Exploration Results from the Winston Lake Property 2008-2010

for

Orebot Inc.

307 Euclid Ave., Suite # 463, Thunder Bay ON P7E 6G6 CANADA

NTS 42 D/14
Bounded by UTM coordinates (NAD 83 Zone 16):
470620 and 473440 East; 5422310 and 5427500 North

Kevin R. Kivi, P.Geo.

8 June 2010

2.45096

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Introduction

The Winston Lake property is 145 km east of Thunder Bay near Schreiber, Ontario, with road access from Highway 17, along the Whitesand-Winston Lake road which extends north for 20 kilometers, terminating at the former mine site.

Orebot Inc holds 100% interest in the Winston Lake property, which includes the high grade Pick Lake zinc deposit, and six zinc and copper surface showings amongst hundreds of hectares of VMS-style alteration feeders mapped in felsic to mafic metavolcanics and metasediments. The Winston Lake volcanic are the southwestern part of the larger Big Duck Lake metavolcanic belt.

KIVI Geoscience Inc (KGI) conducted mineral exploration on the property on behalf of landholder Orebot Inc from 2008-2010. KGI initiated exploration techniques to identify near-surface VMS massive sulphide occurrences on Orebot's property.

Exploration reported herein includes compilation and GIS mapping, geological mapping, ground-checking geophysical conductors, and soil geochemisty. A petrological and EMP geochemical report on ore types was also completed by R.L. Barnett Geological Consulting Inc for Orebot Inc, is also included in this report. R.L. Barnett compares ore textures of samples from three known orebodies in the area, and comments on similarities and differences between them, and identifies possible genetic relationships.

Location and Access

Orebot's Winston Lake property is accessible by using an all-weather road known as the Whitesand/Winston Lake road, which extends north from Highway 17 between Rossport and Schreiber, Ontario. The Whitesand/Winston Lake road is located about 145 kilometers east of Thunder Bay, Ontario and is marked by the Winston Lake Mine sign, erected by Inmet Mining.

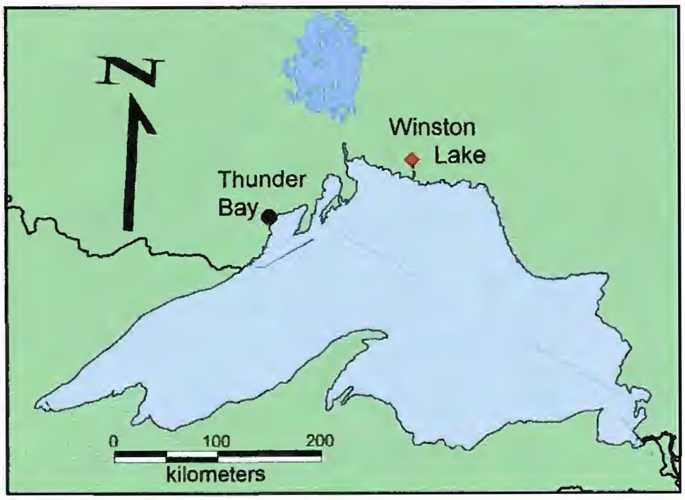

Figure 1. Winston Lake Property.

Orebot's claims occur on the Winston Lake road at 20 kilometers north of Highway 17. Orebot Inc has a key to the gate erected by Inment Mining that restricts traffic to capped shafts and other mine reclamation workings above the Pick Deposit on claim 4244751.

Property

Orebot Inc holds 100% interest in 5 claims, which total 53 units, with a surface area of 848 hectares (Figure 2 and Table 1).

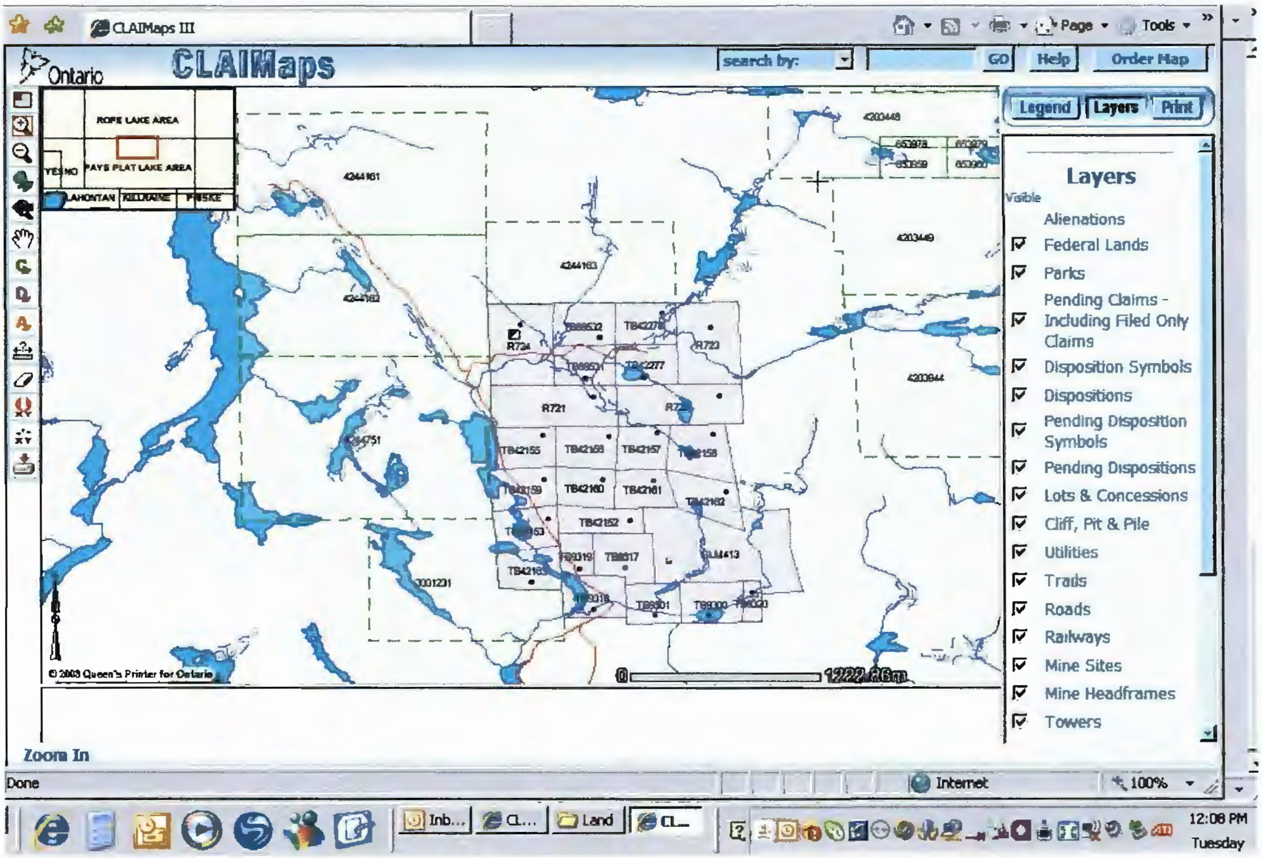

Figure 2: Orebot Winston Lake Property, CLAIMaps III Website, Sept, 23, 2009.

Table 1: Claim List of Winston Lake Property.

Winston Lake Property

Recorded Holder	Interest	Claim Name	Number 16 Ha Units	Total Hectares
Orebot Inc	100%	4244751	16	256
Orebot Inc	100%	4244161	12	192
Orebot Inc	100%	4244162	12	192
Orebot Inc	100%	4244163	6	96
Orebot Inc	100%	3001231	7	112
		Total	53	848

Previous Work

The Winston Lake area has a long history of exploration and production, with many long breaks between activities and discovery.

Exploration began in the late 1800's with discovery of the Zenith zinc deposit. Massive coarse-grained sphalerite ore was hand-mined in the early 1900s, and brought by horse and wagon to the shore of Lake Superior, where it was shipped by boat to a mill.

Zenmac Metal Mines Ltd mined Zenith between 1966-1970 producing 180,000 tons of ore grading 16.5% zinc.

Corporation Falconbridge Copper acquired the property from 1978-1980. Exploration included geological, geochemical, geophysical surveys, and diamond drilling which resulted in discovery of the Winston Lake massive sulphide deposit in June, 1982.

Encouraging results prompted underground evaluation, and in November 1983, CFC commenced a 3-compartment shaft to -510 meters for underground delineation drilling. It took 15-18 months to complete the shaft and underground drilling, which resulted in a deposit inventory of 2.95 MT @ 17.8% Zn, 0.94% Cu, 0.7 oz/ton Ag and 0.025 oz/ton Au.

On September 23, 1985 the company announced a production decision with an estimated capital cost of $52.5 million. The plan proposed 1200 tons per day production which would generate an operating cash flow of $37M/year. On November 1, 1985, low zinc prices and political events caused suspension of development and exploration resumed elsewhere on the property.

When economics improved, Minnova (formerly CFC) the Winston Lake mine went into production with pre-production expenses of $73.6M. By January, 1988 the company reported completion of a 741m shaft with 5 working levels for production of 1000 metric tonnes per day, from 16 hour/day mine production and 24 hr/day mill production. Payback on initial investment was estimated at 5-7 years, but due to high zinc prices and good production was only 2.5 years.

On December 6, 1984, the Pick Lake discovery was announced. Pick Lake was reported to occur 1000 meters stratigraphically below the Winston Lake deposit in sediments, not volcanic. The deposit was described as an extensive, narrow sheet of zinc-rich massive sulphides that was tested by drill holes at 200m centres. The best intersection of the time was 1.49% Cu and 21.95% Zn over 1.5 meters. Strike of the deposit in 1985 was 300-400 meters, open down dip.

By December, 1990 a 7000m diamond drill program intersected the Deep Pick Zone, occurring at 1050m depth in 4/8 holes, reporting the following diamond drill hole intersections:

WL67C – 3.6m @ 34.4% Zn, 1.2% Cu, 56.9 g/T Ag
WL32A – 3.5m @ 17.8% Zn, 0.71% Cu, 59.5 g/T Ag
WL67 – 13.4m @ 25.1% Zn, 2.6% Cu, 106.4 g/T Ag.

Inmet(formerly CFC, Minnova) discovered and mined-out the Winston Lake deposit, and continued development to the adjacent Pick Lake deposit where they commenced mining in 1997. Inmet intended to mine the Pick Lake Deposit for 7 years, but poor economics caused the mine to close in 1998, and most of the Pick Lake orebody remains underground. There is no record of production from Pick Lake, or record of exploration work since mine closure. The former mine site is a reclamation project managed by Inmet Mining Corp.

Pick Lake's flooded underground development included a 1.5 km drift from the former Winston Lake mine shaft, an internal shaft between -600 to -1200m depth, minor ramping and stoping at 600m depth, and a capped vent raise and winze. The winze has been removed, and shafts sealed with several feet of cement (Figure 3). A hydraulic dam was installed along the Winston to Pick drift, and all underground workings are flooded (personal communication, Mark Smyk, MNDMF and various sources at INMET).

Figure 3. Capped winze and ventilation shaft above the Pick Deposit on Orebot's Claims.

Underground workings in Orebot's Winston Lake property are held by the Crown, and can be accessed by application. Inmet Mining still maintains leases and ownership of flooded underground workings on the adjacent and contiguous property from which the Winston Lake deposit was mined. All mine buildings and infrastructure were removed with the exception of a mine gatehouse, tailings pond and various pumps and pipelines related to reclamation and environmental operations. Some electrical infrastructure remains in place.

Pick Lake is the highest grade zinc deposit in Ontario, and its current (non 43-101) grade and tonnage has been assembled from research of various sources in the public domain. Inmet completed a detailed underground drilling campaign on the Pick Deposit prior to mine closure, and recalculated reserves at Pick Lake. The Pick Lake reserves determined from this work was not released to the public by the company prior to mine closure.

Table 2 compiles tonnage and grade of deposits in the area, from various sources in public domain.

Table 2: Winston Lake Mineral Deposits, all categories, not 43-101 compliant.

Deposit	**Ore (all categories)**	**Metal Grades**				**Dilution**
	Million Tonnes	**Zn (%)**	**Cu (%)**	**Ag (g/t)**	**Au (g/t)**	**(%)**
Winston Lake (mined out)	3.1	15.9	1	30.3	1.02	20
Pick Lake						
Upper and Middle	0.26	11.21	0.77	31.5	0.65	30
Lower	1.2	15.9	0.86	38	0.46	25
Zenmac (mined out)	0.2	15.9	1	30.3	1.02	20

Start-up costs for the Winston Lake Mine was $76M, which was paid back in 2½ years. This shows the benefit of mining high grade ore, at a good price, with low operating costs.

Pick Lake was developed and mined briefly, but Inmet Mining Corporation closed the Winston Lake Mine abruptly in 1998, leaving 7 years production underground at Pick Lake. The Pick Lake deposit is one of the highest grade un-mined Zn-Cu-Ag-Au deposits in Canada.

Property Geology

The Winston Lake Property is held 100% by Orebot Inc., a private corporation registered in Ontario. The property covers 100% of the Pick Lake Deposit, and 6 mineralized surface showings (Ciglen, Anderson, Clear Lake, Trail Zone, Cabin Showing and Rain Mountain) within a package of Archean volcanic rocks which were extensively altered during VMS emplacement (Figure 4).

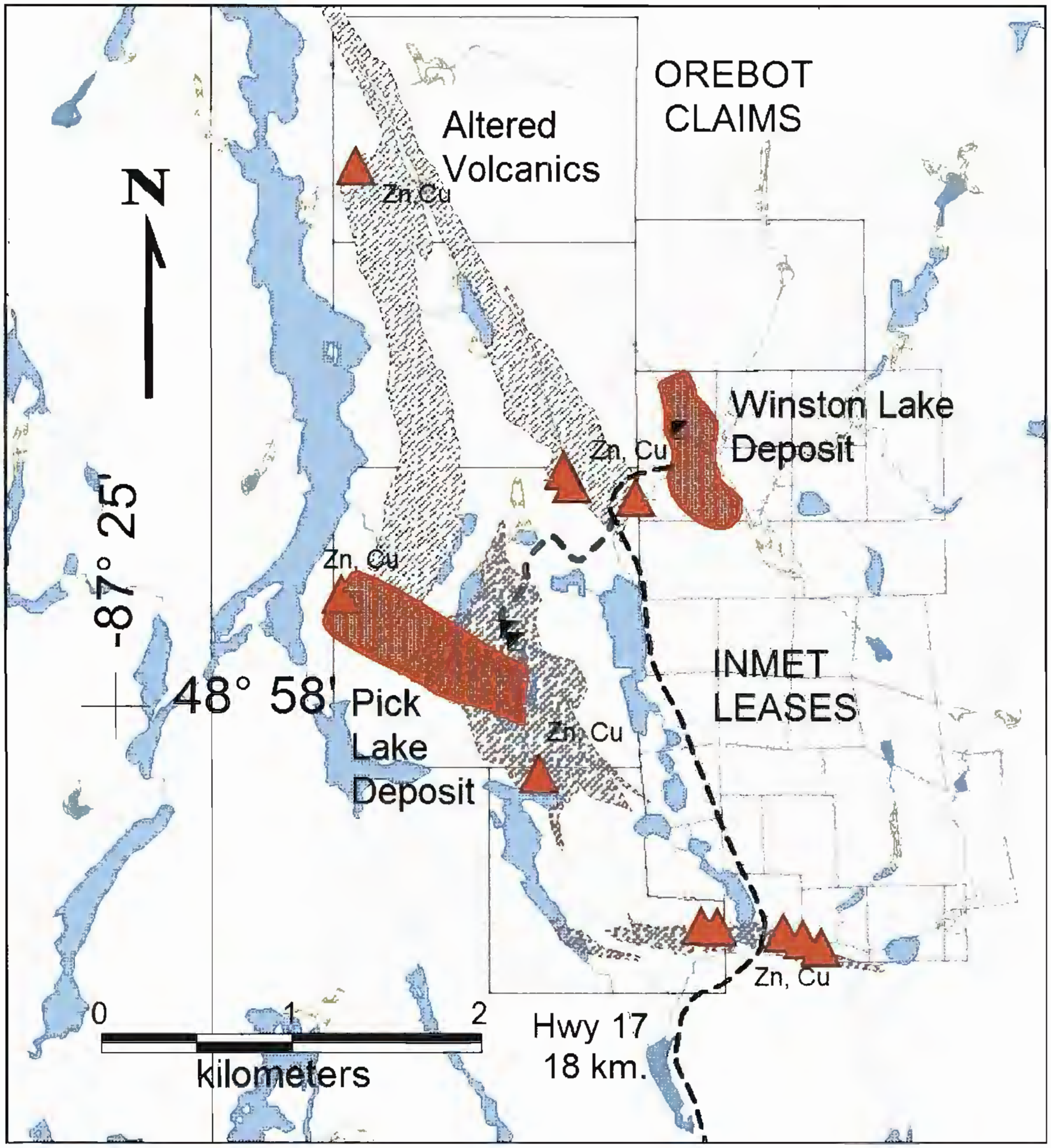

Figure 4: Winston Lake Property Mineral Occurrences.

The Pick Lake deposit is described as "several thin, but continuous massive sulphide sheets with a down-plunge length of 1000m. The Upper and Lower zones average 2.0 and 4.0 meters in thickness, respectfully. Massive Sulphide ore, in sharp contact with host rocks, has a strike length which varies from 100 to 400 meters. It forms a dyke-like body which locally crosscuts both foliation and granitic dikes." (Doiron, 1997).

The Pick Deposit is a large high grade remobilized Zn-Cu-Ag-Au orebody, that was relocated to its present position from a similarly high grade primary VMS deposit that has not yet been found.

Pick Lake's exceptional grade is demonstrated by drill intercepts in hole WL67C, which reported 3.6m of 34.3% Zn, 1.2% Cu, and 56.9 g/T Ag and hole WL67, which reported 13.4 m of 26.0% Zn, 2.6% Cu and 106 g/t Ag. The cemented collar of drill hole WL67 was found while mapping and it is located on Orebot's claims (Figure 5).

Figure 5: Cemented collar of DDH WL67 and Garmin GPSmap 76Csx.

Property geology is best described in University of Minnesota doctoral thesis "STRATIGRAPHY, PHYSICAL VOLCANOLOGY, AND HYDROTHERMAL ALTERATION FO THE FOOTWALL ROCKS TO THE WINSTON LAKE MASSIVE SULPHIDE DEPOSIT, NORTHWESTERN ONTARIO" completed by Steven Arvid Osterberg, in September, 1993. Mr. Osterberg mapped metavolcanics on the property, and reports 50% altered volcanic in the abstract of his thesis:

"The Winston Lake Zn-Cu-Ag massive sulfide deposit is situated above a sequence of metamorphosed Archean calc-alkaline volcanic and volcaniclastic rocks. A detailed mapping, petrographic, and chemical study was undertaken to evaluate the stratigraphic and hydrothermal development of the footwall rocks with regard to depositional environment and spatial controls on metasomatism and mineralization.

The footwall rocks are dominated by interlayered successions of metamorphosed volcaniclastic and volcanic rocks that have been extensively intruded and block faulted. Volcaniclastic-sediments were deposited at the base of the stratigraphy where they were interlayered with felsic pyroclastic deposits and/or their turbiditic equivalents. Locally massive sulfide and cherty exhalative beds were deposited.

A relatively thick section of interlayered felsic and mafic lava flows were erupted and deposited above the basal volcaniclastic rocks; minor interflow clastic and base metal-poor exhalative sediments accumulated during pauses in mafic volcanism. An upper clastic succession accumulated above the lava flows; basinal volcaniclastic-sediments were deposited and were overlain in part by felsic pyroclastic material that was erupted from a distant, extraneous source. Interlayered mafic lava flows and volcaniclastic rocks cap the footwall stratigraphy and host the Winston Lake deposit and stratigraphically equivalent mineralized occurrences.

Facies analysis of lava flows, along with the basinal distribution of volcaniclastic-sediments indicates the Winston Lake footwall stratigraphy developed in a subsiding, subaqueous rift environment. Subsidence was focussed in the rift axis; associated stresses resulted in development of synvolcanic faults within and distal to the rift axis. The dominance of passive eruption products indicates volcanism occurred in relatively deep water beneath the volatile fragmentation depth.

Approximately 50% of the footwall stratigraphy has been hydrothermally altered in subconcordant to cross-stratal zones. Interaction of the rocks with metasomatic fluids, followed by isochemical metamorphism has resulted in unusual modal abundances of tremolite/actinolite, biotite, sillimanite, staurolite, anthophyllite/gedrite, chlorite, and quartz relative to metamorphosed primary compositions. Microprobe analyses indicate extreme Fe/Mg enrichment of ferromagnesian silicates near the base of the stratigraphy.

Mass balance analysis indicates variable enrichment of MgO, Fe2O3T, and K2O, and depletion of CaO and Na20 in altered rocks; TiO2 and Al203 were relatively immobile. Overall mass losses, indicative of metasomatic leaching, dominate alteration towards the base of the stratigraphy, whereas both gains and losses occurred in the upper portions of the section.

Mg enrichment occurred in stratiform zones through shallow circulation of seawater-based hydrothermal fluids during progressive stratigraphic growth. Minor associated base metal-poor exhalites developed during intermittent pauses in volcanism and sedimentation. Substratiform zones of iron-aluminous-potassic alteration developed as chemically evolved fluids, which originated at depth, interacted with permeable lithologic units through which they buoyantly migrated.

The distribution of alteration indicates that chemically-evolved fluids rarely reached the sea floor environment but were generally confined beneath impermeable stratigraphic units. Metalliferous fluids periodically passed through the footwall rocks to the sea floor; no distinct chemical or mineralogical fingerprint of their passage is evident in the rocks, suggesting the metalliferous fluids were similar to chemically-evolved fluids except in metal content. The metalliferous fluids reached the sea floor during at least two stages of stratigraphic growth in which metals were deposited as massive sulfides. The first stage was at the Pick Lake deposit, near the base of the stratigraphy and the second stage was at the Winston Lake deposit at the top of the section.

The distribution and composition of alteration and associated base metal sulfide and cherty exhalative occurrences indicates the Winston Lake hydrothermal system was multistaged and involved multiple hydrothermal fluids. Stratigraphic development in a subsiding rift environment spatially controlled the movement of buoyant hydrothermal fluids through permeable lithologic units. Periodic synvolcanic faulting released metalliferous fluids to the sea floor where base metal sulfides were deposited." (Osterberg, 1993)

Figure 6. Garnet Anthophyllite altered pillow basalts at Ladder Occurrence.

Orebot Inc staked this altered volcanic belt in addition to the claim hosting the Pick deposit. The extensive alteration package suggests that the local greenstone belt has been exposed to long-lived hydrothermal activity and VMS deposition. So far 3.2 million tonnes of high grade Zn ore occurs as a primary deposit, and 1.4 million tonnes is remobilized ore. With the large extent of VMS-style alteration in the belt, and 50% of the ore accounted for as remobilized from somewhere else, there is an opportunity to discover new primary VMS deposits on the property.

Given the scale alteration, much larger deposits are possible. With the low conductivity of massive sphalerite, geophysical detection of these primary deposits may be difficult, and will require the most modern geophysical applications available, and expert interpretation.

Ore Petrology and Electron-microprobe work

R.L. Barnett Geological Consulting Inc, of London Ontario was contracted by Orebot Inc to investigate several four samples of ore received from geologist Mark Smyk, at MNDMF who collected the samples from each massive sulphide ore body at Winston Lake. The samples are known as Pick Lake A, Pick Lake B, Winston Lake and Zenith, with names corresponding to the deposit of origin. Figure 4 and Map 4 (DDH Locations and Traverses)shows the spatial relationship of orebodies from which samples were collected.

Figure 7. Sample Pick Lake A:

Sample Pick Lake A (Figure 7) is massive sphalerite-pyrrhotite with 20% lithic, multimineralic and single grain xenoliths with diverse array of mineral compositions and textures which were incorporated into a volume of mobile sphalerite-pyrrhotite-chalcopyrite, transported and then reconsolidated into massive sulphides once again. Also observed was a rounded pyrite-sphalerite ball-shaped zenolith of pre-existing metamorphosed sulphide ore.

Figure 8. Sample Pick Lake B:

Sample Pick Lake B (Figure 8) is massive sphalerite (more sphalerite than Pick A) with 30% rounded fragments of quartzofeldspathic rock, which lacks lithic fragments with cummingtonite-grunerite amphiboles observed in Pick Lake A, which suggests these mobile massive sulphides sampled different rock types to form samples Pick Lake A and B.

Figure 9. Sample Winston Lake:

Sample Winston Lake (Figure 9) is massive sphalerite with subtle mineral banding of fine-grained pyrrhotite, with occasional concentrations of chalcopyrite, and fine cassiterite distributed throughout. Minor inclusions of biotite-phlogopite solid solution micas, the zinc spinel gahnite, and coarse plagioclase also were observed. Winston Lake lacks lithic fragments as it is primary ore.

Figure 10. Sample Zenith:

Sample Zenith (Figure 10) has coarse-scale mineralogical banding with half massive pyrrhotite with 35% discontinuous linear domains of chalcopyrite and 10% sphalerite throughout as linear domains, and the other half essentially massive coarse sphalerite with discontinuous linear stringers of pyrrhotite and less than 5% chalcopyrite disseminated throughout the sphalerite. Despite the banding both halves have 15% single grain hornblende and ragged discontinuous domains of calcite. The sample lacks mica, and shows little evidence of deformation.

The importance of work completed by R.L. Barnett is that it shows the remarkable differences between ores of Pick Lake, Winston Lake and Zenith. Ore diversity puts helps geologists understand methods of ore emplacement in each case, which will help steer new exploration towards finding more ore on the property.

Pick Lake is clearly remobilized and is different than Winston Lake and Zenith ore. It's mobile history is recorded in the compositions of lithic and massive sulphides it sampled.

R.L. Barnett's report "Petrographic Electron-microprobe investigations of samples of massive sulphides from the Pick Lake, Winston Lake and Zenith Deposits" is included in Appendix A.

Geophysics

The Winston Lake Property has been held under leases since the mine opened, and has not been explored since the 1998 with closure of the Winston Lake Mine. The property has not benefited from GIS compilation, modern deep-penetrating airborne geophysical surveys, or systematic use of GPS in exploration. Government airborne surveys, released 2 years after the mine closed show many conductors on the property that have not been tested.

Following a geophysical compilation of KIVI Geoscience conducted ground follow-up to geophysical anomalies that resulted from the most recent airborne geophysical survey in public domain, available online as Geophysical Data Set 1104 – Revised (GDS1104). This airborne survey was part of "Operation Treasure Hunt", which commenced in 1999, with 2000 vintage AEM data.

Survey specifications are as follows:

Contractor: High-Sense
Survey Dates: November 1999 – January 2000.
Survey System: High-Sense magnetic and electromagnetic frequency domain helicopter system Flight line direction: 0° / 180°
Line spacing: 200m
Control line direction: 90° / 270°
Control line spacing: 1500m
EM bird height: 30m a.g.l.
Lower magnetometer height: 30m a.g.l.

Upper magnetometer height: 45m a.g.l. EM coil separation: 6.4m
EM frequencies:

Coaxial	925Hz
Coplanar	877Hz
Coaxial	4,468 Hz
Coplanar	4,891Hz
Coplanar	33,840Hz

Only EIGHT (8) 200m north-south flight lines were flown over Orebot's claims. The flight lines are sub-parallel to volcanic stratigraphy mapped by Osterberg (1993), which may not couple with conductors oriented parallel or beside flight lines.

The EM profile data and system specifications were imported into UBC GIF's EM1DINV inverse modelling software to produce conductivity depth sections by Geophysicist Grant Lockhart, of Petra Geophysical Consulting Inc. for Kaminak Gold Corporation in November 2009 (Petra).

Table 3: AEM Conductors identified by Petra Geophysical Consulting Inc (Lockhart, 2009).

Conductor	**x83z16**	**y83z16**	**Mag**	**EM**	**Area**	**Depth**	**Comments**
WL001	471929	5424495	neutral	conductor	1.0	60	Narrow, 800m long, vertical, weakly conductive sheet which strikes SW between the Winston and Pick deposits. Offset 250m SE from WL002.
WL002	472078	5424919	neutral	weak deep conductor	0.6	60	Narrow, 650m long, vertical, weakly conductive sheet which strikes SW from the Winston deposit.
WL003	472214	5424259	neutral	Moderately strong shallow conductor	2.0	15	Flat lying tabular, shallow, moderately strong conductor.
WL004	472789	5424473	neutral	Moderately strong conductor	0.8	55	Isolated, circular and moderately strong conductor which is located on N-S granite-metasediment contact. It is a one-line response where the actual source location could be east or west of the flightline and at a shallower depth.

Petra further describes conductors WL001, WL002, WL003 and WL004 as follows:

"The most significant conductors are WL001 and WL002 as they have significant tonnage potential given their long strike lengths. And of these the WL001 is the most important since it has the longest strike length and is entirely captured by the Orebot claims. Both display the classic profile shape of thin (< 10m wide) vertical or near vertical sheets. The average modelled depth to top of source has been estimated to be 60m, although a case could be made that the top edge of the sheets plunges to the SW.

WL003 is a shallow flat-lying conductor which is located 250m south of WL001 on the eastern boundary of the Orebot claims.

WL004 modelled deeper than WL003 at 55m. It is a one line response, and the increased depth may be due to the source being located to the east or to the west of the survey line. WL004 occurs at the north of the upper edge of the Pick Lake deposit and at the intersection of two interpreted structures.(Lockhart, 2009)"

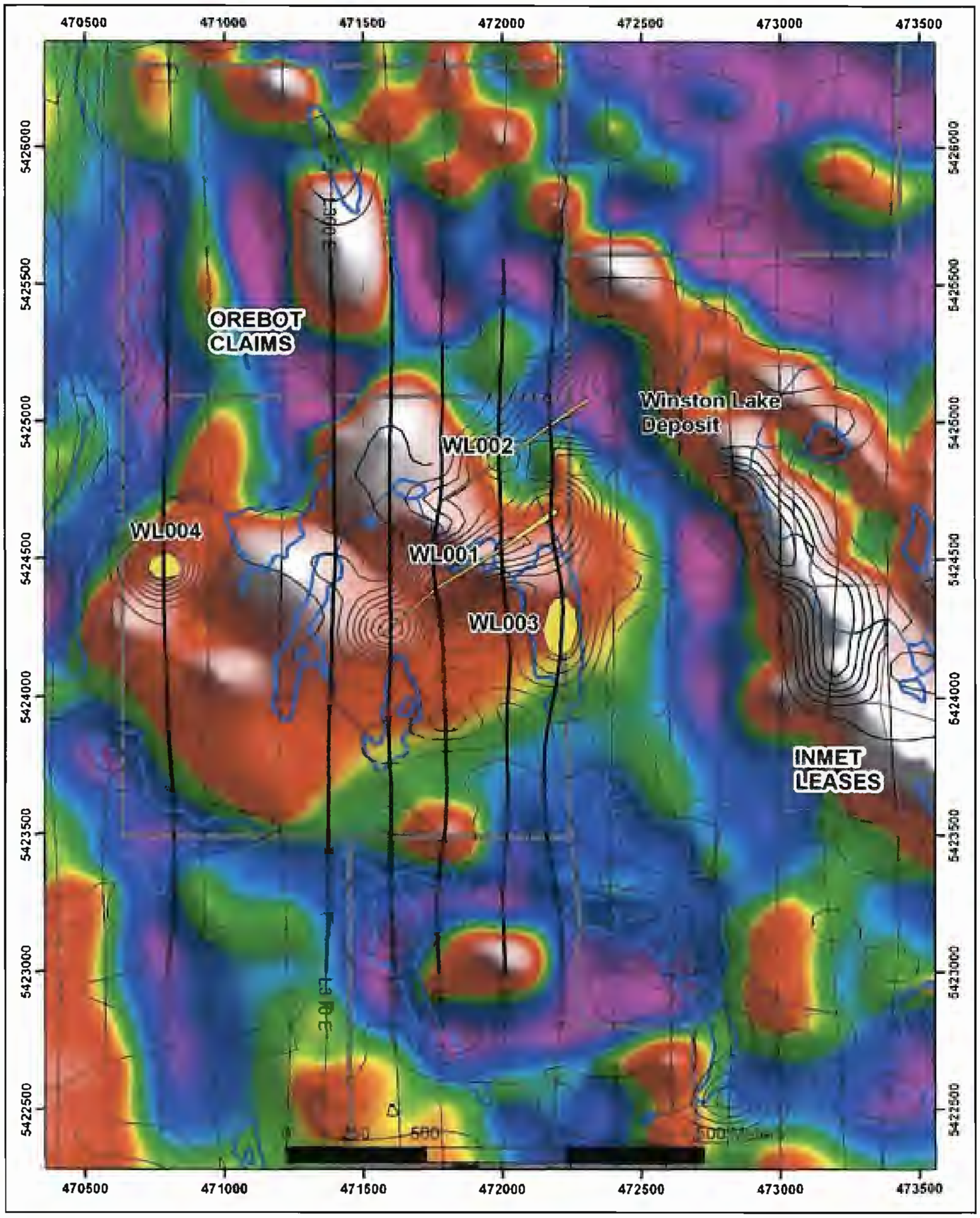

Figure 11: Winston Lake Conductor Map (Lockhart, 2009) on gridded total magnetic intensity.

KIVI Geoscience Inc conducted ground checking of anomalies WL001, WL002, and WL003. WL001 and WL002 are are the largest and most significant conductors identified by Petra. These conductors align between the former Winston Lake shaft and Pick Lake shafts on Orebot's property, and were suggested by Petra as potential remobilized massive sulphide ore.

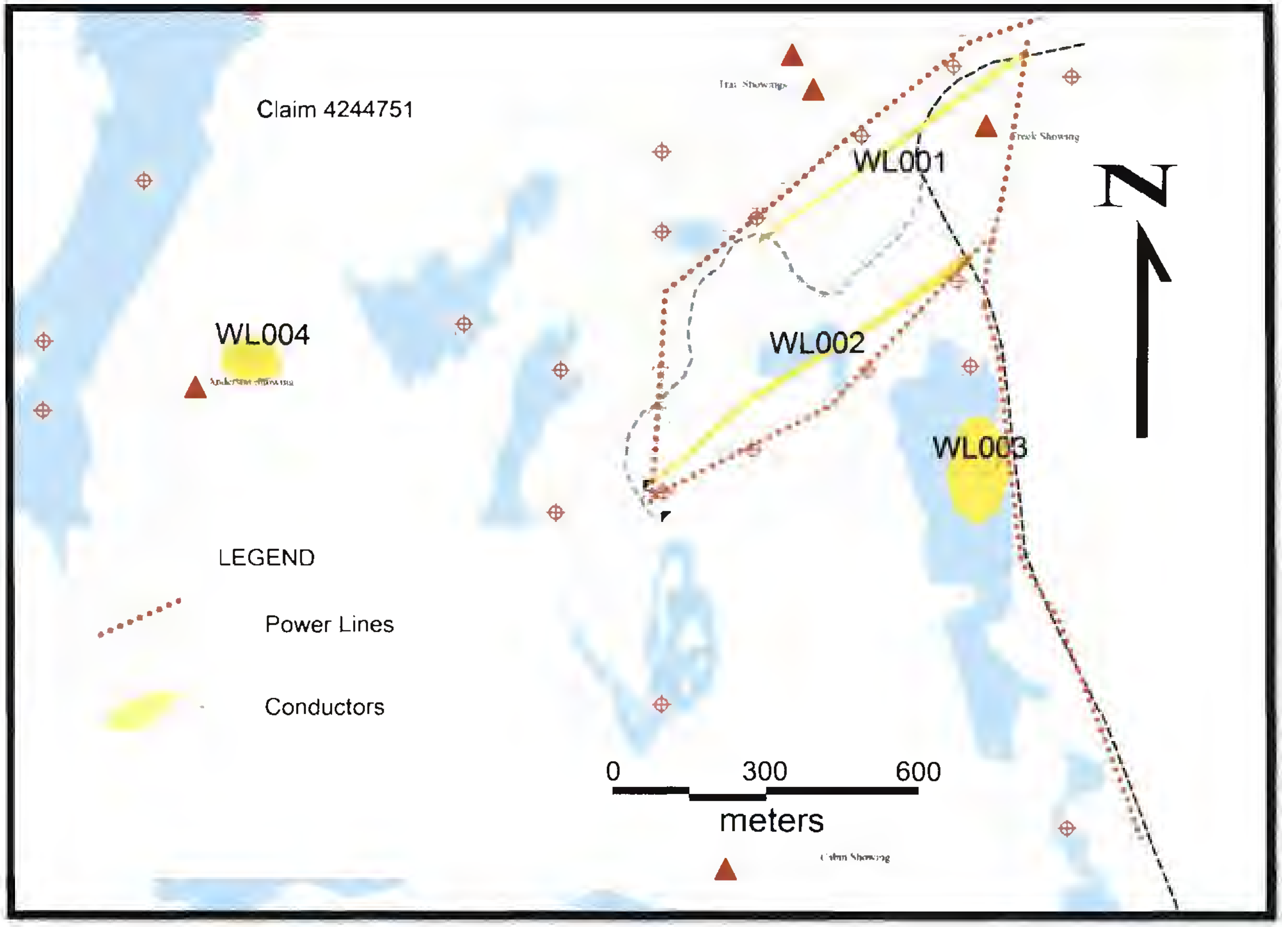

Figure 12: GDS1104 Anomalies and Conductors WL001-WL004 with cultural conductors.

Conductors from OGS GDS1104 are represented as red cross-hairs and Petra conductors WL001-WL004 are yellow polygons (Figure 12).

The power lines have been disconnected from the electrical supply, and occur as high tension cable conductors still suspended on hydro poles. Electrical powerlines form cultural geophysical anomalies on Orebot's property, but only if they cross-cut the north south flight lines. The north-south portion of the powerline just north of the Pick shafts and the live powerline that extends along Winston Lake road to the former Winston Lake Mine do not create anomalies on the GDS1104 geophysical survey.

Electrical power lines that crosscut flight lines at near right angles likely explain conductors WL001 and WL002. There is a small displacement of conductors 25-50 meters of GPS'd hydro poles and the dormant high-tension power lines between them, but generally good correlation. Bedrock anomalies may have a similar displacement from anomalies identified by this survey.

During extensive mapping of Claim 4244751, no other cultural conductive sources were identified, which suggests that all other conductors are likely bedrock conductors, which will form exploration targets for future investigation.

A base metal conduit of remobilized ore between Winston Lake and Pick Lake is not evident in conductors identified in the GDS1104 airborne survey. There is no geophysical evidence connecting Pick Lake remobilized ore to the Winston Lake primary VMS deposit.

Conductor WL003 is located beneath Cleaver Lake in the eastern part of Claim 4244751, and is interpreted as a shallow conductor modeled at 15 meters depth and has not been explained. Field examinations of this area did not identify cultural features to explain this conductor. The power line that extends north-south alone the Winston Lake road, which follows the eastern shore of Cleaver Lake did not result in airborne anomalies in the GDS1104 Airborne Survey. No evidence of diamond drilling by prior landholders was observed, so conductor WL003 remains unexplained.

Conductor WL004 occurs in close proximity to the Anderson Zinc showing (red triangle) with historically was interpreted as the up-dip surface expression of the deep Pick Lake deposit. Conductor WL004 modeled depth is 55 meters. The Anderson-WL004 area has not yet been visited, but this area will be a focus of geological mapping and sampling in future to determine if any massive sulphide occurrences discovered here have ore textures consistent with remobilized massive sulphide ore of the Pick Deposit.

Many other isolated EM conductors occur on Orebot's Winston Lake property. These conductors may represent undiscovered massive sulphide occurrences on the property and will ground checked, mapped and sampled to prioritize new exploration targets on the property.

Quaternary Geology

The Winston Lake property is characterized by rugged topography with high relief in excess of 200m in the surrounding area. Rain Mountain is the most prominent feature on Winston Lake property, and also a large hill mapped north of Pick Lake at the Cabin Occurrence and another to the west in the SW corner of claim 424475.

Government Quaternary mapping occurred on a regional scale by Zoltai (1965), as 1:100,000 engineering terrain maps (Gartner 1979). Compilation of this data was completed by Barnett et al (1991). Quaternary geology on the property consists of thin till veneer and locally thicker till blanket deposits, with glaciofluvial outwash deposits occupying major river valleys, suggesting that modern drainages mimic drainage patterns during glacial periods.

KIVI Geoscience Inc mapped glacial ice flow, and discovered two events. The most recent ice-flow direction is 205° Azimuth, and an earlier ice flow direction is 160° Azimuth. Both ice directions were observed on gabbro outcrop in the northern part of Claim 424475 (Figure 13) on the south shore of a small lake that drains into Cleaver Lake (Figure 14).

Figure 13. Gabbro outcrop showing divide line between younger 220° Azimuth ice flow on top of outcrop, and 165° Azimuth ice flow on outcrop face closest to viewpoint. Glacial striations were measured; auger point is oriented to north.

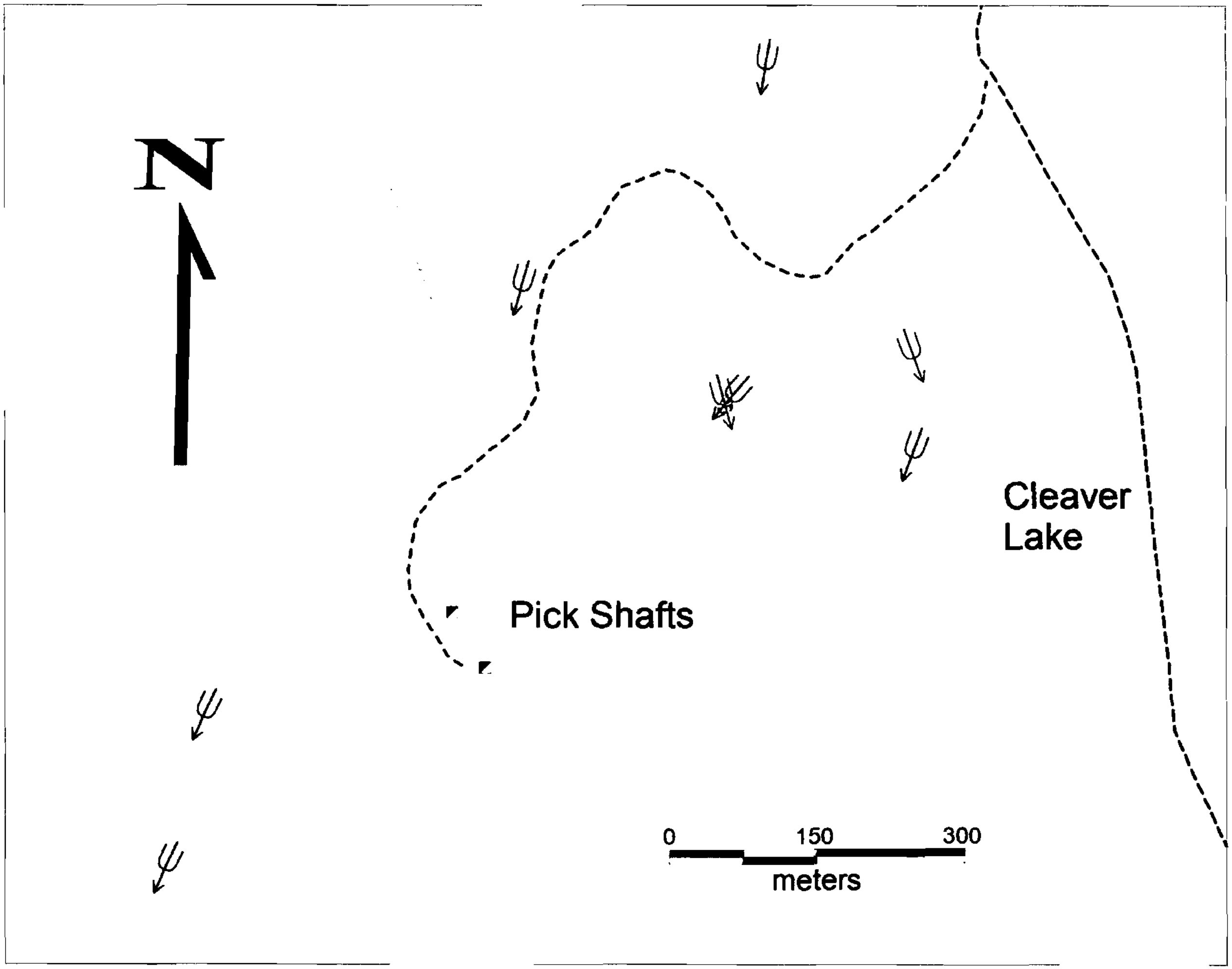

Figure 14: Quaternary Mapping with older ice flow direction in blue, more recent in black.

Field mapping of glacial ice flow directions capture both ice flow orientations, with the most recent ice advance of 205-220° Azimuth dominating outcrop surfaces, and older ice flow directions (in blue) about 165° Azimuth observed in the northeast part of Figure 14.

Ice flow history helps interpret glacial boulder dispersal trains and soil sampling results.

Geochemistry

Orebot contracted KIVI Geoscience Inc to conduct soil sampling at nominal 100m intervals on the property, analyze, and report results. Numbered waypoints were pre-programmed into GPS with initial focus on Claim 4244751, which covers the Pick Lake deposit and associated geology (Figure 15). Samples were collected in till veneer and glacial outwash areas not covered by water or affected by streams. Swamps were avoided if possible.

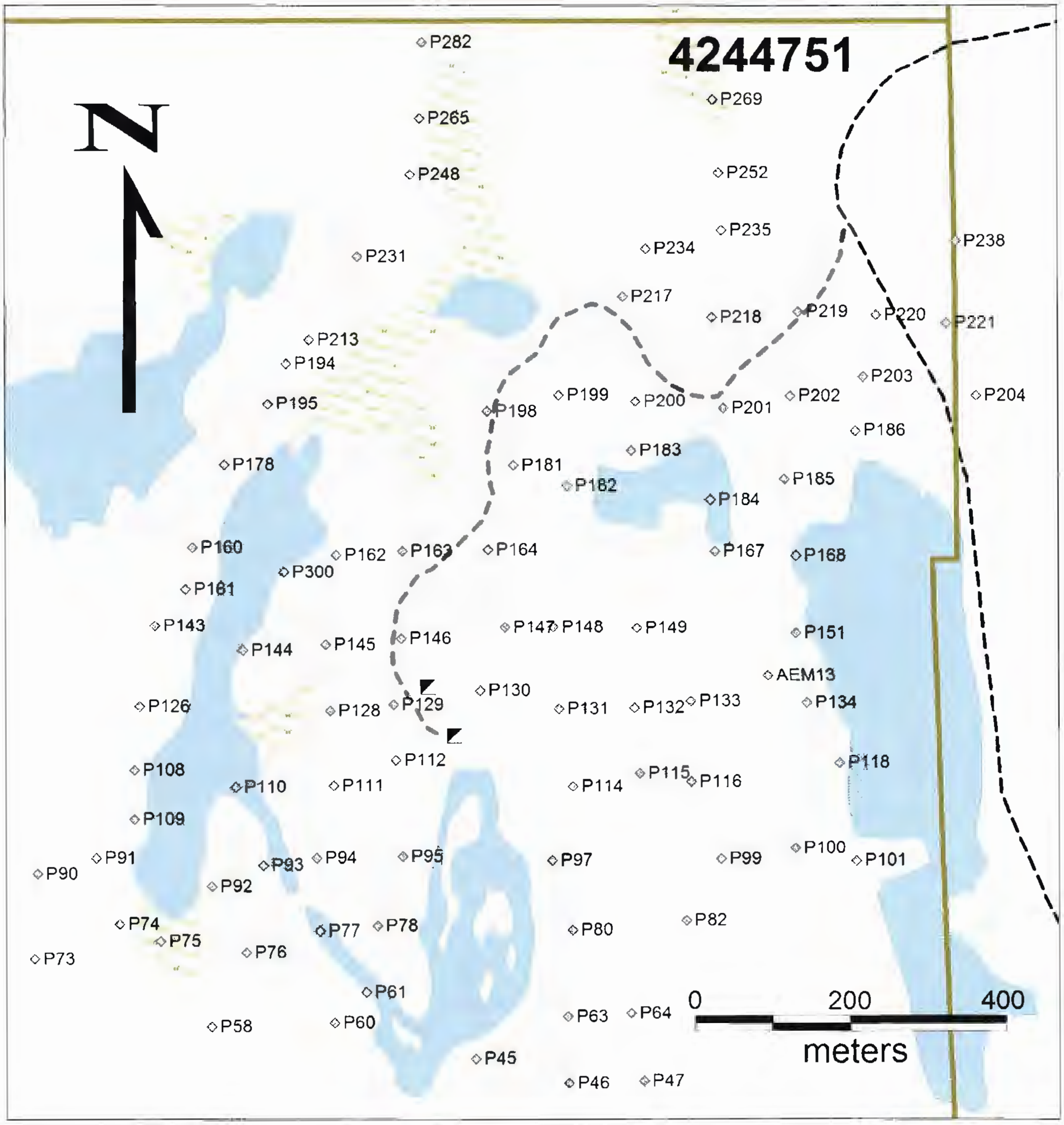

Figure 15. Soil Samples (n=96) Location Map on Claim 4244751.

In total 96 soil samples were collected over an area 1.3 by 1.6 km in size on claim 4244751. Soil sampling will continue through summer 2010, with detail follow-up sampling planned in areas of anomalous zinc and copper.

Sample locations which were collected in the field using a Garmin GPSmap 76CSx handheld GPS, at a nominal 100m spaced sampling grid. The GPS collects a waypoint with +/- 3 meters accuracy. All sample positions were recorded in UTM co-ordinates using datum NAD83, zone 16.

B-horizon till was targeted, from a typical depth of 20-50 cm, and collected using a "T"-shaped one-piece open-faced soil sampling auger. The sampler screws the auger into the ground and brings up soil until the desired soil profile is identified, which is then collected in a small kraft paper bag. The auger was cleaned between samples to avoid cross-contamination. Samples were labeled with the Waypoint number, and air-dried in secure storage prior to processing.

Subsamples from each sample were collected to form a small pellet using a Beuhler sample press (Figure 16), and remaining soil was recombined and stored. Soil pellets provide a compact sample density, which allows XRF instruments to provide better results. Glacial till was found to compact easily with the press, but fluvial silt required the use of small plastic vials to hold the mineral specimen together for analysis. Binding agents were not used.

Figure 16: A soil pellet from the Beuhler sample press.

Soil analysis was completed using an Innov-X Systems X-50 portable XRF (X-ray fluorescence) instrument in a home laboratory (Figure 17). The X-50 mobile XRF operates at 25 times the power of a similar handheld XRF, and on-board factory calibrations result in good accuracy and precision. The instrument is exceptionally easy to use. Detection limit is between 10-100 ppm for base metals such as Cu and Zn (copper and zinc), and between 50-150 ppm for Ag and Au (silver and gold). Elemental values are output into comma separated values, which are later matched with other sample data and observations.

Figure 17: Innov-X X-50 Portable XRF analyzing a Winston Lake soil sample.

The most abundant elements reported by the X-50 are iron, titanium and light elements (silica, etc...) which report in percents, while other elements in fractions of a percent. To locate undiscovered zinc mineralization, geochemistry has been targeted at Zn and Cu, which are in high concentrations in ore and mineralized rocks on the property, and could also be found to occur in high concentrations in soil. VMS massive sulphide ore from deposits in the belt commonly assays 30% Zn, 1% Cu, 30g/T Ag and 1 g/T Au, so these elements are targeted with the survey.

Sampling traverses recorded by GPS track files included 4.3 lkm on May 12, 2010, 10.2 lkm on May 13, 2010, 3.6 lkm on May 18, 2010, 6.4 lkm on May 19, 2010 and 5.9 lkm on May 22, 2010, for a total of 30.4 lkm, as shown on Figure 24 and on Map 4 (DDH Locations and Traverses).

Quality Control and Quality Assurance

Sample drying, care and storage, and preparation of XRF pellets was completed in a secure building. Samples were air-dried at low temperature in a solar oven for several days, and then sampled for fine-grained mineral soil, which was pressed into compact pellets of similar density using a Beuhler sample press. Fine samples with a clay fraction pelletize easily at about 2-5 tonnes per square inch. Samples with silt-size lower size fraction, require a plastic case to hold the sample together for analysis.

Analytical Quality Control and Quality Assurance was controlled by the use of standard, blank and duplicate analysis, as employed by analytical labs.

ML2 Standard

A gossan found on the property, attracted moose as evidenced by a pasture of tracks in the area. Moose Lick was sampled and sample ML2 was created with hopes that it could be used as a mineral standard to monitor the accuracy of XRF detection of zinc.

Table 4. Summary statistics for ML2 determined from 29 analyses.

	LE	*Fe*	*Zn*	*Zr*	*As*	*Nb*	*Mn*	*W*	*Ti*
Mean	51.7568	44.4593	3.5908	0.0098	0.0177	0.0069	0.0762	0.1575	0.2112
Standard Error	0.7268	0.6242	0.0958	0.0003	0.0007	0.0003	0.0031	0.0088	0.0024
Median	50.2260	45.8338	3.7156	0.0098	0.0183	0.0066	0.0760	0.1605	0.2125
Mode	#N/A	#N/A	#N/A	0.0092	0.0117	0.0061	#N/A	#N/A	#N/A
Standard Deviation	3.9139	3.3612	0.5161	0.0015	0.0039	0.0013	0.0119	0.0291	0.0042
Sample Variance	15.3185	11.2977	0.2663	0.0000	0.0000	0.0000	0.0001	0.0008	0.0000
Kurtosis	2.3660	2.1443	3.7849	0.5571	-0.1022	-0.2232	-1.4163	1.6618	#DIV/0!
Skewness	1.5596	-1.4715	-1.9335	-0.6841	-0.6477	0.0079	0.1140	-0.6443	-1.2586
Range	16.3062	14.0263	2.0254	0.0061	0.0151	0.0053	0.0375	0.1125	0.0081
Minimum	46.4132	35.2235	2.0351	0.0061	0.0095	0.0041	0.0582	0.0956	0.2065
Maximum	62.7194	49.2498	4.0605	0.0122	0.0246	0.0094	0.0957	0.2081	0.2146
Sum	1500.9481	1289.3197	104.1319	0.2839	0.4768	0.1378	1.1436	1.7322	0.6336
Count	29	29	29	29	27	20	15	11	3

ML2 had a range of zinc values between 2.03% and 4.06%, and returned a mean value of 3.59% Zn. This shows that samples which contain zinc can be detected by the portable XRF every time they are analyzed, but the accuracy varies. Variance may be due to a nugget effect of particles of different size that are exposed to the X-Ray beam.

Sample ML2 was sampled frequently during four days of analysis, showing that the instrument was detecting zinc throughout analysis of all soil samples collected.

Blank

Quartz-dominant sand was used to create a sample blank and was analyzed three times. The blank was analyzed to establish if there was any cross-contamination of results from one reading to the next.

XRF analysis showed that the sample was >99% light elements (LE) with trace amounts of iron and zirconium. The lack of zinc and other elements suggests cross contamination is not evident using a portable XRF.

Table 5. Summary Statistic of Blank

	LE	Fe	Zr
Mean	99.8233	0.174667	0.002067
Standard Error	0.034968	0.034979	0.00012
Median	99.8292	0.1685	0.002
Mode	#N/A	#N/A	#N/A
Standard Deviation	0.060566	0.060586	0.000208
Sample Variance	0.003668	0.003671	4.33E-08
Kurtosis	#DIV/0!	#DIV/0!	#DIV/0!
Skewness	-0.43421	0.453283	1.293343
Range	0.1207	0.1207	0.0004
Minimum	99.76	0.1174	0.0019
Maximum	99.8807	0.2381	0.0023
Sum	299.4699	0.524	0.0062
Count	3	3	3

Duplicate Analyses

Soil samples collected, processed and analyzed by KGI were frequently analyzed twice to monitor the analytical precision of the portable XRF. Several graphs were generated during data processing to demonstrate reproducibility above detection limits within the range of compositions detected by the portable XRF.

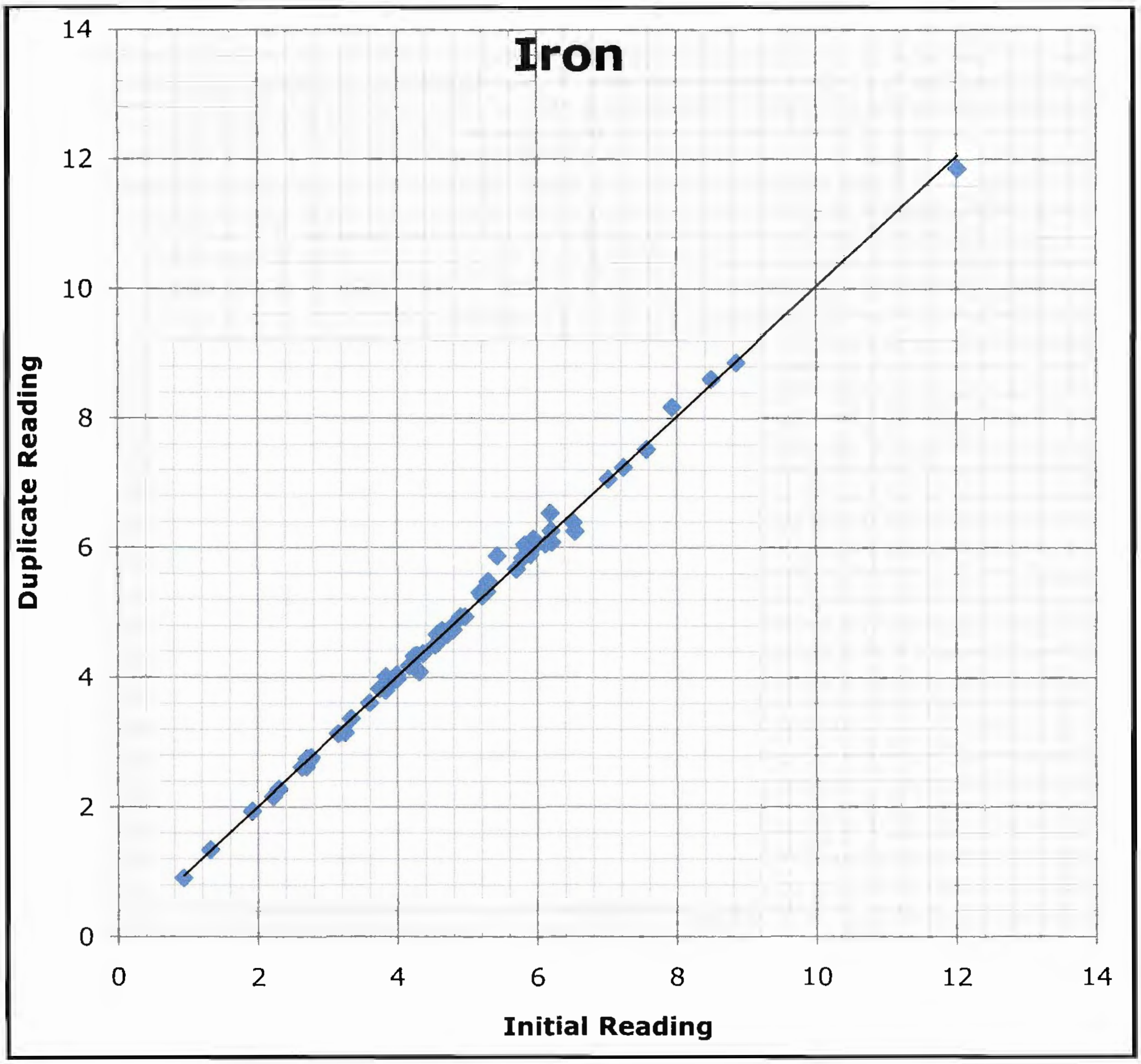

Figure 18. Iron was detected in 61 duplicate samples, and shows excellent repeatability over a large range of compositions in percent.

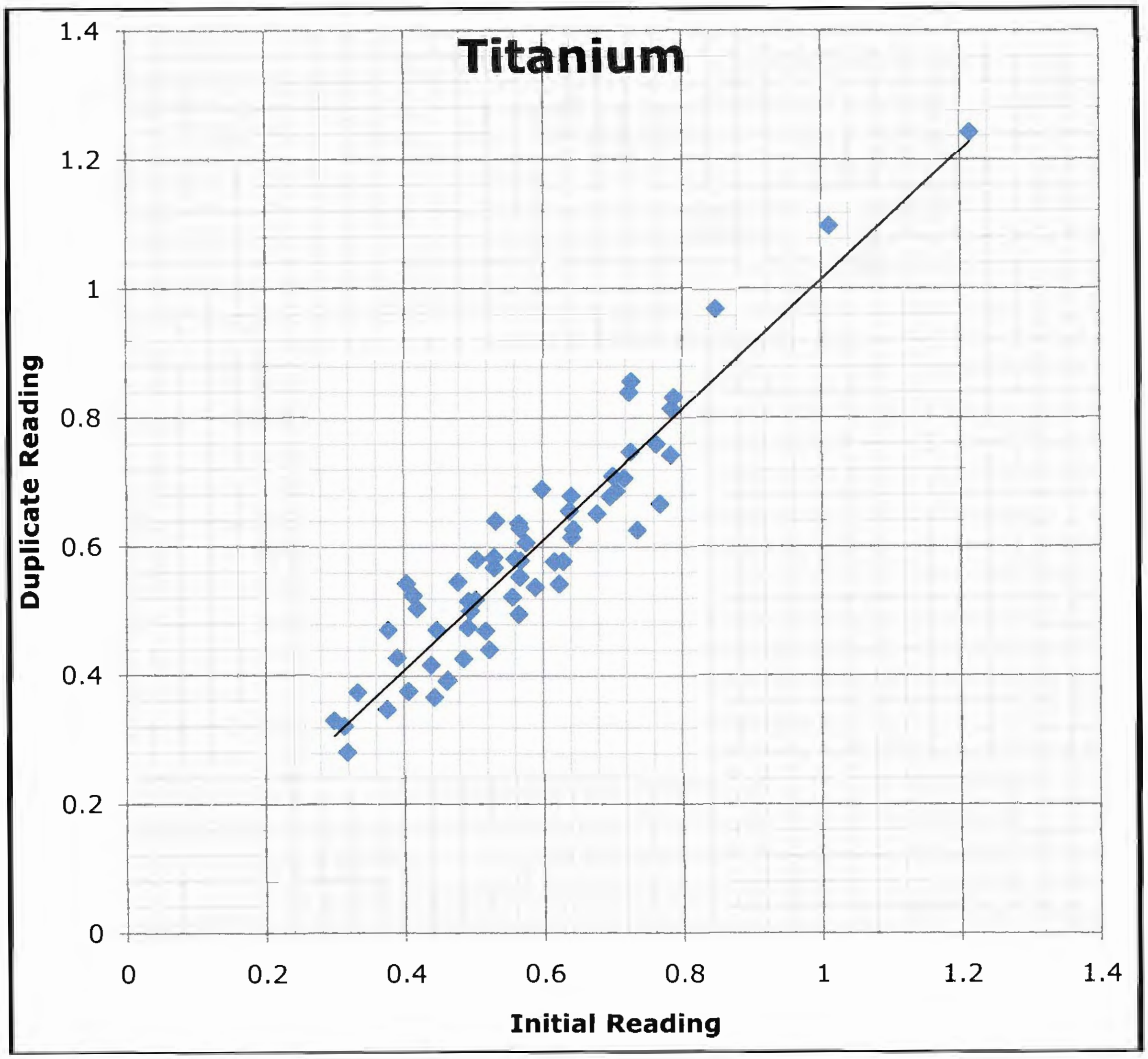

Figure 19. Titanium was detected in 61 duplicate samples, and shows excellent repeatability over the range of compositions encountered.

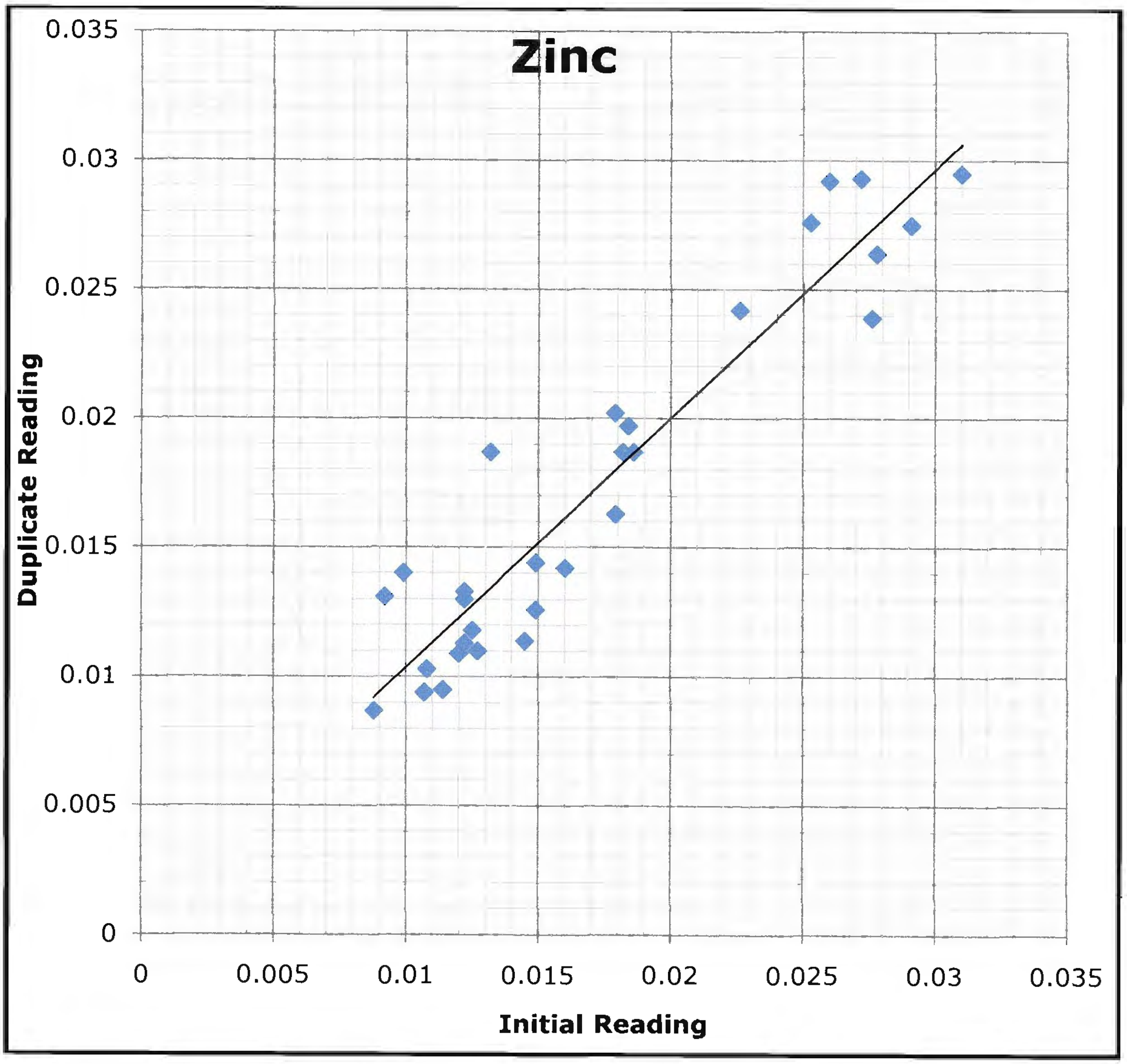

Figure 20. **Zinc was detected in 30 duplicate samples, and shows more variance as many of the results approach the detection limit of the instrument.**

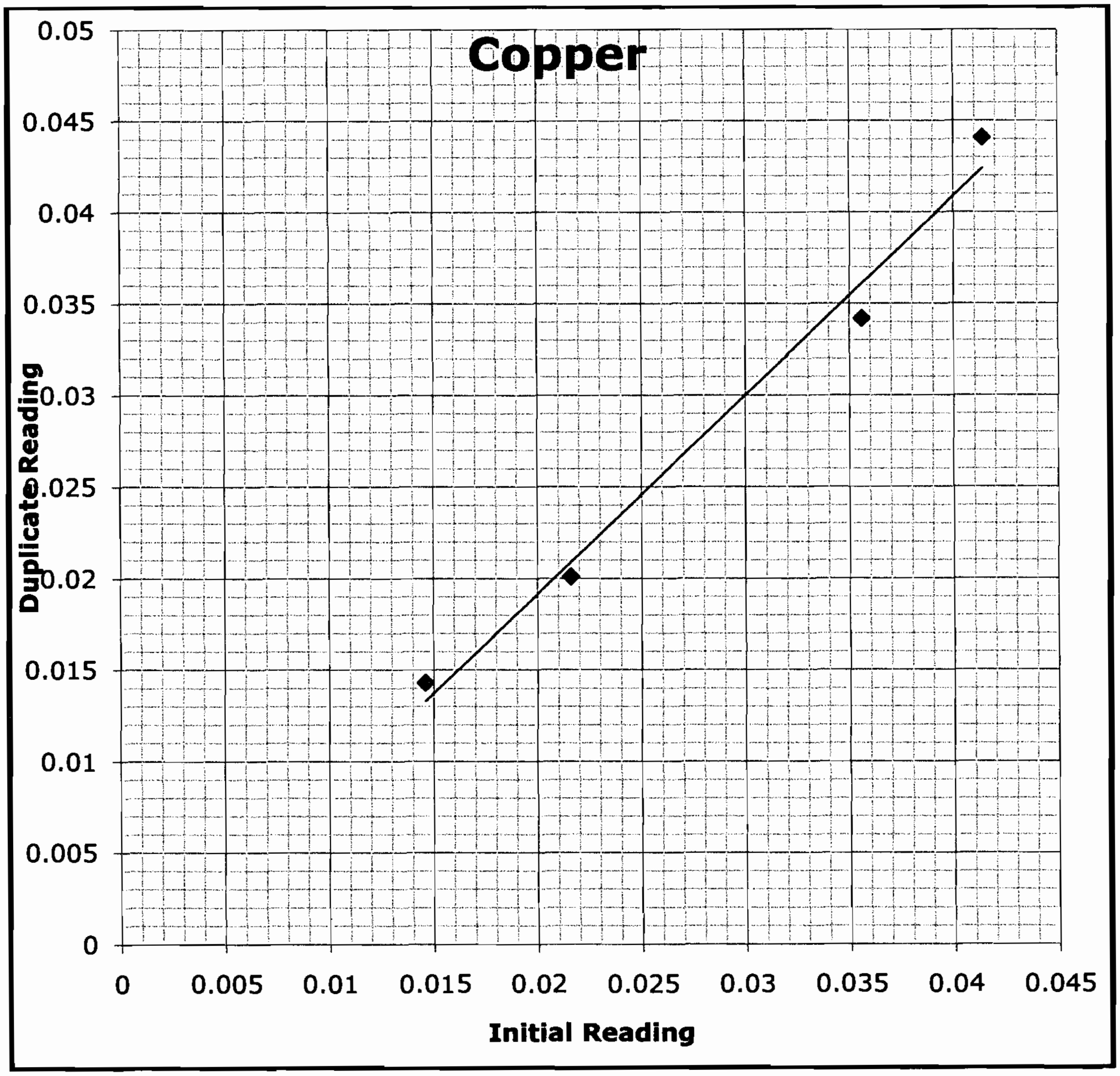

Figure 21. Copper was detected in 4 duplicate samples, and shows good repeatability.

Zinc was detected in 30 samples, and copper detected in 4 samples and their relative concentration is shown with brown dots (zinc) and green dots (copper), where higher concentrations are represented by largest dots (Figures 22 & 23).

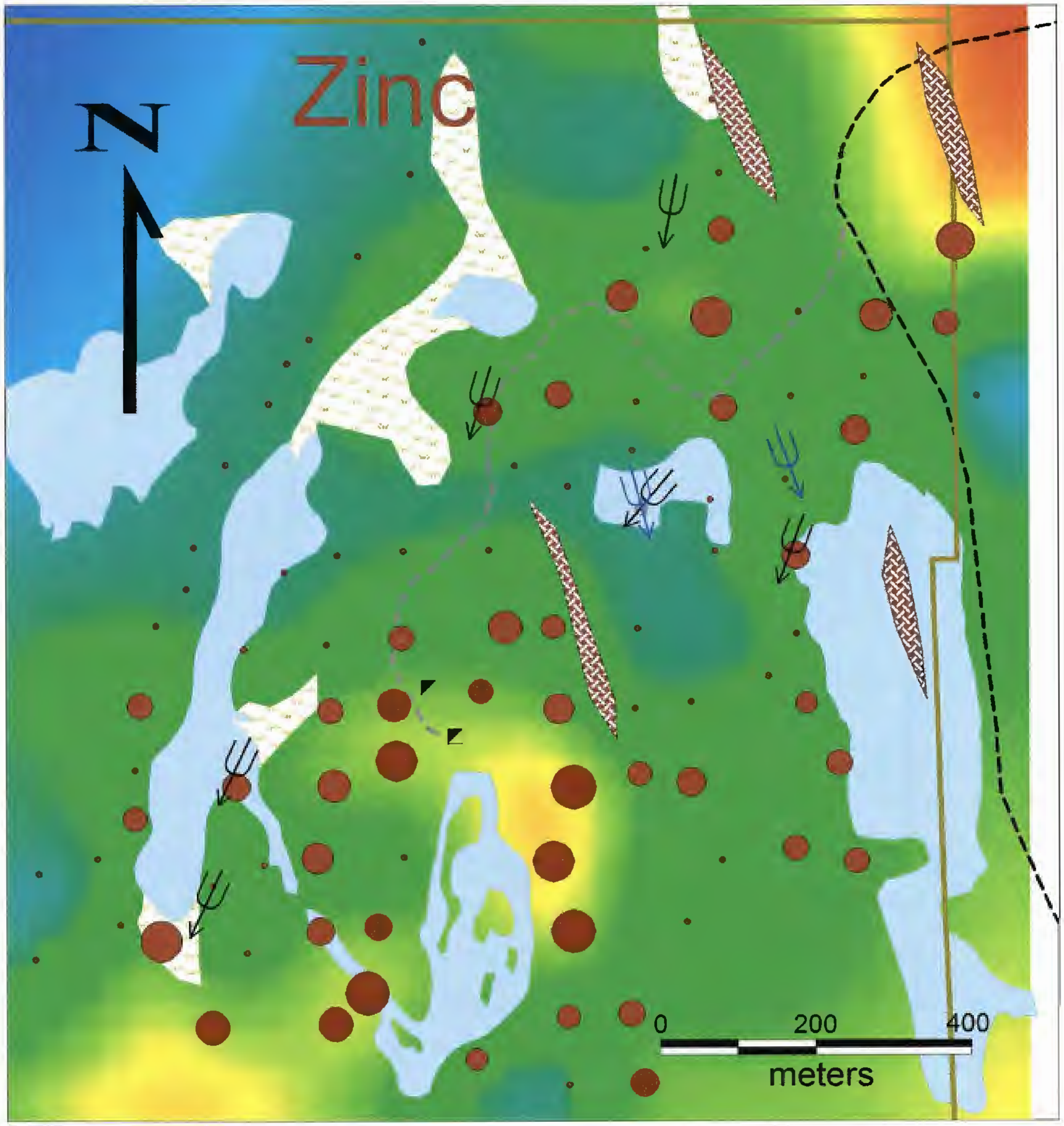

Figure 22. Zinc in soils, with large brown dots highest values on gridded zinc image. Proposed sources shown as cross-hatched lenses.

Zinc show a distribution down-ice from the Winston Lake Deposit and Ladder Zone in the Northeast part of the claim, and potential sources in the northern part of Cleaver Lake and Northeast of the Pick Shafts (shown as cross-hatched polygons – Figure 14).

There are no known sub-soil bedrock zinc occurrences near the Pick shaft. The Pick orebody occurs at -600m depth beneath the shafts, and the Anderson occurrence is located about 700m west of the Pick shafts. Known occurrences are nowhere near the soil anomaly in the central part of this map (Figure 4).

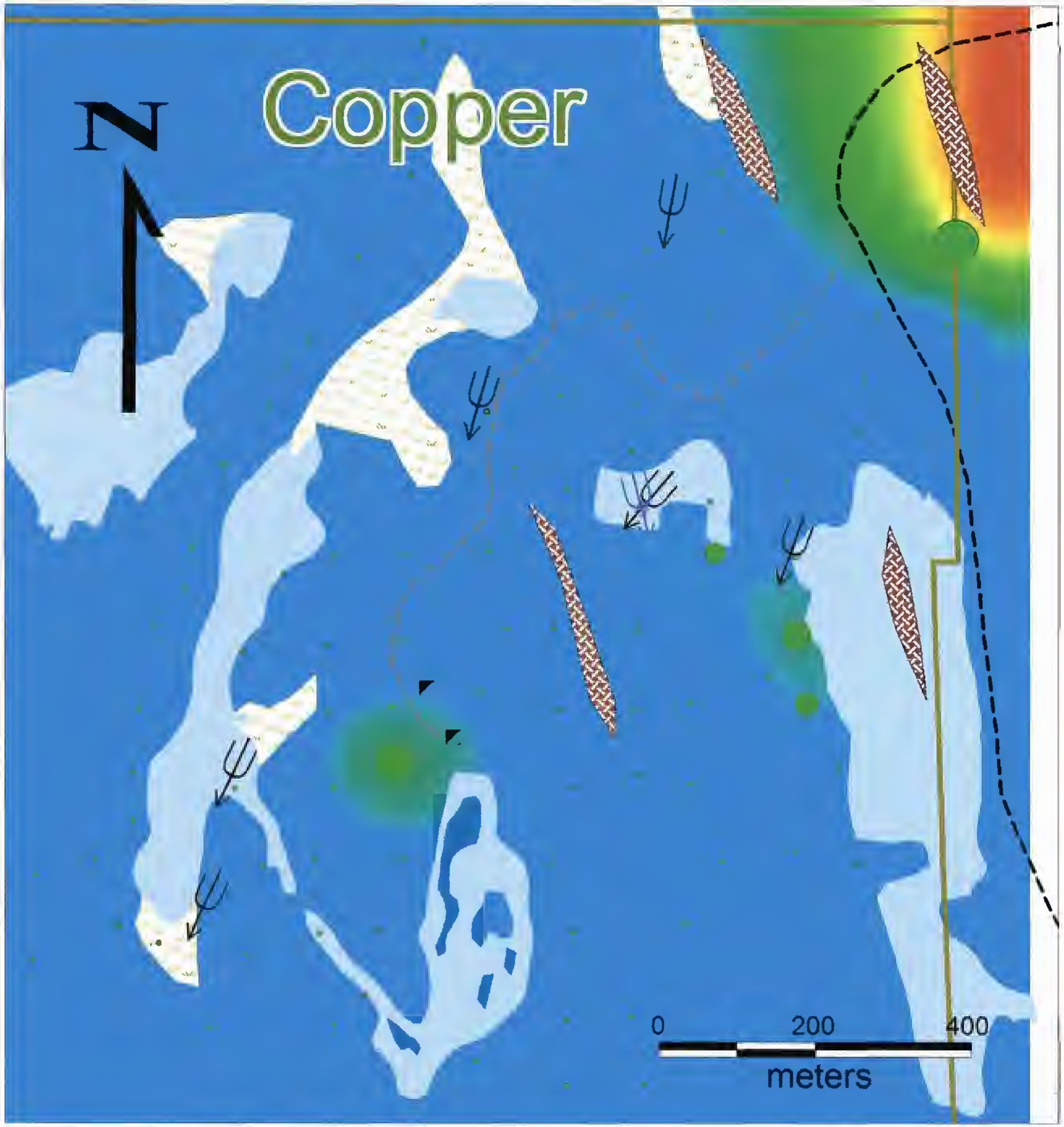

Figure 23. Copper in soils, large green dots are highest copper values, on gridded copper image.

Copper in soil samples is detected in four samples, which spatially correlate well with known copper in bedrock showings, and correlate somewhat with zinc soil anomalies (Figure 23).

The northern anomalous sample correlates with Winston Lake stratigraphy and a copper occurrence known as the Creek Showing. Anomalous samples west of Cleaver Lake may correlate with conductor WL003 located in the northern part of Cleaver Lake. The sample SW of the Pick shafts is not located near a known bedrock copper showing.

Soil samples commonly returned elevated Zn values using the portable XRF, and sometimes returned elevated copper. Gold and silver levels were not detected, and are presumed at concentrations below the instruments detection limit. Sample rejects have been retained for re-analysis with a multi-element ICP package when budget allows.

Analytical data is provided in raw and processed formats (Appendix B and C). The processed data includes conversion of percent to ppm (1 percent = 10,000 ppm) and substitution of a minimum detection limit value=10 (in red) for all values labeled ND (not detected). This enables statistical calculations to be performed to create thematic maps discussed earlier.

Historical DDH Collar and Grid Mapping

Assessment work is provided with respect to old claim posts that no longer exist, and to picket grids which have long since grown over. While mapping and soil sampling, many old drill trails, drill collars, and grids have been recognized and mapped. GPS waypoints and tracks has been collected, locations are preserved for future compilations.

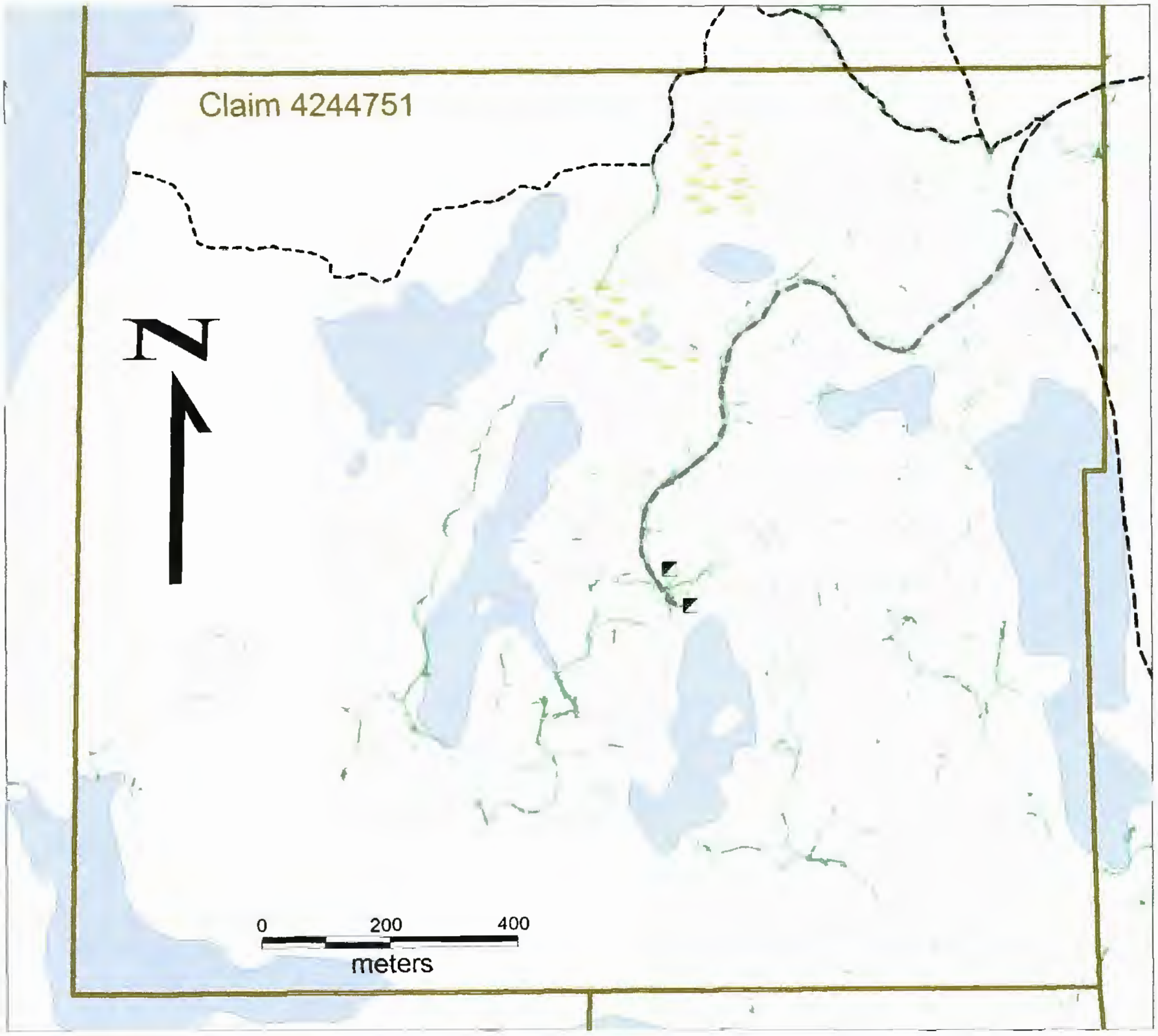

Figure 24. GPS Tracks in green showing extent of mapping and sampling on claim 4244751.

The drill database in the public domain is incomplete, as only work filed as assessment work is in the public domain. Mapping drill trails and drill collars will provide future exploration companies with some idea of which targets have been tested and which targets have not.

Where there are drill trails, there was drilling. Access is good, and was good when it was explored in the 1980's, so it is unlikely that helicopter-portable fly rigs were in use. Figure 25 shows drill hole collars that have been located in the field (black) to date amongst estimated locations referenced to historic claim posts and grown in grids.

There is a relationship between the red and black dots, but correlation is +/- 30m at best.

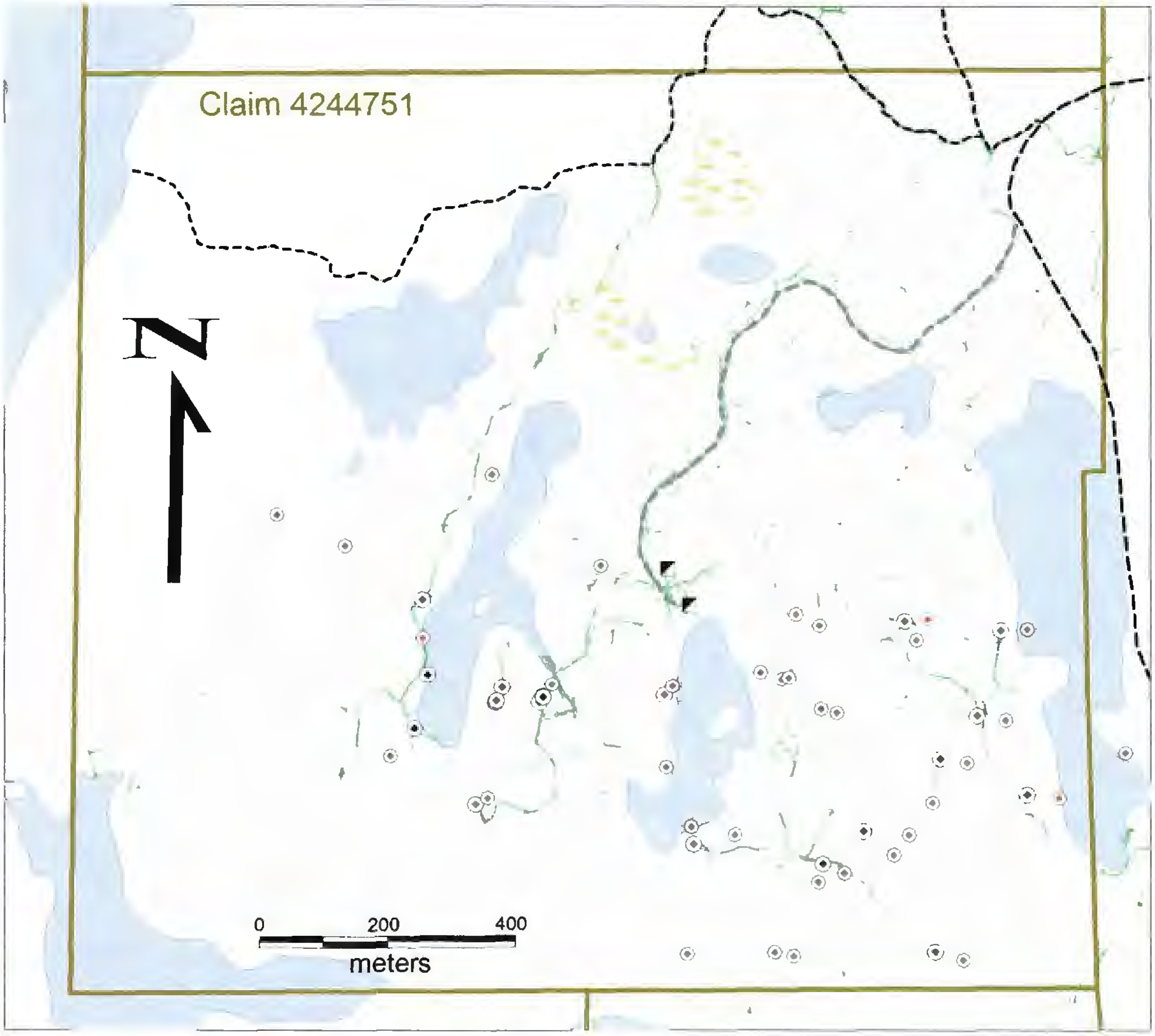

Figure 25. Drill hole collars located in field and GPS (Black) amongst estimated locations of drill holes (red) recovered from assessment files.

Picket grids have also been located in the field, including a few pickets that still have eastings and northings preserved with a DYMO tape label (Figure 26).

Figure 26. Small (once red) picket from Pick Lake grid – DYMO tag still legible and attached.

The surveyed Pick grid line known as 5000E was surveyed along its entirety and two pickets were found. This suggests the current estimate of the grid's location in the GIS should be shifted some 30 meters. Knowing the Pick Grid's real location will allow accurate positioning of diamond drill holes and mine development that may have been positioned from survey points along this grid (Figure 27).

Collecting GPS points to ground truth the Pick grid and others is very important when stitching together work from the past and present.

Despite considerable field work, repositioning of historic grids used to spot drill holes for surface delineation of the Pick Deposit is not yet reliable. In other words, the location of a drill hole in local grid co-ordinates cannot yet be converted to UTM co-ordinates with confidence.

Future work may include re-cutting some of the grids or baselines to try and fit earlier surveys into GIS space, so that their results can be re-evaluated and ground checked with confidence.

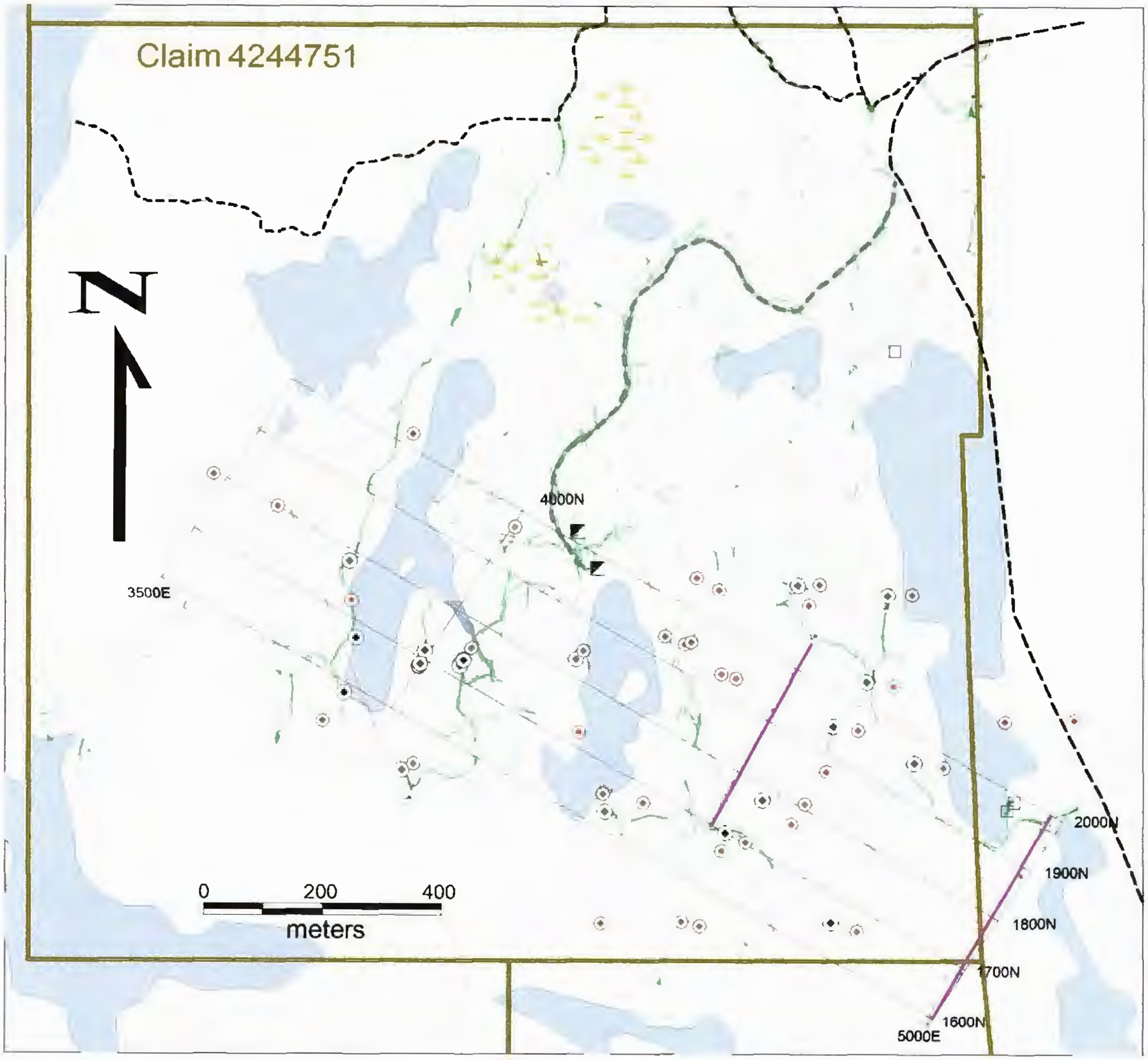

Figure 27. Pick Grid lines located in the field (pink) with current best fit GIS location (black).

Conclusions and Recommendations

Current work at Winston Lake shows that there is a high probability that new, zinc-dominant shallow VMS deposits may be discovered in the altered volcanics of the Winston Lake property.

Ore samples from Winston Lake, Pick Lake and Zenith are all mineralogically and physically different. The ore from each is very sphalerite-rich, and would result in weak or non-conductors, not easily detected by geophysical surveys. New soil geochemical anomalies suggest that other zinc sources may occur just beneath the soil.

Detailed petrographic and electron microprobe investigation of several ore samples from the Pick Lake and other deposits in the Winston Lake area (Barnett, 2009), reports on mineralogical and textural diversity between the Pick Lake, Winston Lake and Zenith deposits.

Barnett's report is filed along with this on as a separate report called "Petrographic Electron-Microprobe Investigation of Samples of Massive Sulphide from the Pick Lake, Winston Lake and Zenith Deposits Ontario."

Pick Lake is dominated by lithic and crystalline fragments, and includes unusual abraded pyrite-sphalerite balls, which appear to be a small population of exotic fragments of pre-consolidated ore that have been abraded and transported by mobile Pick Lake ore to its current location. This pyrite-sphalerite ball may be a xenolithic sample of the primary orebody from which Pick Lake is derived.

Pick Lake and Winston Lake contain cassiterite grains, and Zenith does not. A discrete population of amphiboles also occurs at Zenith. The lack of tin (cassiterite) in Zenith, and a discrete population of amphibole proves that Zenith is unrelated to Pick Lake and Winston Lake.

Amphiboles from Pick Lake and Winston Lake are somewhat similar, but Pale blue Na-Ca amphibole: tschermakite occurs only in Winston Lake ore, and not in Pick Lake samples.

Dormant power lines have been mapped and correlate with large geophysical anomalies WL001 and WL002 that were identified in a report completed by Petra Geophysics. WL001 and WL002 have been removed from the target list as cultural anomalies, and they no longer suggest any geophysical connection between Winston Lake and Pick Lake.

The pale blue tschermakite grains occurring only in Winston Lake, and lack of a conductive conduit between deposits suggests that Pick Lake is not derived from Winston Lake.

The primary deposits for both Pick Lake and Zenith have not been found, and neither Pick nor Zenith are sourced from Winston Lake. Pick Lake and Zenith are different, and they are derived from two other primary zinc-rich orebodies that remain to be discovered.

Soil sampling is direct evidence of glacial erosion of geological units mineralized with zinc and copper. Glacial ice flow is about 220 Azimuth, which would results in a down-ice dispersal of zinc-mineralized till. The up-ice front of these dispersal trains is the logical source of the mineral components that contribute to each soil anomaly.

The Innov-X Portable XRF detects zinc and copper mineralized particles in till and silt samples, and has proven to provides an analytical result that can be mapped. There is no record of soil sampling at Winston Lake in the public record.

Mapping of previous drilling and grids compiles the extent of intense exploration related to discovery and delineation of the Pick deposit on claim 4244751. So far field evidence shows that most of the drilling occurred roughly south of the Pick Lake shafts. The search for other drill collars is ongoing.

Geochemical anomalies located north of the Pick Lake shafts may be untested by diamond drilling, and testing of these targets may result in new shallow primary zinc discoveries at Winston Lake.

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Innov-X Systems website: http://www.innovx.com/

Ontario Mining Lands Website: http://www.geologyontario.mndm.gov.on.ca/

Appendix A

Petrographic Electron-microprobe investigations of samples of massive sulphides from the Pick Lake, Winston Lake and Zenith Deposits

PETROGRAPHIC ELECTRON-MICROPROBE INVESTIGATION OF

SAMPLES OF MASSIVE SULPHIDE

FROM

THE PICK LAKE, WINSTON LAKE AND ZENITH DEPOSITS ONTARIO

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JANUARY 10,
2009

INTRODUCTION

This report presents results of a detailed petrographic-electron microprobe investigation of four samples of massive sphalerite-pyrrhotite-chalcopyrite sulphide, two from the Pick Lake deposit, Pick Lake A and B, and a sample each from the Winston Lake and Zenith deposits. Polished thin sections were carbon coated and examined in reflected and transmitted light and regions of interested were circled with a diamond scribe to enable relocation during examination with the electron microprobe. Photomicrographs were taken of these scribed regions of interest to facilitate relocation during detailed mineralogical examination in the microprobe. All analyses were performed with a JEOL 733 electron microprobe equipped with five wavelength spectrometers and a Tracor Northern automation and EDS system. Backscattered electron detector images were taken of relevant domains and these images have been integrated with the light optical images throughout this report. Analyses of amphibole, mica, and sphalerite are given in Tables 1-3.

PICK LAKE — The two samples from the Pick Lake deposit contain a quite unexpected and amazing textural and mineralogical array of silicate lithic fragments and multimineralic and single mineral inclusions throughout the massive sphaleritepyrrhotite-chalcopyrite ore. There are occasional grains of cassiterite throughout the massive sulphide. The lithic inclusions include quite coarse quartzofeldspathic granodioritic material intergrown with pale brown phlogopite-biotite solid solution and deep green crystalline hornblende. Other fragments are essentially quite coarse crystalline cummungtonite-grunerite solid solution with a strong metamorphic fabric occasionally intergrown with pale brown mica and minor chlorite. Other lithic fragments are highly acicular needles of cummingtinite-grunerite solid solution within fine-grained chlorite. In these fragments the acicular cummingtonite-grunerite needles display a highly contorted and apparently rotated aspect within fine-grained chlorite Similar fragments of essentially massive chlorite again with a decided contorted and rotated texture are without the amphibole. Smaller fragments are pale brown biotite-phlogopite solid solution intimately intergrown with acicular colourless amphibole and lesser chlorite. There is a complete mineralogical and textural array of these diverse lithic fragments that with decreasing size become increasingly less complex mineralogically. Smaller fragments are essentially green hornblende intergrown with colourless cummingtonitegrunerite solid solution and minor mica. Importantly such fragments contain appreciable amounts of sulphide material along grain margins. Other fragments are essentially quartz and calcic plagioclase with minor pale brown mica and green hornblende. Ultimately, it is apparent that the massive sulphide ore actually contains single grains of pale brown phlogopite-biotite solid solution, and amphibole both deep green hornblende and cummingtonite-grunerite solid solution, calcic plagioclase and quartz. In rare occasions, the feldspathic inclusions have oriented marginal zones of albite and potassium feldspar and micaceous multimineralic inclusions have oriented marginal zones of chlorite. These marginal zones of mineral orientation are quite reminiscent of pressure shadows.

WINSTON LAKE— The Winston Lake sample does not contain the abundant fragments and disaggregated fragments of quartzofeldspathic and micaceous lithic material as observed in the Pick Lake samples but nonetheless does indeed contain a mineralogical and textural array of lithic and crystalline mineral inclusions. Certain fragments are apparently contorted pale brown biotite-phlogopite solid solution intergrown with a pale blue Na-Ca aluminous amphibole of certain metamorphic origin. Importantly such multimineralic fragments also include crystalline zinc spinel, gahnite. Interestingly, single grains of crystalline gahnite occur within massive sphalerite-pyrrhotite in close spatial relationship to the multimineralic fragments and one could easily imagine that they were derived by the disaggregation of these fragments. In certain regions of the section, single grains of pale brown phlogopite-biotite solid solution are oriented in parallel bands aligned with a subtle banding in the massive sulphide imparted by fine-scale pyrrhotite bands. A coarse *grain* of pyrite has a marginal zone at one edge of colourless cummingtonite-grunerite amphibole that is oriented parallel to the fine-scale pyrrhotite banding and similar orientation of pale brown mica. Indeed this marginal amphibole zone appears to be in the process of disaggregation into single grains within the massive sphalerite. In many ways this tail of oriented amphibole resembles the pressure shadows of feldspathic minerals and importantly has the same orientation,

ZENITH – The inventory of silicate mineral inclusions in the Zenith sample is quite similar to that of Winston Lake in that it lacks the array lithic and mineralogical inclusions observed in the Pick Lake samples and yet does include numerous grains of deep green hornblende intergrown with plagioclase. One inclusion consists of mottled green hornblende within simple calcite that includes sphalerite. In addition even single grains of hornblende in massive sulphide have a mottled aspect and subsequently it is demonstrated that this colour variation corresponds to compositional variation with decreasing aluminum and alkali content. Other regions of the section contain concentrations of acicular cummingtonite-grunerite solid solution that also appear to be in the process of disaggregation in a manner similar to that observed in the Winston Lake sample.

The mineralogical and textural diversity in the inventory of lithic and mineral inclusions among the three deposits particularly in the case of Pick Lake was unexpected and is quite interesting. The purpose of this investigation was to examine a well-documented array of lithic, multimineralic and single minerals inclusion in the three deposits with the EDS system and backscattered electron detector on the microprobe and to analyze all relevant grains in order to provide a set of mineral compositions that would serve as a basis of discussion of some of the observed features such as colour variation in hornblende and overall comparison of the three massive sulphide bodies.

The writer recognises that this study involves only four samples and is reluctant to come to broad conclusions from such a small sample population. Nonetheless there are a number of statements that can be made with some degree of confidence.

SAMPLE PICK LAKE A
SPHALERITE -35%
PYRRHOTE -35%
CHALCOPYRITE -<5%
PYRITE -<5%
CASSITERITE ->1%
PHLOGOPITE-BIOTITE ss. -15%
HORNBLENDE -<5%
CUMMINGTONITE-GRUNERITE ss -10%. CHLORITE -<5%

The sample is massive finely-intergrown sphalerite-pyyrohite with occasional grains fine-grained pyrite with 20% lithic, multimineralic and single grain inclusions scatterered throughout. Certain inclusions are relatively coarse intergrown green hornblende and colourless cummingtonite-grunerite solid solution with occasional grain of pale brown phlogopite-biotite soldid solution (PLATES 1-3 C-1). Analyses of the amphiboles and micas are given in the appropriate Tables of Analyses keyed by sample number and circle number. The green hornblende and colourless amphibole apparently form an equilibrium metamorphic assemblage (PLATE 2 PLA C-1) and this equilibrium pair is plotted on the amphibole quadrilateral in Figure 2. Comparison of Figure 1 and 2 reveals that the composition of calcium-poor amphibole in sample Pick Lake A plots quite close to the boundary between anthophyllite and cummingtonite in terms of crystal structure. Importantly single grains of cummingtonite-grunerite ss. occur within the field of view in C-1 with a decided random orientation and the sample is without fabric (PLATE 3 PLA C-1). In rare examples, relatively coarse single grains of cummingtonite-grunerite occur within the massive sphalerite-pyrrhotite (PLATES 4 PLA C-2). It may be important that quite large single grains of pyrite also occur within the fine-grained massive sulphide (PLATE 5 PLA C-2). Other relatively smaller lithic fragments consist of plates of pale brown mica intergrown with acicular cummingtonite-grunerite ss (PLATES 6,7 PLA C3). The largest lithic fragment within the massive sulphide of sample Pick lake A is a lozenge-shaped domain over 1.5 centimeters in size that consisting of linear bundles of cummingtonite-grunerite needles within a highly foliated assemblage of pale brown mica and chlorite (PLATES 8,9 PLA C-4). Interestingly there is a minor but significant amount of fine-grained pyrrhotite and chalcopyrite within this large lithic fragment (PLATE 10 PLA C-4. These sulphide minerals were apparently within the system during the metamorphism that produced the acicular cummingtonite-grunerite, mica and chlorite assemblage. Importantly the fine-grained massive pyrrhotite and sphalerite that hosts this lithic fragment is without pyrrhotite. Another typical region of this lathe lithic fragment consists of highly acicular cummingtonite-grunerite in fine-grained brown mica replaced by chlorite (PLATE 11,12 PLA C-5). In the writer's view the mineralogy and fabric apparent in this coarse lithic fragment was produced in some metamorphic scenario prior to incorporation into the massive sphalerite-pyrrhotite. Other lithic inclusion fragments are an highly contorted S-shaped distribution of acicular amphibole within extremely fine-grained mica replaced by chlorite (PLATES 13,14 PLA C-7).

The diversity of textures and mineralogy is further illustrated by a certain population of lithe fragments that include grains of coarse crystalline pyrite within extremely fine-grained chlorite. Remarkably the crystalline pyrite is constrained to the chlorite lithic inclusion while pyrite is not present in the massive fine-grained sphalerite-pyrrhotite that hosts the pyrite (PLATES 15,16,17 PLA-1 C-1). Another remarkable example of the extreme textural and mineralogical diversity in fragments that reside side by side within the massive sphalerite-pyrrhotite is apparent in PLATE 18 PLA-1 C-4 reveals a linear lithic fragment consisting a fine-scale matte of cummingtonite-grunerite ss. The adjacent fragment on the other hand is highly attenuated calcite intergrown with and including chlorite that is better illustrated in PLATE 19 PLA-1 C-4. In the writer's view it is highly unlikely that the textural and mineralogical diversity of lithic fragments observed in sample Pick Lake A developed by metamorphic processes in situ in their present geological situation and this is well illustrated in PLATES 18 PLA-1 C-1 and19 PLA-1 C-1. One fragment is highly foliated cummingtonite-grunerite that is most certainly the product of a metamorphic process while the other immediately adjacent fragment is highly foliated calcite and chlorite that has not been metamorphosed and would have reacted to produce calcic amphibole if it had been in the same geological situation and metamorphic grade as that illustrated in Plate 18.

The logical conclusion is that the massive sulphide sphalerite-pyrrhotite mass sampled by Pick Lake A has incorporated and juxtaposed lithic fragments with a diverse array of mineral assemblages and textures. The exact geological origin and process by which this happened is unclear and beyond the experience of the writer but some form of sulphide mobility is clearly indicated. In this process of sulphide mobility lithic fragments of diverse metamorphic mineralogy and texture were incorporated into a volume of mobile sphalerite, pyrrhotite and chalcopyrite that has since reconsolidated into massive sulphide once again.

A possible clue to some of the processes involved is illustrated by a truly spectacular texture manifest in a fragment in the sulphide ore and well illustrated in PLATES 20,21 PLA-1 C-2. In reflected light, the fragment appears as a concentration or cluster of relatively coarse pyrite grains that reside along with silicate fragments in the fine-grained massive sphalerite-pyrrhotite that defines sample Pick Lake A sulphide material (PLATE 20 PLA-1 C-2). In transmitted light it is apparent that the pyrite grains are included within a roughly circular region of sphalerite that is without pyrrhotite (PLATE 21 PLA1 C-2). This pyrite-sphalerite "ball" resides in a fine-scale sphalerite-pyrrhotite intergrowth and appears to be a fragment of pre-existing assemblage of crystalline pyrite within massive sphalerite without pyrrhotite. The interpretation is that this pyritesphalerite "ball" as well as a great abundance of the lithic fragments in sample Pick Lake A are fragments of metamorphosed sulphide ore and importantly metamorphosed equivalents of possible primary hydrothermal alteration now manifest as <u>domains</u> of metamorphic cummingtonite, grunerite and hornblende.

One can only imagine the processes involved in the generation of this mobile sulphide *mass*. Logically, since the lithic fragments include metamorphic minerals the source region for some of these fragments had clearly been metamorphosed before disruption and incorporation into the mobile sulphide. It is not clear however whether the metamorphic minerals were generated by a regional metamorphic event or a more localized domain of contact metamorphism. However some of the fragments are essentially fine-grained chlorite that significantly also contains a grain of crystalline pyrite (PLATE 15 PLA-1 C-1). It is possible that the source domain for these diverse sulphide and silicate fragments was a metamorphic terrain that had experienced some degree of post peak metamorphic retrogression producing chlorite. There a numerous possible scenarios that can only be tested by an intimate knowledge of the field relationships of the Pick Lake and other sulphide bodies. Further insight into the processes involved are somewhat clarified by examining the finer details of lithic inclusions or fragments in a second sample examined form the Pick ore zone, sample Pick Lake B.

SAMPLE PICK LAKE B

SPHALERITE -35%
PYRRHOTITE -30%
CHALCOPYRITE -10%
PYRITE -<2%
HORNBLENDE -<5%
PHLOGONTE-BIOTITE ss. -10%
PLAGIOCLASE -<5%
POTASSIUM FELDSPAR - <5%
CHLORITE -<1%

Sample Pick Lake B differs from sample Pick Lake A in that it does not contain calcium-poor cunningtonite-grunerite amphibole either in lithic fragments or as single grains. The massive sulphide contains more sphalerite and widely disseminated chalcopyrite and significantly less pyrrhotite than sample Pick Lake A and only minor pyrite. Sample Pick Lake B contains approximately 30% rounded fragments of a relatively coarse-grained quartzofeldspathic rock type consisting of up to 50% calcic plagioclase, An65, and quartz intergrown with abundant pale brown phlogopite-biotite solid solution and importantly deep green hornblendic amphibole (PLATES 22,23 PLB C-1). The fragment population in sample Pick Lake B was derived from a different rock type than that of sample Pick Lake A, possibly a hornblendic micaceous intrusive. However this rock might simply be associated host quartzofeldspathic country rock has been metamorphosed to amphibolite facies rank and incorporated into the mobile sulphide. The remaining lithic inclusions all appear to have originated by the disaggregation of this original rock type. There is a complete gradation in decreasing size of the lithic fragments down to the abundant biminerafic inclusions of green hornblende and pale brown mica, quartz and mica and single crystal inclusions.of hornblende, mica, calcic plagioclase and quartz. There is a common juxtaposition of single green hornblende grains and quartofeldspathic micaceous inclusions within massive sphalerite-pyrrhotite (PLATE 24 PLB C-2). Remarkably, there is a well-defined pressure shadow at the margin of the calcic plagioclase grain within the plagioclase-mica fragment at the right of Plate 24. Seen in both birefringent light (PLATE 25 PLB C-3) and in a backscatter electron image (PLATE 26 PLB C-3), the marginal fringe zone is comprised by both potassium feldspar and albite. A similar relationship is seen as an oriented zone of albite and quartz at the margin of a large multigranular quartz inclusion (PLATES 27,28,29 PLB C-6). Many domains of sample consist of abundant quartzofeldspathic micaceous fragments commonly with green hornblende (PLATES 30,31 PLB C-4) within massive sphalerite-chalcopyrite-pyrrhotite.

Commensurate with their deep green colour the hornblendic amphiboles in the sample have an elevated content of alkalis and tetrahedral aluminum.

It is interesting to note that the pale brown mica throughout both samples Pick Lake A and Pick Lake B have essentially the same chemical composition in that they are not simply biotite but are more magnesian and are intermediate members of the phlogopitebiotite solid solution. The exception to this are the outer marginal more iron-rich zones present in certain mica grains in sample Pick Lake A that are associated with the initiation of chloritization. The unaltered micas in sample Pick Lake A and throughout sample Pick Lake B have essentially the same composition with a persistent content of fluorine. Thus while sample Pick Lake B does not contain cummingtonite-grunerite amphibole and has a lithic inclusion population of hornblendic quartofeldspathic material, sample Pick Lake A contains mica quite similar to and possibly derived from this quartzofeldspathic material in addition to a source that provide considerable amounts of highly acicular cumingtonite-grunerite with micas of a similar composition.

SAMPLE WINSTON LAKE

SPHALERITE -70%
PYRRHOTITE -15%
CHALCOPYRITE -<3%
PYRITE -7%
CASSITERITE -<<1%
GAHNITE -2%
PHLOGOPITE-BIOTITE ss. -3%
NA,CA-AMPHIBOLE -2%
CUMMINGTONITE-GRUNERITE ss. -<1% PLAGIOCLASE-<<1%

The sample from Winston Lake is massive sphalerite with a subtle mineral banding defined fine-scale subparallel layers or bands of fine-grained pyrrhotite. Occasional concentrations of chalcopyrite and grains of cassiterite occur throughout. The sample includes small population of silicate mineral inclusions that including phlogopite-biotite ss. and metamorphic amphiboles with a have a definite preferred orientation and are aligned with the subtle banding defined by the pyrrhotite. Importantly, some of the multimineralic silicate inclusions also contain zinc spine!, gahnite. Occasional grains of coarse plagioclase occur isolated in massive sphalerite.

Away from the silicate inclusions the fine-scale banding is defined by alternating parallel zones of fine-grained pyrrhotite and lesser chalcopyrite (PLATES 32,33 WIN C6). There are occasional multimineralic lithic inclusions that display some degree of random orientation. These consist of coarse pale brown mica intergrown with amphibole with a characteristic blue colour (PLATES 34,35,36 WIN C-1). The aspect of these micas is quite reminiscent of certain grains observed in sample Pick Lake A (PLATE 6 PLA C3). There are occasional grains of relatively coarse chalcopyrite throughout that are not simply grains in massive sulphide but rather are associated with both minute mica plates and fine-grained chlorite (PLATES 34,35,36). One interpretation is that these coarse chalcopyrite grains within mica and chlorite might well comprise a small population of exotic sulphide-silicate inclusions. For the most part however, the remainder of the multimineralic inclusions are aligned with the fine-scale fabric defined by bands of pyrrhotite. In one spectacular example, highly crystalline grains of pale blue gahnite occur within the blue sodium-calcium amphibole intergrown with pale brown mica (PLATES 37,38,39,40). Importantly, there are small grains of gahnite present in massive sphalerite in close spatial relationship to the mica-amphibole inclusions containing gahnite (PLATE 38 WIN C-5) and one could easily imagine that these gahnite grains isolated in sphalerite originated through disaggregation of these multimineralic inclusions. Throughout the sample there a numerous examples were single linear plates of mica are aligned with the fine-scale banding defined by pyntotite and in rare situations these mica grains appear to be present within certain pyrrhotite bands (PLATES 41,42 WIN C-4). Pyrite occurs throughout as concentrations of quite coarse grains that without too much imagination appear to be associated with and contained within bands of pyrrhotite. In one important example, a coarse pyrite grain has a marginal zone or tail of cummungtonite-grunerite at one end that appears to have been attenuated and is in the process of disaggregation (PLATES 43,44,45 WIN C-3). It is important that this is the only occurrence of cummingtonite in the sample and it appears in an attenuated tail on a coarse grain of pyrite. The interpretation is that this pyrite-cummingtonitegrunerite is actually an exotic fragment that was included within a volume of mobile sulphide along with the exotic fragments of mica, Na-Ca amphibole and gahnite. The tail of cummingtonite-grunerite on the coarse pyrite is aligned with the linear grains of mica and the overall fabric defined by bands of pyrrhotite.

It is important that the grains of phlogopite-biotite throughout the sample have essentially the same composition as the micas in sample Pick Lake A and B. The blue amphibole in the sample has an elevated content of alkalis and tetrahedral aluminium as seen in Figure 9 and clearly has a metamorphic origin. According to strict amphibole nomenclature the amphibole is tschennakite.

The interpretation is that the volume of the Winston Lake represented by this sample contains an array of exotic fragments derived from a metamorphosed domain as evidenced by the presence of Na-Ca amphibole, ctunmingtonite-grunerite and galinite. The volume of massive sulphide has been deformed and attenuated as evidenced by the alignment of the exotic fragments. The attenuation tails of cummingtonite-gnmerite on certain pyrite.grains arte evidence that even the coarse pyrite grains might have an exotic origin. However despite the evidence for inclusion of exotic fragments and attenuation at Winston Lake this does not necessarily imply that the sulphide mass was extensively mobile. Penetrative deformation fabric is not evidence more sulphide mobility.

SAMPLE ZENITH DEPOSIT

SPHALERITE -45%
PYRRHOTITE -35%
CHALCOPYRITE -15%
HORNBLENDE -<2%
CUMMINGTONITE-GRUNERITE -«1% CALCITE - 5%

The sample has coarse scale mineralogical banding. One half is massive pyrrhotie with approximately 35% discontinuous linear domains of chalcopyrite and 10% sphalerite throughout as isolated domains (PLATES 46,47 ZEN C-1) while the other half is essentially massive sphalerite with discontinuous linear stringers of pyrrhotite and less than 5% fine-grained chalcopyrite throughout the sphalerite (PLATES 48,49). Despite this coarse-scale mineralogical banding in sulphide minerals, both halves of the sample have essentially the same content and overall aspect of multmineralic inclusions that consist of approximately 15% abundant single grains of hornblende and discontinuous, ragged linear domains of calcite that include grains of green hornblende. In contrast to the samples from Pick Lake and Winston Lake, the Zenith deposit does not contain inclusions of mica. In addition, the sample from Zenith little evidence that it has been deformed or has experienced any degree of attenuation.

Both halves of the sample contain abundant inclusions that are simply single crystals within massive sulphide. Within the massive pyrrhotite-chalcopyrite individual hornblende grains have a mottled domainal colour variation and have an overall aspect of retrogression (PLATE 50 ZEN C-1). An immediately adjacent inclusion consists of several grains of hornblende within calcite that contains sphalerite. As seen in backscatter these grains have a domainal and core to marginal compositional variation in alkali and aluminum contents.(PLATE 51,52 ZEN C-2). A similar situation is seen in the amphiboles in the sphalerite half of the sample as well were individual amphibole grains have core to marginal green to colourless variation that corresponds a progressive decrease in alkali and aluminum content (PLATES 53,54 ZEN C-4). The only signinificant variation in the population of inclusions between the two halves of the sample is a single domain in massive sphalerite that contains a two amphibole assemblage of hornblende and cummingtonite-grunerite (PLATES 55,56,57 ZEN C-5). The colour variation of calcium amphiboles in Zenith corresponds to a compositional variation, darkest green domains have elevated alkali and aluminum contents and the increasingly colourless domains contain an ever decreasing component of these elements. This compositional variation is seen in Figures 12-15 which are plots of tetrahedral aluminum versus A-site occupancy.

AMPHIBOLE — PICK LAKE, WINSTON LAKE, ZENITH DEPOSIT

All four samples of massive sulphide examined contain a colourless calcium-poor amphibole in addition to hornblende. The writer is well aware that cordieriteanthophyllite assemblages have been noted in the metamorphosed footwall of the Winston deposit and there is a predisposition to call these amphiboles, anthophyllite There are rather complicated compositional and textural relationships between anthophyllite, a magnesian calcium-poor amphibole with an orthorhombic crystal structure and cummingtonite, a calcium-poor with a monoclinic crystal structure. Both amphiboles occupy essentially the same compositional space at the magnesian and calcium-poor corner of the amphibole quadrilateral with the main difference between them being crystal structure. These two minerals may be distinguished using extinction angle with anthophyllite having parallel extinction and cummingtonite with an extinction angle near 10-12 degrees but can barely be distinguished on the basis of chemical composition. The a great preponderance of the colourless calcium-poor amphibole grains examined have a pronounced extinction angle and in the lack of detailed structural evidence these grains have been called members of the cummingtonite-grunerite solid solution series.

All analyses from Pick Lake, Winston Lake and Zenith deposit are plotted in terms of magnesium, calcium and iron in Figure 1. The calcium amphiboles in all three deposits have form a linear trend with a restricted magnesium and iron contents on the tremoliteactinolite join. The calcium-poor amphiboles from all three deposits form a tight cluster in terms of magnesium and iron on the cummingtonite-grunerite join. These data on an individual deposit basis for the Pick, Winston and Zenith are plotted in Figures 1A, 1B 1C. There is a correlation of variation in the magnesium-iron ratio of calcium amphibole in the Pick Lake samples with their origin. Hornblendic amphiboles of metamorphic origin form a linear trend of more magnesian compositions (Figure 1A) while the two iron-rich compositions at the right of the trend are actually grains of actinolite associated with chlorite replacing mica in certain micaceous lithic fragments in Pick Lake ore. The hornblende and cummingtonite-grunerite grains in a lithic fragment in Pick Lake A C-1 form a miscibility gap equilibrium pair as plotted in Figure 2. The plot of amphiboles from Winston Lake (Figure 1B) is quite similar to the plot from Pick Lake and as was the case for Pick Lake, the two most iron-rich compositions on the tremolite-actinolite join from Winston Lake are actinolitic compositions associated with chlorite. The calcium-rich and calcium-poor compositions of metamorphic origin form two tight clusters that could easily be joined by tie lines in the manner of Plate 2. The plot of amphiboles from the Zenith deposit exhibits a more extended range of magnesium-iron ratio compared to the calcium amphiboles from Pick and Winston Lake when their retrogressive actinolitic compositions are excluded. In addition the calcium-poor amphibole at Zenith is significantly more enriched in iron than calcium-poor amphiboles from the other two deposits.

These same data are plotted in terms of tetrahedral aluminum and the sodium and potassium content of the A-site of the amphibole structure, Na-A + K (Figures 3-15). This plot is commonly used in discussions of amphibole compositions and metamorphic grade. Analyses for all three deposits define a linear trend from quite elevated tetrahedral aluminum and alkali contents that characterize high grade metamorphic amphibole with a progressive decrease toward the origin as the metamorphic grade falls through lower amphibolite, and upper greenschist to lower greenschist facies conditions (Figure 3). Further, the calcium-poor amphiboles that characteristically have minimal aluminum and alkali contents define a tight cluster near the origin. It is possible to distinguish the different composition populations of amphibole in each deposit. The total population of amphiboles from the Pick Lake deposit are plotted in Figure 4 and individual textural and compositional populations in Figures 5-8. The hornblendic metamorphic amphiboles from Pick Lake A and Pick Lake B (Figures 5 & 8) and the lower greenschist facies actinolitic grains with chlorite (Figures 6 & 7). Amphiboles from the Winston Lake deposit have essentially the same distribution of data points as that from Pick

Lake (Figure 9) with cummingtonite-grunerite and actinolite falling within the cluster near the origin and the blue amphiboles form a separate cluster with elevated and alkali contents (Figures 10 & 11). It is interesting that the green hornblendic amphiboles from Pick Lake (Figure5 & 8) can be distinguished from the blue Na-Ca tschermakitic amphiboles from Winston Lake (Figures 10 & 11). Amphiboles from the Zenith define a complete distribution of data points commensurate with the colour variation an indication of retrogression noted in thin section. Certain grains within the massive sphalerite are preserved at elevated metamorphic conditions (Figure 13) while other compositionally zoned grains define a trend of data points toward the origin (Figures 14 & 15).

Comparison of the ternary and aluminum-alkali plots of amphiboles from the three deposits reveals quite a remarkable similarity between data from the Pick Lake and Winston Lake deposit while amphiboles from the Zenith deposit form a separate population in that the grains are defined by the fact that they have a characteristic compositional variation. While these observations are valid, in the writer's view, the sample population is too small to allow any broad comparative conclusions. What is important is all three deposits contain high grade metamorphic amphiboles that did not develop in situ within the sulphides but rather are inclusions within the sulphide material. The minerals have definite metamorphic origin and this metamorphism occurred prior to incorporation into the sulphides. The real problem lies in defining a process by which lithic fragments and metamorphic minerals of diverse origin all end up within same massive sulphide body. Some form of sulphide mobility is clearly indicated but the actual mechanisms involved are not obvious. The samples from all three deposits contain numerous examples in which single grains of metamorphic minerals, amphibole, mica, gahnite and feldspar all occur as single grains isolated within sulphide. This relationship indicated that pre-existing, consolidated metamorphic mineral assemblages were broken up and disaggregated by some process and incorporated into the sulphide. It is also possible however that the very processes which induced the mobility of sulphide were also intimately involved in the disaggregation of the metamorphic mineral material.

SPHALERITE — PICK LAKE, WINSTON LAKE, ZENITH

To further serve as a means of comparison, a representative population of sphalerite was analysed in all three deposits and these analyses are given in Table 3. Sphalerite in all three deposits is simple iron-bearing sphalerite without a significant component of trace elements and the average iron contents at Pick Lake A, Pick Lake B, Winston Lake and the Zenith deposit is 6.84, 6.68, 7.74 and 7.59 wt% Fe respectively. Once again the sample population is too small to attempt to characterize the sphalerite composition from a million ton ore body on the basis of one sample. Attention was given to the pyritesphalerite "ball" in sample Pick Lake B (PLATES 20,21 PLB C-2) and the data reveal that the sphalerite included within the pyrite and the sphalerite in the surrounding "ball" have essentially the same composition as the fine-grained sphalerite intergrown with pyrrhotite in the surrounding host sulphide. Thus although the texture of the pyritesphalerite "ball" supports the interpretation that it is indeed a fragment of previously-consolidated pyrite-sphalerite that has been abraded by some process, unfortunately the similarity in sphalerite compositions does not allow a comment as to its the possible exotic origin. Nonetheless, the interpretation is that this pyrite-sphalerite "ball" is a part of a small population exotic fragments that are present in the Pick Lake ore that are distinguished by the presence of coarse crystalline pyrite. An inclusion in Pick Lake A includes a grain of coarse crystalline pyrite within a matte of fine-grained chlorite (PLATES 15,16,17). It is possible that both of these features are fragments of previously-consolidated massive pyrite-sphalerite-chloritic material that was included within a body of mobile pyrrhotite-sphalerite sulphide that has since reconsolidated.

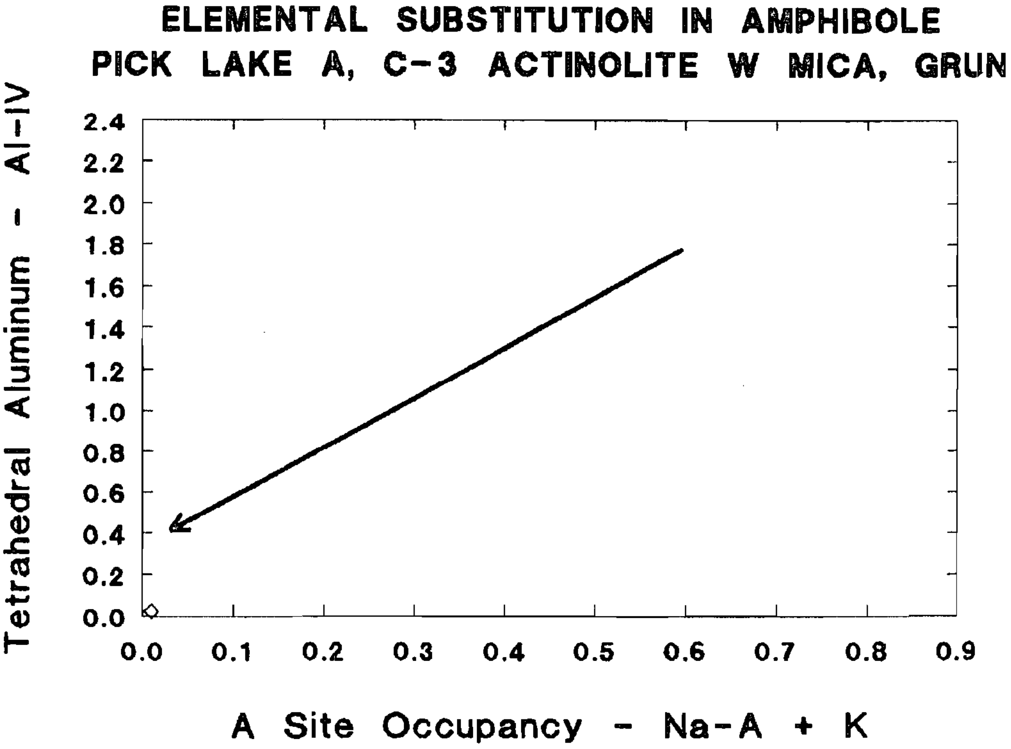

FIGURE 6: Actinolite replacing mica in Pick Lake A, C-3.

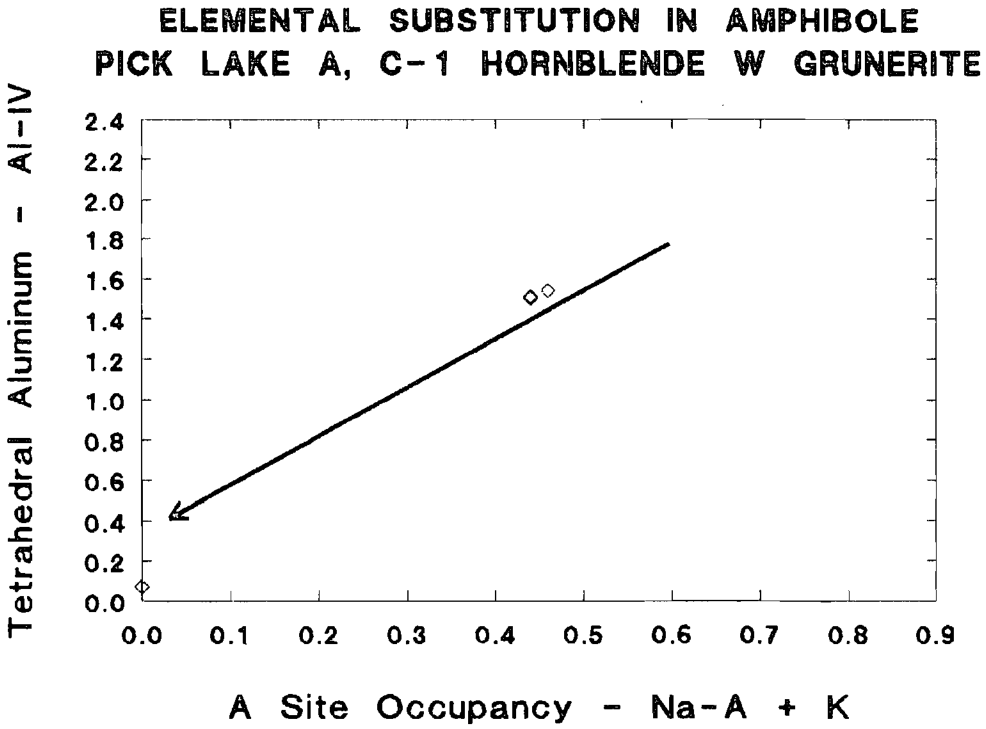

FIGURE 5: **Hornblende and cummingtonite-grunerite equilibrium pair in sample Pick Lake A, C-1, associated with pale brown mica.**

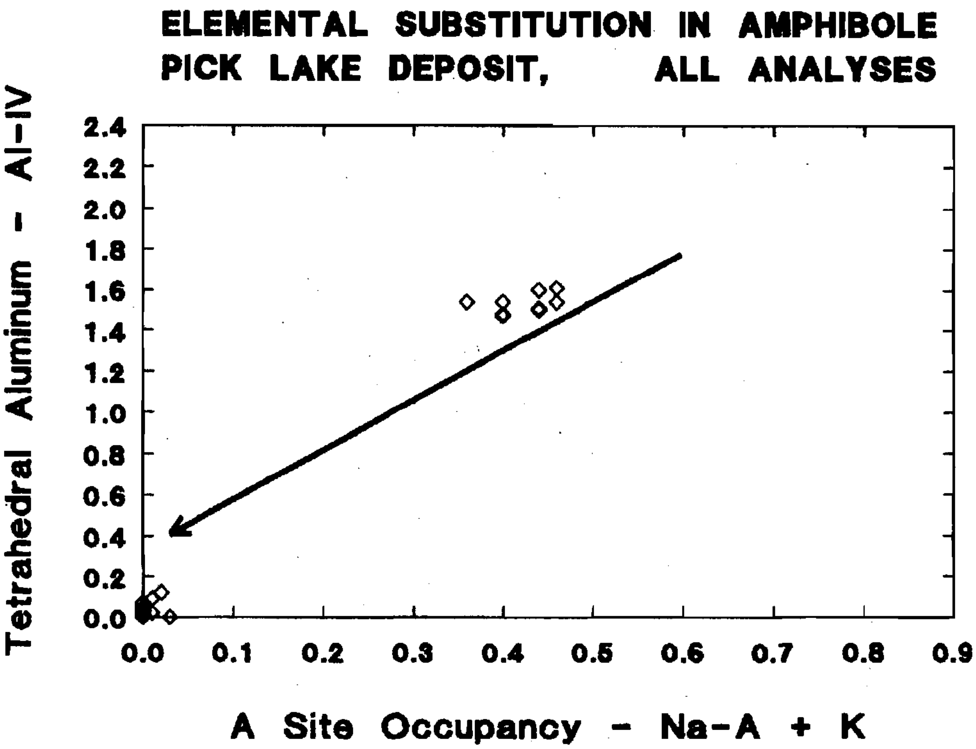

FIGURE 4: All amphibole analyses from Pick Lake deposit plotted in terms of tetrahedral aluminum and A-site occupancy.

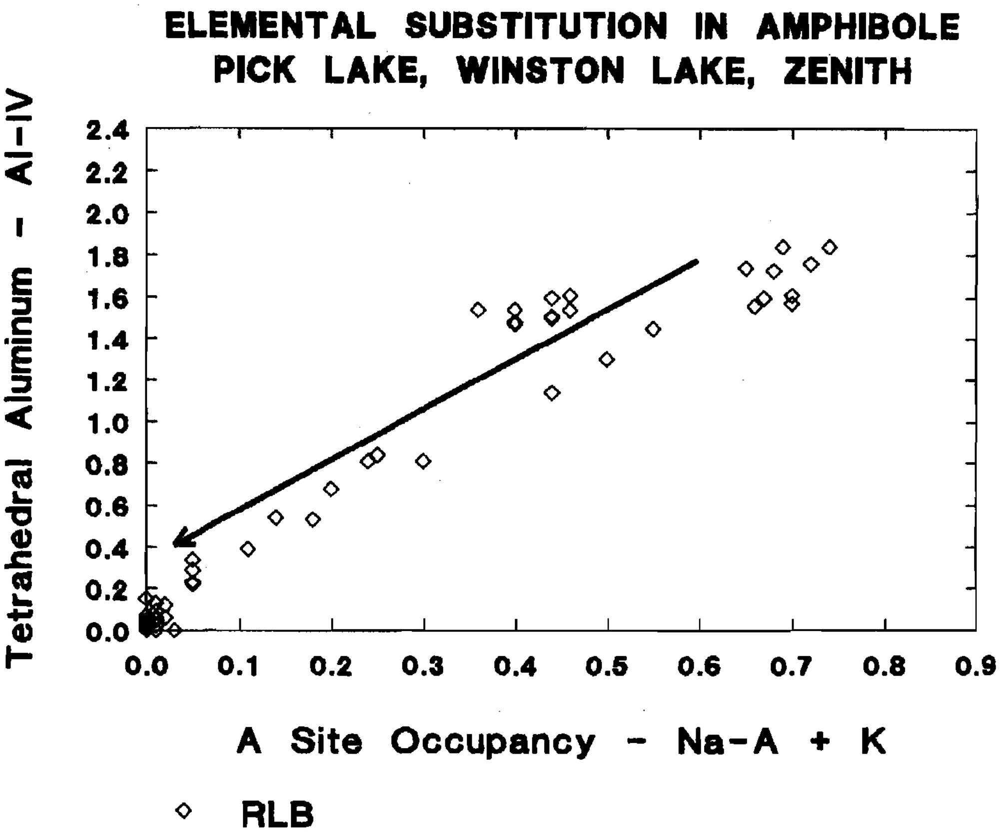

FIGURE 3: All analyses from Pick Lake, Winston Lake and Zenith deposit plotted in terms of tetrahedral aluminum and A-site occupancy.

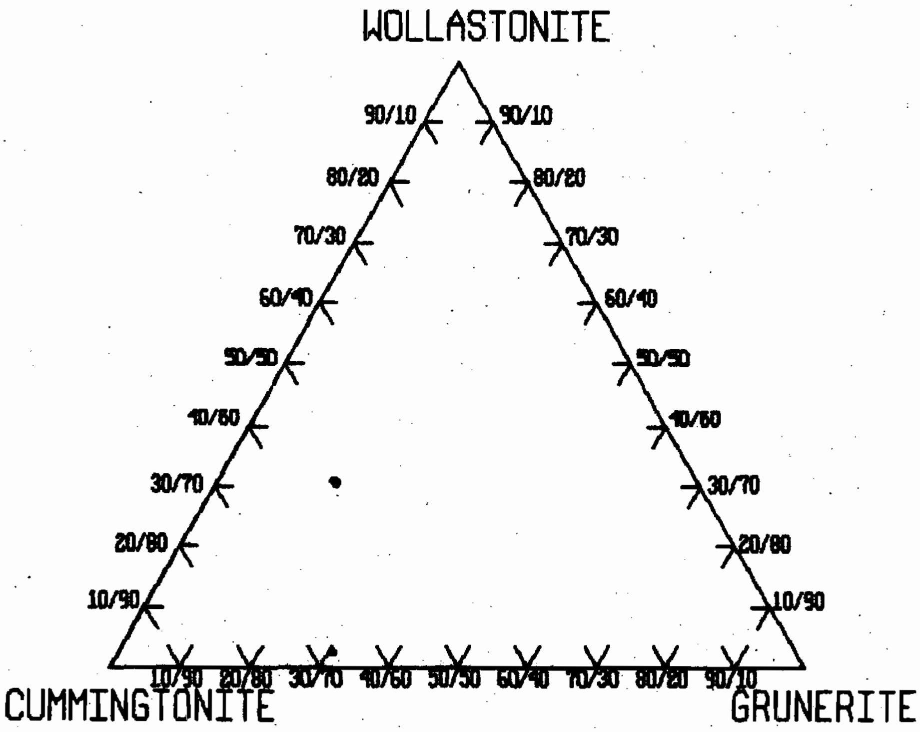

FIGURE 2: Hornblende and cummungtonite-grunerite equilibrium pair from Pick Lake A C-1 plotted on amphibole quadrilateral.

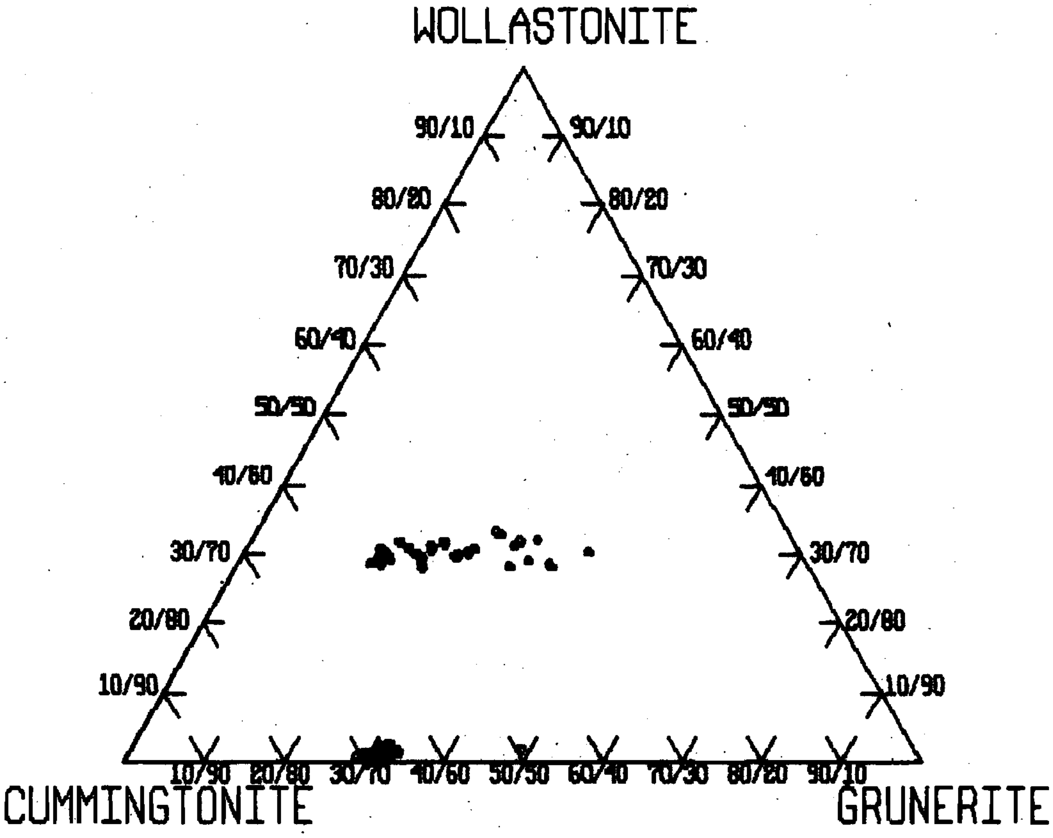

FIGURE 1: All amphibole analyses from Pick Lake, Winston Lake and Zenith deposit plotted on amphibole quadrilateral.

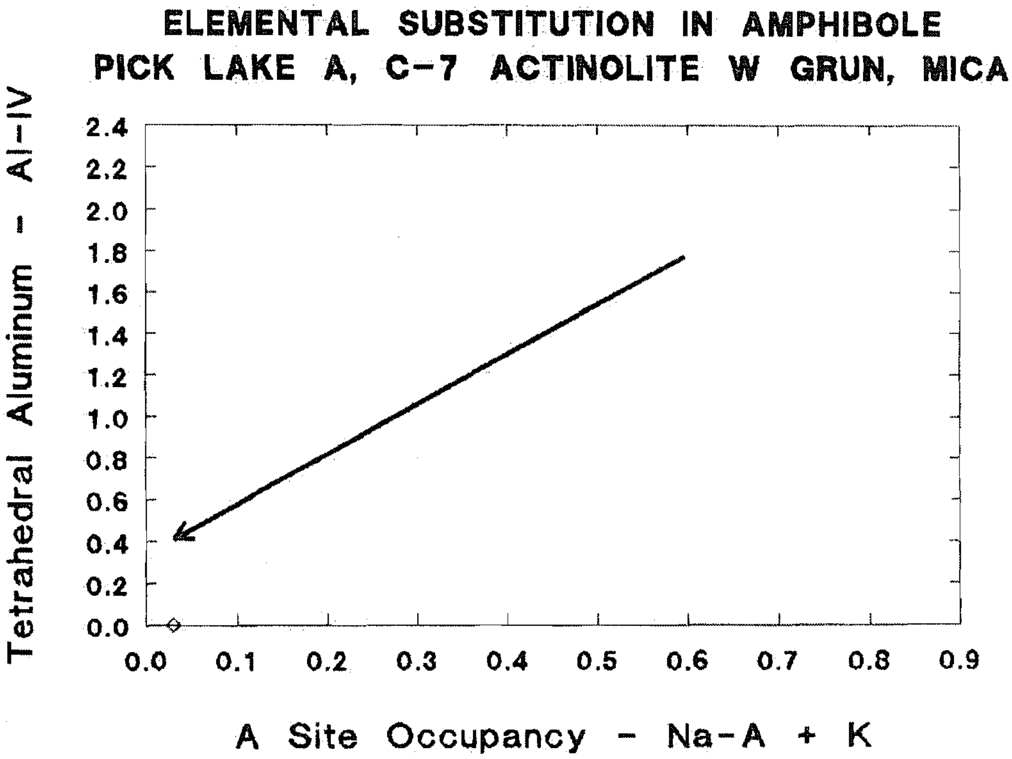

FIGURE 7: Actinolite replacing mica with cummingtonite-grunerite in Pick Lake A, C-7.

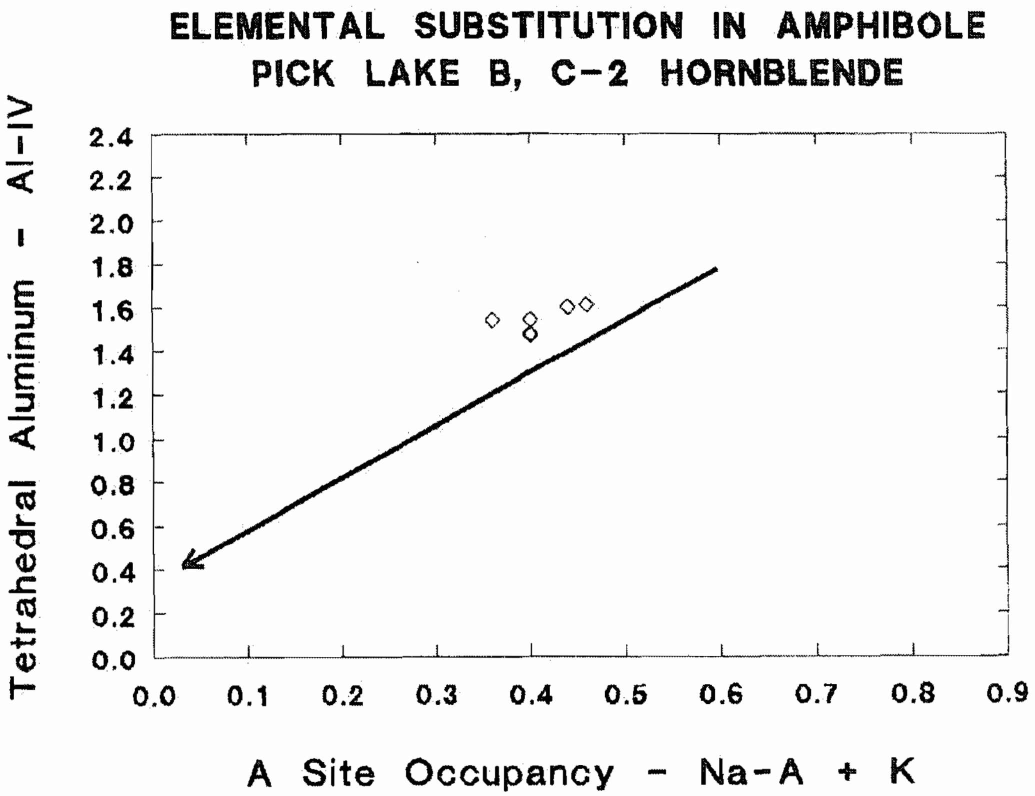

FIGURE 8: Individual grains of hornblende within massive sphalerite in Pick Lake B, C-2.

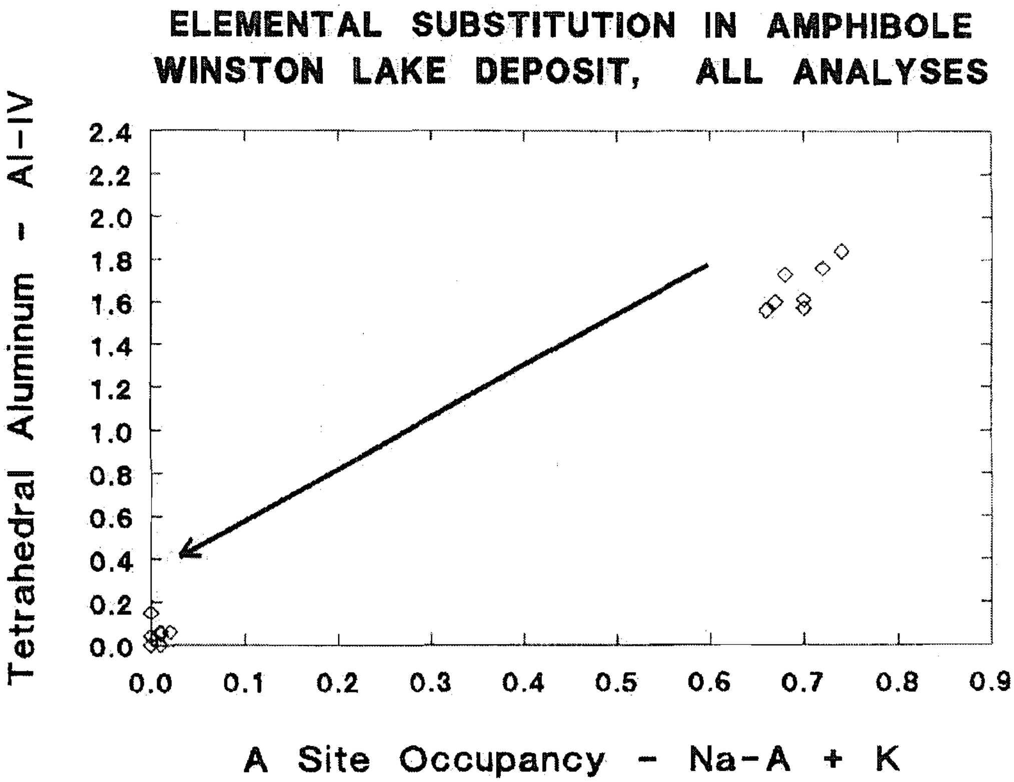

FIGURE 9: Pale blue Na-Ca amphibole, tschermakite in in massive sphalerite of Winston Lake deposit.

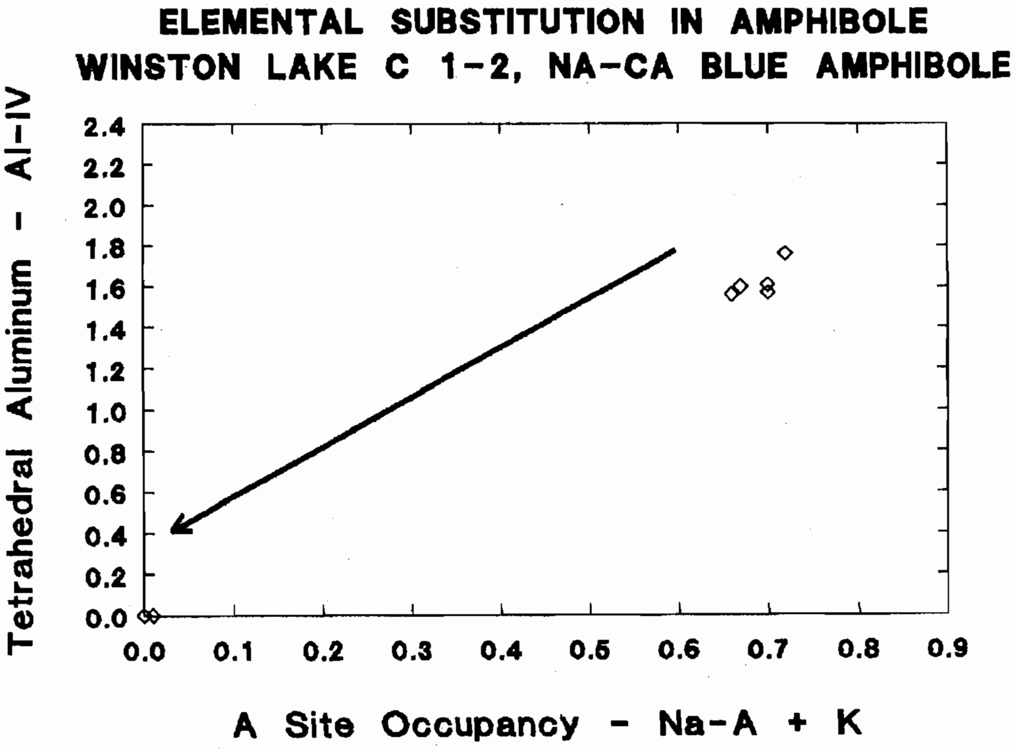

FIGURE 10: Blue Na-Ca amphibole, tschermakite with mica in massive sphalerite of Winston Lake deposit, C-1-2.

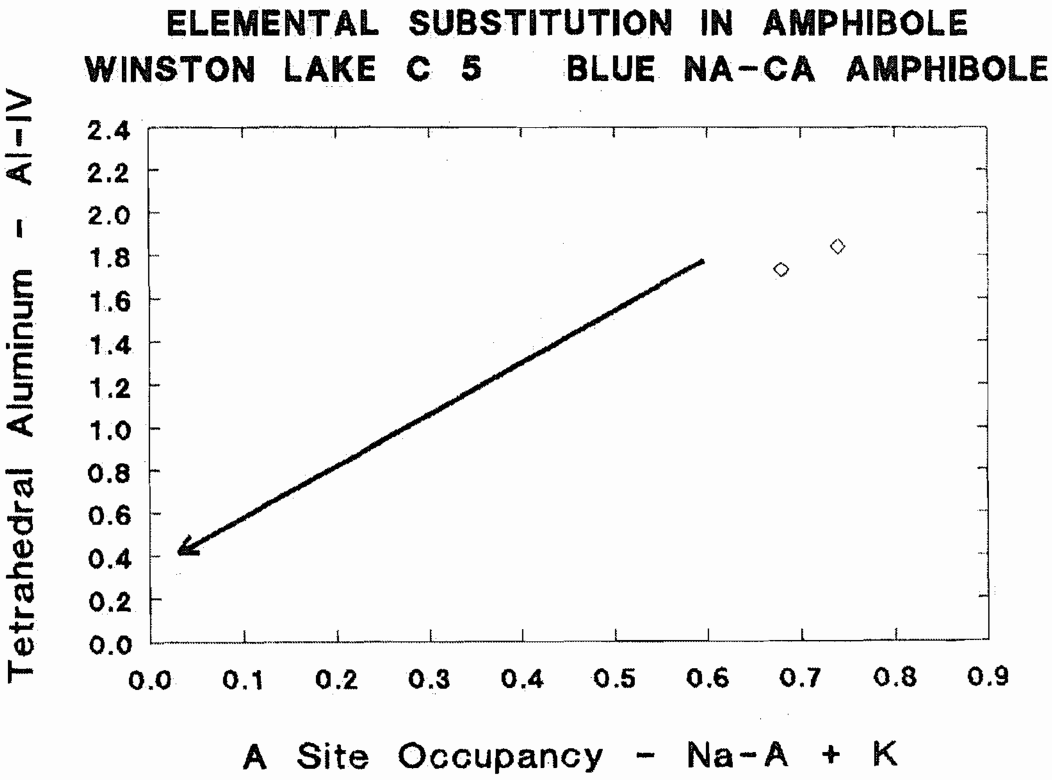

FIGURE 11: Blue Ba-Ca amphibole, tschermakite with gahnite inclusions in massive sphalerite at Winston Lake, C-5.

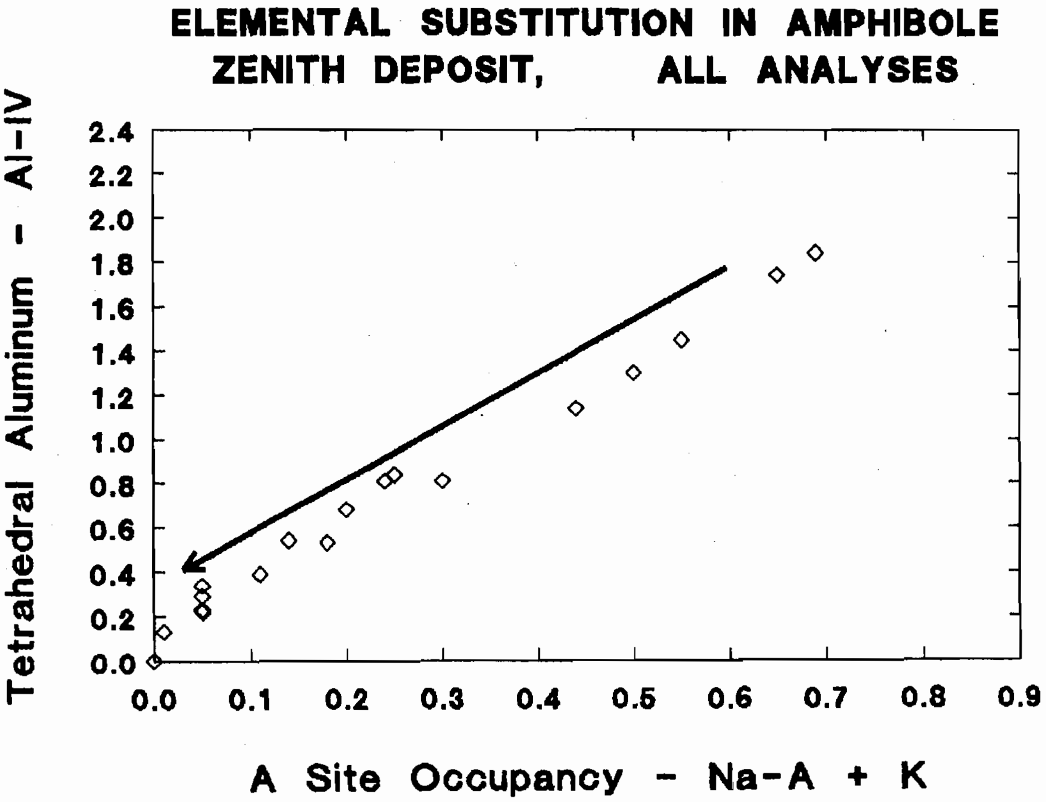

FIGURE 12: Compositional variation of individual amphibole grains included in massive sphalerite-pyrrhotite at the Zenith deposit, all analyses.

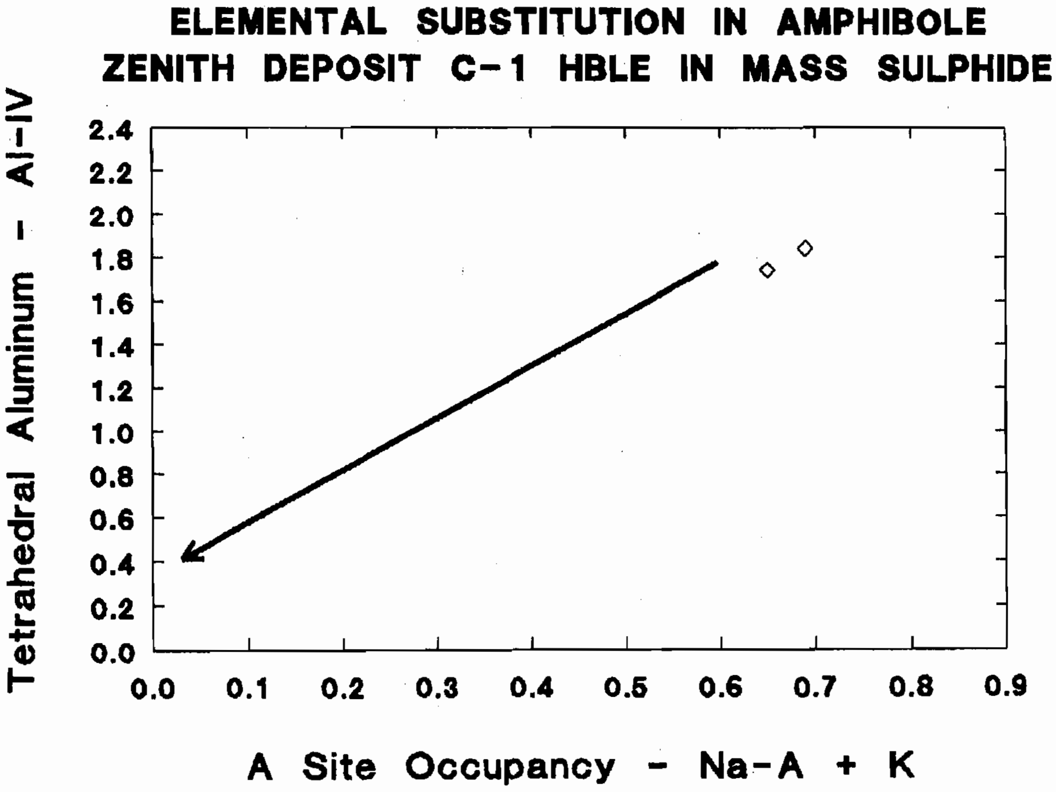

FIGURE 13: Individual grains of hornblende included in massive sulphide of Zenith deposit, C-1.

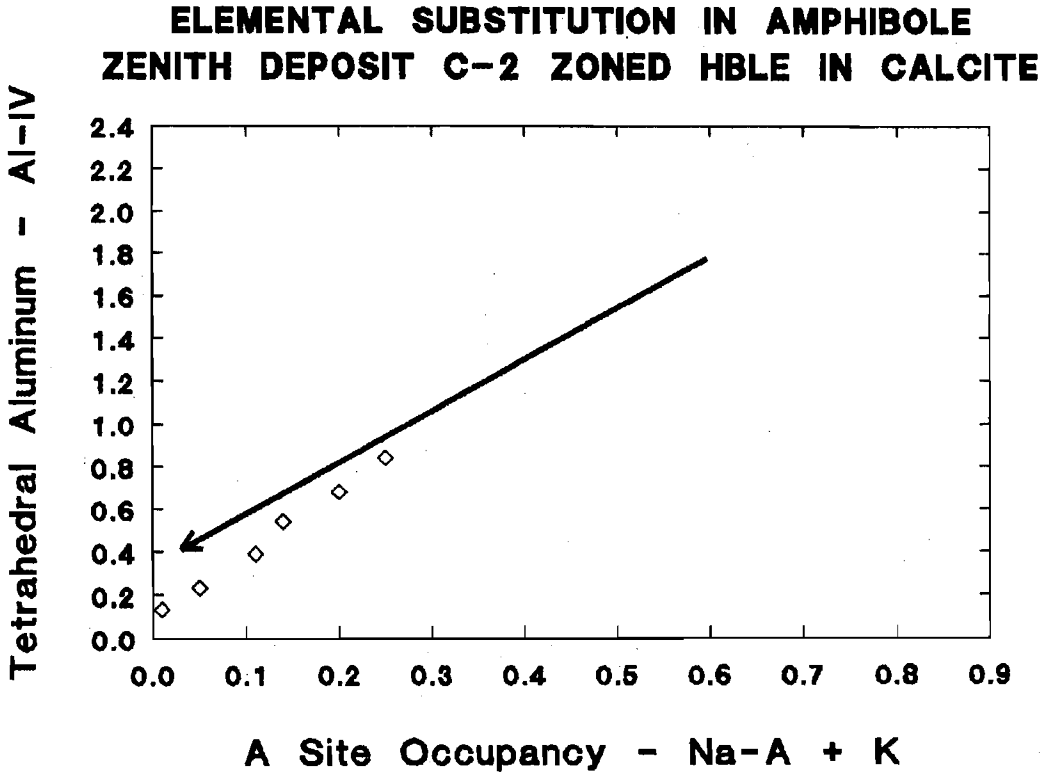

FIGURE 14: Compositional variation of amphibole in calcite included in massive sulphide of the Zenith deposit, C-2.

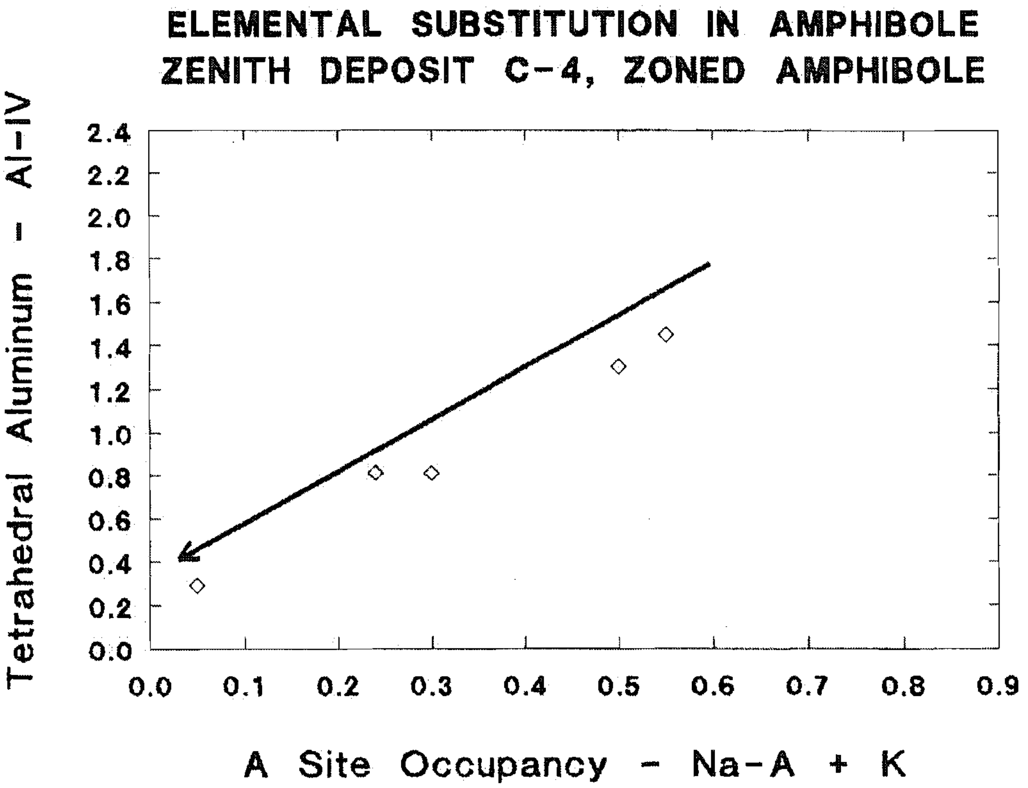

FIGURE 15: Compositional variation of individual amphibole grain included in massive sphalerite of the Zenith deposit, C-4, Plates 53 and 54.

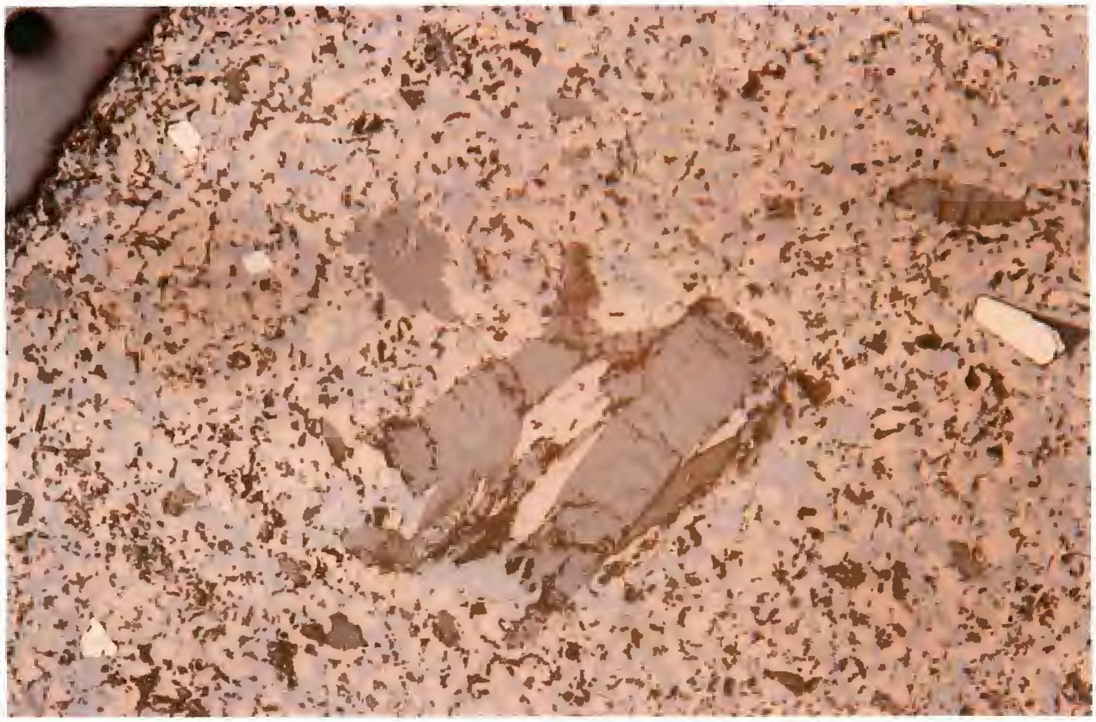

PLATE 1 PLA C-1: Angular silicate multimineralic fragments (medium grey) with finely intergrown sphalerite (light grey) and pyrrhotite (light brown). Two small pyrite grains at top left (white). Note that the sample is without fabric.

PLATE 2 PLA C-1: Assemblage of green hornblende and colourless cummingtonite-grunerite ss. intergrown with laths of pale brown mica.

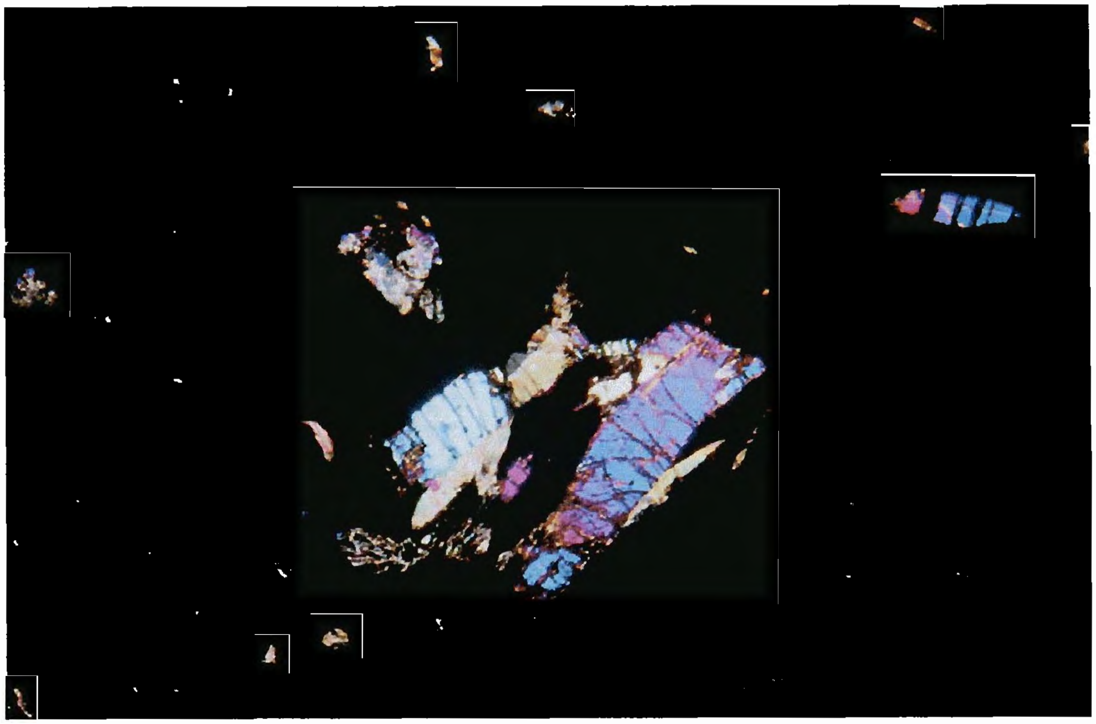

PLATE 3 PLA C-1: Randomly oriented birefringent red-blue grains of cummingtonite-grunerite in massive sulphide. The smaller single grains might well have originated by disaggregation of the larger multimineralic fragment.

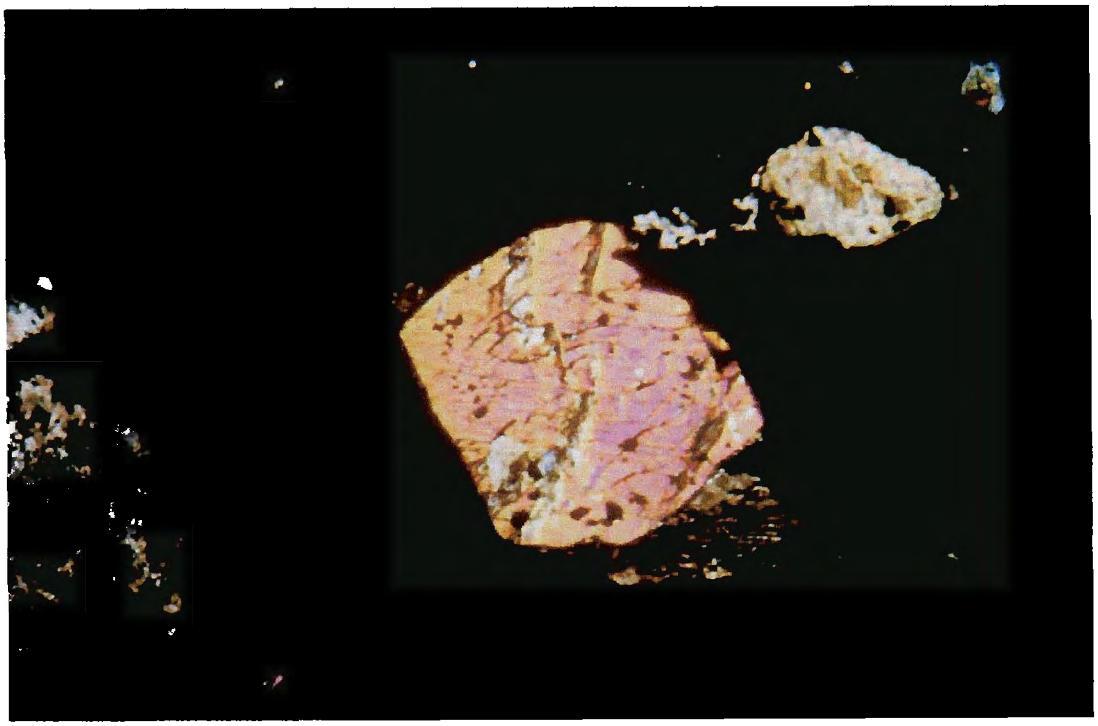

PLATE 4 PLA C-2: Single quite coarse grain of cummingtonite-grunerite ss. In massive sphalerite-pyrrhotite, crossed polars

PLATE 5 PLA C-2: Coarse grain of pyrite along with single grain cummingtonite-grunerite with fine-grained sphalerite and pyrrhotite, same field of view as Plate 4 in reflected light.

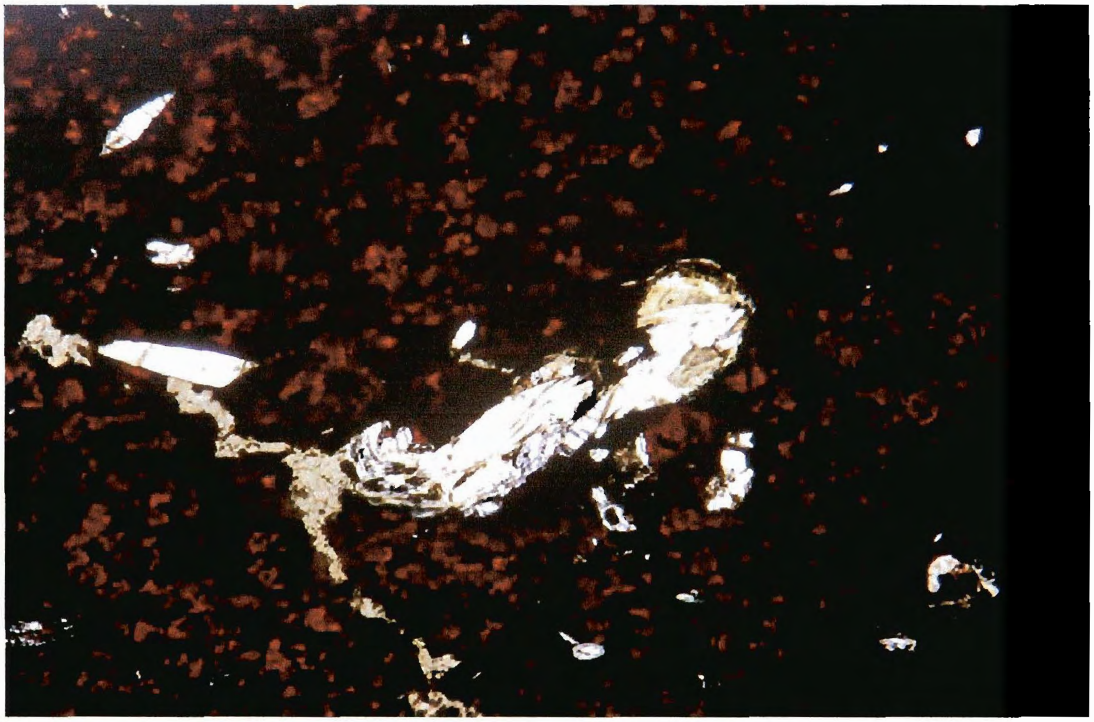

PLATE 6 PLA C-3: Contorted region of coarse mica and single grains of cummingtonite-grunerite is deep red massive sphalerite intergrown with pyrrhotite, transmitted light.

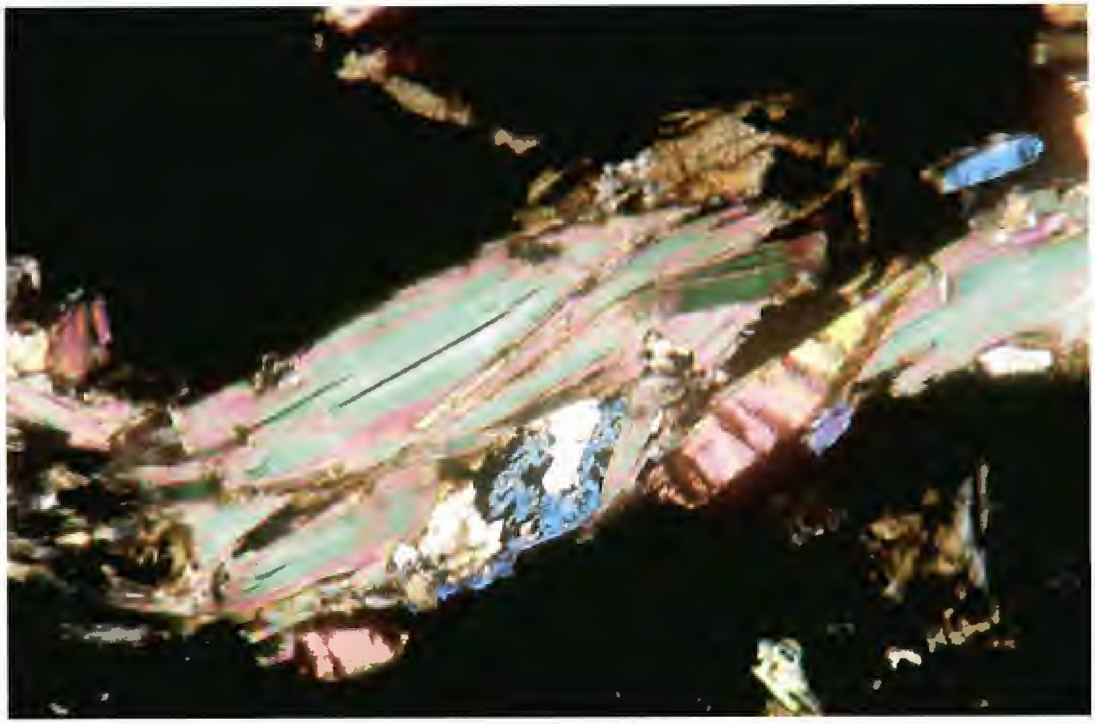

PLATE 7 PLA C-3: Multmineralic domain of birefringent red-green mica intergrown with acicular cummingtonite-grunerite (birefringent red), sane field of view as Plate 6 at higher magnification.

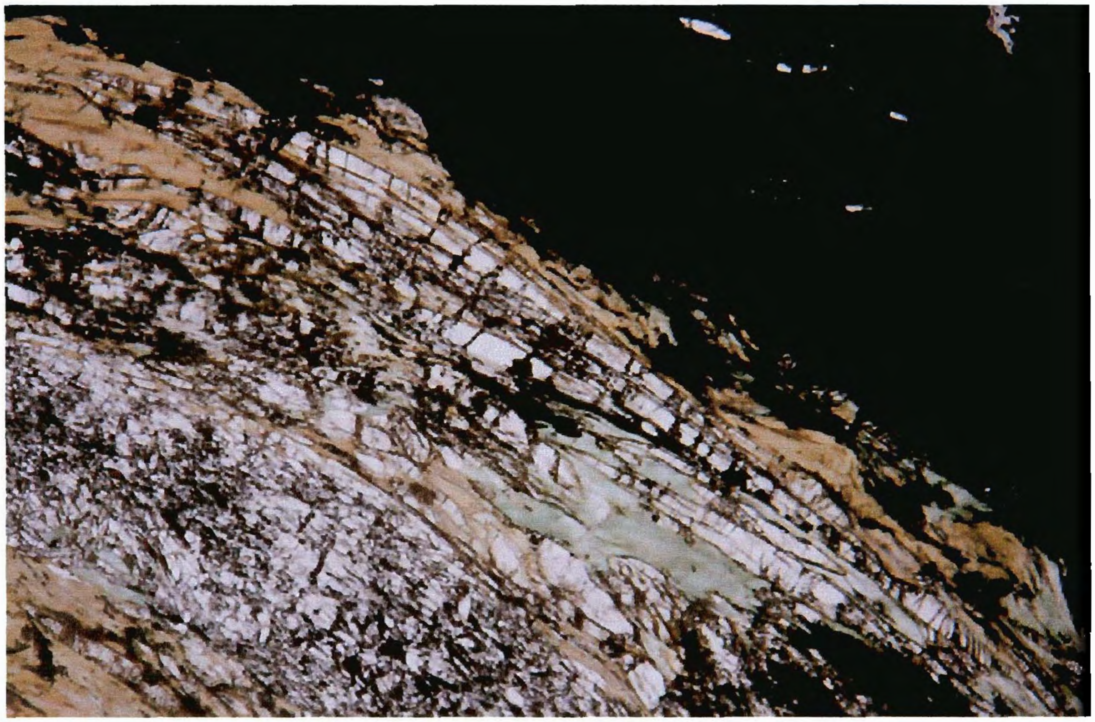

PLATE 8 PLA C-4: Acicular colourless grains cummingtonite-grunerite with strong fabric within a matrix of pale brown mica and chlorite, plane light.

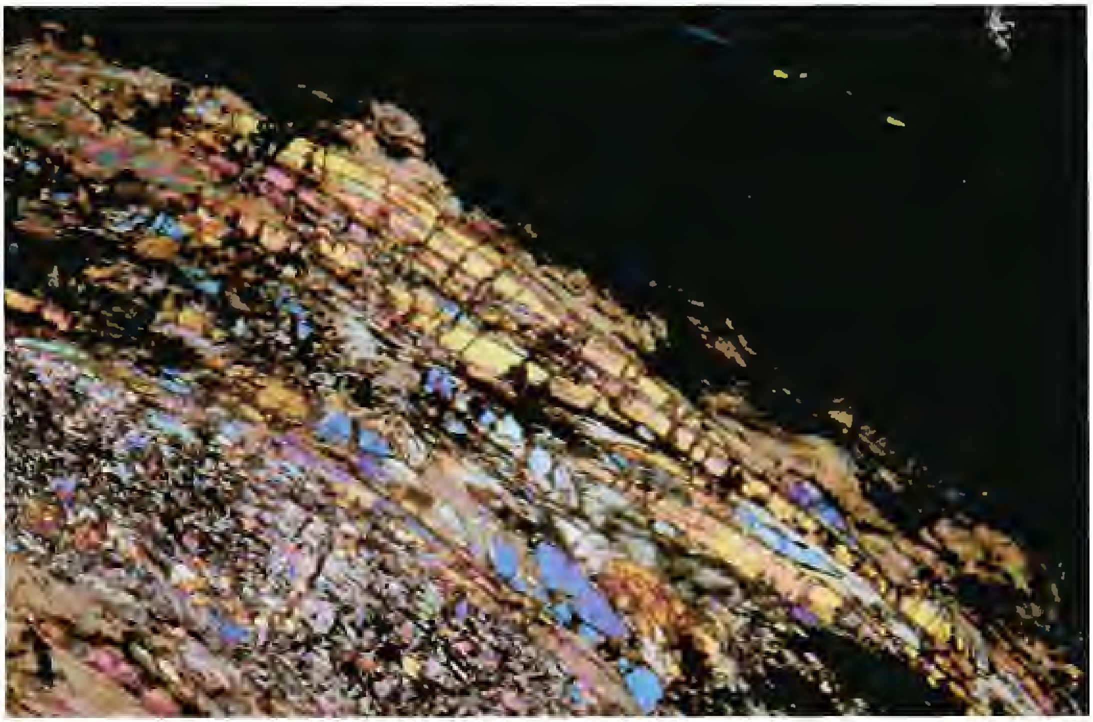

PLATE 9 PLA C-4: Acicular birefringent yellow-blue cummingtonite-grunerite in mica chlorite matrix, same field of view as Plate 8, crossed polars.

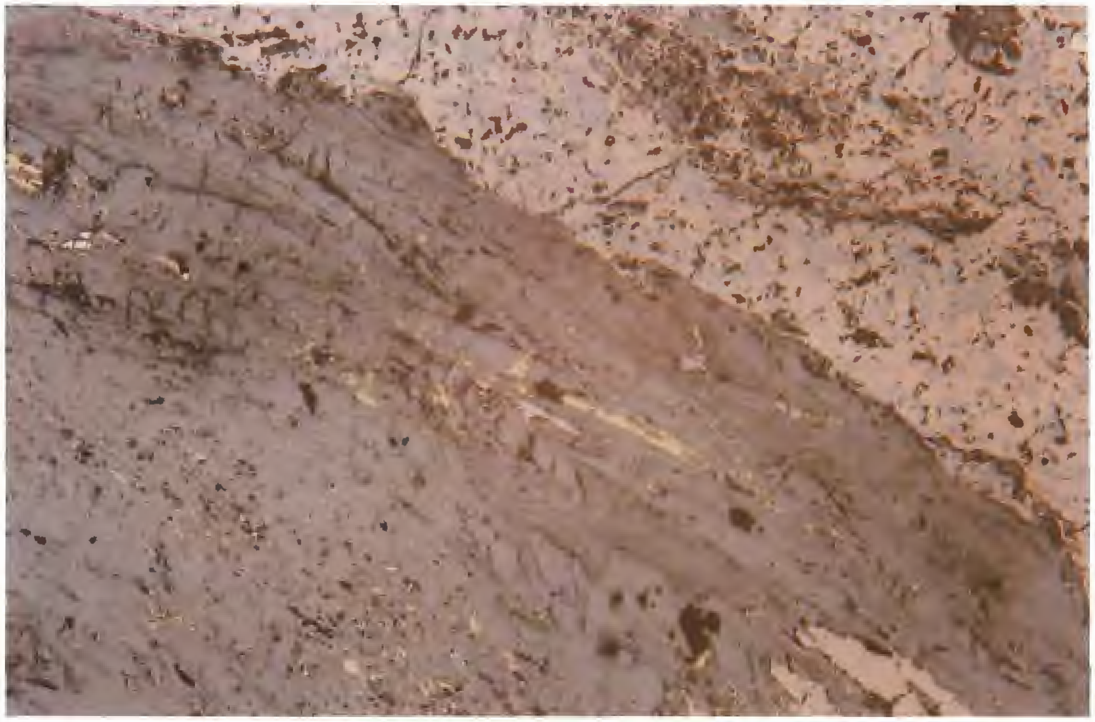

PLATE 10 PLA C-4: Small linear grains of chalcopyrite and pyrrhotite intimately intergrown with acicular cummingtonite-grunerite, mica and chlorite. Note that the enclosing massive sphalerite and pyrrhotite is without chalcopyrite.

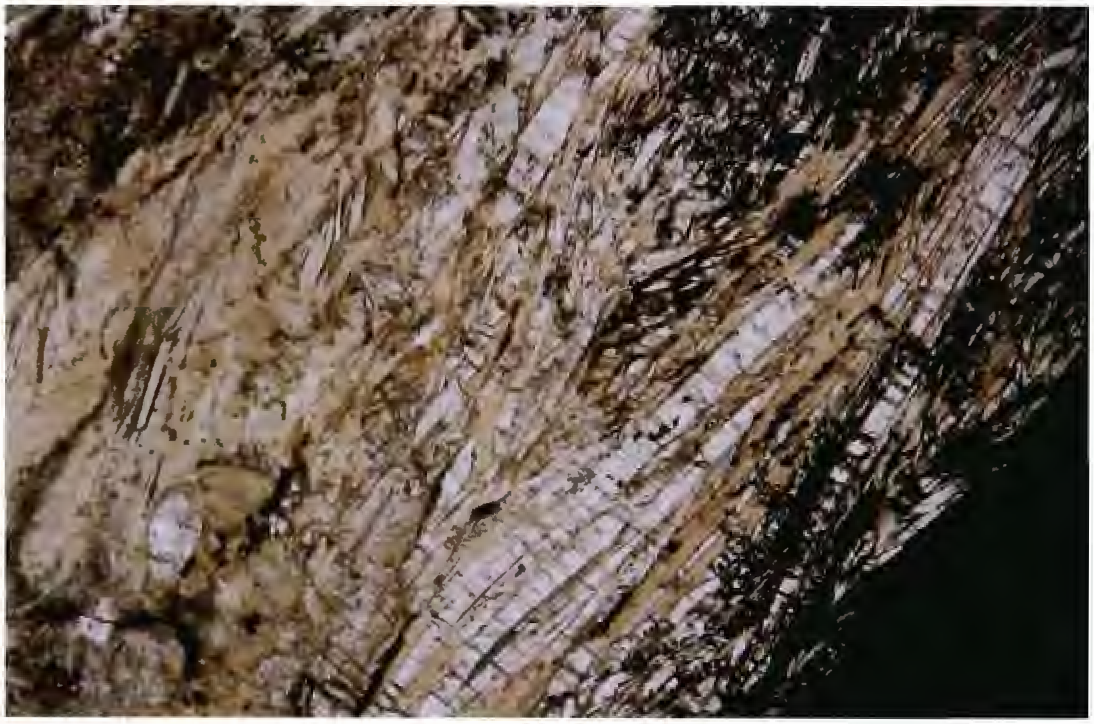

PLATE 11 PLA C-5: Highly acicular needles of colourless amphibole within matrix of brown mica replaced by chlorite, plane light.

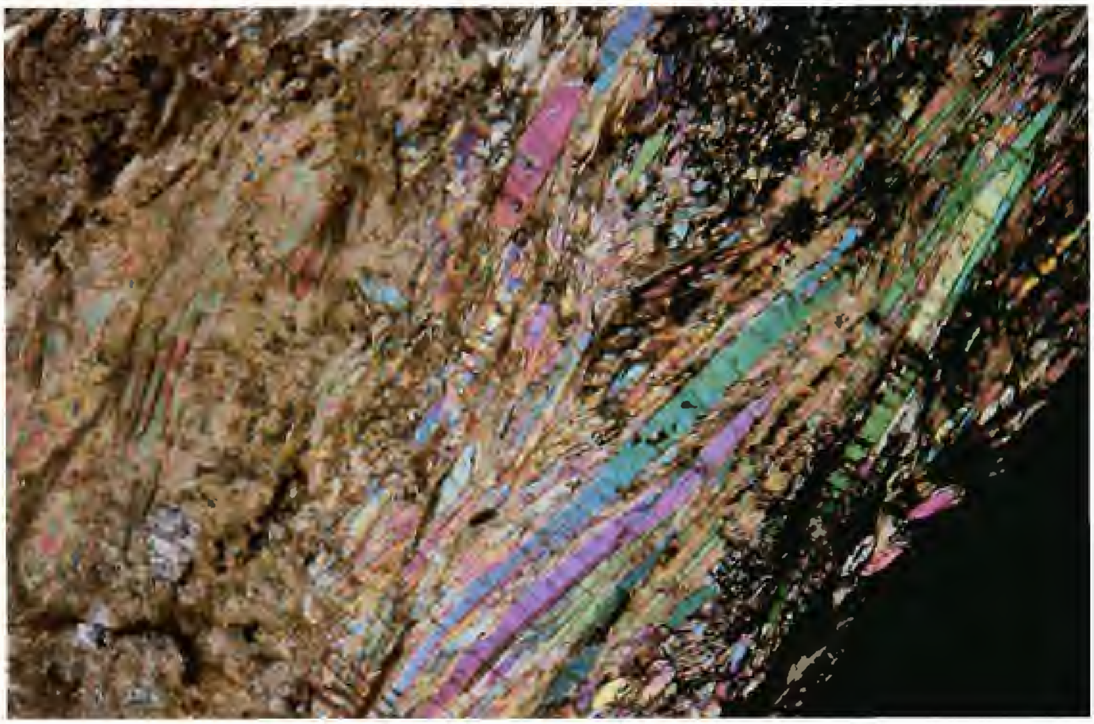

PLATE 12 PLA C-5: Birefringent red-blue cummingtonite-grunerite ss. in fine-grained mica and chlorite, same field of view as Plate 11, crossed polars.

PLATE 13 PLA C-7: Lithic fragment with highly contorted S-shaped distribution of cummingtonite-grunerite within fine-grained pale brown mica and chlorite, plane light.

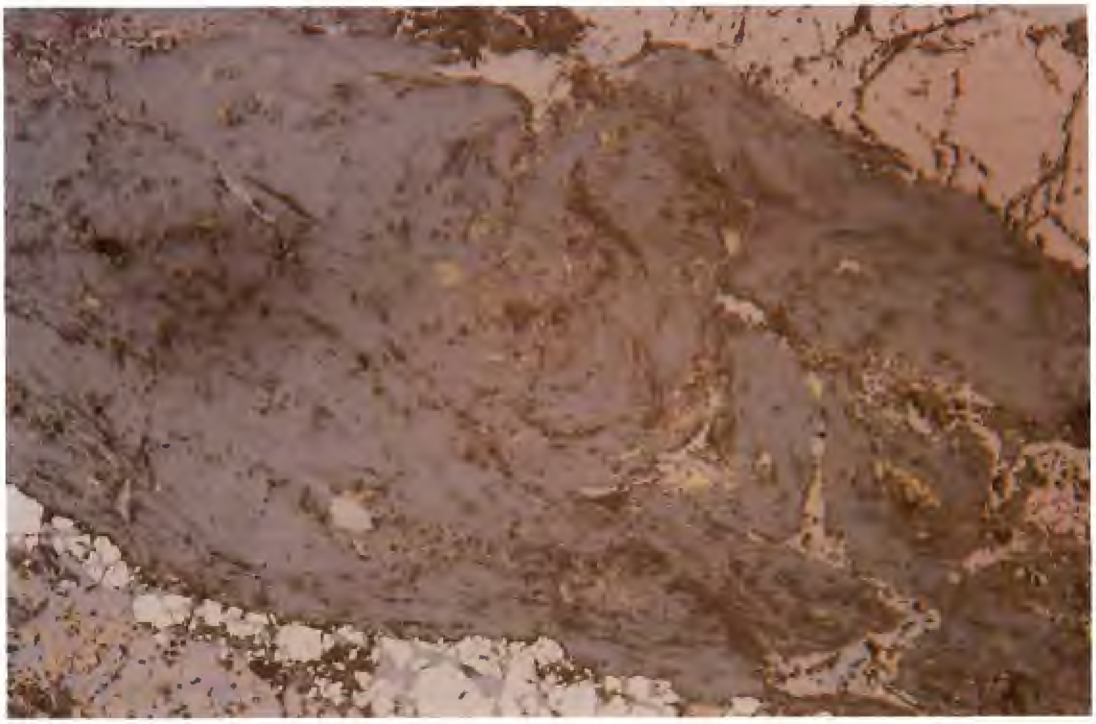

PLATE 14 PLA C-7: Chalcopyrite and pyrrhotite have an intimate textural relationship with the highly deformed and contorted amphibole and other silicate minerals. Note the granular grains of pyrite at the fringe of this domain of contorted silicates. same field of view as Plate 13, reflected light..

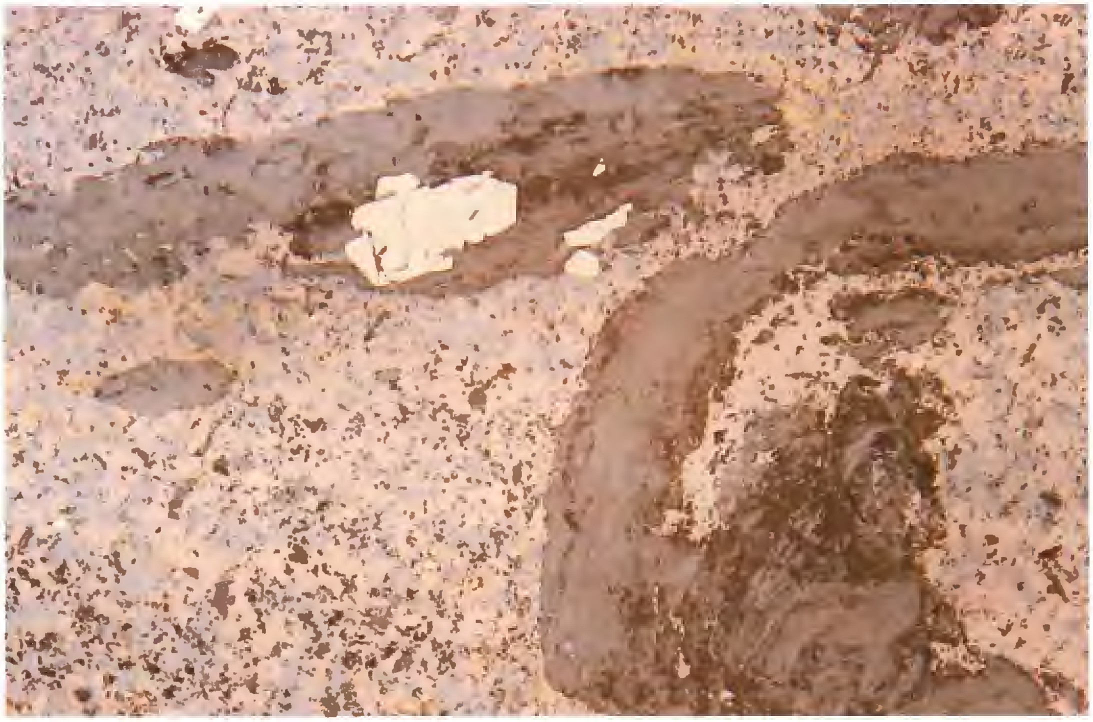

PLATE 15 PLA-1 C-1: Single grain of crystalline pyrite within contorted lithic fragment. Note that enclosing sphalerite and pyrrhotite is without pyrite, plane light.

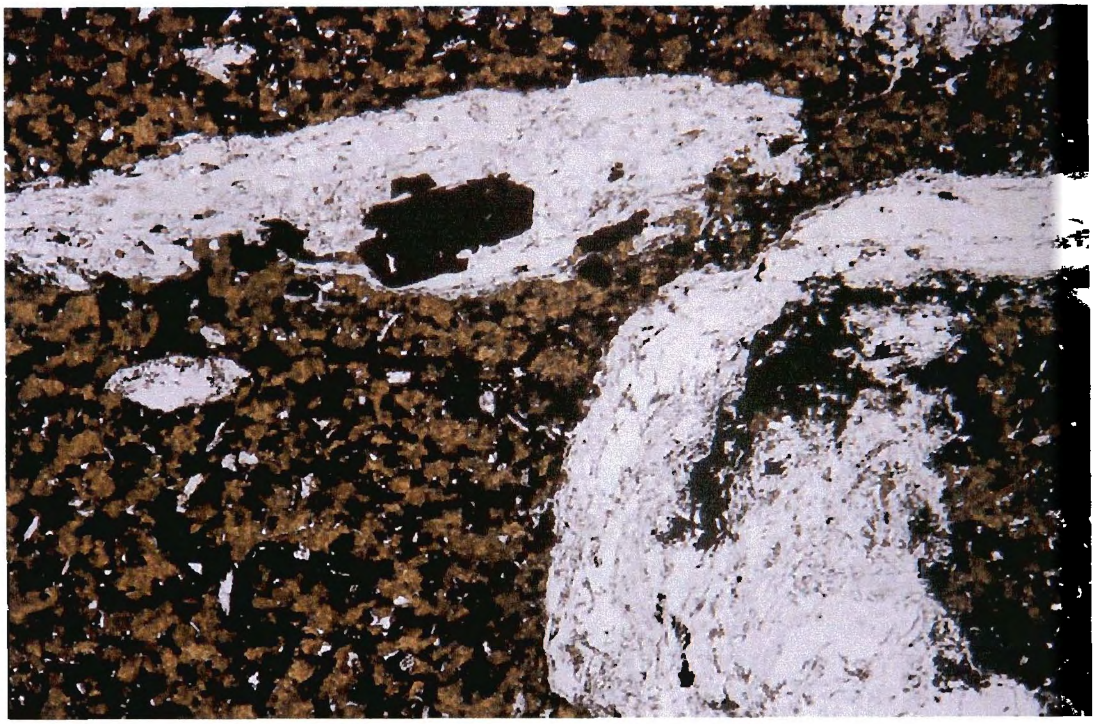

PLATE 16 PLA-1 C-1: Single grain of crystalline pyrite internal to chloritic lithic fragment with fine-grained sphalerite-pyrrhotite host,. same field of view as Plate 15, transmitted light.

PLATE 17 PLA-1 C-7: Contorted and arcuate essentially monomineralic domains of chlorite including crystalline pyrite within massive sphalerite-pyrrhotite, same field of view as Plates 15,16 crossed polars. Note the small acicular grain of green hornblende at left central within massive sulphide.

PLATE 18 PLA-1 C-4: Linear lithic fragment composed essentially of a highly-foliated matte of 1st-order grey cummingtonite-grunerite with muscovite along grain margins, crossed polars. Note the adjacent fragment consisting of highly-oriented calcite.

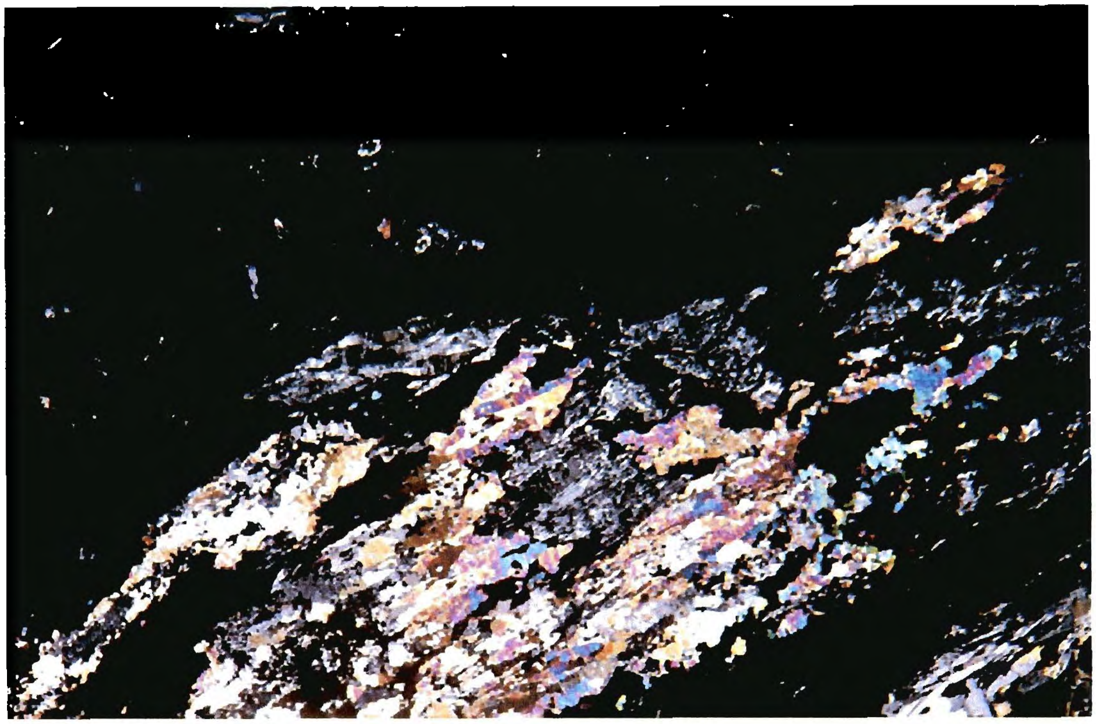

PLATE 19 PLA-1 C-4: Linear fragment comprised by highly oriented birefringent yellow-red calcite including domains of fine-grained chlorite.This assemblage is clearly not at upper greenschist or amphibolite facies metamorphic rank.

PLATE 20 PLA-1 C-2: Concentration of relatively coarse crystalline pyrite and lithic fragments within finer-grained sphalerite and pyrrhotite. Note that the pyrite is included within a zone of sphalerite that is without pyrrhotite.

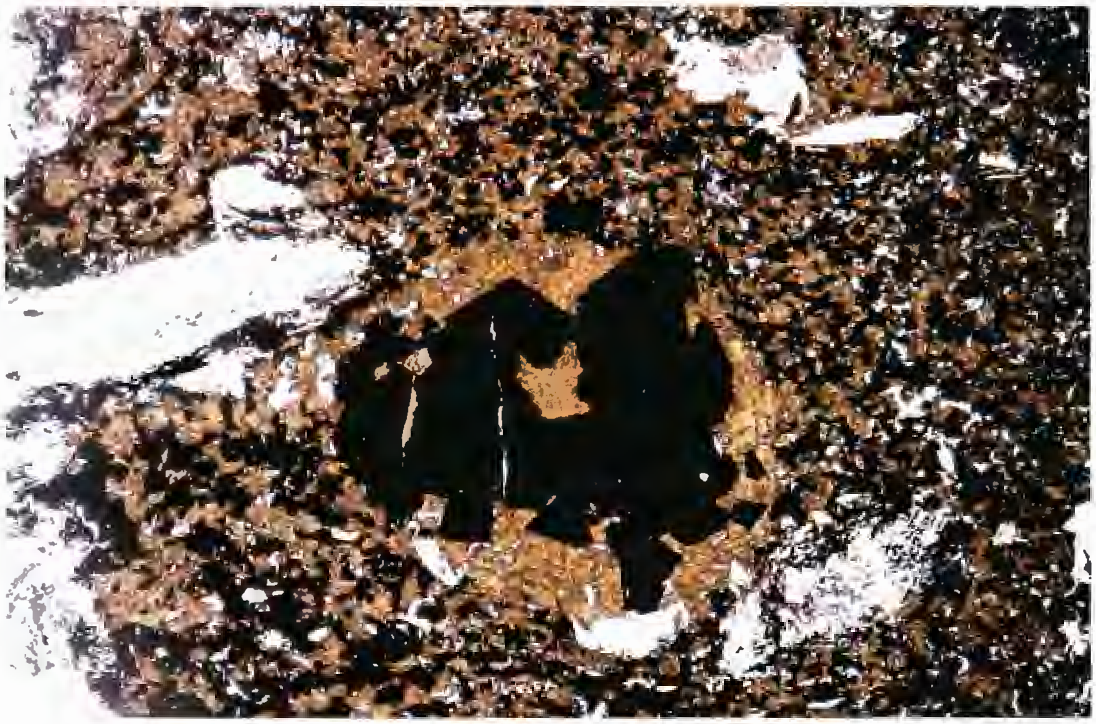

PLATE 21 PLA-1 C-1: Spectacular relationship in which a relatively coarse concentration of pyrite is included within a circular region that is essentially massive sphalerite. This peculiar pyrite-sphalerite "ball" as well as the lithic fragments reside in a finer-grained matrix of sphalerite and pyrrhotite. The "ball" appears to be a fragment of previously consolidated pyrite-sphalerite material that was disrupted and apparently abraded by processes involved in the mobility of the Pick Lake sulphide mass.

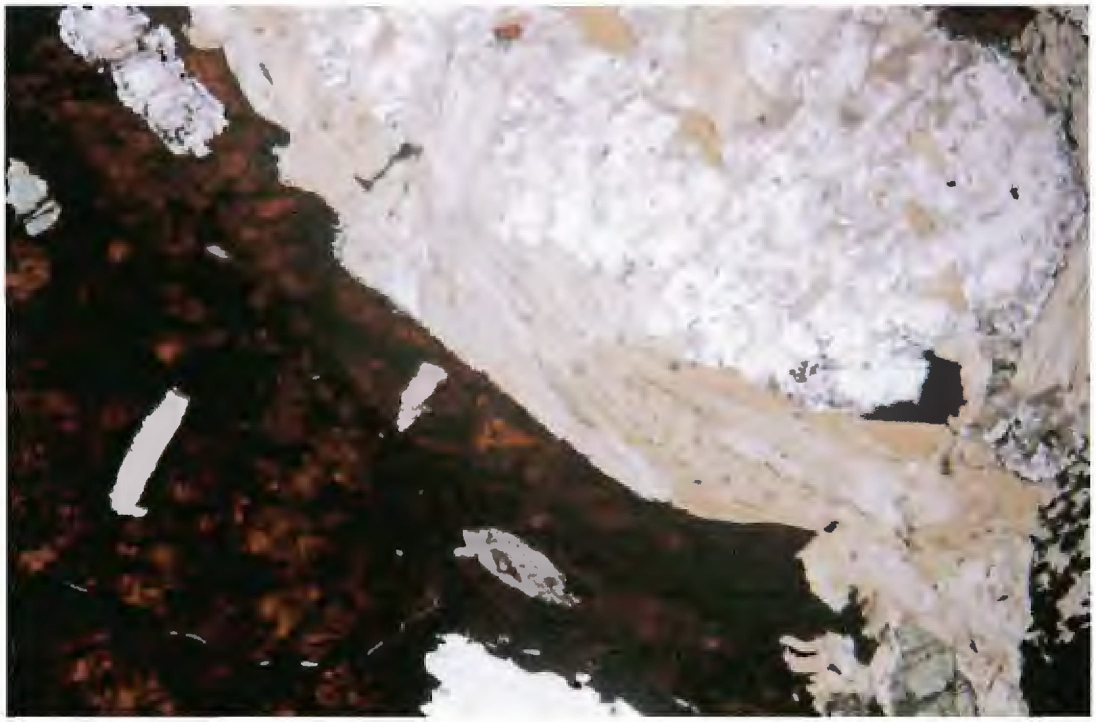

PLATE 22 PLB C-1: Large quartzofeldspathic micaceous lithic fragment within massive sphalerite with pyrrhotite and chalcopytite. Note green hornblende grain within pale brown mica at bottom right.

PLATE 23 PLB C-1: Birefringent red-yellow mica in quartzofeldspathic fragment with hornblende, same field of view as Plate 21 crossed polars.

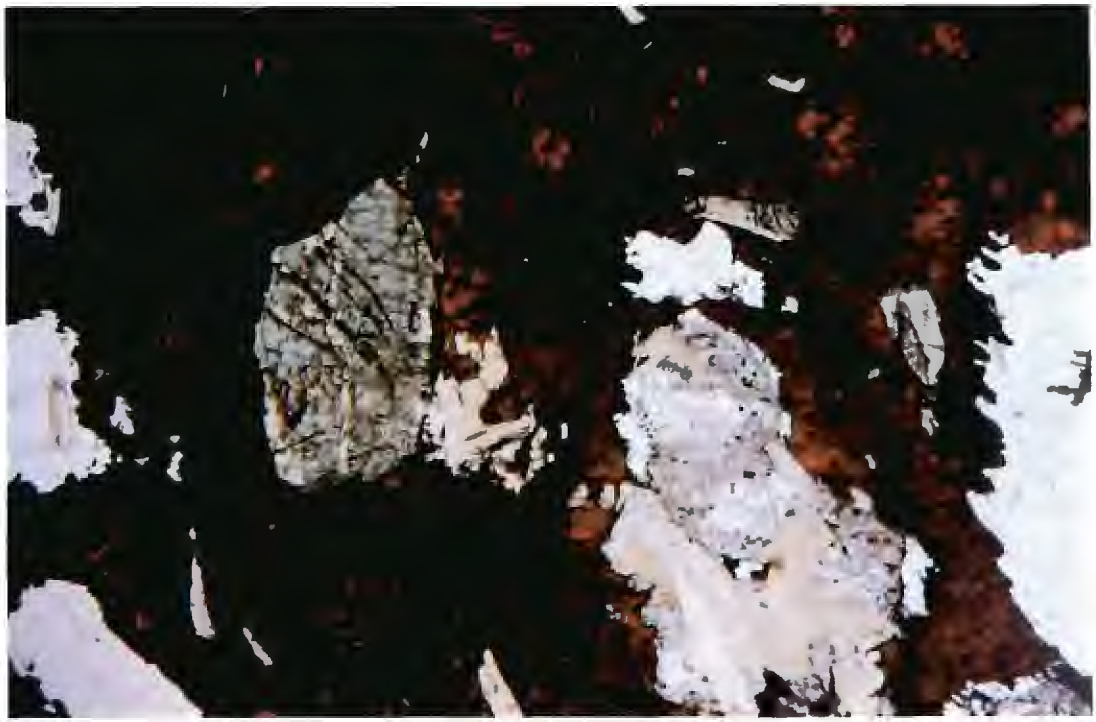

PLATE 24 PLB-C-2: Green hornblende crystal adjacent to a lithic fragment of calcic plagioclase and pale brown mica within massive sphalerite.

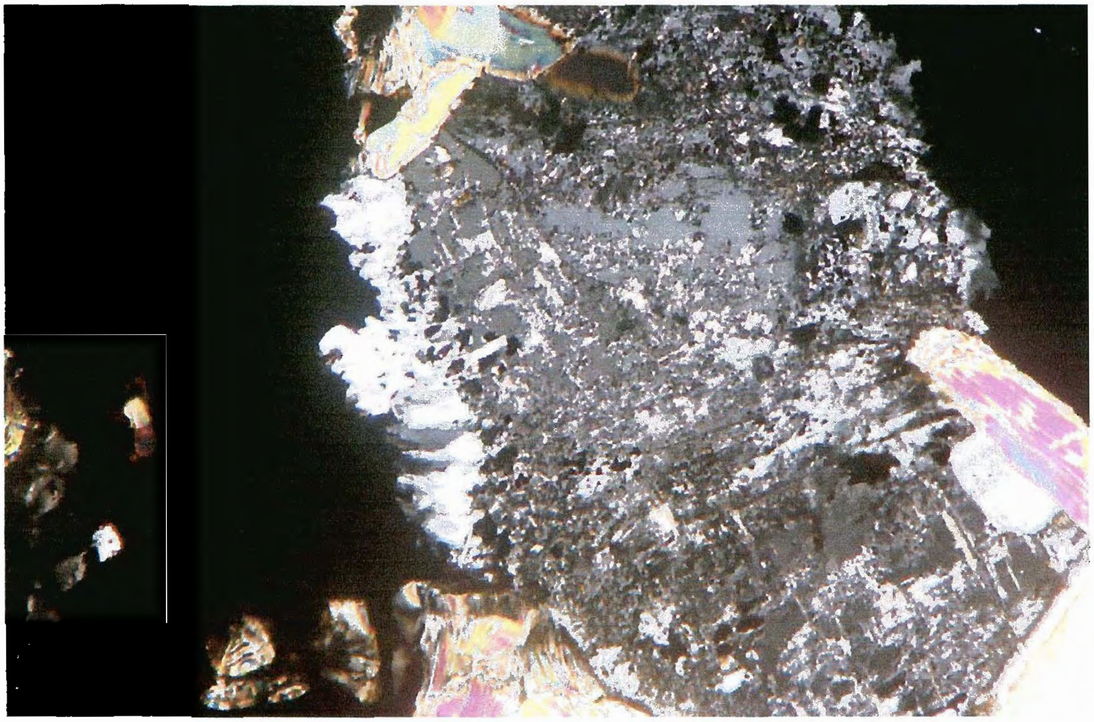

PLATE 25 PLB C-3: Calcic plagioclase intergrown with mica with marginal zone of finely intergrown, oriented potassium feldspar and albite, likely a pressure shadow and evidence for attenuation of the sulphide mass after consolidation in a regime of low temperature greenschist facies fluids.

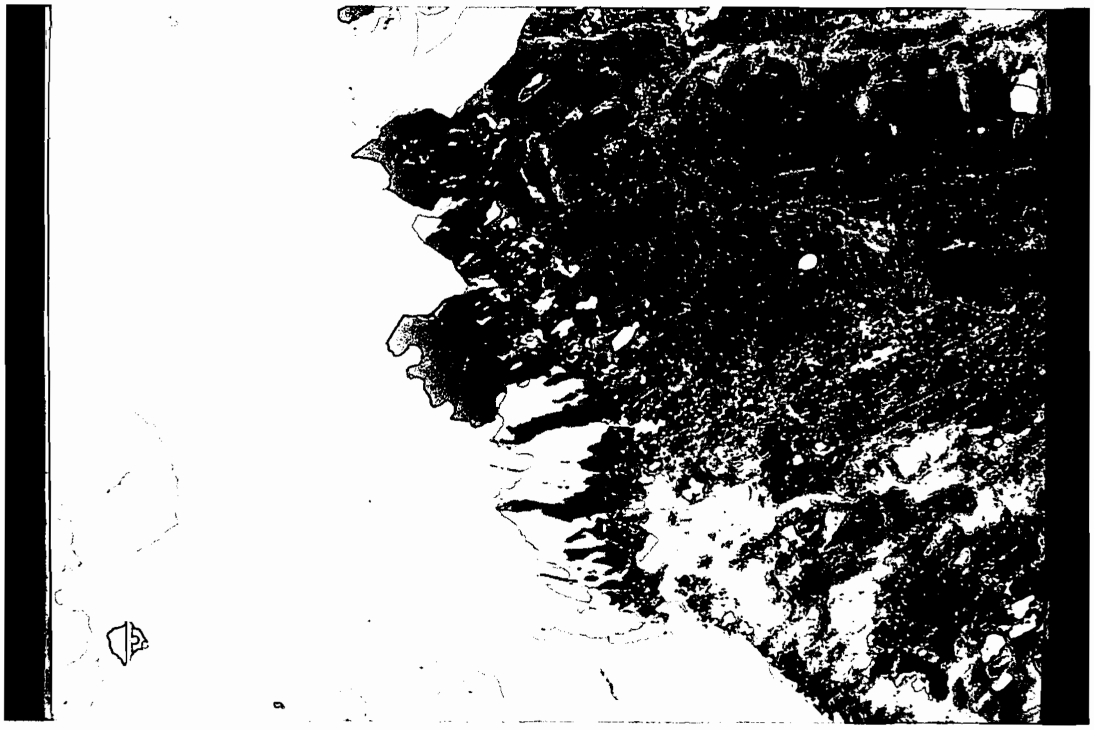

PLATE 26 PLB C-3: BSE image of oriented albite (dark) and potassium feldspar (light grey) in pressure shadow at the margin of calcic plagioclase grain, same field of view as Plate 25..

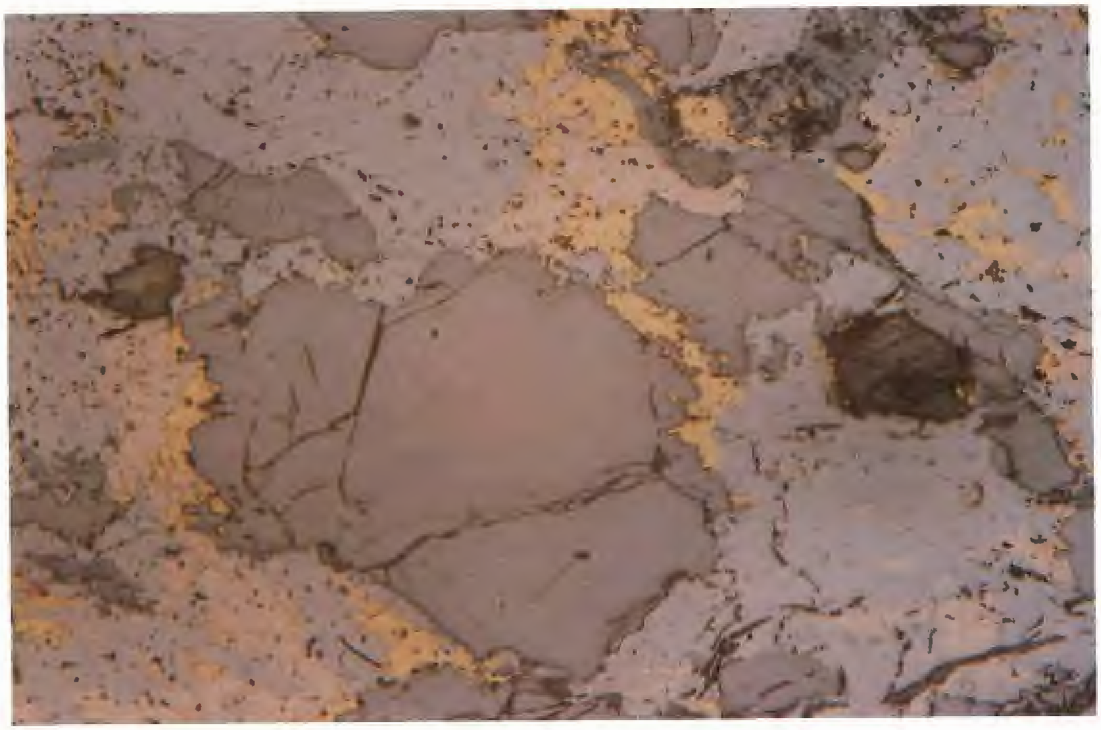

PLATE 27 PLB C-6: Coarse grain of multigranular quartz with marginal zones of chalcopyrite and pyrrhotite within massive sphalerite.

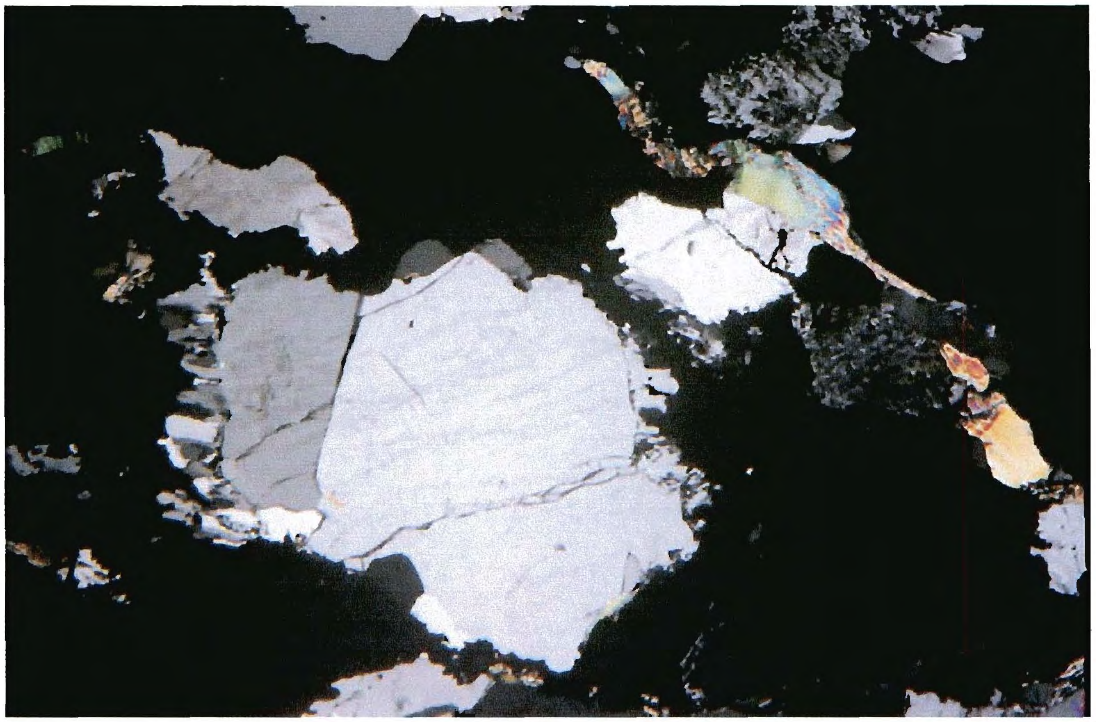

PLATE 28 PLB C-6: Multigranular quartz inclusion with marginal zones on opposite margins consisting of oriented quartz and albite, evidence for strain after the consolidation of the massive sulphide, same field of view as Plate 27..

PLATE 29 PLB C-6: Marginal zone of oriented quartz and albite in pressure shadow zone at the margin of quartz inclusion, same field of view as Plate 28 at higher magnification.

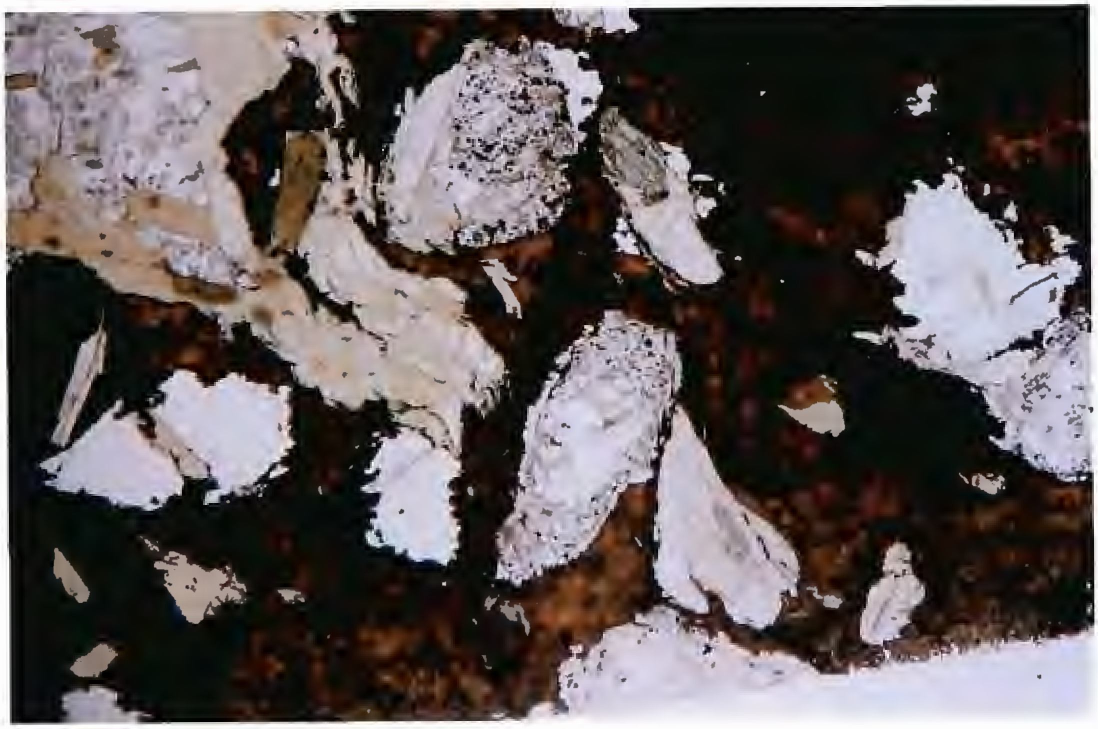

PLATE 30 PLB C-4: Region of massive sulphide with concentration of micaceous quartzofeldspathic fragments some with green hornblende, transmitted light..

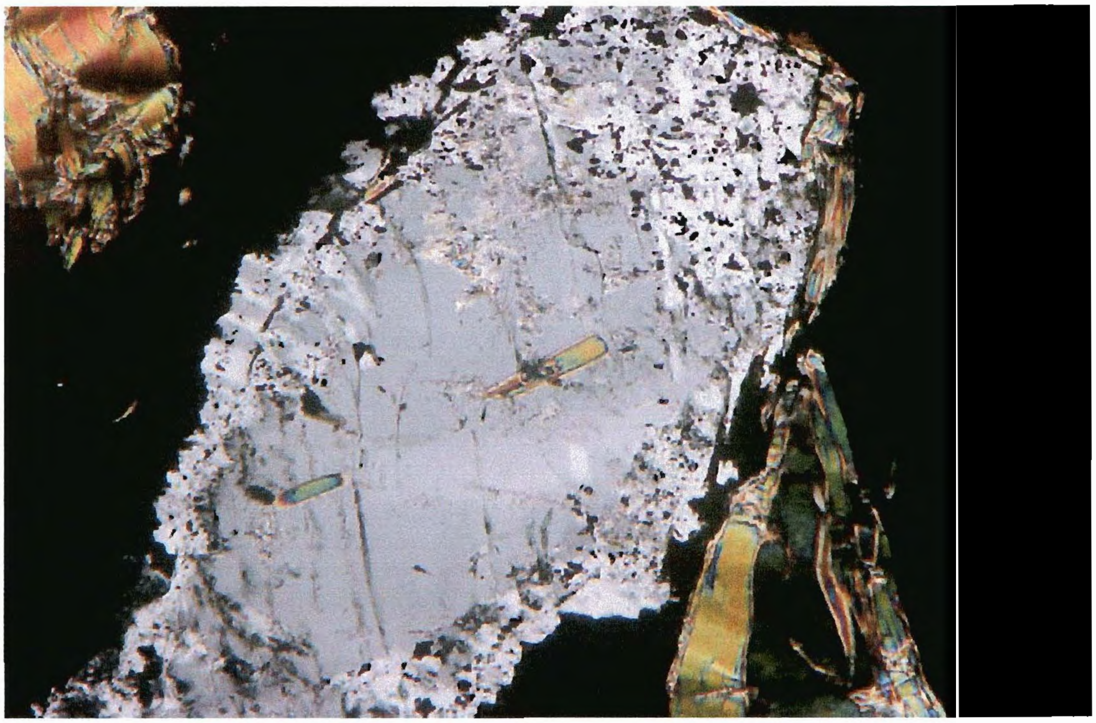

PLATE 31 PLBC-4: Grain of calcic plagioclase with marginal reaction zone of albitization. Note minute grain of hornblende with small micaceous lath central to the grain, central region of Plate 30 at higher magnification.

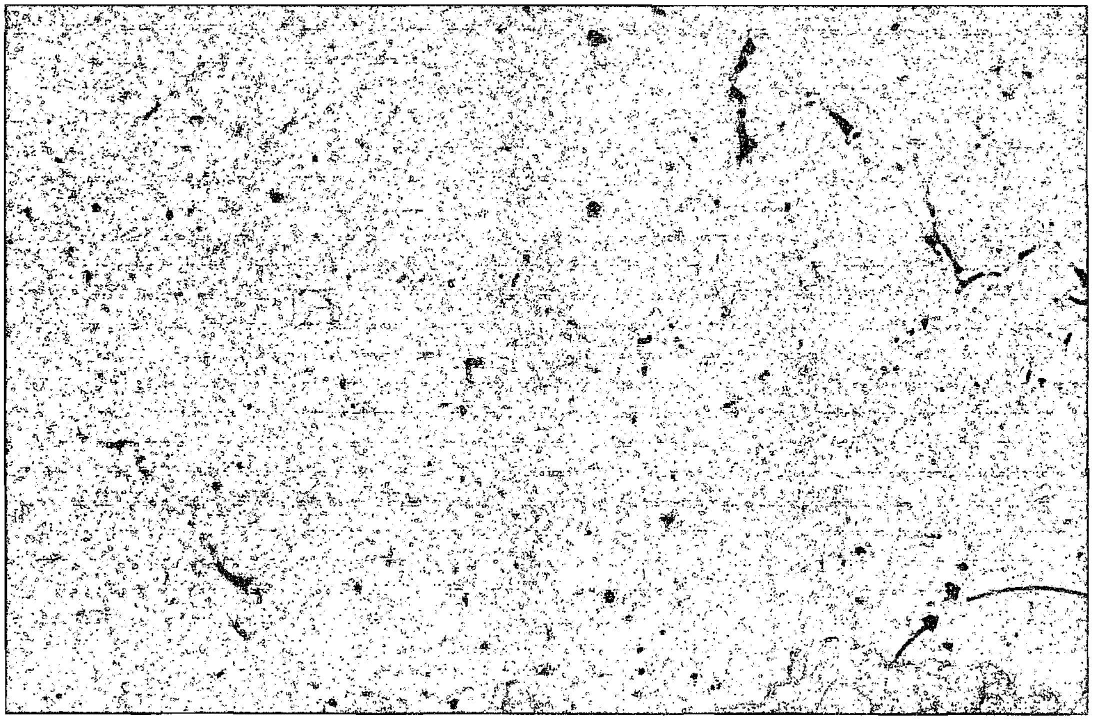

PLATE 32 WIN C-6: Massive sphalerite (medium grey) with fine-scale banding defined by fine-grained pyrrhotite (brown) and chalcopyrite, reflected light.

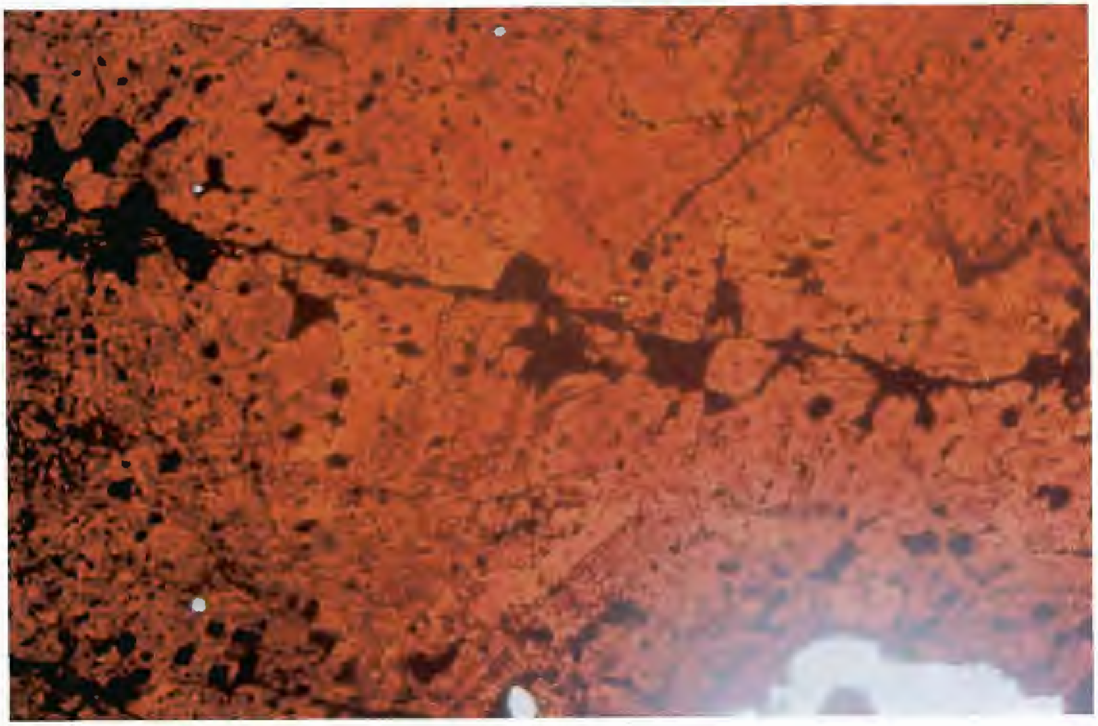

PLATE 33 WIN C-6: Translucent red sphalerite with fine-scale banding defined by pyrrhotite and chalcopyrite, same field of view as Plate 32, transmitted light.

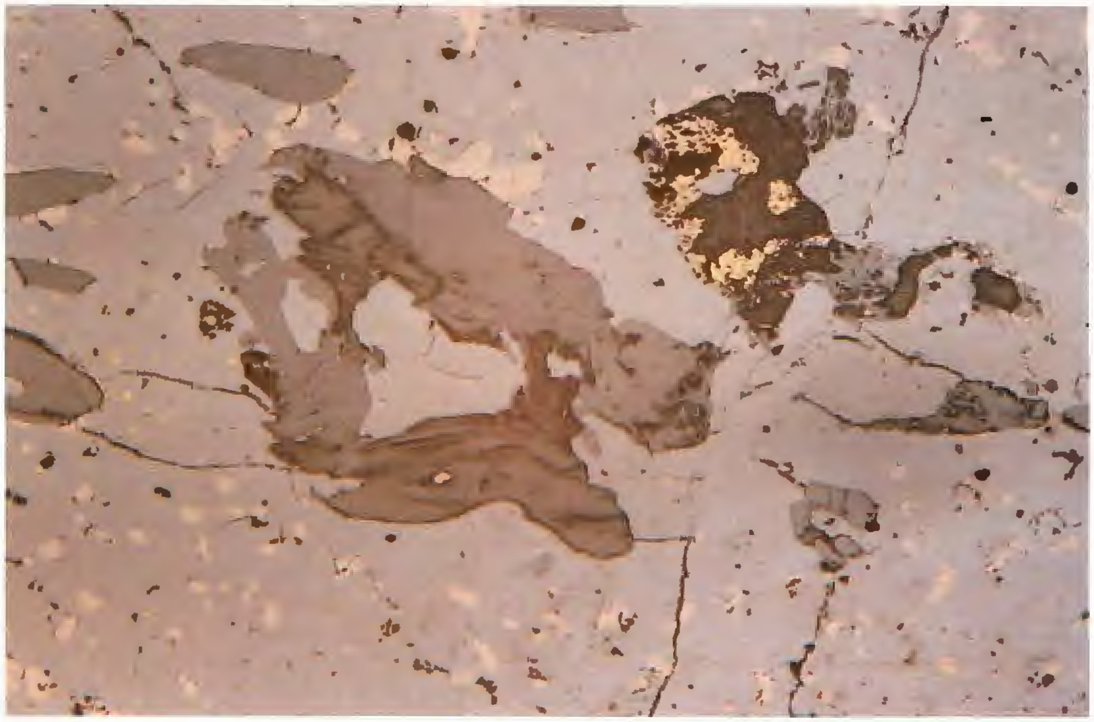

PLATE 34 WIN C-1: Multimineralic inclusions of mica and amphibole with some degree of random orientation with massive sphalerite. Note that the chalcopyrite is also situated within a silicate inclusion, reflected light.

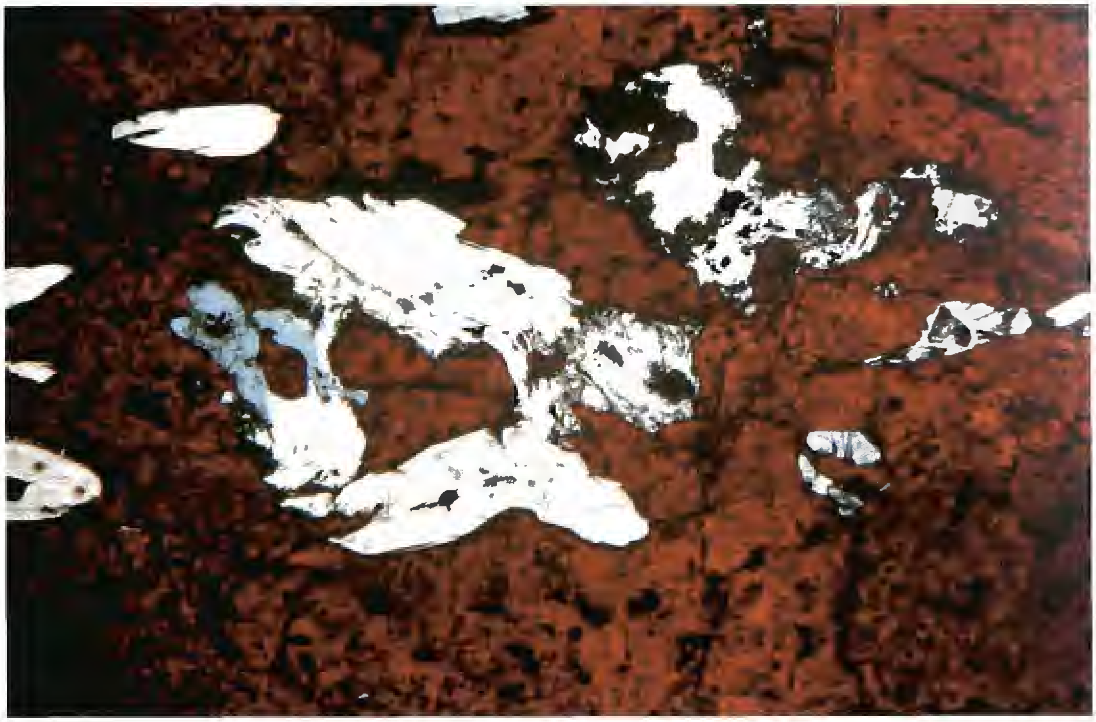

PLATE 35 WIN C-1: Arcuate contorted grains of pale brown mica intergrown with Na-Ca amphibole, tschermakite, with a characteristic blue colour, same field of view as Plate 34, transmitted light.

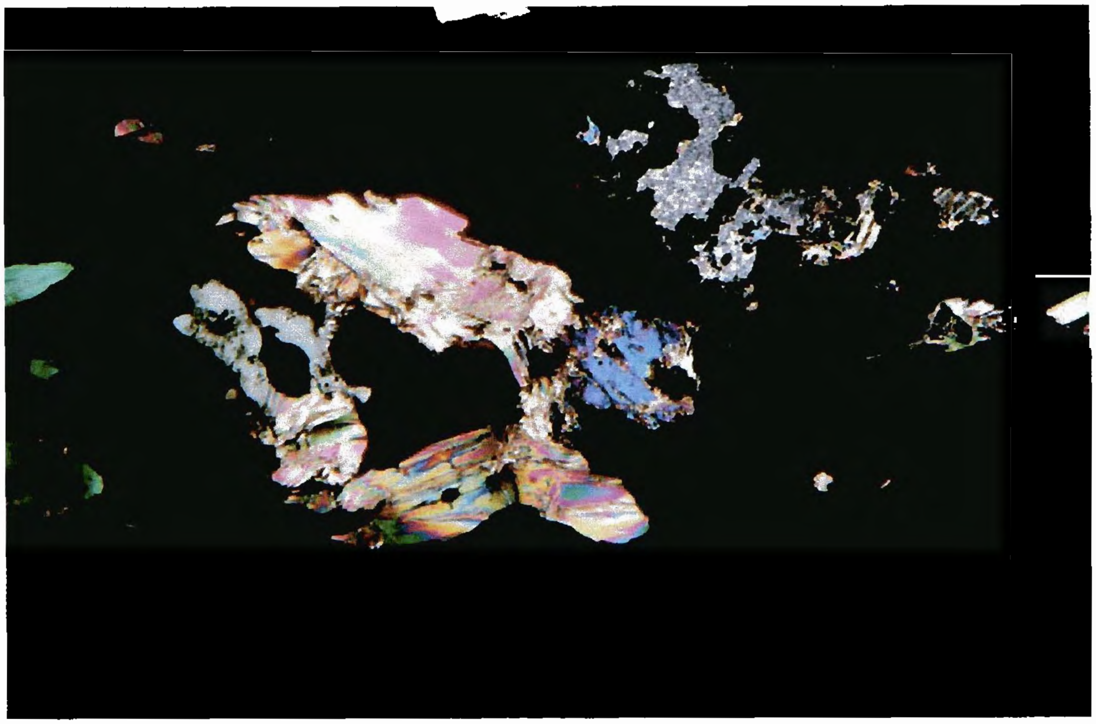

PLATE 36 WIN C-2: Contorted plates of phlogopite-biotite solid solution and birefringent blue amphibole in massive sphalerite. Note that the domain of chalcopyrite at top right occurs within fine-grained 1st-order grey chlorite, same field of view as Plates 24 and 35, birefringent light.

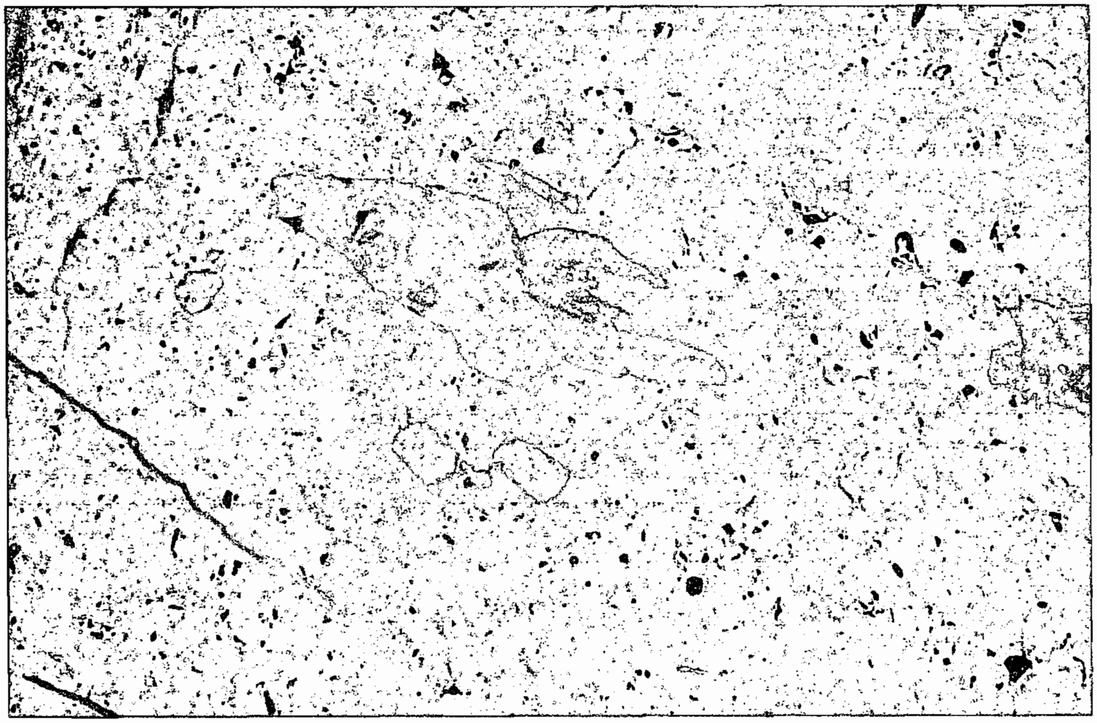

PLATE 37 WIN C-5: Multimineralic inclusion consisting of mica and Na-Ca amphibole including grains of gahnite. Note that this inclusion is aligned with the fine-scale banding defined by pyrrhotite. Also note the three small grains of gahnite within a single band of pyrrotite below the main inclusion, reflected light.

PLATE 38 WIN C-5: Composite grain of pale blue Na-Ca amphibole with mica. Note the small equant grain of gahnite within the amphibole and the three grains of gahnite within the massive sulphide and apparently aligned with the fabric defined by the subparallel bands of pyrrhotite, same field of view as Plate 37, transmitted light.

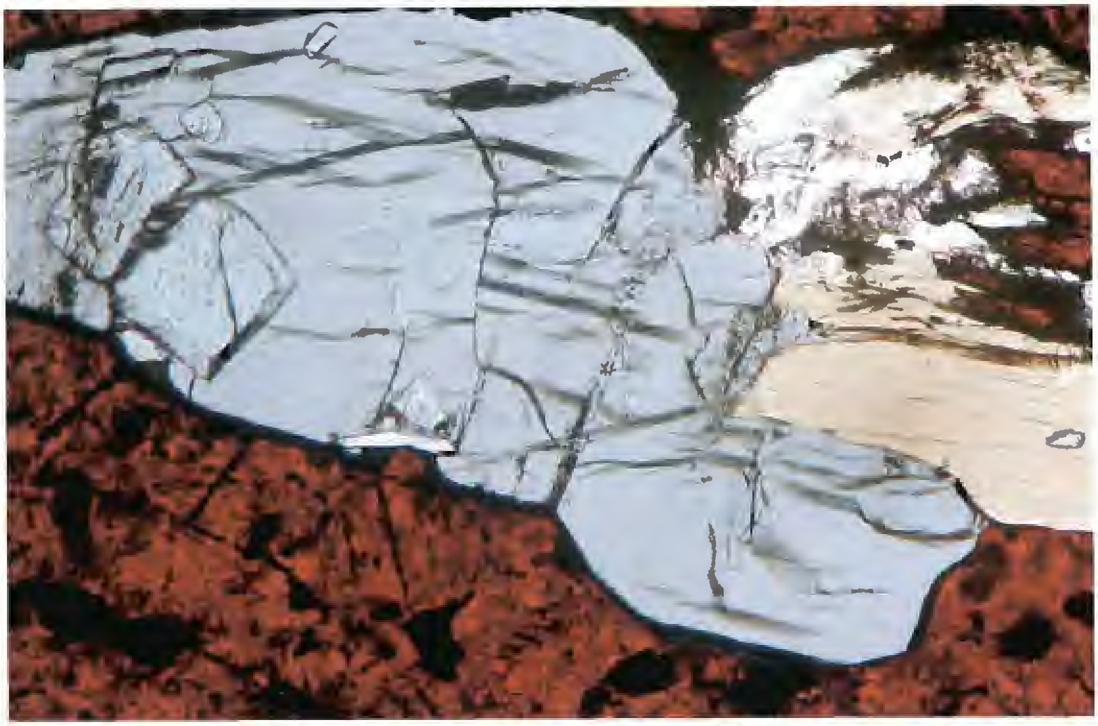

PLATE 39 WIN C-5: Blue Na-Ca amphibole intergrown with pale brown phlogopite-biotite ss. with multiple equant inclusions of gahnite, transmitted light, central region of Plate 38 at higher magnification.

PLATE 40 WIN C-6: Blue amphibole including equant grains of isotropic gahnite and intergrown with birefringent green mica, same field of view as Plate 39, crossed polars.

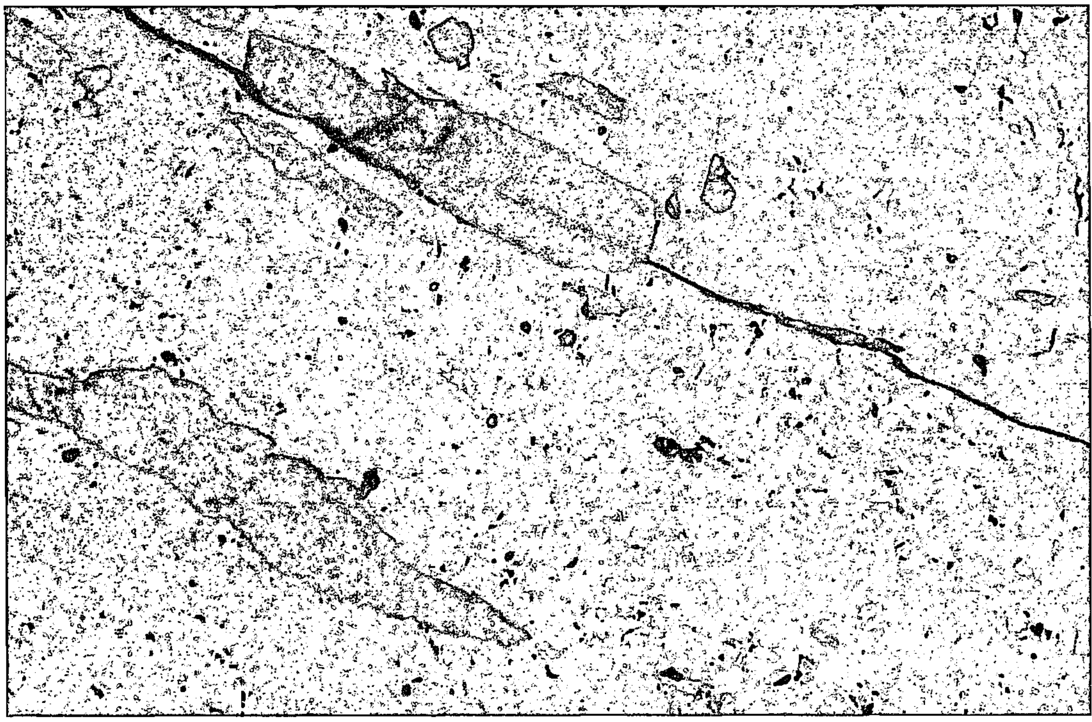

PLATE 41 WIN C-4: Linear plates of mica aligned with the fabric defined by fine-grained pyrrhotite. Note that the mica grain at the lower left actually appears to be situated within two enclosing bands of pyrrhotite. The three small grains in sphalerite above the uppermost mica grain are gahnite, reflected light.

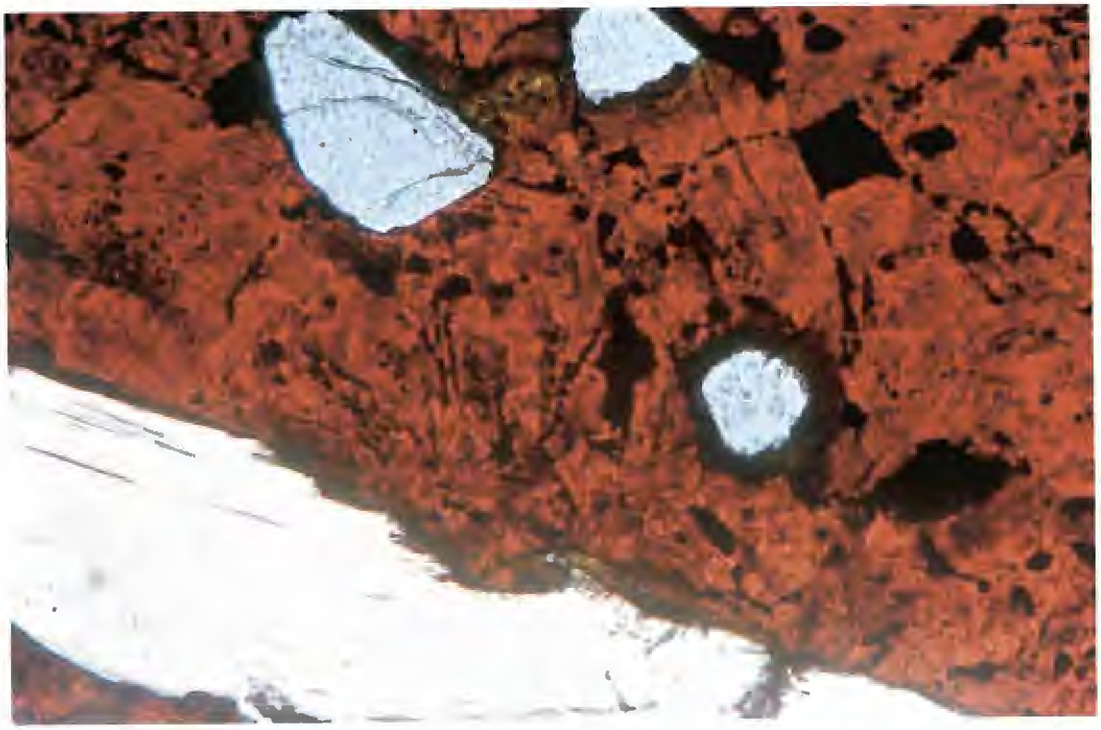

PLATE 42 WIN C-4: Three equant grains pale blue gahnite within massive sphalerite associated with oriented mica, transmitted light.

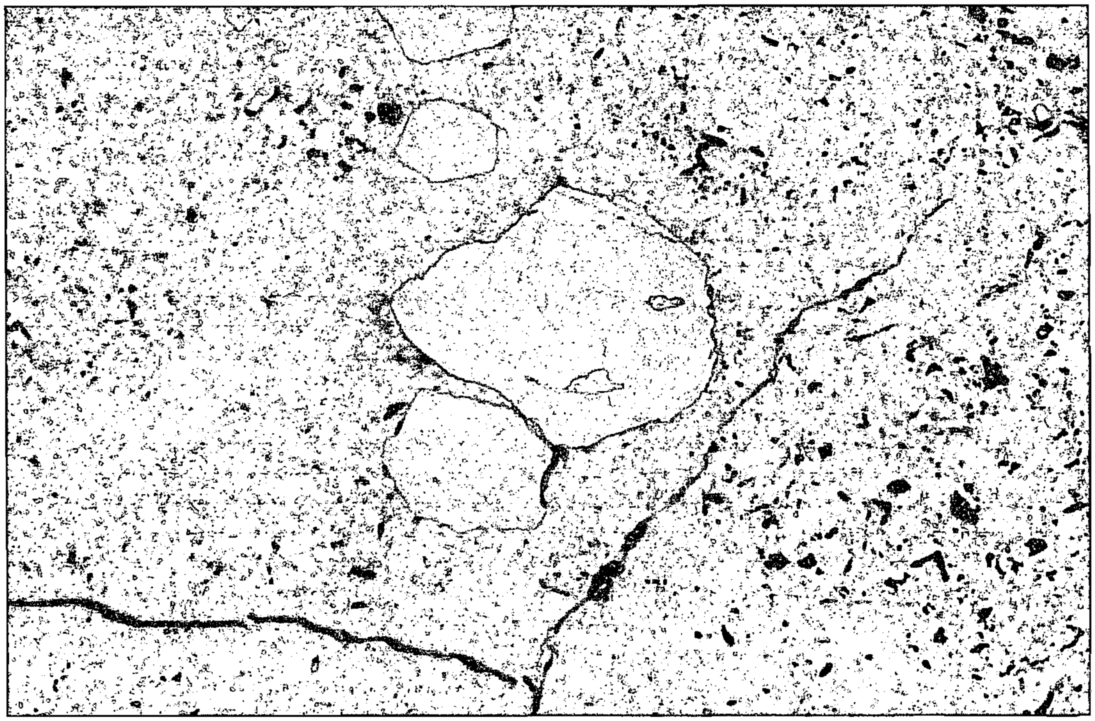

PLATE 43 WIN C-3: Coarse grain of pyrite, central, with an attenuated tail of cummingtonite-grunerite (dark grey) aligned with the banding defined by fine-grained pyrrhotite and chalcopyrite.

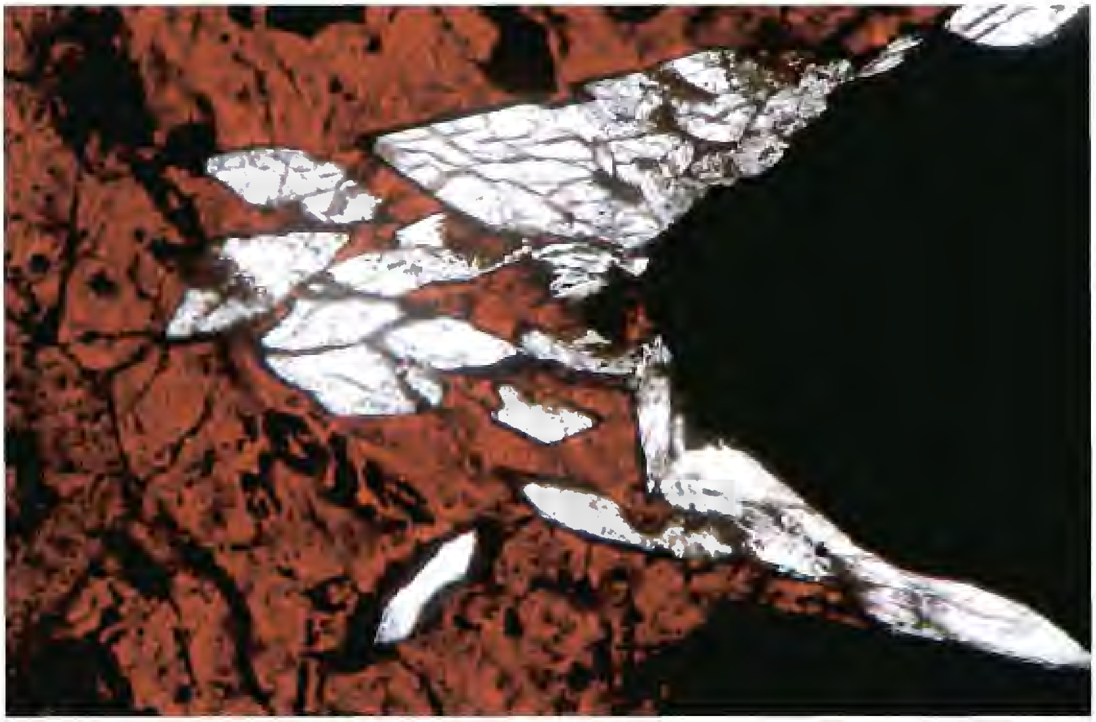

PLATE 44 WIN C-3): Attenuated tail of cummingtonite-grunerite on coarse pyrite in the processs of disaggregation within translucent sphalerite, transmitted light.

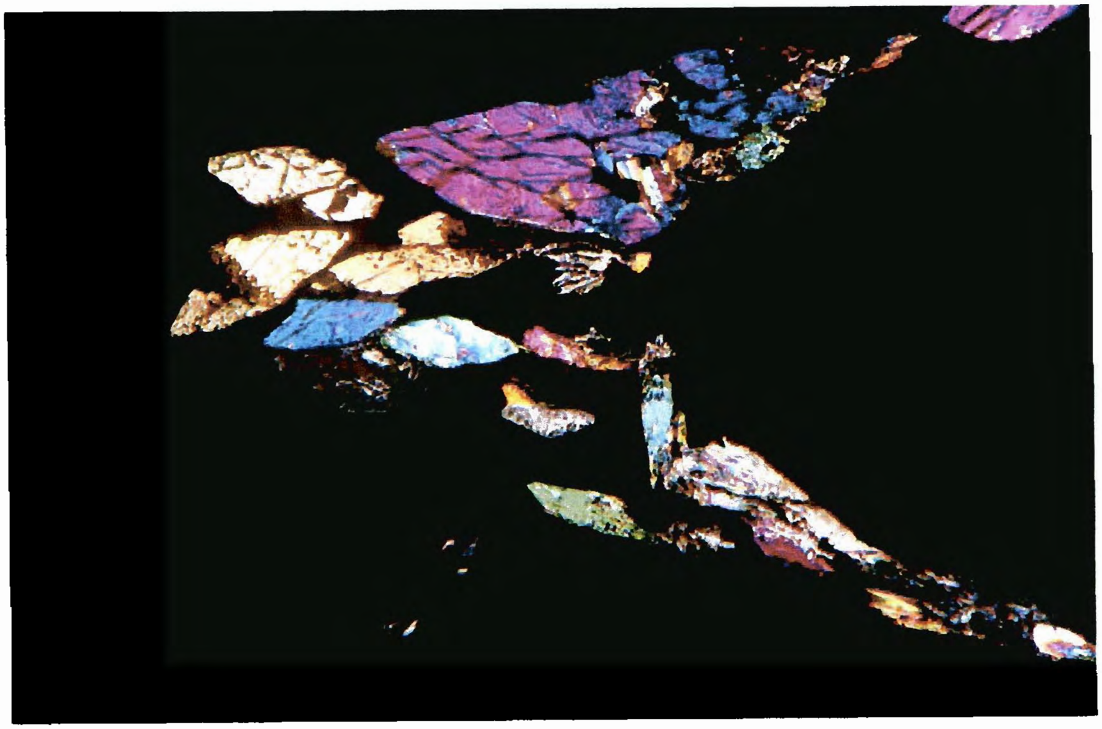

PLATE 45 WIN C-3: Birefringent grains of cummingtonite-grunerite in zone of attenuation or "tail" on a grain of coarse pyrite, same field of view as Plate 44, crossed polars.

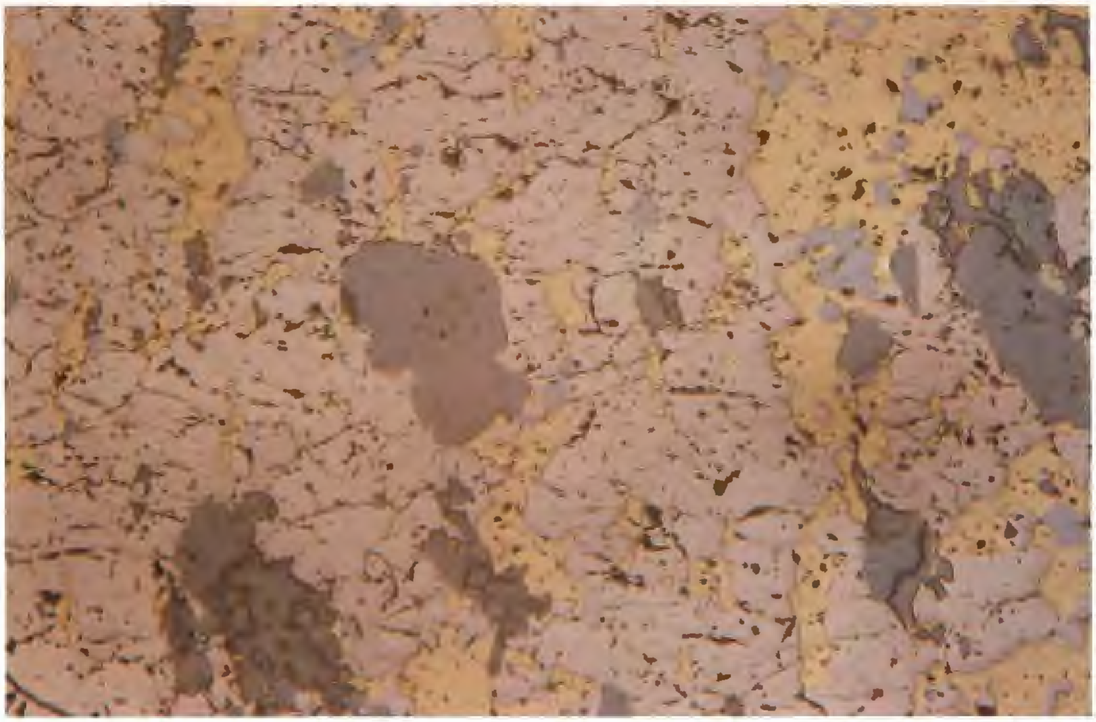

PLATE 46 ZEN C-1: One half of sample consisting of massive pyrrhotite with discontinuous linear stringers of chalcopyrite and 15% ragged linear inclusions of hornblende and hornblende-calcite.

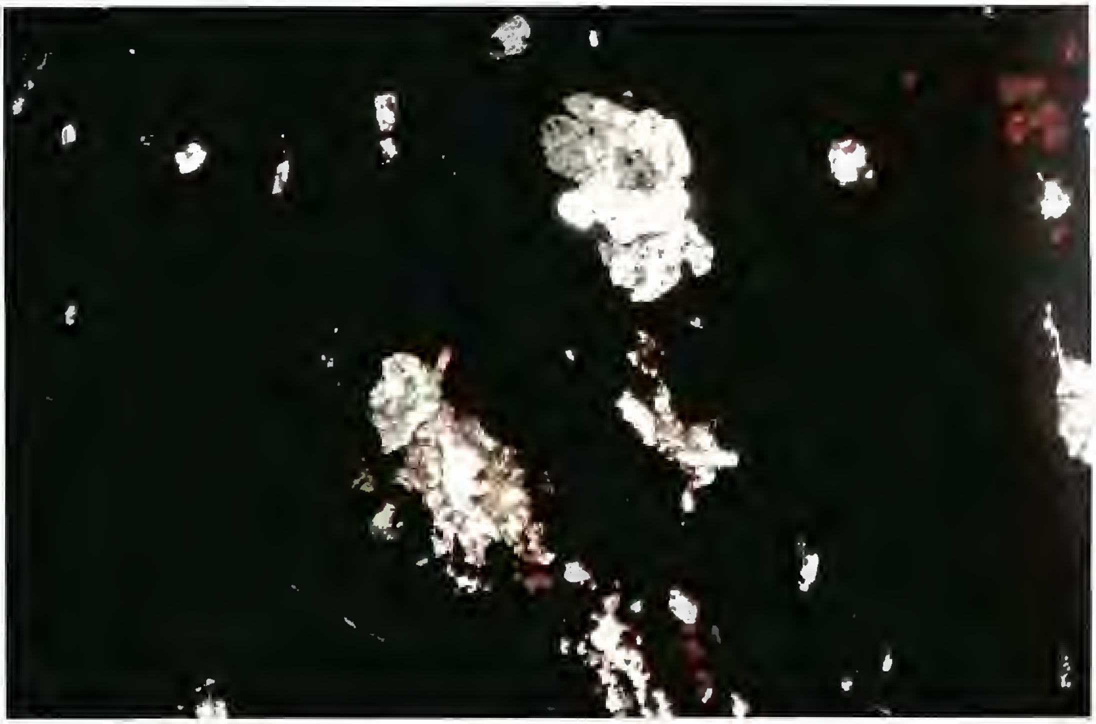

PLATE 47 ZEN C-1: Ragged inclusions with some degree of alignment, grain at top is hornblende with apatite while the lower domain is contains several grains of hornblende included with calcite, same field of view as Plate 46 plane light.

TABLE 2: MICA, ORBBOT INC., PICK L., WINSTON L., ZENITH, Jan. 2009, R.L.B.

	9	10	11	12	13	14	15	16
SIO2	41.67	37.39	40.67	40.26	39.91	34.17	38.49	34.67
TIO2	.59	.51	.58	.54	.62	.48	.49	.49
A203	15.77	14.51	14.76	14.98	15.30	13.67	15.47	14.19
C203	.00	.00	.00	.03	.01	.00	.00	.00
FEO	9.42	16.99	12.91	11.75	10.29	20.89	12.09	20.11
MGO	19.98	16.49	18.47	19.48	20.22	15.14	18.41	15.37
MNO	.00	.10	.00	.02	.04	.32	.03	.23
BAO	.05	.01	.06	.00	.02	.06	.10	.06
CAO	.00	.04	.00	.00	.01	.00	.00	.00
K2O	8.70	8.42	8.46	8.67	8.68	5.84	8.34	6.27
NA2O	.37	.09	.12	.14	.29	.00	.09	.05
F	.89	1.01	1.31	1.15	.95	.79	1.12	.82
CL	.01	.05	.09	.03	.02	.05	.02	.03
SUM	97.45	95.61	97.43	97.05	96.36	91.41	94.65	92.29
-0= F+CL	.38	.44	.57	.49	.40	.34	.48	.35
SUM	97.07	95.17	96.86	96.56	95.96	91.07	94.17	91.94

	9		10		11		12		13		14		15		16	
SI	5.835	*	5.587	*	5.798	*	5.742	*	5.703	*	5.424	*	5.650	*	5.429	*
AL	2.165	8.000	2.413	8.000	2.202	8.000	2.258	8.000	2.297	8.000	2.557	7.982	2.350	8.000	2.571	8.000
AL	.437	*	.142	*	.277	*	.260	*	.280	*	.000	*	.325	*	.048	*
TI	.062	*	.057	*	.062	*	.058	*	.067	*	.057	*	.054	*	.058	*
CR	.000	*	.000	*	.000	*	.003	*	.001	*	.000	*	.000	*	.000	*
FE	1.103	*	2.123	*	1.539	*	1.402	*	1.230	*	2.773	*	1.484	*	2.634	*
MG	4.170	*	3.673	*	3.925	*	4.141	*	4.307	*	3.582	*	4.028	*	3.588	*
MN	.000	5.772	.013	6.008	.000	5.803	.002	5.866	.005	5.889	.043	6.456	.004	5.895	.031	6.357
CA	.000	*	.006	*	.000	*	.000	*	.002	*	.000	*	.000	*	.000	*
BA	.003	*	.001	*	.003	*	.000	*	.001	*	.004	*	.006	*	.004	*
K	1.554	*	1.605	*	1.538	*	1.577	*	1.582	*	1.182	*	1.561	*	1.252	*
NA	.100	1.657	.026	1.638	.033	1.575	.039	1.616	.080	1.665	.000	1.186	.026	1.593	.015	1.271
F	.394	*	.477	*	.591	*	.519	*	.429	*	.397	*	.520	*	.406	*
CL	.002	*	.013	*	.022	*	.007	*	.005	*	.013	*	.005	*	.008	*
O	22.000	*	22.000	*	22.000	*	22.000	*	22.000	*	22.000	*	22.000	*	22.000	*
FE		20.92		36.63		28.17		25.29		22.21		43.64		26.93		42.33
MG		79.08		63.37		71.83		74.71		77.79		56.36		73.07		57.67
F/M		.265		.582		.392		.339		.287		.786		.369		.743
F/FM		.209		.368		.282		.253		.223		.440		.270		.426

9 PICK LAKE A, DARK CENTRAL AGAIN, C-6
10 PICK LAKE A, BRIGHT MARG ZONE, INT W CUMM-GRUN, C-5
11 PICK LAKE A, DARK RELICT CENTRAL IN CHL, C-5
12 PICK LAKE A, COARSE PLATE, C-6
13 PICK LAKE A, DARK CENTRAL, C-6
14 PICK LAKE A, BRIGHT MARGINAL ZONE, PARTLY CHLORITIZED, C-6
15 PICK LAKE A, ZONED MICA, DARK CENTRAL, C-7
16 PICK LAKE A, BRIGHT MARGINAL ZONE, C-7 2-6-206

TABLE 2: MICA, OREBOT INC., PICK L., WINSTON L., ZENITH, Jan. 2009, R.L.B.

	41	42
SIO2	39.17	38.93
TIO2	.62	.49
A2O3	16.30	15.38
C2O3	.02	.00
FEO	9.79	10.95
MGO	19.70	19.22
MNO	.04	.03
BAO	.07	.05
CAO	.00	.00
K2O	8.30	9.51
NA2O	.98	.67
F	.93	.88
CL	.06	.08
SUM	95.98	96.19
-O= F+CL	.41	.39
SUM	95.57	95.80

SI	5.614	*	5.641	*
AL	2.386	8.000	2.359	8.000
AL	.367	*	.268	*
TI	.067	*	.053	*
CR	.002	*	.000	*
FE	1.173	*	1.327	*
MG	4.208	*	4.151	*
MN	.005	5.823	.004	5.803
CA	.000	*	.000	*
BA	.004	*	.003	*
K	1.517	*	1.758	*
NA	.272	1.794	.188	1.949
F	.422	*	.403	*
CL	.015	*	.020	*
O	22.000	*	22.000	*

FE	21.80	24.22
MG	78.20	75.78
F/M	.280	.321
F/FM	.219	.243

41 WINSTON LAKE, INT W NA-CA AMPH, C-5
42 WINSTON LAKE, LATH IN SPHAL

TABLE 3: SPHALERITE, ORBOT, PICK LAKE, WINSTON LAKE, ZENITH, Jan. 10 2009, R.L.B.

	ZN	S	FE	MN	CU	IN	CD	HG	AS	TOTAL
****** PICK LAKE A, C-3	58.88	33.31	7.59	.05	.00	.03	.13	.00	.00	99.98
PICK LAKE A, IN C W MICA, C-3	60.31	33.04	7.27	.04	.01	.00	.16	.00	.00	100.82
PICK LAKE A, RANDOM	59.76	32.70	7.26	.05	.01	.01	.16	.00	.00	99.94
PICK LAKE A, RANDOM	59.34	33.75	7.50	.05	.04	.01	.13	.00	.00	100.83
PICK LAKE A, RANDOM	60.05	33.42	7.28	.05	.02	.00	.12	.00	.00	100.95
PICK LAKE A, RANDOM	59.78	33.75	7.22	.03	.02	.00	.11	.00	.00	100.91
PICK LAKE A, RANDOM	60.16	33.35	7.18	.03	.04	.02	.08	.00	.00	100.88
PICK LAKE A, RANDOM	59.83	33.44	7.24	.05	.04	.00	.15	.00	.00	100.75
PICK LAKE A, RANDOM	60.28	32.52	7.32	.04	.37	.00	.10	.00	.00	100.63
PICK LAKE A, RANDOM	59.23	33.98	7.24	.05	.07	.00	.13	.00	.00	100.70
PICK LAKE A, RANDOM	59.29	33.15	7.13	.04	.08	.01	.15	.00	.00	99.85
PICK LAKE A, RANDOM	59.10	33.02	7.09	.01	.04	.00	.14	.00	.00	99.41
PICK LAKE A, RANDOM	59.85	33.69	7.06	.05	.02	.01	.11	.00	.00	100.80
PICK LAKE A, RANDOM	59.75	32.95	7.09	.06	.07	.01	.12	.00	.00	100.06
PICK LAKE A-1, F SPHAL INT W PO, CP, C-2	59.00	34.59	6.84	.05	.01	.00	.13	.00	.00	100.61
PICK LAKE A-1, F SPHAL INT W PO, CP, C-2	57.86	33.75	7.00	.03	.00	.00	.09	.00	.00	98.73
PICK LAKE A-1, F SPHAL INT W PO, CP, C-2	57.99	33.37	6.96	.01	.05	.00	.16	.00	.00	98.55
PICK LAKE A-1, F SPHAL INT W PO, CP, C-2	58.96	32.63	6.66	.03	.03	.00	.11	.00	.00	98.42
PICK LAKE A-1, F SPHAL INT W PO, CP, C-2	58.69	32.88	6.60	.05	.01	.00	.15	.00	.00	98.39
PICK LAKE A-1, F GR SPHAL W PO, AS HOST, C-2	58.01	33.41	6.87	.03	.04	.01	.14	.00	.00	98.52
PICK LAKE A-1, F GR SPHAL W PO, AS HOST, C-2	59.91	33.62	6.96	.03	.00	.01	.15	.00	.00	100.68
PICK LAKE A-1, F GR SPHAL W PO, AS HOST, C-2	60.03	33.00	7.03	.03	.00	.01	.11	.00	.00	100.20
PICK LAKE A-1, F GR SPHAL W PO, AS HOST, C-2	59.38	32.86	6.61	.05	.01	.03	.15	.00	.00	99.09

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PICK LAKE A-1, F GR SPHAL W PO, AS HOST, C-2
  59.71  33.85   6.73    .03    .03    .01    .14    .00    .00 100.50
PICK LAKE A-1, F GR SPHAL W PO, AS HOST, C-2
  59.44  33.66   6.86    .05    .01    .01    .14    .00    .00 100.17
PICK LAKE A-1,  SPHAL WITHIN PYRITE CENTRAL, C-2
  58.82  34.32   7.19    .04    .02    .01    .14    .00    .00 100.53
PICK LAKE A-1,  NEAR MARGIN BALL
  58.77  33.97   7.17    .05    .00    .00    .11    .00    .00 100.07
PICK LAKE A-1,  AT MARGIN BALL W PO, C-2
  58.64  33.94   7.01    .04    .00    .00    .13    .00    .00  99.75
PICK LAKE A-1,  INT W PO NEAR BALL
  59.61  33.65   6.87    .04    .01    .00    .11    .00    .00 100.28
PICK LAKE A-1,  CENTRAL TO PY AGAIN
  59.29  33.62   7.03    .03    .00    .01    .13    .00    .00 100.11
PICK LAKE A-1,  CENTRAL TO PY AGAIN
  58.45  33.18   6.97    .04    .01    .02    .15    .00    .00  98.82
PICK LAKE A-1,  CENTRAL TO PY AGAIN
  58.76  32.70   7.33    .05    .00    .01    .15    .00    .00  99.01
PICK LAKE A-1,  CENTRAL TO PY AGAIN
  58.74  33.60   6.90    .05    .00    .00    .09    .00    .00  99.39
PICK LAKE A-1,  CENTRAL TO PY AGAIN
  59.64  33.95   6.99    .03    .02    .02    .12    .00    .00 100.77
PICK LAKE A-1,  INT W PO
  59.04  33.61   6.74    .05    .01    .02    .15    .00    .00  99.62
PICK LAKE B C-1
  60.02  33.36   6.55    .08    .00    .00    .22    .00    .00 100.23
PICK LAKE B C-1
  59.95  33.28   6.70    .08    .00    .00    .21    .00    .00 100.22
PICK LAKE B RANDOM
  60.27  33.16   6.64    .06    .00    .00    .21    .00    .01 100.34
PICK LAKE B RANDOM
  60.47  32.81   6.52    .09    .00    .00    .21    .00    .00 100.09
PICK LAKE B RANDOM
  59.60  33.61   6.85    .08    .00    .00    .22    .00    .00 100.37
PICK LAKE B RANDOM
  59.96  32.86   6.94    .08    .01    .00    .21    .00    .00 100.06
PICK LAKE B RANDOM
  59.91  31.87   6.58    .07    .00    .00    .20    .00    .00  98.63
PICK LAKE B RANDOM
  59.78  33.55   6.61    .06    .00    .00    .22    .00    .00 100.22
PICK LAKE B RANDOM
  60.12  32.63   6.48    .07    .00    .00    .19    .00    .00  99.50
PICK LAKE B RANDOM
  59.91  33.37   6.40    .11    .00    .00    .23    .00    .00 100.02
PICK LAKE B RANDOM
  60.26  31.97   6.65    .07    .00    .00    .20    .00    .00  99.16
PICK LAKE B RANDOM
  58.92  33.21   7.11    .08    .25    .00    .19    .00    .00  99.76
PICK LAKE B RANDOM
  59.18  33.13   7.07    .08    .10    .00    .19    .00    .00  99.74
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PICK LAKE B RANDOM
  60.50  33.23   6.63    .11    .01    .00    .19    .00    .00 100.67
PICK LAKE B RANDOM
  61.09  32.09   6.24    .06    .00    .00    .14    .00    .00  99.62
PICK LAKE B RANDOM
  60.77  32.94   6.75    .07    .00    .00    .19    .00    .00 100.72
*****WINSTON LAKE RANDOM
  59.05  32.88   7.99    .12    .01    .00    .11    .00    .00 100.15
WINSTON LAKE RANDOM
  57.77  32.85   8.45    .10    .00    .00    .12    .00    .00  99.28
WINSTON LAKE RANDOM
  58.71  34.14   8.61    .10    .00    .00    .13    .00    .00 101.70
WINSTON LAKE RANDOM
  57.99  33.38   8.58    .11    .02    .00    .11    .00    .00 100.18
WINSTON LAKE RANDOM
  58.41  33.25   8.13    .09    .00    .00    .13    .00    .00 100.02
WINSTON LAKE RANDOM
  58.53  33.70   8.13    .08    .00    .00    .12    .00    .00 100.56
WINSTON LAKE RANDOM
  59.50  32.74   7.37    .14    .00    .00    .14    .00    .00  99.89
WINSTON LAKE RANDOM
  60.34  32.90   7.51    .10    .01    .00    .11    .00    .00 100.98
WINSTON LAKE RANDOM
  59.53  33.17   7.53    .09    .02    .00    .16    .00    .00 100.51
WINSTON LAKE RANDOM
  58.20  33.87   8.44    .11    .01    .00    .13    .00    .00 100.76
WINSTON LAKE RANDOM
  59.70  32.76   7.33    .09    .00    .00    .14    .00    .00 100.02
WINSTON LAKE RANDOM
  58.65  33.69   8.13    .09    .00    .00    .11    .00    .00 100.68
WINSTON LAKE RANDOM
  59.27  32.89   7.42    .10    .00    .00    .12    .00    .00  99.81
WINSTON LAKE RANDOM
  58.73  32.50   7.78    .12    .01    .00    .14    .00    .00  99.27
WINSTON LAKE RANDOM
  59.30  33.73   7.93    .09    .00    .00    .14    .00    .00 101.19
WINSTON LAKE RANDOM
  58.78  32.94   7.94    .08    .00    .01    .12    .00    .00  99.88
WINSTON LAKE RANDOM
  59.62  34.00   7.21    .08    .00    .00    .14    .00    .00 101.05
WINSTON LAKE RANDOM
  59.26  32.52   7.42    .11    .02    .00    .12    .00    .00  99.44
WINSTON LAKE RANDOM
  59.59  33.59   7.05    .09    .04    .00    .16    .00    .00 100.53
WINSTON LAKE RANDOM
  59.47  32.79   7.07    .10    .00    .00    .16    .00    .00  99.59
WINSTON LAKE RANDOM
  59.64  33.19   7.23    .09    .01    .01    .15    .00    .00 100.33
WINSTON LAKE RANDOM
  59.37  32.96   6.86    .13    .00    .00    .14    .00    .00  99.46
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WINSTON LAKE RANDOM
  59.36  33.81   7.16    .08    .00    .00    .15    .00    .00 100.55
WINSTON LAKE RANDOM
  57.54  33.00   8.12    .11    .00    .00    .15    .00    .00  98.92
WINSTON LAKE RANDOM
  58.41  33.57   8.15    .09    .00    .00    .14    .00    .00 100.36
*****ZENITH RANDOM
  59.35  32.97   7.87    .04    .01    .00    .17    .00    .00 100.41
ZENITH RANDOM
  59.80  32.48   7.68    .02    .07    .00    .13    .00    .00 100.18
ZENITH RANDOM
  60.12  32.82   7.89    .02    .00    .00    .15    .00    .00 100.99
ZENITH RANDOM
  59.09  32.37   7.90    .03    .00    .00    .10    .00    .00  99.49
ZENITH RANDOM
  59.45  33.22   7.70    .05    .00    .00    .15    .00    .00 100.56
ZENITH RANDOM
  59.11  33.12   7.63    .03    .00    .00    .15    .00    .00 100.05
ZENITH RANDOM
  59.78  33.81   7.70    .04    .02    .00    .17    .00    .00 101.51
ZENITH RANDOM
  59.23  33.32   7.59    .02    .02    .00    .17    .00    .00 100.34
ZENITH RANDOM
  60.04  33.77   7.41    .03    .00    .00    .14    .00    .00 101.39
ZENITH RANDOM
  59.83  32.94   7.40    .04    .02    .00    .15    .00    .00 100.39
ZENITH RANDOM
  59.90  33.52   7.59    .04    .00    .00    .14    .00    .00 101.19
ZENITH RANDOM
  59.36  33.31   7.73    .03    .01    .00    .18    .00    .00 100.62
ZENITH RANDOM
  59.63  32.93   7.52    .04    .03    .00    .14    .00    .00 100.30
ZENITH RANDOM
  59.79  33.08   7.50    .02    .07    .00    .15    .00    .00 100.62
ZENITH RANDOM
  59.43  32.52   7.22    .03    .07    .00    .14    .00    .00  99.41
ZENITH RANDOM
  60.05  33.36   7.39    .04    .03    .00    .17    .00    .00 101.04
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Appendix B

Innov-X X-50 Data Output (minor editing)

Innov-X X-50 Data Output (minor editing)

Date	Reading	Sample_ID	Mode	LiveTime	LE	LE +/-	Ti	Ti +/-	Mn	Mn +/-	Fe	Fe +/-	Co	Co +/-	Ni	Ni +/-	Cu	Cu +/-	Zn	Zn +/-	Zr	Zr +/-	Nb	Nb +/-	Mo	Mo +/-	Hf	Hf +/-	Pb	Pb +/-	U	U +/-
27-May-10	7	P129	Process An	31.21	93.725	0.0618	0.7281	0.0797	ND		5.4281	0.0387	0.0616	0.0101	ND		ND		0.0182	0.0015	0.035	0.0006	0.0041	0.0003	ND		ND		ND		ND	
27-May-10	8	P129	Process An	31.76	93.1455	0.0686	0.8573	0.0832	ND		5.8734	0.0406	0.0654	0.0105	ND		ND		0.0187	0.0016	0.0352	0.0006	0.0044	0.0003	ND		ND		ND		ND	
27-May-10	14	P181	Process An	47.98	91.128	0.0817	0.7733	0.0753	0.0912	0.0125	7.9016	0.043	0.0643	0.011	ND		ND		ND		0.0313	0.0005	ND		ND		ND		ND		0.0102	0.0007
27-May-10	15	P199	Process An	30.36	94.2102	0.0574	0.4956	0.0708	0.0456	0.0113	5.2089	0.038	ND		ND		ND		0.0127	0.0014	0.0215	0.0004	ND		ND		ND		ND		0.0055	0.0006
27-May-10	16	P199	Process An	30.23	94.1487	0.0586	0.5014	0.0721	0.0626	0.0122	5.2545	0.0386	ND		ND		ND		0.011	0.0014	0.0219	0.0005	ND		ND		ND		ND		ND	
27-May-10	17	P252	Process An	25.16	98.3839	0.0182	0.6291	0.0815	ND		0.9326	0.018	ND		ND		ND		ND		0.0497	0.0006	0.0047	0.0003	ND		ND		ND		ND	
27-May-10	18	P252	Process An	25.36	98.4598	0.0174	0.5782	0.0793	ND		0.9093	0.0178	ND		ND		ND		ND		0.0483	0.0006	0.0044	0.0003	ND		ND		ND		ND	
27-May-10	19	P234	Process An	28.86	95.7437	0.044	0.4436	0.0693	0.0425	0.0112	3.7388	0.0335	ND		ND		ND		ND		0.0264	0.0005	ND		ND		ND		ND		0.0049	0.0005
27-May-10	20	P234	Process An	28.71	95.7347	0.0446	0.3676	0.07	0.0434	0.0113	3.8219	0.0342	ND		ND		ND		ND		0.0265	0.0005	ND		ND		ND		ND		0.006	0.0006
27-May-10	21	P126	Process An	29.61	94.8793	0.0529	0.4921	0.0717	ND		4.5876	0.037	ND		ND		ND		0.0122	0.0014	0.0287	0.0005	ND		ND		ND		ND		ND	
27-May-10	22	P202	Process An	34.41	91.2017	0.0853	0.8492	0.0813	ND		7.9283	0.0456	ND		ND		ND		ND		0.0208	0.0005	ND		ND		ND		ND		ND	
27-May-10	23	P202	Process An	34.47	90.8327	0.0905	0.9708	0.0846	ND		8.1738	0.047	ND		ND		ND		ND		0.0227	0.0005	ND		ND		ND		ND		ND	
27-May-10	25	P217	Process An	30.98	95.6119	0.0459	0.6967	0.08	0.0449	0.012	3.5959	0.0332	ND		ND		ND		0.0179	0.0016	0.0303	0.0005	0.0024	0.0003	ND		ND		ND		ND	
27-May-10	26	P217	Process An	30.81	95.6714	0.0454	0.6785	0.0811	ND		3.6029	0.0331	ND		ND		ND		0.0163	0.0015	0.031	0.0005	ND		ND		ND		ND		ND	
27-May-10	27	P235	Process An	27.27	96.918	0.0325	0.39	0.0676	ND		2.6302	0.0283	ND		ND		ND		0.0122	0.0013	0.0438	0.0006	0.0058	0.0004	ND		ND		ND		ND	
27-May-10	28	P235	Process An	27.32	96.8971	0.0323	0.4285	0.0649	ND		2.6165	0.0281	ND		ND		ND		0.0113	0.0013	0.0415	0.0006	0.005	0.0003	ND		ND		ND		ND	
27-May-10	29	P218	Process An	31.48	93.0036	0.0696	0.736	0.0776	ND		6.2047	0.0416	ND		ND		ND		0.0278	0.0019	0.0224	0.0005	ND		ND		ND		ND		0.0054	0.0006
27-May-10	30	P218	Process An	31.8	93.0604	0.0689	0.6265	0.0764	ND		6.2579	0.0417	ND		ND		ND		0.0264	0.0018	0.0222	0.0005	ND		ND		ND		ND		0.0065	0.0006
27-May-10	33	P198	Process An	30.35	93.0925	0.0671	0.6313	0.0726	0.038	0.0119	6.2045	0.0407	ND		ND		ND		0.0141	0.0015	0.0196	0.0004	ND		ND		ND		ND		ND	
27-May-10	34	P201	Process An	29.12	94.6014	0.053	0.5184	0.0694	ND		4.8444	0.0364	ND		ND		ND		0.0134	0.0013	0.0223	0.0004	ND		ND		ND		ND		ND	
27-May-10	35	P200	Process An	51.16	98.4605	0.0252	0.3822	0.0983	ND		1.1406	0.0279	ND		ND		ND		ND		0.0168	0.0006	ND		ND		ND		ND		ND	
27-May-10	39	P61	Process An	31.08	95.1939	0.049	0.5173	0.0731	0.0461	0.0112	4.1653	0.0349	ND		ND		ND		0.0272	0.0019	0.0464	0.0006	0.0039	0.0003	ND		ND		ND		ND	
27-May-10	40	P61	Process An	30.26	95.2366	0.0494	0.4703	0.0712	0.0411	0.012	4.1735	0.0354	ND		ND		ND		0.0293	0.0019	0.046	0.0006	0.0033	0.0003	ND		ND		ND		ND	
27-May-10	41	P82	Process An	50.71	98.7336	0.0195	0.356	0.0929	ND		0.8678	0.0233	ND		ND		ND		ND		0.038	0.0008	0.0045	0.0005	ND		ND		ND		ND	
27-May-10	42	P78	Process An	32.92	95.9187	0.041	1.2146	0.0945	0.0576	0.0127	2.7599	0.028	ND		ND		ND		0.0092	0.0012	0.0375	0.0005	0.0026	0.0003	ND		ND		ND		ND	
27-May-10	43	P78	Process An	32.88	95.8809	0.0416	1.2457	0.0951	0.0567	0.0126	2.7624	0.0281	ND		ND		ND		0.0131	0.0013	0.039	0.0006	0.0023	0.0003	ND		ND		ND		ND	
27-May-10	44	P76	Process An	32.62	96.6005	0.035	0.5559	0.0747	0.0612	0.0115	2.7333	0.0284	ND		ND		ND		0.0092	0.0012	0.0339	0.0005	ND		ND		ND		ND		0.0059	0.0005
27-May-10	45	P76	Process An	32.03	96.6623	0.0344	0.523	0.0729	0.059	0.0118	2.7174	0.0283	ND		ND		ND		ND		0.0329	0.0005	ND		ND		ND		ND		0.0053	0.0005
29-May-10	3	P95	Process An	29.02	98.0684	0.021	0.5598	0.0762	ND		1.3143	0.0206	ND		ND		ND		ND		0.0532	0.0007	0.0043	0.0003	ND		ND		ND		ND	
29-May-10	4	P95	Process An	28.73	98.0192	0.022	0.5821	0.0773	ND		1.3411	0.0212	ND		ND		ND		ND		0.0527	0.0007	0.0049	0.0003	ND		ND		ND		ND	
29-May-10	5	P301	Process An	29.47	93.7899	0.0604	0.4616	0.0673	ND		5.6983	0.0391	ND		ND		0.0119	0.0021	0.0122	0.0014	0.0262	0.0005	ND		ND		ND		ND		ND	
29-May-10	6	P301	Process An	30.19	93.8937	0.0578	0.3923	0.0635	ND		5.6723	0.0381	ND		ND		ND		0.0133	0.0013	0.0261	0.0005	0.0023	0.0003	ND		ND		ND		ND	
29-May-10	7	P282	Process An	30.8	93.4812	0.0644	0.5029	0.0704	0.0451	0.012	5.9366	0.0404	ND		0.01	0.002	ND		ND		0.019	0.0004	ND		ND		ND		ND		0.0052	0.0005
29-May-10	8	P282	Process An	31.03	93.4078	0.0655	0.519	0.0723	0.058	0.0124	5.9867	0.0408	ND		0.0093	0.002	ND		ND		0.0192	0.0004	ND		ND		ND		ND		ND	
29-May-10	9	P269	Process An	31.24	95.9431	0.0411	0.445	0.0683	ND		3.59	0.0321	ND		ND		ND		ND		0.0219	0.0004	ND		ND		ND		ND		ND	
29-May-10	10	P265	Process An	31.27	93.0314	0.0678	0.4035	0.0665	ND		6.544	0.0418	ND		ND		ND		ND		0.0211	0.0004	ND		ND		ND		ND		ND	
29-May-10	11	P265	Process An	33.84	93.1683	0.0645	0.544	0.0706	ND		6.2535	0.0398	ND		ND		ND		0.0118	0.0013	0.0224	0.0004	ND		ND		ND		ND		ND	
29-May-10	12	P284	Process An	34.07	93.2727	0.0636	0.505	0.0673	ND		6.1898	0.0396	ND		ND		ND		0.0111	0.0013	0.0215	0.0004	ND		ND		ND		ND		ND	
29-May-10	13	P284	Process An	32.38	92.8633	0.0676	0.5812	0.0705	ND		6.5315	0.0409	ND		ND		ND		ND		0.0241	0.0005	ND		ND		ND		ND		ND	
29-May-10	18	P75	Process An	51.08	95.4563	0.0601	0.4855	0.0899	0.0525	0.0152	3.9629	0.0433	ND		ND		ND		0.0276	0.0024	0.0152	0.0005	ND		ND		ND		ND		ND	
29-May-10	19	P75	Process An	51.22	95.4967	0.0594	0.4272	0.085	0.0624	0.0152	3.9675	0.0432	ND		0.0073	0.0022	ND		0.0239	0.0023	0.0151	0.0005	ND		ND		ND		ND		ND	
29-May-10	20	P77	Process An	33.49	94.462	0.0556	0.5888	0.0741	ND		4.8951	0.0372	ND		ND		ND		0.0145	0.0015	0.0313	0.0005	0.0023	0.0003	ND		ND		ND		0.0059	0.0006
29-May-10	21	P77	Process An	33.22	94.48	0.0557	0.5381	0.074	ND		4.9333	0.0376	ND		ND		ND		0.0114	0.0014	0.0314	0.0005	ND		ND		ND		ND		0.0058	0.0006
29-May-10	22	P60	Process An	47.78	90.7421	0.0797	1.1615	0.0823	0.1021	0.0125	7.9229	0.0404	ND		ND		ND		0.02	0.0015	0.037	0.0005	0.0043	0.0003	ND		0.01	0.0022	ND		ND	
29-May-10	23	P110	Process An	29.21	95.3942	0.0473	0.5361	0.0732	ND		4.0206	0.0345	ND		0.0073	0.0019	ND		0.0144	0.0015	0.0274	0.0005	ND		ND		ND		ND		ND	
29-May-10	24	P94	Process An	28.47	94.7441	0.0524	0.5473	0.0717	ND		4.6576	0.0361	ND		0.0062	0.0017	ND		0.0172	0.0015	0.0277	0.0005	ND		ND		ND		ND		ND	
29-May-10	25	P92	Process An	32.74	95.2451	0.0482	0.6781	0.0774	0.0428	0.0112	3.9928	0.0341	ND		ND		ND		0.0094	0.0012	0.0317	0.0005	ND		ND		ND		ND		ND	
29-May-10	26	P92	Process An	32.37	95.3322	0.0475	0.652	0.0765	ND		3.9744	0.0339	ND		0.0055	0.0017	ND		ND		0.0311	0.0005	ND		ND		ND		ND		0.0048	0.0005
29-May-10	27	P93	Process An	51.11	96.3562	0.0505	0.2994	0.0817	ND		3.3332	0.0413	ND		ND		ND		ND		0.0112	0.0005	ND		ND		ND		ND		ND	
29-May-10	28	P93	Process An	51.27	96.2974	0.0505	0.3317	0.0824	ND		3.3591	0.0409	ND		ND		ND		ND		0.0118	0.0005	ND		ND		ND		ND		ND	
29-May-10	29	P58	Process An	32.29	95.6889	0.0438	0.4188	0.0686	ND		3.8355	0.0332	ND		0.0127	0.002	ND		0.0179	0.0015	0.0262	0.0005	ND		ND		ND		ND		ND	
29-May-10	30	P58	Process An	32.97	95.5472	0.0453	0.5051	0.0703	ND		3.8823	0.0334	ND		0.013	0.0021	ND		0.0202	0.0016	0.0269	0.0005	ND		ND		ND		ND		0.0053	0.0005
29-May-10	33	P47	Process An	28.6	96.3599	0.0382	0.4341	0.0727	0.0384	0.0117	3.117	0.0309	ND		ND		ND		0.0145	0.0015	0.0337	0.0005	0.0024	0.0003	ND		ND		ND		ND	
29-May-10	34	P131	Process An	31.68	94.5255	0.0554	0.6233	0.0752	ND		4.7905	0.0372	ND		ND		ND		0.016	0.0015	0.0423	0.0006	0.0025	0.0003	ND		ND		ND		ND	
29-May-10	35	P131	Process An	32.57	94.6221	0.0535	0.5431	0.0748	0.0412	0.0118	4.7332	0.0363	ND		ND		ND		0.0142	0.0015	0.0431	0.0006	0.0031	0.0003	ND		ND		ND		ND	
29-May-10	36	P100	Process An	32.14	95.183	0.0472	0.3957	0.0654	ND		4.3684	0.0343	ND		ND		ND		0.0117	0.0013	0.0369	0.0005	0.0042	0.0003	ND		ND		ND		ND	
29-May-10	37	P99	Process An	36.8	87.2603	0.119	0.7007	0.0723	ND		12.0165	0.0523	ND		ND		ND		ND		0.0192	0.0004	0.0033	0.0003	ND		ND		ND		ND	
29-May-10	38	P99	Process An	36.28	87.3863	0.1169	0.7102	0.074	ND		11.8638	0.0518	ND		0.007	0.0022	ND		ND		0.0185	0.0004	0.0027	0.0003	ND		0.0115	0.0024	ND		ND	

Innov-X X-50 Data Output (minor editing)

Date	Reading	Sample_ID	Mode	LiveTime	LE	LE +/-	Ti	Ti +/-	Mn	Mn +/-	Fe	Fe +/-	Co	Co +/-	Ni	Ni +/-	Cu	Cu +/-	Zn	Zn +/-	Zr	Zr +/-	Nb	Nb +/-	Mo	Mo +/-	Hf	Hf +/-	Pb	Pb +/-	U	U +/-
29-May-10	39	P45	Process An	32.63	95.2305	0.0486	0.7427	0.08	0.0805	0.0128	3.8945	0.0337	ND		ND		ND		0.0094	0.0013	0.0397	0.0006	0.0026	0.0003	ND		ND		ND		ND	
29-May-10	40	P64	Process An	29.42	95.6386	0.0455	0.4899	0.0714	ND		3.8249	0.034	ND		ND		ND		0.0132	0.0014	0.0284	0.0005	ND		ND		ND		ND		0.005	0.0005
29-May-10	41	P114	Process An	31.29	93.7228	0.0596	0.333	0.0628	0.0514	0.0111	5.8233	0.0387	ND		0.0072	0.0019	ND		0.031	0.0018	0.0288	0.0005	0.0025	0.0003	ND		ND		ND		ND	
29-May-10	42	P114	Process An	30.71	93.4742	0.0632	0.375	0.0652	0.0386	0.0109	6.0494	0.0402	ND		ND		ND		0.0295	0.0018	0.0302	0.0005	0.0029	0.0003	ND		ND		ND		ND	
29-May-10	43	P80	Process An	29.74	95.2034	0.0485	0.3755	0.0658	ND		4.361	0.0353	ND		ND		ND		0.0291	0.0018	0.0281	0.0005	0.0029	0.0003	ND		ND		ND		ND	
29-May-10	44	P80	Process An	29.24	95.1882	0.0487	0.3485	0.0663	0.0422	0.011	4.3629	0.0355	ND		ND		ND		0.0275	0.0018	0.028	0.0005	0.0027	0.0003	ND		ND		ND		ND	
29-May-10	48	P101	Process An	33.44	95.5237	0.0458	0.4304	0.0695	0.0489	0.0114	3.9459	0.034	ND		0.0062	0.0018	ND		0.0125	0.0014	0.0275	0.0005	ND		ND		ND		ND		0.0048	0.0005
29-May-10	49	P97	Process An	33.52	93.4875	0.0631	0.5672	0.0713	ND		5.8771	0.0394	ND		0.0079	0.0019	ND		0.0253	0.0017	0.0326	0.0005	0.0022	0.0003	ND		ND		ND		ND	
29-May-10	50	P97	Process An	32.49	93.3274	0.0665	0.6293	0.0733	ND		5.9696	0.0407	ND		0.009	0.002	ND		0.0276	0.0018	0.0331	0.0005	0.004	0.0003	ND		ND		ND		ND	
29-May-10	51	P46	Process An	50.76	98.8547	0.0166	0.3286	0.0826	ND		0.791	0.0211	ND		ND		ND		ND		0.0257	0.0006	ND		ND		ND		ND		ND	
29-May-10	53	P116	Process An	32.85	94.591	0.0529	0.7854	0.0806	ND		4.5654	0.035	ND		0.0125	0.002	ND		0.0149	0.0014	0.0309	0.0005	ND		ND		ND		ND		ND	
29-May-10	54	P116	Process An	31.47	94.4651	0.0554	0.8151	0.0819	ND		4.6591	0.0363	ND		0.0144	0.0021	ND		0.0126	0.0014	0.0312	0.0005	0.0024	0.0003	ND		ND		ND		ND	
03-Jun-10	3	P63	Process An	32.66	92.4789	0.0689	0.5005	0.0654	0.0367	0.0111	6.9493	0.0406	ND		ND		ND		0.0099	0.0012	0.0215	0.0004	0.0031	0.0003	ND		ND		ND		ND	
03-Jun-10	4	P115	Process An	33.43	93.1549	0.0674	0.6562	0.0757	0.055	0.0124	6.0872	0.0407	ND		ND		ND		0.0115	0.0014	0.0272	0.0005	0.003	0.0003	ND		ND		ND		0.0051	0.0005
03-Jun-10	5	P118	Process An	33.94	94.7176	0.0509	0.5321	0.0712	ND		4.714	0.0352	ND		ND		ND		0.012	0.0013	0.0243	0.0005	ND		ND		ND		ND		ND	
03-Jun-10	6	P118	Process An	34.04	94.665	0.051	0.6409	0.0721	ND		4.6595	0.0348	ND		ND		ND		0.0109	0.0013	0.0237	0.0004	ND		ND		ND		ND		ND	
03-Jun-10	7	P132	Process An	30.42	97.6012	0.0247	0.447	0.0656	ND		1.9123	0.0236	ND		ND		ND		ND		0.035	0.0005	0.0045	0.0003	ND		ND		ND		ND	
03-Jun-10	8	P132	Process An	30.09	97.5524	0.0255	0.4718	0.068	ND		1.9343	0.0239	ND		ND		ND		ND		0.0371	0.0005	0.0045	0.0003	ND		ND		ND		ND	
03-Jun-10	10	P134	Process An	33.77	92.907	0.0669	0.4919	0.068	0.0397	0.0107	6.5186	0.0407	ND		ND		0.0146	0.0022	0.0088	0.0012	0.0196	0.0004	ND		ND		ND		ND		ND	
03-Jun-10	11	P134	Process An	34.39	93.0908	0.0645	0.4755	0.0646	ND		6.3913	0.0398	ND		ND		0.0143	0.0021	0.0087	0.0012	0.0195	0.0004	ND		ND		ND		ND		ND	
03-Jun-10	12	AEM13	Process An	33.44	95.8188	0.0422	0.4912	0.0696	0.0534	0.0117	3.5989	0.032	ND		ND		ND		ND		0.0312	0.0005	ND		ND		ND		ND		0.0065	0.0006
03-Jun-10	13	P133	Process An	28.87	97.2597	0.0292	0.5834	0.0754	ND		2.1082	0.0256	ND		ND		ND		ND		0.0443	0.0006	0.0044	0.0003	ND		ND		ND		ND	
03-Jun-10	14	P149	Process An	32.25	95.4987	0.0461	0.4777	0.0721	ND		3.986	0.0341	ND		ND		ND		ND		0.0324	0.0005	ND		ND		ND		ND		0.0052	0.0005
03-Jun-10	15	P149	Process An	31.91	95.331	0.0482	0.5465	0.0755	0.0424	0.0118	4.0371	0.0348	ND		0.0084	0.002	ND		ND		0.0321	0.0005	0.0024	0.0003	ND		ND		ND		ND	
03-Jun-10	16	P163	Process An	30.25	94.9526	0.0513	0.4929	0.0719	ND		4.5362	0.0363	ND		ND		ND		ND		0.0183	0.0004	ND		ND		ND		ND		ND	
03-Jun-10	17	P163	Process An	30.58	94.9191	0.0512	0.5167	0.0728	0.0456	0.0117	4.4942	0.0358	ND		ND		ND		ND		0.0184	0.0004	ND		ND		ND		ND		0.0061	0.0006
03-Jun-10	18	P162	Process An	50.74	96.1352	0.0505	0.5985	0.0944	ND		3.2466	0.0387	ND		ND		ND		ND		0.0198	0.0005	ND		ND		ND		ND		ND	
03-Jun-10	19	P162	Process An	50.76	96.1483	0.0509	0.6896	0.0989	ND		3.1411	0.0382	ND		ND		ND		ND		0.0209	0.0005	ND		ND		ND		ND		ND	
03-Jun-10	20	P151	Process An	34.1	90.4575	0.0903	0.6384	0.0705	ND		8.8456	0.0468	ND		0.0106	0.0021	0.0216	0.0025	ND		0.0177	0.0004	ND		0.0035	0.0004	ND		ND		0.0052	0.0006
03-Jun-10	21	P151	Process An	35.07	90.43	0.0891	0.6562	0.0709	ND		8.8614	0.0462	ND		0.0122	0.0022	0.0201	0.0025	ND		0.017	0.0004	ND		0.0031	0.0004	ND		ND		ND	
03-Jun-10	22	P147	Process An	32.19	93.4739	0.065	0.5653	0.0714	ND		5.9023	0.0406	ND		0.0123	0.0022	ND		0.0184	0.0016	0.0278	0.0005	ND		ND		ND		ND		ND	
03-Jun-10	23	P147	Process An	31.81	93.5078	0.0646	0.4961	0.0698	0.0393	0.012	5.8898	0.0405	ND		0.0159	0.0023	ND		0.0197	0.0016	0.0264	0.0005	ND		ND		ND		ND		0.0051	0.0006
03-Jun-10	24	P144	Process An	28.7	97.0749	0.0314	0.6413	0.0788	0.0396	0.0119	2.2121	0.0264	ND		ND		ND		ND		0.0273	0.0005	ND		ND		ND		ND		0.0048	0.0005
03-Jun-10	25	P144	Process An	27.84	97.1383	0.0312	0.6153	0.0801	0.0525	0.0118	2.1603	0.0266	ND		ND		ND		ND		0.0278	0.0005	ND		ND		ND		ND		0.0059	0.0006
03-Jun-10	26	P130	Process An	31.58	94.7915	0.0526	0.53	0.0712	ND		4.6072	0.0362	ND		0.016	0.0023	ND		0.0108	0.0013	0.0369	0.0006	0.0023	0.0003	ND		ND		ND		0.0054	0.0006
03-Jun-10	27	P130	Process An	32.05	94.731	0.0528	0.5685	0.0727	0.0545	0.0119	4.5814	0.036	ND		0.0148	0.0022	ND		0.0103	0.0013	0.0371	0.0006	0.0025	0.0003	ND		ND		ND		ND	
03-Jun-10	28	P146	Process An	33	94.6533	0.0534	0.5527	0.0725	ND		4.7502	0.0365	ND		0.006	0.0018	ND		0.0116	0.0013	0.0201	0.0004	ND		ND		ND		ND		0.0061	0.0006
03-Jun-10	29	P145	Process An	31.78	92.012	0.0756	0.4061	0.0651	ND		7.5645	0.0437	ND		ND		ND		ND		0.0174	0.0004	ND		ND		ND		ND		ND	
03-Jun-10	30	P145	Process An	31.04	92.0757	0.0751	0.3767	0.0626	ND		7.5206	0.0436	ND		0.0099	0.0021	ND		ND		0.0172	0.0004	ND		ND		ND		ND		ND	
03-Jun-10	31	P151	Process An	30.23	95.364	0.0467	0.6225	0.0739	ND		3.9837	0.0336	ND		ND		ND		ND		0.0246	0.0005	ND		ND		ND		ND		0.0051	0.0005
03-Jun-10	32	P151	Process An	29.94	95.2303	0.049	0.6601	0.0787	ND		4.0784	0.0346	ND		ND		ND		ND		0.0257	0.0005	ND		ND		ND		ND		0.0055	0.0006
03-Jun-10	35	P148	Process An	32.33	95.6748	0.0438	0.4386	0.0693	ND		3.8258	0.0331	ND		0.0071	0.0018	ND		0.0107	0.0013	0.035	0.0005	0.0029	0.0003	ND		ND		ND		0.0051	0.0005
03-Jun-10	36	P148	Process An	31.78	95.7344	0.043	0.4172	0.0682	ND		3.7959	0.0329	ND		0.0066	0.0017	ND		0.0094	0.0013	0.0342	0.0005	0.0023	0.0003	ND		ND		ND		ND	
03-Jun-10	37	P111	Process An	32.34	92.1944	0.0718	0.5227	0.0679	ND		7.2351	0.0418	ND		0.0125	0.0021	ND		0.0186	0.0015	0.0167	0.0004	ND		ND		ND		ND		ND	
03-Jun-10	38	P111	Process An	32.44	92.2376	0.0711	0.4411	0.0631	0.0351	0.0107	7.2442	0.0416	ND		0.0065	0.0019	ND		0.0187	0.0015	0.0166	0.0004	ND		ND		ND		ND		ND	
03-Jun-10	39	P128	Process An	32.22	92.2451	0.0747	0.7053	0.0765	ND		7.0176	0.043	ND		ND		ND		0.0122	0.0014	0.0199	0.0004	ND		ND		ND		ND		ND	
03-Jun-10	40	P128	Process An	32.44	92.2198	0.0755	0.6869	0.077	ND		7.0596	0.0433	ND		ND		ND		0.013	0.0014	0.0206	0.0004	ND		ND		ND		ND		ND	
03-Jun-10	41	P112	Process An	31.79	94.0403	0.0585	0.5759	0.0724	ND		5.294	0.0379	ND		ND		0.0356	0.0027	0.026	0.0018	0.0282	0.0005	ND		ND		ND		ND		ND	
03-Jun-10	42	P112	Process An	31.14	93.8195	0.0613	0.6071	0.0722	ND		5.4793	0.0389	ND		ND		0.0342	0.0028	0.0292	0.0019	0.0283	0.0005	0.0024	0.0003	ND		ND		ND		ND	
03-Jun-10	43	P164	Process An	34.29	97.3586	0.0268	0.3138	0.0599	ND		2.2993	0.0254	ND		ND		ND		ND		0.021	0.0004	ND		ND		ND		ND		0.0073	0.0006
03-Jun-10	44	P164	Process An	34.55	97.3343	0.0268	0.3228	0.0586	0.0367	0.0103	2.2786	0.0252	ND		ND		ND		ND		0.0208	0.0004	ND		ND		ND		ND		0.0068	0.0005
03-Jun-10	45	P300	Process An	50.82	97.7296	0.0307	0.5965	0.0987	ND		1.6562	0.0284	ND		ND		ND		ND		0.0178	0.0005	ND		ND		ND		ND		ND	
03-Jun-10	48	P203	Process An	31.8	95.9806	0.0421	0.7892	0.0853	0.0401	0.0124	3.1483	0.0309	ND		ND		ND		ND		0.0418	0.0006	ND		ND		ND		ND		ND	
03-Jun-10	49	P203	Process An	31.17	95.9955	0.0421	0.8326	0.0847	ND		3.1264	0.0309	ND		ND		ND		ND		0.0406	0.0006	ND		ND		ND		ND		0.005	0.0005
03-Jun-10	50	P185	Process An	34.31	94.0748	0.0594	0.6168	0.0749	ND		5.2734	0.0385	ND		ND		ND		ND		0.0296	0.0005	ND		ND		ND		ND		0.0054	0.0006
03-Jun-10	51	P185	Process An	34.42	94.0186	0.0596	0.5776	0.074	0.0429	0.0115	5.3266	0.0387	ND		0.0055	0.0017	ND		ND		0.0287	0.0005	ND		ND		ND		ND		ND	
03-Jun-10	52	P112	Process An	30.59	93.9417	0.0597	0.53	0.0709	ND		5.4285	0.0385	ND		ND		0.0397	0.0028	0.0294	0.0018	0.0283	0.0005	0.0024	0.0003	ND		ND		ND		ND	
03-Jun-10	54	P168	Process An	33.36	93.2993	0.0651	0.717	0.0765	ND		5.9489	0.0397	ND		ND		ND		0.0099	0.0013	0.0248	0.0005	ND		ND		ND		ND		ND	

Innov-X X-50 Data Output (minor editing)																																
Date	**Reading**	**Sample_ID**	**Mode**	**LiveTime**	**LE**	**LE +/-**	**Ti**	**Ti +/-**	**Mn**	**Mn +/-**	**Fe**	**Fe +/-**	**Co**	**Co +/-**	**Ni**	**Ni +/-**	**Cu**	**Cu +/-**	**Zn**	**Zn +/-**	**Zr**	**Zr +/-**	**Nb**	**Nb +/-**	**Mo**	**Mo +/-**	**Hf**	**Hf +/-**	**Pb**	**Pb +/-**	**U**	**U +/-**
03-Jun-10	55	P168	Process An	33.19	93.1143	0.0676	0.707	0.0774	ND		6.1386	0.0408	ND		ND		ND		0.014	0.0014	0.0261	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	3	P221	Process An	36.85	93.3869	0.0641	0.7249	0.0764	ND		5.7918	0.0392	0.0553	0.0101	ND		ND		0.0125	0.0014	0.0264	0.0005	0.0022	0.0003	ND		ND		ND		ND	
04-Jun-10	4	P221	Process An	37.13	93.2651	0.0648	0.8404	0.0796	ND		5.8451	0.0392	ND		ND		0.0114	0.0021	0.0118	0.0013	0.0262	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	5	P204	Process An	32.1	96.4674	0.0369	0.7685	0.0824	ND		2.6902	0.0285	ND		ND		ND		0.011	0.0013	0.0477	0.0006	0.0023	0.0003	ND		ND		0.005	0.0009	0.0078	0.0006
04-Jun-10	6	P204	Process An	32.5	96.6173	0.0345	0.6669	0.0781	0.0374	0.0114	2.6194	0.0275	ND		ND		ND		ND		0.0447	0.0006	ND		ND		ND		0.0072	0.001	0.007	0.0006
04-Jun-10	7	P219	Process An	51.03	95.2638	0.0571	0.4132	0.078	ND		4.3071	0.0415	ND		0.0062	0.002	ND		ND		0.0097	0.0004	ND		ND		ND		ND		ND	
04-Jun-10	8	P219	Process An	51.02	95.3783	0.0567	0.5253	0.0847	ND		4.0814	0.0411	ND		ND		ND		ND		0.0091	0.0004	0.0033	0.0004	0.0025	0.0005	ND		ND		ND	
04-Jun-10	9	P182	Process An	30.64	93.2871	0.0662	0.9476	0.0836	ND		5.7359	0.0396	ND		ND		ND		ND		0.0241	0.0005	ND		ND		ND		ND		0.0053	0.0005
04-Jun-10	10	P167	Process An	34.31	95.0322	0.0491	0.6408	0.0721	ND		4.2767	0.0343	ND		ND		0.0125	0.0021	ND		0.035	0.0005	0.0028	0.0003	ND		ND		ND		ND	
04-Jun-10	11	P167	Process An	34.25	94.9349	0.0501	0.6792	0.0779	ND		4.3358	0.0344	ND		0.007	0.0018	ND		ND		0.0356	0.0005	0.0023	0.0003	ND		ND		ND		0.0051	0.0005
04-Jun-10	12	P183	Process An	50.91	97.444	0.037	0.6004	0.0975	ND		1.9399	0.0329	ND		ND		ND		ND		0.0158	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	14	P220	Process An	36.38	94.1255	0.0576	1.0127	0.0892	0.0512	0.0126	4.7597	0.0359	ND		ND		ND		0.0132	0.0014	0.0377	0.0006	ND		ND		ND		ND		ND	
04-Jun-10	15	P220	Process An	36.32	94.026	0.0589	1.1	0.091	0.0575	0.0128	4.7604	0.0361	ND		ND		ND		0.0187	0.0016	0.0375	0.0006	ND		ND		ND		ND		ND	
04-Jun-10	16	P186	Process An	34.13	93.0251	0.0701	0.7642	0.081	0.0471	0.0126	6.1198	0.0417	ND		ND		ND		0.0149	0.0015	0.0289	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	17	P186	Process An	34.92	93.141	0.0683	0.76	0.0804	ND		6.0497	0.0411	ND		0.0062	0.002	ND		0.0144	0.0015	0.0288	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	18	P184	Process An	30.61	96.0288	0.0403	0.3819	0.0661	ND		3.5158	0.0318	ND		ND		ND		ND		0.0659	0.0007	0.0076	0.0004	ND		ND		ND		ND	
04-Jun-10	20	P238	Process An	33.83	94.7107	0.0533	0.5297	0.0726	0.0561	0.012	4.596	0.0362	ND		0.007	0.0019	0.0414	0.0029	0.0226	0.0017	0.0311	0.0005	ND		ND		ND		ND		0.0053	0.0005
04-Jun-10	21	P238	Process An	34.01	94.5638	0.0547	0.5843	0.0717	0.0514	0.012	4.6907	0.0365	ND		0.0089	0.002	0.0441	0.0029	0.0242	0.0018	0.0325	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	22	P108	Process An	34.47	93.0122	0.0687	0.727	0.0793	ND		6.2143	0.0411	ND		0.0059	0.0018	ND		ND		0.0334	0.0005	ND		ND		ND		ND		0.0072	0.0006
04-Jun-10	24	P109	Process An	31.43	94.2114	0.0568	0.5668	0.0706	ND		5.1809	0.0375	ND		ND		ND		0.0114	0.0013	0.0296	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	26	P213	Process An	31.38	91.1598	0.0802	0.3182	0.057	ND		8.4869	0.0446	ND		0.0082	0.002	ND		0.0091	0.0012	0.0177	0.0004	ND		ND		ND		ND		ND	
04-Jun-10	27	P213	Process An	31.97	91.0866	0.0813	0.2827	0.0582	ND		8.6036	0.0448	ND		0.009	0.0021	ND		ND		0.0182	0.0004	ND		ND		ND		ND		ND	
04-Jun-10	28	P91	Process An	29.28	96.4662	0.0374	0.7847	0.0832	ND		2.699	0.0289	ND		ND		ND		ND		0.0355	0.0006	0.0028	0.0003	0.0064	0.0005	ND		ND		0.0055	0.0005
04-Jun-10	29	P91	Process An	29.7	96.4606	0.0373	0.7432	0.0804	ND		2.748	0.0289	ND		ND		ND		ND		0.0369	0.0006	ND		0.0062	0.0004	ND		ND		0.0052	0.0005
04-Jun-10	30	P160	Process An	31.61	95.2537	0.0474	0.5132	0.071	ND		4.1999	0.0342	ND		ND		ND		ND		0.0285	0.0005	ND		ND		ND		ND		0.0048	0.0005
04-Jun-10	32	P248	Process An	33.01	94.6529	0.0522	0.6439	0.0733	0.0383	0.0116	4.6248	0.0352	ND		0.0063	0.0018	ND		ND		0.029	0.0005	ND		ND		ND		ND		0.0048	0.0005
04-Jun-10	33	P248	Process An	32.76	94.6979	0.0515	0.6278	0.0716	ND		4.6308	0.0351	ND		ND		ND		0.0087	0.0012	0.0299	0.0005	ND		ND		ND		ND		0.0048	0.0005
04-Jun-10	34	P231	Process An	32.16	92.2522	0.0761	0.6858	0.076	0.0377	0.0121	6.9888	0.0436	ND		0.0081	0.0021	ND		ND		0.0274	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	36	P143	Process An	33.57	94.5194	0.0541	0.6206	0.0767	ND		4.8165	0.0363	ND		ND		ND		ND		0.036	0.0006	0.0022	0.0003	ND		ND		ND		0.0052	0.0005
04-Jun-10	37	P161	Process An	30.68	95.1688	0.0488	0.5653	0.0727	ND		4.2345	0.0348	ND		ND		ND		ND		0.0314	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	38	P161	Process An	30.9	95.0017	0.0509	0.6368	0.0804	ND		4.3234	0.0354	ND		ND		ND		ND		0.0329	0.0005	ND		ND		ND		ND		0.0052	0.0005
04-Jun-10	39	P194	Process An	31.58	95.6099	0.0445	0.5301	0.0711	0.0377	0.0114	3.7978	0.0331	ND		ND		ND		ND		0.0245	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	41	P195	Process An	33.58	95.3548	0.0466	0.5444	0.0722	ND		4.0667	0.0339	ND		ND		ND		ND		0.0273	0.0005	ND		ND		ND		ND		0.0067	0.0006
04-Jun-10	42	P73	Process An	28.72	95.1854	0.0477	0.5467	0.0701	ND		4.2441	0.0343	ND		ND		ND		ND		0.0238	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	43	P178	Process An	30.05	96.0683	0.0407	0.535	0.0712	ND		3.3704	0.0317	ND		ND		ND		ND		0.0262	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	44	P74	Process An	31.39	95.681	0.0438	0.4627	0.0678	ND		3.8311	0.0332	ND		ND		ND		ND		0.0252	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	46	P74	Process An	31.7	95.571	0.0443	0.394	0.0658	ND		4.0107	0.0336	ND		ND		ND		ND		0.0243	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	47	P126	Process An	32.04	94.5854	0.0542	0.3772	0.0659	0.0444	0.0113	4.963	0.0375	ND		ND		ND		ND		0.03	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	48	P126	Process An	32.46	94.5732	0.0548	0.3708	0.0676	ND		5.0131	0.0379	ND		0.0072	0.0019	ND		ND		0.0303	0.0005	ND		ND		ND		ND		0.0054	0.0006
04-Jun-10	49	P126	Process An	32.62	94.5226	0.0541	0.4717	0.0687	0.0399	0.0111	4.9365	0.0369	ND		ND		ND		ND		0.0292	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	50	P90	Process An	31.15	94.7689	0.0518	0.5679	0.0718	ND		4.6341	0.0358	ND		ND		ND		ND		0.0292	0.0005	ND		ND		ND		ND		ND	
04-Jun-10	51	P90	Process An	31.92	94.6689	0.0524	0.5791	0.0732	ND		4.7225	0.0358	ND		ND		ND		ND		0.0295	0.0005	ND		ND		ND		ND		ND	

Appendix C

Innov-X Winston Lake Data with percent to ppm conversions and ND=10ppm.

Sample_ID	Date	LiveTime	LE_pct	Fe_Pct	Ti_pct	Ti_ppm	Mn_pct	Mn_ppm	Ni_pct	Ni_ppm	Ni_ppm	Cu_pct	Cu_ppm	Zn_pct	Zn_ppm	Zr_pct	Zr_ppm	Nb_pct	Nb_ppm	Mo_pct	Mo_ppm	U_pct	U_ppm
P144	03-Jun-10	28.7	97.0749	2.2121	0.6413	6413	0.0396	396	ND	10		ND	10	ND	10	0.0273	273	ND	10	ND	10	0.0048	48
P145	03-Jun-10	31.78	92.012	7.5645	0.4061	4061	ND	10	ND	10		ND	10	ND	10	0.0174	174	ND	10	ND	10	ND	10
P146	03-Jun-10	33	94.6533	4.7502	0.5527	5527	ND	10	0.006	60	60	ND	10	0.0116	116	0.0201	201	ND	10	ND	10	0.0061	61
P147	03-Jun-10	31.81	93.5078	5.8898	0.4961	4961	0.0393	393	0.0159	159	159	ND	10	0.0197	197	0.0264	264	ND	10	ND	10	0.0051	51
P148	03-Jun-10	32.33	95.6748	3.8258	0.4386	4386	ND	10	0.0071	71	71	ND	10	0.0107	107	0.035	350	0.0029	29	ND	10	0.0051	51
P149	03-Jun-10	32.25	95.4987	3.986	0.4777	4777	ND	10	ND	10		ND	10	ND	10	0.0324	324	ND	10	ND	10	0.0052	52
P151	03-Jun-10	34.1	90.4575	8.8456	0.6384	6384	ND	10	0.0106	106	106	0.0216	216	ND	10	0.0177	177	ND	10	0.0035	35	0.0052	52
P162	03-Jun-10	50.74	96.1352	3.2466	0.5985	5985	ND	10	ND	10		ND	10	ND	10	0.0198	198	ND	10	ND	10	ND	10
P163	03-Jun-10	30.25	94.9526	4.5362	0.4929	4929	ND	10	ND	10		ND	10	ND	10	0.0183	183	ND	10	ND	10	ND	10
P164	03-Jun-10	34.29	97.3586	2.2993	0.3138	3138	ND	10	ND	10		ND	10	ND	10	0.021	210	ND	10	ND	10	0.0073	73
P168	03-Jun-10	33.19	93.1143	6.1386	0.707	7070	ND	10	ND	10		ND	10	0.014	140	0.0261	261	ND	10	ND	10	ND	10
P185	03-Jun-10	34.31	94.0748	5.2734	0.6168	6168	ND	10	ND	10		ND	10	ND	10	0.0296	296	ND	10	ND	10	0.0054	54
P203	03-Jun-10	31.8	95.9806	3.1483	0.7892	7892	0.0401	401	ND	10		ND	10	ND	10	0.0418	418	ND	10	ND	10	ND	10
P300	03-Jun-10	50.82	97.7296	1.6562	0.5965	5965	ND	10	ND	10		ND	10	ND	10	0.0178	178	ND	10	ND	10	ND	10
P63	03-Jun-10	32.66	92.4789	6.9493	0.5005	5005	0.0367	367	ND	10		ND	10	0.0099	99	0.0215	215	0.0031	31	ND	10	ND	10
P108	04-Jun-10	34.47	93.0122	6.2143	0.727	7270	ND	10	0.0059	59	59	ND	10	ND	10	0.0334	334	ND	10	ND	10	0.0072	72
P109	04-Jun-10	31.43	94.2114	5.1809	0.5668	5668	ND	10	ND	10		ND	10	0.0114	114	0.0296	296	ND	10	ND	10	ND	10
P143	04-Jun-10	33.57	94.5194	4.8165	0.6206	6206	ND	10	ND	10		ND	10	ND	10	0.036	360	0.0022	22	ND	10	0.0052	52
P160	04-Jun-10	31.61	95.2537	4.1999	0.5132	5132	ND	10	ND	10		ND	10	ND	10	0.0285	285	ND	10	ND	10	0.0048	48
P161	04-Jun-10	30.68	95.1688	4.2345	0.5653	5653	ND	10	ND	10		ND	10	ND	10	0.0314	314	ND	10	ND	10	ND	10
P167	04-Jun-10	34.31	95.0322	4.2767	0.6408	6408	ND	10	ND	10		0.0125	125	ND	10	0.035	350	0.0028	28	ND	10	ND	10
P178	04-Jun-10	30.05	96.0683	3.3704	0.535	5350	ND	10	ND	10		ND	10	ND	10	0.0262	262	ND	10	ND	10	ND	10
P182	04-Jun-10	30.64	93.2871	5.7359	0.9476	9476	ND	10	ND	10		ND	10	ND	10	0.0241	241	ND	10	ND	10	0.0053	53
P183	04-Jun-10	50.91	97.444	1.9399	0.6004	6004	ND	10	ND	10		ND	10	ND	10	0.0158	158	ND	10	ND	10	ND	10
P184	04-Jun-10	30.61	96.0288	3.5158	0.3819	3819	ND	10	ND	10		ND	10	ND	10	0.0659	659	0.0076	76	ND	10	ND	10
P186	04-Jun-10	34.13	93.0251	6.1198	0.7642	7642	0.0471	471	ND	10		ND	10	0.0149	149	0.0289	289	ND	10	ND	10	ND	10
P194	04-Jun-10	31.58	95.6099	3.7978	0.5301	5301	0.0377	377	ND	10		ND	10	ND	10	0.0245	245	ND	10	ND	10	ND	10
P195	04-Jun-10	33.58	95.3548	4.0667	0.5444	5444	ND	10	ND	10		ND	10	ND	10	0.0273	273	ND	10	ND	10	0.0067	67
P204	04-Jun-10	32.5	96.6173	2.6194	0.6669	6669	0.0374	374	ND	10		ND	10	ND	10	0.0447	447	ND	10	ND	10	0.007	70
P213	04-Jun-10	31.97	91.0866	8.6036	0.2827	2827	ND	10	0.009	90	90	ND	10	ND	10	0.0182	182	ND	10	ND	10	ND	10
P219	04-Jun-10	51.03	95.2638	4.3071	0.4132	4132	ND	10	0.0062	62	62	ND	10	ND	10	0.0097	97	ND	10	ND	10	ND	10
P220	04-Jun-10	36.32	94.026	4.7604	1.1	11000	0.0575	575	ND	10		ND	10	0.0187	187	0.0375	375	ND	10	ND	10	ND	10
P221	04-Jun-10	36.85	93.3869	5.7918	0.7249	7249	ND	10	ND	10		ND	10	0.0125	125	0.0264	264	0.0022	22	ND	10	ND	10
P231	04-Jun-10	32.16	92.2522	6.9888	0.6858	6858	0.0377	377	0.0081	81	81	ND	10	ND	10	0.0274	274	ND	10	ND	10	ND	10
P238	04-Jun-10	34.01	94.5638	4.6907	0.5843	5843	0.0514	514	0.0089	89	89	0.0441	441	0.0242	242	0.0325	325	ND	10	ND	10	ND	10
P248	04-Jun-10	33.01	94.6529	4.6248	0.6439	6439	0.0383	383	0.0063	63	63	ND	10	ND	10	0.029	290	ND	10	ND	10	0.0048	48
P73	04-Jun-10	28.72	95.1854	4.2441	0.5467	5467	ND	10	ND	10		ND	10	ND	10	0.0238	238	ND	10	ND	10	ND	10
P74	04-Jun-10	31.39	95.681	3.8311	0.4627	4627	ND	10	ND	10		ND	10	ND	10	0.0252	252	ND	10	ND	10	ND	10
P90	04-Jun-10	31.15	94.7689	4.6341	0.5679	5679	ND	10	ND	10		ND	10	ND	10	0.0292	292	ND	10	ND	10	ND	10
P91	04-Jun-10	29.28	96.4662	2.699	0.7847	7847	ND	10	ND	10		ND	10	ND	10	0.0355	355	0.0028	28	0.0064	64	0.0055	55

Sample_ID	Date	LiveTime	LE_pct	Fe_Pct	Ti_pct	Ti_ppm	Mn_pct	Mn_ppm	Ni_pct	Ni_ppm	Ni_ppm	Cu_pct	Cu_ppm	Zn_pct	Zn_ppm	Zr_pct	Zr_ppm	Nb_pct	Nb_ppm	Mo_pct	Mo_ppm	U_pct	U_ppm
P126	27-May-10	29.61	94.8793	4.5876	0.4921	4921	ND	10	ND	10		ND	10	0.0122	122	0.0287	287	ND	10	ND	10	ND	10
P129	27-May-10	31.21	93.725	5.4281	0.7281	7281	ND	10	ND	10		ND	10	0.0182	182	0.035	350	0.0041	41	ND	10	ND	10
P181	27-May-10	47.98	91.128	7.9016	0.7733	7733	0.0912	912	ND	10		ND	10	ND	10	0.0313	313	ND	10	ND	10	0.0102	102
P198	27-May-10	30.35	93.0925	6.2045	0.6313	6313	0.038	380	ND	10		ND	10	0.0141	141	0.0196	196	ND	10	ND	10	ND	10
P199	27-May-10	30.36	94.2102	5.2089	0.4956	4956	0.0456	456	ND	10		ND	10	0.0127	127	0.0215	215	ND	10	ND	10	0.0055	55
P200	27-May-10	51.16	98.4605	1.1406	0.3822	3822	ND	10	ND	10		ND	10	ND	10	0.0168	168	ND	10	ND	10	ND	10
P201	27-May-10	29.12	94.6014	4.8444	0.5184	5184	ND	10	ND	10		ND	10	0.0134	134	0.0223	223	ND	10	ND	10	ND	10
P202	27-May-10	34.41	91.2017	7.9283	0.8492	8492	ND	10	ND	10		ND	10	ND	10	0.0208	208	ND	10	ND	10	ND	10
P217	27-May-10	30.98	95.6119	3.5959	0.6967	6967	0.0449	449	ND	10		ND	10	0.0179	179	0.0303	303	0.0024	24	ND	10	ND	10
P218	27-May-10	31.48	93.0036	6.2047	0.736	7360	ND	10	ND	10		ND	10	0.0278	278	0.0224	224	ND	10	ND	10	0.0054	54
P234	27-May-10	28.86	95.7437	3.7388	0.4436	4436	0.0425	425	ND	10		ND	10	ND	10	0.0264	264	ND	10	ND	10	0.0049	49
P235	27-May-10	27.27	96.918	2.6302	0.39	3900	ND	10	ND	10		ND	10	0.0122	122	0.0438	438	0.0058	58	ND	10	ND	10
P252	27-May-10	25.16	98.3839	0.9326	0.6291	6291	ND	10	ND	10		ND	10	ND	10	0.0497	497	0.0047	47	ND	10	ND	10
P61	27-May-10	30.26	95.2366	4.1735	0.4703	4703	0.0411	411	ND	10		ND	10	0.0293	293	0.046	460	0.0033	33	ND	10	ND	10
P76	27-May-10	32.03	96.6623	2.7174	0.523	5230	0.059	590	ND	10		ND	10	ND	10	0.0329	329	ND	10	ND	10	0.0053	53
P78	27-May-10	32.88	95.8809	2.7624	1.2457	12457	0.0567	567	ND	10		ND	10	0.0131	131	0.039	390	0.0023	23	ND	10	ND	10
P82	27-May-10	50.71	98.7336	0.8678	0.356	3560	ND	10	ND	10		ND	10	ND	10	0.038	380	0.0045	45	ND	10	ND	10
P100	29-May-10	32.14	95.183	4.3684	0.3957	3957	ND	10	ND	10		ND	10	0.0117	117	0.0369	369	0.0042	42	ND	10	ND	10
P101	29-May-10	33.44	95.5237	3.9459	0.4304	4304	0.0489	489	0.0062	62	62	ND	10	0.0125	125	0.0275	275	ND	10	ND	10	0.0048	48
P110	29-May-10	29.21	95.3942	4.0206	0.5361	5361	ND	10	0.0073	73	73	ND	10	0.0144	144	0.0274	274	ND	10	ND	10	ND	10
P114	29-May-10	31.29	93.7228	5.8233	0.333	3330	0.0514	514	0.0072	72	72	ND	10	0.031	310	0.0288	288	0.0025	25	ND	10	ND	10
P116	29-May-10	32.85	94.591	4.5654	0.7854	7854	ND	10	0.0125	125	125	ND	10	0.0149	149	0.0309	309	ND	10	ND	10	ND	10
P131	29-May-10	31.68	94.5255	4.7905	0.6233	6233	ND	10	ND	10		ND	10	0.016	160	0.0423	423	0.0025	25	ND	10	ND	10
P265	29-May-10	31.27	93.0314	6.544	0.4035	4035	ND	10	ND	10		ND	10	ND	10	0.0211	211	ND	10	ND	10	ND	10
P269	29-May-10	31.24	95.9431	3.59	0.445	4450	ND	10	ND	10		ND	10	ND	10	0.0219	219	ND	10	ND	10	ND	10
P282	29-May-10	30.8	93.4812	5.9366	0.5029	5029	0.0451	451	0.01	100	100	ND	10	ND	10	0.019	190	ND	10	ND	10	0.0052	52
P284	29-May-10	32.38	92.8633	6.5315	0.5812	5812	ND	10	ND	10		ND	10	ND	10	0.0241	241	ND	10	ND	10	ND	10
P301	29-May-10	30.19	93.8937	5.6723	0.3923	3923	ND	10	ND	10		ND	10	0.0133	133	0.0261	261	0.0023	23	ND	10	ND	10
P45	29-May-10	32.63	95.2305	3.8945	0.7427	7427	0.0805	805	ND	10		ND	10	0.0094	94	0.0397	397	0.0026	26	ND	10	ND	10
P46	29-May-10	50.76	98.8547	0.791	0.3286	3286	ND	10	ND	10		ND	10	ND	10	0.0257	257	ND	10	ND	10	ND	10
P47	29-May-10	28.6	96.3599	3.117	0.4341	4341	0.0384	384	ND	10		ND	10	0.0145	145	0.0337	337	0.0024	24	ND	10	ND	10
P58	29-May-10	32.97	95.5472	3.8823	0.5051	5051	ND	10	0.013	130	130	ND	10	0.0202	202	0.0269	269	ND	10	ND	10	0.0053	53
P60	29-May-10	47.78	90.7421	7.9229	1.1615	11615	0.1021	1021	ND	10		ND	10	0.02	200	0.037	370	0.0043	43	ND	10	ND	10
P64	29-May-10	29.42	95.6386	3.8249	0.4899	4899	ND	10	ND	10		ND	10	0.0132	132	0.0284	284	ND	10	ND	10	0.005	50
P75	29-May-10	51.08	95.4563	3.9629	0.4855	4855	0.0525	525	ND	10		ND	10	0.0276	276	0.0152	152	ND	10	ND	10	ND	10
P77	29-May-10	33.49	94.462	4.8951	0.5888	5888	ND	10	ND	10		ND	10	0.0145	145	0.0313	313	0.0023	23	ND	10	0.0059	59
P80	29-May-10	29.74	95.2034	4.361	0.3755	3755	ND	10	ND	10		ND	10	0.0291	291	0.0281	281	0.0029	29	ND	10	ND	10
P92	29-May-10	32.37	95.3322	3.9744	0.652	6520	ND	10	0.0055	55	55	ND	10	ND	10	0.0311	311	ND	10	ND	10	0.0048	48
P93	29-May-10	51.11	96.3562	3.3332	0.2994	2994	ND	10	ND	10		ND	10	ND	10	0.0112	112	ND	10	ND	10	ND	10
P94	29-May-10	28.47	94.7441	4.6576	0.5473	5473	ND	10	0.0062	62	62	ND	10	0.0172	172	0.0277	277	ND	10	ND	10	ND	10
P95	29-May-10	29.02	98.0684	1.3143	0.5598	5598	ND	10	ND	10		ND	10	ND	10	0.0532	532	0.0043	43	ND	10	ND	10
P97	29-May-10	32.49	93.3274	5.9696	0.6293	6293	ND	10	0.009	90	90	ND	10	0.0276	276	0.0331	331	0.004	40	ND	10	ND	10
P99	29-May-10	36.8	87.2603	12.0165	0.7007	7007	ND	10	ND	10		ND	10	ND	10	0.0192	192	0.0033	33	ND	10	ND	10
AEM13	03-Jun-10	33.44	95.8188	3.5989	0.4912	4912	0.0534	534	ND	10		ND	10	ND	10	0.0312	312	ND	10	ND	10	0.0065	65
P111	03-Jun-10	32.34	92.1944	7.2351	0.5227	5227	ND	10	0.0125	125	125	ND	10	0.0186	186	0.0167	167	ND	10	ND	10	ND	10
P112	03-Jun-10	31.79	94.0403	5.294	0.5759	5759	ND	10	ND	10		0.0356	356	0.026	260	0.0282	282	ND	10	ND	10	ND	10
P115	03-Jun-10	33.43	93.1549	6.0872	0.6562	6562	0.055	550	ND	10		ND	10	0.0115	115	0.0272	272	0.003	30	ND	10	0.0051	51
P118	03-Jun-10	33.94	94.7176	4.714	0.5321	5321	ND	10	ND	10		ND	10	0.012	120	0.0243	243	ND	10	ND	10	ND	10
P128	03-Jun-10	32.22	92.2451	7.0176	0.7053	7053	ND	10	ND	10		ND	10	0.0122	122	0.0199	199	ND	10	ND	10	ND	10
P130	03-Jun-10	31.58	94.7915	4.6072	0.53	5300	ND	10	0.016	160	160	ND	10	0.0108	108	0.0369	369	0.0023	23	ND	10	0.0054	54
P132	03-Jun-10	30.42	97.6012	1.9123	0.447	4470	ND	10	ND	10		ND	10	ND	10	0.035	350	0.0045	45	ND	10	ND	10
P133	03-Jun-10	28.87	97.2597	2.1082	0.5834	5834	ND	10	ND	10		ND	10	ND	10	0.0443	443	0.0044	44	ND	10	ND	10
P134	03-Jun-10	33.77	92.907	6.5186	0.4919	4919	0.0397	397	ND	10		0.0146	146	0.0088	88	0.0196	196	ND	10	ND	10	ND	10

Appendix D

Authors Signature Pages

Kevin Robert Kivi, P.Geo.
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Phone (604) 628-2397 Fax (604) 628-2479
Email: kivik@shawcable.com

I Kevin Robert Kivi, P.Geo., (P.Geol. in NWT) am a Professional Geoscientist, employed by KIVI Geoscience Inc., of Thunder Bay, Ontario. I am:

- a practising member of the Association of Professional Geoscientists of Ontario (APGO), Registration 0326;
- a member of the Association of Professional Engineers, Geologists and Geophysicists of the Northwest Territories (NAPEGG), Registration L821;
- a member of the Association of Professional Engineers and Geoscientists of the Province of Manitoba (APEGM), Registration 25680;
- A member of the Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS), Registration #13687.

I graduated from Lakehead University, Thunder Bay with a Bachelor of Science Geology (4 year programme) in 1983, and I have practiced in my profession continuously since 1983 including but not limited to:

- gold exploration with Ovaltex Inc. along the Cadillac Break in Rouyn and Val D'Or, Quebec in winters of 1984, 1985 and 1986, and between 1986-1988 in NW Ontario.
- diamond exploration with BP Resources Inc – Selco Division in Ontario, Quebec, Manitoba and NWT in summers of 1984, 1985 and 1988;
- gold and base metals exploration in NW Ontario with Rio Algom Exploration between 1988 and 1992.
- diamond exploration with Kennecott Canada Exploration between 1992-1994 at Lac De Gras, NWT, Diamond Laboratory Manager between 1995-2000 in Thunder Bay, Ontario, diamond exploration 2000-2004 in Wawa in Archean lamprophyric volcaniclastic rocks and Group 2 kimberlites, March-June 2004, Exploration Manager at Diavik Diamond Mines Ltd, Lac De Gras, NT.
- geological consultant specializing in diamond exploration. Clients include Arctic Star Diamonds Corp., Sanatana Diamonds Inc, Diavik Diamond Mines Inc., New Nadina Explorations Ltd., Cougar Minerals Corp., European Diamonds PLC, and Russian Diamonds PLC.

I personally conducted all exploration and sampling, conducted sample preparation, designed QA and QC and implemented the Innov-X Portable XRF to determine the zinc content of soil samples on behalf of Orebot Inc. I am President of Orebot Inc., a private company that holds 100% interest in the Winston Lake property. I am also President of KIVI Geoscience Inc, a geological consulting firm.

Dated at Thunder Bay, ON, CANADA on the 8th day of June, 2010.

KIVI Geoscience Inc.

Per:____________________

Kevin R. Kivi, P.Geo., President

KEVIN R. KIVI
0326

Robert Lawrence Barnett,
R. L. Barnett Geological Consulting Inc.,
9684 Longwoods Road, RR#32, London,
Ontario, N6P 1P2
Ph 519-652-1498 Fax 519-652-3696 E-mail Rbarnett@odyssey.on.ca

I, Robert L. Barnett, am President and full time employee of R. L. Barnett Geological Consulting Inc., employed as a research scientist and electron microprobe analyst.

I graduated from the University of Toronto in 1970 with a four year Geology Degree in Honours Science. I graduated from the University of Western Ontario in 1973 with a Master's Diploma in Geology. My thesis involved the study of a base metal skarn deposit at Copper Flat, New Mexico.

From 1973-1993, I was employed by the University of Western Ontario as a Chief Technical Officer where I managed the Electron Microprobe Analytical Laboratory. During this time, I was intimately involved with and assisted numerous Masters and Doctoral Candidates in understanding their "rocks of study" through detailed petrographic and electron microprobe techniques. I collaborated with both students and Faculty in the generation of numerous scientific publications involving various aspects of igneous and metamorphic geology and mineral deposits. Research and topics of publication included massive sulphide nickel deposits of the Sudbury Nickel Irruptive, gold deposits of the Timmins, Kirkland Lake, Bousquet and Hemlo gold camps and base metal deposits of the Noranda and Mattagami. I also completed numerous petrographic-electron microprobe studies of various gold and base metal deposits farther afield such as a gold-copper skarn deposit in Toqui, Chile, the Lynn massive zinc deposit in Wisconsin, the Red Mountain gold deposit, Yukon, the Haile and Ridgway gold deposits in South Carolina and the Eskay Creek gold deposit, British Columbia.

From 1993 to present, I have been a full time research scientist at R. L. Barnett Geological Consulting Inc., and have been intimately involved in analysis of indicator minerals for various companies such as Kennecott Canada Exploration, Aber Resources, SouthernEra Resources and Stornoway Diamond Corporation. During this time I completed a number of petrographic-electron studies including the DO27 kimberlite, the the Renard 2 and 3 kimberlites in Quebec, the gold deposit at Damoti lake, NWT, and most recently, the Arctic Star nickel-PGE occurrence in the NWT, the Fruta del Norte gold deposit, Peru, the Sulliden gold deposit, Peru, the Nickel King copper-nickel deposit, NWT and the developing gold deposits of the White Gold District, Yukon.

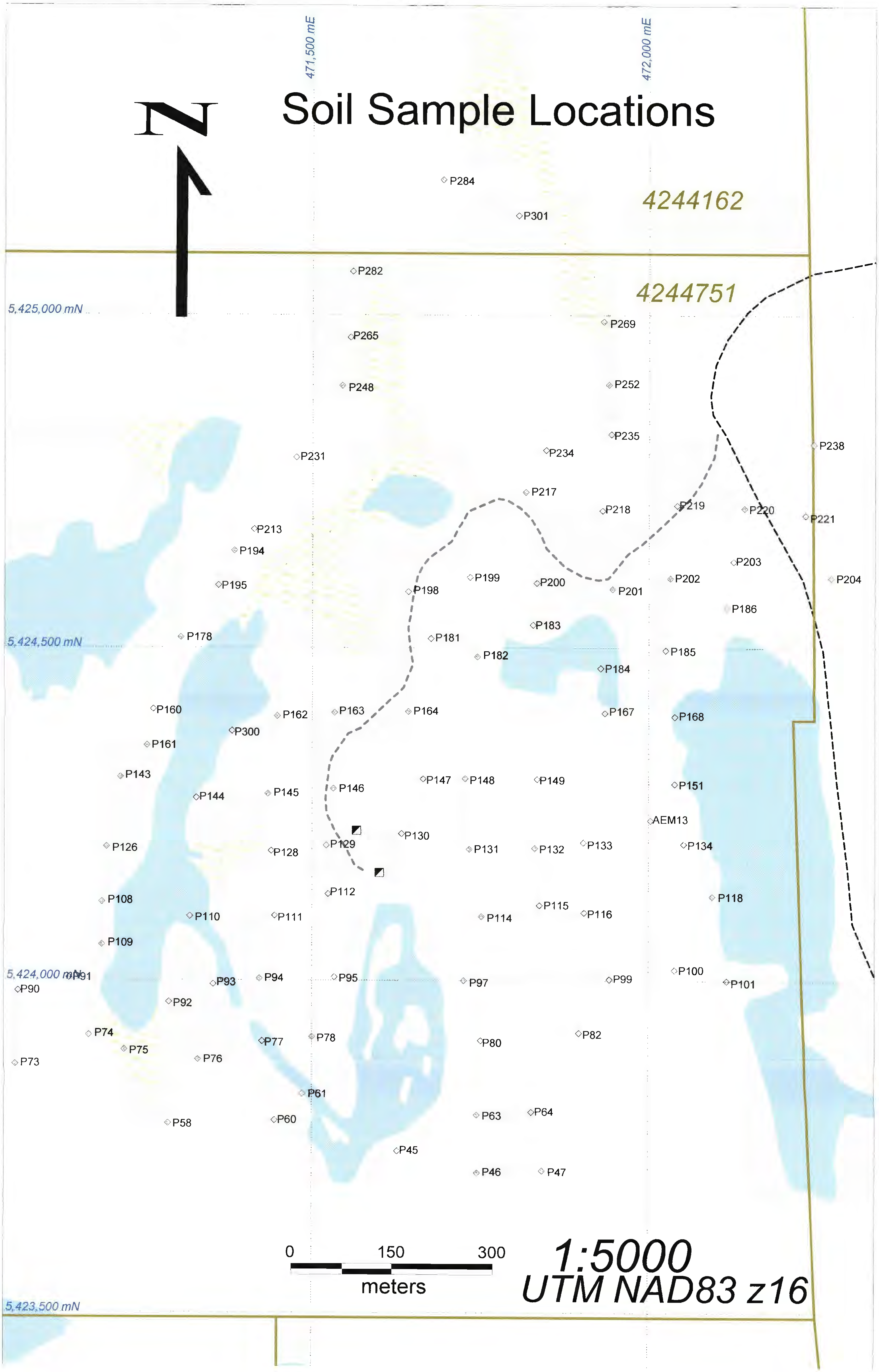
Dated at London, Ontario this 8th day of June 2010.

R. L. Barnett Geological Consulting Inc.,

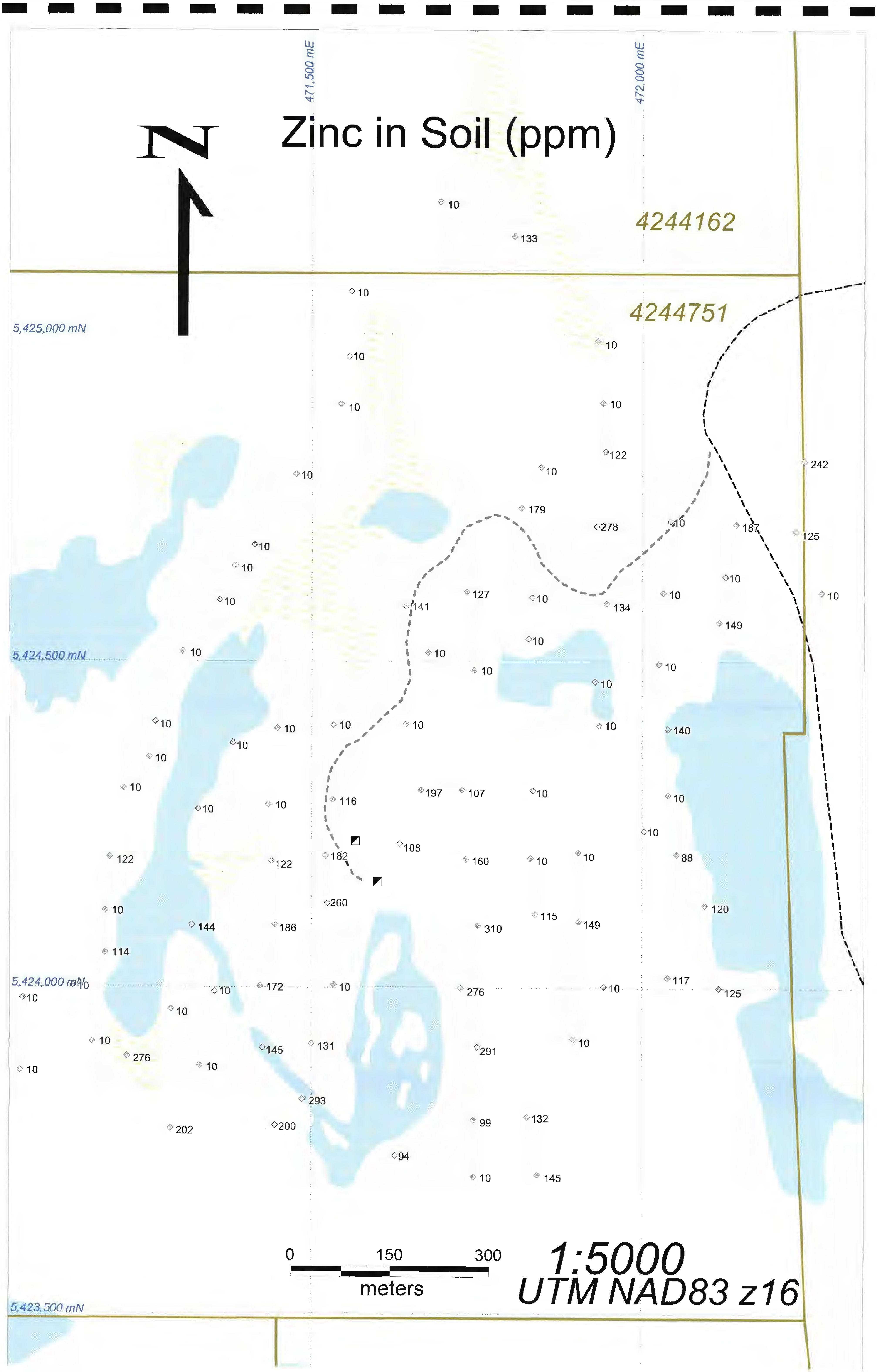
Per: R. L. Barnett

R. L. Barnett, Geologist, President

MAPS



Soil Sample Locations



Zinc in Soil (ppm)
N
471,500 mE
472,000 mE
4244162
4244751
5,425,000 mN
5,424,500 mN
5,424,000 mN
5,423,500 mN
10
133
10
10
10
10
10
122
10
10
179
278
10
187
242
125
10
10
10
10
141
127
10
134
10
10
149
10
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10
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10
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10
140
10
10
10
116
197
107
10
10
10
10
122
122
182
108
160
10
10
88
10
260
120
144
186
310
115
149
114
10
10
172
10
276
10
117
125
10
10
10
10
276
145
131
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202
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94
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145
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150
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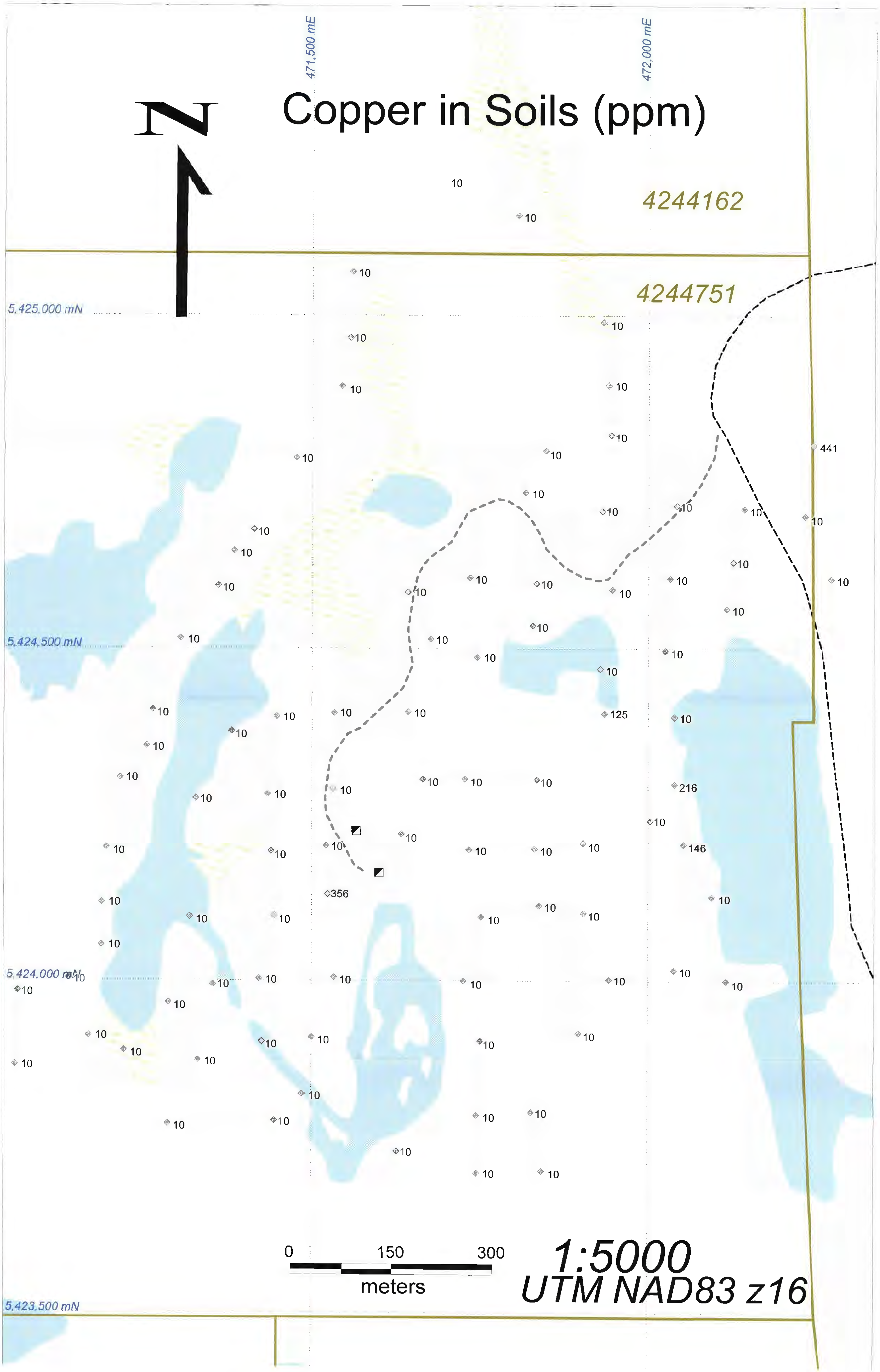
meters
1:5000
UTM NAD83 z16


Copper in Soils (ppm)
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472,000 mE
5,425,000 mN
5,424,500 mN
5,424,000 mN
5,423,500 mN
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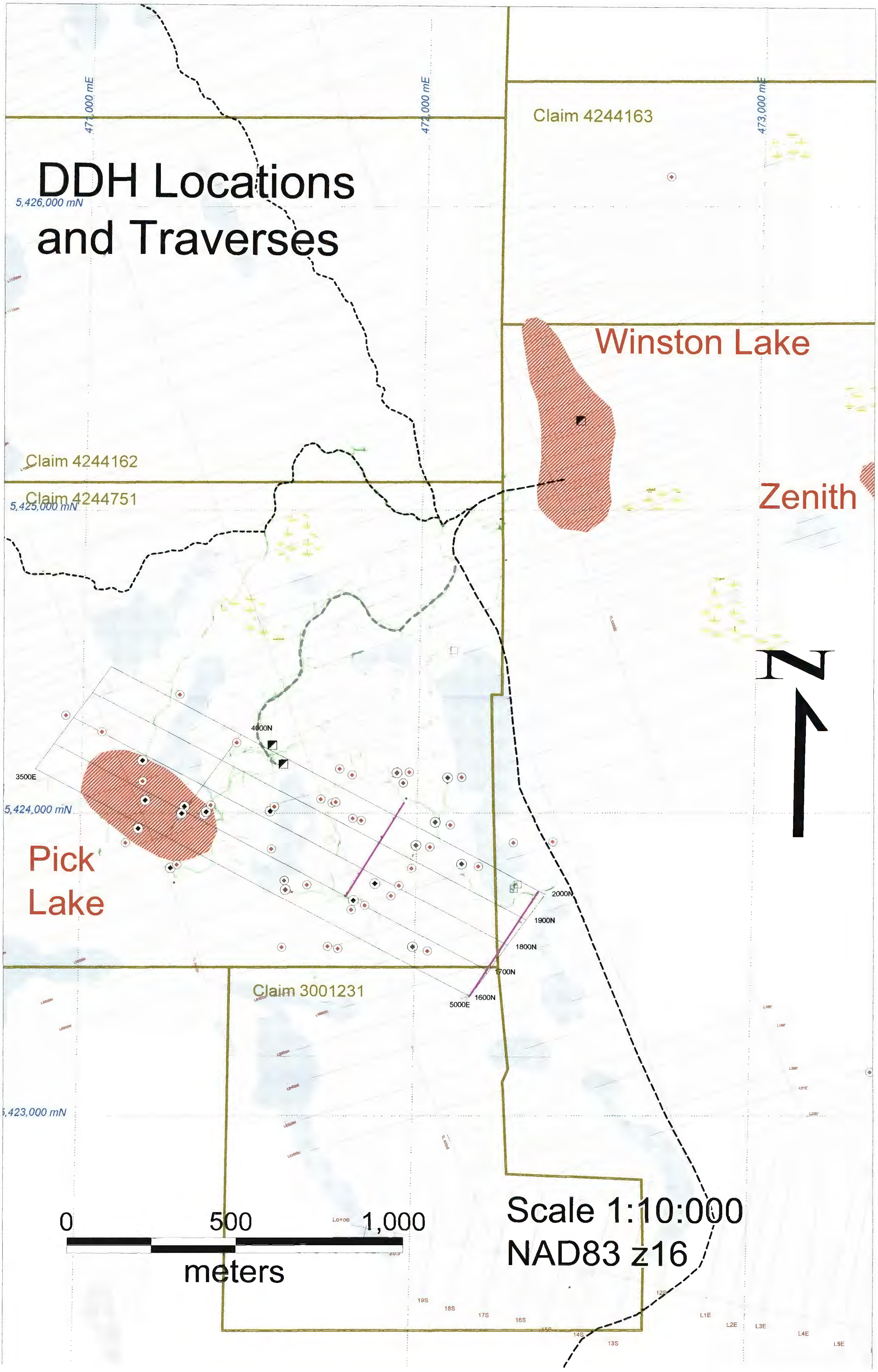
4244751
10
441
125
216
146
356
0
150
300
meters
1:5000
UTM NAD83 z16


DDH Locations and Traverses
Claim 4244163
Claim 4244162
Claim 4244751
Claim 3001231
Winston Lake
Zenith
Pick Lake
471,000 mE
472,000 mE
473,000 mE
5,426,000 mN
5,425,000 mN
5,424,000 mN
5,423,000 mN
4000N
3500E
2000N
1900N
1800N
1700N
1600N
5000E
N
0
500
1,000
meters
Scale 1:10:000
NAD83 z16
19S
18S
17S
16S
15S
14S
13S
12S
L1E
L2E
L3E
L4E
L5E

DDH and Survey Marker Waypoints and Field Notes

Description	Notes	Waypoint Name	Date found	NAD83 UTM Co-ordinates	Elevation
DDH WL-12	cemented -85 dip, BTW casing	WL12	19-MAY-10 10:51:26AM	16 U 471373 5424005	421 m
DDH WL-23	cemented BTW casing , sub-vertical	WL-23	19-MAY-10 9:56:08AM	16 U 471563 5424007	422 m
DDH WL-24		WL24	18-MAY-10 6:36:11PM	16 U 471612 5423748	420 m
DDH WL-32	Collar is NW and cemented with picket beside it, subvertical dip	DDH WL32	01-NOV-08 2:50:26PM	16 U 471878 5423768	427 m
DDH WL-67	25 m diameter clearing with cemented NW casing and welded cap (labelled WL67C) 5 m east of gossan quartz crystal tuff, Collar Azimuth 307 Dip -83	DDH WL67	01-NOV-08 1:36:44PM	16 U 472054 5423969	410 m
DDH WL-69	cemented collar NW casing with BQ anchor Azim 307 Dip -87 located in gravel clearing on drill trail	DDH WL69	01-NOV-08 1:20:35PM	16 U 472135 5423831	410 m
DDH WL-71	NW casing -90 degrees, subvertical with BQ anchor in 20 by 50m grassy clearing 40 m west of the lake with clear view of Winston Lake road	DDH WL71	01-NOV-08 2:21:10PM	16 U 472089 5424117	410 m
DDH WL-72	20m NE of trail in small grassy clearing beside large dead birch tree, about 10cm of NW casing cemented sticking out, very difficult to find	DDH WL72	01-NOV-08 2:00:23PM	16 U 471938 5424134	426 m
DDH WL-77	BW casing cemented in low grassy spot by anthophyllite altered basalt	DDH WL77	01-NOV-08 2:39:46PM	16 U 471998 5423894	428 m
Drill Hole Unknown	BTW drill collar, inclined at -87 degrees, azimuth 360 degrees, cemented	28-1DDH	28-SEP-08 2:44:17PM	16 U 471373 5424006	423 m
Drill Hole Unknown	10 m at 220 Azim from 28-1DDH, NW casing , Azim 285, inclined -74 degrees	28-2DDH	28-SEP-08 2:49:59PM	16 U 471369 5423999	421 m
Drill Hole Unknown	10m SE of trail, BW casing cut off at ground and cemented, sub-vertical by lake	28-3DDH	28-SEP-08 5:05:20PM	16 U 471190 5424044	427 m
Drill Hole Unknown	BW casing at 345 Azim and -50 dip	28-4DDH	28-SEP-08 5:05:20PM	16 U 471171 5423950	427 m
Drill Hole Unknown	Vertical BW casing, no cement	28-5DDH	28-SEP-08 5:15:23PM	16 U 471269 5423819	424 m
Drill Hole Unknown	BTW casing on high outcrop 25 m from lake with -80 dip and Azim 290 degrees	BTW1	19-MAY-10 11:25:01AM	16 U 471298 5423996	421 m
Drill Hole Unknown		DD2	28-SEP-08 4:58:49PM	16 U 471181 5424175	421 m
Drill Hole Unknown	sub-vertical BW casing found in large clearing with sericitic rusty volcanics in nearby outcrop	DDH CABIN	01-NOV-08 3:01:21PM	16 U 471994 5423559	420 m

DDH and Survey Marker Waypoints and Field Notes

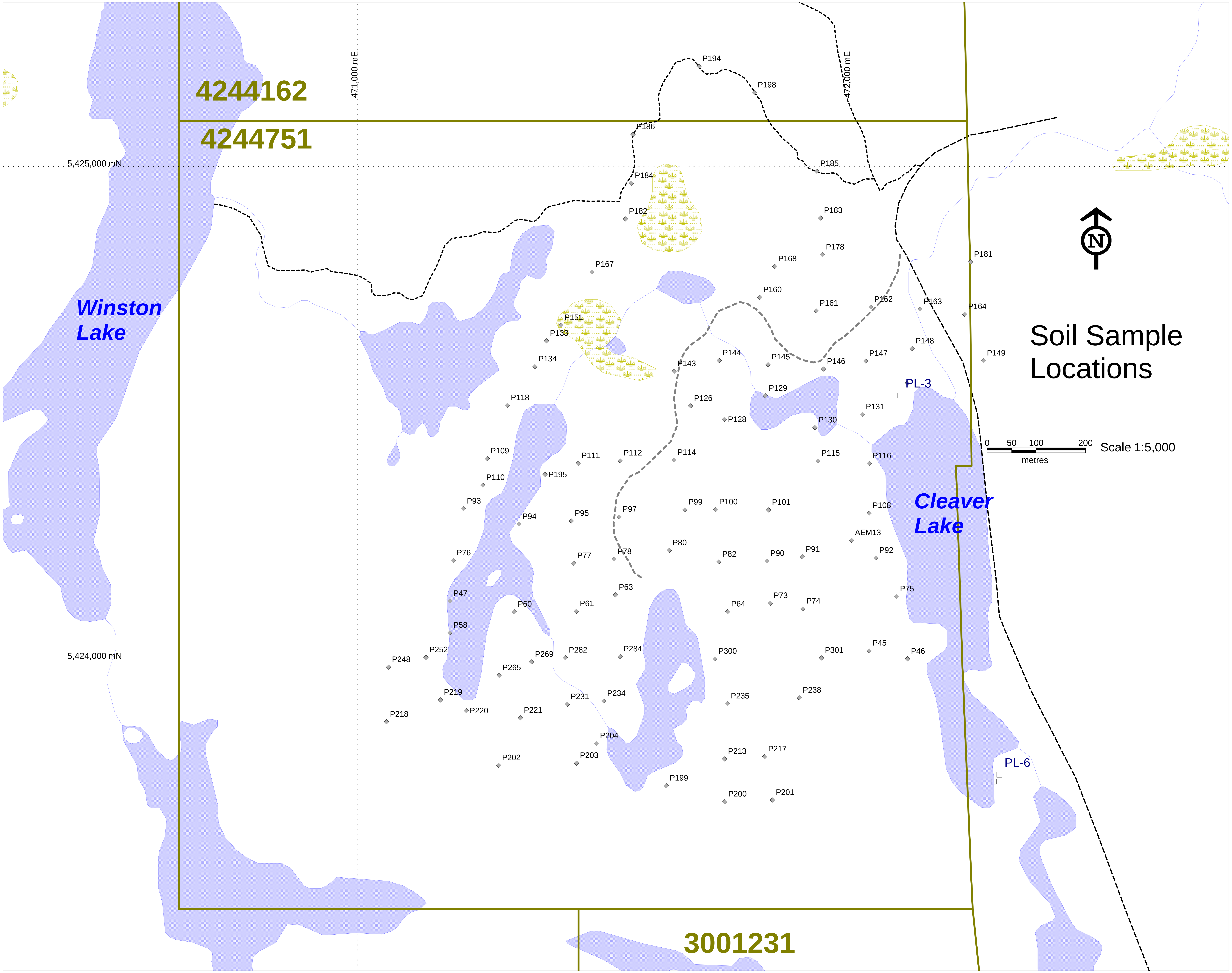
Description	Notes	Waypoint Name	Date found	NAD83 UTM Co-ordinates	Elevation
Drill Hole Unknown	sub-vertical BW casing (cemented) with BQ anchor in 25m diameters outcrop of felsic tuff with minor rust	DDH CABIN2	01-NOV-08 4:09:58PM	16 U 471815 5423712	432 m
Drill Hole Unknown	BTW casing -90 dip cemented	DDH55?	18-MAY-10 4:36:11PM	16 U 471612 5423748	420m
Drill Hole Unknown		DDH6	22-MAY-10 2:02:48PM	16 U 471191 5424043	420 m
Drill Hole Unknown	inclined -85 dip cemented NTW casing	NTW DDH	19-MAY-10 10:53:15AM	16 U 471367 5423996	421 m
Drill Hole Unknown	DD collar -74 dip Azim 290 cemented hole is rusty aquifer creating local gossan that moose seem to like	NTW2	19-MAY-10 11:18:56AM	16 U 471308 5424022	421 m
Drill Hole Unknown	Cemented NTW casing with 6 inches protruding, with inclination of -85 Azim 290, located about 3m north of BTW1 waypoint	NTW3	19-MAY-10 11:28:31AM	16 U 471300 5423999	420 m
Survey Marker PL-3	Survey base station PL-3 located 9 m north of this waypoint, possible error in SIAL report	PL3	28-SEP-08 6:00:07PM	16 U 472095 5424541	418 m
Survey marker PL-6	PL-6 waypoint located exactly where expected, 2 photos taken, one red flag on top of outcrop 15m E of Cleaver Lake, PL-5 is next outcrop to south on lakeshore, lots of cutting at PL-5 site but no picket found	PL6-GPS	26-SEP-08 9:07:53AM	16 U 472301 5423767	402 m

Winston Lake Property - Soil Sample Locations and Descriptions

Sample_ID	E_NAD83z16	N_NAD83z16	Datum	Colour	Soil	Comments
AEM13	472003	5424241	NAD83_Zone 16	grey beige	silt	grey beige silt, hard to pack
P45	471627.042	5423742.773	NAD83_Zone 16	grey	till	grey till, very fine
P46	471745.65	5423710.331	NAD83_Zone 16	grey	silt	grey silt, hard to pack
P47	471842.357	5423713.731	NAD83_Zone 16	grey	A-soil	grey till, likely A-horizon
P58	471286.611	5423784.208	NAD83_Zone 16	brown	till	brown till
P60	471444.82	5423788.718	NAD83_Zone 16	brown	till	light brown till
P61	471485.472	5423828.718	NAD83_Zone 16	grey	fluvial	grey silty soil, high in silica
P63	471745.337	5423797.176	NAD83_Zone 16	brown	till	brown till
P64	471826.722	5423801.843	NAD83_Zone 16	brown	till	light brown till
P73	471058.977	5423872.354	NAD83_Zone 16	brown	till	brown till some organics
P74	471168.579	5423916.818	NAD83_Zone 16	grey brown	till	grey brown till
P75	471221.165	5423895.091	NAD83_Zone 16	grey	silt	silty grey hard to pack
P76	471330.877	5423880.406	NAD83_Zone 16	grey-beige	silt	grey beige silty soil
P77	471426.045	5423908.052	NAD83_Zone 16	brown	till	pale brown till
P78	471500.113	5423914.809	NAD83_Zone 16	grey	silt	grey silty soil, high in silica
P80	471750.958	5423909.537	NAD83_Zone 16	reddish brown	till	Reddish brown B-horizon till
P82	471897.049	5423921.114	NAD83_Zone 16	grey	silt	grey silty soil, high in silica
P90	471063.171	5423983.444	NAD83_Zone 16	brown	till	brown till
P91	471139.173	5424003.226	NAD83_Zone 16	brown	till	brown till
P92	471287.635	5423966.739	NAD83_Zone 16	brown	till	light brown till
P93	471353.509	5423994.113	NAD83_Zone 16	brown	fluvial	pale brown fluvial material
P94	471422.161	5424002.575	NAD83_Zone 16	reddish brown	till	reddish brown B-horizon in till
P95	471533.335	5424004.895	NAD83_Zone 16	brown	silt	pale brown silt
P97	471725.722	5424000.156	NAD83_Zone 16	brown	till	medium brown till
P99	471942.2	5424002.105	NAD83_Zone 16	reddish brown	till	reddish brown till
P100	472038.665	5424016.682	NAD83_Zone 16	brown	till	brown till, some organics
P101	472116.714	5424000.249	NAD83_Zone 16	brown	till	brown till
P108	471187.925	5424117.653	NAD83_Zone 16	brown	till	brown till
P109	471187.715	5424053.11	NAD83_Zone 16	brown	till	light brown till
P110	471318.551	5424095.945	NAD83_Zone 16	brown	till	light brown till
P111	471444.523	5424097.041	NAD83_Zone 16	brown	till	gravel till few fines
P112	471523.796	5424130.129	NAD83_Zone 16	brown	till	brown till
P114	471751.746	5424096.217	NAD83_Zone 16	reddish brown	till	Light reddish brown till
P115	471838.094	5424113.343	NAD83_Zone 16	brown	till	light brown till
P116	471904.405	5424102.068	NAD83_Zone 16	brown	till	brown till
P118	472094.566	5424127.124	NAD83_Zone 16	brown	till	brown till
P126	471194.617	5424200.049	NAD83_Zone 16	brown	B-Soil	Brown silty B-horizon
P128	471439.38	5424194.395	NAD83_Zone 16	reddish brown	till	reddish brown till
P129	471521.035	5424202.725	NAD83_Zone 16	brown	till	brown till
P130	471632.972	5424220.562	NAD83_Zone 16	brown	till	light brown till
P131	471733.743	5424197.359	NAD83_Zone 16	reddish brown	B-Soil	Reddish brown B-horizon till
P132	471831.113	5424198.921	NAD83_Zone 16	brown	till	dark brown till
P133	471903.254	5424207.505	NAD83_Zone 16	grey brown	till	grey brown till
P134	472052.32	5424205.353	NAD83_Zone 16	reddish brown	till	reddish brown till
P143	471215.215	5424305.095	NAD83_Zone 16	brown	till	light brown till
P144	471327.988	5424273.819	NAD83_Zone 16	grey	till	grey till
P145	471434.289	5424280.275	NAD83_Zone 16	brown	till	light brown till
P146	471531.421	5424288.526	NAD83_Zone 16	brown	till	brown till
P147	471664.856	5424303.13	NAD83_Zone 16	brown	till	light brown till
P148	471727.25	5424303.568	NAD83_Zone 16	brown	till	brown till
P149	471834.508	5424302.734	NAD83_Zone 16	brown	silt	light brown silty till
P151	472038.9	5424296.133	NAD83_Zone 16	reddish brown	B-Soil	reddish brown B- till
P160	471263.474	5424407.097	NAD83_Zone 16	brown	till	light brown till
P161	471254.574	5424353.072	NAD83_Zone 16	brown	till	brown till

Winston Lake Property - Soil Sample Locations and Descriptions

Sample_ID	E_NAD83z16	N_NAD83z16	Datum	Colour	Soil	Comments
P162	471447.902	5424397.231	NAD83_Zone 16	brown	silt	pale brown silt
P163	471533.242	5424402.596	NAD83_Zone 16	brown	till	pale brown till
P164	471642.933	5424404.126	NAD83_Zone 16	brown	silt	pale brown silt - no packing
P167	471934.947	5424402.288	NAD83_Zone 16	brown	till	light brown till
P168	472038.961	5424396.95	NAD83_Zone 16	brown	till	brown till
P178	471304.591	5424515.106	NAD83_Zone 16	brown	till	light brown till
P181	471676.374	5424513.844	NAD83_Zone 16	brown	till	light brown till
P182	471745.109	5424486.703	NAD83_Zone 16	brown	B-Soil	brown B-horizon till
P183	471827.983	5424534.351	NAD83_Zone 16	grey	silt	grey silt
P184	471928.687	5424469.787	NAD83_Zone 16	reddish brown	B-Soil	Reddish brown B-horizon till
P185	472024.994	5424496.637	NAD83_Zone 16	brown	B-Soil	Brown till B-horizon
P186	472116.155	5424560.045	NAD83_Zone 16	brown	till	brown till
P194	471383.871	5424645.819	NAD83_Zone 16	brown	till	dark brown till
P195	471360.404	5424593.603	NAD83_Zone 16	brown	till	light brown till
P198	471642.76	5424584.073	NAD83_Zone 16	brown	till	brown till
P199	471734.366	5424606.184	NAD83_Zone 16	brown	till	brown till
P200	471833.573	5424597.599	NAD83_Zone 16	grey	silt	high silica no clays
P201	471946.149	5424588.67	NAD83_Zone 16	brown	till	brown till with pebbles
P202	472031.921	5424605.079	NAD83_Zone 16	brown	till	brown till pebbles
P203	472126.058	5424630.253	NAD83_Zone 16	grey	till	grey till
P204	472270.917	5424605.727	NAD83_Zone 16	grey	silt	grey silt poor binding
P213	471413.492	5424677.85	NAD83_Zone 16	brown	till	brown till organics
P217	471816.848	5424734.264	NAD83_Zone 16	grey brown	silt	grey brown siliceous, hard to compact
P218	471931.231	5424706.805	NAD83_Zone 16	brown	B-Soil	B-horizon, brown till
P219	472042.249	5424714.627	NAD83_Zone 16	brown	esker	
P220	472141.995	5424710.269	NAD83_Zone 16	grey	silt	grey silt
P221	472232.666	5424699.854	NAD83_Zone 16	brown	till	brown silty till
P231	471476.054	5424785.994	NAD83_Zone 16	brown	till	light brown till
P234	471847.2	5424797.097	NAD83_Zone 16	brown	B-Soil	Brown, B-horizon Silty
P235	471944.087	5424820.975	NAD83_Zone 16	rusty brown	B-Soil	B-horizon, rusty brown silty till
P238	472244.754	5424806.392	NAD83_Zone 16	grey	till	grey till
P248	471543.96	5424893.579	NAD83_Zone 16	brown	till	brown till
P252	471940.262	5424895.488	NAD83_Zone 16	grey	A-soil	A-horizon, sooty, quartz-rich
P265	471556.069	5424966.065	NAD83_Zone 16	brown	B-Soil	Brown silty B-horizon till
P269	471932.487	5424990.331	NAD83_Zone 16	brown	fluvial	sandy fluvial soil
P282	471559.525	5425065.053	NAD83_Zone 16	brown	till	brown till
P284	471693.521	5425203.405	NAD83_Zone 16	reddish brown	B-Soil	reddish brown B-horizon till
P300	471380.859	5424374.809	NAD83_Zone 16	grey	silt	grey silt - poor packing
P301	471805.711	5425149.897	NAD83_Zone 16	brown	B-Soil	brown B-horizon till


Soil Sample Locations
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472,000 mE
5,425,000 mN
5,424,000 mN
Winston Lake
Cleaver Lake
N
0
50
100
200
metres
Scale 1:5,000
PL-3
PL-6
AEM13
P194
P198
P186
P185
P184
P182
P183
P178
P181
P168
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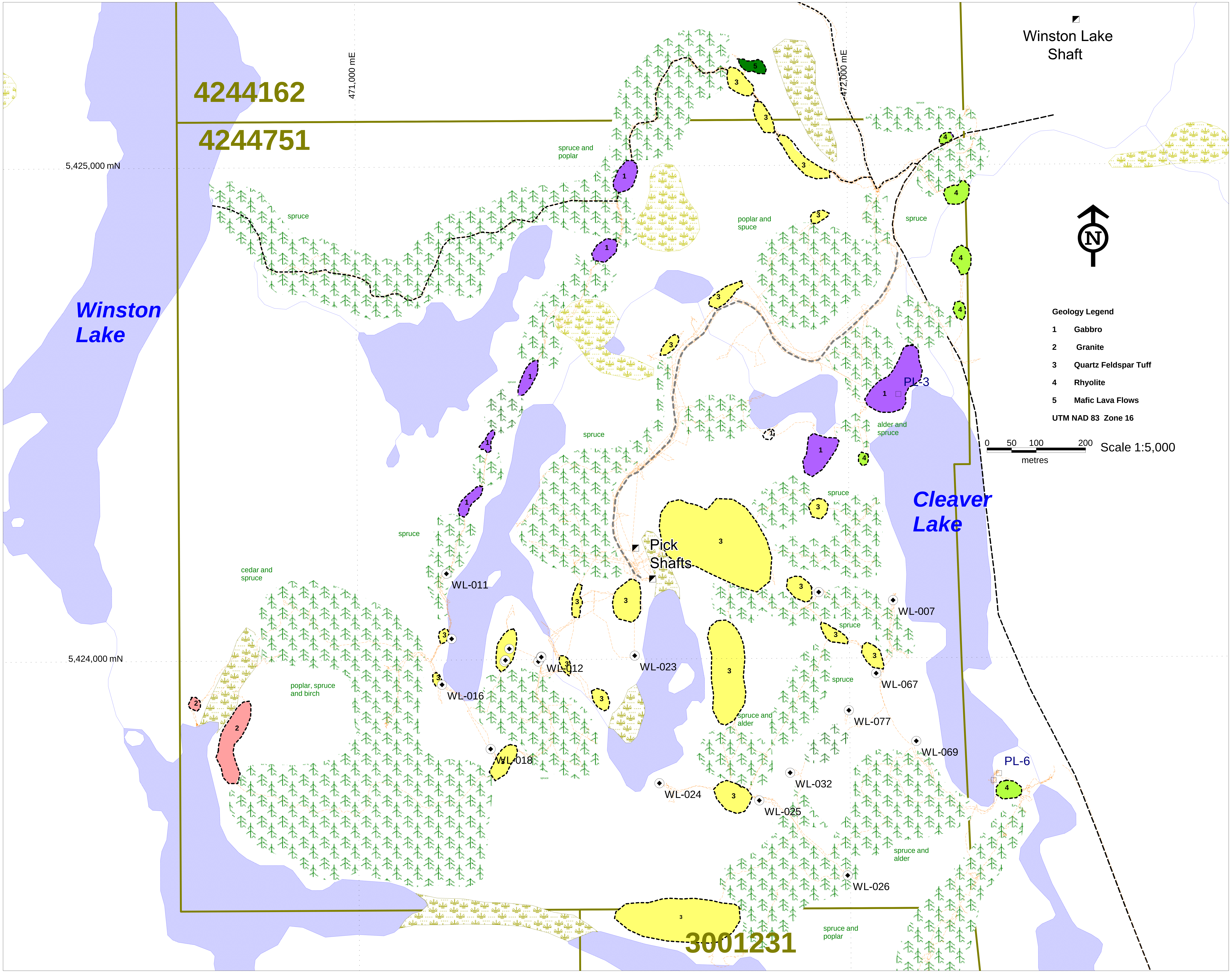
P201


Winston Lake Shaft
4244162
4244751
471,000 mE
472,000 mE
5,425,000 mN
5,424,000 mN
Winston Lake
Cleaver Lake
Pick Shafts
spruce and poplar
spruce
poplar and spruce
alder and spruce
cedar and spruce
poplar, spruce and birch
spruce and alder
spruce and poplar
PL-3
PL-6
WL-007
WL-011
WL-012
WL-016
WL-018
WL-023
WL-024
WL-025
WL-026
WL-032
WL-067
WL-069
WL-077
3001231
N
Geology Legend
1 Gabbro
2 Granite
3 Quartz Feldspar Tuff
4 Rhyolite
5 Mafic Lava Flows
UTM NAD 83 Zone 16
0 50 100 200
metres
Scale 1:5,000