095083

# Assessment Report on GPS Control, Base Map Preparation and Preliminary Data Compilation on the Lime Claims

## Whitehorse Mining District

## Yukon

105D10

Longitude 134°58'37" W Latitude 60°35'01" N

Assessment report on GPS control establishment work, base map preparation and preliminary data compilation completed between March 25, 2008 and March 25, 2006 on the Lime 1-2 incl. Claims (YC 66874 – YC 66875 incl.)
Registered Owner: Gregg Jilson



April 6, 2009

Gregg Jilson
38 Dawson Road
Whitehorse Yukon Y1A 5T6

# TABLE OF CONTENTS



## APPENDICES

# Introduction

The Lime claims are located on claim sheet 105D10, 10 km. south of Whitehorse (Figure 1) within the Whitehorse Copper Belt (figure 2). Access to the area is readily gained by road and off road trail from Whitehorse. Two trails access the claim group, on the west the former Whitehorse Copper Haul Road (now the Trans-Canada Trail) traverses the property. The area east of the main valley running through Lime #1 is accessed by a smaller ATV suitable trail that connects to the Haul Road just north of Wolf Creek.

The purpose of this work was to follow-up on preliminary geological reconnaissance and prospecting and to develop a cost effective base map for future detailed geological mapping.

The property is comprised of two claims (Lime 1- 2 inclusive) with Grant Numbers YC66874 to YC66875 inclusive registered in the name of Gregg Jilson. The work described herein has been applied as representation work of 4 years on each claim bringing the expiry date of each claim to March 25, 2013.

The Lime claims were staked late in March 2008 to cover an area of open ground between three of the major land holders in the southern part of the Whitehorse Copper Belt (Figure 3). Although the area is underlain mainly by granitoid rocks, structural features suggested the area had potential. Additionally the location of the contact of the Whitehorse Batholith is unclear on available public domain maps, further suggesting the area may have potential.

# Regional Setting

The Lime claims are located in the southern part of the Whitehorse Copper Belt about 1 km. north of the Keewenaw open pit (Figure 4). They are underlain by mid Cretaceous granitoid rocks of the the Whitehorse Batholith. The Whitehorse Batholith is intrusive into sedimentary rocks of the Whitehorse Trough (Heon, 2004; Gordey and Makepeace, 1999).

Strata of the Whitehorse Trough are comprised of the Lewes River and Laberge Groups. The upper Triassic Lewes River Group underlies a large part of the Copper Belt. The oldest unit is the Povoas Formation consisting of andesite and basalt flows and pyroclastics of Carnian age (Colpron et. al., 2007). The volcanic rocks crop out mainly west of the copper Belt but were encountered in some deep drill holes (Morrison, 1981). The Povoas Formation volcanic sequence is overlain by the Aksala Formation, which is divided regionally into three members:

1. Casca member: Carnian to Norian, brown or rusty weathering, brown and greenish, calcareous greywacke and sandstone, limestone, argillaceous limestone, minor conglomerate and agglomerate (unit uTrAK1 on figure 2).

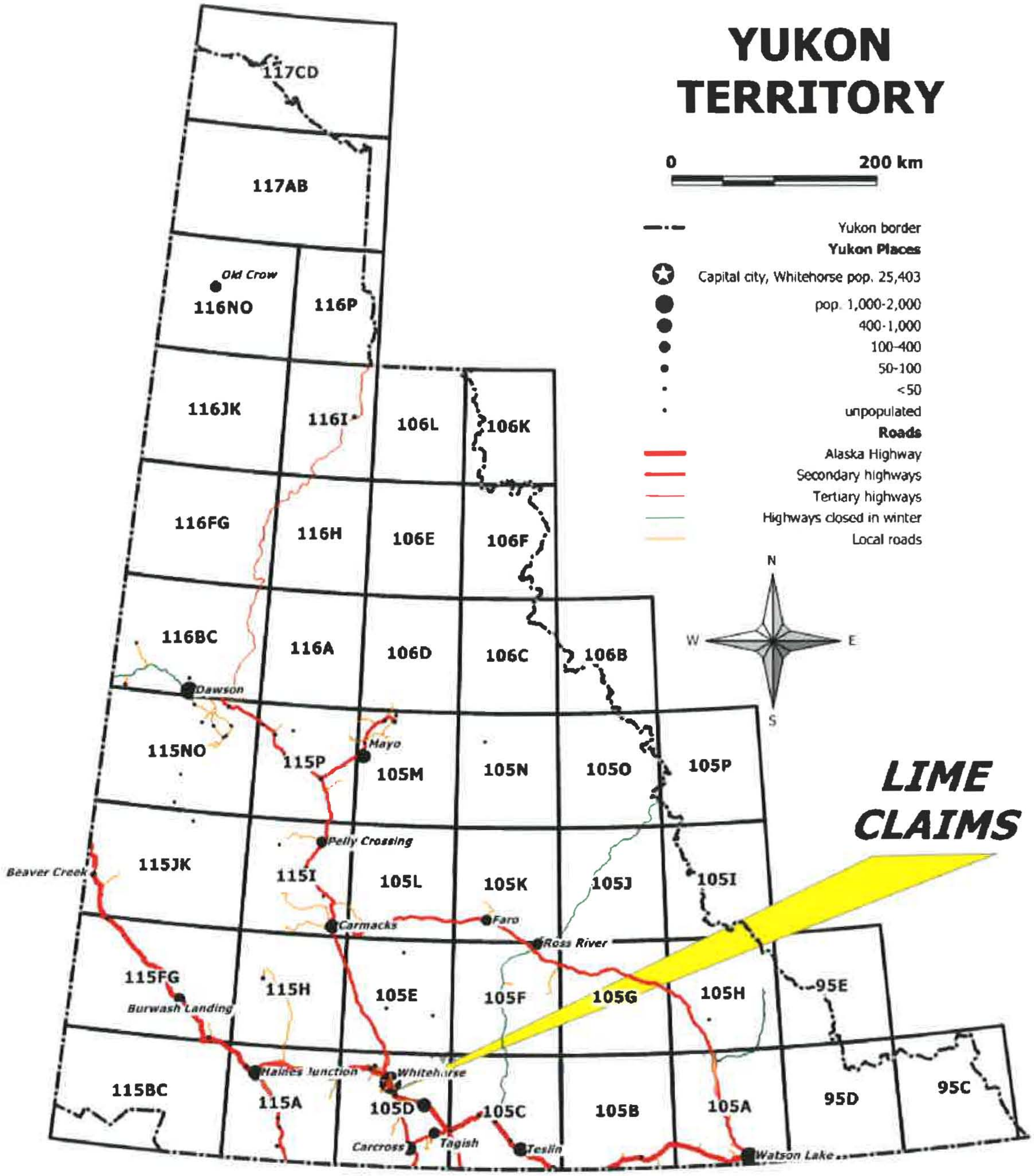


**Figure 1**. Location Map of the Lime Claims 10 km. south of Whitehorse on claim sheet 105D10.

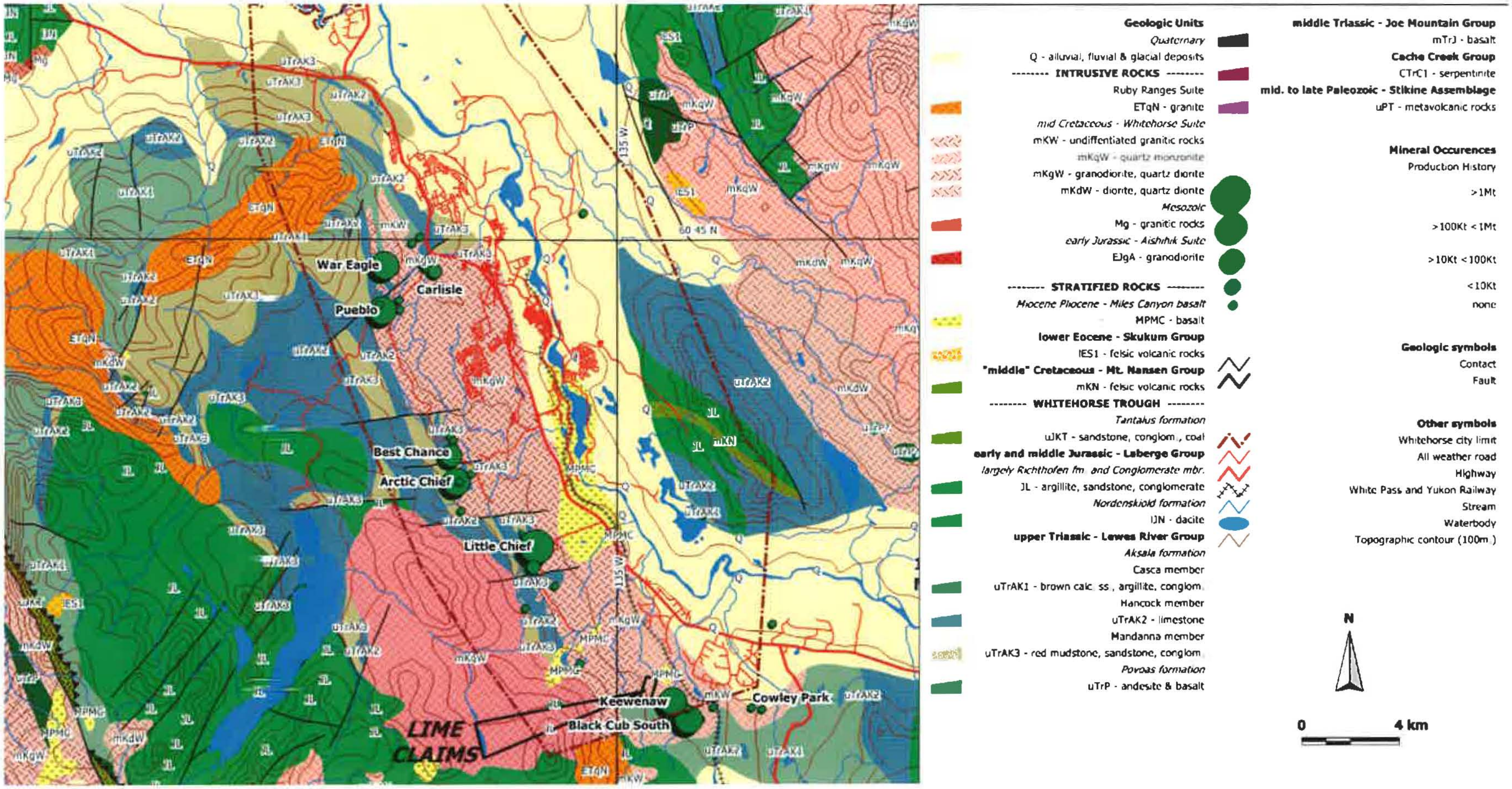


**Figure 2.** Geology of the Whitehorse Copper Belt showing the location of the Lime Claims. Base map from 1:250,000 National Topographic Data Base on NRCan's website, road network is from the same source. Geological information derived from Gordey and Makepeace (1999); mineral occurrence data based on Watson (1984) with modifications from Deklerk and Traynor (2004).

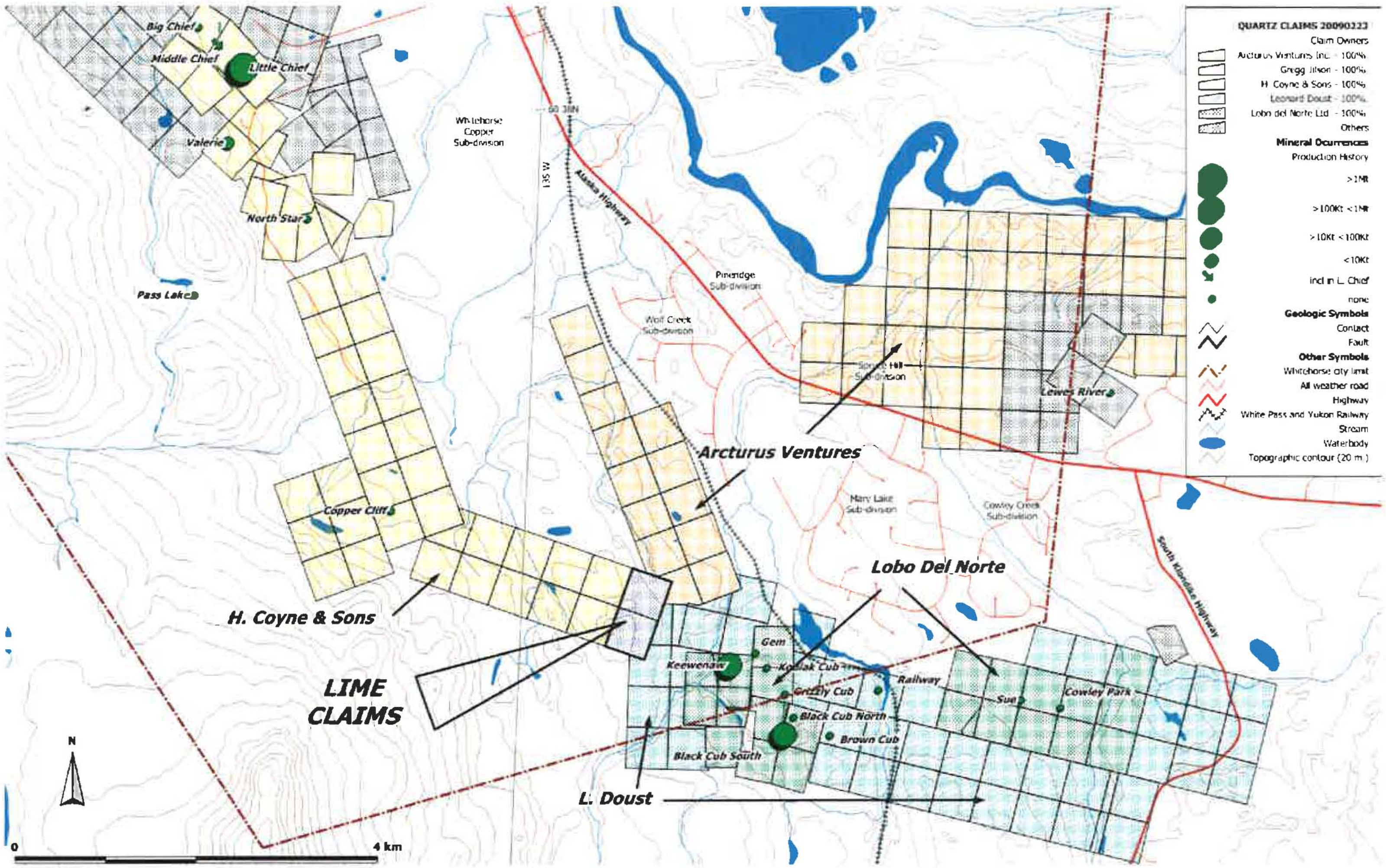


**Figure 3.** Lime Claims showing adjoining claims of other owners, the location of the Whitehorse city limits, nearby residential areas and mineral occurrences Topographic base is 1:50,000 NTDB data from NRCan's website; road network from same source. Claims are derived from Mining Recorder's website current to early March 2009.

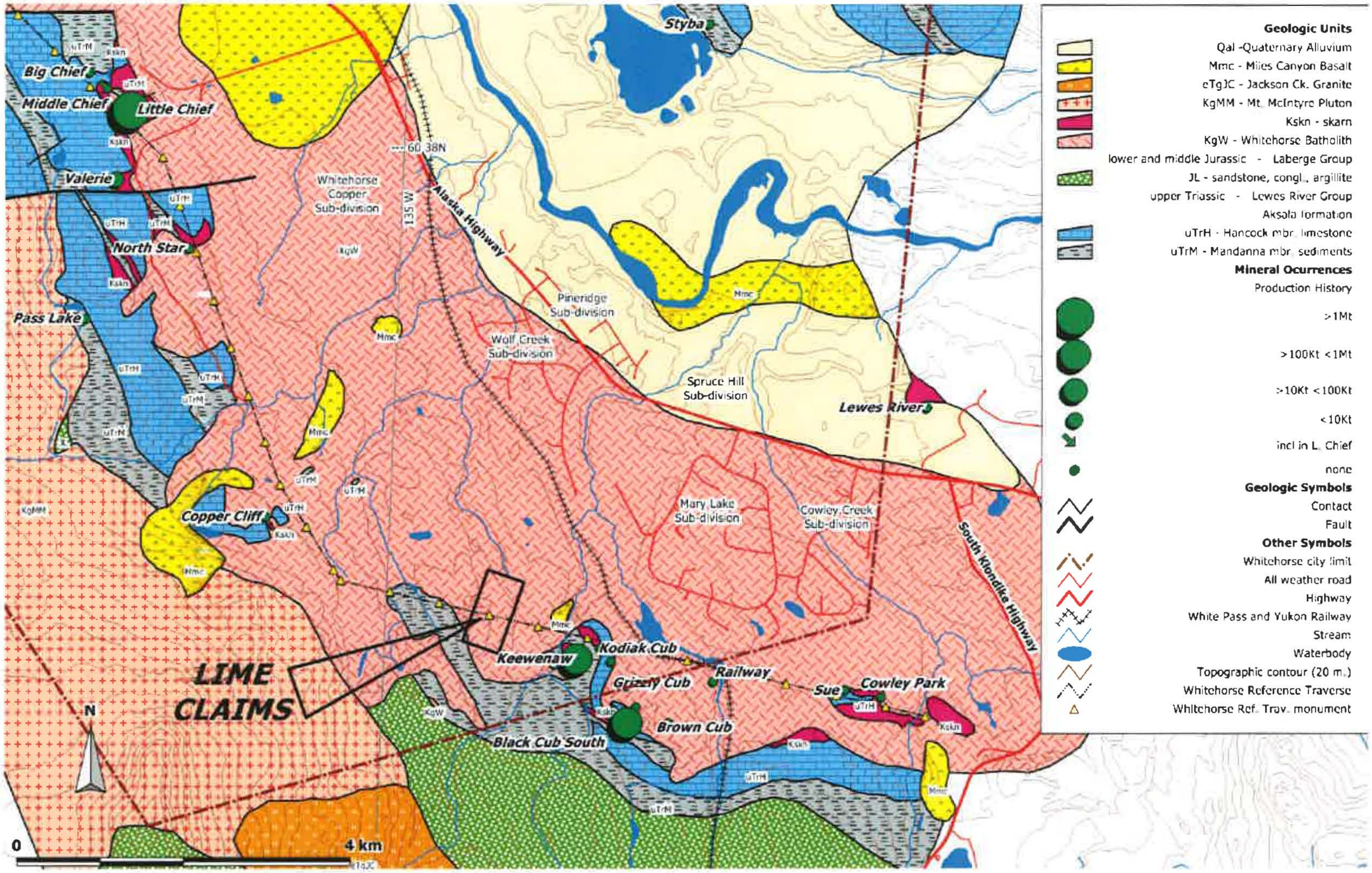


**Figure 4.** Geological setting of the Lime claims in the southern Whitehorse Copper Belt Topographic base is 1:50,000 NTDB data from NRCan's website; road network from same source. Geology is from Heon (2004) and differs significantly near Keewenaw and the Lime claims from the Yukon Digital Geology map. Both also differ significantly from the map patterns of Watson (1984) and Morrison (1981).

2. Hancock member: Norian to Rhaetian (Colpron et. al., 2007), white weathering massive to thick bedded limestone and minor thin bedded argillaceous limestone (unit uTrAK2 on figure 2).

3. Mandanna member: Rhaetian (ibid), red weathering, green and red greywacke and pebble conglomerate, red shale and siltstone (unit uTrAK3 on figure 2).

Morrison (1981), building on observations of Duke and Hodder (1974), developed a more detailed model of the depositional environment of the Lewes River Group. Briefly, and simplistically, he describes a westerly shoaling fore-arc basin developed along an eroding volcanic arc to the west. He describes facies belts that range from shallow water back reef facies in the west to fringing and patch reefs and a deep water turbidite basin to the east beyond the fringing reefs. In the back reef dolomite facies were developed in shallow water, locally euxenic, tidal flat environments. Co-extensive with the back reef dolomites is an underlying unit of pyritic siltstone which has elevated metal contents. The dolomitic facies is only developed in the area west of Whitehorse which is also where all the skarns of the Copper Belt are found. Morrison attaches great importance to carbonate facies as a determinant of skarn type, ore potential of skarns and to the pyritic siltstone as a source of metals. Duke and Hodder argued models other than the classic contact metasomatic model should be investigated since they recognized evidence of shabka like, evaporative, conditions locally during deposition of the Lewes River Group carbonates.

The Lewes River Group is overlain by the lower to middle Jurassic Laberge Group which consists of marine turbidites: sandstone, argillite and conglomerate (Richthofen formation and Conglomerate member, Lowey (2007)). Dacite tuffs and related clastic sediments of the Jurassic Nordenskiold formation occur locally in the north of the Copper Belt.

The Lewes River group is intruded by the Whitehorse Batholith (downgraded to pluton by Hart and Pelletier, 1989; but retained as a batholith for historic reasons). The bulk of the Whitehorse Batholith consists of massive, uniform, medium- grained, equigranular, grey, biotite hornblende quartz monzonite to granodiorite. This forms the central core of the batholith; it is unaltered and unmineralized. This central unit passes outwards, through a variable transition zone, to a grey-green, medium to coarse grained, hornblende quartz diorite which occurs discontinuously along the batholith's western border, particularly near irregularities in the batholith margin (Morrison, 1981). The quartz diorite includes discrete diorite and gabbroic phases (Hart and Pelletier, 1989). The western contact is irregular and steeply dipping, locally overhanging; the north and south contacts dip gently outward (Morrison, 1981). The eastern border is not exposed but may dip steeply based on aeromagnetic surveys (ibid). Most known mineral deposits are associated with the quartz diorite (ibid). The quartz diorite is noted to be xenocrystic to xenolithic and is thought to represent the effect of disaggregation and assimilation of Povoas formation mafic volcanic rocks by the core granitic rocks (ibid). The xenocrysitic quartz diorite is extensively saussuratized and chloritized unlike the unaltered interior (ibid).

The younger mid Cretaceous Mt McIntyre Pluton west of the south end of the Whitehorse Batholith consists pink to grey, medium to coarse grained, locally granophyric, hornblende - biotite quartz monzonite (Godrey, 2008; Watson, 1984).

Small bodies of smokey quartz bearing, light colored, biotite granite (including the Jackson Creek Granite) of the late Paleocene to early Eocene Nisling Range Plutonic Suite (Gordey, 2008) occur at the north and south ends of the Copper Belt (figure 2 –unit ETqN).

The youngest unit of the Copper Belt is the Miles Canyon basalt, flows and flow breccias of chocolate brown to red brown weathering, dark grey to black, olivine basalt, commonly amygdaloidal and vesicular; locally showing prominent columnar jointing (Gordey, 2008). The Miles Canyon basalts are late Miocene based on K-Ar and $^{40}Ar$-$^{39}Ar$ dating (Hart and Villeneuve, 1999).

The mineral deposits of the Copper Belt are Cu-Au-Ag (Fe) skarns. Production from 1900 to 1982 totaled 10.1 Mt. averaging approximately 1.2 % Cu (based on 123,000 tonnes recovered Cu), 0.7 g/t Au (based on 7 tonnes recovered gold) and 8.9 g/t Ag (based on 90 tonnes recovered silver) (Hart and Pelletier, 1989) from 12 deposits of 30 occurrences along a 30 km. length of the west contact of the Whitehorse Batholith (figure 2). The overwhelming majority of the production was from the Little Chief deposit (Tenney, 1981).

The skarn deposits are generally localized within 100m. of the Whitehorse Batholith contact with Lewes River Group; particularly carbonate rocks of the Hancock member of the Aksala formation. Skarn type is strongly controlled by the Hancock carbonate facies; there are 2 main skarn types:

- Iron rich skarns: contain Mg rich pyroxene [nearly pure diopside, fine to coarse grained], reddish brown garnet, yellow- green Mg rich olivine [ol occurs only in iron skarns], readily retrograde to serpentine, talc, chlorite, phlogopite, brucite and magnetite, in places, associated with large masses of magnetite; typically strongly sheared and fractured and cut by dykes; associated with relatively less magnetic diorite; Cu mineral mainly bornite; higher in Au & Ag. *These skarns were formed from rocks that were originally dolomites.*

- Calc-silicate, or silicate, skarns: contain Fe rich pyroxene [up to 37 mole% hedengergite and usually coarse grained], yellowish brown and light brown to dark brown garnet, tremolite, idocrase, wollastonite [id and wo occur only in silicate skarns], actinolite, diopside, quartz and feldspar; little or no magnetite or serpentine; generally less sheared and faulted than iron skarns; associated with relatively more magnetic diorite; Cu mineral mainly chalcopyrite; higher in Mo. *These skarns were formed from rocks that were originally limestone.*

The above summarized from Tenney (1981), Morrison (1981) and Minert (1987).

Sulphide mineralization is late in the paragenetic sequence and associated with retrograde alteration, chalcopyrite and pyrite are associated mainly with retrograde actinolite and chlorite; bornite and chalcocite are associated mainly with retrograde epidote and serpentine. Valleriite, the only other Cu rich mineral, occurs only in iron rich skarns in association with phlogophite, serpentine and chlorite (Minert,1987).

Most mineral deposits in the Copper Belt are hosted in skarn developed in Hancock member carbonates near the contact of the Whitehorse Batholith. The deposits tend to favor irregularities in the contact and particularly seem to be developed along NNW trending tongues of quartz diorite into the country rocks and embayments of country rock into the quartz diorite or isolated roof pendants as at Cowley Park.

The Keewenaw deposit is the largest deposit in the district that was mainly developed in the batholith rather than along a contact. Morrison (1981) describes the form of the orebody as "a north-northwest plunging and tapering pipe that is oval at surface and has dimensions of 500 feet by 250 feet". The pipe is isolated within unaltered granodiorite but includes a few small pendants of faulted fragments of garnet-diopside-calcite skarn suggesting it may have been connected to the nearby Gem deposit skarn (ibid). Within the pipe the granodiorite is strongly altered, K-feldspar and quartz occurs in patches and veins; there are also epidote - chlorite veins and patchy sassurite and skarn relics (ibid). Morrison notes that where K-feldspar - quartz patches or the other alteration types occur alone, or in combination, the zone is barren but, where cut by K-feldspar – quartz veins, the zone averages 1% Cu. In the lower benches of the pit Morrison notes that bornite, chalcopyrite, chalcocite and covellite are along the margins of quartz bearing veins, in some fractures and in vertical shear zones that trend 150 degrees. Some of the shear zones are occupied by dikes of Miles Canyon Basalt and there are also dikes of dacite porphyry.

Tenney (1981) on the basis of observation of pit bench records, describes the Keewenaw mineralized zone as an irregular pipe-like mass with no indication of dip. Kindle (1964) on the basis of early trenches and drill-holes, described the zone as a southeasterly trending oval (250 ft. by 500 ft.), he noted the "granite" in the oval zone was fine grained and altered with a strong development of epidote and chlorite with many thin quartz veins and tiny fractures. The oval zone was paralleled by a number of dark, fine grained, diorite dikes varying from 10 feet or less to 30 feet wide; these dikes cut older feldspar porphyry and felsite dikes that also trend southeasterly. Kindle noted abundant copper stain in the vicinity of the diorite dikes. Kindle also noted strong southeasterly trending, near vertical, shear zones associated with copper mineralization within the oval zone.

## Base Map Options

There were several options for a base map of the area of the Lime claims. A 1999 City of Whitehorse black and white othophoto lacks sufficient resolution to be a suitable detailed base map.

Recently, a fall 2007, colour, georegistered, orthophoto for the City of Whitehorse was released by Yukon Geomatics. This is a beautiful image showing spectacular fall vegetation colours, highly suitable for vegetation and wildlife habitat mapping, but its low sun angle causes open areas of outcrop to be heavily shadowed. The version readily available on the internet (1 m. resolution) is not sufficiently detailed to be of use for this study. A more detailed (0.25 m. resolution) version is available but it is a large compressed ECW image file (1.5 Gb) that would not be practical to work with on my computers in uncompressed form.

Several vintages of air photographs are available for the Whitehorse area. The best quality, black and white, most detailed, image with an acceptable sun angle was a 2001 set of photographs.

These were acquired from the EMR Library and scanned at several resolutions, up to 2400 dpi. The most useful image was airphoto A28473-156, centered close to the area of interest.

## GPS base network

The area is crossed by a number of old logging roads, dozer lines and cut lines from mineral exploration carried out roughly 40 years ago. This creates a good opportunity to find clear and unambiguous points on the air photographs that can also be located in the field. The network used is shown on Figure 5.

A network of stations was established at identifiable points and GPS observations were made at each station. At each station GPS data were averaged for at least 20 minutes. Repeat visits were made to each station at least twice for a total of three sets of readings. The GPS units used were all Garmin 12 channel hand held units; one a 76cs and the other two older 12XL models. The Garmin receivers used do not record Rinex data consequently it is not possible to make corrections on the data collected. All units were set to collect data in UTM coordinates for the NAD 83 datum.

Table 1 gives the average of the 3 observations made at each station and used for the purpose of geo-registration of the selected air photograph. Table 2 gives the GPS data recorded. There were 11 stations, 4 are on the claim block, 3 are on vacant crown land (figure 5) and the remainder on nearby claims owned by others. Only the work done on the Lime claims and on vacant crown land has been filed as assessment work.

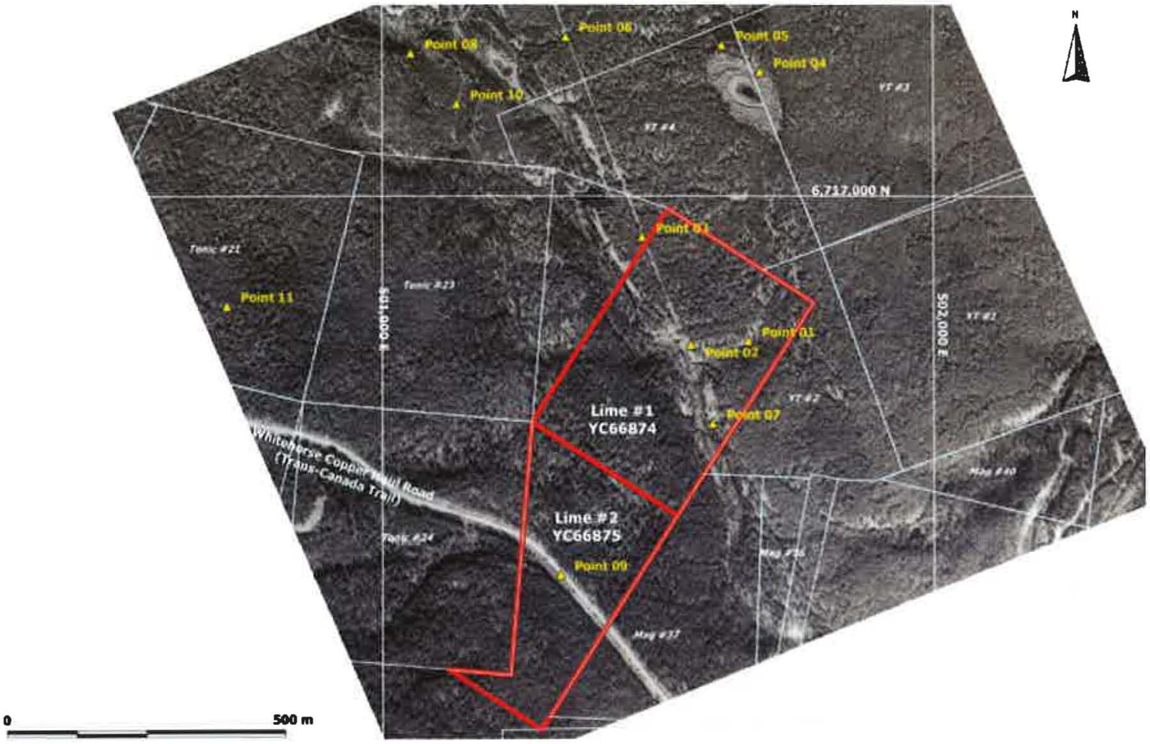


**Figure 5**. The area of the Lime claims showing the GPS base network.

**Table 1**

Averages used for Control Points

| Control Point Name | Northing | Easting |
|---|---|---|
| Point 01 | 6,716,739.7 | 501,663.7 |
| Point 02 | 6,716,732.7 | 501,561.3 |
| Point 03 | 6,716,927.0 | 501,472.0 |
| Point 04 | 6,717,224.0 | 501,685.7 |
| Point 05 | 6,717,273.3 | 501,617.3 |
| Point 06 | 6,717,288.0 | 501,333.5 |
| Point 07 | 6,716,590.7 | 501,600.0 |
| Point 08 | 6,717,257.7 | 501,052.0 |
| Point 09 | 6,716,318.0 | 501,323.0 |
| Point 10 | 6,717,166.7 | 501,134.7 |
| Point 11 | 6,716,802.7 | 500,718.7 |

The accuracy of these points can not be known with certainty but the precision is good with most observations clustering within a circle of 2 to 6 m. diameter; one point, #11 in heavier tree cover, clustered in an 11 m. circle. The accuracy is probably consistent with the uncertainty in picking the points off the photo.

| Table 2 GPS field Data Collected – UTM Zone 8 – NAD 83 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Notes Station | Date | Time_finished | UnitType | Unit_No | Unit Waypoint | Control Point | Northing | Easting | Duration (min) | Number of Readings Averaged | Unit Error Estimate (m.) |
| 2 | 2009-02-28 | 1:19:35 PM | Garmin 76cs | 1 | 2 | Point 05 | 6,717,274 | 501,617 | 2 | 250 average | NR |
| 3 | 2009-02-28 | 1:35:44 PM | Garmin 76cs | 1 | 3 | Point 06 | 6,717,287 | 501,335 | 2 | 250 average | 2.1 |
| 7 | 2009-03-01 | 2:00:10 PM | Garmin 76cs | 1 | 7 | Point 05 | 6,717,272 | 501,617 | 8 | 1000 average | 2.8 |
| 8 | 2009-03-01 | 2:24:21 PM | Garmin 76cs | 1 | 8 | Point 04 | 6,717,223 | 501,684 | 8 | 1030 average | NR |
| 9 | 2009-03-01 | 2:49:03 PM | Garmin 76cs | 1 | 9 | Point 06 | 6,717,288 | 501,333 | 8 | 1000 average | NR |
| 10 | 2009-03-01 | 3:14:35 PM | Garmin 76cs | 1 | 10 | Point 03 | 6,716,927 | 501,471 | 20 | 1200 average | 4.0 |
| 11 | 2009-03-01 | 3:40:51 PM | Garmin 76cs | 1 | 11 | Point 02 | 6,716,732 | 501,561 | 21 | 1305 average | NR |
| 12 | 2009-03-01 | 4:06:11 PM | Garmin 76cs | 1 | 12 | Point 01 | 6,716,742 | 501,663 | 20 | 1200 average | 3.6 |
| 13 | 2009-03-01 | 4:31:49 PM | Garmin 76cs | 1 | 13 | Point 07 | 6,716,591 | 501,599 | 8 | 1000 average | 4.0 |
| 14 | 2009-03-02 | 2:17:58 PM | Garmin 76cs | 1 | 14 | Point 06 | 6,717,290 | 501,332 | 20 | 1200 average | NR |
| 15 | 2009-03-02 | 2:45:03 PM | Garmin 76cs | 1 | 15 | Point 08 | 6,717,258 | 501,051 | 20 | 1200 average | |
| 16 | 2009-03-02 | 3:20:53 PM | Garmin 76cs | 1 | 16 | Point 10 | 6,717,166 | 501,135 | 20 | 1200 average | 4.4 |
| 17 | 2009-03-02 | 4:07:01 PM | Garmin 76cs | 1 | 17 | Point 11 | 6,716,798 | 500,719 | 20 | 1200 average | NR |
| 18 | 2009-03-02 | 4:44:24 PM | Garmin 76cs | 1 | 18 | Point 09 | 6,716,318 | 501,323 | 20 | 1200 average | NR |
| 19 | 2009-03-22 | 2:37:00 PM | Garmin 12XL | 2 | 1 | Point 05 | 6,717,274 | 501,618 | 24 | | 5.0 |
| 20 | 2009-03-22 | 4:10:00 PM | Garmin 12XL | 3 | 1 | Point 04 | 6,717,225 | 501,687 | 111 | | NR |
| 21 | 2009-03-22 | 3:33:00 PM | Garmin 12XL | 2 | 2 | Point 10 | 6,717,166 | 501,135 | 43 | | NR |
| 22 | 2009-03-22 | 4:03:00 PM | Garmin 12XL | 2 | 3 | Point 06 | 6,717,287 | 501,334 | 20 | | NR |
| 23 | 2009-03-23 | 12:06:00 PM | Garmin 12XL | 2 | 4 | Point 04 | 6,717,224 | 501,686 | 53 | | 4.0 |
| 24 | 2009-03-23 | 12:21:00 PM | Garmin 12XL | 3 | 2 | Point 03 | 6,716,927 | 501,472 | 48 | | NR |
| 25 | 2009-03-22 | 11:47:25 AM | Garmin 76cs | 1 | 22 | Point 02 | 6,716,732 | 501,560 | 56 | 3445 average | 2.0 |
| 26 | 2009-03-23 | 3:58:00 PM | Garmin 12XL | 2 | 5 | Point 01 | 6,716,741 | 501,664 | 209 | | 0.7 |
| 27 | 2009-03-23 | 3:52:00 PM | Garmin 12XL | 3 | 3 | Point 07 | 6,716,590 | 501,601 | 195 | | NR |
| 28 | 2009-03-23 | 1:03:59 PM | Garmin 76cs | 1 | 23 | Point 08 | 6,717,258 | 501,051 | 30 | 1822 average | 2.7 |
| 29 | 2009-03-23 | 1:56:11 PM | Garmin 76cs | 1 | 24 | Point 11 | 6,716,801 | 500,719 | 34 | 2042 average | 3.8 |
| 30 | 2009-03-23 | 2:46:24 PM | Garmin 76cs | 1 | 25 | Point 09 | 6,716,318 | 501,323 | 30 | 1830 average | NR |
| 31 | 2009-03-24 | 3:02:00 PM | Garmin 12XL | 3 | 4 | Point 03 | 6,716,927 | 501,473 | 30 | | 0.6 |
| 32 | 2009-03-24 | 3:34:00 PM | Garmin 12XL | 2 | 6 | Point 02 | 6,716,734 | 501,563 | 54 | | 0.6 |
| 33 | 2009-03-24 | 2:47:07 PM | Garmin 76cs | 1 | 26 | Point 07 | 6,716,591 | 501,600 | 40 | 2421 average | NR |
| 34 | 2009-03-24 | 4:49:00 PM | Garmin 12XL | 3 | 5 | Point 01 | 6,716,736 | 501,664 | 91 | | 3.7 |
| 35 | 2009-03-24 | 4:23:00 PM | Garmin 12XL | 2 | 7 | Point 08 | 6,717,257 | 501,054 | 30 | | 0.7 |
| 36 | 2009-03-24 | 3:57:09 PM | Garmin 76cs | 1 | 27 | Point 10 | 6,717,168 | 501,134 | 30 | 1800 average | NR |
| 37 | 2009-03-25 | 10:51:07 AM | Garmin 76cs | 1 | 28 | Point 11 | 6,716,809 | 500,718 | 30 | 1842 average | 0.7 |
| 38 | 2009-03-25 | 11:37:20 AM | Garmin 76cs | 1 | 29 | Point 09 | 6,716,318 | 501,323 | 30 | 1800 average | 1.2 |

## Base Map Preparation

Base map preparation was completed using Manifold System 8.0 GIS software. The air photo image and Table 1 spreadsheet data were imported, a drawing was created from the Table 1 data and control points created at each location. The corresponding control points were located on the image. The image was geo-registered to the control point drawing using an affine transformation that rotates, shifts and scales the image to a best fit of the control point network but does not "rubber sheet' the image. The "rubber sheet' capability exists in Manifold but the resulting registered image only includes the area within the control network. The resulting map is in UTM zone 8 projection, NAD 83 datum.

A 5 m. DEM is available for the area of the City of Whitehorse. The DEM was downloaded from the Yukon Geomatics website and loaded as a surface to the Manifold GIS. Contours of elevation were created at a 2 m. interval and added to the GIS project. The fit between the registered photo and the contours is excellent (figure 6).

As a further check on the resulting map, old GPS data collected in the area over the last several years were added to the GIS. This included trail locations and outcrop areas shown on figure 6. The fit to the newly registered image is also excellent and indicate that the base map will be suitable for mapping to a scale of at least 1:1,000.

## Data Compilation

To better understand the setting of the Lime claims some of the available public domain information on the area was compiled using the GIS. These include a summary composite map from Hureau (1975) and a sketch map of the area that would be developed as the Keewenaw pit from Kindle (1964).

Figure 7 shows a sketch map of the Keewenaw pit area from Kindle (1964). The map was geo-referenced by registering some 1946 air photographs to the 1999 Whitehorse orthophoto map and then using the trenches visible on the old air photos to register the Kindle map. Despite the indirect steps needed to locate the Kindle map the fit seems good. Figure 7 provides the context of two lines that appear on Figure 8, the average dike trend and mineralized zone elongation.

Figure 8 is derived from a Whitehorse Copper Mines exploration composite map of the southern Copper Belt (figure 7 in Hureau, 1975). The drawing was registered using the Whitehorse Reference Traverse base stations (cairns) available from the NRCan legal survey website and drill sites recognizable on the 1999 Whitehorse orthophoto. Figure 8 shows the location of the intrusive contact and is the best available map of the batholith margin found by the writer among the many assessment reports and publications consulted. The various mineralized zones in the area south of the Lime claims are indicated on figure 8. Also shown on figure 8 are the two lines from figure 7 showing the generalized dike (green line) and mineralized zone (red line) trend and location.

Figure 8 has proved to be a very useful geographic reference framework from which to study the somewhat disembodied drawings of the area available in Morrison (1981), Tenney (1981) and Watson (1984). Of particular note is the tongue of granitic rocks (apophyse of Morrison, 1981) that extends south from the Keewenaw deposit and is the axis of a southwest plunging antiform (figure 20 in Morrison, 1981) along which the various mineral zones are found. The Keewenaw deposit is in the center of the tongue where it necks into the main body of the batholith as noted by Morrison (ibid). The tongue and antiform trend parallel to the average dike and mineralization trends noted by Kindle (1964).

These observations suggest the possibility that there may have been a long lived structural feature that controlled the location of the tongue of the batholith and hence the trend of the antiform, the slightly later but essentially synchronous elongation direction of the Keewenaw pipe (Morrison, 1981) and later dikes and faults cutting the batholith and mineralized zones. This hypothetical structural feature could have been instrumental in the structural control of ore deposition in the Copper Belt along the west margin of the Whitehorse Batholith.

The hypothetical feature passes through the center of the Lime #1 claim close to a gully roughly paralleled by one of the larger dikes of diorite that appear to constitute a swarm of NNW trending dikes and "dikelets" paralleling the west margin of the batholith and to which the Keewenaw dikes belong. Interestingly a small piece of float of what appeared to be K-feldspar veining was found along this gulley during casual prospecting on the Lime # 1 claim.

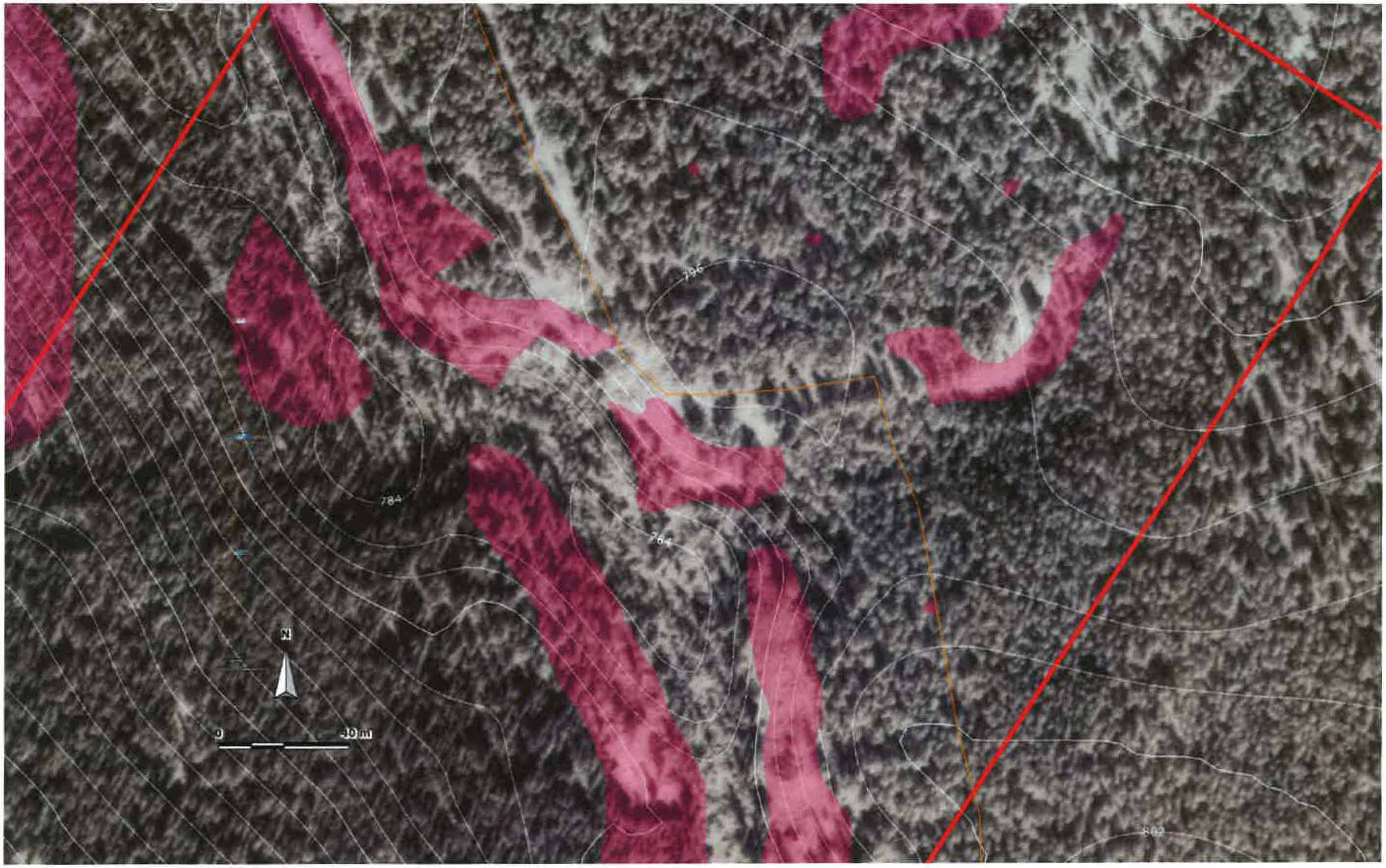


**Figure 6**. Detail of the central part of Lime #1 claim showing the good fit of the image to the topographic contours and previously located outcrop areas and trails. The pink areas are outcrop areas underlain by granitic rocks cut by a swarm of northwest to north northwest trending diorite to feldspar porphyry dikes and "dikelets"

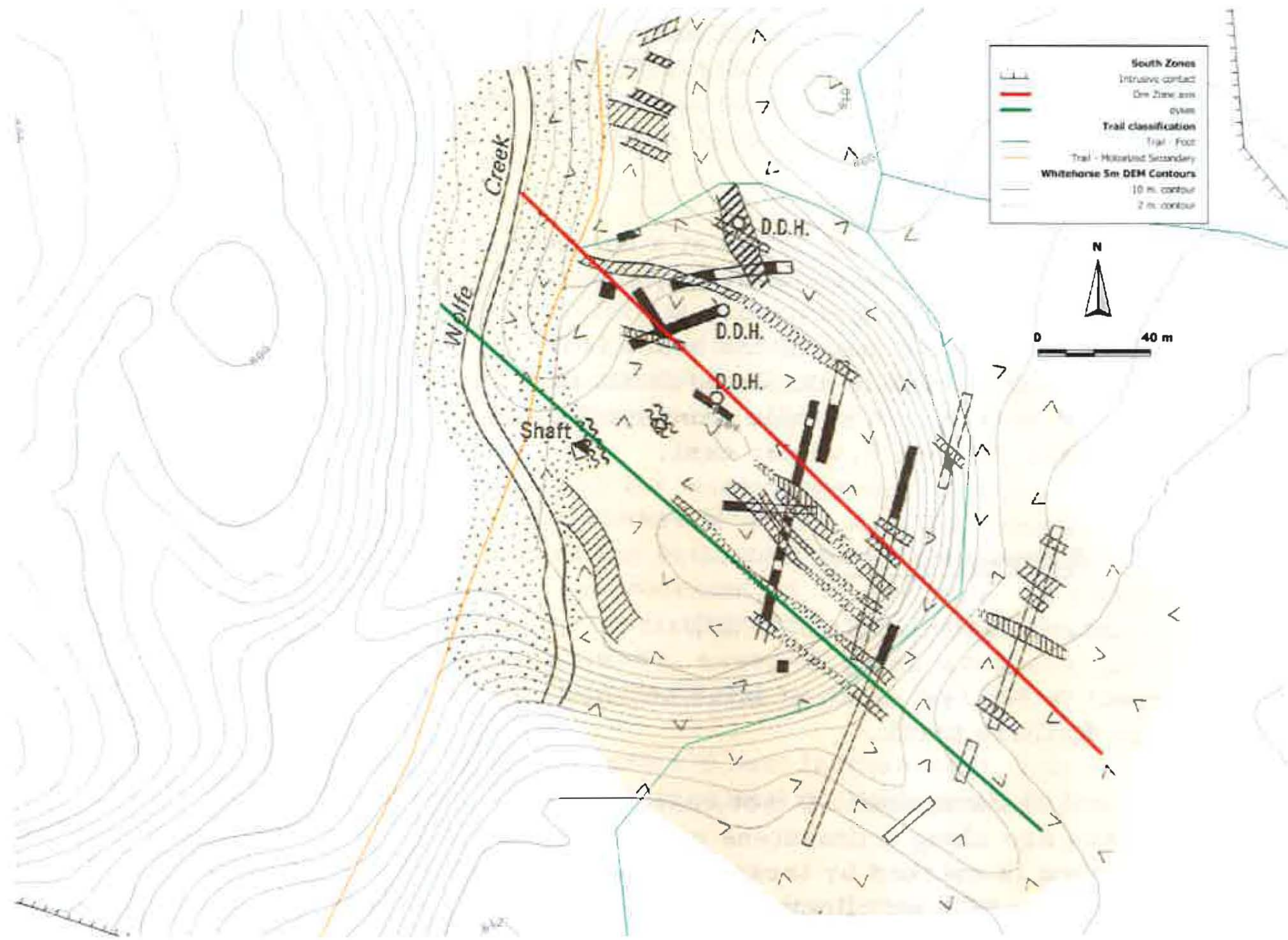


**Figure 7**. Sketch map of the Keewenaw pit area from Kindle (1964, figure 5) the red line is an approximation of the axis of the mineralized zone and the green line is a generalization of the orientation of the diorite dikes. These two lines are shown on the overall compilation in figure 8. The units with light diagonal pattern are diorite dikes, heavy diagonal pattern are feldspar porphyry dikes, the light vertical line pattern are felsite dikes, the black pattern is copper mineralization, the mapped trenches shown as long rectangular solid outlines. The random "V" pattern indicates "granite". The intrusive contact from Hureau (1975), see figure 8, is just visible on the northeast and southwest of the drawing. Superimposed are 2 m. contours from the Whitehorse DEM and GPS mapped recreational trails. The fit is reasonably good except for Wolf Creek – inspection of this area in the field, on a 1970 legal survey plan (CLSR 56961) and on the 1946 air photographs makes it clear that the creek, a salmon spawning stream, was diverted for about 100 m. to excavate the pit.

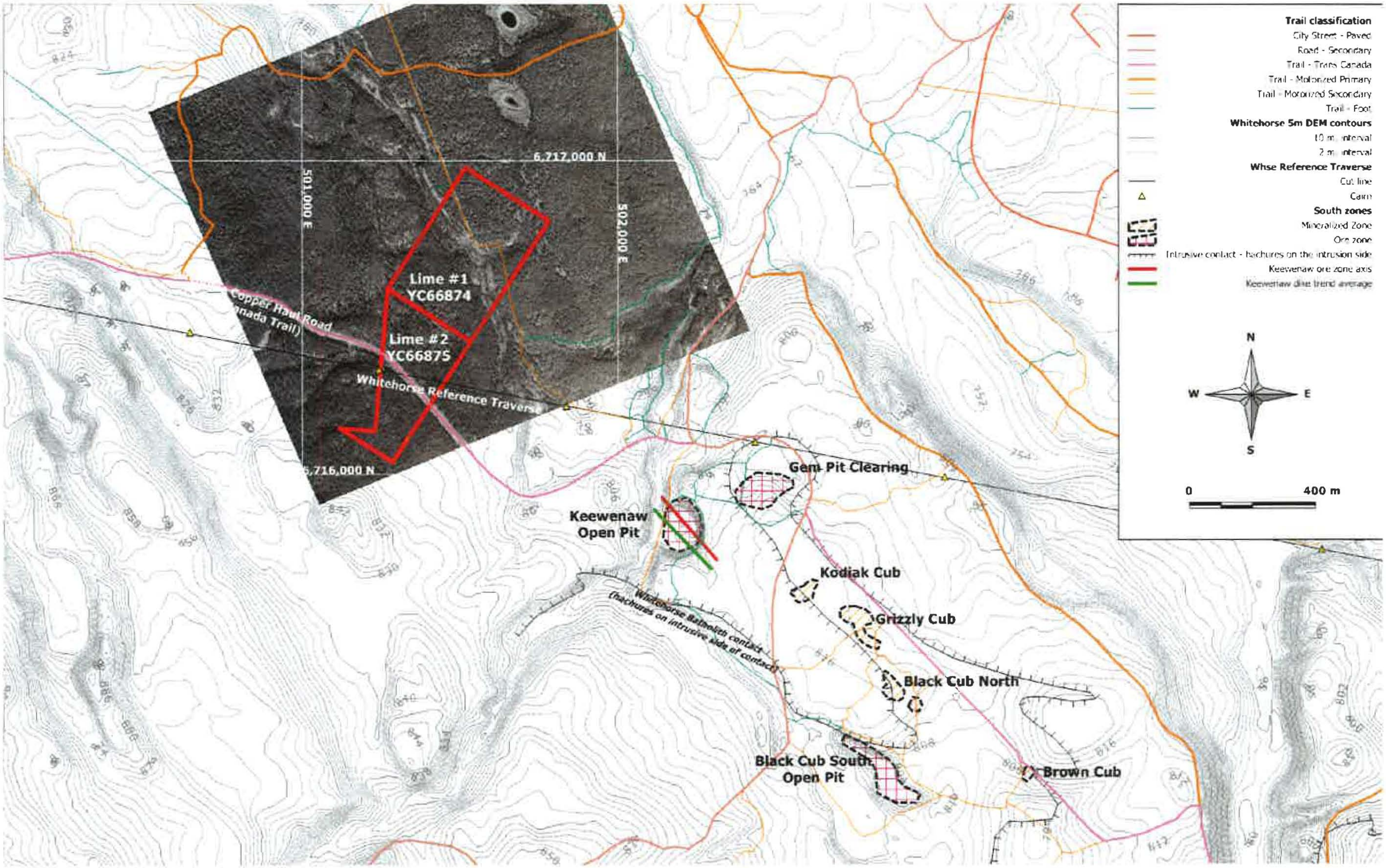


**Figure 8**. Compilation map of the area of the Lime claims showing the relation of the claims to mineralized zones in the area, to the tongue of granitic rocks between the Keewenaw and the Black Cub South pits and to the dike trends at Keewenaw.

## Conclusions and Recommendations

The base map prepared as a result of this work will be suitable for the purpose of additional detailed mapping.

Using the base map prepared, the Lime claims should be geologically mapped in detail paying particular attention to the distribution and orientation of the dikes and "dikelets" cutting the granitoid rocks. Fracture mapping should be done at the same time. An attempt should also be made to objectively map the spatial distribution of widespread, weak, chlorite +- epidote alteration of the granitioid rocks on the Lime claims.

More detailed prospecting should be carried out to confirm local origin of float of possible K-feldspar alteration on Lime #1.

Respectfully Submitted,

Gregg Jilson

## References


Colpron, M., Nelson, J. and Israel, S. , 2007
**A transect through the accreted terranes of the northern Canadian Cordillera: from Cassiar British Columbia to Kluane Lake Yukon**, Guide Book No. 15 for Arizona Geological Society Ores and Orogenesis Symposium, Sept. 24-30, 2007: Tuscon, Arizona Geological Society, Yukon Geological survey Open File 2007-3, 84 pg. plus a !:1,000,000 scale map

Deklerk, R. and S. Traynor, 2004
**Yukon MINFILE 2004 – a database of mineral occurrences**. Yukon Geological Survey, CD-ROM

Duke, N. A, and Hodder, R. W., 1974
**Preliminary report on geological control to ore distribution in the Whitehorse Copper Belt, Yukon Territory**, unpublished report for D.I.A.N.D., assessment report 062108

Gordey, S.P., 2008
**Geology of the Whitehorse Map Area, Yukon**, Geological Survey of Canada Open file 5xxx

Gordey, S.P. and Makepeace, A.J. (comp.) 1999
**Yukon bedrock geology** in Yukon digital geology, S.P. Gordey and A.J. Makepeace (comp.); Geological Survey of Canada Open File D3826 and Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, Open File 1999-1(D)

Hart, C.J.R. and Pelletier, K., 1989
**Geology of Whitehorse (105D/11) Map Area**, Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada Open File 1989-2, 51 p.

Hart, C.J. R. and Villeneuve, M., 1999
**Geochronology of Neogene alkaline volcanic rocks (Miles canyon basalt), southern Yukon Territory: the relative effectiveness of $^{40}Ar/^{39}Ar$ and K/Ar geochronology,** Canadian Journal of Earth Sciences, v. 36, p. 1495-1507

Heon D., 2004
**The Whitehorse Copper Belt, An annotated geology map (scale 1:50,000)**, Yukon Geological Survey Open File 2004-15 2 sheets

Hureau, A., 1975
**Report on Exploratory work done under " Northern Mineral Exploration Assistance Program" March 1974 – July 1974 File N-1790-5-309**, unpublished report for Whitehorse Copper Mines Ltd, assessment report 061254

Kindle, E. D., 1964
**Copper and Iron Resources, Whitehorse Copper Belt, Yukon Territory**, Geological Survey of Canada Paper 63-41, 46 p.

Lowey, G. W., 2007
**Summary of the stratigraphy, sedimentology and hydrocarbon potential of the Laberge Group (lower-middle Jurassic), Whitehorse trough, Yukon**, *in*: Yukon Exploration and Geology 2007, Emond, D.S., Blackburn, L.R., Hill, R.P. and Weston, L. H. (eds.), Yukon Geological Survey, p. 179-197

Minert, L., 1987
**Gold in skarns of the Whitehorse Copper Belt, southern Yukon**, *in* Yukon Geology, vol. 1, Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, p19-43

Morrison, G.W., 1981
**Setting and origin of skarn deposits in the Whitehorse Copper Belt, Yukon**, Unpubl. Ph. D. thesis, University of Western Ontario, London, Ontario, 308 p.

Tenney, D., 1981
**The Whitehorse Copper Belt: Mining, Exploration and Geology (1967-1980)**, Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, Bulletin 1, 29p.

Watson, P. H., 1984
**The Whitehorse Copper Belt – A Compilation, Yukon (1:25,000 scale)**, Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada Open File 1984-!

# Appendix I

## Statement of Costs and Invoices

### Statement of Costs (excluding GST)

| | |
|---|---|
| Wages (field technician @ $250/day) for GPS data collection 3 man days (over 6 calendar days): | $ 750.00 |
| Wages (geologist @ $450/day) for data processing and report preparation 1 man day: | $ 450.00 |
| Field Equipment (batteries) | $ 30.28 |
| GPS rental 1 Garmin 76cs and 2 Garmin 12XL units ($90 / mo) for 12 unit days | $ 36.00 |
| **Total Cost** | **$1,266.28** |

### List of Personnel

Gregg Jilson
38 Dawson Road
Whitehorse, Yukon Y1A 5T6

# Appendix II

Statement of Qualifications

# Statement of Qualifications

I, Gregg Jilson, of 38 Dawson Road Whitehorse Yukon certify that:

- I am a graduate of the University of California, Davis Campus, with a Bachelor of Science degree in Geology granted in 1972.
- I have been engaged in mineral exploration in Yukon since 1969.
- I organized, and carried out the work described in this report.
- I wrote this report and prepared the images.
- The costs summarized in Appendix I are true and accurate.
- I am the registered owner of the Lime Claims.

Gregg Jilson
April 6, 2009