MAP No. 105-O,P 106-A,B,C,D,E ~~116-A,B,C,I~~	ASSESSMENT REPORT [ ] N. M. E. A. P. [ ] CONFIDENTIAL [ ] OPEN FILE [X]	TYPE OF WORK:	University Research Study
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DATE PERFORMED	1975, 1976 and 1977	DATE FILED:	December 8, 1977
LOCATION - LAT.	63°00' to 67°00'N	AREA:	Ogilvie & Mackenzie Mts.
LONG.	128° to 135°30'W		Yukon and Mack.
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WORK DONE BY	C.I. Godwin, G. McLaren, M. McArthur (U. of British Columbia)		
WORK DONE FOR	Indian and Northern Affairs EGS 1978-3		
REMARKS	Fluid Inclusion Study of Sulphide Deposits of the Ogilvie and Mackenzie Mountains, Yukon and Northwest Territories.		

Indian and Northern Affairs
Affaires indiennes et du Nord

THE UNIVERSITY OF BRITISH COLUMBIA

Department of GEOLOGICAL SCIENCES

SUMMARY REPORT - NOVEMBER 1977

FLUID INCLUSION STUDY OF SULPHIDE DEPOSITS OF THE OGILVIE AND MacKENZIE MOUNTAINS, Y.T. AND N.W.T.

Dr. C.I. Godwin

SUMMARY REPORT - NOVEMBER 1977

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FLUID INCLUSION STUDY OF SULPHIDE DEPOSITS OF THE OGILVIE AND MacKENZIE MOUNTAINS, Y.T. AND N.W.T.

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PREVIOUS REPORT: SUMMARY REPORT - FEBRUARY 1976. By Dr. C.I. Godwin.
DDS FILE NO: 04 SU C7111-5-0142
TO STUDY AND CATALOGUE THE ZINC-LEAD DEPOSITS OF THE NORTHERN YUKON TERRITORY AND ADJACENT NORTHWEST TERRITORY

~~DATA CONTAINED IN THIS REPORT IS NOT TO BE USED FOR PUBLICATION WITHOUT WRITTEN PERMISSION BY DR. C.I. GODWIN~~

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CONTENTS

Page

INTRODUCTION

Several hundred carbonated hosted zinc-lead deposits were recently discovered in northern Yukon and adjacent Northwest Territories (between latitudes 64° and 66° north). Activity is currently very low in this area. Fortunately, during 1975 and 1976 The University of British Columbia acquired samples from about one hundred of these showings through the efforts of graduate students and mining companies that had worked in the region.

A summary report on this project in February 1977 (see cover page) included:

1) a cross-indexed catalogue of this collection prepared with the aid of the MINDEP system of the Department of Geological Sciences, U.B.C.,
2) a detailed description of fluid inclusion sample preparation procedures developed for this study.

Currently well advanced are studies in: 1) geothermometry, and 2) trace element contents in sphalerite. In addition, samples have been prepared for lead isotope analysis in co-operation with Dr. W. Slawson, The Department of Geophysics, The University of British Columbia.

GEOTHERMOMETRY

Geothermometry studies were mainly carried out using a fluid inclusion stage and operating console (Chaixmeca Corp.), with an operating range from -180°C to +600°C. The stage is mounted on a Leitz Ortholux II binocular microscope loaned temporarily by the principal investigator. Almost all work with this equipment was done by technician, Mr. J. McLeod, M.Sc. Calibration of the stage, preparation of slabs for fluid inclusion study, reconnaissance of slabs for estimating their suitability, and freezing and heating runs on the best available slabs were done at various times in 1976 and 1977. Limited funds allowed Mr. McLeod to be hired on a part-time basis only.

Appendix A contains a summary of all data obtained to date by F.I. studies. A total of 91 polished slabs from 45 deposits were prepared and examined for fluid inclusions. Brief descriptions of these slabs are given in Table A-1. Only about half of the slabs prepared, however, provided useful data. For example, Tables A-2 and A-3 represents data obtained from only 27 polished slabs from 14 deposits. Data could be obtained from about an additional ten slabs that have been examined on a reconnaissance basis only (Table A-1). Other suitable slabs could be obtained from the collection.

Aside from the one histogram in Fig. A-3, which illustrates that temperatures range from about 125°C to 325°C but are most common in the 125°C to 225°C range, no attempt has been made to evaluate this data in this report. Study of this data will likely be incorporated into the sphalerite trace element study.

SPHALERITE TRACE ELEMENT STUDY

Masters candidate Mr. Graeme McLaren is well advanced in his study of trace element contents of sphalerite from these carbonate hosted zinc-lead deposits. Thesis completion is anticipated by spring 1978. The following describes his evaluation of analyses done to date. Analytical and statistical tabulations are in Appendix B.

Sphalerite samples were taken either by propectors and geologists working in the field involved in reconnaissance exploration, or from more detailed mapping and developments (i.e. trenches, diamond drill cores, etc.) on the larger more promising showings. Therefore, there is a broad spectrum in actual sphalerite samples ranging from large boulders of essentially pure sphalerite, through coarsely crystalline and granular samples, to very fine disseminations through the host rock. In some cases, sphalerite is a minor sulphide component, being dominated by galena and/or pyrite.

Other sulphides observed in some of the samples include chalcopyrite, tetrahedrite, and boulangerite. The host rocks are usually dolomite or limestone or breccias of these lithologies with sulphides in a matrix of sparry calcite, dolomite or coarsely crystalline quartz. Most specimens, particularly the coarser grained members, produce good clean unaltered sphalerite. However, often fine fractures through the sphalerite contain thin coatings of carbonate contaminants, and in a few cases, the sphalerite has undergone a moderate to extreme degree of oxidation, commonly producing smithsonite.

The selection of samples destined for minor element analysis was essentially controlled by the ability to visibly separate any contaminants using a maximum 40X binocular microscope. In this manner, a total of 167 samples from 49 locations were selected for analysis.

Distribution of these samples is in the following Table:

	Number of Samples	Number of Locations
YUKON	82	25
N.W.T.	85	24
TOTALS	167	49

The number of samples per location is normally low (from 1 to 3), but may be as many as 20, with at least 9 deposit locations having a minimum of 5 samples. Table B-8 specifies general geological data on those deposits in which sphalerite was studied.

SAMPLE PREPARATION

Obtaining a pure sphalerite concentrate is one of the most time consuming and most important phases of a mineralogic minor element study. Due to the relatively simple mineralogy of the samples in general, visual separation of sphalerite from contaminants by 'needle and tweezers' picking under a binocular microscope was thought to be the easiest and perhaps quickest method. Magnetic separation and heavy liquid concentration will effectively remove the carbonate and quartz gangue materials, however separation of all sulphide contaminants is ineffective due to contamination by middlings and examination under the binocular microscope is still required in the final stage (c.f. Price, 1972).

Samples in this project were crushed and picked to apparent purity under 8 X to 40 X magnification. Finer grained samples, or those with fine grained contaminations, were normally cut to a thin slab, which was found to disaggregate into discrete mineral grains more readily, thereby facilitating further hand picking. At this stage a number of samples were rejected on the basis of excessive weathering and alteration to smithsonite, or overly fine grain size and intimate association with other sulphides of similar grain size. Fine grained carbonate contaminants were dissolved away after several days soaking in warm dilute acetic acid. After sufficient hand picking to insure a visual purity samples were ground to approximately -200 mesh in an alumina-ceramic Spex ball mill, and were stored in clean plastic vials.

Throughout the separation process, notes were maintained on the observed paragenetic associations, and, hence, on possible contaminants, in all samples in order to aid in interpreting any anomalous values. A number of samples considered to have a higher probability of containing contaminants were examined to attempt to determine the degree of contamination due to particles smaller in size than practical visual resolution would permit. Initially an x-ray diffraction method was tested by comparing sphalerite sample diffraction charts with those of a presumably pure sphalerite sample, 'spiked' with known quantities of pyrite, galena and chalcopyrite (i.e., those minerals suspected of providing a large quantity of a contaminating element, within a small volume of a mineral). This method was found to be insufficiently sensitive to defect the trace amounts of the foreign minerals which would be present. Therefore a number of polished grain mounts were made to be used in point counting studies and to provide a qualitative measure of the non-sphalerite material present in each sample. This test was impractical to use on every separated sample, but in choosing the samples most suspected to contain foreign inclusions it gave an estimate of the effectiveness of the visual separation technique. A discussion of these results is included in the section concerning sources of error.

A total of 17 samples were independantly picked twice from the same hand specimen in order to investigate small scale sampling variances from a single specimen. These variances could then be compared to the within deposit variances, the regional between deposit variances, and to the overall analytical variances, in order to determine their magnitudes, and, hence, also to determine the significance to be attached to the fact that most samples were not collected with the intent of forming a research collection.

ANALYTICAL PROCEDURES

Emission Arc Spectroscopy

Emission arc spectroscopy was thought to be a relatively simple and expedient method to process a large number of samples in a qualitative (or perhaps semi-quantitative) manner, with the hopes of rapidly gaining information about the range of minor constituents to be found in these particular sphalerite samples, and possibly about the relative magnitude of these minor constituent concentrations, prior to the detailed atomic absorption analysis. To investigate this, arc spectroscopy was performed using a Hilger Watts E-742 automatic quartz spectrograph.

100 mg. of the finely ground sphalerite was weighed out on a tension balance and stored in a plastic vial. A further 100 mg of carbon matrix material was added to provide a medium which would insure a constant and even burn. These volumes provided sufficient sample for 3 spec runs if necessary. After these powders were mixed in the vials for 1 minute in a 'Spex' mill shaker, 2 glass beads were added and shaking proceeded for a further two minutes, providing a homogeneous sample of sphalerite and graphite. Samples were then packed into cup-type carbon electrodes, and 1 - drop of a sucrose solution was dropped on top of each to bind the sample to the electrode and to aid in maintaining an even burn. The electrode holder was placed on a hot plate for 1 hour.

Samples were excited in a 12 amp. D.C. arc for 30 seconds, with the emitted spectra being recorded on Kodak SA #1 glass photographic plates. Each plate recorded 10 samples plus 1 known standard, plus 1 duplicated sample from another plate. These plates were then processed in pairs in a Jarrel-Ash photoprocessor.

Concentrations were estimated from these plates by visual comparison to standard plates with spectra ranging from 1 to 10,000 ppm, increasing in logarithmic steps (i.e. 1, 2, 5, 10, 20, 50.....10,000). Iron is determined as an equivalent to weight percent FeO. It should be pointed out that the sample values determined are purely qualitative; even their relative magnitudes cannot be confirmed. This is because the standard plates, which are the basis of the numerical determinations, were prepared using a granitic rock as matrix with foreign elements 'spiked' into this matrix in varying amounts. The relative matrix effects of this material and sphalerite sulphide type material remains completely uninvestigated and renders the numerical results unreliable on a quantitative basis. Development of zinc-sulphide matrix standards is overly time consuming and beyond this project. Furthermore, the analytical technique described above is highly non-reproducible and hence, has not met with wide acceptance as a quantitative analytical tool.

A total of 20 elements of potential interest could be determined using this method.[1] Four elements, Be, Bi, Mo, and Pt, were looked for but not found. The results for 16 other elements, Ag, As, Ba, Co, Cr, Cu, Fe, Ga, Mn, Ni, Pb, Sb, Sn, Sr, T, and V, are listed in Table B-9. complete with approximate detection limits for each element (Table B-1).

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[1] A 21st element of interest, In, could be determined using the standard plates, but this element was used as an internal standard in the graphite matrix material, hence, it could not be recorded as a sphalerite constituent.

Atomic Absorption Spectroscopy

Atomic absorption spectroscopy was performed on solutions obtained from each sample in order to provide quantitative analyses. Sphalerite is a relatively easy mineral to dissolve, thus a simple $HCl-HNO_3$ acid attack was used to digest the samples. Initially, this digestion presented problems in that, even though the mineral itself was dissovled, sulphur was liberated which coalesced into a yellow plastic ball and remained undigested. To combat this, strongly oxidizing conditions were required; this was obtained simply by adding an excess of HNO_3. Due to the range in overall sample sizes, some of which were as low as approximately 0.5 gm, an atomic absorption sample size of 200 mg was decided upon in order to maintain a standard sample size throughout, yet maintain an error margin allowing for the duplication of any sample if necessary. Also this size kept the problem of removal of "plastic sulphur" to a manageable level using HNO_3 as an oxidant.

Procedure consisted of weighing out 200 mg. of sample on a tension balance into a clean beaker. To this was added 10 mls. of concentrated HCl and 25 mls. of HNO_3. The covered beakers were left on a warm hotplate for 18-24 hours until samples slowly came to dryness. They were then removed from the hotplate, taken up in 3 mls. of concentrated HCl, washed into a 25 ml. volumetric flask and made up to volume. Final solutions were then at an acidity of 1.5 M HCl, the level at which all samples, standards and blanks were analyzed on the atomic absorption unit. These solutions were transferred to acid cleaned, rinsed poly bottles and stored for analysis.

A complete set of 1:10 dilutions was made by pipeting 1 ml. of sample solution into a test tube and adding 9 mls. of 1.5 M HCl, immediately prior to the spectroscopy. Further dilutions of 1:100 of original sample concentration, were made as required.

Blanks were made by duplicating the acid attack using empty beakers. Secondary standard solutions were prepared from 100 ppm stock solutions in the lab and were aspirated before and after each group of samples run.

Determinations were performed on a Varian Techtron A.A.-4 for Cu, Fe, and Mn, and on a Perkin Elmer model 303, with background correction instrumentation, for Ag, Cd, Co, Ni, and Pb, similar to procedures outlined by W.K. Fletcher (1970). Operating conditions and detection limits for these 8 elements are given in Table 2A. Samples were run in groups of 24, each group consisting of 21 samples, 2 duplicates from different groups, and 1 blank solution. The 17 duplicates isolated in the separation procedures were treated as independent samples (i.e. as if the total sample population was 183). Furthermore, the initial sample out of each of these duplicates was analyzed twice; first as a normal sample, and second as an internal check on the analytical procedure. In this way information on variations due to combined analytical procedure and hand specimen sampling and those due to analytical procedure alone, could be obtained and studied.

Computer calculated calibration curves provided conversion of all sample data from absorbance to concentrations in ppm.

Three other elements, Cr, Sb, and Ti, were attempted since their presence was indicated by the emission spectrographic analyses. Sb proved highly unstable in the region of standard solution concentrations, with instrumental interferences swamping both the standard and sample absorbance readings, and therefore could not be accurately determined. Cr and Ti were both sufficiently stable to determine at the lower detection levels of the standard solutions, however, sample solutions were insufficiently concentrated to reveal any results. Similar problems were encountered for the Ni and Co determinations.

Analytical precision of this overall procedure is discussed in the following section.

Interlaboratory standard materials of a pure sphalerite matrix are not readily available, making a true test of the accuracy of the analytical procedure difficult.[1] However, sphalerite ore concentrates, presently being established as internal laboratory standards at the Geological Survey of Canada geochemical labs in Ottawa, were made available through Dr. I.R. Jonasson for an interlaboratory standard check on the analytical procedure. When these powders were subjected to the HCl-HNO_3 attack, a fine white granular residue was left in each sample, making it necessary to filter all solutions prior to being made up to volume and aspirated on the A.A. Otherwise these standards were treated exactly as samples.

All atomic absorption analyses are listed in Table B-10. Atomic absorption spectroscopy operating and detection limits are listed in Table B-2.

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[1]Flanagan (1974) indicates that a sphalerite standard, SF-Y, has been synthesized in Germany, but the nature of the sphalerite and the availability at present is unknown. This source was discovered too late to be investigated.

Mercury Analysis

160 samples, including 13 duplicates, were sent out for commercial analysis for mercury to Min-En Labs Ltd. of North Vancouver. The analytical procedure used by this firm digests 1.000 gram of sample with nitric and sulphuric acid. It is then further oxidized with 30% H_2O_2 while heating; oxidizing steps are repeated as required. After cooling and diluting to suitable volume to refine the oxidation procedure, 5% $KMnO_4$ is added in the titrating manner until a pink colour is obtained. Mercury is realized by reducing the solution into the flameless atomic absorption chamber and measured by comparing samples with known standards (J.J. Barakso, pers. comm., 1977). Precision, based on the 12 duplicate samples, is discussed in the following section. Analytical results for mercury are included with the atomic absorption results in Table B-10.

ANALYTICAL PRECISION

Analytical precision was calculated for the atomic absorption and commercial mercury analyses only. The atomic absorption method contained 17 samples which were analyzed in triplicate. Each triplicate has been treated as 2 sets of paired analyses, with one set of pairs representing the precision of combined hand specimen sampling and analytical procedures, and the other set representing only analytical precision. The method used was based on that of Garrett (1969) for geochemical mineral exploration. Samples were initially grouped according to concentration levels to avoid unrealistically good precision values at lower concentration levels due to including higher concentrations in the sample means. Precision was then calculated at the 95% confidence level for each group using the formula:

$$P = \frac{1.98\ \sigma A}{\overline{X}} \times 100\%$$

where $\sigma A = \sqrt{\frac{1}{2N} \sum_{i=1}^{N} (x_{1i} - x_{2i})^2}$ for duplicate samples and $\overline{X}$ is the replicate mean within the group. Replicate pairs and paired precision tests are shown in Table B-4.

Overall analytical precision is considered reasonable for Ag, Cd, Fe, Mn, and Pb, but is poor for Cu and Hg. Co and Ni provided insufficient data for practical precision analysis. No definite conclusions can be drawn concerning the differences between precision of combined hand specimen sampling and analytical procedure, and precision of analytical procedure alone. The differences are too small and appear random, thus any variations provided by the picking of two samples from the same hand specimen appear to be insignificant relative to the analytical variations. This suggests that each analysis is representative of the sphalerite of an entire hand specimen, i.e. the specimen is homogeneous within the limits of the analytical precision.

A few cases do show the possibly anticipated result of significantly poorer precision for the pair including sampling variance (e.g. Cu and Pb at the lower concentration levels). If poor precision is partially due to the presence of fine mineral contaminants, then these contaminants will presumably have a greater relative effect on the lower concentration ranges and precision will be poorer there.

In one case, a highly anomalous sample with poor reproducibility is responsible for the majority of the variance within that group (Cu - group 1-B). Precision calculated for set 1 without that sample (20024-07) is reduced from ±93% to ±6%. This simply highlights the fact that sporadic highly anomalous samples do occur and may unrealistically bias the results.

Further interpretations based on the data will now be limited by the precision of the results. For example, in attempting to contour data, the elements with the widest range in absolute values and with the best precision will exhibit any regional variations best (i.e. Cd, Fe and perhaps Pb will provide the most reliable information). In order to effectively determine significant differences between samples in terms of standard deviations, the precision variances must be accounted for. This leads to an investigation of the sources and nature of variances within the data in order that they may be defined and explained prior to proceeding to confidently relating the values and their variances to geological parameters.

ANALYSIS OF VARIANCE

An analysis of variance is a statistical technique whereby the overall variation within a set of data can be reduced and attributed to a number of component sources of variability. This can be achieved by treating each analytical result as an estimator of the expected mean value plus contributions from various other sources. If an experiment has a structure which can attempt to define the prime sources, then a measure of each contribution to the variation of the analytical result about the expected mean can be determined. Hence, a knowledge of the relative significance of each source will permit the confident utilization of the overall data set within any restricitons discovered during the analysis of variance.

In this experiment, sources of variability to be considered are: 1) analytical variance versus hand sampling variance (even though this has already been examined within the precision analysis, it may be briefly re-examined within the analysis of variance tables); 2) overall analytical variance between deposits versus overall analytical variance within deposits, and 3) the general data variability between deposits in the region versus, the variability of the data within each of those deposits. Determining the relative importance of the sources in 2) and 3) is critical to utilizing the data further, in characterization of specific deposits within the entire study area as a whole.

The analysis of variance treatment uses a sum of squares method whereby the total population variance can be expressed as a sum of the between population variance and the within population variance.

Calculations in this analysis are displayed as a ratio of variance between these two sources, with the final result having an F-distribution. The equations used and the resulting table (c.f. Walpole and Myers, 1972, p. 356) are shown below.

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
between	$n\sum_{i=1}^{K}(\bar{y}i - \bar{y})^2 = SSB$	K-1	$S_1^2 = \frac{SSB}{K-1}$	$F = \frac{S_1^2}{S_2^2}$
within	$\sum_{i=1}^{K}\sum_{j=1}^{n}(yij - \bar{y}i)^2 = SSW$	K(n-1)	$S_2^2 = \frac{SSW}{K(n-1)}$	
Total	$\sum_{i=1}^{K}\sum_{j=1}^{n}(yij - \bar{y})^2 = SST$	nK-1		

K = # deposits $\qquad$ $\bar{y}i$ = deposit mean

n = # samples $\qquad$ $\bar{y}$ = total population mean

yij = single sample result

A comparison of the mean square values for the within sample pair variance of both analytical sets 1 and 2 provides a ratio which also follows an F distribution and which yields information on variance due to hand sampling and analysis versus variance due to analysis alone.

The basic assumptions underlying these tests is that the samples are randomly chosen from a normal population, and hence the sample population is also a normal population. Trace element data usually conforms to a log-normal distribution and the sample population used for these tests may not strictly reflect the same normal distribution, but will be sufficiently accurate to ensure a meaningful test.

The analysis of variance results are displayed for each element in Table B-5. Each analytical set is tabulated and the computed F value is shown, along with the critical F value for a sample population of this design. Furthermore, for each element, the comparison F ratio of the two analytical sets is also shown, with its critical value as well. These results are discussed relative to the sources of variability considered. In all cases the critical F values were determined using a one-sided test at the 95% confidence level.

The comparison F ratio, recorded for each element in Table B-5, demonstrates that in most cases the variances due to hand sampling and analysis combined, versus hand sampling alone, are of the same order of magnitude and hence, are drawn from the same population. This would indicate that variability introduced through sampling the same specimen twice, is neglibible. However, as can be seen from the within sample pair, mean square values, and the resultant F values, for Cd and Cu, this is not necessarily the case. As discussed previously, the precision for Cu was noticeably poor, more so for analytical set 1, suggesting the fine particles of a copper bearing contaminant may have been commonly missed during the separation procedure. However, the cadmium variances remain unexplained. Greenockite a cadmium-bearing mineral, was tentatively identified but was rarely seen. Another possible cause is inhomogeneity in the Cd distribution within the sphalerite crystal structure; however, this has not yet been documented here. This point will be investigated further.

The second test that the variance tables provides is that of comparing the analytical variance within a single deposit to the analytical and hand sampling variances between deposits. It is necessary to know, at this stage, if the data variances incurred during the analysis of the samples are large enough to overwhelm and perhaps conceal regional sample variations between deposits, or if the regional variations will be able to be observed through the analytical variability.

This method of variance analysis provides for the breakdown of total variance into these two component sources. The test has been performed on both analytical sets and in all cases shows that the within deposit analytical variances are negligible relative to the between deposit variances. The magnitude of the mean square value for the between and within factors demonstrates this, and the computed F ratio, when compared to the critical $F_{(0.05)}$ (16,17) ratio, shows that the between deposit analytical and sample variances result from a different population than the within deposit variances at the 95% confidence level. Therefore, further statistical grouping of the overall data population may proceed in the confidence that the analytical results for each deposit can be characterized above the analytical error.

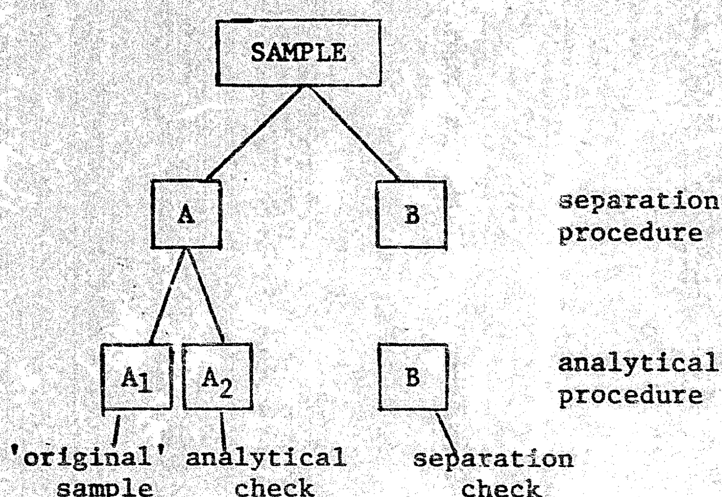
One further test was performed to examine the variance of individual samples themselves, between and within deposits. Again, this is to test the hypothesis that the samples from a single deposit can characterize that deposit above the variations found in all samples across the region, that is, to determine if within deposit sample variances are small relative to the regional between deposit sample variances.

In this case, the 9 deposits having a minimum of 5 samples each were chosen, with the results tabulated for each element precisely as in the case of sample duplicates. From deposits containing more than 5 samples, a random selection of 5 representative sampleswas made. Table B-6 tabulates the sample results used, the F-ratio calculations, and the critical F at the 95% confidence level.

These results demonstrate that for each element the computed F value exceeds the critical F value, thereby suggesting that these two components of the total sample variance are drawn from two independant sources and, hence, data variances between deposits may be considered greater than data variances within deposits, at the 95% confidence level. Therefore further data manipulations characterizing regional geologic parameters to the individual deposits will be valid.

EXPLANATION OF PRECISION AND VARIANCE TABLES

Each sample has been split into two in the separation procedure, and following this, one of these splits has been analyzed in duplicate as an internal analytical check (schematic diagram). The results for each element from each of these analyses have been grouped into two sets of analytical results. The first analytical set compares the 'original' sample with the second separate of that sample (i.e. A_1 versus B). The second analytical set compares the 'orginal' sample with the duplicate analysis of that same sample (i.e. A_1 versus A_2). Table 3 displays the analytical results of each of the 17 triplicated sample analyses, grouped into analytical sets 1 and 2, and also tabulates the standard deviation and mean for each pair of sample analyses within each set. Calculated precision values are displayed in Table B-4. Analytical set 1 represents precision affected by variability in hand specimen sampling and in analysis, while analytical set 2 is affected by variability in analysis alone.



References for this section are available in Appendix B-7.

GALENA LEAD ISOTOPE STUDY

Thirty eight hand-picked galena samples from 35 of the carbonate hosted zinc-lead deposits have been prepared for lead isotope analyses (Table C-1). Analyses will be carried out in the Department of Geophysical Sciences, The University of British Columbia. Laboratory work will be supervised by Dr. W. Slawson. Funds for the analytical part of this work are available from the National Research Council of Canada.

SUMMARY

The University of British Columbia collection of samples from carbonate hosted zinc-lead deposits in the Ogilvie and Mackenzie mountains, Y.T. and N.W.T. is a strong base for the three lines of research outlined here. The potential of this collection is by no means exhausted yet! Additional fluid inclusion and sulphur isotope studies for geothermometric data appear to be warranted.

A total of more than $20,000 has been spent on making this collection, on purchasing basic fluid inclusion equipment (excluding the microscope costs), and on analytical costs. Monies were received as follows:

DSS/DIANA 04 SU.C7111-5-0142	$7,405
DSS/DIANA 06 SU.A7111-6-0138	9,000
Arctic and Alpine Research Grant	2,000
Industry (5 contributors)	1,600
Total	$20,005

Data in this report will form the basis for several masters theses and will be published, in part, as professional papers. Some thought might be given to concise presentation of data in the Yukon Territory "Mineral Industry Report". The material presented in this report, and the one which preceded it, will be made available to anyone interested ~~on the basis that data contained in the reports will not be published without the written permission of Dr. C. Godwin.~~ A copy will be available for viewing in the thesis collection of the reading room, Department of Geological Sciences, The University of British Columbia. Those companies that participated in this project by donation will be notified by letter of the availability of these documents (Appendix D is a list of participating companies). Copies of the two aforementioned reports will be made available to participating companies at cost if they wish them.

APPENDIX A

DATA FOR GEOTHERMOMETRY FROM CARBONATE HOSTED ZINC-LEAD DEPOSITS, Y.T. AND ADJACENT N.W.T.

TABLE A-1

Description of Polished Slabs and Fluid Inclusions From Carbonate Hosted Zinc-Lead Deposits[1], Y.T.[2] and N.W.T.[3]

SAMPLE 10001-3, SPHALERITE; CARNE SHOWING

1. Section is of very fine-grained botryoidal sphalerite associated with calcite gangue and minor pyrite.
2. Sphalerite is optically poor and inclusions, 5 to 15μ in diameter contain only 1 phase.
3. Sample is unsuitable for further fluid inclusion studies.

SAMPLE 10002-1, BARITE; BILBO SHOWING

1. Section is from coarse grained barite specimen.
2. Primary, pseudo-secondary and secondary inclusions are common but generally contain only 1 phase; locally negative crystal P inclusions contain 2 phases but necking down of these inclusions is apparent.
3. Sample is unsuitable for further fluid inclusion studies.

SAMPLE 10003-1, SPHALERITE; CIG SHOWING

1. Section is from coarse grained sphalerite specimen.
2. Secondary inclusions are small, optically cloudy and contain only 1-phase.
3. Sample is unsuitable for further fluid inclusion studies.

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[1] Detailed location and general geology of deposits without fluid inclusion results are available in Summary Report-February 1976.

[2] Y.T. samples have numbers within the range 10000 to 19999.

[3] N.W.T. samples have numbers within the range 20000 to 29999.

Table A-1 (cont.)

SAMPLE 10004-1, SPHALERITE, SIHOTA SHOWING

1. Section is of a coarse sphalerite grain surrounded by carbonate spar.
2. Good primary and/or pseudo-secondary negative crystal inclusions are abundant and contain 2-phases.
3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 10005-3, CALCITE, KIWI SHOWING

1. Section is from coarse grained calcite specimen.
2. Calcite is extensively fractured but one secondary 2-phase inclusion was noted.
3. Further inclusion work has not been attempted at this time because of marginal potential.

SAMPLE 10006-2, SPHALERITE, NEWT SHOWING

1. Section is from a specimen of coarse, grained sphalerite.
2. Zones of primary (negative crystal) inclusions are abundant but most are very dark in colour (filled with oils?); some large, prismatic, 2-phase inclusions occur but the volume of the vapour phase is variable.
3. Further inclusion work has not been attempted yet, but potentially useful data might be forthcoming.

SAMPLE 10006-3, SPHALERITE, NEWT SHOWING

1. Section is from coarse grained orange-brown specimen of sphalerite with minor galena.
2. Primary (negative crystals) and pseudo-secondary (flat, elongate and tabular) inclusions have 2-phase fillings but vapour phase is small; zones of abundant pseudo-secondary inclusions occur;

Table A-1 (cont.)

individual inclusions are commonly 5 to 10μ in diameter. Daughter crystals are common.

3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 10006-5, SPHALERITE, NEWT SHOWING

1. Section is of coarse grained sphalerite.
2. Many large negative crystal fluid inclusions up to 25μ in diameter with a 15% vapour volume occur.
3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 10007-1, BARITE, CHAPMAN SHOWING

1. Section is from coarse grained barite specimen.
2. Primary (negative crystals) and secondary inclusions are very abundant; many inclusions are clearly necked down.
3. Further inclusion data has not been obtained at this time because of "necking down".

SAMPLE 10008-2, SPHALERITE, HOT SHOWING

1. Reconnaissance study of a section of sphalerite did not identify suitable inclusions.

SAMPLE 10009-1, BARITE, COOT SHOWING

1. Section is from coarse grained barite specimen.
2. Primary, pseudo-secondary and secondary inclusions are generally 1-phase; the few 2-phase inclusions are necked down.
3. Sample is unsuitable for further inclusion studies because of "necking down" feature.

Table A-1 (Cont.)

SAMPLE 10010-1, SPHALERITE, ECONOMIC SHOWING

1. Section is from specimen of yellow, coarse grained sphalerite cut by stringers of galena.
2. Primary (negative crystals), pseudo-secondary and secondary 2-phase inclusions are commonly 10 to 15μ in diameter; a few inclusions are necked down; inclusions, pseudo-secondary, occur in zones.
3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 10012-2, SPHALERITE, GILLESPIE CK. SHOWING

1. Section is from a 0.6 cm. wide calcite-sphalerite-quartz vein which cuts a brecciated host rock.
2. Primary or pseudo-secondary, 2-phase inclusions, 10 to 15μ in diameter, are abundant in the sphalerite; secondary, 2-phase inclusions, up to 10μ in diameter, occur in quartz.
3. Inclusion data for sphalerite and quartz are in Tables A-2 and A-3.

SAMPLE 10013-1, SPHALERITE, UG SHOWING

1. Section is from a brecciated dolomite cemented with sphalerite.
2. Inclusions are rare and small.
3. Further inclusion work has not been attempted yet but one area of the slide offers some potential.

SAMPLE 10014-1, CALCITE, QUARTZ, QMY SHOWING

1. Section is from specimen of coarse grained calcite and quartz.
2. Inclusions are very small, and calcite is fractured.
3. Further inclusion work is not recommended for this sample.

Table A-1 (Cont.)

SAMPLE 10016-2, SPHALERITE, GREMLIN SHOWING

1. Reconnaissance study of a section of sphalerite did not identify suitable inclusions.

SAMPLE 10018-1, SPHALERITE, ALE SHOWING

1. Reconnaissance study of a section of sphalerite did not identify suitable inclusions.

SAMPLE 10019-1, SPHALERITE, GEORDIE SHOWING

1. Reconnaissance study of a section of sphalerite did not identify suitable inclusions.

SAMPLE 10020-1, SPHALERITE, TART SHOWING

1. Section is from specimen of coarse grained sphalerite.
2. Primary (negative crystal), 2-phase inclusions are present but section is cloudy so viewing is difficult.
3. Further inclusion work has not been attempted but slide might provide some potential for further study.

SAMPLE 10020-4, SPHALERITE, TART SHOWING

1. Section is part of a sphalerite, pyrite, calcite vein which cuts black argillite.
2. Inclusions appear to be filled with crystalline material.
3. Further inclusion study is not recommended on this sample.

Table A-1 (cont.)

SAMPLE 10021-1, FLUORITE, MAGIC SHOWING

1. Section is cut from coarse grained, purple fluorite and quartz specimen.
2. Pseudo-secondary, 2-phase inclusions, up to 30μ in diameter, are common.
3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 10022-4, SPHALERITE, WILL SHOWING

1. Section is cut from view of fine-grained sphalerite and calcite.
2. Inclusions usually are filled by crystalline daughter products.
3. Further inclusion work is not recommended for this sample.

SAMPLE 10024-1, SPHALERITE, COMINCO A SHOWING

1. Section is cut from specimen of coarse grained yellow sphalerite with minor galena and siliceous fragments.
2. A few pseudo-secondary, 2-phase inclusions with a very low vapour phase volume were observed but are very small. Most inclusions are very dark and all do not contain a vapour phase.
3. Further inclusion work has not been attempted; the slide offers limited potential.

SAMPLE 10025-4, QUARTZ AND SPHALERITE; COMINCO B AND C SHOWING

1. Section consists of yellow sphalerite with banded rock fragments.
2. Sphalerite contains abundant primary and pseudo-secondary, 2-phase fluid inclusions which are 30 to 70μ in diameter; quartz crystals contain pseudo-secondary, 2-phase inclusions which are 15 to 40μ in diameter.
3. Inclusion data are in Tables A-2 and A-3.

Table A-1 (cont.)

SAMPLE 10025-6, SPHALERITE, COMINCO B AND C SHOWING

1. Section is from very coarse grained sphalerite specimen.
2. Primary, 2-phase inclusions are up to 110μ in diameter; vapour phase occupies about 15% of the inclusion void.
3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 10026-1, SPHALERITE, VUG SHOWING

1. Section is from fine-grained sphalerite specimen.
2. Sphalerite is very dark; fluid inclusions are very small.
3. Specimen is too dark and fine grained for further inclusion studies.

SAMPLE 10027-2, SPHALERITE, COMINCO 7 SHOWING

1. Section is of coarse sphalerite.
2. Inclusions are abundant but most are black or one phase.

SAMPLE 10027-3, SPHALERITE, COMINCO 7 SHOWING

1. Section contains coarse grained sphalerite with galena and calcite.
2. Fluid inclusions are abundant, S, but commonly necked down; volume of the vapour phase is small when present.
3. Further inclusion work has not been attempted; the slide offers limited potential for significant results.

SAMPLE 10028-3, BARITE, COMINCO 1 SHOWING

1. Section is from coarse grained barite specimen.
2. Primary, 2-phase fluid inclusions are up to 17μ in maximum dimension.
3. Inclusion data are in Tables A-2 and A-3.

Table A-1 (cont.)

SAMPLE 10028-5, SPHALERITE, COMINCO 1 SHOWING

1. Reconnaissance study of a section of sphalerite did not identify suitable inclusions.

SAMPLE 10028-6, SPHALERITE, COMINCO 1 SHOWING

1. Reconnaissance study on an additional section (see samples 10028-6A and 6B below) did not identify suitable inclusions.

SAMPLE 10028-6A, SPHALERITE, COMINCO 1 SHOWING

1. Section cut from a coarse grained sphalerite and calcite vein.
2. Most fluid inclusions are black, ragged and contain 1-phase.
3. Further inclusion study is not recommended on this sample.

SAMPLE 10028-6B, SPHALERITE, COMINCO 1 SHOWING

1. Section contains coarse grained yellow-brown sphalerite with calcite.
2. Primary (negative crystals) inclusions are necked down and contain 1-phase.
3. Further inclusion study is not recommended on this sample.

SAMPLE 10028-7, SPHALERITE, COMINCO 1 SHOWING

1. Section is of coarse grained sphalerite and calcite with siliceous rock fragments.
2. One area of the section contains several good, two-phase pseudo-secondary fluid inclusions about 10μ in diameter.
3. Suitable for further study; not yet done.

SAMPLE 10029-2, SPHALERITE, TOPOROWSKI SHOWING

1. Section consists of a coarse grained sphalerite and calcite network enclosing grey siliceous rock fragments.
2. Fluid inclusions are small, up to 10μ in diameter, occur in zones, have a small vapour phase and are very dark.
3. Further inclusion study might be warranted on a re-cut section; this one is too thick to see marginally useful inclusions.

Table A-1 (cont.)

SAMPLE 10029-2A, SPHALERITE, TOPOROWSKI SHOWING

1. Reconnaissance of an additional section (as suggested above under description of Sample 10029-2) did not reveal suitable inclusions for this study.

SAMPLE 10029-4, SPHALERTIE, TOPOROWSKI SHOWING

1. Section is of layered, banded and generally very fine-grained sphalerite.
2. Fluid inclusions are small and poor.
3. Further inclusion study is not recommended on this sample.

SAMPLE 10029-5, SPHALERITE, TOPOROWSKI SHOWING

1. Reconnaissance study of a section of sphalerite did not identify suitable inclusions but section is poorly polished and too thick.

SAMPLE 10029-8, SPHALERITE, TOPOROWSKI SHOWING

1. Reconnaissance study of a section of sphalerite did not identify suitable inclusions, but sample is poorly polished.

SAMPLE 10030-1, SPHALERITE AND CALCITE, COMINCO 3 SHOWING

1. Section consists of alternate bands of sphalerite (with galena) and sphalerite.
2. Fluid inclusions in sphalerite are very poor but calcite contains 2-phase inclusions.
3. Inclusion study on calcite might be warranted (note: 2 sections are available).

Table A-1 (cont.)

SAMPLE 10032-1, SPHALERITE AND CALCITE, CLOE SHOWING

1. Section is of brecciated argillite cemented by sphalerite and calcite.
2. One fluid inclusion in sphalerite was noted; section is generally too dark.
3. Inclusion study might be warranted.

SAMPLE 10033-1, SPHALERITE and GANGUE, GOZ SHOWING

1. Section consists of a "sugary" mixture of gangue and sphalerite.
2. No good fluid inclusions were noted; some inclusions are large but have a very small vapour phase.
3. Section is not satisfactory for this study.

SAMPLE 10033-5, SPHALERITE, GOZ SHOWING

1. Section is of coarsely crystalline sphalerite.
2. Inclusions are difficult to see but section is too thick for good viewing. Inclusions noted were either clear or black -- i.e. all one phase.

SAMPLE 10033-13, SPHALERITE, GOZ SHOWING

1. Section is of coarsely crystalline sphalerite.
2. Zones of tabular, negative crystal fluid inclusions are common. Vapour volume is from 10 to 20%.
3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 10033-16, SPHALERITE AND GANGUE, GOZ SHOWING

1. Section consists of "sugary" mixture of gangue and sphalerite.
2. No good fluid inclusions were noted.
3. Section is not satisfactory for this study.

Table A-1 (cont.)

SAMPLE 10033-21, SPHALERITE AND GANGUE, GOZ SHOWING

1. Section consists of "sugary" mixture of gangue and sphalerite.
2. No good fluid inclusions were noted.
3. Section is not satisfactory for this study.

SAMPLE 10033-22, SPHALERITE, GOZ SHOWING

1. Section consists of coarse grained sphalerite.
2. Zones of negative crystal fluid inclusions 25μ in diameter are abundant. Vapour volume is about 10%.
3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 10033-25, SPHALERITE, GOZ SHOWING

1. Section is of coarsely crystalline sphalerite.
2. Triangular, pseudo secondary inclusions with 5 to 10% vapour volume are common.
3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 10034-2, SPHALERITE, BIRKELAND SHOWING

1. Two sections of yellow sphalerite with minor galena and carbonate veining were prepared.
2. Abundant negative crystals occur but they appear to be mainly one phase inclusions.
3. Several areas are marked for possible work but section does not seem promising.

SAMPLE 10034-2A, SPHALERITE, BIRKELAND SHOWING

1. Reconnaissance study of a second section of sphalerite (see sample 10034-2) did not identify suitable inclusions.

Table A-1 (cont.)

SAMPLE 10035-1, SPHALERITE, COMINCO 8 SHOWING

1. Section of sphalerite from this sample does not reveal satisfactory fluid inclusions but section is too thick and needs a better polish.

SAMPLE 10035-2, SPHALERITE, COMINCO 8 SHOWING

1. Section of sphalerite from this sample does not reveal useful inclusions but section is poorly polished and too thick.

SAMPLE 10036-1, SPHALERITE, COMINCO 9 SHOWING

1. The section of sphalerite from this showing does not have useful inclusions.

SAMPLE 10037-3, SPHALERITE, OZ SHOWING

1. Reconnaissance study on a section of sphalerite did not identify suitable inclusions.

SAMPLE 10037-10, SPHALERITE, OZ SHOWING

1. Reconnaissance study on a section of sphalerite did not identify suitable inclusions.

SAMPLE 10037-20, SPHALERITE, OZ SHOWING

1. Reconnaissance study on a section of sphalerite found inclusions that should be run on the heating and freezing stage.

Table A-1 (cont.)

SAMPLE 10037-30, SPHALERITE, OZ SHOWING

1. Section is of reddish brown sphalerite with a rock fragment inclusion.
2. Inclusions are very small and are probably not satisfactory for further work.

SAMPLE 10037-30A, SPHALERITE, OZ SHOWING

1. Reconnaissance study on a section of sphalerite did not identify suitable inclusions.

SAMPLE 10037-53, BARITE, OZ SHOWING

1. Section is of whitish barite.
2. Section is clouded with inclusions of two main types:
   (1) necked inclusions with no vapour phase, and
   (2) equant, negative crystal inclusions with about a 35% volume of vapour.
3. Only homogenization temperatures were obtained (Tables A-2 and A-3). Upon heating many inclusions, near the surface or near cleavages, would decrepitate and leave an orange residue on the section surface.

SAMPLE 10038-1, CALCITE, MONSTER SHOWING

1. Section is of sparry calcite.
2. Inclusions are small but primary with about a 10% vapour volume.
3. Only homogenization temperatures were obtained (Tables A-2 and A-3).

Table A-1 (cont.)

SAMPLE 10042-1, SPHALERITE, PROFEIT SHOWING

1. Section of coarse grained sphalerite.
2. Two phase pseudo secondary fluid inclusions are 10 to 20μ in diameter and are 5 to 10% vapour by volume.
3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 10042-3, SPHALERITE, PROFEIT SHOWING

1. Section is of coarse grained sphalerite.
2. Large, primary, two-phase inclusions up to 75μ in diameter are common.
3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 10042-9, SPHALERITE, PROFEIT SHOWING

1. Reconnaissance study of a section of sphalerite did not identify suitable inclusions. Inclusions noted were dark, small and one phase.

SAMPLE 10042-34, SPHALERITE, PROFEIT SHOWING

1. Section is of coarse sphalerite.
2. Fluid inclusions are either too small or too opaque for study.

SAMPLE 10042-44, QUARTZ, PROFEIT SHOWING

1. Section is of a quartz crystal.
2. Poor polish precludes inclusion description.
3. Repolishing this sample might provide useful inclusions.

Table A-1 (cont.)

SAMPLE 10043-2, SPHALERITE, FISHING BRANCH SHOWING

1. Reconnaissance study of a section of sphalerite did not identify suitable inclusions.

SAMPLE 10043-4, SPHALERITE, FISHING BRANCH SHOWING

1. Reconnaissance study of a section of sphalerite indicates that some inclusions might be useful for study.

SAMPLE 10043-5, SPHALERITE, FISHING BRANCH SHOWING

1. Reconnaissance study of a section of sphalerite did not identify suitable inclusions.

SAMPLE 10044-1, SPHALERITE, WART SHOWING

1. Reconnaissance study of a section of sphalerite indicates abundant inclusions, suitable for this study, are available.

SAMPLE 10044-3, SPHALERITE, WART SHOWING

1. Reconnaissance study of a section of sphalerite did not identify suitable inclusions.

SAMPLE 10045-1, SPHALERITE, AXE SHOWING

1. Reconnaissance study of a section of sphalerite did not identify suitable inclusions.

SAMPLE 10046-1, SPHALERITE, 148/75 SHOWING

1. Reconnaissance study of a section of sphalerite indicates abundant inclusions, suitable for this study, are available.

Table A-1 (cont.)

SAMPLE 10049-1, SPHALERITE, TF 134 SHOWING

1. Reconnaissance study of a section of sphalerite did not identify suitable inclusions.

SAMPLE 10051-1, SPHALERITE, GJ7 SHOWING

1. Reconnaissance study of a section of sphalerite indicates abundant inclusions, suitable for this study, are available.

SAMPLE 10051-2, SPHALERITE, GJ7 SHOWING

1. Reconnaissance study of a section of sphalerite indicates abundant inclusions, suitable for this study, are available.

SAMPLE 10051-2A, SPHALERITE, GJ7 SHOWING

1. Reconnaissance study of a section of sphalerite indicates abundant inclusions, suitable for this study, are available.

SAMPLE 10052-1, SPHALERITE, MEL SHOWING

1. Reconnaissance study of a section of sphalerite indicates abundant inclusions, suitable for this study, are available.

SAMPLE 10052-2, SPHALERITE, MEL SHOWING

1. Reconnaissance study of a section of sphalerite indicates abundant inclusions, suitable for this study, are available.

Table A-1 (cont.)

SAMPLE 20005-4, SPHALERITE, SISCOE SHOWING

1. Reconnaissance study of a section of sphalerite did not reveal any inclusions.

SAMPLE 20012-4, SPHALERITE, TWITYA (BEAR) SHOWING

1. Section is of large sphalerite grains.
2. A cluster of five primary and or pseudo-secondary inclusions, up to 20μ in maximum diameter, with 15% vapour volume were studied.
3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 20023-25, SPHALERITE AND QUARTZ, REV (MAIN) SHOWING

1. Section of quartz and sphalerite. is composed
2. Inclusions in sphalerite are very difficult to see and are about 15%. Quartz inclusions are 5 to 15μ in diameter and have constant vapour volumes of about 10%.
3. Inclusion data on quartz are in Tables A-2 and A-3; heating data are not reliable because of problems in viewing and leaking of bubbles.

SAMPLE 20023-61, SPHALERITE, REV (ESAU) SHOWING

1. Section is composed of large sphalerite grains.
2. Several primary and/or pseudo-secondary one and possibly 2-phase inclusions occur but they are very small and difficult to see.
3. Runs have not yet been made on this material.

SAMPLE 20023-62, CALCITE, REV (ESAU) SHOWING

1. Section consists of a chip-slab of calcite.
2. Inclusions are very small, 3.5μ diameter, and contain 1 phase; a very few 2-phase inclusions might exist but they are indistinct.

Table A-1 (cont.)

3. No runs have been attempted on this section.

SAMPLE 20023-67, QUARTZ AND SPHALERITE, REV (ESAU) SHOWING

1. Section is of a clear quartz crystal and large sphalerite grains.
2. Inclusions are up to 30μ in diameter and are 2-phase with vapour volumes consistently about 15%. Negative crystal habit to inclusions suggest they are primary or pseudo-secondary.
3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 20023-99, QUARTZ AND SPHALERITE, REV (WATER FALL) SHOWING

1. Section consists of coarse quartz and sphalerite.
2. Inclusions appear to be mainly 1-phase; one area of sphalerite and one area of quartz possibly contains some very small 2-phase inclusions.
3. No runs have been attempted on this section.

SAMPLE 20023-99A, QUARTZ (WATERFALL) SHOWING

1. Sample is of a quartz crystal.
2. Inclusions are up to 100μ long by 35μ wide and consist of 3-phases (2 immiscible liquids and a vapour phase occupying about 20% of the volume of the inclusion); several daughter products locally were noted--one is probably halite, the other is rectangular in form and otherwise unidentified.
3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 20023-134, SPHALERITE AND CALCITE, REV (WEST CIRQUE) SHOWING

1. Section consists of coarse sphalerite and calcite.
2. Inclusions in both sphalerite and calcite are of one phase (liquid or solid?).
3. Section is not suitable for further study.

Table A-1 (cont.)

SAMPLE 20023-156A & B, SPHALERITE, REV (WEST CIRQUE) SHOWING

1. Sections consist of coarse grained sphalerite.
2. Inclusions are generally one phase.
3. Section does not appear to be of use in further study.

SAMPLE 20023-157, QUARTZ, REV (WEST CIRQUE) GROUP

1. Sample is of a quartz crystal.
2. Primary or pseudo-secondary negative crystals contain 3-phase liquids; vapour volume is about 20%.
3. Inclusion data are in Table A-2 but inclusions leaked or decrepitated on heating to homogenization.

SAMPLE 20025-1, SPHALERITE, TEGART SHOWING

1. Reconnaissance study of a section of sphalerite did not identify suitable inclusions. Inclusions are generally hard to see, dark and very small. However, occasionally a small bubble is seen in PS inclusion zones.

SAMPLE 20025-12, SPHALERITE, TEGART SHOWING

1. Reconnaissance study of a section of this sphalerite did not reveal suitable inclusions. The sphalerite is extremely fine grained.

Table A-1 (cont.)

SAMPLE 20027-1, SPHALERITE, CLIMAX SHOWING

1. Section is composed of large sphalerite grains.
2. Inclusions are large, primary and contain a 30% vapour volume.
3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 20027-2, SPHALERITE, CLIMAX SHOWING

1. Section is of coarse sphalerite.
2. Inclusions occur in zones (pseudo secondary) and contain about a 25% vapour volume.
3. Inclusion data are in Tables A-2 and A-3.

SAMPLE 20027-3, SPHALERITE, CLIMAX SHOWING

1. Section is composed of large sphalerite grains.
2. Inclusions are large, primary and contain a 40% vapour volume.
3. Most inclusions decrepitate but homogenization was observed, in some instances prior to decrepitation; inclusion data are in Tables A-2 and A-3.

TABLE A-2

Location and Geologic Descriptions for Those Deposits with

Fluid Inclusion Data

NUMBER	DEPOSIT	N.T.S.	LAT.	LONG.	HOST AGE	HOST RØCK	CØMMØDITY
10004 Y.T.	SIHOTA	106D14	64.83	135.01	HELIKIAN	DØLM	PB ZN CU
10006 Y.T.	NEWT	106D11	64.53	135.47	ØRDØVIC	DØLM	ZN PB
10010 Y.T.	ECONOMIC	106B06	64.33	131.22	CAMBRIAN	DØLM	PB ZN
10012 Y.T.	GILLESPIE	106C12	64.70	133.83	HADRYNI	DØLM	ZN PB
10021 Y.T.	MAGIC	106E03	65.00	135.07	ØRDØVIC	LIMS	PB ZN FL BA
10025 Y.T.	COMINCOBC	106C10	64.70	132.95	HADRYNI	CARB	PB ZN
10028 Y.T.	COMINCO1	106C10	64.58	132.58	SIL-DEV	DØLM	PB ZN
10033 Y.T.	GOZ	106C07	64.43	132.55	L. CAMB?	DØLM	ZN PB CD AG
10037 Y.T.	OZ	116B12	64.75	139.75	HELIKIAN	DØLM	PB ZN
10038 Y.T.	MØNSTER	116B13	64.82	139.97	PRØTERO	DØLM	ZN PB CU
10042 Y.T.	PROFEIT	106C14	64.82	133.55	HADRYNI	DØLM	PB ZN AG BA CU
20012 N.W.T.	TWITYA	106A03	64.03	129.37	ØRD-SIL	DØLM	ZN PB AG
20023 N.W.T.	REV	106A03	64.13	129.33	ØRD-SIL	DOLM	ZN PB
20027 N.W.T.	CLIMAX	105P08	63.35	128.38	CAM-HAD?	DOLM	ZN PB SB

TABLE A-3

Fluid Inclusion and Last Melting Homogenization Data for Inclusions in Minerals Associated with Carbonate Hosted Zinc-Lead Deposits, Y.T. and N.W.T.

NUMBER	SAMPLE	MIN.[4] and	TYPE[5]	DEPOSIT[6]	LAST MELTING °C[7] LOW	MEAN	HIGH	NO	HOMOGENIZATION °C[7] LOW	MEAN	HIGH	NO
10004[1]	001	SL	P	SIHOTA	-5.7	-4.4	-2.1	4	156.0	159.9	165.0	4
10006	003	SL	PS D	NEWT	-28.0	-23.2	-18.0	4	120.0	125.9	133.0	10
10006	005	SL	PS OR S	NEWT	-13.5	-12.1	-9.4	6	124.0	131.5	134.9	4
10010	001	SL	P OR PS	ECONOMIC	-5.5	-4.6	-4.1	3	143.3	152.0	160.7	2
10012	002	SL	P OR PS	GILLESPIE	-14.5	-14.4	-14.3	4	130.0	136.3	144.0	3
10012	002	QE	S OR PS	GILLESPIE	-14.6	-14.5	-14.4	2	165.0	176.2	189.5	7
10021	001	FU	PS	MAGIC	-4.5	-4.5	-4.4	2	182.0	188.0	192.1	5
10025	004	SL	P and PS	COMINCO BC	-6.1	-5.5	-4.9	2	240.0	243.9	250.8	4
10025	004	QZ	PS	COMINCO BC	-3.4	-3.4	-3.4	4	163.2	165.0	167.5	7
10025	004	QZ	S	COMINCO BC	--	-1.4	--	1	LOWER THAN FOR PS			1
10025	006	SL	P and PS	COMINCO BC	-4.9	-4.5	-4.0	2	230.0	238.2	250.8	5
10028	003	BA	P	COMINCO 1	-3.9	-3.6	-3.2	2	--	158.8	--	1
10033	013	SL	PS	GOZ	-6.8	-4.4	-4.5	8	146.0	150.5	155.0	4
10033	022	SL	PS	GOZ	-12.3	-11.1	-9.5	4	169.9	171.6	173.3	2
10033	025	SL	PS	GOZ	-15.8	-15.7	-15.6	2	--	130.9	--	1
10037[2]	053	BA	P	OZ	NOT DONE			0	345.0	351.0	353.0	4
10038[2]	001	CA	P	MONSTER	NOT DONE			0	--	225.0	--	1
10042	001	SL	PS	PROFEIT	-8.6	-7.3	-6.6	3	201.8	209.6	217.2	3
10042	003	SL	P	PROFEIT	-9.3	-9.3	-9.3	3	195.0	203.7	212.4	2
20012	004A	SL	P OR PS	TWITYA	-2.8	-2.4	-2.1	2	307.2	308.1	309.0	2
20012	004B	SL	P OR PS	TWITYA	-1.4	-1.3	-1.3	2	--	204.0 ?	--	1
20023	025	QZ	PS	REV (MAIN)	-7.0	-5.0	-3.0	4	INCLUSIONS LEAKED			0

Table A-3 (cont.)

NUMBER	SAMPLE	MIN.[4] and TYPE[5]	DEPOSIT[6]	LAST MELTING °C[7] LOW	MEAN	HIGH	NO	HOMOGENIZATION °C[7] LOW	MEAN	HIGH	NO
20023	067[3]	SL P or PS	REV (ESAU)	-15.7	-15.4	-15.1	2	180.0	187.3	190.0	9
20023	099A[3]	QZ PS D	REV (WATF)	NOT	DONE		0	165.0	210.7	246.0	5
20027	001	SL P	CLIMAX	-8.7	-8.1	-7.5	4	200.5	246.3	279.0	4
20027	002	SL PS D	CLIMAX	-9.0	-8.3	-7.6	2	265.5	267.9	272.0	4
20027	003	SL P	CLIMAX	-8.0	-6.9	-6.2	3	--	278.0	--	1

[1]All runs were by J. McLeod, unless noted.

[2]Runs were by R. Carne.

[3]Runs were by M. McArthur

[4]Mineral host to fluid inclusion is coded as follows: SL = sphalerite, QZ = auartz, FU = fluorite, BA = barite, CA = Calcite.

[5]Type of fluid inclusion is coded as follows: P = primary, PS = pseudo-secondary, S = secondary, D = daughter product noted.

[6]Deposit character, location, etc. is in Table A-2.

[7]Temperature data are uncorrected for pressure or instrument deviation; calibration chart for instrument is in Figure A-1.

Table A-4

Sulphur Isotope Analysis[1] of Galena-Sphalerite Pairs from Carbonate Hosted Zinc-Lead Deposits, N.W.T.

NUMBER	NAME	N.T.S.	LAT.	LONG.	δS^{34} 0/00 GALENA	δS^{34} 0/00 SPHALERITE	$\Delta\delta^{34}S$ 0/00 SPHALERITE-GALENA	APPX. TEMP. °C[7]
20012-1	TWITYA (BEAR)	106/A/03	64.03	129.37	+10.38[2]	+12.19[2]	1.81	400
20023-14	REV (MAIN SHOW)	106/A/03	64.13	129.33	+6.0[3]	+9.4[3]	3.4	220
20023-24	REV (MAIN SHOW)	106/A/03	64.13	129.33	+6.5[3]	+10.0[3]	3.5	215
20023-98	REV (WATERFALL)	106/A/03	64.13	129.33	+10.9[3]	+13.1[3.4]	2.2	325
20023-146	REV (WEST CIRQUE)	106/A/03	64.13	129.33	11.4[3.5]	12.35[3.6]	0.95	670

[1] Analyses by Dr. C.E. Rees, Department of Physics, McMaster University, Hamilton, Ontario, L8S 4K1.
[2] Mass spectrometry on samples converted to SF_6.
[3] Mass spectrometry on samples converted to SO_2.
[4] Two separate analyses both +13.1.
[5] Two separate analyses both +11.4.
[6] Two separate analyses, one +12.3, the other +12.4.
[7] Temperature determined from graph by Kajiwara and Krouse, 1971 (Fig. 1).

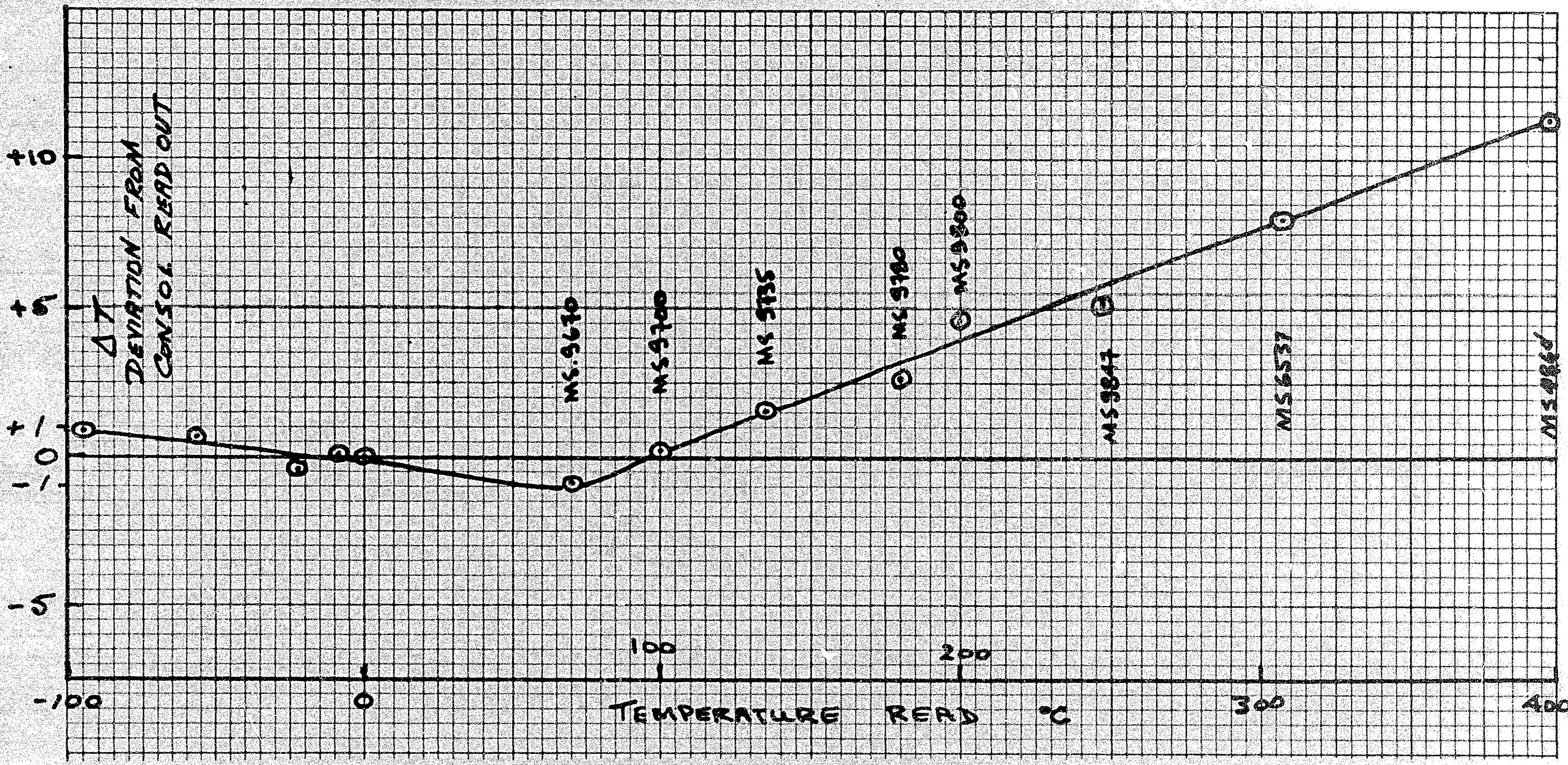

Figure A-1: Calibration curve (April 1976) defining deviation in temperature between consol read out and stage temperature. Chaixmeca fluid inclusion heating and freezing stage, room 301, Department of Geological Sciences, U.B.C.

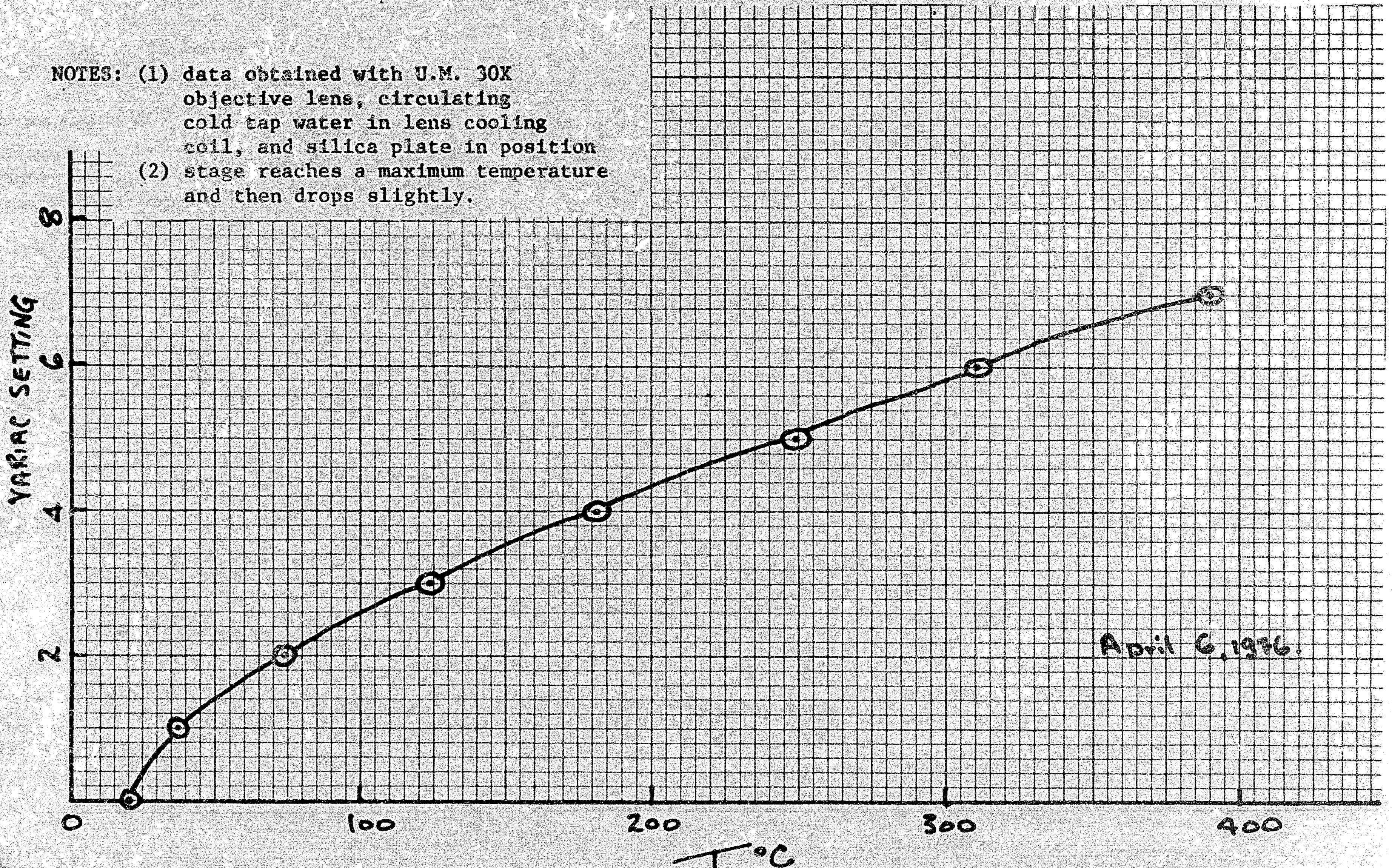

Figure A-2: Calibration curve (April 1976) defining the variac setting required to obtain an approximate stage temperature. Chaixmeca fluid inclusion heating and freezing stage, room 301, Department of Geological Sciences, U.B.C.

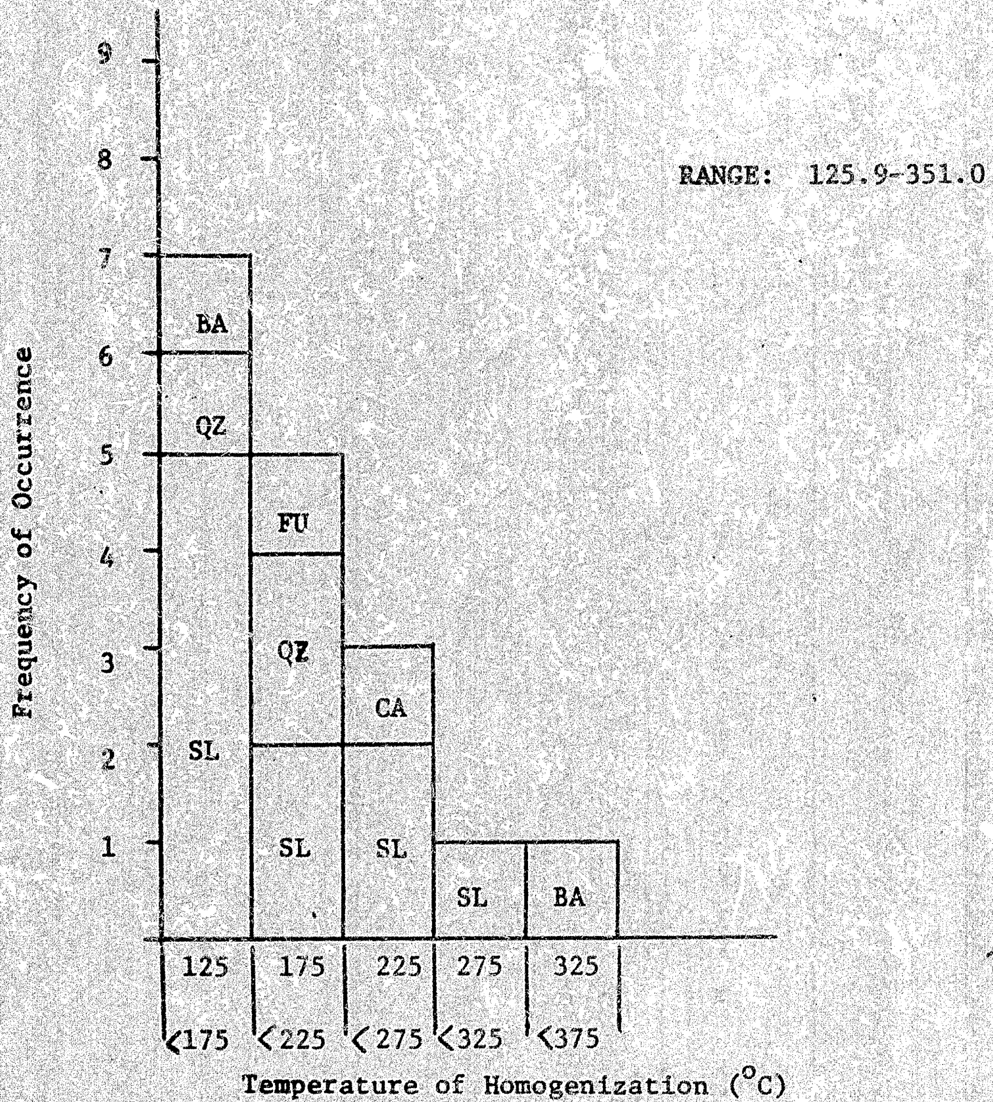

Figure A-3: Histogram of homogenization temperatures determined from 27 polished slabs from 14 carbonate hosted zinc-lead deposits, Y.T., and N.W.T. Only mean values of each mineral for each deposit (from Table A-3) are plotted. SL = sphalerite, QZ = quartz, BA = barite, Fu = fluorite, CA = calcite.

APPENDIX B

SPHALERITE TRACE ELEMENT

DATA FROM CARBONATE

HOSTED ZINC-LEAD DEPOSITS,

Y.T. AND ADJACENT N.W.T.

TABLE B-1

EMISSION ARC SPECTROSCOPY DETECTION LIMITS

Ag - 1 ppm	Sr - 100 ppm
Co - 2 ppm	Ti - 1 ppm
Cu - 1 ppm	V - 1 ppm
Mn - 1 ppm	Ba - 200 ppm
Ni - 2 ppm	Ga - 1 ppm
Pb - 1 ppm	Sn - 1 ppm
Sb - 100 ppm	Mo - 2 ppm
As - 200 ppm	Be - 2 ppm
Cr - 1 ppm	Bi - 2 ppm

Fe 0.1% wt FeO.

TABLE B-2

ATOMIC ABSORPTION SPECTROSCOPY

OPERATING CONDITIONS AND DETECTION LIMITS

	Element	Wave length	Slit Width	M-amps Current	H_2 lamp	Detection Limits
a	Ag	3280.7	1000	6	+	1 ppm
a	Cd	2288	1000	6	+	50
a	Co	2407.3	300	20	+	1
b	Cu	3247.5	50	3		1
b	Fe	2483	50	5		30
b	Mn	2794	50	5		1
a	Ni	2320	300	20	+	5
a	Pb	2170	1000	14	+	4

a - Perkin Elmer b - Techtron

TABLE B-3 A: 17 TRIPLICATED SAMPLE ANALYSES
CADMIUM

ANALYTICAL SET #1

SAMPLE NUMBER	10006 3	10024 1	10027 2	10033 14	10036 2	10042 1	10042 9	10044 1	20005 4	20008 9	20012 2	20023 96	20023 126	20024 7	20025 1	20034 1	20035 1
A_1	1010	1548	2065	2401	1064	1599	1318	1760	4586	767	1560	2040	2511	1574	1618	1176	1184
B	940	1525	2065	1879	1155	1773	1308	1783	5504	791	1624	1939	2944	1374	1644	1194	1004

STANDARD DEVIATION	50	16	0	369	64	123	7	16	650	17	45	71	306	141	18	13	127
MEAN	975	1536	2065	2140	1110	1686	1313	1772	5045	779	1592	1990	2728	1474	1631	1185	1094

ANALYTICAL SET #2

SAMPLE NUMBER	10006 3	10024 1	10027 2	10033 14	10036 2	10042 1	10042 9	10044 1	20005 4	20008 9	20012 2	20023 96	20023 126	20024 7	20025 1	20034 1	20035 1
A_1	1010	1548	2065	2401	1064	1599	1318	1760	4586	767	1560	2040	2511	1574	1618	1176	1184
A_2	942	1327	1926	1953	1022	1618	1426	1755	4524	714	1453	2048	2393	1539	1531	1090	1125

STANDARD DEVIATION	48	156	98	317	30	13	76	3.5	44	37	76	5.6	83	25	62	61	42
MEAN	976	1437	1896	2177	1043	1609	1372	1758	4555	741	1507	2044	2452	1567	1575	1133	1155

TABLE [illegible] 17 [illegible] SAMPLE [illegible]

COPPER

ANALYTICAL SET #1

Sample Number	10006 3	10024 1	10027 2	10033 14	10036 2	10042 1	10042 9	10044 1	20005 4	20008 9	20012 2	20023 96	20023 126	20024 7	20025 1	20034 1	20035 1
A_1	95	26	140	13	563	280	271	722	110	8	29	5	12	525	73	198	366
B	103	33	144	16	545	280	293	740	114	8	31	21	39	105	14	192	362

Standard Deviation	5.6	5	2.8	2.1	13	0	16	13	2.8	0	0.7	11	19	297	42	4	2.8
Mean	99	30	142	14.5	554	280	282	731	112	8	30	13	26	315	44	195	364

ANALYTICAL SET #2

Sample Number	10006 3	10024 1	10027 2	10033 14	10036 2	10042 1	10042 9	10044 1	20005 4	20008 9	20012 2	20023 96	20023 126	20024 7	20025 1	20034 1	20035 1
A_1	95	26	140	13	563	280	271	722	110	8	29	5	12	525	73	198	366
A_2	92	29	152	16	558	280	272	733	110	8	29	21	58	519	71	191	367

Standard Deviation	2.1	2.1	8	2.1	4	0	0.7	8	0	0	0	11	12	525	73	198	366
Mean	93	28	146	15	561	280	272	728	110	8	29	13	58	519	71	191	367

Table 8. 17 Replicated Sample Analyses

COPPER

ANALYTICAL SET #1

Sample Number	10006 3	10024 1	10027 2	10033 14	10036 2	10042 1	10042 9	10044 1	20005 4	20008 9	20012 2	20023 96	20023 126	20024 7	20025 1	20034 1	20035 1
A_1	95	26	140	13	563	280	271	722	110	8	29	5	12	525	73	198	366
B	103	33	144	16	545	280	293	740	114	8	31	21	39	105	14	192	362
Standard Deviation	5.6	5	2.8	2.1	13	0	16	13	2.8	0	0.7	11	19	297	42	4	2.8
Mean	99	30	142	14.5	554	280	282	731	112	8	30	13	26	315	44	195	364

ANALYTICAL SET #2

Sample Number	10006 3	10024 1	10027 2	10033 14	10036 2	10042 1	10042 9	10044 1	20005 4	20008 9	20012 2	20023 96	20023 126	20024 7	20025 1	20034 1	20035 1
A_1	95	26	140	13	563	280	271	722	110	8	29	5	12	525	73	198	366
A_2	92	29	152	16	558	280	272	733	110	8	29	21	58	519	71	191	367
Standard Deviation	2.1	2.1	8	2.1	4	0	0.7	8	0	0	0	11	12	525	73	198	366
Mean	93	28	146	15	561	280	272	728	110	8	29	13	58	519	71	191	367

TABLE B3C: 17 TRIPLICATED SAMPLE ANALYSES
IRON

ANALYTICAL SET #1

SAMPLE NUMBER	10006 3	10024 1	10027 2	10033 14	10036 2	10042 1	10042 9	10044 1	20005 4	20008 9	20012 2	20023 96	20023 126	20024 7	20025 1	20034 1	20035 1
A_1	13,280	4976	749	1701	3260	2319	2149	4954	4174	1590	124	421	411	117	481	726	290
B	12,750	4990	728	1341	3403	2382	2117	5129	3220	1421	104	213	268	145	445	701	176

STANDARD DEVIATION	375	10	15	255	101	45	23	124	675	120	14	147	101	20	26	18	81
MEAN	13,015	4983	739	1521	3332	2351	2133	5042	3697	1506	114	317	340	131	463	714	233

ANALYTICAL SET #2

SAMPLE NUMBER	10006 3	10024 1	10027 2	10033 14	10036 2	10042 1	10042 9	10044 1	20005 4	20008 9	20012 2	20023 96	20023 126	20024 7	20025 1	20034 1	20035 1
A_1	13280	4976	749	1701	3260	2319	2149	4954	4174	1590	124	421	411	117	481	726	290
A_2	12520	5113	765	1739	3235	2957	2261	5391	3722	1426	97	275	209	90	431	633	104

STANDARD DEVIATION	537	97	11	27	18	451	79	309	320	116	19	103	143	19	35	66	132
MEAN	12,900	5045	757	1720	3248	2638	2205	5173	3948	1508	111	348	310	104	456	680	197

TABLE B-3D: 17 TRIPLICATED SAMPLE ANALYSES

MANGANESE

ANALYTICAL SET #1

SAMPLE NUMBER	10006 3	10024 1	10027 2	10033 14	10036 2	10042 1	10042 9	10044 1	20005 4	20008 9	20012 2	20023 96	20023 126	20024 7	20025 1	20034 1	20035 1
A_1	26	14	11	0	18	58	102	22	24	18	50	53	46	46	8	35	28
B	25	13	10	0	19	62	104	24	24	13	39	43	36	48	8	33	24

STANDARD DEVIATION	0.7	0.7	0.7	0	0.7	2.8	1.4	1.4	0	3.5	7.7	7.1	7.1	1.4	0	1.4	2.8
MEAN	26.5	13.5	10.5	0	18.5	60	103	23	24	16	45	48	41	47	8	34	26

ANALYTICAL SET #2

SAMPLE NUMBER	10006 3	10024 1	10027 2	10033 14	10036 2	10042 1	10042 9	10044 1	20005 4	20008 9	20012 2	20023 96	20023 126	20024 7	20025 1	20034 1	20035 1
A_1	26	14	11	0	18	58	102	22	24	18	50	53	46	46	8	35	28
A_2	30	17	10	0	12	69	122	31	24	18	49	55	49	49	8	36	26

STANDARD DEVIATION	2.8	2.1	0.7	0	2.8	7.7	14.2	6.4	0	0	0.7	1.4	2.1	2.1	0	0.7	1.4
MEAN	28	16	10.5	0	20	64	112	27	24	18	49.5	54	47.5	47.5	8	35.5	27

TABLE 53E: 17 TRIPLICATED SAMPLE ANALYSES LEAD.

ANALYTICAL SET #1

SAMPLE NUMBER	10006 3	10024 1	10027 2	10033 14	10036 2	10042 1	10042 9	10044 1	20005 4	20008 9	20012 2	20023 96	20023 126	20024 7	20025 1	20034 1	20035 1
A_1	3462	870	132	29	50	347	659	309	870	336	84	463	573	30	18	56	29
B	3450	802	86	29	47	330	719	286	612	370	92	476	755	13	11	55	19
STANDARD DEVIATION	8	48	33	0	2.1	12	42	16	182	24	6	9	129	12	5	0.7	7.0
MEAN	[illegible]456	836	109	29	48	339	689	248	741	353	88	470	664	22	15	56	24

ANALYTICAL SET #2

SAMPLE NUMBER	10006 3	10024 1	10027 2	10033 14	10036 2	10042 1	10042 9	10044 1	20005 4	20008 9	20012 2	20023 96	20023 126	20024 7	20025 1	20034 1	20035 1
A_1	3462	870	132	29	50	347	659	309	870	336	84	463	573	30	18	56	29
A_2	3422	904	123	35	42	327	619	317	767	394	110	546	916	22	16	51	19
STANDARD DEVIATION	28	24	6	4	5.6	14	28	179	73	41	18	59	243	5.6	1.4	3.5	7.1
MEAN	3442	887	128	32	46	337	639	509	819	365	97	505	745	26	17	54	24

TABLE B-3F: 17 TRIPLICATED SAMPLE ANALYSES
SILVER

ANALYTICAL SET #1

SAMPLE NUMBER	10006 3	10024 1	10027 2	10033 14	10036 2	10042 1	10042 9	10044 1	20005 4	20008 9	20012 2	20023 96	20023 126	20024 7	20025 1	20034 1	20035 1
A_1	13	11	7	295	28	15	36	5	4	0	3	3	6	8	0	0	5
B	13	10	3	288	27	19	35	5	5	0	3	2	6	7	0	2	8
STANDARD DEVIATION	0	0.7	2.8	4.9	0.7	2.8	0.7	0	0.7	0	0	0.7	0	0.7	0	1.4	2.1
MEAN	13	10.5	5	291.5	27.5	17	35.5	5	4.5	0	3	2.5	6	7.5	0	1.0	6.5

ANALYTICAL SET #2

SAMPLE NUMBER	10006 3	10024 1	10027 2	10033 14	10036 2	10042 1	10042 9	10044 1	20005 4	20008 9	20012 2	20023 96	20023 126	20024 7	20025 1	20034 1	20035 1
A_1	13	11	7	295	28	15	36	5	4	0	3	3	6	8	0	0	5
A_2	12	11	3	290	29	15	37	3	2	0	3	5	7	10	0	0	5
STANDARD DEVIATION	0.7	0	2.8	3.5	0.7	0	0.7	1.4	1.4	0	0	1.4	0.7	1.4	0	0	0
MEAN	12.5	11	5	292.5	28.5	15	36.5	4	3	0	3	4	6.5	9	0	0	5

TABLE B-3G: 13 DUPLICATED SAMPLE ANALYSES
MERCURY

SAMPLE NUMBER	10006-2	10024-2	10025-4	10033-4	10034-1	10042-1	20012-1	20012-4	20019-4	20023-96	20024-8	20025-2	20034-1
A_1	3.0	215.0	10.5	26.5	10.5	8.8	27.0	27.5	0.29	0.18	2.5	14.5	23.5
B	5.2	233.0	7.8	25.2	18	61.5	25.5	22	8.5	0.10	2.3	9.8	19.5
STANDARD DEVIATION	1.55	12.72	1.90	0.91	5.3	37.3	1.1	3.8	5.8	0.05	0.14	3.32	2.82
MEAN	4.1	224	9.15	25.8	14.3	35.2	26.3	24.8	4.4	0.14	2.40	12.15	21.5

TABLE B-4: PRECISION CALCULATIONS

ELEMENT	GROUP #	MEAN VALUE RANGE	NUMBER OF SAMPLES IN GROUP	PRECISION (± %)	
				ANALYTICAL SET #1	ANALYTICAL SET #2
Ag	A	0-40	16	19%	23%
	B	300	1	3%	2%
Cd	A	700-2700	16	17%	13%
	B	5000	1	25%	1%
Cu	A	0-50	7	150%	90%
	B	100-370	8 (7)*	93%	3%
	C	400-800	2 (3)*	3%	1%
Fe	A	0-800	8	36%	44%
	B	1500-2400	4	15%	23%
	C	3300-5000	4	16%	10%
	D	13000	1	1%	8%
Mn	A	0-60	16	25%	22%
	B	100	1	2%	24%
Pb	A	15-130	8	51%	30%
	B	300-850	8	29%	31%
	C	3400	1	0.5%	1%
Hg	A	0-40	12	147%	
	B	225	1	11%	

*Sample 20024-7 provided significantly different results for the two separated samples. The difference was great enough (105 ppm vs 525 ppm) to warrant a change from group B in Set 1 to group C in Set 2. The resultant improvement in Precision in Set 2 demonstrates that isolated cases of contamination in different parts of a single hand sample do occur.

SILVER

ANALYTICAL SET # 1

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	COMPUTED F
BETWEEN	153,191	16	9574	3,255
WITHIN	50	17	2.94	
TOTAL	153,241	33		

ANALYTICAL SET # 2

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	COMPUTED F
BETWEEN	154,539	16	9659	5,383
WITHIN	30	17	1.79	
TOTAL	154,569	33		

CRITICAL $F_{0.05}$ (16,17)	
	2.29

COMPARISON F (17,17)
1.64

CRITICAL $F_{0.05}$ (17,17)
2.29

CADMIUM

ANALYTICAL SET # 1

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	COMPUTED F
BETWEEN	30,346,243.5	16	1,896,640.2	44.91
WITHIN	717,792.5	17	42,223.0	
TOTAL	31,064,036	33		

ANALYTICAL SET # 2

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	COMPUTED F
BETWEEN	23,791,355.8	16	1,486,959.7	141.90
WITHIN	178,136.5	17	10,478.6	
TOTAL	23,969,442.3	33		

CRITICAL $F_{0.05}$ (16,17)	
	2.29

COMPARISON F (17,17)
4.03

CRITICAL $F_{0.05}$ (17,17)
2.29

TABLE 85A: ANALYSIS OF VARIANCE OF TRIPLICATED SAMPLES.

Copper

Analytical Set #1

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	1,398,936.5	16	87,433.5	16.31
Within	91,104	17	5,359.0	
Total	1490,040.5	33		

Analytical Set #2

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	1,564,152.9	16	97,759.6	1195.6
Within	1,390	17	81.8	
Total	1,565,542.9	33		

Critical $F_{0.05}$ (16,17)
2.29

Comparison F (17,17)
65.51

Critical $F_{0.05}$ (17,17)
2.29

Iron

Analytical Set #1

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	327,067,452.7	16	20,441,715.8	467.8
Within	742,847.5	17	43,696.9	
Total	327,810,300.2	33		

Analytical Set #2

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	325,562,305.2	16	20,347,644.1	446.56
Within	774,599	17	45,564.6	
Total	326,336,904.2	33		

Critical $F_{0.05}$ (16,17)
2.29

Comparison F (17,17)
0.96

Critical $F_{0.05}$ (17,17)
2.29

Table B-58 Analysis of Variance of Triplicated Samples.

Manganese

Analytical Set # 1

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	19,258.5	16	1,203.7	102.82
Within	199.0	17	11.7	
Total	19,457.5	33		

Analytical Set # 2

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	22,752.5	16	1,422.0	71.94
Within	336	17	19.8	
Total	23,088.5	33		

Critical $F_{0.05}$ (16,17)	
	2.29

Comparison F (17,17)
0.59

Critical $F_{0.05}$ (17,17)
2.29

Lead

Analytical Set # 1

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	21,388,316.5	16	1,336,769	402.83
Within	56,413.5	17	3,318.4	
Total	21,444,730.0	33		

Analytical Set # 2

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	21,351,253.9	16	1,334,453.4	314.24
Within	72,190.5	17	4,246.5	
Total	21,423,444.4	33		

Critical $F_{0.05}$ (16,17)	
	2.29

Comparison F (17,17)
0.78

Critical $F_{0.05}$ (17,17)
2.29

TABLE B5C: ANALYSIS OF VARIANCE OF TRIPLICATED SAMPLES.

TABLE B-5: ANALYSIS OF VARIANCE OF DUPLICATED SAMPLES

MERCURY

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE	COMPUTED F
BETWEEN	83,519.1	12	6,959.9	54.68
WITHIN	1,654.7	13	127.3	
TOTAL	85,173.8	25		

CRITICAL $F_{0.05}$ (11,12)	2.72

SILVER

Samples	Deposits: 10027	10033	10037	10042	20012	20023	20024	20025	20034
1	4	24	12	7	0	3	50	0	2
2	3	90	38	5	9	0	59	0	0
3	23	3	33	13	5	0	32	6	0
4	16	4	16	4	4	0	7	0	0
5	20	155	43	83	18	2	19	3	6

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	13,540	8	1692.5	2.40
Within	25,306	36	702.9	
Total	38,846	44		

Critical $F_{0.05}(8,36)$	2.22

CADMIUM

Samples	Deposits: 10027	10033	10037	10042	20012	20023	20024	20025	20034
1	1584	1943	2105	1815	1436	2242	1793	164[illegible]	1194
2	2065	1680	1140	1448	1223	2569	1374	1752	1381
3	2123	1460	2299	1605	1389	2000	1615	1400	1134
4	2359	1515	1733	1048	1166	2608	1374	1416	1584
5	2274	1622	2375	2827	1166	2114	1648	1641	1015

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	4,903,065	8	612,883.2	5.39
Within	4,089,626	36	113,600.7	
Total	8,992,691	44		

Critical $F_{0.05}(8,36)$	2.22

TABLE 86A: ANALYSIS OF VARIANCE, BETWEEN-WITHIN DEPOSITS

COPPER

		Deposits								
		10027	10033	10037	10042	20012	20023	20024	20025	20034
Samples	1	165	42	145	335	39	21	8	14	192
	2	144	343	389	171	73	131	19	20	29
	3	157	26	337	31	110	5	40	26	21
	4	222	18	218	214	47	9	105	26	50
	5	209	160	524	317	241	4	38	60	68

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	387,877	8	48,484.7	5.91
Within	295,003	36	8,194.5	
Total	682,880	44		

Critical $F_{0.05}(8,36)$	2.22

IRON

		Deposits								
		10027	10033	10037	10042	20012	20023	20024	20025	20034
Samples	1	1311	1775	2873	1890	92	165	3572	445	701
	2	729	1848	6654	2268	1042	175	2157	340	4629
	3	1246	1083	3781	2759	110	165	1058	1988	5803
	4	2077	1159	5255	5321	47	286	145	1693	5872
	5	2368	1304	5028	2220	241	185	340	1900	5561

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	109,806,550	8	13,725,818.8	10.07
Within	49,066,697	36	1,362,963.8	
Total	158,873,247	44		

Critical $F_{0.05}(8,36)$	2.22

TABLE B6B: ANALYSIS OF VARIANCE, BETWEEN-WITHIN DEPOSITS

Manganese

Samples	10027	10033	10037	10042	20012	20023	20024	20025	20034
1	13	8	103	51	20	35	28	8	33
2	10	2	16	86	22	35	34	3	23
3	13	0	25	14	19	36	24	8	10
4	16	2	46	51	18	47	48	5	15
5	11	0	103	73	16	36	8	5	11

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	16,500	8	2,062.5	6.45
Within	11,601	36	319.5	
Total	28,001	44		

Critical $F_{0.05}(8,36)$ 2.22

Lead

Samples	10027	10033	10037	10042	20012	20023	20024	20025	20034
1	451	839	177	113	36	755	281	11	55
2	86	142	326	197	2814	59	793	0	30
3	594	68	180	49	4837	463	146	21	78
4	266	73	95	21	281	476	13	12	8
5	710	0	621	1307	3284	760	0	36	10

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	18,613,412	8	2,326,676.5	4.25
Within	19,689,248	36	546,923.6	
Total	38,302,660	44		

Critical $F_{0.05}(8,36)$ 2.22

Table 8.6C Analysis of Variance, Between [illegible] Deposits [illegible]

Samples	Deposits: 10027	10033	10037	10042	20012	20023	20024	20025	20034
1	192.5	120.5	12.0	45.5	23.5	0.23	2.2	12.0	23.5
2	267.5	267.0	5.0	67.5	220.5	0.65	1.0	14.5	9.7
3	295.0	46.5	8.8	163.0	12.5	0.32	3.2	18.5	34.5
4	295.0	44.5	8.8	7.5	24.0	0.44	20.0	12.5	26.0
5	292.5	154.0	7.5	61.0	41.0	0.23	2.5	17.0	26.5

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	301,408	8	37,676.0	15.72
Within	86,254	36	2,395.9	
Total	387,662	44		

Critical $F_{0.05}(8,36)$	2.22

TABLE B6D: ANALYSIS OF VARIANCE, BETWEEN-WITHIN DEPOSITS

TABLE B-7

References for Text on Sphalerite Trace Elements

Flanagan, F.J. 1974. Reference Samples for the earth sciences. Geoch. et Cosmoch. Acta. vol. 38, p. 1731-1744.

Garrett, Robert G. 1969. The Determination of Sampling and Analytical Errors in Exploration Geochemistry: Economic Geology, vol. 14, p. 568-569.

Price, B.J. 1972. Minor Elements in Pyrites from the Smithers Map Area, B.C. and Exploration Applications of Minor Element Studies. Unpublished M.Sc. Thesis, Department of Geological Sciences, U.B.C. 270 p.

Walpole, Ronald E., and Raymond H. Myers, 1972. Probability and Statistics for Engineers and Scientists; Macmillan, 506 p.

		Deposits								
		10027	10033	10037	10042	20012	20023	20024	20025	20034
Samples	1	192.5	120.5	12.0	45.5	23.5	0.23	2.2	12.0	23.5
	2	267.5	267.0	5.0	67.5	220.5	0.65	1.0	14.5	9.7
	3	295.0	46.5	8.8	163.0	12.5	0.32	3.2	18.5	34.5
	4	295.0	44.5	8.8	7.5	24.0	0.44	20.0	12.5	26.0
	5	292.5	154.0	7.5	61.0	41.0	0.23	2.5	17.0	26.5

Source	Sum of Squares	Degrees of Freedom	Mean Square	Computed F
Between	301,408	8	37,676.0	15.72
Within	86,254	36	2,395.9	
Total	387,662	44		

Critical $F_{0.05}(8,36)$	2.22

TABLE B6D: ANALYSIS OF VARIANCE, BETWEEN-WITHIN DEPOSITS

TABLE B-7

References for Text on Sphalerite Trace Elements

Flanagan, F.J. 1974. Reference Samples for the earth sciences. Geoch. et Cosmoch. Acta. vol. 38, p. 1731-1744.

Garrett, Robert G. 1969. The Determination of Sampling and Analytical Errors in Exploration Geochemistry: Economic Geology, vol. 14, p. 568-569.

Price, B.J. 1972. Minor Elements in Pyrites from the Smithers Map Area, B.C. and Exploration Applications of Minor Element Studies. Unpublished M.Sc. Thesis, Department of Geological Sciences, U.B.C. 270 p.

Walpole, Ronald E., and Raymond H. Myers, 1972. Probability and Statistics for Engineers and Scientists; Macmillan, 506 p.

TABLE B-8

Computer Print Out of Basic Data for those Carbonate Hosted Zinc-Lead Deposits, Y.T. and Adjacent N.W.T., in which the Trace Elements in Sphalerite were studied.

******************************** LISTING ********************************

TABLE B-8

$LIST

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MINOR ELEMENTS IN SPHALERITE FROM NORTHERN YUKON & ADJACENT NORTHWEST TERRITORY

GEOGRAPHIC AND GEOLOGIC INFORMATION

ID.NO.	NAME	NTS	LAT	LONG	HOST LITH.	HOST AGE	COMMODITIES
10006002	NEWT	106D11	64.53	135.47	DOLM BRXX	ORD-SIL	ZN PB
10006003	NEWT	106D11	64.53	135.47	DOLM BRXX	ORD-SIL	ZN PB
10006005	NEWT	106D11	64.53	135.47	DOLM BRXX	ORD-SIL	ZN PB
10010001	ECONOMIC	106B06	64.33	131.22	DOLM	LOW CAMB	PB ZN
10020004	TART	116B13	64.83	139.83	DOLM BRXX	HELIKIAN	PB ZN
10022004	WILL	106D07	64.40	134.70	DOLM BRXX	HELIKIAN	PB ZN CU
10024001	COMINCO A+6	106C10	64.75	132.95	DOLM BRXX	CAMBRIAN	PB ZN
10024002	COMINCO A+6	106C10	64.75	132.95	DOLM BRXX	CAMBRIAN	PB ZN
10025001	COMINCO BC+5	106C10	64.70	132.[illegible]	DOLM BRXX	HADRYNIAN	PB ZN
10025004	COMINCO BC+5	106C10	64.70	132.95	DOLM BRXX	HADRYNIAN	PB ZN
10025006	COMINCO BC+5	106C10	64.70	132.95	DOLM BRXX	HADRYNIAN	PB ZN
10026001	VUG	116A09	64.57	136.28	DOLM BRXX	HELIKIAN	ZN PB
10027001	COMINCO 7+D	106C11	64.62	133.25	DOLM	HADRYNIAN	PB ZN
10027002	COMINCO 7+D	106C11	64.62	133.25	DOLM	HADRYNIAN	PB ZN
10027003	COMINCO 7+D	106C11	64.62	133.25	DOLM	HADRYNIAN	PB ZN
10027004	COMINCO 7+D	106C11	64.62	133.25	DOLM	HADRYNIAN	PB ZN
10027005	COMINCO 7+D	106C11	64.62	133.25	DOLM	HADRYNIAN	PB ZN
10028003	COMINCO 1	106C10	64.58	132.58	DOLM BRXX	SIL-DEV	PB ZN
10028007	COMINCO 1	106C10	64.58	132.58	DOLM BRXX	SIL-DEV	PB ZN
10029002	TOPOROWSKI	106C10	64.70	132.65	LIMS CONG	SIL-DEV	PB ZN
10029004	TOPOROWSKI	106C10	64.70	132.65	LIMS CONG	SIL-DEV	PB ZN
10029005	TOPOROWSKI	106C10	64.70	132.65	LIMS CONG	SIL-DEV	PB ZN
10029008	TOPOROWSKI	106C10	64.70	132.65	LIMS CONG	SIL-DEV	PB ZN
10030001	COMINCOF 3	106D05	64.50	133.83	LIMS CONG	HELIKIAN	PB ZN
10032001	CLOE	106E02	65.20	134.70	SHAL BRXX	HELIKIAN	ZN PB
10033001	GOZ	106C07	64.43	132.55	DOLM BRXX	LOW CAMB	ZN PB CD AG
10033004	GOZ	106C07	64.43	132.55	DOLM BRXX	LOW CAMB	ZN PB CD AG
10033005	GOZ	106C07	64.43	132.55	DOLM BRXX	LOW CAMB	ZN PB CD AG
10033012	GOZ	106C07	64.43	132.55	DOLM BRXX	LOW CAMB	ZN PB CD AG
10033013	GOZ	106C07	64.43	132.55	DOLM BRXX	LOW CAMB	ZN PB CD AG
10033014	GOZ	106C07	64.43	132.55	DOLM BRXX	LOW CAMB	ZN PB CD AG
10033015	GOZ	106C07	64.43	132.55	DOLM BRXX	LOW CAMB	ZN PB CD AG
10033016	GOZ	106C07	64.43	132.55	DOLM BRXX	LOW CAMB	ZN PB CD AG
10033017	GOZ	106C07	64.43	132.55	DOLM BRXX	LOW CAMB	ZN PB CD AG
10033021	GOZ	106C07	64.43	132.55	DOLM BRXX	LOW CAMB	ZN PB CD AG
10033022	GOZ	106C07	64.43	132.55	DOLM BRXX	LOW CAMB	ZN PB CD AG
10033023	GOZ	106C07	64.43	132.55	DOLM BRXX	LOW CAMB	ZN PB CD AG
10033024	GOZ	106C07	64.43	132.55	DOLM BRXX	LOW CAMB	ZN PB CD AG
10033025	GOZ	106C07	64.43	132.55	DOLM BRXX	LOW CAMB	ZN PB CD AG
10034001	BIRKELAND	106B04	64.15	131.92	DOLM BRXX	HADRYNIAN	ZN PB
10034002	BIRKELAND	106B04	64.15	131.92	DOLM BRXX	HADRYNIAN	ZN PB
10034009	BIRKELAND	106B04	64.15	131.92	DOLM BRXX	HADRYNIAN	ZN PB
10035001	COMINCO 8	106C04	66.33	135.52	DOLM BRXX	CAMBRIAN	PB ZN
10035002	COMINCO 8	106C04	66.33	135.52	DOLM BRXX	CAMBRIAN	PB ZN
10036001	COMINCO 9	106C14	64.97	133.20	DOLM	HELIKIAN	PB ZN

52	10036002	COMINCO 9	106C14	64.97	133.20	DOLM		HELIKIAN	PB ZN
53	10037003	OZ	116B12	64.75	139.75	DOLM	BRXX	HELIKIAN	PB ZN
54	10037004	OZ	116B12	64.75	139.75	DOLM	BRXX	HELIKIAN	PB ZN
55	10037020	OZ	116B12	64.75	139.75	DOLM	BRXX	HELIKIAN	PB ZN
56	10037028	OZ	116B12	64.75	139.75	DOLM	BRXX	HELIKIAN	PB ZN
57	10037030	OZ	116B12	64.75	139.75	DOLM	BRXX	HELIKIAN	PB ZN
58	10037031	OZ	116B12	64.75	139.75	DOLM	BRXX	HELIKIAN	PB ZN
59	10037032	OZ	116B12	64.75	139.75	DOLM	BRXX	HELIKIAN	PB ZN
60	10042001	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
61	10042002	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
62	10042003	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
63	10042004	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
64	10042008	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
65	10042009	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
66	10042010	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
67	10042011	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
68	10042015	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
69	10042019	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
70	10042023	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
71	10042027	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
72	10042031	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
73	10042036	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
74	10042040	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
75	10042041	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
76	10042042	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
77	10042043	PROFEIT	106C14	64.82	133.55	DOLM		HADRYNIAN	PB ZN AG BA CU
78	10043004	FISHING BRCH	116J05E	66.33	139.67	DOLM	BRXX	ORD-SIL	ZN PB
79	10043005	FISHING BRCH	116J05E	66.33	139.67	DOLM		ORD-SIL	ZN PB
80	10044001	HART	116J03W	66.07	139.47	DOLM		ORD-SIL	ZN PB
81	10045001	AXE	106C10E	64.56	132.58	DOLM	BRXX	SIL-DEV	ZN PB
82	10046001	GE8/19/75	106B04E	64.25	131.31	DOLM		CAMBRIAN	PB ZN
83	10046002	GE8/19/75	106B04E	64.25	131.31	DOLM		CAMBRIAN	PB ZN
84	10050001	ODD	105O13W	63.91	132.00	DOLM		HADRYNIAN	ZN
85	10053001	MT TILLICUM	106C02W	64.42	132.86	DOLM		LOW CAMB	ZN PB
86	20003002	PALM	106A05	64.40	129.80	DOLM		LOW CAMB	ZN PB
87	20003004	PALM	106A05	64.40	129.80	DOLM		LOW CAMB	ZN PB
88	20003005	PALM	106A05	64.40	129.80	DOLM		LOW CAMB	ZN PB
89	20004001	JUDE	106A05	64.37	129.87	DOLM		ORD-SIL	ZN PB
90	20004002	JUDE	106A05	64.37	129.87	DOLM		ORD-SIL	ZN PB
91	20004003	JUDE	106A05	64.37	129.87	DOLM		ORD-SIL	ZN PB
92	20005001	SISCOE	106B01	64.18	130.38	LMST		DEVONIAN	ZN PB
93	20005004	SISCOE	106B01	64.18	130.38	LMST		DEVONIAN	ZN PB
94	20006001	PAM	105P11	63.52	129.12	DOLM		LOW CAMB	PB ZN
95	20006005	PAM	105P11	63.52	129.12	DOLM		LOW CAMB	PB ZN
96	20006004	PAM	105P11	63.52	129.12	DOLM		LOW CAMB	PB ZN
97	20008007	BACKBONE	105P14	63.85	129.17	LMST	BRXX	DEVONIAN	ZN PB BA
98	20008009	BACKBONE	105P14	63.85	129.17	LMST	BRXX	DEVONIAN	ZN PB
99	20009004	WEATHER	105P14	63.[illegible]7	129.28	DOLM	BRXX	DEVONIAN	ZN PB
100	20012001	TWITYA	106A03	64.03	129.37	DOLM	BRXX	ORD-SIL	ZN PB AG
101	20012002	TWITYA	106A03	64.03	129.37	DOLM	BRXX	ORD-SIL	ZN PB AG
102	20012003	TWITYA	106A03	64.03	129.37	DOLM	BRXX	ORD-SIL	ZN PB AG
103	20012004	TWITYA	106A03	64.03	129.37	DOLM	BRXX	ORD-SIL	ZN PB AG
104	20012005	TWITYA	106A03	64.03	129.37	DOLM	BRXX	ORD-SIL	ZN PB AG
105	20012006	TWITYA	106A03	64.03	129.37	DOLM	BRXX	ORD-SIL	ZN PB AG
106	20012007	TWITYA	106A03	64.03	129.37	DOLM	BRXX	ORD-SIL	ZN PB AG
107	20012008	TWITYA	106A03	64.03	129.37	DOLM	BRXX	ORD-SIL	ZN PB AG
108	20012010	TWITYA	106A03	64.03	129.37	DOLM	BRXX	ORD-SIL	ZN PB AG
109	20012011	TWITYA	106A03	64.03	129.37	DOLM	BRXX	ORD-SIL	ZN PB AG
110	20012013	TWITYA	106A03	64.03	129.37	DOLM	BRXX	ORD-SIL	ZN PB AG
111	20013001	ESSAU	106B15	64.75	133.53	DOLM-LIMS		HADRYNIAN	ZN PB AG

112	20015004	JIM	106B08	64.48	130.45	DOLM		DEVONIAN	ZN PB AG
113	20019004	GILDERSLEEVE	106C16	64.98	132.45	DOLM	BRXX	LOW CAMB	ZN PB AG
114	20020003	MOGUL	106C15	64.98	132.30	DOLM		LOW CAMB	ZN PB
115	20021001	FC CLAIMS	106B08	64.36	130.20	DOLM		SIL-DEV	ZN BA PB
116	20021002	FC CLAIMS	106B08	64.36	130.20	DOLM		SIL-DEV	ZN BA PB
117	20023010	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
118	20023024	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
119	20023055	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
120	20023060	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
121	20023061	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
122	20023096	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
123	20023097	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
124	20023126	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
125	20023127	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
126	20023128	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
127	20023129	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
128	20023136	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
129	20023138	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
130	20023140	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
131	20023141	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
132	20023142	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
133	20023144	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
134	20023153	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
135	20023154	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
136	20023155	REV	106A03	64.13	129.33	DOLM		ORD-SIL	ZN PB
137	20024001	GAYNA	106B15	64.95	130.70	DOLM		HADRYNIAN	ZN CD PB
138	20024003	GAYNA	106B15	64.95	130.70	DOLM		HADRYNIAN	ZN CD PB
139	20024005	GAYNA	106B15	64.95	130.70	DOLM		HADRYNIAN	ZN CD PB
140	20024007	GAYNA	106B15	64.95	130.70	DOLM		HADRYNIAN	ZN CD PB
141	20024008	GAYNA	106B15	64.95	130.70	DOLM		HADRYNIAN	ZN CD PB
142	20024011	GAYNA	106B15	64.95	130.70	DOLM		HADRYNIAN	ZN CD PB
143	20025001	TEGART	106B09	64.53	130.17	DOLM		ORD-SIL	ZN PB
144	20025002	TEGART	106B09	64.53	130.17	DOLM		ORD-SIL	ZN PB
145	20025003	TEGART	106B09	64.53	130.17	DOLM		ORD-SIL	ZN PB
146	20025005	TEGART	106B09	64.53	130.17	DOLM		ORD-SIL	ZN PB
147	20025006	TEGART	106B09	64.53	130.17	DOLM		ORD-SIL	ZN PB
148	20025010	TEGART	106B09	64.53	130.17	DOLM		ORD-SIL	ZN PB
149	20025011	TEGART	106B09	64.53	130.17	DOLM		ORD-SIL	ZN PB
150	20025012	TEGART	106B09	64.53	130.17	DOLM		ORD-SIL	ZN PB
151	20027004	CLIMAX	105P08	63.35	128.38	DOLM		HADRYNIAN	ZN PB
152	20027005	CLIMAX	105P08	63.35	128.38	DOLM		HADRYNIAN	ZN PB
153	20032001	MNTN RIVER	106B08E	64.33	130.10	DOLM		SIL-DEV	ZN PB
154	20034001	KIND	106A08	64.37	129.73	DOLM		ORD-SIL	ZN PB
155	20034002	KIND	106A08	64.37	129.73	DOLM		ORD-SIL	ZN PB
156	20034003	KIND	106A08	64.37	129.73	DOLM		ORD-SIL	ZN PB
157	20034005	KIND	106A08	64.37	129.73	DOLM		ORD-SIL	ZN PB
158	20034011	KIND	106A08	64.37	129.73	DOLM		ORD-SIL	ZN PB
159	20035001	SEREM	106B08E	64.40	130.13	DOLM		ORD-SIL	ZN PB
160	20035002	SEREM	106B08E	64.40	130.13	DOLM		ORD-SIL	ZN PB
161	20035003	SEREM	106B08E	64.40	130.13	DOLM		ORD-SIL	ZN PB
162	20035006	SEREM	106B08E	64.40	130.13	DOLM		ORD-SIL	ZN PB
163	20036001	KWI	106B09E	64.61	130.03	DOLM		LOWCAM	ZN PB
164	20036003	KWI	106B09E	64.61	130.03	DOLM		LOWCAM	ZN PB
165	20036005	KWI	106B09E	64.61	130.03	DOLM		LOWCAM	ZN PB
166	20036006	KWI	106B09E	64.61	130.03	DOLM		LOWCAM	ZN PB
167	20037001	GJ7/30/75	106B08E	64.40	130.25	DOLM	BRXX	DEVONIAN	ZN
168	20037002	GJ7/30/75	106B08E	64.40	130.25	DOLM	BRXX	DEVONIAN	ZN
169	20038001	GJ7/14/75	106A05W	64.40	129.80	DOLM		ORD-SIL	ZN
170	20039001	GUN	105P15E	62.98	128.55	DOLM		CAMBRIAN	ZN BA PB
171	20040001	GJ7/27/75	106B09E	64.42	130.20	DOLM		ORD-SIL	PB ZN

```
        172      20040002 GJ7/27/75    106809E 64.42 130.20 DOLM        ORD-SIL   PB ZN
        173      20040003 GJ7/27/75    106809E 64.42 130.20 DOLM        ORD-SIL   PB ZN
        174      $ENDFILE
   .138 SEC. CPU TIME
 10.416 SEC. ELAPSED TIME
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TABLE B-9

Computer Print Out of Emission Spectrometer Analyses of Sphalerite from Carbonate Hosted Zinc-Lead Deposits, Y.T. and Adjacent N.W.T.

************************************ LISTING ************************************

$LIST

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TABLE B-9

MINOR ELEMENTS IN SPHALERITE FROM NORTHERN YUKON & ADJACENT NORTHWEST TERRITORY

ANALYTICAL RESULTS: EMISSION ARC SPECTROSCOPY

NOTE NO ANALYSES FOR DEPOSITS 10020, 10032, 10058, & 10053.

ID. NO.	AG	CO	CU	MN	NI	PB	SB	AS	CR	SR	TI	V	BA	GA	SN	FE
10006002	5	40	800	20	8	80	0	0	0	0	0	0	0	2	15	8.0
10006003	15	80	600	30	8	1000	0	0	0	0	0	0	0	2	15	8.0
10006005	8	35	100	70	10	30	0	0	5	0	5	0	0	2	8	8.0
10010001	100	5	0	100	0	3000	0	200	0	0	2500	30	0	40	0	6.0
10020004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
10022004	60	150	600	35	40	3000	200	0	20	0	2500	30	0	40	0	6.0
10024001	15	50	50	35	5	600	100	0	0	0	5	0	0	1	8	3.0
10024002	15	0	1000	40	0	500	0	0	0	0	10	0	0	25	35	1.0
10025001	2	0	40	40	0	40	0	0	2	0	0	0	0	1	0	3.0
10025004	2	0	40	40	0	40	0	0	2	0	0	0	0	0	0	0.5
10025006	2	0	80	5	0	15	0	0	0	0	0	0	0	0	20	0.5
10026001	70	70	750	35	60	1000	0	0	0	0	30	0	0	35	0	5.0
10027001	7	0	1100	10	0	50	0	0	3	0	10	0	0	15	0	0.3
10027002	2	0	900	8	0	15	0	0	0	0	10	0	0	20	5	1.0
10027003	50	0	1000	15	0	100	100	0	0	0	10	0	0	20	15	1.0
10027004	40	0	2000	30	0	800	200	0	0	130	15	0	0	50	30	5.0
10027005	30	0	600	15	0	150	100	0	0	0	3	0	0	30	35	1.0
10028003	4	0	5	3	15	100	0	0	0	0	5	0	0	0	0	1.0
10028007	8	0	0	2	0	50	0	0	2	0	0	0	0	8	0	0.2
10029002	2	0	15	8	0	100	0	0	0	0	1	0	0	0	0	1.0
10029004	15	0	30	15	50	700	100	0	0	0	1	0	0	1	0	3.0
10029005	40	0	40	10	100	100	150	0	4	0	1	0	0	0	0	0.8
10029008	0	0	50	10	50	300	0	0	0	0	5	0	0	1	0	1.0
10030001	20	100	800	25	40	9000	0	500	8	130	20	8	0	0	0	5.0
10032001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
10033001	15	0	700	8	0	100	130	0	0	0	100	0	150	0	0	0.5
10033004	5	0	35	2	2	15	100	0	15	0	0	0	0	1	0	0.5
10033005	5	0	35	1	0	20	0	0	0	0	2	0	0	0	0	1.0
10033012	25	0	75	8	0	120	150	0	0	0	8	0	0	0	0	1.0
10033013	50	0	600	1	0	30	80	00	0	0	0	0	0	15	0	1.0
10033014	100	0	25	1	0	15	0	0	2	0	100	0	0	0	0	2.0
10033015	2	0	0	3	0	200	0	0	0	0	2	0	0	0	3	1.0
10033016	5	0	0	5	0	150	150	0	0	0	5	0	0	1	0	0.5
10033017	15	0	400	1	0	50	180	0	0	0	2	0	0	1	0	1.0
10033021	5	0	50	1	0	30	80	0	0	0	1	0	0	0	0	1.0
10033022	5	0	60	1	0	15	0	0	0	0	2	0	0	0	0	0.5
10033023	2	0	30	3	0	20	0	0	0	0	2	0	0	0	0	1.0
10033024	8	0	40	10	0	60	80	0	0	0	50	0	0	0	0	0.5
10033025	200	0	500	1	0	0	0	0	0	0	0	0	0	0	0	1.0
10034001	1	0	10	20	0	100	0	0	0	0	0	0	0	0	0	2.0
10034002	1	8	20	15	0	75	0	0	3	0	5	0	0	0	0	2.0
10034009	0	10	5	10	0	350	0	0	0	0	2	0	0	0	0	0.5
10035001	30	0	500	35	0	50	0	0	0	0	150	0	0	70	8	1.0
10035002	15	0	500	35	0	35	0	0	8	0	150	0	0	40	8	0.8

52	10036001	60	0	700	25	0	15	400	0	0	0	5	0	0	40	0	1.0
53	10036002	80	0	700	50	8	30	750	0	0	0	20	0	0	20	0	3.0
54	10037003	40	20	600	80	25	100	0	0	0	0	40	0	0	65	0	2.0
55	10037004	50	30	600	30	25	150	0	0	3	0	750	0	0	30	0	4.0
56	10037020	130	180	700	40	20	130	150	0	0	180	20	0	0	85	20	3.0
57	10037028	15	130	600	30	20	40	0	0	5	130	2	0	0	50	0	2.0
58	10037030	35	25	500	40	50	700	0	0	0	0	15	0	0	50	0	2.0
59	10037031	40	15	700	60	20	150	0	0	0	0	20	0	0	50	0	3.0
60	10037032	40	10	700	40	30	230	0	0	0	0	1	0	0	40	0	1.5
61	10042001	15	0	700	40	0	100	80	0	0	0	5	0	0	50	4	1.0
62	10042002	10	0	400	40	0	20	80	0	0	0	5	0	0	50	0	0.5
63	10042003	10	0	200	40	4	50	0	0	0	0	5	0	0	40	10	1.0
64	10042004	15	0	400	30	0	30	100	0	0	0	8	0	0	50	0	1.0
65	10042008	25	0	600	10	0	75	200	0	0	0	2	0	0	50	100	0.5
66	10042009	25	0	300	50	0	150	150	0	0	0	0	0	0	20	50	0.5
67	10042010	05	0	150	15	0	300	0	0	0	0	3	0	0	8	5	1.0
68	10042011	35	0	70	10	0	500	0	0	0	0	2	0	0	8	2	1.0
69	10042015	20	0	300	5	0	80	0	0	0	0	1	0	0	8	0	1.0
70	10042019	25	0	200	15	0	30	0	0	0	0	2	0	0	2	2	1.0
71	10042023	18	0	100	10	0	10	0	0	0	0	1	0	0	8	2	3.0
72	10042027	10	100	300	30	10	20	0	0	0	0	0	0	0	40	2	2.0
73	10042031	10	150	300	40	10	20	0	0	1	0	0	0	0	40	10	2.0
74	10042036	50	0	300	40	0	2000	200	0	0	0	90	0	0	1	0	1.0
75	10042040	100	0	300	40	0	800	300	0	1	0	15	0	0	1	0	0.5
76	10042041	80	0	400	50	0	1200	200	0	0	0	40	0	0	1	0	2.0
77	10042042	15	0	100	20	0	15	0	0	0	0	0	0	0	2	0	2.0
78	10042043	3	30	50	2	0	0	0	0	0	0	0	0	0	0	10	1.0
79	10043004	5	0	30	2	0	80	0	0	0	0	30	0	0	15	0	1.5
80	10043005	3	0	40	1	0	60	0	0	2	0	15	0	0	25	0	0.8
81	10044001	4	0	900	20	0	100	0	0	0	0	20	0	0	0	0	1.0
82	10045001	8	0	80	5	40	120	0	0	2	0	10	0	0	0	0	1.0
83	10046001	15	10	800	5	0	100	0	0	0	0	5	0	0	35	0	3.0
84	10046002	50	0	700	40	0	1000	200	0	0	0	20	0	0	5	0	5.0
85	10050001	00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
86	10053001	00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
87	20003004	0	0	40	10	0	10	0	0	0	0	2	0	0	10	0	5.0
88	20003005	4	0	500	2	0	700	0	0	2	750	0	0	0	20	10	0.0
89	20004001	0	0	0	10	0	60	0	0	2	0	0	0	0	0	0	0.2
90	20004002	3	0	100	60	0	20	0	0	0	0	0	0	0	2	0	0.3
91	20004003	0	0	4000	15	0	20	0	0	0	0	20	0	0	75	5	1.3
92	20005001	0	0	10	10	0	250	0	0	0	100	0	2	0	2	20	2.0
93	70005004	7	0	200	25	0	400	0	0	0	0	0	0	0	8	0	5.0
94	20006001	3	400	400	20	10	800	0	0	0	0	0	0	0	20	2	5.0
95	20006004	10	80	1500	15	30	100	0	0	2	150	300	1	0	40	8	4.0
96	20006005	3	300	400	10	10	800	0	0	0	0	20	0	0	20	2	5.0
97	20008007	0	0	15	10	0	150	0	0	0	0	10	0	0	2	0	0.5
98	20008009	0	0	15	10	0	100	0	0	0	0	0	2	0	2	0	0.5
99	20009004	8	0	15	25	0	500	0	0	0	0	0	0	0	0	0	0.5
100	20012001	0	0	30	10	0	15	0	0	0	0	0	0	0	2	5	0.0
101	20012002	10	0	50	30	0	25	0	0	0	0	0	0	0	5	0	0.0
102	20012003	0	0	70	20	0	15	0	0	0	0	0	0	0	8	5	0.0
103	20012004	5	0	200	20	0	100	100	0	3	0	80	0	0	0	0	0.3
104	20012005	15	0	200	20	0	100	100	0	3	0	80	0	0	0	0	0.3
105	20012006	2	0	150	70	0	700	0	0	0	0	5	0	0	15	0	0.1
106	20012007	15	0	300	40	0	1000	100	0	0	0	40	0	0	2	0	0.2
107	20012008	10	0	150	30	0	600	150	0	0	0	30	0	0	2	0	0.5
108	20012010	15	0	150	30	0	3000	0	0	0	0	30	0	0	2	0	0.5
109	20012011	15	300	70	15	0	100	0	0	3	0	40	0	0	2	8	0.3
110	20012013	15	0	20	8	0	700	0	0	5	0	5	0	0	5	10	0.1
111	20013001	3	0	700	0	0	80	0	0	0	0	0	0	0	30	15	0.0

112	20015004	10	0	700	50	0	100	0	0	1	100	40	8	0	400	100	0.1
113	20019004	5	0	40	10	0	40	0	0	0	100	20	0	1200	2	0	0.5
114	20020003	5	0	60	20	0	40	0	0	0	0	70	0	0	10	0	2.5
115	20021001	8	0	150	15	0	150	0	0	0	0	5	2	300	15	15	0.2
116	20021002	8	0	200	25	0	300	0	0	0	0	0	0	0	40	10	1.0
117	10023010	2	0	30	15	0	150	0	0	0	0	0	0	0	1	0	0.0
118	20023024	2	0	50	10	0	100	0	0	0	0	0	0	0	1	0	0.0
119	20023055	2	0	40	15	0	15	0	0	0	0	0	0	0	5	2	0.1
120	20023060	3	0	30	30	0	70	0	0	0	100	0	0	300	1	0	0.1
121	20023061	5	0	30	40	10	40	0	0	5	0	0	0	0	1	0	0.2
122	20023096	2	0	30	30	0	120	0	0	0	0	0	0	0	1	0	0.0
123	20023097	2	0	30	30	0	70	0	0	0	100	0	0	0	2	0	0.1
124	20023126	0	0	50	30	0	150	0	0	1	300	0	0	0	8	0	0.1
125	20023127	0	0	10	30	0	15	0	0	0	0	0	0	0	3	0	0.0
126	20023128	10	0	200	30	0	150	0	0	0	0	0	0	0	2	0	0.0
127	20023129	10	0	400	30	0	300	0	0	0	0	0	0	0	10	2	0.2
128	20023136	2	0	100	20	0	80	0	0	0	0	0	0	0	2	0	0.0
129	20023138	5	0	200	10	0	150	0	0	0	100	0	0	0	5	0	0.0
130	20023140	5	0	200	30	0	150	0	0	0	800	0	0	600	8	0	0.0
131	20023141	3	0	40	30	0	100	0	0	0	0	0	0	0	2	0	0.0
132	20023142	3	0	50	40	0	200	0	0	0	0	0	0	0	1	0	0.0
133	20023144	5	0	100	50	0	500	0	0	0	100	0	0	0	8	0	0.0
134	20023153	10	0	40	50	0	800	0	0	0	0	0	0	0	2	0	0.0
135	20023154	3	0	40	15	0	300	0	0	0	0	0	0	0	0	0	0.0
136	20023155	10	0	150	30	0	150	0	0	0	200	0	0	200	10	0	0.1
137	20024001	60	0	150	25	0	100	0	0	0	0	0	0	0	8	0	1.0
138	20024003	60	0	300	20	0	200	0	0	0	0	0	0	0	25	0	1.0
139	20024005	50	0	500	20	0	80	0	0	0	0	0	0	0	50	8	0.8
140	20024007	15	0	700	40	0	15	0	0	0	0	5	0	0	50	10	0.0
141	20024008	20	0	500	5	0	0	0	0	3	0	50	0	1500	2	0	0.0
142	20024011	30	0	150	25	0	30	0	0	0	0	5	0	0	10	8	0.3
143	20025001	1	0	150	5	0	8	0	0	0	0	0	0	0	10	0	0.3
144	20025002	0	0	200	1	0	0	0	0	0	0	0	0	0	8	5	0.0
145	20025003	2	0	200	8	0	15	0	0	0	0	5	0	0	15	0	1.0
146	20025005	0	0	100	10	0	2	0	0	1	0	0	0	0	0	0	1.5
147	20025006	1	0	200	10	0	30	0	0	0	0	8	0	0	5	5	1.5
148	10025010	0	0	100	5	0	5	0	0	0	0	50	0	0	2	0	1.0
149	20025011	2	0	150	5	0	40	0	0	0	0	0	0	0	8	5	0.3
150	20025012	2	0	80	2	0	2	0	0	0	0	0	0	0	5	0	0.3
151	20027003	0	80	30	30	3	400	0	0	0	0	2	0	0	3	5	0.8
152	20027004	0	0	70	15	0	3000	0	0	0	0	15	0	0	3	25	2.0
153	20032001	100	0	1	30.	0	400	0	0	0	0	0	0	0	0	0	0.0
154	20034001	0	0	700	15	0	15	0	0	0	0	30	0	0	40	20	3.5
155	20034002	0	0	50	10	3	25	0	0	0	0	0	0	0	5	3	2.0
156	20034003	0	0	60	10	0	30	0	0	0	0	0	0	0	7	0	4.0
157	20034005	3	0	200	8	5	7	0	0	1	0	0	0	0	2	3	2.5
158	20034011	2	0	200	8	0	20	0	0	0	0	0	0	0	8	3	2.0
159	20035001	15	0	1000	20	0	10	0	0	0	0	0	0	0	80	5	0.0
160	20035002	15	0	500	4	0	400	0	0	3	0	1	0	0	40	0	0.8
161	20035003	0	0	600	20	0	8	0	0	0	0	0	0	0	95	30	0.0
162	20035006	3	0	600	15	0	15	0	0	0	0	0	0	0	2	0	1.5
163	20036001	0	40	30	5	5	2	0	0	1	0	300	0	0	0	0	0.8
164	20036003	8	30	500	2	0	10	0	0	0	0	0	0	0	0	0	1.5
165	20036005	0	0	500	30	0	15	0	0	1	0	40	0	0	25	3	2.0
166	20036006	1	8	400	2	8	10	0	0	0	0	10	0	0	8	3	1.0
167	20037001	200	0	500	30	0	100	0	300	8	0	40	0	0	25	5	0.0
168	20037002	15	0	400	10	0	10	0	0	2	800	20	0	500	30	0	1.0
169	20038001	0	0	500	20	0	0	0	0	0	0	25	0	0	30	15	0.0
170	20039001	20	0	25	50	10	40	0	0	8	0	150	0	0	25	0	5.0
171	20040001	0	0	40	20	10	20	0	0	0	0	10	0	0	5	15	1.0

```
        172       20040002    0   0   30  20 10   10    0   0  0   0   0  0   0  5   0 2.0
        173       20340003    2   0  750  30  0    3    0   0  0   0   0  0   0 30   0 0.0
   .162 SEC. CPU TIME
  8.700 SEC. ELAPSED TIME
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TABLE B-10

Computer Print Out of Atomic Absorption Analyses of Sphalerite from Carbonate Hosted Zinc-Lead Deposits, Y.T. and Adjacent N.W.T.

TIME: 10:12 A.M. UNIVERSITY OF B. C. COMPUTING CENTRE DATE: NOV. 10, 1977

************************************ LISTING ************************************

$LIST

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TABLE B-10

MINOR ELEMENTS IN SPHALERITE FROM NORTHERN YUKON & ADJACENT NORTHWEST TERRITORY

ATOMIC ABSORPTION ANALYTICAL RESULTS (PPM) PLUS COLOUR CODES

ID NO	AG	CD	CO	CU	FE	MN	NI	PB	HG	COLOUR (HUE VAL/CRMA)
10006002	4.7	878	12.6	128	13840	26	0.0	217	3.00	12.5 3/0
10006003	13.2	1010	15.1	95	13280	26	0.0	3462	0.00	12.5 3/2
10006005	3.4	975	10.5	61	10130	71	0.0	55	2.50	15.0 6/8
10010001	59.4	1110	0.0	10	120	165	0.0	1850	0.02	15.0 6/8
10020004	32.8	1460	5.4	394	6313	230	0.0	477	0.00	22.5 5/8
10022004	35.6	706	22.1	172	9180	32	0.0	3711	12.50	17.5 5/6
10024001	10.5	1548	9.7	26	4976	14	0.0	870	0.00	20.0 5/6
10024002	11.4	1993	0.0	229	1857	34	0.0	987	215.00	10.0 3/5
10025001	2.5	1785	0.0	15	3642	26	0.0	98	144.00	20.0 7/8
10025004	2.6	1688	0.0	67	2004	5	0.0	83	10.50	15.0 6/8
10025006	3.0	1740	0.0	56	1530	4	0.0	0	12.50	12.5 5/8
10026001	45.1	1425	8.4	412	6812	47	0.0	1279	8.00	10.0 3/6
10027001	4.1	1584	0.0	164	1311	13	0.0	451	192.50	10.0 3/5
10027002	6.6	2065	0.0	140	749	11	0.0	132	0.00	17.5 6/8
10027003	22.6	2123	0.0	157	1245	13	0.0	594	295.00	15.0 4/4
10027004	15.7	2359	0.0	222	2076	16	0.0	266	295.00	12.5 4/8
10027005	19.9	2274	0.0	209	2368	11	0.0	710	292.50	12.5 4/8
10028003	1.8	3445	0.0	13	1712	0	0.0	255	7.50	20.0 7/8
10028007	2.8	4200	0.0	10	496	0	0.0	91	2.20	20.0 8/3
10029002	2.1	1135	0.0	13	2477	4	0.0	350	0.00	15.0 5/8
10029004	10.9	2922	0.0	18	4554	7	9.5	1314	2.00	12.5 3/6
10029005	16.7	2963	0.0	21	1821	4	16.4	203	0.11	15.0 5/8
10029008	0.0	2117	0.0	24	1884	3	0.0	570	0.05	17.5 7/7
10030001	45.5	172	27.9	513	12140	75	12.0	10750	60.00	10.0 4/8
10032001	6.8	1100	97.9	92	35870	83	0.0	3870	0.00	10.0 3/8
10033001	6.3	1629	0.0	99	1159	2	0.0	218	52.50	15.0 6/8
10033004	2.6	1529	0.0	18	1159	0	0.0	61	26.50	20.0 6/6
10033005	2.3	1226	0.0	21	986	0	0.0	42	26.50	20.0 7/8
10033012	23.9	1943	0.0	41	1775	8	0.0	839	120.50	17.5 6/6
10033013	90.3	1680	0.0	343	1848	2	0.0	142	267.00	10.0 3/6
10033014	295.9	2401	0.0	13	1701	0	0.0	29	0.00	17.5 5/8
10033015	0.0	1222	0.0	31	1069	2	0.0	467	40.00	17.5 7/6
10033016	2.9	1202	0.0	13	1087	5	0.0	640	40.00	17.5 7/6
10033017	16.0	1612	0.0	123	1322	2	0.0	136	148.00	12.5 5/8
10033021	2.6	1460	0.0	26	1083	0	0.0	68	46.50	17.5 7/8
10033022	4.7	1234	0.0	37	1087	3	0.0	38	63.50	17.5 6/8
10033023	3.6	1515	0.0	18	1159	2	0.0	73	44.50	17.5 6/8
10033024	0.0	1570	0.0	21	1123	3	0.0	95	38.50	17.5 7/8
10033025	155.3	1622	0.0	160	1304	0	0.0	0	154.00	12.5 4/8
10034001	0.0	930	0.0	31	2500	13	0.0	229	10.50	25.0 4/4
10034002	0.0	930	0.0	13	2645	6	0.0	165	4.00	25.0 6/6
10034009	0.0	719	7.3	8	1304	6	0.0	1587	2.00	25.0 8/4
10035001	15.2	2224	0.0	356	2500	32	0.0	110	3.50	22.5 6/4
10035002	14.3	2495	0.0	249	2193	57	0.0	87	3.00	22.5 6/4

52	10036001	27.4	1200	0.0	571	1739	11	0.0	23	82.50	10.0	3/8
53	10036002	28.2	1064	0.0	563	3260	18	0.0	50	0.00	10.0	3/8
54	10037003	11.7	2105	0.0	145	2873	103	0.0	177	12.00	12.5	4/8
55	10037004	37.6	1140	0.0	389	6654	16	0.0	326	5.00	10.0	3/8
56	10037020	32.7	2299	13.6	337	3781	25	0.0	180	0.00	10.0	4/8
57	10037028	15.8	1733	18.6	218	5255	46	0.0	95	8.80	15.0	5/8
58	10037030	40.3	2613	6.5	555	4234	74	0.0	2307	8.50	10.0	3/8
59	10037031	43.0	2375	5.4	524	5028	103	0.0	621	7.50	10.0	3/8
60	10037032	40.3	2835	0.0	501	5558	146	9.4	853	8.80	10.0	3/8
61	10042001	15.2	1599	0.0	280	2319	58	0.0	347	0.00	12.5	5/8
62	10042002	7.1	1815	0.0	335	1890	51	0.0	113	45.50	12.5	5/8
63	10042003	5.1	1448	0.0	171	2268	86	0.0	197	67.50	12.5	5/8
64	10042004	9.4	1668	0.0	356	1890	49	0.0	95	0.00	10.0	5/8
65	10042008	40.3	1489	0.0	535	1928	10	0.0	327	103.50	10.0	3/6
66	10042009	35.6	1318	0.0	271	2149	102	0.0	659	0.00	10.0	5/4
67	10042010	34.3	1439	0.0	73	3629	26	0.0	1601	124.50	15.0	6/6
68	10042011	24.2	1470	0.0	62	3478	29	0.0	700	117.70	15.0	5/6
69	10042015	13.8	1630	0.0	169	2268	3	0.0	353	135.50	12.5	6/8
70	10042019	13.2	1605	0.0	31	2760	14	0.0	99	163.00	15.0	6/6
71	10042023	4.5	1069	25.2	210	6578	83	0.0	44	71.00	12.5	4/6
72	10042027	14.8	1474	0.0	48	7311	16	0.0	35	8.00	17.5	6/6
73	10042031	4.4	1048	26.0	214	5321	51	0.0	21	7.50	12.5	3/6
74	10042036	56.6	2388	0.0	219	3362	116	0.0	4975	66.50	10.0	3/6
75	10042040	82.8	2827	0.0	317	2220	73	0.0	1307	61.00	12.5	3/6
76	10042041	41.2	2355	0.0	188	2794	99	0.0	3049	58.50	10.0	4/8
77	10042042	13.7	1231	0.0	45	3292	28	0.0	24	108.50	17.5	5/6
78	10042043	2.1	1394	5.4	45	2488	5	0.0	15	62.50	20.0	6/8
79	10043004	0.0	1261	0.0	11	2603	0	0.0	183	2.00	20.0	6/6
80	10043005	0.0	1624	0.0	16	1837	3	0.0	115	0.22	22.5	6/8
81	10044001	4.9	1760	0.0	722	4954	22	0.0	309	0.00	10.0	3/8
82	10045001	5.2	2676	0.0	29	2526	3	0.0	235	0.81	22.5	6/8
83	10046001	6.8	1465	0.0	560	3483	3	0.0	87	17.50	10.0	4/8
84	10046002	22.9	1829	0.0	679	5895	29	0.0	1055	41.00	10.0	3/6
85	10050001	0.0	693	0.0	40	1011	15	0.0	473	0.00	25.0	6/6
86	10053001	4.3	1795	0.0	5	859	8	0.0	37	0.00	15.0	6/6
87	20003004	0.0	1427	0.0	60	14840	10	0.0	28	2.50	15.0	3/6
88	20003005	3.5	2384	0.0	96	401	2	0.0	1230	44.00	15.0	5/8
89	20004001	0.0	1138	0.0	8	720	15	0.0	263	0.36	17.5	6/8
90	20004002	0.0	1933	0.0	68	635	87	0.0	39	18.00	12.5	7/6
91	20004003	0.0	1201	0.0	2183	619	10	0.0	41	0.00	10.0	8/8
92	20005001	0.0	4466	0.0	10	1863	8	0.0	481	0.00	17.5	6/8
93	20005004	3.7	4586	0.0	110	4174	24	0.0	870	0.00	22.5	4/4
94	20006001	2.6	1080	66.9	221	6630	9	0.0	2114	6.20	17.5	5/6
95	20006004	5.2	1594	7.0	1663	5935	13	0.0	148	6.50	10.0	3/8
96	20006005	2.6	1193	64.0	434	7893	10	0.0	2114	4.90	10.0	3/3
97	20008007	0.0	755	0.0	8	1294	9	0.0	450	0.00	17.5	6/6
98	20008009	0.0	767	0.0	8	1590	18	0.0	336	0.00	20.0	5/3
99	20009004	0.0	2398	0.0	10	1326	21	0.0	1831	0.49	17.5	6/6
100	20012001	0.0	1450	0.0	36	120	17	0.0	60	27.00	20.0	7/6
101	20012002	3.5	1560	0.0	29	124	50	0.0	84	0.00	20.0	7/6
102	20012003	0.0	1436	0.0	39	92	20	0.0	36	23.50	20.0	7/6
103	20012004	0.0	1441	0.0	44	114	14	0.0	24	27.50	17.5	6/6
104	20012005	8.7	1223	0.0	73	1042	22	0.0	2814	0.00	12.5	6/8
105	20012006	0.0	1142	0.0	44	177	77	0.0	1230	220.50	20.0	7/8
106	20012007	5.5	1377	0.0	99	622	25	0.0	2067	0.00	22.5	7/4
107	20012008	4.4	1385	0.0	110	1546	22	0.0	1132	0.00	22.5	7/4
108	20012010	5.2	1389	0.0	110	1134	19	0.0	4837	12.00	12.5	6/8
109	20012011	3.8	1166	51.7	47	725	18	0.0	281	24.00	20.0	6/6
110	20012013	18.3	1166	0.0	241	907	16	0.0	3284	41.00	12.5	3/6
111	20013001	3.5	1522	0.0	1732	203	2	0.0	271	0.00	10.0	3/8

112	20015004	9.1	1453	0.0	1837	567	135	0.0	465	0.00	10.0	4/8
113	20019004	5.8	868	0.0	37	1993	22	0.0	103	0.29	12.5	6/4
114	20020003	0.0	813	0.0	73	8076	51	0.0	101	0.00	15.0	5/6
115	20021001	7.0	3076	0.0	184	873	51	0.0	368	1.12	20.0	4/4
116	20021002	8.8	3076	0.0	168	2096	40	0.0	105	1.83	17.5	4/4
117	20023010	2.6	2242	0.0	21	165	35	0.0	755	0.23	12.5	4/8
118	20023024	0.0	2040	0.0	37	175	30	0.0	252	0.23	12.5	4/8
119	20023055	0.0	1672	0.0	34	344	15	0.0	103	310.00	17.5	6/8
120	20023060	0.0	2555	0.0	18	254	46	0.0	205	3.40	20.0	7/8
121	20023061	0.0	2133	0.0	16	241	41	0.0	179	2.40	20.0	7/8
122	20023096	3.0	2040	0.0	5	421	53	0.0	463	0.00	12.5	4/8
123	20023097	0.0	1933	0.0	21	299	41	0.0	239	0.49	20.0	7/8
124	20023126	6.1	2511	0.0	12	411	46	0.0	573	0.00	12.5	5/8
125	20023127	0.0	2841	0.0	8	175	35	0.0	59	0.65	25.0	8/2
126	20023128	5.2	2841	0.0	131	288	40	0.0	766	0.48	12.5	5/8
127	20023129	3.0	2762	0.0	12	270	43	0.0	565	0.47	12.5	5/8
128	20023136	0.0	2114	0.0	15	179	36	0.0	303	0.44	12.5	5/8
129	20023138	4.9	2800	0.0	12	175	48	0.0	749	0.71	12.5	5/8
130	20023140	2.7	2724	0.0	13	259	43	0.0	385	0.54	12.5	5/8
131	20023141	0.0	2000	0.0	5	165	36	0.0	463	0.32	12.5	5/8
132	20023142	0.0	1945	0.0	6	183	34	0.0	323	0.19	12.5	5/8
133	20023144	0.0	2608	0.0	9	286	47	0.0	475	0.44	12.5	5/8
134	20023153	1.8	2114	0.0	4	185	36	0.0	760	0.23	12.5	5/8
135	20023154	0.0	2365	0.0	4	290	37	0.0	650	0.20	12.5	5/8
136	20023155	3.0	2477	0.0	9	458	36	0.0	222	0.61	12.5	5/8
137	20024001	50.0	1793	0.0	8	3572	28	0.0	281	2.20	15.0	5/8
138	20024003	58.6	1374	0.0	19	2157	36	0.0	793	0.00	15.0	5/8
139	20024005	32.5	1615	0.0	40	1058	24	0.0	146	3.20	12.5	5/8
140	20024007	8.2	1574	0.0	525	117	46	0.0	30	0.00	12.5	6/8
141	20024008	19.1	1648	0.0	38	340	8	0.0	0	2.50	12.5	5/8
142	20024011	16.0	1629	0.0	8	516	19	0.0	62	1.00	17.5	6/8
143	20025001	0.0	1618	0.0	73	481	8	0.0	18	0.00	20.0	7/8
144	20025002	0.0	1752	0.0	20	340	3	0.0	0	14.50	15.0	5/8
145	20025003	1.8	1303	0.0	13	1449	9	0.0	17	18.50	20.0	5/8
146	20025005	1.8	1526	0.0	7	2022	8	0.0	0	12.00	22.5	7/8
147	20025006	6.1	1400	0.0	26	1988	8	0.0	21	0.00	22.5	7/8
148	20025010	0.0	1416	0.0	26	1693	5	0.0	12	12.50	22.5	7/8
149	20025011	1.9	1820	0.0	100	1589	10	0.0	192	22.50	17.5	5/8
150	20025012	2.5	1641	0.0	60	1900	5	0.0	36	17.00	22.5	5/6
151	20027003	0.0	2099	12.4	18	1071	34	0.0	536	170.00	22.5	7/8
152	20027004	0.0	1937	0.0	45	5527	34	0.0	6545	157.00	15.0	4/3
153	20032001	69.4	1170	0.0	10	155	142	0.0	1512	2.40	12.5	5/8
154	20034001	0.0	1176	0.0	198	726	35	0.0	55	0.00	10.0	4/8
155	20034002	0.0	1381	0.0	29	4629	23	0.0	80	9.70	17.5	5/8
156	20034003	0.0	1134	0.0	21	5803	10	0.0	23	34.50	17.5	5/8
157	20034005	0.0	1584	0.0	50	5872	15	0.0	9	26.00	17.5	5/6
158	20034011	5.7	1015	0.0	68	5561	11	0.0	40	26.50	17.5	5/8
159	20035001	5.5	1184	0.0	366	290	28	0.0	29	0.00	12.5	5/8
160	20035002	0.0	1161	0.0	617	3143	4	0.0	1500	6.50	10.0	4/8
161	20035003	0.0	1709	0.0	331	245	22	0.0	0	5.70	20.0	6/8
162	20035006	0.0	1528	0.0	210	2487	5	69.9	22	0.00	22.5	6/8
163	20036001	0.0	860	12.4	26	2729	8	0.0	0	4.50	22.5	6/8
164	20036003	6.7	1836	13.8	247	12435	5	0.0	36	7.80	20.0	4/4
165	20036005	0.0	1872	0.0	97	4421	46	0.0	15	4.00	20.0	5/8
166	20036006	0.0	2042	0.0	71	370	4	0.0	22	4.00	20.0	5/8
167	20037001	50.6	1964	0.0	281	725	31	0.0	175	0.03	12.5	5/8
168	20037002	2.5	1910	0.0	126	2763	10	0.0	20	0.12	25.0	6/6
169	20038001	0.0	1176	0.0	152	602	35	0.0	0	11.80	20.0	5/8
170	20039001	11.1	1196	0.0	13	6365	49	0.0	71	2.31	17.5	5/8
171	20040001	0.0	1682	0.0	21	3521	18	0.0	74	10.00	20.0	7/8

52	10036001	27.4	1200	0.0	571	1739	11	0.0	23	82.50	10.0	3/8
53	10036002	28.2	1064	0.0	563	3260	18	0.0	50	0.00	10.0	3/8
54	10037003	11.7	2105	0.0	145	2873	103	0.0	177	12.00	12.5	4/8
55	10037004	37.6	1140	0.0	389	6654	16	0.0	326	5.00	10.0	3/8
56	10037020	32.7	2299	13.6	337	3781	25	0.0	180	0.00	10.0	4/8
57	10037028	15.8	1733	18.6	218	5255	46	0.0	95	8.80	15.0	5/8
58	10037030	40.3	2613	6.5	555	4234	74	0.0	2307	8.50	10.0	3/8
59	10037031	43.0	2375	5.4	524	5028	103	0.0	621	7.50	10.0	3/8
60	10037032	40.3	2835	0.0	501	5558	146	9.4	853	8.80	10.0	3/8
61	10042001	15.2	1599	0.0	280	2319	58	0.0	347	0.00	12.5	5/8
62	10042002	7.1	1815	0.0	335	1890	51	0.0	113	45.50	12.5	5/8
63	10042003	5.1	1448	0.0	171	2268	86	0.0	197	67.50	12.5	5/8
64	10042004	9.4	1668	0.0	356	1890	49	0.0	95	0.00	10.0	5/8
65	10042008	40.3	1489	0.0	535	1928	10	0.0	327	103.50	10.0	3/6
66	10042009	35.6	1318	0.0	271	2149	102	0.0	659	0.00	10.0	5/4
67	10042010	34.3	1439	0.0	73	3629	26	0.0	1601	124.50	15.0	6/6
68	10042011	24.2	1470	0.0	62	3478	29	0.0	700	117.70	15.0	5/6
69	10042015	13.8	1630	0.0	169	2268	3	0.0	353	135.50	12.5	6/8
70	10042019	13.2	1605	0.0	31	2760	14	0.0	99	163.00	15.0	6/6
71	10042023	4.5	1069	25.2	210	6578	83	0.0	44	71.00	12.5	4/6
72	10042027	14.8	1474	0.0	48	7311	16	0.0	35	8.00	17.5	6/6
73	10042031	4.4	1048	26.0	214	5321	51	0.0	21	7.50	12.5	3/6
74	10042036	56.6	2388	0.0	219	3362	116	0.0	4975	66.50	10.0	3/6
75	10042040	82.8	2827	0.0	317	2220	73	0.0	1307	61.00	12.5	3/6
76	10042041	41.2	2355	0.0	188	2794	99	0.0	3049	58.50	10.0	4/8
77	10042042	13.7	1231	0.0	45	3292	28	0.0	24	108.50	17.5	5/6
78	10042043	2.1	1394	5.4	45	2488	5	0.0	15	62.50	20.0	6/8
79	10043004	0.0	1261	0.0	11	2603	0	0.0	183	2.00	20.0	6/6
80	10043005	0.0	1624	0.0	16	1837	3	0.0	115	0.22	22.5	6/8
81	10044001	4.9	1760	0.0	722	4954	22	0.0	309	0.00	10.0	3/8
82	10045001	5.2	2676	0.0	29	2526	3	0.0	235	0.81	22.5	6/8
83	10046001	6.8	1465	0.0	560	3483	3	0.0	87	17.50	10.0	4/8
84	10046002	22.9	1829	0.0	679	5895	29	0.0	1055	41.00	10.0	3/6
85	10050001	0.0	693	0.0	40	1011	15	0.0	473	0.00	25.0	6/6
86	10053001	4.3	1795	0.0	5	859	8	0.0	37	0.00	15.0	6/6
87	20003004	0.0	1427	0.0	60	14840	10	0.0	28	2.50	15.0	3/6
88	20003005	3.5	2384	0.0	96	401	2	0.0	1230	44.00	15.0	5/8
89	20004001	0.0	1138	0.0	8	720	15	0.0	263	0.36	17.5	6/8
90	20004002	0.0	1933	0.0	68	635	87	0.0	39	18.00	12.5	7/6
91	20004003	0.0	1201	0.0	2183	619	10	0.0	41	0.00	10.0	8/8
92	20005001	0.0	4466	0.0	10	1863	8	0.0	481	0.00	17.5	6/8
93	20005004	3.7	4586	0.0	110	4174	24	0.0	870	0.30	22.5	4/4
94	20006001	2.6	1080	66.9	221	6630	9	0.0	2114	6.20	17.5	5/6
95	20006004	5.2	1594	7.0	1663	5935	13	0.0	148	6.50	10.0	3/8
96	20006005	2.6	1193	64.0	434	7893	10	0.0	2114	4.90	10.0	3/3
97	20008007	0.0	755	0.0	8	1294	9	0.0	450	0.00	17.5	6/6
98	20008009	0.0	767	0.0	8	1590	18	0.0	336	0.00	20.0	5/3
99	20009004	0.0	2398	0.0	10	1326	21	0.0	1831	0.49	17.5	6/6
100	20012001	0.0	1450	0.0	36	120	17	0.0	60	27.00	20.0	7/6
101	20012002	3.5	1560	0.0	29	124	50	0.0	84	0.00	20.0	7/6
102	20012003	0.0	1436	0.0	39	92	20	0.0	36	23.50	20.0	7/6
103	20012004	0.0	1441	0.0	44	114	14	0.0	24	27.50	17.5	6/6
104	20012005	8.7	1223	0.0	73	1042	22	0.0	2814	0.00	12.5	6/8
105	20012006	0.0	1142	0.0	44	177	77	0.0	1230	220.50	20.0	7/8
106	20012007	5.5	1377	0.0	99	622	25	0.0	2067	0.00	22.5	7/4
107	20012008	4.4	1385	0.0	110	1546	22	0.0	1132	0.00	22.5	7/4
108	20012010	5.2	1389	0.0	110	1134	19	0.0	4837	12.00	12.5	6/8
109	20012011	3.8	1166	51.7	47	725	18	0.0	281	24.00	20.0	6/6
110	20012013	18.3	1166	0.0	241	907	16	0.0	3284	41.00	12.5	3/6
111	20013001	3.5	1522	0.0	1732	203	2	0.0	271	0.00	10.0	3/8

112	20015004	9.1	1453	0.0	1837	567	135	0.0	465	0.00	10.0	4/8
113	20019004	5.8	868	0.0	37	1993	22	0.0	103	0.29	12.5	6/4
114	20020003	0.0	813	0.0	73	8076	51	0.0	101	0.00	15.0	5/6
115	20021001	7.0	3076	0.0	184	873	51	0.0	368	1.12	20.0	4/4
116	20021002	8.8	3076	0.0	168	2096	40	0.0	105	1.83	17.5	4/4
117	20023010	2.6	2242	0.0	21	165	35	0.0	755	0.23	12.5	4/8
118	20023024	0.0	2040	0.0	37	175	30	0.0	252	0.23	12.5	4/8
119	20023055	0.0	1672	0.0	34	344	15	0.0	103	310.00	17.5	6/8
120	20023060	0.0	2555	0.0	18	254	46	0.0	205	3.40	20.0	7/8
121	20023061	0.0	2133	0.0	16	241	41	0.0	179	2.40	20.0	7/8
122	20023096	3.0	2040	0.0	5	421	53	0.0	463	0.00	12.5	4/8
123	20023097	0.0	1933	0.0	21	299	41	0.0	239	0.49	20.0	7/8
124	20023126	6.1	2511	0.0	12	411	46	0.0	573	0.00	12.5	5/8
125	20023127	0.0	2841	0.0	8	175	35	0.0	59	0.65	25.0	8/2
126	20023128	5.2	2841	0.0	131	288	40	0.0	766	0.48	12.5	5/8
127	20023129	3.0	2762	0.0	12	270	43	0.0	565	0.47	12.5	5/8
128	20023136	0.0	2114	0.0	15	179	36	0.0	303	0.44	12.5	5/8
129	20023138	4.9	2800	0.0	12	175	48	0.0	749	0.71	12.5	5/8
130	20023140	2.7	2724	0.0	13	259	43	0.0	385	0.54	12.5	5/8
131	20023141	0.0	2000	0.0	5	165	36	0.0	463	0.32	12.5	5/8
132	20023142	0.0	1945	0.0	6	183	34	0.0	323	0.19	12.5	5/8
133	20023144	0.0	2608	0.0	9	286	47	0.0	475	0.44	12.5	5/8
134	20023153	1.8	2114	0.0	4	185	36	0.0	760	0.23	12.5	5/8
135	20023154	0.0	2365	0.0	4	290	37	0.0	650	0.20	12.5	5/8
136	20023155	3.0	2477	0.0	9	458	36	0.0	222	0.61	12.5	5/8
137	20024001	50.0	1793	0.0	8	3572	28	0.0	281	2.20	15.0	5/8
138	20024003	58.6	1374	0.0	19	2157	36	0.0	793	0.00	15.0	5/8
139	20024005	32.5	1615	0.0	40	1058	24	0.0	146	3.20	12.5	5/8
140	20024007	8.2	1574	0.0	525	117	46	0.0	30	0.00	12.5	6/8
141	20024008	19.1	1648	0.0	38	340	8	0.0	0	2.50	12.5	5/8
142	20024011	16.0	1629	0.0	8	516	19	0.0	62	1.00	17.5	6/8
143	20025001	0.0	1618	0.0	73	481	8	0.0	18	0.00	20.0	7/8
144	20025002	0.0	1752	0.0	20	340	3	0.0	0	14.50	15.0	5/8
145	20025003	1.8	1303	0.0	13	1449	9	0.0	17	18.50	20.0	5/8
146	20025005	1.8	1526	0.0	7	2022	8	0.0	0	12.00	22.5	7/8
147	20025006	6.1	1400	0.0	26	1988	8	0.0	21	0.00	22.5	7/8
148	20025010	0.0	1416	0.0	26	1693	5	0.0	12	12.50	22.5	7/8
149	20025011	1.9	1820	0.0	100	1589	10	0.0	192	22.50	17.5	5/8
150	20025012	2.5	1641	0.0	60	1900	5	0.0	36	17.00	22.5	5/6
151	20027003	0.0	2099	12.4	18	1071	34	0.0	536	170.00	22.5	7/8
152	20027004	0.0	1537	0.0	45	5527	34	0.0	6545	157.00	15.0	4/8
153	20032001	69.4	1170	0.0	10	155	142	0.0	1512	2.40	12.5	5/8
154	20034001	0.0	1176	0.0	198	726	35	0.0	55	0.00	10.0	4/8
155	20034002	0.0	1381	0.0	29	4629	23	0.0	80	9.70	17.5	5/8
156	20034003	0.0	1134	0.0	21	5803	10	0.0	23	34.50	17.5	5/8
157	20034005	0.0	1584	0.0	50	5872	15	0.0	8	26.00	17.5	5/6
158	20034011	5.7	1015	0.0	68	5561	11	0.0	40	26.50	17.5	5/8
159	20035001	5.5	1184	0.0	366	290	28	0.0	29	0.00	12.5	5/8
160	20035002	0.0	1161	0.0	617	3143	4	0.0	1500	6.50	10.0	4/8
161	20035003	0.0	1709	0.0	331	245	22	0.0	0	5.70	20.0	6/8
162	20035006	0.0	1528	0.0	210	2487	5	69.9	22	0.00	22.5	6/8
163	20036001	0.0	860	12.4	26	2729	8	0.0	0	4.50	22.5	6/8
164	20036003	6.7	1836	13.8	297	12435	5	0.0	35	7.80	20.0	4/4
165	20036005	0.0	1872	0.0	97	4421	46	0.0	15	4.00	20.0	5/8
166	20036006	0.0	2042	0.0	71	370	4	0.0	22	4.00	20.0	5/8
167	20037001	50.6	1964	0.0	281	725	31	0.0	175	0.03	12.5	5/8
168	20037002	2.5	1910	0.0	126	2763	10	0.0	20	0.12	25.0	6/6
169	20038001	0.0	1176	0.0	152	602	35	0.0	0	11.80	20.0	5/8
170	20039001	11.1	1196	0.0	13	6365	49	0.0	71	2.31	17.5	5/8
171	20040001	0.0	1682	0.0	21	3521	18	0.0	74	10.00	20.0	7/8

172	20040002	0.0	1604	0.0	21	3368	18	0.0	68	10.20	20.0 7/8
173	20040003	0.0	9424	0.0	87	406	18	0.0	13	9.20	20.0 7/8
174	END										

.158 SEC. CPU TIME
9.123 SEC. ELAPSED TIME

TIME: 10:12 A.M.   UNIVERSITY OF B. C. COMPUTING CENTRE   DATE: NOV. 10. 1977

************************************ LISTING ************************************

$LIST

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MINOR ELEMENTS IN SPHALERITE FROM NORTHERN YUKON & ADJACENT NORTHWEST TERRITORY

ANALYTICAL RESULTS ATOMIC ABSORPTION SPECTROSCOPY

MEAN VALUES FOR 48 LOCATIONS

ID.NO.	AG	CD	CO	CU	FE	MN	NI	PB	HG
10006999	7.1	954	12.7	95	12416	41	0.0	1245	1.83
10010001	59.4	1110	0.0	10	120	165	0.0	1850	0.02
10020004	32.8	1460	5.4	394	6313	230	0.0	477	0.03
10022004	35.6	706	22.1	172	9180	32	0.0	3711	12.50
10024999	11.0	1770	4.9	128	3416	21	0.0	929	107.00
10025999	2.7	1738	0.0	46	2392	12	0.0	60	55.70
10026001	45.1	1425	8.4	412	6812	47	0.0	1279	8.00
10027999	13.8	2081	0.0	184	1550	13	0.0	430	215.00
10028999	2.3	3823	0.0	12	1104	0	0.0	173	4.85
10029999	7.4	2284	0.0	19	2684	5	6.5	609	0.54
10030001	45.5	172	27.9	513	12140	75	12.0	10750	60.00
10032001	6.8	1100	97.9	92	35870	83	0.0	3879	0.00
10033999	43.1	1560	0.0	69	1276	2	0.0	204	76.28
10034999	0.0	860	2.4	17	2150	8	0.0	660	5.50
10035999	14.8	2360	0.0	326	2320	45	0.0	99	3.25
10036999	27.8	1132	0.0	567	2500	15	0.0	37	41.25
10037999	31.6	2038	6.3	381	4769	73	1.3	651	7.22
10042999	24.8	1626	3.1	198	3203	50	0.0	775	66.70
10043999	0.0	1443	0.0	14	2220	2	0.0	150	1.11
10044001	4.9	1760	0.0	722	4954	22	0.0	309	0.00
10045001	5.2	2676	0.0	29	2526	3	0.0	235	0.81
10046999	14.9	1647	0.0	620	4689	16	0.0	571	29.25
10050001	0.0	693	0.0	40	1011	15	0.0	473	0.00
10053001	4.3	1795	0.0	5	859	8	0.0	37	0.00
20003999	1.8	1966	0.0	78	7620	6	0.0	629	23.25
20004999	0.0	1424	0.0	753	658	37	0.0	114	6.12
20005999	1.8	4526	0.0	60	3018	16	0.0	630	0.00
20006999	3.5	1289	45.9	773	6819	11	0.0	1459	5.86
20008999	0.0	761	0.0	8	1442	14	0.0	393	0.00
20009004	0.0	2393	0.0	·10	1326	21	0.0	1831	0.49
20012999	4.5	1340	15.6	79	736	27	0.0	1441	34.13
20013001	3.5	1522	0.0	1732	203	2	0.0	271	0.00
20015004	9.1	1453	0.0	1837	567	135	0.0	465	0.00
20019004	5.8	868	0.0	37	1993	22	0.0	103	0.29
20020003	0.0	813	0.0	73	8076	51	0.0	101	0.00
20021999	7.1	3076	0.0	176	1485	46	0.0	237	1.47
20023999	1.6	2336	0.0	20	261	39	0.0	425	1.10
20024999	30.7	1606	0.0	166	1293	26	0.0	219	1.48
20025999	1.8	1560	0.0	4	1433	7	0.0	37	12.12
20027999	0.0	2018	6.2	32	3299	34	0.0	3541	163.50
20032001	69.4	1170	0.0	10	155	142	0.0	1512	2.40
20034999	1.1	1258	0.0	73	4518	19	0.0	42	19.34
20035999	1.4	1396	0.0	381	1541	15	17.5	388	3.05

52	20036999	1.7	1653	6.6	123	4989	16	0.0	19	5.07
53	20037999	26.6	1937	0.0	204	1744	21	0.0	98	0.07
54	20038001	0.0	1176	0.0	152	602	35	0.0	0	11.80
55	20039001	11.1	1196	0.0	13	6365	45	0.0	71	2.31
56	20040999	0.0	4237	0.0	43	2432	18	0.0	52	9.80
57	$ENDFILE									

.043 SEC. CPU TIME
1.540 SEC. ELAPSED TIME

APPENDIX C

DATA FOR

LEAD ISOTOPE STUDY

TABLE C-1

DESCRIPTIONS OF CARBONATE HOSTED ZINC-LEAD DEPOSITS FROM WHICH GALENA SAMPLES HAVE BEEN SUBMITTED FOR LEAD ISOTOPE ANALYSIS

NUMBER	NAME	N.T.S.	LAT.	LØNG.	HØST AGE	HOST ROCK	COMMOD.
10002-002	BILBØ	116G07	65.25	138.67	L. PAL.	DØLM.	BA, PB
10005-001	KIWI	116B10	64.75	138.75	HELIKIAN	DØLM.	PB, ZN
10006-001	NEWT	106D11	64.53	135.47	ØRD.	DØLM.	ZN, PB
10007-001	CHAPMAN	116B16	65.00	138.28	P.C. & ØRD.	PHYL. & DØLM	PB, ZN
10008-002	HØT	116A13	64.98	137.77	ØRD.	DØLM.	PB, ZN
10010-017	ECØNOMIC	106B06	64.33	131.22	L. CAMB.	DØLM.	PB, ZN
10011-001	MICHELLE	116A13	64.97	137.68	ØRD.-SIL.	DØLM.	PB, ZN
10030-001	CØMINCØ3	106D05	64.50	133.83	SIL.-DEV.	CARB.	PB, ZN
10031-003	CØMINCØ4	106C10	64.58	132.98	L. CAMB.	DØLM.	PB, ZN
10033-009	GØZ	106C07	64.43	132.55	L. CAMB.	DØLM.	ZN, PB, CD
10034-009	BIRKELAN	106B04	64.15	131.92	HARDYNIAN	DØLM.	ZN, PB
10034-010	BIRKELND	106B04	64.15	131.92	HARDYNIAN	DØLM.	ZN, PB
10037-048	ØZ	116B12	64.75	139.75	HELIKIAN	DØLM.	PB, ZN
10038-016	MØNSTER	116B13	64.82	139.97	PRØTERØZ	DØLM	ZN, PB
10040-003	TUKU	106E14	65.58	135.42	L. CAMB.	LIMS.	PB, BA, ZN
10042-014	PRØFEIT	106C14	64.82	133.55			PB, ZN, BA
10050-001	ØDD (McIn)	105013	63.55	132.00	HADRYNIAN	DØLM.	PB, ZN
20003-002	PALM	106A05	64.40	129.80	L. CAMB.	DØLM.	ZN, PB
20004-002	JUDE	106A05	64.37	129.87	ØRD.-SIL.	DØLM.	ZN, PB
20006-001	PAM	105P11	63.52	129.12	L. CAMB.	DØLM.	PB, ZN
20008-009	BACKBØNE	105P14	63.85	129.17	DEV.	LIMS'.	ZN, PB, BA
20009-002	WEATHER	105P14	63.97	129.28	DEV.	DØLM.	ZN, PB
20010-002	EMILY	105P11	63.67	129.12	L. CAMB.	DØLM.	PB, ZN
20011-001	LAN	105P14	63.85	129.35	L. CAMB.	DØLM.	PB, ZN

20012-006	TWITYA	106A03	64.03	129.37	ØRD.-SIL.	DØLM.	ZN, PB, AG
20012-015	TWITYA	106A03	64.03	129.37	ØRD.-SIL.	DØLM.	ZN, PB, AG
20015-001	JIM	106B08	64.48	130.45	DEV.	DØLM.	ZN, PB
20022-001	GUILD	106B09	64.63	130.10	ØRD.-DEV.	CARB.	ZN, PB, AG
20023-014	REV	106A03	64.13	129.33	ØRD.-SIL.	DØLM.	ZN, PB
20023-098	REV	106A03	64.13	129.33	ØRD.-SIL.	DØLM.	ZN, PB
20023-137	REV	106A03	64.13	129.33	ØRD.-SIL.	DØLM.	ZN, PB
20024-005	GAYNA R.	106B15	64.95	130.70	HELIKIAN	LIMS. & DØLM	ZN, CD. PB
20025-008	TEGART	106B09	64.53	130.17	ØRD.-SIL.	DØLM.	ZN, PB
20026-008		106A03	64.05	129.30	ØRD.SIL.	DØLM.	ZN, PB
20027-001	CLIMAX	105P08	63.35	128.38	CAM.-HAD.?	DØLM.	ZN, PB, SB
20028-001	VIC	106A07	64.30	128.62	HELIKIAN	DØLM.	PB
20030-001	ZIE	106B14	62.87	131.48	L. CAMB.	DØLM.	ZN, PB
20034-007	KIND	106A08	64.38	129.73	ØRD.-SIL.	DØLM.	ZN, PB

APPENDIX D

MINING COMPANY

PARTICIPANTS

TABLE D-1

Mining Companies that Participated in the Study of Carbonate Hosted Zinc-Lead Deposits, Y.T. and Adjacent, N.W.T.

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683-0474

Dr. D. Craig
Department of Indian Affaris
and Northern Resources
Federal Building
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682-8977

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Geological Survey of Canada
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666-1526

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Senior Geologist
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Mr. Bob Gifford
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688-5476

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687-1658

Mr. Peter Tegart
Serem Limited
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Dr. Hugh Morris
Cominco Ltd.
200 Granville Square
Vancouver, B.C. 682-0611

Mr. Bob Cathro
Archer, Cathro and Assoc. Ltd.
Whitehorse, Y.T.

Mr. Bert Reeve
Barrier Reef
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