit in a geographically different area. Is this coincidence?

Another soil sample was obtained from Noranda's Gilmour South base-metal occurrence in the Bathurst Mining camp in northern New Brunswick. As shown below, this sample contained a very complex SGH signature, however the visible portion of the VMS signature as indicated by the red arrows is still observed as in the black smoker, Mattabi and Kidd Creek ore samples.

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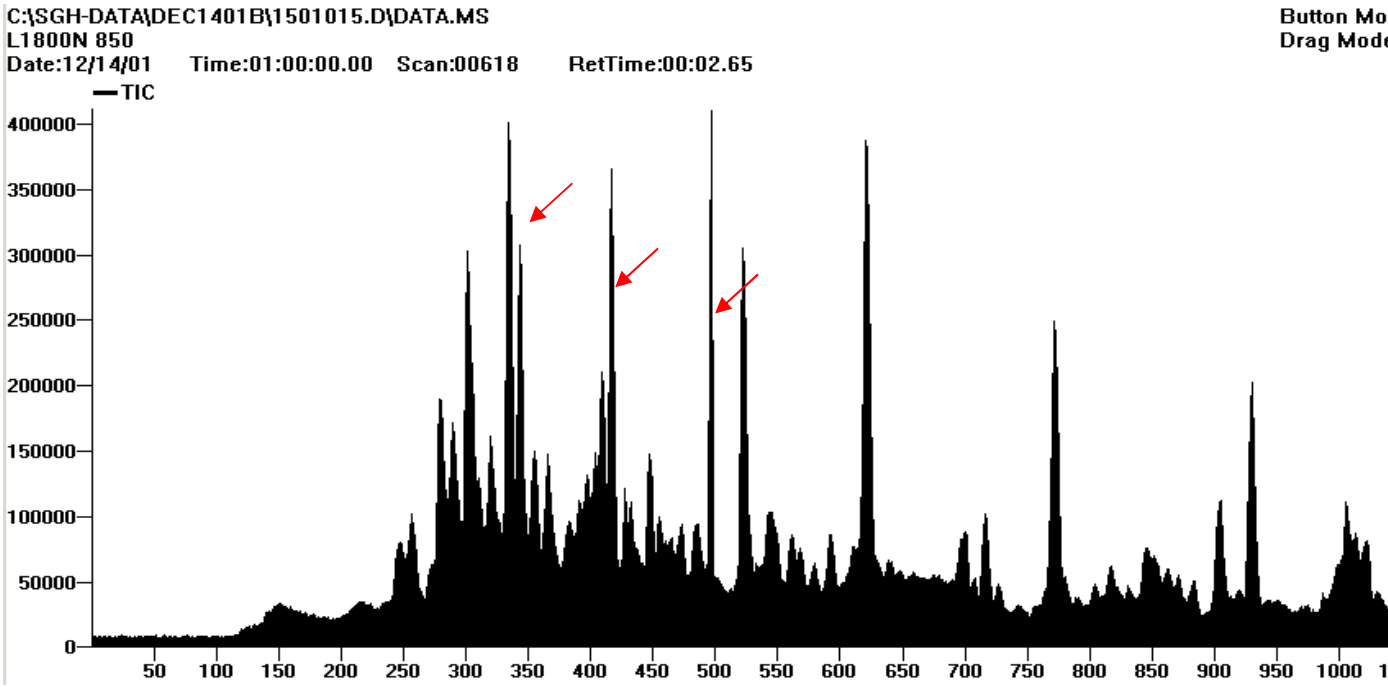

In research conducted by the Ontario Geological Survey, this same portion of the SGH signature was also observed over the VMS deposit at Cross Lake in Ontario. **Note that the visible signature shown as the three compounds indicated by the red arrows is only a small portion of the complete SGH VMS signature**. The full VMS signature is made up of at least three groups, as three organic chemical classes, that together contain at least 35 of the individual SGH hydrocarbons.

The chromatograms shown on the preceding page from the GC/MS analysis are not used directly in the interpretation of SGH data. As we are only interested in a specific list of 162 hydrocarbons, the mass spectrometer and associated software programs specifically identifies the hydrocarbons of interest, runs calculations using relative responses to a short list of hydrocarbons used as standards, and develops an Excel spreadsheet of semi-quantitative concentration data to represent the sample. Thus the SGH results for a sample, like that observed in ore from the Ruttan, are filtered to obtain the concentrations for the specific 162 hydrocarbons. A simple bar graph drawn from the Excel spreadsheet of the hydrocarbons and their concentrations results in a DNA like *forensic SGH signature* as shown below. The portion discussed hear as the "visible" SGH VMS signature in the GC/MS chromatograms, is again shown by the red arrows.

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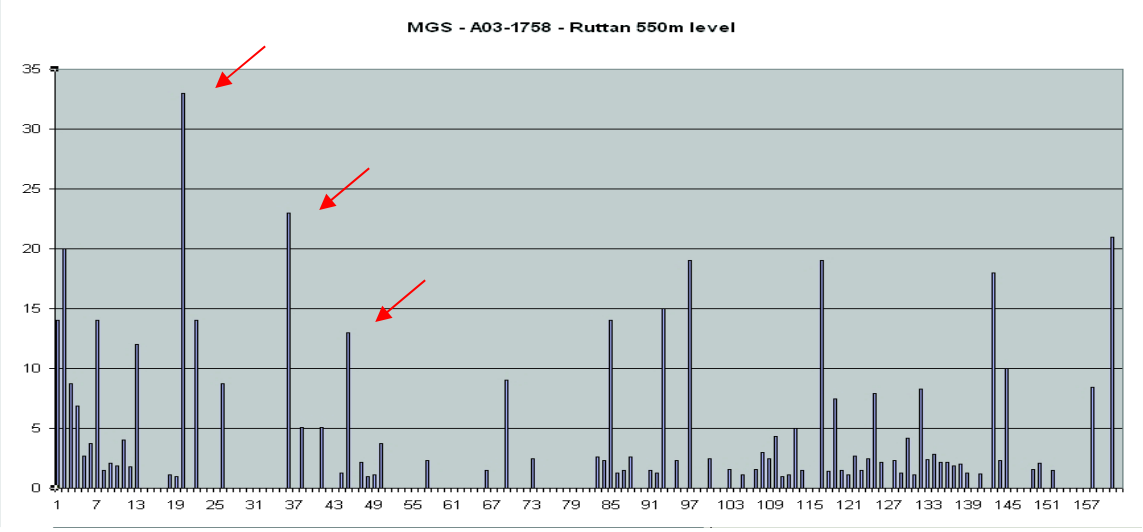

Through the work done in the SGH CAMIRO research projects, it was observed that the hydrocarbon signature produced by the SGH technique appeared to also be able to be used to differentiate barren from ore-bearing conductors. This was explored further through the submission and analysis of specific specimen samples that represented a barren pyritic conductor and a barren graphitic conductor.

The GC/MS chromatograms from these two specimens are compared to that obtained from the Kidd-Creek ore as shown below. This diagram conclusively shows that the SGH signatures obtained from the two types of barren conductors are completely different than that obtained by SGH over VMS type ore. SGH is thus able to differentiate between ore-bearing conductors and barren conductors as **the Forensic SGH Geochemical signature is different**.

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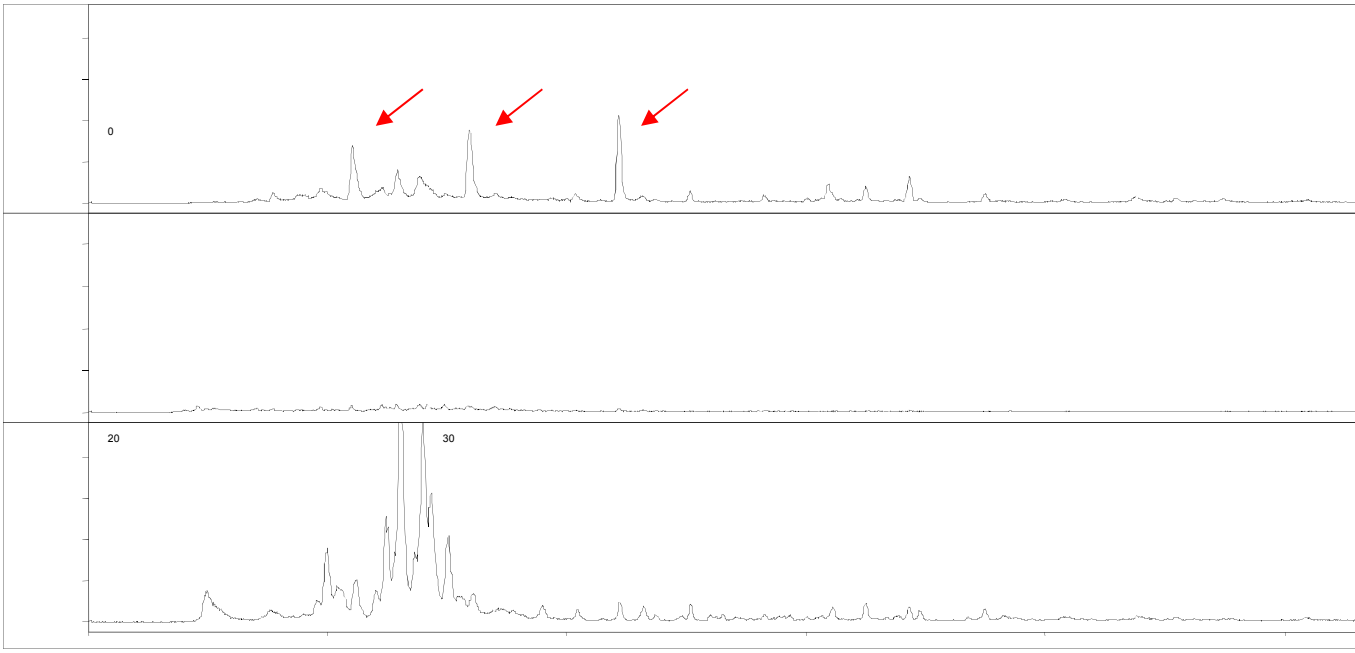

SGH has been described by the Ontario Geological Survey of Canada (OGS) as a "REDOX cell locator". Many SGH surveys for Gold and other mineral targets can result in multiple types of anomalies, depending on the class of SGH compounds, even over the same target and in the same set of samples. Thus "Apical", "Nested-Halo", and "Rabbit-Ear" or "Halo" type SGH anomalies are all typically observed from the effect of REDOX cells that have developed over deposits. REDOX cells are also related to the presence of bacteriological activity.

The VMS template of SGH Pathfinder Classes uses low and medium weight classes of hydrocarbon compounds. Again, at least three Pathfinder Class group maps, associated with the SGH signature for VMS, must be present to begin to be considered for assignment of a good rating. The Pathfinder Class anomalies in these maps must logically concur and support a consistent interpretation in relation to the expected geochromatographic characteristics of the Pathfinder Class, for a specific area.

The interpretation development history for VMS SGH Pathfinder Class map(s) shown in this report is similar to the development history for other target types. The reader should not draw a conclusion that SGH is used only for sulphide based mineralization as some of the most intense SGH anomaly has been associated with Kimberlites where sulphides are essentially not present.

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APPENDIX "C"
SOIL GAS HYDROCARBON SURVEY DESIGN AND SAMPLING

Sample Type and Survey Design: It is highly recommended that a ***minimum*** of 50 sample "locations" is preferred to obtain enough samples into background areas on both sides of *small* suspected targets (wet gas plays, Kimberlite pipes, Uranium Breccia pipes, veins, etc.). SGH is not interpreted in the same way as inorganic based geochemical method. SGH must have enough samples over both the target and background areas in order to fully study the dispersion patterns or geochromatography of the SGH classes of compounds. Based on our minimum recommendation of at least 50 sample locations we further suggest that all samples be *evenly spaced* with about one-third of the samples over the target and one-third on each side of the target in order for SGH to be used for exploration. Targets other than gas plays, pipes, dykes or veins usually require additional samples to represent both the target and background areas.

SGH has been shown to be very robust to the use of different sample types even "within" the same survey or transect. Research has illustrated that it is far more important to the ultimate interpretation of the results to take a complete sample transect or grid than to skip samples due to different sample media. The most ideal natural sample is still believed to be soil from the "Upper B-Horizon", however excellent results can also be obtained from other soil horizons, humus, peat, lake-bottom sediments, and even snow. The sampling design is suggested to use evenly spaced samples from 15 metres to 200 metres and line spacing from 50 metres to 500 metres depending on the size and type of target. A 4:1 ratio is suggested, however, larger orientation surveys have also been successful. Ideally even large grids should have one-third of the samples over the target and two-thirds of the samples into anticipated background areas. This will allow the proper assessment of the SGH geochromatographic vectoring and background site signature levels with minimal bias. Individual samples taken at significant distances from the main survey area to represent background are not of value in the SGH interpretation as SGH results are not background subtracted. Samples can be drip dried in the field and do not need special preservation for shipping and has been specifically designed to avoid common contaminants from sample handling and shipping. SGH has also been shown to be robust to cultural activities even to the point that successful results and interpretation has been obtained from roadside right-of-ways. In conclusion, the conditions for the sample type and survey design include:

- Fist sized samples are usually retrieved from a shallow dug hole in the 15 to 40 cm range of depth.
- Different sample types can be taken even "within" the same survey or transect, data leveling is rarely ever required. SGH is highly effective is areas of very difficult terrain. The Golden Rule is to always take a sample.

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- Samples should be evenly spaced in a grid or a series of transects with sample lines spaced at a ratio of up to 4:1 (line spacing: sample spacing).
- A minimum of 50 sample "locations" is recommended with one-third over the target and one-third on each side of the target into background if this can be predicted. This provides the opportunity of optimal data contrast.
- If very wet, samples can be drip dried in the field.
- No special preservation is required for shipping.

APPENDIX "D"
SAMPLE PREPARATION AND ANALYSIS

Upon receipt at Activation Laboratories the samples are air-dried in isolated and dedicated environmentally controlled rooms set to 40°C. The dried samples are then sieved. In the sieving process, it is important that compressed air is not used to clean the sieves between samples as trace amounts of compressor oils "may" poison the samples and significantly affect some target signatures. At Activation Laboratories a vacuum is used to clean the sieve between each sample. The -60 mesh sieve fraction (<250 microns, although different mesh sizes can be used at the preference of the exploration geologist) is collected and packaged in a Kraft paper envelope and transported from our sample preparation building to our analytical building on the same street in Ancaster Ontario. Each sample is then extracted, separated by gas chromatography and analyzed by mass spectrometry using customized parameters enabling the highly specific detection of the 162 targeted hydrocarbons at a *reporting limit* of one part-per-trillion (ppt). This trace level limit of reporting is critical to the detection of these hydrocarbons that, through research, have been found to be related at least in part to the breakdown and release of hydrocarbons from the death phase of microbes directly interacting with a deposit at depth. The hydrocarbon signatures are directly linked to the deposit type, which is used as a food source. The hydrocarbons that are mobilized and metabolized by the microbes are released in the death phase of each successive generation. Very few of the hydrocarbons measured are actually due to microbe cell structure, or hydrocarbons present or formed in the genesis of the deposit or from anthropogenic contamination. The results of the SGH analysis is reported in raw data form in an Excel spreadsheet as "semi-quantitative" concentrations without any additional statistical modification.

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APPENDIX "E"
SGH DATA QUALITY
Reporting Limit

The SGH Excel spreadsheet of results contains the raw unaltered concentrations of the individual SGH compounds in units of "part-per-trillion" (ppt). The reporting of these ultra low levels is vital to the measurement of the small amounts of hydrocarbons now known to be leached/metabolized and subsequently released by dead bacteria that have been interacting with the ore at depth. To ensure that the data has a high level of confidence, a "reporting limit" is used. The reporting limit of 1 ppt actually represents a level of confidence of approximately 5 standard deviations where SGH data is assured to be "real" and non-zero. Thus in SGH the use of a reporting limit automatically removes site variability, and there is no need to further background subtract any data as the reporting limit has already filtered out any site background effects. Thus we recommend that all data that is equal to or greater than 2 ppt should be used in any data review. It is important to review all SGH data as low values that may be the centre of halo anomalies and higher values as apical anomalies or as halo ridges are all important.

Laboratory Replicate Analysis

A laboratory replicate is a sample taken randomly from the submitted survey being analyzed and are not unrelated samples taken from some large stockpile of bulk material. In the Organics laboratory an equal portion of this sieved sample, or pulp, is taken and analyzed in the same manner using the Gas Chromatography/Mass Spectrometer. The comparison of laboratory replicate and field duplicate results for chemical tests in the parts-per-million or even parts-per-billion range has typically been done using an absolute "relative percent difference (RPD)" statistic which is an easy proxy for error estimation rather than a more complete analysis of precision as specified by Thompson and Howarth. An RPD statistic is not appropriate for SGH results as the reporting limit for SGH is *1 part-per-trillion*. Further, *SGH is a semi-quantitative technique* and was not designed to have the same level of precision as other less sensitive geochemistry's as it is only used as an exploration tool and not for any assay work. SGH is also designed to cover a wide range of organic compounds with an unprecedented 162 compounds being measured for each sample. In order to analyze such a wide molecular weight range of compounds, sacrifices were made to the variability especially in the low molecular weight range of the SGH analysis. The result is that the first fifteen SGH compounds in the Excel spreadsheet is expected to exhibit more imprecision than the other 147 compounds. An SGH laboratory replicate is a large set of data for comparison even for just a few pairs of analyses. Precision calculations using a Thompson and Howarth approach should only be used for estimating error in individual measurements, and not for describing the average error in a larger data set. In geochemical exploration geochemists seek concentration patterns to interpret and thus rigorous precision in individual samples is not required because the concentrations of many samples are interpreted collectively. For these reasons recent and independent research at Acadia University in Canada promote that a percent Coefficient of Variation (%CV) should be used as a universal measurement of relative error in all geochemical applications. As SGH results are a relatively large data set for nearly all submissions, %CV is a better

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statistic for use with SGH. By using %CV, the concentration of duplicate pairs is irrelevant because the units of concentration cancel out in the formation of the coefficient of variation ratio. For SGH, the %CV is calculated on all values ≥ 2 ppt. These values are averaged and represent a value for each pair of replicate analysis of the sample. All of the %CV values for the replicates are then averaged to report one %CV value to represent the overall estimate of the relative error in the laboratory sub-sampling from the prepared samples, and any instrumental variability, in the SGH data set for the survey. Actlabs' has successfully addressed the analytical challenge to minimize analytical variability for such a large list of compounds. Thus as SGH is also interpreted as a signature and is solely used for exploration and not assay measurement, the data from SGH is *"fit for purpose"* as a geochemical exploration tool.

Historical SGH Precision

In the general history of geochemistry, studies indicate that a large component of total measurement error is introduced during the collection of the initial sample and in sub-sampling, and that only a subordinate amount of error in the result is introduced during preparation and analysis. A historical record encompassing many projects for SGH, including a wide variety of sample types, geology and geography, shows that the consistency and precision for the analysis of SGH *is excellent* with an overall precision of 6.8% Coefficient of Variation (%CV). When last calculated, this number had a range of a maximum of 12.4% CV, a minimum of 3.0% CV, with a standard deviation of 1.6%, in a population made up of over 400 targets (over 45,000 samples) interpreted since June of 2004. Again the precision of 6.8% CV included all of the sample types as soil from different horizons, peat, till, humus, lake-bottom sediments, ocean-bottom sediments, and even snow. When field duplicates have been revealed to us, we have found that the precision of the field duplicates are in the range of about 9 to 12 %CV. As SGH is interpreted using a combination of compounds as a chemical "class" or signature, the affect of a few concentrations that may be imprecise in a direct comparison of duplicates is not significant. Further, projects that have been re-sampled at different times or seasons are expected to have different SGH concentrations. The SGH anomalies may not be in exactly the same position or of the same intensity due to variable conditions that may have affected the dispersion of different pathfinder classes. However, the SGH "signature" as to the presence of the specific mix of SGH pathfinder classes will definitely still exist, and will retain the ability to identify the deposit type and vector to the same target location.

Laboratory Materials Blank – Quality Assurance (LMB-QA)

The Laboratory Materials Blank Quality Assurance measurements (LMB-QA) shown in the SGH spreadsheet of results are matrix free blanks analyzed for SGH. These blanks are not standard laboratory blanks as they do not accurately reflect an amount expected to be from laboratory handling or laboratory conditions that may be present and affect the sample analysis result. The LMB-QA measurements are a pre-warning system to only detect any contamination originating from laboratory glassware, vials or caps. As there is no substrate to emulate the sample matrix, the full solvating power of the SGH leaching solution, effectively a water leach, is fully directed at the small surface area of the glassware, vials or caps. In a sample analysis the solvating power of the SGH leaching solution is distributed between the large sample surface area (from soil, humus, sediments, peat, till, etc.) and the relatively small contribution from the laboratory materials surfaces. The sample matrix also buffers

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the solvating or leaching effect in the sample versus the more vigorous leaching of the laboratory materials which do not experience this buffering effect. Thus the level of the LMB-QA reported is biased high relative to the sample concentration and the actual contribution of the laboratory reagents, equipment, handling, etc. to the values in samples is significantly lower. This situation in organic laboratory analysis only occurs at such extremely low part-per-trillion (ppt) measurement levels. This is one of the reasons that SGH uses a reporting limit and not a detection limit. The 1 ppt reporting limit used in the SGH spreadsheet of raw concentration data is 3 to 5 times greater than a detection limit. The reporting limit automatically filters out analytical noise, the actual LMB-QA, and most of the sample survey site background. This has been proven as SGH values of 1 to 3 parts-per-trillion (ppt) have very often illustrated the outline of anomalies directly related to mineral targets. **Thus all SGH values greater than or equal to 1 or 2 ppt should be used as reliable values for interpretations.**

The LMB-QA values thus should not be used to background subtract any SGH data. The LMB-QA values are only an early warning as a quality assurance procedure to indicate the relative cleanliness of laboratory glassware, vials, caps, and the laboratory water supply at the ppt concentration level. *Do not subtract the LMB-QA values from SGH sample data.*

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APPENDIX "F"
SGH DATA INTERPRETATION

SGH Interpretation Report

All SGH submissions must be accompanied by relative or UTM coordinates so that we may ensure that the sample survey design is appropriate for use with SGH, and to provide an SGH interpretation with the results. In our interpretation procedure, we separate the results into 19 SGH sub-classes. These classes include specific alkanes, alkenes, thiophenes, aromatic, and polyaromatic compounds. Note that none of the SGH hydrocarbons are "gaseous" at room temperature and pressure. The classes are then evaluated in terms of their geochromatography and for coincident compound class anomalies that are unique to different types of mineralization. Actlabs uses a six point scale in assigning a subjective rating of similarity of the SGH signatures found in the submitted survey to signatures previously reviewed and researched from known case studies over the same commodity type. Also factored into this rating is the appropriateness of the survey and amount of data/sample locations that is available for interpretation. This rating scale is described in detail in the following section.

SGH PATHFINDER CLASS MAGNITUDE

The magnitude of any individual concentration or that of a hydrocarbon class *does not imply* that the data is of more importance or that mineralization is of higher quantity or grade. SGH interpretation must use the review of the combination of specific hydrocarbon classes to make any interpretation.

GEOCHEMICAL ANOMALY THRESHOLD VALUE

In the interpretation of "inorganic" geochemical data one of the determinations to be made is to calculate a "Threshold" value above which data is considered anomalous. This is done on an element by element basis. In the interpretation of this "organic" geochemical data this determination is done differently. The determination of a threshold value is not calculated for each hydrocarbon compound. The determination of a threshold value is also a concentration below which geochemical data is considered as "noise" for the purposes of geochemical interpretation. As discussed, SGH uses a "Reporting Limit" instead of some type of Detection Limit. The amount of noise that is already eliminated in the data, as below the Reporting Limit of 1 part-per-trillion (shown in the data spreadsheet as "-1" as "not-detected at a Reporting Limit of 1 ppt") is equivalent to approximately 5 standard deviations of variability. *To thus calculate an additional Threshold Value is a loss of real and valuable data.* Further, in the interpretation of SGH data, individual compounds are not considered (unless explicitly mentioned in the report). The interpretation of SGH data is exclusively conducted by "compound chemical class" which is the sum of four to fourteen individual hydrocarbons in the same organic chemical class as these compounds naturally have the same chemical properties that ultimately define their spatial dispersion characteristics in their rise from a mineral target through the overburden. This combined class is more reliable than the measurement of any one compound. SGH also eliminates the need for a Threshold value determination above the Reporting Limit due to the "high specificity" of the specific hydrocarbons and the classes they form. Each of the hydrocarbons has been

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hand selected due to their lower probability of being found in general surface soils. Further, only those classes where the majority of the compounds are detected above the Reporting Limit are considered in the interpretation. This defines the SGH geochemistry as having less geochemical noise due to the use of a reporting limit and as having higher confidence in the use of groups (classes) of data instead of individual compounds. However the most important aspect of interpretation is the use of a forensic signature. At least three specific "Pathfinder" classes, based on the combinations or template of classes we have developed, must be present to define the hydrocarbon signature to confidently predict the presence of a specific type of mineral target. *Do not calculate another Threshold value*. **Fact:** It has been proven many times that important SGH anomalies that depict mineralization at depth can exist even with data at 3 ppt.

Mobilized Inorganic Geochemical Anomalies

It is important to note that SGH is essentially "blind" to any inorganic content in samples as only *organic* compounds as hydrocarbons are measured. Thus inorganic geochemical surface anomalies that have migrated away from the mineral source, and thus may be interpreted and found to be a false target location, is not detected and does not affect SGH results. This fact is of great advantage when comparing the SGH results to inorganic geochemical results. If there is agreement in the location of the anomalies between the organic and inorganic technique, such as Actlabs' Enzyme Leach, a significant increase in confidence in the target location can be realized. If there is no agreement or a shift in the location of the anomalies between the techniques, the inorganic anomaly may have been mobilized in the surficial environment.

The Nugget Effect

As SGH is "blind" to the inorganic content in the survey samples, any concern of a "nugget effect" will not be encountered with SGH data. A "nugget effect" may be of a concern for other inorganic geochemical methods from surveys over copper, gold, lead, nickel, etc. type targets.

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SGH DATA LEVELING

The combination of SGH data from different field sampling events has rarely required leveling in order to combine survey grids. The only circumstances that have occasionally required leveling has been the combination of samples that are very fine in texture, thus having a combined large surface area to samples of peat that may be in nearby areas. Even after maceration of the peat and in using the maximum size of sample amenable to this test method, peat samples have a significantly lower surface area. Peat samples have only required leveling in one survey in the last 500 SGH interpretations.

In only the last year it has been observed that SGH data *may* require leveling when different field sampling events have significantly different soil temperature. It has been documented that only when "soil" samples are taken from "frozen" ground that data leveling may be required as frozen sample act as a frozen cap to the hydrocarbon flux and may collect a higher concentration of hydrocarbon compounds compared to sampling during seasons where the samples are not frozen. Only two surveys have required leveling in the last 500 SGH interpretations.

The author has taken introductory training in the leveling of geochemical data. If leveling is required, both data sets are reviewed in terms of maximum, minimum and average values for each SGH Pathfinder Class intended for use in the interpretation. Data in sectioned into quartiles and each section is assigned specific leveling factors that is then applied to one data set. It should be noted that any type of data leveling is an approximation.

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APPENDIX "G"
SGH RATING SYSTEM DESCRIPTION

To date SGH has been found to be successful in the depiction of buried mineralization for Gold, Nickel, VMS, SEDEX, Uranium, Cu-Ni-PGE, IOCG, Base Metal, Tungsten, Lithium, Polymetallic, and Copper, as well as for Kimberlites, Coal Seam, Wet Gas and Oil Plays. SGH data has developed into a dual exploration tool. From the interpretation, a vertical projection of the predicted location of the target can be made as well as a statement on the rating of the comparability of the identification of the anticipated target type to that from known case studies, as an example: if the client anticipates the target to be a Gold deposit, what is the rating or comparability that the target is similar to the SGH results over a Gold deposit in Nunavut, shear hosted and sediment hosted deposits in Nevada, or Paleochannel Gold mineralization in Western Australia.

- **A rating of "6"** is the highest or best rating, and means that the SGH classes most important to describing a Gold related hydrocarbon signature are all present and consistently vector to the same location with well defined anomalies. To obtain this rating there also needs to be other SGH classes that when mapped lend support to the predicted location.

- **A rating of "5"** means that the SGH classes most important to describing a Gold signature are all present and consistently describe the same location with well defined anomalies. The SGH signatures may not be strong enough to also develop additional supporting classes.

- **A rating of "4"** means that the SGH classes most important to describing a Gold signature are mostly present describing the location with well defined anomalies. Supporting classes may also be present.

- **A rating of "3"** means that the SGH classes most important to describing a Gold signature are mostly present and describe the same location with fairly well defined anomalies. Some supporting classes may or may not be present.

- **A rating of "2"** means that some of the SGH classes most important to describing a Gold signature are present but a predicted location is difficult to determine. Some supporting classes may be present

- **A rating of "1"** is the lowest rating, and means that one of the SGH classes most important to describing a Gold signature is present but a predicted location is difficult to determine. Supporting classes are also not helpful.

The SGH rating is directly and significantly affected by the survey design. Small data sets, especially if significantly <50 sample locations, or transects/surveys that are geographically too short *will automatically receive a lower rating no matter how impressive an SGH anomaly might be*. When there is not enough sample locations to adequately review the SGH class geochromatography, or when the sample spacing is inadequate, or if the spacing is highly variable such that it biases the interpretation of the results, then the confidence in the interpretation of any geochemistry is adversely

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affected. The SGH rating is not just a rating of the agreement between the SGH pathfinder classes for a particular target type; it is a rating of the overall confidence in the SGH results from this particular survey. The interpretation is only based on the SGH results without any information from other geochemical, geological or geophysical information unless otherwise specified.

HISTORY & UNDERSTANDING

The subjective SGH rating system has been used since 2004 when Activation Laboratories started providing an SGH Interpretation Report with ever submission for SGH analysis to aid our clients in understanding this organic geochemistry and ensuring that they obtain the best results for their surveys. As explained in the previous section, the SGH rating is not just a rating of how definitive an SGH anomaly is, and it is not based just on the map(s) provided in this report. It is a rating of "confidence in the interpreted anomaly" from the combination of:

- (i) are the expected SGH Pathfinder Classes of compounds present from the template for this target type (one Pathfinder Class map is shown in the report, at least three must be present to adequately describe the correct signature for a particular target),
- (ii) how well do these SGH Pathfinder Classes agree in describing an particular area,
- (iii) how well does this agreement compare to SGH case studies over known targets of that type,
- (iv) how well is the interpreted anomaly defined by the survey (i.e. a single transect does not provide the same confidence as a complete grid of samples), and
- (v) is there at least a minimum of 50 sample locations in the survey so that there may be an adequate amount of data to observe the geochromatography of the different SGH Pathfinder Class of compounds.

The question often arises by clients as to the frequency of a rating, e.g. "how often is a rating of 5.0 given in an interpretation". To better understand this we present this review of the history of the SGH rating program since 2004 and some of the underlying situations that can affect the historical rating charts. Originally it was recommended that a minimum of 35 sample location be used for small target exploration, however it was quite quickly realized that this is often insufficient and at least 50 sample locations were required. In 2007 the rating scale was refined to include increments of 0.5 units rather than just integer values from 0 to 6.

A rating frequency may be biased high as most clients conduct an orientation study over a known target, thus several of these projects result in high ratings. Note that, at this time, the rating is not said to be linked to grade of a deposit or depth to the target. Even in exploration surveys clients tend to submit samples over more promising targets due to knowledge of the geology and prior geochemical or geophysical results. As shown in the following chart, projects with SGH data from 200 or more sample locations have a higher level of confidence in the interpretation as the

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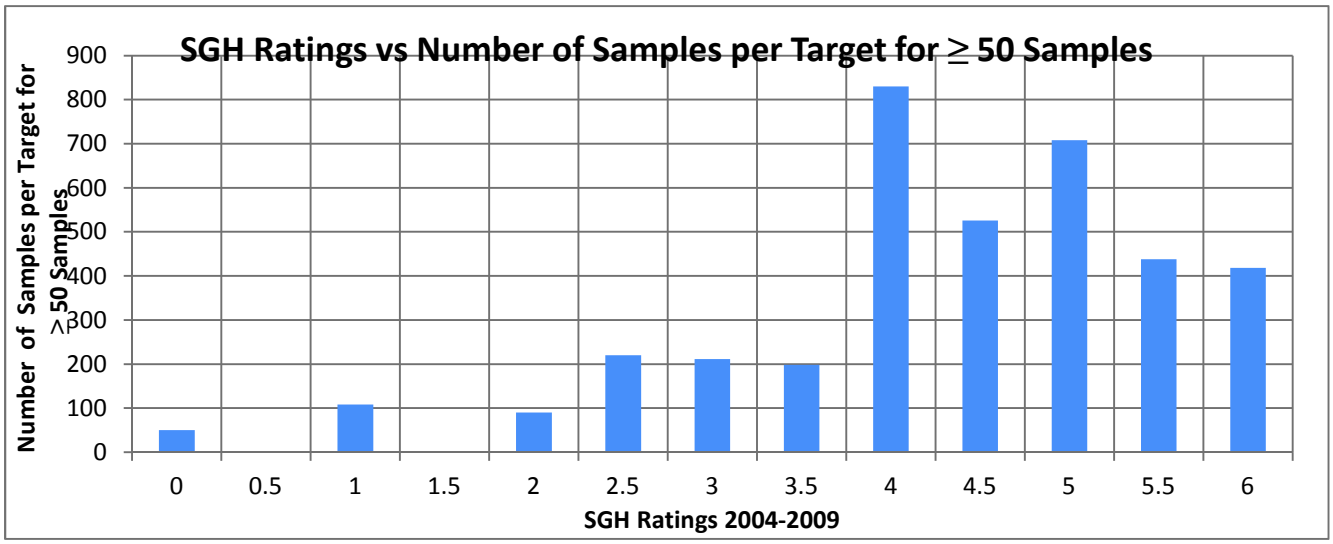
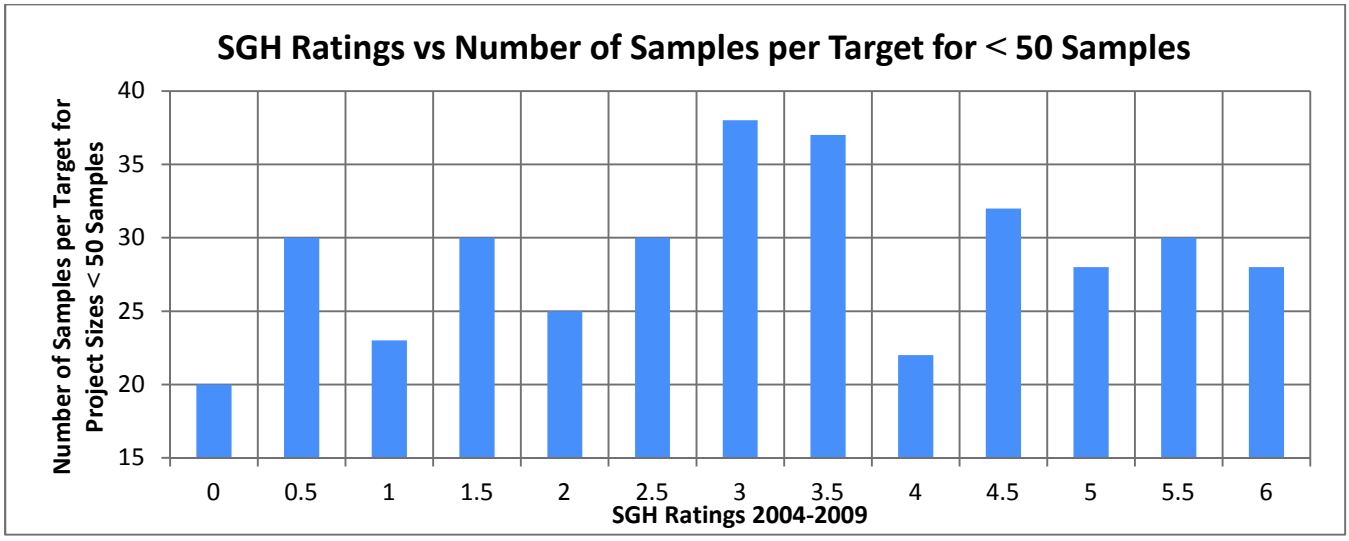
geochromatography of the SGH Pathfinder Classes of compounds can be more completely observed and reviewed.



The rating frequency may be biased low as research projects often include a bare minimum of samples to reduce costs. Research projects may also be over targets known to be difficult to depict with geochemistry. Multiple targets in close vicinity in a survey may result in a low bias as the Pathfinder Class geochromatography is more difficult to deconvelute. Ratings may also be biased low if less than the recommended 50 sample locations are submitted as indicated by the following chart. This chart also illustrates that there is no interpretation bias to a particular rating value.



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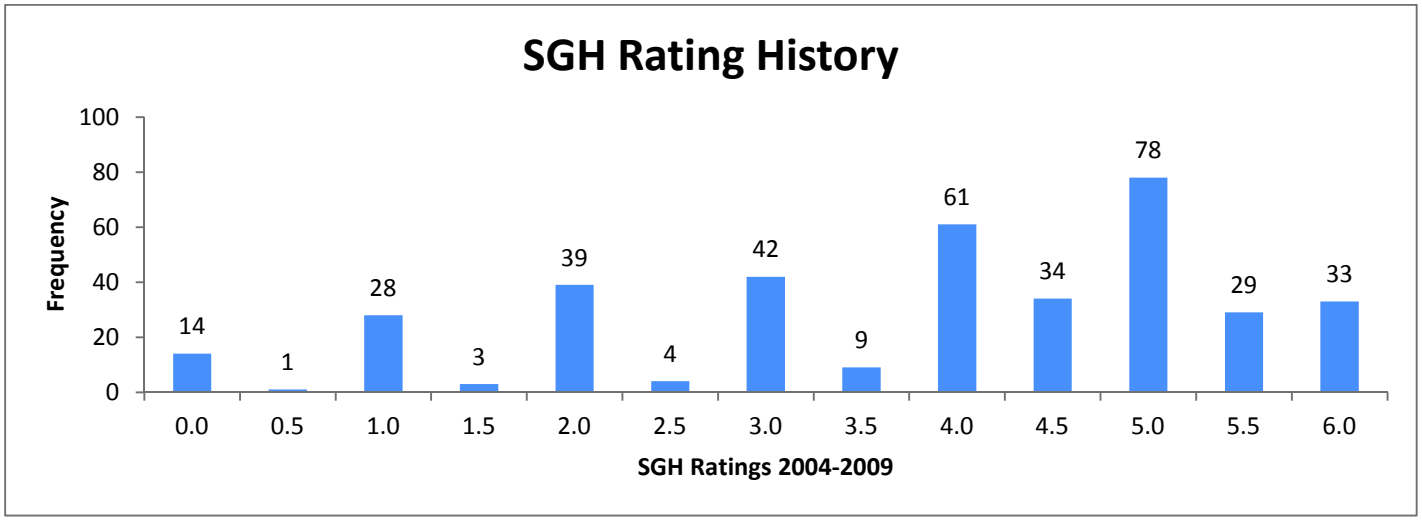
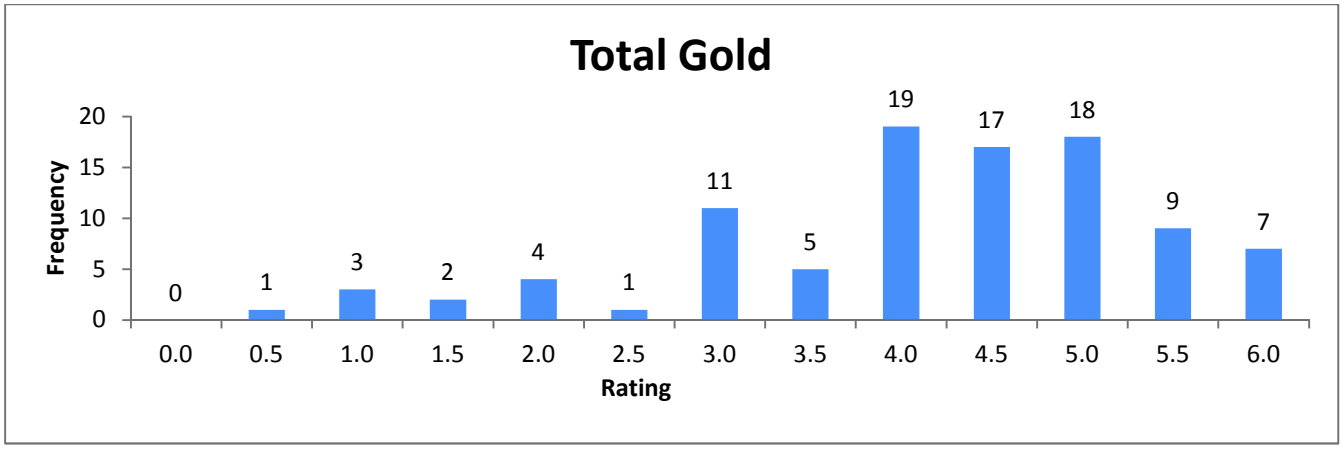
The overall rating frequency for over 400 targets from January 2004 to December 2009 is shown in the chart below illustrating that surveys over more promising targets are most often submitted for best use of research or exploration dollars. It also indicates that the 0.5 increments were less frequent as they started in 2007.



More specific for SGH interpretation for Gold targets, the overall rating frequency for 97 targets from January 2004 to December 2009 is shown in the chart below that also illustrates that surveys over more promising Gold targets are most often submitted for best use of research or exploration dollars.



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APPENDIX "H"

NOTE: THERE IS NEW PRICING FOR THE SGH AND OSG GEOCHEMISTRIES AS OF 2014

SAMPLE PREPARATION: CODE S4 - $4.20 CDN per sample

INTERPRETATION FOR ONE COMMODITY TARGETS: Included in the price of analysis of $48.00 CDN per sample

INTERPRETATION FOR MULTI-COMMODITY TARGETS: i.e. VMS, SEDEX, Polymetallic, IOCG, IOCGU, Cu-Au-Porphyry, etc. – add additional price of $500 is applied to cover the additional time in interpretation.

"SUPPLEMENTAL REPORT": ($ 1,200.00)

Those clients who have determined that these SGH results will add an important aspect to their exploration effort can request a "Supplemental Report". This report contains the additional SGH Pathfinder Classes and an explanation of their use in the SGH interpretation that supports the initial applied "Rating" for the survey as a relative comparison to the results previously obtained in case studies that were used to create the SGH template for the general target type.

"ADDITIONAL INTERPRETATIONS": ($ 1,200.00) - if 30 days after delivery of the report.

The SGH data can be interpreted multiple times in comparison to a variety of SGH templates developed for exploration for different mineral targets or petroleum plays. The samples do not have to be reanalyzed. This can be addressed as a separate section of a report or as a separate report based on the client's wishes. The price is per survey area, e.g. if there are two projects in a submission, perhaps a North area and South area, and both survey areas are to be interpreted for say Gold and Copper, the first interpretation is included in the SGH analysis price, the second interpretation for each area would be priced at $1,200 per area, thus a total of $2,400.

"BASIC OR SUPPLEMENTAL REPORT GIS PACKAGE": ($ 300.00)

Those clients that wish to import the SGH results into their GIS software can request a "GIS Package", which will include the geo-referenced image files that reflect the mapped SGH Pathfinder Class or Classes contained in the Standard or Supplemental Report and an Excel CSV file(s) containing the associated Class Sum data.

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