

**SUMMARY REPORT  
AND  
PRELIMINARY RESOURCE ESTIMATION  
FOR THE  
EAST EMERALD AND EMERALD MINE TUNGSTEN ZONES**

**JERSEY-EMERALD PROPERTY, BC**

**NELSON MINING DIVISION, BC**

**MAPSHEETS: 082F.004/005/014/015**

**LATITUDE 49°26'N LONGITUDE 117°17'E**

**for**

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## 1.0) SUMMARY

- This report provides an update of exploration and a tungsten resource evaluation for the Jersey-Emerald property, located near to the community of Salmo in south-eastern British Columbia. The authors of this report were retained by Sultan Minerals Inc. to review and assess the results of exploration work conducted on the property and complete preliminary resource calculations for tungsten mineralization within the Emerald Mine and East Emerald Tungsten zones of the property. This preliminary resource follows a 2006 preliminary tungsten resource that was reported for the Invincible and Dodger-East Dodger zones of the property. Most of the background information contained within this report was extracted from the 2006 report. Recommendations for further exploration are provided. Author Perry Grunenberg, P.Geo, has directly supervised much of the work carried out by Sultan Minerals Inc. on the property to date. Author Gary Giroux, P.Eng, is an independent qualified person contracted to complete modeling and resource calculations on the project data, collected by Sultan Minerals Inc.
- In October of 1993, Sultan Minerals Inc entered into an option agreement with Lloyd Addie and Robert Bourdon to purchase a 100% interest in the Jersey Claim Group near Salmo, British Columbia. The claims overlie the former Jersey and Emerald lead-zinc-silver mines and the Emerald, Dodger and Invincible tungsten mines operated by Canadian Exploration Ltd. a wholly-owned subsidiary of Placer Development Ltd. (now Placer Dome) from 1947 to 1973. Sultan Minerals Inc. also acquired a 100% ownership in the surrounding ground by staking. Once the property was under agreement, Sultan conducted exploration programs with the intent of exploring for precious and base metals.
- The property is located in south-eastern British Columbia centred at approximate UTM coordinates of 5438700 N and 0484000 E. The claims are located approximately ten kilometres southeast of the community of Salmo. The Jersey-Emerald Property covers an area of approximately 30 square kilometres, between the Salmo River on the west and the peak of Nevada Mountain on the east, and is bounded on the north by Sheep Creek and on the south by Lost Creek. The property consists of a block of 44 crown granted claims totalling 660.36 ha, and 72 mineral claims comprising 8634.5 ha, in the Nelson Mining Division.
- Access to the Jersey-Emerald Property is via Highway 6 between the town of Salmo and the Highway 3 junction to Creston. A network of good quality, gravel mine roads provide excellent access to the centre of the property from Highway 6, which is situated along the west edge of the property.
- The earliest record of exploration in the area dates to 1895 when gossanous outcrops on the south side of Iron Mountain attracted the attention of prospectors. In 1906 lead mineralization was discovered on the Emerald claims. Several small, high

grade ore shipments were made and in 1910 Iron Mountain Ltd. was formed by Pacific Coast Steel of San Francisco to develop the property. A 25 ton mill was erected in 1919 and operated until 1926 when low metal prices forced closure. In 1934 the mill was destroyed by a major forest fire. In 1938, tungsten and molybdenite mineralization was discovered in skarn bands at the site of the long abandoned gold workings on the Emerald, Emerald Fraction and Gold Standard claims. In 1942, the Emerald Tungsten Mine was put into production for the war effort by Wartime Metals Corp., a Federal Government Agency. Operations were suspended in 1943 when the war demand for tungsten eased. The property remained inactive until 1947 when Canadian Exploration Ltd. (later Placer Dome Ltd.) purchased the property of Iron Mountain Ltd. Placer Dome eventually purchased the government held tungsten reserves and tungsten mill in 1952. Tungsten production recommenced in 1947 and lead-zinc production began in 1949. Lead-zinc concentrate was produced from two zones: the Jersey and the Emerald Lead-Zinc Deposits. Tungsten concentrate was produced from four zones: the Emerald, Feeney, Invincible and Dodger deposits. Production continued until September 1973 when the mine was closed due to low metal prices and negative economic factors. Over the mine life 7,968,080 tons of lead-zinc ore grading 1.95% Pb and 3.83% Zn, and 1,597,802 tons of tungsten ore grading 0.76% WO<sub>3</sub> were mined and milled.

- In October of 1993, the property was optioned by Sultan Minerals Inc. Sultan undertook an exploration program that entailed ground and airborne geophysical surveys, prospecting and rock chip sampling. This work led to the identification of several targets believed to have potential for gold mineralization. During the winter of 1994-95 an eleven hole (1,324 metres) diamond drill program was undertaken by Sultan to follow up targets identified by the previous work. Drilling resulted in the discovery of several gold bearing zones in the vicinity of both the Jersey Lead-Zinc Deposit and the Emerald Tungsten Deposit. The drilling also intersected a lead-zinc zone situated 55 metres below the former Jersey Lead-Zinc Deposit. In 1996, an exploration program consisting of soil and silt sampling, geological mapping, prospecting, rock sampling and diamond drilling was carried out on the property to better delineate mineralized areas identified to date. A total of 3 underground and 13 surface diamond drill holes were completed for a total of 1,707 metres. Drilling was designed to test the gold potential of the Bismuth-Gold zone, Emerald Gold zone, Leroy Gold zone and the lower lead-zinc horizon. Three drill holes were completed to the east of the mine area to test an anomalous multi-element geochemical zone delineated from surface exploration, called the East Ridge zone. Exploration on the claims was inactive until market values for molybdenum increased dramatically in 2005. With the improved molybdenum prices, Sultan Minerals conducted exploration for molybdenum focussing on the Dodger Mine area where mine records indicated the presence of molybdenite. As well, an assessment of the potential tungsten resources was undertaken and target areas surrounding the Dodger Tungsten, and Emerald and Invincible Tungsten historic mines were delineated.
- In 2006 and 2007 exploration on the property continued in an effort to expand the molybdenum mineralization in the Dodger Mine area, expand the tungsten

mineralization in the Invincible and Emerald mine areas, and continue to test for lead-zinc resources.

- The Jersey Emerald property lies near the south end of the Kootenay Arc and is underlain by rocks of the Cambrian Laib Formation and the Ordovician Active Formation. This is a sequence of transitional rocks comprised of mixed carbonates and pelites. In the vicinity of the property the Laib Formation has been further subdivided into the Truman Member, comprised of interbedded thin grey and white, locally dolomitic limestone; the Emerald Member, a black argillite unit; and the Upper Laib Formation, comprised of green phyllite and micaceous quartzites. These rocks, have been intruded by granite of the Nelson batholith.
- Mineralization on the Jersey property is associated with the east limb of a complex major anticlinal structure referred to locally as the Jersey anticline and regionally as the Salmo River anticline. The HB lead-zinc mine located four kilometres to the north and the Reeves MacDonald lead-zinc mine located ten kilometres to the south are also associated with this major structure. Several zones of significant and often very different mineralization have been identified on the property. Historically mined areas produced lead-zinc and tungsten, with known areas of high molybdenum, gold, bismuth, arsenic, copper, silver, cadmium and barium.
- To date, within the Emerald East Tungsten target area, Sultan has completed a total of 24 diamond drill holes totalling 3689 metres (12,102 feet). This drilling was designed to intersect a skarn band that was shown to contain tungsten mineralization as evidenced by historic diamond drilling conducted during the 1940's to 1970's.
- The tungsten resource estimate in this study is made up of several different discrete tungsten bearing zones: the Emerald, which surrounds the old mine workings, and the East Emerald and the Lower East Emerald (both to the North-northeast of the Emerald).
- In the Emerald mine area a cap level of 2 standard deviations above the mean of population 2, a value of 8.0 %  $\text{WO}_3$ , was used to cap 16 assays. Within the East Emerald zones a total of 6 overlapping lognormal populations were partitioned from the total data set. A similar strategy was used to cap 5 assays at 1.1 %  $\text{WO}_3$ .
- For all zones 10 foot (3.05 m) down hole composites were produced for the segments of drill holes within the mineralized solids. Tungsten grades were interpolated into the block model by ordinary kriging.
- A total of 100 pieces of drill core from the East Emerald zone were measured for specific gravity by the weight in air-weight and in water method. Samples were taken from both mineralized and unmineralized sections of core. Blocks within the mineralized zone but with grades less than 0.05 %  $\text{WO}_3$  were assigned an

average SG of 3.05 (tonnage factor of 10.51 cu. ft./ton). Blocks with grades from 0.05 to 0.1 %  $\text{WO}_3$  were assigned a specific gravity of 3.11 (tonnage factor of 10.31 cu. ft./ton). Blocks with grades from 0.1 to 0.5 %  $\text{WO}_3$  were assigned a specific gravity of 3.16 (tonnage factor of 10.14 cu. ft./ton) the average of samples between 0.1 and 0.5 %  $\text{WO}_3$ . Blocks with grades greater than 0.5 %  $\text{WO}_3$  were assigned a value of 3.24 (tonnage factor of 9.89 cu. ft./ton). The parts of blocks in the waste surrounding the skarn zone were assigned a value of 2.77 (tonnage factor of 11.57 cu. ft./ton).

- Within the Emerald tungsten zone tonnages within blocks were adjusted to account for underground mining. Detailed underground level plans and sections were digitized to produce a reasonable 3 dimensional model of the underground stopes and drifts. The proportion of underground voids within each block was determined and this amount of material was subtracted from the tonnage calculated for each block.
- The results are presented in two forms, one set estimated if the company could mine to the limits of the mineralized three dimensional solids and a second estimated if one had to mine to the limits of the 25 x 25 x 25 ft. blocks. The results obtained from actual mining would probably lie between these two extremes.
- The results for the **mineralized solids** provide an **indicated** resource of 256,000 tons averaging 0.19%  $\text{WO}_3$  at a 0.15% cutoff, and 18,000 tons with an average grade of 0.28%  $\text{WO}_3$  at a 0.24% cutoff. The **inferred** resource is 1,122,000 tons with average grade of 0.27%  $\text{WO}_3$  at 0.15% cutoff and 430,000 tons averaging 0.45%  $\text{WO}_3$  at a cutoff of 0.24%.
- The results for the **25 x 25 x 25 foot blocks** provide an **indicated** resource of 209,000 tons averaging 0.19%  $\text{WO}_3$  at a 0.15% cutoff, and 12,000 tons averaging 0.29%  $\text{WO}_3$  at a 0.24% cutoff. The **inferred** resource is 1,110,000 tons averaging 0.29%  $\text{WO}_3$  at a 0.15% cutoff, and 470,000 tons averaging 0.43%  $\text{WO}_3$  at a 0.24% cutoff.
- The 2006 report (Grunenberg and Giroux) on the resource estimate for tungsten in the **Dodger 4200 and Invincible mine** areas provided a measured and indicated resource of 2,510,000 tons averaging 0.37%  $\text{WO}_3$ , and an inferred resource of 1,210,000 tons averaging 0.40%  $\text{WO}_3$ , all at a 0.15% cutoff. The additional resource estimate provided in this 2008 report totals 209,000 tons averaging 0.19% indicated and 1,110,000 tons averaging 0.29% inferred.
- By combining the weighted average of the 2006 and 2008 reported resources, the total resource estimate is 2,719,000 tons averaging 0.36%  $\text{WO}_3$  measured plus indicated, and 2,320,000 tons averaging 0.34%  $\text{WO}_3$  inferred.



- Recommendations are made to further explore the tungsten mineralization on the Jersey Project. The preliminary resource estimates are substantial, but further infill definition drilling, and drilling within the historic mined zones for verification of the historic reported grades, is required to move the resource to the “measured” category. As well, scoping and economic studies are required to establish cutoff grades for possible underground and open pit mining scenarios.
- Recommendation, consistent with the 2006 Preliminary Resource Estimate, is also made to dewater the Invincible Mine workings to provide direct access to the tungsten resource available surrounding the mine workings, and sections of the East Emerald target zone.
- Total cost for continued exploration with definition and verification drilling, and trenching of the tungsten resource, is estimated at \$1,295,500. Total cost for completion of work required to complete an economic study for tungsten extraction is estimated at \$99,000. The combined total cost to complete the recommended work is estimated at \$1,358,500.

## **2.0) INTRODUCTION**

This report provides a summary and updated resource evaluation for tungsten mineralization on the Jersey-Emerald property, located near to the community of Salmo in south-eastern British Columbia. The authors of this report were retained by Sultan Minerals Inc. to review and assess the results of the previous 2 years exploration work conducted on the property, and update the preliminary resource calculations for tungsten mineralization encountered on the property. The tungsten resource had been previously assessed and summarized in a report completed by Giroux and Grunenberg in 2006 (Summary Report and Preliminary Resource Calculation on the Dodger 4200 Molybdenum Zone, and Tungsten Zones, Jersey-Emerald Property). At that time a preliminary resource for tungsten mineralization within the Invincible and Dodger-East Dodger zones of the property was estimated. Recommendations for further exploration were also provided.

Sultan Minerals has continued exploration as recommended to expand the tungsten mineralization on the property, thus providing increased data for updating the tungsten resource evaluation. This exploration for tungsten has primarily taken place within the Emerald Tungsten Mine and East Emerald zones. A review and update of historic drilling conducted by previous property owners was also utilized in the resource estimate for tungsten provided in this report.

Author Perry Grunenberg, P.Geo, directly supervised the majority of work carried out by Sultan Minerals Inc. on the property to date. Author Gary Giroux, P.Eng, is an independent qualified person contracted to complete modeling and resource calculations on the project data being collected by Sultan Minerals Inc. Author Giroux has visited the property on February 19 -20, 2009.

This technical report is prepared in compliance with the requirements of National Instrument 43 – 101 and is intended for use as a supporting document to be filed with the British Columbia Securities Commission and the TSX Venture Exchange. Imperial Units of measure are used in the Resource estimation and for all property work in order to be consistent with the historic mine grid and the results of more than 5,000 diamond drill holes completed over the 60 year mine life.

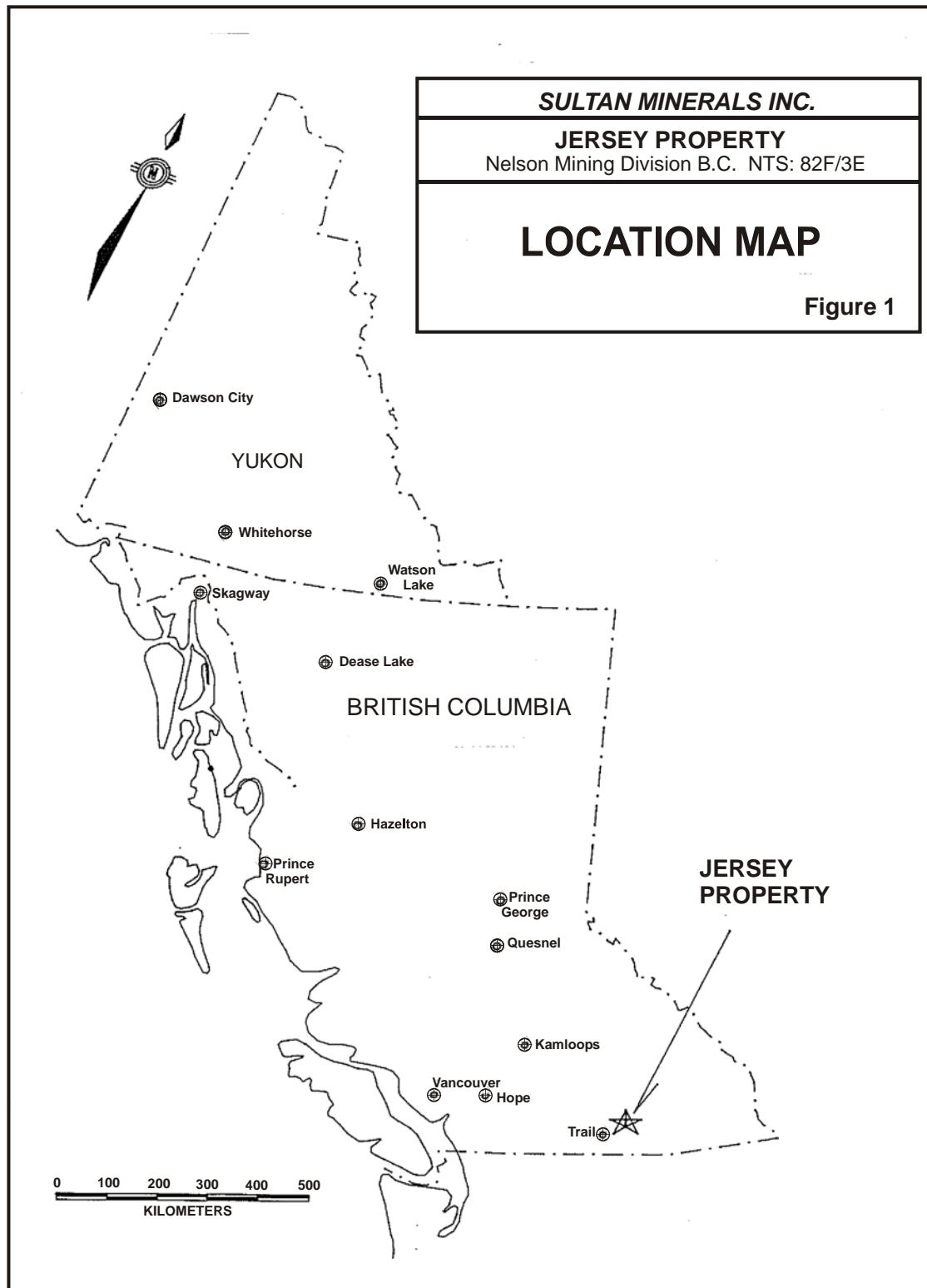
## **3.0) RELIANCE ON OTHER EXPERTS**

The authors have prepared this report based upon information believed to be accurate at the time of completion, but which is not guaranteed. The authors have relied on sources of information for the data contained in this report as provided by Sultan Minerals Inc, and from British Columbia Ministry of Energy and Mines bulletins as well as the website “Map Place”; and Sultan Minerals Inc corporate files. Some information provided in this report was obtained from recent press releases and articles authorized for distribution into the public domain by the participating companies. In writing this technical paper the authors have relied on the truth and accuracy presented within the sources listed in the

Reference section of this report. The authors do not claim responsibility for accuracy of information provided within these sources.

Mr. Ed Lawrence, P.Eng, previous mine manager of the Jersey and Emerald Mines was instrumental in assisting with compilation and interpretation of the large volume of historic mine plans, sections and reports that were used in the preparation of this report.

For information pertaining to ownership of claims on the property, we have relied on information provided by the property vendors and Sultan Minerals Inc., which to the best of our knowledge and experience is correct. A review of claim ownership was also conducted utilizing the British Columbia Mineral Titles Online information website.



## 4.0) PROPERTY DESCRIPTION AND LOCATION

The property is located in south-eastern British Columbia centred at approximate UTM coordinates of 5438700 N and 0484000 E (see Figure 1). The claims are covered by UTM map-sheets 082F004, 005, 014, and 015 within the Nelson Mining Division. The claims are located approximately ten kilometres southeast of the community of Salmo (see Figure 2). The Jersey-Emerald Property covers an area of approximately 30 square kilometres, between the Salmo River on the west and the peak of Nevada Mountain on the east, and is bounded on the north by Sheep Creek and on the south by Lost Creek.

The property consists of a block of 44 crown granted claims (see Table 1) totalling 660.36 ha, and 72 mineral claims (see Table 2) comprising 8634.5 ha, in the Nelson Mining Division (see Figure 2).

**Table 1**  
**CROWN GRANTED MINERAL CLAIMS**

TYPE	CLAIM NAME	TENURE	AREA (ha)
CG	BIG DICK	L 14882	18.790
CG	BRUCE FRACTION	L 14890	1.620
CG	CALCITE	L 14763	9.430
CG	COMET	L 14761	14.420
CG	CONTACT	L 14762	14.860
CG	COPPERFIELD	L 14904	16.610
CG	DODGER	L 12083	19.540
CG	EMERAL	L 9073	20.900
CG	EMERALD FRACTIONAL	L 9074	16.890
CG	GOLD STANDARD	L 9071	20.900
CG	HAL NO. 1	L 15020	20.510
CG	HAL NO. 2	L 15021	20.520
CG	HILLSIDE	L 14881	14.040
CG	JERSEY	L 9070	17.820
CG	KING ALFRED	L 3368	19.270
CG	KING SOLOMAN	L 3369	8.480
CG	LAST CHANCE	L 12116	20.020
CG	MARK TAPLEY	L 12117	18.730
CG	MORNING	L 9075	8.940
CG	PICKWICK	L 12087	18.490
CG	REX FRACTION	L 14889	4.160
CG	ROYAL CANADIAN	L 12115	15.970
CG	SCOTT FRACTION	L 14765	16.490
CG	STAN FRACTION	L 14764	1.450
CG	STANDARD FRACTIONL	L 9072	5.360
CG	SUNSHINE	L 9076	18.790
CG	SUNSHINE NO. 2	L 15033	13.970
CG	VICTOR FRACTION	L 14888	15.480
CG	BONCHER	L 12686	20.900
CG	JUMBO 2	L 12688	18.320

CG	ALFIE	L 15091	20.900
CG	DEN #1 FR	L 15041	20.890
CG	DEN FR	L 15040	13.740
CG	MASTADON	L 1070	20.900
CG	NELLIE J	L 1071	20.900
CG	TUNGSTEN KING	L 15092	15.870
CG	TUNGSTEN KING #1	L 15094	17.180
CG	TUNGSTEN KING #1FR	L 14766	18.280
CG	TUNGSTEN KING #2	L 15093	3.830
CG	TUNGSTEN KING #3	L 15095	11.490
CG	TUNGSTEN KING #4	L 15096	10.140
CG	TUNGSTEN KING #5	L 15097	9.160
CG	TUNGSTEN KING #7	L 15098	18.660
CG	TUNGSTEN KING #8FR	L 15099	6.750
		<b>Total</b>	<b>660.360</b>

**Table 2**  
**LOCATED MINERAL CLAIMS**

Tenure Number	Tenure Type	Claim Name	Map Number	Good To Date	Area (ha)
233462	RGC	SUMMIT	082F015	2009/DEC/27	25.0
234582	RGC	INVINCIBLE	082F014	2011/MAR/15	25.0
318816	Mineral	JERSEY #4	082F014	2009/DEC/27	500.0
318817	Mineral	JERSEY #2	082F014	2009/DEC/27	500.0
319025	Mineral	JERSEY 1	082F014	2009/DEC/27	500.0
319026	Mineral	JERSEY 3	082F014	2009/DEC/27	500.0
322324	Mineral	BLUE JAY 1	082F004	2009/DEC/27	25.0
322325	Mineral	BLUE JAY 2	082F004	2009/DEC/27	25.0
322326	Mineral	BLUE JAY 3	082F004	2009/DEC/27	25.0
322327	Mineral	BLUE JAY 4	082F004	2009/DEC/27	25.0
322328	Mineral	BLUE JAY #5	082F004	2009/DEC/27	25.0
322329	Mineral	BLUE JAY 6	082F004	2009/DEC/27	25.0
322859	Mineral	LEROY 5	082F014	2009/DEC/27	25.0
322860	Mineral	LEROY 6	082F014	2009/DEC/27	25.0
322861	Mineral	LEROY 7	082F014	2009/DEC/27	25.0
322862	Mineral	LEROY 8	082F014	2009/DEC/27	25.0
324439	Mineral	LOST GOLD	082F004	2009/DEC/27	225.0
325259	Mineral	MV 1	082F004	2009/DEC/27	25.0
325260	Mineral	MV 2	082F004	2009/DEC/27	25.0
325261	Mineral	MV 3	082F004	2009/DEC/27	25.0
325262	Mineral	MV 4	082F004	2009/DEC/27	25.0
325269	Mineral	JERSEY 5	082F004	2009/DEC/27	500.0
325270	Mineral	JERSEY 6	082F004	2009/DEC/27	300.0
329070	Mineral	POSIE 1	082F004	2010/DEC/27	500.0
330364	Mineral	LEROY 9	082F014	2009/DEC/27	25.0
330365	Mineral	LEROY 10	082F014	2009/DEC/27	25.0
330366	Mineral	LEROY NORTH 1	082F014	2010/DEC/27	25.0
330367	Mineral	LEROY NORTH 2	082F014	2010/DEC/27	25.0

330368	Mineral	LEROY NORTH 3	082F014	2010/DEC/27	25.0
330369	Mineral	LEROY NORTH 4	082F014	2010/DEC/27	25.0
330370	Mineral	LEROY NORTH 5	082F014	2010/DEC/27	25.0
330371	Mineral	LEROY NORTH 6	082F014	2010/DEC/27	25.0
330372	Mineral	LEROY NORTH 7	082F014	2010/DEC/27	25.0
330373	Mineral	LEROY NORTH 8	082F014	2010/DEC/27	25.0
331985	Mineral	HANGOVER	082F004	2009/DEC/27	25.0
331986	Mineral	GULLY	082F004	2009/DEC/27	25.0
342202	Mineral	JERSEY #7	082F015	2009/DEC/27	500.0
342203	Mineral	JERSEY #8	082F015	2009/DEC/27	400.0
347849	Mineral	SUMIT 1	082F015	2009/DEC/27	25.0
347850	Mineral	SUMIT 2	082F015	2009/DEC/27	25.0
347851	Mineral	SUMIT 3	082F015	2009/DEC/27	25.0
347852	Mineral	SUMIT 4	082F015	2009/DEC/27	25.0
348168	Mineral	J1	082F015	2007/DEC/27	25.0
348169	Mineral	J2	082F015	2007/DEC/27	25.0
348170	Mineral	J3	082F015	2007/DEC/27	25.0
348171	Mineral	J4	082F015	2007/DEC/27	25.0
348172	Mineral	J5	082F014	2007/DEC/27	25.0
348173	Mineral	J6	082F015	2009/DEC/27	25.0
348174	Mineral	J7	082F015	2009/DEC/27	25.0
348175	Mineral	J8	082F015	2009/DEC/27	25.0
348176	Mineral	J9	082F015	2009/DEC/27	25.0
348177	Mineral	J10	082F015	2009/DEC/27	25.0
348178	Mineral	J11	082F015	2009/DEC/27	25.0
348179	Mineral	J12	082F015	2009/DEC/27	25.0
348180	Mineral	JERSEY 9	082F015	2009/DEC/27	400.0
348181	Mineral	JERSEY 10	082F015	2009/DEC/27	500.0
348182	Mineral	JERSEY 11	082F015	2009/DEC/27	500.0
348183	Mineral	JERSEY 12	082F015	2009/DEC/27	450.0
349449	Mineral	J-13	082F004	2009/DEC/27	25.0
349450	Mineral	J-14	082F004	2009/DEC/27	25.0
349451	Mineral	J-15	082F004	2009/DEC/27	25.0
349452	Mineral	J-16	082F004	2009/DEC/27	25.0
349453	Mineral	J-17	082F004	2009/DEC/27	25.0
349901	Mineral	JERSEY 13	082F015	2009/DEC/27	450.0
349902	Mineral	JERSEY 14	082F015	2009/DEC/27	450.0
349903	Mineral	J 18	082F015	2009/DEC/27	25.0
349904	Mineral	J 19	082F015	2009/DEC/27	25.0
349905	Mineral	J 20	082F015	2009/DEC/27	25.0
349906	Mineral	J 21	082F015	2009/DEC/27	25.0
349907	Mineral	J 22	082F015	2009/DEC/27	25.0
349908	Mineral	J 23	082F015	2009/DEC/27	25.0
518176	Mineral	ART 1	082F	2007/JUL/22	84.5
				TOTAL	8634.54

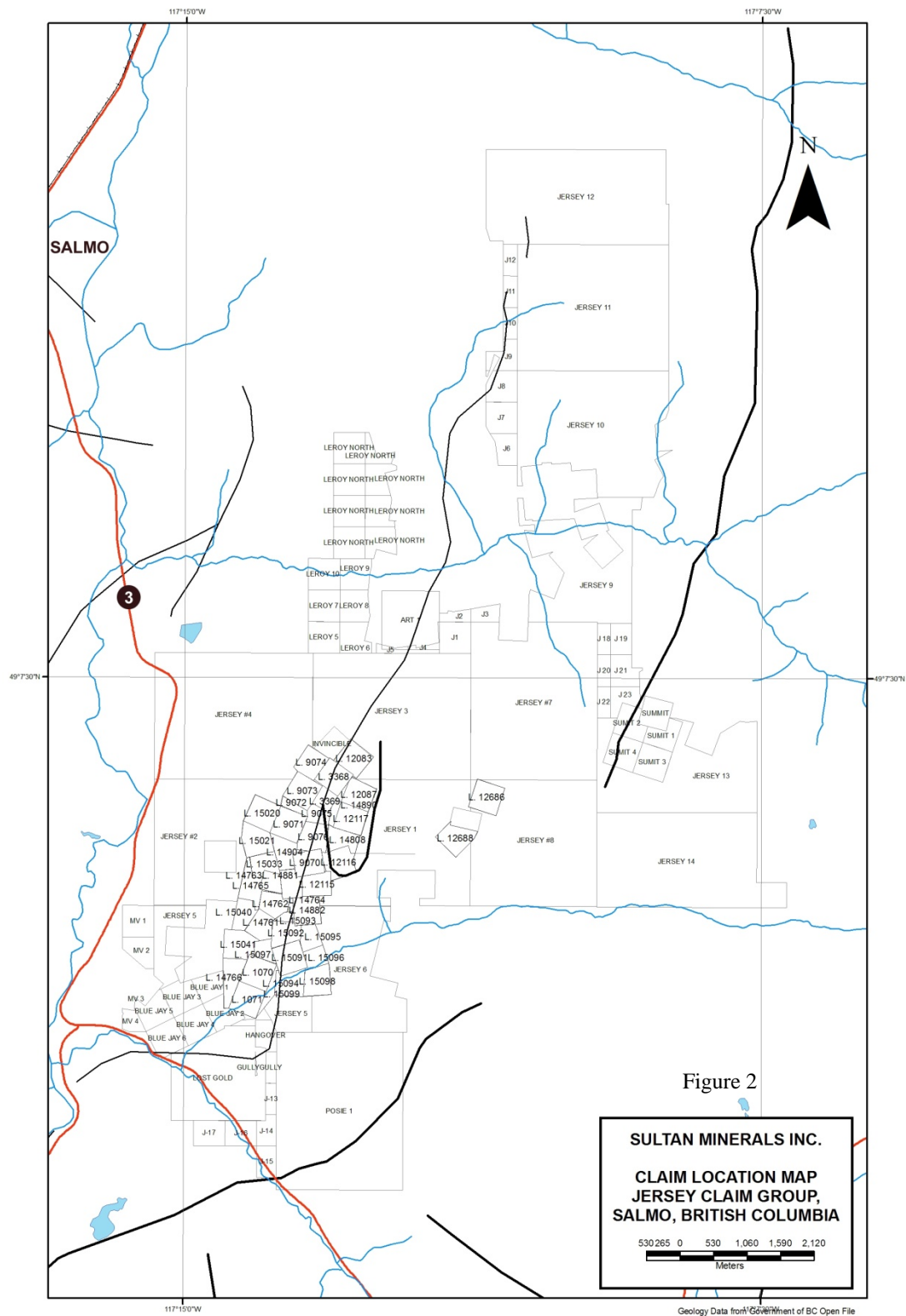
In October of 1993, the Company entered into an option agreement with Lloyd Addie and Robert Bourdon, whereby the Issuer acquired an option to purchase a 100% interest in the Jersey Claim Group near Salmo, British Columbia, for consideration of 200,000 shares of the Issuer and cash payments totaling \$43,389. The claims overlie the former Jersey and Emerald lead, zinc and tungsten mines operated by Placer Dome from 1947 to 1973.

The Company's interest in the Jersey Emerald property is subject to a 3% NSR, which can be reduced to 1.5% by making additional cash and share payments totaling \$500,000 and 50,000 shares on completion of a positive feasibility study. The property is subject to an advance royalty payment that was due to commence on October 2000. In October 2000 an amendment to the agreement extended the start of the royalty payments to 2004 and in October 2004 a second amendment extended the start of the royalty payments to 2009. In consideration, 400,000 common shares were issued to the royalty holders.

In May 2005, the Company entered into a purchase agreement to acquire the Invincible Tungsten Mine property, covering an area of 25 hectares. Sultan will purchase the property from the Seller for a cash payment of \$3,000 and 9,000 common shares of Sultan common stock and will acquire a 100% right, title and interest in and to the property, subject to a 2% Net Smelter Return royalty ("NSR"), which Sultan may, at its discretion, reduce to a 0.5% NSR by the payment of \$150,000 to the Seller after the completion of a positive feasibility study; and an Annual Advance Royalty Payment of \$3,000, which will commence in year 2010. The Invincible Mine property is located within the Jersey Emerald property boundary.

The optioned property is comprised of 28 crown granted mineral claims, 4 two-post claims and 80 mineral units encompassing approximately 1,700 hectares in the Nelson Mining Division. The property has since been expanded by staking, optioning and purchasing additional claims and now includes 47 crown granted mineral claims, 60 two-post claims and 278 mineral units in 15 four-post claims.





There are no other pre-production royalties, back-in rights or other agreements or encumbrances to these claims with respect to Sultan's option right to them known to the author. There are no environmental liabilities existing on the property.

Sultan Minerals has been actively purchasing surface lands that cover the Jersey Property and area. This includes nearly 1000 acres of land in 2 titles that covers a large portion of the old mine workings in the Jersey mine area.

The authors foresee no permitting obstacles for a year round drill program. Prior drill programs have been permitted and conducted throughout the property in the past.

## **5.0) ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY**

Access to the Jersey-Emerald Property is via Highway 6 between the town of Salmo and the Highway 3 junction to Creston (see Figure 3). A network of good quality, gravel mine roads provide excellent access to the centre of the property from Highway 6, which is situated along the west edge of the property.

Salmo enjoys a pleasant summer climate with August temperatures averaging 25°C and moderate precipitation. Winter temperatures average -10°C in January with moderate snowfall. Total annual precipitation is on the order of 750 millimetres of moisture with much of this falling during the rainy season from April to June. The property is not in a heavy snow belt but up to four feet or more can be expected at the mine site during the winter months. Snow free conditions at higher elevations can be expected from late April to early November. Access to the property can be attained for year-round exploration.

The Highway 6 corridor carries a power line and rail bed. Teck Cominco Trail Smelter facility is located about 45 minutes drive south of the property. Crew lodgings are available in Nelson or Salmo. A skilled labour force for mining and exploration is available in Nelson, Salmo, Trail and Castlegar. Trail, Nelson and Castlegar are also major supply and service centres for resource industries.

The property is situated in the rugged mountainous physiographic division known as the Selkirk Mountains. In the vicinity of the claims relief is on the order of 1200 metres (4000 feet) between Salmo Creek in the valley bottom at 600 metres (2000 feet) and the crest of Nevada Mountain at 1860 metres (6100 feet). Slopes vary from rolling within the centre of the claims to moderately steep along the east and west margins. Preliminary inspection of topography indicates that there are numerous areas for development of infrastructure required for mining and milling within the claims.

Much of the area has been logged or previously burned resulting in vegetation consisting of small diameter stands of larch, balsam, fir, jackpine and mountain alder. In many areas second growth vegetation is extremely dense making movement through the forest difficult. Several areas of extensive outcrop occur over and immediately north of the Jersey mine site but much of the property is covered by a veneer of glacial till. Till cover varies in thickness, from less than one metre on the slopes to more than 20 metres in valley bottoms.

# JERSEY-EMERALD PROPERTY SALMO, BRITISH COLUMBIA

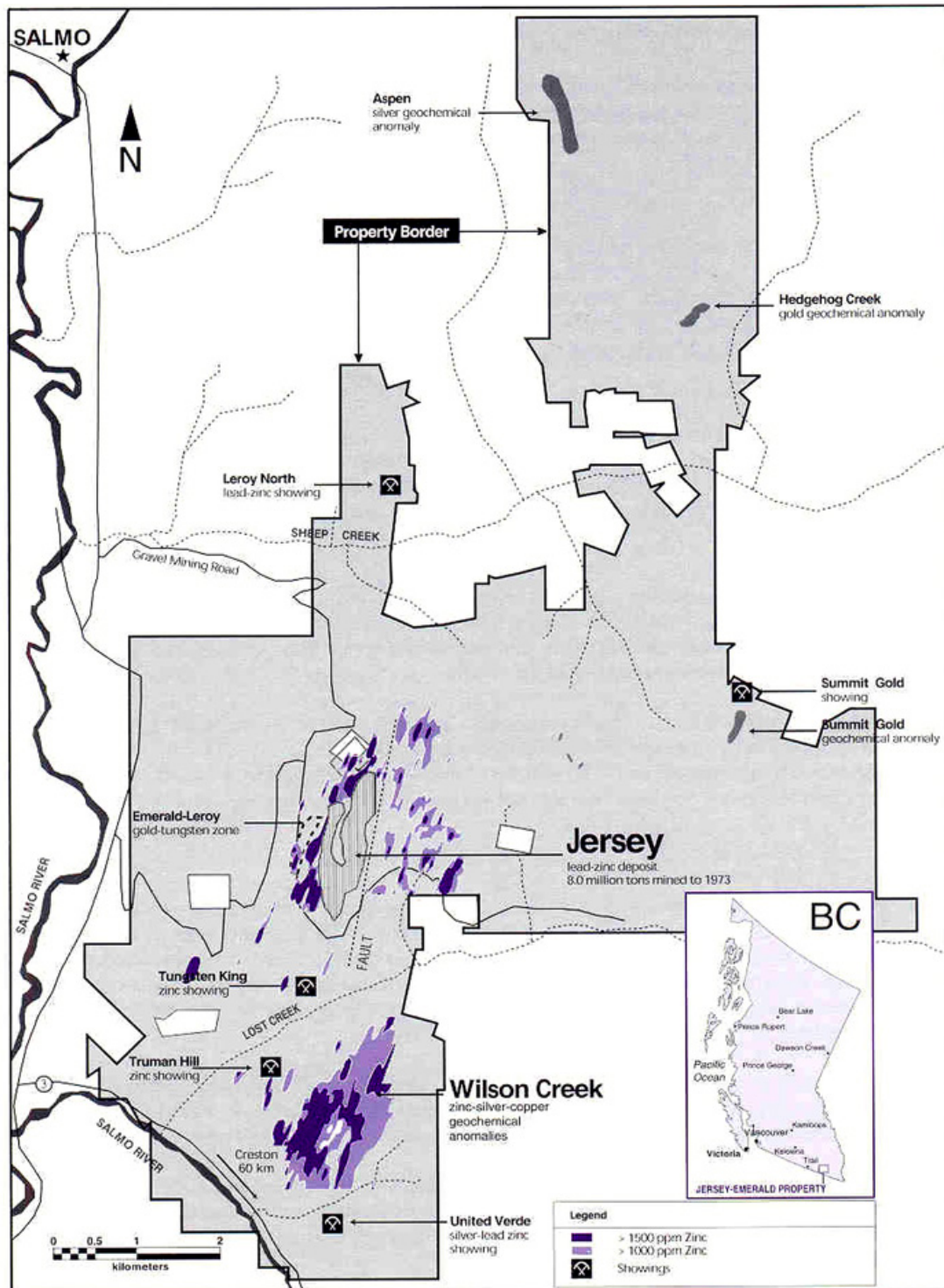


Figure 3: Location Map showing exploration and mining zones on the Property

## 6.0) HISTORY

The earliest record of exploration in the area dates to 1895 when gossanous outcrops on the south side of Iron Mountain attracted the attention of prospectors. The area was initially explored for gold and the 1896 Minister of Mines Report states that assays as high as \$70.00 per ton in gold (about 3.5 oz/t or 100 g/t) were obtained from the area.

Prospecting continued and in 1906 lead mineralization was discovered on the Emerald claims. Several small, high grade ore shipments were made and in 1910 Iron Mountain Ltd. was formed by Pacific Coast Steel of San Francisco to develop the property. A 25 ton mill was erected in 1919 and operated until 1926 when low metal prices forced closure. In 1934 the mill was destroyed by a major forest fire.

In 1938, tungsten and molybdenite mineralization was discovered in skarn bands at the site of the long abandoned gold workings on the Emerald, Emerald Fraction and Gold Standard claims. In 1942, the Emerald Tungsten Mine was put into production for the war effort by Wartime Metals Corp., a Federal Government Agency. Operations were suspended in 1943 when the war demand for tungsten eased.

The property remained inactive until 1947 when Canadian Exploration Ltd. (later Placer Dome Ltd.) purchased the property of Iron Mountain Ltd. Placer Dome eventually purchased the government held tungsten reserves and tungsten mill in 1952. Tungsten production recommenced in 1947 and lead-zinc production began in 1949. Lead-zinc concentrate was produced from two zones: the Jersey and the Emerald Lead-Zinc Deposits. Tungsten concentrate was produced from four zones: the Emerald, Feeney, Invincible and Dodger deposits. Production continued until September 1973 when the mine was closed due to low metal prices and depleted lead, zinc and tungsten reserves. Over the mine life 7,968,080 tons of lead-zinc ore grading 1.95% Pb and 3.83% Zn, and 1,597,802 tons of tungsten ore grading 0.76% WO<sub>3</sub> were mined and milled.

In 1979 Mentor Exploration Ltd carried out a diamond drill program to explore the south extension of the Emerald Shaft tungsten zone. This work encountered favourable geology but the target zone was found to be too deep and too narrow to be adequately tested by surface drilling.

In 1981 Mentor Exploration Ltd completed a five hole diamond drill program totalling 1,070 metres to test for molybdenum mineralization in the Emerald stock area. This work provided valuable information on the nature of the intrusive in this area, being the deepest testing carried out to that time. However, no economic zones of molybdenite were encountered.

In 1990, the property was sold to Nu-Dawn Resources Inc. who in 1993 sold it to Lloyd Addie and Bob Bourdon, both of Nelson, B.C. In 1993, Addie and Bourdon found that fine particles of free gold could be panned from the tungsten tailings. A prospecting and lithogeochemical sampling program was therefore initiated over the known tungsten zones. This work led to the discovery of significant bedrock gold values in the vicinity of the Jersey and Emerald zones.

In October of 1993, the property was optioned by Sultan Minerals Inc. Sultan undertook an exploration program that entailed ground and airborne geophysical surveys, prospecting and rock chip sampling. This work led to the identification of several targets believed to have potential for gold mineralization.

During the winter of 1994-95 an eleven hole (1,324 metres) diamond drill program was undertaken by Sultan to follow up targets identified by the previous work. Drilling resulted in the discovery of several gold bearing zones in the vicinity of both the Jersey Lead-Zinc Deposit and the Emerald Tungsten Deposit. The drilling also intersected a lead-zinc zone situated 55 metres below the former Jersey Lead-Zinc Deposit.

In 1996, an exploration program consisting of soil and silt sampling, geological mapping, prospecting, rock sampling and diamond drilling was carried out on the property to better delineate the mineralized areas identified by Sultan. A total of 3 underground and 13 surface diamond drill holes were completed for a total of 1,707 metres. Drilling was designed to test the gold potential of the Bismuth-Gold zone, Emerald Gold zone, Leroy Gold zone and the lower lead-zinc horizon. Three drill holes were completed to the east of the mine area to test an anomalous multi-element geochemical zone delineated from surface exploration, called the East Ridge zone.

Exploration on the claims was inactive until market values for molybdenum increased dramatically in 2005. With the improved molybdenum prices, Sultan Minerals conducted exploration for molybdenum focussing on the Dodger Mine area where mine records indicated the presence of molybdenite. As well, an assessment of the potential tungsten resources was undertaken and target areas surrounding the Dodger Tungsten, and Emerald and Invincible Tungsten historic mines were delineated.

In 2006 and 2007 exploration on the property continued in an effort to expand the molybdenum mineralization in the Dodger Mine area, expand the tungsten mineralization in the Invincible and Emerald mine areas, and continue to test for lead-zinc resources.

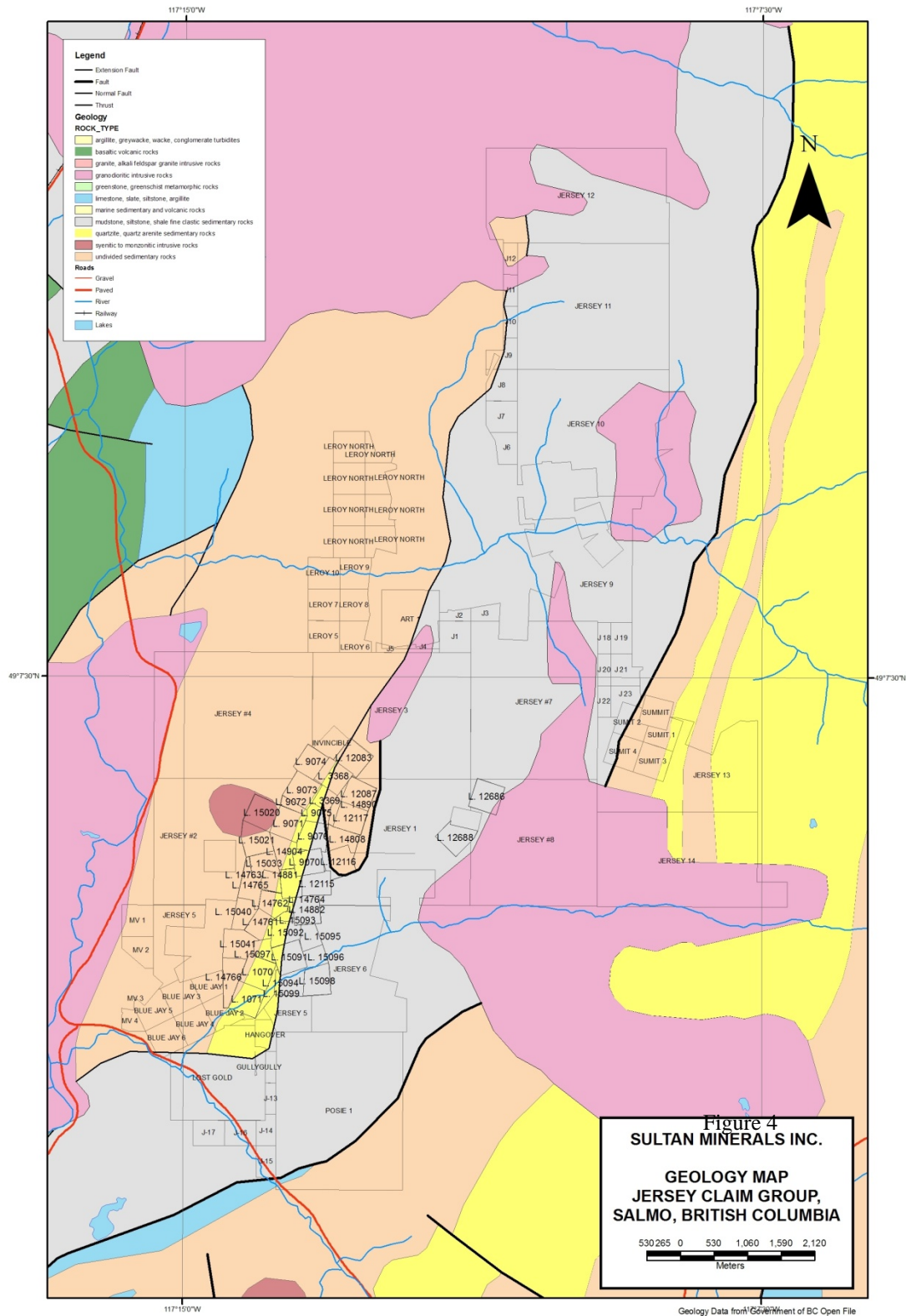
## **7.0) GEOLOGICAL SETTING**

### **7.1 Regional Geology**

The Jersey Emerald property lies near the south end of the Kootenay Arc and is underlain by rocks of the Cambrian Laib Formation (CmL) and the Ordovician Active Formation (OA). The Laib Formation is comprised of mixed carbonates and pelites that have been subdivided into the Truman Member brown argillites, the Emerald Member black argillites and the Reeves Member limestones (see Figure 4).

The eastern part of the property has historically been mapped as a much younger (Ordovician) Active argillite, however recent work by the Company indicates that the contact may in fact be conformable and that the Active Formation appears to be geochemically identical to the Laib Formation Emerald Member black argillites.

The sedimentary formations are intruded by granitic dykes, sills and bodies mapped as Cretaceous Granite (Hoy and Dunne, 1997).



## 7.2 Local and Property Geology

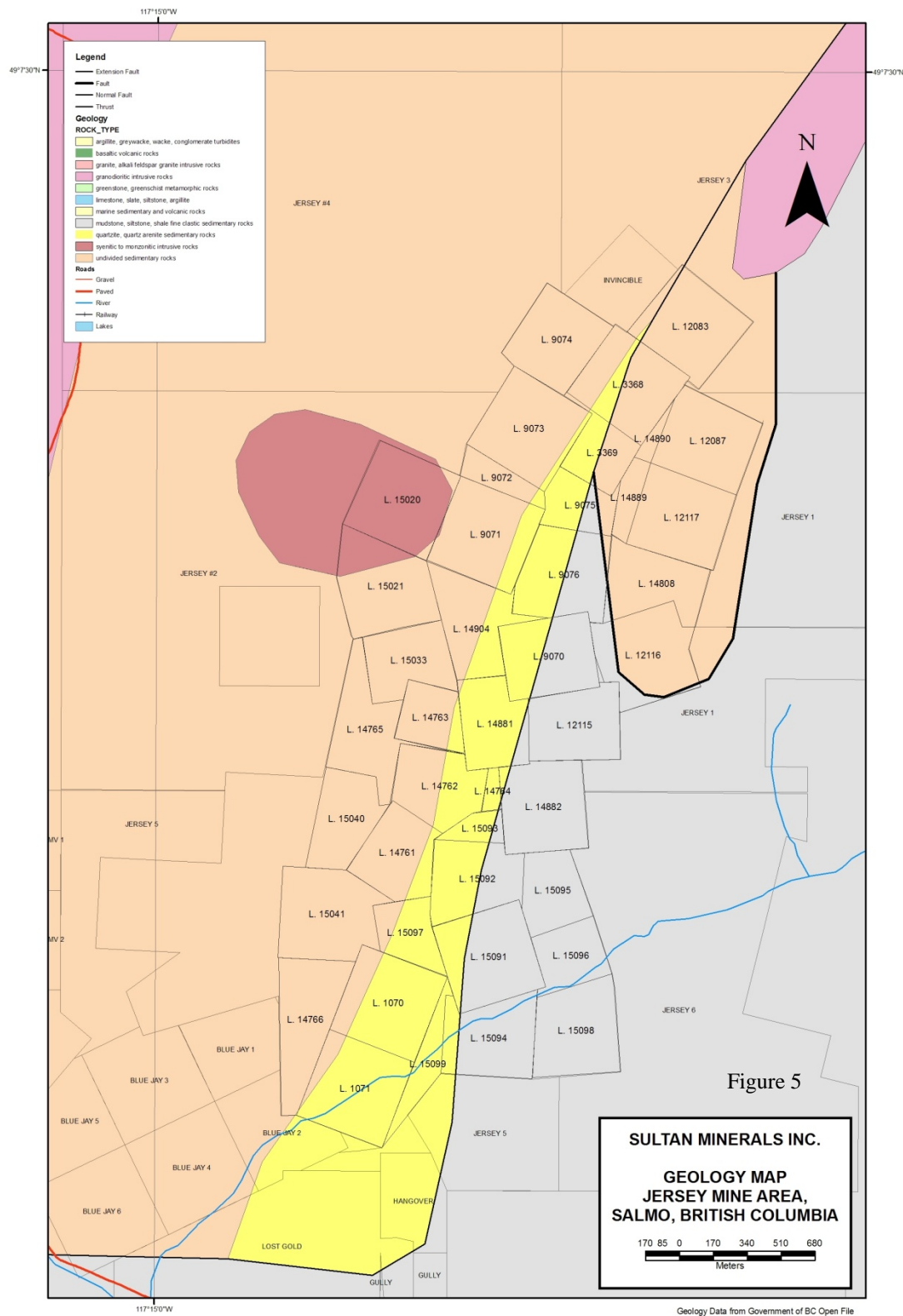
The property is underlain by rocks of the Cambrian Laib Formation. This is a sequence of transitional rocks comprised of mixed carbonates and pelites (Little, 1960). In the vicinity of the property the Laib Formation has been further subdivided into the Truman Member, comprised of interbedded thin grey and white, locally dolomitic limestone; the Emerald Member, a black argillite unit; and the Upper Laib Formation, comprised of green phyllite and micaceous quartzites.

The sedimentary rocks are intruded by small plugs, dykes and sills of Cretaceous granite. The sedimentary rocks that are in contact with the granitic bodies are typically skarnified, resulting in a variety of skarn rocks ranging from re-crystallized coarse grained marble to garnet-pyroxene bearing skarn.

The Laib Formation has been deformed by three phases of folding all at least of local significance. Within the mine area structure is dominated by a major north-northeast trending anticline known locally as the Jersey anticline.

Three small stock-like bodies of Cretaceous biotite granite, elongate parallel with the local foliation, intrude the Jersey anticline and locally cut the ore-zones near the Jersey mine. From south to north these are the Jersey, Emerald and Dodger stocks. Potassium-argon age dates obtained from biotite from the Dodger stock give a date of 100.0 +/- 3.0 million years. One kilometre west of the Jersey mine the Laib sediments are intruded by a small circular body of Tertiary, augite monzonite referred to as the Salmo River stock. Biotite from this stock gave a potassium-argon age of 50.6 +/- 1.5 million years.







## **8.0) DEPOSIT TYPES**

### **8.1 Lead Zinc Deposits**

Lead-zinc deposition on the Property is located mostly within the Reeves member dolomites. The deposits have been categorized as primary bedded Irish-Style Sedimentary Exhalative (SEDEX) deposits. Some zones within the deposits also display aspects indicative of replacement deposition within limestone.

### **8.2 Tungsten Deposits**

Tungsten mineralization has been discovered in two distinct environments. The first is skarn style mineralization where granitic intrusions contact the limestone. The second is in favourable zones within the Truman member as stratabound disseminate mineralization.

### **8.3 Gold Deposition**

Gold values have been obtained from areas historically mined for tungsten. Work by Sultan minerals indicated that the gold is believed to be skarn-related, occurring in silicified horizons with pyrite, pyrrhotite, arsenopyrite, stibnite and native bismuth.

### **8.4 Molybdenum Porphyry**

At different periods during exploration and development of lead-zinc and tungsten deposits on the property, quartz stockwork veining and alteration zones suggested the potential for gold mineralization within the granites underlying the existing mined areas. As well, mapping of underground headings and sampling of diamond drill core during mining operations indicated the presence of molybdenite within these porphyry-style veined zones. Based on these positive indicators, in 2005 and 2006, and 2007 exploration focused on molybdenum including diamond drilling within the Dodger zone.

## **9.0) MINERALIZATION**

Mineralization on the Jersey property is associated with the east limb of a complex major anticlinal structure referred to locally as the Jersey anticline and regionally as the Salmo River anticline. The HB lead-zinc mine located four kilometres to the north and the Reeves MacDonald lead-zinc mine located ten kilometres to the south are also associated with this major structure.

Several zones of significant and often very different mineralization have been identified on the property. Historically mined areas produced lead-zinc and tungsten, with known areas of high

molybdenum, gold, bismuth, arsenic, copper, silver, cadmium and barium. Work done by Sultan Minerals outlined numerous mineralized zones that are discussed below, along with the historically known mineralized zones.

## **9.1 Lead Zinc Zones**

### **Jersey Lead-Zinc Deposit**

The Jersey lead-zinc deposit occurs in dolomite near the base of the Reeves limestone member. Five ore bands, ranging in thickness from 0.3 to 9.0 metres were mined. These bands in order of stratigraphic sequence are: 1) upper lead band; 2) upper zinc band; 3) middle zinc band; 4) lower zinc band; 5) lower lead band. The five ore bands are locally very close together and in the A Zone frequently have been mined as a unit up to 24 metres thick. Ore mineralization consists of fine-grained sphalerite and galena with pyrite, pyrrhotite and minor arsenopyrite. Cadmium is associated with the sphalerite and silver with galena. Iron content of the sphalerite is low, about 6%. The overall grade for the 7,968,080 tons milled averaged 3.83% zinc and 1.95% lead. Mining ceased in 1970 with unmined reserves of 106,000 tons grading 3.10% zinc and 0.80% lead.

### **Emerald Lead-Zinc Deposit**

The Emerald lead-zinc deposit is located immediately to the north of the Jersey lead-zinc deposit, along the same host structure. Mineralization in the Emerald lead-zinc mine consists of banded limestone and dolomite of the Reeves Member hosting stratabound lead and zinc bands.

## **9.2 Gold Zones**

### **Bismuth Gold Zone**

The Bismuth Gold Zone (known in the underground workings as part of the F zone) is located along the east side of the Jersey lead-zinc deposit at the contact between the Reeves limestone and the underlying Reeves dolomite. Gold mineralization was initially recognized here in 1963 when Placer Dome obtained 0.12 oz/t (3.4 g/t) gold from four samples assayed from an extensive native bismuth and arsenopyrite bearing zone. The zone was intersected while exploring the Jersey lead-zinc deposit and the underlying East Dodger tungsten zone. The zone was rediscovered in 1993 by the present property owners while inspecting Placer Dome drill logs. The gold mineralization, believed to be skarn-related, occurs in a silicified horizon with pyrite, pyrrhotite, arsenopyrite, stibnite and native bismuth. Underground samples assay up to 0.28 oz/t (8.0 g/t) gold across widths of 96.0 centimetres. Placer Dome drill logs suggest that this siliceous zone may be 20 metres or more in thickness. It was intersected in four surface drill holes along a strike length of 300 metres.

## **#1 Zone**

The #1 Zone is located in the area of the 1994 diamond drill holes DDH94-1 and 2. This zone is located along the contact of the Reeves limestone and the Emerald argillite members where they trend south from the Emerald Tungsten open pit mine.

A series of small to large pits and trenches trend for 300 metres along the limestone-argillite contact. In the workings, rusty banded sulphide mineralization occurs with iron oxides (limonite and goethite) and coarsely recrystallized limestone. Sulphide mineralization occurs as massive pyrrhotite bands, which return high values for arsenic, copper and zinc, with minor gold, silver and molybdenum.

## **Emerald Gold Zone**

The Emerald gold zone was first recognized in 1895 and may be coincident with the Emerald tungsten zone. The zone was prospected for gold from 1895 to 1906 and assays up to 3.5 oz/t (100.0 g/t) were reported. After the lead-zinc potential of the property was recognized in 1906 and later with the discovery of the tungsten mineralization over this area the gold potential of this zone was not explored. The zone was rediscovered in 1993 when the current property owners found that free gold could be panned from the tungsten tailings. Gold mineralization has been found to be associated with the quartz and pyrrhotite rich sections of the skarn and sulphide-type tungsten zones.

The Emerald gold zone occurs along the contact with the Reeves limestone and Emerald argillite, and trends from the Emerald Tungsten deposit towards the #1 Zone. These three areas may actually represent mineral zonations grading away from the Emerald Stock.

## **Leroy Gold Zone**

The Leroy gold zone is located approximately one kilometre north of the Emerald gold and tungsten zones. Gold mineralization was discovered here in the late 1890's and the zone was explored with a series of pits, adits and hand trenches along an 800 metre strike length. Gold exploration ceased with the discovery of lead-zinc in 1906.

Over the Leroy zone gold mineralization is associated with pyrrhotite, pyrite and native bismuth in a silicified horizon at the contact between the Reeves limestone member and the Emerald argillite member. Recent sampling of this zone gave gold grades up to 0.898 oz/t (25.5 g/t) from grab samples and up to 0.174 oz/t (4.8 g/t) across a true width of 3.0 metres for chip samples.

## **ABC Zone**

The ABC zone occurs just to the east of the Jersey and Dodger underground workings along the Iron Mountain Fault. This major fault structure represents the contact of the Ordovician Active Formation argillites with the Cambrian Reeves Member limestones.

Anomalous samples were collected from slices of pyritic garnet-diopside skarn bands entirely within Active Formation argillite, but adjacent to the Reeves limestones. Rusty, limonitic, decomposed argillite(?) with minor quartz stockworking is found on the west side of the skarn banding. Sulphide mineralization is confined to pyrite within the skarn bands, with limonite occurring adjacent to this unit. Assays indicate the presence of high arsenic and minor gold, molybdenum and lead values.

## **9.3 Tungsten Zones**

### **Dodger Tungsten Deposit**

Near the Jersey Lead-Zinc Mine, skarn-type tungsten mineralization occurs where the Cretaceous intrusions are in contact with either of the calcareous Truman or Reeves members. Tungsten was mined from two distinct zones on the property: The Dodger zone located along the east side of the Jersey lead-zinc deposit; and the Emerald zone comprised of the Emerald, Feeney and Invincible deposits located along the west side of the lead-zinc deposit.

The Dodger tungsten skarn deposit is comprised of three zones with finely disseminated scheelite grains in light brown to green garnet-diopside skarn. The conformable deposit occurs in a skarnified limestone unit near the top of the Truman Member. The mineralized zones are separated by a tongue of granite believed to be an appendage of the Dodger Stock.

In this deposit, scheelite is accompanied by pyrrhotite, biotite, quartz, molybdenite and minor powellite. The ore zones range from 2.0 to 9.0 metres in width and average 3.0 metres.

The Dodger tungsten zone was mined intermittently from 1951 to 1973 and averaged 0.56%  $\text{WO}_3$  for 521,023 tons of production. Production ceased in 1973 leaving unmined reserves of 42,500 tons grading 0.45%  $\text{WO}_3$ . During the final year of operation extensive reserves of low grade ore were found to the north and south of the East Dodger deposit. These reserves were not developed due to low tungsten prices.

### **Dodger "D" Zone**

The Dodger "D" Zone is represented by a series of pits and trenches located along the contact of the Dodger Stock and skarnified Truman Member argillites. This zone is located about 300 metres southwest of the Dodger 4400 Adit.

In the vicinity of the workings, the Dodger Stock is pegmatitic, consisting entirely of white quartz and feldspar phenocrysts up to 15 centimetres diameter. The workings are located within very rusty, skarn banded Truman Member sediments. Visible mineralization consists of massive to disseminated and banded pyrrhotite, pyrite, bismuth, molybdenite, and chalcopyrite, with assays also indicating the presence of gold, zinc, and tungsten.

## **Emerald Tungsten Deposit**

The Emerald tungsten deposit occurs along the contact between the Reeves limestone member and the Emerald argillite member, located along the west side of the Emerald stock. Within the deposit four distinct types of mineralization are recognized: skarn, sulphide, greisen, and quartz ores. The skarn-type of ore occurs mainly along or near the limestone argillite contact. It consists of garnet, diopside, calcite and quartz with lesser amounts of pyrrhotite, pyrite, scheelite and molybdenite. The sulphide-type of ore, consisting of pyrrhotite, calcite, biotite and scheelite, is often spatially associated with the skarn mineralization and consists of irregularly shaped "replacement" bodies in limestone and dolomite. Locally quartz, pyrite, molybdenite and chalcopyrite may be present. The greisen-type of ore occurs in altered granite and extends up to 12 metres into the granite from the limestone contact. The ore consists of potash feldspar - in some places completely kaolinized, abundant quartz, sericite, pyrite, tourmaline and scheelite. Locally, calcite, ankerite, apatite, pyrrhotite or molybdenite may be present. The quartz-type ore in many places grades into greisen. It consists of silicified limestone cut by numerous veins of quartz with ankerite, scheelite, minor molybdenite and apatite. The veins are enveloped by disseminated mineralization comprised of scheelite, pyrite, pyrrhotite and tremolite.

Scheelite is the main tungsten mineral but minor powellite and wolframite was also recovered. Most of the scheelite ore was recovered from lenticular skarn zones developed along the contact between the Emerald argillite and the Reeves limestone.

The Emerald tungsten zone was mined intermittently from 1943 to 1973. Grades ranged from 0.5 to 1.5%  $\text{WO}_3$  and averaged 0.86%  $\text{WO}_3$  for the entire 1,076,799 tons of production. Mining ceased in 1973 due to low tungsten prices leaving recoverable reserves of 34,800 tons grading 0.73%  $\text{WO}_3$ . Potential is believed to exist north of the Invincible and south of the Emerald deposits but due to low tungsten prices there was no incentive to explore and develop these potential reserves.

## **East Emerald Tungsten Zone**

The East Emerald Tungsten Zone, is located about 300 metres southwest of the Dodger 4400 Adit and approximately 100 metres stratigraphically above the Invincible Tungsten Deposit. Also referred to as the Dodger "D" Zone, it is represented by a series of pits and trenches located along the contact of the Dodger Stock and two parallel skarnified Truman Member argillite bands, each about 10 metres in thickness. Evidence of the potential for Dodger-type mineralization was provided in historic drilling to the north and east of the Emerald and Invincible mines.. This stratabound mineralization is in the stratigraphically higher metamorphosed Truman rocks. Twenty four(Wartime Metals) and sixteen(Canex) historic drill holes were completed through this zone, herein termed the East Emerald Zone. Drilling into this zone encountered tungsten-skarn mineralization adjacent to and distant from the granitic contact similar to that historically mined in the Dodger Tungsten deposit to the east. In 2006 Sultan Minerals completed a four hole drill program into this mineralized zone in order to verify the presence of the reported tungsten grades and the widths of

mineralization. A preliminary assessment of the potential of this zone is covered in this report.

These tungsten-bearing horizons have been shown by historical drilling and surface sampling to be more than 1,100 metres long and to extend up to 300 metres down dip. Drill logs show that the zone ranges from 4.0 feet (1.2 metres) to more than 60.0 feet (20.0 metres) in thickness with tungsten assays varying from less than 0.10% WO<sub>3</sub> to greater than 0.28% WO<sub>3</sub>.

In the vicinity of the workings, the Dodger Stock is pegmatitic, consisting entirely of white quartz and feldspar phenocrysts up to 15 centimetres in diameter. The workings are located within very rusty, skarn banded Truman Member sediments. Visible mineralization consists of massive to disseminated and banded pyrrhotite, pyrite, bismuth, molybdenite, and chalcopyrite, with assays also indicating the presence of gold, zinc, and molybdenum with the tungsten.

### **Invincible Tungsten Deposit**

The Invincible Tungsten Deposit is adjacent to the western margin of the Late Jurassic Dodger stock where it transects flat-lying beds of the Reeves Member limestone of the Lower Cambrian Laib Formation. The deposit lies 1,500 metres northeast and along strike, but on the east side of the Emerald granite stock from the Emerald tungsten deposit.

The orebody is bounded above and below by skarn and argillite of the Truman and Emerald members of the Laib Formation respectively. Most of the scheelite occurs in lenticular zones that extend at a high angle from the granitic stock, more or less conformable with layering of the host rocks. The scheelite occurs as fine, disseminated grains within garnet-diopside skarn and is accompanied by pyrite, pyrrhotite, minor powellite and traces of molybdenite and wolframite. Quartz is common in zones of mineralized granite.

The ore zone extends up to 24 metres from the stock, and may be more than 3 metres thick in places. The zone lies about 260 metres below surface and produced 256,480 tonnes of 0.65 per cent WO<sub>3</sub> from 1970 to 1973 (Geology, Exploration and Mining in British Columbia 1973, pages 54-57).. The northern extension of the Invincible mine remains untested.

### **Feeney Tungsten Deposit**

The Feeney tungsten deposit is located on the east side of the Emerald granitic stock along strike to the north of the Emerald mine and south of the Invincible mine. The zone forms a relatively shallow ore body within the Lower Cambrian Laib Formation along the granite-limestone contact between the Reeves Member limestone and Emerald Member argillite.

The mineralization consists of scheelite with minor powellite, rare wolframite and traces of molybdenite in a green and brown garnet-diopside skarn containing augite, actinolite,

epidote, pyrrhotite and quartz. Most of the scheelite occurs as fine, disseminated grains in lenticular skarn zones which extend from the granite contact out into the limestone-argillite country rock conformable to bedding. The skarn zones are up to 6 metres long and average about 2 metres in width. Grades are about 0.5 to 1.5 per cent tungsten. The Feeney mine operated between 1951 and 1955 and produced about 54,000 tonnes of ore averaging 0.92% WO<sub>3</sub> (Bulletin 41, page 119).

## **9.4 Molybdenum Zones**

### **Dodger Zone**

Molybdenum mineralization was noted in several areas within the historic Jersey, Dodger, Invincible, Emerald and Feeney mine workings. Follow-up work during 2000 to 2005 field seasons indicated that the most readily accessible area for initial molybdenum exploration is within the Dodger 4200 mine workings. These workings were found to be in good condition where access drifts were completed during the historic mining for tungsten. Mapping of the drifts indicated that the granitic rock that underlies the Dodger-type skarn tungsten mineralization contains porphyry style quartz veining with molybdenite mineralization.

Exploration of the molybdenum-bearing porphyry system, along the margin of the historic Dodger East Tungsten zone, revealed a stockwork of quartz veining and fractures with molybdenite. The general orientation of fractures and quartz veins was found to be cross-cutting north-south and east-west, with steep dips. Several high grade molybdenite zones were intersected, including 1% to 3% Mo over short widths of 3 to 5 feet (0.9 to 1.5 metres). The 20 hole drill program completed during the 2005 field season indicated the potential for larger volumes of lower grade molybdenum containing short sections of higher grade material. The current resource calculation summarized in this report has been undertaken to further assess this zone.

### **East Zone**

During the 1995 field season, a large mineralized zone was discovered to the east of the previous workings entirely within the Ordovician Active Formation argillites.

An anomalous area trending north-south for two kilometres and up to one kilometre wide contains significant copper, zinc, silver, barium and molybdenum values in soils. The black, shaly argillites are cross-cut by quartz stringers in many areas, but mineralization is believed to be hosted within the argillite beds.

## **Posie Zone**

The Posie claim occurs to the south of the Jersey lead-zinc mine, on the south side of Lost Creek. Preliminary work done on this claim in 1995, returned anomalous metal values from soil samples.

The Posie mineralized zone occurs within Ordovician Active Formation argillites with inter-fingered limestones of the Lower Cambrian Reeves Member in the north. The limestone tends to be skarnified in some areas, while other areas have the appearance of fresh limestone but are completely silicified. A zone of anomalous soil sample results trends from Lost Creek south-southwest for over one kilometre, roughly following the argillite-limestone contact. Along this zone, soil samples are highly anomalous in copper, silver, zinc, cadmium and barium, with scattered elevated values for gold, tungsten and molybdenum .

## **10.0) EXPLORATION**

Sultan Minerals Inc has undertaken a number of exploration programs on the Jersey-Emerald Property. These have been summarized in the History section of this report. Perry Grunenberg (author) managed or monitored much of this work.

Perry Grunenberg has monitored the progress of exploration and has been involved in documenting periodic reports in the form of letters and news releases regarding the Jersey-Emerald property.

A total of 20 underground diamond drill holes and 2 surface drill holes were completed on the property for the exploration of molybdenum in 2005. The 20 underground drill holes were all located within areas of the Dodger Tungsten Mine workings, particularly the Dodger 4200 Drift North and associated cross-cuts, herein referred to as the Dodger 4200 zone. The 2 surface diamond drill holes were located at distance from the Dodger 4200 zone to the west and north to test for other potential zones of molybdenum mineralization. Drill hole locations are provided on Figure 8.

In 2006, a total of 431 metres of drilling in 4 drill holes was completed on the Emerald East Tungsten zone. This drilling was located in an area of historic diamond drilling for tungsten mineralization that was carried out when mining for tungsten was active on the property. This tested for grade and continuity of tungsten mineralization, and provided verification of results presented in drill logs and maps contained in the historic information.

Following completion of a preliminary resource estimate in early 2006, Sultan continued drilling within the East Emerald zone with an additional 4 drill holes totalling 585 metres (1918 feet). In 2007, Wardrop completed a technical report for Sultan that involved developing conceptual design of all aspects of the project, including mine design, mineral processing, tailings disposal, concentrate transportation and economic evaluation.

Sultan utilized the results of the Wardrop study as a guide for further exploration for tungsten and molybdenum on the property.



In 2007, Sultan completed a total of 19 underground drill holes totalling 3886 metres (12,749 feet). This drilling was primarily designed to follow up the molybdenum mineralization outlined by previous drilling in the East Dodger zone. Sultan continued drilling on surface, with an additional 61 drill holes totalling 9147 metres (30,010 feet). These drill holes were distributed over the property in order to test for lead-zinc, molybdenum and tungsten mineralization. Prior to the writing of this report, nineteen drill holes were completed within the East Emerald tungsten zone target area, the results of which were used in this resource evaluation.

Sultan is continuing exploration, including database update and diamond drilling, of the Jersey property into 2008.

## **11.0) DRILLING**

Sultan Minerals Inc completed a number of drill programs during exploration for gold, tungsten and lead-zinc on the property. These programs have been summarized in the History section of this report. Prior to 2005 a total of 3,031 metres of diamond drilling were completed by Sultan Minerals on the property.

Sultan Minerals directed exploration primarily towards the molybdenum and tungsten potential of the property from 2005-2008, with lesser exploration for lead and zinc. This work was conducted over a large area of the property, within and adjacent to the historic workings. Drilling took place within an approximate 2.5 square kilometre area.

### **Molybdenum Exploration**

As of writing of this report, Sultan has completed 51 diamond drill holes totalling 9,297 metres (30,501 feet) within the East Dodger Molybdenum zone. Results of the most recent drilling completed in 2008 are currently being compiled and assessed.

Molybdenum mineralization has been intersected in many sections of the underground drill holes. The mineralization is comprised of a network of high-grade molybdenite bearing quartz veins hosted within a granite intrusive body. The grade of the mineralization is variable over the 1,000-foot (300 metre) long zone and is highest in areas where there are a greater number of veins. Assay results from this drilling included drill hole JM05-02 which assayed 0.13% Mo over its entire 58.5 metre (192 foot) length, and hole 3 which averaged 0.068% MoS<sub>2</sub> over 150.9 metres (495 feet). Assays as high as 3% Mo over 1 metre lengths were also encountered.

Continued drilling within the underground Dodger 4200 zone was designed to more fully assess the molybdenum potential within the zone. Sultan is contemplating completion of an updated preliminary resource calculation to reflect continued exploration of the zone. Drilling of the zone indicates the potential for large volumes of lower grade molybdenum

mineralization (0.05 to 0.1% Mo) containing more limited zones of high grade mineralization (0.5 to 1% Mo).

### **Tungsten Exploration**

To date Sultan has completed a total of 24 diamond drill holes totalling 3689 metres (12,102 feet) within the Emerald East Tungsten target area. This drilling was designed to intersect a skarn band that was shown to contain tungsten mineralization as evidenced by historic diamond drilling conducted during the 1940's to the 1970's. The tungsten bearing bedrock had also been historically trenched and sampled, suggesting that mineralization extends to surface. Tungsten, as scheelite, was intersected within the drill holes, associated with a skarn band that is located marginal to, and extends northward from, the Emerald Tungsten mine workings.

Sultan is currently testing the shallow, in places extending to surface, mineralization by completing a series of short diamond drill holes.

## **12.0) SAMPLING METHOD AND APPROACH**

Drill core was removed from each drill site at the end of each shift. Drill core was logged at a fenced compound facility located on the property near Salmo. Following drill core logging and sample layout, the core was split using a standard manual core splitter, and, for some intervals by using a diamond saw. One half of the core was then placed in a sample bag labelled with an assay tag number and the second half returned to the core box with its location marked with the same assay tag number.

Sample intervals were determined based on lithological changes, structures and observed mineralization within the core. Minimum sample intervals were set at approximately 1 metre (3 feet).

## **13.0) SAMPLE PREPARATION, ANALYSES AND SECURITY**

The core to be assayed was shipped by trucking company from site directly to one of two laboratories located in Vancouver, BC. This included Acme Labs Ltd and Assayers Canada Ltd. All sample preparation was done at the laboratory by their staff.

Laboratories utilized by Sultan are registered with ISO 9001:2000 accreditation. The International Standards Organization (ISO) adopted a series of guidelines (ISO 9000 to 9004) for the global standardization of Quality Assurance for products and services. A company seeking accreditation must implement and maintain a quality assurance system that is compliant with one of the three applicable models (i.e. ISO 9001, 9002 or 9003). Some of the aspects specifically addressed in a quality assurance system include:

- Responsibility of management in defining and achieving quality goals,
- Contract review to ensure customer needs are understood and met,
- Procurement of supplies and services capable of delivering the desired level of quality,

- Handling of material supplied by the customer to ensure integrity,
- Controlling processes to ensure consistency of quality,
- Inspection and testing to ensure that all work meets or exceeds quality criteria,
- Correction and prevention of non-conformities (errors),
- Training of staff, and
- Statistical analysis to ensure quality criteria are met.

The Labs utilize standards and duplicate analysis of samples as part of their quality assurance. The laboratory identifies and remedies situations where the analysis of duplicates or standards is not within allowable levels of variation.

Perry Grunenberg personally monitored procedures for sample collection and delivery to courier in either Salmo or Castlegar, BC. From point of collection until delivery to the courier, the samples were under complete control of Sultan Minerals contractors.

The assay laboratories catalogue all samples and assure a complete chain of custody of each sample through the analytical process. The samples were analyzed for greater than 30 elements by ICP methodology. In the analysis a representative sample is crushed and pulverized to 95% passing 150 mesh. A split of minimum 15 gram is leached in hot Aqua Regia. The resulting solution is analyzed by ICP-ES and ICP-MS. The lab reports that solubility of some elements will be limited depending on mineral species present. Samples that returned elevated levels of either molybdenum or tungsten were further analyzed by more complete leaching, and analysis by ICP-ES.

## **14.0) DATA VERIFICATION**

Data used in the preparation of this report were predominantly generated by Sultan Minerals Inc. during past and current exploration programs. All data is stored in Sultan's office in Vancouver and within the exploration office located in Salmo, BC. Perry Grunenberg managed or otherwise participated in most of the previous exploration. There appears to be no reason to doubt the accuracy or veracity of the geological exploration data that is presented as written material and as illustrations on maps, sections or diagrams.

Historic drilling dating from as early as the 1940's provided a great amount of data to the database used by Sultan to establish areas of interest for further exploration. In particular, drilling performed by Wartime Metals in the East Emerald Tungsten target area was instrumental in indicating the potential of that area. Drilling in 2006, 2007 and 2008 by Sultan Minerals has verified the existence of this mineralization, with grades intersected in recent drilling verifying the grades reported in the historic drill logs.

### **Assay Checks With a Second Laboratory**

During the program it was standard practice to have the lab crush, pulverize and split out two 250 gram samples. One sample was for analysis and the second was for storage. A

representative from Sultan would pick up the second pulps and selections would be made for submittal to an alternative laboratory for reanalysis.

In 2006 and 2007, reanalysis for tungsten was done by Becquerel Laboratories Inc. in Ontario using neutron activation procedures. The inter lab precision was an excellent 12.3 %. In 2006, the comparison of the two sets of tungsten assays show the Becquerel Laboratories results to be 8.52% higher.

The higher results for the neutron activation analysis were expected as this method will determine total tungsten content of the sample while the acid digestion procedure used by Acme will not determine encapsulated tungsten.

In 2007 an additional 17 samples were sent to Becquerel Laboratories Inc. as a check on the Primary Lab Acme. The mean grade of samples from Becquerel was 2232 ppm compared to 2286 ppm determined by Acme with a correlation of coefficient between the two data sets an excellent 0.9999. The scatter plot below shows a slight proportional bias (Bequerel underestimating W relative to Acme) with the best fit regression line pulled slightly away from the equal value line based on one very high sample (164000 ppm at Bequerel vs 174000 ppm at Acme). There is no apparent bias present in the remaining samples and the overall sampling precision between the two labs is  $\pm 4.3\%$ .

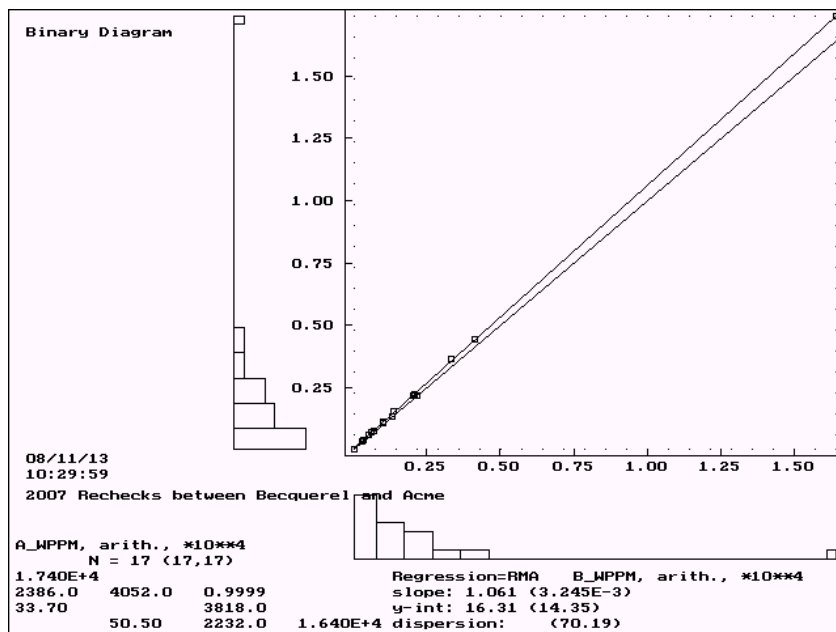


FIGURE 6: 2007 Lab Check Scatter Plot for samples at Becquerel (B\_WPPM) vs. Acme (A\_WPPM)

During the resource estimation numerous checks of the digital database through basic software analysis identified typos which were corrected from original drill hole logs and assay sheets. The level of data accuracy was within industry standards for a resource estimation.

## 15.0) ADJACENT PROPERTIES

The area around the Jersey-Emerald property has undergone extensive historic exploration and development. A listing of Minfile occurrences from the BC Ministry of Energy and Mines website indicates numerous past producers in close proximity to the Jersey Emerald. A summary of the significant listings are provided below. The information presented is not necessarily indicative of the mineralization on Sultan Minerals Inc Jersey-Emerald Property.

### 15.1 Molly

The Molly molybdenum property is located at about 1219 metres elevation on the south side of Lost Creek, 12.8 kilometres south-southeast of Salmo. The 4 claims comprising the property were the Bromyrite King, Bromyrite, Molybdenite, and Molybdenum No.1. In 1914, the property was leased for 6 months to Bell brothers of Salmo and molybdenum ore was shipped to Denver, Colorado from open cuts and pits. Early in 1915 the property was leased for one year to B.C. Molybdenite Company, Limited and additional ore was shipped to Denver. In 1916, the property was under lease to International Molybdenum Company, Limited who shipped about 90 tonnes of ore to their plant at Renfrew, Ontario. The original owners resumed work on the property in 1917 and shipped about 45 tonnes of ore to the Mines Branch, Ottawa.

The property was restaked as the Molly and Molly 1-9 claims (Lots 14232-14241 respectively). The Consolidated Mining and Smelting Company of Canada Limited purchased the property in 1926 and a small amount of underground work and diamond drilling was carried out the following year. The claims were Crown-granted to the company in 1930. The workings at that time included about 30 metres of drift and crosscut, an 18-metre raise, and a winze.

Scheelite was discovered on the Molly 4 claim, about 305 metres southeast and 122 metres above the molybdenum showing, by Joe Gollo, of Howser, in 1942; the company carried out considerable exploration for scheelite that same year. Further work by the company on the molybdenum showing during the period July 1942-February 1943 included 35 metres of crosscut, 21 metres of drift, and a 5-metre raise; a small tonnage of ore was mined but not shipped.

The Molly mine is hosted by granites of the Lost Creek stock of the Middle to Late Jurassic Nelson Intrusions, which are intruded into a sequence of argillites and limy argillites of the Ordovician Active Formation. The granite is quartz rich and appears to have an upper fine-grained, aplitic chilled zone or border capping in the order of 2 metres thick.

The aplite is sparsely impregnated with molybdenum but the main molybdenum ore occurs below this capping within a zone about 3 metres thick containing numerous joints parallel to the intrusive contact. The best mineralization appears within this sheeted zone where the intrusive contact dips at low angles and/or where there are prominent fractures intersecting this sheeting. Molybdenite occurs as selvages on the joint planes or

disseminated between the joints. The more massive granite below the sheeted zone is host to very little molybdenite. Tungsten, as scheelite, occurs locally disseminated in skarn zones of small size.

Records indicate that the Molly mine produced at least 171 tonnes of ore which carried 3.5 to 5.88 per cent MoS<sub>2</sub>. From 1914 to 1917, a total of 11,366 kilograms of molybdenum were produced. Minor pyrite, pyrrhotite, and uraninite are also associated with the deposit. A sample assayed 0.13 equivalent uranium (Geological Survey of Canada, Economic Geology #16).

## **15.2 HB**

The HB property is located on Aspen Creek, a tributary of Sheep Creek, directly north of the Jersey-Emerald property. The north end of the No. 1 ore body outcropped at an elevation of 1219 metres, west of Aspen Creek and almost a 1.6 kilometres north of Sheep Creek.

The Consolidated Mining and Smelting Company of Canada (Limited) optioned the claims in 1911. The No. 2 level crosscut was driven during the winter but results were disappointing and the option was dropped in 1912. On the expiry of the lease the entire property was optioned to a Spokane syndicate operating under the name Hudson Bay Zinc Company. The low level No. 7 crosscut (3,100 level) was started in 1915 and reached a length of 579 metres on completion in 1916. Diamond drilling (473 metres) from the crosscut failed to find ore and the option was given up in 1917. Exploration work was all done in the heavily oxidized zone at the north and on No. 1 ore body where the flat-plunging ore was exposed on surface. The Consolidated Mining and Smelting Company returned in 1927 and starting about 1946, the company began geological investigations that led to an intensive diamond drilling program beginning in 1948. Large bodies of low-grade disseminated sulphides plunging gently south from the oxidized ore body were indicated by this drilling. In 1951 construction of a 1,000 ton per day concentrator began and a new adit level (No. 8) was driven 823 metres north from the Sheep Creek valley mill site to the ore zone.

David Minerals Ltd. by an agreement dated May 8, 1981 purchased the mine, mill and adjacent properties from Cominco Ltd. Renovation of the H.B. mill was carried out to prepare a flotation circuit to custom mill gold-bearing sulphide ores, and a second circuit to treat molybdenite-gold ore from the company's Rossland properties. A gold circuit was put into operation for a short period on ore from the Gold Belt property in December 1981.

The HB ore bodies are currently thought to be Kootenay Arc-type carbonate hosted sedimentary exhalative (sedex) deposits. The ore bodies are located within dolomitized limestone of the Lower Cambrian Laib Formation, Reeves Member (correlative with limestone of the Badshot Formation). The east boundary of the Laib Formation is in contact with argillites of the Lower to Middle Ordovician Active Formation, on a fault contact, with the Active rocks overthrust from the east over the Reeves rocks.

Two distinct calcareous layers of the Reeves Member can be recognized in the area, an upper one about 110 metres thick separated from a lower 12-metre member by 15 to 30 metres of micaceous brown limey argillite. The HB ore bodies occur within a hundred metres or so to the west of the thrust fault. It is thought that the mineralization is related to the intrusion of granitic stocks of the Middle to Late Jurassic Nelson Intrusions with the nearest outcrop about 1 kilometre away from the mine. The only intrusives present in the mine are post-ore diabase dykes up to 3 metres thick.

In the vicinity of the HB mine, the beds are folded into a broad synclinorium, and the limestone layers in the mine are on the west limb of this structure. The principal ore zones consist of three steeply dipping, parallel zones lying approximately side by side and extending as pencil-like shoots for about 900 metres along the gentle south plunge of the controlling structures. The largest and most easterly ore zone has a maximum height of about 140 metres and a maximum width of 30 metres. Within these zones are steeply dipping discontinuous ore stringers with a lead to zinc ratio of 1:5. There is evidence to indicate ore deposition was controlled by shear zones within the folded limestone; the best ore concentrations occurring at the junctions between steeply dipping shears (the pencil-like ore bodies) and flat lying shears (the flat-lying brecciated ore bodies).

The mineralogy of the ore is relatively simple with pyrite, sphalerite and galena in order of abundance and minor pyrrhotite found locally. The northern portion of these bodies is exposed at surface, near the original HB claim, and are oxidized to a depth of about 100 metres at that point. A smaller zone, located to the southwest of the main HB mine, is known as the Garnet ore body. The Garnet zone was mined from the surface from a small open pit, whereas the main mine is entirely underground.

The HB mine produced a total of 6,656,101 tonnes of ore in 29 years between 1912 and 1978. Recovered from this ore were 29,425,521 grams of silver, 49,511,536 kilograms of lead, 260,431,646 kilograms of zinc, 2,019,586 kilograms of cadmium, 105,412 kilograms of copper and 6,159 grams of gold. Measured and indicated reserves published December 31, 1978 by Canadian Pacific Limited were given as approximately 36,287 tonnes grading 0.1 per cent lead and 4.1 per cent zinc (Energy, Mines and Resources Canada Mineral Bulletin MR 198, page 209).

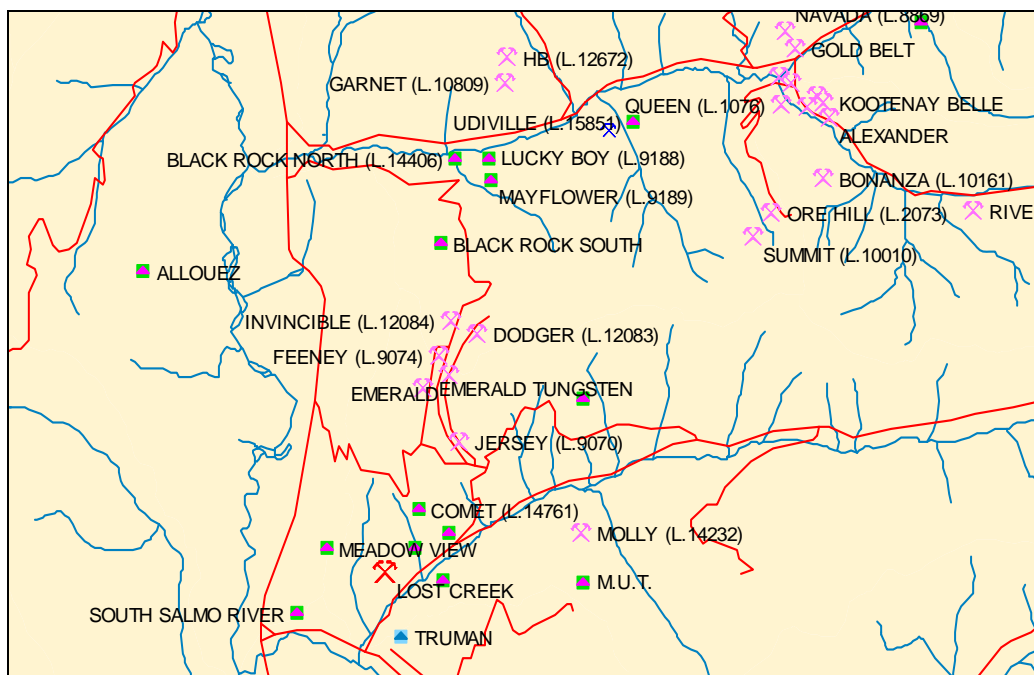
### **15.3 Summit, Ore Hill, Bonanza**

A series of historic mines that produced silver, gold, lead and zinc are located to the northeast of the Jersey-Emerald property. These are generally quartz vein occurrences that cut the Lower Cambrian Laib formation limestone and schist.

The Summit occurrence is a quartz-siderite vein deposit which contains erratically distributed pyrite, galena and sphalerite within a narrow fault zone striking 55 degrees and dipping southeast. Most of the mine production was from a 20 metre long "Glory Hole". Production from 1906 to 1938 totalled about 1094 tonnes which contained 27,059 grams of gold, 37,883 grams of silver, 13,728 kilograms of lead and 12,988 kilograms of zinc.

The Ore Hill vein deposit includes several adits with over 1000 metres of underground development. Between 1906 and 1940, a total of 2,241 tonnes of ore were mined and 88,612 grams of gold, 168,424 grams of silver, 80,257 kilograms of lead and 75,651 kilograms of zinc were recovered. South of the adits a trench exposes limestone in fault contact with schists. The fault strikes 050 degrees and dips 75 degrees southeast. A one metre wide lamprophyre dyke is injected along the fault and there is about 30 centimetres of fine-grained galena, sphalerite, pyrrhotite and pyrite on the footwall side, within highly altered limestones. North of this exposure, in the adits, the vein is about 45 centimetres wide within quartzite but narrows along strike as it crosscuts argillites. No mineralization is reported in the quartzite section.

The Bonanza North and South veins are developed by four adits on the Dip claim. About 17 tonnes were shipped in 1910 but the value of the shipment was not reported (Minister of Mines Annual Report 1910, page 110). In 1963, a total of 14 tonnes were mined, from which 124 grams of gold, 2,861 grams of silver and 118 kilograms of lead were recovered. Results of a 1982 sampling program indicates that there is an ore shoot above and below the second level on the North vein. Potential is indicated at depth where the productive horizon is projected to below an elevation of 914 metres. In 1983, 2720 tonnes of proven and possible ore at a grade of 18.86 grams per tonne gold was outlined on the North Bonanza vein (Assessment Report 11249). A later estimate of the ore on the property was reported to be 14,254 tonnes grading 10.28 grams per tonne gold (George Cross News Letter No.217 (November 12), 1987).



**Figure 7: Minfile Occurrence Locations (from BC Ministry of Energy and Mines website)**



## **16.0) MINERAL PROCESSING AND METALLURGICAL TESTING**

With regards to tungsten recoveries, the best information available is from the last few years of operation of the Invincible and East Dodger mines. According to Ed Lawrence, P.Eng., the mine manager for Placer Dome at that time, the total throughput was 370,600 short dry tons with a  $\text{WO}_3$  recovery of 81.5 % during the last two years of normal operations 1971-1972.

## 17.0) RESOURCE ESTIMATION

### 17.1 Tungsten Resource

This tungsten resource reported here is made up of several different discrete tungsten bearing zones: the Emerald (although partially mined as this zone surrounds old workings), the East Emerald and the Lower East Emerald (both to the North-northeast of the Emerald). These resources are additional to the Invincible, Dodger and East Dodger zones estimated in 2006 (see Giroux and Grunenberg, 2006).

#### 17.11 Statistics and Grade Capping

Data provided for the 2008 tungsten resource estimate consisted of 633 diamond drill holes totalling 121,248.6 ft. within the Emerald zones area. Of these 242 had intersections within the mineralized zones for a total of 42,303 ft. (see Appendix 1 for a listing of holes used in this study). Missing assays between assayed intervals were replaced with a nominal 0.0001 %  $\text{WO}_3$  taking the total number of assays to 7,732. Geologic domain 3 dimensional solids were constructed to constrain three mineralized areas: the Emerald Mine Area, East Emerald – Upper and East Emerald – Lower. The assays were compared to these solids and each assay within each domain was tagged. The statistics for assays within the Emerald Mine Area and those within the two East Emerald zones are tabulated below.

**Table 3**  
**Statistics for  $\text{WO}_3$  grades**

	<b>EMERALD Mine Area</b>	<b>EAST EMERALD</b>
	<b>Assayed Values</b>	<b>Assayed Values</b>
	<b><math>\text{WO}_3</math> %</b>	<b><math>\text{WO}_3</math> %</b>
Number	1,132	523
Mean	0.859	0.113
S.D.	1.809	0.182
Minimum	0.0001	0.0001
Maximum	22.35	2.08
Coef. Of Variation	2.11	1.62

Lognormal cumulative frequency plots were produced for  $\text{WO}_3$  assays in both the Emerald Mine and East Emerald Zones.

Within the Emerald mine zone a total of 5 overlapping lognormal populations were partitioned from the total data set. The partitioned populations are tabulated below.

**Table 4**  
**Individual Overlapping Populations for WO<sub>3</sub> in the Emerald Mine Zone**

Population	Mean WO <sub>3</sub> %	Proportion of Total Data Set	Number of Samples
1	10.53	1.01 %	11
2	2.56	17.05 %	193
3	0.70	22.75 %	258
4	0.16	13.16 %	149
5	0.0001	46.03 %	521

Population 1 appears to be erratic high grade that is widely scattered throughout the zone. A cap level of 2 standard deviations above the mean of population 2, a value of 8.0 % WO<sub>3</sub> was used to cap 16 assays.

Within the East Emerald zones a total of 6 overlapping lognormal populations were partitioned from the total data set. A similar strategy was used to cap 5 assays at 1.1 % WO<sub>3</sub>.

The effects of capping three samples, within the two zones, adjusted the mean grade and coefficient of variation slightly downward as shown in Table 13.

**Table 5**  
**Statistics for capped WO<sub>3</sub> grades**

	EMERALD WO <sub>3</sub> (%)	EAST EMERALD WO <sub>3</sub> %
Number	1,132	523
Mean	0.813	0.110
S.D.	1.520	0.158
Minimum	0.0001	0.0001
Maximum	8.00	1.10
Coef. Of Variation	1.87	1.44

## 17.12 Geologic Model

Based on cross sections and underground workings, QP P. Grunenberg built 3 dimensional geologic solids to outline the tungsten skarn zones (see Figure 15). Underground workings were modelled by A. Walcott.

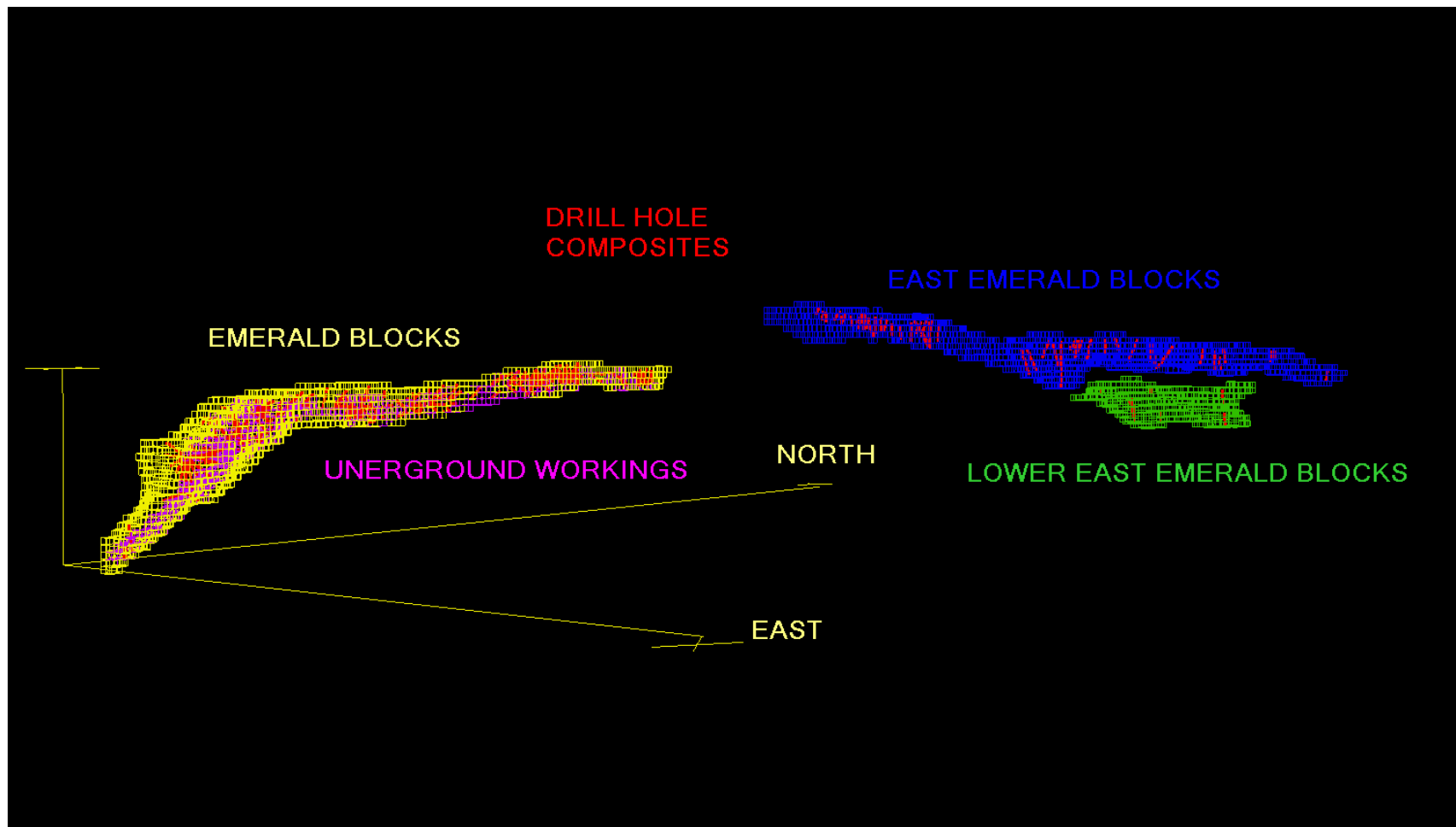


Figure 8: Isometric drawing of Mineralized Domains: Emerald in Yellow, East Emerald in Blue, Lower East Emerald in Green and Underground workings shown in Magenta. Drill hole composites are shown in red.

### 17.13 Compositing

All drill holes were “passed through” the geologic tungsten solids with the points each hole entered and left the solid determined. For all zones 10 foot (3.05 m) down hole composites were produced for the segments of drill holes within the mineralized solids. Composites less than 5 ft. (1.52 m) at the end of holes were joined with the adjoining samples to produce a uniform support of composites  $10 \pm 5$  ft. For intervals of holes with missing assays a nominal 0.0001 %  $\text{WO}_3$  was inserted. Statistics for 10 ft composites are shown in Table 14. Similar 10 ft. composites were also formed for the Waste material from parts of drill holes outside the mineralized solids.

**Table 6**  
**Statistics for 10 ft.  $\text{WO}_3$  Composites**

	<b>Emerald 10 ft. Composite <math>\text{WO}_3</math> %</b>	<b>East Emerald 10 ft. Composite <math>\text{WO}_3</math> %</b>	<b>East Emerald Lower 10 ft. Composite <math>\text{WO}_3</math> %</b>	<b>Waste 10 ft. Composite <math>\text{WO}_3</math> %</b>
Number of Composites	1,471	376	40	2,254
Mean % $\text{WO}_3$	0.263	0.070	0.041	0.016
Standard Deviation	0.717	0.098	0.063	0.077
Minimum Value % $\text{WO}_3$	0.0001	0.0001	0.0001	0.0001
Maximum Value % $\text{WO}_3$	6.003	0.749	0.239	1.000
Coefficient of Variation	2.72	1.40	1.52	4.78

### 17.14 Variography

Tungsten 10 ft. composites within the Emerald and Emerald East zones were examined using pairwise relative semivariograms. Nested anisotropic spherical models were fit along the strike of both zones. Maximum continuity of 300 ft. for tungsten mineralization was along azimuth 285 dip 0 within the Emerald Zone and at 220 ft. along azimuth 300 dip 0 within the East Emerald zones. There was insufficient data to model the East Emerald Lower zone so the East Emerald model was applied. The semivariogram parameters are summarized in Table 15 and the models are shown in Appendix 2.

**Table 7**  
**Semivariogram parameters for  $\text{WO}_3$**

<b>Zone</b>	<b>Variable</b>	<b>Azimuth</b>	<b>Dip</b>	<b>Nugget Effect</b>	<b>Short Structure</b>	<b>Long Structure</b>	<b>Short Range (ft)</b>	<b>Long Range (ft)</b>
Emerald	$\text{WO}_3$	15	0	0.50	0.25	0.35	20	80
		285	0	0.50	0.25	0.35	35	300
		0	-90	0.50	0.25	0.35	10	200
Emerald East	$\text{WO}_3$	30	0	0.40	0.20	0.50	10	50
		300	0	0.40	0.20	0.50	50	220
		0	-90	0.40	0.20	0.50	40	150
Waste	$\text{WO}_3$	Omni Directional		0.20	0.15	0.40	80	300

### 17.15 Block Model

Rotated block models with block dimensions 25 x 25 x 25 ft. were placed over all solids with the proportion of each block below the topographic surface and inside the solid recorded. The block model parameters are listed below.

Minimum Easting 7800 E	blocks 25 ft wide	72 columns
Minimum Northing 5000 N	blocks 25 ft long	256 rows
Maximum elevation 4650	blocks 25 ft high	66 levels
No Rotation		

For each block the percentage within underground workings was also recorded. The percentage of underground workings was always assumed to be within the mineralized solid and was subtracted out.

### 17.16 Grade Interpolation

Tungsten grades were interpolated into the block model by ordinary kriging. Each of the three solids was estimated using only composites within that solid. Search ellipses to constrain the ordinary kriging runs were based on the ranges of the semivariograms along the three principal directions of anisotropy. A minimum of 4 composites were required to estimate a block and a maximum of 12 composites were allowed. If more than 12 composites were found the closest 12 were used. The blocks were estimated in a series of runs or passes with the search ellipse for Pass 1 set at  $\frac{1}{4}$  the ranges of the semivariogram. For blocks not estimated during Pass 1 the search ellipse was expanded to  $\frac{1}{2}$  the ranges of the semivariogram and the kriging exercise was repeated. For blocks still not estimated the search ellipse was expanded to the full range of the semivariogram. Finally a fourth pass using dimensions of the search ellipse equal to twice the semivariogram range was completed to fill in blocks still not estimated. An isotropic search for estimated blocks containing some percentage of waste was completed in three passes and the waste part of the blocks was estimated from composites outside the mineralized zones.

**Table 8**  
**Kriging search strategy**

Zone	Pass	Direction	Dist. (ft)	Direction	Dist. (ft)	Direction	Dist. (ft)
Emerald	1	Az 15 Dip 0	20	Az 285 Dip 0	75	Az 0 Dip -90	50
	2	Az 15 Dip 0	40	Az 285 Dip 0	150	Az 0 Dip -90	100
	3	Az 15 Dip 0	80	Az 285 Dip 0	300	Az 0 Dip -90	200
	4	Az 15 Dip 0	160	Az 285 Dip 0	600	Az 0 Dip -90	400
East Emerald & East Emerald Lower	1	Az 30 Dip 0	12.5	Az 300 Dip 0	55	Az 0 Dip -90	37.5
	2	Az 30 Dip 0	25	Az 300 Dip 0	110	Az 0 Dip -90	75.0

	3	Az 30 Dip 0	50	Az 300 Dip 0	220	Az 0 Dip -90	150.0
	4	Az 30 Dip 0	100	Az 300 Dip 0	440	Az 0 Dip -90	300.0
Waste	1	Omni Directional			75		
	2	Omni Directional			150		
	3	Omni Directional			300		

### 17.17 Specific Gravity

During 2008, a total of 100 pieces of drill core from the East Emerald zone, were measured for specific gravity by the weight in air-weight in water method. The East Emerald Zone consists of finely disseminated scheelite grains in light brown to green garnet-diopside skarn. Samples were taken from both mineralized and unmineralized sections of core within the skarn zone with the results sorted into 5 grade ranges (see Table below).

**Table 9**  
**Summary of Specific Gravity Determinations in Emerald Tungsten Zone**

Sample Type	Sample Location	Hole Footage	Specific Gravity SG	0 to 0.05 % W	0.05 to 0.1 % W	0.1 to 0.3 % W	0.3 to 0.5 % W	>0.5 W %
Core	JS07-33	330	2.37	2.37				
		334	2.42		2.42			
		328	2.78			2.78		
		336	3.02				3.02	
		335	3.57					3.57
		364	2.74	2.74				
		371	3.61		3.61			
		368	2.92			2.92		
		368	3.31			3.31		
		369	2.84				2.84	
		371	3.16				3.16	
		370	3.08					3.08
		370	3.39					3.39
	JS07-34	327	3.09		3.09			
		412	3.08	3.08				
		435	2.79	2.79				
		443	2.53		2.53			
		422	3.19			3.19		
		425	2.73			2.73		
		421	2.67				2.67	
		421	3.42				3.42	
		420	3.19					3.19
		422	3.00					3.00
	JS07-36	203	3.46			3.46		
		203	3.21				3.21	

	202	<b>3.13</b>					3.13
	223	<b>3.13</b>	3.13				
	227	<b>3.14</b>			3.14		
	329	<b>3.33</b>	3.33				
	331	<b>3.32</b>		3.32			
	334	<b>3.37</b>			3.37		
	335	<b>3.31</b>				3.31	
JS07-37	183	<b>3.09</b>	3.09				
	173	<b>3.24</b>		3.24			
JS07-38	231	<b>3.31</b>	3.31				
	232	<b>3.29</b>		3.29			
	242	<b>3.44</b>			3.44		
	243	<b>3.36</b>				3.36	
	238	<b>3.32</b>					3.32
	244	<b>3.35</b>	3.35				
	248	<b>3.42</b>		3.42			
	246	<b>3.34</b>			3.34		
	244	<b>3.10</b>				3.10	
	337	<b>2.39</b>		2.39			
	333	<b>3.36</b>			3.36		
	336	<b>2.58</b>				2.58	
JS07-38	335	<b>3.24</b>					3.24
JS07-39	275	<b>2.73</b>	2.73				
	280	<b>3.25</b>		3.25			
	281	<b>3.24</b>			3.24		
	286	<b>3.13</b>				3.13	
	273	<b>2.87</b>					2.87
	285	<b>3.09</b>				3.09	
	274	<b>3.29</b>					3.29
JS07-40	128	<b>2.99</b>	2.99				
	134	<b>3.29</b>		3.29			
	138	<b>3.11</b>			3.11		
	135	<b>3.22</b>			3.22		
	137	<b>3.34</b>				3.34	
	136	<b>3.05</b>					3.05
JS07-41	224	<b>3.33</b>	3.33				
	231	<b>3.16</b>		3.16			
	227	<b>3.28</b>	3.28				
	230	<b>2.98</b>		2.98			
	228	<b>3.24</b>			3.24		
	235	<b>3.08</b>				3.08	
	240	<b>3.20</b>					3.20
	246	<b>2.86</b>	2.86				
	247	<b>2.84</b>			2.84		
	248	<b>3.25</b>				3.25	
	258	<b>3.32</b>					3.32
JS07-42	203	<b>3.29</b>			3.29		
	197	<b>3.38</b>				3.38	



	206	<b>3.35</b>					3.35
	204	<b>3.33</b>	3.33				
	213	<b>3.37</b>					3.37
JS07-46	118	<b>2.95</b>	2.95				
	120	<b>3.22</b>		3.22			
	169	<b>3.21</b>	3.21				
	173	<b>3.02</b>		3.02			
	174	<b>3.29</b>			3.29		
	176	<b>3.25</b>				3.25	
	174	<b>3.28</b>			3.28		
	176	<b>3.11</b>				3.11	
	175	<b>3.30</b>					3.30
JS07-47	150	<b>3.15</b>	3.15				
	141	<b>3.20</b>		3.20			
	142	<b>3.36</b>			3.36		
	143	<b>3.32</b>				3.32	
	222	<b>2.96</b>	2.96				
	219	<b>3.20</b>		3.20			
	220	<b>3.23</b>			3.23		
	221	<b>3.29</b>				3.29	
	221	<b>3.44</b>					3.44
JS07-46	233	<b>3.10</b>	3.10				
	232	<b>3.37</b>		3.37			
	240	<b>2.93</b>			2.93		
	237	<b>3.01</b>				3.01	
	234	<b>3.38</b>					3.38
JS07-47	225	<b>3.16</b>					3.16
<b>Averages</b>			<b>3.05</b>	<b>3.11</b>	<b>3.19</b>	<b>3.14</b>	<b>3.24</b>

Clearly, bulk density is a function of the tungsten grade within a sample. This increase in SG is also the result of increased garnet and diopside content with increased scheelite. Blocks within the mineralized zone but with grades less than 0.05 %  $\text{WO}_3$  were assigned an average SG of 3.05 (tonnage factor of 10.51 cu. ft./ton). Blocks with grades from 0.05 to 0.1 %  $\text{WO}_3$  were assigned a specific gravity of 3.11 (tonnage factor of 10.31 cu. ft./ton). Blocks with grades from 0.1 to 0.5 %  $\text{WO}_3$  were assigned a specific gravity of 3.16 (tonnage factor of 10.14 cu. ft./ton) the average of samples between 0.1 and 0.5 %  $\text{WO}_3$ . Blocks with grades greater than 0.5 %  $\text{WO}_3$  were assigned a value of 3.24 (tonnage factor of 9.89 cu. ft./ton). The parts of blocks in the waste surrounding the skarn zone were assigned a value of 2.77 (tonnage factor of 11.57 cu. ft./ton).

The Emerald Zone occurs along the contact between the Reeves limestone member and the Emerald argillite member located along the west side of the Emerald stock. This is a different geologic domain with scheelite mineralization accompanied by pyrrhotite, biotite and quartz. Within the deposit four distinct types of mineralization are recognized: skarn, sulphide, greisen, and quartz ores. The skarn-type of ore occurs mainly along or near the limestone argillite contact. It consists of garnet, diopside, calcite and quartz with lesser amounts of pyrrhotite, pyrite, scheelite and molybdenite. The sulphide-type of ore, consisting of pyrrhotite, calcite, biotite and scheelite, is often spatially associated with the skarn mineralization and consists of irregularly shaped "replacement" bodies in limestone and

dolomite. Locally quartz, pyrite, molybdenite and chalcopyrite may be present. The greisen-type of ore occurs in altered granite and extends up to 12 metres into the granite from the limestone contact. The ore consists of potash feldspar - in some places completely kaolinized, abundant quartz, sericite, pyrite, tourmaline and scheelite. Locally, calcite, ankerite, apatite, pyrrhotite or molybdenite may be present. The quartz-type ore in many places grades into greisen. It consists of silicified limestone cut by numerous veins of quartz with ankerite, scheelite, minor molybdenite and apatite. The veins are enveloped by disseminated mineralization comprised of scheelite, pyrite, pyrrhotite and tremolite.

Only historic drilling was used for the estimate on the Emerald and as a result no drill core was available to test. Ed Lawrence took samples from the dumps around the mine and tested them for specific gravity. A total of 21 samples of waste rock consisting mostly of Reeves limestone had an average specific gravity of 2.71 (tonnage factor of 11.83 cu. ft./ton). A total of 13 samples of mineralized rock with a high proportion of pyrrhotite present had an average specific gravity of 5.63. Considering the fact that the majority of this high grade style mineralization has been mined and using the geological sections of the Emerald mined stopes as a guide, Mr. Lawrence estimates to proportion of ore to waste in the remaining mineralized zone to be 15 to 85. Using these estimates, a reasonable specific gravity for the material remaining might be  $(.15 * 5.63) + (.85 * 2.71)$  or 3.15 (tonnage factor of 10.18 cu. ft./ton).

## 17.2 Classification

### 17.21 Introduction

Based on the study herein reported, the delineated mineralization at the Emerald Tungsten Zones 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 in 43-101 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,*

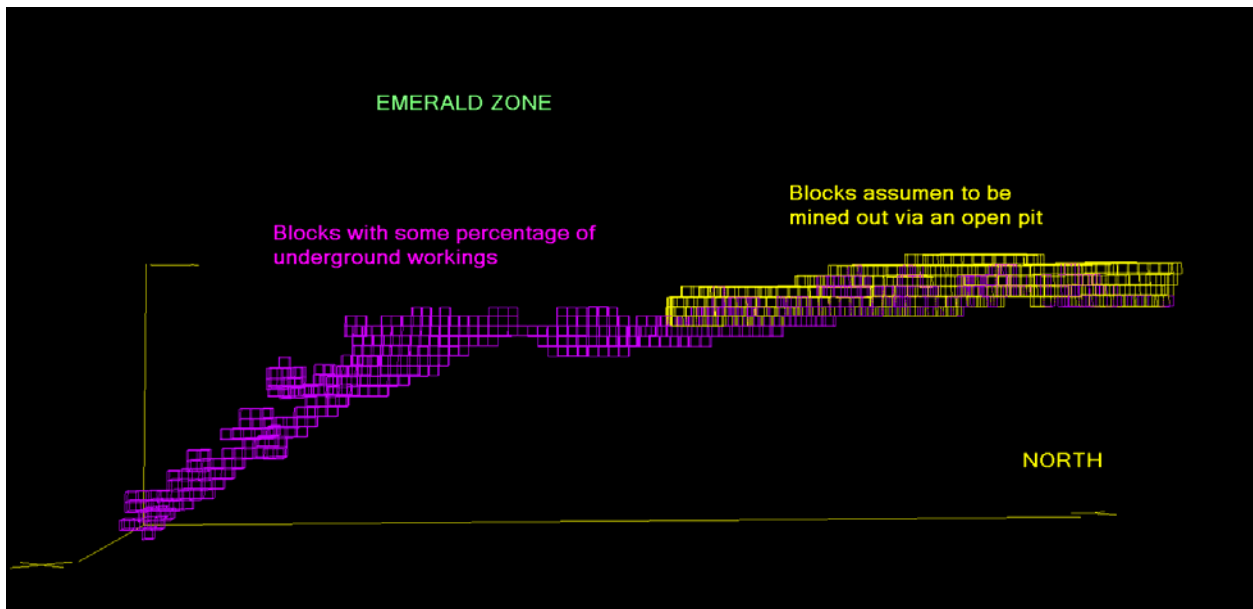
*geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.”*

### 17.22 Results

Geologic continuity of the Emerald tungsten zones has been established through underground mapping and diamond drilling. Grade continuity has been quantified through the use of the semivariograms. Within the Emerald Zone that surrounds the old mine workings all of the resource is classified as inferred at this time due to the lack of current drill holes and specific gravity determinations. For the East Emerald and East Emerald Lower zone the blocks are classified as Indicated and Inferred based on grade continuity. Blocks estimated in Pass 1 or 2 using search ellipse dimensions of up to ½ the semivariogram range were classified as Indicated. The remaining blocks estimated were classified as Inferred.

The following grade tonnage tables outline the results at a series of WO<sub>3</sub> cutoff grades. At this time no economic analysis has been completed and as a result no economic cutoff is known. A cutoff of 0.15 % WO<sub>3</sub> has been highlighted as a possible open pit cutoff while a cutoff of 0.24 % WO<sub>3</sub> might reflect underground mining.

For the Emerald zone the existing underground workings were modeled and the proportion of blocks mined out were removed from the resource. In addition for the Emerald Zone north of 6750 N and above the 3950 level all blocks were presumed to be mined out by the surface open pit and were removed from the resource.



**Figure 9: Isometric drawing showing blocks above the 3950 level and north of 6750 N (in yellow) that were removed from the resource in the open pit area.**

The results are presented in two forms. The tables titled Resource within Mineralized Solids reflect the grade and tonnage estimated if one could mine to the limits of the mineralized three dimensional solids. The tables titled Resource within Total Diluted Blocks reflect the grade and tonnage estimated if one had to mine to the limits of the 25 x 25 x 25 ft. blocks. The results obtained from actual mining would probably lie between these two extremes.

The results for the **mineralized solids** provide an **indicated** resource of 256,000 tons averaging 0.19% WO<sub>3</sub> at a 0.15% cutoff, and 18,000 tons with an average grade of 0.28% WO<sub>3</sub> at a 0.24% cutoff. The **inferred** resource is 1,122,000 tons with average grade of 0.27% WO<sub>3</sub> at 0.15% cutoff and 430,000 tons averaging 0.45% WO<sub>3</sub> at a cutoff of 0.24%.

The results for the **25 x 25 x 25 foot blocks** provide an **indicated** resource of 209,000 tons averaging 0.19% WO<sub>3</sub> at a 0.15% cutoff, and 12,000 tons averaging 0.29% WO<sub>3</sub> at a 0.24% cutoff. The **inferred** resource is 1,110,000 tons averaging 0.29% WO<sub>3</sub> at a 0.15% cutoff, and 470,000 tons averaging 0.43% WO<sub>3</sub> at a 0.24% cutoff.

<b>Table 10 : EMERALD AND EAST EMERALD ZONES INDICATED RESOURCE WITHIN MINERALIZED SOLIDS</b>			
<b>WO3 Cutoff</b>	<b>Tons&gt; Cutoff</b>	<b>Grade &gt; Cutoff</b>	<b>Pounds of</b>
<b>(%)</b>	<b>(tons)</b>	<b>WO3 %</b>	<b>WO3</b>
0.02	1,405,000	0.094	2,641,400
0.04	1,138,000	0.109	2,480,840
0.06	902,000	0.124	2,236,960
0.08	705,000	0.139	1,959,900
0.10	510,000	0.157	1,601,400
0.12	391,000	0.172	1,345,040
0.14	288,000	0.187	1,077,120
<b>0.15</b>	<b>256,000</b>	<b>0.192</b>	<b>983,040</b>
0.16	205,000	0.202	828,200
0.18	140,000	0.217	607,600
0.20	83,000	0.237	393,420
0.22	62,000	0.247	306,280
<b>0.24</b>	<b>18,000</b>	<b>0.282</b>	<b>101,520</b>
0.26	11,000	0.307	67,540
0.28	7,000	0.326	45,640
0.30	4,000	0.354	28,320

<b>Table 11 : EMERALD AND EAST EMERALD ZONES INFERRED RESOURCE WITHIN MINERALIZED SOLIDS</b>			
<b>WO3 Cutoff</b>	<b>Tons&gt; Cutoff</b>	<b>Grade &gt; Cutoff</b>	<b>Pounds of</b>
<b>(%)</b>	<b>(tons)</b>	<b>WO3 %</b>	<b>WO3</b>
0.02	6,480,000	0.111	14,385,600
0.04	5,340,000	0.129	13,777,200
0.06	4,220,000	0.150	12,660,000
0.08	3,310,000	0.172	11,386,400
0.10	2,580,000	0.195	10,062,000
0.12	1,980,000	0.221	8,751,600
0.14	1,520,000	0.249	7,569,600
<b>0.15</b>	<b>1,220,000</b>	<b>0.274</b>	<b>6,685,600</b>
0.16	930,000	0.312	5,803,200
0.18	750,000	0.345	5,175,000
0.20	570,000	0.394	4,491,600
0.22	500,000	0.419	4,190,000
<b>0.24</b>	<b>430,000</b>	<b>0.452</b>	<b>3,887,200</b>
0.26	380,000	0.478	3,632,800
0.28	350,000	0.497	3,479,000
0.30	320,000	0.513	3,283,200

<b>Table 12: EMERALD AND EAST EMERALD ZONES INDICATED RESOURCE WITHIN TOTAL DILUTED BLOCKS</b>			
<b>WO3 Cutoff</b>	<b>Tons&gt; Cutoff</b>	<b>Grade &gt; Cutoff</b>	<b>Pounds of</b>
<b>(%)</b>	<b>(tons)</b>	<b>WO3 %</b>	<b>WO3</b>
0.02	1,754,000	0.081	2,841,480
0.04	1,334,000	0.097	2,587,960
0.06	997,000	0.114	2,273,160
0.08	726,000	0.130	1,887,600
0.10	487,000	0.150	1,461,000
0.12	350,000	0.166	1,162,000
0.14	245,000	0.182	891,800
<b>0.15</b>	<b>209,000</b>	<b>0.188</b>	<b>785,840</b>
0.16	157,000	0.200	628,000
0.18	99,000	0.217	429,660
0.20	59,000	0.237	279,660
0.22	43,000	0.248	213,280
<b>0.24</b>	<b>12,000</b>	<b>0.291</b>	<b>69,840</b>
0.26	9,000	0.308	55,440
0.28	6,000	0.323	38,760
0.30	3,000	0.355	21,300

Table 13: EMERALD AND EAST EMERALD ZONES INFERRED RESOURCE WITHIN TOTAL DILUTED BLOCKS			
WO3 Cutoff	Tons> Cutoff	Grade > Cutoff	Pounds of
(%)	(tons)	WO3 %	WO3
0.02	8,640,000	0.093	16,070,400
0.04	6,460,000	0.115	14,858,000
0.06	4,590,000	0.142	13,035,600
0.08	3,320,000	0.169	11,221,600
0.10	2,490,000	0.196	9,760,800
0.12	1,840,000	0.226	8,316,800
0.14	1,370,000	0.259	7,096,600
<b>0.15</b>	<b>1,110,000</b>	<b>0.285</b>	<b>6,327,000</b>
0.16	930,000	0.311	5,784,600
0.18	760,000	0.343	5,213,600
0.20	600,000	0.383	4,596,000
0.22	550,000	0.399	4,389,000
<b>0.24</b>	<b>470,000</b>	<b>0.429</b>	<b>4,032,600</b>
0.26	410,000	0.455	3,731,000
0.28	370,000	0.476	3,522,400
0.30	340,000	0.492	3,345,600

Table 14: EMERALD ZONE INFERRED RESOURCE WITHIN MINERALIZED SOLIDS			
WO3 Cutoff	Tons> Cutoff	Grade > Cutoff	Pounds of
(%)	(tons)	WO3 %	WO3
0.02	2,200,000	0.160	7,040,000
0.04	1,850,000	0.184	6,808,000
0.06	1,510,000	0.215	6,493,000
0.08	1,230,000	0.247	6,076,200
0.10	1,040,000	0.276	5,740,800
0.12	890,000	0.303	5,393,400
0.14	760,000	0.334	5,076,800
<b>0.15</b>	<b>710,000</b>	<b>0.346</b>	<b>4,913,200</b>
0.16	670,000	0.358	4,797,200
0.18	600,000	0.380	4,560,000
0.20	540,000	0.404	4,363,200
0.22	470,000	0.429	4,032,600
<b>0.24</b>	<b>420,000</b>	<b>0.455</b>	<b>3,822,000</b>
0.26	370,000	0.483	3,574,200
0.28	340,000	0.503	3,420,400
0.30	310,000	0.520	3,224,000

Table 15: EAST EMERALD ZONES INDICATED RESOURCE WITHIN MINERALIZED SOLIDS			
WO3 Cutoff	Tons> Cutoff	Grade > Cutoff	Pounds of
(%)	(tons)	WO3 %	WO3
0.02	1,405,000	0.094	2,641,400
0.04	1,138,000	0.109	2,480,840
0.06	902,000	0.124	2,236,960
0.08	705,000	0.139	1,959,900
0.10	510,000	0.157	1,601,400
0.12	391,000	0.172	1,345,040
0.14	288,000	0.187	1,077,120
<b>0.15</b>	<b>256,000</b>	<b>0.192</b>	<b>983,040</b>
0.16	205,000	0.202	828,200
0.18	140,000	0.217	607,600
0.20	83,000	0.237	393,420
0.22	62,000	0.247	306,280
<b>0.24</b>	<b>18,000</b>	<b>0.282</b>	<b>101,520</b>
0.26	11,000	0.307	67,540
0.28	7,000	0.326	45,640
0.30	4,000	0.354	28,320

Table 16: EAST EMERALD ZONES INFERRED RESOURCE WITHIN MINERALIZED SOLIDS			
WO3 Cutoff	Tons> Cutoff	Grade > Cutoff	Pounds of
(%)	(tons)	WO3 %	WO3
0.02	4,280,000	0.087	7,447,200
0.04	3,490,000	0.099	6,910,200
0.06	2,710,000	0.114	6,178,800
0.08	2,080,000	0.127	5,283,200
0.10	1,540,000	0.141	4,342,800
0.12	1,090,000	0.154	3,357,200
0.14	770,000	0.164	2,525,600
<b>0.15</b>	<b>510,000</b>	<b>0.174</b>	<b>1,774,800</b>
0.16	260,000	0.190	988,000
0.18	150,000	0.205	615,000
0.20	36,000	0.259	186,480
0.22	31,000	0.268	166,160
<b>0.24</b>	<b>12,000</b>	<b>0.330</b>	<b>79,200</b>
0.26	12,000	0.330	79,200
0.28	12,000	0.330	79,200
0.30	12,000	0.330	79,200



## 18.0) OTHER RELEVANT DATA AND INFORMATION

The Jersey-Emerald property has undergone historic mining over a significant span of time, for a variety of commodities. Both underground and surface mining methods have been utilized in the extraction of ore. Remnants of this historic work exist on the property surface, including open cuts and pits, portals to underground access, waste dumps and mill tailings. The zones of mineralization covered in this report are primarily within or adjacent to these areas of previous mining, and is therefore considered to be “brownfields” exploration. Brownfields exploration may allow for more readily available permitting and advancement of continued work, and for eventual development of resources on the property. Further consideration is required to ascertain the level of liability attached to the remnant disturbed areas from historic mining. Sultan Minerals is continuing baseline environmental data collection on the property, including surface stream water sampling and sampling of waters draining the underground workings.

### 18.10 Total Tungsten Resource Estimate, 2006 to 2008

The 2006 report (Grunenberg and Giroux) on the resource estimate for tungsten in the Dodger, East Dodger and Invincible mine areas provided an measured and indicated resource of 2,510,000 tons averaging 0.372% WO<sub>3</sub>, and an inferred resource of 1,210,000 tons averaging 0.397% WO<sub>3</sub>, all at a 0.15% cutoff. The additional resource estimate provided in this 2008 report totals 209,000 tons averaging 0.188% indicated and 1,110,000 tons averaging 0.285% inferred.

By combining the weighted average of the 2006 and 2008 reported resources, the total resource estimate is 2,719,000 tons averaging 0.358% WO<sub>3</sub> measured plus indicated, and 2,320,000 tons averaging 0.341% WO<sub>3</sub> inferred.

**Table 17**  
**COMBINED 2006-2008 TOTAL WO<sub>3</sub> RESOURCE SUMMARY**

Year	Deposit	Classification	Cutoff	Tons>Cutoff	WO <sub>3</sub> %	Pounds of WO <sub>3</sub>
2006	Dodger, East Dodger and Invincible	Measured	0.15	1,200,000	0.379	9,096,000
		Indicated	0.15	1,310,000	0.365	9,563,000
		Measured + Indicated	0.15	2,510,000	0.372	18,674,000
		Inferred	0.15	1,210,000	0.397	9,607,000
2008	Emerald and East Emerald	Indicated	0.15	209,000	0.188	786,000
		Inferred	0.15	1,110,000	0.285	6,327,000
<b>2006 &amp; 2008</b>	<b>Combined</b>	<b>Measured + Indicated</b>	<b>0.15</b>	<b>2,719,000</b>	<b>0.358</b>	<b>19,460,000</b>
		<b>Inferred</b>	<b>0.15</b>	<b>2,320,000</b>	<b>0.341</b>	<b>15,934,000</b>

## **19.0) INTERPRETATION AND CONCLUSIONS**

This study was conducted as a preliminary assessment of the potential of the Emerald mine and East Emerald exploration zones on the Jersey property. The results of the study summarized in this report demonstrate potential for tungsten resources in both the Emerald mine and the East Emerald Zone.

This preliminary resource study indicates that average grades of Tungsten within the two zones are significant enough for underground mining methods of extraction. The near-surface geometry of some portions of the zones also suggest potential for open pit extraction.

The skarn mineralization associated with the deposition of tungsten is primarily generated by the intrusion of the underlying granitic stock into limey country rock. Drill hole compilations indicate that the granite surface is extensive and is possibly more complex in geometry than shown on current interpretations. The model showing the granite surface should be updated with the recent drill hole data in order to provide a more detailed interpretation of the geometry of that surface with emphasis on its proximity and contact with limey host rock.

Based on the results of this preliminary resource calculation, further work is recommended to better define and upgrade the Tungsten resources in the Emerald and East Emerald area of the property, as well as the Invincible and Dodger Tungsten zones previously covered in the 2006 Grunenberg-Giroux report. Continued exploration for tungsten outside of these zones is also recommended.

## **20.0) RECOMMENDATIONS**

The recommendations presented here are designed for further exploration for tungsten mineralization on the property, as well as addressing requirements to advance the presently defined resources toward a mining feasibility study.

Several drill holes are required to verify intercepts reported in the historic drilling used to obtain preliminary resources in the Emerald Mine area. More drilling is required in the East Emerald zone in order to better define the resource therein, especially within the Lower mineralized zone where limited information is available. It is estimated that 5,000 metres of diamond drilling may be required to fully define the Emerald and East Emerald tungsten zones.

The East Emerald zone has been historically trenched at surface and has been shown to extend northward from the north end of the historic Emerald Mine, geometrically above the historic Feeney and Invincible mines. Definition of this zone should include surface trenching along this corridor. Trenching of the zone is possible where surface exposures occur to the north of the Feeney Mine and where the zone projects to the south of the historic Emerald mine workings. A total of 20 trenches is proposed to test the East Emerald zone and its projected extension to the north and south.

As was discussed previously in the 2006 report, the Invincible Mine workings may provide further access for underground testing of the East Emerald Tungsten zone. This access would also allow further investigation of molybdenum mineralization within the Invincible Mine area noted in mine plans and observed within waste piles from the decline development. Dewatering of the mine workings and stabilization of access portals is required for re-establishment of this access.

Historic mine plans and drill hole data indicate that there are remaining tungsten reserves within the East Dodger Mine. Sultan has recently completed diamond drilling within the East Dodger Mine while exploring for molybdenum potential. Some of these drill holes would have passed through remnant tungsten mineralization adjacent to the workings. It is recommended that the tungsten model in this area be updated to include the recent drilling. This tungsten mineralization may potentially be added to the resource estimate calculated in the 2006 Grunenberg-Giroux report.

Completion of the 5000 metres of surface diamond drilling, surface trenching, and support, for tungsten mineralization on the property is estimated at a cost of \$1,005,000. Dewatering of the Invincible Mine workings and access rehabilitation/stabilization is estimated to cost \$90,000.

It is recommended that an economic scoping study be completed by the company at this stage. This will update the 2007 Wardrop study further toward a feasibility decisions. The study for the tungsten deposits will include:

1. Preparation of a mine plan.
2. Design and costing of surface facilities
3. Continuing implementation of environmental studies
4. Review of ore transport options.
5. Review of tailings disposal options.
6. Review wastewater disposal alternatives
7. Review historic metallurgy and conduct further metallurgical testing

Costing for completion of the preliminary economic scoping study will vary depending upon the level of work required at this site. Based on review of similar studies, the cost associated will range between \$100,000 and \$200,000. Some of this work has been completed by Waldrop, providing a base for continued work and possibly decreasing the cost under \$100,000.

Total cost for continued exploration with definition and verification drilling, and trenching of the tungsten resource, is estimated at \$1,295,500. Total cost for completion of work required to complete an economic study for tungsten extraction is estimated at \$99,000. The combined total cost to complete the recommended work is estimated at \$1,358,500.

## 21.0) PROPOSED PROGRAM BUDGET ESTIMATES

### **Tungsten Exploration Program**

Surface Diamond Drilling, Emerald East Zone – 2000 m @ \$150/m all inclusive	\$300,000
Surface Diamond Drilling, Emerald Mine confirmation – 3000 m @ \$150/m all inclusive	450,000
Surface trenching – 10 days @ \$1500/day	15,000
Consultants – management, model, supervisions, interpretations	100,000
Field crew	50,000
Laboratory analysis 3000 samples at \$20	60,000
Dewatering/Stabilizing Invincible Mine workings –	90,000
Rentals, consumables, travel	50,000
Reporting/drafting	30,000
<b>SUBTOTAL</b>	<b>\$1,145,000</b>
10% Contingency	114,500
<b>Tungsten Exploration Phase Budget Total</b>	<b>\$1,259,500</b>

### **Economic Scoping Study**

Mine Planning study	\$50,000
Consultants – further groundwater and surface water mapping, interpretations	10,000
Surface topographical surveying and preliminary facility sitting	10,000
Tungsten metallurgical research and study	5,000
Rentals, consumables, travel	5,000
Reporting/drafting	10,000
<b>SUBTOTAL</b>	<b>\$90,000</b>
10% Contingency	9,000
<b>Economic Scoping Study Budget Total</b>	<b>\$99,000</b>

**ESTIMATED BUDGET GRAND TOTAL, All PHASES      \$1,358,500**

## 22.0) REFERENCES

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## 23.0) QUALIFICATIONS

### **CERTIFICATE: Perry Grunenberg**

I, **Perry Grunenberg**, hereby certify that:

- a) I am a consulting Geoscientist with PBG Geoscience having an office at 759 Dominion Street, Kamloops, British Columbia, V2C 2X8.
- b) This certificate applies to the report titled "Summary Report and Preliminary Resource Estimation For East Emerald and Emerald Mine Tungsten Zones, Jersey-Emerald Property, BC" dated January 12, 2009 and amended and restated February 23, 2009.
- c) I am a graduate of the University of British Columbia with the degree of Bachelor of Science in Geology (1982).

I am a member of the Association of Professional Engineers and Geoscientists of British Columbia Registration No. 19246) and a Fellow of the Geological Association of Canada (Membership No. F5203).

I have practiced my profession in North America since 1982, having worked as an employee and consultant for major mining corporations, junior resource companies and BC government ministries.

As a result of my experience and qualification I am a Qualified Person as defined in National Instrument 43 – 101.

- d) I personally managed exploration programs on the Jersey-Emerald property including the diamond drilling programs for the exploration of tungsten within the East Emerald Tungsten zone. I also created the 3 dimensional geologic solids, utilizing Gemcom-Surpac software, surrounding mineralized zones within the historic Emerald Mine and the East Emerald Tungsten zones.
- e) I have personally prepared or have reviewed all sections of this report including the illustrations. Section 17 of this report was primarily prepared by the co-author, Gary Giroux. Sources of information are noted in the text or on the illustrations.
- f) In the preparation of this report I am not totally independent of the company Sultan Minerals Inc as described in section 1.4 of NI 43-101, due to the granting of options to purchase stock until the year 2012.
- g) I have managed exploration programs as a geoscientist consultant on behalf of Sultan Minerals Inc since 1994, including exploration for tungsten and molybdenum as covered within this report.
- h) I have read National Instrument 43 – 101 and the foregoing technical report has been prepared in conformity with this instrument and generally accepted Canadian mining industry practice.
- i) As of the date of the certificate, I am not aware of any material fact or material change with respect to the subject matter of this technical report that is not reflected in this report, the omission to disclose which would make this report misleading.

Dated this 23<sup>rd</sup> day of February, 2009  
Kamloops, B.C.

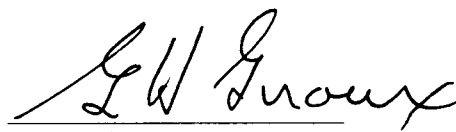


### CERTIFICATE: G.H. Giroux

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 #1215 - 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. I have had over 30 years experience calculating mineral resources. I have previously completed resource estimations on a wide variety of skarn deposits both in B.C. and around the world, including Merry Widow, El Rosario, Crystal Peak Garnet and Oracle Ridge.
- 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 N.I. 43-101.
- 6) This report titled "**Summary Report and Preliminary Resource Estimation for the East Emerald and Emerald Mine Tungsten Zones**" and dated January 12 and amended February 23, 2009, is based on a study of the data and literature available on the Jersey Project. I am responsible for Section 17, the resource estimations completed in Vancouver during 2008, and for the report in general. I have visited the property on February 19 and 20, 2009.
- 7) While I have had no prior involvement with the Emerald tungsten deposits, I have previously co-authored a report on the Dodger Mo and W deposits on the Jersey-Emerald property in 2006.
- 8) As to the date of this certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.
- 9) I am independent of the issuer applying all of the tests in section 1.4 of National Instrument 43-101.
- 10) 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.

Dated this 23<sup>rd</sup> day of February, 2009

  
G. H. Giroux, P.Eng., M.A.Sc.





## APPENDIX 1

### LISTING OF DRILL HOLES USED IN RESOURCE ESTIMATE

HOLE	EASTING	NORTHING	ELEVATION	HOLE LENGTH (ft)
C1	6193.00	7332.00	4057.00	146.00
C11	6349.00	7694.00	4073.50	116.00
C13	6247.00	7522.00	4061.00	126.00
C14	6247.00	7522.00	4061.00	116.00
C2	6193.00	7332.00	4057.00	111.00
C8	6296.00	7605.00	4073.00	130.00
C9	6296.00	7605.00	4073.00	116.00
D1	6208.20	7215.50	4030.30	109.00
D101	6120.45	6745.84	3955.13	96.00
D102	6120.27	6745.88	3957.16	96.00
D104	6131.00	6846.40	3956.53	85.00
D105	6130.45	6846.28	3958.16	101.00
D106	6130.00	6846.00	3960.00	113.00
D107	6133.98	6948.98	3958.03	85.00
D108	6133.85	6948.92	3960.16	140.00
D109	6132.83	6949.30	3961.22	125.00
D11	6249.52	7355.43	4033.13	132.00
D110	6149.03	7047.10	3960.68	140.00
D111	6172.46	7141.51	3961.01	158.00
D113	6099.33	6639.48	3956.79	83.00
D115	6047.87	6554.03	3956.60	57.00
D116	6046.74	6554.21	3958.90	71.00
D117	6000.11	6466.52	3957.60	161.00
D118	5999.31	6466.73	3960.10	182.00
D119	5767.02	6269.38	3960.88	114.00
D12	6249.52	7355.43	4030.93	94.00
D120	5966.04	6269.55	3963.28	112.00
D123	5983.00	6315.96	3961.06	119.00
D124	5982.73	6316.01	3964.08	63.00
D125	5994.56	6199.47	3957.64	71.00
D127	5989.10	6203.98	3964.35	112.00
D128	5965.44	6269.66	3957.18	88.00
D129	6131.00	6846.40	3953.00	47.00
D12A	9454.50	10039.36	4430.30	140.00
D13	6249.52	7355.43	4029.39	51.00
D130	6125.79	6847.74	3960.70	66.00
D131	6044.51	6554.58	3952.40	38.00
D134	6120.45	6745.84	3952.00	97.00
D137	6031.88	6506.89	3953.31	83.00
D138	6081.37	6495.06	3954.08	58.00
D14	6259.42	7377.99	4032.25	35.00
D140	6071.90	6497.51	3960.62	100.00
D141	6077.47	6496.24	3953.90	60.00
D143	6045.05	6562.37	3960.25	115.00
D144	6042.24	6562.98	3960.42	62.00

D145	5931.22	6151.41	3961.21	138.00
D146	5931.43	6151.33	3958.19	138.00
D147	5930.99	6151.50	3964.10	138.00
D148	5923.77	6154.25	3964.66	74.00
D149	5927.81	6030.64	3962.06	89.00
D15	6259.42	7377.99	4029.97	58.00
D150	5928.67	6030.50	3958.92	58.00
D151	5933.62	6029.55	3958.92	155.00
D153	5905.93	5936.30	3959.40	91.00
D154	5908.51	5936.73	3959.40	223.00
D155	5911.26	5936.01	3959.90	227.00
D156	5907.30	5937.05	3959.40	142.00
D158	5932.50	6029.84	3958.90	74.00
D16	6259.42	7377.99	4032.71	76.00
D161	6142.40	6915.00	3956.00	16.00
D162	6140.00	6817.00	3952.00	23.00
D17	6259.42	7377.99	4033.47	122.00
D19	6265.00	7514.00	4035.00	102.00
D2	6208.20	7215.50	4031.60	107.00
D20	6264.00	7514.00	4036.00	121.00
D21	6262.00	7514.00	4036.40	130.00
D22	6344.00	7498.00	4035.00	41.00
D23	6293.18	7445.92	4035.50	90.00
D24	6292.49	7446.21	4035.50	90.00
D26	6319.00	7441.00	4034.00	74.00
D27	6319.00	7441.00	4035.00	60.00
D28	6324.74	7476.49	4035.00	64.00
D29	6324.65	7472.32	4035.76	52.00
D3	6208.20	7215.50	4027.20	74.00
D30	6235.00	7262.50	4025.40	71.00
D31	6235.00	7262.50	4033.00	68.00
D32	6232.00	7262.50	4033.00	69.00
D34	6307.05	7472.15	4035.10	68.00
D35	6306.39	7472.52	4036.10	50.00
D36	6278.00	7411.00	4035.50	120.00
D37	6303.00	7303.00	4026.30	100.00
D39	6203.33	7128.43	4032.43	95.00
D4	6216.00	7249.00	4029.40	66.00
D40	6202.72	7130.98	4032.27	119.00
D6	6228.10	7321.30	4033.20	96.00
D7	6226.00	7322.00	4032.60	97.00
D8	6224.00	7322.70	4033.00	144.00
E0601	7397.00	8434.00	4345.00	403.00
E0602	7305.00	8190.00	4370.00	533.00
E0603	7350.00	8206.00	4370.00	293.00
E0604	7420.00	8590.00	4332.00	185.00
E0605	7872.00	9243.00	4341.00	457.00
E0606	7870.00	9244.00	4341.00	847.00
E0607	7760.00	9305.00	4240.00	287.00
E0608	7757.00	9306.00	4240.00	327.00

JS0730	8650.00	9165.00	4665.00	1116.00
JS0733	8662.00	10058.00	4380.00	658.00
JS0736	8193.00	9784.00	4352.00	568.00
JS0737	8191.00	9784.00	4352.00	598.00
JS0738	8197.00	9784.00	4352.00	551.00
JS0739	8195.00	9784.00	4352.00	750.00
JS0740	7990.00	9543.00	4339.00	498.00
JS0741	7986.00	9543.00	4339.00	558.00
JS0742	7987.00	9542.00	4339.00	863.00
JS0746	7792.00	9066.00	4334.00	468.00
JS0747	7789.00	9067.00	4334.00	557.00
N1	6391.49	7855.27	4071.11	212.00
N2	6391.49	7855.27	4071.11	164.00
S1	7215.91	8082.94	4391.16	141.00
S10	7351.00	8248.00	4407.00	202.00
S11	7351.00	8248.00	4407.00	178.00
S12	7354.00	8292.00	4391.00	191.00
S13	7375.00	8341.00	4382.00	198.00
S14	7374.00	8341.00	4381.00	190.00
S16	7388.00	8386.00	4377.00	188.00
S17	7410.00	8433.00	4367.00	201.00
S2	7215.81	8082.94	4391.16	121.00
S20	7472.50	8480.50	4363.00	202.00
S21	7445.00	8527.00	4358.00	164.00
S22	7445.00	8527.00	4358.00	154.00
S23	7445.00	8527.00	4358.00	162.00
S24	7462.00	8574.00	4360.00	160.00
S3	7215.80	8082.94	4391.16	132.00
S4	7268.68	8114.25	4385.73	121.00
S5	7283.70	8166.14	4405.95	151.00
S6	7285.70	8166.14	4405.95	133.00
S7	7287.70	8166.00	4403.00	150.00
S8	7318.04	8208.50	4403.00	157.00
S9	7351.00	8247.60	4409.30	192.00
T1	6002.74	6509.26	3953.00	77.50
T10	6093.51	5975.81	3808.04	96.50
T101	6050.32	6490.00	3875.58	163.00
T102	6054.44	6493.05	3873.30	167.00
T104	6200.81	6698.38	3938.70	66.00
T105	6200.15	6698.87	3938.78	58.00
T106	5999.51	6403.89	3947.37	114.00
T107	6043.00	6505.00	3942.00	88.00
T109	6469.90	7800.60	4016.70	74.00
T11	6093.12	5945.20	3806.40	92.00
T110	6469.90	7800.60	4016.70	50.00
T113	6459.60	7756.10	4018.70	79.00
T114	6441.30	7701.20	4016.60	59.00
T116	6437.60	7690.40	4016.70	47.00
T117	5939.10	6107.30	3943.70	143.00
T118	5939.10	6107.30	3945.30	116.00

T119	5939.10	6107.30	3947.20	162.00
T120	5939.10	6107.30	3946.20	121.00
T121	5939.10	6107.30	3946.60	132.00
T122	6037.40	6423.60	3944.50	77.00
T123	6036.50	6423.20	3945.30	87.00
T126	5939.60	6031.30	3946.95	206.00
T128	6460.00	7756.00	4016.70	64.00
T129	6469.00	7776.80	4018.00	80.00
T131	6476.00	7799.00	4017.90	82.00
T132	5918.20	5951.60	3995.20	237.00
T133	5918.20	5951.60	3945.70	232.00
T134	6025.80	5795.30	3790.10	215.00
T135	6025.30	5776.70	3790.20	203.00
T136	6286.00	7269.00	4044.50	87.00
T137	6047.90	5469.20	3438.30	53.00
T138	6049.90	5463.77	3438.90	58.00
T14	5960.85	6248.12	3944.91	81.00
T15	6029.66	6537.59	3941.48	22.00
T158	6097.00	5682.00	3670.00	100.00
T16	6029.17	6537.62	3939.99	106.50
T161	6099.00	5681.00	3671.00	144.00
T162	5984.00	5875.00	3790.00	220.00
T163	5985.00	5874.00	3789.00	230.00
T17	5960.98	6248.21	3945.07	121.00
T2	6023.04	6533.79	3953.00	66.00
T20	6098.62	5981.02	3793.64	110.00
T21	6137.63	6588.92	3945.11	75.00
T22	6011.67	5755.00	3786.38	190.00
T23	6073.12	6606.07	3940.47	64.00
T24	6013.70	5755.37	3786.43	159.00
T25	6073.25	6605.71	3943.32	55.00
T26	6014.31	5755.25	3788.11	181.00
T28	6013.93	5755.32	3790.49	252.00
T29	5910.26	5883.27	3792.68	66.00
T30	6009.42	5756.09	3786.61	137.00
T31	5907.78	5880.43	3792.31	97.00
T32	6004.70	5755.94	3786.89	113.00
T33	5910.00	5886.84	3792.60	114.00
T34	6002.42	5756.26	3787.01	122.00
T35	5987.00	5866.00	3786.00	71.00
T36	6001.19	5756.43	3788.31	122.00
T37	5988.00	5869.00	3786.00	57.00
T38	6001.29	5756.46	3789.99	158.00
T39	5986.00	5861.00	3786.00	47.00
T4	5934.99	6027.37	3958.98	191.00
T43	6172.19	6767.37	3940.48	41.00
T44	5984.00	5870.00	3790.00	29.50
T45	6172.62	6767.25	3942.00	112.00
T46	6000.57	5756.72	3791.65	246.00
T47	6172.18	6767.42	3937.77	55.00

T48	5996.00	6040.00	3835.00	8.00
T49	6178.20	6766.36	3943.70	35.00
T5	6016.48	6020.10	3809.27	34.00
T50	5997.00	6016.00	3830.00	24.00
T51	6177.03	6766.50	3943.90	43.00
T52	6007.00	6001.00	3828.00	24.00
T53	6162.09	6689.71	3940.04	81.00
T55	6162.56	6688.02	3942.52	95.00
T6	6019.00	6020.00	3809.00	47.00
T60	5996.00	6290.00	3919.00	10.00
T61	5988.78	6055.54	3823.98	70.00
T62	6033.14	5855.86	3789.37	68.50
T63	5988.89	6055.55	3822.64	55.00
T65	5988.80	6055.53	3821.03	101.00
T68	6137.25	6887.92	3940.59	73.00
T69	5991.49	6055.75	3827.44	92.00
T7	6016.40	6020.00	3809.00	40.00
T71	5994.81	6201.73	3943.11	74.00
T72	6209.37	7308.84	3946.58	177.00
T73	6000.80	6208.54	3945.31	85.00
T75	6025.00	6058.00	3852.00	50.00
T77	6025.00	6058.00	3852.00	51.00
T78	6203.43	7275.50	3945.36	138.00
T79	6045.00	5986.00	3823.00	49.00
T85	6181.97	6893.76	3940.38	54.00
T88	5955.80	5472.10	4015.90	566.00
T89	6110.54	6579.90	3939.34	44.00
T9	6010.00	6098.00	3809.00	63.00
T90	6144.32	6579.77	3937.60	60.00
T91	6117.75	6787.64	3949.71	63.00
T92	6073.86	6550.06	3937.50	78.00
T93	6079.23	6545.08	3941.80	57.00
T94	6071.00	6550.00	3937.50	61.00
T96	6448.00	7763.00	4093.00	124.00
T97	6447.87	7762.83	4093.23	47.00
T98	6469.13	7838.61	4105.79	122.00
T99	6469.00	7839.00	4106.00	78.00
V13	7905.87	9283.63	4341.40	789.00
V15	7907.94	9283.13	4341.30	853.00
V16A	7667.66	8826.47	4328.95	911.00
V18	7907.94	9283.13	4341.30	844.00
V19	7386.70	8465.10	4327.46	904.00
V2	8623.01	10247.91	4281.55	611.00
V20	7668.88	8827.56	4329.18	850.00
V26	8403.04	9898.89	4377.47	1151.00
V28	8403.04	9898.89	4377.47	1085.00
V30	7771.91	8935.62	4371.96	912.00

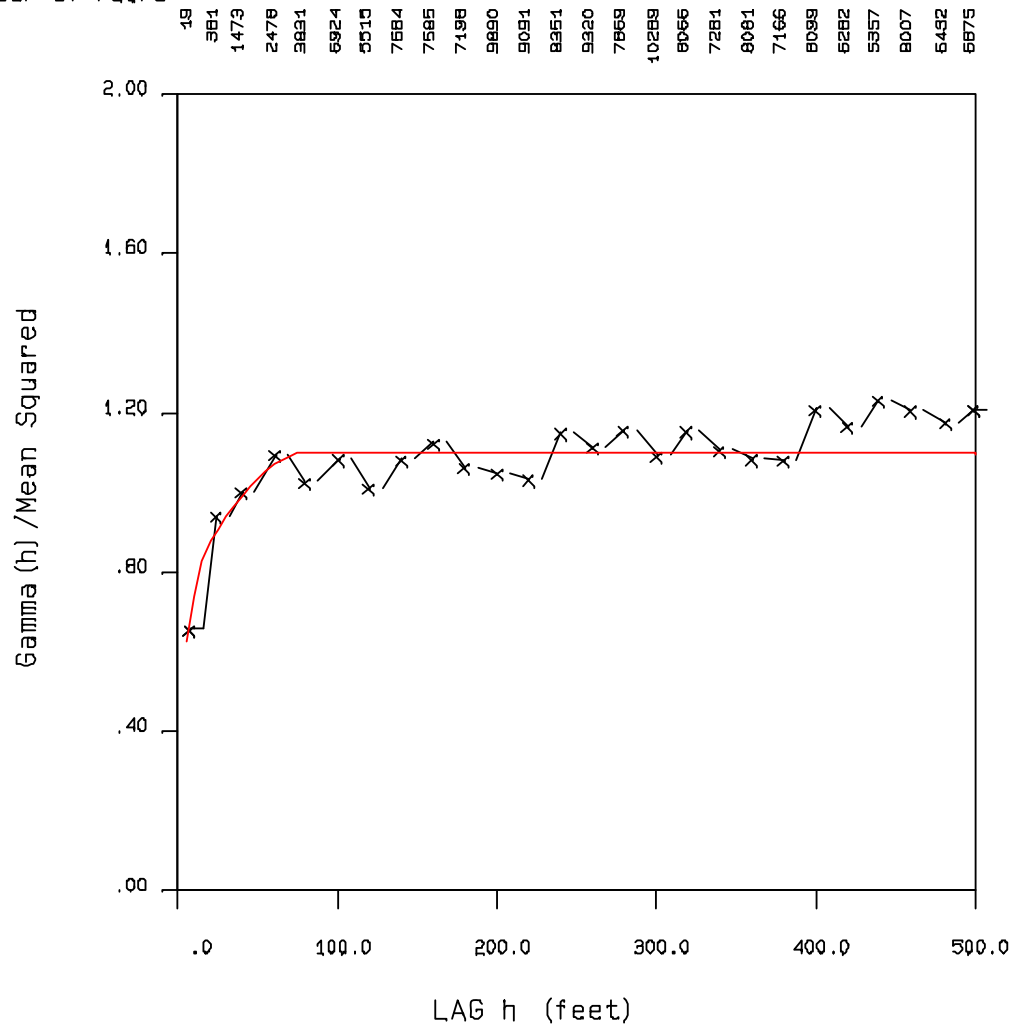
**242 Drill Holes Totalling**

**42303.50 ft.**

## APPENDIX 2 SEMIVARIOGRAM MODELS

$C0 = .500$   
 $C1 = .250$   
 $C2 = .350$   
 $A1 = 20.0$   
 $A2 = 80.0$

Number of Pairs



EMERALD W03 - AZ 15 DIP 0

C0 = .500

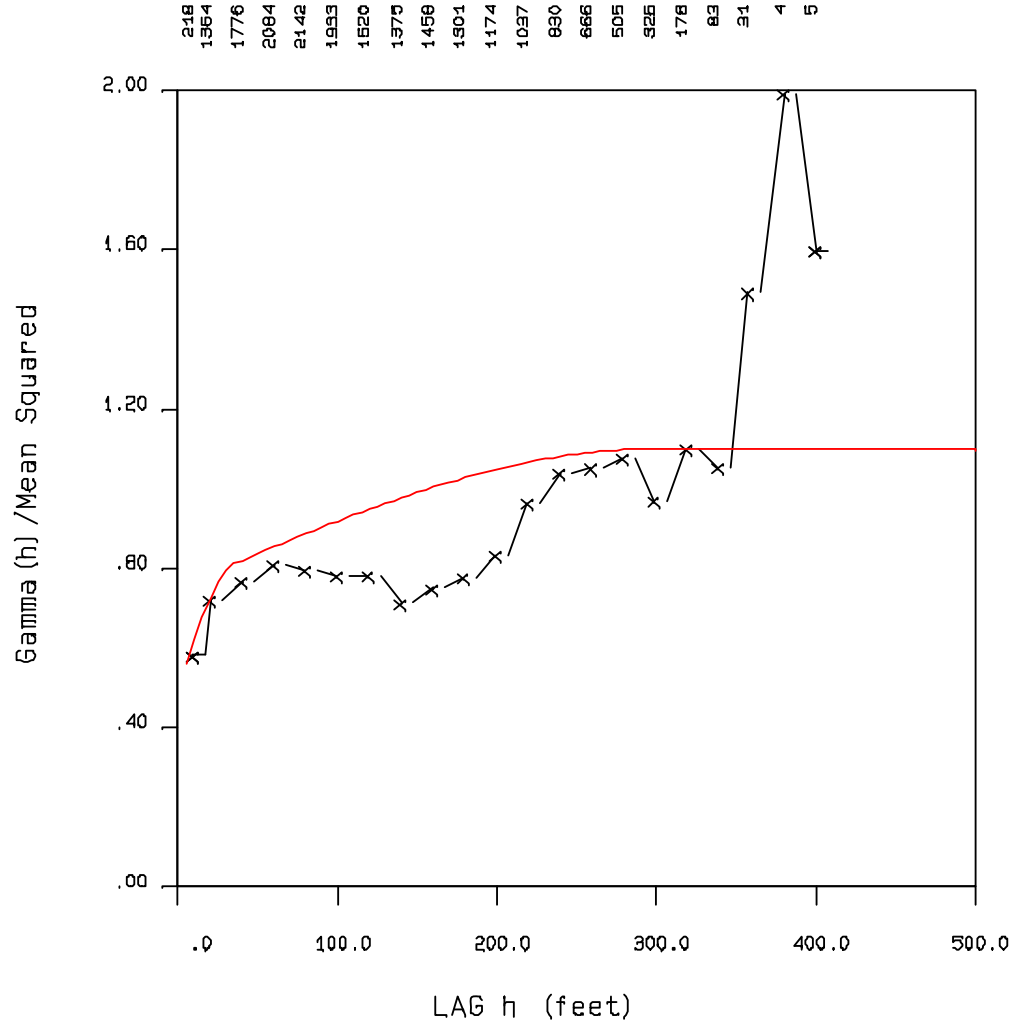
C1 = .250

C2 = .350

A1 = 35.0

A2 = 300.0

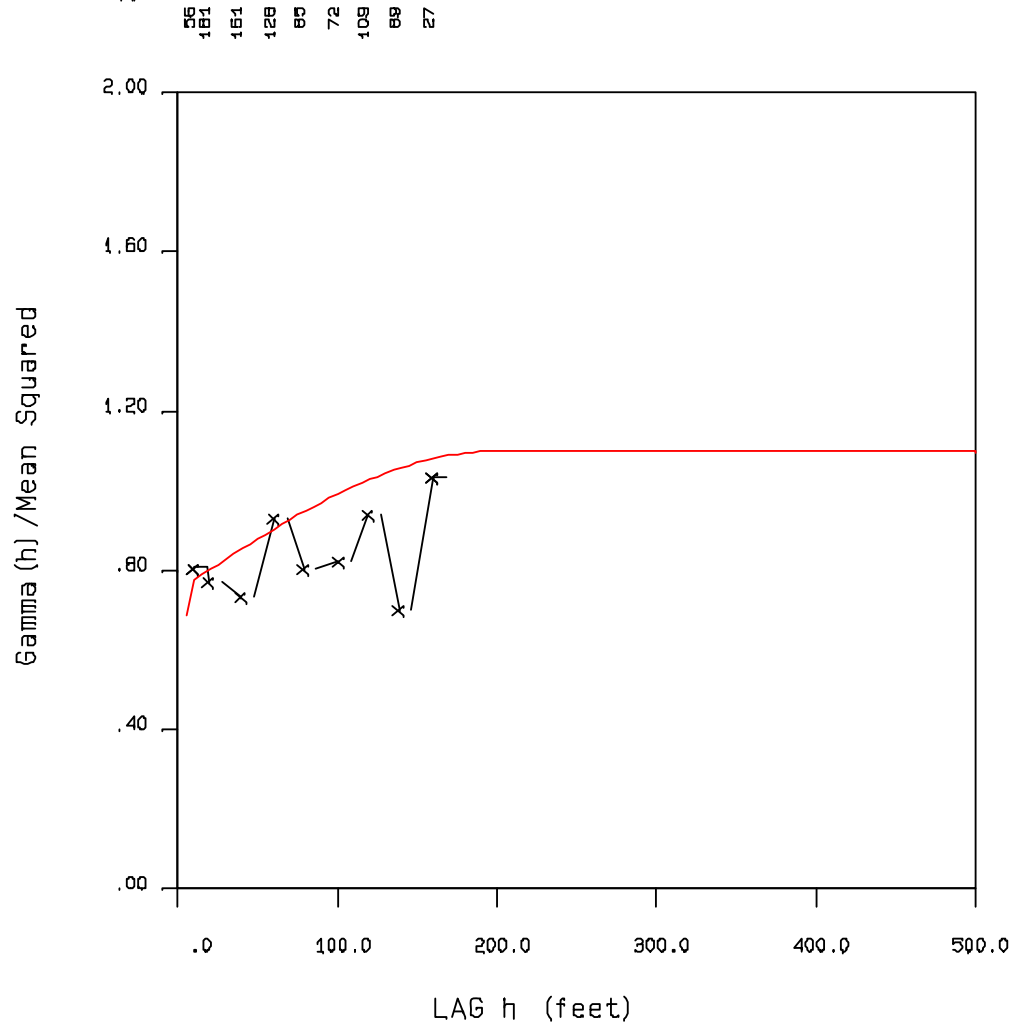
Number of Pairs



EMERALD W03 - AZ 285 DIP 0

C0 = .500  
 C1 = .250  
 C2 = .350  
 A1 = 10.0  
 A2 = 200.0

Number of Pairs

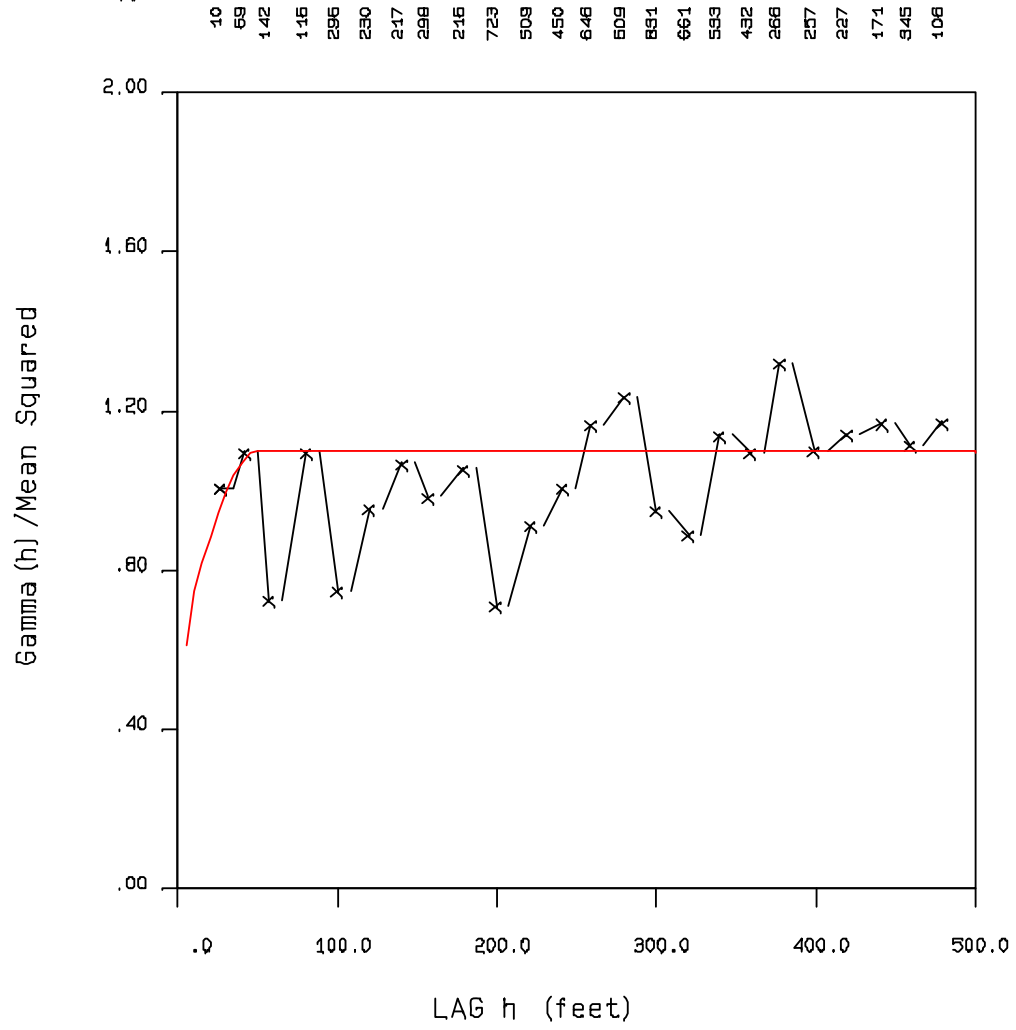


EMERALD W03 - AZ 0 DIP -90



C0 = .400  
 C1 = .200  
 C2 = .500  
 A1 = 10.0  
 A2 = 50.0

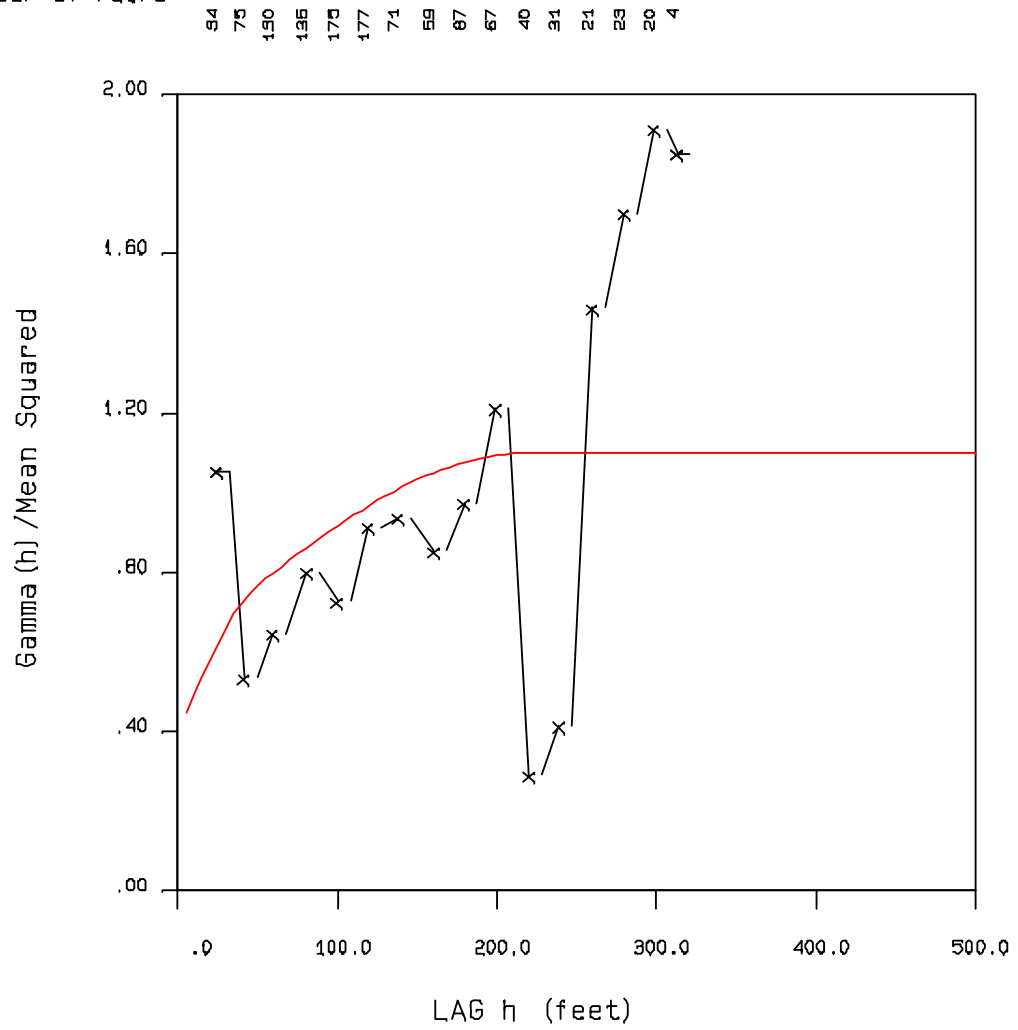
Number of Pairs



EAST EMERALD W03 - AZ 30 DIP 0

C0 = .400  
 C1 = .200  
 C2 = .500  
 A1 = 50.0  
 A2 = 220.0

Number of Pairs

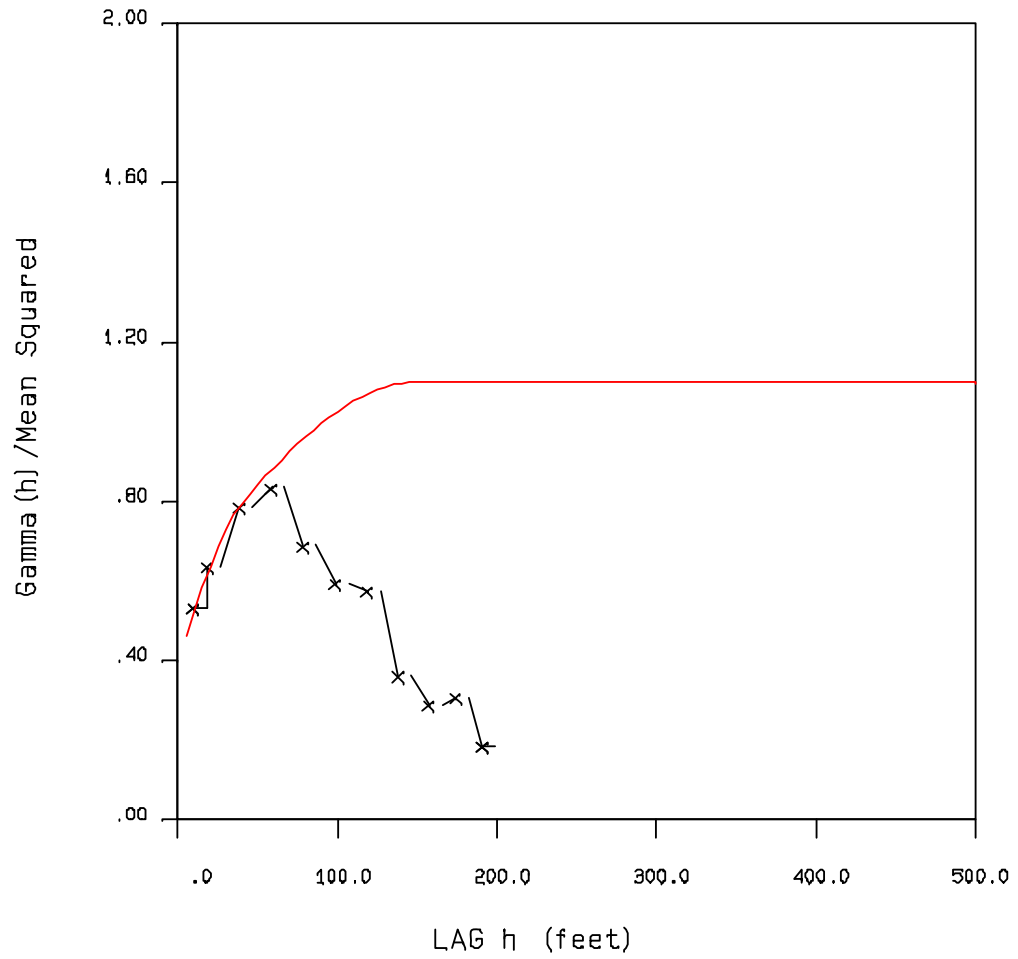


EAST EMERALD W03 - AZ 300 DIP 0

C0 = .400  
 C1 = .200  
 C2 = .500  
 A1 = 40.0  
 A2 = 150.0

Number of Pairs

75  
 190  
 114  
 73  
 41  
 29  
 23  
 17  
 11  
 6  
 1



EAST EMERALD W03 - AZ 0 DIP -90

