Expatriate Resources Limited

Logan Zinc-Silver Mineral Property

Independent Technical Report

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Expatriate Resources Ltd.
Logan Zinc-Silver Property

Independent Technical Report

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1. Summary

The Logan zinc-silver property is located in the Yukon Territory, 108 kilometres north-west of the town of Watson Lake and 38 kilometres north of the Alaska Highway. In the late 1980s, exploration by Total Energold Corporation, Regional Resources Inc., and Getty Resources Ltd. led to the delineation of an 8,000 m long NE-trending fault-related structure within which a Main Zone and two flanking zones were identified through programs of trenching, drilling, and geological investigations. The principal Main Zone is tabular, dips 70 degrees to the NW, extends for 1,100 m along strike, and has been traced by drilling to depths of up to 275 m at widths varying from 50 m to 150 m.

In 2003, Expatriate Resources Limited ("Expatriate") entered into a purchase agreement to buy a 60% joint venture interest in the Logan property from Total Energold. On completion of the acquisition, Almaden retains a 40% interest in the property while Expatriate controls 60% and is the operator of the project. Expatriate is investigating the property as part of a broader evaluation of the combined resources of the Logan property and the Wolverine property further to the north.

In November 2003, Expatriate commissioned Hatch to complete a resource estimate and data compilation as part of an Independent Technical Report to NI 43-101 standards. Hatch completed this assignment with the assistance of Mr. Gary Giroux, P.Eng., while Hatch's Qualified Person for this assessment is Mr. Callum Grant, P.Eng. who visited and inspected the property in October 2003.

The Hatch resource has been estimated from a data base of 103 diamond drill holes completed between 1986 and 1988 by Cordilleran Resources whom did the work on behalf of Total Energold. Following corrections and verification of the data base by Hatch, a 3-D geological interpretation of the Main Zone (MZO) portion of the deposit was created using a combination of geology, mineralization type, and grade; additional zones along strike from the MZO have not been considered at this time. A total of 58 drill holes intersect the interpreted MZO on 23 cross-sections over a 1,530 m strike length.

Statistical and geostatistical analysis was completed on the total data base of assay information to assess the characteristics and distribution of zinc, silver, and tin values across the deposit. Variograms were generated for zinc and silver, and search parameters established for grade interpolation using kriging. A combination of Ordinary Kriging and Indicator Kriging was applied in order to account for both low and high grade zinc and silver populations respectively. Densities of 2.95 for mineralization and 2.70 for waste rock were taken from limited test work completed as part of the 1988 drill program.

The Base Case resource estimate completed by Hatch in February 2004 can be summarised as follows (referred to as "Model 2 - Uncapped" in the text of the report):

Model 2 (Origin at Elevation -5m) Inferred				
Cutoff Zn Equiv.	Tonnes > Cutoff (Tonnes)	Grade > Cutoff		
		Zn (%)	Ag (oz/t)	Zn Equiv (%)
0.00	78,120,000	1.91	0.31	2.05
1.00	53,000,000	2.52	0.41	2.70
2.00	25,850,000	3.81	0.58	4.06
3.00	16,600,000	4.66	0.66	4.94
3.50	13,080,000	5.10	0.69	5.40
4.00	9,820,000	5.63	0.75	5.95

As a further check on the sensitivity of the model results, assays above 22% Zn (40 samples) and above 17.5 oz/ton Ag (12 samples) were capped to 22% Zn and 17.5 oz/ton Ag respectively with the following results:

Capped Model 2 (Origin at Elevation -5m) – Inferred				
Cutoff Zn Equiv.	Tonnes > Cutoff (Tonnes)	Grade > Cutoff		
		Zn (%)	Ag (oz/t)	Zn Equiv (%)
0.00	78,120,000	1.81	0.27	1.93
1.00	53,660,000	2.34	0.34	2.49
2.00	26,990,000	3.36	0.45	3.56
3.00	15,950,000	4.09	0.53	4.32
3.50	11,670,000	4.47	0.55	4.72
4.00	8,260,000	4.87	0.58	5.12

To test for sensitivity to a change in elevation, an additional model was generated by adjusting the reference elevation of the block model upwards by 5 m with no significant changes observed.

Metallurgical testwork at Lakefield Research Laboratories was carried out in 1989 under the supervision of Strathcona Mineral Services Limited using sample material collected from the drill programs completed between 1986 and 1988. Both low and high grade zinc ore was tested and indicated encouraging characteristics and recoveries. Flotation on both low and high grade zinc samples indicated that recoveries of 93-95% for zinc and 85-90% for silver could be projected in zinc concentrate. Tin recoveries of 20% were indicated from the test work.

Hatch concludes that the Logan zinc-silver property with its near surface Main Zone merits additional investigations to advance the project towards feasibility, within Expatriate's overall plan to combine it with the Wolverine deposits into a single project. Hatch recommends a work program of infill drilling to improve resource classification, mine design studies, geotechnical and metallurgical investigations, together with collection of environmental data for baseline studies. A total of C$3.65 million has been estimated for the 2004/2005 field season.

2. Disclaimer

In preparing this report, Hatch has relied largely on information completed during the 1986 to 1988 exploration and drilling program, and on a brief site inspection completed in October 2003. Hatch has not carried out any independent sampling in trenches or from drill core.

Hatch has not completed any significant environmental or legal due diligence as part of this assessment.

3. Introduction

Expatriate Resources Ltd., (Expatriate) is an emerging base metal resource company located in Vancouver, Canada, whose shares trade on the Toronto Venture Exchange (EXR - TSX.V). Expatriate has exploration properties in Canada, California (USA) and Chile, and is currently developing the Yukon Zinc Project in south central Yukon based on the Logan and Wolverine zinc-silver properties.

In November 2003, Expatriate commissioned Hatch Associates Ltd. (Hatch) to prepare a resource estimate and Technical Report for the Logan zinc deposit in south central Yukon, and follows a pre-feasibility of the Kudz Ze Kayah (KZK) and Wolverine deposits completed by Hatch in 2000.

Hatch's terms of reference from Expatriate for this resource study were to:

- generate a scoping-level resource model, meaning in sufficient detail for assessment of the distribution of the mineralized zones
- compile all relevant geological information for the property
- inspect the site
- assess and comment on current exploration strategy, ore zone continuity, and resource classification issues (precision);
- review Logan metallurgy

This report presents an updated resource estimate for the Logan deposit. Callum Grant, P.Eng served as the Qualified Person responsible for preparation of the report and traveled to the Logan site in October 2003. Gary Giroux, P.Eng served as the Qualified Person responsible for preparation of the resource estimate.

4. Location, Accessibility, Physiography, and General Description

The Logan property is located 108 kilometres north-west of Watson Lake in south central Yukon. Figure 4-1 presents the location of the Logan property and Expatriate's Wolverine project. Expatriate currently plans to evaluate both properties within what will be termed the Yukon Zinc Project.

The Logan property consists of 156 contiguous quartz mining claims located in the Watson Lake Mining District, Yukon. The project is currently being operated under a 60:40 Joint Venture between Expatriate and Almaden Minerals Ltd. (Almaden); noting that Almaden is carried through to feasibility. Logan 1 to 106 quartz mining claims are currently in the name of Almaden. Logan 107 to 152 and Strip 1 to 4 are in the name of Expatriate. Please note that assessment work has recently been filed by Expatriate on all the Logan quartz mining claims; meaning that new expiry dates are pending from the Watson Lake Mining Recorder's office.

The property can currently be accessed via helicopter directly to the site since the original winter road used for the 1988 drill program is no longer passable (although it can be re-established along its original trace).

Access to the Logan property would be achieved by constructing a 55 km gravel road heading north off the Alaska Highway at a point approximately 80km west of Watson Lake. The town of Watson Lake is a southern Yukon transportation hub with roads connecting to Whitehorse (441 km), the port at Skagway (615 km) and the rail head at Fort Nelson (531 km).

The Yukon Zinc Project is within the traditional territory of the Ross River Kaska Dena First Nation. The Ross River Kaska are part of the Kaska Nation that includes the Liard Kaska and Kaska Dena Council in north-central British Columbia. The Kaska are negotiating their land claim as a nation involving the governments of Canada, Yukon, and British Columbia. Three areas of land, referred to as R-Blocks, have been withdrawn from staking of mineral claims in the general Wolverine project area. Some of these lands may be prospective for minerals and their proximity to the development areas will result in their consideration for possible impacts from mining or exploration.

The Yukon Umbrella Agreement provides clear guidelines with regard to access across First Nations settlement lands and mechanisms to resolve any disputes related to access for development. In general, the First Nations have been supportive to development that addresses their social and economic needs.

The climate is cold continental with a mean daily summer temperature of 15°C and a mean daily winter temperature of -25°C. Precipitation falls fairly evenly throughout the year, predominantly as rain from May through September, and snow for the balance of the year. The mean annual precipitation is 655 mm.

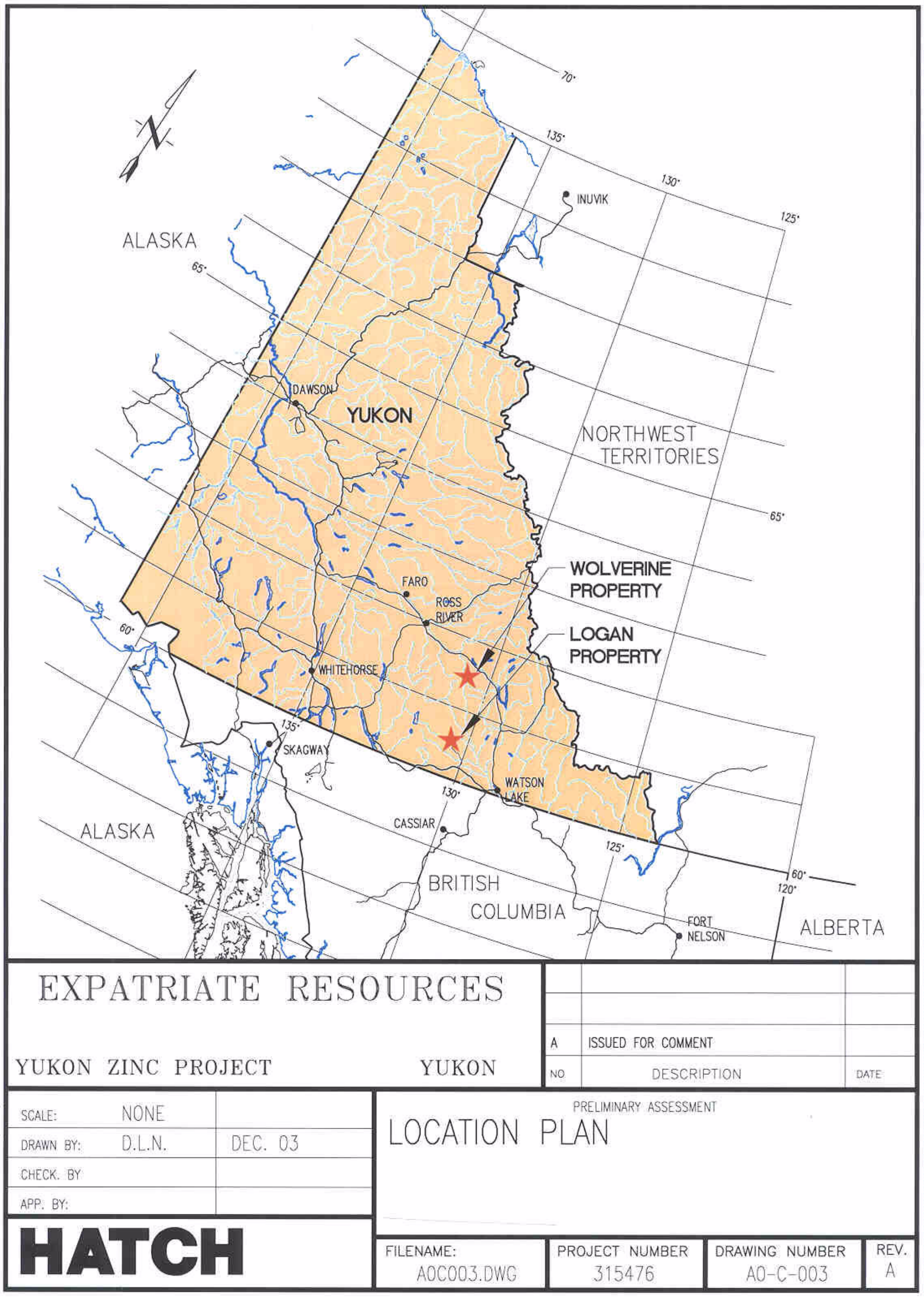
The area of the project falls into the Pelly River and Pelly Mountain ecoregions . The major part of the Pelly River ecoregion is underlain by metamorphic rock; however, large areas of volcanic and intrusive rocks and small areas of sedimentary rocks occur throughout. During the last glacial period, ice moved across the eastern part of the ecoregion (including the general area of the project site) in a northwesterly to westerly direction and extended to heights of about 1525 m.

The region has intermittent permafrost with moist depressional areas containing peat plateaus, patterned fen and bog complexes. Scree covered slopes are most prominent in sedimentary rock. Deep colluvium occurs on steeper mid to lower slopes. The project area is mostly a forest region, except for topographic peaks, which are in the tundra region. White and black spruce are the most common tree types. Black spruce is usually dominant in wetter areas, white spruce dominates in drier areas. Paper birch, aspen, balsam and lodgepole pine also occur. Alpine fir occurs at the treeline (1350 m to 1500 m). In dense coniferous stands, feathermoss dominates the understorey, but in more open areas willows and heath-like shrubs become prevalent. Sedge or sphagnum tussocks are common in wetlands and under black spruce. Shrub birch and willow occur in the sub-alpine and extend well above the treeline.

Regionally significant wildlife resources occur in the Wolverine project area, notably the Finlayson caribou herd. The herd uses the uplands around the project area from the spring to the fall, and the lowlands of the Pelly River in the winter. These caribou provide a valuable food source for the Ross River Dena First Nation and are also of economic significance to sport hunters and the guiding industry. Moose are also a significant wildlife resource. Furbearer populations are also utilized by the Ross River Dena First Nation. Fish in the larger lakes (including Finlayson Lake) and streams include arctic grayling, whitefish, lake trout and Dolly Varden char.

Land use in the immediate area is currently limited to hunting and fishing for food by First Nations, and for recreation by visitors to local lodges. Previous and existing mines are common in the Ross River - Watson Lake area (Sa Dena Hes near Watson Lake and both Ketza River and Faro near Ross River, for example).

Figure 4-1: General Location Map



5. History

The Logan property was originally staked in 1979, with additional claims picked up over the years. The property has been worked on by Cordilleran Engineering Ltd. for Regional Resources Ltd. (pre-May 1986), Fairfield Minerals Ltd. (post-May 1986) followed by Total Energold Minerals Inc.

Drilling occurred between 1986 and 1988 in three campaigns, with 103 holes completed to date. In 1988, a manual resource estimate was prepared by M.A. Stammers for Total Energold with the following results:

ZONE	Tonnes	Zn, %	Ag, oz/ton
Main & East Zones	12,295,236	6.17	0.77

These resources were based on a 2% zinc cut-off grade, a minimum intercept length of 4m, and a total of 44 drill holes, and can be classified as Inferred using CIMM definitions. A cross-sectional method was applied and checked on plans with good coincidence of the results.

In 2003, Expatriate Resources Limited ("Expatriate") entered into a purchase agreement to buy a 60% joint venture interest in the Logan property from Total Energold whose predecessors conducted $4.5 million in exploration in the mid 1980's. On completion of the acquisition, Almaden retains a 40% interest in the property while Expatriate controls 60% and is the operator of the project. Expatriate is investigating the property as part of a broader evaluation of the combined resources of the Logan property and the Wolverine property further to the north.

To date, exploration activities have defined three areas of sulphide mineralization along an 8,000 m long, northeast-trending, structure that are known as the Main, East and West Zones.

6. Geological Setting

Regional Geology

The regional geology of the NTS 105B and Logan property area has been previously studied by Poole (1951 to 1955), Roddick and Green (1959), Amukun and Lowey (1986), and Murphy (1987). The mineral potential for the southern half of NTS 105B was studied by Abbott (1983).

Property Geology and Mineralization

Bedrock exposure across the Logan property is extremely poor and Stammers (1989) noted that less than 5% rock outcroppings, except in areas of steep relief where rock outcroppings might increase to 10%. Overburden is extensive in the area with diamond drilling revealing a varied thickness from less than one metre up to 36.6m locally.

The geological framework of the Logan property is dominated by a Cretaceous granodiorite intrusion known as the Marker Lake Batholith; which intrudes Lower Cambrian-aged meta-siliciclastic rocks. It is important to note that there are large, quartz-biotite-muscovite schist xenoliths inside the intrusion in proximity to the mineralized structure hosting the deposit. The property is also crosscut by Tertiary-aged, andesite and quartz-feldspar, monzonite-latite porphyry dykes. Quartz veining and hydrothermal breccia units are also common throughout the property area (Stammers, 1989).

The Lower Cambrian meta-siliciclastic rocks are composed of quartzo-feldspathic-biotite-muscovite schist, bedded meta-siltstone, and minor interbedded quartzite. Locally, there are also pyroxene-garnet skarn occurrences contained within the schist unit (Stammers, 1989).

The Cretaceous-aged Marker Lake Batholith is characterized by a light grey weathered surface, is medium- to coarse-grained and composed of quartz, plagioclase, and muscovite. Locally, there are pegmatite phases that display mineral intergrowths typical of graphic texture. A notable feature with respect to mineralization is that the intrusion is weakly to strongly foliated along the structure bounding the mineralization. The foliated granodiorite may have been mapped by previous workers as biotite-muscovite schist (Stammers, 1989).

In diamond drill core, the Marker Lake Batholith has been subdivided into three phases: (i) fresh granodiorite (unit GD); (ii) altered granodiorite (unit AGD); and (iii) severely altered granodiorite (unit SAGD). Unit GD is present outside the current bounds of sulphide mineralization; noting the mineralized zone is bounded on both the hanging wall and footwall by significant fault structures. Unit AGD is present closer to mineralization within the bounding structures. The most diagnostic characteristic for Unit AGD is the pervasive phyllosilicate (sericite, chlorite) and clay alteration that are replacing feldspar crystals. Rare epidote has been observed locally. The most altered rock unit is SAGD; which is the most common rock unit associated with sulphide mineralization. Pervasive metasomatic alteration has resulted in near complete replacement of the primary igneous mineralogy. Towards the footwall bounding fault, the SAGD is extremely friable and described by previous workers as ‘crumbly’ (Stammers, 1989).

Two other intrusion rock units have been noted on the property including quartz-feldspar, latite (also known as monzonite) porphyry (QFP) and andesite (also known as felsite or unit FD) dykes. The QFP dykes have been recognized by previous workers along the western margin of the Main Zone and are described as dark green, aphanitic to fine-grained, phyric (quartz and feldspar phenocrysts – 10 to 25%, 2 mm to 3 mm); noting that both plagioclase and alkali-feldspar has been noted in petrographic examination, as well as hornblende and biotite. Hydrothermal alteration is also present in the QFP with sericite, chlorite and biotite known to occur locally. It should also be noted from a paragenetic perspective that late-stage mineralized veins and breccia units crosscut the dykes. Unit FD is pale to medium grey-green, aphanitic to fine-grained, weakly phyric (less than 5% quartz phenocrysts). Stammers (1989) noted that unit FD occurs preferentially subparallel to the major faults and range in thickness from 1 m to 15 m. It should also be noted that FD is commonly mineralized and/or brecciated.

7. Deposit Types

The style of mineralization is best described as vein-, breccia-, and stockwork-like that occupies a uniform and consistent tabular body that is hosted within SAGD bounded by hanging wall and footwall faults. Mineralization is composed of coarse-grained, brown to grey sphalerite (up to 80%); pyrite and minor marcasite (12%); arsenopyrite (5%); chalcopyrite (2%); silver-bearing, lead sulphosalts (<1%); cassiterite (<1%); and trace pyrrhotite, covellite, galena, chalcocite, tetrahedrite, stannite, jamesonite, kobellite, and native copper. It should be noted that repeated fracturing of the SAGD has allowed for elevated porosity, thereby facilitating a multiphase, overprinting, mineralizing system (Stammers, 1989).

8. Mineralisation

Mineralization on the Logan property has been previously defined as a 1,100 m long zone of sulphide mineralization with a geological mineral inventory of 12.3Mt grading 6.17% zinc and 25 grams per tonne (gpt) silver at a 2% Zn cut-off; noting that work done on the geological mineral inventory is pre-NI 43-101 standards and should be considered in the Inferred resource category. It is important to note that the Main zone mineralization is open to depth. Stammers (1989) noted that there is potential for the addition of underground ore that could supplement open pit ores; which is suggested by intersections of 9 metres grading 10.07 % zinc and 65.2 gpt silver; 7 metres grading 10.89 % zinc; and 17.1 g/tonne silver, and 10 metres grading 14.30 % zinc and 21.0 g/tonne silver. Shallow drilling could also add additional resources in the East Zone (Stammers, 1989).

Late-stage quartz, quartz-sulphide, quartz-ankerite-sulphide, and other styles of veins are known to crosscut all rock-types on the Logan property. These multiphase veins contain variable quantities of sulphide minerals such as sphalerite (Stammers, 1989). In addition to the late-stage, crosscutting veins, what are described by Stammers (1989) as diatreme and tectonic/cataclastic breccia units have also been identified on the Logan property. The tectonic or cataclastic breccia units are composed of subangular to angular fragments of various rock-types, veins, and sulphide mineralization that are cemented together by a quartz, quartz-ankerite, and/or quartz-ankerite-sulphide matrix. The diatreme breccia units are located in the core of the Main Zone and are composed of subrounded fragments of ankerite chert, sulphide mineralization, and AGD that are cemented by a micritic ankerite and/or dolomite matrix (Stammers, 1989); noting that Stammers (1989) stated a possible interpretation for the diatreme breccia units is that the vein- and stockwork-like sulphide mineralization preceded the formation of the brittle diatreme breccia units; which has subsequently re-brecciated the mineralized SAGD.

9. Exploration

The Logan property has been thoroughly explored by means of sequential programs of mapping, soil sampling, geophysics, and diamond drilling. The work conducted on the Logan quartz mining claims by Cordilleran Engineering Ltd. for Regional Resources Ltd. (pre-May 1986) and Fairfield Minerals Ltd. (post-May 1986) is briefly summarised as follows (Stammers, 1989):

1979: Staking of Logan 1 to 36 quartz mining claims to cover new zinc-silver tin-copper gossan.
Geological mapping, soil and stream sediment geochemistry, hand trenching, and test IP, EM and magnetometer geophysical surveys.

1980: The area southeast of present claim boundary was explored with soil geochemistry.

1982: Soil geochemistry was undertaken over the West Zone, as well as further hand trenching over the Main Zone.

1984: Additional staking of Logan 37 to 84 quartz mining claims. Grid preparation, property-scale soil geochemistry, geological mapping, additional hand trenching and further magnetometer and IP geophysical surveys were successfully completed.

1985: Grid preparation, detailed geological mapping, hand trenching, additional soil geochemistry, and IP geophysical surveys were completed over the East Zone.

1986: Exploration drilling of 1,897.68 m in 15 holes along the Main and East Zones. Staking of Logan 95 to 168 quartz mining claims further added to the land package.

1987: Additional exploration drilling of 7,769.66 m in 44 holes along the Main Zone was successfully completed. Ground control surveys and aerial photography for ortho-rectification were completed in preparation for additional grid preparation work. Soil geochemistry and IP geophysical surveys were also completed over the East Zone. Construction was also undertaken on the road access, airstrip and camp location. Staking of Logan 169 to 200 quartz mining claims completed the land package.

1988: Additional exploration drilling of 6,771.44 m in 44 holes along the Main, East, and West zones was successfully completed. Trenching using a JD490 excavator completed 15 trenches for a total of 2,412 m along the Main, West and East Zones; noting all were mapped and sampled for assay geochemistry. Further ground control surveys were completed including establishing of control points; noting all claim posts, trenches, and drill hole collars were also surveyed and assigned elevation, local grid and UTM coordinates. Soil geochemistry was done over the West Zone and IP geophysical surveys were also completed over both the Main and West Zones.

2003: A baseline environmental survey was conducted in and around the Logan property in advance of further exploration and/or engineering studies. Staking of Logan 107 to 152 quartz mining claims was completed to cover areas of potential infrastructure such as a tailings impoundment facility; noting that Logan 107-200 had been allowed to expire prior to 2003. Core storage facilities at the old exploration camp were refurbished and core inventoried for future examination.

10. Adjacent Properties

The Wolverine poly-metallic massive sulphide deposit lies approximately 395 kms to the north of the Logan property (see Figure 4-1). It has been explored by diamond drilling and consists of a gently dipping zone of mineralization that has been studied as part of Hatch's Finlayson pre-feasibility study in 2000. A preliminary underground plan indicates that production of 1,250tpd is technically feasible from Wolverine using a selective stoping method requiring cemented backfill.

11. Trenching and Drilling

In mid-1998, an excavator trenching program comprising 15 trenches totalling 2,412 m (17,400 m^3) was completed principally along the Main Zone (11 trenches), but also along the flanking East and West Zones (4 trenches in total). Trenches were typically cut across the mineralised structures for 100 m to 350 m and to depths of 2 m. In general, the trenches returned low values in zinc (owing probably to leaching effects) but with encouraging silver values:

Trench#	Length (m)	Zn, %	Ag, oz/ton
801	26 incl. 3m @	0.04 0.17	1.97 5.43
802	74 incl. 5m @	0.18 0.03	2.00 4.84
804	5 96 incl. 5m @	7.07 1.19 0.12	1.10 2.01 10.1
805	21 incl. 7m @	7.08 15.26	1.63 1.51
812	13 incl. 5m @	- -	5.06 10.35

An initial drill program of 15 holes was completed on the property in 1986 totalling 1,898 m. No results from this program have been reviewed. This was followed by 7770 m of drilling in 1987.

In 1988, 6,771 m of BQ core was completed between June and September. This work was completed using a contracted skid-mounted Longyear 38 rig. Core recovery is reported to have averaged 82.4% with only one hole lost to bad ground., however the fractured rock required use of mud and polymer additives to maintain core recovery. The objectives of the drilling was to test favourable geochemical anomalies identified from the earlier field work, and also to test for the extension of mineralization to depth in the Main Zone. The drill results were also used for preliminary estimation of a Mineral Resource using traditional, polygonal methods. Significant intercepts have been reported as follows:

Drill Hole#	Intercept Length (m)	Zn, %	Ag, oz/ton
99	9.0	5.40	0.47
100	25.0	9.58	0.53
103	35.0	7.15	0.33

The core from this work program has been stored at site in open core racks, and was examined by Hatch during the October 2003 site visit.

12. Sampling and Assaying

12.1 Sampling Methods

Trenches

Trenches were systematically sampled along the faces of 2m cuts through the mineralized structures. A total of 1,368 rock chips plus 113 soil samples were collected and sent to the Bondar-Clegg laboratory in Vancouver for zinc, silver, copper, lead, arsenic, and tin assaying. Assaying was by hot Agua Regia digestion and Atomic Absorption, except for tin that was analysed using XRF.

Drilling

BQ core was logged at site, split, and shipped to Bondar-Clegg in Vancouver. Preparation of samples for assaying is assumed to have involved standard crushing, grinding, and pulverisation to produce pulps for assaying using the methods described above.

12.2 Data Verification

No reference to QA/QC programs is available on the reports reviewed by Hatch, however it is assumed that Bondar-Clegg applied industry-standard internal checks as part of its own procedures.

As explained in Section 14 of this report, Hatch carried out various checks of the data base prior to its resource estimation work.

13. Metallurgy

13.1 Mineralogy

The zinc, silver, and tin values are carried principally in sphalerite and silver-bearing lead sulfo-salts. Other sulphides noted are chalcopyrite, arseno-pyrite, pyrite and marcasite, and rare pyrrhotite, covellite, galena, and tetrahedrite, stannite, and jamesonite. Gangue minerals include quartz and carbonate minerals such as ankerite.

13.2 Testwork

Metallurgical testwork at Lakefield Research Laboratories was carried in 1989 under the supervision of Strathcona Mineral Services Limited using sample material collected from the drill programs completed in 1986 and in 1988. Both low and high grade zinc ore was tested and indicated encouraging characteristics and recoveries. Flotation on both low and high grade zinc samples indicated that recoveries of 93-95% for zinc and 85-90% for silver could be projected in zinc concentrate. Final zinc concentrate grades exceeded 50% Zn. The best results on the individual composites were obtained at a primary grind of 80% passing 75 micron with a regrind of 80% passing 30 micron. Tin recoveries of 20% were also indicated from the test work.

14. Mineral Resources

14.1 Background

The following section summarises the resource and mine planning work completed in November and December, 2003, by Hatch on the Logan zinc-silver deposit. Orebody modeling and data base management were performed by Hatch, while geostatistics and block model estimation were performed by Gary H. Giroux, MASc., P.Eng. of Giroux Consultants Limited (Giroux).

The resource estimates prepared by Giroux are of an Inferred category only. All Hatch modeling work was performed using Surpac software.

14.2 Database Verification

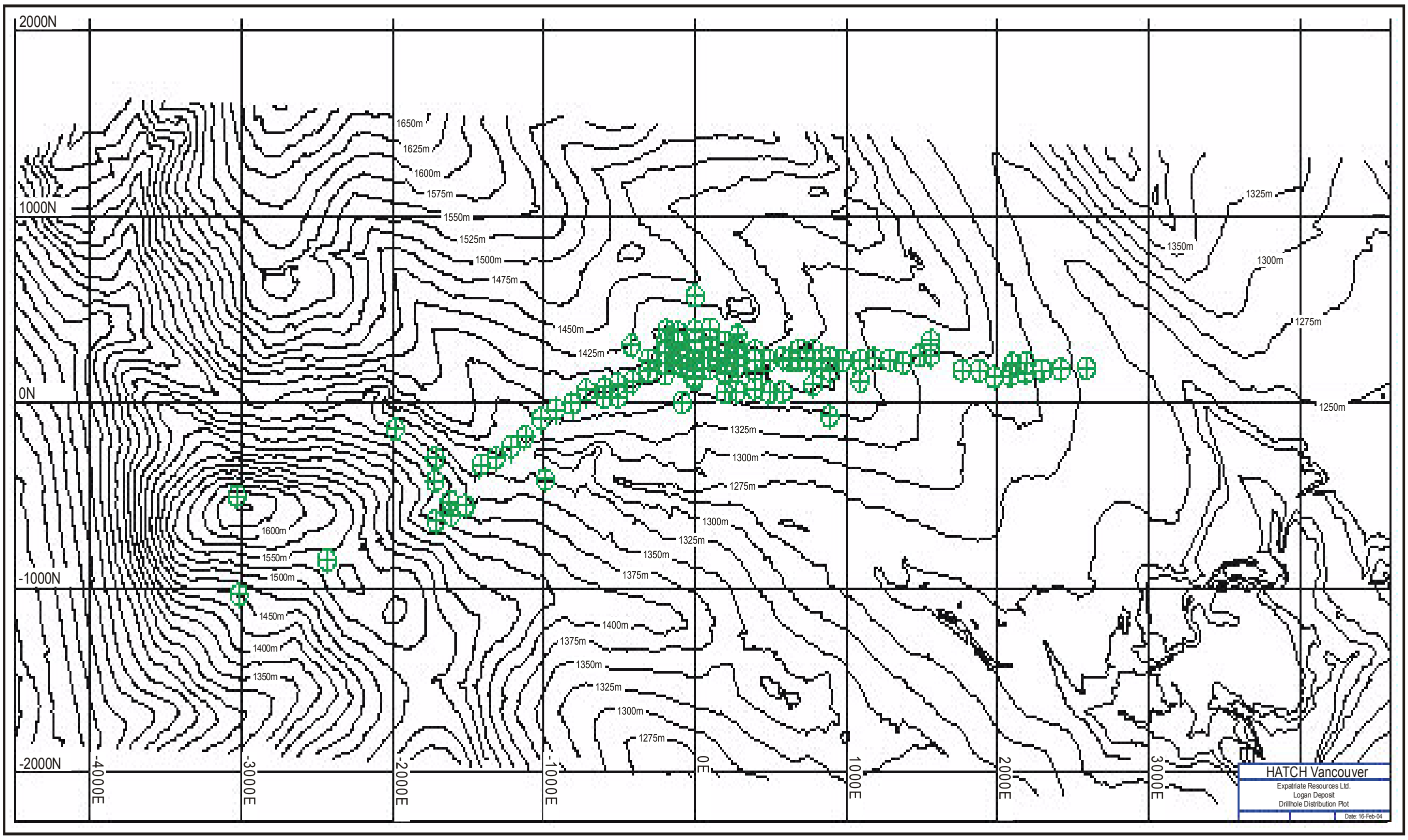
On November 13, 2003, Expatriate supplied Hatch with an Access database for the Logan Deposit in the Yukon Territory. The database contained 103 drill holes with downhole surveys located on a local grid, and 5048 interval samples (see Appendix II). Although in good condition, the database required modification and numerous items were corrected with direction from Expatriate.

All samples that reported below detection limit were adjusted using the rule of one half the detection limit (see Tables II-B and II-C, Appendix II) and un-sampled intervals were filled with the below detection limit values as required within the ore zone boundary. These changes were compiled into a new table in the existing database, and additional changes were made to create a user friendly interface with Surpac.

Topography maps were digitized for Expatriate by TerraCad, and an updated version was supplied to Hatch by Expatriate on December 1, 2003. Figure 14-1 shows all 103 drill hole collars and their traces with contours and the local grid. The local grid corresponds to the drill program completed by Energold in the late 1980s, and is oriented 324.41 degrees from UTM north (declination correction for 1988 has not been verified).

Topography was verified within the Main Zone, and found to be within acceptable limits in comparison to drill hole collars with only a few exceptions (acceptable limits were taken to be plus 0.5 metres above surface and minus 1.5 metres below surface). It was decided not to make adjustments to topography or drill hole collars for those outside of the acceptable limits at this time, with corrections to be incorporated into the 2004 field season.

Figure 14-1: Drillhole Distribution Plot



14.3 Statistical Analysis

14.3.1 Data

Hatch was provided with a total of 103 diamond drill holes having 383 down hole surveys and 5,048 assay intervals (all in an Access data base). The assay data contained some "<" values and a few ">" values that were adjusted using the rule of one half of the detection limit for the "<" values and the detection limit for the ">" values.

Each assay was coded by geology (Table II-D, Appendix II), and the statistics for Zn and Ag are shown in Tables II-E and II-F in Appendix II as a function of rock type. Of particular interest is the fact that high zinc and silver values are not confined to a single or few geologic domains, but instead are present in a large number of rock units. This points to the probability that economic mineralization is related to structures cross-cutting a variety of rock types.

14.3.2 Capping of Assays

Cumulative probability plots were used to partition out the overlapping populations in a process described by Dr. A.J. Sinclair (Sinclair, 1976). In short, the cumulative distribution of a single normal distribution will plot as a straight line on probability paper while a single lognormal distribution will plot as a straight line on lognormal probability paper. Overlapping populations will plot as curves separated by inflection points. Sinclair proposed a method of separating out these overlapping populations using a technique called partitioning. In 1993 a computer program called P-RES was made available to partition probability plots interactively on a computer (Bentzen and Sinclair, 1993). Screen dumps from this program are shown for zinc as Figure 14-2 and for silver in Figure 14-3, both located in Appendix II.

For zinc, five overlapping mineralized populations were recognized and partitioned with the following parameters:

Population	Mean, %Zn	% of Data	Samples
1	25.42	0.96	48
2	13.87	3.1	157
3	1.54	63.24	3,192
4	0.20	24.29	1,226
5	0.013	8.41	425

Populations 1 and 2 probably represent high grade quartz and massive sulphide veins while Population 3 represents the mineralized breccia bodies, stockworks and silicified zones within the mineralized shear zone. Population 4 probably represents background mineralization in the host rocks. Population 5 would represent samples at or below detection. A threshold of 1% Zn which represents two standard deviations past the mean of Population 4 would effectively separate the three upper populations from background. A threshold of 10% zinc or two standard deviations past the mean of Population 3 would be useful in separating out the higher grade vein mineralization.

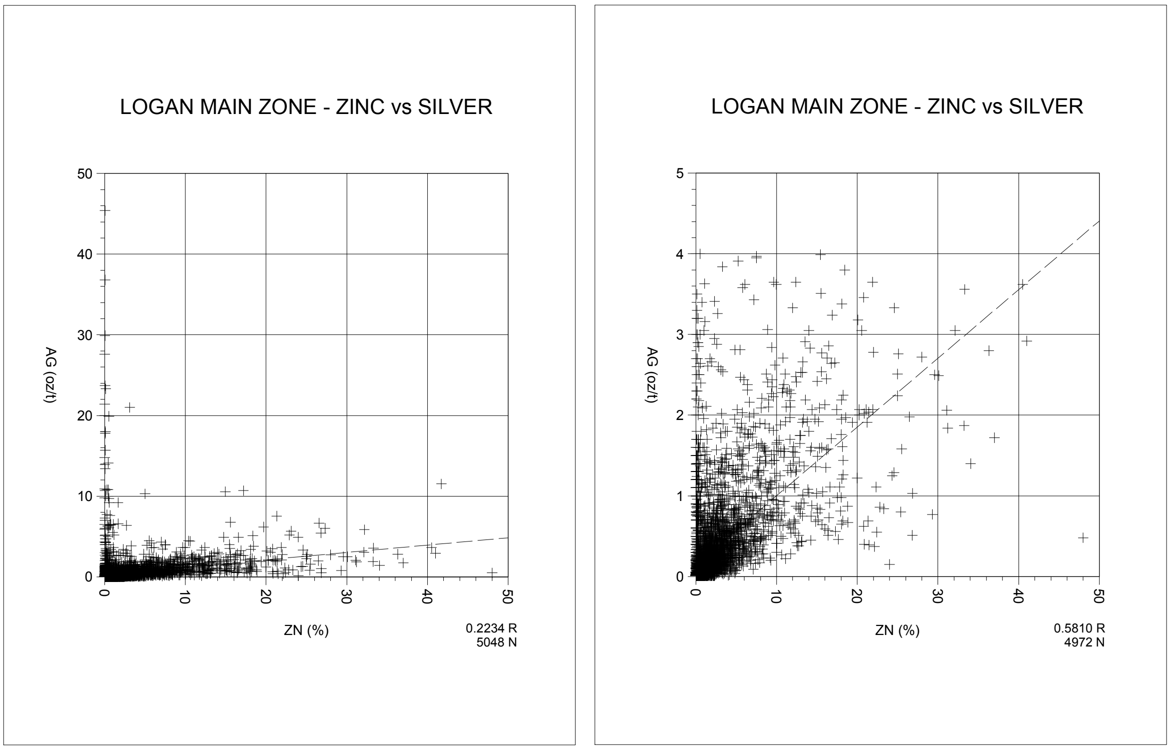
Silver also shows a skewed distribution and when log transformed indicated 5 overlapping lognormal populations:

Population	Mean, oz/ton Ag	% of Data	Samples
1	42.43	0.06	3
2	23.53	0.16	8
3	10.15	0.55	28
4	0.71	30.15	1,522
5	0.05	69.08	3,487

A threshold to separate populations 1, 2 and 3 from population 4 would be two standard deviations past the mean of Population 4, that is 4.03 opt Ag. A sample with silver greater than 4 opt would belong to one of the three upper populations and would most likely represent vein style mineralization.

On first examination, correlation between silver and zinc does not appear to be good (R = 0.223) as shown in Figure 14-4, however removing the upper three populations of silver from the data set (all with silver greater than 4.03 opt) improves the correlation (R = 0.581). This indicates that while both zinc and silver are concentrated in veins and breccia zones, they may not necessarily be in the same veins and breccia zones. The highest values for silver appear to be in zinc poor areas indicating perhaps a different mineralizing event.

Figure 14-4
Scatter plots: Zn vs. Ag in drill hole assays.
(Plot on right with all assays > 4.0 oz/ton Ag removed)



14.3.3 Review of other Variables

A total of 921 samples analyzed for Zn and Ag also had Sn, Cu, Pb and As analysis. These results are presented as a correlation matrix below:

Correlation Matrix

n = 921

Zn (%)					
0.714	Ag (opt)				
0.109	0.000	Sn (ppm)			
0.712	0.796	0.084	Cu (ppm)		
0.505	0.637	-0.022	0.512	Pb (ppm)	
0.061	0.138	0.651	0.191	0.091	As (ppm)

Another way of viewing this data is as a dendograph which is a graphical approach that groups the variable with the highest correlation coefficients and shows possible relationships (see Figure 14-5 in Appendix II).

From these result it appears the tin is most closely associated with arsenic and appears to have little if any correlation with the silver-zinc mineralization. This can be further explored through a series of scatter plots between individual elements shown in Appendix II.

14.3.4 Tin Grades for Model

A total of 925 samples have tin analysis out of a total of 5074 or 18% of the data.

The Statistics for tin, copper, lead and arsenic are as follows:

Statistics for Sn, Cu, Pb and As assays (ppm)

	Sn	Cu	Pb	As
Number of Assays	925	925	926	921
Mean Grade	291	504	243	298
Standard Deviation	467	1362	531	390
Minimum	0.01	0.50	0.93	0.01
Maximum	5700	20000	7800	1000
Coef. Of Variation	1.61	2.70	2.18	1.31

As shown earlier, Sn is not well correlated with either Zn or Ag. In the following tables, average tin grades can be evaluated as a function of Zn and Ag grades. Three grade ranges for Zn and Ag are shown for those samples assayed for both Zn and Sn, or Ag and Sn:

Statistics for zinc and tin in the three main zinc populations.

	Zn < 1.0 %		Zn >1.0 < 10%		Zn >10 %	
	Zn	Sn	Zn	Sn	Zn	Sn
Number of Assays	423	423	427	427	76	76
Mean Grade	0.371 %	147 ppm	3.13 %	428 ppm	17.95	313
Standard Deviation	0.288	302	2.09	557	7.64	424
Minimum	0.005	0.01	1.0	0.01	10.0	0.02
Maximum	0.990	5500	10.0	5700	48.0	3000
Coeff. Of Variation	0.77	2.05	0.66	1.29	0.43	1.39

Statistics for silver and tin in the three main silver populations.

	Ag< 0.5 oz/ton		Ag >0.5 < 4 oz/ton		g >4 oz/ton	
	Ag	Sn	Ag	Sn	Ag	Sn
Number of Assays	704	704	213	213	8	8
Mean Grade	0.112 g/t	258 ppm	1.34 g/t	406 ppm	5.96	111
Standard Deviation	0.124	413	0.84	604	2.17	104
Minimum	0.01	0.01	0.50	0.01	4.23	0.04
Maximum	0.48	5700	3.99	5500	11.52	250
Coef. Of Variation	1.10	1.60	0.63	1.48	0.36	0.94

14.4 Variography

Upon completion of the geologic model, drill-hole data was 'passed through' the model to determine the pierce points through the solid. Uniform down-hole 5 m composites were produced to honour the upper and lower contacts with the solid. Composites less than 2.5 m were combined with the adjoining composite to produce a file of 5 ± 2.5 m length composites.

Zinc values greater than 10% Zn and silver values greater than 4 oz/ton Ag were left out of the compositing procedure. In this manner the 5 m composites reflect the main mineralizing event and are not unduly influenced by the higher grade vein mineralization.

To model the narrow-vein mineralization, 1 m down-hole composites were produced and converted to Indicators as follows:

Zn ≤ 10 %:	set to Indicator 1
Zn > 10 % :	set to Indicator 0
Ag ≤ 4 oz/ton:	set to Indicator 1
Ag > 4 oz/ton:	set to Indicator 0

Semi-variograms were produced for Zn and Ag using 5 m composites in four horizontal directions:

- Grid Azimuth 90/Zero Dip
- Grid Azimuth 0/Zero Dip
- Grid Azimuth 45/ Zero Dip
- Grid Azimuth 135/ Zero Dip.

Owing to the wide spacing of drill holes (numerous sections with only a single hole), there was negligible paired data at lag distances of less than 50 m in any horizontal direction, and so this made modelling semi-variograms very difficult in the horizontal planes (mostly this direction was used to confirm the sill level). Short range variability was tested in the directions of drilling namely Grid Azimuth 0^0 and 180^0. Semi-variograms were produced at various dip angles in these two directions, and spherical nested general relative models fit to the various dip directions.

Summary of Semi-variogram Parameters for zinc and silver.

Variable	Grid Azimuth	Dip	Nugget Effect	Short Range Structure	Long Range Structure	Short Range (m)	Long Range (m)
Zn	90	0	0.5	0.6	1.2	30	80
	0	-40	0.5	0.6	1.2	10	80
	180	-50	0.5	0.6	1.2	30	140
Ag	90	0	1.4	1.0	0.7	25	60
	0	-35	1.4	1.0	0.7	15	70
	180	-55	1.4	1.0	0.7	25	100

Semi-variograms were also produced for the high grade Zn and Ag indicators. The 0 and 1 values were modeled in a similar manner to the 5 m composites. Zinc high grade indicators showed maximum continuity along strike and down dip of 50 m, while across strike the maximum range was 25 m. Silver showed no preferred direction and a simple isotropic spherical model was fit with range of 50 m:

Summary of Semi-variogram parameters for high grade zinc and silver indicators.

Indicator	Azimuth	Dip	Nugget Effect	Short Range Structure	Long Range Structure	Short Range (m)	Long Range (m)
Zn	90	0	0.4	0.2	0.75	10	50
	0	-50	0.4	0.2	0.75	15	50
	180	-40	0.4	0.2	0.75	5	25
Ag	Omni Directional		0.5	0.5		50	

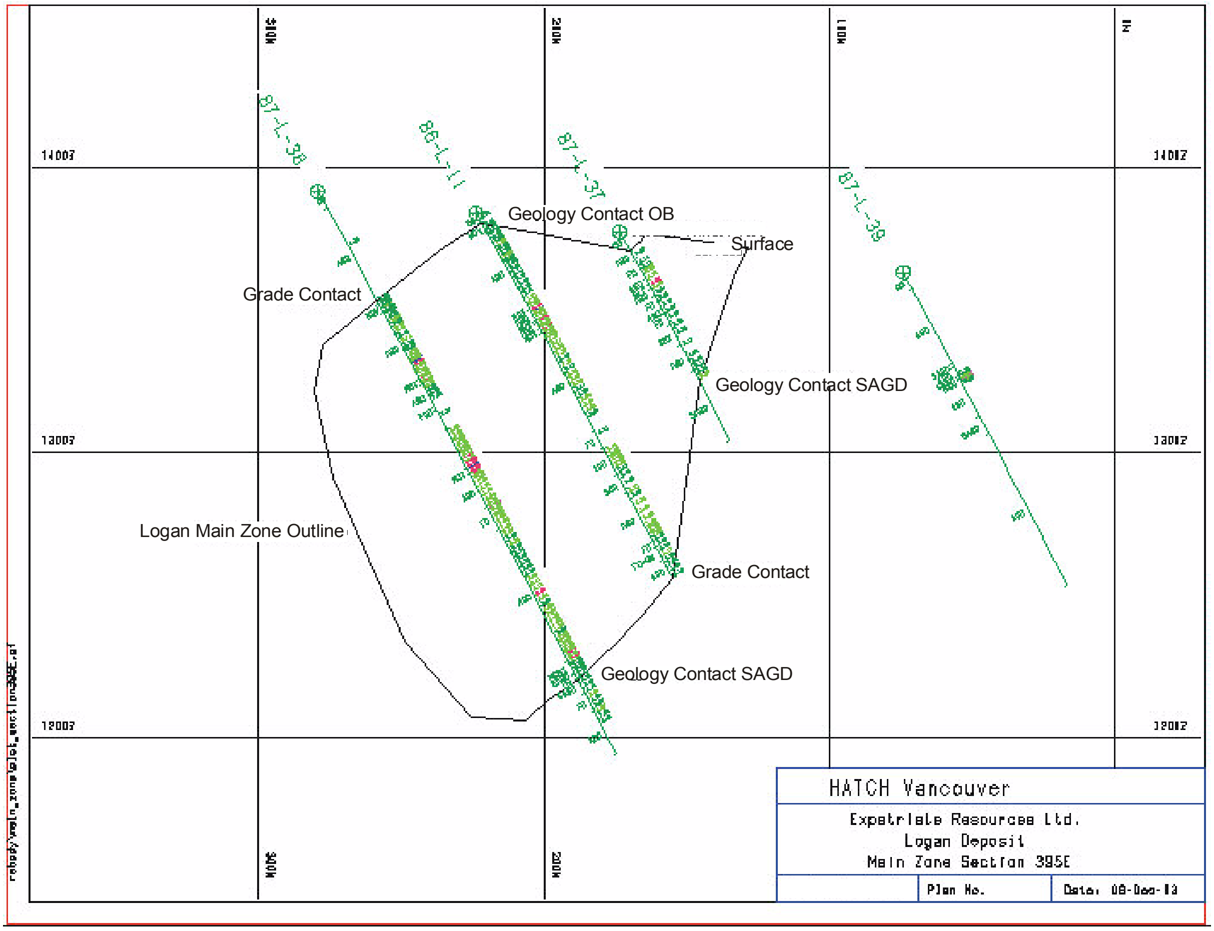
14.5 Geological Modeling

Using a combination of geology, mineralization, and grades, an orebody outline was digitized for the Main Zone Orebody (MZO). The MZO contains the high grade zinc mineralization throughout the structure, and has been modeled between easting sections 620W and 910E for a total strike length of 1530 m. The strike extent of the mineralization go beyond these limits, but contains an insignificant quantity of zinc assays greater than 1%. In total, 58 drill holes intersect the MZO.

The MZO was digitised on all sections which contained drill holes for a total of 23 sections at uneven interval spacing. The min/max for section spacing is 45 metres and 120 metres respectively. The most easterly and most westerly sections digitized were copied and offset an additional 20 metres at which point the MZO was closed off.

The MZO was digitized on each section by defining a hangingwall and footwall contact point on the intersecting drill hole trace. The hangingwall contact was based on the first mineralization with grade after the SAGD geology code. When no SAGD was present, the end of the OB geology code was chosen, otherwise, the first significant zinc assay. For the footwall contact, the start of the last SAGD geology code within mineralization if present, otherwise, the last significant zinc assay record (see Appendix II for description of lithology codes). The following figure illustrates an example of the location of hangingwall and footwall contacts:

Sample Geological Modeling: Cross Section 395E (Local Grid Looking East)



The MZO was extrapolated above topography and clipped. On sections with more than one drill hole, the down dip portion of the deposit was extrapolated one half to one times the distance of drill hole spacing. Sections which contained only one drill hole were extrapolated using the dip angle and down dip extents of nearest neighbour sections on either side which contained more than one drill hole intercept.

The MZO footwall fault was modeled on a total of nine sections between 310W and 785E for a total strike length of 1095 m. Only sections with more than one drill hole trace were used to model the footwall fault. The footwall fault was modeled by taking the end of the interval of the last occurrence of SAGD geology code on the drill hole trace.

A sulphide-oxide surface was modeled by subtracting 20 m from the Z-coordinates of the topography digital terrain map. All material below the surface is classified as sulphide, while material above the surface is oxide.

The following Specific Gravities for mineralized material and non-mineralized host rock have been used for resource estimation:

Logan Specific Gravities

MATERIAL	SPECIFIC GRAVITY
Main Zone Orebody	2.95
Host Rock / Waste	2.70

14.6 Block Modelling

14.6.1 Introduction

A block model was produced using blocks 25 m along strike and 10 m x 10 m across strike and in the vertical plane (MODEL 1). The block model parameters are presented below:

Block Model 1 Parameters (Local Grid)

	Easting	Northing	Elevation
Lower Left Coordinates	-1200	-1100	0
Top Right Coordinates	1400	1400	2000
Numbers	104 Columns	250 Rows	200 Levels
Block Dimensions	25 metres	10 metres	10 metres

To test the sensitivity of the model to elevation, a second block model (MODEL 2) with all parameters identical to the one described above was built and estimated with the only change being the model was started at elevation -5 m (i.e. all blocks were five metres lower in MODEL 2).

For each model the blocks were compared to the geologic solids model and surface topography. The proportion of each block within the solid and below topography was recorded.

14.6.2 Block Model Interpolation

Grades for zinc and silver were interpolated into the block model in two stages. The first stage determined the grade for the main mineralizing event by using ordinary kriging of the 5 m composites within the mineralized zones. These composites had the high grade zinc and silver values removed as explained above. The kriging was completed in two passes using the search ellipses outlined below. In general, pass 1 used a search ellipse with dimensions equal to ½ the range of the semivariograms. Blocks that failed to find a minimum of 4 composites within this search ellipse were then estimated in Pass 2 where the search ellipse was expanded to the full range of the semivariogram. In the case of silver a total of 192 blocks estimated for zinc could still not find the minimum four composites so for these few blocks the search ellipse was expanded to two time the range.

Search Ellipse Parameters used for Ordinary Kriging

Variable	Pass	Az	Dip	Distance	Az	Dip	Distance	Az	Dip	Distance	Blocks Estimated Krige 1	Blocks Estimated Krige 2
Zinc	1	090	0	40 m	0	-40	40 m	180	-50	70 m	8,117	8,106
	2	090	0	80 m	0	-40	80 m	180	-50	140 m	2,279	2,330
Silver	1	090	0	30 m	0	-35	35 m	180	-55	50 m	5,830	5,837
	2	090	0	60 m	0	-35	70 m	180	-55	100 m	4,374	4,404
	3	090	0	120 m	0	-35	140 m	180	-55	200 m	192	195

Indicator Kriging was used to estimate the high grade zinc and silver populations present in any given block (that is, kriging a value between zero and one for each block based on 1 m composites coded with 0 if above the cutoff or 1 if below cutoff). Indicator ellipse parameters were as follows:

Search Ellipse Parameters used for Indicator Kriging

Variable	Pass	Az	Dip	Distance	Az	Dip	Distance	Az	Dip	Distance	Blocks Estimated Krige 1	Blocks Estimated Krige 2
Zinc	1	090	0	25 m	0	-50	25 m	180	-40	12.5 m	2,640	2,644
	2	090	0	50 m	0	-50	50 m	180	-40	25 m	5,825	5,811
	3	090	0	100 m	0	-50	100 m	180	-40	50 m	5,371	5,369
Silver	1	090	0	25 m	0	0	25 m	0	-90	25 m	4,674	4,653
	2	090	0	50 m	0	0	50 m	0	-90	50 m	6,333	6,357
	3	090	0	100 m	0	0	100 m	0	-90	100 m	2,829	2,814

The results of this kriging estimated the proportion of material within the block that corresponded to the lower grade main mineralizing event (the material estimated in the ordinary kriging exercise described above). The remaining material within each block was then the high grade population and was accounted for by the following equation.

Estimated Grade Zn = (IKPZn * Kriged Grade Zn) + ((1-IKPZn) * 16.95 %)

Estimated Grade Ag = (IKPAg * Kriged Grade Ag) + ((1-IKPAg) * 10.2 oz/ton)

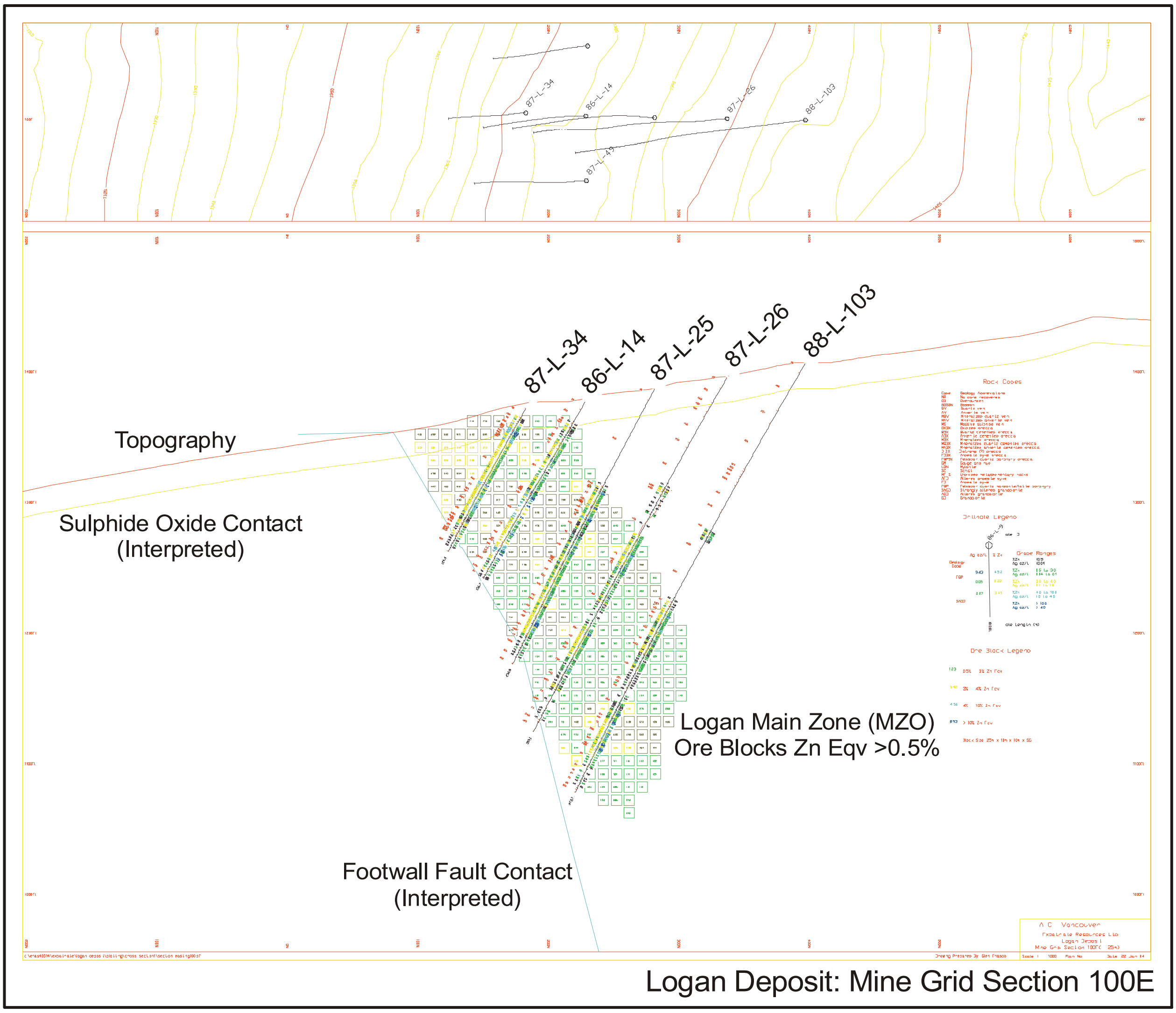
Where: IKPZn is the indicator kriged proportion of lower grade zinc mineralization

IKPAg is the indicator kriged proportion of lower grade silver mineralization

16.95 % Zn is the average grade of all zinc assays above 10% representing the high grade zinc population

10.2 oz/ton Ag is the average grade of all silver assays above 4 oz/ton representing the high grade silver population

Block Model Cross Section 100 E (Local Grid Looking West)



As a further check on the estimation approach used and described above, another run of ordinary kriging was completed using 5 m composites with all high values included, but capped. A total of 40 assays for zinc above 22 % were capped at 22 % while a total of 12 assays with silver values above 17.5 oz/ton were capped at 17.5 oz/ton. Ordinary kriging was then completed using the semi-variograms established for zinc and silver for both block models.

14.7 Resource Classification

14.7.1 Introduction and Definitions

Based on the study herein reported, the delineated zinc and silver mineralization for the Logan Deposit is classified as a resource according to the following definition from National Instrument 43-101:

"In this Instrument, the terms "mineral resource", "inferred mineral resource", "indicated mineral resource" and "measured mineral resource" have the meanings ascribed to those terms by the Canadian Institute of Mining, Metallurgy and Petroleum, as the CIM Standards on Mineral Resources and Reserves Definitions and Guidelines adopted by CIM Council on August 20, 2000, as those definitions may be amended from time to time by the Canadian Institute of Mining, Metallurgy and Petroleum."

*"A **Mineral Resource** is a concentration or occurrence of natural, solid, inorganic or fossilized organic material in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge."*

The terms Measured, Indicated and Inferred are defined as follows:

*"A **'Measured Mineral Resource'** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity."*

*"An **'Indicated Mineral Resource'** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed."*

*"An **'Inferred Mineral Resource'** is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes."*

14.7.2 Results

At Logan the spacing and number of drill holes at this time, does not allow for the classification of any material as measured. There is excellent geologic continuity displayed within the fault bounded mineralized zone at Logan. Grade continuity, however is more problematic, especially the higher grade mineralization. For this study blocks estimated for zinc and silver during the first pass of kriging, using a search ellipse equal to ½ the semivariogram ranges, were considered indicated. All other blocks were classed inferred at this time (Pass 2 or 3).

An average specific gravity of 2.95 was used to determine tonnages. This value came from the February 1989 Report of Cordilleran Engineering Ltd. (Stammers, 1989) where it was reported the 2.95 value was a weighted average of 53 separate SG determinations from drill core pulp composite samples representing 556 m of diamond drill core.

The tonnage for each block was determined by SG * 25 x 10 x 10 x Proportion of Block below Topography and within the MZO solid.

Zinc equivalent values have been calculated as follows:

- Price Assumptions: Zn Price = US$0.43/lb; Ag = US$5.50/oz
- Recoveries: Zn = 94 %; Ag = 64 %
- Zn Value = (Zn % / 100% x 2204.623 lbs) x 0.94 x US$0.43/lb
- Therefore, for a grade of 1% Zn, value would be (1/100) x 2204.623 x 0.94 x 0.43 = US$8.91
- Ag Value = (Ag oz/ton) x 0.64 x $5.50 / oz x 1.1023
- Zn Equiv = (Zn $ + Ag $) / $8.91/ %Zn

The results are presented as a series of grade-tonnage tables in Appendix IV, and show tonnes and grade for capped and uncapped MODEL 1 and MODEL 2. A summary of the results is presented as follows:

Uncapped Model 1 Resources, Elevation 0

Model 1 (Origin at Elevation 0) Inferred				
Cutoff Zn Equiv.	**Tonnes > Cutoff (Tonnes)**	**Grade > Cutoff**		
		Zn (%)	**Ag (oz/t)**	**Zn Equiv (%)**
0.00	78,120,000	1.89	0.32	2.03
1.00	53,080,000	2.49	0.41	2.67
2.00	26,190,000	3.72	0.58	3.98
3.00	15,830,000	4.66	0.68	4.96
3.50	12,080,000	5.18	0.72	5.49
4.00	9,320,000	5.68	0.77	6.01

Uncapped Model 2 Resources, Elevation -5m

Model 2 (Origin at Elevation -5m) Inferred				
Cutoff Zn Equiv.	Tonnes > Cutoff (Tonnes)	Grade > Cutoff		
		Zn (%)	Ag (oz/t)	Zn Equiv (%)
0.00	78,120,000	1.91	0.31	2.05
1.00	53,000,000	2.52	0.41	2.70
2.00	25,850,000	3.81	0.58	4.06
3.00	16,600,000	4.66	0.66	4.94
3.50	13,080,000	5.10	0.69	5.40
4.00	9,820,000	5.63	0.75	5.95

Capped Model 1 Resources, Elevation 0

Capped Model 1 (Origin at Elevation 0) – Inferred				
Cutoff Zn Equiv.	Tonnes > Cutoff (Tonnes)	Grade > Cutoff		
		Zn (%)	Ag (oz/t)	Zn Equiv (%)
0.00	78,120,000	1.81	0.27	1.93
1.00	53,750,000	2.34	0.34	2.49
2.00	26,904,000	3.37	0.45	3.57
3.00	15,929,900	4.09	0.53	4.32
3.50	11,643,600	4.48	0.55	4.72
4.00	8,275,800	4.87	0.58	5.12

Capped Model 2 Resources, Elevation -5m

Capped Model 2 (Origin at Elevation -5m) – Inferred				
Cutoff Zn Equiv.	Tonnes > Cutoff (Tonnes)	Grade > Cutoff		
		Zn (%)	Ag (oz/t)	Zn Equiv (%)
0.00	78,120,000	1.81	0.27	1.93
1.00	53,660,000	2.34	0.34	2.49
2.00	26,990,000	3.36	0.45	3.56
3.00	15,950,000	4.09	0.53	4.32
3.50	11,670,000	4.47	0.55	4.72
4.00	8,260,000	4.87	0.58	5.12

15. Interpretation & Conclusions

The Logan deposit consists of a tabular, shear-hosted zone of zinc-silver mineralization in a heavily-altered granodiorite cut by andesite dyke rocks. Mineralization is interpreted to have occurred in several stages of replacement and brecciation along a prominent north-east trending fault zone. A central Main Zone dipping at 70 degrees to the north-west has been investigated by trenching and drilling along a 1,100 m strike length and to depths of 275 m with widths varying from 50 m to 150 m. The mineralization responds to standard flotation metallurgy with good zinc and silver recoveries indicated from bench-scale test work completed at Lakefield Research; tin also provides some contribution, but at low recoveries.

The overall dimension and grade of the mineralization, its location close to surface, and the resource estimates completed by Hatch justify further consideration within Expatriate's overall plan to combine the Logan and adjacent Wolverine deposits into a single project.

16. Recommendations

An infill drill program is recommended to increase the confidence in the Logan Resource. In general, the drill hole spacing should be tightened to 25 m centres with hole collar locations staggered relative to existing drill holes to maximize the coverage. Infill holes should be drilled at local grid azimuth 180^o dip -60^o (roughly perpendicular to the mineralized zone). In addition, a number of holes should be drilled at azimuth 0 dip -50^o to test the orientation of the high grade veins that have been interpreted to occur approximately parallel to the main structure.

A complete QA/QC program involving independent high and low grade standards, blanks and duplicate samples should be initiated. Two standards for both Zn and Ag that reflect the average grades of the two main mineralized populations should be obtained and inserted at random intervals so as to have at least one standard in every laboratory assay batch. Blank samples should also be obtained, again independent of the primary lab, and submitted blind and at random intervals into the assay stream. Pulps from one in every twenty assays should also be selected from the primary lab and sent to a second check lab. Here they should be assayed with the remaining pulp re-bagged and re-numbered with a random number sequence provided by Expatriate, and then shipped back to the primary lab for reanalysis as "blind" samples. This process will test for analytical bias and also allow for quantifying sampling variability.

Specific gravity measurements should be completed on a representative number of samples from various grade ranges to determine the relationship between grade and bulk density as well as in the host rock.

Hatch recommends that an additional work program be undertaken at Logan as follows:

Work Program	**Description**	**C$ thous.**
Diamond Drilling	10,000m to upgrade resources to Measured and Indicated categories (all-in cost of $225/m)	$2,250
Other Field Activities	Trenching, surveying, geophysics	$200
Metallurgical Testwork		$50
Environmental	Expansion of baseline studies	$450
Camp & Logistics	6-month drilling program	$150
Geotechnical		$50
General & Admin		$100
Pre-Feasibility Study		$100
Contingency, 10%		$300
TOTAL ESTIMATE		***$3,650***

The objective of this work program will be to advance the project towards feasibility on the basis of production from open pit mining at Logan and underground mining at Wolverine.

References

1. Stammers, M.A., 1988 Summary Report of Exploration on the Logan #1-200 Claim Group for Faifield Minerals and Total Energold Corporation

STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

I, Callum Leith Brown Grant, P.Eng., do hereby certify that:

I. I am currently employed as Manager of Geology & Mining by:

HATCH Associates Ltd.,
Suite 200, 1550 Alberni Street,
Vancouver, British Columbia,
CANADA V6G 1A5

II. I graduated with the degree of B.Sc. Geology (Honours) from the University of Aberdeen, Scotland in 1971. In addition I obtained the degree of M.Eng. (Mining) from McGill University in 1977.

III. I am a member of the Association of Professional Engineers and Geoscientists of the Province of British Columbia, and of the Association of Professional Engineers of the Province of Ontario.

IV. I have worked as a geologist and mining engineer for 27 years since my graduation from my first university.

V. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

VI. I am responsible for compiling this report (the "Technical Report") and supervising the resource estimation procedures. I visited the property in October 2003.

VII. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.

VIII. I am independent of the issuer applying all the tests in section 1.5 of National Instrument 43-101.

IX. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

X. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their website accessible by the public, of the Technical Report.

Dated this 14th day of February 2004

CLB Grant, P.Eng.
Manager Geology & Mining
Hatch Vancouver

CERTIFICATE G.H. Giroux

I, G.H. Giroux, of 982 Broadview Drive, North Vancouver, British Columbia, do hereby certify that:

1) I am a consulting geological engineer with an office at #513 - 675 West Hastings Street, Vancouver, British Columbia.

2) I am a graduate of the University of British Columbia in 1970 with a B.A. Sc. and in 1984 with a M.A. Sc., both in Geological Engineering.

3) I am a member in good standing of the Association of Professional Engineers and Geoscientists of the Province of British Columbia.

4) I have practiced my profession continuously since 1970.

5) I have read the definition of "qualified person" set out in National Instrument 43-101 and certify that by reason of education, experience, independence and affiliation with a professional association, I meet the requirements of an Independent Qualified Person as defined in National Policy 43-101.

6) This report is based on a study of the data and literature available on the Logan Project. I am responsible for the resource estimations completed in Vancouver during 2003-04

7) I am not aware of any material fact or material change with respect to the subject matter of the technical report that is not reflected in the Technical Report.

8) I am independent of the issuer applying all of the tests in section 1.5 of National Instrument 43-101.

9) I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

10) I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public files on their websites accessible by the public.

Dated this 14th day of February, 2004

GH Giroux

G. H. Giroux, P.Eng., MASc.

APPENDIX I

Mineral Claims

Table I-A: Land Status of Quartz Mining Claims for the Logan Property

Claim Name	Number	Grant No.	Expiry Date	NTS Number
LOGAN	1	YA45047	31-Dec-04	105B09
LOGAN	2	YA45048	31-Dec-04	105B09
LOGAN	3	YA45049	31-Dec-04	105B09
LOGAN	4	YA45050	31-Dec-04	105B09
LOGAN	5	YA45051	31-Dec-04	105B09
LOGAN	6	YA45052	31-Dec-04	105B09
LOGAN	7	YA46254	31-Dec-04	105B09
LOGAN	8	YA46255	31-Dec-04	105B09
LOGAN	9	YA46256	31-Dec-04	105B09
LOGAN	10	YA46257	31-Dec-04	105B09
LOGAN	11	YA46258	31-Dec-04	105B08
LOGAN	12	YA46259	31-Dec-04	105B08
LOGAN	13	YA46260	31-Dec-04	105B08
LOGAN	14	YA46261	31-Dec-04	105B08
LOGAN	15	YA46262	31-Dec-04	105B08
LOGAN	16	YA46263	31-Dec-04	105B08
LOGAN	17	YA46264	31-Dec-04	105B07
LOGAN	18	YA46265	31-Dec-04	105B07
LOGAN	19	YA46266	31-Dec-04	105B08
LOGAN	20	YA46267	31-Dec-04	105B08
LOGAN	21	YA46268	31-Dec-04	105B08
LOGAN	22	YA46269	31-Dec-04	105B08
LOGAN	23	YA46270	31-Dec-04	105B09
LOGAN	24	YA46271	31-Dec-04	105B09
LOGAN	25	YA46272	31-Dec-04	105B08
LOGAN	26	YA46273	31-Dec-04	105B08
LOGAN	27	YA46274	31-Dec-04	105B08
LOGAN	28	YA46275	31-Dec-04	105B08
LOGAN	29	YA46276	31-Dec-04	105B08
LOGAN	30	YA46277	31-Dec-04	105B08
LOGAN	31	YA46278	31-Dec-04	105B08
LOGAN	32	YA46279	31-Dec-04	105B08
LOGAN	33	YA46280	31-Dec-04	105B08
LOGAN	34	YA46281	31-Dec-04	105B08
LOGAN	35	YA46282	31-Dec-04	105B08
LOGAN	36	YA46283	31-Dec-04	105B08
LOGAN	37	YA71027	31-Dec-06	105B09
LOGAN	38	YA71028	31-Dec-06	105B09

LOGAN	39	YA71029	31-Dec-06	105B09
LOGAN	40	YA71030	31-Dec-06	105B09
LOGAN	41	YA71031	31-Dec-06	105B09
LOGAN	42	YA71032	31-Dec-06	105B09
LOGAN	43	YA71033	31-Dec-06	105B09
LOGAN	44	YA71034	31-Dec-06	105B09
LOGAN	45	YA71035	31-Dec-06	105B09
LOGAN	46	YA71036	31-Dec-06	105B09
LOGAN	47	YA71037	31-Dec-06	105B09
LOGAN	48	YA71038	31-Dec-06	105B09
LOGAN	49	YA71039	31-Dec-06	105B09
LOGAN	50	YA71040	31-Dec-06	105B09
LOGAN	51	YA71041	31-Dec-06	105B09
LOGAN	52	YA71042	31-Dec-06	105B09
LOGAN	53	YA71043	31-Dec-06	105B09
LOGAN	54	YA71044	31-Dec-06	105B09
LOGAN	55	YA71045	31-Dec-06	105B10
LOGAN	56	YA71046	31-Dec-06	105B10
LOGAN	57	YA71047	31-Dec-06	105B07
LOGAN	58	YA71048	31-Dec-06	105B07
LOGAN	59	YA71049	31-Dec-06	105B08
LOGAN	60	YA71050	31-Dec-06	105B08
LOGAN	61	YA71051	31-Dec-06	105B08
LOGAN	62	YA71052	31-Dec-06	105B08
LOGAN	63	YA71053	31-Dec-06	105B08
LOGAN	64	YA71054	31-Dec-06	105B08
LOGAN	65	YA71055	31-Dec-06	105B08
LOGAN	66	YA71056	31-Dec-06	105B08
LOGAN	67	YA71057	31-Dec-06	105B08
LOGAN	68	YA71058	31-Dec-06	105B08
LOGAN	69	YA71059	31-Dec-06	105B08
LOGAN	70	YA71060	31-Dec-06	105B08
LOGAN	71	YA71061	31-Dec-06	105B08
LOGAN	72	YA71062	31-Dec-06	105B08
LOGAN	73	YA71063	31-Dec-06	105B08
LOGAN	74	YA71064	31-Dec-06	105B08
LOGAN	75	YA71065	31-Dec-06	105B08
LOGAN	76	YA71066	31-Dec-06	105B08
LOGAN	77	YA71067	31-Dec-06	105B08
LOGAN	78	YA71068	31-Dec-06	105B08
LOGAN	79	YA71069	31-Dec-06	105B08
LOGAN	80	YA71070	31-Dec-06	105B08
LOGAN	81	YA71071	31-Dec-06	105B09
LOGAN	82	YA71072	31-Dec-06	105B09
LOGAN	83	YA71073	31-Dec-06	105B09
LOGAN	84	YA71074	31-Dec-06	105B09
LOGAN	85	YA71075	31-Dec-06	105B09

LOGAN	86	YA71076	31-Dec-06	105B09
LOGAN	87	YA71077	31-Dec-06	105B09
LOGAN	88	YA71078	31-Dec-06	105B09
LOGAN	89	YA71360	31-Dec-04	105B09
LOGAN	90	YA71361	31-Dec-04	105B09
LOGAN	91	YA71362	31-Dec-04	105B09
LOGAN	92	YA71363	31-Dec-04	105B09
LOGAN	93	YA71364	31-Dec-04	105B09
LOGAN	94	YA71365	31-Dec-04	105B09
LOGAN	95	YA91214	31-Dec-04	105B09
LOGAN	96	YA91215	31-Dec-04	105B09
LOGAN	97	YA91216	31-Dec-04	105B09
LOGAN	98	YA91217	31-Dec-04	105B09
LOGAN	99	YA91218	31-Dec-04	105B09
LOGAN	100	YA91219	31-Dec-04	105B09
LOGAN	101	YA91220	31-Dec-04	105B09
LOGAN	102	YA91221	31-Dec-04	105B09
LOGAN	103	YA91222	31-Dec-04	105B09
LOGAN	104	YA91223	31-Dec-04	105B09
LOGAN	105	YA91224	31-Dec-04	105B09
LOGAN	106	YA91225	31-Dec-04	105B09
STRIP	1	YC24040	28-Apr-04	105B09
STRIP	2	YC24041	28-Apr-04	105B09
STRIP	3	YC24042	28-Apr-04	105B09
STRIP	4	YC24043	28-Apr-04	105B09
LOGAN	107	YC24422	7-Nov-04	105B09
LOGAN	108	YC24423	7-Nov-04	105B09
LOGAN	109	YC24424	7-Nov-04	105B09
LOGAN	110	YC24425	7-Nov-04	105B09
LOGAN	111	YC24426	7-Nov-04	105B09
LOGAN	112	YC24427	7-Nov-04	105B09
LOGAN	113	YC24428	7-Nov-04	105B09
LOGAN	114	YC24429	7-Nov-04	105B09
LOGAN	115	YC24430	7-Nov-04	105B09
LOGAN	116	YC24431	7-Nov-04	105B09
LOGAN	117	YC24432	7-Nov-04	105B09
LOGAN	118	YC24433	7-Nov-04	105B09
LOGAN	119	YC24434	7-Nov-04	105B09
LOGAN	120	YC24435	7-Nov-04	105B09
LOGAN	121	YC24436	7-Nov-04	105B09
LOGAN	122	YC24437	7-Nov-04	105B09
LOGAN	123	YC24438	7-Nov-04	105B09
LOGAN	124	YC24439	7-Nov-04	105B09
LOGAN	125	YC24440	7-Nov-04	105B09
LOGAN	126	YC24441	7-Nov-04	105B09
LOGAN	127	YC24442	7-Nov-04	105B09
LOGAN	128	YC24443	7-Nov-04	105B09

LOGAN	129	YC24444	7-Nov-04	105B09
LOGAN	130	YC24445	7-Nov-04	105B09
LOGAN	131	YC24446	7-Nov-04	105B09
LOGAN	132	YC24447	7-Nov-04	105B09
LOGAN	133	YC24448	7-Nov-04	105B09
LOGAN	134	YC24449	7-Nov-04	105B09
LOGAN	135	YC24450	7-Nov-04	105B09
LOGAN	136	YC24451	7-Nov-04	105B09
LOGAN	137	YC24452	7-Nov-04	105B09
LOGAN	138	YC24453	7-Nov-04	105B09
LOGAN	139	YC24454	7-Nov-04	105B09
LOGAN	140	YC24455	7-Nov-04	105B09
LOGAN	141	YC24456	7-Nov-04	105B09
LOGAN	142	YC24457	7-Nov-04	105B09
LOGAN	143	YC24458	7-Nov-04	105B09
LOGAN	144	YC24459	7-Nov-04	105B09
LOGAN	145	YC24460	7-Nov-04	105B09
LOGAN	146	YC24461	7-Nov-04	105B09
LOGAN	147	YC24462	7-Nov-04	105B09
LOGAN	148	YC24463	7-Nov-04	105B09
LOGAN	149	YC24464	7-Nov-04	105B09
LOGAN	150	YC24465	7-Nov-04	105B09
LOGAN	151	YC24466	7-Nov-04	105B09
LOGAN	152	YC24467	7-Nov-04	105B09

NB:Assessment work filed on all quartz mining claims and new expiry dates are pending from the Watson Lake Mining Recorder, Yukon

APPENDIX II

Statistical Tables and Figures

Table IA: Access Database Summary

TABLE NAME	# OF COLUMNS	# OF ROWS
d_head	20	103
d_geol	9	1976
d_featR	16	0
d_featP	12	0
d_assay	11	5048
d_test	6	383
d_samp	5	5048

Table IB: Assay Detection Limits Protocol

ELEMENT	DETECTION LIMIT	NEW ASSAY VALUE
Zn	<.01	0.005
Ag	<.02	0.01
Ag	<.1	0.05
Ag	<.09	0.05
Cu	<1	0.5
Cu	>20000 ppm	20000 ppm
Sn	<.01	0.005
Sn	<5	2.5
Pb	Nil	Nil
Au	<.002	0.001
As	<2	1
As	<.01	0.005
As	>1000	1000

Table IC: Un-sampled Interval Adjustments

HOLE ID	INTERVAL(S) FILLED
87-L-30	0.0 – 39.0
86-L-5	0.0 – 12.2, 24.85 – 57.4, 157.2 – 162.9
86-L-17	0.0 – 15.5, 24.5 – 64.3
86-L-16	0.0 – 11.0, 108.0 – 149.0
86-L-1	0 – 2.3, 16.5 – 33.0, 36.0 – 60.0
86-L-11	0.0 – 4.0, 82.0 – 94.0, 106.0 – 110.0
87-L-38	0.0 – 43.0, 84.0 – 95.0

Table ID: Lithological Codes

OB - Overburden
GD - Fresh granodiorite
AGD - Altered granodiorite
SAGD - Severely altered granodiorite
FGD - Foliated granodiorite
QFP - Quartz-feldspar monzonite/Latite porphyry dykes
AFQP - Altered quartz-feldspar monzonite/Latite porphyry dykes
SAFQP - Severely altered quartz-feldspar monzonite/Latite porphyry dykes
FD - Andesite dykes (Felsite)
AFD - Altered andesite dykes (Felsite)
MS - Muscovite schist
SCH - Schist
FQP - Feldspar Quartz Porphyry
FD+GM - Andesite Dyke with Gouge and mud
GM - Gouge and mud
GM+FD - Gouge and mud with Andesite Dyke
LON - Mylonite
METS - Undivided metasedimentary rocks

Breccias

BX - Tectonic or cataclastic breccia
DIBX - Diatreme breccia
FDBX - Brecciated Andesite (Felsite) Dykes
FQPBX - Brecciated Quartz-feldspar Monzonite/Late Porphyry Dykes
MABX - Mineralized Ankerite breccia
MBX - Mineralized Breccia
MQBX - Mineralized Quartz Breccia
OXBX - Oxidized Breccia
QBX - Quartz Breccia

Veins

AV - Ankerite Veins
MAV - Mineralized Ankerite, quartz-ankerite-sulphide veins
MQV - Mineralized Quartz Veins
QV - Quartz Veins

Table IE : Statistics for Zinc and Silver as a function of Rock Type

Rock Type	Number	Zinc (%)					Silver (oz/ton)				
		Mean	S.D.	Min.	Max.	C.V.	Mean	S.D.	Min.	Max.	C.V.
AFD	113	0.915	1.792	0.002	10.48	1.96	1.060	3.317	0.010	21.40	3.13
AFQP	2	0.150	0.020	0.130	0.170	0.13	0.015	0.005	0.010	0.02	0.33
AGD	3042	1.828	2.864	0.001	30.08	1.57	0.281	0.828	0.010	21.00	2.94
AV	6	0.927	0.695	0.25	2.14	0.75	0.430	0.527	0.030	1.450	1.22
BX	18	0.314	0.351	0.012	1.24	1.12	0.758	0.707	0.060	2.300	0.93
DIBX	32	5.078	9.053	0.150	48.00	1.78	0.393	0.382	0.010	1.61	0.97
FD	389	2.516	3.578	0.005	33.25	1.42	0.320	0.517	0.010	4.20	1.61
FD+GM	3	0.613	0.344	0.360	1.100	0.56	0.010		0.010	0.010	
FDBX	19	0.566	0.716	0.007	2.900	1.26	4.410	12.66	0.010	45.40	2.87
FGD	116	1.294	3.458	0.005	31.21	2.67	0.152	0.308	0.010	1.97	2.03
FQP	89	0.515	1.229	0.005	7.520	2.38	0.345	0.649	0.010	3.97	1.88
FQPBX	10	0.444	0.554	0.020	1.590	1.24	0.448	0.688	0.010	2.00	1.53
GD	12	0.491	0.458	0.004	1.360	0.93	0.234	0.393	0.010	1.40	1.68
GM	186	0.302	0.638	0.005	5.520	2.11	0.725	1.480	0.010	10.80	2.04
GM+FD	5	1.384	1.011	0.480	2.940	0.73	0.080	0.075	0.030	0.23	0.94
LON	1	0.610					0.030				
MABX	20	5.159	6.083	0.100	26.83	1.18	0.619	0.812	0.010	3.58	1.31
MAV	15	9.360	8.556	1.080	29.31	0.91	0.769	0.644	0.180	2.19	0.83
MBX	82	3.396	5.148	0.011	23.30	1.51	1.050	3.739	0.010	29.90	3.56
METS	23	0.149	0.218	0.017	1.050	1.46	1.063	2.827	0.050	14.10	2.66
MQBX	101	2.687	3.581	0.050	18.05	1.33	0.461	1.087	0.010	10.28	2.36
MQV	323	7.249	6.754	0.009	36.31	0.93	1.358	1.440	0.010	10.90	1.06
MS	26	22.159	10.92	6.080	41.72	0.49	3.047	2.393	0.380	11.52	0.78
OXBX	2	2.175	1.055	1.120	3.230	0.48	2.150	1.010	1.140	3.16	0.47
QBX	16	1.271	1.564	0.050	5.250	1.23	0.354	0.458	0.10	1.58	1.29
QFP	1	2.46					0.65				
QV	33	0.366	0.773	0.001	4.200	2.11	3.133	6.794	0.010	27.60	2.17
QZ	1	0.020					0.010				
SAFQP	1	0.440					0.010				
SAGD	305	0.500	0.997	0.002	8.840	1.99	0.637	2.282	0.010	23.30	3.58
SCH	56	1.101	2.067	0.005	11.74	1.88	0.206	0.343	0.010	2.18	1.67

Table IF: Statistics for zinc and silver as a function of rock type sorted by occurrence.

Rock Type	Number	Zinc (%)					Silver (oz/ton)				
		Mean	S.D.	Min.	Max.	C.V.	Mean	S.D.	Min.	Max.	C.V.
AGD	3042	1.828	2.864	0.001	30.08	1.57	0.281	0.828	0.01	21.00	2.94
FD	389	2.516	3.578	0.005	33.25	1.42	0.32	0.517	0.01	4.20	1.61
MQV	323	7.249	6.754	0.009	36.31	0.93	1.358	1.44	0.01	10.90	1.06
SAGD	305	0.5	0.997	0.002	8.84	1.99	0.637	2.282	0.01	23.30	3.58
GM	186	0.302	0.638	0.005	5.52	2.11	0.725	1.48	0.01	10.80	2.04
FGD	116	1.294	3.458	0.005	31.21	2.67	0.152	0.308	0.01	1.97	2.03
AFD	113	0.915	1.792	0.002	10.48	1.96	1.06	3.317	0.01	21.40	3.13
MQBX	101	2.687	3.581	0.05	18.05	1.33	0.461	1.087	0.01	10.28	2.36
FQP	89	0.515	1.229	0.005	7.52	2.38	0.345	0.649	0.01	3.97	1.88
MBX	82	3.396	5.148	0.011	23.30	1.51	1.05	3.739	0.01	29.90	3.56
SCH	56	1.101	2.067	0.005	11.74	1.88	0.206	0.343	0.01	2.18	1.67
QV	33	0.366	0.773	0.001	4.20	2.11	3.133	6.794	0.01	27.60	2.17
DIBX	32	5.078	9.053	0.15	48.00	1.78	0.393	0.382	0.01	1.61	0.97
MS	26	22.159	10.92	6.08	41.72	0.49	3.047	2.393	0.38	11.52	0.78
METS	23	0.149	0.218	0.017	1.05	1.46	1.063	2.827	0.05	14.10	2.66
MABX	20	5.159	6.083	0.1	26.83	1.18	0.619	0.812	0.01	3.58	1.31
FDBX	19	0.566	0.716	0.007	2.90	1.26	4.41	12.66	0.01	45.40	2.87
BX	18	0.314	0.351	0.012	1.24	1.12	0.758	0.707	0.06	2.30	0.93
QBX	16	1.271	1.564	0.05	5.25	1.23	0.354	0.458	0.1	1.58	1.29
MAV	15	9.36	8.556	1.08	29.31	0.91	0.769	0.644	0.18	2.19	0.83
GD	12	0.491	0.458	0.004	1.36	0.93	0.234	0.393	0.01	1.40	1.68
FQPBX	10	0.444	0.554	0.02	1.59	1.24	0.448	0.688	0.01	2.00	1.53
AV	6	0.927	0.695	0.25	2.14	0.75	0.43	0.527	0.03	1.45	1.22
GM+FD	5	1.384	1.011	0.48	2.94	0.73	0.08	0.075	0.03	0.23	0.94
FD+GM	3	0.613	0.344	0.36	1.10	0.56	0.01		0.01	0.01	
AFQP	2	0.15	0.02	0.13	0.17	0.13	0.015	0.005	0.01	0.02	0.33
OXBX	2	2.175	1.055	1.12	3.23	0.48	2.15	1.01	1.14	3.16	0.47
LON	1	0.61					0.03				
QFP	1	2.46					0.65				
QZ	1	0.02					0.01				
SAFQP	1	0.44					0.01				

Figure 14-2 : Lognormal Cumulative Frequency Plot for Zinc Assays

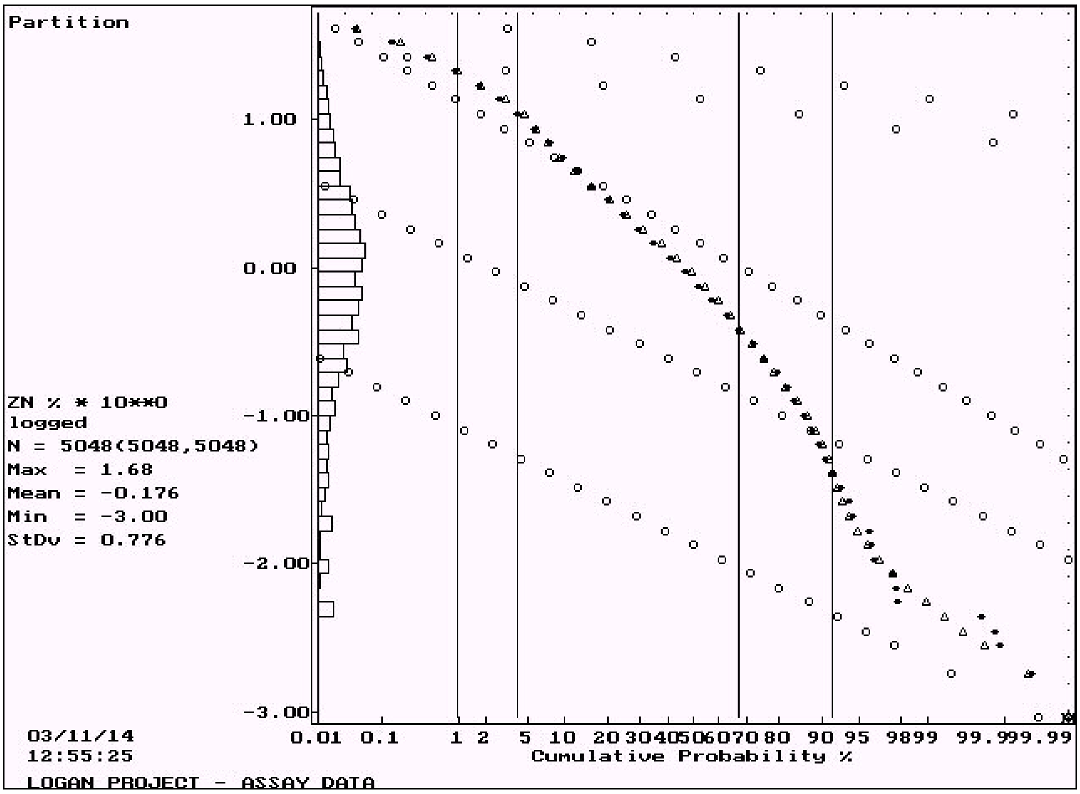


Figure 14-3: Lognormal Cumulative Frequency Plot for Silver Assays

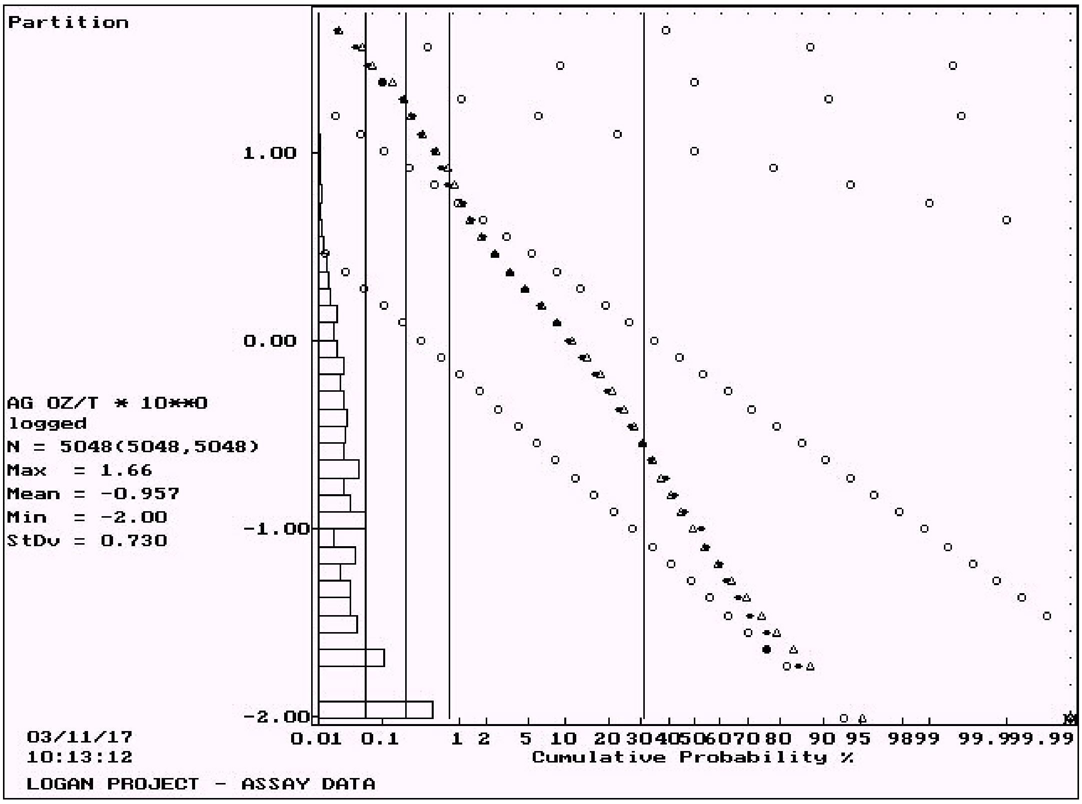
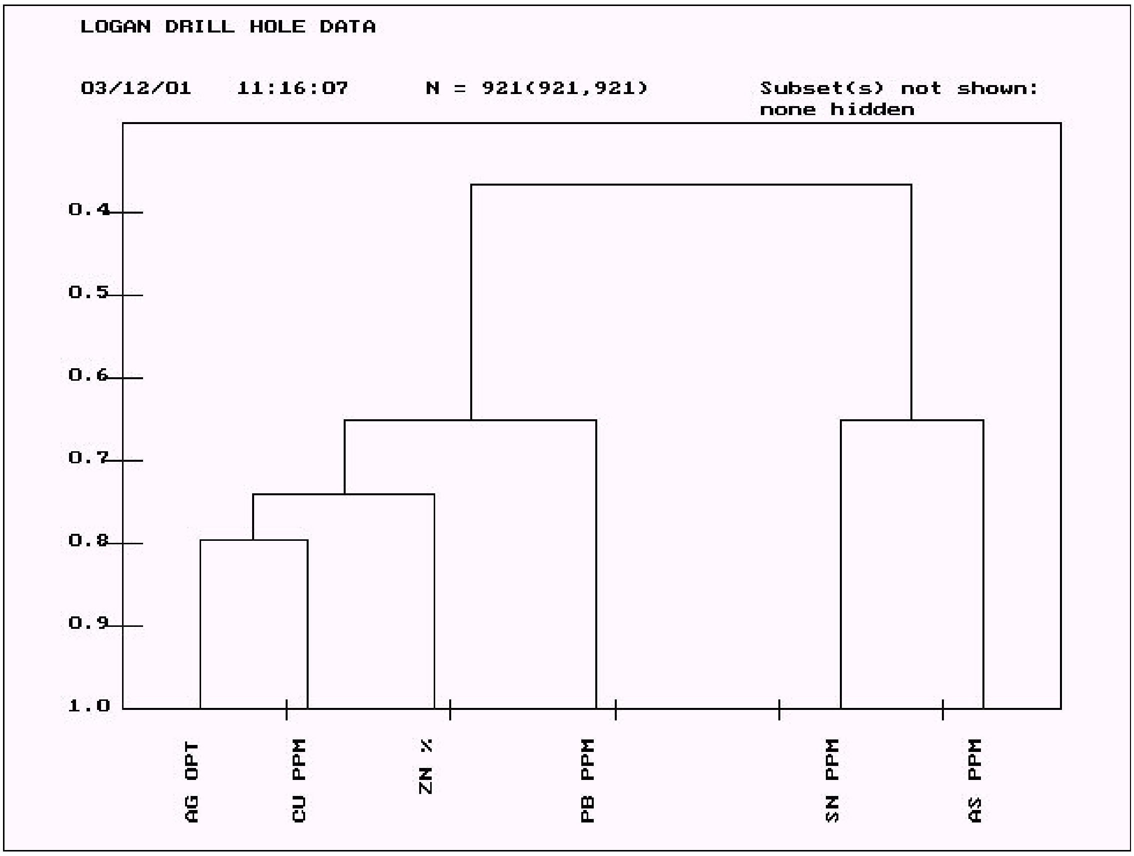


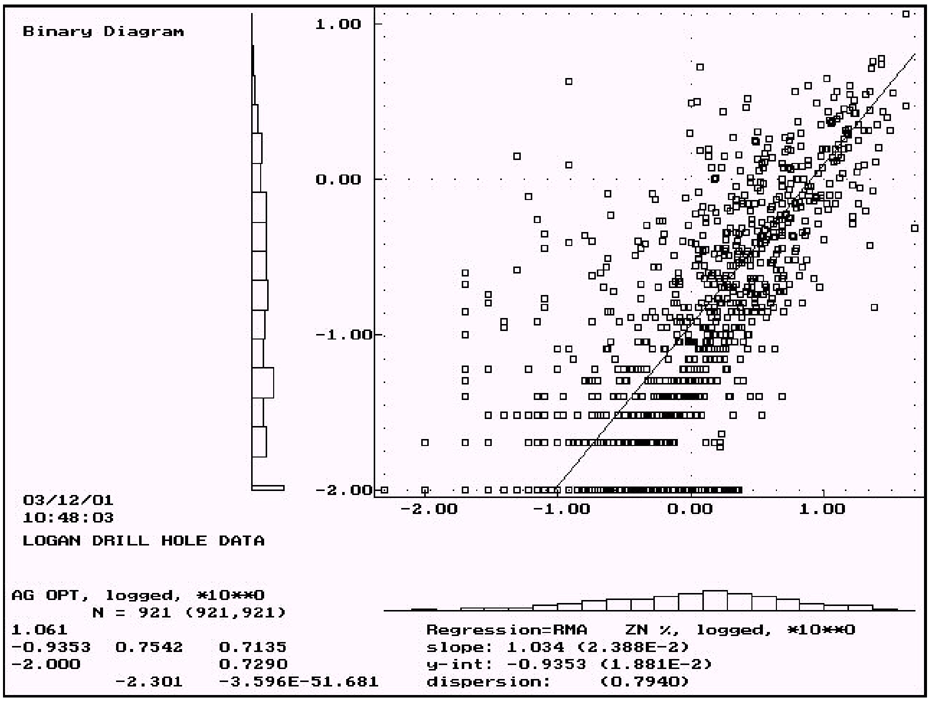
Figure 14-5 : Dendrograph showing the relationship between the various variables.



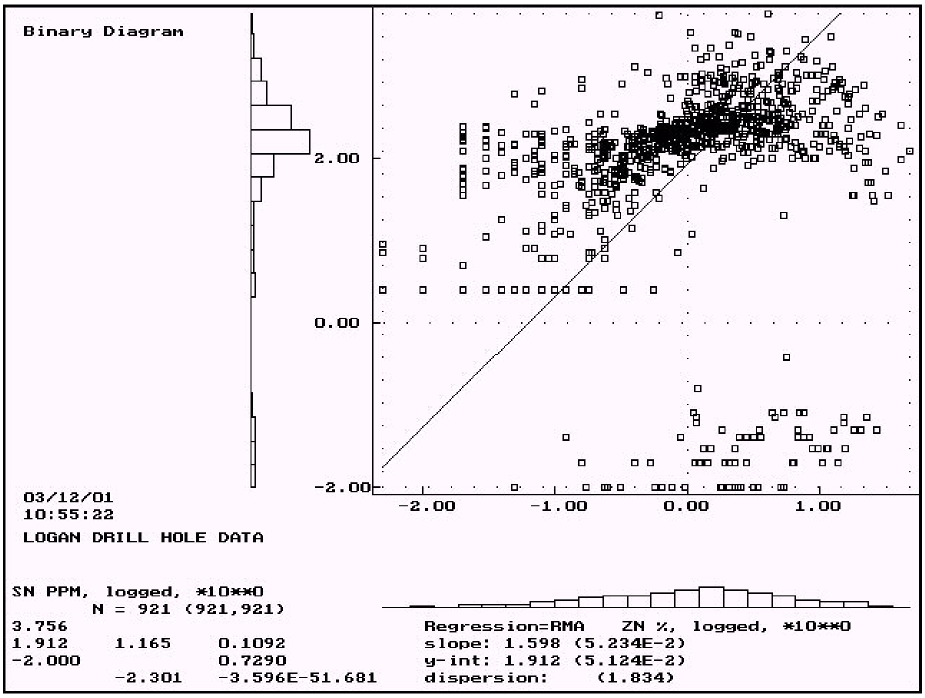
APPENDIX III

Correlation Plots

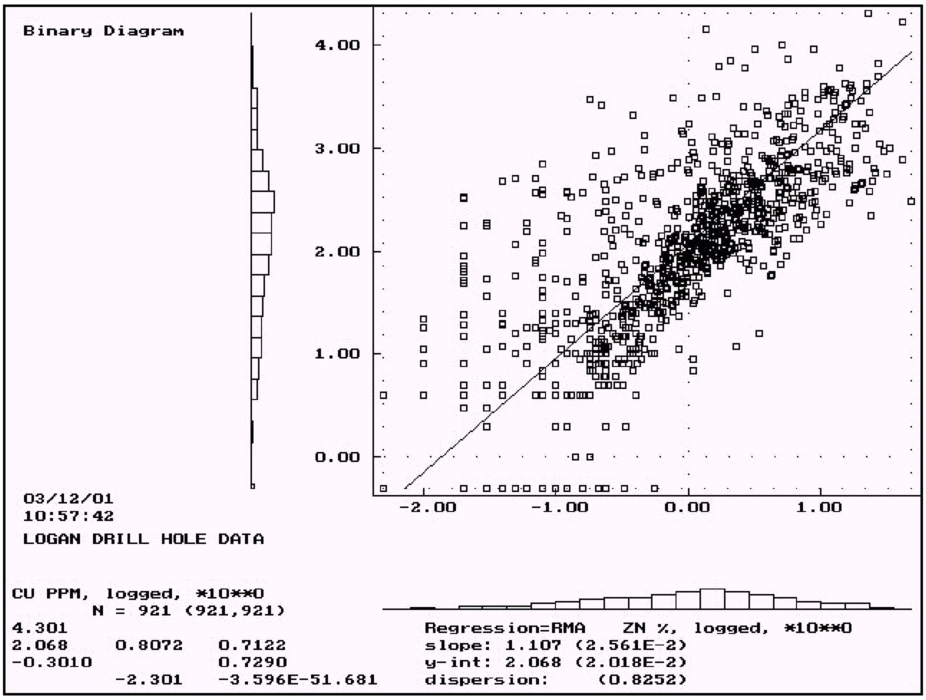
Zn-Ag


Binary Diagram
1.00
0.00
-1.00
-2.00
-2.00
-1.00
0.00
1.00
03/12/01
10:48:03
LOGAN DRILL HOLE DATA
AG OPT, logged, *10**0
N = 921 (921,921)
1.061
-0.9353 0.7542 0.7135
-2.000 0.7290
-2.301 -3.596E-51.681
Regression=RMA ZN %, logged, *10**0
slope: 1.034 (2.388E-2)
y-int: -0.9353 (1.881E-2)
dispersion: (0.7940)

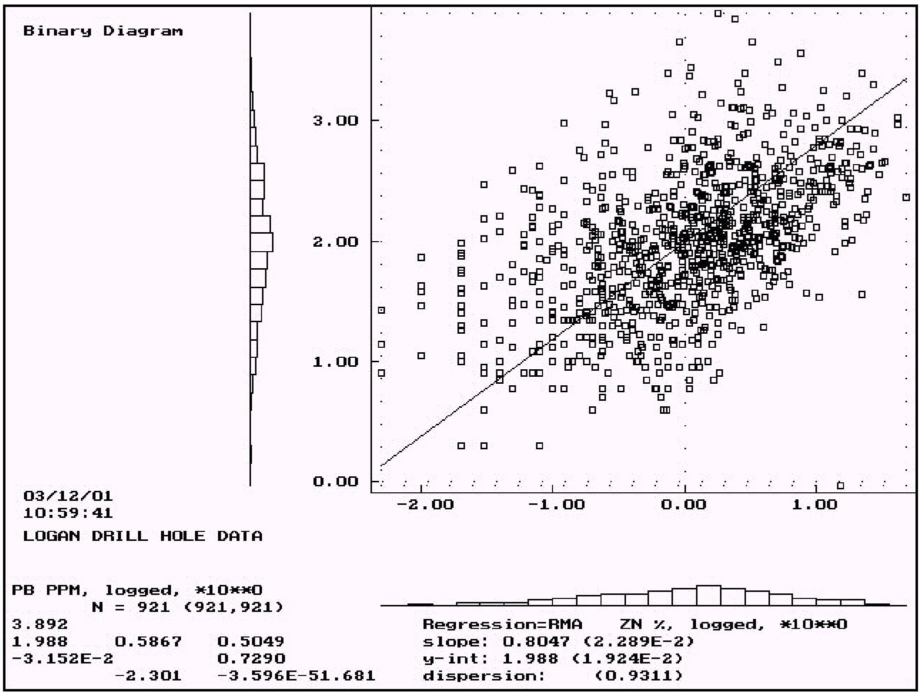
Zn-Sn


Binary Diagram
2.00
0.00
-2.00
-2.00
-1.00
0.00
1.00
03/12/01
10:55:22
LOGAN DRILL HOLE DATA
SN PPM, logged, *10**0
N = 921 (921,921)
3.756
1.912 1.165 0.1092
-2.000 0.7290
-2.301 -3.596E-51.681
Regression=RMA ZN %, logged, *10**0
slope: 1.598 (5.234E-2)
y-int: 1.912 (5.124E-2)
dispersion: (1.834)

Zn-Cu


Binary Diagram
4.00
3.00
2.00
1.00
0.00
-2.00
-1.00
0.00
1.00
03/12/01
10:57:42
LOGAN DRILL HOLE DATA
CU PPM, logged, *10**0
N = 921 (921,921)
4.301
2.068 0.8072 0.7122
-0.3010 0.7290
-2.301 -3.596E-51.681
Regression=RMA ZN %, logged, *10**0
slope: 1.107 (2.561E-2)
y-int: 2.068 (2.018E-2)
dispersion: (0.8252)

Zn-Pb



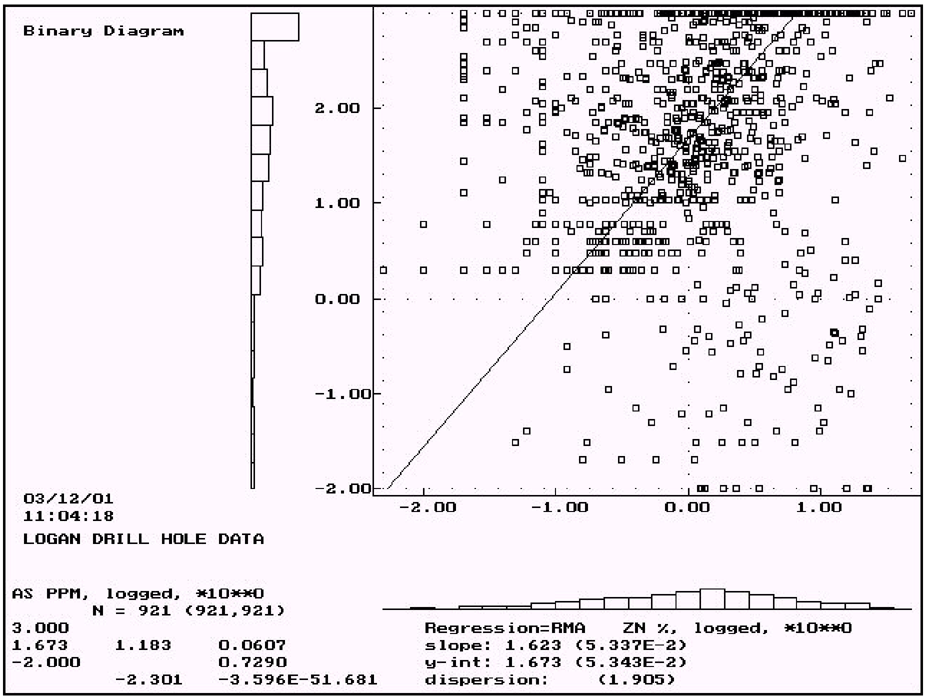
```
Binary Diagram

03/12/01
10:59:41
LOGAN DRILL HOLE DATA

PB PPM, logged, *10**0
       N = 921 (921,921)
3.892
1.988     0.5867   0.5049
-3.152E-2          0.7290
          -2.301   -3.596E-51.681

Regression=RMA    ZN %, logged, *10**0
slope: 0.8047 (2.289E-2)
y-int: 1.988 (1.924E-2)
dispersion:     (0.9311)
```

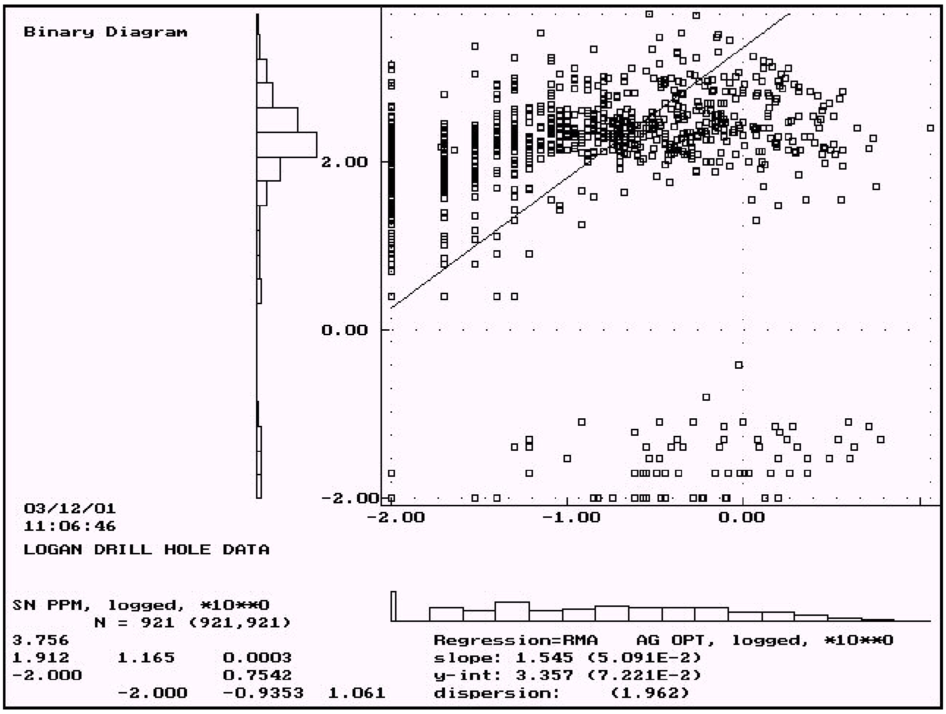
Zn-As



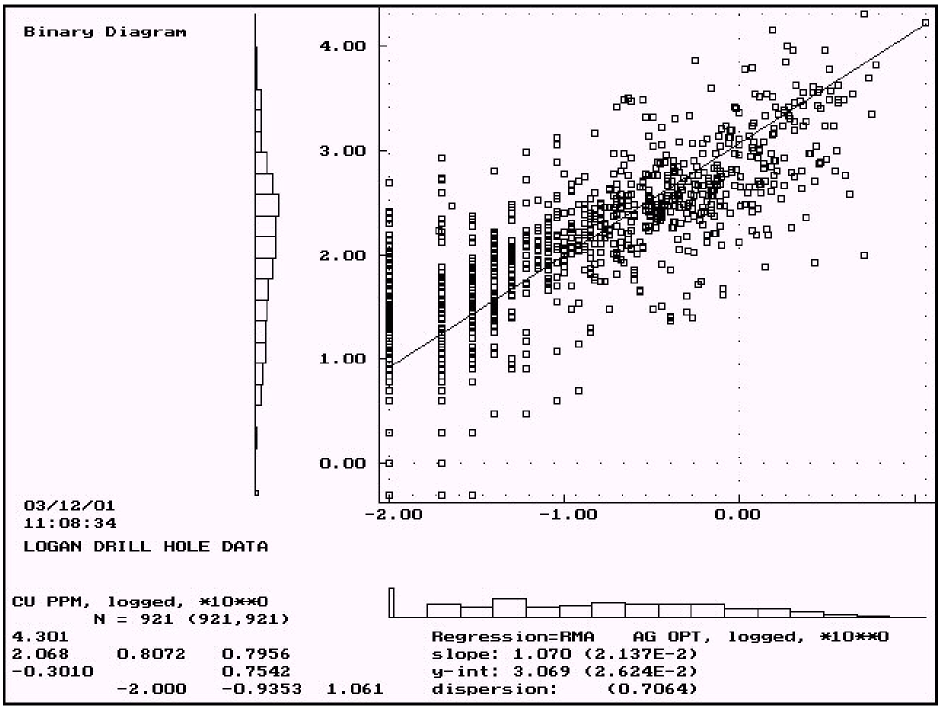
```
03/12/01
11:04:18
LOGAN DRILL HOLE DATA

AS PPM, logged, *10**0
       N = 921 (921,921)
3.000                                 Regression=RMA    ZN %, logged, *10**0
1.673     1.183     0.0607            slope: 1.623 (5.337E-2)
-2.000              0.7290            y-int: 1.673 (5.343E-2)
          -2.301    -3.596E-51.681    dispersion:     (1.905)
```

Ag-Sn


Binary Diagram
2.00
0.00
-2.00
-2.00
-1.00
0.00
03/12/01
11:06:46
LOGAN DRILL HOLE DATA
SN PPM, logged, *10**0
N = 921 (921,921)
3.756
1.912 1.165 0.0003
-2.000 0.7542
-2.000 -0.9353 1.061
Regression=RMA AG OPT, logged, *10**0
slope: 1.545 (5.091E-2)
y-int: 3.357 (7.221E-2)
dispersion: (1.962)

Ag-Cu



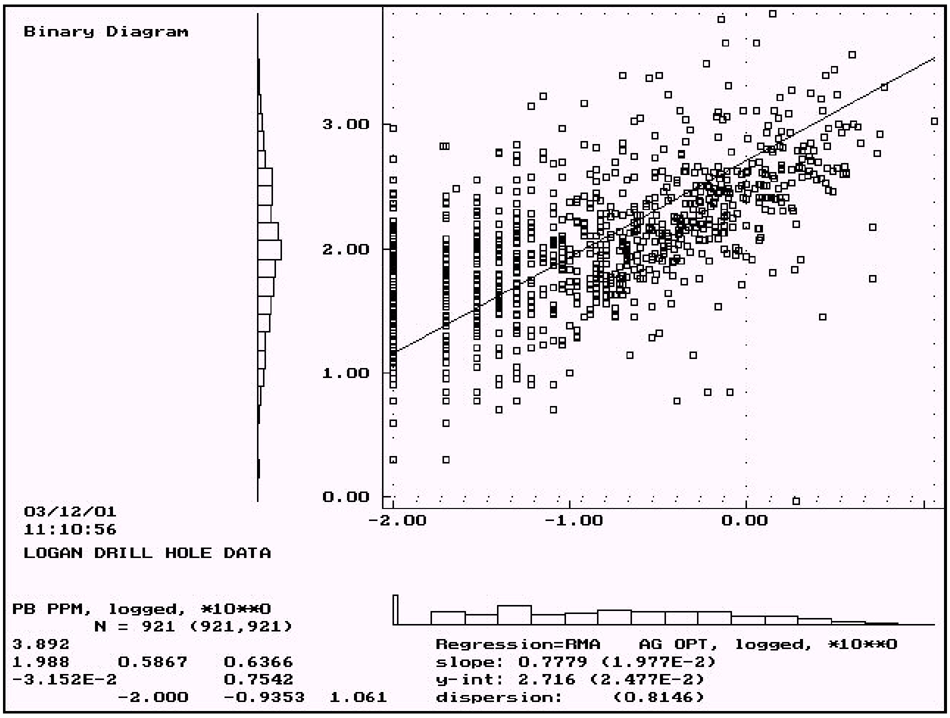
```
Binary Diagram

03/12/01
11:08:34
LOGAN DRILL HOLE DATA

CU PPM, logged, *10**0
       N = 921 (921,921)
4.301
2.068     0.8072    0.7956
-0.3010             0.7542
          -2.000    -0.9353   1.061

Regression=RMA    AG OPT, logged, *10**0
slope: 1.070 (2.137E-2)
y-int: 3.069 (2.624E-2)
dispersion:     (0.7064)
```

Ag-Pb

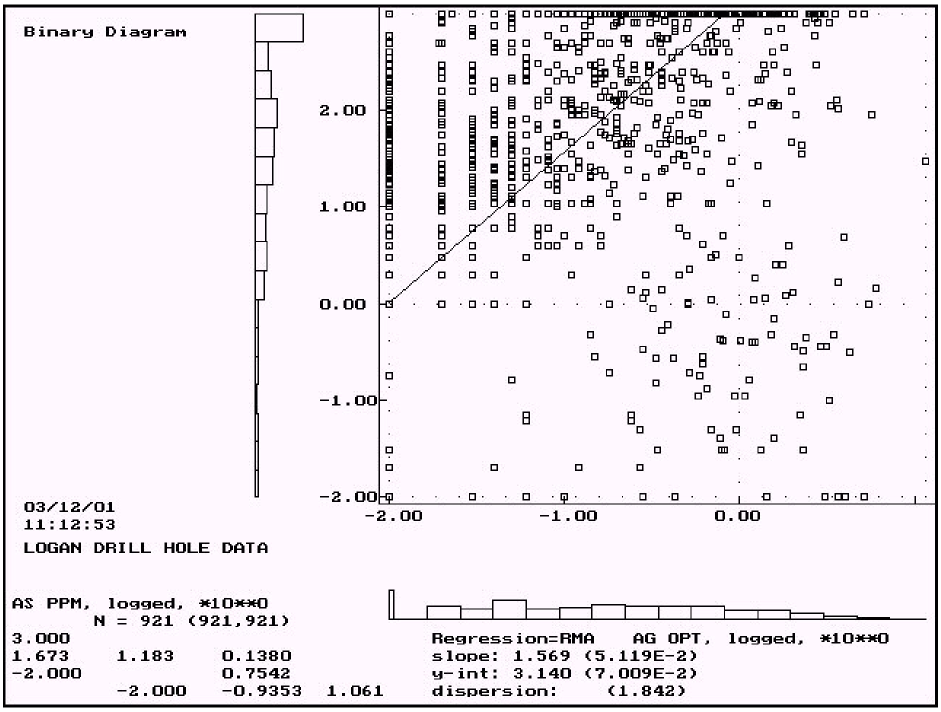


```
03/12/01
11:10:56
LOGAN DRILL HOLE DATA

PB PPM, logged, *10**0
       N = 921 (921,921)
3.892
1.988     0.5867    0.6366
-3.152E-2           0.7542
          -2.000    -0.9353   1.061
```

```
Regression=RMA    AG OPT, logged, *10**0
slope: 0.7779 (1.977E-2)
y-int: 2.716 (2.477E-2)
dispersion:     (0.8146)
```

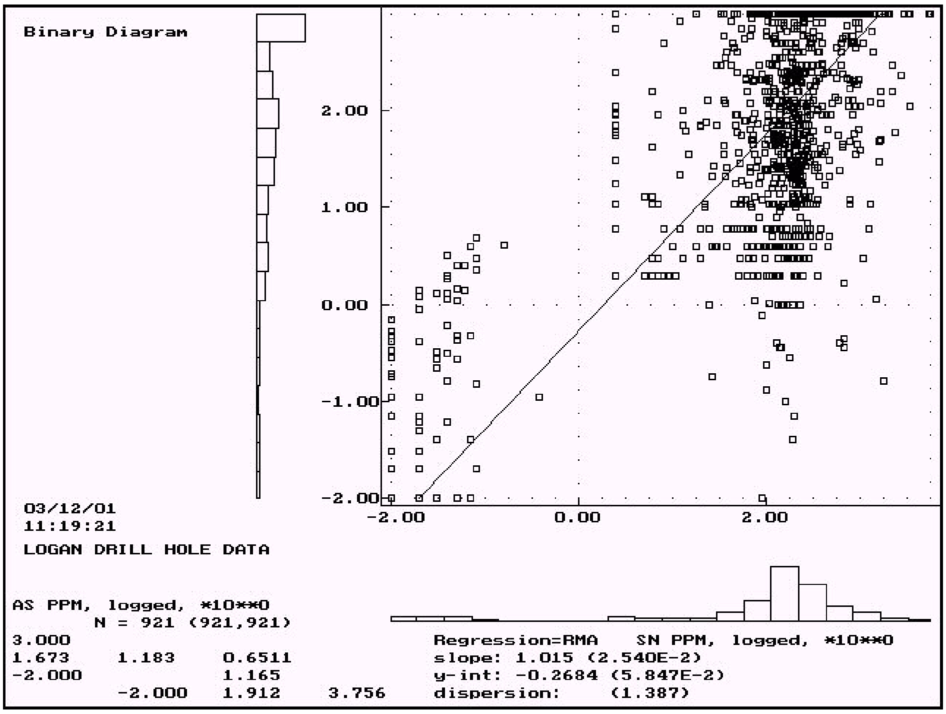
Ag-As



```
03/12/01
11:12:53
LOGAN DRILL HOLE DATA

AS PPM, logged, *10**0
       N = 921 (921,921)
3.000                                     Regression=RMA    AG OPT, logged, *10**0
1.673    1.183    0.1380                  slope: 1.569 (5.119E-2)
-2.000            0.7542                  y-int: 3.140 (7.009E-2)
         -2.000   -0.9353   1.061         dispersion:    (1.842)
```

Sn-As


Binary Diagram
2.00
1.00
0.00
-1.00
-2.00
-2.00
0.00
2.00
03/12/01
11:19:21
LOGAN DRILL HOLE DATA
AS PPM, logged, *10**0
N = 921 (921,921)
3.000
1.673 1.183 0.6511
-2.000 1.165
-2.000 1.912 3.756
Regression=RMA SN PPM, logged, *10**0
slope: 1.015 (2.540E-2)
y-int: -0.2684 (5.847E-2)
dispersion: (1.387)

APPENDIX IV

Resource Tables

Model 1 Resources (Uncut), Elevation 0

Model 1 (Origin at Elevation 0) - Classed Inferred				
Cutoff Zn Equiv.	Tonnes > Cutoff (Tonnes)	Grade > Cutoff		
		Zn (%)	Ag (oz/t)	Zn Equiv (%)
0.00	78,120,000	1.89	0.32	2.03
0.10	77,450,000	1.91	0.32	2.05
0.20	77,240,000	1.91	0.32	2.05
0.30	76,430,000	1.93	0.32	2.07
0.40	75,300,000	1.95	0.33	2.10
0.50	72,670,000	2.01	0.34	2.16
0.60	69,450,000	2.08	0.35	2.23
0.70	66,190,000	2.15	0.36	2.31
0.80	62,500,000	2.24	0.37	2.40
0.90	57,440,000	2.37	0.39	2.54
1.00	53,080,000	2.49	0.41	2.67
1.10	48,990,000	2.62	0.43	2.80
1.20	45,320,000	2.74	0.45	2.94
1.30	41,730,000	2.88	0.47	3.08
1.40	38,430,000	3.02	0.49	3.23
1.50	35,300,000	3.17	0.51	3.39
1.60	32,700,000	3.31	0.53	3.54
1.70	30,270,000	3.45	0.55	3.69
1.80	28,520,000	3.56	0.56	3.81
1.90	27,450,000	3.64	0.57	3.88
2.00	26,190,000	3.72	0.58	3.98
2.50	20,810,000	4.15	0.63	4.43
3.00	15,830,000	4.66	0.68	4.96
3.50	12,080,000	5.18	0.72	5.49
4.00	9,320,000	5.68	0.77	6.01

Model 2 Resources (Uncut), Elevation -5m

Model 2 (Origin at Elevation 0) - Classed Inferred				
Cutoff Zn Equiv.	**Tonnes > Cutoff (Tonnes)**	**Grade > Cutoff**		
		Zn (%)	**Ag (oz/t)**	**Zn Equiv (%)**
0.00	78,120,000	1.91	0.31	2.05
0.10	77,460,000	1.93	0.32	2.06
0.20	77,250,000	1.93	0.32	2.07
0.30	76,470,000	1.95	0.32	2.09
0.40	75,350,000	1.97	0.32	2.11
0.50	72,580,000	2.03	0.33	2.18
0.60	69,380,000	2.10	0.35	2.25
0.70	66,050,000	2.18	0.36	2.33
0.80	62,240,000	2.27	0.37	2.43
0.90	57,470,000	2.39	0.39	2.56
1.00	53,000,000	2.52	0.41	2.70
1.10	49,090,000	2.64	0.43	2.83
1.20	45,150,000	2.78	0.44	2.97
1.30	41,630,000	2.92	0.47	3.12
1.40	38,280,000	3.06	0.49	3.28
1.50	35,120,000	3.22	0.51	3.44
1.60	32,420,000	3.37	0.53	3.60
1.70	30,070,000	3.51	0.55	3.75
1.80	28,460,000	3.62	0.56	3.86
1.90	27,200,000	3.71	0.57	3.96
2.00	25,850,000	3.81	0.58	4.06
2.50	20,870,000	4.22	0.63	4.49
3.00	16,600,000	4.66	0.66	4.94
3.50	13,080,000	5.10	0.69	5.40
4.00	9,820,000	5.63	0.75	5.95

Model 1 Resources (Cut), Elevation 0

Capped Model 1 (Origin at Elevation 0) - Classed Inferred				
Cutoff Zn Equiv.	**Tonnes > Cutoff (Tonnes)**	**Grade > Cutoff**		
		Zn (%)	**Ag (oz/t)**	**Zn Equiv (%)**
0.00	78,120,000	1.81	0.27	1.93
0.10	77,450,000	1.83	0.27	1.94
0.20	77,240,000	1.83	0.27	1.95
0.30	76,470,000	1.85	0.27	1.97
0.40	75,490,000	1.87	0.28	1.99
0.50	73,290,000	1.91	0.28	2.03
0.60	70,500,000	1.97	0.29	2.09
0.70	66,980,000	2.04	0.30	2.17
0.80	63,010,000	2.12	0.31	2.26
0.90	57,890,000	2.24	0.33	2.38
1.00	53,750,000	2.34	0.34	2.49
1.10	49,900,000	2.45	0.35	2.60
1.20	46,330,000	2.56	0.36	2.72
1.30	42,850,000	2.67	0.38	2.84
1.40	39,809,300	2.78	0.39	2.95
1.50	36,989,100	2.89	0.40	3.06
1.60	34,509,900	2.99	0.41	3.17
1.70	31,989,900	3.11	0.42	3.29
1.80	30,186,900	3.20	0.43	3.38
1.90	28,444,500	3.29	0.44	3.48
2.00	26,904,000	3.37	0.45	3.57
2.50	20,858,700	3.73	0.49	3.95
3.00	15,929,900	4.09	0.53	4.32
3.50	11,643,600	4.48	0.55	4.72
4.00	8,275,800	4.87	0.58	5.12

Model 2 Resources (Cut), Elevation -5m

Capped Model 2 (Origin at Elevation -5m) - Classed Inferred				
Cutoff Zn Equiv.	**Tonnes > Cutoff (Tonnes)**	**Grade > Cutoff**		
		Zn (%)	**Ag (oz/t)**	**Zn Equiv (%)**
0.00	78,120,000	1.81	0.27	1.93
0.10	77,460,000	1.82	0.27	1.94
0.20	77,250,000	1.83	0.27	1.95
0.30	76,520,000	1.84	0.28	1.96
0.40	75,570,000	1.86	0.28	1.98
0.50	73,250,000	1.91	0.28	2.03
0.60	70,540,000	1.96	0.29	2.09
0.70	66,850,000	2.04	0.30	2.17
0.80	62,840,000	2.12	0.31	2.26
0.90	57,960,000	2.24	0.33	2.38
1.00	53,660,000	2.34	0.34	2.49
1.10	49,940,000	2.45	0.35	2.60
1.20	46,210,000	2.56	0.37	2.72
1.30	42,980,000	2.66	0.38	2.83
1.40	39,860,000	2.78	0.39	2.94
1.50	37,030,000	2.88	0.40	3.06
1.60	34,410,000	2.99	0.41	3.17
1.70	32,110,000	3.10	0.42	3.28
1.80	30,150,000	3.19	0.43	3.38
1.90	28,440,000	3.28	0.44	3.47
2.00	26,990,000	3.36	0.45	3.56
2.50	20,640,000	3.74	0.50	3.96
3.00	15,950,000	4.09	0.53	4.32
3.50	11,670,000	4.47	0.55	4.72
4.00	8,260,000	4.87	0.58	5.12