DIAMOND DRILLING

on the

WOOD MINERAL CLAIMS

Kamloops Mining Division
British Columbia

N.T.S. 092I/10E
Latitude 50° 37' 00" N
Longitude 120° 32' 30" W

for

operator:
GREEN VALLEY MINES INC.
2245 West 13th Avenue
Vancouver, B.C.
V6K 2S4

owners:
Mr. Charles Boitard

and

Mr. Victor Doucet

by

P. REYNOLDS, B.Sc., P.Geo.
February 5, 1996

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1. SUMMARY

1.1 The Wood property consists of 31 contiguous mineral claims totaling 100 units. The claims are located approximately five kilometres southwest of the former producing Afton Mine and 18 kilometres west-southwest of the town of Kamloops, B.C. The claims are accessible by good gravel roads from Kamloops.

1.2 The property is underlain for the most part by andesites of the Nicola Volcanics.

1.3 One diamond drill hole was completed in 1995 to test for copper mineralization. No economic amounts of copper mineralization were encountered.

1.4 It is recommended that all previous work be compiled into a single database and reviewed. It is further recommended that a preliminary geological mapping program be carried out on the camp property. Particular attention should be paid to alteration types. Three to four lines of soil geochemistry, analyzed by enzyme leach, should be tried as a test case.

2. INTRODUCTION

2.1 This report has been prepared at the request of Mr. Charles Boitard, President of Green Valley Mines Inc., to satisfy assessment requirements.

2.2 The information for the following report was obtained from sources cited under references and from the authors drill log of diamond drill hole 95-1. The drilling program was carried out by Mr. Charles Boitard between October 5 and October 24, 1995. The author logged diamond drill hole 95-1 in January 1996. The diamond drill core is stored at the drill site on the property.

2.3 The registered owner of the Wood claims is Mr. Charles Boitard and Mr. Victor Doucet. The claims are being operated by Green Valley Mines Inc. The claims lie approximately 18 kilometres west-southwest of Kamloops, B.C. This area is known for its porphyry copper and molybdenum production from both volcanic and intrusive host rocks. Significant gold and silver has also been recovered from these deposits.

3. LOCATION, ACCESS AND PHYSIOGRAPHY

3.1 The Wood property is located on the Thompson Plateau approximately 18 kilometres west-southwest of Kamloops, B.C. The claims are centered at 50° 37' north latitude and 120° 33' west longitude on NTS map sheet 092I/10E. The claims are in the Kamloops Mining Division.

REYNOLDS GEOLOGICAL			
GREEN VALLEY MINES INC.			
LOCATION MAP			
KAMLOOPS M. D.			NTS: 092I/10E
	DRAWN: P.R.	MAY '93	FIG. NO. 1

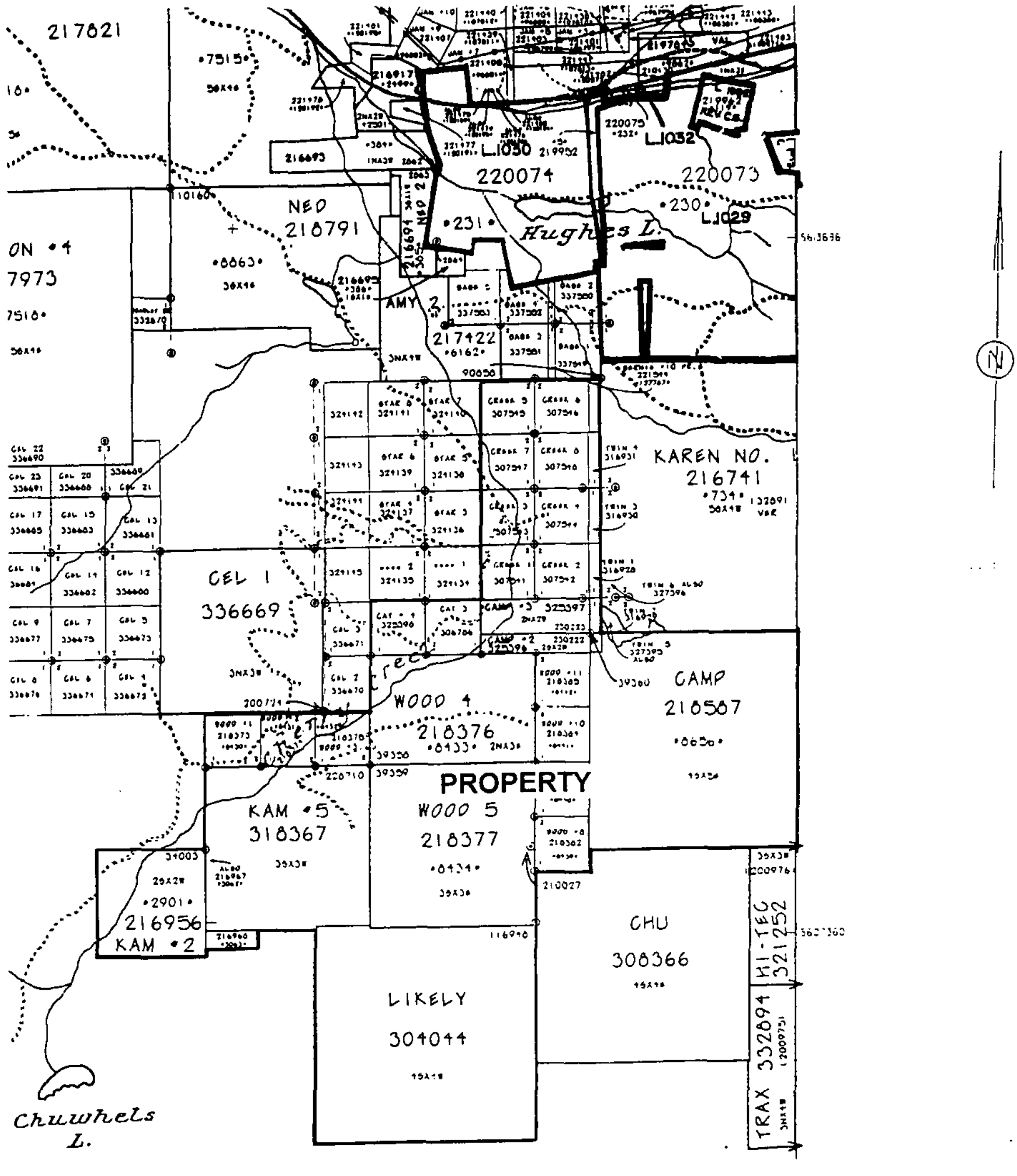
3.2 Access is provided by the Trans-Canada Highway and then south along the Green Mountain Road which branches off the highway approximately two kilometres west of the Afton Mine. Good dirt roads provide access to most of the claim area.

3.3 The property lies between elevations 700 to 900 metres above sea level. Vegetation consists of pockets of Pine within grasslands. Water for all stages of exploration is available from nearby creeks. The climate is semi-arid with an average annual precipitation of 250 to 280 millimetres.

4. CLAIM STATUS

4.1 The Wood property comprises 31 mineral claims totaling 100 units. Complete claim information is as follows:

NAME	UNITS	RECORD NO.	EXPIRY DATE *
Camp	20	218587	13 June 99
Wood #1	1	218373	4 April 98
Wood #2	1	218374	4 April 98
Wood #3	1	218375	4 April 98
Wood #4	6	218376	4 April 98
Wood #5	9	218377	5 April 98
Wood #8	1	218382	16 April 98
Wood #9	1	218383	16 April 98
Wood #10	1	218384	16 April 98
Wood #11	1	218385	16 April 98
Kam #2	9	216956	26 August 99
Kam #3	1	216967	10 November 99
Kam #4	1	216968	10 November 99
Kam #5	9	318367	18 June 2000
Creek #3	1	307543	3 February 99
Creek #4	1	307544	3 February 99
Creek #5	1	307545	3 February 99



REYNOLDS GEOLOGICAL

GREEN VALLEY MINES INC.

CLAIM MAP

0 500 1000 2000 3000
METRES

KAMLOOPS M.D. NTS: 092I/10E

SCALE AS SHOWN	DRAWN: P.R.	Jan '96	FIG. NO. 2

NAME	UNITS	RECORD NO.	EXPIRY DATE *
Creek #6	1	307546	3 February 99
Creek #7	1	307547	3 February 99
Creek #8	1	307548	3 February 99
Cat #3	1	306786	17 December 98
Twin #1	1	316928	8 April 97
Twin #2	1	316929	8 April 97
Twin #3	1	316930	8 April 2000
Twin #4	1	316931	8 April 2000
Likely	16	304044	14 September 98
Camp #2	4	325396	14 May 98
Camp #3	4	325397	14 May 98
Cat #4	1	325398	13 May 98
Twin #5	1	327395	3 July 98
Twin #6	1	327396	3 July 98

* Includes assessment currently being applied.

4.2 The Camp #2 and Camp #3 claims overstake parts of Creek #3, Creek #4, Wood #10 and Wood #4 and completely overstake Wood #11.

4.3 All claims are recorded in the name of Mr. Charles Boitard except Likely (Record No. 304044) which is recorded in the name of Victor Doucet. Any legal aspect of claim ownership is beyond the scope of this report.

5. HISTORY

5.1 The Afton orebody, located five kilometres northeast of the Wood claims, began production in 1977 and continued through 1991 when it was shut down for economic reasons. At start-up, Afton had drill proven ore reserves of 30.84 million tonnes grading 1.0% copper, 0.58 ppm gold and 4.19 ppm silver at a cut off grade of 0.25% copper (Carr & Reed, 1976). It is reported that underground reserves still exist and that with an improvement in copper and/or gold prices the mine could be re-opened. Currently, the Afton mill is being operated and copper ore is being mined from the Ajax pit.

5.2 In 1980, three diamond drill holes were completed on the Kam claim adjoining the west side of the Wood #5 claim. Drill core showed native copper in the fractures. In 1981, nine percussion holes were completed on the Kam claims. These holes returned anomalous copper, silver and gold values.

5.3 During the 1981 field season, VLF-EM surveys were carried out over part of what is now the Wood claims. These surveys delineated three anomalous electromagnetic conductor zones.

5.4 In 1989, five kilometres of induced polarization surveys were completed on the Wood claims by the present owner. Results from this survey were inconclusive as only two lines were surveyed.

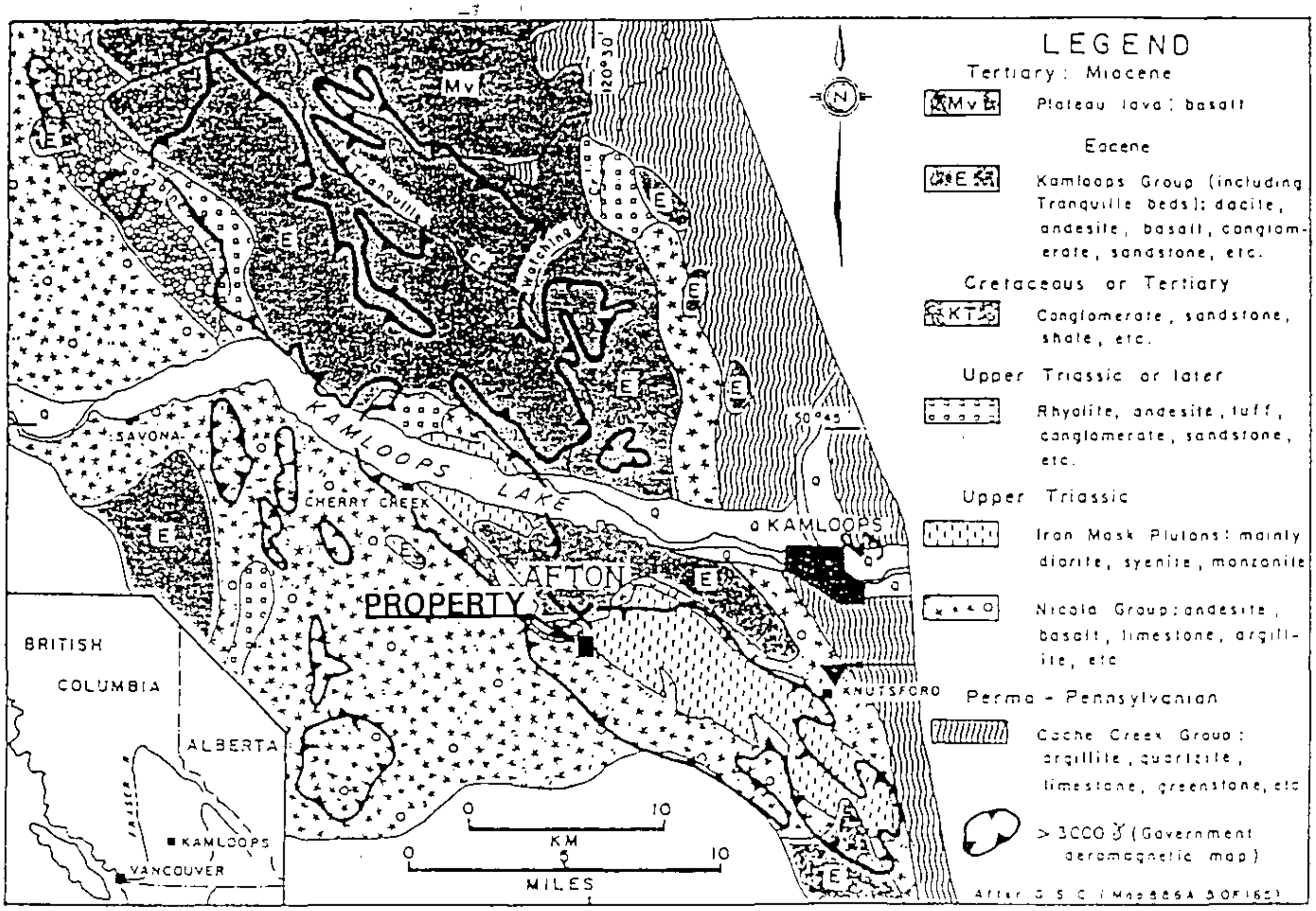
5.5 During 1993, three percussion holes and three diamond drill holes were completed on the Wood property. Disseminated native copper was noted in all three diamond drill holes.

5.6 During 1994 one percussion hole and one diamond drill hole were completed on the Camp 3 claim. The diamond drill hole returned trace amounts of native copper.

6. GEOLOGY

6.1 The Wood claims lie within the Quesnel Trough, a 30 to 60 kilometre wide belt of Lower Mesozoic volcanic and related sedimentary rocks bounded by older sedimentary rocks of the Cache Creek Group to the east and younger Coast Intrusions to the west. In the area of the Wood claims the Quesnel Trough is dominated by Upper Triassic Nicola Group andesites, basalts, tuffs and argillites. The Nicola Group is intruded by Upper Triassic - Lower Jurassic diorite, syenite and monzonite of the Iron Mask Batholith. This batholith represents a major northwest trending structure that crosscuts the north-northwesterly trending Nicola volcanics. Portions of this area are obscured by later plateau lavas.

6.2 Bedrock exposure in this area amounts to only about ten percent, the rest being covered by glacial drift deposited from Pleistocene ice sheets that moved from northwest to southeast.



AFTER CARR & REED, 1976

REYNOLDS GEOLOGICAL			
GREEN VALLEY MINES INC.			
REGIONAL GEOLOGY			
KAMLOOPS M.D.		NTS: 092I/10E	
SCALE AS SHOWN	DRAWN: P.R.	MAY '93	FIG. NO. 3

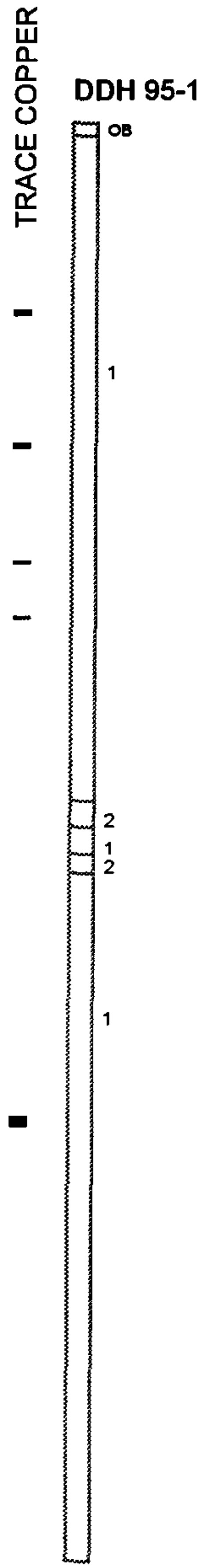
6.3 No systematic, property scale geological mapping has been carried out on the property.

7. DIAMOND DRILLING

8.1 During the period October 5 to October 24, 1995 one diamond drill hole was completed on the Camp 3 claim. The drill hole location is plotted on Figure 4.

8.2 Drilling was supervised by Mr. Charles Boitard, President of Green Valley Mines Inc. Core size is NQ and BQ. The core is stored at the drill site. Drill logs are included in appendix II.

8.3 Diamond drill hole 95-1 was drilled vertically to a depth of 544.82 metres. The drill hole intersected predominately andesite with minor intervals of phyllite. The andesite displayed chlorite and epidote alteration. Trace amounts of disseminated native copper were noted in the core. No core was assayed. A drill section is plotted on Figure 5.



LEGEND

OB Overburden

2 Phyllite

1 Andesite

REYNOLDS GEOLOGICAL LTD.		
GREEN VALLEY MINES INC.		
WOOD PROPERTY SECTION THROUGH DDH 95-1		
		NTS: 092J/10E
DATE: February '96	SCALE: 1:2,500	FIGURE: 5

9. CONCLUSION AND RECOMMENDATIONS

9.1 Diamond drill hole 95-1 intersected a large zone of propylitically altered andesite with a few small sections displaying native copper.

9.2 The Wood group of claims lies within an area favorable to the development of porphyry copper deposits. This area has been looked at by several different individuals but, to the Author's knowledge, none of this previous work has been compiled into a single database. It is recommended that all previous work be compiled onto a single database. In conjunction with this, property scale geological mapping should be completed paying particular attention to alteration types.

9.3 Three to four lines of soil geochemistry with analysis by enzyme leach should be conducted as an orientation. In test cases the enzyme leach technology has been able to detect mineral deposits buried by up to several hundred metres of overburden and/or barren cap rock. An article on enzyme leach is included in appendix III.

10. **REFERENCES**

Carr, J.M. and Reed, A.J. Afton: A Supergene Copper Deposit. Part of C.I.M., Special Volume 15: Porphyry Deposits of the Canadian Cordillera. 1976.

Cockfield, W.E. Geology and Mineral Deposits of Nicola Map Area, British Columbia. Geological Survey of Canada, Memoir 249, 1961.

LaRue, John Assessment Report on a Geophysical Survey Conducted on the Wood Group. British Columbia Ministry of Energy, Mines and Petroleum Resources. Assessment Report 20,116. June 6, 1990.

Reynolds, P. Diamond Drilling and Percussion Drilling Report on the Wood Mineral Claims for Green Valley Mines Inc. June 22, 1994.

Tully, Donald Assessment report on the Hank 1 mineral claim. British Columbia Ministry of Energy, Mines and Petroleum Resources. Assessment Report 11,550. August 24, 1981.

11. CERTIFICATE

I, Paul Reynolds, of the city of Vancouver in the province of British Columbia do hereby certify that:

1) I am a Professional Geoscientist registered with the Association of Professional Engineers and Geoscientists of British Columbia.

2) I am a graduate of the University of British Columbia with a B.Sc. degree in geology.

3) I have practiced my profession as exploration geologist since graduation in 1987.

4) This report is based on a review of previous reports and the Author's diamond drill log DDH 95-1.

5) I have no interest, directly or indirectly, in the Wood property or in the securities of Green Valley Mines Inc., nor do I expect to receive any interest in the future.

6) Permission is hereby granted to Mr. Charles Boitard and Green Valley Mines Inc. to use this report in support of any filing to be submitted to the Ministry of Energy, Mines and Petroleum Resources of the Province of British Columbia for the purpose of filing assessment on the Wood mineral claims.

Dated this 5th day of February, 1996.

P. Reynolds, B.Sc., P.Geo.

APPENDIX I

STATEMENT OF COSTS

STATEMENT OF COSTS

Diamond Drilling	545 metres @ $60/metre	32,700
Truck Rental		750
Supervision	20 days @ $200/day	4,000
Room and Board	20 days @ $100/day	2,000
Mob/Demob		500
GST		2,797
TOTAL		**$42,747**

APPENDIX II

DRILL LOGS

DIAMOND DRILL RECORD

PROPERTY WOOD GROUP

HOLE No. 95-1

DIP TEST		
	Angle	
Footage	Reading	Corrected
COLLAR	-90°	

Hole No. 95-1 Sheet No. 1 of 2
Section 417 N
Date Begun 05 OCT 95
Date Finished 24 OCT 95
Date Logged

Lat.
Dep. 5W.
Bearing
Elev. Collar

Total Depth 544.82 m
Logged By P. REYNOLDS
Claim CAMP 3
Core Size NQ & BQ

DEPTH (m) FROM	TO	RECOVERY	DESCRIPTION	SAMPLE No.	FROM	TO	WIDTH OF SAMPLE				
0	3.05		CASING.								
3.05	254.27		LIGHT TO DARK GREEN ANDESITE WITH MODERATE								
			CHLORITE AND LIGHT TO MODERATE EPIDOTE ALT'N.								
			54.88 - 57.01 TR NATIVE CU.								
			68.60 - 69.21 QTZ STRINGERS & VEINLETS. TO 1cm								
			WIDE AT 10° TO C.A.								
			70.73 - 71.34 TR NATIVE CU								
			120.43 - 121.04 TR NATIVE CU.								
			166.77 TR NATIVE CU.								
			185.06 TR NATIVE CU.								
254.27	264.33		WHITE, GREY & LIGHT GREEN PHYLLITE. FABRIC								
			ORIENTED AT 85° TO C.A.								
264.33	275.00		ANDESITE. SAME AS 3.05 - 254.27								
275.00	282.00		WHITE & GREY PHYLLITE. FABRIC ORIENTED AT								
			85° TO C.A.								

DIAMOND DRILL RECORD

HOLE No: 95-1

DEPTH FROM	DEPTH TO	RECOVERY	DESCRIPTION	SAMPLE No.	FROM	TO	WIDTH OF SAMPLE				
282.9	544.82		LIGHT TO DARK GREEN ANDESITE, MODERATE								
			CHLORITE ALT'N. VARIABLE EPIDOTE ALT'N.								
			329.21-344.51 UNALTERED W/R. DK GREEN								
			TO BLACK IN COLOUR, BASALTIC, NUMEROUS								
			QTZ FLOWERS, SOME WITH EPIDOTE								
			373.48-374.09 FAULT ZONE. SHEARED &								
			BRECCIATED W/R. TR NATIVE CU.								
			405.49-414.63 AUGITE PORPHYRY, HIGHLY								
			CHLORITIC. AUGITE LATHS TO 2 mm								
			437.50-438.72 HIGHLY CHLORITE ALTERED ANDESITE								
			445.73-451.22 HIGHLY BLEACHED W/R.								
			450.30 COARSE PY IN 1cm FRACTURE,								
			451.22-472.56 HIGHLY CHLORITE ALTERED W/R.								
544.82			E.O.H.								

PROFESSIONAL
PROVINCE
PAUL S REYNOLDS
GEOSCIEN

05 FEB 96

APPENDIX III

ENZYME LEACH TECHNOLOGY

INNOVATIVE ENZYME LEACH PROVIDES COST-EFFECTIVE OVERBURDEN PENETRATION

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Keywords: deposit, overburden, analysis, desert, glacial, soil

Introduction

Layers of glacial till and glaciolacustrine sediments cover large areas of the Canadian Shield, and much of the bedrock in the Basin and Range Province of United States and Mexico and much of the Atacama Desert of Chile and Peru have been buried by basin fill and volcanic rocks. The problem, when trying to perform geochemical exploration in terrains that are covered by transported overburden, is that the overburden is usually exotic to the bedrock that it covers. In some regions, intense weathering has stripped the surficial material of the original chemical signature of the parent rock. Conventional chemical analysis would reveal only the composition of the overburden and would not give any indication of the underlying bedrock. Total methods of analysis and stronger-leaching techniques produce results that are dominated by the overburden signature, and random variations in this signature suppress any anomalous chemistry emanating from underlying mineralization. In the past, drilling has been the only means of collecting useful geochemical samples in areas of extensive overburden. An inexpensive means is needed for detecting subtle geochemical dispersion through transported or deeply weathered overburden and providing some indication of the chemistry of the bedrock.

Trace elements released by weathering of mineral deposits in the bedrock will migrate up through overburden by such means as ground water flow, capillary action, or diffusion of volatile compounds. However the amount of these bedrock-related trace elements is typically a very small component of the total concentration of these elements in the overburden. The goal is to determine the amount of a trace element that has been added to the overburden rather than the total amount in the overburden sample. Upon reaching the near surface environment, many of the trace elements migrating through overburden will be trapped in manganese oxide and iron oxide coatings, which form on mineral grains in the soils. One of the most effective traps for trace elements migrating toward the surface is amorphous manganese dioxide, which is usually a very small component of the total manganese oxide phases in the soil sample. Not only does amorphous manganese dioxide have a relatively large surface area, but the irregular surface and the random distribution of both positive and negative charges on that surface make it an ideal adsorber for a variety of cations, anions, and polar molecules.

A selective leach has been developed that employs an enzyme reaction to selectively dissolve amorphous manganese oxides. When all the amorphous manganese dioxide in the sample has been reacted, the enzyme reaction slows, and the leaching action ceases. Because the enzyme leach is self limiting, there is minimal leaching of the mineral substrates in the sample. Thus, the background concentrations for many elements determined are extremely low and the anomaly/background contrast is dramatically enhanced. Typically, three types of geochemical anomalies are found with the Enzyme Leach: 1. Mechanical/hydromorphic dispersion anomalies; 2. Oxidation halo anomalies; 3. Apical anomalies. In terrains where the bedrock is buried by glacial overburden, mechanical/hydromorphic anomalies are the most common type found (although all three types of anomalies are observed in soils developed on tills). Mechanical dispersion trains were formed in the basal till as mineralized bedrock material was smeared down ice during glaciation. Gradual weathering of this mineralized material releases trace elements into the ground water flowing through the till. Vegetation with roots tapping into either the mineralized till or anomalous ground water picks up trace elements which are eventually shed to the forest floor in plant litter. Anomalous trace elements are often relatively quickly leached from the *A*-soil horizon and trapped in oxide coatings in the *B* horizon. In essence the *B*-soil horizon often acts as a long-term integrator of vegetation anomalies (J.R. Clark, 1993). The Enzyme Leach has been used to detect very subtle mechanical/hydromorphic anomalies related to mineralized bedrock in a number of glacial overburden situations, including areas where the glacial till is blanketed with glaciolacustrine sediments. Subtle hydromorphic dispersion anomalies in stream sediments have also been detected with the Enzyme Leach. Trace element suites comprising mechanical/hydromorphic-related soil anomalies commonly reflect at least part of the chemical signature of the bedrock source. Anomaly contrast in soils developed on glacial till often range from 2-times to 10-times the background concentrations for the elements forming the anomaly.

Oxidation halo anomalies are produced by the gradual oxidation of buried reduced bodies. Any reduced body (an ore deposit, a barren body of disseminated pyrite, a buried geothermal system, a petroleum reservoir, etc.) can produce one of these anomalies. Once these anomalies are found it is up to the geologist to make a geological interpretation based on all the information at hand, including Enzyme Leach data, as to what the source of the anomaly might be. These anomalies are characterized by very high contrast values for a suite of elements, the "oxidation suite," which can include Cl, Br, I, As, Sb, Mo, W, Re, Se, Te, V, U, and Th. Often, rare-earth elements and base metals will be anomalous in the same soil samples, but with reduced contrast. Evidence indicates that the oxidation suite migrates to the surface as halogen gases and volatile halide compounds. These elemental gases and compounds would tend to form under the acid/oxidizing conditions of the anode of an electrochemical cell. The low contrast base-metal anomalies coinciding with oxidation-suite anomalies may result from the gradual migration of cations away from these anodes along electrochemical gradients. Less commonly, enzyme-soluble Au and enzyme-soluble Hg will be found in the area of these anomalies. Metallic Au and Hg are not soluble in the enzyme leach. These low-level Au and Hg anomalies often appear to form as a result of the oxidation of these elements in the soil by the subtle flux of oxidizing gases passing through the soil. Oxidation anomalies often form an asymmetrical halo or partial halo around the buried reduced body, and that body underlies part of the central low within that halo. The trace element suite in oxidation anomalies, although often enriched in many types of metal deposits, is not typically representative of the composition of the buried reduced body. For example, essentially the same suite of elements forms halos around petroleum reservoirs as is found around porphyry copper deposits, epithermal gold deposits, buried geothermal systems, and barren pyritic bodies. Sometimes, the low contrast base metal association in the halo can be somewhat indicative of the composition of the source. Oxidation anomalies can form above reduced bodies that are covered by either overburden or barren rock. The depth of detection for oxidation anomalies is often too great for the mineralized body to be of economic interest. In arid climates, anomaly-to-background ratios for the oxidation suite commonly range between 5:1 to 50:1, and sometimes anomaly contrast exceeds 100-times background. Oxidation anomalies tend to have more subdued contrasts in humid climates.

Apical anomalies detected with the Enzyme Leach occur directly over the source of the anomaly rather than forming a halo around the source. Often these anomalies appear to form as the result of diffusion of trace elements away from a highly concentrated source. That source can be the actual source of the anomalous trace elements, or it can be a structure such as a fault that facilitates the movement of trace elements to the surface. Simple apical anomalies that lie directly over a buried mineral deposit will not show dramatic halogen contrast, as is typically found with oxidation anomalies. A fault-related anomaly will occur almost directly over the subcrop of the fault. The suite of trace elements represented in the anomaly will often be indicative of the chemical composition of the ultimate source of those trace elements. However, where a deeply buried reduced body is intersected by a fault, an oxidation suite of elements, including one or more halogens, can form an extremely-high-contrast anomaly directly over the trace of the buried fault. Otherwise, apical anomalies usually exhibit a diminished contrast above background, compared to oxidation anomalies. Fault-related anomalies commonly contain very-high-contrast concentrations of zirconium and other supposedly "immobile" elements.

Sample Collection

Although the Enzyme Leach can be used as a partial-analysis method for virtually any surficial geological material, the sample media most commonly analyzed with this method is *B*-horizon soils. Research to date indicates that amorphous MnO_2 in soils is most abundant in the *B* horizon. This horizon is the most chemically active part of the soil, with regard to the formation of oxide coatings on mineral grains. Studies in both arid and humid climates indicate that the sampler should be careful to collect soil samples from the *B* horizon.

The following information is based on observations from studies in glacially-buried terrain in northern Minnesota and Canada, desert pediments in Nevada, areas of extensive overburden in South America, test sites in the Colorado Front Range, and over oil fields in western Wyoming and southeastern Texas. Soil horizons vary in appearance and depth, even within relatively small areas. It should be emphasized that the samplers should be collecting material from a consistent soil horizon, rather than a consistent depth. Samplers should be encouraged to expose the soil profile whenever they encounter soil zoning that varies from previous observations. Before beginning, it is a good idea to observe soils profiles in ditches and trenches in and near the area to be sampled. The best potential sample sites are those that appear to be undisturbed and that have mature vegetation growing on and around the site. Samples collected from trenches and pit cuts are also good, as long as a fresh surface is scraped on the face of the soil profile to be sure that you are collecting freshly exposed material. Ditch banks, on the side away from infrequently used roads, under most circumstances can also be good sample sites, after scraping the bank to expose fresh material. The sampler should observe the conditions at such sites and make a judgement about the potential for contamination or of excessive disturbance. Road fill (new or old) is not usable sample material. Also, roads are often contaminated with a variety of pollutants that can linger for centuries. Plowed fields can provide usable samples, if an undisturbed site is not available. It is better to move a sample site a relatively short distance rather than to use a bad site just because it is at the specified spot.

<u>Desert-Pediment Soils</u>. There is an adage to the effect that desert soils are not zoned (azonal). In many cases this is not true. The appearance of the horizons is different from soils in humid climates, but they are still frequently zoned. The current surface on many desert pediments is more than one million years old, which is more than sufficient time for soil horizons to develop. Relatively little organic matter is found in *A*-horizon soils in desert climates. The *A* horizon is typically a light-gray to light-grayish-tan, loose, fine sand to silt. Descending through the soil profile, the *B* horizon begins where the soil is more cemented and slightly darker in color, often becoming slightly more brown than the overlying loose material. The brown color often becomes darker farther down into the *B* horizon, but in other cases, the color difference between the *A* and *B* horizons is almost imperceptible. Where the color changes are minimal, a key criteria is that the cementing of the grains in the *B* horizon often produces a weak blocky fracture that is absent in the *A* horizon. In areas that have a history of previous mining activity, the upper centimeter of the *A* horizon can be highly contaminated with many trace elements. Rarer elements, such as gold, can be enriched by as much as 10- to 100-times background. The *A* horizon should be scraped from the area around the spot to be

sampled for a radius large enough to prevent this contaminated material from trickling into the sample material. In areas of extreme aridity, such as the Atacama desert of South America, the sampler often will not find soil horizons. At most locations in that region the best level to sample is 25 cm to 40 cm beneath the surface. All the Enzyme Leach studies performed to date have used *B*-horizon soils collected above the caliche layer. Do not sample from the caliche layer or immediately beneath it. Caliche will produce extremely erratic Enzyme Leach data. Where caliche comes too close to the surface to collect a sample, move the sample site a short distance or abandon it. In the Atacama desert a reddish layer will often be encountered just above the caliche layer. This reddish color results from selenite that has formed in the soil. The presence of granular selenite in the soil does not detract from the results.

Humid Climate Soils. Sample sites with the best developed soil horizons are usually found in groves of trees. In northern climates, aspen groves are the best. The *A* horizon consists of an upper humus layer, a dark layer of mixed organic and mineral matter, and there may be a bleached mineral layer at the bottom. The bleached layer results from the reducing action of the overlying organic-rich layers, which dissolves oxide coatings on mineral grains. The top of the *B* horizon is the point below which there is no organic matter and where oxide coatings are found on mineral grains. Iron oxide coatings typically give *B*-horizon soils colors that are some shade of brown or red (dark brown, medium brown, light brown, brick red, tan, orange, etc.). Where the *A* horizon is quite thick, such as around bogs, there is often a faintly gray layer beneath the bleached layer of the *A* horizon. The faint gray color is due to manganese oxides, and this material is usable *B* horizon, if a darker colored *B*-horizon layer is not available. In a humid, forested area all the material comprising the *A* horizon of the soil (decaying leaf litter, humus, and organic-rich mineral layers) should be scraped away to reveal the *B* horizon. The sample is collected from 10 to 30 centimeters into the top of the *B* horizon. *A*-horizon contamination of *B*-horizon samples should be avoided as much as possible.

Mountain Soils and Glacially Scoured Terrain. Due to the rapid rate of mechanical weathering in mountainous areas, there are localities where the soil is truly azonal. Also, during Pleistocene glaciation, the regolith was completely removed in many areas and a chemically mature soil profile has not had sufficient time to redevelop. In such cases the sampler should dig deep enough to obtain soil material that is as free of organic matter as possible.

Sample Handling

Samples should consist of about 100 to 200 grams of material depending on the fineness of the soil. Coarser soils require more material to assure adequate sieved sample material for analysis. If at all possible, the sample should be air dried. If circumstances require the use of a drying oven, the temperature should not exceed 40°C, and the drying time should not be longer than is necessary to dry the sample. Too high a drying temperature alters the chemistry of the amorphous manganese dioxide coatings and drives out the volatile halogens and halide compounds. If in doubt, let the laboratory perform the sample preparation. They know which sieve sizes to use, and what steps must be followed to maintain the geochemical integrity of the sample material. Pulverized samples and samples that have been "cooked" are not suitable for analysis with the Enzyme Leach.

References

Clark, J.R., 1993. Enzyme-induced leaching of *B*-horizon soils for mineral exploration in areas of glacial overburden. Trans. Instn. Min. Metall. (Sect. B: Appl. earth sci.), 102: B19-B29.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

24,317

TWIN LAKE ZONE

KAMLOOPS MINING DIVISION

DRILL HOLE LOCATIONS

SCALE 1=2000	1995	N.T.S. 92 I/10 E.	FIG 1