ELECTRUM RESOURCES INC.

Assessment Report - 1996 EXPLORATION

PIL Claims

Toodoggone Area, British Columbia

Omineca Mining Division
British Columbia
Canada

NTS 94E/7W
Latitude 57°19'N
Longitude 126°55'W

Claim	Tenure
PIL2	308128
PIL5	316951
PIL6	316952
PIL7	316953
PIL9	316955
PIL11	316957
PILL13	319650

Owner and Operator

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1.0 SUMMARY

The PIL property consists of 256 contiguous units, centered at Latitude 57°19'N Longitude 126°55'W on NTS map 94E-7. They straddle Jock Creek, roughly 5 kilometers south of Toodoggone Lake, 280 kilometers due north of Smithers in the Omenica Mining Division, north central British Columbia.

The Omenica Resources Access Road is located 7 km to the southwest where it passes the old Black Lake airstrip. A good dirt road leads northeast along Jock Creek and passes through the southern end of the claim group. Access by helicopter is possible from Smithers or from temporary bases commonly situated in the Toodoggone area. The Sturdee River airstrip is located 13 kilometres to the southwest.

The claims are wholly owned by Electrum Resources.

The area has been worked by Serem Ltd. (1980-81), Toodoggone Gold (1986-87), Beachview Resources (1987) and Electrum Resources (1992, 1993, 1995). Collectively, these operators completed heavy mineral, silt, soil and rock sampling, geological mapping, and Toodoggone Gold flew an airborne magnetic survey.

The PIL property is underlain by volcanic rocks of the Metsantan, Saunders and Attycelly Members of the Toodoggone Formation, Lower Jurassic Hazelton Group which according to Diakow et al. (1993) are intruded by an elongate, northwesterly trending, multiphase granodiorite to monzonite pluton. A number of conspicuous gossans are situated at the northwestern and southeastern ends of this intrusive. A 1996 program of rock sampling and prospecting was carried out to follow up several gold, copper and zinc heavy mineral anomalies located in 1992, 1993 and 1995 as well as to investigate the known showings and gossans with respect to their possible relationship to porphyry copper-gold mineralization.

Fourteen samples were collected on the property. Anomalous values in gold, copper, zinc, lead, molybdenum and barium are concentrated in the vicinity of a number of gossans throughout the claim block, with the two most noteworthy samples located at northern and southern extremities.

In 1996, Electrum Resources commissioned Geomatics International Inc. to obtain Landsat TM and Radar imagery of district for the purpose of:

-performing regional analyses of the spectral response and structural controls of porphyry copper-gold mineralization in the district,

-to relate spectral response associated with proven mineralization to similar features which might occur on the PIL claims,

-to examine the spectral response of areas of known jarosite and goethite alteration and determine if the two could be distinguished with any degree of certainty,

-to differentiate the Hazelton Group volcanics from the quartz monzonite intrusive body in order to clarify the relationship between intrusive and mineralization.

An area bounded by 57° N to 57°34'N Latitude and 126°36'W to 127° 05'W Longitude was analysed and in particular, the spectral response of alteration zones and apparent regional structural controls on the Kemess deposits were compared to mineralization located on the PIL claims.

While the spectral response of alteration facies is identical, some of the regional structural controls appear to be different. Although somewhat simplistic, the major stream valleys surrounding the massif containing the Kemess deposits appear to be structurally controlled, suggestive of a caldera type feature containing Hazelton and Takla Group volcanics intruded by the Kemess stock. No such feature was immediately apparent on Electrum Resource's property. A possible similarity in structural control is that Diakow et al. (1993) show a northeast trending structure proximal to the Kemess North deposit and some of the PIL mineralization is proximal to northeast-trending structures.

The gossans in the northwestern part of the property are developed on sericite-pyrite altered rocks near an intrusive-volcanic contact (Staargaard, 1994, Area One). Local concentrations of jarosite and argillic alteration are also present and a thick, layered ferricrete deposit is developed in at least one creek bottom in the area. Anomalous Cu, Au, Zn, Pb, Mo and Ba values occurring in stream sediments in the vicinity suggest potential for porphyry style copper-gold mineralization. Extensive sericite-pyrite alteration is interpreted as possibly representing peripheral phyllic alteration associated with such a system, which would lie in the valley bottom in this area.

A second and smaller gossan zone (Area Two) occurs near the mouth of the main creek draining the central portion of the property where Toodoggone volcanics are cut by a number of monzonite dykes. Various zones of sericitic alteration with disseminated pyrite are present and the rocks are generally highly fractured and/or shattered over an exposed length of about 400 metres. Within this area are several zones of quartz-magnetite fracture fillings, some of which contain traces of malachite. Representative samples taken in this area returned values of up to 608 ppb Au and 582 ppm Cu. The style of alteration, veining and the presence of anomalous copper and gold values suggests potential for porphyry style mineralization. Similar mineralization is reported on the Brenda property adjoining the PIL claims in the southeast where elevated copper values, shown to be present at depth by drilling, have been leached out to background levels at surface.

2.0 Recommendations

A two phase exploration program is proposed for the PIL claims, the second phase contingent on results of the first.

Phase One

a) ground truth and sample the areas where Landsat interpretation indicates combined iron and clay alteration, but no such features have been delineated.

b) ground truth the structures outlined by Radar interpretation and sample where structures intersect alteration and volcanic/intrusive contacts. In particular, the northeast structures cutting and extending off the PIL1 and PIL 11 claims require intensive prospecting.

c) complete a series of 2 km long, E-W reconnaissance IP lines spaced at 500 metres in Area One in an attempt to locate and delineate any sulphide systems potentially related to porphyry-style mineralization.

d) complete a series of 1 km E-W reconnaissance IP lines spaced at 300 metres centred on the gossanous outcrops in Area Two to determine whether or not a sulphide system exists at depth and, if so, its approximate extent.

Phase Two

a) drill 2-3 200 metre diamond drill holes to test any favourable anomalies in Area One.

b) drill 2-3 200 metre diamond drill holes to test any favourable anomalies in Area Two.

3.0 INTRODUCTION

3.1 Statement of Activities

The PIL claims were staked to cover a number of known mineral occurrences and gossans in the Toodoggone area about 10 kilometres to the east of the Baker Mine. This report documents the results of a sampling programme and interpretation derived from LandSat Thematic Mapper and Radar satellite imagery. Property history, regional geology, property geology and descriptions of mineralization based on past work are summarized to set the base for LandSat interpretation.

Recommendations are made for ground truthing of the LandSat and Radar interpretation, and continued exploration based on results of ground follow-up.

3.2 Location and Access

The PIL claims are located in north-central British Columbia, centred at 57°19'N Latitude 126°55'W Longitude on NTS sheet 94E/7W, in the Omenica Mining Division, approximately 280 km due north of Smithers and 455 km northwest of Prince George (Fig. 1, Map 1). The claims are 45 km north northwest of the Kemess property, where two large gold-copper porphyry deposits have been delineated.

Access to the PIL property is from Fort St. James or Mackenzie, via all-weather, mainline logging roads and the Omenica Acceses Road which passes 7 km to the southwest near the old Black Lake airstrip. A good dirt road leads northeast along Jock Creek and crosses the southern end of the claim group. Access by helicopter is possible from Smithers or from temporary bases commonly situated in the Toodoggone area. The Sturdee River airstrip, which may be serviced by aircraft based in Smithers or Vancouver is located 13 kilometres to the southwest.

3.3 Topography, Vegetation and Climate

Topography on the property is steep, with elevations ranging from 1,300 to 2,000 metres ASL. Ridges are cut by broad to narrow stream valleys draining into a broad northwest- and southeast-flowing creek (here informally named Strap Creek), which empties into the Toodoggone River to the north and Jock Creek to the south.

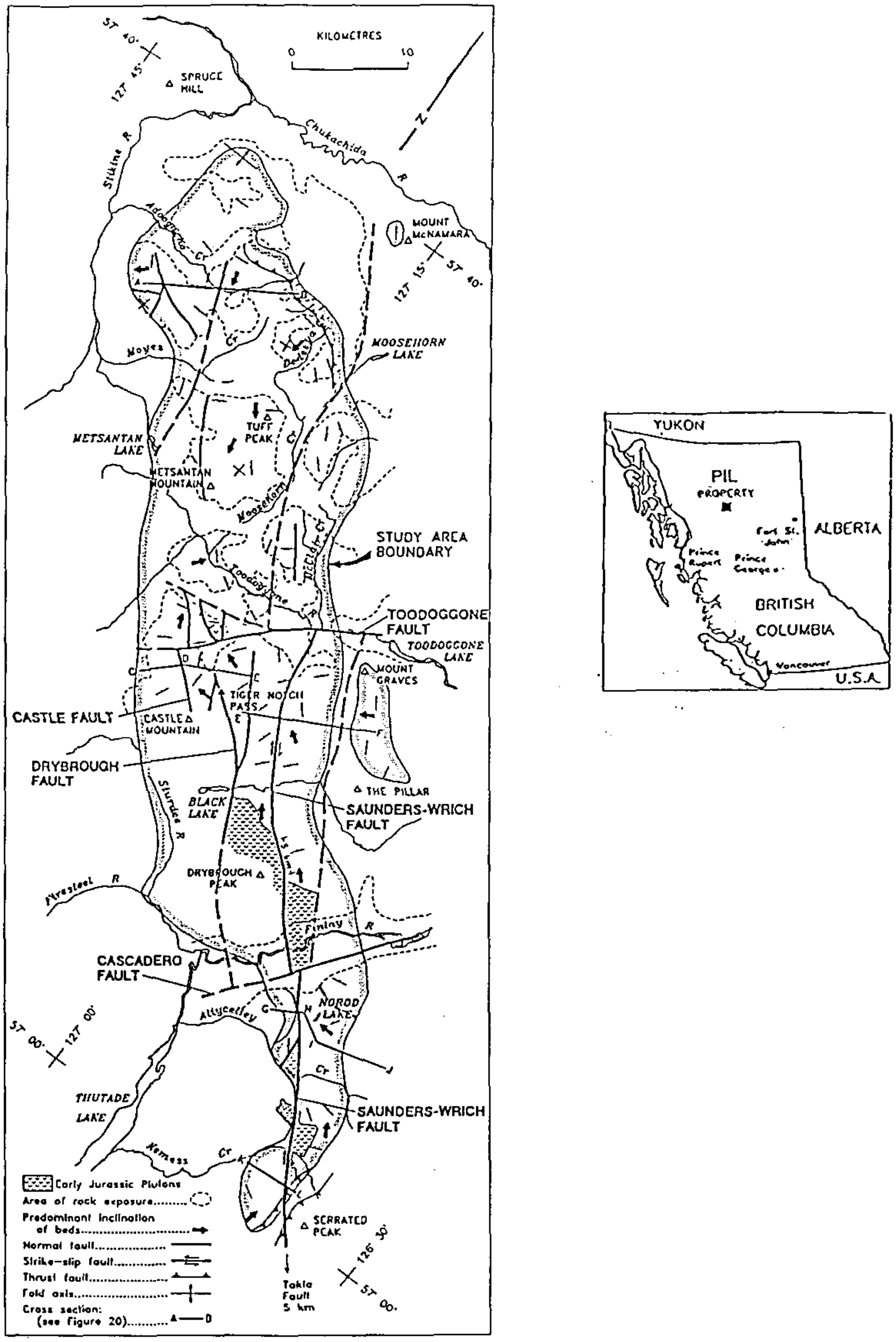

Figure 1. Location map of the PIL claim area showing major faults in the Kemess Toodoggone district after Diakow et al., 1993. Map shows dominant northwest fabric of faults offset by northeast-trending structures. Dextral motion on the Saunders- Wrich fault is indicated by displacement of volcanic and plutonic rocks by as much as 5 kilometres.

Grasses, dwarf alder and birch, and clumps of conifers are typical of valley bottoms while patchy conifer forest occupies slopes. Vegetation at elevations above 1,500 to 1,700 metres is typified by alpine grasses, stunted conifers and dwarf alder.

The climate is generally moderate, with temperatures ranging from -35° to +35° Celsius. Precipitation is moderate (in the range of 890mm per year) and in general, is uniformly distributed throughout the year.

3.4 Claims

The claims comprising the PIL property are wholly owned by Electrum Resources Corporation and their particulars are listed in Table 1.

Name	Units	Tenure No.	Expiry Date
PIL 1	8	308127	March 14, 1993
PIL 2	20	308128	March 14, 1993
PIL 4	20	316950	March 29, 1994
PIL 5	15	316951	March 29, 1994
PIL 6	12	316952	March 29, 1994
PIL 7	20	316953	March 29, 1994
PIL 9	16	316955	March 29, 1994
PIL 10	18	316956	March 29, 1994
PIL 11	20	316957	March 29, 1994
PIL 12	20	319649	July 21, 1994
PIL 13	20	319650	July 21, 1994
PIL 20	9	340215	Sept.16, 1997
PIL 21	16	340216	Sept.16, 1997
PIL 22	16	340217	Sept.16, 1997
PIL 23	18	340218	Sept. 17,1997
PIL 24-33	10x1	340219-28	Sept.16, 1997
Total Claims 25		**Total Units 258**	

Table 1. PIL Property Mineral Claims, NTS 94E-07, Omenica Mining Division.

3.5 History of Work

1980-81	Serem Ltd.	stream silt and contour soil sampling, rock sampling and preliminary geological mapping
1986	Toodoggone Gold	airborne magnetics

1987	Toodoggone Gold	reconnaissance soil and rock sampling
1987	Beachview Resources	reconnaissance soil and rock sampling
1992	Electrum Resource Corp.	heavy mineral sampling
1993	Electrum Resource Corp.	reconnaissance silt sampling, prospecting, rock sampling
1995	Electrum Resource Corp.	soil and rock sampling, magnetometer survey.

4.0 REGIONAL GEOLOGY

4.1 Stratigraphy

Regional geology is summarized after Rebagliati et al. (1995a,b), Rebagliati (1993) and Diakow et al. (1985, 1993). The PIL property is located in the north-central portion of the Kemess-Toodoggone district. A northwesterly-trending belt of mafic flows, breccias and minor sedimentary rocks of the Upper Triassic to Lower Jurassic Takla Group and pyroclastic volcanic and epiclastic sedimentary rocks of the Lower to Middle Jurassic Hazelton Group (Toodoggone Formation) underlies the area (Figure 2).

Takla Group rocks are characterized by massive, dark green, coarse-grained porphyritic augite basalt, and fine grained, aphyric, basaltic andesite lava flows with subordinate interbeds of lapilli tuff and volcanic breccia. Less common are flows with amygdules or platy, glomerophyric plagioclase clusters up to 1.5 cm long. Pillow lavas interbedded with hyaloclastite and well bedded sandstone and conglomerate were mapped east of the Black Lake stock (Diakow et al., 1993). Epidote replaces plagioclase and chlorite pseudomorphs mafic minerals in all the flows. Although a very gentle angular unconformity may be present, contacts of Takla Group volcanics with Jurassic sequences are generally faulted.

The Hazelton Group is subdivided into three formations of nonmarine and marine volcanic and volcaniclastic rocks in north-central British Columbia. The Toodoggone Formation is time equivalent to the Telkwa Formation, the oldest of these three formations. It is characterised by two main periods of eruptive activity. The Toodoggone Formation consists of interstratified red and maroon flow and pyroclastic rocks divided into lower and upper volcanic cycles. The lower cycle consists of four members; Adoogacho, Moyez, Metsantan and McClair. The upper cycle consists of the Attycelley and Saunders Members. The Metsantan, Attycelly and Saunders Members outcrop on the PIL claims.

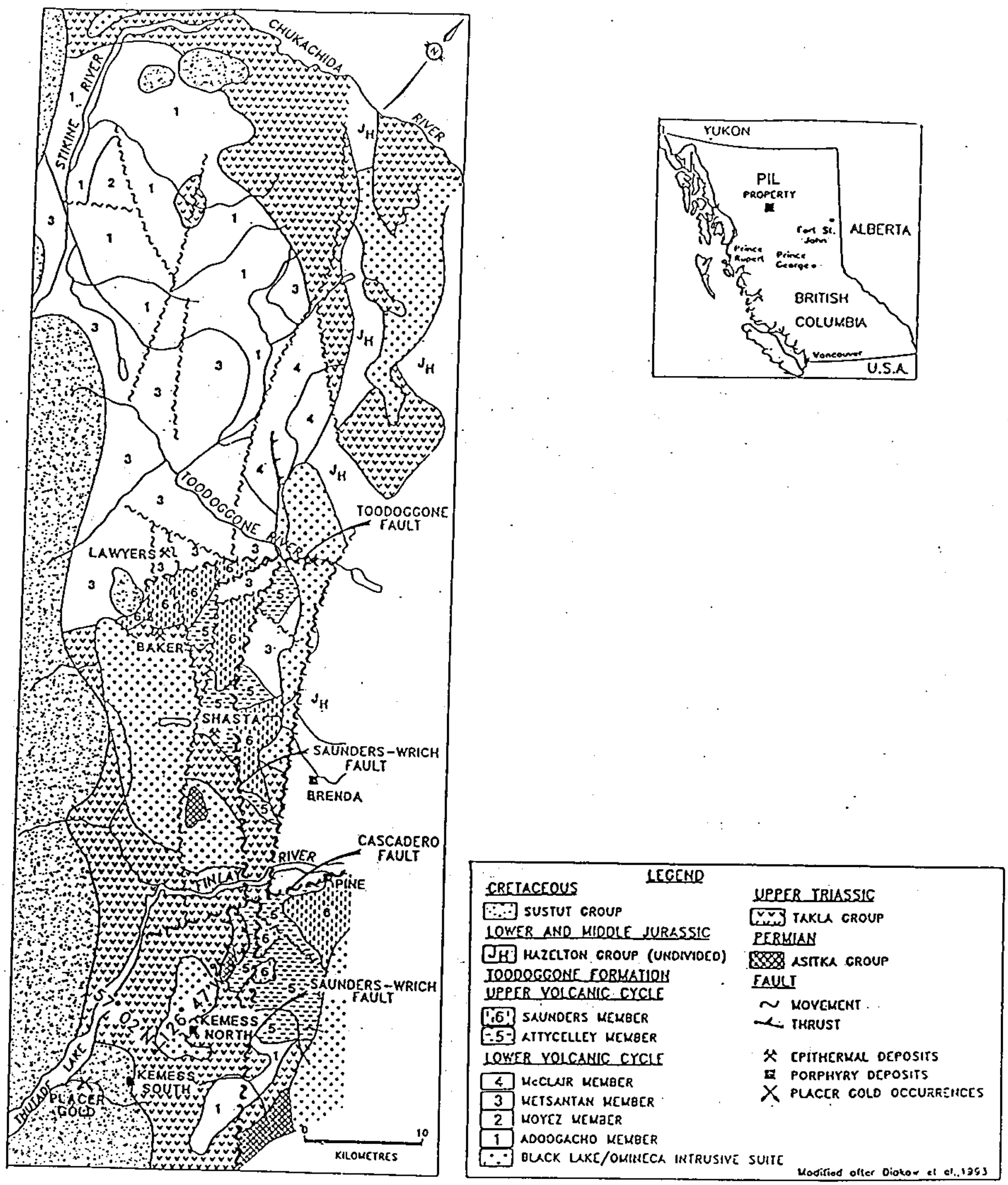

Figure 2. Regional Geology of the Kemess-Toodoggone District, Northern B.C. (after Diakow et al., 1993) and Rebagliati et al., (1995).

The Metsantan Member is composed of massive high-potassium latite flows with local flow breccia, crystal-lithic and lapilli tuffs, minor laharic breccia, and well bedded volcanic conglomerate, with rare interbeds of graded and cross-laminated sandstone and mudstone containing plant debris. Near Mount Graves, immediately north of the claim block, rocks thought to be correlative to the Metsantan Member consist of well-layered epiclastic and pyroclastic facies, which grade laterally to the west into thickly layered flows and pyroclastic rocks. Diakow et al. (1993) suggest that this represents a transition from a volcaniclastic apron to the flows of a lower slope setting of a large stratovolcano, and indicates either

- coalescing deposits from separate point sources **or**
- a facies gradation.

A major fault has subsequently juxtaposed slightly different stratigraphy.

The Attycelley Member is a 500m thick, heterogeneous mixture of green, grey and mauve lapilli-ash tuff, subordinate lapilli-block tuff, a few interspersed ash and lava flows, and interbedded epiclastic rocks. It is similar in texture to the Adoogacho Member and distinguished only by its relationship with the distinctive bounding strata of the overlying Saunders and underlying Metsantan Members.

The Saunders Member is composed almost exclusively of welded, crystal-rich, dacitic ash flow tuffs. Although the lower contact of this member appears to be conformable with the Attycelley Member, locally, the lower contact is erosional with lava flows of the Takla Group, where conglomerate, derived mainly from lava flows of the Takla Group, is interstratified with tuffites forming the base.

Mapping by Bailey et al.(1991) and earlier workers has established a continuous lithological gradation from Takla Group rocks, characterized by subaqueous, low energy volcanism with minor periods of quiescence and sedimentation, through to a more turbulent, high energy, proximal volcanic series that may in part comprise the Hazelton Group.

To the west, Takla and Hazelton Groups are unconformably overlain by subaerial sedimentary rocks of the Lower to Upper Cretaceous Sustut Group (Figure 2).

Pleistocene glaciation has intensively scoured the entire district, and deposited variably thick mantles of till and glaciofluvial material over much of the lower benchland topography. Cirque features with rock glaciers and residual moraine debris are present at higher elevations.

4.2 Black Lake / Omenica Intrusive Suite

Lower to Middle Jurassic Omineca stocks and subvolcanic porphyritic plutons (Black Lake Intrusive Suite) cut older strata and are spatially associated with Toodoggone Formation volcanic rocks. They are mainly felsic in composition and form several porphyry systems, a number of skarns and many vein-type mineral occurrences. Rubidium-strontium analyses of samples from an intrusion located 3 km north of the Kemess South deposit gave a Lower Jurassic date of 190+/-9 Ma. (Cann et al., 1980). A U-Pb zircon age determination from the quartz monzonite-granodiorite Sovereign stock (possibly the same intrusion) adjacent to the Kemess North deposit is 202.7 +1.9-1.7 Ma. (Mortensen, pers. com., 1994 **in** Rebagliati et al., 1995). According to Diakow et al. (1993), the spatial and temporal relationship of these intrusions with predominantly calc-alkaline Upper Triassic to Lower Jurassic volcanic successions suggests that they probably mark the locus of an extensive magmatic arc.

Most of the felsic intrusions form dykes, sills and small stocks ranging in composition from diorite and quartz-diorite through quartz monzonite, with minor syenite to granodiorite. Later, minor intrusions of a more mafic compsition (gabbro to mafic diorite) have been observed cutting the felsic plutons. The plutons are also cut by a suite of late, post-mineral dykes including quartz latite porphyry, trachyte and minor mafic varieties.

Detailed relationships and association of the igneous rocks with the Takla and Hazelton Groups are at present unclear. Clarification would require substantial whole rock analyses and age dating.

4.3 Structural Geology

Numerous, steeply dipping normal faults and a few strike slip and thrust faults cut the Takla Group and Toodoggone Formation (Figure 2), but relative displacement is difficult to measure due to paucity of marker horizons within these rocks. Deep-seated, steeply dipping, northwesterly trending fault zones (e.g. Drybrough, Saunders-Wrich) have controlled Lower to Middle Jurassic comagmatic, intrusive, volcanic and hydrothermal events and form the dominant regional structural fabric. Northeasterly-trending, high angle faults (e.g. Cascadero, Toodoggone) comprise a subordinate fault system, which truncates and displaces the northwest trending structures, forming boundaries for variably tilted and rotated blocks of monoclinal strata (Diakow et al., 1993). The former are often an important control to mineralization in the district.

Diakow et al. (1993) believe the majority of northwest and northeast-trending faults to be extensional, with normal and rarely, strike slip movement. Movement on the faults is in part synchronous with eruptions of the Toodoggone Formation and emplacement of high level intrusive bodies. Granitoid stocks, smaller bodies and several sets of dykes are either elongated or preferentially oriented northwest or to a lesser extent northeast, parallel to the regional structural fabric, suggesting that upward movement of magma was facilitated by extensional structures.

The PIL claims are located in the northeast quadrant of the central segment of the Toodoggone Formation, bounded by the Cascadero fault in the south, the Toodoggone fault to the north (Figure 3), and lying west of a structure defined by Diakow et al. (1993) as the Central Toodoggone Depression. Diakow (op. cit.) interprets displacement along the Cascadero fault as normal with south side downthrown, and Toodoggone Fault displacement as southwest side down normal. LandSat interpretation and a review of geology and geophysical anomalies on the Pine claims by Sterenberg (1996) indicates an apparent sinistral strike-slip component of 1,773m and the possibility of north side downthrown displacement on the Cascadero Fault. Possible strike-slip movement on the Toodoggone Fault will be discussed in a later section.

4.4 Metamorphism

Regional metamorphism of the supracrustal rocks in the Kemess-Toodoggone District is of subgreenshist or zeolite facies (Bailey et al., 1991). Strata are typically non-schistose, with original textures generally well preserved. With one exception, prehnite and pumpellyite have not been recognized in the Toodoggone Formation. They are common in the underlying Takla Group.

Minor thermal metamorphism and recrystallization has occurred adjacent to intrusive bodies. Large areas of hydrothermal metasomatism have overprinted the effects of metamorphism in the vicinity of the Pine and Kemess properties.

4.5 Mineralization

The Kemess and Toodoggone district is well-documented for its porphyry copper and epithermal precious metals mineralization (Diakow et al., 1993, 1991). Gold-rich porphyry copper deposits are hosted by both Takla Group and Toodoggone Formation volcanic rocks and are spatially and temporally associated with porphyry dikes and plutons. The Kemess North and South porphyry gold-copper deposits located 39km and 45km south of the PIL property have geological reserves of 175 million tonnes grading 0.37 g/tAu and 0.18% Cu and 248 Mt grading 0.62 g/t Au and 0.22% Cu respectively. The volcanic rocks also host epithermal gold and silver mineralization which is doubtless genetically related to the deeper seated porphyry copper deposits (Diakow et al., 1991). The most well-known of these is the currently inactive Lawyer's Deposit which hosted reserves of 1.75 million tonnes of 6.8 gt Au and 242.7 gt Ag.

5.0 PROPERTY GEOLOGY AND GEOPHYSICS

5.1 Introduction

Property geology is summarized from Staargaard (1994) and results of a limited magnetometer survey from Zastavnikovich and Visser (1996). Interpretation of LandSat and Radar imagery and its relationship to previous geological interpretations is discussed in a separate section. Although discrepancies were noted in text, previous property geology maps filed show no appreciable difference from Diakow et al.'s (1993) regional interpretation which is shown in Map 2. The property is underlain by volcanic rocks of the Lower Jurassic Hazelton Group and intermediate- to mafic dikes and subvolcanic intrusions contemporaneous with the lower volcanic cycle of this group (Black Lake/Omenica Intrusions).

5.2 Hazelton Group Lithologies

The Toodoggone Formation is represented on the PIL claims by the Metsantan Member of the Lower Volcanic Cycle and the Attycelly and Saunders Members of the Upper Volcanic Cycle. The bulk of the property is underlain by Metsantan Member. East of the Strap Creek valley, volcanics include high-potassium latite flows, flow breccias and tuff of the Metsantan Member plus undivided, well-bedded lapilli tuff and pyroclasitc breccia interspersed with volcanic conglomerate, laminated siltstone and mudstone of the Hazelton Group.

To the west, the volcanics include the Metsantan Member flows, high-potassium dacitic ash flow tuffs of the Saunders Member and minor lithic crystal tuffs and pyroclastic breccias of the Attycelly Member. Southwest and west of the PIL 21claim, Attycelly tuffs have been dated at 193.8 +/-2.6 Ma and Saunders tuffs dated at 182.8 +/-8 Ma. (Diakow et al., 1993).

5.3 Black Lake/Omenica Intrusive Suite

An elongate, northwesterly trending, multiphase granodiorite to monzonite pluton, mapped by Diakow et al. (1993) is thought to transect the centre of the PIL claim block (Map 2). Portions of this intrusive, exposed along the Sturdee airstrip-Brenda road, consist of magnetite-bearing gabbro. The pluton, which has been interpreted to occupy the west side of the Strap Creek valley, is poorly exposed.

Staargaard (1994) observed abundant outcrops of Toodoggone volcanics cut by numerous monzonitic dykes on the PIL 6 claim where Strap Creek intersects Jock Creek. Other exposures of Toodoggone Formation in areas previously mapped as intrusive, plus lack of magnetic contrast displayed along 4 geophysical transects of the property (Zastanikovitch, 1995) indicates that the intrusive may not be as extensive as previously mapped.

A small gabbro dyke outcrops on the PIL6 claim. Vertical, 0.5 to 4.0m wide basaltic dykes striking 145° to 165° intrude altered monzonite on the PIL2 claim. Their origin is uncertain; they may be coeval with the Metsantan Member, or they may post date the Upper Volcanic Cycle members.

5.4 Structure

Numerous faults cut or occur immediately adjacent to the PIL claims. Two northeast trending faults, (striking parallel to Cascadero and Toodoggone Faults), have been mapped by Diakow et al. (1993) and Staargaard (1994) on the PIL1, 2, 20, and 7, 9, 11claims. No displacement is discussed by these authors. Displacement inferred by the author from LandSat and Radar interpretation will be discussed in a later section.

A prominent, northwest-trending, steeply dipping, normal fault (here informally named Strap Fault), northeast side downthrown, cuts the centre of the claim block (Map 2, Diakow et al., 1993). It strikes parallel to the Saunders-Wrich and Drybrough faults to the west (Figure 2), forms part of the regional fabric and is thought to exert similar control on comagmatic, intrusive, volcanic and hydrothermal events to that of the above structures. Two other faults, trending subparallel to the above structure, with no inferred displacement strike through the PIL 21,20, 9 and 23 claims.

5.5 Alteration and Mineralization

PIL property alteration and mineralization are briefly summarized from Staargaard (1994) and Zastavnikovich and Visser (1995).

The northwestern end of the claim group (PIL 10, 11, 22 and 23-33) is marked by abundant gossans which appear to straddle intrusive contacts with volcanics. Most of these are limonitic, with local concentrations of jarosite, goethite and argillic alteration. Thick layers of ferricrete in the creek bottom were noted by Staargaard (1994), and zones of silicification and sericitization, some of which contain disseminated pyrite was observed in places. Stream sediment and soil samples with anomalous values of Au, Cu, Zn, Mo and Sb were collected from this area in 1993 and 1994 (Staargaard, op. cit., Zastavnikovich & Soux, 1995). Samples of porphyritic monzonite with chloritized hornblende, minor limonite and/or pyrite collected from southwest PIL10 were weakly to not anomalous. Samples of silicified, barite-bearing andesite float collected from northeast PIL 10 contained anomalous Au, Cu, Pb, Zn, Cr and Ba.

A variety of mineralization occurs on the central sector of the claim group (PIL 1,2,4,7 and 9). An epithermal vein-type occurrence on the PIL 1 consists of propylitized, locally silicified andesite cut by several generations of quartz veins, vein stockworks and silicification. Finely disseminated pyrite was observed in the veins and maximum values of 74.2 ppm Ag and 850 ppb Au were returned in 1993.

Fine to medium grained monzonite float with abundant millimetre scale quatrtz-limonite-jarosite and quartz-magnetite fracture fillings displaying traces of malachite was sampled on the PIL7 claim. Some fracture fillings exhibit narrow K-feldspar alteration envelopes. Samples returned 11-366 ppb Au and 136-3,335 ppm Cu.

Diversity of mineralization continues to the south (PIL 5,6,12,13,20 and 21) where on the PIL 6 claim, a number of steeply dipping, less than 1m wide, sericitized pyritic shears cut porphyritic andesite. Strong fracturing and quartz-magnetite veinlets with minor malachite staining are present in variable quantities in the surrounding volcanics. Immediately to the south of this mineralization, fractured, sericitized, limonitic outcrops ran 40-300ppb Au and background Cu.

The PIL 2 claim hosts 0.5-4.0m wide southeast-striking basaltic dykes which intrude K-feldspar-rich, epidotized, variably silicified mozonite. Quartz vein float sampled in the vicinity of these outcrops contains128-154 ppb Au associated with anomalous Ag, Cu, Pb, Zn, Co, V, Cr, Ba, Sb and Hg.

Samples of silicified and argillized andesite containing disseminated pyrite and secondary iron hydroxides on the PIL 12 claim contained up to 240 ppb Au, 38.6 ppm Ag, 0.4%Cu, 180 ppm Mo, 0.2% Pb, 359 ppm Cr and 3 ppm Th.

In summary, elevated values of gold and copper are found throughout the property and are associated with a variety of rock types indicative of porphyry style mineralization. Anomalous zinc was found to be related to the large northwest structure which transects the property.

INTERPRETATION OF LANDSAT TM AND RADAR DATA

5.6.1. Introduction

Examination of RadarSat Standard Beam data and principal component analysis of seven band Landsat TM imagery covering an area bounded by 57° N to 57°34'North Latitude and 126°36'W to 127° 05'W Longitude was conducted for the purpose of :

-performing regional analyses of the spectral response and structural controls of porphyry copper-gold mineralization in the district,

-to relate spectral response associated with proven mineralization to similar features which might occur on the PIL claims,

-to examine the spectral response of areas of known jarosite and goethite alteration and determine if the two could be distinguished with any degree of certainty,

-to differentiate the Hazelton Group volcanics from the quartz monzonite intrusive body in order to clarify the relationship between intrusive and mineralization.

In particular, the spectral response of alteration zones and apparent regional structural controls on the Kemess and Pine deposits were compared to mineralization located on the PIL claims.

One 1:100,000 scale plot of regional Crosta imagery was made of an area including the Kemess and Pine deposits and plots of the following band combinations and ratios were made at a scale of 1:50,000 for the purposes of interpretation.

False Color Composite (R7, G5, B2)
True Color Composite (R3,G2, B1)
Iron Ratio (R3/1, G3, B1)
Crosta Plot
RadarSat Standard Beam Mode

Other band combinations were examined during analysis, but plots were not made because the interpretations were deemed inconclusive. For example, ratios 5/4, 5+,3/1 and 5/4, 5+, 5/7 were analysed to search for zones of silicification and possibly differentiate them from those of iron and/or clay enrichment.

A pronounced striping caused by poor data quality of the 1:100,000 scale scene to the south of the PIL caused some difficulty with interpretation of the Crosta Image, especially in areas where striping was parallel to regional structures.

Claim outlines, regional geology, mineralization, sample locations and mapped alteration were plotted at a scale of 1:50,000 on mylar overlays, using the imagery as base reference. Additional structure and alteration patterns were added subsequent to image interpretation. Claim outlines, geology, sample locations with selected values and interpretive work were digitized in MapInfo and superposed on various images (Maps 1 - 5). The perimeter of the claim block was laid over all of the above images with detailed claim distribution shown on Maps 1 and 3. Geology after Diakow et al. (1993) is plotted on Map 2. Features distinguished as a result of this study's interpretive work are outlined in red on Map 5 and yellow on Map 4. Sample locations with values for gold, copper and silver are overlain on Map 4.

5.6.2 Alteration Features

Alteration features were distinguished primarily through interpretation of LandSat imagery. The TCC (3,2,1) color composite in RGB (Red, Green, Blue) provided imagery closest to that of a color air photograph (Map 2) and the FCC (7,5,2) (Map1) enhanced the color contrasts between features with differing spectral response. The most obvious color anomalies occur where vegetation is sparse or absent. Visible gossans on the PIL were delineated and their locations plotted on the Iron Ratio (R3/1, G3, B1) (Map 3) and Crosta (Maps 4, 6) images. Areas rich in iron oxide are displayed in bright yellow-orange on the Iron Ratio image and areas of enriched hydroxyl and iron oxide plot as pale blue to white on the Crosta image. The spectral response of areas where mineralization is known to occur were used as a basis to delineate other anomalous zones.

Spectral response of areas known to contain jarosite and goethite was examined and although a slightly darker orange signature was noted where jarosite occurs, consultation with another remote sensing specialist indicated that TM analyses were unreliable. An airborne hyperspectral survey was recommended to differentiate between the two.

Map 6 is a Crosta image of central Kemess - Toodoggone district. The Kemess North deposit, with abundant talus weathering from mineralized outcrops at the heads of a series of cirques, creates a striking east-northeast-trending spectral anomaly centred at UTM 635600m E, 6325700m N. Although located in the forested Finlay River valley, the area underlain by the Pine deposit (UTM 6341000 x 6344000m N and 637000 x 640000m E) displays a subtle anomalous pattern of iron enrichment and to a lesser extent, hydroxyl enrichment. As with the Pine, Kemess South is in a forested zone centred at UTM 6362500m E, 632000m N, but can be distinguished by iron enrichment at drill roads and sites. Clay content of some of the lakes, secondary stream valleys and that of the Finlay River is evinced by a yellow to orange response. Iron-rich streams and lakes plot dark blue.

Returning to the PIL claim block, three large areas and five small areas (outlined in yellow) display the bright blue-white response of combined iron and hydroxyl enrichment. High albedo on south-facing slopes has reinforced the Crosta response in the three largest areas. Although Maps 2 and 3 show good iron enhancement in these areas, Maps 1 and 2 show a very high albedo on the south-facing slopes due to sun angle, lack of vegetation and rock type.

The strongest response is centred on the boundary between the PIL 12 and 21 claims at UTM 6349000mN, 625000mE. It extends to the south off the claim block, forming an L-shaped anomaly roughly 2.3km by 5.0km along the north-south axis and 2.0km by 5.0km along the east-west axis. The Crosta response follows the contact between Saunders Group welded dacite ash flow tuffs and biotite-hornblende granodiorite to monzonite. Strongly anomalous gold values (295 ppb, 240 ppb and 127 ppb) were reported in soils and rock samples taken from this area by Zastavnikovich and Visser (1995).

The second largest area of combined iron and hydroxyl enrichment occurs in the northwest corner of the claim block, centred on UTM 620500mE, 6357650mN, covering the northeast corner of PIL23, the northwest corner of PIL10 and most of PIL28 and 30. Again, a strong iron enrichment is displayed in Maps 2 and 3 and both Staargaard and Zastavnikovich have reported silicification and small scale potassic alteration from this area. The latter reported molybdenum values of 69 and 62 ppm accompanied by gold values of up to 152 ppb from two soil samples on the PIL23 claim (Zastavnikovich and Visser,1995). Metsantan Member high potassium latite lava flows are thought to be in contact with the intrusive body here.

The third largest area strikes northeast through north-central PIL9 into the southeast corner of PIL10, centred on UTM 622250mE, 6355700mN. It is dominated by iron, with a weak clay signature and rock samples have returned very strongly anomalous copper, gold and silver values (Map 4). Diakow et al. (1993) have mapped a narrowing of the contact between intrusive and Metsantan Member, but interpretation of both Landsat and Radar imagery indicates the presence of a northeast trending fault, (thought to be equivalent to fault mapped to south by Diakow op. cit.) with probable vertical and strike-slip movement, which may have displaced the contact and which may in part be responsible for increased iron content. Another northeast-striking, but weaker Crosta response (yellow and blue) parallels this structure on the PIL11 claim, continuing northeast off the property. This anomaly occurs entirely within Metsantan Member latite flows, and strongest response is localised along a north-northeasterly trending splay? off the main fault.

Of the smaller areas, the two largest are located in the northeast corner of the claim block, east of but proximal to the major northwest-trending normal fault which occupies the Strap Creek valley. The stronger of the two anomalies lies in central west PIL 22, centred on UTM 623000mE, 6358800mN; it also seems to have been enhanced by the strong albedo of its south-facing slope. The dark blue to black central zone of this anomaly is due to vegetation. The anomaly lies within Metsantan Member, adjacent to the eastern border of the monzonite/granodiorite; the Strap fault cuts this contact 500 metres to the west.

A west-northwest trending Crosta anomaly approximately 1km by 0.5km in size is centred at UTM 623450mE, 6357250mN on northwest PIL11. Zastavnikovich and Visser (1995) reported anomalous values of gold (up to 61 ppb), molybdenum (up to 25 ppm), copper (87 ppm), lead (131 ppm), zinc(up to 220 ppm) in soils and one float sample of silicified andesite with 80 ppb gold accompanied by barite from this area. Two small north-trending Crosta anomalies occur west of here on the PIL 10 claim, centred at UTM 622350mE, 6357400mN in Strap Creek. Staargaard (1994) noted abundant ferricrete here.

Finally a group of three small, rounded to elongate areas of iron and hydroxyl enrichment are located on southwest PIL4 and east-central PIL1. These are subsets of a larger, iron-rich area indicated by Radar image analysis to be cut by a northeast-trending fault (Map 5). An epithermal vein-type occurrence described by Serem (Crawford,1982; AR 10326) is located on PIL1 at the area centred at UTM 627050mE, 6352550mN. As mentioned in Section 4.5, Staargaard (1994) obtained values of up to 74.2 ppm silver, and 850 ppb gold with slightly elevated arsenic values from propylitized and locally silicified andesite cut by quartz stockwork here, and similar values from an iron-rich talus slope 500m to the east (pale yellow and blue area).

Northwest of the epithermal occurrence a northeast-trending weakly anomalous area, measuring 1.5 km by 0.5 km and centred on 626600mE, 6353000mN cuts undifferentiated Hazelton Group rocks. It has a strong iron response, but hydroxyl content may be masked by vegetation. This anomaly trends parallel to the trace of the northeast trending fault interpreted from Radar data.

A tiny, northwest trending, but strong anomaly is centred at 626500mE, 6352050mN in undifferentiated Hazelton Group.

5.6.3 Structural and Other Lithological Features

The existence and location of contacts between the granodiorite/monzonite intrusive and Toodoggone volcanics has been quite problematic to previous workers. As prophyry copper-gold deposits are often localized at contacts between these lithologies in the Kemess - Toodoggone district, it is of utmost importance to delineate them.

Diakow et al. (1993) have mapped the intrusive as an elongate, northwest trending body occupying the west side of the Strap Creek valley, but have only defined the contact in one location (south of and on the PIL8 claim). Previous workers have noted the presence of variably altered monzonite dykes on the PIL claim block, but no large body has been definitively mapped. Results from four lines of reconnaissance magnetic survey, carried out by S. Visser (Zastavnikovich and Visser, 1995) at the north and south ends of the claim block were somewhat inconclusive. Variation in susceptibility within what is thought to be the intrusive, made it difficult to define a contact, however there appears to be a significant contrast on the PIL11 and 22 claims. This would establish and eastern contact on the east side of the Strap Fault in the vicinity of Diakow et al.'s assumed contact. Except for a small gabbro plug, intrusive contacts on the PIL12 and 13 claims could not be defined with any certainty.

The FCC (R7,G5, B2) image (Map 2) has been used by the author to differentiate intrusive rocks in similar settings in Peru. Here on the PIL, the color contrast is not as evident and further ground truthing is necessary to support the following hypotheses. Metsantan Member latite flows appear to be purple-blue where they outcrop on, and to the east and west of the claims. Further west of the claims, Saunders Member dacites have less of a purple tinge. Areas thought to be occupied by the intrusive display yellowish orange to pale purple tinge. Gossans in the Metsantan are smoky blue whereas gossans in what is thought to be granodiorite/monzonite are white to ice blue. Again, high reflectivity on south-facing slopes may enhance the pale response, but south facing Metsantan gossans on PIL11 and 22 display marked difference to those on PIL10 and 12.

Interpretation of Map 2 indicates that the granodiorite/monzonite is likely to occur on PIL10,23,28,30 in the north, PIL2,7,9 in the central area and PIL12, 13 in the south. Further mapping and geophysical surveys are necessary to determine whether this is one, near-surface body with several surface exposures, or several separate plugs.

Map 6 displays interpretation of RadarSat Standard Beam imagery. Data quality was not particularly good and the resultant scene displays layover and lacks resolution necessary for dip determination and lithological differentiation. However, pronounced linear features thought to represent faults are evident and a few dip direction determinations were possible. Again all these features must be ground checked.

Several northeast trending structures are equivalent to faults mapped by Diakow et al. (1993). Although they believe that displacement on most of these features is "extensional with normal, and rarely strike-slip movement" (op. cit., p.39), distribution of the granodiorite/monzonite body relative to them suggests that strike-slip movement may be present. Apparent dextral movement in the order of 1km is suggested for the fault striking through the PIL7, 9, and 11 claims; apparent sinistral movement of roughly 500m is suggested for the fault cutting PIL1, 2, and 20 claims. Although not on the claim block, apparent sinistral displacement in the order of 5km is suggested for the Toodoggone fault, based on realignment of intrusive bodies and northwest-trending faults. This disputes Daikow et al.'s claim that "The Toodoggone fault truncates important northwest trending faults in the central segment." (see Figure1).

6.0 Sampling Programme

Appendices B and C contain rock sample descriptions and analytical results. Samples were taken on or downslope of areas with both iron and hydroxyl enrichment. Sample locations with gold, copper and silver were plotted on Map 4. Sampling by Bowen (1993) on the PINE property, approximately 18km to the southeast established threshold and anomalous soil sample values for copper, moybdenum, gold, lead zinc and silver as shown below:

ELEMENT	THRESHOLD	ANOMALOUS
Copper	50 ppm	100 ppm
Molybdenum	10 ppm	15 ppm
Gold	20 ppb	50 ppb
Lead	150 ppm	300 ppm
Zinc	150 ppm	300 ppm
Silver	1.5 ppm	2.5 ppm

As with past sampling, the most promising specimens were collected in the northwest (LPJ-01, -04, -06) and southern (LPJ-02,and -12) claim areas.

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8.0 Statement of Qualifications

I, Velma Zwaantje Sterenberg of 8111 Ash Street, Vancouver, B.C. hereby certify that:

1. I am an employee of Geomatics International Inc. with offices at Suite 201, 1600 West 6th Avenue, Vancovuer, B.C.

2. I am a graduate of University of Alberta, Edmonton (B.Sc., Geological Sciences, 1974).

3. I am a graduate of Queen's University at Kingston, Ontario (M.Sc., Geological Sciences, 1985).

4. I am a member in good standing of the Association of Professional Engineers, Geologists and Geophysicists of Alberta.

5. I am a Fellow of the Geological Association of Canada.

6. I have practised my profession continuously since graduation.

7. The foregoing report is based on:
   a) a study of reports listed in references.
   b) communications with Electrum staff who have been on the property.
   c) my personal knowledge of the district based on a visit to the Toodoggone property in 1981 and work on a related deposit (Mt. Milligan) in B.C.
   d) my knowledge of the use of remote sensing techniques in mapping and mineral exploration which I have used since 1979.

8. I have no interest, either directly or indirectly, in the subject properties or the client company.

Dated this 30th day of June, 1997 in Vancouver, B.C.

Velma Z. Sterenberg

Velma Z. Sterenberg, P.Geol.

Appendix A

Statement of Costs

LandSat Imagery:	
One Seven (7) Band Quarter Scene (92km x 86km) @$2,400.00	$ 2,400.00
Shipping and GST	$ 183.00
LandSat Processing:	
Load scene	
Geo-referencing	
Band and ratio combinations	
(7,5,2) FCC, (3,2,1) TCC, Crosta, and Iron Ratio (R3/1, G3, B1)	
Principal Component Analysis	
Edge Filtering (Band 5)	
Layer Lat., Long., UTM and claim boundaries on each image	
Total Landsat Processing Cost	$ 2,300.00
Radar Imagery:	
One Standard Beam full scene	$2,430.00
Radarsat Rush Processing	$1,350.00
Shipping & GST	$ 280.65
Geomatic's Processing	$ 600.00
Interpretation, Report and Map Generation:	
Delineate features est.16 hours @ $85.00/h	$ 1,360.00
Digitally layer Landsat interpretation over image est. 32 hours @$60.00	$ 1,920.00
Report generation and assembly est. 40 hours @ $85.00/h	$ 3,400.00
Map Plots:	
Five (5) 1:50,000 Plots of Claim area	$ 1,000.00
One (1) 1:50,000 FCC Plot of Claim area w/ claim boundaries, geology and interpretation	$ 300.00
Two (2)Copies of each plot for assessment reports	$ 1,000.00
Disbursements, Courier, Communications:	
Includes cost of CD'S, plot lamination	$ 200.00
Total Cost, Remote Sensing:	**$18,723.65**
Analytical Costs:	**$ 165.68**
TOTAL COST:	**$18,889.33**

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QTY	DESCRIPTION	UNIT PRICE	AMOUNT
14	GEOCHEM - AU FIRE	8.50	119.00
14	ICP - 31 ELEMENT	7.30	102.20
	*30% DISCOUNT APPLIED		

SUB TOTAL	221.20
DISCOUNT	66.36-
GST REGISTRATION # R100294743	10.84
* TOTAL *	165.68

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Appendix B

Rock Sample Descriptions

ROCK SAMPLE NOTES - PIL Claims
(Hand specimens)

LPJ- 1	*Highly chloritized, epidotized monzonite, with malachite, pyrite.*
LPJ- 2	*Outcrop o/c of silicified andesite, with dissem. py.*
LPJ- 3	*Quartz veins in propylitized, monz. with mal., cpy., Fe-OH.*
LPJ- 4	*Fine to medium grained intrusive (?); 5% dissem. pyrite; possible chlorite; abundant limonite; sample strongly weathered.*
LPJ- 5	*Medium grained monzonite with chloritized hornblende; abundant mm sized quartz veinlets; trace dissem. pyrite often associated with mafics.*
LPJ- 6	*Hydrothermal quartz vein breccia; weak limonitic stain in matrix;*
minor	*open space texture.*
LPJ- 7	*Fine to medium grained monzonite (?), abundant X mm quartz-limonite fractures, possible narrow K-spar alteration on fractures.*
LPJ- 8	*Weakly to moderately sericitized porphyritic andesite; possible weak pervasive silicification or feldspathization; 1-2% finely dissem. pyrite; limonite on fractures.*
LPJ- 9	*Silicified andesite with Fe-OH, and barite.*
LPJ-10	*Weakly porphyritic and generally finegrained, greenish gray andesite; common <3 mm fine-grained and dark, cherty silica veinlets; later set of <1 mm banded drusy quartz veinlets with minor open space texture (hydrothermal).*
LPJ-11	*Silicified rock, with quartz veining, abundant Fe-OH.*
LPJ-12	*Quartz veinlets in monz., with mal., cpy., + Fe-OH.*
LPJ-13	*Medium grained syenite to monzonite, abundant chloritized hornblende, 13% pyrite 3 chalcopyrite. as grains assoc. with hornblende and fracture fillings, limonitic fractures. Dyke and shear type of mineralization.*
LPJ-14	*Moderately sericitized porphyritic andesite; <1 % finely disseminated pyrite; limonite on fractures.*

Appendix C

Analytical Results

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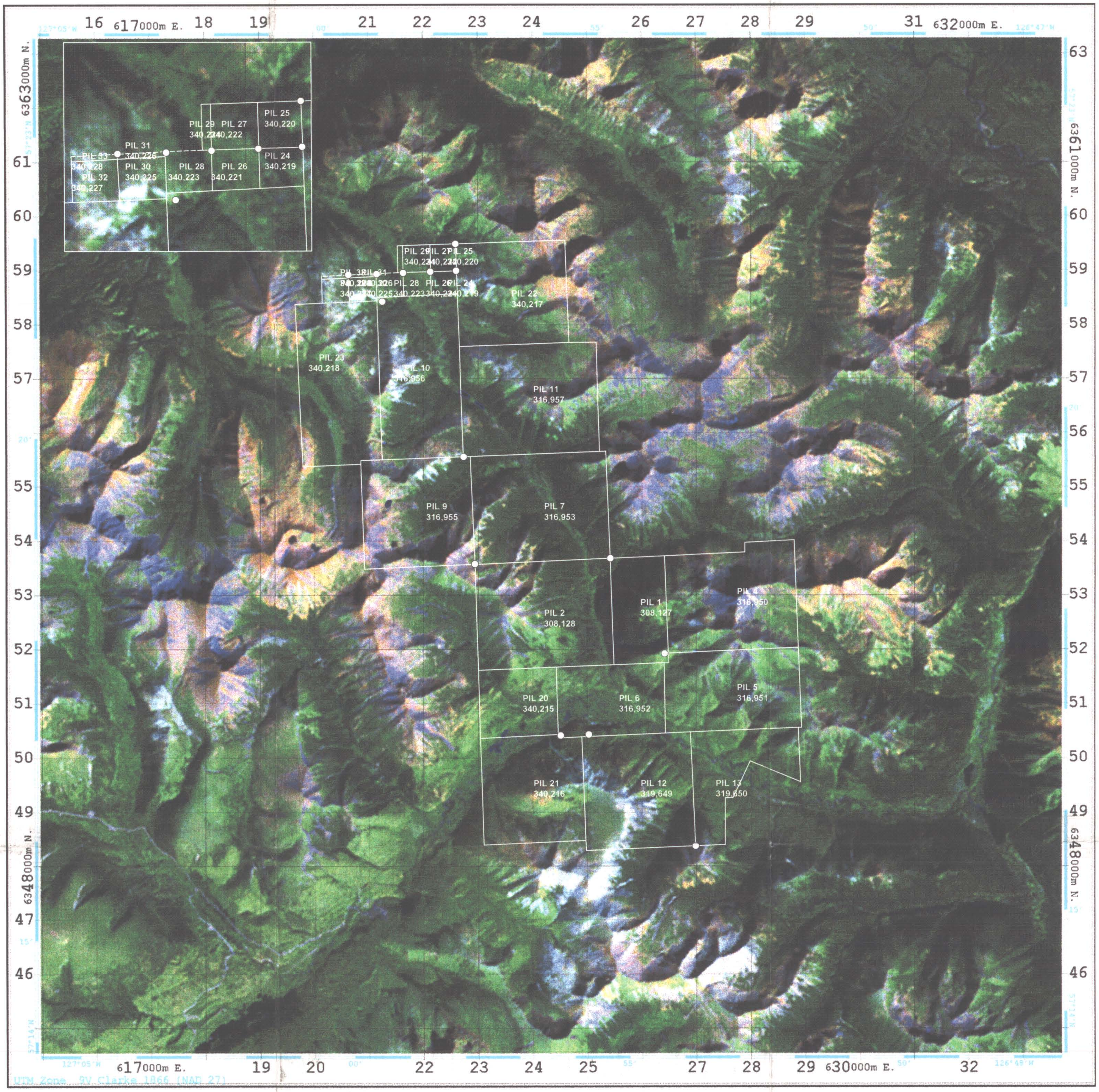
FILE NO: 7V-0132-RJ1
DATE: 97/02/28
* * (ACT:F31)

SAMPLE NUMBER	AG PPM	AL %	AS PPM	BA PPM	BE PPM	BI PPM	CA %	CD PPM	CO PPM	CR PPM	CU PPM	FE %	GA PPM	K %	LI PPM	MG %	MN PPM	MO PPM	NA %	NI PPM	P PPM	PB PPM	SB PPM	SN PPM	SR PPM	TH PPM	TI %	U PPM	V PPM	W PPM	ZN PPM	Au-fire PPB
LPJ-01	>200.0	2.91	1	71	1.5	29	.37	.1	46	68	>10000	12.36	1	.17	10	1.23	3205	40	.01	4	1010	166	48	1	55	1	.01	2	28.0	1	336	398
LPJ-02	41.4	.29	45	41	.3	38	.05	.1	6	509	1785	3.84	2	.03	1	.07	146	379	.01	10	400	556	4	1	13	1	.04	1	22.9	27	52	197
LPJ-03	5.7	2.32	1	72	.7	1	1.72	.1	21	224	2161	3.75	1	.13	5	.72	1770	10	.01	10	830	53	3	1	285	1	.08	1	32.2	13	148	14
LPJ-04	1.7	1.05	16	251	.5	3	.15	.1	14	213	423	4.00	1	.34	1	.35	417	23	.09	4	520	32	1	1	42	3	.05	1	27.8	12	83	84
LPJ-05	.9	1.84	1	62	.6	4	1.71	.1	9	151	64	1.89	1	.07	3	.83	1351	3	.05	6	870	33	3	1	248	1	.11	1	31.7	9	116	1
LPJ-06	38.7	.54	16	72	.3	1	.06	.5	2	244	38	1.14	1	.04	5	.40	484	3	.01	6	150	90	3	1	6	1	.01	1	13.0	13	188	768
LPJ-07	.3	.79	8	124	.6	1	.16	.1	6	38	22	3.57	1	.14	5	.46	473	12	.03	1	1060	32	1	1	20	3	.01	1	23.7	3	54	95
LPJ-08	1.9	3.68	1	25	1.5	1	1.69	.1	34	41	1178	9.05	1	.01	9	3.12	3371	13	.01	13	1200	95	1	1	373	1	.22	1	87.3	1	262	16
LPJ-09	.2	.44	6	1220	.3	1	.15	.1	3	80	35	.74	1	.20	1	.09	224	4	.01	3	480	66	1	1	32	2	.01	1	5.4	5	67	53
LPJ-10	6.5	.98	15	286	.5	1	.19	.1	8	210	49	2.81	1	.22	7	.57	449	5	.01	4	830	35	1	1	29	1	.01	1	47.3	12	67	59
LPJ-11	4.0	.72	9	42	.4	2	.45	.1	7	252	665	1.88	1	.09	2	.36	589	5	.01	8	740	18	3	1	51	2	.07	1	13.5	14	46	14
LPJ-12	132.8	.86	34	44	1.0	34	.53	.1	16	317	>10000	6.35	1	.04	3	.30	985	365	.01	8	470	492	47	1	156	1	.01	1	10.2	15	345	304
LPJ-13	6.9	2.79	1	217	1.5	1	1.88	.1	37	57	4458	6.40	1	.13	18	2.43	1261	9	.10	1	1230	27	1	1	162	1	.30	1	138.9	4	108	18
LPJ-14	2.0	3.04	1	112	.7	14	1.94	.1	11	41	214	3.15	1	.22	4	.87	447	4	.11	2	1350	21	6	1	211	1	.23	1	54.5	4	127	8



PIL Claim Area, Northern B.C.

False Color Composite, PIL Claims
Landsat TM Bands 7,5,2 (RGB)

Map 1

1:50 000 Scale

Kilometres 1 0 1 2 3 4 5 6 7

Miles 1 0 1 2 3 4

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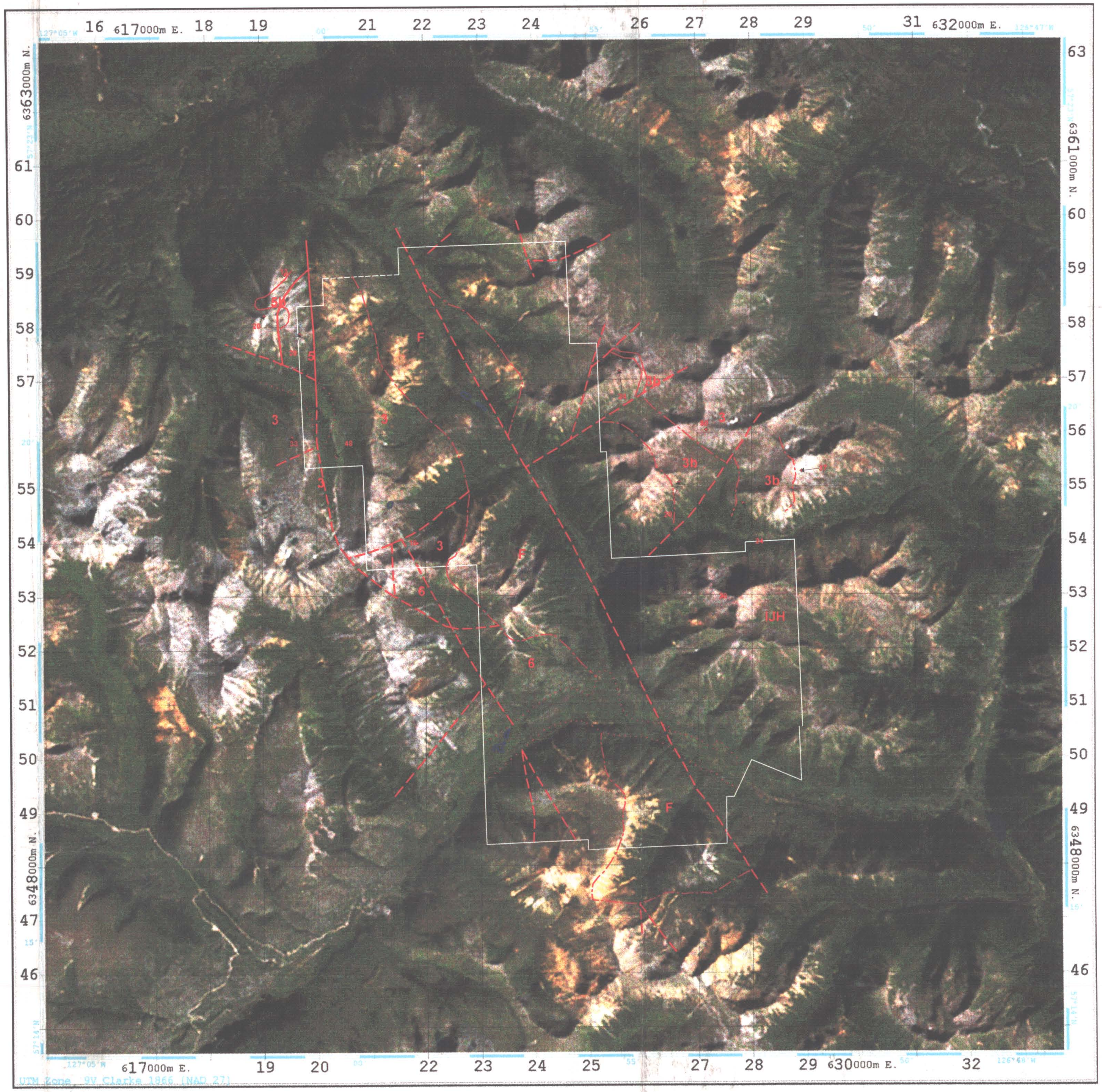
GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

25,054



PIL Claim Area, Northern B.C.

Map 2

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True Color Composite With Geology After Diakow et al. (1993)
Landsat TM Bands 3,2,1 (RGB)

1:50 000 Scale

Kilometres 1 0 1 2 3 4 5 6 7

Miles 1 0 1 2 3 4

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LEGEND

JURASSIC

LOWER AND (?) MIDDLE JURASSIC

HAZELTON GROUP

lJH UNDIVIDED, PREDOMINANTLY GREY, GREEN, PURPLE AND ORANGE-BROWN HONRBLENDE PLAGIOCLASE AND PLAGIOCLASE PHYRIC ANDESITE PORPHYRY FLOWS, WELL BEDDED TUFFS, BRECCIA, SOME LAHAR, CONGLOMERATE, GREYWACKE, SILTSTONE, RARE RHYOLITE-PERLITE. INCLUDES SOME DYKES AND SILLS.

LOWER TO MIDDLE JURASSIC

TOODOGGONE FORMATION - UPPER VOLCANIC CYCLE

SAUNDERS MEMBER

6 *"GREY DACITE"* DARK TO PALE GREY OR GREEN QUARTZOSE BIOTITE HORNBLENDE PLAGIOCLASE ASH FLOW TUFFS OF HIGH POTASSIUM , DACITIC COMPOSITION. INCIPIENTLY TO INTENSELY WELDED WITH LOCALLY WELL-DEVELOPED COMPACTION LAYERING; CONTAINS DIAGNOSTIC JUVENILE CRYSTAL-VITRIC AND LOCALLY ABUNDANT ACCIDENTAL GRANODIORITE CLASTS; OUTCROPS ARE COMMONLY BLOCKY AND STRONGLY JOINTED.

ATTYCELLY MEMBER

5 RECESSIVE, CRUDELY LAYERED, GREY, MAUVE, PURPLE QUARTZOSE PLAGIOCLASE LITHIC-CRYSTAL TUFF, LAPILLI TUFF AND LOCAL PYROCLASTIC BRECCIA, MINOR INCIPIENTLY TO MODERATELY WELDED ASH-FLOW TUFF AND RARE, CROSS STRATIFIED SURGE DEPOSITS; INTERSPERSED VOLCANIC SILTSTONE-SANDSTONE AND RARE LIMESTONE LENSES.

5b BIOTITE-PYROXENE-HORNBLENDE PHYRIC ANDESITE LAVA FLOWS AND SMALL SUBVOLCANIC INTRUSIONS (PETROGRAPHICALLY INDISTINGUISHABLE FROM UNIT 3).

TOODOGGONE FORMATION - LOWER VOLCANIC CYCLE

METSANTAN MEMBER

3 GREEN TO GREY, HIGH-POTASSIUM, LATITE (TRACHYANDESITE) FLOWS; MASSIVE WITH LOCAL FLOW BRECCIA.

3b WELL-BEDDED VOLCANIC CONGLOMERATE WITH INTERBEDS OF GRADED AND CROSS-LAMINATED SANDSTONE, AND MUDSTONE CONTAINING PLANT DEBRIS.

3c CRYSTAL-LITHIC AND LAPILLIE TUFFS, MINOR LAHARIC BRECCIA; INCLUDES RARE LENSES OF SANDSTONE AND MUDSTONE WITH PLANT DEBRIS.

TRIASSIC

UPPER TRIASSIC

TALKA GROUP

TR DARK GREEN, COARSE GRAINED, AUGITE PHYRIC BASALT AND ANDESITE FLOWS, LESSER AMYGDALOIDAL AND COARSE BLADED PLAGIOCLASE PHYRIC FLOWS, LOCAL PILLOW LAVA AND HYALOCLASITE; INTERFLOW TUFFACEOUS SILTSTONE AND FOSSIL-BEARING MUDSTONE; LIMESTONE LENSES.

INTRUSIVE ROCKS

JURASSIC

LOWER TO MIDDLE (?) JURASSIC

DYKES AND SUBVOLCANIC INTRUSIONS CONTEMPORANEOUS WITH VOLCANISM OF THE LOWER VOLCANIC CYCLE

F STOCKS AND SMALLER SATELLITE INTRUSIONS OF EQUIGRANULAR, BIOTITE-HORNBLENDE GRANODIORITE; QUARTZ MONZONITE AND QUARTZ DIORITE

SYMBOLS

Geological Contact; defined, assumed ....

Bedding and Igneous Layering; inclined ....

Fault: defined, assumed; dot on downthrown side, arrows indicate sense of strike-slip movement ....

Fault Inferred From Landsat Interpretation ....

Boundary Between Areas With Abundant Outcrop and Those With Abundant Overburden........

Breccia .... BX

HYDROTHERMAL ALTERATION

Gossan, Limonitic Zone i

M3

PIL Claim Area, Northern B.C.

Iron Anomalies, PIL Claims

Landsat TM Iron Ratios (R3/1,G3,B1)

1:50 000 Scale

Kilometres 1 0 1 2 3 4 5 6 7

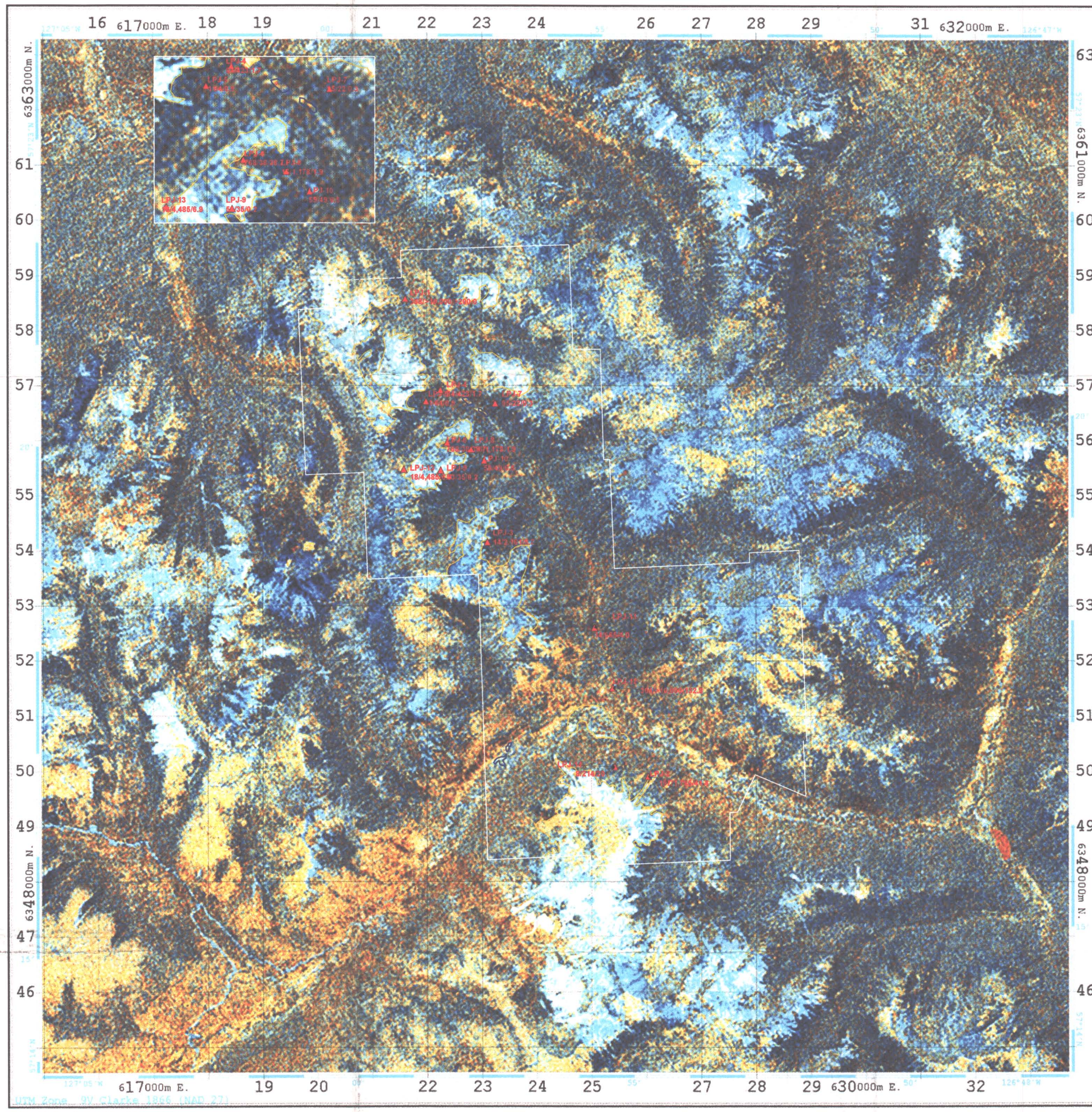
Miles 1 0 1 2 3 4

Map 3

Electrum Resources Corporation

Geomatics International
Canada • United States • Germany

MH



PIL Claim Area, Northern B.C.

Crosta Anomalies, PIL Sample Locations
Landsat TM Crosta Plot

Map 4

1:50 000 Scale

Kilometres 1 0 1 2 3 4 5 6 7

Miles 1 0 1 2 3 4

Electrum Resources Corporation

Geomatics International
Canada • United States • Germany

LEGEND

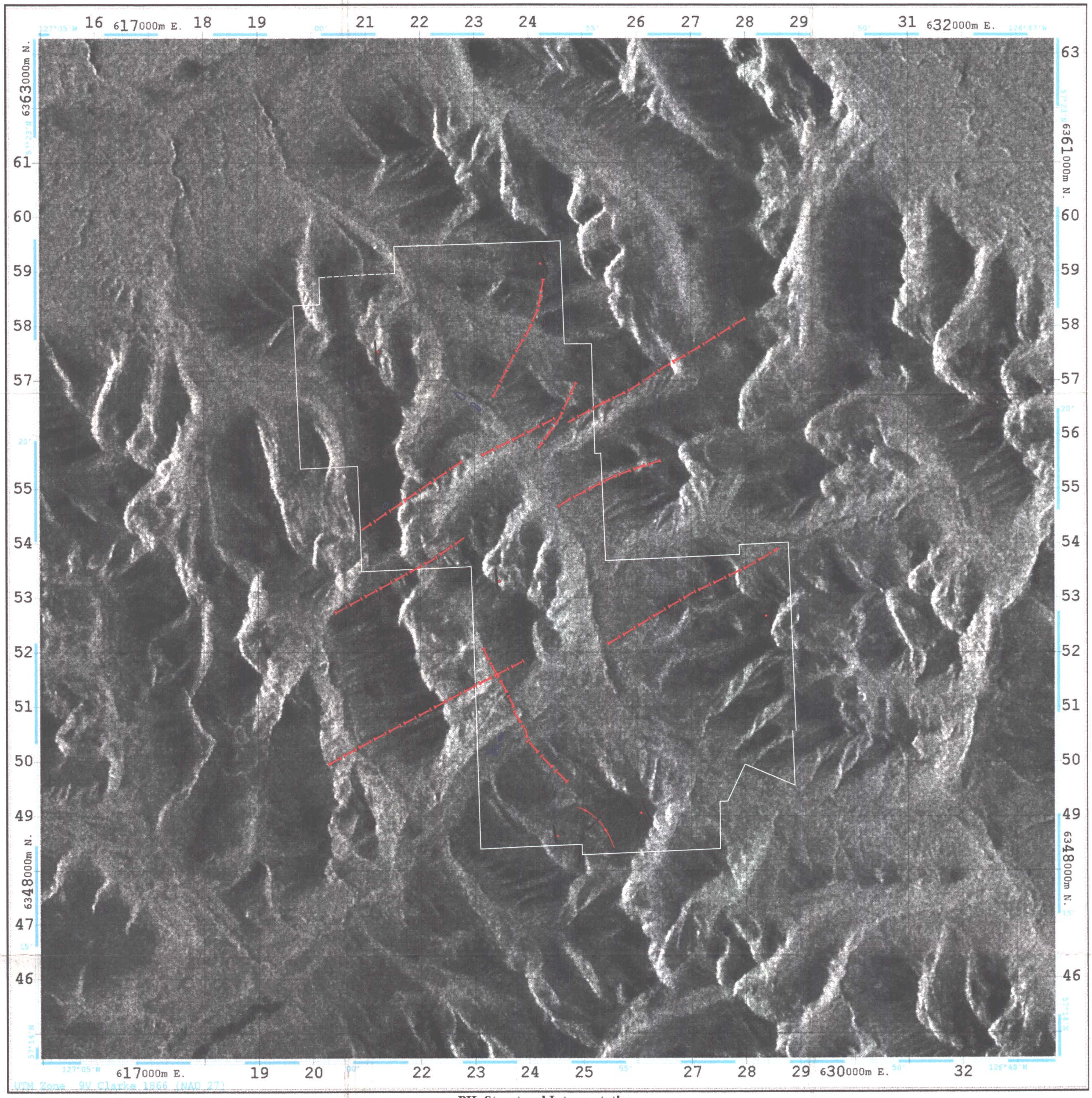
CROSTA ANOMALIES

Sample Locations With Gold, Copper, Silver Values LP1-11 14/665/4.0

Fault Inferred From Landsat and Radar Interpretation

Breccia .... BX

M5



PIL Claim Area, Northern B.C.

Map 5

Electrum Resources Corporation

PIL Structural Interpretation

RADARSAT Standard Image - 12.5 m

1:50 000 Scale

Kilometres 1 0 1 2 3 4 5 6 7

Miles 1 0 1 2 3 4

Geomatics International

Canada • United States • Germany

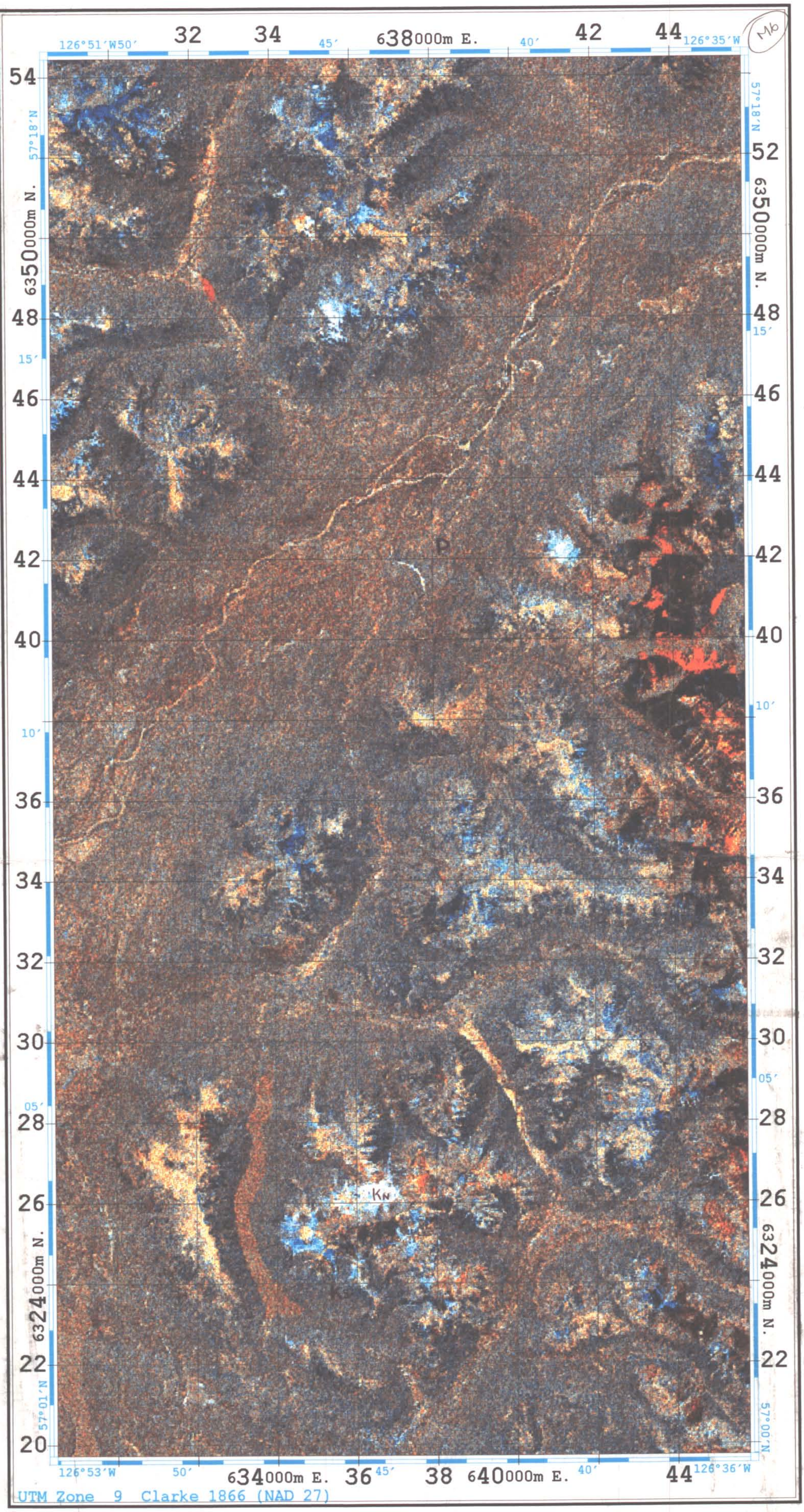
LEGEND

Inferred Geological Contact ....

Inferred Bedding and Igneous Layering: inclined ....

Inferred Fold Axis ....

Fault Inferred From RADAR and LANDSAT Interpretation ....



Landsat TM - Path 52 Row 20

Crosta Alteration Image OH-, OH- + Fe, Fe (RGB)

1:100 000 Scale

Kilometres 1 0 1 2 3 4 5 6 7

Map 6

Geomatics International
Canada • United States • Germany

KEMESS NORTH.. KN

KEMESS SOUTH.. KS

PINE .... P