



# **SGH – SOIL GAS HYDROCARBON Predictive Geochemistry**

*for*

## ***HEBERLIN GEOCONSULTING "SGH – MT. MILLIGAN PROJECT"***

*October 23, 2009*

*Dale Sutherland, Eric Hoffman*

*Activation Laboratories Ltd*

**EXPLORATION FOR: "COPPER and/or Gold" FORMATION**

***Workorder: A09-4788***

Results represent only the material tested. Actlabs is not liable for any claim/damage from the use of this report in excess of the test cost. Samples are discarded in 90 days unless requested otherwise. This report is only to be reproduced in full.

## **SOIL GAS HYDROCARBON (SGH) GEOCHEMISTRY - OVERVIEW**

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. SGH has been successful for delineating targets found at over 500 metres in depth. Samples of various media have been successfully analyzed such as soil (any horizon), drill core, rock, peat, lake-bottom sediments and even snow. 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. SGH is also different from soil hydrocarbon tests that thermally extract or desorb 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 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 in two Canadian Mining Industry Research Organization (CAMIRO) projects (97E04 and 01E02).

Over the past 13+ 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 projects.

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 400 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 geochemistries were unsuccessful at illustrating anomalies related to the target.

## **SOIL GAS HYDROCARBONS (SGH) GEOCHEMISTRY – OVERVIEW**

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. 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](http://www.goldenbandresources.com))

**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 geochemistries. 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 maximum 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.

## **SOIL GAS HYDROCARBONS (SGH) GEOCHEMISTRY – OVERVIEW**

**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.

**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 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 inorganic geochemistries from surveys over copper, gold, lead, nickel, etc. type targets.

## **SOIL GAS HYDROCARBONS (SGH) GEOCHEMISTRY – OVERVIEW**

**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 RATING SYSTEM**

To date SGH has been found to be successful in the depiction of buried mineralization for Gold, Nickel, VMS, SEDEX, Uranium, Polymetallic, and Copper, as well as for Kimberlites. 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, e.g. if the client anticipates the target to be a Copper deposit, what is the rating or comparability that the target is similar to SGH case studies over Copper deposits in Nunavut, shear hosted as well as sediment hosted deposits in Nevada, Paleochannel Copper mineralization in Western Australia, and the Spence deposit in the Atacama desert in Chile.

- A rating of “6” is the highest or best rating, and means that the SGH classes most important to describing a Copper 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 Copper 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 Copper signature are mostly present describing the location with well defined anomalies. Supporting classes may also be present.

## **SGH RATING SYSTEM** (continued)

- A rating of "3" means that the SGH classes most important to describing a Copper 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 Copper 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 Copper 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 <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 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.

## **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.



**SGH DATA QUALITY** (continued)

- **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 geochemistries 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 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  $\geq 2$  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.

**SGH DATA QUALITY** (continued)

- **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, having 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 6.6% Coefficient of Variation (%CV). When last calculated, this number has a range having a maximum of 10% CV and a minimum of 3% CV in a population made up of a total of some 400 targets interpreted since June of 2004 that has encompassed a wide variety of sample types as soils, peat, etc. in over 32,000 samples. 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 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



**LABORATORY MATERIALS BLANK – QUALITY ASSURANCE (LMB-QA):** (cont.)

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 which 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.

**EVALUATION OF SGH RESULTS – A09-4788**  
**HEBERLEIN GEOCONSULTING – MT. MILLIGAN PROJECT**

- This report is based on the SGH results from the analysis of a total of 50 soil samples from one northwest trending transect. The samples were spaced at 50 metres in the middle third of the transect and are spaced 100 metres apart for about one third of the samples at each end of the transect. UTM coordinates were provided for mapping purposes of the results for these soil samples.
- The number of sample locations submitted for this survey (43 distinct sample locations, some samples submitted were hole duplicates and site duplicates that were not mapped) is just less than the recommended number of samples to use SGH as an exploration tool, however based on the results, no reduction in the rating for this project site was made. Usually, less than 50 sample locations does not enable the interpretation of the complete geochromatographic signatures from all of the SGH Copper or Gold indicator classes of hydrocarbons which then affects the interpretation of the results and the subjective rating is reduced. A lower number of samples **may** be adequate as a first look at SGH data, as a screening tool, or in an orientation type survey. Note that the SGH data is only reviewed for the particular target deposit type requested, in this case for the presence of a porphyry Copper-Gold type deposit. It is also assumed that there is only one potential target. To obtain the best interpretation the client should indicate if there are possible multiple targets, say from geophysical data. The possibility of multiple targets should be known due to potential SGH signature overlap and thus increased complexity of the resulting geochromatographic anomalies which could alter the interpretation.

**EVALUATION OF SGH RESULTS – A09-4788**  
**HEBERLEIN GEOCONSULTING – MT. MILLIGAN PROJECT**

- **The overall precision of the SGH analysis for this survey was excellent** as demonstrated by 4 different pairs of samples taken from this survey, each used for laboratory replicate analysis. The average Coefficient of Variation (%CV) using the method by Thompson and Howarth, of these replicate results for this project was 6.2% which represents an excellent level of analytical performance. A total of 5 "hole duplicates" were identified. The average Coefficient of Variation for the sample and its "hole duplicate" was 9.1 %CV which is slightly higher in variability than the laboratory replicates as expected. A total of 5 "site duplicates" were also submitted. To calculate the overall precision of the site duplicates an average value was obtained for each sample and its hole duplicate. This average value was then compared to the associated site duplicate. The average of these 5 "site duplicates" was then derived to determine an overall site precision for this project which was determined to be 6.7 %CV.
- The SGH signatures used in the exploration for a Copper target are primarily made up of relatively low molecular weight SGH classes of compounds while the signature for Gold has relatively low molecular weight and medium molecular weight pathfinder classes. These templates are applicable to a wide variety of lithologies. A wide variety of SGH signatures or interpretive templates for specific mineral types have been defined through the research conducted using surficial samples since 1997 on previously analyzed case studies, especially from the two Canadian Mining Industry Research Organization projects (CAMIRO 97E04 & 01E02).
- The SGH Interpretation Report usually reviews the data for one type of mineralization target, i.e. Gold, Uranium, Kimberlite, etc., however for this project, the target sought is thought to be a porphyry Copper-Gold type targets. SGH has been previously been successful in the exploration for both Vein and Porphyry type target. During the review of the data in this project, as in several other Copper-Gold target projects previously encountered, it was evident that SGH was able to distinguish between areas that were predominantly Copper or predominantly Gold. In some projects the signatures appear to be equally mixed. Note in research to date, a focused effort to connect SGH response to deposit grade has not been made. Thus the plan and 3D view maps presented in this report represent an important SGH pathfinder class signature for either a Copper target or Gold type target. The data is mapped with a Kriging trending algorithm set in the GeoSoft Oasis Montaj mapping software.
- The SGH interpretations are presented on the plan view of the SGH pathfinder class maps on pages 12 and 13 as an area within a black oval applied to each map. The black oval contains within it an area that has a

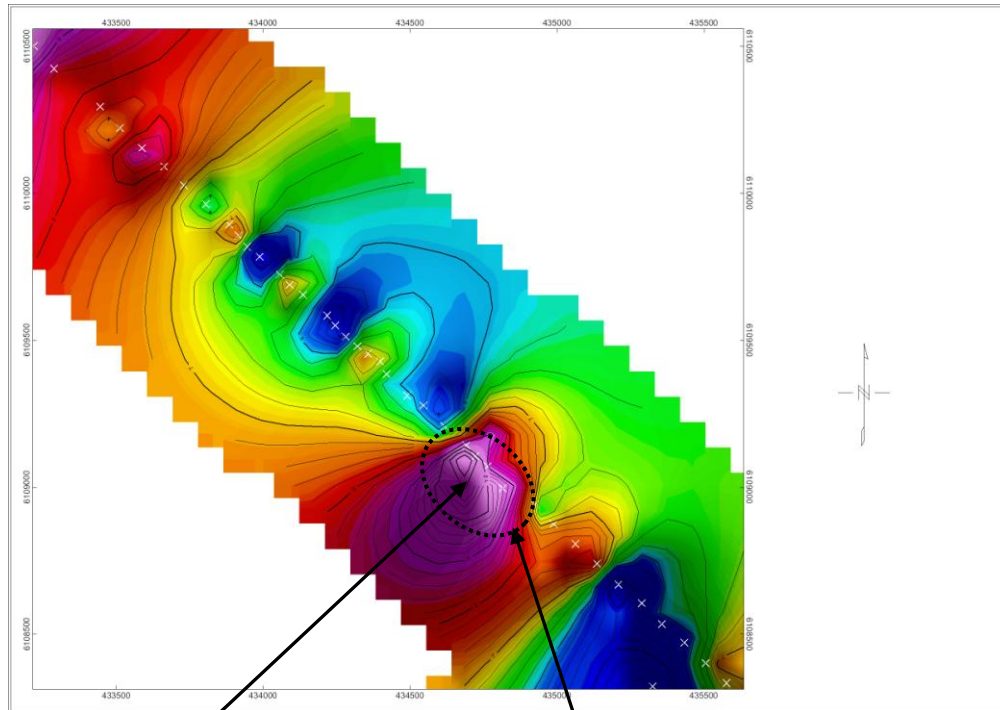
**EVALUATION OF SGH RESULTS – A09-4788**  
**HEBERLEIN GEOCONSULTING – MT. MILLIGAN PROJECT**

consistent SGH signature for the mineral target described. The data mapped is simply the summation of “multiple” compound concentrations that make up the particular pathfinder chemical class of compounds, resulting in a higher level of confidence than the mapping of a single parameter. No statistics are used. The area within the oval also has a high level of agreement with several (at least two) other SGH pathfinder classes shown to define anomalous areas for the same type of target. The agreement between multiple pathfinder classes further improves the confidence of the interpretation which increases the subjective rating applied. The template of multiple SGH pathfinder classes that have been developed for a specific mineralization is a pattern recognition approach similar to some Forensic identifications.

- After review of the SGH pathfinder class maps found over known case studies for “Gold”, the SGH results suggest a **“rating of 5.5” within the dotted black oval drawn on the map in relation to the presence of a Gold based target** as mapped on page 12. A reduction of 0.5 was made as some SGH pathfinder classes overlap with the copper template, thus other Gold pathfinder classes are less definitive. This rating represents the similarity of these SGH results to case studies for Gold in Nunavut, shear hosted as well as sediment hosted deposits in Nevada, and Paleochannel Gold deposits in Australia.
- Multiple SGH classes indicate the presence of a REDOX cell as a “rabbit ear” anomaly on this transect. After review of the SGH pathfinder class maps found over known case studies for “Copper”, the SGH results suggest a **“rating of 6.0” within the solid black oval drawn on the map in relation to the presence of a Copper based target** as mapped on page 13. This rating represents the similarity of these SGH results to case studies over Copper deposits in Nunavut, shear hosted as well as sediment hosted deposits in Nevada, Paleochannel Copper mineralization in Western Australia, and the Spence deposit in the Atacama desert in Chile.
- These ratings are based on a scale of 6, with a value of 6 being the best. The degree of confidence in these ratings only starts to be “good” at a level of 4.0. The best vertical drill location, based only on the SGH data, would be at the apical anomaly relative to Gold, or in the centre of the halo anomaly relative to Copper as shown. However, vertical drilling may not be the best method of exploration of this anomaly.
- This interpretation has been conducted without any knowledge of any other geochemical results or geophysical results that the client may have. The client should use a combination of the accompanying spreadsheet of SGH results and this interpretation report with additional geochemical, geophysical, and geological information to possibly obtain a more confident and precise target location.

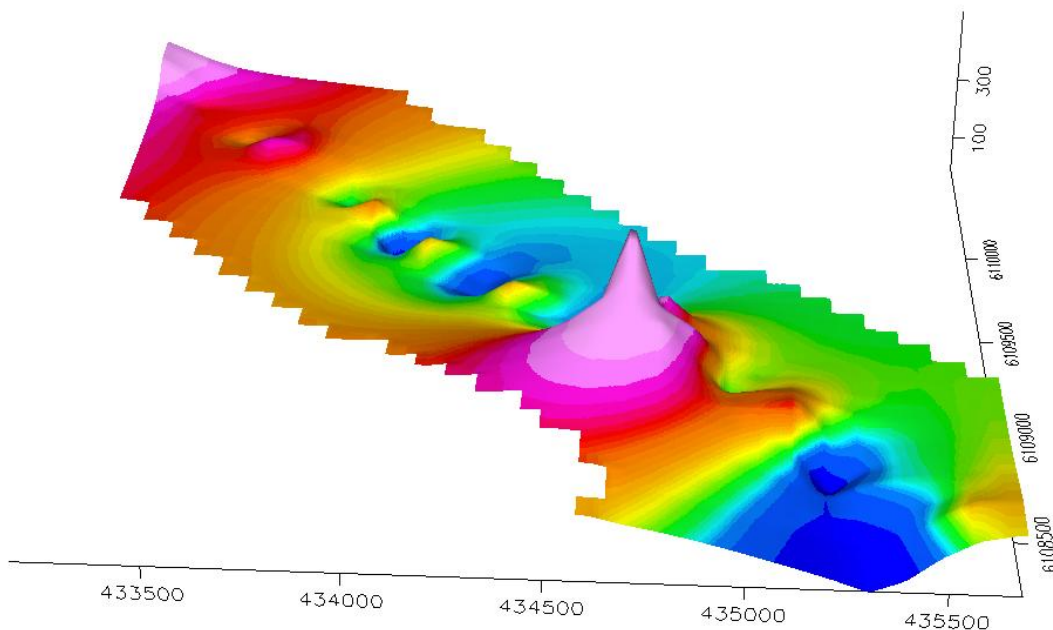
**EVALUATION OF SGH RESULTS – A09-4788**  
**HEBERLEIN GEOCONSULTING – MT. MILLIGAN PROJECT**

**SGH "GOLD" PATHFINDER MAP**



Drill Target

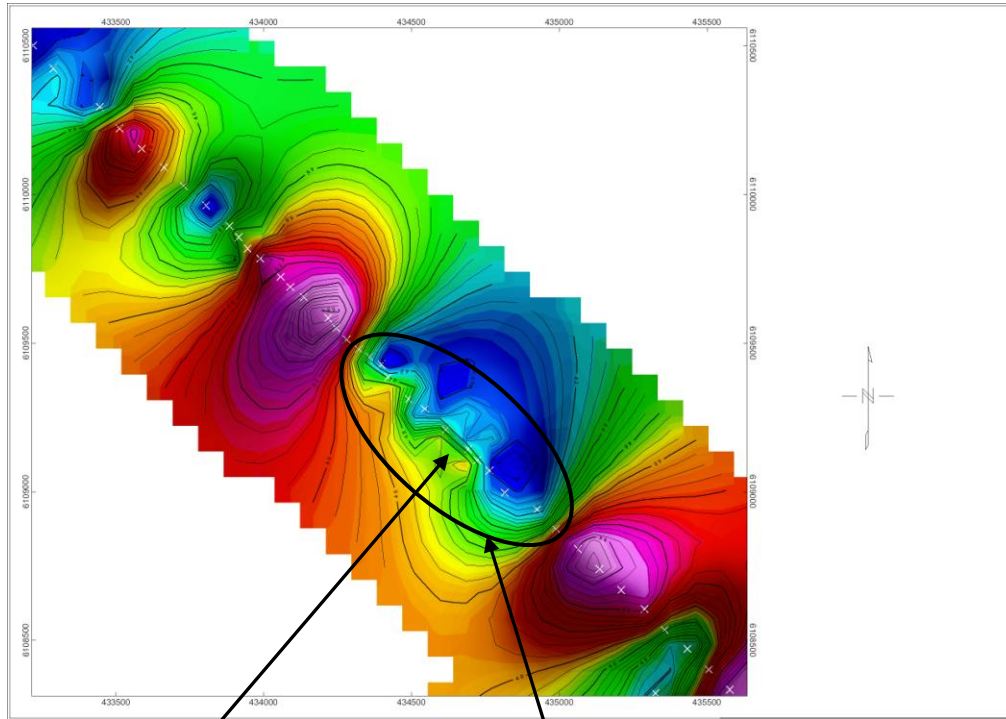
Anomaly Outer Boundary



Results represent only the material tested. Actlabs is not liable for any claim/damage from the use of this report in excess of the test cost. Samples are discarded in 90 days unless requested otherwise. This report is only to be reproduced in full.

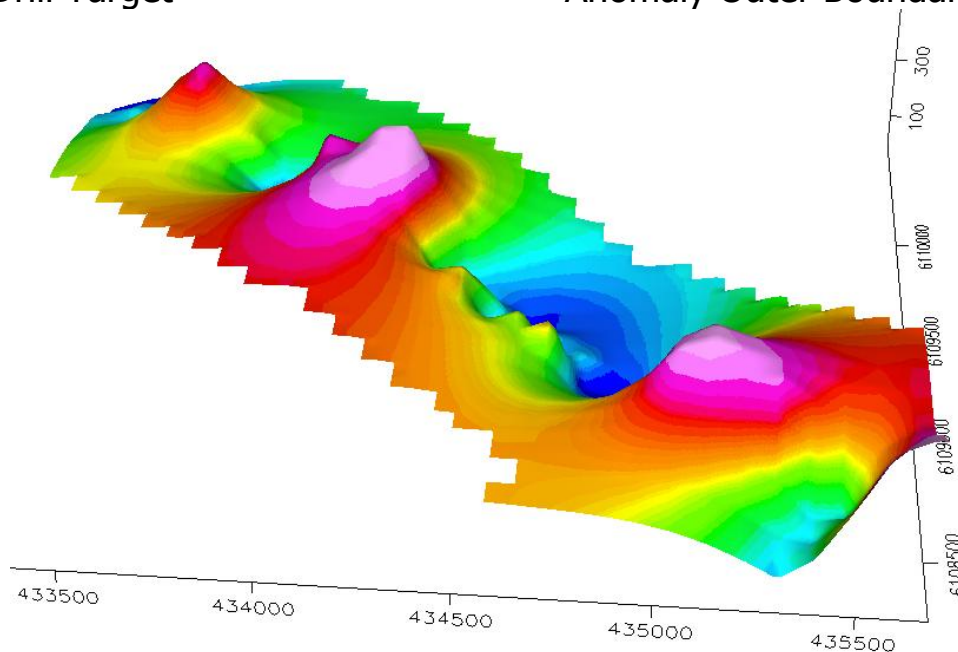
**EVALUATION OF SGH RESULTS – A09-4788**  
**HEBERLEIN GEOCONSULTING – MT. MILLIGAN PROJECT**

**SGH "COPPER" PATHFINDER MAP**



Drill Target

Anomaly Outer Boundary



Results represent only the material tested. Actlabs is not liable for any claim/damage from the use of this report in excess of the test cost. Samples are discarded in 90 days unless requested otherwise. This report is only to be reproduced in full.



### **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 certain forward-looking information related to 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 other geochemistries, 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 geochemistries, the implied rating and anticipated target characteristics may be different than that actually encountered if the target is drilled 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 stated, Activation Laboratories Ltd. has not physically observed the exploration site and has no prior knowledge of any site description or details. 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, season, 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. Although the Company 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 not to be as 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".

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.

Results represent only the material tested. Actlabs is not liable for any claim/damage from the use of this report in excess of the test cost. Samples are discarded in 90 days unless requested otherwise. This report is only to be reproduced in full.