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# TELKWA GOLD CORPORATION

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(@ Calgary Res. Conf  
- from Mike Marchant)

## The Limonite Creek Project, Central B.C.

### PROPERTY AND LOCATION

The Limonite Creek high sulfidation (HS) prospects lie along a mountain ridge about one to 2 kilometers northerly from Limonite Creek, a small, fast flowing tributary of the Zymoetz (Copper) River. Elevation at the prospect area is 1275 to 1400 meters. NTS Map Sheet 93L12W.

The area is in the westernmost part of Telkwa Pass about 50 kilometers southwesterly from Smithers, British Columbia. Access is via road from Telkwa along the Telkwa River logging road and/or from Terrace, B.C. along the Copper River logging road. Current logging along the Copper River and its tributaries has brought good logging roads within 7 kilometers of the prospect site. Ultimate access is via helicopter from staging areas which are located along the logging roads.

A 500 KV power transmission line, which is owned by B.C. Hydro and Power Authority traverses Telkwa Pass as does a 10 inch, high pressure underground natural gas pipeline, which is owned by Pacific Northern Gas Ltd.

### CLAIMS

Five claims comprise the Bear group;

Claim Name	Tenure No.	Units	Expiry Date
Bear		241471	20 Dec. 14, 2006
Bear 2	313995	18	Oct. 12, 2004
Bear 3	313994	12	Oct. 12, 2004
Bear 4	313993	10	Oct. 11, 2004
Bear 5	328314	10	July 19, 2005
		Total 70	(1750 ha)

All of the claims are 100% owned by Telkwa Gold Corp but subject to a 1.5% Gross Overriding Royalty to the original staking group. The distribution of the 1.5% GORR is: 50% of the 1.5% to 555571 Alberta Ltd., 10% of the 1.5% to Kenneth M. Tompson, 30% of the 1.5% to WDT Ltd. , 5% of the 1.5% to National Research Group and 5% of the 1.5% to Pelagic Holdings Inc .

### HISTORY AND EXPLORATION RECORD

Early prospectors were attracted to the area by large exotic limonite deposits exposed on the slopes just north of Limonite Creek. The first documented record of work on the prospects was in 1912. Prospectors trenched the limonite deposits evaluating them as a possible source for iron ore.

In 1957, the limonite was tested with 27 drill holes, again testing the limonite as a possible source for iron ore.

Noranda Exploration Co., Ltd. in 1964, conducted geological, geochemical and geophysical (mag and EM) surveys on the ridge between Limonite Creek and Many Bear Creek and drilled one short (123 feet) diamond drill hole, recovering EX core. The rock encountered was a medium-grained, slightly sericitized porphyritic latite hypabyssal intrusive rock.

Evergreen Explorations and Pacific Petroleum, Ltd. prepared a grid, 730 by 1524 meters in 1969 and conducted geological, geochemical and geophysical surveys and in 1970 drilled two diamond drill holes for a total of 1250 feet (381m) recovering AX core, testing a possible porphyry copper environment.

Cyprus Canada Inc. conducted geological mapping, rock, water and soil geochemical sampling, a transient electromagnetic (TEM) survey, petrographic studies and diamond drilling. The TEM survey which was run by Cyprus identified several strong conductors, which strike east-northeasterly across the prospect area.

Cyprus also conducted a limited geochemical survey north of the aluminous alteration zone. The sample area was 100 by 300 meters and the underlying rock was exotic limonite. Copper analyses ranged from 200 to 2465 ppm. Total costs for all work done by Cyprus and various geological subcontractors during the 1992 field season amounted to \$220,000.

In 1994, Limonite Creek Limited Partnership and 555571 Alberta, Ltd. re-mapped the prospect area, conducted an induced polarization survey and drilled nine diamond drill holes for a total of 1163 meters (3814 feet). Planned depth of the holes was 500 feet (152 meters) but only four holes were completed to that depth. Most were terminated early or were lost due to ground conditions. Core recovery was about 40 to 50 percent.

Diamond drill holes which were drilled in induced polarization anomalies encountered mostly quartz, sericite, clay and pyrite. Holes drilled in hydrothermal breccias encountered mostly white, gray and brown quartz, cherty quartz, limonite and pyrite. No ore intersections were made in the drilling, although anomalous values in copper and silver were encountered throughout much of the drill core.

## **EXOTIC LIMONITE DEPOSITS**

The exotic limonite deposits on the slopes north of Limonite Creek are very colourful and are very visible. They were thought to cover an area of up to 50 acres (20 ha) but the work in 1996 shows that they are not continuous through that area. Nevertheless, they are very large and very visible

There are three principal areas of exotic limonite accumulation in the Limonite Creek-Many Bear Creek area and a few lesser accumulations on Many Bear Creek between elevations 1220 to 1300 meters, including an apparent fairly large, but poorly exposed deposit on the east side of Red Lake.

Cari Deyell, of the University of British Columbia mapped and sampled the limonite deposits during the summer of 1996 in connection with her work on a Master of Science degree. Her work is directed toward the study of the geological environment which exists before, during and after weathering and oxidation of in-situ sulfide deposits and the geological and chemical processes which are involved in the development of exotic limonites.

## **REGIONAL GEOLOGY**

Limonite Creek and the surrounding area are underlain by Lower Jurassic Hazelton Group volcanic rocks of the Telkwa Formation. These are highly variable sub-aerial, purple, red and green andesites and basalts, water-lain andesitic to rhyolitic tuffs and various andesitic to dacitic flows, tuffs and agglomerates. Mafic to intermediate pyroclastic varieties dominate over the lesser flow banded textures and rhyolitic-dacitic compositions. Bedding is difficult if not impossible to recognize in most exposures. These foliated and chloritized volcanic rocks are intruded by coeval(?) Jurassic granodiorite, quartz monzonite, quartz diorite and monzonite. The extrusive and intrusive rocks are intruded and cross cut by narrow basalt and diorite dike swarms. Many types of younger intrusive rocks occur throughout the region, but their relative ages and rock relationships are not worked out. Six different kinds of younger intrusive rocks are recognized in the relatively small grid area of the prospects at Limonite Creek.

## **GEOLOGY OF THE CLAIM AREA**

The prospect area as defined by the 1992-1994 grid area is underlain by a variety of green and lesser maroon rhyodacite, dacite and andesitic tuffs and flows. These are Lower Jurassic rocks of the Telkwa Formation and are bounded on the east by coarse to medium grained granodiorite which is considered to be part of the Howson batholith of uncertain age, but clearly is intrusive into the volcanic rocks of the Telkwa formation.

To the west, the grid area is bounded by slightly porphyritic granodiorite containing phenocrysts of plagioclase and grains of quartz and biotite in a very fine grained groundmass dominated by quartz and K-feldspar

These rocks are intrusive into the flows and tuffs of the Telkwa Formation and are thought to be of the Coast Range Intrusive Complex, but proof of this is lacking.

Several other kinds of intrusive rocks occur and these are mostly in the eastern half of the map area. These may be divided into three groups of intrusives; hypabyssal intrusive rocks, hypabyssal volcanic rocks and various mafic to felsic dikes.

### **Hypabyssal Intrusive Rocks**

A small stock(?) lies adjacent to and westerly from the Howson(?) batholith. It occupies an area of about 20 to 25 hectares and is slightly rectangular or blocky in its outcrop pattern. Petrographic analysis shows it to be porphyritic granodiorite to hornblende quartz diorite.

### **Hypabyssal Volcanic Rocks**

There are two principal kinds of hypabyssal volcanic rocks in the map area; shallow intrusive andesite and/or fine-grained diorite porphyry and fine-grained porphyritic latite.

Shallow Intrusive Andesite and/or Fine -Grained Diorite Porphyry.- This small body of intrusive andesite may be the remnants of a volcanic neck or plug which occupied a vent on an andesitic volcano. Petrographically, it is described as hypabyssal quartz-bearing diorite porphyry and as porphyritic hypabyssal andesite.

It occupies an area of about 4 to 5 hectares in the northeastern part of the map area and its position appears to be influenced by the fault.

Fine-Grained Porphyritic Latite.- This small intrusive body is irregular to nearly dike-like in outcrop pattern and occurs over a strike length of 650 meters and is from 10 to 100 meters wide. In 1963 Noranda Exploration Co.Ltd. drilled a short diamond drill hole testing its potential as a porphyry copper target. The petrographic descriptions of three specimens are very similar. Phenocrysts of plagioclase, biotite, hornblende and apatite are set in a groundmass dominated by extremely fine-grained K-feldspar and plagioclase with minor disseminated chlorite/biotite and opaques.

### **Dikes**

There are two principal types of dikes recognized and mapped and perhaps others not identified. Those identified are fine to coarse-grained diorite dikes which are very magnetic and fine-grained, white, quartz-eye rhyolite (field identification) or porphyritic dacite (petrographic identification).

Fine to Coarse-Grained Diorite Dikes.- A very prominent diorite dike system strikes northerly through the eastern part of the map area. It is mapped through a length of 1250 meters and no doubt continues southerly from the map area to Limonite Creek, a distance of about 1100 meters. It is fresh and unaltered and is intrusive into the Telkwa volcanic rocks and into the various intrusive rocks.

Petrographic analysis shows that the composition of the diorite is dominated by plagioclase and hornblende with minor interstitial quartz and K-feldspar and secondary patches of chlorite and one to 5 percent magnetite/limonite.

Rhyolite or Porphyritic Dacite Dike.- One large and apparently persistent felsic dike occurs in the northwestern part of the map area. In the field it was called "quartz eye rhyolite", but the petrographic description shows it to be a porphyritic dacite. Phenocrysts of plagioclase and quartz and minor hornblende and biotite and patches of pyrite are set in a groundmass dominated by very fine grained plagioclase altered slightly to moderately, to sericite.

The dike apparently has a near-vertical dip and is exposed in a few scattered exposures over a strike length of 500 meters. The strike is about N.75W.

Pre-Hydrothermal Alteration Dikes.-Several narrow, shallow-dipping dikes occur in intensely hydrothermally altered rocks in Lazulite Canyon. The dikes are pre- or syn- alteration and apparently were andesite or latite dikes. They are brownish in color due to a limonite content of 2 to 3 percent and are visually prominent when observed against their whitish sericite-quartz-clay host rock.

## HYDROTHERMAL ALTERATION

### The High Sulfidation (HS) Epithermal Model

The high sulfidation epithermal system, which may develop rich gold-copper deposits, develops in an active volcano, and is produced by sulfur-rich, oxidized fluids which originate from SO<sub>2</sub>-rich magmatic volatiles in the presence of varying amounts of meteoric water. The fluids produced in this system are very acidic.

In contrast to the HS deposits, low sulfidation (LS) deposits are produced by near-neutral pH thermal waters in the same volcano-dominated environment.

Epithermal gold deposits occur mostly in volcano-plutonic arcs which are associated with subduction zones. Host rocks are mainly volcanic rocks and related sedimentary tuffs.

HS gold-copper deposits are characterized by a suite of minerals, many of which also occur in LS deposits, but a few of which are diagnostic for HS deposits.

The suite of ore minerals which are characteristic of HS gold-copper deposits includes:

Pyrite, FeS <sub>2</sub>	Always present, abundant.
Enargite, Cu <sub>3</sub> AsS <sub>4</sub>	Commonly present in small amounts; may constitute ore.
Covellite, CuS	Commonly present in small amounts, may constitute ore.
Chalcopyrite, CuFeS <sub>2</sub>	Commonly present in small amounts.
Native gold, Au	In minor amounts, but may be enough to constitute ore.
And several other copper, silver, gold and arsenic-bearing minerals which may or may not occur.	

Zunyi Fe?  
(AP)

Several gangue minerals which occur in the HS system are diagnostic; alunite is commonly an abundant mineral and must be present in the HS assemblage and zunyiite may occur, but is in minor amounts. Several other minerals are common to the HS suite of gangue minerals; quartz, pyrophyllite, kaolinite, illite and barite may occur in minor to significant amounts. This suite of minerals constitutes the "advanced argillic" facies of hydrothermal alteration. However, quartz and some of the clay minerals and barite may also occur in the LS system.

## **The High Sulfidation (HS) Epithermal Model And Advanced Argillic Alteration at Limonite Creek**

At Limonite Creek a large zone of hydrothermally altered rocks strikes east-northeasterly across the grid area. In this zone of alteration there are many occurrences of rocks which display advanced argillic alteration mineralogy, similar to that which occurs with HS gold-copper deposits throughout the world. Diamond drilling in 1996 demonstrated the continuation of the hydrothermal alteration to depth, as well as its continuity on strike, in areas where there are no outcrops.

Rocks that display advanced argillic alteration at Limonite Creek are intermittently exposed over a length of about 1100 meters and a width of 850 meters and are approximately centered along the map grid area. This zone of altered rocks is called the "Ridge Zone" due to its location along the height of land between Limonite Creek and Many Bear Creek.

The zone of alteration appears to terminate easterly against the diorite dike and disappears beneath glacial debris to the west.

At the end of the 1996 field season, outcrops of gossan were observed from a helicopter on strike and about 500 meters west-southwesterly from the Ridge zone. These outcrops are apparently the continuation of the zone of alteration where it becomes exposed from beneath glacial debris.

At Limonite Creek the zone of advanced argillic alteration is extensively and complexly faulted, as may be expected, since it lies near the vent of a volcano. This zone was the focus of exploration efforts in 1992, 1994 and 1996, in a search for a high sulfidation gold-copper deposit.

### **Zone of Aluminous Alteration**

A zone of aluminous alteration occurs adjacent to and north of the zone of argillic and advanced argillic alteration. Aluminous alteration is characterized by the presence of minor to significant amounts of corundum, andalusite and at Limonite Creek, jazulite and reflects a higher temperature environment of alteration than exists in argillic and advanced argillic alteration. Aluminous alteration is considered to have developed deeper in the hydrothermal system than argillic alteration and advanced argillic alteration and may be associated with a porphyry copper environment, similar to El Salvador, Chile.

The aluminous zone is separated from the advanced argillic and argillic zones by a probable fault. This fault is believed to have telescoped the argillic-advanced argillic zone downward against the deeper aluminous altered rocks, a type of occurrence that may be expected in volcano-hosted ore deposits.

The fault is marked at the surface by a small drainage and swampy, gentle terrain lying along the north margin of the Ridge zone. Thus, since aluminous alteration is known to occur above some porphyry copper deposits, certain preliminary exploration measures should be taken to evaluate the potential of a porphyry copper target north of the zone of aluminous alteration, possibly centered on the slopes to the north and south of Many Bear Creek.

## **EXPLORATION**

In 1994, about 3000 meters of new grid lines were cut and chained and 9000 meters of grid lines that were cut in 1992 were cleaned and re-chained.

The grid area and a broad perimeter surrounding the grid were mapped during the field season of 1994.

An induced polarization survey was conducted during July, 1994 as a second phase of geophysical work, following transient electromagnetic (TEM) surveys which were conducted by Cyprus Canada Inc. in 1992.

The I.P. survey delineated a large chargeability high which correlates well with mapped zones of advanced argillic alteration and several smaller I.P. anomalies which correlate with TEM conductors and with possible breccia zones.

Some of the I.P. anomalies and two limonitic quartz breccias were tested by diamond drilling.

Nine holes were drilled in 1994 for a total length of 1163.0 meters (3814.6 ft.). Drilling was done by J.T. Thomas Drilling Ltd. of Smithers, B.C. using a Longyear 38 diamond drill with NQ equipment. Both NQ and NQII coring equipment were used.

The nine diamond drill holes were drilled from 6 setups over an area of 260 x 740 meters (853 x 2427 feet). Overburden depths varied from 2.1 to 9.1 meters (7 to 30 feet).

Drill sites were cleared by hand as needed and drill moves were made by helicopter, creating minimal surface disturbance.

Throughout most of the drilling core recovery was less than 40 percent. The unusually difficult ground conditions also had an adverse affect on the drill equipment. A total of 69 drill rods (690 feet) were lost in the holes and could not be recovered and 26 more were "belled" and ruined. Several core barrels and diamond bits were lost as were 470 feet of casing and several diamond casing shoes. An inordinate amount of drill mud (772 bags) and chemical additives (287 bags) were required in trying to keep the holes open. Three holes were abandoned because the drill rods stuck and were ultimately lost in the holes (DDH 94-5, 7 and 9) and three other holes were terminated prematurely in order to prevent the loss of the drill rods (DDH 94-3, 6 and 8).

It is concluded therefore that the level of oxidation along the ridge between Limonite Creek and Many Bear Creek is about 90 meters below the present surface, as pyrite which occurred in quartz veins above that level was oxidized and leached. It should be noted here, that the present induced polarization survey, which is thought to have penetrated to a depth of about 75 meters, probably did not penetrate below the level of oxidation and would not have detected sulfide mineral at levels deeper than 75 meters. Very fine grained disseminated pyrite however, which is ubiquitous throughout the hydrothermally altered rocks, is fresh and bright, even at the surface.

In the 1994 drilling no ore-grade intersections were made, even though hydrothermal alteration of the host rocks is similar to rock alteration associated with large, precious metal deposits throughout the world

During the period, August 21, 1996 to September 15, 1996 three diamond drill holes were drilled for a total of 862.9 meters (2830.3 feet). Each of the holes was planned for 1500 feet (457m) depth or to penetrate through the advanced argillic alteration zone or through a high sulfidation zone of mineralization (if one was encountered) and into adjacent wall rock. Drill hole 96-1 completed successfully and core recovery was 100 percent through a zone of argillic alteration with pyrite, but drill holes 96-2 and 96-3 terminated prior to planned depth, due to bad ground conditions.

Three widely spaced drill holes, all inclined at minus 60 degrees with bearings near grid-north encountered wide intersections of fine-grained to extremely fine-grained pyrite in amounts to 25 percent. Rocks displaying prominent advanced argillic alteration were encountered in DDH 96-2, downward from elevation 1247 meters and continued to the bottom of the hole at elevation 1106 meters. Hypogene covellite (CuS) occurrences are noted in thin sections at elevations 1151 meters. Covellite, colusite (Cu,Fe,Mo,Sn)<sub>4</sub>(S,As,Te)<sub>3-4</sub> and sphalerite (ZnS) occur in minor to trace amounts through the intervals to the bottom of the hole. It is noted that an extensive deposit of vuggy silica occurs in DDH 96-2 between elevations 1164 to 1119 meters. Calculated width of the zone is 26 meters. Diamond drill holes 96-1 and 96-3 encountered strong and pervasive argillic alteration with pyrite contents to 20 percent throughout broad sections.

No ore grade intersections were found in the 1996 drilling.

Exploration activities during 1997 centred on helicopter-borne geophysical surveys conducted over each of the Bear claim group. The Corporation contracted out to Frontier Geophysics the acquisition of magnetic, electromagnetic and VLF data to assist in the interpretation of structures and alteration zones, and to expand on ground geophysics carried out in previous years.

As a follow-up to the geophysical survey which was recorded in March, 1997, the Corporation undertook a modest field program consisting of geochemical soil sampling on the Bear claim group during August to examine an area of anomalous geophysical response.

Results of the geochemical survey revealed anomalous copper, zinc and silver, parallel to the major structures as well as an area measuring 200 metres by more than 600 metres of anomalous arsenic with coincident antimony and gold values elevated over background. This latter area cross cuts the major structures.

### **Conclusions and Recommendations**

Several of the anomalies from the present geochemical soil survey continue beyond the boundaries of the grid; thus the soil geochemical survey should be extended beyond the boundaries of the present grid in order to examine possible continuations of those anomalies.

Geological mapping should be extended to the boundaries of the sample area and beyond, taking advantage of any significant outcrops and cover the complete claim area.

Diamond drilling on the Ridge Zone for a potential high sulphidation gold-copper deposit and on the Many Bear aluminous alteration zone for a potential porphyry copper deposit.

Although no work is planned for the immediate future, the property will be maintained in good standing. The intention is to option the property to a third party.