BC Geological Survey Assessment Report 29765d

# **GEOLOGICAL TECHNICAL REPORT** 2007 Mapping and Data Compilation

Schaft Creek Deposit

Liard Mining Division, British Columbia

LATITUDE: 57.35° N LONGITUDE: 130.98° W NTS: 104G

# **Copper Fox Metals Inc.**

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October 31<sup>st</sup>, 2007

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# 1.0 SUMMARY

The Schaft Creek copper-molybdenum-gold-silver deposit, located in northwestern British Columbia has been the focus of extensive exploration and drilling from 1966 to 1981 by Silver Standard Mines Ltd., Liard Copper Mines Ltd., Asarco Ltd., Hecla Mining Co. and Teck Corporation. Copper Fox Metals Inc., the present operator, acquired the property in 2005 and began a validation and infill drilling program shortly thereafter. In 2005 and 2006, 15-holes totaling 3,160-meters and 42-holes totaling 9,007-meters were drilled, respectively, on the property. The twinned holes confirmed results obtained from past drill programs. The validation of the integrity of the past drill hole data, as well as the addition of infill drilling, aided in expanding the resource model to the current estimate of measured plus indicated categories: 1.3bt grading 0.25% copper, 0.019% molybdenum, 0.18 g/t gold and 1.55 g/t silver. In the 2007 drill program, the focus was on condemnation drilling around the outer deposit area, resulting in 42 holes, totaling 6,306-meters.

A deposit-scale mapping program was implemented during the 2007 drill program. The focus of this program was the production of a current map, see Figure D-1 and a simplification of the numerous rock types generated throughout the history of this deposit to a more workable set for modeling purposes, see Table 10-1. This report and the geologic maps included were produced through the compilation of outcrop mapping, drill hole data and historical maps and cross sections.

Geologically the Schaft Creek deposit is situated within the Triassic Stuhini volcanics, in faulted contact with the Stikine Assemblage. It is located at the eastern contact of a large, late Triassic, felsic batholith, the Hickman. Regional faulting is intense throughout the deposit. The property geology is dominated by andesitic volcanics, including flows, volcanoclastics, tuffs and in the northern portion of the deposit, felsic intrusives of the Hickman batholith. These lithologies are cut by relatively narrow felsic intrusive porphyry dikes and very late mafic/intermediate dikes.

The deposit is classified as a porphyry copper deposit. An extensive stockwork mineralization and mineralized felsic intrusive bodies exist, formed by a shallowly emplaced magma chamber of intermediate composition. Copper-molybdenum-gold-

silver mineralization at Schaft Creek is divided into three zones: the Liard Main Zone, the West Breccia Zone and the Paramount Zone.

Stockwork and veins are the principal ore bearing features in the Liard Main Zone. In the West Breccia and Paramount Zones, complex felsic intrusive, vein systems and hydrothermal breccia mineralization predominate as the ore type, with various emphasis of either igneous or hydrothermal features. Chalcopyrite, pyrite, bornite and molybdenite are almost exclusively the ore minerals in all three zones in order of relative abundance, with variations of their relative abundances within each zone.

Observations on lithology reduced the number of rock types from 40 historical litho-codes down to 9 using genetic temporal associations, see Table 10-1. The relative abundance of these rock types in decreasing order is andesitic volcanics, volcanoclastics, quartz feldspar porphyry, Hickman felsic intrusives, vein systems, mafic/intermediate dikes, augite porphyry, diorite and tourmaline breccia, see Chart 10-3-1. The andesitic volcanics and volcanoclastic rocks constitute the most abundant host rocks for mineralization, whereas felsic intrusive rocks, feldspar quartz porphyry dikes and vein systems are less ubiquitous.

An evolving work in progress, the geological model suggests a multi phase, magmatic hydrothermal history related to one or several apophyses, stemming from a Hickman batholith linked cupola, see Figure 8-1. The Paramount Zone is thought to represent the deepest, hottest level, closest to the cupola; the Liard Zone the mid-depth level; and the West Breccia Zone the shallow level of the epizone, closest to the area of fault brecciation. Strong structural modification as a result of; block faulting, rotation, thrusting, subsidence and uplifting are considered to explain the poorly understood, complex, juxtapositioning of geological units. The boundaries of the deposit remain to be defined.

The fundamental goal of the 2007 mapping and data compilation program is to generate a geological computer model of the deposit. Hopefully, the results of the program documented by this report will assist with achieving this objective.

# 2.0 INTRODUCTION AND TERMS OF REFERENCE

### 2.1 INTRODUCTION

The Schaft Creek deposit, over the past 40-years, was explored and developed in four major campaigns, conducted by: Asarco 1965-68, Helca 1969-78, Tech 1979-81 and lastly by Copper Fox 2005-ongoing. Each campaign contributed significantly to the advancement of the property. With the development of the property to a deposit status, a voluminous data base of assays, lithological nomenclature and observations have been amassed. The on-going program initiated by Copper Fox Metals Inc., in 2005, which will culminate with a feasibility study and production decision, incorporates new reserve and resource estimates. An integral component of this process is the development of a geological model and refining of the lithological framework for the deposit.

A magmatic-hydrothermal model for the deposit was advanced in early 2007, see Figure 8-1. This model, greatly simplified, is a work in progress and hopefully serves as a base to assist with not only mine planning and reserve estimates but also to the understanding of the genesis of the deposit. In this context, a complete review of the data base was undertaken in-conjunction with a mapping, compilation program in 2007.

This manuscript documents the content of this program and serves to summarize much of the archival data base.

### 2.2 TERMS OF REFERENCE

The Schaft Creek porphyry copper-molybdenum-gold-silver deposit, located in northwestern British Columbia, explored and drilled extensively from 1966 to 1981, was drilled in the summer of 2005 and 2006 by Copper Fox Metals Inc., targeting verification and expansion of the reserve-resource base. In 2007, as the deposit evaluation entered a scoping study, the company completed a 6,306-meter program of condemnation drilling, mapping and data compilation.

Copper Fox Metals Inc. is a Calgary based junior resource company trading on the TSX Ventures Exchange under the symbol CUU-TSX, with Mr. Guillermo Salazar being the current president.

Although most of the archived files report data in the Imperial System of measure this report adheres to current industry standards and employs to the Metric System for units of measure. Conversion factors from one system to another can be obtained from various sources. Most of the conversions involve drill core measurements and therefore are simple to deal with.



Figure 2-1. View looking south from upper slope of Paramount zone. Main zone pit would be situated approximately in the middle of the photo.

### 3.0 RELIANCE ON OTHER EXPERTS

This report contains information from government documents, company reports, public domain documents and other technical reports. These reports were authored by competent individuals and there is no reason to believe that the information contributed by others is not accurate and factual, and to be of genuine and sound quality. The authors have exercised all reasonable care in the compilation and production of this report.

The authors of this report do not hold any interest, direct or indirect, in the securities of Copper Fox Metals Inc., nor do they expect to receive any.



Figure 3-1. View of Mount La Casse from Wolverine Creek. Looking northeast.

# 4.0 PROPERTY LOCATION, DESCRIPTION AND OWNERSHIP

### 4.1 LOCATION

The Schaft Creek property is situated in northwestern British Columbia, approximately 60-kilometers south of the village of Telegraph Creek, within the upper source regions of Schaft Creek, which drains northerly into Mess Creek and then into the Stikine River. Located within the Boundary Range of the Coast Mountains, the elevation of the valley at the Schaft Creek camp site is 866-meters with nearby mountains exceeding 2,400-meters. The property lies in proximity to the southwest corner of Mount Edziza Provincial Park, and is located 45-kilometers due west of Highway 37. Referenced to Energy, Mines and Resource Canada topographic sheet 104G, Telegraph Creek, the geographic co-ordinate at the camp site is 57.35° north latitude, 130.98° west longitude. In terms of UTM co-ordinate, NAD 83, the location is Zone 9 V, 378734 E, 6358648 N. The actual deposit is situated approximately 1-kilometers east of the camp. See figures 4-1 and 5-1.



# 4.2 DESCRIPTION

The Schaft Creek property consists of 12-contiguous claims staked in accordance with British Columbia Energy Mines and Resources regulations. The claims encompass an area totalling approximately 10,371-hectares. The deposit is situated on claims 514603 and 514637, straddling the south and north boundaries respectively. See figure 5-1.

# 4.3 OWNERSHIP

The deposit owned by Teck-Cominco is the subject of an option agreement initiated by Mr. G. Salazar dated January 1, 2002, the terms of which are to acquire 100% of Teck-Cominco's defined 'Direct Holding'. This is a 70% direct participating interest in the Schaft Creek property, by incurring \$5-million in expenditures, as defined on or before December 31, 2006, and aggregate expenditures of \$15-million on or before December 31, 2011, as well as Teck-Cominco's defined 'Indirect Holding', of 23.4% carried interest through its 78% shareholding in Liard Copper Mines Ltd., the latter holding a 30% carried interest in the property. Additional conditions include the completion of a positive bankable feasibility study, as defined, and delivering of a Feasibility Notice to Teck-Cominco.

# 5.0 ACCESSIBILITY, CLIMATE, PHYSIOGRAPHY, RESOURCES, INFRASTRUCTURE

### 5.1 ACCESS

The Schaft Creek property can be accessed by helicopter from Bob Quinn, a small outpost located 80-kilometers southeast of the property on Highway 37. Bob Quinn serves as a base for several helicopter companies. The Burrage airstrip, situated 37-kilometers east of Schaft Creek, located on Highway 37 provides a more direct means of access by helicopter and fixed wing. A temporary air base was established at this site for the 2007 program. Alternatively, fixed wing aircraft can be chartered at Smithers, B.C., directly flying to the Schaft Creek camp, and utilizing either of the two gravel airstrips that exist at the camp.





Figure 5-1-2. View of Mount Hickman and Schaft Creek. Looking southwest from slope above Main zone.

### 5.2 CLIMATE, VEGETATION AND PHYSIOGRAPHY

The climate at the camp site is alpine, warm in the summer (10°C to 28°C), cold during the winter (-10°C to -20°C), see Figures 3-1 and 5-2. The valley bottom at Schaft Creek is snow free from approximately mid May through to mid October. Wind velocities during the summer can be high and incessant in duration.

The closest active weather station is located at Bob Quinn and the data from this source is not necessarily representative of the weather at Schaft Creek. High mountains, glaciated terrain and deep valleys modify local weather conditions. In an on-going base line study commissioned by Copper Fox Metals Inc, Rescan Ltd. is monitoring and acquiring data at Schaft Creek by remote, strategically located weather stations.

Physiographically, the Schaft Creek valley area is the up-stream extension of the Telegraph Creek Lowlands. The immediate area of the Schaft Creek property is approximately 3 x 3-kilometers in size rising rapidly eastward from the valley bottom to near-tree line elevation at the saddle in the vicinity of Snipe Lake, and towards Mess Creek to the east. The surrounding mountain terrain to the south and west of the deposit

is steep and rugged, rising to > 2,000-meters from the valley floor to snow capped mountain peaks and ice fields within a few kilometers of the camp, see Figure 5-1-2. To the east, the terrain drops from the Snipe Lake and the Saddle pass to Mess Creek. The terrain to the north of the deposit is the west-facing slope of Mount La Casse (2,200meters above sea level), see Figure 5-2. The broad, 1-kilometer, north-south trending valley of Schaft Creek near the camp site is a braided stream plain of thick glaciofluvial and fluvial deposits. The gradient of Schaft Creek up-stream of the camp site is fairly steep, causing high water velocities and strong erosional forces rapidly changing the multiple creek channels during early summer melting and run-off.



Figure 5-2. View northeast from base camp. Trails in left of photo are within the Paramount zone.

### 5.3 INFRASTRUCTURE AND LOCAL RESOURCES

Infrastructure is all but non-existent in the immediate project area. An old, overgrown and now frequently flooded bull dozer trail exists on the east side of the broad Schaft Creek valley heading north to Telegraph Creek. The local network of reestablished drill roads exists only in a 3 x 3-kilometer area.



Figure 5-3. Camp facility 2007. Quanset buildings destroyed by high winter snowfall of 2006-07, conspicuously absent in this photo.

# 6.0 PROPERTY HISTORY

### 6.1 GENERAL HISTORY

Schaft Creek was the subject of intense and extensive exploration since mineralization was first discovered on the property in 1957. The culmination of this exploration lead Teck Corp. to commission a pre-feasibility study which included condemnation drilling in the early 1980's. Prevailing economic conditions for the next 20years prevented the deposit from advancing. Realizing its potential, Mr. G. Salazar, acquired the right to secure a significant ownership of the property in 2002 and subsequently incorporated it into the holdings of Copper Fox Metals Inc., in 2005. The company completed 3,160-meters of PQ coring in 2005 and 9,006-meters of PQ and HQ coring in 2006. Both of these programs were designed to twin historical drill holes, as well as in fill drilling to confirm and expand the deposit's reserves. In 2007, as the project advanced to a scoping study stage a 6,306-meter condemnation drilling program was completed.

### 6.2 EXPLORATION HISTORY

The history of the property is summarized below:

- 1957, discovery at Galore Creek spurred exploration northward into the Schaft Creek-Mess Creek areas, leading to the discovery of mineralization at Schaft Creek.
- Area staked in 1957 for the BIK Syndicate; subsequently completed 3,000 feet of hand trenching.
- 1965, mapping, IP survey and 3-holes were drilled by Silver Standard Mines Ltd., totalling 2,063-feet.
- 1966, Liard Copper Mines Ltd. was formed to consolidate area land holdings.
- 1966, Asarco options the property; a 4,000-foot airstrip was constructed, a camp was built and 24-holes were drilled, totalling 11,000-feet.
- 1967, in mid spring of the year, a D6 cat walked from Telegraph Creek. A second 4,000foot airstrip was built and construction of the camp continued. Asarco initially drills 2holes and continues to complete 22-additional holes for a program total of 24-holes, amounting to 11,000-feet. Paramount Mining drills 1-hole.
- 1968, Asarco drops option and Hecla Mining acquires the properties. The airstrip was extended to 5,280-feet.
- 1968, Hecla drills 9-holes, totalling 13,095-feet. 3 of the holes were drilled in the Paramount Zone.
- 1969, Hecla drills 9-holes, totalling 15,501-feet.
- 1970, Hecla drills 26-holes, totalling 32,575-feet. 5 of the holes were drilled in the Paramount Zone.
- 1971, Hecla drills 25-holes, totalling 22,053-feet. 3 of the holes were drilled in the Paramount Zone.
- Total Hecla footage; 83,224-feet, of which 8,610-feet were drilled on the Paramount Property and 74,614-feet were drilled on the Schaft Creek Property.
- 1972-1977, Hecla drilled 35-holes, totalling 38,386-feet.
- 1977, 104-holes drilled on the properties held by Hecla, totalling 113,000-feet. A reserve of 505 mt with 0.38% Cu and 0.039% MoS<sub>2</sub> delineated.
- Between 1978 and 1979, Helca Mining forfeits option and Teck Corp. acquires the property.
- 1980, Teck Corp. drilled 47,615-feet, in 45-holes, between mid May to mid November. The drill sites were prepared with a D6 Caterpillar bulldozer. Assaying of core on 10-foot sample intervals, by Afton Mines Ltd. in Kamloops.
- 1981, between June and September, Teck Corp. drilled 33,315-feet, in 73-holes, and 3,503-feet of condemnation drilling for a tailings pond and mill sites.
- Resource expanded to a global estimate of 1bt with 0.30% Cu and 0.034% MoS<sub>2</sub>.
- Total property drilling is 197,500-feet, in 230-holes.
- 2005, between August and September, 15-holes amounting to 3,160-meters of PQ drilling was completed by Copper Fox Metals Inc.
- 2006, between July and October, 42-holes amounting to 9,006-meters of PQ and HQ drilling completed by Copper Fox Metals Inc.
- 2007, between June and October, 42-holes amounting to 6,306-meters of HQ and NQ condemnation drilling completed by Copper Fox Metals Inc.



Figure 6-2. Lyncorp drill at outcrop 66, Paramount zone.

# 7.0 GEOLOGICAL SETTING

# 7.1 REGIONAL GEOLOGY

The Schaft Creek porphyry Cu-Mo-Au-Ag deposit is situated in the Stikina terrane of the Intermontane belt which hosts important porphyry copper showings and deposits within the Canadian Cordillera. The Stikina terrane is composed of arc related volcanic, plutonic and sedimentary rocks of Devonian to Jurassic age and consists of a number of assemblages, including the Stuhini group. The Stuhini group is a volcanic succession consisting of flows, pyroclastics and derived volcanoclastics that occupy much of the valley of Schaft Creek and the La Casse ridge to the east.

West of Schaft Creek, the Hickman batholith, a 65-kilometer long by 17-kilometer wide felsic body intrudes the Stuhini group. The batholith, from south to north is composed of three plutons, the Hickman, the Yehiniko and the Nightout. The Hickman pluton is a hornblende granodiorite, while the Yehiniko pluton and the Nightout pluton are considered to be biotite, hornblende monzonite and biotite, and hornblende granodiorite, respectively. Their relationship to each other is somewhat uncertain, while the Hickman pluton and the Nightout pluton are thought to be coveal, the Yehiniko is considered to be younger, (Brown, Gunning, Greig, 1996).<sup>1</sup> See figure 7-1.



<sup>&</sup>lt;sup>1</sup> J.Scott, work in progress, addresses these relationships, MSC thesis, University of Alberta, sponsored by Copper Fox Metals Inc.

# 7.2 LOCAL GEOLOGY

The Schaft Creek deposit is classified as a high level calc-alkaline coppermolybdenum deposit that is associated with felsic intrusive rocks and hydrothermal fluids believed to be co-magmatic with the Hickman batholith. The deposit occurs in upper Triassic rocks of the Stuhini group and is spatially associated with the east contact of the Hickman batholith.

The majority of the deposit as defined to date is hosted in north-south striking, steep, easterly dipping volcanic rocks comprised of a package of: andesitic pyroclastics ranging from tuff to breccia tuff; aphanitic to augite-feldpar-phyric andesite, and derived volcanoclastics, see Appendix F. The deposit is elongated in a general north-south direction, as a result of modification from regional stress regimes and has been structurally transformed into complex assemblages of juxtaposed lithological units by post formation faulting, see Figure D-1.

Narrow, discontinuous feldspar porphyry and quartz feldspar porphyry dikes, genetically related to the Hickman batholith, intrude the volcanic package, occupying structural planes of weakness, (Salazar, 1973, Seraphim, 1967). The orientation of the mineralizing structures, originally related to local stress fields, is associated with the emplacement of the batholith. Potassic alteration envelopes are associated within the dikes as well as forming cm-dm wide halos.

# 8.0 DEPOSIT TYPE

# 8.1 DEFINITION

Porphyry deposits are large low to medium grade deposits in which the primary ore minerals are dominantly structurally controlled and which are spatially and genetically related to felsic and intermediate porphyritic intrusions (Kirkham 1972).

Typical grades for porphyry systems are:

- Copper grades range from .02% to 1%.
- Molybdenum grades range from 0.005% to 0.03%.
- Gold grades range from 0.004 g/t to 0.35 g/t.

• Silver grades range from 0.2 g/t to 0.5 g/t.<sup>2</sup>

With the exception of silver the current reported grades for the Schaft Creek deposit fall within these global averages, being;

- Copper 0.25%.
- Molybdenum 0.019%.
- Gold 0.18 g/t.
- Silver 1.55 g/t.

Total measured and indicated reserves amount to 1.3 billion tonnes.<sup>3</sup>

The silver grade at Schaft Creek is 300% higher possibly reflecting a lower temperature hydrothermal system.

### 8.2 DEPOSIT MODEL

The Schaft Creek deposit is considered to be of magmatic-hydrothermal origin. A late high level magma, in part the subvolcanic facies of a stratovolcano, is genetically and temporally associated with the Hickman batholith. The subvolcanic phase evolved to an extrusive phase forming the Stuhini volcanics. Within a roof cupola stemming from the main intrusion, subsequent crystallization of the high level magma partitioned and concentrated a volatile phase that generated sufficient overpressure, overcoming the tensile strength of the rock and lithostatic load, see Figure 8-1.

This overpressure event triggered the release of hydrothermal fluids into the overlying volcanic succession, forming mineralized veins, vein sets, fractures, stockworks and crackle zones. Several episodes of hydrothermal activity occurred resulting in the development of at least three sulphide mineralized quartz-carbonate  $\pm$  chlorite vein systems. The latest hydrothermal event generated late quartz-molybdenum  $\pm$  sulphide filled fractures.

The magmatic phase related to this event is represented by mineralized feldspar ± quartz porphyry dikes. The multi-phase, dynamic system generated complex breccia hosted mineralization within the intrusive as well as within fault controlled zones.

<sup>&</sup>lt;sup>2</sup> Sinclair, W. D., 2007. Porphyry Deposits *in* Mineral Deposits of Canada. Special Publication No. 5, Geological Association of Canada, Mineral Deposits Division, p226.

<sup>&</sup>lt;sup>3</sup> McCandlish, K., 2007. Updated Resource Estimates for the Schaft Creek Deposit, Northwestern British Columbia, Canada, Associated Geosciences Ltd., for Copper Fox Metals Inc. pp 196.

High angle structural discontinuities were the primary conduits for ascending hydrothermal fluids as opposed to compositional variations within the volcanic succession. See figure 8-1.



# 9.0 MINERALIZATION

### 9.1 REGIONAL METALLOGENIC SETTING

The Stikine terrane hosts numerous significant deposits; the two most important of these are Copper Fox's Schaft Creek deposit and Nova Gold's Galore Creek deposit. The Schaft Creek deposit is associated with the eastern margin of the Hickman batholith, as are four mineral occurrences. Within a 13.5-kilometer north-south distance the following occurrences are known: the Late, the Arc-Post, the Nabs and the Hicks. Although small in size, their association with shears may delineate a regional scale fault spatially associated with the contact zone of the Hickman batholith. See figure 7-1.

# 9.2 PROPERTY MINERALIZATION

Three geologically distinct, but not necessarily disparate, spatially separate zones, representing distinct porphyry facies constitute the Schaft Creek deposit.

The largest of these zones is the Main zone, which is characterized by synintrusive, poly-phase quartz-carbonate veins, vein sets, stockworks, crackle zones, and feldspar ± quartz porphyry dikes, see Figure D-2. These are mineralized with variable amounts of chalcopyrite, bornite and molybdenite, as well as late fracture molybdenite. This environment represents the upper mesozone of the porphyry system

The second largest zone is the Paramount zone, which is characterized by; primary sulphide mineralization associated with a felsic intrusive auto-brecciated phase, containing chalcopyrite, bornite and molybdenite; quartz-carbonate stockworks; and late fracture molybdenite mineralization. This zone represents a deeper cupola environment.

The smallest of the three zones is the West Breccia zone. It is characterized by quartz tourmaline, chlorite, epidote veining, pyrite and a hydrothermal breccia, incorporating xenoliths of andesitic rocks and autoliths of feldspar  $\pm$  quartz porphyry. This zone represents a low temperature epizonal environment. See figure 9-2.

The mineralization at Schaft Creek is associated with mm-dm potassic alteration halos enveloping veins, vein systems and felsic dikes. An outer propylitic alteration zone affects the Stuhini group rocks, forming up to dm-scale epidote-pyrite-carbonate patches. The latest alteration phase is an obscure phyllic overprinting affecting all rock types and is feldspar destructive.



Figure 9-2. Schaft Creek deposit showing approximate location of mineralized zones.

### **10.0 EXPLORATION**

### **10.1 2007 MAPPING PROGRAM INTRODUCTION**

In the fall of 2007, a mapping program that encompassed an area of 3.6kilometers by 2.6-kilometes (936-hectares) was completed at a scale of 1:5,000 using GPS control. Targeted outcrops were identified by airphoto interpretation and archival geological maps. Their locations were subsequently plotted on a 1:5000 topographical base map derived from digital orthophoto georeferenced maps produced by Eagle Mapping Ltd.

The recognition of mappable units within the volcanic succession was difficult and was hampered by isolated outcrops. The original approach was to map on a lithological basis which ultimately lead to a generalized genetic terminology, discriminating between lavas, early post volcanic intrusions, late post volcanic intrusions pyroclastic and volcanoclastic rocks.



Figure 10-1-1. View of Saddle pass. Looking east from Wolverine Creek.

In the field uncertainty and ambiguity resulted from poor outcrop exposure, intense fracturing and variable alteration intensities and overprinting. In the end, most of the lithological details resulting in unit recognition and continuity were extracted from drill logs. Field mapping did illustrate the structural complexity of the deposit in terms of orientation, spatial distribution and severity of faulting and fracturing, as well as the abundance and orientation of late intermediate to mafic dikes. A total of 139-outcrops were site visited, located by GPS referenced to NAD 83 UTM datum and plotted on a selected window of a 1:5000 topographical base map, see Figure D-3. An archival data base of the diamond dill record containing lithological codes and available in ACCESS was re-coded to mesh with a simpler codification, see Table 10-1. The final geological map is a product derived from the compilation of this outcrop mapping, drill log data and pre-existing maps and sections generated by Asarco Ltd, Hecla Mining Company, Teck Corp and Copper Fox Metals Inc, see Figure D-1.



Figure 10-1-2. Close up of trail system in Paramount zone referenced to above photo. Note cut base line heading diagonally to upper left corner of photo. Base line cut at north-south azimuth, 2007.

### **10.2 LITHOLOGICAL CLASSIFICATION**

A simplification of archival lithological codes was completed to assist with the computer geological modeling. In this respect, 40-archival litho-code units were reduced to 9-units. Table 10-1, is a compilation summarizing the grouping of the archival units to the current proposed classification. The new classification in general terms reflects genetic temporal associations and is loosely based on the geochronological system employed by the British Columbia Geological Survey Branch.

The 2007 Schaft Creek mapping project consists of nine rock types, simplified from the 17 rock types used in the 2006 diamond drill hole program and the 40-rock types used in the past. The nine rock types include: mafic/intermediate dike, tourmaline breccia, vein systems, feldspar quartz porphyry, diorite, Hickman pluton felsic suite, volcanoclastics, andesite volcanics and augite porphyry.

# Mafic/Intermediate Dike, TMid (B/BS, D/BS, DYKE)

This rock type is commonly seen throughout the deposit area, showing a variety of trends when in contact with the volcanics and felsic units, with a general north-south orientation. It is the youngest unit of the rock types and comprises 2.5% of the 2006 core. Mafic/Intermediate dikes within the deposit area are 1-5m wide in outcrop, massive with minor fracturing and commonly steeply dipping between 80-90°. The dikes are dark green-grey to medium grey and fine-medium grained, see Figures 10-2-1 and 10-2-2. They are commonly plagioclase feldspar or plagioclase feldspar-augite-phyric, with subrounded calcite vesicles. Epidote and hematite alteration is minimal, leaving the rock fresh looking with few mm carbonate veins. The weathered surface is generally brown and smooth, at times showing an mm-cm rind. Mineralization within the dikes is rare, limited to trace-3% disseminated pyrite.



### Fig 10-2-1:

**06CF284-58.8 m. D/BS, Basic Dike.** Massive, feldspar phyric mafic dike with chilled margin at contact to feldspar phyric andesite, shown on the right.



#### Fig 10-2-2:

**Outcrop 89. B/BS, Intermediate dike.** Medium grained intermediate composition dyke with 20% subhedral to euhedral plagioclase feldspar phenocrysts.

### Tourmaline Breccia, EJtbx (TOBR, TOIG, TOIV, TOVL)

This rock type comprises 0.1% of the 2006 core. The unit primarily has a brecciated host rock of feldspar quartz porphyry, andesitic volcanics or volcanoclastics, and is intensely hydrothermally altered and fractured. The fine grained matrix consists of quartz-epidote-chlorite-tourmaline-pyrite ± chalcopyrite, see Figure 10-2-3. The distribution of tourmaline breccia within the deposit is fault controlled and occurs mainly in the West Breccia zone in a north-south orientation, see Figure D-1.





### Vein Systems, LTvns (HVBX, BRXX, QZVN, CCBX)

This rock type is found within all of the other units throughout the deposit and comprises 2.7% of the 2006 core. The hydrothermal breccia consists of stockworks and heavy quartz veining, brecciating the host rock and creating sharp, angular breccia clasts. Minor to moderate chlorite and sericite and local chlorite and epidote alter the host rocks. Potassic alteration halos occur around breccia clasts on a cm-scale. Bornite and chalcopyrite mineralization are found within quartz-only veins and with molybdenite, as disseminations, see Figure 10-2-4. Magnetite is typically present as veins and in quartz veins up to 2% in abundance, rarely occurring up to 30%, with trace hematite.

Quartz veins are greater than 20cm, made up of >50% quartz and often brecciate the host rock, creating angular fragments. In some cases, up to 8% total sulphides, including bornite, molybdenite and chalcopyrite stringers and fracture coatings occur within the quartz veins.



#### Fig 10-2-4:

**06CF288-28.0 m. HVBX, Hydrothermal Breccia.** Clasts of feldspar porphyry within a minor igneous, fine grained and mainly hydrothermal matrix. This matrix is made up of white carbonate, chlorite, magnetite, chalcopyrite, bornite and molybdenite.

The unit, carbonate-chlorite hydrothermal breccia is characterized by strong carbonate overprinting and strong chlorite alteration. Moderate sericite and weak potassic alteration can also be associated with this type. Trace chalcopyrite and molybdenite mineralization is associated with the breccia vein walls.

### Feldspar Quartz Porphyry, LTfqp (PPFQ, PPPL)

This rock type is found throughout the deposit area as dm-m-scale outcrops and comprises 7.7% of the 2006 core. Feldspar quartz porphyry consists of 10-40% subhedral to euhedral plagioclase feldspar phenocrysts within a fine-medium grained feldspathic groundmass, see Figure 10-2-5. This unit is typically massive with sericite overprinting and overall silicification. The feldspar phenocrysts are often altered by sericite, quartz, chlorite and carbonate, while minor augite phenocrysts are pseudomorphed by chlorite and sericite. Disseminated chalcopyrite and pyrite occur within cm-m potassic alteration halos, along with rare hairline stringers. The feldspar porphyry unit is similar to feldspar quartz porphyry with the absence of quartz eyes.



#### Fig 10-2-5:

**06CF284-242.80 m. PPFQ. Feldspar Quartz Porphyry.** Strongly feldspar phyric, medium grained, felsic intrusive. Euhedral and subhedral plagioclase phenocrysts in variously textured, fine grained, igneous groundmass with weak potassic alteration.

### Diorite, LTdr (DIOR)

This rock type is rare within the deposit both as outcrop and within drill core; it represents 0.2% of the 2006 core. Diorite is fine to medium grained, rarely coarse grained, with equigranular plagioclase feldspar and pyroxene crystals. Alteration within this unit includes alteration of the plagioclase feldspar to chlorite and sericite and the pyroxene crystals to chlorite, carbonate and magnetite, see Figure 10-2-6. Locally moderate epidote, minor hematite and rare strong potassic alteration are found. Mineralization consists of trace-1% disseminated pyrite and chalcopyrite and mm quartz-carbonate veins with chalcopyrite and molybdenite.



### Fig 10-2-6:

**06CF268-151.9 m. DIOR, Diorite.** This sample is intermediate in composition, equigranular, medium grained and is made up of anhedral to subhedral plagioclase and ~20 % interstitial chlorite and iron magnesium minerals.



Hickman Batholith Felsic Suite, LTgr (GRDR, QZMZ, INBX, BRIG)

### Fig 10-2-7:

**06CF287-207.4 m. GRDR, Granodiorite.** Equigranular, medium grained and made up of pink subhedral potassic feldspar, plagioclase, minor interstitial quartz and dark green chlorite

This rock type is associated with the Hickman batholith, found to the west of the deposit area and comprises 6% of the 2006 core. Granodiorite is a medium to coarse grained, equigranular, felsic rock with weak potassic alteration, see Figure 10-2-7. Minor epidote-chlorite alteration overprinting and local silicification, sericite and chlorite alteration affect the rock. Mineralization occurs as veining, stringers and minor disseminations of chalcopyrite and molybdenite. A large portion of the host rocks of the intrusive and hydrothermal breccias in the Paramount zone are granodiorite.

Quartz monzonite in this deposit is similar to the granodiorite in terms of alteration and mineralization. Compositionally, it has less quartz than the granodiorite. Epidote alteration is moderate to intense; while hematite alteration is often moderate. In addition to the sulphides mentioned, trace disseminated bornite occurs, as well as minor malachite on fractures.



### Fig 10-2-8:

**06**CF287-19.3 m INBX, Intrusive Breccia (polished surface). Closely packed clasts of predominantly granodiorite and minor feldspar porphyry, within a dark grey, fine grained, igneous, felsic matix. Accessory infilling by chalcopyrite and pyrite as 1 cm stringers and disseminations.



#### Fig 10-2-9:

**06CF287-18.3 m. INBX, Intrusive Breccia.** Closely packed clasts of granodiorite in a minor matrix of dark grey, fine grained, igneous, felsic matix. Note 3 cm, zoned bleb of sulphide consisting of pyrite-chalcopyrite-molybdenite. This bleb is interpreted to be generated by a high temperature, hydrothermal event.

The intrusive breccia and breccia, mostly igneous fragments, are generally found in the West Breccia and Paramount zones. These rock types consist of brecciated host rocks with largely igneous textures and minor hydrothermal overprinting. The igneous breccia matrix is fine grained, felsic and feldspathic. The brecciated protolith, which comprises >80% of the rock, is dominantly granodiorite or andesitic volcanics and rarely feldspar quartz porphyry, see Figures 10-2-8 to 10-2-10. Mineralization of chalcopyrite, molybdenite and bornite occurs as veins, breccia associated and disseminations, up to 10% total sulphides.



### Fig 10-2-10:

**06**CF288-7.0 m. BRIG. Intrusive – Hydrothermal Breccia. Angular clasts of grey feldspar porphyry in 20 % igneous breccia matrix of light grey, fine grained, feldspatic rock. Subsequent hydrothermal infilling by chlorite, bornite, pyrite and carbonate.

**Volcanoclastics, LTSvs** (ANBX, ANCG, ANLP, ANTF, ANFT, BRIV, BRVI, BRVL, PVLP, PVAN, VSED)

This rock type is found primarily in the Main and West breccia zones and comprises 32.3% of the 2006 core. Alteration of the volcanoclastic rocks consists of moderate sericite alteration and minor carbonate, chlorite and quartz. Fine grained magnetite is pervasive, as is quartz ± carbonate veining on an mm-cm scale within the andesite clasts.

Andesitic tuff is generally tan to light grey in colour and has a feldspathic composition with trace ferro-magnesium minerals. This tuffaceous sediment rock is fine to very fine grained, with cm bedding, see Figure 10-2-11.

Andesitic lapilli breccia is comprised of 1mm to >10cm subrounded, heterolithic andesitic breccia clasts, see Figure 10-2-12. The clasts consist of 30-50% of the rock, with a chlorite dominated matrix.



### Fig 10-2-11:

**06CF264-238.9 m. ANTF, Andesitic Tuff.** The lower right portion shows a very fine grained, homogeneous tuff with weak bedding. The left part of the photograph shows a fine grained, clastic tuff with mm lapilli. Note the disseminated chalcopyrite throughout the sample.



**Fig 10-2-12:** 06CF273-235.15 m. ANBX. Andesite Lapilli Breccia. Heterolithic volcanic breccia with mm to >10 cm size, rounded and angular clasts in chlorite dominated, 30–50 % matrix. Andesitic lapilli tuff is medium grey, has fine grained cm-scale andesitic volcanic rounded to subangular mono- to heterolithic clasts, see Figure 10-2-13. The matrix consists of a fine grained tuff and varies in amount from half to almost nought.



#### Fig 10-2-13:

**06**CF256-277.3 m. ANLP, Andesite Lapilli Tuff. Heterolithologic, subrounded, mm-2cm andesitic clasts within a fine grained, fragmental crystal tuff matrix, with minor carbonate veins.

Andesitic conglomerate is medium grey, has rounded to subrounded andesitic clasts with a fine grained volcanic matrix.

Andesitic breccia is medium green-grey and consists of andesite brecciated by a fine grained chlorite-dominated fluid matrix.

Volcanic breccia consists of 2-20cm, heterolithic, rounded to angular clasts. The clasts are closely packed with little matrix, see Figure 10-2-14.


### Fig 10-2-14:

**06CF255-242.3 m. BRVL. Volcanic Breccia.** Closely spaced, 1-20 cm, angular to rounded, heterolithologic volcanic clasts within a small amount of matrix. Note the 1 mm wide chalcopyrite-veinlets.

Volcanic sediment is formed in a subaqueous environment, displaying mm-cm bedding.

The purple fine-grained pyroclastics and purple fragmental andesite volcanic tuff breccia units are akin to their andesitic counterparts with the addition of strong hematite alteration.

Andesitic Volcanics, LTSav (ANDS, ANPF, ANPL, ANAP, ANXX, PVPF)

This rock type is found throughout the deposit area and comprises 37.9% of the 2006 core. This type is generally medium green-grey to tan to pink to light green, depending on the alteration, fine grained, plagioclase feldspar porphyritic and fractured, see Figures 10-2-15 to 10-2-17. Compositionally this unit consists of predominantly plagioclase feldspar, minor chlorite and quartz. Alteration is dominantly from sericite and minor chlorite, carbonate, quartz, biotite and opaque minerals which create accessory minerals in the rock, see Figure 10-2-18. Sericite alteration affects the plagioclase phenocrysts, while chlorite frequently pseudomorphs the augite phenocrysts. Quartz  $\pm$  carbonate veins are found throughout this unit in varying intensities on an mm-dm scale.



### Fig 10-2-15:

**06CF249-122.0 m. ANDS, Andesite.** A massive, very fine grained to aphanitic, igneous lava of intermediate composition with no discernible phenocrysts.



#### Fig 10-2-16:

**06CF249-103.7 m. ANPF, Feldspar Phyric Andesite.** 10-20 %, 0.1–0.5 mm sized, light grey subhedral feldspar phenocrysts within a predominantly very fine grained igneous groundmass.



### Fig 10-2-17:

**06CF258-106.7 m. ANAP, Feldspar-Augite-Phyric Andesite.** 10 - 30 % light grey feldsparphenocrysts and 5% dark green-grey, altered augite phenocrysts within a fine grained igneous groundmass. Note: accessory chalcopyrite is in <1mm wide, sub-parallel stringers.



### Fig 10-2-18:

**06CF282-60.25 m. ANXX.** Alteration Zone. Strongly silicified and chlorite-carbonate altered, deformed rocks. This rock type consists of various protoliths, generally and esitic and minor quartz feldspar porphyry. Commonly consists of fabric and brecciation.

Mineralization of pyrite, chalcopyrite, molybdenite and bornite generally occurs as very fine grained disseminations, mm quartz-carbonate veining and patches, stringers and

fracture associated. The hematized plagioclase feldspar-augite-phyric andesite is similar to its andesitic counterpart with the addition of strong hematite alteration.

## Augite Porphyry, LTSap (PPAU, ANAU)

This rock type comprises 2.5% of the 2006 core. Augite-phyric andesite is fine to coarse grained, with a gabbroic composition and subhedral to euhedral augite phenocrysts often pseudomorphed by chlorite, see Figure 10-2-19. This rock has moderate epidote and minor hematite alteration. Trace disseminated and fracture associated pyrite occurs.



#### Fig 10-2-19:

**06CF261-164.5 m. ANAU, Augite Phyric Andesite**. Subhedral, altered, dark green augite phenocrysts, 1-2 mm in size, within a weakly altered, fine grained, igneous groundmass. The augite phenocrysts are entirely replaced mainly by chlorite.

## Faults (FAUL, SHER, MYLN)

Faults and shears are found throughout the deposit area and comprise 4.4% of the 2006 core. The faults and shearing in this deposit can be described as strongly fractured, generally steep, well delineated zones of structurally destroyed, clay rich gouge material, see Figure 10-2-20. Trace to significant amounts of sulphides can be present, especially as painted surfaces or slickenside films. Apart from generally steep dips, no hard information on the strike and sense of movement is obtainable from nonoriented core. Mylonite zones are narrow sections of highly comminuted rock with a strong fabric. The mylonite zones have a presumed north-south trend and a moderate eastern dip, based on the moderate to high core axis angles.



### Fig 10-2-20:

**06CF268-149.45 m. FAUL/SHER, Faults, Shearing.** Mylonitic shearing of phyllically altered andesite, with closely spaced, oriented, parallel carbonate veins.

### Overburden (OVER)

Overburden comprises 3.6% of the 2006 core.

2007 Rock Types	2005/2006 Rock Codes	Historical Rock Codes	Rock Description
Mafic/Intermediate Dyke	B/BS	DYKE	Basalt dyke
TMid Tourmaline Breccia	D/BS DYKE TOBR	DYKE DYKE BF	Late mafic dyke Andesite dyke/Andesite porphyry dyke Tourmaline breccia
EJtbx	TOIG TOIV TOVL PNBX	BF BF BF PNBX	Breccia, tourmaline, igneous Breccia, tourmaline, igneous and volcanic Breccia, tourmaline volcanic Pneumatolytic breccia
Vein Systems	HVBX	HVBX	Hydrothermal breccia
LTvns	QZVN CCBX	QZVN CCBX	Quartz vein Chlorite-carbonate breccia
Feldspar Quartz Porphyry	PPFQ	LThd	Feldspar porphyry
	PPPL PPBR	LTHD BF	Plagioclase porphyry Breccia, igneous porphyry dykes
	DIOR	inga	Dionte
LIHagr	GRDR QZMZ BRXX INBX BRIG	ITgd ITgd BF INBX BF	Granodiorite Quartz monzonite Intrusive breccia, andesite Intrusive breccia Breccia, mostly igneous fragments
Volcanoclastics	ANBX	uTSv	Breccia, andesite
LTSvs Andesitic Volcanics	ANCG ANLP ANTF BRIV BRVI BRVL PVLP PVAN VSED ANAP	uTSv uTSv BF BF BF PVLP PVAN uTSv ANPF	Andesite conglomerate Lapilli Andesite Andesitic tuffite, sandstone, greywacke, conglomerate Breccia, mostly volcanic fragments Volcanic breccia Altered volcanic breccia/lapilli Purple fragmental andesite volcanic tuff breccia Purple fine-grained pyroclastics Volcanic sediment Feldspar augite phyric andesite
LTSav	ANAU	ANPF	Altered augite-phyric andesite
	ANDS ANFT ANPF ANPL ANXX PVPF	uTSv uTSv uTSv uTSv uTSv PVPF	Andesite Andesite Altered feldspar-phyric andesite, strong Andesite, plagioclase-phyric Altered andesite, moderate to strong Hematized plagioclase-augite-phyric andesite
Augite Porphyry	PPAU	uTSp	Augite-phyric andesite

### **10.3 LITHOLOGICAL DISTRIBUTION BY ZONES**

#### 10.3.1 DEPOSIT

In regards to the deposit as a whole, nine rock types, in addition to the units, faults and overburden were observed and recorded. Using the data from the 2006 core, which contain drill holes from all three zones; statistics on the percentages of the nine rock types were determined throughout the deposit, see Figure 10-3-1. Andesitic volcanics represent the major rock type throughout the deposit with 37.9%, followed by volcanoclastics at 32.3% of the total rocks types. These figures represent the major distribution of the host rocks, which are part of the volcano-sedimentary sequence, present prior to the intrusion of the Hickman batholith and its related successions. One of these successions, the feldspar ± quartz porphyry, forming the outer fingering limits of the Hickman batholith, represents 7.7% of the total rock types; while the Hickman batholith felsic intrusives amount to 6% of the deposit. The units overburden and faulting/shearing equate to 3.6% and 4.4% of the 2006 core, respectively, displaying the strong faulting created by the overpressure from the batholith throughout the deposit area. The vein systems, related to the Hickman batholith intrusion, comprise 2.7% of the total. Mafic/intermediate dikes and the augite porphyry unit each consist of 2.5% of the deposit. Diorite, related to the Hickman batholith and tourmaline breccia each represent <1% of the deposit, with 0.2% and 0.1%, respectively.



Lithology Percentage of the Meterage in the Schaft Creek Deposit

Chart 10-3-1: Schaft Creek Deposit Lithology Percentage

### 10.3.2 LIARD MAIN ZONE

The majority of the rocks in the Liard Main zone consist of the host volcanosedimentary package within the deposit, see Figure 10-3-2. The andesitic volcanics and the volcanoclastics represent half of this dominant package, each making up 41% of the core. Feldspar ± quartz porphyry which intrudes the host rocks as an outer extension of the Hickman batholith, makes up 7% of the rocks in the Liard Main zone. Faulting/shearing and overburden each consist of 3% of the rocks in this zone. Augite porphyry, a portion of the volcano-sedimentary package represents 2% of the rocks. Vein systems, successive phases of the intrusive, are less abundant in this zone as compared to the other two, comprising 2% of the rocks. Mafic/Intermediate dikes found throughout the zone with varying trends represent 1% of the rocks in this zone. Tourmaline breccia, diorite and the Hickman felsic suite each represent <1%, reflecting the distal relationship of the Liard Main zone from both the batholith source and the fault breccia zone.



Lithology Percentage of Meterage in the Liard Main Zone

Chart 10-3-2: Liard Main Zone Lithology Percentage

### 10.3.3 WEST BRECCIA ZONE

The lithologic distribution of the West Breccia zone is dominated by 54% andesitic volcanics, 14% volcanoclastics and 8% augite porphyry, representing the volcano-sedimentary host rocks emplaced prior to the intrusion of the Hickman batholith, see Figure 10-3-3. Faulting and shearing comprises 6% of this zone, as these features control the distribution of the tourmaline breccia within the West Breccia zone. Vein systems are typically mineralized in this zone and represent 5%, while overburden consists of 4% of the core in this area. Mafic/Intermediate dikes correspond to 2% and the narrow tourmaline breccia zone which shows strong mineralization comprises 1% of the core. The Hickman felsic suite consists of 2% of the core and diorite makes up <1%, reinforcing that the West Breccia zone represents the epizonal level of the main source of the batholith.



Chart 10-3-3: West Breccia Zone Lithology Percentage

### **10.3.4 PARAMOUNT ZONE**

The dominant rock type within the Paramount zone is the Hickman batholith felsic intrusives with 44%, see Figure 10-3-4. The feldspar ± quartz porphyry and vein system units represent 14% and 5% of the core in this zone, respectively. This representation of over half of the core within the Paramount zone by the Hickman felsic intrusives and its successions, indicates the proximity of this zone at depth to the cupola. The remnants of the volcano-sedimentary basin in this area are represented in equal 7% proportions by the andesitic volcanics and volcanoclastics. Faulting and shearing comprise 9% of the core in the Paramount zone, displaying the results from intense overpressure caused by the batholith. This high level of faulting produced greater areas of weakness, accounting for the overall increase to 10% mafic/intermediate dikes in this zone, as compared to the percentages in the West Breccia and Liard Main zones. Overburden makes up 4%, the largest proportion compared to the other two zones, while augite porphyry consists of <1% of the core. Tourmaline breccia comprises <1% of the core in this zone, signifying the position of the Paramount zone at depth from the shallowly emplaced fault breccia zone.



Lithology Percentage of Meterage in the Paramount Zone

Chart 10-3-4: Paramount Zone Lithology Percentage

### **10.4 GEOLOGICAL MAP**

The final geological compilation map is a product of over 40-years of acquired data and observations, all which were relevant in the context of the time. The current map is by no means a final product; it should be considered to be a work in progress. Hopefully, future map iterations will be able to expand and refine the current interpretation, see Figure D-1.

In a general sense the simplification of the lithological units did not contextually simplify the geological setting of the Schaft Creek deposit. Although the northwest-southeast linear tends of the geological units remain unchanged, their relationship to each other within fault bounded domains is complex.

The current interpretation evolved subsequent to the development of the deposit geological model and attempts to reconcile field data, drill data, and observation into the context of the model. In this respect, the northwest striking, easterly dipping volcanic succession of the Stuhini group has been retained, see Appendix F. The Stuhini group volcanic successions are the most widespread of the lithologies while the volcanoclatics facies emphasizes the strong northwest-southeast orientation of the group.

The greatest change influenced by the proposed model is to the spatial orientation and distribution of the feldspar ± quartz porphyry dikes. The current interpretation favors a strong bias to high angle, sub-vertical orientations of these felsic bodies, resulting in significantly increasing their interpreted bedrock exposure. On plan, the most striking features are; the bifurcating distribution of the porphyries originating from the area of the Paramount zone, then splitting in two distinct branches into the West Breccia zone and the east section of the Main zone; their discontinuous strike extent and narrow widths within the center of the deposit area; and their preferred northwest-southeast orientations mimicking the trends within the Stuhini group, see Figure D-1.

Within the Main zone the majority of the sulphide mineralization is associated with veins, vein sets, stockworks, crackle zones and late fractures. These features, although evident in drill core have not been consistently documented in the past. With the limited data that was extracted from Hecla drill logs, representing them graphically either on plan or in section was highly interpretive. Their distribution imitates the

previously mentioned trends with a loose spatial association with the feldspar  $\pm$  quartz feldspar intrusions.





An east-northeast trending fault, Liard fault, extending from the Hickman pluton across to the northeast sector of the Main zone appears to delineate a major break offsetting and terminates lithological units as well as mineralization. The Liard fault has apparently affected the continuity of the vein systems northwestward beyond the Main zone into the Paramount zone.

The ostensible termination of the vein systems at this fault is somewhat speculative. Although the vein systems could not be extended across section northward in this area, another plausible explanation could be the lack of data as a result of the low density of drilling between the Main zone and the Paramount zone.



Figure 10-4-2. Abandoned boulder creek bed of Wolverine Creek. Facing up-stream.

Intrusive rocks of the Hickman/Yehiniko pluton form a southeasterly directed, multi-fingering array stemming from a protruding extension of the Hickman batholith, in the Paramount zone area. This feature in-conjunction with the strong directional orientation of the vein systems and the feldspar ± quartz porphyry dikes re-enforces the hypothesis that the Paramount zone delineates the magmatic source region of the porphyry system.

All of the above features indicate a northwestward plunging system.

The regional stress regime that produced the strong directional structural fabric was developed in response to the overpressure event generated by a sub-volcanic intrusion that is exposed today as the Hickman batholith. Post mineralization faulting and fracturing associated with on-going accretionary tectonics structurally modified the deposit. The effects of these processes are evident by the numerous multi-oriented faults and dikes.

# 11.0 OTHER RELEVANT DATA AND INFORMATION

### Abbreviations

- UTM Universal Transverse Mercator
- GPS Gobal Positioning System
- NAD North American Datum
- C Centigrade
- mt million tonnes
- bt billion tonnes
- mm millimeter
- cm centimeter
- dm decimeter
- m- meter
- PQ core size 8.5-centimeters
- HQ core size 6.4-centimeters
- NQ core size 4.8-centimeters
- Cu copper
- Mo molybdenum
- Au gold
- Ag silver
- Tmid Tertiary mafic to intermediate dike
- EJtbx early Jurassic tourmaline breccia
- LTvns Late Triassic vein system
- LTHfqp Late Triassic Hickman suite feldspar ± quartz porphyry
- LTHdr Late Triassic Hickman suite diorite
- LTHgr Late Triassic Hickman suite granodiorite/quartz monzonite
- LTSvs Late Triassic Stuhini group volcanoclastics
- LTSav Late Triassic Stuhini group andesitic volcanics
- LTSap Late Triassic Stuhini group augite porphyry

# 12.0 CONCLUSIONS

Over the past 40-years, that the Schaft Creek deposit has been explored and evaluated, a very detailed but encumbered lithological classification evolved. The detailed classification system initially served to document geological observations. From these observations, geological concepts evolved, which lead to the recognition that the Schaft Creek deposit represents a complex porphyry system. Ultimately a geological model evolved that attempted to resolve the complexity of the porphyry system. The proposed simplification of the lithological classification endeavors to unify the geological concepts of the past, recognizing that the mineralization at Schaft Creek is largely structurally controlled and associated with various felsic intrusive bodies, vein styles and fractures. The volcanic succession of the Stuhini group simply serves as the host rock to the mineralization. Unraveling its complex facies relationships becomes secondary and not necessary within the context of the current model. The fundamental goal is to generate a geological computer model of the deposit. Hopefully, the results of the program documented by this report will assist with achieving this objective.

# 13.0 RECOMMENDATIONS

In the process of the mapping program and the compilation of the archival data, target areas warranting exploration drilling have become evident.

- The West Breccia zone remains poorly defined. A series of angled fence drilling commencing at section 6359300N to 6360500N, and between the contact zone of the Hickman batholith to 379700E should be undertaken.
- The area between the Paramount zone and the Laird Main zone from sections 6360200N and 6360800N and between 379400E and 379900E should be drilled by a series of angled fence holes.

The rationale for the angled holes is to cut the high angle faults and fault zones at a high angle to core axis. This may improve core recovery and penetration rates by avoiding drill bit deflection into the sub-vertical gouge zones, commonly associated with the faults. Angled holes will also provide cross-sectional intercepts which would be more useful for section interpretation.

## 14.0 REFERENCES

- Betmanis, A.I., 1980. Summary Report of the 1980 Exploration Program, Schaft Creek Deposit, Liard District, B.C., pp 95.
- Betmanis, A.I., 1978. Report on the Geology (Including Prospector's Report) of the Lacasse and Schaft Claims, Schaft Creek Area, Liard Mining Division B.C. *prepared for* Teck Corporation, pp 37.
- Brown, D.A., Gunning, M.H., Greig, C.,J. 1996. The Stikine Project: Geology of Western Telegraph Creek Area, Northwestern British Columbia. Bulletin 95. Energy and Minerals Division, Geological Survey Branch, pp 175.
- Burmeister, M.W., 1966. Schaft Creek Copper, 1965 Summary Report, *prepared for* Silver Standard Mines Ltd, pp 43.
- Ewanchuk, S., Fischer, P., Hanych, W., 2007. 2006 Diamond Drill Report, Schaft Creek Property, Northwestern B.C., Final Report, *prepared for* Copper Fox Metals Inc., pp 72.
- Fischer, P., Hanych, W., 2006. 2005 Diamond Drill Report, Schaft Creek Property, Northwestern B.C., Final Report, *prepared for* Copper Fox Metals Inc., pp 71.
- Fox, P.E., 1978. Summary Report, Liard Project 1977, Schaft Creek B.C., *prepared for* Hecla Mining Company of Canada Ltd. pp 100.
- Fox, P.E., 1977. Summary Report, Liard Project 1976, Schaft Creek B.C., *prepared for* Hecla Mining Company of Canada Ltd. pp 27.
- Lange, I.M., 1971. 1971 Surface Geological Report of the Liard Copper-Molybdenum Deposit, pp 22.
- Linder, H. 1969. Summary Report, Schaft Creek Propery, Liard Copper Mines Ltd., *prepared for* Hecla Operating Company, pp 95.
- Logan, M. James, et al 1994. Geology and Mineral Deposits of the Galore Creek Area, Bulletin 92, Geological Surveys Branch British Columbia, Ministry of Energy Mines and Resources, pp 67.
- Logan. M. James, et al. Geology of the Forrest Kerr-Mess Creek Area, Northwestern British Columbia, Bulletin 104, British Columbia Geological Survey, Ministry of Energy Mines and Resources, pp 123.
- McCandlish, K., 2007. Updated Resource Estimate for the Schaft Creek Deposit, Northwestern British Columbia. Associated Geosciences Ltd. *for* Copper Fox Metals Inc. pp 196.
- McKinney, J.E., Stelck, D.R, 1969. Summary Report, Schaft Creek Deposit, Liard Copper Mines Ltd. and Paramount Mining Limited, *prepared for* Hecla Operating Company, pp 110.
- Salazar, G.M., 1973. Summary Report, Liard Project 1972, Properties of Liard Copper Mines Ltd. and Paramount Mining Ltd., Schaft Creek B.C., Volume III, Addendum II and III, *prepared for* Hecla Mining of Canada Ltd., pp 34.
- Seraphin, R.H., 1971. Liard Copper Mines, Schaft Creek Property, Summary Report for 1970,

prepared for Silver Standard Mines Ltd., pp 12.

- Seraphin, R.H., 1967. Report on Liard Copper Mines, Schaft Creek Property, *prepared for* Silver Standard Mines Ltd., pp 41.
- Sinclair, W., D., 2007. Porphyry Deposits *in* Mineral Deposits of Canada, A Synthesis of Major Deposit Types, District Metallogeny, the Evolution of Geological Provinces and Exploration Methods. Special Publication No. 5. Geological Association of Canada, Mineral Deposits Division, pg 223-244.
- Spilsbury, T.W., 1995. The Schaft Creek copper-molybdenum-gold-silver porphyry deposit, northwestern British Columbia. *In* Porphyry Deposits of the Northwestern Cordillera of North America. *Edited by* T.G. Schroeter. Canadian Institute of Mining, Metallurgy and Petroleum, Special Volume 46, p. 239-246.
- Spilsbury, T.W. 1982. A Study of the 1981 Drill Program on the Schaft Creek Porphyry Copper-Molybdenum Deposit. *An* independent project submitted to the Department of Geological Sciences *for* a Non-Research Master of Science Degree in Mineral Exploration, Queen's University, pp. 61.

# **APPENDIX-A**

# Statements of Qualifications/Signature Pages

### STATEMENT of QUALIFICATIONS, DATE and SIGNATURE PAGE

#### I, Walter Hanych of the town of Collingwood, Province of Ontario, do hereby declare that:

- 1. I am a geologist and reside at 235 11<sup>th</sup> Line, Collingwood, Ontario, L9Y 5G6. Telfax 705.445.6440.
- 2. I graduated from Laurentain University in 1979, with an Honors Degree, Bachelor of Science in Geology.
- 3. I have been practicing my profession since graduation, and that I am in the process of applying for accreditation with the Association of Geoscientist of Ontario'.
- 4. I personally conducted and supervised, together with Sheena Ewanchuk of Collingwood, Ontario the geological work, the results of which were compiled to generate this co-authored report titled; *Geological Technical Report: 2007 Mapping and Data Compilation, Schaft Creek Deposit,* for Copper Fox Metals Inc. of Calgary, Alberta.
- 5. I personally examined and studied archival reports and literature, and company surveys on the property that were generated by past operators with respect to the Schaft Creek deposit.
- 6. I have been involved with property in 2005 and 2006 as Project Geologist and Manager and have co-authored technical reports documenting the results of the programs conducted during those field seasons.
- 7. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which would make the Technical Report misleading.
- 8. I am independent of the issuer applying all of the tests in section 1.5 of National Instrument 43-101. I do not own, directly or indirectly, nor am I under an agreement, arrangement or understanding or expect to acquire any securities of Copper Fox Metals Inc. or any affiliated entity of the Company. I hold no interest, directly or indirectly, in the mineral properties that are the subject of the forgoing report or in any adjacent mineral properties in the area.
- 9. I consent to the filing of the Technical Report with any Stock Exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

### Walter Hanych

Collingwood, Ontario

November 1<sup>st</sup>, 2007

### STATEMENT of QUALIFICATIONS, DATE and SIGNATURE PAGE

#### I, Sheena Ewanchuk of the city of Collingwood, Ontario do hereby declare that:

- I am a graduate geologist and reside at 235-11<sup>th</sup> Line, Collingwood, Ontario, L9Y5G6, TELFAX 705.445.6440
- 2. I graduated from University of Alberta in Edmonton, with an Honors Degree, Bachelor of Science in Geology, in 2006.
- 3. I am practicing my profession as a contract geologist.
- 4. I am a member in training with the Association of Professional Engineers, Geologists and Geophysicists of Alberta.
- I personally conducted together with Walter Hanych of Collingwood, Ontario the geological work, the results of which were compiled to generate this co-authored report titled; *Geological Technical Report: 2007 Mapping and Data Compilation, Schaft Creek Deposit,* for Copper Fox Metals Inc. of Calgary, Alberta.
- 6. I have been involved with property in 2006 as a junior Geologist and co-authored the technical report documenting the results of the program conducted during that field season.
- 7. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which would make the Technical Report misleading.
- 8. I am independent of the issuer applying all of the tests in section 1.5 of National Instrument 43-101. I do not own, directly or indirectly, nor am I under an agreement, arrangement or understanding or expect to acquire any securities of Copper Fox Metals Inc. or any affiliated entity of the Company. I hold no interest, directly or indirectly, in the mineral properties that are the subject of the forgoing report or in any adjacent mineral properties in the area.
- 9. I consent to the filing of the Technical Report with any Stock Exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public of the Technical Report.

Shura Ewanchuk

Sheena Ewanchuk Geol.I.T

Collingwood, Ontario

November 1<sup>st</sup>, 2007

# **APPENDIX-B**

**Outcrop Descriptions** 

0/0				
0/C #s	UTM Easting	UTM Northing	Rock Type	Description
1	380897	6362047	Granodiorite	fine grained, massive; outcrop is blocky and jointed; has an orange-pink weathering colour and rind which is a hematite-rich rind; faulted contact between granodiorite (east - hanging wall) and feldspar-phyric andesite (west - foot wall); strike of fault 275, dip 65 (right hand rule); granodiorite appears to be ~30m wide, andesite has ~15% anhedral to subhedral feldspars
2	380937	6362035	Andesite	Altered andesite with cm wide orange, Fe-rich rind (hematite alteration)
3	380816	6362025	Feldspar Porphyry	Intrusive valley ~40m across, feldspar porphyry, 30% subhedral to euhedral phenocrysts
4	380703	6362046	Andesite	Area of extensive outcrop, andesite, fine grained
5	380638	6362131	Andesite	Andesite, 5m in diameter, extends to 20m outwards; outcrop of andesite 5m west is 1m in diameter
6	380780	6361798	Andesite	Fine grained andesite outcrop, middle, intense carbonate in filled jointing with m scale epidote alteration (would fit into James' propylitic facies)
7	380873	6361813	Andesite	End of traverse #2
8	380693	6361591	Gossan	Weak gossan, dark orange to dark red in colour; ~1% disseminated pyrite, also found as mm clusters; host rock is andesite; was mineralized, then oxidized to a rusty gossan; area is 20*20m
9	380603	6361389	Andesite	Very fine grained andesite; trace pyrite; few subhedral augite phenocrysts; green-grey; o/c area 3x3m
10	380688	6361337	Andesite	Very fine grained andesite; ~20% augite and feldspar phenocrysts, subhedral; minor cm patchy epidote; o/c area 5x5m; green-grey
11	380806	6361451	Andesite	Very fine grained andesite; ~10% hematized throughout as veins and mm patches; mm carbonate veins
12	380862	6361578	Andesite	Very fine grained andesite; ~15% subhedral feldspar phenocrysts
13	380997	6361398	Andesite	Very fine grained andesite; ~5% feldspar phenocrysts; o/c area is 20x40(north- south)m; feldspars are epidotized on the south portion of the o/c
14	380700	6361337	Andesite	Very fine grained andesite; 15% subhedral feldspar phenocrysts; trace-1% fracture and disseminated pyrite mineralization; minor epidote alteration; cm-dm patchy iron staining; fracturing generally 106/88 (RHR)
15	380512	6361228	Andesite	Very fine grained andesite; ~10% anhedral to subhedral feldspar phenocrysts, epidote alteration: o/c area is 10x10m

	380512	6361228	Mafic Dyke	1m wide mafic dyke, massive with 25% mm subrounded vesicles, at 086/8 (RHR), fractured contact on north of dyke with andesite (sample of dyke taken)
	380512	6361258	Andesite	Very fine grained andesite; trace - 1% stringer and disseminated pyrite; hematite veining, cm rusting
				Very fine grained and exite with 15% subbedral foldspar phonospycts, on to dm enidete
16	380494	6361280	Andesite	patches
	380494	6361280	Mafic Dyke	1-2m and 1-1m, separated by 5m mafic dykes with mm subrounded vesicles, at 292/88 (RHR)
17	380529	6361094	Quartz Monzodiorite	Medium to coarse grained quartz diorite, with 15% mm patchy hematite; 15% mm-cm patchy epidote, sometimes forming 10cmx4cm elliptical patches; 5% magnetite phenocrysts
18	380468	6361075	Intrusive Breccia/ or Conglomerate?	Possibly intrusive breccia or conglomerate; mm-dm coarse grained intrusive (granodiorite?) clasts, some preferentially epidotized or hematized, clasts are rounded and average 3cm, ranging from 0.5-10cm; matrix has euhedral feldspar phenocrysts ranging from 1-3mm; cm patches of hematite are pre brecciation (affecting clasts) and post brecciation, throughout the rock; minor malachite; southeast end of o/c
	380468	6361075	Diorite	Fine grained diorite
	380468	6361075	Andesite	Very fine grained andesite with few augite phenocrysts
19	380754	6360894	Andesite	Very fine grained andesite; 5% augite and feldspar phenocrysts
20	380445	6360669	Andesitic Lapilli Tuff	Fine grained andesitic lapilli tuff; 15% mm-cm epidote alteration patches; 5% mm hematite patches; on weathered surface, cm subangular clasts are epidotized, mm feldspar phenocrysts are apparent; mm lapilli fragments
21	380627	6360724	Andesite	Very fine grained, augite phyric andesite; 5% subhedral mm augite phenocrysts
22	280704	6260720	Andooito	Medium grained augite-feldspar-phyric andesite; 10% hematization; 15% epidote
	360704	6360736	Andesite	
23	380743	6360784	Andesite	Andesite; 15% hematization; 15% epidote alteration
24	380850	6360801	Andesite	Medium grained andesite
25	380712	6360668	Andesite	Feldspar-phyric andesite; heavy epidote alteration ~40%; euhedral to subhedral feldspar phenocrysts
26	380603	6360525	Andesite	Fine grained andesite; intensely fractured with cm epidote veining associated with late fracturing and cm-dm epidote patches ~10%; late mm quartz veining cuts through the epidote, quartz blebs up to 5cm wide; ~5% cm to dm hematite patches

27	380580	6360459	Andesite	Augite-phyric andesite, fine grained; 10% mm to cm epidote patches; 20% cm-dm hematite patches; in part a volcanic breccia showing 1-3cm subrounded to subangular, dark grey to cream coloured clasts; quartz veining throughout; intensely fractured; rubble found directly at base of o/c found to have chalcopyrite associated with malachite and rusting on rind of andesite (sample taken); fault 196/30, 036/88; m-scale areas intensely faulted; conjugate joint sets 311/74, 131/56; jointing 340/88
	380580	6360459	Mafic Dyke	2m wide mafic dyke with 10% rounded augite phenocrysts, weathers light brown, smooth and rounded, recessed area, 0.5-1.5cm brown rind, orientation 314/90
28	380676	6360334	Andesite	Fine grained andesite; 40% patchy hematization; cm epidote patches and mm veining associated with fractures; fault 074/75; large o/c; 1 m wide hematite band, andesite is intensely hematized, 325 bearing, erratic; hematization up to 50% (sample taken)
	380676	6360334	Mafic Dyke	orientation of 2m wide dyke (same as WP49) 336/80, fine grained with subhedral augite phenocrysts; 2 dykes sub parallel to this dyke, same description
29	380706	6360258	Andesite	20m from the south edge of WP 50 o/c
30	380613	6360246	Andesite	Fine grained andesite; not as fractured and jointed as WP 50; 15% hematite in cm patches
	380608	6360237	Mafic Dyke	1 m wide dykes, same description as WP 49, strike 040 (location 380608, 6360237)
31	380532	6360278	Andesite	Fine grained andesite; 5% mm-cm patchy hematite
32	380516	6360342	Andesite	Fine grained andesite; jointed and faulted; west portion of o/c has augite phenocrysts; minor mm hematite patches
33	380473	6360280	Andesite	Southwest edge of o/c 54; mm to cm minor quartz veining, surrounds pink, vuggy areas where quartz crystals form euhedral, pink is possibly potassic alteration or was once calcite, strong epidote alteration associated with quartz veining as well as moderate to strong hematization; minor epidote alteration throughout
34	380466	6360339	Andesite	Fine grained andesite; intensely jointed; depression to the west of this o/c has a bearing of 040, possibly a fault system
35	380458	6360357	Andesite	Fine grained andesite; strong epidote alteration as patches and 1-4cm wide veins associated with fractures; intense jointing and faulting; possibly a major fault to the east of $o/c$
00	000-00	0000001	, indesite	Fine grained andesite; intensely jointed/fractured; 15% epidote alteration; 15%
36	380409	6360340	Andesite	hematization
37	380439	6360279	Andesite	Fine grained andesite; intense fracturing; jointing 118/80; variable hematization from moderate to intense (25-60%); 15% dm-m epidote patches
38	380374	6360265	Andesite	Fine grained andesite; 5% epidote; 10% hematite

39	380411	6360207	Andesite	Fine grained andesite; 60% hematite in areas, on average 40% throughout; 15% epidote as cm to dm patches; intensely jointed; in faulted contact with a coarse grained augite-feldspar phyric intermediate composition dyke 108/87
	380411	6360207	Mafic Dyke	5m wide mafic dyke south of #61 with a bearing of 050; augite-feldspar-phyric, intermediate composition; massive, does not exhibit the intense fracturing, jointing and deformation of the fine grained andesite; minor epidote, mostly along joints, some permeates
40	380467	6360161	Andesite	Fine grained andesite, intensely fractured
41	380446	6360143	Intermediate Dyke	Fine grained intermediate composition dyke, massive, dm-m spaced fractures; faulted contact with highly fractured andesite 340/60, contact zone of 0.5m
42	380463	6360123	Andesite	Fine grained andesite; strong rusting throughout, weak gossan area; cm-scale quartz, ankerite veining; vein breccia; orientation of veining is 240/65; highly oxidized area; o/c area of 2.5x2.5m; contact between gossan and andesite 280/60
43	380468	6360106	Feldspar Quartz Porphyry	Feldspar quartz porphyry; malachite-rich, 10% throughout as mm-dm patches; 2% disseminated pyrite; coarse grained
44	380514	6360097	Feldspar Quartz Porphyry	Feldspar quartz porphyry, zone of quartz-carbonate veining, silicification; 5-10% variable malachite staining; 3-5% disseminated pyrite; 1% oxidized chalcopyrite along fractures and disseminated; trace bornite disseminated in quartz veins and along fractures; 10% hematite alteration; mm quartz eyes; fracturing, brecciation
				Gossan; cm quartz banding oriented 180/80; heavily oxidized, rusting; 3-5% pyrite; o/c to the south becomes andesitic, silica alteration, 3-5% disseminated pyrite, 30%
45	380546	6360047	Gossan	hematization
46	380596	6360045	Andesite	Fine grained andesite; intensely fractured; 10% hematization, rusty; 1-3% pyrite; edge of mineralization zone?; cataclastic texture (mechanical breaking of the rock) fault 212/88
47	380610	6360070	Andesite	Intensely fractured andesite; 30cm wide fault 322/84; fine grained; 40% hematization; mm quartz-carbonate veining with 60% hematite in the veins; 3% pyrite and 2% chalcopyrite stringers, disseminations and mm clusters along fractures and in veins
10	380612	6360004	Gosson	2m wide gossan, can be traced for 10m; heavily oxidized, heavy rusting; trending 235;
40	300013	0300094	GUSSAII	quare vening, 3% usseminated pyrite
49	380646	6360122	Andesite	Fine grained andesite; minor cm to dm malachite staining on fractures; 30% hematization; 3m wide dyke 180/72

50	380452	6360081	Feldspar Quartz Porphyry	Feldspar quartz porphyry; 10% malachite staining throughout associated with fractures; mm euhedral to subhedral feldspar phenocrysts; 1-2% disseminated pyrite; faulted/sheared contact, rubble in between with a strike of 052 (or 232, dip is unknown), in contact with intermediate composition dyke within the FQP o/c
	380452	636081	Intermediate Dyke	Intermediate composition dyke; massive, moderately jointed; east contact of dyke has a strike of 000 (or 180, dip is unknown)
51	380399	6360130	Feldspar Quartz Porphyry	Location of 1m wide feldspar quartz porphyry, appears to be dipping to the west 40 with a general southerly strike; overlying (in the vertical sense) fine grained highly fractured andesite
52	380467	6360024	Intermediate Dyke	Feldspar-augite-phyric intermediate dyke, medium grained; euhedral to subhedral plagioclase feldspar phenocrysts; massive; weathered brown and smooth; mm rind
53	380461	6359993	Intermediate Dyke	Feldspar-augite-phyric andesite; east side of o/c; weathered surface is brown, smooth, rounded; massive; fresh looking; minor cm epidote patches; jointing 176/85 (sub parallel to the contact with fractured andesite); contact meanders a couple of degrees either way; 10% hematite staining on weathered surface; 5% disseminated pyrite in rusty patches (likely andesite in contact with the dyke; close to the contact it appears to be an assimilation of the two rock types
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	380461	6359993	Andesite	Fractured andesite; fine grained; plagioclase feldspar-phyric; 1-3% disseminated pyrite, 1% disseminated chalcopyrite; minor malachite staining; 20% hematite alteration; 10% epidote alteration as cm patches; entire o/c is ~50m long; photo taken of contact with dyke
	380461	6359993	Gossan	Gossan; 2m (N-S)x5m; located ~1/2m underneath (in the vertical sense) the south end of the intermediate dyke o/c; host rock is a feldspar quartz porphyry; coarse grained; very fine grained 5-7% disseminated pyrite; highly oxidized, heavy rusting
54	380495	6359933	Andesite	Very fine grained, highly silicified andesite; trace malachite staining; trace disseminated pyrite and chalcopyrite; 5% hematite staining; fractured
55	380460	6359892	Intermediate Dyke	Feldspar-phyric intermediate dyke; brown weathered, rounded, smooth surface; fresh looking inside; orientation of dyke is ~187/80 (using jointing surface); 3 m wide
	380460	6359892	Andesite	Fine grained andesite above dyke (in the vertical sense) ~5m wide
56	380426	6359996	Mafic Dyke	Very fine grained mafic dyke; north end of o/c; 3% disseminated pyrite; in contact with feldspar quartz porphyry; possibly an older dyke than WP 77 & 78 (cannot see WP 80 cross these dykes); total o/c area is 40m (N-S) x 5m; photo of mafic dyke and feldspar quartz porphyry

	380426	6359996	Feldspar Quartz Porphyry	Fine grained fractured plagioclase feldspar quartz porphyry; contact with intermediate dyke 130/83; 3-5% disseminated chalcopyrite; 1% disseminated pyrite; minor malachite staining; few quartz eyes; mm euhedral to subhedral plagioclase feldspar phenocrysts
	380426	6359996	Andesite	Andesite; 20m south of o/c; 1x1m o/c area
57	380387	6360056	Feldspar Quartz Porphyry	Feldspar quartz porphyry; 10m N-S x 1m
58	380389	6360079	Mafic Dyke	Fine to medium grained mafic dyke; 2% disseminated pyrite; similar to WP 80 mafic dyke; could be bent, faulted, fork or a different dyke
				Fault zone of intense fracturing, shearing, gouge; fine grained andesite; intense ~60%
59	380277	6360189	Andesite	hematization pervasive; 10% cm epidote patches; o/c 10m (N-S) x 2m; fault and sub parallel jointing 104/90; picture taken looking along trend of fault
60	380245	6360224	Andesite	Feldspar-augite-phyric andesite; 5% cm-dm epidote patches; 20% pervasive hematite alteration; o/c 15m (along road); north end of o/c is intensely fractured
61	380219	6360263	Diorite	Coarse grained diorite; subrounded mm plagioclase feldspar phenocrysts; moderate cm-dm epidote alteration; mm brown rind; vertically above mafic dyke and granodiorite
	380219	6360263	Intermediate Dyke	Intermediate dyke; 1m wide fine-medium grained chill zone of intermediate dyke; approximate orientation of dyke is 144; vertically below diorite and above granodiorite
	380219	6360263	Granodiorite	Coarse grained granodiorite; 5% fe-mag phenocrysts; 5% mm epidote patches, pervasive
62	380192	6360296	Granodiorite	Coarse grained granodiorite; 5% fe-mag phenocrysts
	380192	6360296	Intermediate Dyke	3m wide intermediate dyke; augite-feldspar-phyric; medium grained; orientation of contact with granodiorite 315/90; <1m wide fine grained chill zone, west contact; epidote near contact; vertically below granodiorite; photo taken of contact with granodiorite
63	380146	6360296	Diorite	Granodiorite is intensely epidotized; fractured
	380146	6360296	Mafic Dyke	3m wide fine grained mafic dyke; 300/60
64	380118	6360383	Mafic Dyke	Fine grained mafic dyke; sub parallel jointing 001/72; 4m wide; minor 10% mm epidote patches, pervasive; 10% mm hematite patches, pervasive; o/c 5m long, 10m of scree slope, more o/c 7m long (along road): on trend with WP 87 mafic dyke

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	65	380062	6360436	Andesite	Volcanic conglomerate; 2% clasts, 1-8cm long, subrounded, pale pink to cream coloured, appear to be felsic; andesitic matrix, fine grained; 10% erratic cm-dm and pervasive mm epidote patches and 10% hematite patches; highly fractured
	66	379992	6360581	Granodiorite	Coarse grained granodiorite; 1% disseminated pyrite; 5% mm epidote alteration, pervasive, product of fe-mags; 10% fe-mag mineral (hornblende?); north of andesite (can't see contact); highly oxidized and rusted 3-5cm layers of fault gouge 052/41, 4-5 layers ~1/2-1m vertically apart; photo taken of fault gouge
		379992	6360581	Andesite	Fine grained andesite (patchy within o/c)
	67	380382	6359999	Feldspar Quartz Porphyry	Feldspar quartz porphyry; 2% disseminated pyrite; 3% disseminated chalcopyrite; fractured; minor malachite on fractures; 5% hematite staining (fqp appears pink); 5% chlorite alteration (fqp appears blue green)
	68	380407	6359937	Feldspar Quartz Porphyry	Feldspar quartz porphyry; fine grained; ankerite veining and on fractures; 2% disseminated pyrite; 2% disseminated chalcopyrite; minor malachite staining on fractures; fractured; 10% pervasive chlorite alteration
	69	380412	6359898	Feldspar Quartz Porphyry	Feldspar quartz porphyry; highly altered, same rock description as WP 91; heavy chloritization of feldspar porphyry, especially at contact with dyke, looks like a fault breccia with intense chloritization; contact of dyke with feldspar porphyry 010/90
		380412	6359898	Mafic Dyke	Fine grained mafic dyke; few quartz eyes, 1/2cm brown rind; massive; moderately fractured; 3m wide
	70	380420	6359862	Feldspar Quartz Porphyry	Feldspar quartz porphyry; intensely chloritized (60%); Fe-carbon; fractured; malachite on fractures; 1% disseminated pyrite; 1% disseminated chalcopyrite; south end of o/c
	71	380444	6359784	Feldspar Quartz Porphyry	Fine grained feldspar quartz porphyry; 1% disseminated pyrite; 1% disseminated chalcopyrite; 15-40% variable mm chlorite alteration, pervasive; 10% mm to cm hematite patches, erratic; fault 030/80
	72	379781	6361356	Andesite	Andesite; trace mm hematite alteration; very fine grained trace pyrite; moderate to strongly fractured; moderate silicification
	73	379858	6361399	Andesite	Intensely fractured andesite; major fault 090/90; faults 240/40, 320/74, 300/67 with a 1/2m separation; weak hematization; weak pervasive epidote alteration; a lot of carbonate seeping out of joints, likely from groundwater; mm carbonate veining in joints; cm spaced sub parallel jointing 329/72; minor malachite staining
	74	380027	6360309	Andesite	Highly fractured fine grained plagioclase-phyric andesite; 10% cm-dm epidote alteration patches; 20% pervasive hematization; sub parallel jointing 111/74; 5-15% variable subhedral plagioclase phenocrysts, some epidotized; rare mm-cm quartz- carbonate veining, cm vugs and epidote associated and in vugs

75	380047	6360250	Andesite	Fine grained plagioclase-phyric andesite; similar to WP 98 description
76	380121	6360252	Andesite	Plagioclase feldspar-phyric andesite; moderate cm-dm epidote alteration patches; the north 20m of the o/c is intensely fractured, likely a fault
77	380414	6359810	Feldspar Quartz Porphyry	Fine grained plagioclase feldspar quartz porphyry; strong pervasive chloritization (50%); 1% pyrite, 1% chalcopyrite, disseminated and on fractures; malachite staining on fractures
78	380374	6359791	Feldspar Quartz Porphyry	Fine grained plagioclase feldspar quartz porphyry; same as WP 101; fault 350/60
79	380378	6359753	Feldspar Quartz Porphyry	Fine grained plagioclase feldspar quartz porphyry; highly altered by chlorite (60%); malachite staining on fractures; fault 090/80; contact between feldspar quartz porphyry and intermediate dyke 120/74
	380378	6359753	Intermediate Dyke	Medium grained intermediate composition dyke; smooth, brown weathered surface; jointing spaced 1/2m apart
80	380401	6359708	Andesite	Medium grained plagioclase feldspar phyric andesite; subhedral to euhedral feldspar phenocrysts; randomly oriented fractures; massive
81	380425	6359743	Feldspar Quartz Porobyry	Contact zone: assimilation of various lithologies: Fine grained feldspar quartz porphyry; highly chloritized (50-60%); minor ankerite on fractures; 2% disseminated, fracture associated pyrite and 2% chalcopyrite; strong fracturing; highly altered; 10% hematization, variable: malachite staining on fractures: north end of outcrop
	380425	6359743	Dioritic Dyke (Intermediate)	Coarse grained diorite; little to no epidote or hematization; orientation of jointing and o/c 130/80; ~20cm of fine grained andesitic composition, possibly chill zone at south end; 2m wide
	380425	6359743	Feldspar Quartz Porphyry	Highly altered feldspar quartz porphyry to southwest, same description as previous in o/c
	380425	6359743	Dioritic Dyke (Intermediate)	Coarse grained diorite; 1m wide; same description as previous in o/c
	380425	6359743	Feldspar Quartz Porphyry	Highly altered feldspar quartz porphyry to southwest, same description as previous in o/c; contact between feldspar quartz porphyry and feldspar-phyric andesite is faulted and rubbly
	380425	6359743	Andesite	Fine grained andesite; subhedral feldspar phenocrysts; malachite and ankerite on fractures
	380425	6359743	Fault	5m wide fault, highly fractured, gouge, sub parallel jointing, shatter zone; 300/76; strong ankerite on fractures; located at intersection of two roads

	380425	6359743	Feldspar Quartz Porphyry	Fine grained feldspar quartz porphyry; moderate to strongly (40%) chloritized; malachite and ankerite on fractures; highly fractured; 2% disseminated, fracture associated pyrite; 3m south of fault; ankerite increases in intensity moving south 5m; 3m wide gouge, intense fracturing; fault 000/85, 140/63
82	380413	6359663	Feldspar Quartz Porphyry	Fine grained feldspar quartz porphyry; moderately fractured; 30% pervasive chloritization; malachite and ankerite on fractures; variable mineralization: 2-5% disseminated, fracture related pyrite, 2-5% chalcopyrite; 1% molybdenite; few quartz eyes; 5% hematite staining on fractures; fault 006/63; increased mineralization associated with the fault; zone of brittle-ductile deformation, gouge, fracturing; a 3x3m area of a granodiorite phase in the middle of this o/c, similar to the feldspar quartz porphyry with 3% disseminated, fracture associated, stringer pyrite; DDH 06CF266, 06CF267, 05CF245
	380413	6359663	Fault	Fault scarp 200/40 at south end of o/c; slickensides and gouge along surface; chloritized; malachite staining
83	380612	6359774	Andesite	Fine grained augite-phyric andesite; subhedral augite phenocrysts
84	380501	6359685	Andesite	Fine grained andesite; hematized; epidotized
85	380603	6359417	Andesite	Medium grained feldspar-phyric andesite; massive; anhedral to subhedral feldspar phenocrysts
86	380549	6359252	Andesite	Feldspar-phyric andesite; shattered, fractured; hematized; epidotized; feldspar phenocrysts are epidotized
87	380487	6359193	Andesite	Fine grained andesite; strong cm patches of epidote; hematized; silicic alteration; fractured, shattered; jointing 220/82 cm spaced, sub parallel
88	380280	6359136	Andesite	Fine grained augite-phyric andesite; minor to moderate cm epidote patches; subhedral augite phenocrysts; minor hematite on fractures
89	380234	6359546	Andesite	Fine grained andesite; malachite on fractures; silicic alteration; heavy fracturing, shattered; jointing 182/72; ankerite on fractures
90	380256	6350636	Andesite	Fine grained feldspar-phyric andesite; silicic alteration; intensely faulted; cm gouge oriented 300/60; several sub parallel cm-dm spaced gouge oriented 000/60; carbonate, malachite, ankerite on fractures; 1% fracture associated chalcopyrite; strong bematization; strong chloritization; 10% subhedral feldenar phenocryste
90	500250	0009030	Andesite	
91	380304	6359657	Andesite	Fine grained andesite; intensely fractured; malachite and ankerite on fractures; silicic alteration; trace disseminated pyrite; o/c 3m long
92	380327	6359645	Granodiorite	Intrusive - hard to tell if the pink is caused by iron or potassic alteration or both; coarse grained, looks like granodiorite; heavy iron staining throughout; malachite on fractures; 2% disseminated, mm clusters pyrite; strongly fractured; moderate potassic alteration; o/c 2x2m; rock is cataclastic on 198/80 fault face

				Fine grained andesite; few feldspar phenocrysts; moderate hematization; malachite and ankerite on fractures; 1*x1m o/c area; 10m south of 117, Intrusive - highly altered; grappedigite? Manzacita? minor malachite on fractures; attacked, pale values.
93	380207	6359520	Andesite	colour possibly sericitization; moderate hematization; o/c 2m long
94	380265	6359707	Andesite	Fine grained andesite; moderate to strong hematization; malachite and ankerite on fractures; strongly fractured
95	379918	6359859	Granodiorite/ Feldspar Quartz Porphyry	Highly altered granodiorite/feldspar porphyry; coarse grained; strongly chloritized; malachite on fractures; ankerite on fractures; trace disseminated bornite; trace-1% disseminated chalcopyrite; strongly fractured; weak potassic alteration
96	379929	6359815	Granodiorite	Highly altered granodiorite; coarse grained; strongly chloritized; malachite and ankerite on fractures; trace-1% disseminated chalcopyrite; intensely fractured; weak potassic alteration; major fault 156/72; 5m zone of deformation, fault zone, rock is intensely altered to clay minerals, intensely fractured, cataclastic deformation and hydrothermal alteration, fault 040/70; o/c is 15m long
97	379578	6359673	Granodiorite	Highly altered granodiorite; coarse grained; intense chloritization (60%); 12% disseminated, massive pyrite; 3% disseminated, massive chalcopyrite; strong epidote alteration patches; ankerite on fractures; strong cm vugs, filled with ankerite; cm, angular andesitic fragments brecciated by granodiorite (brecciation is not dominant)
98	379490	6359274	Andesite	Fine grained feldspar-phyric andesite; hematized; fractured; highly chloritized; 5% euhedral green amphiboles (hornblende?)
99	379139	6359490	Quartz Monzodiorite	Coarse grained quartz diorite; blast trench 1m x 10m (E-W); north edge of hill; highly altered multi-phase intrusive; intense epidote alteration; moderate hematite alteration; mm-cm quartz veining associated with epidote; intense chloritization, sericitization; 1% disseminated chalcopyrite, 1% pyrite, trace bornite; strong fault 185/80; moderate malachite on fractures, strong in cm-dm sections; vertical fault 040/90; hard to get a fresh surface; fault 350/74; faulted contact with fine grained andesite 170/82; west faulted contact with andesite oriented 188
	379139	635490	Andesite	Fine grained andesite: highly fractured
100	379126	6359459	Andesite	Augite-phyric andesite; west end of 1.5m wide trench, 15m long, oriented 120; 15% subhedral augite phenocrysts; fine grained; moderate to strong cm-dm patches and sills (010/68) of epidote; minor to moderate hematite alteration; trace disseminated pyrite; cm-dm dykes and dykelets of granodiorite intruding the andesite, sharp contacts, coarse grained, potassic alteration; in the past the andesite in this area was called augite porphyry; trench broken up in two parts separated by 3m towards east end; contact between andesite and granodiorite found at east end (lens shaped); northwest end of o/c is highly altered with epidote, hematite, potassic alteration; hosts 2m x 3m gossan along trench, heavy rusting, oxidation; 2m wide gossan oriented 120/70; photos taken; GPS reading at south end of o/c 379126/6359435

101	270456	6250447	Andonito	Fine grained andesite; 1x1m gossan, heavy rusting; James' rock samples JES 007 &
101	379156	6359417	Andesite	ous, snearing, jointing onented 220/85
102	379137	6359301	Andesite	Augite-phyric andesite (augite porphyry?); subhedral-euhedral augite phenocrysts; coarse grained (almost looks gabbroic); a second o/c 15m to the north; late fracture veining of quartz-carbonate; sample taken
103	379119	6359334	Andesite	Contact zone between augite-phyric andesite and granodiorite intrusive as cm dykelets and patches, potassic alteration
104	379189	6359958	Quartz Monzodiorite	Coarse grained quartz diorite; 2x2m o/c, small; minor hematite and epidote alteration
105	379248	6360882	Granodiorite	Coarse grained granodiorite; 1% disseminated, fracture associated pyrite, 1-3% chalcopyrite; auto brecciated (brecciates itself), fine grained granodiorite clasts, subrounded, gradational edges, cm-scale; malachite on fractures
106	380825	6360160	Andesite	Fine grained andesite: highly fractured: minor hematite
	380825	6360160	Mafic Dyke	Fine grained mafic dyke; 5m wide; oriented 295; cuts through andesite
107	380261	6360140	Feldspar Quartz Porphyry	Feldspar Quartz Porphyry; strongly chloritized; moderate hematization; rare malachite on fractures associated with mineralization; 1% chalcopyrite, 1% pyrite disseminated, fracture associated; highly fractures; 1x1m o/c
108	380145	6360171	Feldspar Quartz Porphyry	Feldspar Quartz Porphyry; strongly chloritized; moderate hematization; minor malachite on fractures; trace molybdenite, 1% pyrite, trace chalcopyrite disseminated, fracture associated; strongly fractures; o/c 3m along slope
109	380178	6360105	Feldspar Quartz Porphyry	Feldspar Quartz Porphyry; very fine grained; strongly chloritized; minor hematite alteration; 0.5% chalcopyrite, 3% pyrite disseminated, fracture associated; fractured; malachite on fractures; o/c to the south is medium grained, the feldspar phenocrysts are larger, 1-3mm
110	380217	6360075	Feldspar Quartz Porphyry	Feldspar Quartz Porphyry; highly chloritized; trace-1% chalcopyrite, 1-2% pyrite disseminated, fracture associated, stringers, massive; malachite on fractures; strongly fractured; minor hematite alteration; 5x5m o/c
	380217	6360075	Andesite	2m wide 'sliver' of fine grained andesite vertically below the feldspar quartz porphyry; malachite on fractures; 1% pyrite, trace chalcopyrite disseminated, fracture associated
	380217	6360075	Feldspar Quartz Porphyry	Feldspar Quartz Porphyry - south end of o/c is highly chloritized; 5-10% alkali feldspar; along old trail; halfway along o/c a fault 320/90
111	380254	6360013	Feldspar Quartz Porphyry	Feldspar quartz porphyry; highly chloritized; trace-1% chalcopyrite, 1-2% pyrite disseminated, fracture associated, stringers, massive; malachite on fractures; strongly fractured; minor hematite alteration; fault 232/78

				Feldspar quartz porphyny: highly chloritized: 1-2% chalcopyrite, trace pyrite
112	380277	6359998	Feldspar Quartz Porphyry	disseminated, fracture associated; fault 008/73 with lineations diagonally downward to the south; highly fractured; malachite on fractures; moderate hematization; sub parallel jointing 110/75
113	380296	6359979	Intermediate Dyke	Feldspar-phyric intermediate dyke; oriented 003/90; subhedral to euhedral feldspar phenocrysts; 1m wide; surrounded by feldspar quartz porphyry with the same description s WP 138
114	380308	6359960	Feldspar Quartz Porphyry	Feldspar quartz porphyry; euhedral to subhedral feldspar phenocrysts; fractured; minor to moderate in cm-dm patches of malachite on fractures; highly chloritized; minor hematite alteration; fault 186/90
115	380314	6359920	Intermediate Dyke	Feldspar-phyric intermediate dyke; mm epidote patches; massive; bearing 050; surrounded by feldspar quartz porphyry on either side, same description as WP 140
116	379163	6359583	Gabbro	Gabbro (could be what was described as augite-porphyry in the past); o/c 2x10cm long, oriented 110 degrees with a trench 1/2 m wide down the center; coarse grained (instances of fine grained); west end of o/c; subhedral to euhedral augite phenocrysts; moderate to strong epidote alteration; minor hematite; minor malachite on fractures, cm patches, mm veining; 1% disseminated, fracture associated pyrite; minor fault 354/64; 1.5m wide zone of strong rusting; 3-5% disseminated, massive pyrite
117	379190	6359652	Gabbro	Gabbro (could be what was described as augite-porphyry in the past); pyroxene and plagioclase feldspar with coarse grained subhedral augite phenocrysts; moderate to strong epidote veining and mm-dm patches; minor hematite; major fault going through two o/c on either side of a 5m wide river, creating a 6m high canyon; malachite on fractures, strong dm patches in places; highly fractured; fault 050/90; second fault face 056/90
118	379164	6359660	Granitic dyke	2m wide granite dyke; coarse grained; 1% disseminated pyrite; sub parallel jointing/fracturing 124/90; equigranular; dyke oriented 130/65
	379164	6359660	Granite	Coarse grained granite in faulted contact with gabbro, 050/64, 2m long, mm-cm wide; very fractured; 3m east of the dyke
	379164	6359660	Gabbro	Dominant rock in o/c; pyroxene and plagioclase feldspar with coarse grained subhedral augite phenocrysts; moderate to strong epidote veining and mm-dm patches; minor hematite; major fault going through two o/c on either side of a 5m wide river, creating a 6m high canyon; malachite on fractures, strong dm patches in places; highly fractured
119	379140	6359605	Quartz Monzodiorite	Quartz monzodiorite; 1-2% disseminated, fracture associated chalcopyrite, oxidized; moderate hematite alteration; minor malachite on fractures; highly fractured; late chlorite veining, string
120	379259	6359951	Quartz Diorite/Tonalite	Coarse grained quartz diorite to tonalite; no mineralization; fractured; o/c area 2x2m; James Scott's sample JES-020; contact with a dioritic intermediate dyke, 136/77, faulted contact

	270250	0050054	Dioritic Intermediate	Distinguistic intermediate data ana active unlike athen datas is the same
	379259	6329921	дуке	Diontic intermediate dyke, massive, unlike other dykes in the area
121	379255	6359877	Diorite	Medium grained diorite; plagioclase feldspar rich; highly chloritized; rare disseminated pyrite; fractured
122	379239	6359799	Gossan	Likely not o/c, mixed with overburden; 1x1m gossan; 5-7% disseminated pyrite; host rock is fine grained augite-phyric gabbro; highly oxidated, rusted; coincides with a Tech o/c from their mapping
				Coarse grained guartz monzonite: 3% disseminated pyrite: mechanical trenching ~10-
123	379583	6359832	Quartz Monzonite	20m in area
124	379548	6359914	Gossan/ Breccia	Fine grained gossan; heavy oxidation, rusting; 5% disseminated pyrite; intense sulpha, oxidation creating a yellow-green colour within the deep orange colour; a lot of boulders of highly oxidized material nearby, possibly bedrock; extensive 20m mechanical trenching; subrounded to subangular xenoliths, intrusive brecciation, 1-5cm clasts
125	379920	6360698	Andesite	Fine grained andesite; <5% subrounded augite phenocrysts; 7% mm rounded epidote patches; 1% disseminated, stringer, fracture associated pyrite; trace disseminated, fracture associated chalcopyrite; minor hematite alteration; strongly fractured
126	380177	6360811	Andesitic Lapilli Tuff	Fine grained andesitic lapilli tuff; highly fractured; strong pervasive hematite alteration; moderate cm-dm patches of epidote alteration, fracture associated mm veining; 10%, 1-mm subangular to subrounded, soft clasts; 3%, subhedral to euhedral augite phenocrysts; 10% (30% in m sections) mm subhedral to euhedral feldspar phenocrysts; sub parallel jointing 246/35
	380177	6360811	Dioritic Dyke (Intermediate)	2m wide fine grained dioritic dyke: equigranular: 305/40, 10m from WP 162
127	380056	6360726	Diorite	Coarse grained diorite; highly chloritized, pervasive; trace-1% disseminated pyrite; sub parallel jointing 340/60; minor to moderate mm-dm hematite patches; moderate to strong epidote patches
128	380045	6360719	Diorite	Fine to medium grained diorite; highly chloritized, pervasive; highly oxidized, rusted; highly fractured; andesite vertically below diorite (~1m wide)
129	380045	6360719	Gossan	Host rock diorite; highly oxidized, rusted; oriented 345/28; yellow, orange, dark orange colour
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130	380032	6360491	Granodiorite	Coarse grained granodiorite; no mineralization
131	379919	6359724	Quartz Monzonite	Coarse grained quartz monzonite; no mineralization
132	378796	6358173	Granodiorite	Coarse grained granodiorite; highly fractured; little to no mineralization, trace disseminated pyrite; 20m along creek, 3m long fault with cm gouge 351/48; continuous fault zone, near vertical faults; fault 080/90, 3m long with cm fault gouge, 20m from first fault

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133	378896	6358140	Granodiorite	Zone of intense alteration and deformation; highly fractured; intense ankerite, quartz, carbonate; cm qz-cb veining, looks like fault gouge, 2m vertical; 6m long fault 354/81
134	378947	6358146	Granodiorite	1m wide fault breccia zone, oriented 120/90
135	379451	6358160	Quartz Monzonite	Quartz Monzonite; highly epidotized, plagioclase feldspar crystals are epidotized; strong chloritization, augite crystals appear to be chloritized; 3% mm specular hematite; 10% subhedral-euhedral augite crystals
136	379462	6358438	Gabbro/Diorite/Augite Porphyry	Gabbro/diorite, probably what was called an augite porphyry in the past; has variable grain size from fine to coarse grained; subhedral to euhedral augite crystals; mm qz-cb veining; highly fractured; minor mm epidote patches
137	379053	6358424	Andesite	Feldspar-augite-phyric andesite; 7% fine grained magnetite; rare-minor mm epidote patches; 15% subhedral feldspar phenocrysts; massive, minor fracturing; 5% subhedral augite phenocrysts
				Intersection of Wolverine Creek and Hickman River
	379023	6357449	Diorite	Coarse grained diorite; trace disseminated pyrite, chalcopyrite; 1-5mm cb-qz veining, multiple phases; minor hematite alteration; strong ankerite, m-sections of heavy rusting; gossan zone oriented 110/60; minor malachite
	378816	6355570	Diorite/gabbro	Coarse grained diorite/gabbro; massive; 15% very fine grained magnetite; 1-3cm wide qz-cb veining; cm scale subangular xenoliths; minor cm epidote patches; 10% euhedral to subhedral hornblende; 10% subhedral to euhedral pyroxene
138	380344	6359896	Feldspar Quartz Porphyry	Fine grained feldspar quartz porphyry; strong chloritization; 1% disseminated pyrite; ankerite on fractures; fractured
139	380392	6359899	Granodiorite	Coarse grained granodiorite; o/c is 10m long (north-south) x 2m; malachite and strong ankerite on fractures; fractured; 200/80 fracture vein set; 2% disseminated chalcopyrite, 2% pyrite, trace bornite

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# **APPENDIX-C**

**Outcrop Pictures**


Figure C-1. Outcrop 13. Possible pillow flow in mafic volcanic. Note vesicles arranged in curvilinear array bordered by cm-scale epidote band. Approximately 0.5-meters along X-axis.



Figure C-2. Outcrop 18. Volcanic breccia. Epidotized cm-dm feldspar-phyric andesite clasts in andesitic matrix.



Figure C-3. Outrcop 44. Quartz-feldspar porphyry exhibiting heavy malachite oxidation and iron oxide staining. Main zone area.



Figure C-4. Outcrop 47. Intense fracture-joint set developed in andesitic volcanics. 30-cm northwest trending fault in center of photo.



Figure C-5. Outcrop 47 close-up. Intense fracture-joint set.



Figure C-6. Outcrop 56. North-northwest trending mafic dike, to the left of the water line, cutting quartz-feldspar porphyry.



Figure C-7. Outrcop 62. West-northwest trending mafic dike cutting granodiorite. Hammer head placed on contact.



Figure C-8. Outcrop 66. Paramount zone. Intense fracturing and faulting of granodiorite. Note sub-parallel fault gouge trending north east and dipping 40-degrees.



Figure C-9. Outcrop 73. Outcropping of intensely fractured and faulted andesite, east of Paramount zone, on steep west side of Lacasse ridge. The white spots are carbonate precipitate resulting from leaching by rain water of carbonate rich fractures.



Figure C-10. Outcrop 82. Quartz-feldspar porphyry, intensely fractured. North trending, moderatey west dipping fault plane in right of photo. Note, rubble pile in foreground resulting from detachment of large blocks from the fault plane.



Figure C-11. Outcrop 100. 1.5-meter blast trench, circa 1964, in augite porphyry within the contact zone of the Hickman pluton. Trace values were reported from this trench.



Figure C-12. Outcrop 110. Quartz-feldspar porphyry exhibiting fracture associated malachite staining. This outcrop contains 1% disseminated chalcopyrite and pyrite. Main Zone.



Figure C-13. Outcrop 125. Weak gossan developed at contact of Hickman granodiorite and augite porphyry. Note contact immediately above hammer head.



Figure C-14. Outcrop 162. Wolverine canyon. Note 0.5-meter wide, high angle fault at hammer location. Looking east.



Figure C-15. Outcrop 162. Wolverine canyon looking west, along strike of fault in above photo.

## APPENDIX D

Figure D-1. Geological Map

Figure D-2. Geological Map with Vein Systems

Figure D-3. Geological Map with Outcrop Identification







## APPENDIX E

Figure E-1. Diamond Drill Hole Plan



## APPENDIX F

- Figure F-1. Cross Section 235+00N
- Figure F-2. Cross Section 250+00N
- Figure F-3. Cross Section 270+00N







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