# BRITISH COLUMBIA

# PROSPECTORS ASSISTANCE PROGRAM

# MINISTRY OF ENERGY AND MINES

# GEOLOGICAL SURVEY BRANCH

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1996 BCPAP PROSPECTING REPORT.

of 33 man days in the field during the total course of this program; as in 1995 every aspect of it including the draughting and preparation of the final report was done by myself. Due to unforeseen employment commitments the 1996 program had to be scaled down from what was originally proposed; nevertheless much valuable information was obtained.

This area of British Columbia is situated about 70 air kms. south-southwest of, and is on approximate strike with, the gigantic Sullivan Mine, in the town of Kimberley which has produced a third of the mineral wealth of British Columbia, its main commod-ities, lead, zinc and silver. Much closer, (ca. 14-22 kms) lie the former producing "Midway gold mine and the "St. Eugene" lead-zinc mine; both are northwards. In the past 15 years, several [redacted] major exploration companies, e.g. Cominco, Chevron and Minnova have conducted large programs in the vicinity of my claims; with the former currently having title to much of it. Most of the exploration seems to have been concentrated in the immediate vicinity of Mt. Mahon, though some has been done from the Moyie River south to Mon-tana. The rocks in this region are of Proterozoic age with the sediments belonging to the Aldridge, a sub-division of the Purcell System with intrusive "Moyie" gabbro sills. It is hypothesized that a "Sullivan-type" Sedimentary Exhalative ("Sedex") deposit may be loca-ted in this region. It is possible that such a deposit is located on my properties; according to the assessment files, very little or no mineral exploration has ever been done over the land encompassed by my claims previous to 1995.

Detailed Location and Access.

All of my claims are located on N.T.S. Map Sheet 82G/04W - "YAHK RIVER" and are in the Yahk Range of the Purcell Mtns. 65 air kms south of the town of Cranbrook & 660 kms. east of the city of Vancouver; they are adjacent to the state of Montana, highway #3 is only 16-22 kms west. The exact geographical coordinates for the legal corner posts of the relevant claims are: NIRVANA: Latitude 49°00'N (coinciding with the Canada/U.S.A. border), Longti-tude 115°51'W.; VALHALA: Latitude 49°04'N and Longtitude 115°55'W.

Both properties are easily accessible by 2 wheel drive pickup for most of the year. They are attainable by the Yahk Meadows Road (Hawkins Creek Rd.) which is wide and all-weather gravel - it commences easterly from highway #3 just north of bridge across Moyie River in the village of Yahk. One follows this road for 16.5 kms. before turning northward onto "Meadow Road" - a rough, steep but gravel road for ca. 4 kms. before reaching southwest corner of "VALHALA" claim. In order to attain the "NIRVANA", one continues on the Yahk Meadows Rd. to the 22 km. signpost, then turns southward unto a gravel logging road and follows it for 2.5 kms. before the northwest corner of the NIRVANA is encountered. The northeast corner of it, is most easily accessed by staying on Yahk Meadows Rd. to the 24 km. signpost & then turning southwards on another road and following it for ca. 3 kms. As cliffs or ravines are absent from these claims even at the highest elevations, all sections are easily accessible by foot.

GEOLOGICAL SUMMARY OF SOUTHERN PURCELL MOUNTAINS

Most of southeastern British Colubia is underlain by the Purcell system,which is divided here into 5 main units:Aldridge,Creston,Kitchener,Siyeh and Gateway;this system is of mid-Proterozoic Helikian age. The Purcell rocks,which consist mainly of fine grained clastics and carbonates,were laid down in the "Beltian Trough",a simple elongated geosyncline in which up to 45000 ft.of dominantly shallow water sediments accumulated. The Aldridge Fm.totals 15000 ft.in thickness of which only 400' belong to the Lower Aldridge;the latter is notable for its rusty appearance in outcrop due to abundant iron sulphides,silicates and carbonates. It also features fine grained laminated quartzite and dark argillite with graded bedding,scour&fill structures,etc,indicating deposition in deep water. The Middle Aldridge,which is 9000 ft,thick is more ordered with less turbulence indicated and contains less disseminated sulphide. The Aldridge is divided in southeast B.C. into 3 main structural blocks by the northeast trending Cranbrook and Moyie faults. Each of these blocks forms a broad,northeast plunging anticline and it is in the anticlinal axis of the most northerly structural block that the Sullivan Mine is situated. The sediments in the Aldridge have been metamorphosed to the Upper Greenschist facies and are intruded by conformable gabbro sills-the "Moyie"rocks.

The Mt.Mahon area is situated in the southernmost structural block-the"MOYie" and is underlain by Middle Aldridge Sediments and Moyie gabbro;these Moyie sills vary in composition from diorite to gabbro and from fine to coarse grained. The sediments are constituted of medium bedded quartzose greywacke intercalated with thin bedded siltstone, argillite and rare conglomerate occurring northeast of Mt.Mahon. As the Mt.Mahon sediments rarely reveal graded bedding,ripple marks,etc.,they are probably representative of a thick turbiditic sequence. All the sediments in the Stone Creek area just northward, belong to the Middle Aldridge;they are mainly siltstone with minor argillite and the Moyie River fault transects it in a west-southwest to east-northeast orientation. The boundary between the Lower and Middle Aldridge intersects the Sullivan orebody and this division extends with a shallow dip across the Mt.Mahon area;the summit of it is the top of a northeast plunging anticline which dips 15°-25°. On the south flank of Mt.Mahon are tourmaline rich argillite and a little tourmalinite-a massive,very hard,black,cherty appearing rock composed of very fine grained tourmaline needles. Tourmaline is an important indicator mineral at the Sullivan Mine;thus its prescence here on Mt.Mahon combined with its Lower/Middle Aldridge stratigraphy has caused area to be a very significant mineral exploration target.

The Sullivan Mine is a gigantic 160 million ton lead-zinc-silver deposit grading 10% combined lead and zinc with ca.68 grams/Tonne silver;it is underlain by tourmalinisation and overlain by an albite-chlorite alteration halo. The ore minerals show excellent stratification and conformability with the enclosing sediments. It comprises high temperature replacements of thin bedded argillite of the Aldridge formation with the orebody lying on the east side of the Purcell Anticlinorium. The source of the ores has traditionally been advocated as epigenetic,with their genesis from the source magma of the Moyie Intrusions or alternatively the sources for the ores may lie elsewhere and these intrusions may have supplied the energy to ultimately engender this deposit. The hydrothermal theories vie with a syngenetic one which roughly states that the ores were deposited in the rocks as sediments and that they were reconstituted by regional metamorphism. Recently this latter theory has gained adherents,partially because the iron-bearing minerals tend to be associated with primary sedimentary features. The lead,silver(and tin) tend to be most abundant towards the centre of the orebody,whilst towards the periphery zinc and antimony predominate. The St.Eugene Mine which produced from 1899-1929 lies just north(15 kms.)from Mt.Mahon;from about 1 million tonnes of ore were extracted 14% lead,5%zinc and 6 ozs./T. silver from a steeply dipping massive sulphide vein. The past producing Midway Gold mine lies a few kms.south of the St.Eugene;gold occurred here in a northerly striking quartz vein which cross-cuts Middle Aldridge rock.

## SUMMARY of PREVIOUS MINERAL EXPLORATION in REGION

In the early eighties to the present much mineral exploration has been carried out in the Mt.Mahon area ;though according to the assessment files very little was done in previous decades. Around 1907 R.Daly traversed this area during his monumental "Mapping of the Cordillera at 49th paralell",though none of his observations directly concern the area in question. According to the files,the first recorded work done here was in 1966 by KennCo Explorations in the Stone Creek watershed. They conducted a soil geochemical survey,taking ca,200 samples;but the results were apparently negative and no further work is recorded by them. From 1978-1981 St.Eugene Mines did work near the summit of Mt.Mahon including staking,mapping and diamond drilling;in 1980-81 Falconbridge was also active in this region. Just north of here in 1981, on ground owned by B. Downing,ground VLF-EM and Magnetic surveys were performed on a 4.5 km.cut grid,but no anomalies were recorded for either survey. During this period,the "LARCH"group (now encompassed by the "CANAM"group)which lies just west of the XANADU, was staked by St.Eugene Mines,centred on Latitude 49°04'N.and Long.115°58'W. In early eighties they drilled 6 BQ holes with assays done for gold,silver,copper,lead and zinc but nothing encouraging was encountered.. They drilled to test EM-16 conductors and to acquire basic geological information as outcrop here is minimal. Thin pyrite seams were postulated to be the cause of the conductors;1 hole was entirely in gabbro,2 in Aldridge sediments with 3 in both lithologies. In 1980,a total of 237 soil samples were taken on a total of 20 kms.of grid-lead and zinc were found to be just barely anomalous locally. Immediately north of LARCH group lied the COLD group from which 142 samples were collected,whilst west on the RYAN group,St.Eugene Mines took 82 soils from 32 kms.of established grid;apparently geophysics and prospecting was done over it,though there is no specific mention made in the files. In any case nothing anomalous was in dicated by these latter geochemical surveys.

By 1983 Chevron Minerals had acquired "St.Eugene"s Mt.Mahon ground and in 1983-84 they did gravity surveys over it,which were quite inconclusive,albeit 2 gravity anomalies were said to be revealed. They also carried out major geochemical,geological and an EM-37 survey on land just 2 kms.west and northwest of the VULCAN on 13 kms.of cut grid;they collected a total of 1092 soil samples,but they analyzed only for lead,zinc, and copper. The geological mapping was conducted at a scale of 1;5000 along grid lines, even though outcrops are quite rare here;the EM-37 survey found "little of Interest". It was apparently the discovery of tourmaline in sediments near Mt.Mahon that piqued the interest of CHEVRON. In 1983 they also worked their TNT group which lies just west of Mt.Mahon;only mapping/prospecting was recorded even though less than 10% of area features exposed bedrock. The lithologies in this area are mainly sandstone with a little siltstone and argillite. In 1984 they drilled a vertical BQ hole of 473 metres @summit of Mt.Mahon to test the extent and charachter of the tourmaline. Only traces of this mineral were noted though 1-3% pyrrhotite was in bottom 2/3 of hole,but only traces of lead and zinc were noted. CHEVRON mapped at least 4 stratiform tourmalinite zones on their Mahon property which indicates stratigraphic proximity to the Lower/Middle Aldridge contact-on which interval the Sullivan Mine lies. These zones seem to lack lateral continuity,but a paucity of outcrop renders this idea speculative. CHEVRON hypothesized that the thick overburden in this region might mask any metal anomalies in the soil(which could also explain the author's poor results). In 1987 they drilled a 1611 metre sub-vertical hole,near their 473 m.1984 one. Only the first hundred metres of this hole lies in Middle Aldridge,with the remainder in lower Aldridge sediments;short sections of gabbro and granophyre were also intersected. In 1991/92 CHEVRON drilled 6 NQ holes for a total depth of 1320 metres collared in the hangingwall of tourmalinite exposed on the south and southwest flank of Mt.Mahon. On this core a total of 37 whole rock analyses and 46 geochemical assyas were done;these drill holes intersected Middle Aldridge turbidites but apparently nothing economic was revealed.

Just north of Mt.Mahon area lie the headwaters of Stone and Sundown Creeks upon which exploration of a moderate intensity has occurred since the early eighties. KOKANEE Explorations was active here on their LEO claims during this time;they collected a total of 490 soil samples which were found to be anomalous in copper,zinc,lead and barium. No further work by them is recorded however. In 1987 MINNOVA staked 301 units in the Stone Creek area and conducted a major exploration program including geochemistry,geology and geophysics on a block of ground extending from Moyie River(near the Midway Mine)south to CHEVRON'S MAHON claims. They completed geological mapping at a scale of 1:10000,collected 226 lithogeochemical samples&cut 15 kms.of grid upon which they performed a CSMAT survey-"Contolled Audio-Magneto-Tellurics". This survey was done to evaluate the property for zones of low resistivity, which could indicate the presence of conductive sulphide mineralisation, and also to reveal any structure transecting the Lower/Middle Aldridge contact and to ascertain its depth. MINNOVA in 1988 did an abortive 15 kms.of Gravity surveying which was essentially a waste of time due to ruggedness of terrain. From 1989-91 they conducted modest drilling programs in order to test the stratigraphy of the area and also several geophysical anomalies;these holes mainly intersected gabbro and sediments derived from turbidite sequences. In 1990 they also did lithogeochemistry and mapping.

The SUN claims lie northeast of the STONE group,with the Midway Mine immediately adjacent;in 1992 they were held by G.M.Rodgers. In the mid eighties,a bit of hand trenching was done on them in stratabound lead-zinc mineralisation. In 1992 along cut grid lines,11.2 kms.of VLF-EM and 3 kms.of Magnetics were completed;as is typical the VLF-EM recorded a couple of conductive zones but no Magnetic anomalies were revealed. In the same year,190 soil samples were picked up;of the analyzed elements only zinc was found to be anomalous.

COMINCO acquired the CANAM group through staking from 1989-1991;by the end of the latter year,they held 355 units grouped into 42 claims-they hold much ground immediately adjacent to mine. They envisage that Lower Aldridge rocks occur on the west side of their block,with the central and east regions underlain by Middle Aldridge. In 1990 they drilled 2 BQ holes on the former LARCH group of ST.EUGENE MINES for a total of 190 metres, encountering gabbro and Aldridge sediments. From 1990 to 1993 they have completed several UTEM surveys-"University of Toronto style ElectroMagnetics";in 1992 they did 20 kms.of line and in 1993 32 line kms.of UTEM on their CANAM group;mainly on geochemical anomalies(none of them specifically mentioned). The latter survey was done on a soil geochemical anomaly just west of South Hawkins creek where there is very little exposed bedrock. In 1991 COMINCO drilled 3 holes for a total of 869 metres ca. 1-3 kms. west of author's UTOPIA claim centred on Latitude 49°01'N and Long.115°57'W. Two of them were drilled to test a lead-zinc anomaly(soil) on the east slope of a hillside; both intersected Middle Aldridge Sediments consisting of alternating quartzites and argillites varying in bedding thickness and a part of a turbidite sequence,with some gabbro intersected in the first hole. One hole cut minor sphalerite and less galena with the rare fractures and quartz veins hosting minor zinc,lead and pyrite;it reached a depth of 344 metres and was drilled westward at a dip of -47°. The second hole was put down at a similar orientation attaining a depth of 206 metres with only very minor disseminated sphalerite noted. The third hole drilled was 2 kms.east of the previous attaining a depth of 319 metres;it was drilled due west@Dip of-68°. Middle Aldridge Sediments were cut including quartzites,limey greywackes,a no.of widely scatterred pyrrhotite laminations with the hole ending in gabbro. No major conclusions have been deduced as yet from all this exploration as the programs are on-going.

1995

DETAILED GEOLOGY OF AUTHOR'S CLAIMS in the YAHK RIVER AREA

Despite the quite large area encompassed by the three claims of the author, there is very little exposed bedrock on them. Perhaps only 5% of the XANADU features outcrop-it being confined to the claim's northwest portion and a strip along the Freeman Creek roadcut. Barely 10% of UTOPIA HAS OUTCROP,WHilst perhaps 7% of the VULCAN does;indeed with the exception of the latter claim,exposed bedrock is not more prevalent on the topographically higher regions. Judging by the steeper hillsides and roadcuts,the overburden layer seems very thick;undoubtedly this has hindered conventional prospecting in the past and may even impede the usefulness of soil geochemistry. As one would expect,creek ravines and roadcuts tend to expose bedrock,although the latter tends to run along the strike of a formation for long distances. Only a few differing lithologies were noted and though the claims lack contiguity,the similarity of their rocks permits them to be discussed together.

Probably the most volumetrically abundant lithology on my ground is the Moyie gabbro which tends to form larger and more topographically prominent outcrops than the sediments;(not strange as it is generally more resistant to erosion). This mafic igneous rock varies considerably both in colour index and grain size. The crystals range from barely 1 mm.to locally(on northwest corner of Xanadu) 3 cms.;the latter featuring long horneblende sheafs-though a more typical size range is 3-7 mms. The colour index varies from 40-70 with plagioclase generally the only felsic mineral and amphiboles(chiefly hornblende?) the only mafic minerals notable in hand specimen. Judging by the rocks low magnetic response,magnetite must be fairly rare. This lithology is invariably massive,dark green and usually appears quite fresh,though locally it can be very rusty . Even the rustiest gabbro reveals only traces of finely disseminated iron sulphide,with rare,rusty,grey quartz veins noted on the central UTOPIA;a couple of the veinlets also contain epidote and carbonate. The veins vary in width from 0.3-20 cms.with none observed longer than a couple metres. A couple samples from this lithology were collected, but the assays revealed nothing of interest. One distinctive variation of the gabbro was noted on the east-central UTOPIA -here is medium grained quartz (ca.20%) in the matrix. This rock could be termed "Tonalitic";it has a significantly lower Colour Index-ca. 30;it is massive,medium grained,quite fresh and is mainly light grey to rarely light green. It was not found elsewhere on any of the staked ground.

The second major lithological division is Aldridge sediment,which on the basis of hand specimen viewing has been split by myself into 3 separate categories even though they are probably all mutually gradational. The "typical sandstone" has a great colour variation,ranging from buff to light grey,light green,pink to brownish and is often externally rusty. It ranges from well-bedded to zones where bedding planes and thus attitudes are indiscernable;but where noted vary from 10-50 cms. ,thus quite thick.

Grain size ranges very fine to sometimes medium;it is impossible to differentiate the type of mineral constituents in the former varieties though quartz seems to be a predominant component. Muscovite (sericite?)is locally common with small amounts of biotite, ,chlorite and probably feldspar,although most of the rocks mapped are probably arenites. One lithological variation is a type so fine grained,it could be termed a siltstone-these are mainly ochre to brownish and although mapped as a distinct unit,may have an identical composition to the Sandstones. A third type is more distinctive and was noted mainly on the VULCAN CLAIM-this is a dark grey,very fine grained, argillaceous rock which seems to contain appreciable quantities of carbonate. These "limey" rocks often fizz only slightly however,so they may contain much dolomite and (judging by their colour)siderite. This lithology may be economically significant, as on the east edge of the VULCAN they host locally abundant stringers of iron sulphide. Wherever discernable the attitude of the beds features strikes of 020° to 055° with dips generally fairly shallow @20-40°.

GEOCHEMICAL DISCUSSION OF SOIL AND ROCK SAMPLES collected in 1995.

A total of 78 soil samples and a dozen rock samples were collected from the three claims;these were all sent to CHEMEX LABS. in North Vancouver,B.C.for geochemical analysis and assaying.(All results are included in this report).Only the"B" horizon material was collected from the soils during the course of the survey,done mainly along grid lines ;each sample weighed about 250 grams and were placed in brown paper bags. Each one had the 32 element I.C.P-A.E.S.procedure done on it-the results for all economic metals yielded in parts per million. A total of 25 samples were taken from the UTOPIA,41 from the XANADU and a dozen from the VULCAN. Although no geochemistry was done for gold per se,several"pathfinder" elements such as arsenic and tungsten were. As is easily deduceable from the geochemical results,no major anomalies were observed. None of the gold pathfinders were even remotely abnormal-all yielded less than 10 ppm. The main elements of interest in this area-lead,zinc,copper and silver,all virtually occur in essentially background amounts with the exception of a few zinc and copper results-and even these occurred in amounts of less than 150 ppm. The highest copper value on the UTOPIA originated from the north edge of the claim;whilst on the XANADU it came from the northwest corner;zinc is slightly more abundant on the latter with 3 analyses yielding over 100 ppm Zn,all originating from the northwest corner of the claim. The only zinc assay exceeding 100 ppm on the UTOPIA is only 100 metres from the site of the highest Cu value. According to some,zinc soil geochemical anomalies . . are often of little significance. Nothing anomalous was indicated by the soils collected from the VULCAN claim,though only a few were taken from here. Quite high amounts of barium were recorded over much of the properties-up to 360 ppm,but this is not too economically significant as it is a relatively common but dispersed element in nature.

Visible sulphide mineralisation was very rare on the claims and usually it occurs as tiny specks of iron sulphide. Amounts of up to 2% pyrite were found in portions of the gabbro and their rare allied quartz veins on the UTOPIA; these were sampled and found to be totally barren in any economic metals, which is not surprising as the exploration targets in this region are in the sediments. In fact 3/4 of all rocks that I assayed were from the sediments-these were chosen mainly for the amount of visible sulphide present, and the fact that so few were taken, is a function of the apparent barrenness of the rocks. Limey argillite from 2 separate locations on the east edge of the VULCAN featured iron sulphide stringers several mms. wide and constituting up to 15% of the rock, they were both sampled . Significantly they yielded the highest gold assay-just 10 ppb, the best copper-64 ppm and zinc-138 ppm of any of the rock samples, though of course with the possible exception of the latter, these results are just barely anomalous. A subanomalous zinc value of 98 ppm was derived from the northwest corner of the VULCAN-again from limey argillite and 102 ppm from the northwest corner of the XANADU. However of a total of a dozen rock samples, 8 show slightly higher amounts of zinc than the background of this area (which is ca. 45 ppm Zn). The best lead result obtained-24 ppm was derived from the southern part of the UTOPIA-very low but still higher than background (12 ppm).

Although none of the geochemical results are spectacular, nevertheless a few trends seem evident. Most of the highest geochemical values obtained are adjacent to areas, e,g. east of VULCAN, THAT are currently (as of late 1995) open for staking; areas which contain limey argillite are certainly worthy of future investigation. The geochemical survey was completed before the geophysics, which is why no soil geochem. was ever done over the central UTOPIA WHERE a modest magnetic high co-incides with rusty, sheared gabbros. Due mainly to budgetary constraints, no geochem. was performed on the south UTOPIA or VULCAN OR in rusty gossanous zones adjacent to road cuts; all of these areas have a high priority of investigation in the near future. A Lanthanum anomaly of 120 ppm is situated in the north-west corner of the Xanadu with a high Zinc & Copper anomaly found in the Soils here.

Discussion of 1996 Soil Geochemical Survey.

A total of 141 soil samples were collected from the Nirvana & Valhala claims - 74 from the former and 67 from the latter. Only the "B" soil horizon material was taken during this survey, which was done mainly along grid lines; each sample weighed ca. 200 grams & was placed in a "Kraft" bag. They were sent to TSL Assayers Labs. of Missis--sauga, Ontario where a 30 element ICAP plasma scan was performed on them. The proce--dure entails a 1 gram sample chosen from each bag & digested with 2 millilitres of $HCl/HNO_3$ acid @ 95°C. for 90 minutes and then diluted with 10 ml. of $H_2O$. The results for all "econo--mic metals" are yielded in parts per million whilst "common" elements such as Calcium are expressed as percentages. The main elements of economic interest in this region are gold, lead, silver and zinc. However the occurrence of boron is deemed to be economically favour-able due to its relationship with the Sullivan ores; in any case it was indetectable in my samples. Several gold "pathfinder" elements such as arsenic and tungsten are included in the assay package, but they all occur in minimal amounts in all 141 samples.

Although only a few samples were collected from east half of the Nirvana, these gave the best results from this property. Sub-anomalous copper-zinc-nickel-cobalt occur together from 70-110 ppm for 1st 3 and 35 ppm for latter (as Co normally 10 ppm background, this is sub-anomalous). It is surprising to note the relative abundance of nickel and cobalt as they normally occur in quite mafic rocks and these lithologies should be very rare here judging by the Magnetometer results. The paucity of lead, which tends to occur with zinc is somewhat unusual, though it is quite rare throughout the claim. Despite the large amount of sampling done on the western side of the claim, nothing was even sub-anomalous. Zinc is sub-anomalous throughout that sector of the Valhala claim that was sampled, generally attaining values of 100, and ranging up to 270ppm (which is notably anomalous). However with the exception of one assay of 13ppb lead, no anomalous amounts of other metals were yielded. According to some authorities, zinc soil geochemical anomalies are often of minor significance, though here the high zinc values correlate with sub-

anomalous barium i.e. 200-540ppm. More soil samples ought to be collected from the eastern portion of the Nirvana - especially from Line 19E where modest magnetic anomalies suggest the presence of mafic plugs with perhaps nickel and cobalt, as hints of these elements originate from the soils here. Although both claims were thoroughly prospected no rock samples were deemed worthy of analysis; this is not as negative as it seems however, because of the rarity of outcrop.

## Principles and Methodology of Magnetic Surveying

An MP-2 portable proton-precession magnetometer manaractured by Scintrex of Concord, Ontario was utilized for the ground Magnetic survey. It consists of 2 separate portions: the sensor and console, which are connected by a cable; the total weight of the Unit including batteries is 3 kg. The sensor is either staff mounted or carried in a back-pack; for steep terrain or dense brush, the latter is quicker, but the former position yields more accurate results. The instrument utilizes the phenomenom of nuclear magnetic resonance to measure the flux of the total magnetic field. The MP-2 sensor consists of a chamber, filled with a proton-rich fluid, such as kerosene, enclosed within 2 coils. When a current is briefly passed through the coils, a magnetic field is engendered which aligns the spinning protons; when it is switched off, the protons precess around earth's magnetic field, eventually re-aligning with it. This precession induces a small, exponentially decaying AC signal whose frequency is proportional to the flux of the ambient magnetic field. The magnetic method consists of measuring this frequency, by the console of the MP-2, which converts it to a gamma value & displays it digitally. The resultant magnetic field of the earth's magnetism affecting lithologies possessing different magnetic charachteristics, is the value measured. This field is the vector sum of induced and remanent magnetism. The magnetic field at any particular locality is determined by 3 factors: 1. Strength of Earth's Magnetic Field. 2. Magnetic susceptibility of the bedrock and 3. The remanent magnetism of the rocks. The MP-2 unit has a resolution of 1 gamma and a range of 20,000 - 100,000 gammas.

The magnetic value yielded by a lithology is mainly a function of its magnetite content, as it is the only widely distributed, strongly magnetic mineral; e.g. pyrrhotite and cobaltite are less magnetic and/or much rarer. Mafic and even more so ultramafic lithologies tend to have more magnetite, thus this is a very useful tool for sub-surface geological mapping, not only for their approximate identification, but also in revealing structural features such as faults. This is of vital importance on the relevant claims which host barely 5% exposed bedrock. The geomagnetic field is variable both in space & time, but long term secular variations may be neglected in surveying, but not short term ones. These often occur within periods of hours and minutes; during magnetic storms the magnitude of variation may attain several hundred gammas. During the course of even a normal survey day, variations of a few hundred gammas are common in many areas. This is the main inherent weakness of this method, but it can be compensated for in 2 ways. The most accurate, quickest (but most expensive) is to establish a base station magnetometer from which continuous readings are obtained during the duration of the survey. As this location is constant, accurate corrections are derivable from the obtained values. An alternative field procedure is to take periodic repeat measurements at convenient traverse points on the survey grid. Thus changes in magnetic intensity can be accounted for. This latter method chosen by author.

Discussion of Results of 1996 Magnetic Survey.

Magnetic responses obtained over the Nirvana & Valhala were even more subdued than those derived from adjacent claims in 1995; as last year, the contour interval chosen was 100 gammas. The highest single value obtained was only 57452 gammas for the Nirvana & 57453 for the Valhala; as the magnetic background for these claims is 57050, this is merely 400nT above it. The lowest reading recorded was 56813 (from west of Valhala) yielding a total difference of only 600 gammas; ca. 60% of the stations yielded values in the narrow interval of 57000-57100nT. As I determined, the diurnal variations of the magnetic field were generally quite minimal, so daily corrections were often superfluous. There were no higher magnetic responses noted over the few areas of exposed bedrock, whether Diorite or sediment or any recognizable differences between them. On the Valhala, the greatest values were obtained from Line 8E (on the central sector) and from Line 19E on the Nirvana (near the eastern edge). The "anomalous" zones (slight as they are) approximately trend north-south, which is roughly the strike of the sediments. Perhaps specific sub-surface strata are slightly more abundant in magnetic minerals or possibly areally small mafic intrusions occur. In any case the derived low magnetic values indicate the paucity of magnetite here & offer very few clues as to the location or even possibility of an economic orebody occurring on the Nirvana or Valhala.

Detailed Geological Description of NIRVANA & VALHALA Claims.

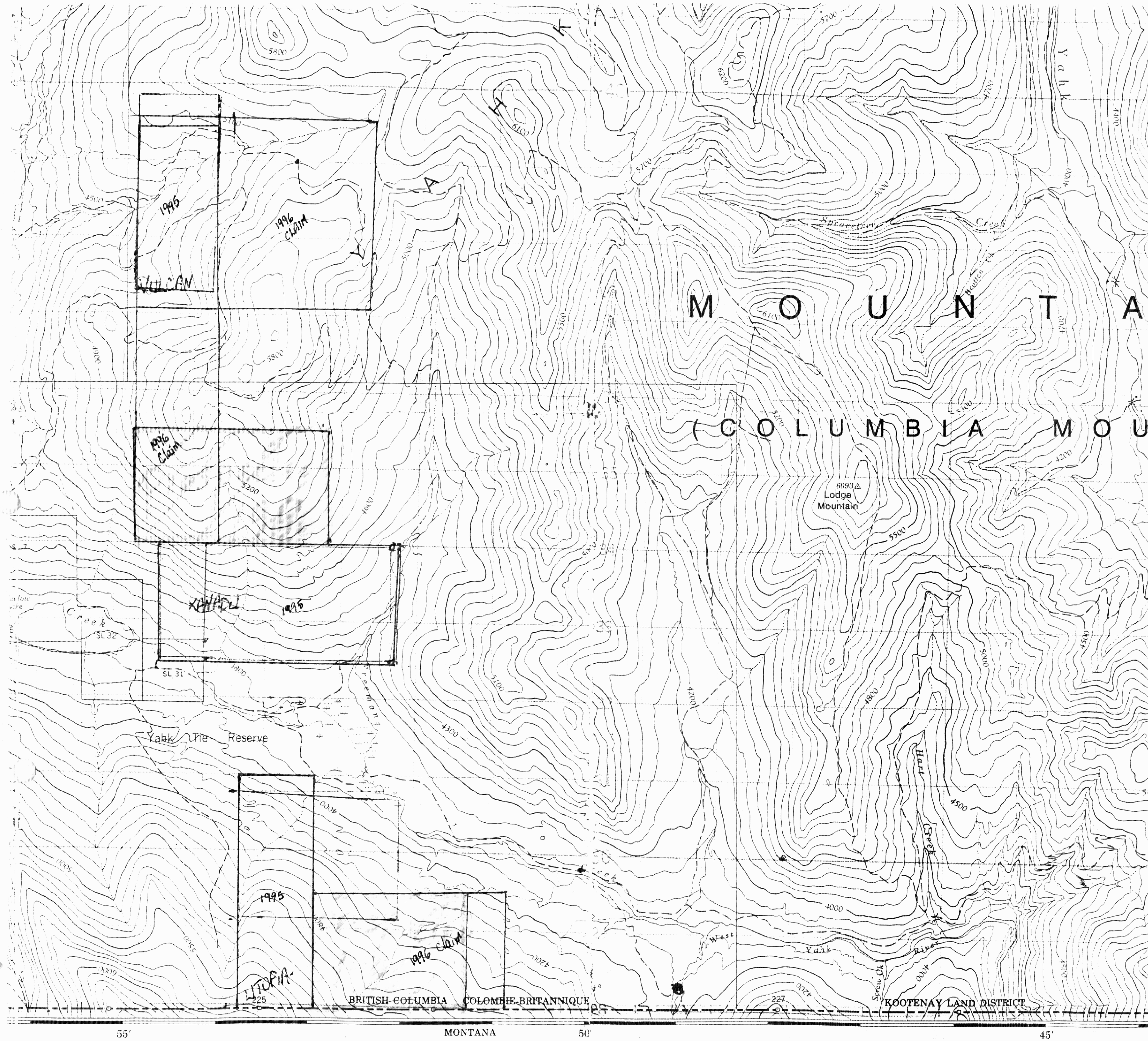
The preceding geological report written in 1995 concerning my adjacent claims which were mapped and prospected in detail, gives a concise and detailed description of the rocks mapped in 1996 on the Nirvana and Valhala. Outcrop is very minimal on both, amounting to about 5%; though on the Valhala it forms a prominent steep knoll on the north edge of the claim. The western topographically lower side is composed of light grey, slightly rusty, calcareous siltstone, grading to fine grained sandstone with mainly indiscernable bedding planes. A similar though slightly coarser grained rock with distinct strata, occurs along the Meadow Lake roadcut & they strike south-southeastwards and dip shallowly east. Typical massive dark green diorite, mainly medium grained occupies the remainder of the aforementioned hill, with essentially identical rock occurring southwards & also near the extreme south-west corner of the claim.

Exposed bedrock is just as sparse on the NIRVANA claim with large areas totally devoid of it; none was noted on the entire eastern half of the Valhala. As on the latter, the NIRVANA tends to have outcrop along roadcuts and on its north and south fringes; the orientations of the strata where measurable, are quite similar on both claims. Greyish, slightly rusty, fine to medium grained calcareous sandstone was noted on the north-central sector and both near the southeast and southwest corners. A relatively large outcrop of similar lithology straddles the Canada/U.S.A border, though very little of it occurs on the Nirvana. A somewhat distinctive lithology also occurs near south edge of Nirvana - it is a moderately soft, fine grained, off-white to pink, calcareous rock with abundant quartz, indiscernable bedding planes and is often externally iron altered. Several outcrops of "typical, massive, medium grained diorite" occur just north of the Nirvana but only 2 outcrops of this lithology were noted on it; A small one on the south central area and another near the northwest corner.

## Recommendations for Future Exploration in Area

Due to the rather disappointing prospecting, geochemical and geophysical survey results, one could easily conclude that the area encompassed by my claims has quite little economic mineral potential. However more geochemistry should be done on the eastern halves of the Valhala & Nirvana. Additionally a VLF-EM survey could be easily accomplished over them, as comprehensive grids have already been established. All of the prospective ground north of Valhala has all been recently claimed, whilst the land immediately west has undergone much advanced exploration. The relative paucity of outcrop does make it difficult to prospect in a conventional sense, thus much of it has received less attention than other regions, potentially increasing the odds for an economic discovery. Vast Tracts open for staking and thus mineral exploration, extend eastwards to Yahk River and beyond, though whether their economic potential justifies even a modest exploration program is difficult to judge.

Proposed Exploration area 1996
Montana
10
11
12
13
ROGERS PASS NATIONAL HISTORIC SITE
LAKE LOUISE
GOLDEN
BANFF
CANMORE
REVELSTOKE
SICAMOUS
KAMLOOPS
SALMON ARM
ENDERBY
ARMSTRONG
SPALLUMCHEEN
VERNON
COLDSTREAM
KELOWNA
PEACHLAND
SUMMERLAND
PENTICTON
OLIVER
OSOYOOS
PRINCETON
MERRITT
LOGAN LAKE
GREENWOOD
GRAND FORKS
ROSSLAND
TRAIL
CASTLEGAR
NELSON
NAKUSP
NEW DENVER
SILVERTON
KASLO
INVERMERE
RADIUM HOT SPRINGS
KIMBERLEY
CRANBROOK
FERNIE
SPARWOOD
ELKFORD
CRESTON
MOUNT REVELSTOKE NATIONAL PARK
GLACIER NATIONAL PARK
MOUNT ASSINIBOINE PARK
PURCELL MOUNTAINS
SELKIRK MOUNTAINS
COLUMBIA RIVER
KOOTENAY LAKE
UPPER ARROW LAKE
LOWER ARROW LAKE
OKANAGAN LAKE
SLOCAN LAKE
Moyie
Kingsgate
Yahk
Eastport
Porthill
Rykerts
Newgate
Roosville
EUREKA
84 J12 DREWRY POINT



M O U N T A
( C O L U M B I A M O U
6093
Lodge Mountain
1995
1996 Claim
VULCAN
1996 Claim
1995
1995
1996 Claim
UTOPIA
SL 32
SL 31
Yahk The Reserve
Hart Creek
Yahk River
BRITISH-COLUMBIA
COLOMBIE-BRITANNIQUE
KOOTENAY LAND DISTRICT
225
227
MONTANA
55′
50′
45′

MR. GUY ROY[illegible]R

ATTN: G. ROYER

PROJ: LITOPJA

S4052

# TSL/ASSAYERS Laboratories

[illegible] REWSTER DRIVE, UNIT 3 MISSISSAUGA, ONTARIO L4W-1A4

[illegible] (905)602-8236 FAX #: (905)206-0513

REPORT No. M8192



FILE No. [illegible]

DATE [illegible]-1996

## I.C.A.P. PLASMA SCAN

[illegible]

| SAMPLE # | Ag ppm | Al % | As ppm | B ppm | Ba ppm | Be ppm | Bi ppm | Ca % | Cd ppm | Co ppm | Cr ppm | Cu ppm | Fe % | Mg % | Mn ppm | Mo ppm | Na % | Ni ppm | P ppm | Pb ppm | Sb ppm | Sc ppm | Sn ppm | Sr ppm | Ti ppm | V ppm | W ppm | Y ppm | Zn ppm | Zr ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N.V. 1E 0N | < 1 | 1.2 | 10 | < 10 | 32 | < 1 | < 5 | 0.10 | < 1 | 5 | 11 | 41 | 1.[illegible] | 0.26 | 140 | < 2 | 0.02 | 11 | 270 | 10 | < 5 | | | 17 | 850 | 51 | < 10 | 7 | 41 | < 1 |
| N.V. 1E 100N | < 1 | 2.[illegible] | < 5 | < 10 | 55 | < 1 | < 5 | 0.11 | < 1 | 12 | 15 | 36 | 2.4 | [illegible] | 190 | < 2 | 0.02 | 15 | 690 | 12 | < 5 | [illegible] | [illegible] | 12 | 1500 | 39 | < 10 | 8 | 69 | 8 |
| N.V. 1E 200N | < 1 | 2.0 | < 5 | < 10 | 81 | < 1 | < 5 | 0.10 | < 1 | 12 | 14 | 27 | 2.4 | [illegible] | 120 | < 2 | 0.0[illegible] | 19 | 630 | 11 | < 5 | 3 | < 10 | 10 | 1300 | 41 | < 10 | 19 | 46 | 9 |
| N.V. 1E 300N | < 1 | 1.2 | < 5 | < 10 | 40 | < 1 | < 5 | 0.28 | < 1 | 5 | 10 | [illegible] | 1.8 | 0.30 | [illegible] | < 2 | 0.03 | 10 | 350 | 7 | < 5 | 4 | < 10 | 7 | 930 | 38 | < 10 | 6 | 37 | < 1 |
| N.V. 1E 400N | < 1 | [illegible] | < 5 | < 10 | 42 | < 1 | < 5 | 0.[illegible] | < 1 | 8 | [illegible] | 14 | 1.9 | 0.27 | 200 | < 2 | 0.04 | 10 | 220 | 5 | < 5 | [illegible] | < 10 | 11 | 870 | 40 | < 10 | 6 | 39 | < 1 |
| N.V. 1E 500N | < 1 | 1.7 | 5 | < 10 | 91 | < 1 | < 5 | 0.17 | < 1 | 7 | 10 | 32 | 2.[illegible] | [illegible] | 110 | < 2 | 0.03 | 11 | 180 | 12 | < 5 | [illegible] | [illegible] | [illegible] | 1100 | 31 | < 10 | 8 | 34 | 2 |
| N.V. 1E 600N | < 1 | [illegible] | < 5 | < 10 | 220 | < 1 | < 5 | 0.17 | < 1 | 16 | 16 | 47 | 1.2 | [illegible] | 140 | < 2 | 0.0[illegible] | 25 | 380 | 13 | 5 | 2 | < 10 | 20 | 1500 | 51 | < 10 | 23 | 58 | 3 |
| N.V. 1E 675N | < 1 | [illegible] | < 5 | < 10 | 120 | < 1 | < 5 | 0.28 | < 1 | 16 | 12 | 41 | 2.2 | 0.28 | 140 | < 2 | 0.03 | 15 | 270 | 8 | < 5 | 3 | < 10 | 12 | 1400 | 44 | < 10 | 16 | 43 | < 1 |
| N.V. 1E 800N | < 1 | [illegible] | < 5 | < 10 | 150 | < 1 | < 5 | [illegible] | < 1 | 13 | 15 | [illegible] | [illegible] | [illegible] | 210 | < 2 | 0.03 | [illegible] | 290 | 12 | < 5 | 4 | < 10 | 28 | 1400 | 40 | < 10 | 13 | 53 | 1 |
| N.V. 1E 900N | < 1 | [illegible] | < 5 | < 10 | 100 | < 1 | < 5 | 0.29 | < 1 | 13 | 14 | [illegible] | 2.2 | 0.40 | 340 | < 2 | 0.03 | 18 | 210 | 12 | < 5 | 4 | < 10 | 16 | 1100 | 42 | < 10 | 13 | 46 | < 1 |
| N.V. 1E 1000N | < 1 | 1.4 | < 5 | [illegible] | 72 | < 1 | < 5 | 0.11 | < 1 | 5 | [illegible] | [illegible] | 1.6 | [illegible] | 100 | < 2 | 0.0[illegible] | 8 | 1000 | 11 | < 5 | 3 | < 10 | [illegible] | 820 | [illegible] | < 10 | 5 | 34 | < 1 |
| N.V. 1E 1100N | < 1 | [illegible] | < 5 | [illegible] | [illegible] | < 1 | < 5 | 0.12 | < 1 | 15 | 12 | [illegible] | 1.9 | [illegible] | 110 | < 2 | 0.02 | 16 | 300 | 12 | < 5 | 4 | < 10 | 16 | 970 | 30 | < 10 | 13 | 39 | 3 |
| N.V. 1E 1200N | < 1 | 1.3 | [illegible] | < 10 | 100 | < 1 | < 5 | 0.37 | < 1 | [illegible] | 16 | [illegible] | 1.8 | 0.45 | 150 | < 2 | 0.03 | 15 | 160 | 7 | < 5 | 4 | < 10 | 23 | 980 | 35 | < 10 | 6 | 40 | 3 |
| N.V. 1E 1[illegible]00N | < 1 | [illegible] | [illegible] | < 10 | 120 | < 1 | < 5 | 0.25 | < 1 | 8 | 12 | 34 | 2.2 | 0.40 | 150 | < 2 | 0.03 | [illegible] | 160 | 13 | < 5 | 4 | < 10 | [illegible] | 1200 | 43 | < 10 | [illegible] | 44 | 4 |
| N.V. 2E 0N | < 1 | 1.[illegible] | [illegible] | 10 | 60 | < 1 | < 5 | 0.12 | < 1 | 6 | 10 | 19 | 1.8 | [illegible] | 110 | < 2 | 0.03 | 9 | 510 | 11 | < 5 | [illegible] | < 10 | 11 | 960 | 27 | < 10 | 11 | 36 | 3 |
| N.V. 2E 100N | < 1 | [illegible] | < 5 | < 10 | 81 | < 1 | < 5 | 0.13 | < 1 | 12 | 11 | 19 | [illegible] | 0.26 | 130 | < 2 | [illegible] | 16 | 1000 | 15 | < 5 | [illegible] | 10 | [illegible] | 1000 | [illegible] | 10 | [illegible] | 52 | [illegible] |
| N.V. 2E 200N | < 1 | 2.1 | < 5 | < 10 | [illegible] | < 1 | < 5 | [illegible] | < 1 | 30 | 13 | 21 | [illegible] | [illegible] | 180 | < 2 | [illegible] | [illegible] | 120 | 10 | < 5 | 3 | < 10 | [illegible] | 1400 | [illegible] | < 10 | 7 | 57 | 1 |
| N.V. 2E 300N | < 1 | 1.2 | < 5 | < 10 | 52 | < 1 | < 5 | 0.37 | < 1 | 7 | 8 | 17 | 1.8 | 0.47 | 160 | < 2 | 0.04 | 9 | 110 | 6 | < 5 | 4 | < 10 | [illegible] | 1000 | [illegible] | < 10 | 7 | 32 | < 1 |
| N.V. 2E 400N | < 1 | 2.6 | 10 | < 10 | 110 | < 1 | < 5 | 0.22 | < 1 | 10 | 9 | 18 | 2.0 | 0.18 | 120 | < 2 | 0.03 | 14 | 820 | 11 | < 5 | 3 | < 10 | 20 | 1100 | [illegible] | < 10 | 4 | 38 | 17 |
| N.V. 2E 500N | < 1 | 2.5 | < 5 | < 10 | [illegible] | < 1 | < 5 | 0.21 | < 1 | 11 | 14 | 27 | 2.4 | 0.30 | 150 | < 2 | 0.03 | 20 | 740 | 11 | < 5 | 2 | < 10 | 19 | [illegible] | [illegible] | < 10 | [illegible] | 56 | 2 |
| N.V. 2E 600N | < 1 | 2.1 | < 5 | < 10 | 130 | < 1 | < 5 | 0.18 | < 1 | 10 | 13 | [illegible] | 2.2 | 0.39 | 120 | < 2 | 0.04 | 21 | 270 | 10 | < 5 | 4 | < 10 | 12 | 1100 | 41 | < 10 | [illegible] | 43 | 2 |
| N.V. 2E 700N | < 1 | 1.5 | < 5 | 10 | 97 | < 1 | < 5 | 0.23 | < 1 | 10 | 14 | [illegible] | 1.9 | 0.36 | 190 | < 2 | 0.03 | 15 | [illegible] | 11 | < 5 | [illegible] | 10 | 14 | [illegible] | 39 | < 10 | 5 | 41 | < 1 |
| N.V. 2E 800N | < 1 | 1.5 | < 5 | < 10 | 77 | < 1 | < 5 | 0.30 | < 1 | 7 | 10 | 19 | 1.7 | 0.28 | 130 | < 2 | 0.03 | 10 | 500 | 7 | < 5 | [illegible] | 10 | 12 | 770 | 32 | < 10 | [illegible] | 31 | [illegible] |
| N.V. 2E 900N | < 1 | [illegible] | < 5 | [illegible] | 33 | < 1 | < 5 | 0.43 | < 1 | 6 | 5 | 20 | 1.8 | 0.27 | 140 | < 2 | 0.05 | 7 | 180 | 3 | < 5 | 4 | < 10 | 6 | 870 | 42 | < 10 | [illegible] | 22 | 2 |
| N.V. 2E 1000N | < 1 | [illegible] | < 5 | [illegible] | 96 | < 1 | < 5 | 0.24 | < 1 | 6 | 11 | [illegible] | 2.1 | 0.24 | 110 | < 2 | 0.03 | 12 | 350 | 10 | < 5 | 3 | < 10 | 16 | 1200 | 32 | < 10 | [illegible] | 31 | 8 |
| N.V. 2E 1100N | < 1 | [illegible] | < 5 | < 10 | 160 | < 1 | < 5 | 0.17 | < 1 | 8 | 12 | 26 | 1.8 | 0.26 | 140 | < 2 | 0.04 | 18 | 190 | 12 | < 5 | 3 | < 10 | 21 | 1300 | 31 | < 10 | [illegible] | [illegible] | 6 |
| N.V. 2E 1200N | < 1 | [illegible] | < 5 | < 10 | 120 | < 1 | < 5 | 0.20 | < 1 | 7 | 8 | 15 | 1.7 | 0.15 | 120 | < 2 | 0.04 | 17 | 580 | 8 | < 5 | 2 | < 10 | 22 | 1200 | 28 | < 10 | [illegible] | [illegible] | 15 |
| N.V. 2E 1300N | < 1 | 2.0 | < 5 | < 10 | 130 | < 1 | < 5 | 0.22 | < 1 | 10 | 14 | 31 | 2.0 | 0.42 | 130 | < 2 | 0.03 | 16 | 180 | 7 | < 5 | [illegible] | < 10 | 11 | 1100 | 42 | [illegible] | 4 | [illegible] | 5 |
| N.V. 2E 1400N | < 1 | [illegible] | < 5 | [illegible] | [illegible] | < 1 | < 5 | 0.29 | < 1 | 5 | 9 | [illegible] | 1.3 | 0.28 | 120 | < 2 | 0.03 | 8 | 110 | 5 | < 5 | [illegible] | 10 | 8 | 820 | [illegible] | [illegible] | [illegible] | 23 | < 1 |
| N.V. 4E 1100N | < 1 | 1.9 | [illegible] | [illegible] | [illegible] | < 1 | < 5 | 0.21 | < 1 | 8 | 13 | 25 | 2.0 | 0.34 | 200 | < 2 | 0.03 | 14 | 140 | 14 | < 5 | 3 | < 10 | 16 | 1000 | 34 | 10 | 8 | 35 | 1 |
| N.V. 3E 12[illegible]N | < 1 | 2.2 | 5 | < 10 | 90 | < 1 | < 5 | 0.18 | < 1 | 11 | 16 | 26 | 2.1 | 0.41 | 380 | < 2 | 0.03 | 18 | 150 | 11 | < 5 | 3 | < 10 | 18 | 1000 | [illegible] | < 10 | 5 | 55 | 2 |
| N.V. 4E 1275N | < 1 | 2.0 | < 5 | < 10 | 120 | < 1 | < 5 | 0.21 | < 1 | 10 | 15 | 32 | 2.2 | 0.38 | 260 | < 2 | 0.03 | 17 | 150 | 11 | < 5 | [illegible] | < 10 | 18 | 1100 | [illegible] | < 10 | 12 | 35 | 3 |
| N.V. 6E 1000N | [illegible] | [illegible] | [illegible] | < 10 | 10 | < 1 | < 5 | 0.14 | < 1 | 8 | 9 | 21 | 1.9 | 0.11 | 150 | < 2 | 0.03 | 18 | 1500 | 12 | < 5 | | | 17 | 1300 | [illegible] | < 10 | [illegible] | 28 | 22 |
| N.V. 5E 1100N | [illegible] | [illegible] | [illegible] | < 10 | [illegible] | < 1 | < 5 | 0.18 | < 1 | [illegible] | 9 | 14 | 1.2 | [illegible] | 80 | < 2 | [illegible] | [illegible] | [illegible] | 8 | < 5 | | | 13 | 830 | [illegible] | 10 | 4 | [illegible] | 1 |
| N.V. 5E 1200N | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | | | [illegible] | [illegible] | [illegible] | 10 | [illegible] | [illegible] | 1 |

A .5 gm sample is digested [illegible] HCl/HNO3
at 95 C for 90 min and [illegible] with water to 20 ml
This method is partial [illegible]

SIGNED [illegible]

# TSL/ASSAYERS Laboratories

1270 FEWSTER DRIVE, UNIT 3 MISSISSAUGA ONTARIO L4W-1A4

PHONE #: (905)602-8236 FAX #: [illegible]


MR. GUY ROYER

ATTN: G. ROYER

PROJ: LITOPIA

S4052

REPORT No. : **M8192**



File No. : [illegible]

Date : OCT-23-1996

## I.C.A.P. PLASMA SCAN

[illegible]

| SAMPLE # | Ag ppm | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | Mg | Mn ppm | Mo ppm | Na | Ni ppm | P ppm | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | V | Y ppm | Zn ppm | Zr ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N.V. 6E 1300N | < 1 | [illegible] | < 5 | < 10 | [illegible] | [illegible] | < 5 | [illegible] | < 1 | | | [illegible] | 1.2 | 0.26 | 150 | < 2 | 0.04 | 8 | 460 | 5 | < 5 | [illegible] | < 10 | | 71 | [illegible] | [illegible] | 5 | 21 | < 1 |
| N.V. 7E 1050N | [illegible] | [illegible] | < 5 | < 10 | [illegible] | | | 0.26 | [illegible] | | | 20 | [illegible] | 0.37 | 120 | < 2 | 0.04 | [illegible] | 94 | [illegible] | [illegible] | 3 | < 10 | 12 | [illegible] | [illegible] | [illegible] | 5 | 32 | 1 |
| N.V. 7E 1150N | [illegible] | [illegible] | < 5 | < 10 | 110 | | | 0.29 | [illegible] | | | [illegible] | 2.0 | 0.44 | 310 | [illegible] | 0.04 | 16 | 160 | 12 | < 5 | [illegible] | < 10 | [illegible] | 1100 | [illegible] | < 10 | 14 | 39 | 3 |
| N.V. 7E 1250N | < 1 | [illegible] | < 5 | < 10 | 110 | | | 0.33 | | | | [illegible] | 2.1 | 0.11 | 310 | < 2 | 0.03 | [illegible] | 200 | 11 | < 5 | 4 | < 10 | [illegible] | 1100 | [illegible] | < 10 | 15 | 37 | 2 |
| N.V. 8E 0N | < 1 | [illegible] | [illegible] | [illegible] | [illegible] | | | [illegible] | [illegible] | | | | [illegible] | 0.4 | [illegible] | [illegible] | [illegible] | 25 | 280 | 13 | < 5 | 3 | < 10 | [illegible] | 940 | | [illegible] | [illegible] | 71 | < 1 |
| N.V. 8E 100N | < 1 | 2.? | [illegible] | [illegible] | 130 | | [illegible] | [illegible] | [illegible] | | | | [illegible] | 0.4? | 310 | < 2 | 0.03 | 25 | 970 | 10 | < 5 | [illegible] | 10 | 15 | 120 | 23 | < 10 | 9 | 76 | 21 |
| N.V. 8E 200N | < 1 | [illegible] | < 5 | 10 | 61 | | | | [illegible] | | | | [illegible] | [illegible] | 200 | < 2 | 0.0? | [illegible] | 180 | [illegible] | < 5 | 3 | < 10 | [illegible] | 860 | 24 | [illegible] | 8 | 39 | < 1 |
| N.V. 8E 300N | < 1 | 2.? | < 5 | 10 | [illegible] | | | | | | | | [illegible] | 0.40 | 200 | < 2 | 0.03 | 21 | 190 | [illegible] | < 5 | [illegible] | < 10 | [illegible] | 1200 | 48 | < 10 | 15 | 66 | < 1 |
| N.V. 8E 400N | < 1 | 2.? | [illegible] | [illegible] | [illegible] | | | | | | | | [illegible] | [illegible] | 240 | < 2 | 0.0? | 15 | 720 | 12 | < 5 | [illegible] | [illegible] | [illegible] | 1000 | [illegible] | [illegible] | [illegible] | 58 | 3 |
| N.V. 8E 500N | [illegible] | 2.2 | [illegible] | [illegible] | 150 | [illegible] | [illegible] | | [illegible] | | | | [illegible] | 0.?9 | 330 | [illegible] | 0.02 | [illegible] | 320 | [illegible] | < 5 | 4 | < 10 | [illegible] | 1300 | [illegible] | 10 | 15 | 59 | 3 |
| N.V. 8E 600N | < 1 | 1.5 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | | | | | [illegible] | 0.38 | 140 | [illegible] | 0.02 | [illegible] | 170 | 10 | < 5 | 2 | < 10 | 12 | 980 | [illegible] | 10 | 5 | 65 | < 1 |
| N.V. 8E 700N | < 1 | [illegible] | < 5 | | [illegible] | | | 0.21 | | | | | [illegible] | 0.27 | 240 | [illegible] | 0.02 | 12 | 2700 | 14 | < 5 | 2 | 10 | [illegible] | 960 | 31 | [illegible] | [illegible] | 65 | 5 |
| N.V. 8E 800N | < 1 | 1.5 | [illegible] | [illegible] | [illegible] | [illegible] | < 5 | 0.20 | [illegible] | | | | [illegible] | 0.20 | [illegible] | < 2 | 0.03 | 10 | 330 | 3 | [illegible] | [illegible] | [illegible] | [illegible] | 830 | [illegible] | 10 | 4 | 27 | 3 |
| N.V. 8E 900N | < 1 | 1.9 | [illegible] | 10 | [illegible] | [illegible] | [illegible] | 0.17 | < 1 | | | | [illegible] | 0.21 | 100 | [illegible] | 0.04 | [illegible] | 140 | 14 | [illegible] | 3 | [illegible] | [illegible] | [illegible] | [illegible] | 10 | 5 | 33 | 2 |
| N.V. 8E 1000N | < 1 | [illegible] | < 5 | 10 | 150 | [illegible] | < 5 | 0.1? | < 1 | [illegible] | | | [illegible] | 0.26 | 100 | < 2 | 0.03 | [illegible] | 690 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 1100 | [illegible] | [illegible] | 3 | 71 | 4 |
| N.V. 8E 1100N | < 1 | 1.5 | < 5 | [illegible] | 91 | < 1 | < 5 | 0.1? | < 1 | 6 | [illegible] | [illegible] | [illegible] | 0.24 | 170 | < 2 | 0.03 | 13 | 180 | | [illegible] | 1 | < 10 | 13 | [illegible] | [illegible] | [illegible] | 3 | 37 | < 1 |
| N.V. 8E 1200N | < 1 | 1.7 | < 5 | [illegible] | [illegible] | | < 5 | [illegible] | < 1 | 7 | 12 | [illegible] | [illegible] | 0.28 | 240 | < 2 | 0.0? | 14 | [illegible] | | 5 | 2 | < 10 | 18 | 910 | 22 | < 10 | [illegible] | 39 | < 1 |
| N.V. 8E 1300N | < 1 | 2.3 | < 5 | < 10 | 220 | < 1 | < 5 | 0.11 | < 1 | 10 | 14 | [illegible] | [illegible] | 0.24 | 170 | < 2 | 0.02 | 19 | [illegible] | | [illegible] | 2 | < 10 | [illegible] | 1100 | [illegible] | < 10 | [illegible] | 61 | 6 |
| N.V. 11E 0N | < 1 | 2.8 | 5 | < 10 | 160 | < 1 | < 5 | 0.18 | < 1 | 14 | 13 | 20 | 2.? | 0.27 | 230 | < 2 | 0.03 | 24 | | | | 1 | < 10 | 15 | 1200 | [illegible] | 10 | [illegible] | 55 | 12 |
| N.V. 11E 100N | < 1 | [illegible] | < 5 | < 10 | [illegible] | < 1 | < 5 | 0.24 | < 1 | 8 | 14 | 26 | 1.? | [illegible] | 230 | < 2 | 0.03 | 15 | | | | 3 | < 10 | [illegible] | 1100 | [illegible] | < 10 | [illegible] | 39 | 2 |
| N.V. 11E 200N | < 1 | 1.8 | < 5 | < 10 | 95 | < 1 | < 5 | 0.22 | < 1 | 8 | 14 | 20 | 1.9 | 0.44 | 190 | < 2 | 0.03 | 3 | | | | 3 | < 10 | 13 | 1100 | 31 | < 10 | 7 | 43 | < 1 |
| N.V. 11E 300N | < 1 | 2.8 | < 5 | < 10 | 130 | < 1 | 5 | 0.12 | < 1 | 12 | 15 | 24 | 2.9 | 0.25 | 250 | < 2 | 0.03 | | | | | 2 | < 10 | [illegible] | 1600 | 42 | < 10 | [illegible] | 58 | 5 |
| N.V. 11E 400N | < 1 | 2.6 | < 5 | < 10 | 150 | < 1 | < 5 | 0.16 | < 1 | 11 | 15 | 30 | 2.3 | 0.34 | 150 | < 2 | 0.03 | | | | | 3 | < 10 | [illegible] | 1200 | 36 | < 10 | [illegible] | [illegible] | 1 |
| N.V. 11E 500N | < 1 | 2.3 | < 5 | < 10 | 100 | < 1 | < 5 | 0.16 | < 1 | 7 | 11 | 19 | 1.8 | 0.19 | 130 | < 2 | 0.04 | | | | | 2 | < 10 | 17 | 1200 | 31 | < 10 | [illegible] | | 5 |
| N.V. 11E 600N | < 1 | [illegible] | < 5 | < 10 | 67 | < 1 | < 5 | 0.15 | < 1 | 5 | 9 | 15 | 1.4 | 0.27 | 130 | < 2 | 0.03 | | | | [illegible] | 2 | < 10 | 10 | 840 | 27 | < 10 | 4 | [illegible] | 1 |
| N.V. 11E 700N | < 1 | 1.6 | < 5 | < 10 | 85 | < 1 | < 5 | 0.19 | < 1 | 10 | 22 | 22 | 2.0 | 0.63 | 190 | < 2 | 0.03 | [illegible] | | | | [illegible] | < 10 | [illegible] | 1100 | 38 | < 10 | [illegible] | | 2 |
| N.V. 11E 800N | < 1 | 1.4 | < 5 | < 10 | 91 | < 1 | < 5 | 0.17 | < 1 | 6 | 11 | 16 | 1.3 | [illegible] | 200 | < 2 | 0.03 | 11 | [illegible] | | [illegible] | 2 | 10 | | [illegible]20 | 24 | < 10 | | | 1 |
| N.V. 1[illegible] 900N | < 1 | 3.8 | < 5 | [illegible] | 110 | < 1 | < 5 | 0.14 | < 1 | 6 | 11 | 10 | 2.1 | [illegible] | 110 | < 2 | 0.02 | [illegible] | | | 5 | 2 | < 10 | | [illegible]00 | 35 | < 10 | | | [illegible] |
| N.V. 11E 1000N | < 1 | 2.3 | 5 | [illegible] | 310 | < 1 | < 5 | 0.13 | < 1 | 6 | 11 | 23 | 1.6 | 0.20 | 130 | < 2 | 0.03 | 14 | | | [illegible] | 2 | [illegible] | [illegible] | 1100 | 27 | < 10 | | | [illegible] |
| N.V. 11E 1100N | < 1 | [illegible] | < 5 | < 10 | 170 | < 1 | < 5 | 0.09 | < 1 | 8 | 10 | 11 | 1.7 | 0.1? | 420 | < 2 | 0.02 | 11 | | | [illegible] | 2 | | 12 | 1000 | 19 | < 10 | 4 | | 5 |
| N.V. 11E 1200N | < [illegible] | [illegible] | 5 | [illegible] | 170 | < 1 | < 5 | 0.17 | < 1 | 6 | 7 | 12 | 1.5 | 0.0? | 210 | < 2 | 0.0? | [illegible] | | | < 5 | | | 21 | 10[illegible] | | 10 | [illegible] | 37 | 10 |
| N.V. 11[illegible] | < 1 | [illegible] | < 5 | < 10 | 140 | < 1 | < 5 | 0.23 | < 1 | 8 | 12 | 22 | 1.6 | 0.26 | 210 | < 2 | [illegible] | | 5[illegible] | 10 | < 5 | | [illegible] | 15 | [illegible] | | 10 | 6 | 45 | 6 |
| N.V. 3[illegible] | < 1 | 2.9 | < 5 | < 10 | 380 | < 1 | < 5 | 0.11 | [illegible] | 10 | 22 | 27 | 2.0 | 0.69 | 310 | [illegible] | [illegible] | | 470 | [illegible] | < 5 | | 10 | 20 | [illegible] | | 10 | 9 | [illegible] | 30 |
| [illegible] | < 1 | [illegible] | [illegible] | 10 | 150 | < 1 | < 5 | 0.1? | | 31 | 30 | 69 | [illegible] | 0.67 | [illegible] | | | [illegible] | 440 | 15 | < 5 | | 10 | 21 | 1400 | [illegible] | < 10 | 1? | | 11 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | | | | [illegible] | [illegible] | [illegible] | | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | | |

[illegible]

[illegible]

[illegible]

MR. GUY ROYER
ATTN: ROYER
PROJ:

S4052

# TSL/ASSAYERS Laboratories

1270 FEWSTER DRIVE UNIT 3 MISSISSAUGA, ONTARIO L4W-1A4
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## I.C.A.P. PLASMA SCAN

| SAMPLE # | Ag ppm | % | A ppm | B ppm | ppm | B ppm | Bi ppm | | ppm | ppm | ppm | ppm | Fe % | | Mn ppm | Mo ppm | Na % | ppm | ppm | ppm | Sb ppm | | ppm | | | ppm | W ppm | Y ppm | Zn ppm | Zr ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N.V. 20E 500N | < 1 | 2.4 | < 5 | < 10 | 160 | < 1 | < 5 | 16 | < 1 | 1 | 23 | 54 | | 45 | 220 | < 2 | 0.02 | | 240 | 15 | | | < 10 | 15 | 2100 | 12 | < 10 | 11 | 68 | 2 |
| N.V. 20E 600N | < 1 | 1.4 | < 5 | < 10 | | < 1 | < 5 | 19 | < 1 | 6 | 16 | 23 | | 14 | 160 | < 2 | 0.02 | 4 | 330 | 9 | | | < 10 | 12 | 1000 | 14 | 10 | 5 | 44 | 2 |
| N.V. 20E 700N | < 1 | 2.8 | < 5 | < 10 | 1 | < 1 | < 5 | 19 | | | | | | 47 | 110 | < 2 | 0.02 | 11 | 273 | 14 | < 5 | | < 10 | 22 | 1200 | 12 | 10 | 17 | 63 | 2 |
| N.V. 20E 800N | < 1 | 3 | < 5 | 10 | 150 | < 1 | < 5 | | 3 | | | | | 5 | 110 | < 2 | 0.02 | 12 | 190 | 13 | < 5 | 4 | < 10 | 24 | 1400 | 23 | < 10 | 12 | 45 | 8 |
| V.H. 0E 500N | 1 | 2 | < 10 | < 10 | 290 | | | 29 | < 1 | | | | | 14 | 120 | < 2 | 0.02 | 27 | 330 | 14 | < | 5 | < 10 | 26 | 1000 | 27 | < 10 | 3 | 100 | 8 |
| V.H. 0E 600N | < 1 | | < 5 | 30 | 130 | < 1 | < 5 | 42 | | | | | | | 390 | < 2 | 0.02 | 12 | 350 | 13 | < 5 | 1 | < 10 | 24 | 910 | 25 | < 10 | 5 | 72 | 4 |
| V.H. 0E 700N | < 1 | 1.7 | | 32 | 210 | | < 5 | 61 | < 1 | 6 | 37 | | | 45 | 500 | < 2 | 0.03 | 17 | 480 | 12 | < 5 | 3 | < 10 | 15 | 960 | 27 | 10 | 4 | 80 | 2 |
| V.H. 0E 800N | < 1 | 2.0 | < 5 | 30 | | | | 5 | < 1 | 5 | 27 | | | 14 | 405 | | 0.02 | 21 | 390 | 15 | < 5 | 4 | < 10 | 26 | 980 | 21 | < 10 | 6 | 120 | 3 |
| V.H. 0E 900N | < 1 | 1 | < 5 | | | < 1 | | 24 | < 1 | 2 | 15 | | | | 500 | < 2 | 0.02 | 17 | 250 | 16 | < 5 | | < 10 | 19 | 910 | | | 2 | 66 | 1 |
| V.H. 0E 1000N | < 1 | 1 | < 5 | < 10 | 170 | < 1 | < 5 | 25 | < 1 | 7 | 17 | | | 5 | 400 | < 2 | 0.02 | 13 | 150 | 11 | < 5 | 5 | < 10 | | 810 | | | 4 | 79 | < 1 |
| V.H. 0E 1100N | < 1 | | < 5 | | 3 | | | | | | | | | 1 | | < 2 | 0.04 | 24 | 430 | 23 | < 5 | 4 | | 23 | | 2 | < 10 | 9 | 100 | 1 |
| V.H. 0E 1200N | < 1 | | | | | | | | | | | | | | | | 0.03 | 29 | 1200 | 26 | < 5 | | < 10 | | | 13 | < 10 | | 110 | |
| V.H. 0E 1300N | | 1 | | | | | | | | 1 | | | | | | | | 29 | 860 | 24 | < 5 | 1 | | 22 | 1500 | | < 10 | 8 | 170 | 2 |
| V.H. 0E 1400N | < 1 | | | | | | | | | | | | | | | | | 1 | 1300 | | | 4 | | | | | | | 130 | 7 |
| V.H. 0E 1500N | < 1 | | | | | | | | | | | | | | | | 0.02 | | 960 | | | | | | | | | | 130 | |
| V.H. 0E 1600N | < 1 | 3.3 | | | | | | | | | | | | | | < 2 | 0.0 | | | | | 4 | < 10 | 21 | 1400 | | | | 0 | 2 |
| V.H. 2E 400N | < 1 | 1 | | | | | | | | | | | | | | < 2 | 0.03 | | | | | 4 | | 21 | 1000 | | | | 7 | < 1 |
| V.H. 2E 500N | 1 | 1 | | | | | 5 | < 5 | 1 | < 1 | 6 | 13 | 11 | 55 | 330 | < 2 | 0.03 | 12 | | | | 5 | < 10 | 19 | 870 | 21 | | | 77 | < 1 |
| V.H. 2E 600N | < 5 | 1 | | | | | 1 | < 5 0.25 | < 1 | 7 | 15 | 22 | 1.7 | 1 | 210 | < 2 | 0.03 | 14 | | | | | < 10 | 21 | 920 | 24 | < 10 | | 72 | 3 |
| V.H. 2E 700N | | | | | | | | 5 6 12 | < 1 | 6 | 15 | 13 | 1.6 | 0.10 | 300 | < 2 | 0.03 | 13 | 300 | | | | < 10 | 20 | 890 | 24 | < 10 | 5 | 69 | 1 |
| V.H. 2E 800N | | | | | | | | | | | 15 | | 1.7 | 10 | 150 | < 2 | 0.02 | 15 | | | | | < 10 | 18 | 800 | 25 | < 10 | | | 1 |
| V.H. 2E 900N | | | | | 200 | | | | | | 19 | 31 | 1.9 | 0.12 | 150 | < 2 | 0.02 | 14 | 6 | 15 | < | | < 10 | 22 | 900 | 25 | < 10 | | | 3 |
| V.H. 2E 1000N | | | | | 390 | | | | | 11 | 18 | 2 | 2.0 | 0.56 | 720 | < 2 | 0.03 | 22 | 1500 | 21 | < 5 | 4 | < 10 | 38 | 1000 | 27 | < 10 | | 140 | 3 |
| V.H. 2E 1100N | < 1 | 2.5 | < 5 | < 10 | 320 | | | | | 12 | 20 | 25 | 2.4 | 0.54 | 540 | < 2 | 0.03 | 27 | | 22 | < 5 | 4 | < 10 | 26 | 1100 | 34 | < 10 | | 130 | 3 |
| V.H. 2E 1200N | < 1 | 2.9 | < 5 | | 240 | | | | | 11 | 19 | 28 | 2.4 | 0.49 | 710 | < 2 | 0.04 | 22 | 300 | 15 | < 5 | 4 | < 10 | 26 | 1300 | 32 | < 10 | 11 | 100 | 9 |
| V.H. 2E 1300N | < 1 | | < 5 | | | | 5 | 0.27 | < 1 | 16 | 18 | 21 | 2.3 | 0.38 | 760 | < 2 | 0.03 | | 2900 | 16 | < 5 | 3 | < 10 | 19 | 1300 | 29 | < 10 | 12 | 110 | 7 |
| V.H. 2E 1400N | < 1 | | < 5 | | | | | | < 1 | 18 | 23 | | 2.9 | 0.61 | 250 | < 2 | 0.02 | 17 | 420 | 16 | < 5 | 4 | < 10 | 19 | 1450 | 37 | < 10 | 27 | | < 1 |
| V.H. 2E 1500N | < 1 | | | | | | | | 1 | 12 | 23 | | 2.7 | 0.70 | 280 | < 2 | 0.02 | 24 | 260 | 12 | < 5 | 4 | < 10 | 16 | 1500 | 38 | < 10 | 12 | 85 | 3 |
| V.H. 2E 1600N | < 1 | | | | | | | 18 | < 1 | | 25 | 13 | 2.6 | 0.56 | 390 | < 2 | 0.02 | 25 | | 15 | < 5 | 5 | < 10 | 12 | | 43 | < 10 | 22 | 120 | 3 |
| V.H. 2E 1700N | < 1 | | | | | | 1 | 18 | < 1 | 9 | | 27 | 2.0 | 1.2 | 500 | < 2 | 0.02 | 22 | | | < 5 | 5 | < 10 | 1 | | 32 | < 10 | 19 | 96 | 4 |
| V.H. 4E 250N | < 1 | 1 | | | 110 | | | 25 | < 1 | 11 | | | 2.3 | | 120 | | | | | 17 | < 5 | | | | 1100 | 35 | < 10 | 18 | 76 | 2 |
| V.H. 4E 300N | < 1 | 2 | | | 200 | | | 17 | < 1 | | | | 2.4 | 0 | | | | | | | | | | 22 | 1300 | 32 | < 10 | 9 | 92 | 9 |
| V.H. 4E | | | | | 130 | | 5 | 21 | | | 17 | 20 | 1.1 | 0.4 | | | | | | | | | | 24 | 1100 | 26 | < 10 | 11 | | 1 |
| V.H | | | | | 200 | | 5 | | | | 16 | 24 | 1.0 | 0.4 | | | | | | | | | | 31 | 1400 | | 10 | | 120 | 5 |
| | | | | | | | | | | | 11 | | 2 | | | | | | | | | | | | 210 | | < 10 | | | |

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This

MR. GUY ROYER

ATTN: G. ROYER

PROJ: [illegible]

S40[illegible]

## I.C.A.P. PLASMA SCAN

Aqua-Regia Digestion

| SAMPLE # | Ag ppm | Al % | As ppm | B ppm | Ba ppm | Be ppm | Bi ppm | Ca % | Cd ppm | Co ppm | Cr ppm | Cu ppm | Fe % | Mg % | Mn ppm | Mo ppm | Na % | Ni ppm | P ppm | Pb ppm | Sb ppm | Sc ppm | Sn ppm | Sr ppm | Ti ppm | V ppm | W ppm | Y ppm | Zn ppm | Zr ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V.H 4E 700N | < 1 | [illegible] | < 5 | < 10 | 450 | < 1 | < 5 | 0.25 | < 1 | [illegible] | 21 | 25 | 2.5 | 0.42 | 740 | < 2 | 0.03 | 11 | 2100 | [illegible] | < 5 | 4 | [illegible] | 31 | [illegible] | 30 | < 10 | 11 | 140 | 2 |
| V.H 4E 800N | [illegible] | [illegible] | < 5 | < 10 | 340 | < 1 | < 5 | 0.26 | [illegible] | 12 | 24 | 28 | 2.4 | [illegible] | 1000 | < 2 | 0.03 | 27 | 570 | [illegible] | < 5 | 1 | [illegible] | 25 | 1300 | [illegible] | [illegible] | 9 | 120 | 2 |
| V.H 4E 900N | [illegible] | 1.0 | < 5 | < 10 | 410 | 1 | < 5 | [illegible] | [illegible] | [illegible] | 20 | 19 | 2.5 | 0.60 | 820 | < 2 | [illegible] | [illegible] | 2000 | 21 | < 5 | 1 | 10 | [illegible] | 1400 | 33 | 10 | 12 | 150 | 4 |
| V.H 5E 10[illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 210 | < 1 | < 5 | [illegible] | [illegible] | 12 | [illegible] | [illegible] | 3.1 | 1.0 | 550 | < 2 | [illegible] | [illegible] | [illegible] | [illegible] | < 5 | [illegible] | [illegible] | [illegible] | 1300 | 41 | < 10 | 30 | 110 | 14 |
| [illegible] 6E [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 240 | < 1 | < 5 | [illegible] | < 1 | [illegible] | [illegible] | [illegible] | 2.5 | [illegible] | [illegible] | < 2 | [illegible] | 31 | 550 | [illegible] | < 5 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 10 | 13 | 100 | 6 |
| V.H 5E [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | < 1 | < 5 | [illegible] | [illegible] | [illegible] | [illegible] | 14 | 1.6 | [illegible] | 420 | < 2 | [illegible] | 11 | [illegible] | 12 | < 5 | [illegible] | < 10 | [illegible] | [illegible] | [illegible] | < 10 | 5 | 77 | < 1 |
| V.H [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | < 5 | [illegible] | [illegible] | [illegible] | [illegible] | 25 | 2.2 | [illegible] | 420 | < 2 | [illegible] | [illegible] | 1000 | [illegible] | < 5 | 1 | [illegible] | [illegible] | 1300 | [illegible] | 10 | 10 | 100 | 14 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | < 5 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 2.2 | [illegible] | [illegible] | < 2 | 0.02 | [illegible] | [illegible] | 25 | [illegible] | [illegible] | [illegible] | [illegible] | 1200 | [illegible] | 10 | 5 | 81 | 10 |
| [illegible] | < 1 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 21 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 1500 | 21 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 110 | 11 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | < 1 | < 5 | [illegible] | [illegible] | [illegible] | 19 | 25 | 2.4 | 0.61 | 420 | < 2 | [illegible] | 40 | 1700 | [illegible] | 5 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 8 |
| V.H 6E [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | < 2 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 2 |
| V.H [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | < 2 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 5 |
| V.H [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 42 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 110 | 7 |
| V.H [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | < 10 | 7 | 200 | 9 |
| V.H [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | < 2 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 40 | < 10 | [illegible] | 84 | < 1 |
| [illegible] | < 1 | [illegible] | < 5 | [illegible] | [illegible] | [illegible] | < 5 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 1.8 | [illegible] | [illegible] | < 2 | [illegible] | [illegible] | 2400 | [illegible] | < 5 | [illegible] | < 10 | [illegible] | 1000 | 25 | < 10 | [illegible] | 130 | 4 |
| [illegible] | < 1 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 21 | [illegible] | [illegible] | [illegible] | < 2 | [illegible] | [illegible] | [illegible] | [illegible] | < 5 | [illegible] | [illegible] | [illegible] | 1000 | 22 | < 10 | 10 | 140 | 4 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 1 | < 5 | [illegible] | [illegible] | [illegible] | [illegible] | 21 | 2.1 | 0.29 | 220 | < 2 | [illegible] | [illegible] | 2000 | [illegible] | < 5 | [illegible] | < 10 | 19 | 990 | 25 | < 10 | 6 | 92 | 7 |
| V.H. [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | < 5 | 0.19 | [illegible] | [illegible] | [illegible] | 28 | 2.2 | 0.39 | 260 | < 2 | [illegible] | 29 | 1200 | 21 | < 5 | 3 | < 10 | 21 | 1100 | [illegible] | < 10 | 12 | 120 | 5 |
| V.H 8[illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | < 1 | < 5 | 0.19 | < 1 | 10 | [illegible] | 29 | 2.0 | 0.47 | 300 | [illegible] | 0.04 | 23 | [illegible] | 16 | < 5 | 3 | < 10 | 19 | 1100 | 31 | < 10 | 10 | 110 | 2 |
| V.H [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0.15 | < 1 | [illegible] | [illegible] | 33 | 2.2 | 0.35 | 500 | < 2 | [illegible] | 29 | 1600 | 21 | [illegible] | [illegible] | 10 | 19 | 1200 | 30 | < 10 | 7 | 130 | 12 |
| V.H 8E [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0.19 | < 1 | 9 | [illegible] | 23 | 1.9 | 0.40 | 210 | < 2 | 0.03 | 16 | 300 | 16 | [illegible] | [illegible] | [illegible] | 11 | 910 | 30 | < 10 | [illegible] | 95 | 2 |
| V.H 8E [illegible] | [illegible] | [illegible] | [illegible] | < 10 | [illegible] | [illegible] | [illegible] | 0.24 | < 1 | 11 | [illegible] | 47 | 2.5 | [illegible] | 160 | < 2 | 0.03 | 17 | 1400 | 15 | [illegible] | [illegible] | 10 | [illegible] | 1000 | 45 | < 10 | 6 | 160 | 2 |
| V.H 8E [illegible]N | [illegible] | [illegible] | 10 | < 10 | [illegible] | [illegible] | < 5 | 0.24 | < 1 | 13 | 13 | 45 | 2.5 | 0.35 | 390 | < 2 | 0.03 | [illegible] | [illegible] | 16 | < 5 | 4 | < 10 | [illegible] | 1100 | 45 | < 10 | 8 | 210 | [illegible] |
| V.H [illegible] | < 1 | 2.0 | < 5 | < 10 | [illegible] | [illegible] | < 5 | [illegible] | < 1 | 8 | 14 | 24 | 1.7 | [illegible] | 150 | < 2 | 0.03 | 21 | [illegible] | 15 | < 5 | 2 | < 10 | 25 | 980 | 25 | < 10 | 5 | 270 | [illegible] |
| V.H [illegible] | [illegible] | 1 | < 5 | < 10 | [illegible] | [illegible] | < 5 | 0.19 | [illegible] | 7 | 10 | [illegible] | 1.6 | [illegible] | 380 | [illegible] | 0.03 | [illegible] | 2200 | 14 | [illegible] | [illegible] | < 10 | 26 | [illegible] | 21 | < 10 | [illegible] | 82 | [illegible] |
| V.H. [illegible] | [illegible] | 3 | [illegible] | 10 | 230 | < 1 | < 5 | 0.17 | < 1 | 7 | [illegible] | [illegible] | 1.7 | [illegible] | 300 | [illegible] | [illegible] | 21 | 1500 | 14 | [illegible] | [illegible] | < 10 | 23 | [illegible] | [illegible] | < 10 | [illegible] | 85 | 13 |
| V.H. 10E [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | < 1 | < 5 | 0.17 | [illegible] | [illegible] | [illegible] | [illegible] | 2.2 | [illegible] | [illegible] | [illegible] | [illegible] | 28 | 1500 | 19 | [illegible] | [illegible] | [illegible] | 76 | [illegible] | [illegible] | 10 | [illegible] | 98 | 7 |
| V.H. 10E 400N | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | < 1 | < 5 | 0.17 | [illegible] | 6 | [illegible] | [illegible] | 1.6 | [illegible] | [illegible] | [illegible] | [illegible] | 12 | 210 | 17 | [illegible] | [illegible] | [illegible] | 12 | [illegible] | [illegible] | [illegible] | 7 | [illegible] | [illegible] |
| V.H. 10E 500N | [illegible] | 1 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0.22 | < 1 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 14 | 170 | 14 | < 5 | [illegible] | [illegible] | 15 | [illegible] | [illegible] | 10 | 6 | [illegible] | 1 |
| V.H. 10E 600N | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0.33 | < 1 | [illegible] | [illegible] | [illegible] | 2.2 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 19 | [illegible] | [illegible] | 10 | [illegible] | [illegible] | [illegible] | 10 | [illegible] | [illegible] | [illegible] |
| V.H. [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0.27 | < 1 | [illegible] | 14 | [illegible] | 1.8 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 16 | < 5 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| V.H. [illegible] | [illegible] | [illegible] | 5 | [illegible] | [illegible] | [illegible] | < 5 | [illegible] | [illegible] | [illegible] | 16 | [illegible] | [illegible] | 0.47 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 15 | < 5 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| V.H. [illegible] | [illegible] | [illegible] | 5 | [illegible] | [illegible] | [illegible] | < 5 | [illegible] | [illegible] | [illegible] | 12 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | < 5 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 1 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 11 | [illegible] | [illegible] | [illegible] | [illegible] |

[illegible]

This [illegible]

TSL [illegible]

SIGNED : ______________________

# TSL/ASSAYERS Laboratories

1270 FEWSTER DRIVE, UNIT 3 MISSISSAUGA, ONTARIO L4W 1A4
[illegible] #: [illegible]-8276 FAX #: (905)206-0513

MR. GUY ROYER
ATTN: G. ROYER
PROJ: LITOPIA

S4052

REPORT No. : M8192

File No. : [illegible]22MA
Date : OCT-23-1996

## I.C.A.P. PLASMA SCAN

[illegible]

| SAMPLE # | [illegible] | W ppm | Y ppm | Zn ppm | Zr ppm |
|---|---|---|---|---|---|
| V.H. 10E 1100N | [illegible] | < 10 | 6 | [illegible] | < 1 |

A [illegible] 3:1 [illegible]
[illegible] with [illegible]
[illegible] materials

SIGNED : ______________________

## BRITISH COLUMBIA
## PROSPECTORS ASSISTANCE PROGRAM
## PROSPECTING REPORT FORM (continued)

**B. TECHNICAL REPORT**

- One technical report to be completed for each project area.
- **Refer to Program Requirements/Regulations, section 15, 16 and 17.**
- If work was performed on claims a copy of the applicable assessment report may be submitted in lieu of the supporting data (*see* section 16) required with this TECHNICAL REPORT.

Name GUY ROYER Reference Number 96/97 P39

**LOCATION/COMMODITIES**

Project Area (as listed in Part A) YAHK RIVER MINFILE No. if applicable

Location of Project Area NTS 82G/04W Lat 49°00'-05'N Long 115°51'-55'W.

Description of Location and Access 16 Kms East of Yahk Village & Hwy #3/95 adjacent To U.S.A. One follows well gravelled all-weather Yahk Meadows Rd for 16.5 Km, then turn north on Meadows Rd To attain 1 claim. 2nd claim accessed 2 logging roads that branch off @ 22 & 24 Kms.

Main Commodities Searched For Gold, lead, Zinc, Silver and Copper.

Known Mineral Occurrences in Project Area Tourmalinisation - MT. Mahon - Old Midway Gold Mine St. Eugene Pb-Zn-Ag Mine. Nothing economic known immediately adjacent.

**WORK PERFORMED**

1. Conventional Prospecting (area) - 27 Claim Units & Areas immediately adjacent -
2. Geological Mapping (hectares/scale) 675 ha / 1:2500 = (1 cm = 25 Metres)
3. Geochemical (type and no. of samples) Soil only - "B" horizon - 141 collected
4. Geophysical (type and line km) Magnetic (ground) only 64.5 line kms.
5. Physical Work (type and amount) (None)
6. Drilling (no,. holes, size, depth in m, total m) "
7. Other (specify)

**SIGNIFICANT RESULTS**

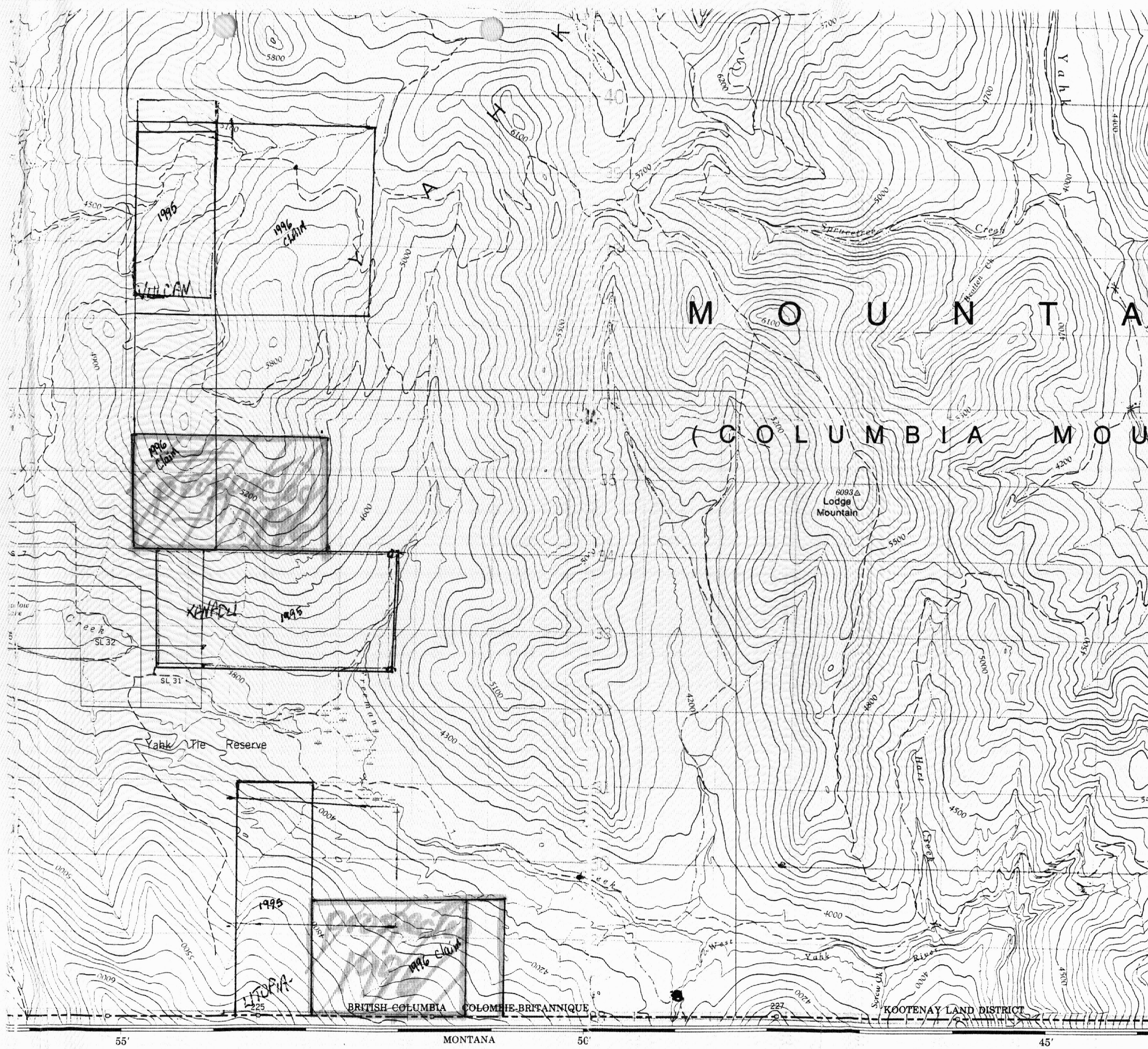
Commodities Zn 100-270 ppm / Ni = 95 & 110 ppm from Soils Claim Name Zn on Valhala / Ni on Nirvana

Location (show on map) Lat 49°04'N / 49°00'N Long 115°54' / 115°51'W Elevation 1450m / 1300m

Best assay/sample type Soil Sample "B" horizon - 270 ppm Zn - VALHALA Soil Sample - B horizon - 110 ppm Ni - NIRVANA

Description of mineralization, host rocks, anomalies Only ca 5% Outcrop on both claims - no mineralisation noted. No veining or shear zones. Very minor magnetic anomalies noted - Central sector of Valhala & east section of Nirvana - though here roughly co-incides with sub-anomalous Cobalt & Nickel soil assays. "Aldridge" sediments outcrop here On Valhala - Zinc sub-anomalous (ie. 100-270 ppm) throughout sampled area of Claim. Aldridge sandstones & Moyie Diorite Sills sporadically outcrop here. - Small outcrops of latter lithology occur on Nirvana also.

*Supporting data must be submitted with this TECHNICAL REPORT*



1995
1996 CLAIM
VULCAN
1996 Claim
1995
Yahk Tie Reserve
1995
UTOPIA
1996 Claim
M O U N T A
( C O L U M B I A M O U
6093
Lodge Mountain
Creek
SL 32
SL 31
Hart
Creek
Yahk
River
BRITISH COLUMBIA
COLOMBIE-BRITANNIQUE
KOOTENAY LAND DISTRICT
225
227
MONTANA
55′
50′
45′

1519.40
15

**T S L LABORATORIES**


DIVISION OF TSL / ASSAYERS INC.
2 - 302 - 48th STREET
SASKATOON, SASKATCHEWAN
S7K 6A4
(306) 931-1033 FAX: (306) 242-4717


200
840 + prep.

**RESULTS & INVOICE TO:**

[illegible] ROYER
Box [illegible]
[illegible]
[illegible]

**COPY TO:**

# SAMPLE/ANALYSIS RECORD

| SAMPLE NUMBER | GEO CHEM TRACE LEVEL | ASSAY | Au | Ag | Cu | Pb | Zn | Ni | Mo | Co | As | OTHER ELEMENTS | | | | ICAP SCAN | WHOLE ROCK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] 1E (0N→1300N) | | | | | | | | | | | | | | | | | |
| V.V. 2E (0N→1400N) | | | | | | | | | | | | | | | | | |
| V.V. [illegible] (1100N → [illegible]N) | | | | | | | | | | | | | | | | | |
| V.V. [illegible]E ([illegible]→1300N) | | | | | | | | | | | | | | | | | |
| V.V. 7E ([illegible]→[illegible]N) | | | | | | | | | | | | | | | | | |
| V.V. 9E (0N→1300N) | | | | | | | | | | | | | | | | | |
| V.V. 11E (0N→1300N) | | | | | | | | | | | | | | | | | |
| V.V. [illegible] | | | | | | | | | | | | | | | | | |
| V.V. [illegible] | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| V.H. 1E (0N → [illegible]N) | | | | | | | | | | | | | | | | | |
| V.H. 2E (400N → [illegible]N) | | | | | | | | | | | | | | | | | |
| V.H. 4E (280N → 700N) | | | | | | | | | | | | | | | | | |
| V.H. 6E ([illegible] → [illegible]N) | | | | | | | | | | | | | | | | | |
| V.H. 8E ([illegible] → [illegible]N) | | | | | | | | | | | | | | | | | |
| V.H. 10E (0N → 1100N) | | | | | | | | | | | | | | | | | |
| V.H. 3E / 300N + V.H. 11/[illegible]N. | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

Total Sum: 1519.40

NO. OF SAMPLES 141
SAMPLE TYPE [illegible] soils
DATE [illegible] 1, 1996
P.O. NO.
GEOLOGIST G. ROYER
PROJECT UTOPIA
SPECIAL INSTRUCTIONS

MR. GUY ROYER
ATTN: G. ROYER
PROJ: LITOPIA

S4052

# TSL/ASSAYERS Laboratories

1270 FEWSTER DRIVE, UNIT 3 MISSISSAUGA,ONTARIO L4W-1A4
PHONE #: (905)602-8236 FAX #: (905)206-0513

REPORT No. : M8192

File No. : 0022MA
Date : OCT-23-1996

## I.C.A.P. PLASMA SCAN

Aqua-Regia Digestion

| SAMPLE # | Ag ppm | Al % | As ppm | B ppm | Ba ppm | Be ppm | Bi ppm | Ca % | Cd ppm | Co ppm | Cr ppm | Cu ppm | Fe % | Mg % | Mn ppm | Mo ppm | Na % | Ni ppm | P ppm | Pb ppm | Sb ppm | Sc ppm | Sn ppm | Sr ppm | Ti ppm | V ppm | W ppm | Y ppm | Zn ppm | Zr ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N.V. 1E ON | < 1 | 1.2 | 10 | < 10 | 72 | < 1 | < 5 | 0.20 | < 1 | 8 | 11 | 21 | 1.7 | 0.28 | 140 | < 2 | 0.02 | 11 | 370 | 10 | < 5 | 2 | < 10 | 13 | 850 | 31 | < 10 | 7 | 41 | < 1 |
| N.V. 1E 100N | < 1 | 2.7 | 5 | < 10 | 95 | < 1 | < 5 | 0.11 | < 1 | 12 | 16 | 26 | 2.4 | 0.38 | 150 | < 2 | 0.02 | 18 | 690 | 12 | < 5 | 3 | < 10 | 12 | 1300 | 39 | < 10 | 8 | 69 | 8 |
| N.V. 1E 200N | < 1 | 2.8 | < 5 | < 10 | 81 | < 1 | < 5 | 0.10 | < 1 | 12 | 14 | 27 | 2.4 | 0.28 | 120 | < 2 | 0.02 | 19 | 620 | 11 | < 5 | 3 | < 10 | 10 | 1300 | 41 | < 10 | 19 | 46 | 9 |
| . 1E 300N | < 1 | 1.2 | < 5 | < 10 | 48 | < 1 | < 5 | 0.28 | < 1 | 9 | 10 | 22 | 1.8 | 0.36 | 300 | < 2 | 0.03 | 10 | 250 | 7 | < 5 | 4 | < 10 | 9 | 930 | 38 | < 10 | 6 | 37 | < 1 |
| . 1E 400N | < 1 | 1.2 | < 5 | < 10 | 62 | < 1 | < 5 | 0.38 | < 1 | 8 | 8 | 14 | 1.9 | 0.27 | 200 | < 2 | 0.04 | 10 | 220 | 6 | < 5 | 4 | < 10 | 11 | 870 | 40 | < 10 | 6 | 39 | < 1 |
| N.V. 1E 500N | < 1 | 1.7 | < 5 | < 10 | 91 | < 1 | < 5 | 0.17 | < 1 | 7 | 10 | 22 | 2.0 | 0.18 | 110 | < 2 | 0.03 | 11 | 380 | 12 | < 5 | 3 | < 10 | 12 | 1100 | 31 | < 10 | 8 | 34 | 2 |
| N.V. 1E 600N | < 1 | 3.5 | < 5 | < 10 | 220 | < 1 | < 5 | 0.17 | < 1 | 16 | 16 | 49 | 3.1 | 0.35 | 160 | < 2 | 0.03 | 25 | 380 | 13 | < 5 | 4 | < 10 | 18 | 1500 | 51 | < 10 | 10 | 58 | 3 |
| N.V. 1E 675N | < 1 | 2.1 | < 5 | < 10 | 120 | < 1 | < 5 | 0.28 | < 1 | 10 | 12 | 31 | 2.2 | 0.28 | 140 | < 2 | 0.03 | 15 | 270 | 8 | < 5 | 4 | < 10 | 17 | 1200 | 44 | < 10 | 16 | 43 | < 1 |
| N.V. 1E 800N | < 1 | 2.8 | < 5 | < 10 | 150 | < 1 | < 5 | 0.26 | < 1 | 13 | 16 | 29 | 2.7 | 0.36 | 210 | < 2 | 0.03 | 23 | 290 | 12 | < 5 | 4 | < 10 | 18 | 1400 | 49 | < 10 | 13 | 53 | 1 |
| N.V. 1E 900N | < 1 | 2.0 | < 5 | < 10 | 100 | < 1 | < 5 | 0.28 | < 1 | 11 | 14 | 28 | 2.2 | 0.40 | 340 | < 2 | 0.03 | 18 | 210 | 12 | < 5 | 4 | < 10 | 18 | 1100 | 42 | < 10 | 13 | 46 | < 1 |
| N.V. 1E 1000N | < 1 | 1.4 | < 5 | < 10 | 62 | < 1 | < 5 | 0.11 | < 1 | 5 | 10 | 10 | 1.6 | 0.19 | 100 | < 2 | 0.02 | 8 | 1000 | 11 | < 5 | 2 | < 10 | 8 | 820 | 28 | < 10 | 6 | 34 | < 1 |
| N.V. 1E 1100N | < 1 | 2.1 | < 5 | < 10 | 180 | < 1 | < 5 | 0.17 | < 1 | 11 | 13 | 54 | 1.9 | 0.29 | 110 | < 2 | 0.03 | 16 | 300 | 12 | < 5 | 3 | < 10 | 15 | 970 | 30 | < 10 | 13 | 39 | 3 |
| N.V. 1E 1200N | < 1 | 1.9 | < 5 | < 10 | 100 | < 1 | < 5 | 0.23 | < 1 | 9 | 15 | 28 | 1.8 | 0.45 | 150 | < 2 | 0.03 | 13 | 360 | 7 | < 5 | 4 | < 10 | 11 | 980 | 35 | < 10 | 8 | 40 | 3 |
| N.V. 1E 1300N | < 1 | 2.2 | 5 | < 10 | 120 | < 1 | < 5 | 0.25 | < 1 | 8 | 13 | 34 | 2.2 | 0.40 | 150 | < 2 | 0.03 | 19 | 160 | 10 | < 5 | 4 | < 10 | 16 | 1200 | 41 | < 10 | 7 | 44 | 4 |
| N.V. 2E ON | < 1 | 1.7 | < 5 | < 10 | 60 | < 1 | < 5 | 0.12 | < 1 | 6 | 10 | 19 | 1.8 | 0.18 | 140 | < 2 | 0.03 | 9 | 310 | 11 | < 5 | 2 | < 10 | 11 | 960 | 27 | < 10 | 11 | 36 | 3 |
| N.V. 2E 100N | < 1 | 2.8 | < 5 | < 10 | 91 | < 1 | < 5 | 0.13 | < 1 | 12 | 14 | 19 | 2.3 | 0.26 | 130 | < 2 | 0.02 | 16 | 1000 | 15 | < 5 | 3 | < 10 | 12 | 1200 | 35 | < 10 | 12 | 52 | 6 |
| N.V. 2E 200N | < 1 | 2.1 | 5 | < 10 | 82 | < 1 | < 5 | 0.19 | < 1 | 10 | 18 | 21 | 2.5 | 0.65 | 180 | < 2 | 0.03 | 17 | 320 | 10 | < 5 | 3 | < 10 | 13 | 1400 | 38 | < 10 | 7 | 57 | 1 |
| N.V. 2E 300N | < 1 | 1.2 | < 5 | < 10 | 52 | < 1 | < 5 | 0.37 | < 1 | 7 | 8 | 17 | 1.8 | 0.37 | 160 | < 2 | 0.04 | 9 | 110 | 6 | < 5 | 4 | < 10 | 9 | 1000 | 37 | < 10 | 7 | 32 | < 1 |
| N.V. 2E 400N | < 1 | 2.6 | 10 | < 10 | 110 | < 1 | < 5 | 0.22 | < 1 | 10 | 9 | 18 | 2.0 | 0.18 | 120 | < 2 | 0.03 | 14 | 820 | 11 | < 5 | 3 | < 10 | 20 | 1100 | 35 | < 10 | 4 | 38 | 17 |
| N.V. 2E 500N | < 1 | 2.8 | < 5 | < 10 | 150 | < 1 | < 5 | 0.21 | < 1 | 11 | 14 | 27 | 2.4 | 0.30 | 150 | < 2 | 0.03 | 20 | 740 | 11 | < 5 | 3 | < 10 | 15 | 1100 | 42 | < 10 | 6 | 56 | 2 |
| N.V. 2E 600N | < 1 | 2.1 | < 5 | < 10 | 130 | < 1 | < 5 | 0.18 | < 1 | 10 | 13 | 38 | 2.2 | 0.39 | 120 | < 2 | 0.04 | 21 | 270 | 10 | < 5 | 3 | < 10 | 16 | 1100 | 41 | < 10 | 6 | 43 | 2 |
| N 2E 700N | < 1 | 1.8 | < 5 | < 10 | 97 | < 1 | < 5 | 0.23 | < 1 | 10 | 14 | 33 | 1.9 | 0.36 | 190 | < 2 | 0.03 | 15 | 300 | 11 | < 5 | 3 | < 10 | 14 | 930 | 39 | < 10 | 9 | 41 | < 1 |
| N 2E 800N | < 1 | 1.5 | < 5 | < 10 | 77 | < 1 | < 5 | 0.30 | < 1 | 7 | 10 | 19 | 1.7 | 0.28 | 130 | < 2 | 0.03 | 10 | 500 | 7 | < 5 | 3 | < 10 | 12 | 770 | 32 | < 10 | 7 | 31 | < 1 |
| N.V. 2E 900N | < 1 | 0.94 | < 5 | < 10 | 33 | < 1 | < 5 | 0.43 | < 1 | 6 | 5 | 20 | 1.8 | 0.27 | 140 | < 2 | 0.05 | 7 | 180 | 3 | < 5 | 4 | < 10 | 6 | 870 | 42 | < 10 | 6 | 22 | 2 |
| N.V. 2E 1000N | < 1 | 2.2 | < 5 | < 10 | 96 | < 1 | < 5 | 0.24 | < 1 | 6 | 11 | 21 | 2.1 | 0.24 | 110 | < 2 | 0.03 | 12 | 350 | 10 | < 5 | 3 | < 10 | 18 | 1200 | 32 | < 10 | 11 | 31 | 8 |
| N.V. 2E 1100N | < 1 | 2.5 | < 5 | < 10 | 160 | < 1 | < 5 | 0.17 | < 1 | 8 | 12 | 26 | 1.8 | 0.26 | 140 | < 2 | 0.04 | 18 | 190 | 12 | < 5 | 3 | < 10 | 21 | 1300 | 31 | < 10 | 9 | 33 | 6 |
| N.V. 2E 1200N | < 1 | 3.0 | < 5 | < 10 | 120 | < 1 | < 5 | 0.20 | < 1 | 7 | 8 | 15 | 1.7 | 0.15 | 120 | < 2 | 0.04 | 12 | 580 | 8 | < 5 | 2 | < 10 | 22 | 1200 | 28 | < 10 | 10 | 19 | 15 |
| N.V. 2E 1300N | < 1 | 2.0 | < 5 | < 10 | 130 | < 1 | < 5 | 0.22 | < 1 | 10 | 13 | 31 | 2.0 | 0.42 | 130 | < 2 | 0.03 | 16 | 180 | 7 | < 5 | 3 | < 10 | 13 | 1100 | 43 | < 10 | 4 | 37 | 5 |
| N.V. 2E 1400N | < 1 | 0.97 | 5 | < 10 | 45 | < 1 | < 5 | 0.29 | < 1 | 5 | 9 | 18 | 1.3 | 0.28 | 120 | < 2 | 0.03 | 8 | 110 | 5 | < 5 | 3 | < 10 | 8 | 820 | 30 | < 10 | 5 | 23 | < 1 |
| N.V. 4E 1100N | < 1 | 1.9 | < 5 | < 10 | 100 | < 1 | < 5 | 0.21 | < 1 | 8 | 13 | 25 | 2.0 | 0.34 | 200 | < 2 | 0.03 | 14 | 140 | 14 | < 5 | 3 | < 10 | 16 | 1000 | 34 | < 10 | 8 | 36 | 1 |
| N.V. 4E 1200N | < 1 | 2.2 | 5 | < 10 | 190 | < 1 | < 5 | 0.18 | < 1 | 11 | 16 | 28 | 2.1 | 0.41 | 380 | < 2 | 0.03 | 18 | 350 | 11 | < 5 | 3 | < 10 | 18 | 1000 | 31 | < 10 | 5 | 55 | 2 |
| N.V. 4E 1275N | < 1 | 2.0 | 10 | < 10 | 120 | < 1 | < 5 | 0.21 | < 1 | 10 | 15 | 32 | 2.2 | 0.38 | 280 | < 2 | 0.03 | 17 | 150 | 11 | < 5 | 4 | < 10 | 18 | 1100 | 40 | < 10 | 12 | 35 | 3 |
| N.V. 6E 1000N | < 1 | 3.5 | 5 | < 10 | 110 | < 1 | < 5 | 0.14 | < 1 | 8 | 9 | 21 | 1.9 | 0.11 | 150 | < 2 | 0.03 | 18 | 1500 | 12 | < 5 | 2 | < 10 | 17 | 1300 | 31 | < 10 | 14 | 28 | 22 |
| N.V. 6E 1100N | < 1 | 1.4 | < 5 | < 10 | 51 | < 1 | < 5 | 0.18 | < 1 | 5 | 9 | 14 | 1.2 | 0.23 | 80 | < 2 | 0.03 | 10 | 170 | 8 | < 5 | 2 | < 10 | 13 | 830 | 21 | < 10 | 4 | 29 | < 1 |
| N.V. 6E 1200N | < 1 | 1.7 | < 5 | < 10 | 120 | < 1 | < 5 | 0.20 | < 1 | 8 | 12 | 23 | 1.6 | 0.27 | 100 | < 2 | 0.04 | 13 | 130 | 10 | < 5 | 2 | < 10 | 16 | 1000 | 30 | < 10 | 4 | 30 | 1 |

A .5 gm sample is digested with 2 ml of 3:1 HCL/HNO3
at 95 C for 90 min and diluted to 10 ml with DI H2O
This method is partial for many oxide materials

SIGNED :

MR. GUY ROYER
ATTN: G. ROYER
PROJ: LITOPIA
S4052

# TSL/ASSAYERS Laboratories

1270 FEWSTER DRIVE, UNIT 3 MISSISSAUGA,ONTARIO L4W-1A4
PHONE #: (905)602-8236 FAX #: (905)206-0513



## I.C.A.P. PLASMA SCAN

Aqua-Regia Digestion

| SAMPLE # | Ag ppm | Al % | As ppm | B ppm | Ba ppm | Be ppm | Bi ppm | Ca % | Cd ppm | Co ppm | Cr ppm | Cu ppm | Fe % | Mg % | Mn ppm | Mo ppm | Na % | Ni ppm | P ppm | Pb ppm | Sb ppm | Sc ppm | Sn ppm | Sr ppm | Ti ppm | V ppm | W ppm | Y ppm | Zn ppm | Zr ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N.V. 6E 1300N | < 1 | 0.74 | < 5 | < 10 | 35 | < 1 | < 5 | 0.33 | < 1 | 5 | 9 | 16 | 1.2 | 0.26 | 140 | < 2 | 0.04 | 8 | 160 | 5 | < 5 | 3 | < 10 | 9 | 710 | 27 | < 10 | 6 | 21 | < 1 |
| N.V. 7E 1050N | < 1 | 1.4 | < 5 | < 10 | 87 | < 1 | < 5 | 0.25 | < 1 | 6 | 13 | 20 | 1.5 | 0.37 | 120 | < 2 | 0.04 | 12 | 94 | 11 | < 5 | 3 | < 10 | 13 | 1000 | 28 | < 10 | 6 | 32 | 1 |
| N.V. 7E 1150N | < 1 | 2.3 | < 5 | < 10 | 130 | < 1 | < 5 | 0.29 | < 1 | 9 | 18 | 29 | 2.0 | 0.44 | 310 | < 2 | 0.04 | 16 | 160 | 12 | < 5 | 4 | < 10 | 24 | 1100 | 33 | < 10 | 14 | 39 | 3 |
| N.V. 7E 1250N | < 1 | 2.4 | < 5 | < 10 | 140 | < 1 | < 5 | 0.34 | < 1 | 9 | 17 | 32 | 2.1 | 0.41 | 310 | < 2 | 0.03 | 17 | 200 | 11 | < 5 | 4 | < 10 | 27 | 1100 | 34 | < 10 | 15 | 37 | 2 |
| V. 8E ON | < 1 | 2.0 | < 5 | < 10 | 110 | < 1 | < 5 | 0.15 | < 1 | 12 | 17 | 25 | 2.3 | 0.42 | 250 | < 2 | 0.02 | 25 | 280 | 13 | < 5 | 3 | < 10 | 13 | 940 | 37 | < 10 | 9 | 71 | < 1 |
| N.V. 8E 100N | < 1 | 2.8 | 5 | < 10 | 120 | < 1 | < 5 | 0.13 | < 1 | 8 | 10 | 20 | 1.8 | 0.19 | 310 | < 2 | 0.03 | 25 | 970 | 10 | < 5 | 4 | < 10 | 16 | 1200 | 30 | < 10 | 9 | 76 | 21 |
| N.V. 8E 200N | < 1 | 1.1 | < 5 | < 10 | 61 | < 1 | < 5 | 0.21 | < 1 | 6 | 10 | 18 | 1.5 | 0.36 | 250 | < 2 | 0.02 | 9 | 180 | 7 | < 5 | 3 | < 10 | 9 | 860 | 29 | < 10 | 8 | 39 | < 1 |
| N.V. 8E 300N | < 1 | 2.0 | < 5 | < 10 | 95 | < 1 | < 5 | 0.26 | 3 | 10 | 18 | 36 | 2.3 | 0.48 | 300 | < 2 | 0.03 | 21 | 190 | 18 | < 5 | 4 | < 10 | 19 | 1200 | 38 | < 10 | 15 | 66 | < 1 |
| N.V. 8E 400N | < 1 | 2.2 | < 5 | < 10 | 110 | < 1 | < 5 | 0.14 | < 1 | 10 | 12 | 21 | 2.2 | 0.27 | 240 | < 2 | 0.03 | 15 | 720 | 12 | < 5 | 3 | < 10 | 14 | 1000 | 34 | < 10 | 9 | 58 | 3 |
| N.V. 8E 500N | < 1 | 3.2 | < 5 | < 10 | 160 | < 1 | < 5 | 0.22 | < 1 | 10 | 18 | 39 | 2.8 | 0.39 | 330 | < 2 | 0.02 | 28 | 320 | 17 | < 5 | 4 | < 10 | 23 | 1300 | 45 | < 10 | 13 | 59 | 3 |
| N.V. 8E 600N | < 1 | 1.5 | 5 | < 10 | 100 | < 1 | < 5 | 0.17 | < 1 | 7 | 13 | 18 | 1.6 | 0.38 | 140 | < 2 | 0.02 | 12 | 120 | 10 | < 5 | 2 | < 10 | 12 | 980 | 27 | < 10 | 5 | 45 | < 1 |
| N.V. 8E 700N | < 1 | 1.8 | < 5 | < 10 | 200 | < 1 | < 5 | 0.21 | < 1 | 6 | 13 | 19 | 1.9 | 0.27 | 240 | < 2 | 0.02 | 12 | 2700 | 14 | < 5 | 2 | < 10 | 22 | 960 | 31 | < 10 | 3 | 65 | 5 |
| N.V. 8E 800N | < 1 | 1.5 | < 5 | < 10 | 66 | < 1 | < 5 | 0.20 | < 1 | 6 | 9 | 13 | 1.6 | 0.20 | 83 | < 2 | 0.03 | 10 | 330 | 8 | < 5 | 2 | < 10 | 10 | 830 | 33 | < 10 | 4 | 27 | 3 |
| N.V. 8E 900N | < 1 | 1.9 | < 5 | < 10 | 97 | < 1 | < 5 | 0.17 | < 1 | 6 | 9 | 17 | 1.3 | 0.21 | 100 | < 2 | 0.04 | 13 | 140 | 14 | < 5 | 2 | < 10 | 19 | 990 | 23 | < 10 | 5 | 33 | 2 |
| N.V. 8E 1000N | < 1 | 1.9 | < 5 | < 10 | 180 | < 1 | < 5 | 0.16 | < 1 | 8 | 12 | 16 | 2.0 | 0.26 | 100 | < 2 | 0.03 | 14 | 690 | 12 | < 5 | 2 | < 10 | 13 | 1100 | 40 | < 10 | 3 | 71 | 4 |
| N.V. 8E 1100N | < 1 | 1.5 | < 5 | < 10 | 91 | < 1 | < 5 | 0.12 | < 1 | 6 | 9 | 12 | 1.2 | 0.21 | 120 | < 2 | 0.03 | 11 | 180 | 12 | < 5 | 1 | < 10 | 12 | 750 | 21 | < 10 | 3 | 37 | < 1 |
| N.V. 8E 1200N | < 1 | 1.7 | < 5 | < 10 | 93 | < 1 | < 5 | 0.23 | < 1 | 7 | 12 | 18 | 1.5 | 0.28 | 340 | < 2 | 0.03 | 14 | 130 | 13 | < 5 | 2 | < 10 | 18 | 810 | 22 | < 10 | 9 | 39 | < 1 |
| N.V. 8E 1300N | < 1 | 2.8 | < 5 | < 10 | 220 | < 1 | < 5 | 0.11 | < 1 | 10 | 14 | 19 | 2.3 | 0.24 | 170 | < 2 | 0.02 | 19 | 680 | 12 | < 5 | 2 | < 10 | 11 | 1100 | 35 | < 10 | 3 | 61 | 6 |
| N.V. 11E ON | < 1 | 2.8 | 5 | < 10 | 160 | < 1 | < 5 | 0.18 | < 1 | 14 | 13 | 29 | 2.2 | 0.27 | 230 | < 2 | 0.03 | 24 | 640 | 11 | < 5 | 3 | < 10 | 18 | 1200 | 37 | < 10 | 7 | 55 | 12 |
| N.V. 11E 100N | < 1 | 1.9 | < 5 | < 10 | 91 | < 1 | < 5 | 0.24 | < 1 | 8 | 14 | 26 | 1.9 | 0.39 | 230 | < 2 | 0.03 | 15 | 190 | 10 | < 5 | 3 | < 10 | 15 | 1100 | 32 | < 10 | 8 | 39 | 2 |
| N.V. 11E 200N | < 1 | 1.8 | < 5 | < 10 | 75 | < 1 | < 5 | 0.22 | < 1 | 8 | 14 | 20 | 1.9 | 0.44 | 190 | < 2 | 0.03 | 13 | 160 | 10 | < 5 | 3 | < 10 | 13 | 1100 | 31 | < 10 | 7 | 43 | < 1 |
| N.V. 11E 300N | < 1 | 2.8 | < 5 | < 10 | 130 | < 1 | < 5 | 0.12 | < 1 | 12 | 15 | 24 | 2.9 | 0.25 | 250 | < 2 | 0.03 | 31 | 450 | 20 | < 5 | 3 | < 10 | 17 | 1600 | 42 | < 10 | 8 | 58 | 5 |
| 11E 400N | < 1 | 2.6 | < 5 | < 10 | 150 | < 1 | < 5 | 0.16 | < 1 | 11 | 15 | 30 | 2.3 | 0.34 | 150 | < 2 | 0.03 | 22 | 370 | 15 | < 5 | 3 | < 10 | 17 | 1200 | 36 | < 10 | 10 | 45 | 1 |
| 11E 500N | < 1 | 2.3 | < 5 | < 10 | 100 | < 1 | < 5 | 0.16 | < 1 | 7 | 11 | 19 | 1.8 | 0.19 | 130 | < 2 | 0.04 | 13 | 410 | 13 | < 5 | 2 | < 10 | 17 | 1200 | 31 | < 10 | 8 | 32 | 5 |
| N.V. 11E 600N | < 1 | 1.3 | < 5 | < 10 | 67 | < 1 | < 5 | 0.19 | < 1 | 5 | 9 | 15 | 1.4 | 0.27 | 130 | < 2 | 0.03 | 10 | 130 | 8 | < 5 | 2 | < 10 | 10 | 840 | 27 | < 10 | 4 | 31 | < 1 |
| N.V. 11E 700N | < 1 | 1.8 | < 5 | < 10 | 85 | < 1 | < 5 | 0.19 | < 1 | 10 | 22 | 22 | 2.0 | 0.63 | 190 | < 2 | 0.03 | 18 | 120 | 10 | < 5 | 3 | < 10 | 16 | 1100 | 35 | < 10 | 5 | 62 | 2 |
| N.V. 11E 800N | < 1 | 1.4 | < 5 | < 10 | 81 | < 1 | < 5 | 0.17 | < 1 | 6 | 11 | 16 | 1.3 | 0.26 | 200 | < 2 | 0.03 | 11 | 130 | 10 | < 5 | 2 | < 10 | 13 | 720 | 24 | < 10 | 5 | 30 | < 1 |
| N.V. 11E 900N | < 1 | 3.8 | < 5 | < 10 | 110 | < 1 | < 5 | 0.14 | < 1 | 6 | 11 | 10 | 2.1 | 0.12 | 110 | < 2 | 0.02 | 8 | 1100 | 11 | < 5 | 2 | < 10 | 15 | 1200 | 35 | < 10 | 4 | 32 | 22 |
| N.V. 11E 1000N | < 1 | 2.3 | 5 | < 10 | 110 | < 1 | < 5 | 0.13 | < 1 | 6 | 11 | 23 | 1.6 | 0.20 | 130 | < 2 | 0.03 | 14 | 310 | 12 | < 5 | 2 | < 10 | 16 | 1100 | 27 | < 10 | 3 | 41 | 3 |
| N.V. 11E 1100N | < 1 | 2.2 | < 5 | < 10 | 170 | < 1 | < 5 | 0.09 | < 1 | 8 | 10 | 11 | 1.7 | 0.13 | 420 | < 2 | 0.02 | 11 | 3100 | 11 | < 5 | 2 | < 10 | 12 | 1000 | 19 | < 10 | 4 | 61 | 5 |
| N.V. 11E 1200N | < 1 | 2.4 | 5 | < 10 | 170 | < 1 | < 5 | 0.17 | < 1 | 6 | 7 | 12 | 1.5 | 0.07 | 210 | < 2 | 0.03 | 11 | 1600 | 9 | < 5 | 1 | < 10 | 21 | 1000 | 26 | < 10 | 3 | 37 | 10 |
| N.V. 11E 1300N | < 1 | 2.1 | < 5 | < 10 | 140 | < 1 | < 5 | 0.23 | < 1 | 8 | 12 | 22 | 1.6 | 0.26 | 210 | < 2 | 0.03 | 15 | 550 | 10 | < 5 | 3 | < 10 | 15 | 950 | 31 | < 10 | 6 | 45 | 6 |
| N.V. 17E 500N | < 1 | 2.9 | < 5 | < 10 | 180 | < 1 | < 5 | 0.11 | < 1 | 10 | 22 | 27 | 2.9 | 0.69 | 310 | < 2 | 0.02 | 23 | 470 | 12 | < 5 | 4 | < 10 | 20 | 1600 | 30 | < 10 | 9 | 100 | 20 |
| N.V. 18E 550N | < 1 | 3.7 | < 5 | < 10 | 150 | < 1 | < 5 | 0.12 | < 1 | 31 | 30 | 69 | 3.6 | 0.67 | 200 | < 2 | 0.02 | 110 | 440 | 18 | < 5 | 5 | < 10 | 21 | 1400 | 40 | < 10 | 16 | 160 | 11 |
| [illegible] | < 1 | [illegible] | [illegible] | < 10 | 220 | < 1 | < 5 | 0.11 | < 1 | 25 | 25 | [illegible] | 2.7 | [illegible] | 310 | < 2 | 0.03 | 95 | 770 | 21 | < 5 | 7 | < 10 | 22 | 1700 | 50 | < 10 | [illegible] | 110 | [illegible] |

A .5 gm sample is digested with 2 ml of 3:1 HCL/HNO3
at 95 C for 90 min and diluted to 10 ml with DI H2O
This method is partial for many oxide materials

SIGNED :

MR. GUY ROYER

ATTN: G. ROYER

PROJ: LITOPIA

S4052

# TSL/ASSAYERS Laboratories

1270 FEWSTER DRIVE, UNIT 3 MISSISSAUGA, ONTARIO L4W-1A4

PHONE #: (905)602-8236 FAX #: (905)206-0513



File No. : OC22MA

Date : OCT-23-1996

## I.C.A.P. PLASMA SCAN

Aqua-Regia Digestion

| SAMPLE # | Ag | Al | As | B | Ba | Be | Bi | Ca | Cd | Co | Cr | Cu | Fe | Mg | Mn | Mo | Na | Ni | P | Pb | Sb | Sc | Sn | Sr | Ti | V | W | Y | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ppm | % | ppm | ppm | ppm | ppm | ppm | % | ppm | ppm | ppm | ppm | % | % | ppm | ppm | % | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm | ppm |
| N.V. 20E 500N | < 1 | 2.4 | 5 | < 10 | 140 | < 1 | < 5 | 0.16 | < 1 | 11 | 24 | 34 | 2.3 | 0.45 | 210 | < 2 | 0.02 | 29 | 240 | 15 | < 5 | 3 | < 10 | 15 | 1100 | 32 | < 10 | 11 | 68 | 2 |
| N.V. 20E 600N | < 1 | 1.4 | < 5 | < 10 | 60 | < 1 | < 5 | 0.19 | < 1 | 6 | 16 | 23 | 1.9 | 0.49 | 160 | < 2 | 0.02 | 14 | 100 | 8 | < 5 | 3 | < 10 | 10 | 1000 | 28 | < 10 | 8 | 44 | 2 |
| N.V. 20E 700N | < 1 | 2.8 | 5 | < 10 | 160 | < 1 | < 5 | 0.19 | < 1 | 15 | 20 | 38 | 2.5 | 0.47 | 340 | < 2 | 0.02 | 31 | 270 | 14 | < 5 | 4 | < 10 | 23 | 1200 | 32 | < 10 | 17 | 63 | 2 |
| N.V. 20E 800N | < 1 | 3.3 | < 5 | < 10 | 150 | < 1 | < 5 | 0.16 | < 1 | 10 | 17 | 39 | 2.3 | 0.37 | 110 | < 2 | 0.03 | 37 | 190 | 13 | < 5 | 4 | < 10 | 23 | 1400 | 33 | < 10 | 12 | 45 | 8 |
| H. OE 500N | < 1 | 2.3 | 10 | < 10 | 290 | < 1 | < 5 | 0.29 | < 1 | 10 | 19 | 29 | 2.1 | 0.44 | 170 | < 2 | 0.03 | 27 | 1100 | 14 | < 5 | 4 | < 10 | 26 | 1000 | 29 | < 10 | 6 | 100 | 8 |
| V.H. OE 600N | < 1 | 1.5 | < 5 | < 10 | 180 | < 1 | < 5 | 0.32 | < 1 | 7 | 17 | 18 | 1.8 | 0.42 | 180 | < 2 | 0.03 | 17 | 390 | 13 | < 5 | 3 | < 10 | 22 | 910 | 23 | < 10 | 5 | 72 | 4 |
| V.H. OE 700N | < 1 | 1.6 | < 5 | < 10 | 210 | < 1 | < 5 | 0.21 | < 1 | 8 | 17 | 20 | 1.8 | 0.45 | 250 | < 2 | 0.03 | 17 | 480 | 12 | < 5 | 3 | < 10 | 18 | 950 | 27 | < 10 | 4 | 80 | 2 |
| V.H. OE 800N | < 1 | 2.0 | < 5 | < 10 | 310 | < 1 | < 5 | 0.25 | < 1 | 9 | 18 | 18 | 1.9 | 0.44 | 400 | < 2 | 0.03 | 21 | 880 | 15 | < 5 | 4 | < 10 | 28 | 980 | 24 | < 10 | 6 | 120 | 3 |
| V.H. OE 900N | < 1 | 1.5 | < 5 | < 10 | 110 | < 1 | < 5 | 0.21 | < 1 | 9 | 18 | 25 | 1.7 | 0.46 | 300 | < 2 | 0.03 | 17 | 280 | 16 | < 5 | 3 | < 10 | 18 | 910 | 26 | < 10 | 8 | 66 | 1 |
| V.H. OE 1000N | < 1 | 1.3 | < 5 | < 10 | 180 | < 1 | < 5 | 0.23 | < 1 | 7 | 13 | 14 | 1.5 | 0.37 | 400 | < 2 | 0.02 | 13 | 330 | 11 | < 5 | 3 | < 10 | 23 | 810 | 22 | < 10 | 4 | 79 | < 1 |
| V.H. OE 1100N | < 1 | 2.0 | < 5 | < 10 | 140 | < 1 | < 5 | 0.26 | < 1 | 12 | 22 | 31 | 2.1 | 0.64 | 500 | < 2 | 0.03 | 24 | 310 | 22 | < 5 | 4 | < 10 | 24 | 1100 | 32 | < 10 | 18 | 100 | < 1 |
| V.H. OE 1200N | < 1 | 2.8 | < 5 | < 10 | 250 | < 1 | < 5 | 0.22 | < 1 | 12 | 21 | 37 | 2.4 | 0.58 | 530 | < 2 | 0.03 | 29 | 1200 | 26 | < 5 | 4 | < 10 | 24 | 1200 | 33 | < 10 | 12 | 110 | 3 |
| V.H. OE 1300N | < 1 | 2.5 | < 5 | < 10 | 230 | < 1 | < 5 | 0.25 | < 1 | 14 | 18 | 28 | 2.2 | 0.56 | 640 | < 2 | 0.03 | 29 | 860 | 24 | < 5 | 4 | < 10 | 27 | 1100 | 28 | < 10 | 8 | 170 | 2 |
| V.H. OE 1400N | < 1 | 3.1 | 10 | < 10 | 210 | < 1 | < 5 | 0.22 | < 1 | 12 | 23 | 30 | 2.5 | 0.70 | 540 | < 2 | 0.03 | 42 | 1100 | 22 | < 5 | 4 | < 10 | 26 | 1300 | 32 | < 10 | 9 | 130 | 7 |
| V.H. OE 1500N | < 1 | 3.5 | 5 | < 10 | 190 | < 1 | < 5 | 0.23 | < 1 | 12 | 26 | 28 | 2.7 | 0.90 | 360 | < 2 | 0.03 | 28 | 960 | 21 | < 5 | 4 | < 10 | 24 | 1500 | 35 | < 10 | 6 | 130 | 8 |
| V.H. OE 1600N | < 1 | 3.3 | 10 | < 10 | 130 | < 1 | < 5 | 0.24 | < 1 | 11 | 24 | 32 | 2.8 | 0.81 | 510 | < 2 | 0.03 | 29 | 350 | 73 | < 5 | 4 | < 10 | 21 | 1400 | 40 | < 10 | 13 | 170 | 2 |
| V.H. 2E 400N | < 1 | 1.7 | < 5 | < 10 | 87 | < 1 | < 5 | 0.27 | < 1 | 8 | 17 | 24 | 1.8 | 0.46 | 250 | < 2 | 0.03 | 15 | 200 | 17 | < 5 | 4 | < 10 | 23 | 1000 | 28 | < 10 | 18 | 67 | < 1 |
| V.H. 2E 500N | < 1 | 1.3 | < 5 | < 10 | 140 | < 1 | < 5 | 0.24 | < 1 | 6 | 13 | 11 | 1.5 | 0.38 | 330 | < 2 | 0.03 | 12 | 230 | 10 | < 5 | 3 | < 10 | 19 | 870 | 24 | < 10 | 5 | 77 | < 1 |
| V.H. 2E 600N | < 1 | 1.4 | < 5 | < 10 | 130 | < 1 | < 5 | 0.23 | < 1 | 7 | 15 | 13 | 1.7 | 0.44 | 210 | < 2 | 0.03 | 14 | 340 | 15 | < 5 | 3 | < 10 | 21 | 920 | 25 | < 10 | 5 | 72 | 3 |
| V.H. 2E 700N | < 1 | 1.3 | < 5 | < 10 | 130 | < 1 | < 5 | 0.23 | < 1 | 6 | 15 | 13 | 1.6 | 0.46 | 300 | < 2 | 0.03 | 13 | 370 | 13 | < 5 | 3 | < 10 | 20 | 890 | 24 | < 10 | 6 | 69 | 1 |
| V.H. 2E 800N | < 1 | 1.4 | < 5 | < 10 | 150 | < 1 | < 5 | 0.21 | < 1 | 8 | 15 | 22 | 1.7 | 0.40 | 350 | < 2 | 0.02 | 16 | 350 | 14 | < 5 | 3 | < 10 | 18 | 850 | 25 | < 10 | 8 | 68 | 1 |
| V.H. 2E 900N | < 1 | 1.9 | < 5 | < 10 | 250 | < 1 | < 5 | 0.20 | < 1 | 9 | 18 | 23 | 1.9 | 0.42 | 350 | < 2 | 0.02 | 19 | 760 | 18 | < 5 | 3 | < 10 | 22 | 900 | 25 | < 10 | 6 | 87 | 3 |
| 2E 1000N | < 1 | 2.2 | < 5 | < 10 | 390 | < 1 | < 5 | 0.28 | < 1 | 11 | 18 | 22 | 2.0 | 0.58 | 720 | < 2 | 0.03 | 22 | 2500 | 21 | < 5 | 4 | < 10 | 38 | 1000 | 27 | < 10 | 6 | 140 | 3 |
| V... 2E 1100N | < 1 | 2.5 | < 5 | < 10 | 320 | < 1 | < 5 | 0.30 | < 1 | 12 | 20 | 26 | 2.4 | 0.54 | 540 | < 2 | 0.03 | 22 | 2000 | 22 | < 5 | 4 | < 10 | 26 | 1100 | 34 | < 10 | 6 | 130 | 3 |
| V.H. 2E 1200N | < 1 | 2.9 | < 5 | < 10 | 280 | < 1 | < 5 | 0.24 | < 1 | 11 | 19 | 28 | 2.4 | 0.49 | 710 | < 2 | 0.04 | 28 | 1100 | 16 | < 5 | 4 | < 10 | 26 | 1300 | 32 | < 10 | 11 | 100 | 9 |
| V.H. 2E 1300N | < 1 | 3.0 | < 5 | < 10 | 300 | < 1 | < 5 | 0.27 | < 1 | 16 | 18 | 23 | 2.3 | 0.38 | 760 | < 2 | 0.03 | 52 | 2800 | 16 | < 5 | 3 | < 10 | 29 | 1300 | 29 | < 10 | 12 | 130 | 7 |
| V.H. 2E 1400N | < 1 | 2.6 | < 5 | < 10 | 100 | < 1 | < 5 | 0.21 | < 1 | 18 | 23 | 45 | 2.9 | 0.61 | 250 | < 2 | 0.02 | 39 | 420 | 16 | < 5 | 4 | < 10 | 19 | 1400 | 37 | < 10 | 27 | 83 | < 1 |
| V.H. 2E 1500N | < 1 | 2.8 | < 5 | < 10 | 170 | < 1 | < 5 | 0.20 | < 1 | 12 | 23 | 26 | 2.7 | 0.70 | 280 | < 2 | 0.02 | 29 | 260 | 19 | < 5 | 4 | < 10 | 18 | 1500 | 38 | < 10 | 12 | 85 | 3 |
| V.H. 2E 1600N | < 1 | 2.8 | 5 | < 10 | 180 | < 1 | < 5 | 0.18 | < 1 | 12 | 23 | 61 | 2.8 | 0.58 | 390 | < 2 | 0.02 | 25 | 440 | 25 | < 5 | 5 | < 10 | 15 | 1300 | 43 | < 10 | 22 | 120 | 3 |
| V.H. 3E 300N | < 1 | 2.7 | < 5 | < 10 | 120 | < 1 | < 5 | 0.38 | < 1 | 8 | 35 | 27 | 2.6 | 1.2 | 550 | < 2 | 0.07 | 22 | 370 | 18 | < 5 | 5 | < 10 | 36 | 1500 | 32 | < 10 | 19 | 96 | 4 |
| V.H. 4E 235N | < 1 | 1.6 | < 5 | < 10 | 110 | < 1 | < 5 | 0.25 | < 1 | 11 | 22 | 26 | 2.3 | 0.51 | 420 | < 2 | 0.03 | 21 | 230 | 17 | < 5 | 5 | < 10 | 21 | 1100 | 35 | < 10 | 18 | 66 | 2 |
| V.H. 4E 300N | < 1 | 2.2 | 5 | < 10 | 200 | < 1 | < 5 | 0.17 | < 1 | 9 | 22 | 19 | 2.4 | 0.62 | 390 | < 2 | 0.02 | 18 | 380 | 16 | < 5 | 4 | < 10 | 22 | 1300 | 32 | < 10 | 9 | 97 | 9 |
| V.H. 4E 400N | < 1 | 1.8 | < 5 | < 10 | 130 | < 1 | < 5 | 0.21 | < 1 | 9 | 19 | 20 | 2.1 | 0.63 | 330 | < 2 | 0.03 | 21 | 280 | 13 | < 5 | 4 | < 10 | 24 | 1100 | 29 | < 10 | 11 | 100 | 1 |
| V.H. 4E 500N | < 1 | 2.1 | < 5 | < 10 | 260 | < 1 | < 5 | 0.24 | < 1 | 9 | 16 | 23 | 2.0 | 0.45 | 560 | < 2 | 0.03 | 23 | 1400 | 14 | < 5 | 4 | < 10 | 40 | 1000 | 26 | < 10 | 10 | 120 | 5 |
| V.H. 4E 600N | < 1 | 2.1 | < 5 | < 10 | 120 | < 1 | < 5 | 0.15 | < 1 | 5 | 15 | 15 | 2.0 | [illegible] | 220 | < 2 | 0.02 | 13 | 250 | 11 | < 5 | 3 | < 10 | 19 | 1100 | 25 | < 10 | 7 | [illegible] | < 1 |

A .5 gm sample is digested with 2 ml of 3:1 HCL/HNO3 at 95 C for 90 min and diluted to 10 ml with DI H2O
This method is partial for many oxide materials

SIGNED :

TSL/96

OCT-30-'96 05:12PM TSL LABORATORIES

MR. GUY ROYER
ATTN: G. ROYER
PROJ: LITOPIA

S4052

# TSL/ASSAYERS Laboratories

1270 FEWSTER DRIVE, UNIT 3 MISSISSAUGA, ONTARIO L4W-1A4
PHONE #: (905)602-8236 FAX #: (905)206-0513

REPORT No. : M8192

File No. : OC22MA
Date : OCT-23-1996

## I.C.A.P. PLASMA SCAN

Aqua-Regia Digestion

| SAMPLE # | Ag ppm | Al % | As ppm | B ppm | Ba ppm | Be ppm | Bi ppm | Ca % | Cd ppm | Co ppm | Cr ppm | Cu ppm | Fe % | Mg % | Mn ppm | Mo ppm | Na % | Ni ppm | P ppm | Pb ppm | Sb ppm | Sc ppm | Sn ppm | Sr ppm | Ti ppm | V ppm | W ppm | Y ppm | Zn ppm | Zr ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V.H. 4E 700N | < 1 | 2.9 | < 5 | < 10 | 350 | < 1 | < 5 | 0.25 | < 1 | 11 | 21 | 20 | 2.5 | 0.47 | 740 | < 2 | 0.03 | 31 | 2100 | 23 | < 5 | 4 | < 10 | 31 | 1300 | 30 | < 10 | 11 | 140 | 2 |
| V.H. 4E 800N | < 1 | 2.5 | < 5 | < 10 | 340 | < 1 | < 5 | 0.26 | < 1 | 12 | 24 | 28 | 2.4 | 0.77 | 1000 | < 2 | 0.03 | 22 | 590 | 28 | < 5 | 4 | < 10 | 25 | 1300 | 33 | < 10 | 8 | 120 | 2 |
| V.H. 4E 900N | < 1 | 3.0 | < 5 | < 10 | 340 | < 1 | < 5 | 0.35 | < 1 | 11 | 20 | 29 | 2.5 | 0.60 | 820 | < 2 | 0.04 | 29 | 2300 | 24 | < 5 | 4 | < 10 | 51 | 1300 | 33 | < 10 | 12 | 150 | 4 |
| V.H. 6E 100N | < 1 | 3.8 | < 5 | < 10 | 210 | < 1 | < 5 | 0.33 | < 1 | 12 | 30 | 35 | 3.1 | 1.0 | 550 | < 2 | 0.04 | 33 | 530 | 19 | < 5 | 7 | < 10 | 39 | 1700 | 41 | < 10 | 30 | 110 | 14 |
| H. 6E 200N | < 1 | 2.7 | < 5 | < 10 | 240 | < 1 | < 5 | 0.22 | < 1 | 10 | 23 | 21 | 2.5 | 0.67 | 580 | < 2 | 0.02 | 23 | 380 | 14 | < 5 | 5 | < 10 | 30 | 1400 | 32 | < 10 | 13 | 100 | 6 |
| V.H. 6E 300N | < 1 | 1.1 | < 5 | < 10 | 170 | < 1 | < 5 | 0.20 | < 1 | 6 | 11 | 14 | 1.6 | 0.35 | 420 | < 2 | 0.02 | 11 | 340 | 12 | < 5 | 3 | < 10 | 15 | 750 | 24 | < 10 | 5 | 77 | < 1 |
| V.H. 6E 400N | < 1 | 2.7 | < 5 | < 10 | 270 | < 1 | < 5 | 0.15 | < 1 | 10 | 19 | 25 | 2.2 | 0.40 | 420 | < 2 | 0.02 | 26 | 1600 | 17 | < 5 | 4 | < 10 | 21 | 1300 | 32 | < 10 | 10 | 100 | 14 |
| V.H. 6E 500N | < 1 | 2.5 | < 5 | < 10 | 240 | < 1 | < 5 | 0.17 | < 1 | 10 | 19 | 22 | 2.2 | 0.45 | 320 | < 2 | 0.02 | 22 | 980 | 25 | < 5 | 3 | < 10 | 22 | 1200 | 31 | < 10 | 6 | 81 | 10 |
| V.H. 6E 600N | < 1 | 2.6 | < 5 | < 10 | 230 | < 1 | < 5 | 0.14 | < 1 | 10 | 16 | 21 | 2.1 | 0.42 | 370 | < 2 | 0.03 | 23 | 1700 | 21 | < 5 | 3 | < 10 | 17 | 1100 | 31 | < 10 | 5 | 110 | 11 |
| V.H. 6E 700N | < 1 | 3.0 | < 5 | < 10 | 300 | < 1 | < 5 | 0.25 | < 1 | 11 | 19 | 25 | 2.4 | 0.61 | 420 | < 2 | 0.04 | 30 | 1700 | 23 | < 5 | 4 | < 10 | 32 | 1300 | 33 | < 10 | 6 | 120 | 8 |
| V.H. 6E 800N | < 1 | 2.0 | 5 | < 10 | 180 | < 1 | < 5 | 0.20 | < 1 | 9 | 20 | 22 | 2.1 | 0.57 | 420 | < 2 | 0.03 | 24 | 550 | 17 | < 5 | 3 | < 10 | 19 | 1200 | 29 | < 10 | 12 | 130 | 2 |
| V.H. 6E 900N | < 1 | 3.6 | 5 | < 10 | 360 | < 1 | < 5 | 0.20 | < 1 | 13 | 20 | 31 | 2.9 | 0.46 | 580 | < 2 | 0.02 | 36 | 4100 | 23 | < 5 | 4 | < 10 | 28 | 1400 | 33 | < 10 | 10 | 170 | 5 |
| V.H. 7E 0N | < 1 | 2.7 | < 5 | < 10 | 330 | < 1 | < 5 | 0.23 | < 1 | 10 | 16 | 19 | 2.1 | 0.39 | 570 | < 2 | 0.03 | 32 | 1300 | 13 | < 5 | 3 | < 10 | 31 | 1200 | 24 | < 10 | 10 | 110 | 7 |
| V.H. 8E 0N | < 1 | 2.2 | 5 | < 10 | 310 | < 1 | < 5 | 0.23 | < 1 | 9 | 16 | 22 | 2.0 | 0.43 | 410 | < 2 | 0.03 | 23 | 1100 | 15 | < 5 | 4 | < 10 | 25 | 1100 | 24 | < 10 | 7 | 200 | 9 |
| V.H. 8E 100N | < 1 | 2.1 | < 5 | < 10 | 87 | < 1 | < 5 | 0.28 | < 1 | 11 | 24 | 60 | 2.6 | 0.65 | 290 | < 2 | 0.03 | 29 | 300 | 17 | < 5 | 6 | < 10 | 21 | 1300 | 40 | < 10 | 55 | 84 | < 1 |
| V.H. 8E 200N | < 1 | 2.2 | < 5 | < 10 | 400 | < 1 | < 5 | 0.24 | < 1 | 9 | 16 | 20 | 1.8 | 0.42 | 540 | < 2 | 0.03 | 23 | 2400 | 24 | < 5 | 3 | < 10 | 30 | 1000 | 25 | < 10 | 4 | 130 | 4 |
| V.H. 8E 300N | < 1 | 2.5 | < 5 | < 10 | 540 | < 1 | < 5 | 0.22 | < 1 | 10 | 16 | 24 | 2.0 | 0.36 | 970 | < 2 | 0.03 | 26 | 3900 | 19 | < 5 | 3 | < 10 | 36 | 1000 | 22 | < 10 | 10 | 140 | 4 |
| V.H. 8E 400N | < 1 | 2.5 | < 5 | < 10 | 300 | < 1 | < 5 | 0.13 | < 1 | 9 | 15 | 21 | 2.1 | 0.29 | 220 | < 2 | 0.02 | 26 | 2900 | 19 | < 5 | 3 | < 10 | 19 | 990 | 26 | < 10 | 6 | 92 | 7 |
| V.H. 8E 500N | < 1 | 2.6 | 5 | < 10 | 240 | < 1 | < 5 | 0.19 | < 1 | 11 | 16 | 28 | 2.2 | 0.39 | 260 | < 2 | 0.03 | 29 | 1200 | 21 | < 5 | 3 | < 10 | 21 | 1100 | 32 | < 10 | 12 | 120 | 5 |
| V.H. 8E 600N | < 1 | 1.8 | 5 | < 10 | 160 | < 1 | < 5 | 0.19 | < 1 | 10 | 17 | 29 | 2.0 | 0.47 | 300 | < 2 | 0.03 | 23 | 320 | 16 | < 5 | 3 | < 10 | 19 | 1100 | 31 | < 10 | 10 | 110 | 2 |
| V.H. 8E 700N | < 1 | 2.8 | < 5 | < 10 | 240 | < 1 | < 5 | 0.15 | < 1 | 12 | 15 | 33 | 2.2 | 0.35 | 500 | < 2 | 0.03 | 29 | 1600 | 21 | < 5 | 4 | < 10 | 19 | 1200 | 30 | < 10 | 9 | 130 | 12 |
| V H. 8E 800N | < 1 | 1.4 | 10 | < 10 | 110 | < 1 | < 5 | 0.19 | < 1 | 9 | 16 | 23 | 1.9 | 0.49 | 210 | < 2 | 0.03 | 16 | 310 | 16 | < 5 | 3 | < 10 | 11 | 910 | 30 | < 10 | 5 | 95 | 2 |
| 8E 900N | < 1 | 1.9 | < 5 | < 10 | 160 | < 1 | < 5 | 0.24 | < 1 | 11 | 15 | 47 | 2.5 | 0.45 | 160 | < 2 | 0.03 | 17 | 1400 | 15 | < 5 | 4 | < 10 | 15 | 1000 | 45 | < 10 | 6 | 160 | 2 |
| V.H. 8E 1000N | < 1 | 2.4 | 10 | < 10 | 210 | < 1 | < 5 | 0.24 | < 1 | 13 | 13 | 48 | 2.5 | 0.36 | 390 | < 2 | 0.03 | 22 | 860 | 16 | < 5 | 4 | < 10 | 17 | 1100 | 45 | < 10 | 8 | 210 | 5 |
| V.H. 10E 0N | < 1 | 2.0 | < 5 | < 10 | 220 | < 1 | < 5 | 0.17 | < 1 | 8 | 14 | 24 | 1.7 | 0.34 | 150 | < 2 | 0.03 | 21 | 440 | 15 | < 5 | 2 | < 10 | 25 | 980 | 25 | < 10 | 5 | 270 | < 1 |
| V.H. 10E 100N | < 1 | 2.4 | < 5 | < 10 | 340 | < 1 | < 5 | 0.19 | < 1 | 7 | 10 | 22 | 1.6 | 0.23 | 380 | < 2 | 0.03 | 22 | 2200 | 14 | < 5 | 2 | < 10 | 26 | 1000 | 21 | < 10 | 7 | 82 | 8 |
| V.H. 10E 200N | < 1 | 2.9 | < 5 | < 10 | 230 | < 1 | < 5 | 0.17 | < 1 | 7 | 12 | 48 | 1.7 | 0.26 | 300 | < 2 | 0.03 | 21 | 1500 | 14 | < 5 | 3 | < 10 | 23 | 1200 | 24 | < 10 | 7 | 85 | 13 |
| V.H. 10E 300N | < 1 | 2.8 | < 5 | < 10 | 380 | < 1 | < 5 | 0.17 | < 1 | 11 | 15 | 27 | 2.2 | 0.39 | 200 | < 2 | 0.03 | 28 | 1500 | 19 | < 5 | 3 | < 10 | 26 | 1100 | 29 | < 10 | 5 | 98 | 7 |
| V.H. 10E 400N | < 1 | 1.2 | < 5 | < 10 | 92 | < 1 | < 5 | 0.17 | < 1 | 6 | 13 | 20 | 1.6 | 0.40 | 180 | < 2 | 0.02 | 12 | 210 | 17 | < 5 | 3 | < 10 | 12 | 940 | 25 | < 10 | 7 | 49 | 2 |
| V.H. 10E 500N | < 1 | 1.4 | < 5 | < 10 | 96 | < 1 | < 5 | 0.22 | < 1 | 7 | 12 | 33 | 1.8 | 0.40 | 150 | < 2 | 0.03 | 14 | 170 | 14 | < 5 | 3 | < 10 | 15 | 920 | 31 | < 10 | 6 | 54 | < 1 |
| V.H. 10E 600N | < 1 | 1.9 | < 5 | < 10 | 140 | < 1 | < 5 | 0.33 | < 1 | 9 | 13 | 65 | 2.2 | 0.45 | 260 | < 2 | 0.04 | 18 | 280 | 19 | < 5 | 6 | < 10 | 19 | 1000 | 45 | < 10 | 13 | 56 | 4 |
| V.H. 10E 700N | < 1 | 1.2 | < 5 | < 10 | 76 | < 1 | < 5 | 0.27 | < 1 | 7 | 14 | 32 | 1.8 | 0.46 | 150 | < 2 | 0.03 | 12 | 170 | 16 | < 5 | 4 | < 10 | 11 | 860 | 35 | < 10 | 7 | 50 | < 1 |
| V.H. 10E 800N | < 1 | 1.9 | 5 | < 10 | 140 | < 1 | < 5 | 0.25 | < 1 | 9 | 16 | 58 | 2.1 | 0.47 | 360 | < 2 | 0.03 | 20 | 220 | 15 | < 5 | 6 | < 10 | 17 | 1000 | 42 | < 10 | 15 | 71 | 3 |
| V.H. 10E 900N | < 1 | 1.4 | 5 | < 10 | 110 | < 1 | < 5 | 0.28 | 1 | 11 | 12 | 56 | 2.1 | 0.39 | 400 | < 2 | 0.03 | 14 | 260 | 13 | < 5 | 4 | < 10 | 10 | 900 | 53 | < 10 | 10 | 65 | < 1 |
| V.H. 10E 1000N | < 1 | 1.4 | < 5 | < 10 | 110 | < 1 | < 5 | [illegible] | < 1 | 9 | 9 | 30 | 1.7 | 0.34 | 170 | < 2 | 0.03 | 12 | 210 | 11 | < 5 | 3 | < 10 | 13 | 900 | 11 | < 10 | 7 | 62 | 2 |

A .5 gm sample is digested with 2 ml of 3:1 HCL/HNO3
at 95 C for 90 min and diluted to 10 ml with DI H2O
This method is partial for many oxide materials

SIGNED :

MR. GUY ROYER

ATTN: G. ROYER

PROJ: LITOPIA

S4052

# TSL/ASSAYERS Laboratories

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REPORT No. : M8192



File No. : CC22MA

Date : OCT-23-1996

## I.C.A.P. PLASMA SCAN

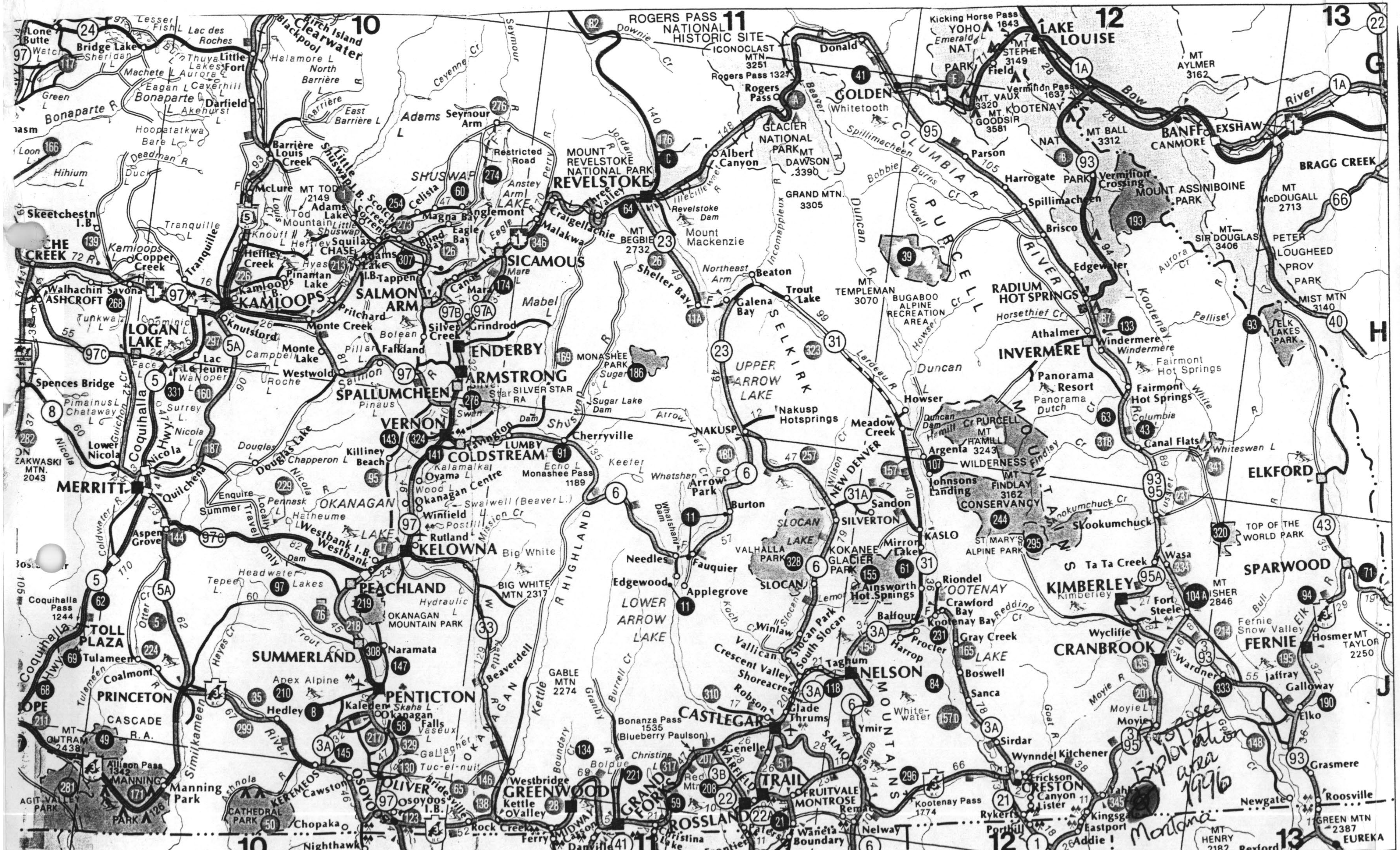
Aqua-Regia Digestion

| SAMPLE # | Ag ppm | Al % | As ppm | B ppm | Ba ppm | Be ppm | Bi ppm | Ca % | Cd ppm | Co ppm | Cr ppm | Cu ppm | Fe % | Mg % | Mn ppm | Mo ppm | Na % | Ni ppm | P ppm | Pb ppm | Sb ppm | Sc ppm | Sn ppm | Sr ppm | Ti ppm | V ppm | W ppm | Y ppm | Zn ppm | Zr ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V.H. 10E 1100N | < 1 | 1.5 | < 5 | < 10 | 110 | < 1 | < 5 | 0.22 | < 1 | 7 | 11 | 40 | 1.9 | 0.36 | 120 | < 2 | 0.03 | 15 | 180 | 11 | < 5 | 3 | < 10 | 14 | 900 | 41 | < 10 | 6 | 62 | < 1 |

A .5 gm sample is digested with 2 ml of 3:1 HCL/HNO3
at 95 C for 90 min and diluted to 10 ml with DI H2O
This method is partial for many oxide materials



SIGNED : ____________________

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1996 BCPAP PROSPECTING REPORT.

# Introduction to 1996 BCPAP - FINAL REPORT

In late summer of 1995, I conducted a modest but comprehensive explora-tion program over 3 separate but adjacent mining claims (consisting of a total of 40 units in the Yahk River area of the southern Purcell Mountains in the south-eastern corner of British Columbia. The specific claims were the UTOPIA, XANADU and VULCAN; this region lies on N.T.S. Map Sheet 82G/04W, is adjacent to the United States of America and is located 60 kms east of Creston and 660 kms. by air east of Vancouver. Comprehensive chained & flagged grids were established over the entirety of the aforementioned properties prior to the commencement of 2 ground geophysical surveys and detailed mapping/prospecting; additionally geochemistry was done over certain zones The total surveyed grid was ca. 100 line kms. with the new blazed claim lines serving as baselines, all 3 trending east-west with perpindicular survey lines nominally 100 metres apart; a Silva compass and hipchain were utilized.

In the autumn of 1996, an identical program of grid preparation, prospecting, geophysics and geochemistry was done over 2 new claims "VALHALA" & "NIRVANA" (which consist of 27 total units and are adjacent to the 3 aforementioned), using the same equipment and techniques. Specifically, the program consisted of detailed mapping/pros-pecting (albeit little outcrop was encountered), a ground Magnetometer survey and geo-chemical sampling of "B" horizon soils which were sent for assay. I expended a total of 33 man days in the field during the total course of this program; as in 1995 every aspect of it including the draughting and preparation of the final report was done by mysel. Due to unforeseen employment commitments the 1996 program had to be scaled down from wha was originally proposed; nevertheless much valuable information was obtained.

This area of British Columbia is situated about 70 air kms. south-southwest of, and is on approximate strike with, the gigantic Sullivan Mine, in the town of Kimberley which has produced a third of the mineral wealth of British Columbia, its main commod-ities, lead, zinc and silver. Much closer, (ca. 14-22 kms) lie the former producing "Midas" gold mine and the "St. Eugene" lead-zinc mine; both are northwards. In the past 15 years, several qui[redacted] major exploration companies, e.g. Cominco, Chevron and Minnova have conducted large programs in the vicinity of my claims; with the former currently having title to much of it. Most of the exploration seems to have been concentrated in the immediate vicinity of Mt. Mahon, though some has been done from the Moyie River south to Mon-tana. The rocks in this region are of Proterozoic age with the sediments belonging to the Aldridge, a sub-division of the Purcell System with intrusive "Moyie" gabbro sills. It is hypothesized that a "Sullivan-type" Sedimentary Exhalative ("Sedex") deposit may be loca-ted in this region. It is possible that such a deposit is located on my properties; according to the assessment files, very little or no mineral exploration has ever been done over the land encompassed by my claims previous to 1995

Detailed Location and Access.

All of my claims are located on N.T.S. Map Sheet 82G/04W - "YAHK RIVER" and are in the Yahk Range of the Purcell Mtns. 65 air kms south of the town of Cranbrook & 660 kms. east of the city of Vancouver; they are adjacent to the state of Montana, highway #3 is only 16-22 kms west. The exact geographical coordinates for the legal corner posts of the relevant claims are: NIRVANA: Latitude 49°00'N (coinciding with the Canada/U.S.A. border), Longtitude 115°51'W.; VALHALA: Latitude 49°04'N and Longtitude 115°55'W.

Both properties are easily accessible by 2 wheel drive pickup for most of the year. The are attainable by the Yahk Meadows Road (Hawkins Creek Rd.) which is wide and all-weather gravel - it commences easterly from highway #3 just north of bridge across Moyie River in the village of Yahk. One follows this road for 16.5 kms. before turning northward onto "Meadow Road" - a rough, steep but gravel road for ca. 4 kms. before reaching southwest corner of "VALHALA" claim. In order to attain the "NIRVANA", one continues on the Yahk Meadows Rd. to the 22 km. signpost, then turns southward unto a gravel logging road and follows it for 2.5 kms. before the northwest corner of the NIRVANA is encountered. The northeast corner of it, is most easily accessed by staying on Yahk Meadows Rd. to the 24 km. signpost & then turning southwards on another road and following it for ca. 3 kms. As cliffs or ravines are absent from these claims even at the highest elevations, all sections are easily accessible by foot.

GEOLOGICAL SUMMARY OF SOUTHERN PURCELL MOUNTAINS

Most of southeastern British Colubia is underlain by the Purcell system, which is divided here into 5 main units: Aldridge, Creston, Kitchener, Siyeh and Gateway; this system is of mid-Proterozoic Helikian age. The Purcell rocks, which consist mainly of fine grained clastics and carbonates, were laid down in the "Beltian Trough", a simple elongated geosyncline in which up to 45000 ft. of dominantly shallow water sediments accumulated. The Aldridge Fm. totals 15000 ft. in thickness of which only 400' belong to the Lower Aldridge; the latter is notable for its rusty appearance in outcrop due to abundant iron sulphides, silicates and carbonates. It also features fine grained laminated quartzite and dark argillite with graded bedding, scour&fill structures, etc, indicating deposition in deep water. The Middle Aldridge, which is 9000 ft, thick is more ordered with less turbulence indicated and contains less disseminated sulphide. The Aldridge is divided in southeast B.C. into 3 main structural blocks by the northeast trending Cranbrook and Moyie faults. Each of these blocks forms a broad, northeast plunging anticline and it is in the anticlinal axis of the most northerly structural block that the Sullivan Mine is situated. The sediments in the Aldridge have been metamorphosed to the Upper Greenschist facies and are intruded by conformable gabbro sills-the "Moyie" rocks.

The Mt. Mahon area is situated in the southernmost structural block-the "MOYie" and is underlain by Middle Aldridge Sediments and Moyie gabbro; these Moyie sills vary in composition from diorite to gabbro and from fine to coarse grained. The sediments are constituted of medium bedded quartzose greywacke intercalated with thin bedded siltstone, argillite and rare conglomerate occurring northeast of Mt. Mahon. As the Mt. Mahon sediments rarely reveal graded bedding, ripple marks, etc., they are probably representative of a thick turbiditic sequence. All the sediments in the Stone Creek area just northward, belong to the Middle Aldridge; they are mainly siltstone with minor argillite and the Moyie River fault transects it in a west-southwest to east-northeast orientation. The boundary between the Lower and Middle Aldridge intersects the Sullivan orebody and this division extends with a shallow dip across the Mt. Mahon area; the summit of it is the top of a northeast plunging anticline which dips 15°-25°. On the south flank of Mt. Mahon are tourmaline rich argillite and a little tourmalinite-a massive, very hard, black, cherty appearing rock composed of very fine grained tourmaline needles. Tourmaline is an important indicator mineral at the Sullivan Mine; thus its prescence here on Mt. Mahon combined with its Lower/Middle Aldridge stratigraphy has caused area to be a very significant mineral exploration target.

The Sullivan Mine is a gigantic 160 million ton lead-zinc-silver deposit grading 10% combined lead and zinc with ca. 68 grams/Tonne silver; it is underlain by tourmalinisation and overlain by an albite-chlorite alteration halo. The ore minerals show excellent stratification and conformability with the enclosing sediments. It comprises high temperature replacements of thin bedded argillite of the Aldridge formation with the orebody lying on the east side of the Purcell Anticlinorium. The source of the ores has traditionally been advocated as epigenetic,with their genesis from the source magma of the Moyie Intrusions or alternatively the sources for the ores may lie elsewhere and these intrusions may have supplied the energy to ultimately engender this deposit. The hydrothermal theories vie with a syngenetic one which roughly states that the ores were deposited in the rocks as sediments and that they were reconstituted by regional metamorphism. Recently this latter theory has gained adherents,partially because the iron-bearing minerals tend to be associated with primary sedimentary features. The lead,silver(and tin) tend to be most abundant towards the centre of the orebody,whilst towards the periphery zinc and antimony predominate. The St.Eugene Mine which produced from 1899-1929 lies just north(15 kms.)from Mt.Mahon;from about 1 million tonnes of ore were extracted 14% lead,5%zinc and 6 ozs./T. silver from a steeply dipping massive sulphide vein. The past producing Midway Gold mine lies a few kms.south of the St.Eugene;gold occurred here in a northerly striking quartz vein which cross-cuts Middle Aldridge rock.

SUMMARY of PREVIOUS MINERAL EXPLORATION in REGION

In the early eighties to the present much mineral exploration has been carried out in the Mt.Mahon area ;though according to the assessment files very little was done in previous decades. Around 1907 R.Daly traversed this area during his monumental "Mapping of the Cordillera at 49$^{th}$ paralell",though none of his observations directly concern the area in question. According to the files,the first recorded work done here was in 1966 by KennCo Explorations in the Stone Creek watershed. They conducted a soil geochemical survey,taking ca,200 samples;but the results were apparently negative and no further work is recorded by them. From 1978-1981 St.Eugene Mines did work near the summit of Mt.Mahon including staking,mapping and diamond drilling;in 1980-81 Falconbridge was also active in this region. Just north of here in 1981,on ground owned by B. Downing,ground VLF-EM and Magnetic surveys were performed on a 4.5 km.cut grid,but no anomalies were recorded for either survey. During this period,the "LARCH"group (now encompassed by the "CANAM"group)which lies just west of the XANADU,was staked by St.Eugene Mines,centred on Latitude 49°04'N.and Long.115°58'W. In early eighties they drilled 6 BQ holes with assays done for gold,silver,copper,lead and zinc but nothing encouraging was encountered.. They drilled to test EM-16 conductors and to acquire basic geological information as outcrop here is minimal. Thin pyrite seams were postulated to be the cause of the conductors;1 hole was entirely in gabbro,2 in Aldridge sediments with 3 in both lithologies. In 1980,a total of 237 soil samples were taken on a total of 20 kms.of grid-lead and zinc were found to be just barely anomalous locally. Immediately north of LARCH group lied the COLD group from which 142 samples were collected,whilst west on the RYAN group,St.Eugene Mines took 82 soils from 32 kms.of established grid;apparently geophysics and prospecting was done over it, though there is no specific mention made in the files. In any case nothing anomalous was indicated by these latter geochemical surveys.

By 1983 Chevron Minerals had acquired "St.Eugene"s Mt.Mahon ground and in 1983-84 they did gravity surveys over it, which were quite inconclusive, albeit 2 gravity anomalies were said to be revealed. They also carried out major geochemical, geological and an EM-37 survey on land just 2 kms.west and northwest of the VULCAN on 13 kms.of cut grid; they collected a total of 1092 soil samples, but they analyzed only for lead, zinc, and copper. The geological mapping was conducted at a scale of 1;5000 along grid lines, even though outcrops are quite rare here; the EM-37 survey found "little of Interest". It was apparently the discovery of tourmaline in sediments near Mt.Mahon that piqued the interest of CHEVRON. In 1983 they also worked their TNT group which lies just west of Mt.Mahon; only mapping/prospecting was recorded even though less than 10% of area features exposed bedrock. The lithologies in this area are mainly sandstone with a little siltstone and argillite. In 1984 they drilled a vertical BQ hole of 473 metres @summit of Mt.Mahon to test the extent and charachter of the tourmaline. Only traces of this mineral were noted though 1-3% pyrrhotite was in bottom 2/3 of hole, but only traces of lead and zinc were noted. CHEVRON mapped at least 4 stratiform tourmalinite zones on their Mahon property which indicates stratigraphic proximity to the Lower/Middle Aldridge contact-on which interval the Sullivan Mine lies. These zones seem to lack lateral continuity, but a paucity of outcrop renders this idea speculative. CHEVRON hypothesized that the thick overburden in this region might mask any metal anomalies in the soil(which could also explain the author's poor results). In 1987 they drilled a 1611 metre sub-vertical hole, near their 473 m.1984 one. Only the first hundred metres of this hole lies in Middle Aldridge, with the remainder in lower Aldridge sediments; short sections of gabbro and granophyre were also intersected. In 1991/92 CHEVRON drilled 6 NQ holes for a total depth of 1320 metres collared in the hangingwall of tourmalinite exposed on the south and southwest flank of Mt.Mahon. On this core a total of 37 whole rock analyses and 46 geochemical assyas were done; these drill holes intersected Middle Aldridge turbidites but apparently nothing economic was revealed.

Just north of Mt.Mahon area lie the headwaters of Stone and Sundown Creeks upon which exploration of a moderate intensity has occurred since the early eighties. KOKANEE Explorations was active here on their LEO claims during this time; they collected a total of 490 soil samples which were found to be anomalous in copper, zinc, lead and barium. No further work by them is recorded however. In 1987 MINNOVA staked 301 units in the Stone Creek area and conducted a major exploration program including geochemistry, geology and geophysics on a block of ground extending from Moyie River(near the Midway Mine)south to CHEVRON'S MAHON claims. They completed geological mapping at a scale of 1:10000, collected 226 lithogeochemical samples & cut 15 kms.of grid upon which they performed a CSMAT survey-"Contolled Audio-Magneto-Tellurics". This survey was done to evaluate the property for zones of low resistivity, which could indicate the prescence of conductive sulphide mineralisation, and also to reveal any structure transecting the Lower/Middle Aldridge contact and to ascertain its depth. MINNOVA in 1988 did an abortive 15 kms.of Gravity surveying which was essentially a waste of time due to ruggedness of terrain. From 1989-91 they conducted modest drilling programs in order to test the stratigraphy of the area and also several geophysical anomalies;these holes mainly intersected gabbro and sediments derived from turbidite sequences. In 1990 they also did lithogeochemistry and mapping.

The SUN claims lie northeast of the STONE group,with the Midway Mine immediately adjacent;in 1992 they were held by G.M.Rodgers. In the mid eighties,a bit of hand trenching was done on them in stratabound lead-zinc mineralisation. In 1992 along cut grid lines,11.2 kms.of VLF-EM and 3 kms.of Magnetics were completed;as is typical the VLF-EM recorded a couple of conductive zones but no Magnetic anomalies were revealed. In the same year,190 soil samples were picked up;of the analyzed elements only zinc was found to be anomalous.

COMINCO acquired the CANAM group through staking from 1989-1991;by the end of the latter year,they held 355 units grouped into 42 claims-they hold much ground immediately adjacent to mine. They envisage that Lower Aldridge rocks occur on the west side of their block,with the central and east regions underlain by Middle Aldridge. In 1990 they drilled 2 BQ holes on the former LARCH group of ST.EUGENE MINES for a total of 190 metres, encountering gabbro and Aldridge sediments. From 1990 to 1993 they have completed several UTEM surveys-"University of Toronto style ElectroMagnetics";in 1992 they did 20 kms.of line and in 1993 32 line kms.of UTEM on their CANAM group;mainly on geochemical anomalies(none of them specifically mentioned). The latter survey was done on a soil geochemical anomaly just west of South Hawkins creek where there is very little exposed bedrock. In 1991 COMINCO drilled 3 holes for a total of 869 metres;ca.1-3 kms. west of author's UTOPIA claim centred on Latitude 49°01'N and Long.115°57'W. Two of them were drilled to test a lead-zinc anomaly(soil) on the east slope of a hillside; both intersected Middle Aldridge Sediments consisting of alternating quartzites and argillites varying in bedding thickness and a part of a turbidite sequence,with some gabbro intersected in the first hole. One hole cut minor sphalerite and less galena with the rare fractures and quartz veins hosting minor zinc,lead and pyrite;it reached a depth of 344 metres and was drilled westward at a dip of -47°. The second hole was put down at a similar orientation attaining a depth of 206 metres with only very minor disseminated sphalerite noted. The third hole drilled was 2 kms.east of the previous attaining a depth of 319 metres;it was drilled due west@Dip of-68°. Middle Aldridge Sediments were cut including quartzites,limey greywackes,a no.of widely scatterred pyrrhotite laminations with the hole ending in gabbro. No major conclusions have been deduced as yet from all this exploration as the programs are on-going.

## 1995 DETAILED GEOLOGY OF AUTHOR'S CLAIMS in the YAHK RIVER AREA

Despite the quite large area encompassed by the three claims of the author, there is very little exposed bedrock on them. Perhaps only 5% of the XANADU features outcrop-it being confined to the claim's northwest portion and a strip along the Freeman Creek roadcut. Barely 10% of UTOPIA HAS OUTCROP,WHilst perhaps 7% of the VULCAN does;indeed with the exception of the latter claim,exposed bedrock is not more prevalent on the topographically higher regions. Judging by the steeper hillsides and roadcuts,the overburden layer seems very thick;undoubtedly this has hindered conventional prospecting in the past and may even impede the usefulness of soil geochemistry. As one would expect, creek ravines and roadcuts tend to expose bedrock,although the latter tends to run along the strike of a formation for long distances. Only a few differing lithologies were noted and though the claims lack contiguity,the similarity of their rocks permits them to be discussed together.

Probably the most volumetrically abundant lithology on my ground is the Moyie gabbro which tends to form larger and more topographically prominent outcrops than the sediments;(not strange as it is generally more resistant to erosion). This mafic igneous rock varies considerably both in colour index and grain size. The crystals range from barely 1 mm.to locally(on northwest corner of Xanadu) 3 cms.;the latter featuring long horneblende sheafs-though a more typical size range is 3-7 mms. The colour index varies from 40-70 with plagioclase generally the only felsic mineral and amphiboles(chiefly hornblende?) the only mafic minerals notable in hand specimen. Judging by the rocks low magnetic response, magnetite must be fairly rare. This lithology is invariably massive,dark green and usually appears quite fresh,though locally it can be very rusty. Even the rustiest gabbro reveals only traces of finely disseminated iron sulphide,with rare,rusty,grey quartz veins noted on the central UTOPIA;a couple of the veinlets also contain epidote and carbonate. The veins vary in width from 0.3-20 cms.with none observed longer than a couple metres. A couple samples from this lithology were collected, but the assays revealed nothing of interest. One distinctive variation of the gabbro was noted on the east-central UTOPIA -here is medium grained quartz (ca.20%) in the matrix. This rock could be termed "Tonalitic";it has a significantly lower Colour Index-ca. 30;it is massive,medium grained,quite fresh and is mainly light grey to rarely light green. It was not found elsewhere on any of the staked ground.

The second major lithological division is Aldridge sediment,which on the basis of hand specimen viewing has been split by myself into 3 separate categories even though they are probably all mutually gradational. The "typical sandstone" has a great colour variation,ranging from buff to light grey,light green,pink to brownish and is often externally rusty. It ranges from well-bedded to zones where bedding planes and thus attitudes are indiscernable;but where noted vary from 10-50 cms. ,thus quite thick.

Grain size ranges very fine to sometimes medium;it is impossible to differentiate the type of mineral constituents in the former varieties though quartz seems to be a predominant component. Muscovite (sericite?)is locally common with small amounts of biotite, ,chlorite and probably feldspar,although most of the rocks mapped are probably arenites. One lithological variation is a type so fine grained,it could be termed a siltstone-these are mainly ochre to brownish and although mapped as a distinct unit,may have an identical composition to the Sandstones. A third type is more distinctive and was noted mainly on the VULCAN CLAIM-this is a dark grey,very fine grained, argillaceous rock which seems to contain appreciable quantities of carbonate. These "limey" rocks often fizz only slightly however,so they may contain much dolomite and (judging by their colour)siderite. This lithology may be economically significant,as on the east edge of the VULCAN they host locally abundant stringers of iron sulphide. Wherever discernable the attitude of the beds features strikes of 020° to 055° with dips generally fairly shallow @20-40°.

GEOCHEMICAL DISCUSSION OF SOIL AND ROCK SAMPLES collected in 1995.

A total of 78 soil samples and a dozen rock samples were collected from the three claims;these were all sent to CHEMEX LABS. in North Vancouver,B.C.for geochemical analysis and assaying.(All results are included in this report).Only the"B" horizon material was collected from the soils during the course of the survey,done mainly along grid lines ;each sample weighed about 250 grams and were placed in brown paper bags. Each one had the 32 element I.C.P-A.E.S.procedure done on it-the results for all economic metals yielded in parts per million. A total of 25 samples were taken from the UTOPIA,41 from the XANADU and a dozen from the VULCAN. Although no geochemistry was done for gold per se,several"pathfinder" elements such as arsenic and tungsten were. As is easily deduceable from the geochemical results,no major anomalies were observed. None of the gold pathfinders were even remotely abnormal-all yielded less than 10 ppm. The main elements of interest in this area-lead,zinc,copper and silver,all virtually occur in essentially background amounts with the exception of a few zinc and copper results-and even these occurred in amounts of less than 150 ppm. The highest copper value on the UTOPIA originated from the north edge of the claim;whilst on the XANADU it came from the northwest corner;zinc is slightly more abundant on the latter with 3 analyses yielding over 100 ppm Zn,all originating from the northwest corner of the claim. The only zinc assay exceeding 100 ppm on the UTOPIA is only 100 metres from the site of the highest Cu value. According to some,zinc soil geochemical anomalies are often of little significance. Nothing anomalous was indicated by the soils collected from the VULCAN claim,though only a few were taken from here. Quite high amounts of barium were recorded over much of the properties-up to 360 ppm,but this is not too economically significant as it is a relatively common but dispersed element in nature.

Visible sulphide mineralisation was very rare on the claims and usually it occurs as tiny specks of iron sulphide. Amounts of up to 2% pyrite were found in portions of the gabbro and their rare allied quartz veins on the UTOPIA;these were sampled and found to be totally barren in any economic metals,which is not surprising as the exploration targets in this region are in the sediments. In fact 3/4 of all rocks that I assayed were from the sediments-these were chosen mainly for the amount of visible sulphide present,and the fact that so few were taken, is a function of the apparent barrenness of the rocks. Limey argillite from 2 separate locations on the east edge of the VULCAN featured iron sulphide stringers several mms.wide and constituting up to 15% of the rock, they were both sampled . Significantly they yielded the highest gold assay-just 10 ppb,the best copper-64 ppm and zinc-138 ppm of any of the rock samples,though of course with the possible exception of the latter, these results are just barely anomalous.A subanomalous zinc value of 98 ppm was derived from the northwest corner of the VULCAN-again from limey argillite and 102 ppm from the northwest corner of the XANADU. However of a total of a dozen rock samples,8 show slightly higher amounts of zinc than the background of this area(which is ca.45 ppm Zn). The best lead result obtained-24 ppm was derived from the southern part of the UTOPIA-very low but still higher than background(12 ppm).

Although none of the geochemical results are spectacular,nevertheless a few trends seem evident. Most of the highest geochemical values obtained are adjacent to areas,e,g.east of VULCAN,THAT are currently(as of late 1995) open for staking;areas which contain limey argillite are certainly worthy of future investigation. The geochemical survey was completed before the geophysics,which is why no soil geochem.was ever done over the central UTOPIA WHERE a modest magnetic high co-incides with rusty,sheared gabbros. Due mainly to budgetary constraints,no geochem. was performed on the south UTOPIA or VULCAN OR in rusty gossanous zones adjacent to road cuts;all of these areas have a high priority of investigation in the near future. A Lanthanum anomaly of 120 ppm is situated in the north-west corner of the Xanadu with a high Zinc & Copper anomaly found in the Soils here.

Discussion of 1996 Soil Geochemical Survey.

A total of 141 soil samples were collected from the Nirvana & Valhala claims - 74 from the former and 67 from the latter. Only the "B" soil horizon material was taken during this survey, which was done mainly along grid lines; each sample weighed ca. 200 grams & was placed in a "Kraft" bag. They were sent to TSL Assayers Labs. of Missis-sauga, Ontario where a 30 element ICAP plasma scan was performed on them. The proce-dure entails a 1 gram sample chosen from each bag & digested with 2 millilitres of $HCl/HNO_3$ acid @ 95°C. for 90 minutes and then diluted with 10 ml. of $H_2O$. The results for all "econo-mic metals" are yielded in parts per million whilst "common" elements such as Calcium are expressed as percentages. The main elements of economic interest in this region are gold, lead, silver and zinc. However the occurrence of boron is deemed to be economically favour-able due to its relationship with the Sullivan ores; in any case it was indetectable in my samples. Several gold "pathfinder" elements such as arsenic and tungsten are included in the assay package, but they all occur in minimal amounts in all 141 samples.

Although only a few samples were collected from east half of the Nirvana, these gave the best results from this property. Sub-anomalous copper-zinc-nickel-cobalt occur together from 70-110 ppm for 1st 3 and 35 ppm for latter (as Co normally 10 ppm background, this is sub-anomalous). It is surprising to note the relative abundance of nickel and [redacted] cobalt as they normally occur in quite mafic rocks and these lithologies should be very rare here judging by the magnetometer results. The paucity of lead, which tends to occur with zinc is some-what unusual, though it is quite rare throughout the claim. Despite the large amount of sampling done on the western side of the claim, nothing was even sub-anomalous. Zinc is sub-anomalous throughout that sector of the Valhala claim that was sampled generally attaining values of 100, and ranging up to 270ppm (which is notably anomalou However with the exception of one assay of 73ppm lead, no anomalous amounts of other metals were yielded. According to some authorities, zinc soil geochemical anomalies are often of minor significance, though here the high zinc values correlate with sub-

anomalous barium ie 200-540ppm. More soil samples ought to be collected from the eastern portion of the Nirvana - especially from Line 19E where modest magnetic anoma-lies suggest the prescence of mafic plugs with perhaps nickel and cobalt, as hints of these elements originate from the soils here. Although both claims were thoroughly pros-pected no rock samples were deemed worthy of analysis; this is not as negative as it seems however, because of the rarity of outcrop.

## Principles and Methodology of Magnetic Surveying

An MP-2 portable proton-precession magnetometer manaracturedo by Scintrex of Concord, Ontario was utilized for the ground Magnetic survey. It consists of 2 separate portions: the sensor and console, which are connected by a cable; the total weight of the Unit including batteries is 3 kg. The sensor is either staff mounted or carried in a back-pack; for steep terrain or dense brush, the latter is quicker, but the former position yields more accurate results. The instrument utilizes the phenomenom of nuclear magnetic resonance to measure the flux of the total magnetic field. The MP-2 sensor consists of a chamber, filled with a proton-rich fluid, such as kerosene, enclosed within 2 coils. When a current is briefly passed through the coils, a magnetic field is engendered which aligns the spinning protons; when it is switched off, the protons precess around earth's magnetic field, eventually re-aligning with it. This precession induces a small, exponentially decaying AC signal whose frequency is proportional to the flux of the ambient magnetic field. The magnetic method consists of measuring this frequency, by the console of the MP-2, which converts it to a gamma value & displays it digitally. The resultant magnetic field of the earth's magnetism affecting lithologies possessing different magnetic charachteristics, is the value measured. This field is the vector sum of induced and remanent magnetism. The magnetic field at any particular locality is determined by 3 factors: 1. Strength of Earth's Magnetic Field. 2. Magnetic susceptibility of the bedrock and 3. The remanent magnetism of the rocks. The MP-2 unit has a resolution of 1 gamma and a range of 20,000 - 100,000 gammas.

The magnetic value yielded by a lithology is mainly a function of its magnetite content, as it is the only widely distributed, strongly magnetic mineral; e.g. pyrrhotite and cobaltite are less magnetic and/or much rarer. Mafic and even more so ultramafic lithologies tend to have more magnetite, thus this is a very useful tool for sub-surface geological mapping, not only for their approximate identification, but also in revealing structural features such as faults. This is of vital importance on the relevant claims which host barely 5% exposed bedrock. The geomagnetic field is variable both in space & time, but long term secular variations may be neglected in surveying, but not short term ones. These often occur within periods of hours and minutes; during magnetic storms the magnitude of variation may attain several hundred gammas. During the course of even a normal survey day, variations of a few hundred gammas are common in many areas. This is the main inherent weakness of this method, but it can be compensated for in 2 ways. The most accurate, quickest (but most expensive) is to establish a base station magnetometer from which continuous readings are obtained during the duration of the survey. As this location is constant, accurate corrections are derivable from the obtained values. An alternative field procedure is to take periodic repeat measurements at convenient traverse points on the survey grid. Thus changes in magnetic intensity can be accounted for. This latter method chosen by author.

Discussion of Results of 1996 Magnetic Survey.

Magnetic responses obtained over the Nirvana & Valhala were even more subdued than those derived from adjacent claims in 1995; as last year, the contour interval chosen was 100 gammas. The highest single value obtained was only 57452 gammas for the Nirvana & 57453 for the Valhala; as the magnetic background for those claims is 57050, this is merely 400nT above it. The lowest reading recorded was 56813 (from west of Valhala) yielding a total difference of only 600 gammas; ca. 60% of the stations yielded values in the narrow interval of 57000-57100nT. As I determined, the diurnal variations of the magnetic field were generally quite minimal, so daily corrections were often superfluous. There were no higher magnetic responses noted over the few areas of exposed bedrock, whether Diorite or sediment or any recognizable differences between them. On the Valhala, the greatest values were obtained from Line 8E (on the central sector) and from Line 19E on the Nirvana (near the eastern edge). The "anomalous zones (slight as they are) approximately trend north-south, which is roughly the strike of the sediments. Perhaps specific sub-surface strata are slightly more abundant in magnetic minerals or possibly areally small mafic intrusions occur. In any case the derived low magnetic values indicate the paucity of magnetite here & offer very few clues as to the location or even possibility of an economic orebody occurring on the Nirvana or Valhala.

Detailed Geological Description of NIRVANA & VALHALA Claims.

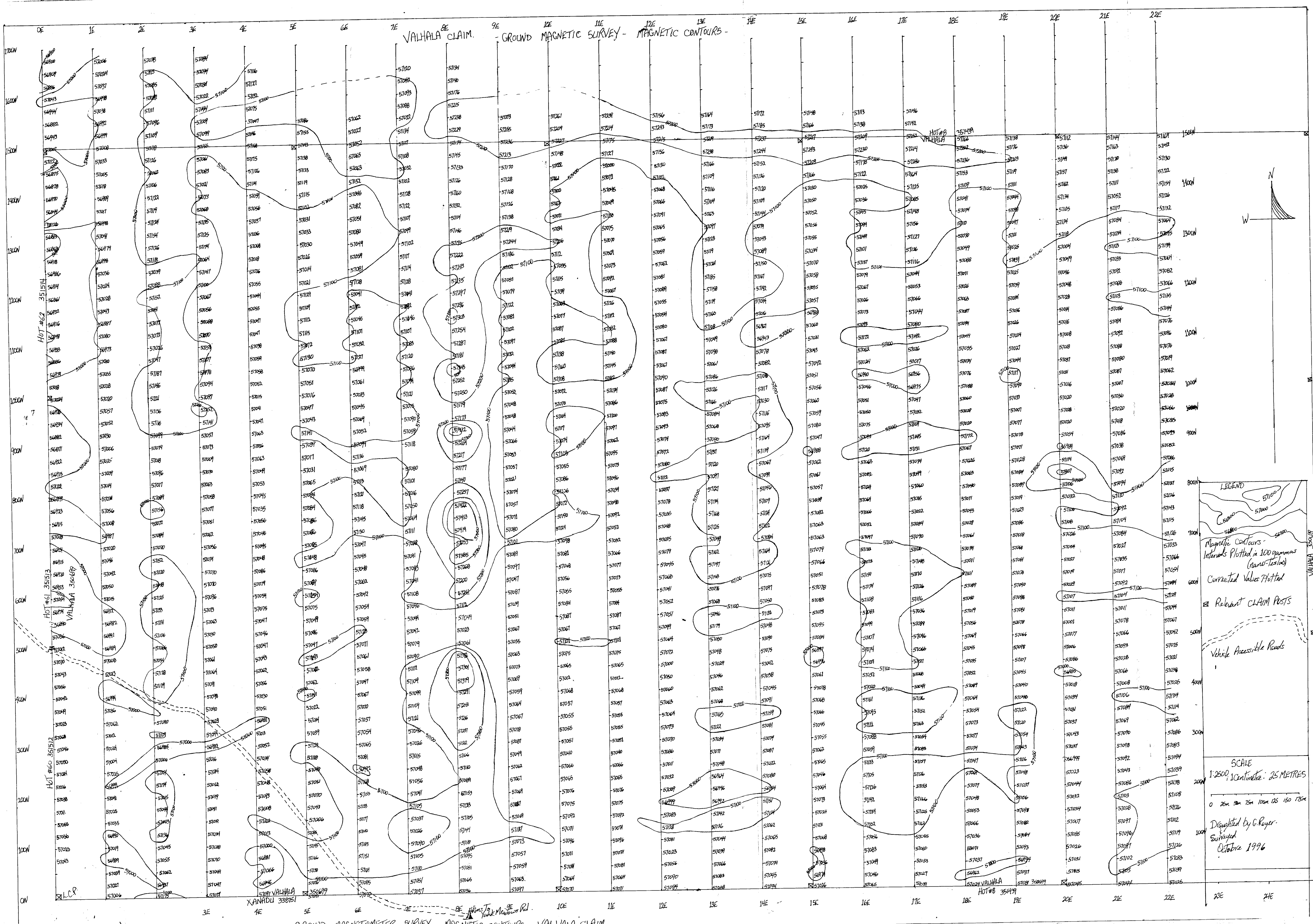
The preceding geological report written in 1995 concerning my adjacent claim which were mapped and prospected in detail, gives a concise and detailed description of the rocks mapped in 1996 on the Nirvana and Valhala. Outcrop is very minimal on both; amounting to about 5%; though on the Valhala it forms a prominent steep knoll on the north edge of the claim. The western topographically lower side is composed of light grey, slightly rusty, calcareous siltstone, grading to fine grained sandstone with mainly indiscernable bedding planes. A similar though slightly coarser grained rock with distinct strata, occurs along the Meadow Lake roadcut & they strike south-southeastwards and dip shallowly east. Typical massive dark green diorite, mainly medium grained occupies the remainder of the aforementioned hill, with essentially identical rock occurring ~~eastwards~~ southwards & also near the extreme south-west corner of the claim.

Exposed bedrock is just as sparse on the NIRVANA claim with large areas totally devoid of it; none was noted on the entire eastern half of the Valhala. As on the latter, the NIRVANA tends to have outcrop along roadcuts and on its north and south fringes; the orientations of the strata where measurable, are quite similar on both claims. Greyish, slightly rusty, fine to medium grained calcareous sandstone was noted on the north-central sector and both near the southeast and southwest corners. A relatively large outcrop of similar lithology straddles the Canada/U.S.A border, though very little of it occurs on the Nirvana. A somewhat distinctive lithology also occurs near south edge of Nirvana - it is a moderately soft, fine grained, off-white to pink, calcareous rock with abundant quartz, indiscernable bedding planes and is often externally iron altered. Several outcrops of "typical, massive, medium grained diorite" occur just north of the Nirvana but only 2 outcrops of this lithology were noted on it. A small one on the south central area and another near the northwest corner.

## Recommendations for Future Exploration in Area

Due to the disappointing prospecting, geochemical and geophysical survey results, one could easily conclude that the area encompassed by my claims has quite little economic mineral potential. However more geochemistry should be done on the eastern halves of the Valhala & Nirvana. Additionally a VLF-EM survey could be easily accomplished over them, as comprehensive grids have already been established. All of the prospective ground north of Valhala has all been recently claimed, whilst the land immediately west has undergone much advanced exploration. The relative paucity of outcrop does make it difficult to prospect in a conventional sense, thus much of it has received less attention than other regions, potentially increasing the odds for an economic discovery. Vast Tracts open for staking and thus mineral exploration, extend eastwards to Yahk River and beyond, though whether their economic potential justifies even a modest exploration program is difficult to judge.


GROUND MAGNETOMETER SURVEY - NIRVANA CLAIM - MAGNETIC CONTOURS
LEGEND
Magnetic Contours
Intervals plotted in 100 nano-Teslas (gammas)
Corrected Values Plotted
Relevant CLAIM POSTS
Vehicle Accessible Trails
Boundary Monument
SCALE
1:2500, 1 Centimetre : 25 METRES
Surveyed & Draughted - Octobre 1996 by Guy Royer
UNITED STATES of AMERICA - MONTANA
To Yahk Meadows Rd 2 Kms
To U.S.A. border 2 Kms
NIRVANA 350700
UTOPIA 338900
96/97
P39
96-19

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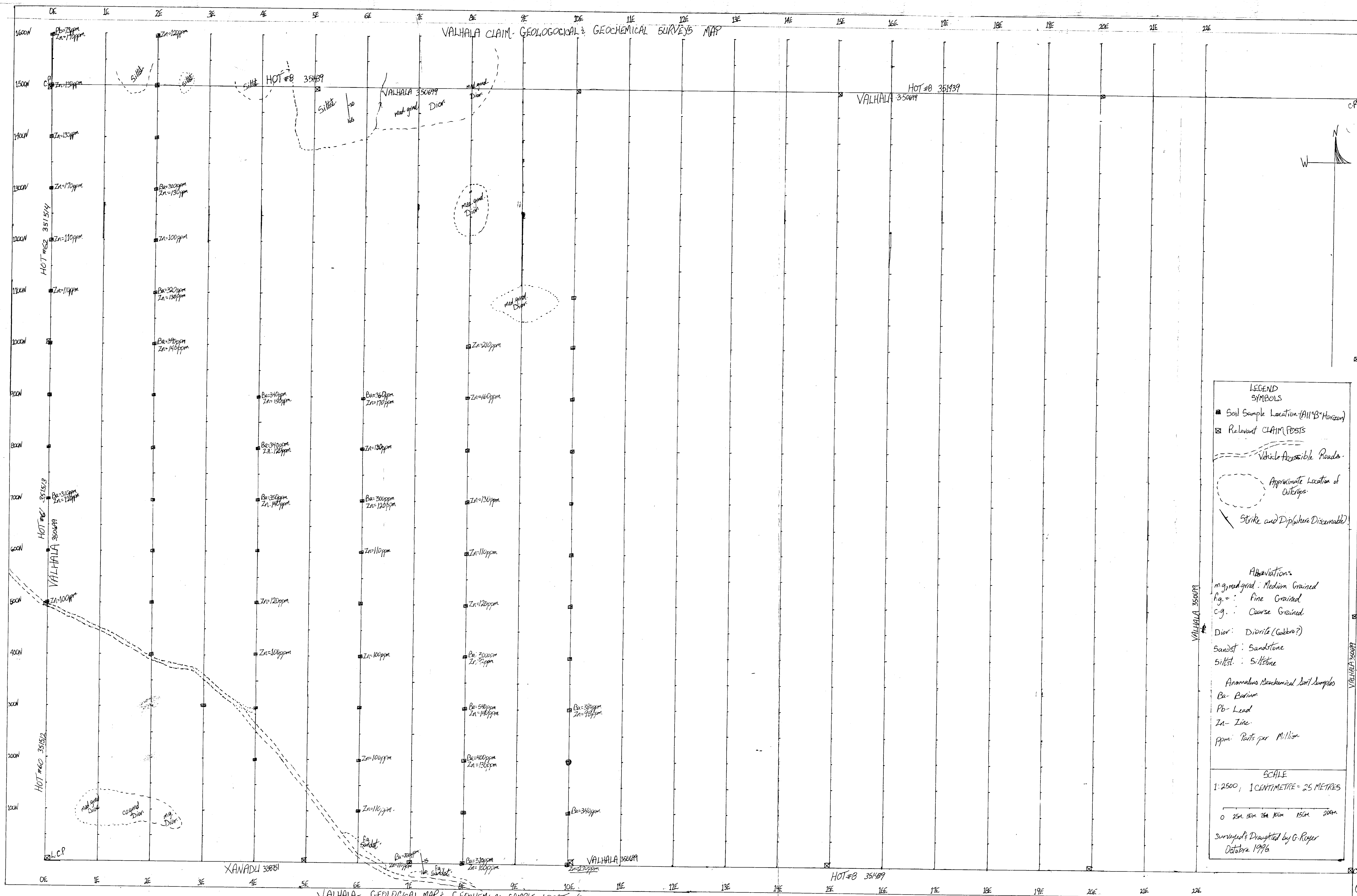
(2) 96-19


NIRVANA CLAIM - GEOLOGICAL MAP & Soil Sample Locations)
NIRVANA CLAIM - GEOLOGICAL MAP & GEOCHEMICAL SAMPLE LOCATIONS.
NIRVANA 350700
LITOPIA 338100
UNITED STATES of AMERICA - MONTANA
British Columbia
Montana - USA
N
W
(No Outcrop!)
No Outcrop!
Co=31ppm
Ni=110ppm
Zn=160ppm
Co=35ppm
Ni=95ppm
Zn=110ppm
f.grn. Sandst
F.grn. Sandst
cul-de-sac
LEGEND
SYMBOLS
Relevant CLAIM POSTS
Boundary Monument
Vehicle Accessible Roads
Approx. Location of Outcrops
Strike & Dip (Where Discernable)
Geochemical Soil Sample Location
Abbreviations
F.g. F.grn.: Fine grained
m.g.: medium grained
cal.: Calcareous: "Limey"
Qtz: Quartzose
Carb.: Carbonate - calcareous Rock
Dior.: Diorite (Gabbro?)
Sandst.: Sandstone
Anomalous Geochemical Soil Samples
Co - Cobalt
Cu - Copper
Ni - Nickel
Zn - Zinc
All Values in ppm: parts per Million
96/97
P39
SCALE
1 Centimetre: 25 METRES, 1: 2500
0 25m 50m 75m 100m 150m 200m 250m
Surveyed and Draughted by: Guy Royer
October 1996
3


VALHALA CLAIM- GEOLOGOCICAL & GEOCHEMICAL SURVEYS MAP
VALHALA- GEOLOGICAL MAP & GEOCHEMICAL SAMPLE LOCATIONS.
HOT #8 351439
VALHALA 350699
XANADU 338811
HOT #62 351514
HOT #61 351513
HOT #60 351512
LEGEND
SYMBOLS
Soil Sample Location-(All "B" Horizon)
Relevant CLAIM POSTS
Vehicle Accessible Roads.
Approximate Location of Outcrops.
Strike and Dip (where Discernable).
Abbreviations
m.g, med.grnd : Medium Grained
f.g. = : Fine Grained
c.g. : Coarse Grained
Dior : Diorite (Gabbro?)
Sandst : Sandstone
Siltst. : Siltstone
Anomalous Geochemical Soil Samples
Ba- Barium
Pb- Lead
Zn- Zinc
ppm: Parts per Million
SCALE
1:2500, 1 CENTIMETRE = 25 METRES
0 25m 50m 75m 100m 150m 200m
Surveyed & Draughted by G. Royer
Octobre 1996
96/97 P39
4 96-19

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(5) 96-19

# GROUND MAGNETOMETER SURVEY - NIRVANA CLAIM - MAGNETIC CONTOURS


GROUND MAGNETOMETER SURVEY - NIRVANA CLAIM - MAGNETIC CONTOURS

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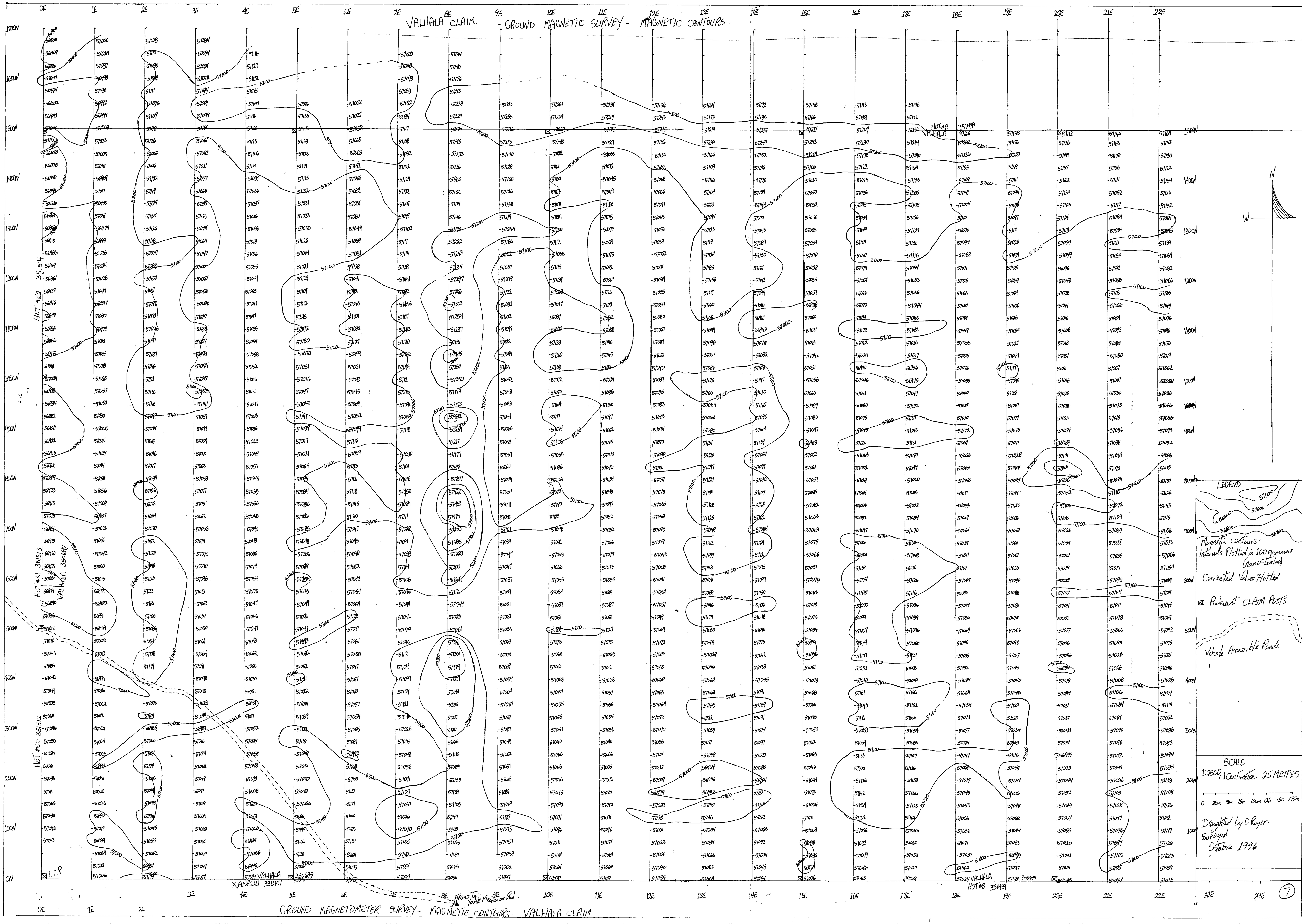


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96-19


NIRVANA CLAIM - GEOLOGICAL MAP & Soil Sample Locations)
NIRVANA 350700
(No Outcrop!)
No Outcrop!
LITOPIA 338800
NIRVANA 350700
British Columbia
UNITED STATES of AMERICA - MONTANA
NIRVANA CLAIM - GEOLOGICAL MAP & GEOCHEMICAL SAMPLE LOCATIONS.
L.C.P. British Columbia
Montana - USA.
LEGEND
SYMBOLS
Relevant CLAIM POSTS
Boundary Monument
Vehicle Accessible Roads
Approx. Location of Outcrops
Strike & Dip (Where Discernable)
Geochemical Soil Sample Location
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Qtz : Quartzose
Carb. : Carbonate - calcareous Rock
Dior. : Diorite (Gabbro?)
Sandst. : Sandstone
Anomalous Geochemical Soil Samples
Co - Cobalt
Cu - Copper
Ni - Nickel
Zn - Zinc
All Values in ppm : parts per Million.
SCALE
1 Centimetre : 25 METRES, 1: 2500
8
0 25m 50m 75m 100m 150m 200m 250m
Surveyed and Draughted by : Guy Royer
Octobre 1996
96/97
P39