GM 48868

REVERSE CIRCULATION OVERBURDEN DRILLING AND HEAVY MINERAL GEOCHEMICAL SAMPLING, PROJECT LAC SHORTT

MINNOVA INC.

PROJECT LAC SHORTT
(PN 090, 114, 115 AND 116)

LESUEUR, BOYVINET, GAND AND LESPERANCE TOWNSHIPS, QUEBEC

REVERSE CIRCULATION OVERBURDEN DRILLING AND HEAVY MINERAL GEOCHEMICAL SAMPLING

PHASE II

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JUNE, 1989

TABLE OF CONTENTS

TABLE OF CONTENTS (cont'd)

FIGURES

TABLE OF CONTENTS (cont'd)

Page

FIGURES (Cont'd)

TABLE OF CONTENTS (cont'd)

Page

TABLES

TABLE OF CONTENTS (cont'd)

1. SUMMARY

The report outlines the results of a second phase of reverse circulation overburden drilling and heavy mineral geochemical sampling conducted by Minnova Inc. in four areas of Project Lac Shortt (Boyvinet, Lesperance, Lesueur West and Lesueur North) situated in the Abitibi Greenstone Belt, northwestern Quebec. Eighty-seven vertical holes were drilled in Phase II and bedrock and overburden were sampled to delineate zones of bedrock deformation and/or alteration that could host epigenetic gold mineralization and to test for glacially dispersed mineralization indicative of subcropping gold deposits. Each area had specific targets. On Boyvinet, drilling was targeted on a broad gold dispersal zone over the Opawica Pluton identified in Phase I to better define underlying bedrock structures as well as to test for higher grade dispersion subzones. On Lesperance, which was not tested in Phase I, drilling was targeted on the regional scale Opawica Lake Fault and possible related shear zones. On Lesueur West, drilling was targeted on an extension of the gold-bearing Lesueur Fault identified in Phase I. On Lesueur North, drilling was targeted on an extension of the gold-bearing Lac Shortt Fault identified in Phase I. Total project costs averaged $112.03/metre ($34.15/foot).

The bedrock units intersected in Phase II are essentially those of Phase I, with the main addition being small ultramafic dykes of post-Archean age and generally kimberlitic character on Lesueur West. Polarity measurements cannot be obtained from reverse circulation drill samples but the general distribution of the volcano-sedimentary units favours a south-facing, island arc-type pile with andesite at the base, rhyolite at the top and sediments and tuffs in the adjacent basins. The rhyolite has an anomalously high sodium content, suggesting that the volcanic rocks are comagmatic with the differentiated subalkaline to alkaline Opawica Pluton. On Lesueur North, the pluton is separated from the andesite by the Lac Shortt Fault. On Lesperance, the rhyolite is separated from basalt of another volcanic pile by the Opawica Lake Fault. All of the rocks probably belong to the established Caopatina - Quevillon Domain but the formations north of the Lac Shortt Fault on Lesueur North may belong to the Chibougamau - Matagami Domain.

Two types of structures are present in the Opawica Pluton on Boyvinet: 1) narrow, probably north-northeast trending zones of brittle shearing that are characterized by reduction of primary igneous magnetite to hematite and pyrite; and 2) an east-west trending, gneissic strain aureole on the southern contact. Gold mineralization is common in the brittle shear zones and may also be present in the contact strain aureole. The segments of the Opawica Lake Fault on Lesperance, Lesueur Fault on Lesueur West and Lac Shortt Fault on Lesueur North are well defined by strong brittle to ductile shear deformation and hydrothermal alteration but are not anomalous in gold. Remobilized lead-zinc mineralization is present in a kimberlitic dyke near a HEM conductor on Lesueur West, suggesting that the conductor may be caused by volcanogenic massive sulphides. The Lesperance geology also appears to favour massive sulphide mineralization over gold, but the drilling here was targeted mainly on dubious, cross-cutting VLF targets in basalt rather than strong conductors in rhyolite and tuff.

Overburden thickness in the Phase II drill holes averages 20 m. Quaternary strata are of Illinoian to Holocene age. Pockets of west-southwesterly transported, Illinoian-age Lower Till, Sangamon-age fluvial interglacial gravel and Early Wisconsinan-age glaciolacustrine sediments are preserved in bedrock depressions. Southwesterly-transported, Late Wisconsinan-age Chibougamau Till is the primary sampling medium. It directly overlies bedrock in 67 percent of the Phase II drill holes and provides good exploration coverage except on Lesueur West where the bedrock is extensively masked by Sangamon interglacial gravel. The Matheson Till is locally supplanted by glaciofluvial sediments associated with the Kruger Road Esker in the Lesueur West and Lesueur North areas and by numerous de Geer moraines in the Boyvinet and Lesperance areas. Glaciolacustrine sand, silt and clay deposited in Lake Ojibway II during ice retreat overlie the Matheson Till and glaciofluvial sediments and are capped by a thin veneer of Holocene organics.

The gold grain counts and gold assays for the overburden heavy mineral concentrates are generally low and match the bedrock gold geochemistry. Of thirty-eight detected heavy mineral gold anomalies, twenty-nine are caused by abraded, background-type gold grains and three other anomalies are equally insignificant because they are related to very weak mineralization occurring in till clasts or subjacent bedrock rather than in the till matrix.

The remaining six anomalous samples are from Holes 151, 170 and 171 on Boyvinet and define two dispersal trains over the Opawica Pluton. The Hole 151 train is relatively weak and appears to be related to a mineralized shear zone intersected in Hole 150. The Holes 170/171 train is stronger and appears to be related to a mineralized shear zone intersected in Holes 168 and 171. The other fill-in holes on Boyvinet gave generally negative results, indicating that the broad dispersal train zone interpreted from the Phase I drilling is actually a collection of scattered small trains. The heavy mineral base metal results are negative in all four drill areas. However, none of the holes in the favourable Lesperance area were drilled near strong conductors, and the till near the lead-zinc target on Lesueur West generally is not in direct contact with bedrock.

Diamond drilling is presently being performed to test the Holes 151 and 170/171 gold targets on Boyvinet and also the gold targets identified on Boyvinet and Lesueur in Phase I. It is recommended that one drill hole be added to test the HEM zone on Lesueur West for volcanogenic massive sulphide mineralization and to obtain samples of the kimerlitic dykes for further study. Future exploration on and near the Lesperance property should be directed toward volcanogenic massive sulphides rather than gold. No additional exploration is warranted on Lesueur North.

2. INTRODUCTION

2.1 Project Outline

Between January 11 and February 04, 1989, Minnova Inc. conducted an 87 hole Phase II reverse circulation drilling program for the purpose of chip sampling of the Archean bedrock subcrop and heavy mineral geochemical sampling of the overlying Quaternary overburden on three gold properties of Project Lac Shortt -- Boyvinet, Lesueur and Lesperance -- near Opawica Lake in the Abitibi Greenstone Belt, northwestern Quebec (Figs. 1 and 2). The drill areas are centred 15 km west-southwest of Minnova's Lac Shortt Gold Mine and 10 km northeast of the Bachelor Lake Gold Mine.

The Phase II drill areas were selected on the basis of encouraging overburden and/or bedrock gold results obtained from a Phase I reverse circulation drilling program conducted in 1988. This work is detailed in a report by Overburden Drilling Management Limited ("ODM"; Graham et al., 1988), who managed both programs. The following summary is exerpted from that report:

> "One hundred and forty-nine vertical holes were drilled on three properties (Wetjack, Lesueur and Boyvinet), and bedrock and overburden were sampled to identify zones of bedrock deformation and alteration that could host epigenetic gold mineralization and to test for glacially dispersed gold indicative of subcropping mineralization within these structural zones. Total project costs averaged $77.83/metre ($23.72/foot).
>
> The drill areas are located either on (Boyvinet) or immediately south of (Wetjack, Lesueur) the Lac Shortt Fault, a regional-scale, east-west trending shear zone. This shear zone forms the contact between two volcano-sedimentary domains -- the southern Caopatina - Quevillon Domain which is dominated by calc-alkalic andesite and turbiditic sediments, and the northern Chibougamau - Matagami Domain which is dominated by layered mafic/ultramafic sills. The drill areas are also immediately north of a second, parallel shear zone -- the Opawica Lake Fault. The volcano-sedimentary rocks of the Caopatina - Quevillon Domain between the faults are intruded by the syntectonic Opawica Pluton. The pluton is zoned (differentiated) with an albite syenite core and chilled quartz diorite, diorite and gabbro border phases. Metamorphic grade in the volcano-sedimentary rocks is greenschist facies, changing to hornblende hornfels facies near the pluton.

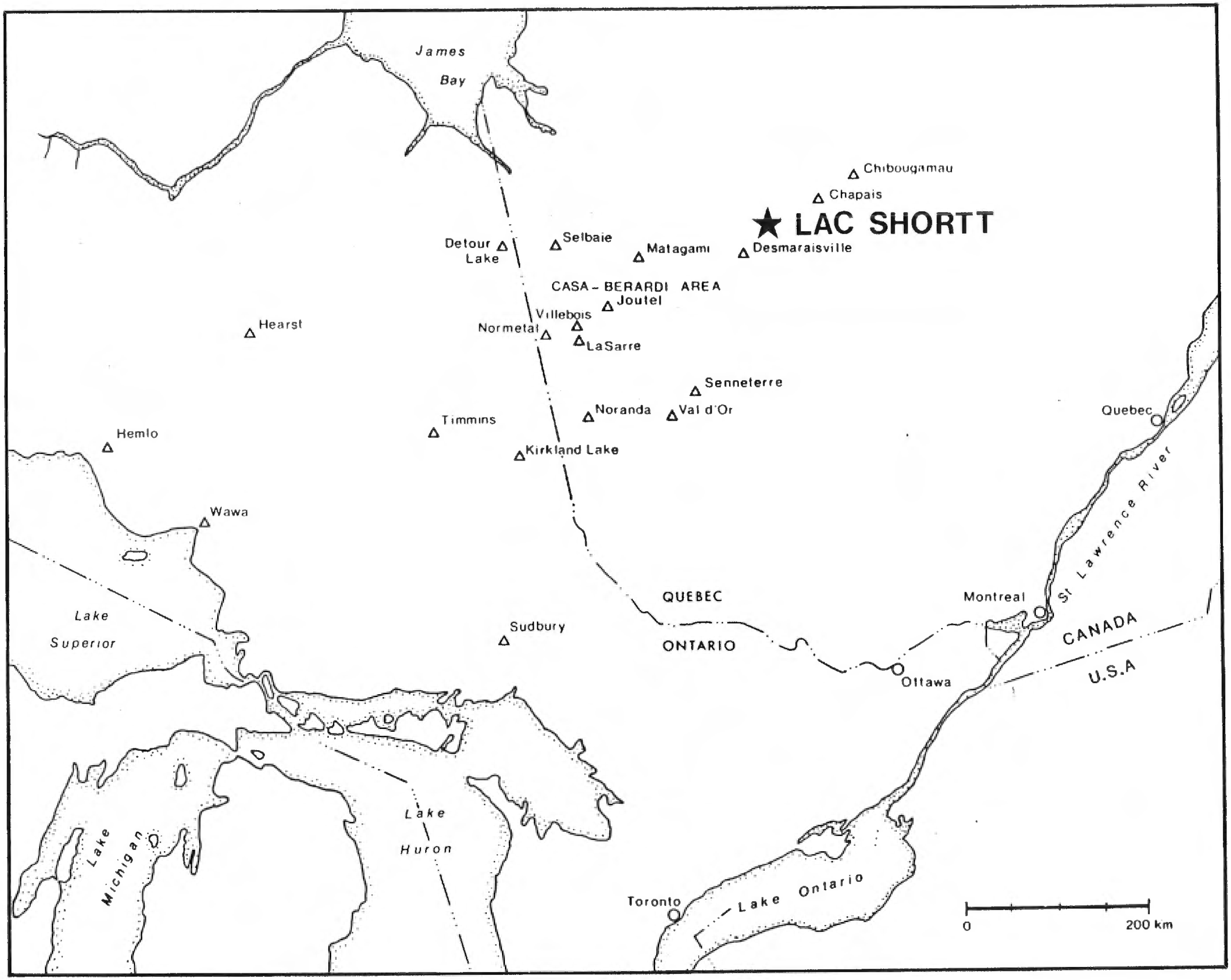

Figure 1 - Project Lac Shortt Location

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All lithologies show significant shear deformation, reflecting their proximity to the major faults. Recognizable east-west trending zones of generally ductile shearing with associated Fe/Mg carbonate alteration are present along the Lac Shortt Fault on Boyvinet, along the southern edge of the turbidites on Wetjack extending eastward to Boyvinet, and along the centre of the turbidites on Lesueur. The Lac Shortt Fault zone is broadly anomalous in gold, and the turbidite hosted zone on Lesueur is strongly anomalous in both gold and arsenic. Deformation within the Opawica Pluton is mainly by brittle shearing. The resulting mylonite zones are characterized by hematitization and pyritization of magnetite and are generally too narrow to be intersected in the vertical drill holes. Weakly anomalous gold values are common along a possible north-northeast trending cross fault in the pluton.

Overburden thickness in the drill holes averages 18.2 m. Quaternary strata are of Illinoian to Holocene age. Pockets of west-southwesterly transported, Illinoian-age Lower Till and Sangamon to Early Wisconsinan-age Missinaibi Formation sediments are preserved in bedrock depressions on the Lesueur and Boyvinet properties where they were protected from the Wisconsinan glaciation. Southwesterly transported, Late Wisconsinan-age Chibougamau Till is the primary sampling medium. It directly overlies bedrock in 71 percent of the drill holes and thus provides good exploration coverage, but is locally supplanted by coeval Ojibway II esker and De Geer moraine sand and gravel. The youngest Quaternary strata comprise Ojibway II clay capped by Holocene peat.

Overburden geochemistry in the areas of good till cover closely mirrors the underlying bedrock geochemistry, with a notable but encouraging exception occurring over the Opawica Pluton in southern and central Boyvinet where the drilling outlined a broad zone of strong gold dispersal train anomalies indicative of proximal bedrock sources of good grade. Overprinting these dispersal trends are background visible gold anomalies that are easily distinguished from the dispersal train anomalies in the heavy mineral fraction but are indistinguishable in the minus 250 mesh fraction. Consequently almost no reliance was placed on the minus 250 mesh geochemistry, and little of value was obtained from it.

A $160,000.00 diamond drilling program and a $150,000.00 Phase II reverse circulation drilling program are proposed to pursue the encouraging findings of the program. The diamond drilling will test the gold-arsenic zone on southern Lesueur, two anomalous gold zones along the Lac Shortt Fault in northern Boyvinet, and an inferred shear zone under the broad dispersal train in southern Boyvinet. The new reverse circulation program will consist of detailed drilling to establish structural orientations and pinpoint other dispersion sources under the train, and reconnaissance drilling along the strike extensions of the Lac Shortt Fault and the Lesueur gold-arsenic zone."

The Phase II drilling on Boyvinet consisted of 31 fill-in holes on the dispersal train over the Opawica Pluton. Other holes that had been planned on the lake to test the eastern extension of the Lac Shortt Fault and the core of the Opawica Pluton were deleted due to poor ice conditions. The Lesueur drilling was performed on two extensions of the property that Minnova acquired on the basis of the positive Phase I results: 1) Lesueur North, where 17 holes were drilled to test the western projection of the Lac Shortt Fault; and 2) Lesueur West, where 12 holes were drilled to test the western projection of the Lesueur gold-arsenic zone. On the Lesperance property, which is 4 km southeast of the Phase I drill areas, 27 reconnaissance holes were drilled to investigate a previously untested segment of the Opawica Lake Fault. The Boyvinet area was drilled first, followed by Lesperance, Lesueur West and Lesueur North.

Overburden Drilling Management Limited prepared the hole layout in consultation with F. Speidel of Minnova. Geologists D. Holmes and P. Collins together with geotechnicians B. Rudnicki and B. Bark of ODM logged and sampled the drill holes (Appendix A), and supervised the drilling at various periods during the program. J. Regis of Minnova assisted with hole layout. Bradley Brothers Limited of Timmins, Ontario, supplied the drilling and road clearing equipment and operators.

All except three holes penetrated the entire overburden section and were extended approximately 1.5 m into bedrock. In total, 437 overburden and 85 bedrock samples were collected. Drilling and sampling statistics are presented in Table 1.

Heavy mineral concentrates (Appendix B) were prepared from the overburden samples at ODM's Nepean, Ontario laboratory. Gold particles sighted during processing were measured to determine their individual contributions to the overall gold content of the concentrates and were classified according to their distance of glacial transport (Appendix C). Three-quarter splits of the heavy mineral concentrates were analyzed for gold, arsenic, copper, zinc and silver (Appendix D) and absolute metal contents were calculated (Appendix E). Subsequently, 1/4 splits of selected heavy mineral concentrates were tested to investigate the causes of unexpected high heavy mineral gold assays (Appendix F).

Hole Number	Grid Coordinates/ Site Numbers	Metres Drilled		Hole Depth (metres)	Samples Collected	
		Overburden	Bedrock		Overburden	Bedrock
PLS-89- 150	L18+50W; 8+50N	8.5	1.5	10.0	0	1
151	L16+00W; 8+00N	26.5	1.5	28.0	6	1
152	L6+00W; 4+40N	28.8	1.2	30.0	2	1
153	L8+00W; 7+00N	13.5	1.5	15.0	1	1
154	L20+00W; 3+50N	7.0	1.5	8.5	1	1
155	L12+00W; 2+00N	19.2	1.5	20.7	3	1
156	L9+00W 1+00N	15.8	1.2	17.0	3	1
157	L18+00W; 0+00	10.3	1.7	12.0	1	1
158	L16+00W; 2+50S	11.8	1.7	13.5	1	1
159	L10+00W; 2+70S	5.0	1.5	6.5	1	1
160	L10+00W; 9+50S	3.9	1.6	5.5	0	1
161	L13+00W; 6+00S	6.8	1.7	8.5	1	1
162	L4+00W; 2+00N	15.5	1.5	17.0	1	1
163	L4+75W; 4+50S	10.5	0.0	10.5	2	0
164	L5+00W; 4+00S	28.5	1.5	30.0	5	1
165	L1+50W; 1+50S	21.5	1.5	23.0	9	1
166	L0+00; 3+50S	33.0	1.5	34.5	14	1
167	L25+00W; 2+30S	25.6	1.6	27.2	4	1
168	L22+00W; 6+00S	25.5	1.5	27.0	7	1
169	L20+00W; 8+50S	33.5	1.5	35.0	9	1
170	L30+00W; 5+75S	16.7	1.3	18.0	1	1
171	L28+00W; 8+50S	18.0	1.5	19.5	5	1
172	L5+50W; 23+50N	29.5	1.5	31.0	6	1
173	L26+00W; 11+00S	14.9	1.5	16.4	1	1
174	L24+00W; 13+50S	11.8	1.5	13.3	1	1
175	L16+75W; 12+00S	33.7	1.3	35.0	14	1
176	L4+00E; 22+50N	7.0	1.5	8.5	1	1
177	L0+50W; 21+50N	9.8	1.5	11.3	1	1
178	L4+00W; 17+50N	9.6	1.5	11.1	0	1
179	L8+00W; 19+50N	20.9	1.5	22.4	1	1
180	L1+25E; 14+90N	13.3	1.5	14.8	7	1
TOTALS		535.9	44.8	580.7	109	30

Table 1a - Drilling and Sampling Statistics, Boyvinet

Hole Number	Grid Coordinates/ Site Numbers	Metres Drilled		Hole Depth (metres)	Samples Collected	
		Overburden	Bedrock		Overburden	Bedrock
PLS-89- 181	No. 20	30.8	1.8	32.6	10	1
182	No. 19	30.6	1.5	32.1	11	1
183	No. 21	24.1	2.5	26.6	5	1
184	No. 22	42.7	1.5	44.2	18	1
185	No. 23	48.8	1.5	50.3	24	1
186	No. 28	28.2	1.4	29.6	7	1
187	No. 29	42.2	0	42.2	19	0
187A	No. 29	41.0	1.5	42.5	0	1
188	No. 30	43.2	2.0	45.2	19	1
189	L64E; 26+50N	3.6	1.5	5.1	0	1
190	L58E; 28+50N	3.4	1.6	5.0	1	1
191	L52E; 28+00N	4.7	1.3	6.0	1	1
192	L48E; 28+50N	6.1	1.4	7.5	1	1
193	L58E; 21+00N	28.0	1.5	29.5	12	1
194	L48E; 15+50N	17.2	1.5	18.7	7	1
195	L64E; 16+50N	33.1	1.5	34.6	13	1
196	L72E; 14+00N	6.8	1.5	8.3	2	1
197	L72E; 19+75N	23.7	1.5	25.2	6	1
198	L80E; 18+50N	12.8	1.7	14.5	4	1
199	L88E; 17+00N	10.0	2.0	12.0	3	1
200	L96E; 17+00N	17.7	1.8	19.5	4	1
201	L57E; 10+00N	6.8	2.0	8.8	1	1
202	L48E; 2+50N	11.6	1.4	13.0	3	1
203	L40E; 5+00N	11.2	1.8	13.0	2	1
204	L36E; 7+50N	7.4	2.1	9.5	1	1
205	L32E; 10+00N	5.5	1.5	7.0	1	1
206	L28E; 11+00N	6.2	1.8	8.0	2	1
TOTALS		547.4	43.1	590.5	177	26

Table 1b - Drilling and Sampling Statistics, Lesperance

Hole Number		Grid Coordinates/ Site Numbers	Metres Drilled Overburden	Metres Drilled Bedrock	Hole Depth (metres)	Samples Collected Overburden	Samples Collected Bedrock
PLS-89	207	No. 12	21.6	1.9	23.5	10	1
	208	No. 13	29.5	1.5	31.0	10	1
	209	No. 14	45.8	1.7	47.5	12	1
	210	No. 17	41.7	2.6	44.3	13	2
	211	No. 18	27.5	2.2	29.7	04	1
	212	No. 15	46.4	1.6	48.0	11	1
	213	No. 16	22.6	2.4	25.0	03	1
	214	No. 22	30.2	1.3	31.5	08	1
	215	No. 21	30.0	1.5	31.5	07	1
	216	No. 23	39.6	1.9	41.5	13	1
	217	No. 20	19.0	2.0	21.0	07	1
	218	No. 19	13.6	1.7	15.3	04	1
	219	L60+00W; 40+00N	5.8	2.2	8.0	0	1
	220	L44+00W; 43+00N	16.5	1.5	18.0	1	1
	221	L47+00W; 48+00N	30.4	2.2	32.6	8	1
	222	L55+00W; 48+00N	17.7	1.8	19.5	1	1
	223	No. 4	15.4	1.6	17.0	3	1
	224	No. 5	9.2	1.3	10.5	0	1
	225	No. 6	20.0	1.5	21.5	5	1
	226	No. 7	9.0	1.5	10.5	1	1
	227	No. 8	8.2	1.3	9.5	1	1
	228	L76+00W; 44+50N	8.6	1.4	10.0	2	1
	229	No. 1	26.5	0	26.5	7	0
	229A	No. 1	29.0	2	31.0	6	1
	230	No. 2	21.5	1.8	23.3	5	1
	231	No. 11	14.2	1.3	15.5	1	1
	232	No. 10	18.5	1.5	20.0	5	1
	233	No. 9	20.7	1.3	22.0	2	1
	234	No. 3	12.4	1.6	14.0	1	1
	TOTALS		651.1	48.1	699.2	151	29

Table 1c - Drilling and Sampling Statistics, Lesueur

The bedrock chip samples were logged under a binocular microscope (Appendix G) and were analyzed for the major oxides (Appendix H); their lithologies and chemistry were then used to map the geology of the properties (Plan 1) in relation to existing interpretations. Subsamples of the bedrock chips were analyzed for gold, arsenic, copper, zinc, silver and zirconium (Appendix H). All geochemical data were reformatted and merged into single computer files (Appendices E and H).

This report documents and describes the Phase II work and the results obtained. Summaries of local Archean stratigraphy, plutonism and structural geology and Quaternary stratigraphy are included and used in the interpretation of the bedrock and heavy mineral geochemistry. Additional details are available in our Phase I report (Graham et al., 1988).

2.2 Principles of Deep Overburden Geochemistry in Glaciated Terrain

During the Pleistocene epoch of the Quaternary period, the crowns of all ore bodies that subcropped beneath the continental ice sheets of North America were eroded and dispersed down-ice in the glacial debris. The dispersal mechanisms were systematic (Averill, 1978) and the resulting ore "trains" in the overburden are generally long, thin and narrow but most importantly are several hundred times larger than the subcrops of the parent ore bodies. These large trains can be used very effectively to locate the remaining roots of the ore bodies.

Because the dispersal trains originated at the base of the ice, they are either partly or entirely buried by younger, nonanomalous glacial debris. Most trains are confined to the bottom layer of debris deposited during glacial recession — the basal till. In fact, the sampling of glacial overburden for exploration purposes is commonly referred to as "basal till sampling". It is important to note, however, that in areas affected by multiple glaciations the bottom layer of debris in the overburden section may be only the lowermost of several stacked basal tills, and that a dispersal train may occur at any level within any one of the basal till horizons. Consequently, the term "basal till sampling" is not synonymous with the collection of samples from the base of the overburden section. Moreover, the term is not strictly correct because significant glacial dispersal trains can occur in formations other than basal till.

From the foregoing statements, it can be seen that glacial dispersion and glacial stratigraphy are interdependent. Consequently, the effectiveness of overburden sampling as an exploration method is related to the ability of the sampling equipment to deliver stratigraphic information from the unconsolidated glacial deposits. In areas of deep overburden, including most of the Abitibi Greenstone Belt in northwestern Quebec, drills must be used. Most drills have been designed to sample bedrock and are unsuitable for overburden exploration, but in the last fifteen years rotasonic coring rigs and reverse circulation rotary rigs have been developed to sample the overburden as well as the bedrock. Both drills provide accurate stratigraphic information throughout the hole and also deliver large samples that compensate for the natural inhomogeneity of glacial debris.

Reverse circulation rotary rigs are much more widely used in the Abitibi than are rotasonic coring rigs. They employ dual-tube pipe and a tricone bit with the outer pipe acting as a casing to contain the drill water for recirculation and to prevent contamination of samples by material caving from overlying sections. Air and water are injected at high pressure through the annulus between the outer and inner pipes to deliver a continuous sample of the entire overburden section through the small inner pipe (Fig. 3). The sample is disturbed but returns to surface instantly, and the precise positions of stratigraphic contacts can be identified. Full sample recovery is possible in all formations regardless of porosity or consistency, although sample loss due to blow-out commonly occurs in the first 1 to 3 metres of the hole until a sediment seal is made around the outer pipe.

Reverse circulation holes are normally extended 1.5 metres into bedrock. Cuttings of maximum 1 cm size are obtained. These cuttings are used to determine the bedrock stratigraphy, structure and geochemistry and are also compared to the till clasts to help determine ice flow directions and glacial dispersal patterns.

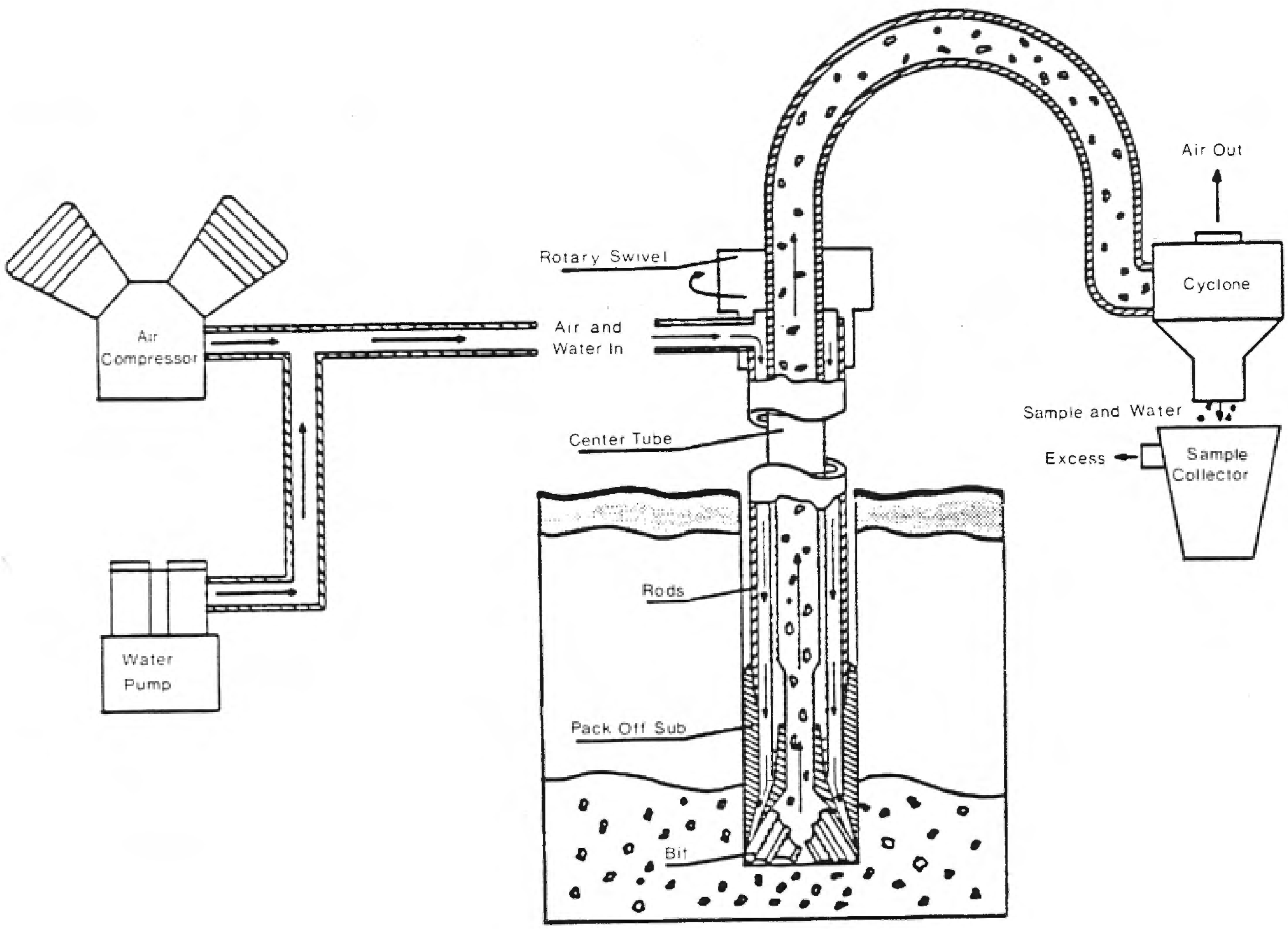

Figure 3 - Schematic Diagram of a Typical Reverse Circulation Rotary Drilling System

Most of the glacial overburden in Canada is fresh, and metals in the overburden occur in primary, mechanically dispersed minerals rather than in secondary chemical precipitates. While ore mineral dispersal trains are very large, they are also weak due to dilution by glacial transport and are difficult to identify from a normal "soil" analysis of the fine fraction of the samples. Consequently, heavy mineral concentrates are prepared to amplify the primary anomalies, and analysis of the fines is normally reserved for areas where significant post-glacial oxidation is evident. The heavy mineral concentrates are very sensitive, and special care must be taken to avoid the introduction of contaminants into the samples. On gold exploration programs, it is advantageous to separate and examine any free gold particles because most gold anomalies in heavy mineral concentrates are caused by background nugget grains that are of no interest.

2.3 Property Descriptions and Access

Detailed descriptions of the Wetjack (PN-090), Boyvinet (PN-114) and Lesueur (PN-116) properties are provided in our Phase I report. The claims comprising these three properties and the three new groups drilled in Phase II are shown in Figure 4. The Phase II claims, including Boyvinet, are also listed in Table 2.

The new Lesueur North extension of PN-116 comprises 34 quarter-mile claims staked by Minnova in Boyvinet Township. The new Lesueur West extension comprises four claims staked by Minnova encompassing surveyed Lots 38 to 41, Range X, Lesueur Township. The Lesperance property (PN-115) comprises 61 quarter-mile claims in western Lesperance Township on the southern shore and adjoining peninsula of Opawica Lake and on the southern part of the lake itself. Like the Boyvinet property, it is one of five properties totalling 294 claims (termed the Opawica Project) optioned from Camchib Mines Inc., a wholly-owned subsidiary of Campbell Resources Inc., in which Minnova can earn a 60 percent interest.

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PERMIT	CLAIM	TOWNSHIP	RANGE	LOT	HECTARES
BOYVINET PROPERTY (PN 114)					
383910	1	Boyvinet			16
382744	4	Boyvinet			16
382744	5	Boyvinet			16
382745	5	Boyvinet			16
383712	1	Boyvinet			16
383712	2	Boyvinet			16
382712	3	Boyvinet			16
382710	2	Boyvinet			8
382710	5	Boyvinet			8
382710	3	Boyvinet			8
382710	4	Boyvinet			8
382743	5	Boyvinet			16
382744	3	Boyvinet			16
382745	3	Boyvinet			16
382745	4	Boyvinet			16
383712	4	Boyvinet			8
382712	5	Boyvinet			8
382743	4	Boyvinet			16
382744	2	Boyvinet			16
382745	2	Boyvinet			16
382749	1	Boyvinet			16
382749	2	Boyvinet			16
382749	3	Boyvinet			16
382749	4	Boyvinet			16
382749	5	Boyvinet			16
383711	1	Boyvinet			16
383711	2	Boyvinet			16
383711	3	Boyvinet			16
383711	4	Boyvinet			16
383711	5	Boyvinet			16
382743	1	Boyvinet			16
382743	2	Boyvinet			16
382743	3	Boyvinet			16
382744	1	Boyvinet			16
382745	1	Boyvinet			16
382746	1	Boyvinet			16
382746	2	Boyvinet			16
382746	3	Boyvinet			16
382746	4	Boyvinet			16
382746	5	Boyvinet			16
382748	1	Boyvinet			16
382748	2	Boyvinet			16
382748	3	Boyvinet			16
382748	4	Boyvinet			16
382748	5	Boyvinet			16
429071	1	Boyvinet			16
429070	4	Boyvinet			16
429070	1	Boyvinet			16
382741	1	Boyvinet			16
382741	2	Boyvinet			16
382742	1	Boyvinet			16
382742	2	Boyvinet			16
382742	3	Boyvinet			16
382742	4	Boyvinet			16
382747	1	Boyvinet			16
382747	2	Boyvinet			16
382747	3	Boyvinet			16
382747	4	Boyvinet			16
382747	5	Boyvinet			16
429070	5	Boyvinet			16
429070	3	Boyvinet			16
429070	2	Boyvinet			16
382741	3	Boyvinet			16
382741	4	Boyvinet			16
382741	5	Boyvinet			16
382742	5	Boyvinet			16
383713	1	Lesueur	X	57	40
383713	2	Lesueur	X	58	40
383714	1	Lesueur	X	59	40
383714	2	Lesueur	X	60	40
383715	1	Lesueur	X	61	40
383715	2	Lesueur	X	62	40
383716	1	Lesueur	X	63	40

PERMIT	CLAIM	TOWNSHIP	RANGE	LOT	HECTARES
LESPERANCE PROPERTY (PN 115)					
383911B	2	Lesperance			16.0
383911B	3	Lesperance			16.0
383912	1	Lesperance			16.0
383912	2	Lesperance			16.0
383912	3	Lesperance			16.0
383912	4	Lesperance			16.0
383912	5	Lesperance			16.0
383913	1	Lesperance			16.0
383913	2	Lesperance			16.0
383913	3	Lesperance			16.0
383913	4	Lesperance			16.0
383913	5	Lesperance			16.0
383914	1	Lesperance			16.0
383914	2	Lesperance			16.0
383914	3	Lesperance			16.0
383914	4	Lesperance			16.0
383914	5	Lesperance			16.0
383915	1	Lesperance			16.0
383915	2	Lesperance			16.0
383915	3	Lesperance			16.0
383915	4	Lesperance			16.0
383915	5	Lesperance			16.0
383916	1	Lesperance			16.0
383916	2	Lesperance			16.0
383916	3	Lesperance			16.0
383916	4	Lesperance			16.0
383917	5	Lesperance			16.0
383917	1	Lesperance			16.0
383917	2	Lesperance			16.0
383917	3	Lesperance			16.0
383917	4	Lesperance			16.0
383917	5	Lesperance			16.0
383918	1	Lesperance			16.0
383918	2	Lesperance			16.0
383918	3	Lesperance			16.0
383918	4	Lesperance			16.0
383918	5	Lesperance			16.0
383919	1	Lesperance			16.0
383919	2	Lesperance			16.0
383919	3	Lesperance			16.0
383919	4	Lesperance			16.0
383919	5	Lesperance			16.0
383920	1	Lesperance			16.0
383920	2	Lesperance			16.0
383920	3	Lesperance			16.0
383921	1	Lesperance			16.0
383921	2	Lesperance			16.0
383921	3	Lesperance			16.0
383921	4	Lesperance			16.0
383921	5	Lesperance			16.0
383922	1	Lesperance			16.0
383922	2	Lesperance			16.0
383922	3	Lesperance			16.0
383922	4	Lesperance			16.0
383922	5	Lesperance			16.0
383923	1	Lesperance			16.0
383923	2	Lesperance			16.0
394540A	1	Lesperance			16.0
394540B	1	Lesperance			16.0
394540B	2	Lesperance			16.0
394540B	3	Lesperance			16.0
394540B	4	Lesperance			16.0

PERMIT	CLAIM	TOWNSHIP	RANGE	LOT	HECTARES
LESUEUR WEST DRILL AREA (PN 116)					
468475	1	Lesueur	X	38	40
468475	2	Lesueur	X	39	40
468476	1	Lesueur	X	40	40
468476	2	Lesueur	X	41	40
LESUEUR NORTH DRILL AREA (PN 116)					
468462	2	Boyvinet			16
468462	3	Boyvinet			16
468462	4	Boyvinet			16
468462	5	Boyvinet			16
468463	2	Boyvinet			16
468463	3	Boyvinet			16
468463	4	Boyvinet			16
468463	5	Boyvinet			16
468464	3	Boyvinet			16
468464	4	Boyvinet			16
468464	5	Boyvinet			16
468465	4	Boyvinet			16
468465	5	Boyvinet			16
468466	4	Boyvinet			16
468466	5	Boyvinet			16
468467	4	Boyvinet			16
468467	5	Boyvinet			16
468468	1	Boyvinet			16
468468	2	Boyvinet			16
468468	3	Boyvinet			16
468468	4	Boyvinet			16
468468	5	Boyvinet			16
468469	4	Boyvinet			16
468469	5	Boyvinet			16
468471	4	Boyvinet			16
468471	5	Boyvinet			16
468472	4	Boyvinet			16
468472	5	Boyvinet			16
468473	4	Boyvinet			16
468473	5	Boyvinet			16
468474	1	Boyvinet			16
468474	2	Boyvinet			16
468474	3	Boyvinet			16
468474	4	Boyvinet			16

Table 2 - List of Boyvinet, Lesueur North, Lesueur West and Lesperance Mining Claims

Highway 113 passes through the Lesueur and Boyvinet properties approximately 15 km north of the town of Desmaraisville. A gravel road branches north off Highway 113 and traverses the Lesueur West drill area. Approximately five km further north along Highway 113, a logging trail branches to the west providing access to most of the Lesueur North drill holes. Across the highway, the Kruger Road extends northeastward providing access to the four remaining Lesueur North holes. Two kilometres from Highway 113, a gravel road branches southward from the Kruger Road and traverses the detailed drilling area on Boyvinet.

Access to the Lesperance property is by a gravel road east off of Highway 113 which follows the north and east shores of Lac Billy before winding east parallel to the Canadian National Railway line south of the property. Approximately 8 km from the highway, a gravel road branches north, traversing the mainland drill area and extending to the peninsula and Opawica Lake.

Access roads were bulldozed to holes in all four drill areas that could not be accessed by existing trails. No advance cutting was required because the trees are not of marketable size.

2.4 Physiography and Vegetation

The Lac Shortt Project area lies in the east-central portion of the Abitibi Upland (Bostock, 1968), a north-sloping clay belt region that was covered by Lake Ojibway 10,000 years ago during Late Wisconsinan ice withdrawal. The southern boundary of the clay belt is the Hudson Bay - St. Lawrence River drainage divide, and also roughly coincides with the southern edge of the Abitibi Greenstone Belt. Average overburden thickness in the clay belt ranges from 10 metres in the south where Lake Ojibway was shallow to 30 metres in the north where the lake was deeper. Average overburden thickness in the 87 Phase II drill holes was 19.9 metres.

The Lesueur West drill area straddles a low hill that was identified as part of the surface expression of the Kruger Road Esker in our Phase I report. Relief varies by 15 metres in this area, and vegetation consists almost entirely of post-harvest regrowth.

The Lesueur North drill area straddles an unnamed, west-flowing, meandering creek and is bounded to the south by a 25-metre high, east-west trending ridge of Kruger Road Esker sediments and to the north by a lower, east-west trending bedrock ridge. The drill area is open along the creek, but supports mature spruce separated by areas of wooded spruce swamps elsewhere.

The detailed drilling area on Boyvinet extends southwesterly from the shore of Opawica Lake, between two 30-metre high syenite ridges, gradually rising 20 metres onto the western end of a third bedrock ridge. Excluding a swampy delta in the northeast, the drill area supports mature spruce forest.

The Lesperance drill area includes both the peninsula on the south shore of Opawica Lake and a mainland area further south roughly between the lake and an east-west section of the Canadian National Railway line. The tip of the peninsula is a sand and gravel ridge approximately 10 metres high, vegetated by mature spruce and poplar forest and separated from the mainland by a low, flat, wooded spruce swamp. The mainland area south of the peninsula is characterized by rolling topography with isolated rock outcrops and is vegetated exclusively by post-harvest regrowth.

2.5 Previous Work

Published geological and geophysical work performed in the area of the reverse circulation drilling to January 10, 1983 as compiled by the Ministère de l'Énergie et des Ressources du Québec (MERQ, 1983a and b) is summarized on Plan 1 (MERQ, 1983c). This interpretation shows outcrops bordering the new Lesueur

North drill area as predominantly diorite and gabbro of the Sturgeon Falls Complex with minor andesite and basalt. The Lesueur West drill area is not close to any outcrops but lies immediately north of a known east-northeast trending iron formation in volcano-sedimentary terrane. The mainland part of the Lesperance drill area is bisected by a contact between predominantly tuff and felsic to intermediate volcanics in the north and predominantly basalt in the south, with steeply dipping east-southeast trending stratigraphy. The east-northeast trending Opawica Lake Fault is placed within the tuffs on the overburden covered peninsula.

Recorded mineral exploration in the Boyvinet drill has been discussed previously (Graham et al., 1988).

On Lesueur North, various operators have prospected the surrounding outcrops and performed mag-EM surveys covering the area. The EM surveys identified several east-southeast trending conductors immediately south of the drill area and one east-northeast trending conductor northeast of the drill area. Falconbridge Nickel Mines Ltd. diamond drilled the northeastern conductor and intersected graphitic mafic tuff (Plan 1).

On Lesueur West, recorded mineral exploration comprises various geophysical surveys which have identified several short, east-west trending HEM and VLF conductors. McWatters Gold Mines Ltd. drilled two diamond drill holes based on a mag-EM survey in 1958 (Dugas, 1975) but apparently did not file the results.

In the mainland part of the Lesperance drill area, various operators have performed mag-EM surveys and geological mapping. A number of short, weak, east-west trending magnetic anomalies occur. Several small lenses of massive pyrite-chalcopyrite-sphalerite are known to occur northwest of the drill area and two gold-copper showings occur on the southwest corner of the property. Exploration work on the peninsula consists solely of limited geophysical surveys, and no anomalies have been identified.

Since 1985, Camchib has conducted HEM (Max Min II), VLF and magnetic surveys and geological mapping on a reconnaissance-scale grid (800 foot line separation) covering the mainland part of the Lesperance property and has performed basal till sampling across one VLF and coincident HEM conductor in the reverse circulation drill area using a hand-held percussion drill with a small flow-through sampler (Potapoff, 1987). The Camchib VLF conductors differ in quantity and orientation from those of previous geophysical surveys, making them suspect, but they have been added to Plan 1. Potapoff does not specify the basal till sample treatment method, but the anomaly threshold used for gold was 20 ppb, suggesting that raw overburden fines were assayed. No overburden anomalies were identified in southern Lesperance.

2.6 Project Costs

Budgeted and actual costs for the Phase II reverse circulation drilling are presented in Table 3. The budget figure of $124.17/metre was based on:

1. A total of 75 holes having an average hole depth of 20 metres.
2. Drilling productivity at 7 metres per operating hour (includes moves).
3. An average bit life of 60 metres.
4. An average of five overburden samples per hole.
5. Ice road preparation costs of $10,000.00.

Eighty-seven holes were drilled. Hole depth averaged 21.5 metres, giving an average of five overburden samples per hole as expected. Drilling productivity averaged 5.8 metres per hour -- significantly less than the budget estimate. This is due in part to having relatively long moves between drill areas (the Lesperance drilling was not included in the original budget). However, the low drilling productivity was more than offset by: 1) a bit life average of 85 metres per bit -- 42 percent better than budget expectations; and 2) cancellation of the ice road work after sinking the Muskeg tractor on the second day. Total invoiced costs were $209,543.86 ($112.03/metre).

	Service	Company	Budget $ Total	Budget $/Metre	Budget $/Foot	Actual $Total	Actual $/Metre	Actual $/Foot
1.	Pre-drilling	ODM	1,500.00	1.00	0.30	2,154.83	1.15	0.35
2.	Ice Road Preparation	Bradley Brothers	10,000.00	6.67	2.04	2,610.00	1.40	0.42
3.	Road clearing and drilling operations	Bradley Brothers	103,150.00	68.77	20.96	110,793.55	59.23	18.05
4.	Field supervision, logging and sampling	ODM	24,245.00	16.16	4.93	32,757.56	17.51	5.34
5.	Sample shipping and processing	Various, ODM	19,050.00	12.70	3.88	20,672.32	11.05	3.37
6.	Analytical	Bondar-Clegg	11,812.50	7.88	2.40	13,555.60	7.25	2.21
7.	Report	ODM	16,500.00	11.00	3.35	(est) 27,000.00	14.44	4.40
	TOTALS		186,257.50	124.17	37.86	209,543.86	112.03	34.15

Table 3 - Budgeted and Actual Costs for the Phase II Project Lac Shortt Reverse Circulation Drilling Program

3. DRILLING AND SAMPLING

3.1 Drill Hole Pattern

Heavy mineral dispersal trains from known gold deposits display varying configurations depending on the relationship between the orientation of the deposit and the direction of ice flow (Fig. 5). Dispersal trains from deposits oriented parallel to ice movement are generally ribbon-like, with widths of 100 to 200 m and a detectable length of a kilometre or more (e.g. the EP train, Table 4). In contrast, dispersal trains from deposits oriented perpendicular to ice movement are apron-like with widths of 300 to 400 m (including low grade fringes related to the anomalous alteration haloes that enclose most gold deposits) and an average detectable length of 500 m.

The regional directions of ice flow for the two major glaciations (Illinoian and Wisconsinan) that affected the Lac Shortt area were both southwesterly (Veillette, 1986; Averill, 1986), whereas regional bedding-controlled shear zones strike east-west. Thus dispersal trains from any shear-hosted gold deposits should trend at about 45 degrees to the strike of the deposits and form elongated aprons. Holes drilled at 300 m stations on east-west or northwest-southeast traverses 400 m apart would be expected to detect dispersion from any significant gold deposits provided these deposits have a good subcrop and till is present down-ice from the deposits. The northwest-southeast orientation is preferred because it is oblique rather than parallel to the bedrock trend and thus provides optimum bedrock stratigraphic, structural and topographic information in addition to good dispersal data.

The follow-up drill holes on central Boyvinet were positioned along seven east-southeast trending traverses on a 100 x 200 metre grid pattern to test for higher grade zones within the broad Phase I dispersal train and to establish the orientations of bedrock structures within the Opawica Pluton.

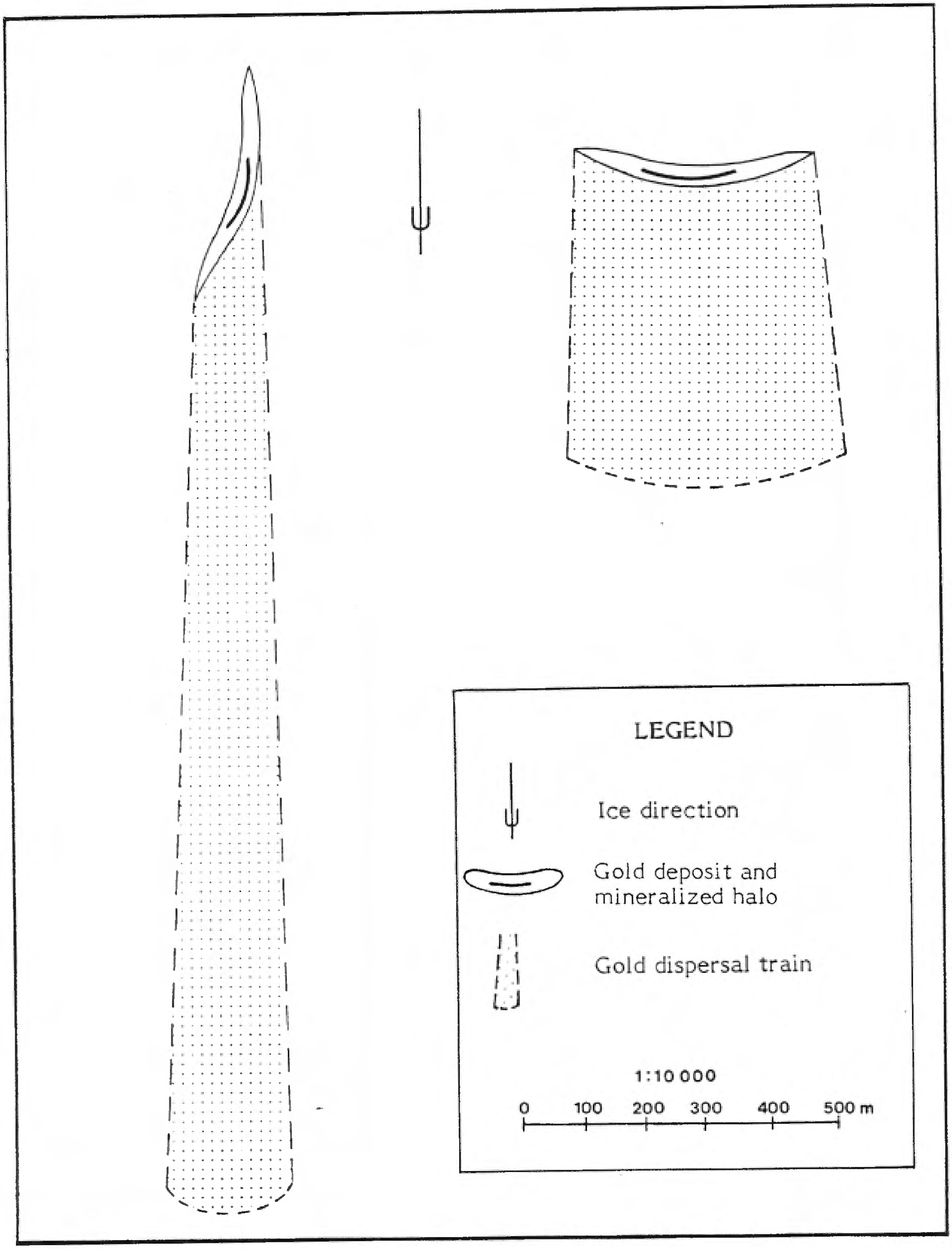

Figure 5 - Typical Sizes and Shapes of Gold Dispersal Trains For Ice-Parallel and Cross-Ice Trending Bedrock Sources

PROVINCE	GOLD DEPOSIT	TRAIN LENGTH[1] (m)	
		TRACED	EST. TOTAL
Saskatchewan	Star Lake	300	800
Saskatchewan	Tower Lake	500	700
Saskatchewan	EP[2]	600	2000
Ontario	McCool	300	400
Quebec	Cooke Mine[3]	800	1000
Quebec	Golden Pond West	300	400[4]
Quebec	Golden Pond	400	500[4]
Quebec	Golden Pond East	800	1000[4]
Quebec	Orenada	100	200
Quebec	Kiena	100	300
Quebec	Chimo	600	1000
Newfoundland	Devil's Cove	2000	2000

1 - Based on minimum 10 gold grains of similar size and shape per 8 kg sample for free gold trains and on coincident high gold and base metal assays for invisible gold trains

2 - Deposit oriented parallel to glacial ice advance

3 - Occluded gold deposit

4 - Train foreshortened and/or gapped by erosion in last ice advance

Table 4 - Heavy Mineral Gold Dispersal Trains Identified by Overburden Drilling Management Limited Laboratory

On Lesperance, the drill holes on the peninsula were at 200 to 250 metre intervals along two irregular, east-west trending traverses about 300 m apart to test both the overburden and the bedrock for evidence of the Opawica Lake Fault shown on the MERQ compilation (Plan 1). The drill holes on the mainland were positioned at 200 to 300 metre intervals along four irregular, east-southeast trending traverses about 300 metres apart, mainly in the basaltic terrane down-ice from the mafic/felsic contact shown on the MERQ compilation. At least one hole was positioned directly over each VLF axis identified in the Camchib survey even though the validity of these conductors is questionable.

On Lesueur North and Lesueur West, reconnaissance holes were generally at 150 to 300 metre intervals along loosely defined east-southeast trending traverses. The traverse separation is roughly equal to the hole spacing; thus the hole pattern provides semi-detailed overburden coverage and good reconnaissance coverage of the bedrock geology.

3.2 Drilling Equipment

Bradley Brothers' drill rig employed a gear-driven Longyear 38 head with 0.6 metre (2 foot) feed. The drill, together with all its ancillary equipment including air compressor, water pump and logging and sampling facilities, was unitized and enclosed on the bed of a Nodwell Model 160 tracked carrier for all-terrain mobility and all-weather operation.

The rig employed an air compressor with a rated capacity of 300 cfm at 160 psi and a water pump having a capacity of 20 gpm at 600 psi. Water flow was normally restricted to 4 to 5 gpm to improve recovery of fines. The rig was equipped with a 12 volt DC Cool White fluorescent fixture that simulates natural sunlight for accurate sample logging.

Ten-foot drill rods were used. However, the holes were logged in metres using the approximate conversion factor of 3 metres to 10 feet. This resulted in the logged hole depth being 1.6 percent less than true depth.

Bradley Brothers supported the drill rig with a Nodwell GT-1000 muskeg tractor that carried the drill rods and was equipped with one 400-gallon, exhaust-heated water tank. They also provided a D-6 wide pad bulldozer for road clearing.

Minnova supplied accommodations and meals for the Bradley and ODM crews at the Lac Shortt Mine.

3.3 Logging and Sampling

The Project Lac Shortt samples were collected in two 20 litre buckets coupled with a plastic tube. This procedure ensures a quiet settling environment thus reducing the loss of fines encountered if only one bucket is used and allowed to overflow. Most of the clay is still lost but a research study made by ODM (Dimock, 1985) showed that sand loss is insignificant and silt loss is reduced to 40 percent compared to 72 percent with the one-bucket system. Interestingly, fine gold is lost in direct proportion to fine minerals of low specific gravity such as quartz and feldspar because the flake shape rather than high density of fine gold is the primary factor controlling the rate of settling. Further research conducted by ODM (Kurina, 1986) on various inlet/outlet attachments on the second bucket showed an additional 33 percent of the fine material in the overflow could be retained by utilizing a horizontally curved inlet tube, which induces spiral flow, and a vertical stack skimmer on the outlet. The two-bucket system with the modified flow configuration was employed on Project Lac Shortt.

A 10-mesh (1700 micron) screen was employed over the first bucket to separate and discard the majority of rock cuttings and thereby increase the proportion of matrix material which is used to identify and trace dispersal trains. The +10 mesh rock cuttings were constantly monitored for any variations which could give clues to overburden stratigraphy, or for any clasts indicative of an environment suitable for gold or base metal mineralization. Approximately 20 percent of the cuttings were kept for future reference. The degree of sorting of the minus 10 mesh matrix was monitored to differentiate till from sand and gravel.

Till units were sampled continuously using an average sample interval of 1.5 metres. Glaciofluvial and interglacial sand and gravel were sampled over longer, 3 to 6 metre intervals because they are far-travelled and thus generally ineffective for mineral tracing. Glaciolacustrine clay and silt were not sampled because they are of no exploration value.

In the field, both the overburden and bedrock samples were assigned an alpha-numeric designation indicating the drilling project, the year the hole was drilled, the position of the hole in the overall drilling sequence (includes both the 1988 Phase I and 1989 Phase II holes), and the position of the sample in the drill hole. Thus a designation such as PLS-89-172-03 indicates the third sample collected from the one hundred and seventy-second hole, which was drilled during Phase II in 1989 on Project Lac Shortt. Holes 150 to 234 were drilled in Phase II.

Following collection, the overburden samples were reduced to 7-9 kilograms with an aluminum scoop, packed in heavy plastic bags and shipped in 20-litre metal pails to the ODM processing laboratory in Nepean, Ontario or Rouyn-Noranda, Quebec.

3.4 Sample Processing

ODM's processing procedures for overburden samples are illustrated in the flow sheet of Figure 6 and may be summarized as follows:

First, a 250 gram character sample is extracted from the bulk sample using a tube-type sampler. This character sample is dried and stored for future reference. On the Phase I program, a second character sample was taken, and its minus 250 mesh fraction was separated and analyzed for gold to complement the heavy mineral data and to check for gold occluded in minerals of low specific gravity that are not recovered in the heavy mineral concentrates. However the minus 250 gold data proved to be of no value. Therefore only one character sample was employed in Phase II.

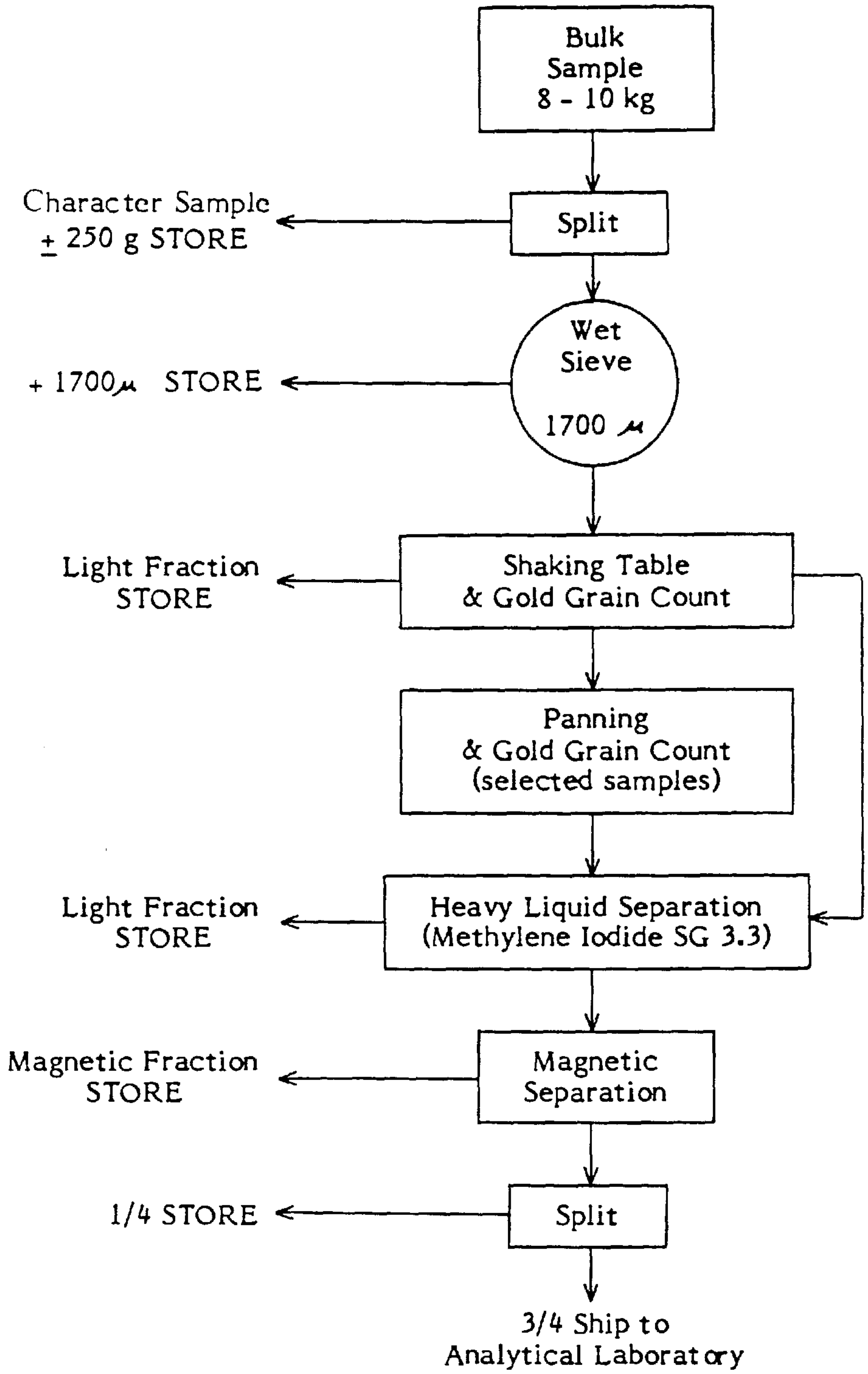

Figure 6 - Sample Processing Flow Sheet

The remainder of the bulk sample is weighed wet and is sieved at 1700 microns (10 mesh) to separate the clasts from the matrix. The +1700 micron clasts are weighed wet and the -1700 micron matrix is processed on a shaking table to obtain a preconcentrate (Fig. 7). The table concentrate and all fractions obtained from it are weighed dry. The sample weights are listed in Appendix B.

While the samples are being tabled, special procedures developed by ODM are used to effect the separation of gold grains from the other heavy minerals. These grains are picked from the deck, placed under a binocular microscope, measured to obtain an estimate of their contribution to the eventual assay of the concentrate (Table 5), and classified as delicate, irregular or abraded (Fig. 8) to determine their approximate distance of glacial transport. Photomicrographs (35 mm slides) are taken if more than 10 gold grains are present.

Magnetite, with a specific gravity of 5.2, is the heaviest of the common minerals and normally forms the top mineral band on the table above garnet and epidote/pyroxene (Fig. 7). Common flake gold coarser than 125 microns separates completely from the magnetite and is readily counted. Fine gold, thick gold and delicate gold travel with the magnetite due to size and shape effects, and only 10 to 20 percent of such grains are readily sighted on the table. Gold particles can also be obscured by pyrite which, if it is abundant, tends to cross the table in the gold path. However, ODM has developed a special panning technique to recover the hidden particles together with some copper, lead and arsenic pathfinder minerals. Samples are normally panned if two or more gold particles are sighted on the table or if any delicate gold is seen or if the table concentrate contains more than 10 percent pyrite. All of the Boyvinet follow-up samples were panned and samples from the other areas were panned to the normal thresholds. The table and pan gold counts are listed in Appendix C.

After the gold grains have been examined, they are recombined with the table concentrate. This concentrate is dried and a heavy liquid separation in methylene iodide (specific gravity 3.3) is performed. The light fraction (S.G. less than 3.3) is stored and the heavy fraction undergoes a magnetic separation to remove drill steel and magnetite. The magnetic separates are checked to ensure that they contain not more than five percent pyrrhotite. The non-magnetic heavy minerals are separated into a 3/4 analytical subsample and a 1/4 library subsample using a riffled microsplitter.

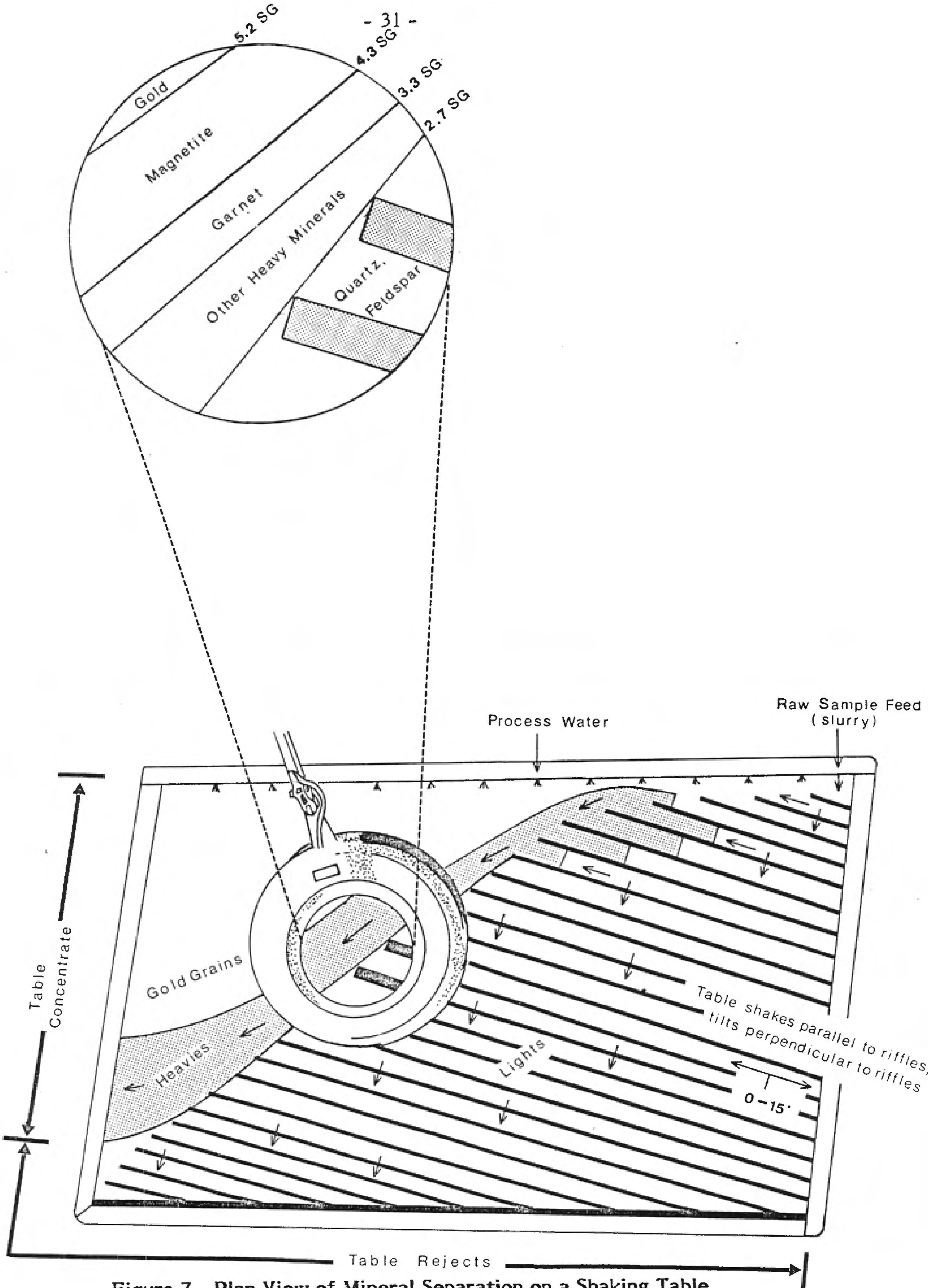

Figure 7 - Plan View of Mineral Separation on a Shaking Table

Size Classification	Flake Diameter (microns)		ppb Au
Very Fine	50		19
"	63	(250 mesh)	38
"	100		150
Fine	150		494
"	177	(80 mesh)	800
"	200		1,140
Medium	300		3,645
"	400		8,160
"	500		15,000
Coarse	600		24,300
"	700		36,015
"	800		49,920
"	900		65,610
"	1,000		82,500
Very Coarse	1,000+		82,500+

Table 5 - Geochemical Contribution of One Gold Grain to a Ten Gram Sample

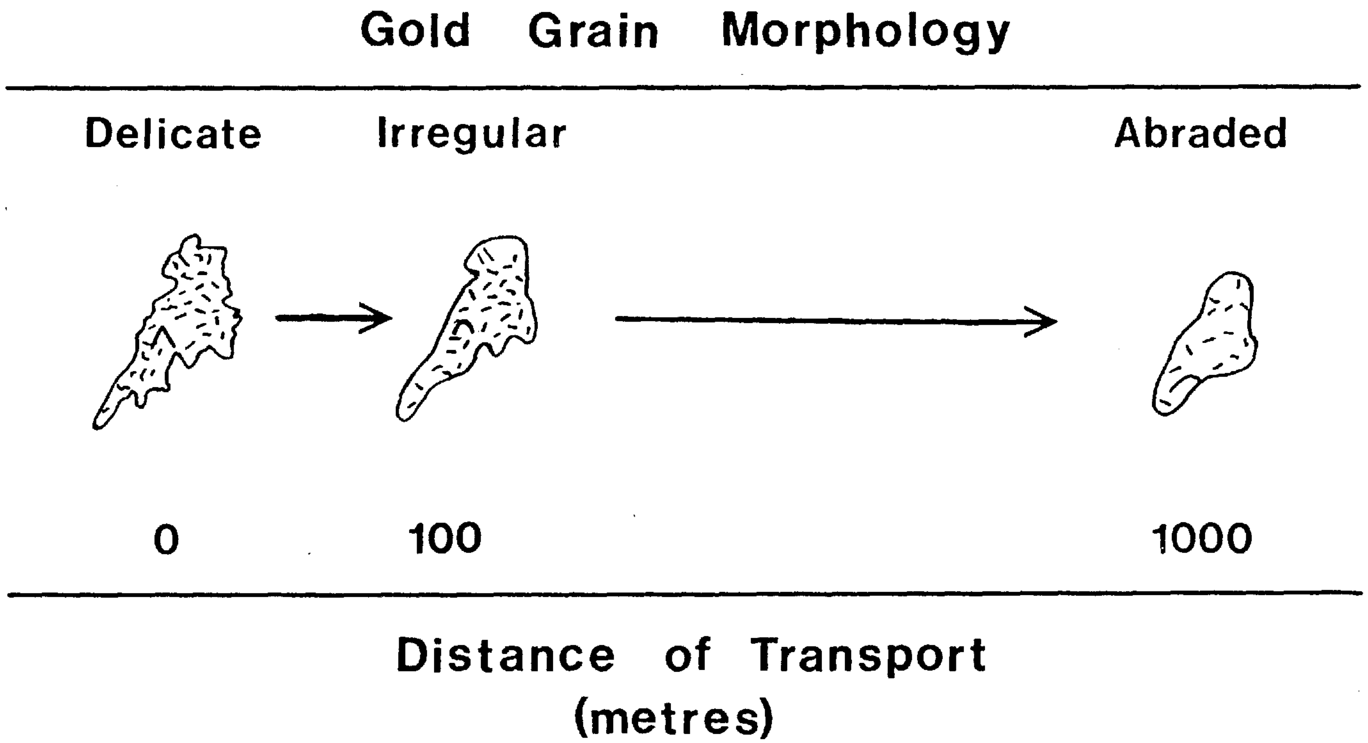

Figure 8 - Effects of Glacial Transport on Gold Particle Size and Shape
(Developed by Overburden Drilling Management Ltd.)

3.5 Sample Analysis

Three-quarter splits of the heavy mineral concentrates (Appendix D) and subsamples of the bedrock chips (Appendix H) were pulped in a shatter box and were analyzed for gold by fire assay with atomic absorption finish (FA/AA), for copper, zinc and silver by AA, and for arsenic by colourimetry. When arsenic values exceeded the 2000 ppm colourimetric detection limit, an assay was done using sodium peroxide fusion and distillation to isolate arsenic followed by measurement of the arsenic content of the distillate with a specific ion meter. Whole rock compositions for the bedrock samples (Appendix H) were determined by DC-plasma and gravimetric (LO1) methods. In addition, carbon dioxide was determined by colourimetry and zirconium by x-ray florescence (XRF).

Gold grains are malleable and thus are difficult to homogenize with the rest of the sample, often forming flattened "metallics" in the pulp. To alleviate this problem and improve assay representativity, concentrates that were known to contain one or more coarse gold grains (generally over 200 microns) capable of producing an anomalous assay (over 1000 ppb) were pulped for shorter periods and screened at 150 mesh after pulping. Separate gold determinations were than made on the -150 mesh pulp and the +150 mesh metallics, and a weighted average assay was calculated.

The 3/4 concentrate analyses contained a number of unexpected and higher than expected gold anomalies. To check the reproducability and significance of these anomalies, the corresponding 1/4 library concentrates were examined for visible gold by panning and submitted for non-destructive INA gold analysis (Appendix F).

All analytical work was done by Bondar-Clegg & Company Ltd. at their Ottawa laboratory and their INA facility in Buffalo, New York. Analytical specifications are given in Table 6.

Sample Type	Sample Preparation	Element		Lower Detection Limit		Extraction	Method
Heavy Mineral Concentrates							
Standard 3/4 splits	Pulverize to -200 mesh	Cu	Copper	1	ppm	HCl-HNO_3, (1:3)	Atomic Absorption
		Zn	Zinc	1	ppm	HCl-HNO_3, (1:3)	Atomic Absorption
		Ag	Silver	0.1	ppm	HCl-HNO_3, (1:3)	Atomic Absorption
		As	Arsenic	2	ppm	HNO_3-$HClO_4$	Colourimetric
		Au	Gold	5	ppb	Aqua Regia	Fire Assay AA
Pulp and metallics 3/4 splits	Pulverize to -200 mesh; screen 150 mesh, weigh +150 and -150	Au	-150	0.01	ppm	Aqua Regia	Fire Assay AA
		Au	+150	0.01	ppm	Aqua Regia	Fire Assay AA
		Au	Average				Calculated
Selected 1/4 splits	None	Au	Gold	5	ppb	None	Neutron Activation
Bedrock Chips	Pulverize to -200 mesh	SiO_2	Silica (SiO_2)	0.01	pct	Borate Fusion	DC Plasma
		TiO_2	Titanium (TiO_2)	0.01	pct	Borate Fusion	DC Plasma
		Al_2O_3	Alumina (Al_2O_3)	0.01	pct	Borate Fusion	DC Plasma
		Fe_2O_3*	Total Iron (Fe_2O_3*)	0.01	pct	Borate Fusion	DC Plasma
		MnO	Manganese (MnO)	0.01	pct	Borate Fusion	DC Plasma
		MgO	Magnesium (MgO)	0.01	pct	Borate Fusion	DC Plasma
		CaO	Calcium (CaO)	0.01	pct	Borate Fusion	DC Plasma
		Na_2O	Sodium (Na_2O)	0.01	pct	Borate Fusion	DC Plasma
		K_2O	Potassium (K_2O)	0.01	pct	Borate Fusion	DC Plasma
		P_2O_5	Phosphorous (P_2O_5)	0.01	pct	Borate Fusion	DC Plasma
		LOI	Loss on Ignition	0.01	gram		Gravimetric
		Total	Whole Rock Total	0.01	pct		Calculated
		CO_2	Carbon Dioxide	0.01	pct	HNO_3-$HClO_4$	Colourimetric
		Zr	Zirconium	1	ppm	None	X-ray Fluorescence
		Cu	Copper	1	ppm	HCl-HNO_3, (1:3)	Atomic Absorption
		Zn	Zinc	1	ppm	HCl-HNO_3,(1:3)	Atomic Absorption
		Ag	Silver	0.1	ppm	HCl-HNO_3, (1:3)	Atomic Absorption
		Au	Gold	5	ppb	Aqua Regia	FA-AA @ 10 gm weight

Table 6 - Bondar Clegg Analytical Specifications

4. BEDROCK GEOLOGY

4.1 Regional Geology

The following summary of the geology of the Project Lac Shortt area is exerpted from our Phase I report:

"The Opawica Lake region is in the northeastern part of the Archean-age Abitibi Greenstone Belt which comprises repeated komatiitic through tholeiitic to calc-alkalic cycles of lavas and volcaniclastics with coeval clastic and exhalative sedimentary rocks, porphyries, layered mafic-ultramafic sills, and plutons of potassium poor dioritic to tonalitic composition. These rocks have been complexly deformed, metamorphosed to the subgreenschist to greenschist facies, and intruded by late kinematic granodiorite and monzonite plutons (Gariepy et al., 1984).

Stratigraphically the Wetjack and Lesueur properties are in the Caopatina - Quevillon Domain while the Boyvinet property straddles the boundary between this domain and the more northerly Chibougamau - Matagami Domain (Giovanezzo, 1983). The two domains contain a similar range of volcano-sedimentary rocks; the main difference between them is that differentiated mafic/ultramafic sills are common in the Chibougamau - Matagami Domain and are rare in the Caopatina - Quevillon Domain.

Formal stratigraphic group names have not yet been developed for the volcano-sedimentary strata of the Opawica Lake area as they have for the Chibougamau area (MERQ-OGS, 1983). However, on examining the collage of maps and reports covering the Opawica Lake area, it is apparent that two main groups are present within the Caopatina - Quevillon Domain: (1) a group that is dominated by tholeiitic basalt and underlies the area south of the Opawica Lake Fault; and (2) a group that is dominated by calc-alkalic andesite, dacite and tuff and underlies the area north of the fault including the Wetjack and Lesueur drill areas and the south part of the Boyvinet drill area. The strata of both groups are steeply dipping, strike east-west and generally face north but the intervening fault obscures the precise age relationship between the two groups. Further to the north in the Chibougamau - Matagami Domain, differentiated mafic/ultramafic sills of the Sturgeon Falls Complex are more abundant than their volcano-sedimentary hosts, precluding subdivision of the volcano-sedimentary strata into groups.

The main structural zone in the area is the Opawica Lake Fault which extends east-northeastward through Lac Billy and the southern part of Opawica Lake (i.e. south of Opawica Island) to the L'Apparent Pluton (Fig. 2). On the opposite side of the pluton, the same structural trend can be traced further east-northeastward through the Opemiska (Chapais) mining district and the western part of the Chibougamau mining district where it is known as the Gwillim Lake Fault (Allard and Gobeil, 1984). Related faults in the Opawica Lake region include a southern splay fault near the Bachelor Lake Mine and a northern splay or parallel fault passing through the Lac Shortt Mine and extending westward through the northern part of Opawica Lake (i.e. north of Opawica Island). Giovanezzo (1983) indicates that the Lac Shortt Fault continues westward from Lac Opawica where it marks the boundary between the northern Chibougamau - Matagami and southern Caopatina - Quevillon Domains.

Cross faults in the Opawica Lake region generally strike north-northeast (MERQ, 1983; Plan 1). The peculiar donut shape of Opawica Lake probably results from the presence of two of these cross-faults between the east-west trending Opawica Lake and Lac Shortt Faults.

The principal mineral deposits in the region are (Fig. 2):

1. The Bachelor Lake gold mine 15 km southwest of Opawica Lake which started production in July, 1982 with preproduction reserves of approximately 900,000 tonnes of ore grading 6.22 g/t including 10 percent dilution. It is an epigenetic, hydrothermal, shear-controlled deposit occurring in a cross-fault between the two branches of the Opawica Lake Fault. The mineralization is characterized by silicification and hematitization and is hosted by assorted volcanic and volcaniclastic rocks and comagmatic gabbro sills (Buro, 1984) in the contact zone of the syenitic O'Brien Stock. Fluorite, amethyst and pyrite accompany the gold and also occur throughout the O'Brien Stock. The gold has a grain size of 10 to 50 microns and is closely associated with the pyrite.

2. The small Coniagas Zn-Ag-Pb massive sulphide deposit which is located 1.5 km west of the Bachelor Lake Mine and was mined from 1961 to 1967.

3. Minnova's Lac Shortt gold mine 10 km east of Opawica Lake which started production in September, 1984 with preproduction reserves of approximately 2 million tonnes of 6.0 g/t gold (cut) at a cut-off grade of 3.0 g/t (Morasse, 1986). It is a shear-controlled deposit hosted by silicified, hematitized and K-metasomatized rocks of uncertain lithology along the Lac Shortt Fault at the contact zone of a syenite stock. The gold is very fine (average 6 microns) and occurs as disseminated free grains in the gangue and as micro-inclusions in pyrite (Cormier et al., 1984).

4. Minnova's Opemiska gold-copper deposits at Chapais, which occur in sheared mafic/ultramafic sills near the Opawica Lake - Gwillim Lake Fault (Watkins and Riverin, 1982).

5. The Chibougamau gold-copper deposits which occur along the Opawica Lake - Gwillim Lake Fault and in a variety of other structural settings.

Considering the strong association of many of the above gold deposits with the Opawica Lake Fault, and the locations of the Project Lac Shortt properties on or proximal to this fault and the related Lac Shortt Fault, these properties should have a high gold potential."

4.2 Bedrock Geology of the Reverse Circulation Drill Holes

Since the Phase II drill areas are located either within (Boyvinet), adjacent to (Lesueur North and Lesueur West) or along strike from (Lesperance) the Phase I drill areas (Plan 1), the lithologic units intersected in Phase II (Table 7) are essentially the same as those of Phase I. The reader is referred to our Phase I report for a detailed description of these units. The only new lithologies intersected in Phase II are:

1. Pyroxenite in Hole 172 on Boyvinet, within the gabbro/diorite border phase of the differentiated Opawica Pluton;

2. Thin mudstone horizons within the turbidite sequence on Lesueur West;

3. Narrow, unmetamorphosed (i.e. post-Archean) ultramafic lamprophyre or kimberlite dikes on Lesueur West.

As in Phase I, structural axes were identified by classifying the samples as unsheared, weakly to moderately sheared, or strongly sheared, and by contouring hydrothermal carbonate (Plan 1). To be considered strongly sheared, a sample must show both severe deformation and advanced hydrothermal alteration. Hydrothermal carbonate includes all Fe/Mg carbonate except sedimentary siderite, and also any non-ingeneous calcite in excess of the normal 5 percent ceiling for metamorphic calcite. The main structural zones intersected in Phase II are:

9	Ultramafic lamprophyre or kimberlite
8	Opawica Pluton 8a - gabbro, pyroxenite 8b - diorite 8c - quartz diorite 8d - syenite
7	Gabbro
6	Chemical sediments 6a - iron formation 6b - chert
5	Clastic sediments 5a - greywacke 5b - siltstone 5c - mudstone
4	Rhyolite
3	Intermediate tuffs
2	Intermediate volcanics 2a - andesite 2b - dacite
1	Basalt

Table 7 - Bedrock Lithologies Intersected in the Reverse Circulation Drill Holes

1. The Lac Shortt Fault on Lesueur North;
2. The Opawica Lake Fault on Lesperance;
3. The Lesueur gold-arsenic shear zone on Lesueur West.

The following four sections describe in more detail the bedrock geology and geochemistry of the four Phase II drill areas in the sequence drilled (i.e. Boyvinet followed by Lesperance, Lesueur West and Lesueur North).

4.2.1 Bedrock Geology and Geochemistry of the Boyvinet Drill Area

The Boyvinet Phase II drill area straddles the central syenite and southern gabbro/diorite border phases of the Opawica Pluton that were delineated in Phase I. The new pyroxenite zone intersected in Hole 172 contains cumulate magnetite layers and coincides with a strong magnetic anomaly (Fig. 9).

Syenite (Map Unit 8d) was intersected in 26 drill holes. Like the Phase I syenite, it is a pink to red (hematite-stained), very sodic (i.e. alkalic, Fig. 10) rock. In order of increasing abundance, the three most common textural varieties are: 1) equigranular; 2) strongly porphyrytic with 80 to 90 percent albite phenocrysts of 1 to 3 mm size in a chilled, inequigranular, 0.1 to 0.5 mm groundmass; and 3) inequigranular with coarse-grained feldspar, medium-grained mafic minerals and fine-grained accessory minerals. Where not sheared, the syenite is generally massive, although the albite phenocrysts locally display a primary trachytic flow foliation.

The average composition of the syenite is 80 to 90 percent feldspar, 1 to 2 percent quartz, 8 to 12 percent hornblende, 1 to 2 percent sphene, 0.5 to 2 percent magnetite, and 2 to 3 percent calcite. Riebeckite, the blue, sodic amphibole, is mixed with the hornblende in Hole 165, and the samples from Holes 152 and 153 in the north part of the drill area contain pyroxene instead of hornblende. The sample from Hole 176 in the south contains a few pyroxene xenocrysts that are probably

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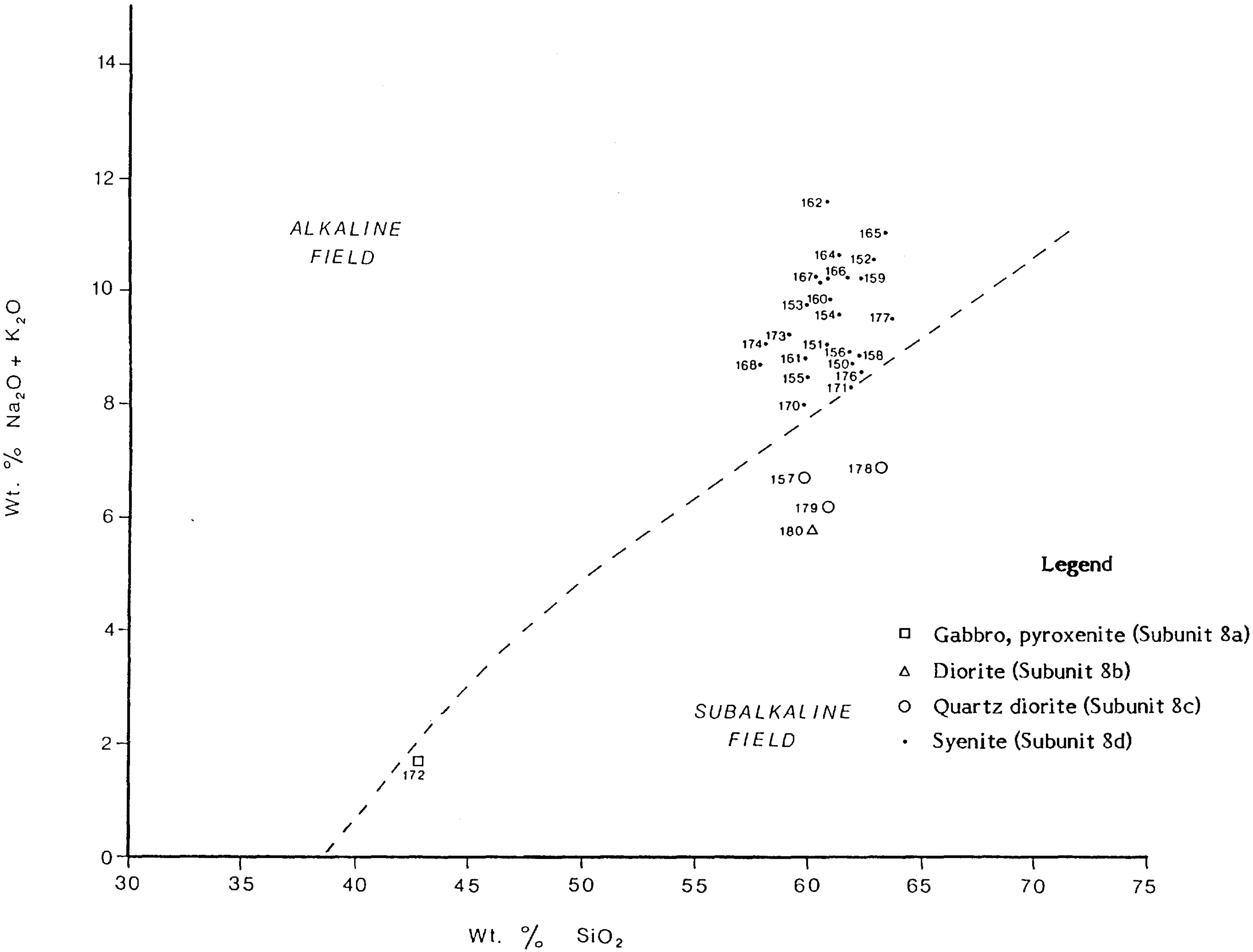


Figure 10 - Alkalies-Silica Plot for Opawica Pluton, Phase II Drilling, Boyvinet Property

derived from the adjoining gabbro and pyroxenite border phases of the pluton. The samples from Holes 155, 156, 164 and 166 contain 1 to 5 percent of an accessory mineral that is believed to be apatite (gray, tabular, H=5). Apatite is also common in the carbonatite core of the Lac Shortt syenite pluton (A. Lichtblau, Minnova; personal communication). The apatite-bearing intersections on Boyvinet are near the shore of Opawica Lake, suggesting that the lake-covered core of the Opawica Lake Pluton may contain a zone of carbonatite.

Deformation of the syenite, where present, is by brittle shearing. The most strongly sheared samples, in Holes 150, 168 and 171, are pervasively microfractured to locally mylonitized. This deformation is accompanied by infilling of the fractures by calcite, and by replacement of magnetite by specular hematite and/or pyrite, of sphene by leucoxene, and of hornblende by chlorite and eventually by Fe/Mg carbonate. However, the sheared syenite still contains some magnetite, indicating that it would be difficult to identify the shear zones using a magnetic survey.

It had been hoped that the 100 x 200 m Phase II drilling pattern on Boyvinet would be sufficiently detailed to trace the shear zones directly between drill holes, thereby establishing whether the direction of structural control is north-northeast or east-west. However, as shown on Plan 1 and detailed in an interim report to Minnova dated 24 February, 1989, the structural orientation is still uncertain; the general distribution of the strongly sheared intersections favours a north-northeast trend but some unsheared intersections are present along the same trend and the distribution of outcrop ridges favours an east-west trend.

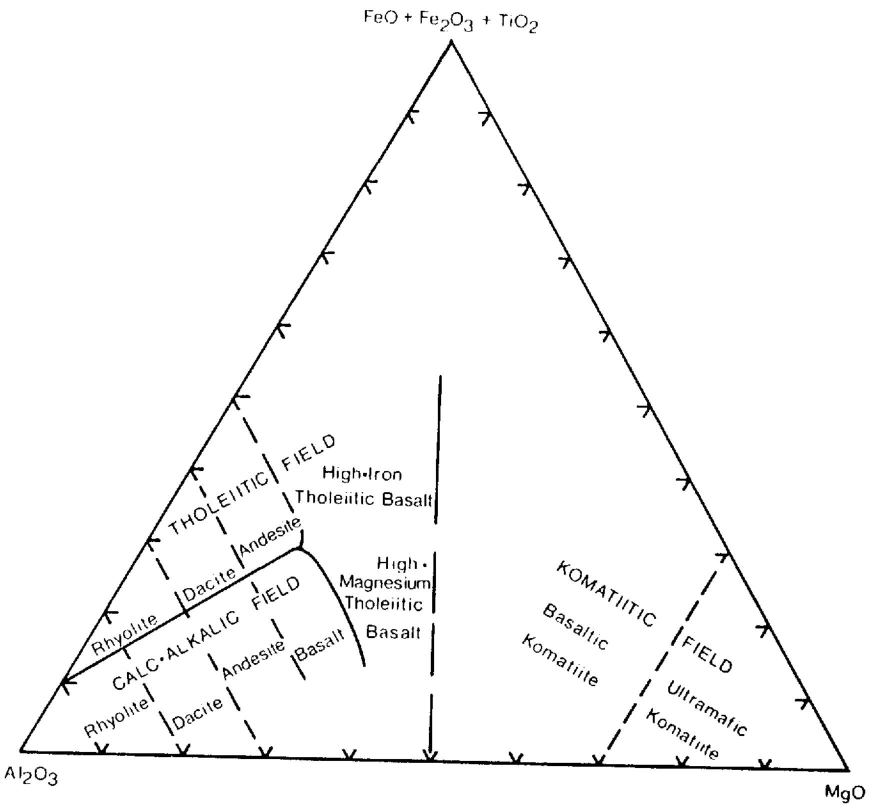
Quartz diorite (Map Unit 8c) was intersected in Phase II Holes 157, 178 and 179. In the Phase I area, this rock forms a major northwestern border phase of the Opawica Pluton that crystallized after the southern gabbro/diorite border phase but before the central syenite. The Hole 157 intersection of Phase II occurs within the central syenite, contains 10 percent syenite, and probably represents a large xenolith. The Hole 178 and 179 intersections define a small body of quartz diorite that occurs within the gabbro/diorite and apparently is separated at surface from the main northwestern quartz diorite body of Phase I.

As in Phase I, the quartz diorite is a pale to medium green rock with pink mottling and a wide variety of chill structures and textures. It is more chilled than both the gabbro/diorite and syenite. Considering the sequence of crystallization, this indicates a hiatus between emplacement of the gabbro/diorite and syenite. A chemical hiatus between the quartz diorite and syenite is also evident in the alkalies-silica plot (Fig. 10), where the quartz diorite has a sufficiently high alkaline content to indicate a magmatic affiliation with the syenite but falls in the subalkaline rather than alkaline field. On the Jensen diagram (Fig. 11), the quartz diorite, excluding the syenite-bearing sample of Hole 157, has a composition equivalent to calc-alkalic dacite.

The quartz diorite contains fewer (20 to 40 percent versus 80 to 90 percent) and smaller (0.5 to 1.5 mm versus 1 to 3 mm) plagioclase phenocrysts than the syenite. The groundmass grain size is variable from 0.05 mm to 0.5 mm -- often within the sample as well as between samples -- and the Hole 157 sample contains xenoliths of earlier-crystallized quartz diorite glass, indicating multi-stage emplacement of the quartz diorite magma. The Hole 178 and 179 samples contain a few xenoliths of gabbro, or xenocrysts of pyroxene derived from the gabbro or pyroxenite. This demonstrates very clearly that the quartz diorite was emplaced after the pyroxenite/gabbro/diorite.

Groundmass material constitutes 60 to 80 percent of the quartz diorite and consists of 60 to 70 percent plagioclase, 15 to 30 percent quartz, 10 to 20 percent hornblende/chlorite, 0 to 5 percent calcite and 0 to 1 percent magnetite. None of the quartz diorite samples are strongly sheared or altered.

The southern pyroxenite/gabbro/diorite border phase of the pluton (Map Units 8a, b) was intersected only in Holes 172 to 180. The Hole 172 sample is a pyroxenite having a Jensen composition equivalent to iron-rich komatiitic basalt whereas the Hole 180 sample is a diorite having a Jensen composition equivalent to calc-alkalic andesite (Fig. 11).



Legend

- □ Gabbro, pyroxenite (Subunit 8a)
- △ Diorite (Subunit 8b)
- ○ Quartz diorite (Subunit 8c)

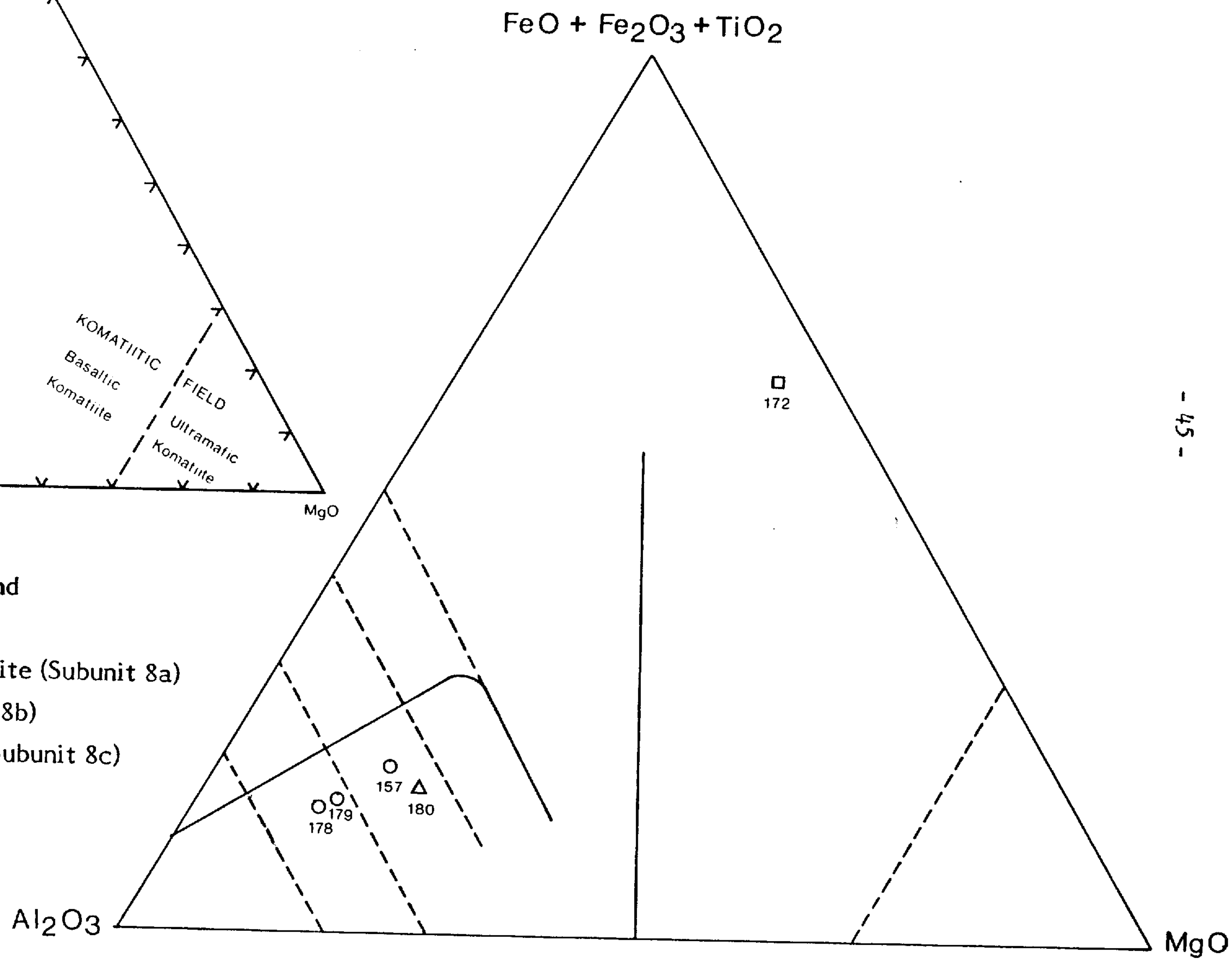


Figure 11 - Jensen Cation Plot for Sub-Alkaline Samples of Opawica Pluton, Phase II Drilling, Boyvinet Property

The pyroxenite is a dark green to black rock consisting of equal proportions of pyroxene-rich and magnetite-rich cumulate layers. The pyroxene-rich layers have a grain size of 0.3 to 1 mm and contain 60 percent dark green pyroxene, 30 percent pale green pyroxene, 10 percent magnetite and 2 percent Fe/Mg carbonate. The magnetite-rich layers are finer-grained (0.05 to 0.2 mm) and contain 60 percent pyroxene, 40 percent magnetite and 0.5 percent pyrite.

The diorite of Hole 180 is a dark green, microporphyrytic rock consisting of 20 to 30 percent plagioclase phenocrysts of 0.3 to 1.5 mm size in an aplitic-textured groundmass of 0.05 to 0.1 mm grain size that consists of 60 percent plagioclase, 30 percent chlorite, less than 10 percent quartz (compared to more than 10 percent in quartz diorite) and 0.5 percent magnetite. An unusual feature of the rock is the partial segregation of the plagioclase, chlorite and magnetite into gneissic bands. The same gneiss was previously observed in Hole 118 of Phase I (Graham et al., 1988). Re-examination of other 1988 samples from nearby holes (Appendix G) shows that similar gneiss is present in Holes 117 and 119, forming a broad, anastomosing gneiss zone that may project eastward into the area of inferred shearing that was recommended for diamond drill testing in our Phase I report. As proposed in our interim report of 24 February, 1989, the diorite gneiss probably represents a ductile shear zone of the "contact strain aureole" type as defined by Stott (1986) in his recent studies of the Red Lake - Pickle Lake area of Ontario. The gneiss probably developed while the central syenite was being emplaced against the already semi-crystallized diorite.

In our Phase I report, we described the problem of differentiating strongly chilled diorite and quartz diorite from the chemically, mineralogically and texturally similar hornfelsed andesite that borders the Opawica Pluton on the south. Indeed, the diorite gneiss samples of Holes 117 and 119 were previously classified as andesite. Re-examination of other questionable 1988 samples from this area (Appendix G) has also resulted in the reclassification of the Hole 120 sample as diorite. Some of these revisions were made with limited confidence, but the revised contact with correspondingly enlarged pluton is used on Plan 1.

Geochemically the Phase II bedrock samples from the Opawica Pluton on Boyvinet contain only background levels of Cu, Zn, As, and Ag (maximum values of 115 ppm, 56 ppm, 10 ppm and 0.3 ppm, respectively), but using a threshold value of 10 ppb, nine of the samples are anomalous in gold. The three highly sheared samples of Holes 150, 168 and 171 assayed 497, 43 and 129 ppb whereas the highest gold assay obtained from the Phase I reconnaissance holes in the same area was 25 ppb. Gold assays for the other six anomalous samples range from 19 to 83 ppb. As shown on Plan 1, all of the anomalies are in the central syenite and their distribution favours a north-northeast structural trend.

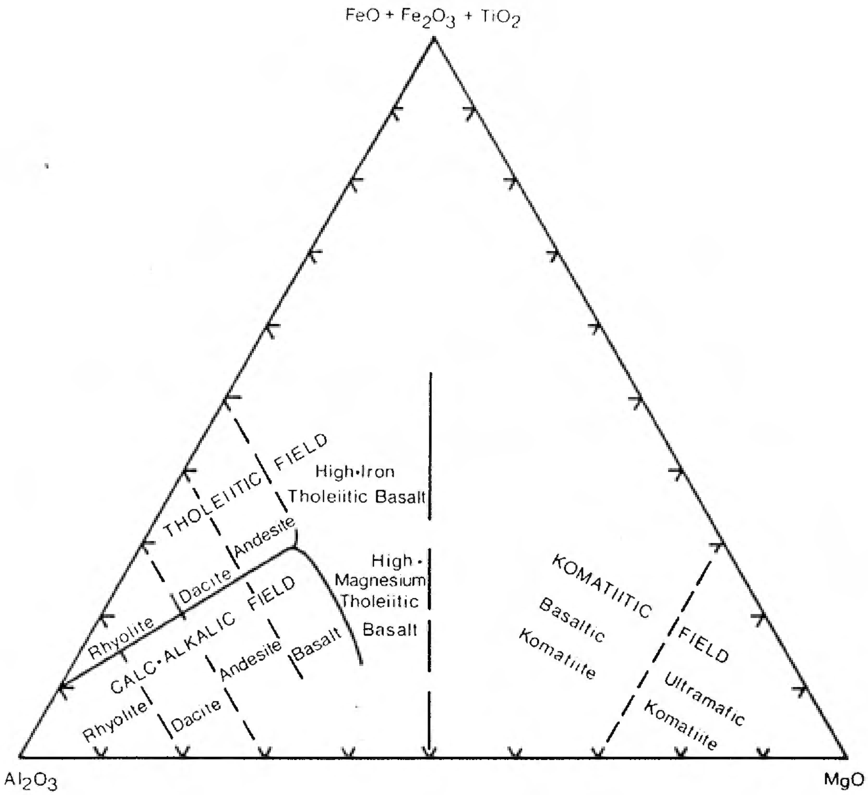
4.2.2 Bedrock Geology and Geochemistry of the Lesperance Drill Area

The mainland area on Lesperance is characterized by a southern belt of tholeiitic basalt and a northern belt of calc-alkalic rhyolite. Within the basaltic terrane, gabbro intersections in Holes 193 and 194 define a 250 m thick sill, and a bedded chert-siltstone intersection in Hole 189 probably represents a thin lens of interflow sediments. The paucity of sediments combined with the east-west stratigraphic trend suggests that the numerous southeast-trending VLF conductors that were identified by Camchib and formed the main targets for the reverse circulation drilling are spurious. Further north on the peninsula, the continuation of the calc-alkalic terrane is represented by a broad zone of rhyolite. Hole 187A intersected quartz diorite that probably forms a small satellite plug, dyke or sill of the Opawica Pluton.

The basalt/rhyolite contact on Lesperance is characterized by strong shearing but does not form a bedrock valley (Plan 2). It appears to be the eastern continuation of the contact that is formed by the Opawica Lake Fault at Lac Billy. Thus the MERQ structural interpretation (Plan 1), in which the Opawica Lake Fault on Lesperance is bent northward through the calc-alkalic terrane, is incorrect. However several of the rhyolite intersections on the northern peninsula are strongly sheared, and the bedrock topography here is depressed 20 to 50 metres relative to the mainland area (Plan 1). Thus a second fault -- probably a subsidiary of the Opawica Lake Fault -- is probably present on the peninsula.

At this point, it is instructive to diverge for a moment from gold exploration to consider stratigraphic relationships in the overall calc-alkalic pile between the Opawica Lake Fault and the Lac Shortt Fault, and the implications of these relationships in base metal massive sulphide metallogenesis. As stated in Section 4.2, the limited information available in the literature suggests that the pile faces north. If, however, one considers the abundance of andesite on Boyvinet and northern Lesueur, of rhyolite on the peninsula on Lesperance, and of turbidites, iron formation and tuff on southern Lesueur, southern Boyvinet and Wetjack (Plan 1), it is much easier to visualize a south-facing sequence in which: 1) the andesite represents the platform of a developing island arc system; 2) the Lesperance rhyolite represents an emergent dome on the platform; 3) the sediments and tuff to the west represent a vent-distal basin; and 4) the numerous, short VEM and HEM conductors and occasional Cu-Zn showings adjoining the rhyolite on or near Lesperance are indicators of vent-proximal exhalative mineralization near the top of the fault-truncated pile. Thus the main potential of the Lesperance property could be for base metal massive sulphide deposits rather than for shear-hosted gold deposits.

Returning now to the Lesperance geology, mafic volcanics (basalt; Map Unit 1) were intersected in 13 drill holes. The samples are a medium to dark green colour except where bleached buff in shear zones. All have an equigranular, interlocking volcanic texture. Most have a relatively coarse grain size of 0.1 to 0.3 mm but a few have a finer grain size (aphanitic to 0.1 mm) indicative of quenching. Other quench indicators such as amygdules, variolites and breccia zones were not observed. Greenschist facies metamorphism has converted most pyroxene to chlorite and imparted a weak foliation to the rock. Deformation, where strongest, is mainly by ductile shearing resulting in: 1) the development of a strong schistosity or lamination, often with lineation; 2) bleaching of chlorite; and 3) a rise in the calcite content to more than 5 percent. The most highly sheared sample, in Hole 190 on the Opawica Lake Fault, contains 20 percent schistosity-parallel quartz-calcite veins that are brecciated and infilled with 10 percent pyrite. The sample from Hole 200 is moderately sheared and contains a trace of tourmaline. The shearing does not appear to have resulted in any major chemical changes as the samples are closely clustered in the tholeiitic basalt field on the Jensen diagram (Fig. 12).



Legend

- ○ Quartz diorite (Subunit 8c)
- ● Gabbro (Unit 7)
- ■ Turbidites (Unit 5)
- ⁘ Rhyolite (Unit 4)
- ▲ Basalt (Unit 1)

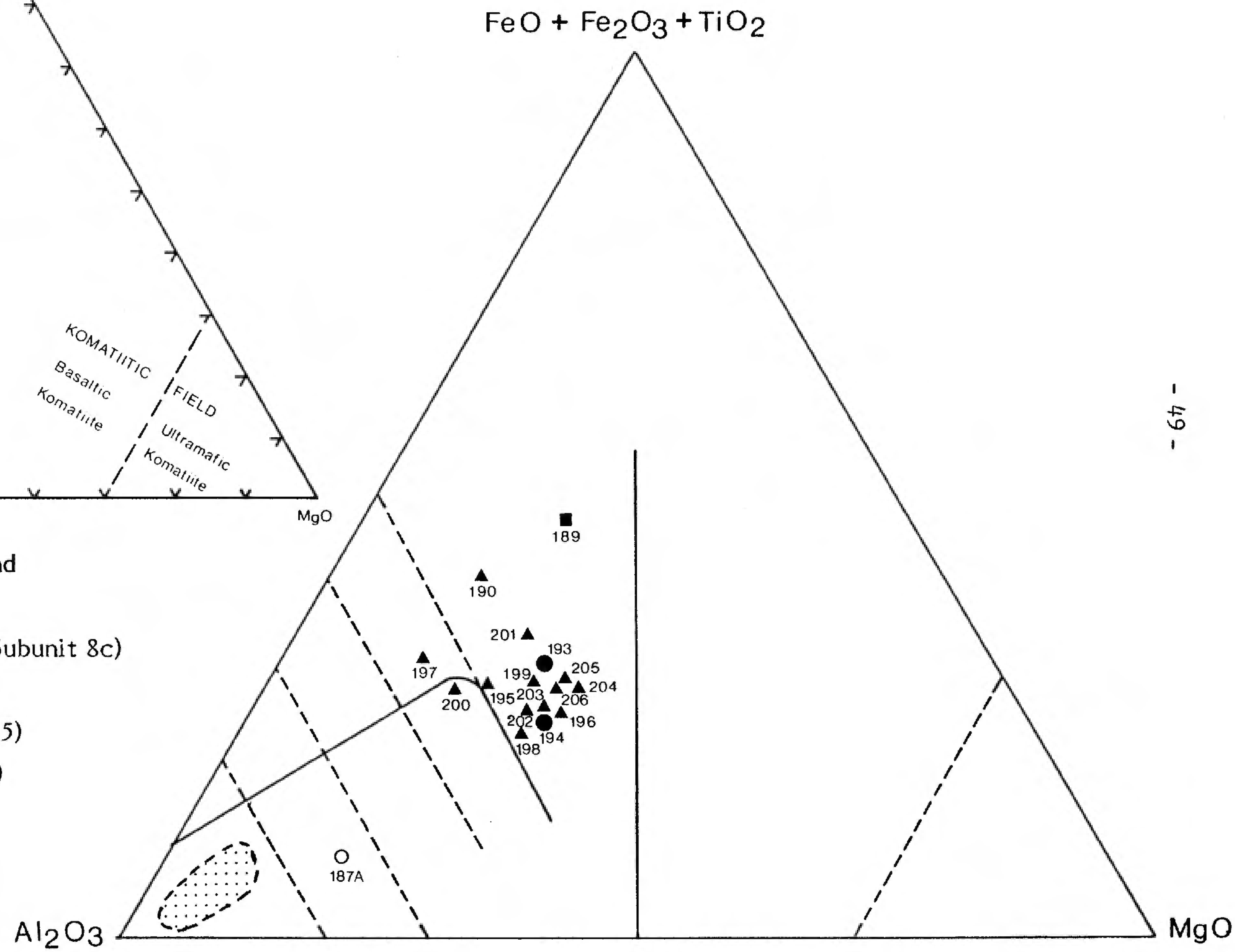


Figure 12 - Jensen Cation Plot for Lesperance Samples

Unsheared basalt samples generally consist of 35 to 60 percent plagioclase, 35 to 60 percent chlorite, 0 to 2 percent quartz, 1 to 3 percent calcite, 0 to 2 percent leucoxene, and trace to 0.2 percent pyrite. The samples from Holes 201 and 204 contain 2 to 3 percent magnetite. Other magnetite occurrences of this type probably account for the scattered magnetic-high axes shown in the basalt terrane on the MERQ compilation (Plan 1).

Felsic volcanics (rhyolite, Map Unit 4) were intersected in Holes 190 and 191 at the Opawica Lake Fault and in seven holes on the northern peninsula. Typically the ryholite is a pale buff-green, unfoliated, porphyrytic rock comprising 20 to 50 percent plagioclase phenocrysts of 0.5 to 4 mm size and 1 to 5 percent quartz phenocrysts of slightly smaller size in an aphanitic to inequigranular (0.05 to 0.2 mm) groundmass. The groundmass is very hard, and where sufficiently coarse is observed to consist of 50 to 60 percent colourless plagioclase (albite), 30 to 40 percent quartz, and 2 to 10 percent of both chlorite and sericite. Pyrite is generally absent. On the alkalies-silica diagram (Fig. 13), the rhyolite is subalkaline but falls near the alkaline field because it has a 6 percent Na_2O content -- much higher than the Abitibi rhyolite average of 3.5 percent (Goodwin, 1977). The high Na_2O content indicates an abundance of albite relative to quartz and results in a SiO_2 content of only 65 percent -- 10 percent lower than Goodwin's Abitibi rhyolite average of 75 percent. It also suggests that the alkaline to subalkaline Opawica Pluton, which intrudes strata that appear to underlie the rhyolite, may be the magma chamber from which the rhyolite was derived. On the Jensen diagram (Fig. 12), the samples are clustered in the calc-alkalic rhyolite field.

Several of the rhyolite samples are strongly sheared by brittle microfracturing and/or lozenging. The fractures are filled with calcite and chlorite but are so pervasive that these minerals have often been weathered out, resulting in a deep ochre discolouration. The shearing is accompanied in Hole 183 by the introduction of 4 percent crystalline pyrite and a trace of fuchsite, and in Hole 188 by 5 percent cummingtonite and a trace of fuchsite.

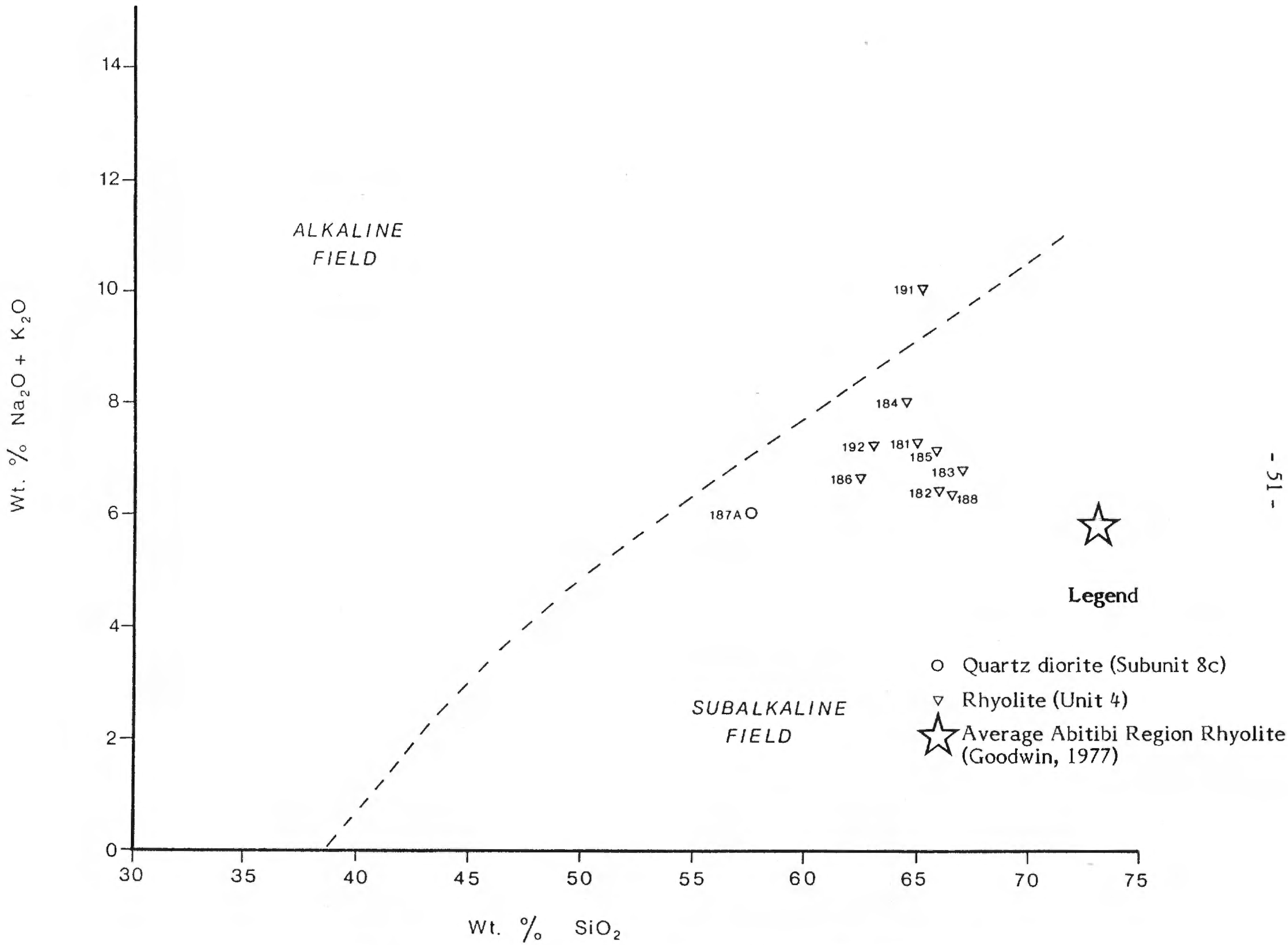


Figure 13 - Alkalies-Silica Plot for Lesperance Rhyolite and Quartz Diorite

Of the three minor rock units intersected on Lesperance, only the sediments of Hole 189 show significant shearing. The sample consists of 40 percent siltstone (Map Unit 5b) and 60 percent chert (Map Unit 6b) interbedded on a scale ranging from 0.5 mm to greater than 10 mm. The siltstone is schistose and lineated, indicating strong shear deformation, but is only weakly altered. It is dark green and consists of silt-sized material (mostly less than 0.05 mm) with sparse fine sand grains (to 0.1 mm). The silt composition, where visible, is 10 percent quartz grains, 40 percent undifferentiable plagioclase and volcanic lithic grains, 40 percent green chlorite and 10 percent calcite. The chert beds have white to gray colour laminations, contain 10 percent amorphous (i.e. syngenetic) pyrite stringers, and are not visibly sheared. However, the chert grains are set in a matrix of calcite that may have replaced sedimentary siderite.

The gabbro (Map Unit 7) samples of Holes 193 and 194 are apparently from the same sill and have almost identical Jensen compositions matching those of the enclosing tholeiitic basalt (Fig. 12), but have very different colours and textures. The Hole 193 gabbro is a dark green rock with 5 percent pyroxene phenocrysts to 1.2 mm size and of ophitic habit set in a diabasic groundmass comprised of 60 percent pyroxene, 40 percent plagioclase and 3 percent leucoxene grains of 0.2 to 0.6 mm size. The Hole 194 gabbro is stained pink by hematite and has a distinctly diabasic texture. It is comprised of 60 percent slender, partly chloritized pyroxene laths of maximum 0.3 x 1 mm size enclosing 40 percent plagioclase grains of 0.2 to 0.5 mm size. Traces of accessory leucoxene and magnetite are also present.

The quartz diorite of Hole 187A is a chilled, feldspar-porphyrytic, hornblende-bearing, sodic rock similar to the Boyvinet border phase samples of the Opawica Pluton (Map Unit 8c) previously described in Section 4.2.1.

Geochemically, the Lesperance bedrock samples contain normal background levels of Cu, Zn and Ag (maximum values of 158 ppm, 365 ppm and 0.3 ppm, respectively) despite the apparently high base metal potential of the area. Probably this is because none of the holes were drilled on or near electromagnetic conductors. The highest arsenic value is 22 ppm from sheared basalt in Hole 190 on the Opawica Lake Fault. Using a gold anomaly threshold of 10 ppb, the sheared rhyolite from Hole 183 on the peninsula (39 ppb Au) and the sheared sediments from Hole 189 south of the Opawica Lake Fault (12 ppb Au) are weakly anomalous.

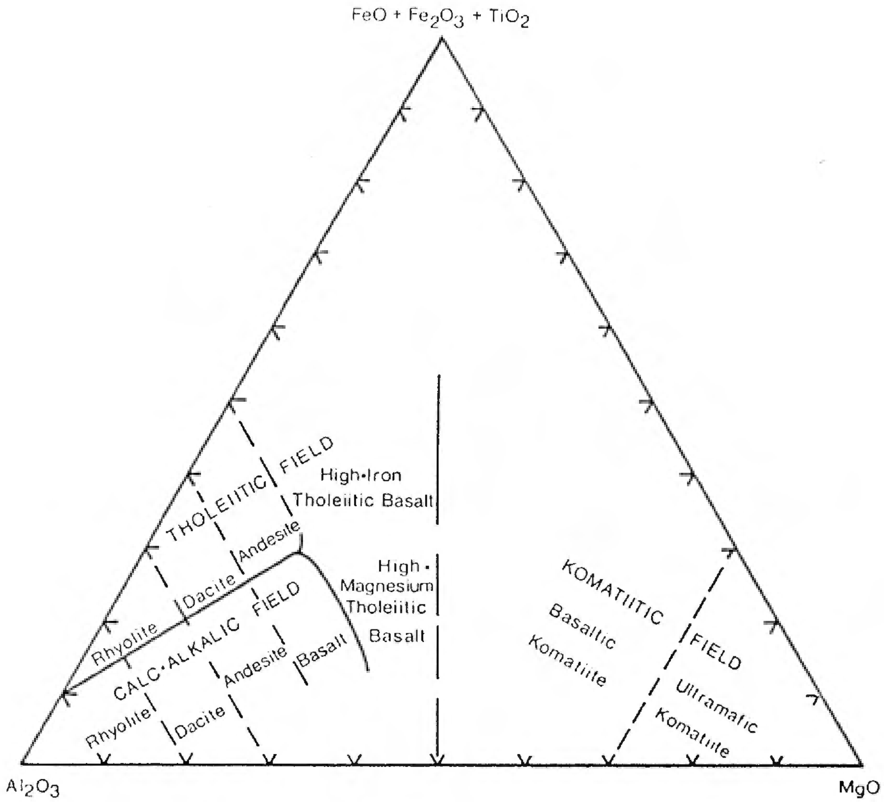
4.2.3 Bedrock Geology and Geochemistry of the Lesueur West Drill Area

The Lesueur West drill area is on the belt of turbidites that hosts the Lesueur gold-arsenic shear zone, hereinafter referred to as the "Lesueur Fault". Ten of the twelve Phase II drill holes intersected turbidites. The other two holes -- Nos. 213 and 214 -- intersected a gabbro sill that appears to be only about 50 m thick.

Three of the turbidite intersections contain narrow (less than 0.3 m thick) dykes of ultramafic lamprophyre or kimberlite. These dykes are unsheared whereas all of the turbidite and gabbro intersections display shear effects. Thus the dykes are of post-Archean age.

As on Lesueur (Graham et al., 1988), the shearing on Lesueur West is mainly ductile, producing a schistosity and lineation. Also as on Lesueur but unlike Boyvinet, Lesperance and Lesueur North, strongly sheared samples always contain Fe/Mg carbonate. An increase in shearing intensity observed within the turbidites in Holes 209 and 215 probably marks the western extension of the Lesueur Fault. As in the Phase I drill area on Lesueur, the fault lacks a coincident bedrock valley (Plan 2). Strong shearing is also evident to the south in Hole 218. This shear zone probably represents the western extension of a barren, unnamed fault on the southern edge of the turbidites that was identified in the Phase I drilling on Lesueur.

The turbidites on Lesueur West include three sediment sub-types which, in conjunction with the local introduction of Fe/Mg carbonate, results in a variety of Jensen compositions (Fig. 14). They consist mainly of fine-grained greywacke (0.05 to 0.25 mm), siltstone (average 0.05 mm) and mudstone (aphanitic). These lithologies appear to be almost randomly interbedded at both the property and drill hole scales. Coarser greywacke consisting of 30 percent plagioclase granules (up to 5 mm) in a medium to coarse-grained sand matrix (0.25 to 1 mm) was intersected in Hole 125. Bedding is generally not evident in the greywacke whereas the siltstone and mudstone typically display laminations less than 1 mm thick.



Legend

- ✡ Ultramafic lamprophyre or kimberlite (Unit 9)
- ● Gabbro (Unit 7)
- ■ Turbidites (Unit 5)

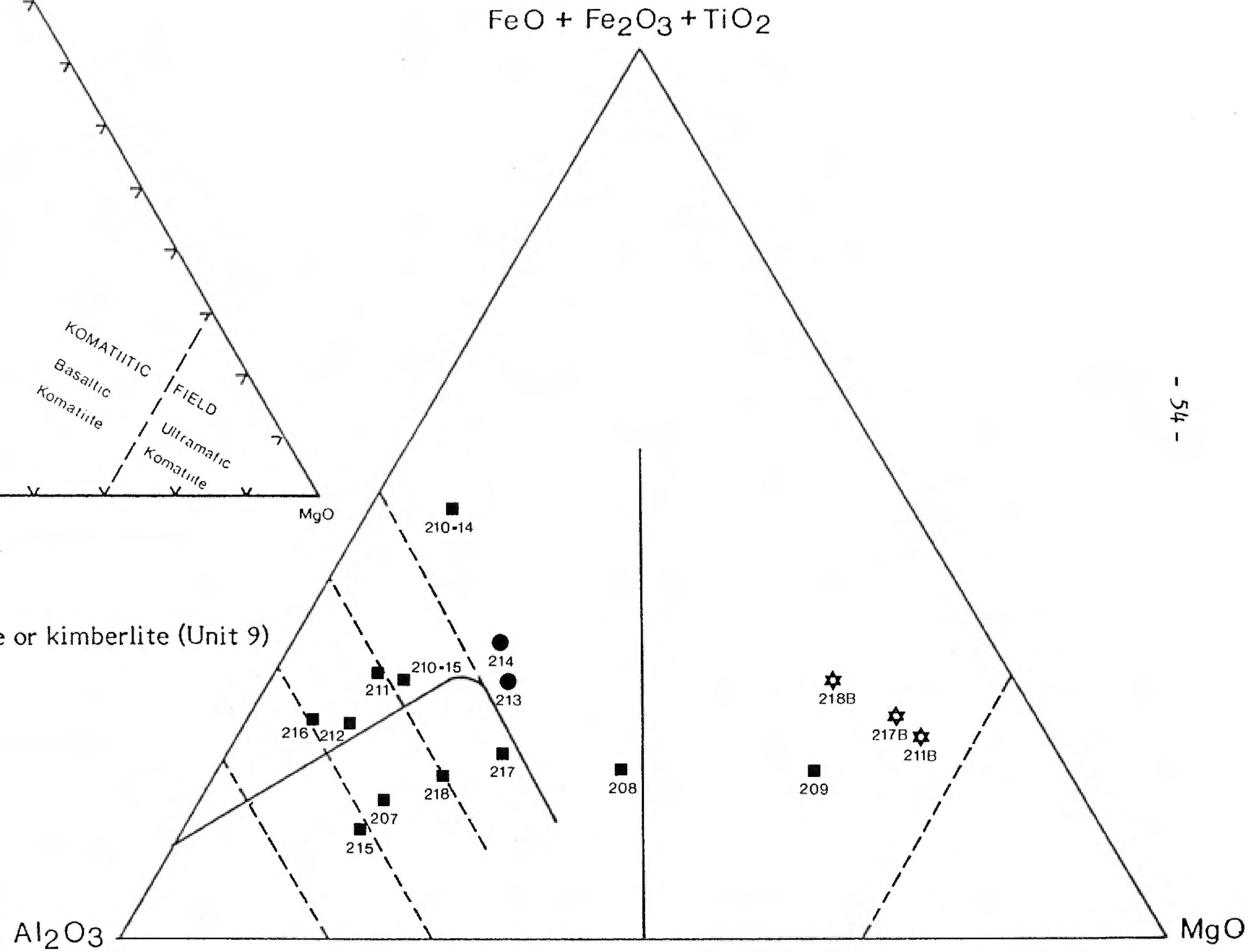


Figure 14 - Jensen Cation Plot for Lesueur West Samples

ODM has observed that turbidites elsewhere in the Abitibi Greenstone Belt are relatively homogeneous, have Jensen compositions equivalent to calc-alkalic andesite, and have four main components: 1) aphanitic ash fragments of intermediate composition; 2) plagioclase grains; 3) quartz grains; and 4) chlorite recrystallized from clay. The main compositional change accompanying the grain size reduction from greywacke to mudstone is an increase in chlorite at the expense of the other three components. On Lesueur West, the quartz content of the greywacke is about 10 percent, and the chlorite content of the turbidites ranges from 10 - 20 percent in greywacke to 50 - 70 percent in mudstone. The feldspar and ash grains are generally not differentiable from one another due to the fine grain size, or in the case of the coarse greywacke of Hole 215, to masking by pervasive shear-controlled silicification.

The turbidites, unlike the volcanic and plutonic rocks described for the other properties, invariable contain pyrite. This pyrite is often amorphous and obviously syngenetic, but is recrystallized to cubic or dodecahedral crystalline forms in the more highly sheared samples. Its concentration is generally only 0.1 to 0.3 percent in the greywacke but reaches 1 to 5 percent in the mudstone intersections of Holes 210 and 216, where it occurs as thin beds. These mudstone intersections also contain 2 to 10 percent graphite but are not proximal to electromagnetic conductors. In addition, the Hole 216 sample contains 5 percent siderite beds, suggesting that it lies on the western extension of the chemical sedimentary horizon (mainly chert; Plan 1) that was intersected on Lesueur in Phase I.

The greywacke of Hole 218 in the south contains, in addition to 0.3 percent pyrite, traces of both galena and sphalerite. These minerals are very fine-grained, suggesting a syngenetic origin. Sphalerite is also present in the younger ultramafic dyke that cuts the greywacke here. Interestingly, the mineralization is located near a small rhyolite dome that was outlined in Phase I, enhancing the potential for volcanogenic massive sulphides, and is also beside an 800 m long HEM conductor that may not have been previously tested by diamond drilling. However, several of the Phase I reverse circulation drill holes were located down-ice from the conductor and did not yield any till anomalies suggestive of base metal massive sulphide mineralization. Possibly the conductive horizon is blind to detection in the till (see Section 5.1.3). Alternatively, the mineralization observed in the greywacke of Hole 218 may be epigenetic, as the greywacke is strongly shear-laminated and bleached and contains 8 percent Fe/Mg carbonate. In the upcoming description of the ultramafic dykes, it is shown that the dyke-hosted sphalerite is definitely epigenetic but is related to a younger structural event than the one that caused major deformation of the greywacke.

The two strongly sheared samples from Holes 209 and 215 on the Lesueur Fault warrant detailed description. The Hole 209 sample is a fine-grained greywacke, and the shearing is manifested by: 1) a strong schistosity with closely spaced (0.1 to 0.5 mm), bleached chloritic shear partings; 2) the development of 5 percent sericite, 5 percent bright green fuchsite, 20 percent Fe/Mg carbonate and 0.3 percent tourmaline; and 3) the presence of 40 percent shear-parallel quartz veins that are brecciated and infilled with 10 percent Fe/Mg carbonate. The Hole 215 sample, as previously noted, is a coarse-grained greywacke. The shearing here is manifested by: 1) bleached chloritic shear laminations that wrap around the sand grains; 2) replacement of part of the chlorite by a grey-green tabular mineral that is probably chloritoid; 3) strong silicification resulting in complete replacement of many of the sand grains by blue (strained) to colourless chert; and 4) the development of 8 percent Fe/Mg carbonate and a trace of fuchsite. Unlike the turbidites along the same fault in the Phase I drill area on Lesueur, the Lesueur West samples are not enriched in pyrite and do not contain visible arsenopyrite.

The gabbro (Map Unit 7) of Holes 213 and 214, like the sill on Lesperance, has a Jensen composition equivalent to tholeiitic basalt (Fig. 14). It is a dark green rock in which all pyroxene has been chloritized. The chlorite : plagioclase ratio is about 1.5 to 1. The grain size of both minerals has been reduced by shear-related shredding. More competent quartz and leucoxene grains up to 1.5 mm in size have survived. They occur at concentrations of 2 to 5 percent, and most of the quartz is blue (i.e. strained).

The unmetamorphosed ultramafic dykes (Map Unit 9) found in the turbidites at Holes 211, 217 and 218 are strongly chilled, porphyrytic rocks containing 15 to 50 percent rounded olivine phenocrysts of 0.2 to 2 mm size and 1 to 5 percent phlogopite book phenocrysts of slightly smaller size. Rare ilmenite phenocrysts are also present in two of the samples. The groundmass generally has a grain size of

0.05 to 0.15 mm but locally contains aphanitic flow bands. It is very calcareous, consisting of 30 to 50 percent igneous calcite, 40 to 50 percent phlogopite, 10 to 20 percent olivine and a trace of pyrite. All of the olivine has been altered to serpentine but without exsolution of magnetite; thus the olivine was probably forsterite (Mg_2SiO_4) and the rock is not magnetic. The abundance of serpentine and calcite results in a soft, clay-like rock that is very susceptible to weathering. In Hole 118, the cores of serpentinized olivine phenocrysts proximal to minor, slickensided slips are vuggy and partly infilled by calcite and sphalerite with a trace of galena. The mineralization is obviously epigenetic, and the slips that control it are obviously younger than the major pre-dyke shear zone in the enclosing greywacke. In any event the dyke mineralization, like that in the greywacke, could be a clue to syngenetic massive sulphide mineralization along the nearby HEM conductor.

The dykes have a Jensen composition equivalent to basaltic komatiite (Fig. 14) but this comparison is not very meaningful as the dykes contain igneous calcite and basaltic komatiite contains plagioclase. Their compositions and textures are highly suggestive of kimberlite. Pyrope -- the diagnostic purple garnet that normally forms sparse phenocrysts in kimberlite — was not observed in the raw rock chips or in special heavy mineral fractions that were prepared by crushing and concentrating the bedrock samples (Appendix I). The exotic xenoliths that typify kimberlite also appear to be absent, although a few small scale plates of turbidites were observed in the Hole 118 sample, but this may be due to the small dyke rather than pipe style of emplacement. Alternatively the dyke rock may be ultramafic lamprophyre rather than kimberlite. In any event the dykes, although calcareous like carbonatite, are much younger than the metamorphosed carbonatite of the differentiated Lac Shortt Stock.

Geochemically, the Lesueur West bedrock samples contain only normal background levels of Cu (maximum 118 ppm) but are locally anomalous in the other analyzed metals. The greywacke portion of the Hole 218 sample which contains traces of sphalerite and galena, assayed only 181 ppm Zn whereas the ultramafic dyke portion with 0.5 percent sphalerite assayed 4375 ppm Zn and 1.1 ppm Ag; Pb was not analyzed. The highest arsenic value is 366 ppm from sheared greywacke in

Hole 209 on the Lesueur Fault. Arsenopyrite was not observed here but is abundant on the same fault on the Lesueur property to the east. Also, six other turbidite samples with no visible arsenopyrite on Lesueur West gave elevated arsenic assays (20 to 79 ppb) and several Phase I samples on Lesueur gave similar results. Using a gold anomaly threshold value of 10 ppm, the only anomaly is 78 ppb in the gabbro of Hole 213. This gabbro is only moderately sheared and the gold anomaly does not appear to be significant. The highly sheared samples of Holes 209 and 215 along the Lesueur Fault are not anomalous in gold, probably because they lack the pyrite and arsenopyrite that hosts the gold in this fault on the Lesueur property to the east (Graham et al., 1988).

4.2.4 Bedrock Geology and Geochemistry of the Lesueur North Drill Area

The Lesueur North drill area is centred on the Lac Shortt Fault, which at this location forms the contact between the quartz diorite border phase of the Opawica Pluton on the south and andesite and intermediate tuff of the Chibougamau - Matagami Domain on the north (Plan 1). The andesite and tuff appear to strike parallel to the fault. They are not contact-metamorphosed like their counterparts along the south side of the pluton, indicating that most of the movement along the fault post-dates emplacement of the pluton.

In addition to forming a major lithologic contact, the Lac Shortt Fault on Lesueur North is marked by strong deformation and alteration (Plan 1). It also coincides with the western extension of a 20 m deep, linear bedrock valley (Plan 2) that was identified in the Phase I drill area on Boyvinet. An apparent dextral offset in the fault and the valley between Holes 221 and 222 suggests that a younger cross fault is present in this area. If the cross-fault strikes north-south as depicted on Plan 1, it could also explain an apparent irregularity in the southern contact of the Opawica Pluton that was identified in the Phase I drilling on Boyvinet. This irregularity was originally interpreted (Graham et al., 1988) to be an embayment caused by east-west shearing.

The northwestern quartz diorite border phase of the Opawica Pluton (Map Unit 8c) was intersected in seven of the Lesueur North drill holes. The quartz diorite here is a strongly chilled, feldspar-porphyrytic, sodic (almost alkaline, Fig. 15; equivalent to calc-alkalic andesite on the Jensen diagram, Fig. 16), hornblende and magnetite bearing rock similar to the Phase II samples from Boyvinet previously described in Section 4.2.1. Co-magmatic (autogenous) xenoliths of quartz diorite glass up to 10 mm in diameter -- often with visible hornblende and magnetite -- are very common, constituting 1 to 10 percent of most samples. The samples from Holes 220 and 222 near the Lac Shortt Fault, like the sheared syenite samples on Boyvinet, are characterized by strong brittle microbrecciation and mylonitization, by carbonatization and brick red hematite staining, and by replacement of most of the original magnetite by specular hematite and pyrite. The carbonate alteration mineral is calcite rather than Fe/Mg carbonate.

The southern diorite rim (Map Unit 8b) of the Opawica Pluton was intersected in Hole 233. The diorite is texturally, mineralogically and chemically similar to the quartz diorite but contains more hornblende (35 percent versus 10 percent) and less quartz (5 percent versus 10 to 20 percent), resulting in a Jensen composition (Fig. 16) equivalent to calc-alkalic basalt rather than andesite.

Andesite (Map Unit 2a) was intersected in five drill holes. It is almost identical to the quartz diorite in the following respects:

1. Both rocks are either green or stained pink;

2. Both are feldspar-porphyrytic;

3. Both have a strongly chilled groundmass with a grain size generally finer than 0.15 mm and often less than 0.05 mm;

4. Both may contain small xenoliths (less than 10 mm diameter);

5. Both contain about 10 percent quartz, 70 percent albitic plagioclase and 10 to 20 percent (rarely 30 percent) mafic minerals.

6. Both fall in the calc-alkalic andesite field on the Jensen diagram (Fig. 16, 17).

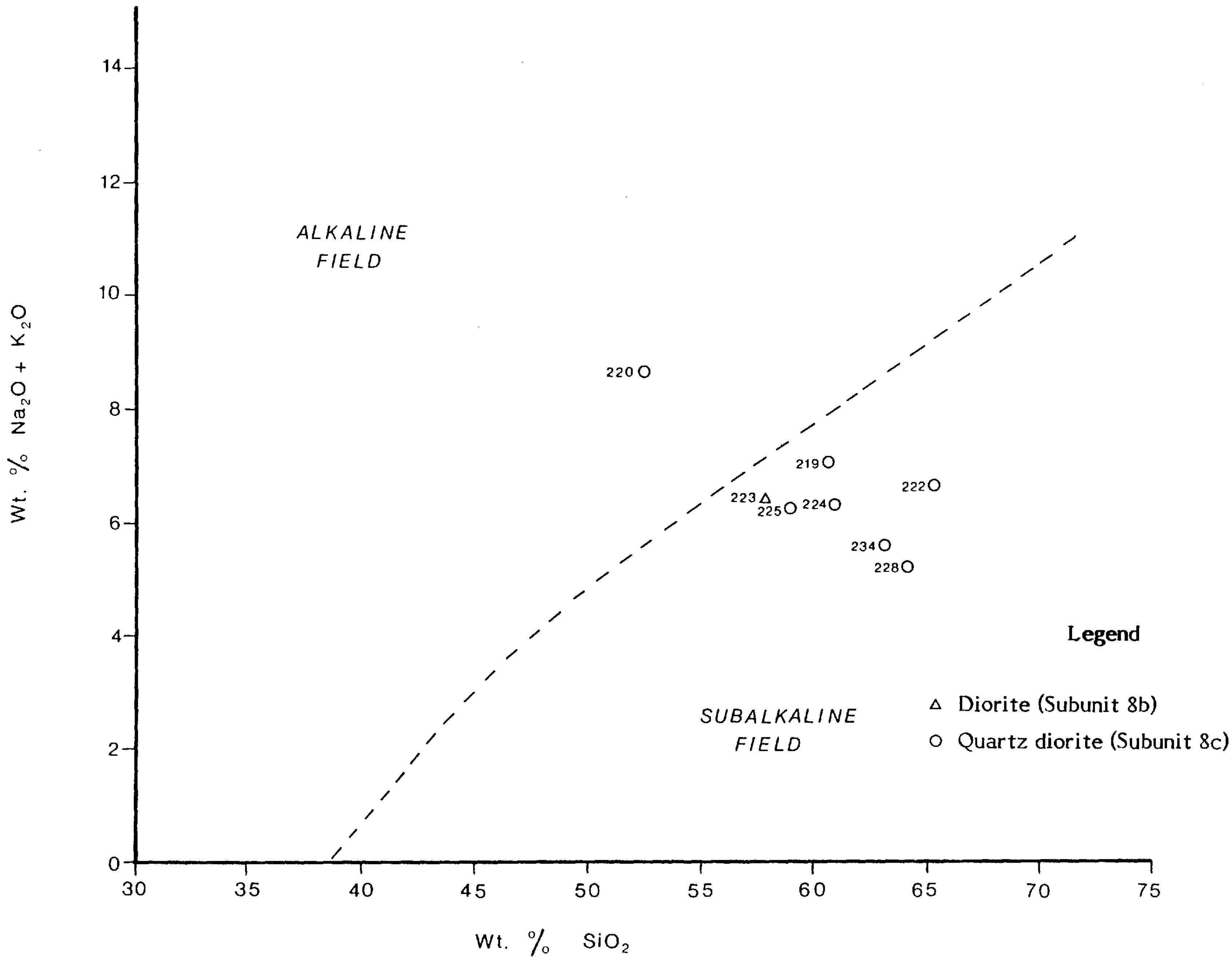
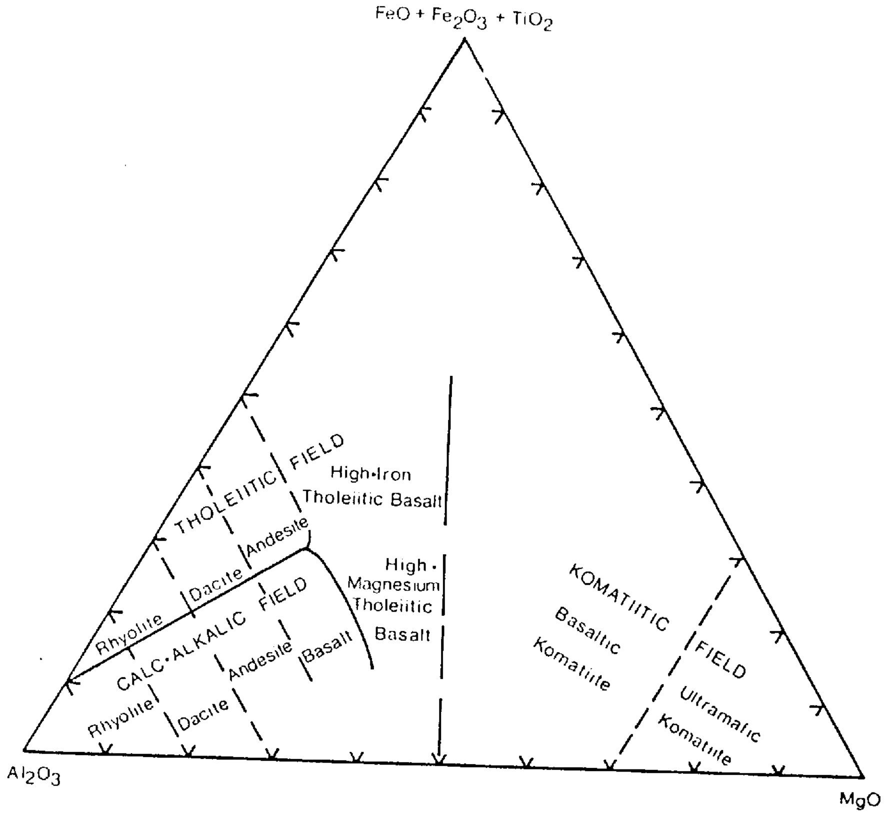


Figure 15 - Alkalies - Silica Plot for Opawica Pluton, Lesueur North



Legend

△ Diorite (Subunit 8b)

○ Quartz diorite (Subunit 8c)

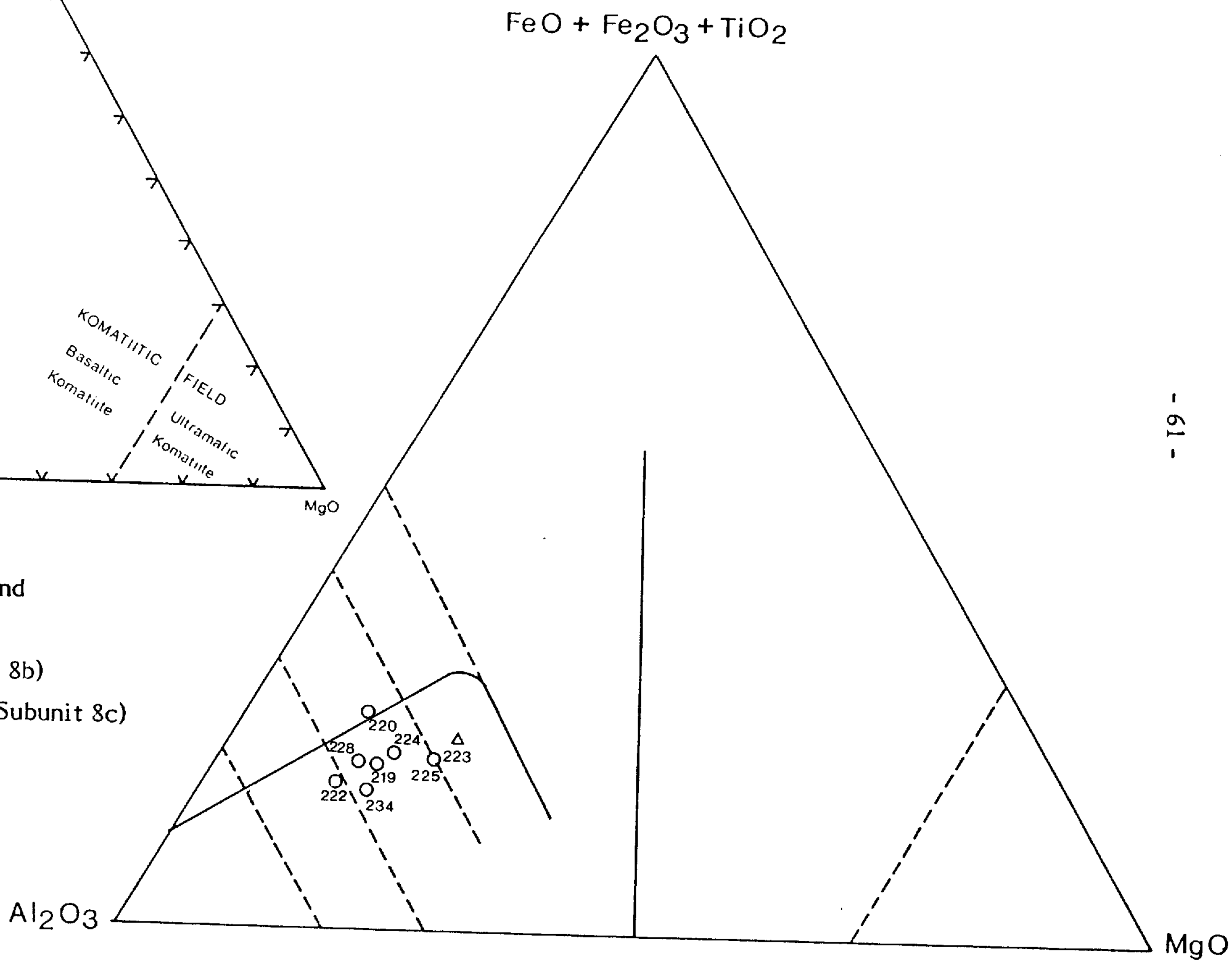


Figure 16 - Jensen Cation Plot for Opawica Pluton, Lesueur North

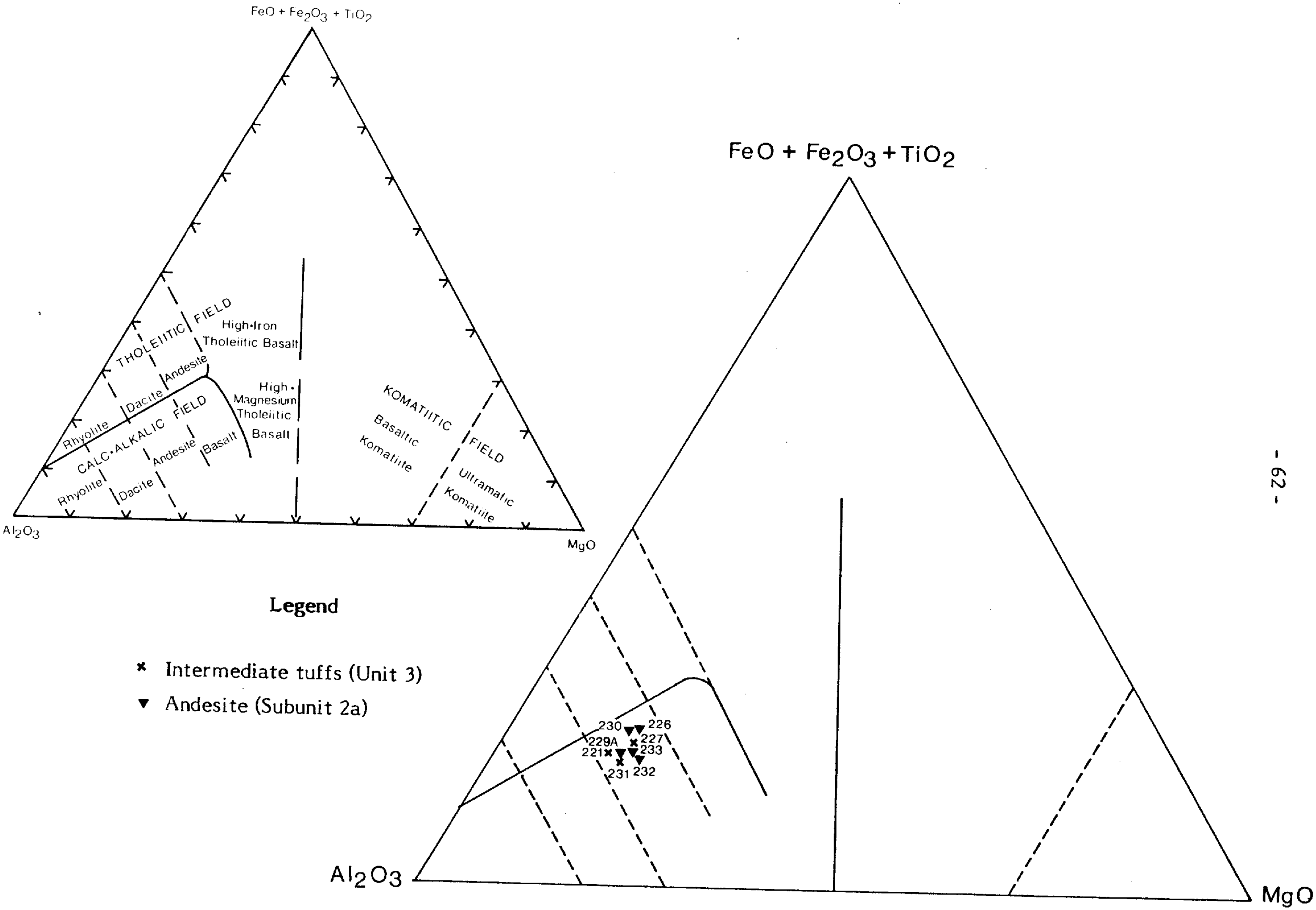


Figure 17 - Jensen Cation Plot for Volcanic Rocks and Tuff, Lesueur North

In fact the two rocks are so similar that, as observed in our Phase I report, several outcrops within the quartz diorite area on western Boyvinet are incorrectly shown as andesite and dacite on the MERQ compilation. However, with careful binocular logging and further examination of the whole rock analyses the two lithologies can be differentiated as they display the following subtle differences:

1. The plagioclase phenocrysts in the andesite are generally larger (mostly 1 to 3 mm) than those in the quartz diorite (typically 0.5 to 1.5 mm);

2. The phenocrysts in the quartz diorite are often markedly euhedral; those in the andesite are always subhedral;

3. The quartz diorite always contains magnetite or locally ilmenite, usually at concentrations of less than 1 percent, regardless of the intensity of shearing or alteration. The andesite never contains these oxides but locally contains leucoxene;

4. Except where its mafic minerals have been leached out due to shearing, the quartz diorite contains hornblende (or chlorite that pseudomorphs hornblende). Andesite contains only chlorite, and this chlorite is derived from pyroxene rather than hornblende;

5. All xenoliths in the quartz diorite are of grey-white, co-magmatic glass that often contains visible hornblende and magnetite. They resist shearing and are therefore equant. The xenoliths in the andesite consist mainly of blue-white chert that was probably rafted from hyaloclastic zones at the top of the next underlying flow. They are often elongated parallel to the shear foliation. Larger-scale (coarser than chip size), xenolith-like glass zones are also present in the andesite samples from Holes 226 and 232. These are microamygdaloidal and probably represent pillow selvages;

6. Shear deformation in the quartz diorite is manifested as brittle microbrecciation and mylonitization. Deformation of the andesite is by

ductile shearing, producing a schistosity and lineation, except in the competent pillow selvages which are brecciated by brittle shearing;

7. Red hematite staining associated with the brittle shearing may permeate the entire quartz diorite but in the andesite is confined to the pillow selvages;

8. The groundmass of the quartz diorite often contains epidote. This mineral does not occur in the groundmass of the andesite;

9. The quartz diorite is more alkalic (Fig. 15) than the andesite (Fig. 18).

As in the quartz diorite, the carbonate alteration mineral in the andesite is calcite. The only other alteration mineral of interest is a trace of fuchsite in the sample from Hole 230 on the Lac Shortt Fault.

Intermediate tuff (Map Unit 3) was intersected in the remaining three holes on Lesueur North, defining a horizon that lies on strike with an HEM conductor located between Lesueur North and Boyvinet, and with the siderite-pyrite iron formation intersected in Hole 80 of the Phase I drilling on Boyvinet (Plan 1). All three samples are of lithic ash tuff, and almost all of the lithic fragments are of aphanitic intermediate volcanics. Plagioclase and quartz crystals are not present; the only other component of the tuff is about 10 percent chlorite. The lithic fragments are of mixed fine to coarse ash sizes (0.1 to 1 mm) with sparse very coarse ash (1 to 2 mm), and in Hole 227 a few lapilli (2 to 4 mm). Bedding was not observed. All of the samples have a weakly to moderately developed ductile shear foliation and lineation, are little altered, and contain less than 0.05 percent pyrite. They have a Jensen composition equivalent to calc-alkalic andesite (Fig. 17).

Geochemically, the Lesueur North bedrock samples contain only background levels of Cu, Zn, Ag, As and Au (maximum values of 74 ppm, 74 ppm, 0.2 ppm, 4 ppm and 5 ppb, respectively). The uniformly low gold values are surprising considering the very strong shear deformation and alteration observed in Holes 220 and 222 along the Lac Shortt Fault, and the high gold values found along the fault to the east in the Phase I drilling on Boyvinet.

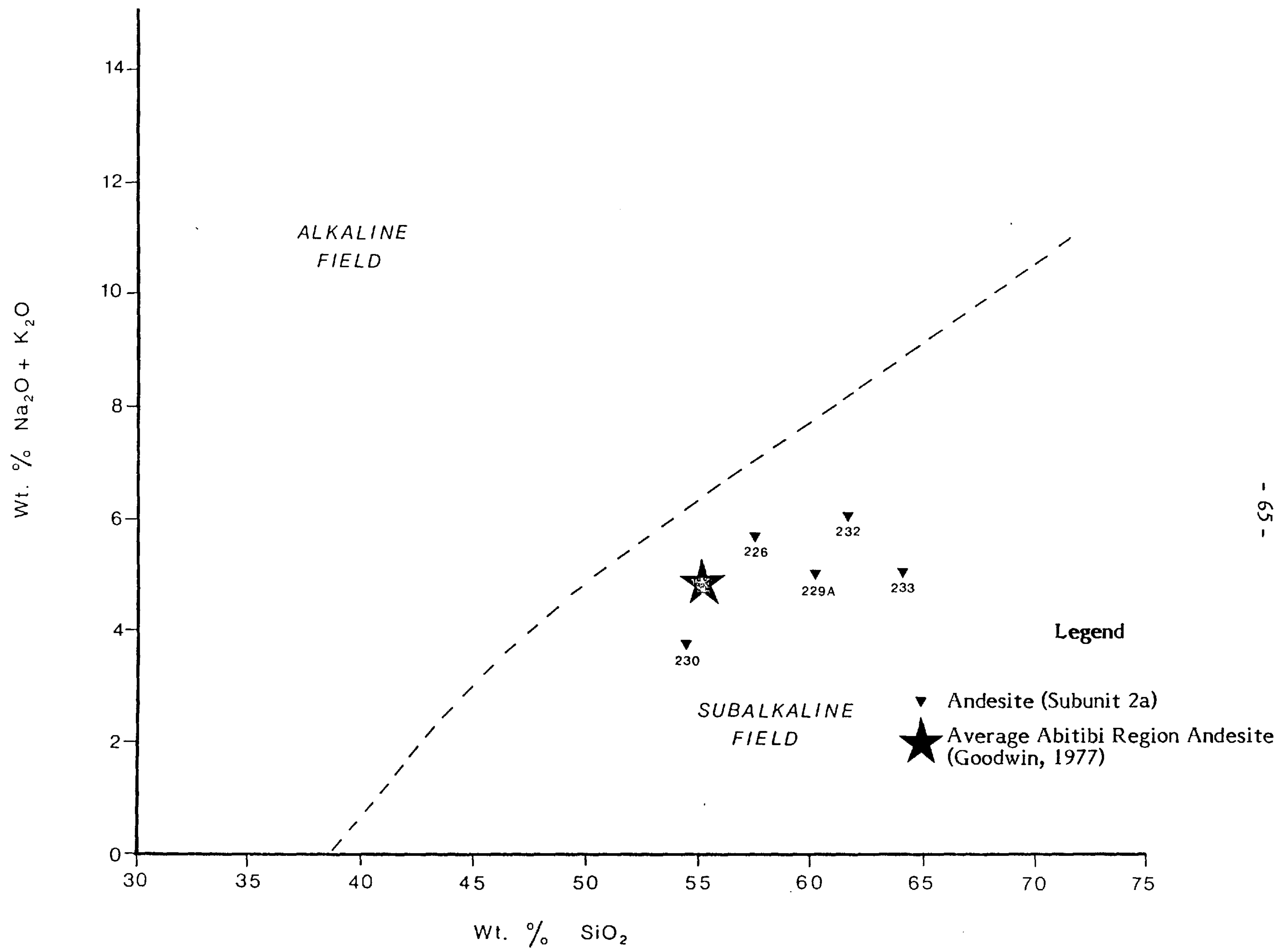


Figure 18 - Alkalies-Silica Plot for Andesite, Lesueur North

5 OVERBURDEN GEOLOGY

5.1 Quaternary Geology of the Drill Areas

A discussion of the Quaternary history and stratigraphy of the Abitibi region can be found along with complete Quaternary unit descriptions in ODM's Phase I report.

All of the Quaternary units intersected in the Phase I program were intersected in the Phase II program as well. They include Illinoian-age Lower Till (deposited by ice advancing at 210 to 240 degrees), the Sangamon to Early Wisconsinan-age Missinaibi Formation, Late Wisconsinan-age Chibougamau Till (deposited by ice advancing at 210 to 220 degrees) and Ojibway II sediments, and Holocene-age organic material. Deposits pre-dating the Late Wisconsinan are preserved in all four drill areas in bedrock depressions (Plan 2) where they were protected from erosion during the Wisconsinan glaciation. Elsewhere the bedrock is generally overlain by Chibougamau Till. This till is widespread, is in most cases of predominantly local provenance, and has a good average thickness. Thus it generally provides very good to excellent geochemical exploration coverage. This is not the case in Lesueur West, however, due to masking of the bedrock by subtill Missinaibi interglacial gravel (Plan 2). Ojibway II glaciofluvial sediments overlie and locally supplant the till along the Kruger Road Esker and in numerous De Geer moraines. The till and glaciofluvial sediments are in turn overlain by Ojibway II glaciolacustrine sediments. A veneer of Holocene organics frequently overlies the Pleistocene units, but was generally washed away while collaring the drill holes.

The intersected units are shown in section on Figures 19 to 22 (in pocket). The following sections describe in more detail the Quaternary geology of the four Phase II drill areas.

5.1.1 Quaternary Geology of the Boyvinet Drill Area

In the Boyvinet Phase II drill area (Fig. 19), deposits older than Late Wisconsinan are restricted to Lower Till intersections overlain by Missinaibi Formation clay in Holes 166 and 169 immediately north and south of the northeastern syenite ridge, respectively. Both Lower Till (Unit 2) intersections are approximately 6.5 m thick and consist of pebble to boulder-sized clasts in a fine sand-silt rock flour matrix. Clast composition in the Hole 166 intersection changes downward from 50:50 volcanics and sediments versus granitoids to 20:80, indicating that the underlying Opawica Pluton is well represented in the basal samples. The overlying Missinaibi Formation clay sections (Subunit 3c) are both less than 5 m thick and consist of dark grey, very compact, varved clay and silt. The Hole 169 occurrence is adjacent to an 11.6 m thick clay intersection in Hole 107 of Phase I.

Chibougamau Till was intersected in 29 of the 31 drill holes. It directly overlies bedrock in 26 holes, was the lowest unit intersected in one abandoned hole (No. 163) and overlies the Missinaibi Formation clay intersections in Holes 166 and 169. The thickness of the till ranges from less than 0.5 m (in three holes) to 22 m (in Hole 164). As in Phase I, the till has a good rock flour matrix and its clast composition strongly reflects the underlying Opawica Pluton. The matrix has a red granitoid tone when observed under good lighting (on the shaking table) compared to the grey tone of common tills derived from volcanic rocks.

Ojibway II glaciofluvial intersections occur in only one hole (No. 180) adjacent to a similar intersection in Phase I Hole 118. These two intersections represent a De Geer moraine. The moraine completely supplants the Chibougamau Till horizon at Hole 180, producing a blind spot in the geochemical exploration coverage. Typical glaciolacustrine sediments -- fine to medium, grey-beige, ice-proximal sand (Subunit 5b) and grey, ice-distal clay-silt (Subunit 5c) -- were intersected in 20 and 28 of the 31 holes, respectively. Both subunits tend to moderate the surface topography --the thinner sand member (average 4 m thick) to a lesser extent than the clay-silt member (average 9 m thick). In Hole 150 on the toe of the northwestern syenite ridge, the clay-silt member directly overlies bedrock.

5.1.2 Quaternary Geology of the Lesperance Drill Area

On Lesperance (Fig. 20), Lower Till and overlying Missinaibi Formation sediments were intersected in three holes (Nos. 184, 187 and 188) in the bedrock valley on the peninsula (Plan 2). The Lower Till sections are Abitibi-typical, having an average thickness of 4.4 m and containing abundant locally derived bedrock material. The Missinaibi Formation intersections include a 3.2 m thick section of Sangamon fluvial interglacial gravel and fine beige sand (Subunit 3a) in Hole 184 and two thin (1 to 2 m) sections of dark grey, very compact Ojibway I glaciolacustrine clay-silt (Subunit 3c) in Holes 187 and 188. On mainland Lesperance, no deposits older than Late Wisconsinan are preserved because the bedrock topography is more subdued and the overburden is thinner.

Chibougamau Till was intersected in all eight of the peninsula holes and in twelve of the eighteen mainland holes. Its thickness ranges from less than 0.5 m in some holes on the mainland to 37.2 m in Hole 185 on the peninsula, and averages approximately 5 m on the mainland and 20 m on the peninsula. The till matrix is grey to grey-beige rock flour, with occasional gritty grey, reworked Ojibway I clay. Clasts in the till are pebble to boulder sized, and vary in composition from 50:50 to 60:40 volcanics and sediments versus granitoids. The till composition is typical of the Project Lac Shortt area, and the predominance of locally derived volcano-sedimentary material makes the till a good sampling medium.

Ojibway II sediments (Unit 5) include thirteen intersections of De Geer moraine sand and gravel (Subunit 5a) averaging 5 m in thickness. One thick moraine forms the prominent ridge at the tip of the peninsula. Two thinner moraines on the mainland display no surface topography but completely supplant Chibougamau Till in five holes. Glaciolacustrine sand (Subunit 5b) and/or clay-silt (Subunit 5c) were intersected in all twenty-six of the Lesperance drill holes, directly overlying bedrock in one of the mainland holes (No. 189).

5.1.3 Quaternary Geology of the Lesueur West Drill Area

On Lesueur West (Fig. 21), seven of the eleven drill holes intersected Sangamon fluvial interglacial sand and gravel (Missinaibi Formation Subunit 3a) directly overlying bedrock. Only two of these intersections -- in Holes 210 and 216 -- are capped by Ojibway I glaciolacustrine clay (Subunit 3c). The interglacial sediments are preserved along a bedrock slope with a generally northwest aspect, and appear to be contiguous with five Phase I intersections along the same bedrock slope. Their presence precludes representation of the underlying bedrock geology -- including part of the HEM zone that may be mineralized with Pb-Zn -- in the Chibougamau Till, although this till was intersected in all but one of the drill holes. The lower part of four of the till intersections has a clay-rich matrix indicative of recycling of Ojibway I clay; thus the clay horizon was initially more extensive than is suggested by the in situ clay intersections of Holes 210 and 216, and was only removed in the waning stages of the Wisconsinan glaciation.

Ojibway II glaciofluvial sediments were intersected in seven Lesueur West drill holes. All of the intersections are associated with the Kruger Road Esker, the full thickness of which is displayed in section at Hole 212 where it attains 35.7 m. Glaciolacustrine sand was intersected in all of the holes except No. 212, and clay-silt is ubiquitous. Both the sand and clay-silt horizons are thin, however.

5.1.4 Quaternary Geology of the Lesueur North Drill Area

On Lesueur North (Fig. 22) a Sangamon interglacial gravel section in Hole 229 is the only pre-Wisconsinan unit encountered. The gravel rests on bedrock in the valley along the Lac Shortt Fault. Chibougamau Till was intersected in fourteen of the sixteen drill holes, and is typically thin (1 to 4 m) except in Hole 221 where it infills the fault valley and attains a thickness of 13.6 m. The till here is similar to the Lesueur Phase I till, and thus is an excellent sampling medium.

Ojibway II glaciofluvial sediments were intersected in five Lesueur North drill holes, and generally occupy depressions in the underlying till surface. The presence of these intersections north of the Kruger Road Esker, and primarily in low areas, indicates that the sediments were deposited by distributary spillage off the main esker channel. Thin (average 4 m) sections of glaciolacustrine fine to medium, grey-beige sand were intersected in nine of the sixteen holes, and thicker (average 8 m) sections of grey clay-silt were intersected in all of the holes. All of the Ojibway II sediments tend to moderate the underlying topography to the extent that the drill area is essentially flat.

6. OVERBURDEN GEOCHEMISTRY

6.1 Regional Gold and Base Metal Background and Anomaly Threshold Levels

The interpretation of the heavy mineral gold geochemistry of overburden samples is an involved process. In summary, the gold background of tills is caused mainly by grains of visible gold and these gold grains are so thinly scattered through the till and are of such a wide size range that it is impossible to obtain either a representative number of grains ("particle sparsity effect") or a representative gold assay ("nugget effect"; Table 5) from a sample of reasonable size. In contrast, gold dispersal trains down-ice from known ore bodies have a large concentration of gold grains of a narrow size range such that both representative gold grain counts and gold assays can be obtained. Through experience, we have established a dispersal train threshold of 10 grains of visible gold for the 8 kg samples that are normally collected on reverse circulation drills. Recognizing that not all gold grains are observed during processing and that gold can be occluded in sulphides or other heavy minerals rather than occurring as free gold grains, we also investigate any anomalies over a second, 1000 ppb threshold. The 1000 ppb value is based on the observation that heavy mineral concentrates from most gold dispersal trains have a gold content similar to that of the source mineralization; thus 1000 ppb in the till is suggestive of highly anomalous bedrock and values over 3,000 ppb are suggestive of ore-grade mineralization. Significant anomalies, in addition to being caused by more than 10 gold grains of a similar size or by occluded gold, also generally display vertical stratigraphic continuity within the host till horizon and may have an associated pathfinder metal, particularly arsenic or copper. Delicate or irregular gold grains are also significant as they normally indicate a proximal source (Fig. 8).

The base metal background of a heavy mineral concentrate, and particularly of our high-density methylene iodide concentrates, is higher than that of a raw till sample, ranging up to several hundred ppm, because base metals tend to substitute to a significant extent for other metal ions in the structures of heavy silicate and sulphide minerals such as pyroxene and pyrite. The established anomaly threshold level for Cu and Zn, indicating the presence of ore-type minerals such as chalcopyrite and sphalerite in potentially economic concentrations, is 800 ppm. Because till concentrates from dispersal train samples tend to grade the same as the bedrock source mineralization, massive sulphide deposits which typically grade 50,000 ppm (5 percent) combined Cu-Zn often produce anomalies over 10,000 ppm in each metal. The same deposits average 35 ppm (1 ounce/ton) silver, and the silver anomaly threshold corresponding to 800 ppm Cu or Zn is about 2 ppm. Arsenic does not have a well-defined anomaly threshold because arsenic deposits are not in themselves of economic interest. However, arsenic is a very important gold pathfinder. Arsenic values in excess of 800 ppm are normal in till concentrates obtained from dispersal trains down-ice from known gold deposits that contain arsenopyrite but lower values can be significant, especially if the sampling sites are too widely spaced to guarantee sampling of the higher grade core portions of the train. Similarly, Cu and Zn values lower than 800 ppm that would not be of interest in base metal exploration can be significant as indicators of gold mineralization.

Significant Cu, Zn, Ag and As anomalies, like significant gold anomalies, normally display vertical continuity in the host till and have a pathfinder association. In the case of copper and zinc, the presence of grains of banded massive pyrite-chalcopyrite-sphalerite mineralization in the concentrate is a favourable indicator whereas the presence of only coarse crystalline vein-type chalcopyrite or sphalerite is unfavourable unless gold is also present.

6.2 Lac Shortt Overburden Geochemistry

6.2.1 Heavy Mineral Gold Anomalies

Of the 431 Lac Shortt heavy mineral concentrates, 18 exceeded our first anomaly thresheld of ten or more grains of visible gold, and 15 of these as well as 20 others exceeded our second anomaly threshold of a measured or calculated gold assay over 1000 ppb. Thus a total of 38 samples (9 percent of the samples collected) met or exceeded one or both of our anomaly thresholds. The 38 anomalies occur in 28 holes that encompass all the drill areas but are concentrated in the Boyvinet followup drill area as are the Phase I anomalies (Plan 3). The anomalies occur in all of the sampled media; one occurs in Lower Till, two occur in Missinaibi fluvial interglacial sediments, thirty-three occur in Chibougamau Till, and two occur in Ojibway II sediments.

In the Abitibi region, on average, 10 percent of samples that contain only background levels of gold yield anomalous assays or visible gold grain counts due to:

1. The chance occurrence of one or two coarse gold grains in the sample (nugget effect); or

2. The chance clustering of 10 or more fine gold grains in the sample (particle sparsity effect).

The 10 percent Abitibi background noise is entirely attributable to the sampling procedure (i.e. samples are too small to give representative gold grain counts and gold assays). It increases to 15 to 50 percent in the south due to the cumulative effect of glaciating a vast expanse of volcanic terrane that contains a plethora of minor gold occurrences. The fact that only 9 percent of the Minnova Phase II samples are anomalous is surprising because 24 percent of the samples were collected from the fill-in holes on Boyvinet. In Phase I, for example, the very positive results obtained from this area raised the overall anomaly average for the program to 20 percent. This discrepancy was noted at the mid-point of the Phase II drilling program because the Boyvinet holes were drilled first and the samples were processed immediately. In seeking an explanation, it was observed that Bradley Brothers, who performed the Phase II drilling, used more water and often generated less sample than Heath and Sherwood, who performed the Phase I drilling. If Bradley was preferentially washing the finest portion of the till matrix away from the drill bit, major gold losses would be expected because most of the gold on Boyvinet occurs in the silt and very fine sand sizes (Graham et al., 1988). Bradley was immediately ordered to modify its drilling procedures (correspondence from S. Averill dated February 13, 1989), and ODM performed a series of sieve tests to check for grain size difference between Bradley and Heath & Sherwood samples from adjacent drill holes. However, these tests showed very conclusively that there are no significant differences between samples (Fig. 23). Thus the generally low gold content of the Phase II fill-in holes on Boyvinet appears to be valid. By extension, the anomalies in the Phase I reconnaissance holes in the same area must represent dispersion from widely separated mineral occurrences of small stature, not mass dispersion from a broadly mineralized structure as interpreted in our Phase I report (Graham et al., 1988). Finally, the low overall frequency of anomalies in the four Phase II drill areas suggests in itself that most of the anomalies represent background noise and therefore are not significant.

Heavy mineral arsenic, copper and zinc values over 400 ppm and silver values over 1.0 ppm occurring in association with heavy mineral gold anomalies will be mentioned in the forthcoming discussion of the gold anomalies. The overburden arsenic geochemistry is generally low, as was observed in the Phase I drill areas; most assays are less than 100 ppm. Low arsenic encountered in the Lesueur West drill area, despite the elevated arsenic content of the underlying turbidites, reinforces the observation that the overburden geochemistry here is unrepresentative due to the presence of the Missinaibi Formation between the Chibougamau Till horizon and bedrock. The only Phase II area that consistently produced elevated overburden arsenic is the extreme northeast corner of the Lesperance peninsula. This arsenic dispersion is not associated with gold. Its significance will be discussed in detail in Section 6.2. Silver assays are also generally low, but are sympathetic to gold assays in some of the Boyvinet and

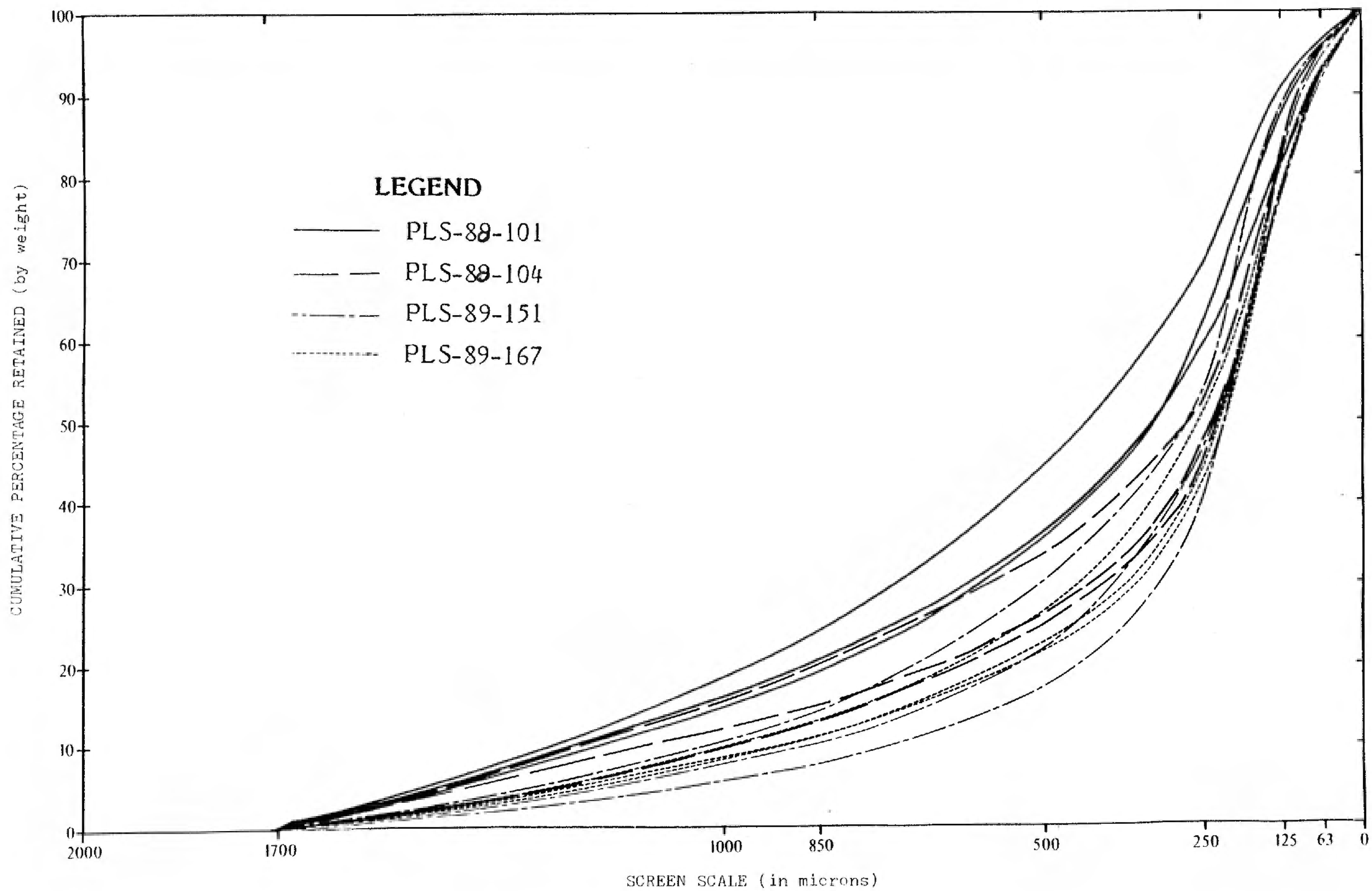


Figure 23 - Comparative Grain Size Distributions for 1988 (Heath & Sherwood) and 1989 (Bradley Brothers) Till Samples, Boyvinet

Lesperance concentrates. Copper and zinc assays are more consistently low than are arsenic and silver, despite the apparently favourable base metal environment of Lesperance, and are rarely sympathetic to gold.

A systematic, three-stage screening process has been applied to each of the 38 heavy mineral gold anomalies (Fig. 24; Table 8) with the objective of eliminating high background noise and isolating any dispersal train anomalies that may be present. In summary, the screening is used to determine the cause of each anomaly, and those anomalies that are caused by background noise are rejected.

The simplest stage in the screening -- and therefore the first one applied -- is to downgrade anomalies which have no vertical stratigraphic continuity; however, these anomalies are not completely eliminated until their cause is determined. An anomaly at the base of a till horizon or in a one-sample thick till horizon is automatically assumed to have vertical stratigraphic continuity even though it generally does not. A lack of vertical stratigraphic continuity is displayed by a single, isolated anomalous sample within or at the top of a multi-sample till horizon or at any level in a sand or gravel horizon. A gold anomaly with no vertical stratigraphic continuity is generally caused by either the nugget effect or the cluster (particle sparsity) effect. These nugget or cluster anomalies sometimes occur in consecutive samples in a drill hole and occasionally they are contiguous with a gold anomaly of another type; we refer to this as "chance" continuity and treat the anomalies as if they had no vertical continuity. To have true vertical continuity, contiguous anomalies must have in common at least one property of a dispersal train anomaly such as delicate gold grains, occluded gold or a pathfinder association. Of the thirty-eight anomalies, four have no vertical stratigraphic continuity by definition because they occur in either Ojibway II or Missinaibi sediments and twenty-one till-hosted anomalies also have no vertical stratigraphic continuity. Of the remaining seventeen till-hosted anomalies, four have vertical continuity and thirteen have basal continuity. Whether the continuity of these anomalies occurs by chance or not will become apparent during the subsequent screening stages.

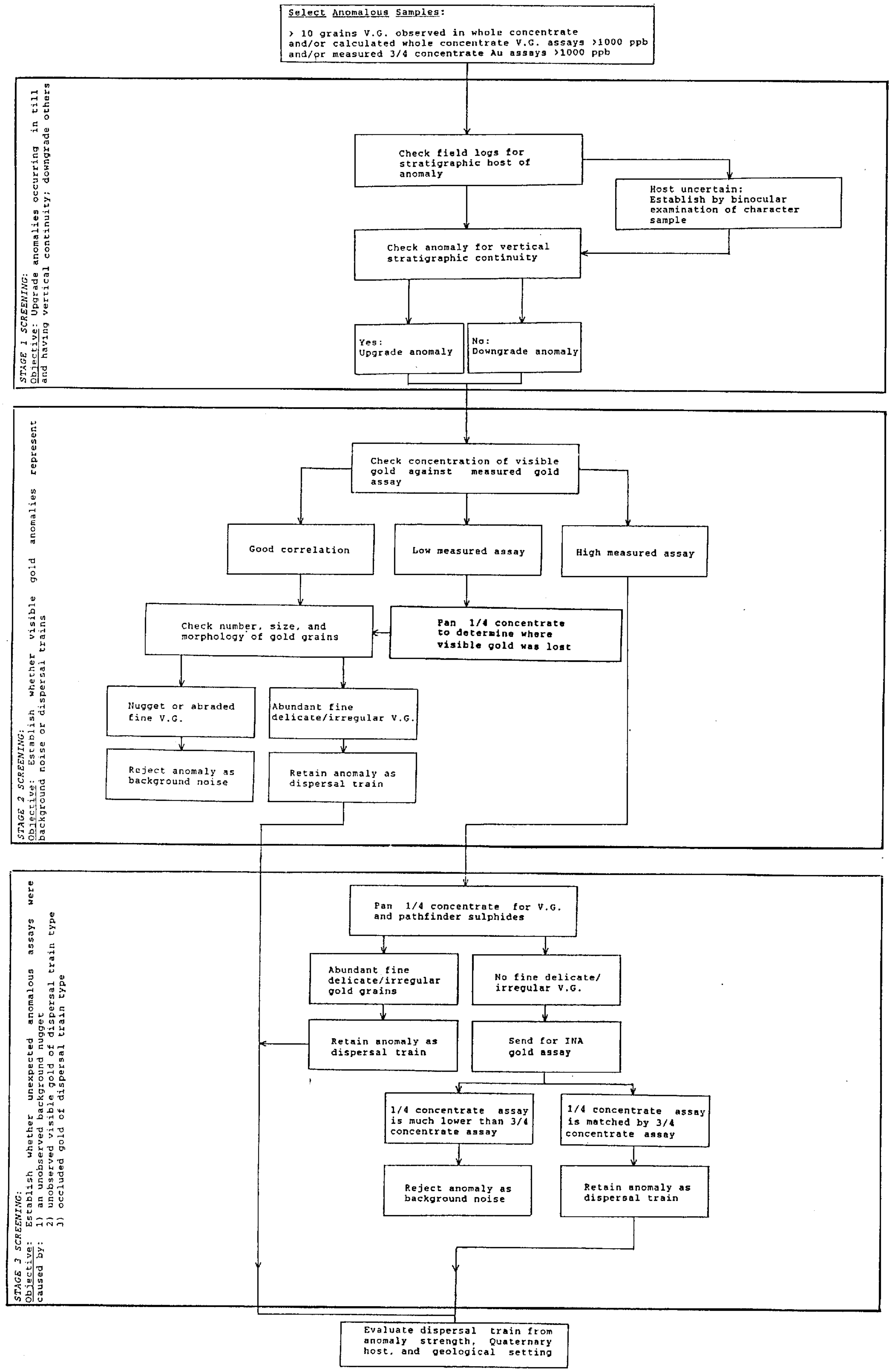


Figure 24 - Flow Diagram for Three-Stage Screening of Heavy Mineral Gold Anomalies

Hole No.	Gold Anomalies: Sample No.	Au Assay (ppb): Meas.	Au Assay (ppb): Calc.	Grains V.G. (*Not Panned)	1st Stage Screening (Strat. Cont.)	2nd Stage Screening (Meas. Assay: Calc. Assay)	3rd Stage Screening (Nugget Effect)	Remarks	Anomaly Class
PLS-89 151	06	4,340	2,051	20	Basal	High (slightly)	Limited	Pulp and metallics assay; mostly coarse gold detected. 2 abraded, 5 irregular and 13 delicate gold grains observed initially. 48% of calc. assay contributed by one gold grain. Check panned 1/4 conc.; found two grains for calc. assay = 55 ppb Au. INA 1/4 conc. check assay = 504 ppb Au.	Potentially Significant
162	01	1,133	754	6	Basal	Good	Inferred	5 abraded and 1 irregular gold grains. 90% of calc. assay contributed by one nugget.	Nugget
167	03	1,209	319	10	No	High	Inferred	6 abraded, 3 irregular and 1 delicate gold grain originally sighted. Check panned 1/4 conc.; found 3 abraded gold grains, 2% pyrite. 1/4 conc. calc. assay = 267 ppb. INA 1/4 conc. check assay = 839 ppb Au.	Nugget/ Cluster
168	01	1,154	265	7	No	High	Inferred	2 abraded and 5 irregular gold grains originally sighted. Check panned 1/4 conc.; found 1 abraded and 1 irregular gold grain and 2% pyrite. 1/4 conc. calc. assay = 80 ppb. INA 1/4 conc. check assay = 260 ppb Au.	Nugget
	07	2,081	468	2	Basal	High	Inferred	2 irregular gold grains originally sighted. Check panned 1/4 conc.; found no V.G., est. 5% pyrite. INA 1/4 conc. check assay = 78 ppb Au.	Nugget
169	03	6,653	2,333	3	No	High	Inferred	Pulp and metallics assay not requested. 2 abraded and 1 delicate gold grain. 99% of calc. assay contributed by one nugget. Check panned 1/4 conc.; found no V.G., 7% pyrite. INA 1/4 conc. assay = 714 ppb.	Nugget

Table 8 - Heavy Mineral Gold Anomaly Screening

Gold Anomalies				Grains V.G. (*Not Panned)	1st Stage Screening (Strat. Cont.)	2nd Stage Screening (Meas. Assay: Calc. Assay)	3rd Stage Screening (Nugget Effect)	Remarks	Anomaly Class
Hole No.	Sample No.	Au Assay (ppb) Meas.	Au Assay (ppb) Calc.						
PLS-89- 169	09	2,370	1,787	5	Basal (Lower Till)	Good	Observed/ Inferred	Pulp and metallics assay, mostly coarse gold detected. 1 abraded, 3 irregular and 1 delicate gold grain sighted, est. 15% pyrite. 77% of calc. assay contributed by one gold grain.	Nugget
170	01	10,515	51	1	Basal	High	No	One irregular gold grain observed initially. Pathfinder Ag = 4.2 ppm. Check panned 1/4 conc.; found 1 abraded gold grain, 50% pyrite. 1/4 conc. calc. assay = 113 ppb. INA 1/4 conc. check assay = 9,030 ppb Au.	Potentially Significant
171	02	1,225	37	8	Vertical	High	No	5 irregular and 3 delicate gold grains originally sighted. Check panned 1/4 conc.; found 7 grains, estimate 5% pyrite. 1/4 conc. calc. assay = 188 ppb. INA 1/4 conc. check assay = 1,030 ppb Au.	Potentially Significant
	03	1,329	46	2	Vertical	High	No	Two irregular gold grains sighted. Check panned 1/4 conc.; found 1 irregular gold grain, estimate 5% pyrite. 1/4 conc. calc. assay = 1,247 ppb. INA 1/4 conc. check assay = 2,770 ppb Au.	Potentially Significant
	04	14,420	690	10	Vertical	High	No	2 abraded, 4 irregular and 4 delicate gold grains originally sighted. Pathfinder Ag = 7.4 ppm. Check panned 1/4 conc.; found 6 grains, estimate 10% pyrite. 1/4 conc. calc. assay = 307 ppb. INA 1/4 conc. check assay = 5,230 ppb Au.	Potentially Significant
	05	18,321	871	55	Vertical, Basal	High	No	5 irregular and 50 delicate gold grains initially observed. Pathfinder Ag = 7.1 ppm. Check panned 1/4 conc.; found 18 gold grains, estimate 30% pyrite. 1/4 conc. calc. assay = 2,450 ppb. INA 1/4 conc. check assay = 15,300 ppb Au.	Potentially Significant

Table 8 - Heavy Mineral Gold Anomaly Screening (cont'd)

Gold Anomalies Hole No.	Sample No.	Au Assay (ppb) Meas.	Au Assay (ppb) Calc.	Grains V.G. (*Not Panned)	1st Stage Screening (Strat. Cont.)	2nd Stage Screening (Meas. Assay: Calc. Assay)	3rd Stage Screening (Nugget Effect)	Remarks	Anomaly Class
PLS-89- 172	01	369	160	10	No (Ojib. II sand)	High (slightly)	No	2 abraded, 1 irregular and 7 delicate gold grains.	Cluster
174	01	1,070	1,107	12	Basal	Good	Limited	Pulp and metallics assay; mostly fine gold detected. 9 abraded and 3 irregular gold grains observed initially. 58% of calc. assay contributed by two nuggets.	Cluster/ Nugget
175	03	530	1,591	7	No	Low	Observed	Pulp and metallics assay; mostly coarse gold detected. 4 abraded, 2 irregular and 1 delicate gold grain initially observed. 97% of calc. assay contributed by two nuggets. Check panned 1/4 conc.; found 3 abraded grains including the larger of the two nuggets observed initially.	Nugget
	05	1,310	1,412	5	No	Good	Observed	Pulp and metallics assay; mostly coarse gold detected. 3 abraded, 1 irregular and 1 delicate gold grain observed initially. 96% of calc. assay contributed by one nugget.	Nugget
180	04	2,964	549	2	No (Ojibway II sand and gravel)	High	Inferred	1 abraded and 1 delicate gold grain observed initially. Check panned 1/4 conc.; found no V.G. INA 1/4 conc. check assay = 116 ppb Au.	Nugget
182	05	1,564	413	1*	No	High	Inferred	Single irregular gold grain observed initially. Check panned 1/4 conc.; found no V.G. INA 1/4 conc. check assay = 47 ppb Au.	Nugget
183	05	1,962	NA	0*	Basal	High	No	Pathfinder Ag = 1.2 ppm. Check panned 1/4 conc.; found 2 abraded, 2 irregular and 2 delicate gold grains, est. 2% pyrite. 1/4 conc. calc. assay = 178 ppb Au, INA 1/4 conc. check assay = 1200 ppb Au.	Potentially Significant

Table 8 - Heavy Mineral Gold Anomaly Screening (cont'd)

Gold Anomalies				Grains V.G. (*Not Panned)	1st Stage Screening (Strat. Cont.)	2nd Stage Screening (Meas. Assay: Calc. Assay)	3rd Stage Screening (Nugget Effect)	Remarks	Anomaly Class
Hole No.	Sample No.	Au Assay (ppb) Meas.	Au Assay (ppb) Calc.						
PLS-89- 185	16	2,084	329	5	No	High	Inferred	3 abraded and 2 delicate gold grains observed. Check panned 1/4 cnc.; found one abraded grain; calc. assay = 25 ppb Au. INA 1/4 conc. check assay = 1,020 ppb Au.	Potentially Significant
188	13	1,004	84	5	No	High	Inferred	4 abraded and 1 irregular gold grain observed initially. Check panned 1/4 conc.; found one abraded and one irregular gold grain, est. 30% pyrite. 1/4 conc. calc. assay = 71 ppb. INA 1/4 conc. check assay = 641 ppb Au.	Nugget
	15	4,580	719	1*	No	High	Inferred	1 abraded gold grain observed initially. Check panned 1/4 conc.; found no V.G. INA 1/4 conc. check assay = 490 ppb Au.	Nugget
191	01	1,299	49	5	Basal	High	Inferred	2 abraded and 3 irregular gold grains observed initially. Pathfinder Cu = 788 ppm. Check panned 1/4 conc.; found 2 abraded grains; calc. assay = 332 ppb Au. INA 1/4 conc. check assay = 1,060 ppb Au.	Potentially Significant
192	01	766	214	10	Basal	High	No	8 abraded and 2 irregular gold grains observed. Pathfinder Cu = 784 ppm, Ag = 1.3 ppm.	Cluster
194	07	1,160	2,393	1*	Basal	Good	Observed	Pulp and metallics assay; mostly coarse gold detected. Single observed gold grain abraded.	Nugget
195	06	1,131	682	6	No	Good	Observed	All abraded gold. 83% of calculated assay contributed by one nugget.	Nugget
	10	450	1,417	2	No	Low	Observed	Pulp and metallics assay; neither fraction anomalous. Both observed gold grains abraded. Check panned 1/4 conc., found no V.G. Nugget lost in handling.	Nugget
196	02	1,038	89	1*	Basal	High	Inferred	Single abraded gold grain observed initially. Check panned 1/4 conc.; found one irregular grain; calc. assay = 45 ppb Au. INA 1/4 conc. check assay = 539 ppb Au.	Nugget

Table 8 - Heavy Mineral Gold Anomaly Screening (cont'd)

Gold Anomalies				Grains V.G. (*Not Panned)	Ist Stage Screening (Strat. Cont.)	2nd Stage Screening (Meas. Assay: Calc. Assay)	3rd Stage Screening (Nugget Effect)	Remarks	Anomaly Class
Hole No.	Sample No.	Au Assay (ppb) Meas.	Calc.						
PLS-89- 197	06	5,650	7,788	1*	Basal	Good	Observed	Pulp and metallics assay; mostly coarse gold detected. Single observed gold grain abraded.	Nugget
208	07	1,420	1,407	1*	No	Good	Observed	Pulp and metallics assay; mostly coarse gold detected. Single observed gold grain abraded.	Nugget
209	06	1,288	773	1*	No	Good	Observed	Single observed gold grain abraded.	Nugget
	10	388	278	13	No	Good	Observed	5 abraded, 7 irregular and 1 delicate gold grain. 42% of calc. assay contributed by one gold grain.	Cluster/ Nugget
217	03	1,270	903	1*	No	Good	Observed	Only observed gold grain abraded.	Nugget
221	05	3,200	4,143	3	No	Good	Observed	Pulp and metallics assay; mostly coarse gold detected. All observed gold is abraded. 83% of calc. assay contributed by two nuggets.	Nugget
	08	1,350	104	1*	No	High	Inferred	Only observed gold grain abraded. Check panned 1/4 conc.; found no V.G. Est. 3% pyrite. INA 1/4 conc. check assay = 40 ppb Au.	Nugget
229	07	5,289	123	1*	No (Missinaibi gravel)	High	Inferred	Initially observed gold grain abraded. Check panned 1/4 conc.; found no V.G., 7% pyrite, 20 grains arsenopyrite. INA 1/4 conc. check assay = 29 ppb Au.	Nugget
229A	06	1,050	522	3	No (Missinaibi gravel)	High (slightly)	Inferred	All abraded gold observed initially. Check panned 1/4 conc.; found no V.G., est. 2% pyrite. INA 1/4 conc. check assay = L5 ppb Au.	Nugget
230	04	260	1,673	3	No	Low	Observed	Pulp and metallics assay; neither fraction anomalous. Initially observed gold all abraded. 93% of calc. assay contributed by one nugget. Check panned 1/4 conc.; found originally sighted nugget.	Nugget

Table 8 - Heavy Mineral Gold Anomaly Screening (cont'd)

The second stage in the screening is used to evaluate anomalies occurring in samples where sufficient visible gold was observed to explain the measured (Bondar-Clegg) assays. In its simplest form, the calculated (predicted) visible gold assays are compared to the measured assays to eliminate those anomalies in which the 1,000 ppb threshold is no longer met after the contributions of one or two observed nuggets have been subtracted from the total assays. In a sample with observed nuggets and little or no fine visible gold, either a good correlation of the two assays or a low measured assay indicates that essentially all of the gold in the concentrate is in the nuggets and the anomaly is of no significance.

The correlation between a calculated and measured assay is "good" if the calculated assay is not more than twice as high as or 50 percent less than the measured assay; this allows for a doubling or halving of the normal thickness factor for flake gold particles used in the calculation. Of the thirty-eight anomalous samples, eleven with measured and/or calculated assays over 1000 ppb show good assay correlation. These eleven anomalies are from samples that yielded between one and twelve gold grains, of which no more than four are delicate and/or irregular in any one sample. All of these anomalies are in concentrates that would assay less than 1000 ppb if the contribution of one or two observed gold grains was subtracted from the concentrate assay. None of the anomalies have a pathfinder association. Six of the anomalies -- all in Chibougamau Till -- have no vertical stratigraphic continuity and thus were downgraded by first-stage screening. The other five -- four occurring in Chibougamau Till and one in Lower Till -- have chance basal continuity. None of the anomalies are significant.

A low measured assay for a concentrate with observed gold nuggets and a calculated assay over 1000 ppb indicates either nugget loss in handling or nugget retention in any of three places: 1) the ODM 1/4 library split; 2) the Bondar-Clegg base metal analytical split of the pulped 3/4 concentrate (normally 1 to 3 grams); 3) the Bondar-Clegg library split of the pulped 3/4 concentrate (also 1 to 3 grams). If little or no other gold is present in the concentrate, the measured assay for the 3/4 concentrate will be below the 1000 ppb anomaly threshold. Three of the thirty-eight anomalies gave low measured assays. Two to seven gold grains were observed in each of the anomalous samples and in each case 58 to 96 percent of the calculated assay is caused by one or two abraded grains with a minimum intermediate dimension of 200 microns (i.e. nuggets). The 1/4 concentrates of the three samples were panned and two contained the nuggets observed in initial processing. The missing nugget in the third case must have been lost in handling as the 3/4 concentrate was submitted for pulp and metallics assay, during which all of the plus 150 mesh (100 microns) pulp is analyzed for gold. None of these three anomalies have a pathfinder association. All three occur in Chibougamau Till samples, but they all lack stratigraphic continuity and thus were downgraded by first stage screening. None of the anomalies are significant.

A variation of the second stage of screening pertains to anomalies possessing ten or more gold grains but lacking a calculated or measured assay over 1,000 ppb. The objective here is to eliminate anomalies caused solely by the erratic clustering of fine background gold grains in the till. Unless the multi-grain anomalies possess other properties of dispersal trains, they are generally not significant. This is especially true if the gold grains are abraded, as we have never succeeded in tracing abraded gold to a bedrock source. If, however, the gold grains are of delicate or irregular morphology and occur in stratigraphically contiguous samples, the subanomalous heavy mineral assays could simply indicate that the source has a low grade or narrow subcrop or that the samples were obtained from the margins of a dispersal train.

Of the thirty-eight anomalies, three are of the above weak, multi-grain type. These three anomalies are caused by between ten and thirteen very fine gold grains. Eight of the gold grains in two of the samples are delicate and/or irregular but other characteristics of dispersal train anomalies are lacking, including a pathfinder association and vertical stratigraphic continuity. The predominance of delicate/irregular gold grains in both of these anomalous samples is probably due to liberation of gold from auriferous clasts by either englacial crushing or drill bit milling. The third anomaly is characterized by abraded gold grains and is therefore a typical cluster anomaly, but has a chance basal continuity and a coincidental elevated copper and silver association. None of these three anomalies are significant.

The second-stage screening is very reliable because it is based on direct observation of the gold grains. This screening has effectively eliminated seventeen of the thirty-eight gold anomalies at the 100 percent confidence level. Eleven of these anomalies also have no stratigraphic continuity and thus were downgraded by the first-stage screening.

The third stage in the screening is used to determine the cause of anomalies occurring in samples for which the measured assays are over 1000 ppb and are too high to be accounted for by the gold grains, if any, observed during processing. High measured assays can be caused by any one of the following:

1. A nugget that was recovered but not sighted during processing;

2. A sighted nugget for which the actual thickness is greater than the assumed thickness (0.1 to 0.2 X diameter) used in the assay calculation;

3. The difference in weight between the total concentrate on which the calculation is based and the portion of 3/4 concentrate that is assayed (applies only to samples in which a nugget is present, as fine gold would be evenly distributed through the sample);

4. A large number of missed fine gold grains;

5. Gold chemically of physically held (occluded) in arsenopyrite or another heavy mineral.

Unsighted nuggets normally account for about 80 percent of unexpectedly high assays, the thickness and weight factors for 10 to 20 percent, and fine gold and occluded gold for less than 10 percent. Only the fine gold and occluded gold anomalies are significant.

The third-stage screening involves a mineralogical investigation of the archived 1/4 concentrate, principally by panning, to determine the probable cause of the high assay in the 3/4 concentrate. The 3/4 concentrate itself cannot be panned as it is pulped (ground in a shatter-box) and largely consumed (by acid digestion) during analysis unless the analysis is by the non-destructive instrumental neutron activation (INA) method.

An absence or minimal amount of fine visible gold in the 1/4 concentrate precludes the occurrence of fine gold in anomalous concentrations in the 3/4 analytical split, and such anomalies can be assumed to have been caused by a missed or unusually thick nugget or by occluded gold. We have encountered occluded gold mainly in samples that contain arsenopyrite; however there is a significant potential for occluded gold in samples that contain other pathfinder minerals or more than 10 percent pyrite. To determine whether occluded gold is actually present, the 1/4 concentrate is analyzed by the non-destructive INA method. Only if the 1/4 split assay duplicates the 3/4 split assay is the presence of occluded gold suggested. The third-stage screening is an indirect method as all checks are made on the 1/4 concentrate rather than on the 3/4 concentrate that was analyzed originally, but is essentially 100 percent reliable.

The twenty-one anomalies that could not be eliminated or enhanced by the second stage screening all had measured assays greater than 1000 ppb and more than twice as high as the corresponding calculated assays. These anomalies are thus amenable to third stage screening.

Five of these anomalies -- in Samples 151-06 and 171-02, 03, 04 and 05 -- were initially recognized as dispersal train type anomalies simply on the basis of their gold grain counts and stratigraphic continuity. They were nonetheless subjected to third stage screening to check for an occluded gold component in the high measured assays, and will be discussed in detail in section 6.2.1.

The remaining sixteen anomalies come from samples that yielded between zero and ten gold grains during initial processing. Calculated whole concentrate gold assays for those samples with observed gold grains range from 37 to 2333 ppb and measured 3/4 concentrate gold assays range from 1,004 ppb to 10,515 ppb. Check panning of the 1/4 concentrate of one of the anomalous samples -- No. 183-05 -- yielded six grains of predominantly delicate/irregular gold (Appendix F) and this anomaly will be discussed in detail in section 6.2.1. The other fifteen 1/4 concentrates yielded between zero and three predominantly abraded gold grains; thus the 3/4 concentrate anomalies were not caused by dispersal train-type concentrations of visible gold. The INA assays (Appendix F) of twelve of these fifteen 1/4 concentrates are well below 1000 ppb and usually show good correlation with the 1/4 concentrate calculated visible gold assays (Table 9). By inference, the twelve high 3/4 concentrate measured assays must have been caused by unsighted nuggets, or by observed nuggets that were thicker than usual, or by analytical problems. None of the twelve anomalies have a pathfinder association. Nine of the twelve -- one occurring in Ojibway II sediments, six in Chibougamau Till and one in Missinaibi interglacial gravel -- have no vertical stratigraphic continuity and thus were downgraded by first stage screening. The other three occur in Chibougamau Till and have chance basal continuity. None of the twelve anomalies are significant. The 1/4 concentrate assays for the other three of the fifteen anomalous samples -- Nos. 170-01, 185-16, 191-01 -- duplicated the 3/4 concentrate assays, indicating that occluded gold is present. These three anomalies will be discussed in detail in Section 6.2.1.

In summary the second and third stage screening, both of which are essentially 100 percent reliable, have eliminated seventeen and twelve of the thirty-eight heavy mineral gold anomalies, respectively. First-stage screening had previously downgraded twenty of the twenty-nine eliminated anomalies. All twenty-nine of the eliminated gold anomalies are caused by background gold grains. The remaining nine anomalies either survived the screening or were identified and enhanced by the screening. These nine anomalies occur in Holes 151, 170 and 171 on Boyvinet and Holes 183, 185 and 191 on Lesperance and all have characteristics of dispersal train anomalies. The six anomalous holes are highlighted on Plan 3 and the anomalies will be described in detail and further evaluated in the following sections.

Sample No.		Gold Assays (ppb) Calc. Whole	Meas. 3/4	Calc. 1/4	Meas. 1/4
151-	06	2,051	4,340	55	504
167-	03	319	1,209	267	839
168-	01	265	1,154	80	260
	07	468	2,081	0	78
169-	03	2,333	6,653	0	714
170-	01	51	10,515	113	9,030
171-	02	37	1,225	188	1,030
	03	46	1,329	1,247	2,770
	04	690	14,420	307	5,230
	05	871	18,321	2,450	15,300
180-	04	549	2,964	0	L 16
182-	05	413	1,564	0	47
183-	05	0	1,962	178	1,200
185-	16	329	2,084	25	1,020
188-	13	84	1,004	71	641
	15	719	4,580	0	490
191-	01	49	1,299	332	1,060
196-	02	89	1,038	45	539
221-	08	104	1,350	0	40
229-	07	123	5,289	0	29
229A-	06	522	1,050	0	L 5

Table 9 - Comparison of Calculated and Measured Gold Assays for Anomalies Requiring Third-Stage Screening

6.2.1.1 Potentially Significant Gold Anomalies

6.2.1.1.1 Hole 151 Anomaly

Hole 151 was drilled immediately north of the northwestern syenite ridge in the Boyvinet follow-up area. Anomalous sample No. 06 was collected from the base of a Chibougamau Till section resting on bedrock. Twenty grains of predominantly delicate gold were observed during initial processing, and calculated and measured assays are 2051 ppb and 4340 ppb, respectively. Half of the calculated assay was contributed by a single gold grain, and the 1/4 concentrate assayed 504 ppb, indicating that the observed nugget was thicker than assumed and thus responsible for the initial high measured assay.

Hole 151 is only 80 m northeast of Hole 150 which did not encounter any till but intersected sheared syenite grading 497 ppb gold. This shear zone probably represents another small occurrence of the type that appears to have been intersected so disproportionately in the widely spaced Phase I reconnaissance drill holes. If the structural control is north-northeast as suspected, the shear zone probably passes just north of Hole 151 and is the source of the gold in the till.

6.2.1.1.2 Hole 170 Anomaly

Hole 170 was drilled over syenite in the centre of the Boyvinet follow-up area. Anomalous Sample No. 01 was collected from the entire Chibougamau Till section resting on bedrock. Only one fine, irregular gold grain was observed during initial panning, but the 3/4 concentrate assayed 10,515 ppb gold and also produced a silver anomaly (4.2 ppm). The 1/4 concentrate yielded one fine gold grain, 65 to 70 percent pyrite, and a trace of galena but no silver minerals (Appendix F), and produced an INA assay of 9030 ppb gold. Thus the anomaly is strictly an occluded gold anomaly.

The till section is clast-supported and the sample is undersized (4.2 kg) and consists primarily of drill-generated clast and/or bedrock cuttings as evidenced by: 1) a disproportionate amount of +10 mesh material (1.6 kg) which is 95 percent "granitoid" (syenite); and 2) a -10 mesh fraction dominated by pink grains of coarse sand rather than rock flour size. Thus the gold may not be hosted in natural till matrix. Direct contamination of the sample by the underlying syenite can probably be ruled out because the syenite, although slightly anomalous in gold (27 ppb), has a very low sulphide content (less than 0.1 percent). If the anomaly was created partly or entirely by drill bit milling of syenite clasts, it overstates the significance of the bedrock source. Nevertheless, the potential for a nearby source of significant grade is considerably enhanced by the proximity of Hole 170 to anomalous Hole 171 described below.

6.2.1.1.3 Hole 171 Anomaly

Hole 171 is located only 150 m east of Hole 170 and produced anomalies from Samples 02 to 05. The anomalies from Samples 04 and 05 are distinguished from the Hole 170 anomaly by the presence of anomalous concentrations (10 and 55 grains) of fine delicate gold grains. Apart from this, the Hole 171 anomaly has seven properties in common with the Hole 170 anomaly: 1) a Chibougamau Till host; 2) good strength, with assays increasing downsection from 1225 ppb in Samples 02 to 18,321 ppb in Sample 05 at the bedrock interface; 3) predominance of occluded gold, which is consistently responsible for 93 to 97 percent of the measured assays; 4) a pyrite association, with the pyrite content increasing downsection from 5 percent to 40 percent; 5) a silver association, which is not present in the top two samples, but is moderately strong in the bottom two (7.1 and 7.4 ppm); 6) a galena association, which was observed only in Sample 04 (100 grains); and 7) a predominance of syenite in the till which imparts a pink tone to the matrix.

The Hole 171 anomaly is more attractive than the Hole 170 anomaly due to: 1) the predominance of delicate/irregular gold grains, which comprise 80 to 100 percent of the 10 and 55 observed gold grains in Samples 171-04 and 05 respectively; 2) the good vertical continuity of the anomaly, which rules out the possibility of bedrock contamination as a significant influence; 3) the downsection strengthening of the anomaly, which is manifested in the calculated and measured assay, the gold grain counts, the pyrite concentration and the silver values; and 4) and quality of the till host, which has a good, unsorted rock flour matrix.

In summary, the Holes 170 and 171 anomalies appear to have a common source, and the presence of delicate gold grains and the down-hole increase in anomaly strength in Hole 171 indicate that this source is very local. Moreover, the syenite bedrock in Hole 171 is strongly sheared and yielded a 129 ppb gold anomaly. Similar shearing was observed 200 m to the north-northeast in Hole 168. A north-northeast trending source is compatible with the disposition of the Hole 170 and Hole 171 anomalies as the direction of ice transport for the host Chibougamau Till was to the southwest.

6.2.1.1.4 Hole 183 Anomaly

Sample 05 in Hole 183 on the Lesperance peninsula was collected from the base of a Chibougamau Till section directly overlying bedrock. The sample was not panned initially, and yielded no visible gold on the table, but the 3/4 concentrate assayed 1962 ppb gold and 1.2 ppm silver. Panning of the 1/4 concentrate produced six fine gold grains of varying morphologies (two each of delicate, irregular and abraded), and no silver minerals. The calculated and measured gold assays for the 1/4 concentrate are 178 ppb and 1200 ppb, respectively, indicating that occluded gold is present.

Sample 05 was collected over a very short interval (25 cm) directly above gold-anomalous rhyolite (39 ppb). Thus the anomaly may be caused by gold milled from the rhyolite by the drill bit, or may simply overstate the significance of the rhyolite mineralization because the gold in the till has not been diluted by glacial transport. Obviously the mineralization is not significant.

6.2.1.1.5 Hole 185 Anomaly

Anomalous sample No. 16 in Hole 185 on the Lesperance peninsula was collected from the middle of a 32 m thick Chibougamau Till section. It yielded three abraded and two delicate gold grains during initial processing for a calculated visible gold assay of 329 ppb, but the 3/4 concentrate assayed 2084 ppb gold. The 1/4 concentrate INA assay is 1020 ppb, confirming the anomaly and indicating that occluded gold is present. The mid-till position of the anomaly and uniformly low gold assays from the flanking samples indicate that a true dispersal train is not present. The anomaly was probably created by drill bit milling of a weakly auriferous till clast.

6.2.1.1.6 Hole 191 Anomaly

Hole 191 was drilled on the Opawica Lake Fault in the Lesperance mainland drill area. The hole was shallow, and anomalous sample No. 01 comprises the entire Chibougamau Till section. This sample yielded two abraded and three irregular gold grains for a calculated gold assay of 49 ppb, but the 3/4 concentrate assayed 1299 ppb and the 1/4 concentrate assayed 1060 ppb, indicating that anomalous concentrations of occluded gold are present. The gold has a weak copper association (788 ppm) but no copper minerals were observed in the 1/4 concentrate. The anomaly is probably related to very weak mineralization along the Opawica Lake Fault.

6.3 Heavy Mineral Arsenic, Copper and Silver Anomalies

In volcanogenic massive sulphide exploration, the heavy mineral anomaly threshold for copper and zinc is 800 ppm and for silver is 2 ppm. The anomaly threshold for arsenic is 800 ppm, but arsenic anomalies are only significant if they have a gold association. Of the 431 samples processed, seven produced anomalies in these metals -- five in silver, one in copper, and one in arsenic (Table 10).

Sample No.	As (ppm)	Cu (ppm)	Ag (ppm)	Zn (ppm)	Au (ppb)
170- 01	87	153	4.2	115	10,515
171- 04	52	98	7.4	41	14,420
05	63	70	7.1	59	18,832
187- 15	840	202	0.6	202	772
188- 03	62	88	8.0	28	492
19	280	940	1.1	57	385
214- 03	34	136	7.0	36	16

Table 10 - Heavy Mineral Arsenic, Copper and Silver Anomalies

Of the five silver anomalies, three are associated with dispersal train-type gold anomalies and have already been discussed in sufficient detail. The other two silver anomalies in Holes 188 and 214 are of moderate strength (7 and 8 ppm) but are spurious as they lack stratigraphic continuity. One occurs in Ojibway II gravel overlying thick till and the other occurs near the top of a thick Chibougamau Till section. Both are flanked by samples that returned background silver assays (maximum 0.2 ppm).

The one copper anomaly is from Sample 188-19, which is the single Lower Till sample collected from the northeasternmost hole on the Lesperance peninsula rhyolites. The anomaly is weak (940 ppm) and associated with elevated silver (1.1 ppm). No copper or silver minerals were observed in the 1/4 concentrate, but abundant pyrite (50 percent) and some arsenopyrite are present. The copper is probably bound in the pyrite, precluding drill-generated contamination from the underlying bedrock which contains no pyrite. The till pyrite is coarse-grained, suggesting that the anomaly represents dispersion from minor, vein-hosted mineralization.

The one arsenic anomaly occurs in Sample 187-15 and is weak (840 ppm). However, the sample is from one of the three northeasternmost holes on the Lesperance peninsula and these three holes yielded 19 samples that define a weak zone of arsenic dispersion (Table 11). This zone comprises the complete Lower Till sections of Holes 187 (five samples) and 188 (one sample), and thirteen of fourteen samples collected from the lower third of thick Chibougamau Till sections in Holes 185, 187 and 188. All nineteen of these samples and only twelve others from the entire Phase II project assayed over 200 ppm arsenic. Thus the dispersion, although weak, is pronounced in relation to the low arsenic background in the other Phase II drill areas. Gold assays for the nineteen arsenic-enriched samples are not sympathetic to the arsenic assays, and the higher assays are generally explained by observed gold grains of abraded background-type morphology. The Quaternary stratigraphic setting of the arsenic dispersion is indicative of a nearby source -- probably a shear zone located between the peninsula and Opawica Island and forming a splay off the Opawica Lake Fault. Chibougamau Till and Lower Till samples collected from adjacent down-ice Holes 183 and 184 are not enriched in arsenic, indicating that the dispersal train decays rapidly. Thus the source mineralization must be both weak and gold-deficient.

Sample No.		As (ppm)	Gold: V.G. (*not panned)	Gold: Calc. Assay (ppm)	Gold: Meas. Assay (ppb)	Quaternary Unit	Strat. Cont.
185-	18	250	5	160	315	Chibougamau Till	Vertical
	19	296	2	91	302	Chibougamau Till	Vertical
	20	352	0*	0	225	Chibougamau Till	Vertical
	21	358	0*	0	246	Chibougamau Till	Vertical
	22	592	0*	0	163	Chibougamau Till	Vertical
	23	356	2	61	314	Chibougamau Till	Vertical
	24	230	0*	0	122	Chibougamau Till	Vertical
187-	13	220	0*	0	73	Chibougamau Till	Vertical
	14	494	5	116	168	Chibougamau Till	Basal
	15	840	4	28	772	Lower Till	Vertical
	16	616	5	494	998	Lower Till	Vertical
	17	515	0*	0	750	Lower Till	Vertical
	18	286	8	319	843	Lower Till	Vertical
	19	322	9	287	582	Lower Till	Basal
188-	14	672	0*	0	363	Chibougamau Till	Vertical
	15	342	1*	719	4,580	Chibougamau Till	Vertical
	16	250	0*	0	330	Chibougamau Till	Vertical
	18	274	0	0	383	Chibougamau Till	Basal
	19	280	1	2	385	Lower Till	Basal

Table 11 - Holes 185, 187 and 188 Arsenic Zone

7. CONCLUSIONS

The objectives of the Phase II reverse circulation bedrock and overburden sampling were: 1) on Boyvinet, to establish the structural pattern and pinpoint the best gold sources beneath the broad dispersal train identified in Phase I; 2) on Lesperance, to locate the Opawica Lake Fault and related structures and test their gold potential; 3) on Lesueur West, to test the western extension of the gold-bearing Lesueur Fault identified in Phase I; and 4) on Lesueur North, to test the western extension of the gold-bearing Lac Shortt Fault identified in Phase I.

In the Boyvinet area, two known or potential gold-bearing structural regimes are now recognized: 1) narrow mylonite zones in the syenite core of the Opawica Pluton that are enveloped by zones of weaker brittle deformation (as intersected in Phase I Holes 101, 104 and 105 and Phase II Holes 150, 168 and 171), probably strike north-northeast, and appear to be the sources of the strong gold dispersion intersected in Phase I Hole 101 and Phase II Hole 171 and weaker dispersion in several other drill holes; and 2) a gneissic contact strain aureole on the southern border of the pluton in the vicinity of the Phase I overburden anomalies of Holes 114, 117 and 118. The fill-in drilling has shown that the gold dispersion over the pluton is much less continuous than the original reconnaissance drilling suggested. In effect, the broad dispersal train zone has been reduced to a collection of scattered dispersal trains indicative of several bedrock sources of varying significance. Diamond drilling that has recently been performed to test the dispersal train anomalies identified in Phase I Holes 114, 117 and 118 and Phase II Hole 171 has basically confirmed this interpretation (F. Speidel, personal communication, 1989).

On Lesperance, the Opawica Lake Fault forms the boundary between the felsic and mafic volcanics rather than passing through the felsic volcanics as shown by previous workers. The fault is not mineralized. The felsic pile appears to face south rather than north, to be comagmatic with the subalkalic to alkalic Opawica Pluton, and to have good potential for base metal massive sulphide mineralization. However, the drilling was focused on VLF rather than VEM or HEM targets, and the VLF conductors are suspect because they cut across the volcanic strata.

In the Lesueur West area, the Lesueur Fault is well defined but lacks the gold-arsenopyrite-pyrite mineralization that characterizes the same fault on the Lesueur property. The presence of ultramafic dykes of generally kimberlitic character is intriguing, and the occurrence of remobilized lead-zinc mineralization in one of the dykes suggests that the nearby HEM zone has a significant potential for hosting volcanogenic massive sulfide mineralization. These conclusions are based mainly on the bedrock data because the overburden on Lesueur West is unrepresentative of the bedrock.

In the Lesueur North area, the results are similar to those on Lesueur West and Lesperance; the target structure (Lac Shortt Fault) is well defined but is unmineralized.

In summary the Phase II program adequately achieved its objectives in all areas except that the overburden data from Lesueur West are of limited value. The Phase II drilling has significantly clarified the nature of gold mineralization in the Opawica Pluton and has indicated that the gold potential of the other three drill areas is low.

8. RECOMMENDATIONS

Diamond drilling is presently being performed to test the Holes 151 and 170/171 gold targets on Boyvinet and also the gold targets identified on Boyvinet and Lesueur in Phase I. It is recommended that one drill hole be added in the vicinity of Hole 218 on Lesueur West to test the HEM zone for volcanogenic massive sulphide mineralization and to obtain samples of the kimberlitic dykes for further study. If the dykes prove to be true kimberlites, the magnetics of the surrounding area should be examined very carefully for evidence of kimberlite pipes that could be diamantiferous. Future exploration at Lesperance should focus on testing electromagnetic conductors, most of which occur on adjacent properties, for volcanogenic massive sulphides. On Lesueur North, the uniformly negative results obtained from the reverse circulation drilling indicate that no further exploration is required.

* * * * * * * * * *

9. CERTIFICATE - STUART A. AVERILL

I, Stuart A. Averill, residing at 192 Powell Avenue, Ottawa, Ontario hereby certify as follows:

That I attended the University of Manitoba at Winnipeg, Manitoba and graduated with a B.Sc. (Hons.) in Geology in 1969.

That I have worked continuously in the field of mining exploration geology since 1971.

That I am President and a principal owner of Overburden Drilling Management Limited, 107-15 Capella Court, Nepean, Ontario, an independent geological consulting company that I founded in 1974.

That I qualify for and have recently applied for fellowship in the Geological Association of Canada.

That this technical report is based on data gathered on the subject property by employees of Overburden Drilling Management Limited and interpreted by me.

That I have no direct or indirect interest in Minnova Inc.

S. Averill

Stuart A. Averill, B.Sc. (Hons.)

Dated at Ottawa, Ontario this 19th day of June, 1989.

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APPENDIX A

REVERSE CIRCULATION DRILL HOLE LOGS

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan 22 19 89

HOLE NO PLS-89-150 LOCATION L 18+50 W; 8+50N ELEVATION 308 m

GEOLOGIST D. HOLMES DRILLER R. FOURNEL BIT NO. CB70159 BIT FOOTAGE 0 - 10.0

SHIFT HOURS

____ TO ____

MOVE TO HOLE

DRILL set up 7:00 - 8:00 AM drill 8:00 - 9:15 AM

TOTAL HOURS

MECHANICAL DOWN TIME

DRILLING PROBLEMS

CONTRACT HOURS

OTHER travel from mine 6:30 - 7:00 AM

MOVE TO NEXT HOLE

NEW BIT & BIT SUB

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG	
1	N/R			0 - 1.5 No Return - probably organics and sand	- Longyear drill using Shell Alvania grease
2				1.5 - 8.5 OJIBWAY II SEDIMENTS	- all visible water system fittings are magnetic
3–4				1.5-2.0 ochre sand, fine grained with a few pebbles	
5–6				2.0-6.0 clay, gray, non-gritty and soft with subtle beige silt varves	
7–8	N/R			6.0-8.5 No Return - very soft, easy drilling assumed to be clay and/or silt	
9–10			01 Bedrock		
10–20				8.5 - 10.0 BEDROCK - dark pink to red colour with dark green mottles - massive structure - coarse grained 0.5 to 1.5mm feldspar ~80% and chlorite ~20% to 30% - evidence of shearing includes chlorite shears and 5-10% fast-reacting (to HCl) carbonate - calcite - slightly magnetic - <1% finely dissem. py. Syenite	

10.0 EOH

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan 22 19 89

HOLE NO PLS-89-151 LOCATION L 16+00W 8+00N ELEVATION 301 m.

GEOLOGIST B. Bork DRILLER R. Fournel BIT NO. CB70159 BIT FOOTAGE 10.0-38.0

SHIFT HOURS ____ TO ____

MOVE TO HOLE 9:30 - 10:00

DRILL 10:00 - 12:00

TOTAL HOURS ____

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

CONTRACT HOURS ____

OTHER ____

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0-6	NR			0-6.0 No Return
				0-23.0 OJIBWAY II Sediments - very easy drilling - poor return - Suspected silt and clay, small amount of fine sand
				6.0-12.0 - poor return - beige to gray-beige fine sand
12-15	NR			12.0-15.0 - no return - rod may be plugged, very easy drilling → rods drop down hole by themselves - probably silt and clay
				15.0-16.0 - fine beige sand
			01	16.0-16.5 - medium sand
				16.5-17.0 - fine beige sand
				17.0-19.0 - medium to coarse sand - beige, slightly oxidized - few rounded pebbles.
			02	19.0-20.0 - fine beige sand
				20.0-23.0 - medium to coarse beige sand, few rounded pebbles.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

SHIFT HOURS

______ TO ______

TOTAL HOURS

______

CONTRACT HOURS

______

HOLE NO PLS-89-151 LOCATION ________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

MOVE TO HOLE ________

DRILL ________

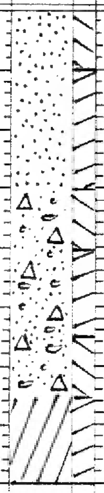
MECHANICAL DOWN TIME ________

DRILLING PROBLEMS ________

OTHER ________

MOVE TO NEXT HOLE ________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			02	
21				23.0-26.5 Chibougamau Till
22			03	23.0-25.6 - abrupt contact with overlying sand
23			04	- fine grained gray to gray-beige sand silt matrix
24				
25			05	- predominantly cobbles with a few pebbles, approximate composition 60% Volcanic/Sediments 40% granitoid
26			06 *	
27			07 Bedrock	- matrix supported till
28				25.6-26.5 - matrix similar to above with a noticeable decrease in sand
29				- clast composition becomes predominantly granitoid, approximately 80% granitoid 20% Volcanic/Sediments
10				
11				
12				
13				* sample 06 probably contaminated by underlying bedrock
14				
15				26.5-28.0 BEDROCK
16				- light pink colour with mottled dark green grains
17				- Coarse grained, approximately 2mm grain size
18				- massive structure
19				- trace carbonate minerals
20				- predominant mafic mineral is chlorite
				- evidence of shearing
				- no visible sulphides, slightly magnetic
				- Syenite
				28.0 E.O.H.



OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan 22 19 89

HOLE NO PLS-89-152 LOCATION 6+00W; 4+40N ELEVATION 301 m

GEOLOGIST D. Holmes DRILLER R. Fournel BIT NO. CB70159 BIT FOOTAGE 38.0 - 68.0

SHIFT HOURS ______ TO ______

MOVE TO HOLE 12:00 - 12:15 PM

DRILL 12:15 - 1:45 PM

TOTAL HOURS ______

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

CONTRACT HOURS ______

OTHER ______

MOVE TO NEXT HOLE ______

page 1

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1–20				0 - 0.5 Organics 0.5 - 25.0 OJIBWAY II SEDIMENTS 0.5 - 16.5 clays gray, nongritty and soft with large silt varves (1 to 3 cm in thickness) - clay/silt is softer downsection 16.5 - 25.0 very fine to fine gray sand with clay partings - approximately one clay seam per ½ metre, less than 5 cm thick

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan 22 1989

HOLE NO PLS-89-152 LOCATION ________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

SHIFT HOURS ________ TO ________

MOVE TO HOLE ________

DRILL ________

TOTAL HOURS ________

MECHANICAL DOWN TIME ________

DRILLING PROBLEMS ________

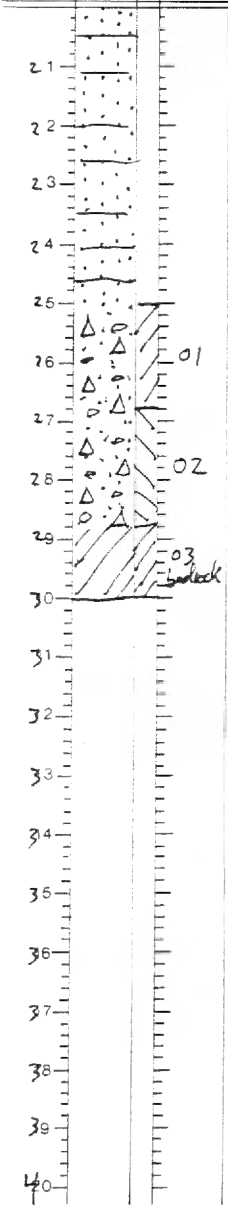
CONTRACT HOURS ________

OTHER ________

MOVE TO NEXT HOLE ________

page 2

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



25.0 - 28.8 CHIBOUGAMAU TILL
- abrupt contact with overlying sand

25.0 - 26.5 clast-supported till
matrix is fine gray sand;
cobble clasts are 50 %
granitoid and 50 % volcanic/sediment

26.5 - 28.8 matrix-supported till;
fine gray sand-silt matrix; with
cobbles ~60% [illegible]
40% granitoid

28.8 - 30.0 BEDROCK
- mottled dark and light pink and dark green colour
- massive structure
- coarse grained 0.5 to 2.5 mm
. 15 % chlorite
- weakly sheared with approx. 1% fast reacting carbonate (to HCl) ⇒ calcite
- slightly magnetic

Syenite

30.0 EOH

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan 22 1989

HOLE NO PLS-89-153 LOCATION L8100W 7400N ELEVATION 305 m

GEOLOGIST B. Bock DRILLER R. Forand BIT NO. CC7061 BIT FOOTAGE 0-15.0

SHIFT HOURS ____ TO ____

MOVE TO HOLE 1:45-2:00

DRILL 2:00-3:00

TOTAL HOURS ____

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

CONTRACT HOURS ____

OTHER ____

MOVE TO NEXT HOLE ____

New Bit

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1–20			01 (≈12 m); 02, Bedrock (≈14–15 m)	

0-0.5 Organics (peat)

0.5-13.2 OSIBWAY II SEDIMENTS

0.5-11.0 · grey slightly gritty clay
- subtle varving
- softens downsection
- below 7.0m becomes soupy

11.0-13.2 - fine grained grey to grey beige sand
- well sorted

13.2-13.5 Chibougamau Till
- fine grained grey to grey-beige sand silt matrix
- clast composition, cobbles approximately 65% Volcanic/Sediments 35% Granitoid
- very thin veneer (.3m thick)

* sample 01 was washed from the hole after hole was completed and incorporates both Osibway sand and Chibougamau till, as well as possible bedrock contamination

13.5-15.0 BEDROCK
- light pink colour with mottled dark green
- coarse grained, approximately 1-2 mm
- massive structure
- moderately sheared.
- predominant mafic mineral is chlorite, approximately 25%
- high percentage of calcite [illegible]
- Syenite

15.0 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan 22 19 89
SHIFT HOURS
____ TO ____
TOTAL HOURS
____
CONTRACT HOURS
____

HOLE NO PLS-89-154 LOCATION L 20+00W; 3+50N ELEVATION 306 m
GEOLOGIST D. Holmes DRILLER R. Fournel BIT NO. CB70161 BIT FOOTAGE 150-23.5
MOVE TO HOLE 3:00 - 3:15 PM
DRILL 3:15 - 5:00 PM
MECHANICAL DOWN TIME
DRILLING PROBLEMS
OTHER travel 5:00 - 5:30 PM
MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–1.5	N/R			0 - 1.5 No Return
1.5–5.5				1.5 - 5.5 OJIBWAY II SEDIMENTS - clay; gray, non-gritty with subtle beige silt varves approx 2cm thick - clay/silt softer downsection
5.5–7.0			01	5.5 - 7.0 CHIBOUGAMAU TILL - abrupt contact with overlying clay/silt - matrix supported till; Fine gray sand-silt matrix, cobble clast composition approximately 60% volcanics/sediments, 40% granitoid.
7.0–8.5			02 bedrock	7.0 - 8.5 BEDROCK - dark pink, mottled with light pink and dark green - massive structure - coarse grained 0.5 to 2mm - approx. 15% hornblende laths - 1-2% carbonate, both fast and slow reacting to HCl

8.5 EOH Syenite

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan 23 19 89

SHIFT HOURS
_____ TO _____

TOTAL HOURS
_____

CONTRACT HOURS
_____

HOLE NO PLS-89-155 LOCATION 12+00W 2+00N ELEVATION 302m

GEOLOGIST B Bork DRILLER R Rurel BIT NO. LB 70161 BIT FOOTAGE 20.5-41m

MOVE TO HOLE 7:00-7:30

DRILL 7:30-8:15

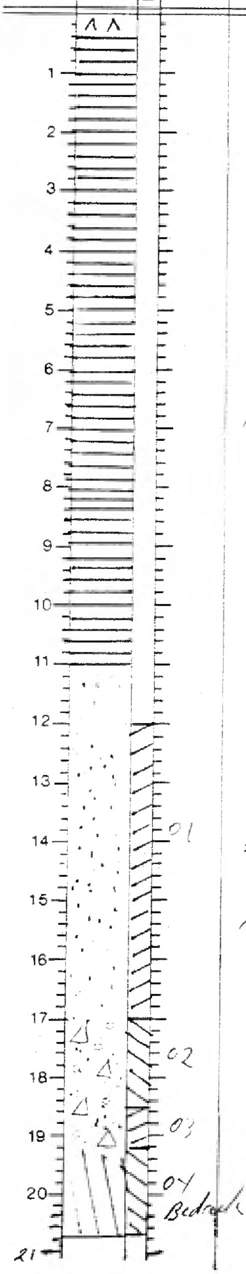
MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel 6:30-7:00

MOVE TO NEXT HOLE

DEPTH IN METRES / GRAPHIC LOG / INTERVAL / SAMPLE NO.	DESCRIPTIVE LOG



0-0.5 Organics

0.5-17.0 OJIBWAY II SEDIMENTS

0.5-11.0 gray non gritty clay
- softens downsection
- rods fall by themselves

11.0-17.0 - fine grained gray sand
- well sorted
- becomes beige below 14m

17.0-19.2 Till (Chibougamau)
- abrupt contact with overlying Sediments
- fine grained gray + gray-beige sand silt matrix
- clasts, cobbles approximate composition
40% Volcanic/Sediments
60% Granitoid

18.2-19.2 - becomes very cobbly
- clast supported till, possible subcrop

* sample 03 maybe contaminated with bedrock

19.2-20.7 BEDROCK
- dark pink colour with mottled dark green grains
- coarse grained, approximately 2mm in size
- massive structure
- slightly brecciated
- approximately 5% carbonate minerals, delayed reaction with HCl
- predominant mafic mineral is chlorite
- moderately sheared
- slightly magnetic
- Syenite

20.7 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE January 23 19 89

HOLE NO PLS-89-156 LOCATION 9100W 1+00N ELEVATION 302 m

GEOLOGIST D. Holmes DRILLER R. Fournel BIT NO. CB70161 BIT FOOTAGE 44.2-61.2

SHIFT HOURS ____ TO ____

MOVE TO HOLE 8:45-9:00 AM

DRILL 9:00-11:15 AM

TOTAL HOURS ____

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

CONTRACT HOURS ____

OTHER ____

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0-1.5	N/R			0-1.5 No Return (probably organics and clay)
1.5-11.0				1.5-11.0 OJIBWAY II SEDIMENTS 1.5-10.5 clay; gray, non-gritty with soft beige silt varves 2-3 cm in thickness - clay/silt becomes softer downsection 10.5-11.0 fine gray to gray-~~beige~~ sand
11.0-15.8			01*, 02, 03	11.0-15.8 CHIBOUGAMAU TILL - abrupt contact with overlying sand matrix supported; fine gray sand-silt matrix; cobble clast composition approximately 60% volcanics/sediments 40% granitoid with the relative percentages changing to 50/50 and 40/60 by sample 03 * Sample 01 consists of both Ojibway sand and Chib. Till
15.8-17.0			04 bedrock	15.8-17.0 BEDROCK - light pink, mottled white and dark green (20% hornblende and chlorite) - coarse grained 0.5 to 3 mm - evidence of strong shearing including brecciation, .5 to 2% qtz veinlets (possibly qtz-carbonate) and 5-10% slow reacting carbonate (to HCl), 2% chlorite shears hematite stain at 16.5m Syenite

17.0 EOH

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 23 19 89
SHIFT HOURS ____ TO ____
TOTAL HOURS ____
CONTRACT HOURS ____

HOLE NO PLS-89-157 LOCATION 18400W 0100 ELEVATION 306m.
GEOLOGIST R. Beck DRILLER R. Bond BIT NO. 0870161 BIT FOOTAGE
MOVE TO HOLE 11:15 - 11:30
DRILL 11:30 - 12:45
MECHANICAL DOWN TIME
DRILLING PROBLEMS
OTHER
MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0-0.5 Organics
				0.5-8.8 OJIBWAY II SEDIMENTS
				0.5-6.2 - slightly gritty gray clay with beige silt varves.
				- very soft, rods penetrate on their own.
				6.2-8.8 fine grained beige sand - well sorted
				8.8-10.3 Chibougamau Till
			01	8.8-9.6 - abrupt contact with overlying sediments
				- fine grained gray-beige sand silt matrix
				- cobbly, approximately 50% Volcanic/Sediment 50% Granitoid
			02	- matrix supported till
			bedrock	9.6-10.3 - decrease in fine grained sand matrix
				- Cobble supported till
				10.3-12.0 BEDROCK
				- dark green with mottled white and pink grains
				- course grained, approximately .5-2mm.
				- massive structure
				- moderately sheared
				- 2% carbonate minerals (slow reacting)
				- predominate mafic mineral is chlorite, ~40% of rock
				- trace hematite stain
				- <0.5% visible disseminated sulphides
				- hard drilling
				- Gabbro
				12.0 E.O.H.

Depth scale: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE January 23 1989

HOLE NO PLS-89-158 LOCATION L16+00W; 2+50S ELEVATION 308 m

GEOLOGIST D. Holmes DRILLER R. Fournel BIT NO. CB70020 BIT FOOTAGE 0-13.5

SHIFT HOURS ____ TO ____

MOVE TO HOLE 12:45 - 1:00 PM

DRILL 1:00 PM - 1:45 PM

TOTAL HOURS ____

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

CONTRACT HOURS ____

OTHER ____

MOVE TO NEXT HOLE ____

New Bit

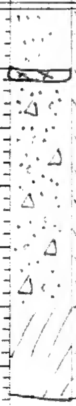
DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–1				0 - 1.0 Organics
1–11				1.0 - 11.0 OJIBWAY II SEDIMENTS 1.0 - 10.5 clay: gray, non-gritty and soft with beige silt varves softer downsection 10.5 - 11.0 Fine gray sand
11			01*	11.0 - 11.8 CHIBOUGAMAU TILL - abrupt contact with overlying sand . clast supported till, fine gray sand matrix; cobble clasts approximately 50% volcanics/sediments and 50% granitoid * Sample 01 was washed after bedrock was drilled and thus may incorporate Ojibway sand and bedrock as well as till.
12–13			02 bedrock	11.8 - 13.5 BEDROCK - light pink, mottled white and dk gn - coarse grained 0.5 to 2 mm - 20% hornblende is predominate mafic mineral, occurs as laths ~1% dk gn chlorite shears - minor hematite stain, dark red - slightly magnetic 2% Fast reacting carbonate → calcite Syenite

13.5 EOH

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 23 19 89
HOLE NO PLS-89-159 LOCATION 10400 W 2470 S ELEVATION 31 m
GEOLOGIST B Bork DRILLER R. Fournel BIT NO. CG70020 BIT FOOTAGE [illegible]
SHIFT HOURS ____ TO ____
MOVE TO HOLE 1:45 - 2:00 PM.
DRILL 2:00 - 3:30
TOTAL HOURS
MECHANICAL DOWN TIME
DRILLING PROBLEMS
CONTRACT HOURS
OTHER
MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



Sample 01 (1.0–5.0 m); Sample 02 (5.0–6.5 m) Bedrock

0-1.0 OJIBWAY II SEDIMENTS
- very fine beige oxidized sand
- poor return

1.0-1.2 Boulder (mafic Volcanic)

1.0-5.0 Chibougamau Till
- abrupt contact with overlying sediments
- fine grained gray to gray-beige sand silt matrix
- clast supported, cobbles, approximately 50% Volcanic/Sediments 50% Granitoid
- poor sample return causing long sample interval

5.0-6.5 BEDROCK
- light to medium pink colour with mottled dark green hornblende
- Coarse grained, .5-2mm.
- massive structure, <1% chlorite shears.
- predominant mafic mineral is hornblende
- approximately 5% carbonate minerals
- Syenite

6.5 E.O.H

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE January 23 19 89

SHIFT HOURS ______ TO ______

TOTAL HOURS ______

CONTRACT HOURS ______

HOLE NO PLS-99-160 LOCATION L 10+00W ; 9+50 ELEVATION 314 m

GEOLOGIST D. H[illegible] DRILLER R. Fournier BIT NO. CB70020 BIT FOOTAGE [illegible]

MOVE TO HOLE 3:30 - 3:45 PM

DRILL 3:45 - 5:00 PM

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER travel 5:00 - 6:00 PM

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–3.8				0 - 3.8 OJIBWAY II SEDIMENTS . Fine beige (oxidized) sand - very poor sample return - no seal at rods.
3.8–3.9				3.8 - 3.9 CHIBOUGAMAU TILL . too thin to log or sample
3.9–5.5			01 bedrock	3.9 - 5.5 BEDROCK . light pink, mottled white and dark green - coarse grained 0.5 to 2 mm · 20% hornblende laths - minor hematite stain - no evidence of shearing - << 1% carbonate Syenite
5.5				5.5 EOH

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE January 24 19 89

HOLE NO PLS-89-161 LOCATION L 15+00 W ; 6+00S ELEVATION 3.0 m

GEOLOGIST D Holmes DRILLER R. Fournel BIT NO. CB70020 BIT FOOTAGE [illegible]

SHIFT HOURS

____ TO ____

MOVE TO HOLE 7:15 - 7:45 AM

DRILL 7:45 - 9:00 AM

TOTAL HOURS

MECHANICAL DOWN TIME

DRILLING PROBLEMS

CONTRACT HOURS

OTHER Travel 6:30 - 7:15 AM

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0				0 - 5.2 OJIBWAY II SEDIMENTS
1				0 - 2.0 clay - beige compact at surface, softer downsection, slightly gritty
3				2.0 - 4.8 clay - gray, non-gritty soft clay with beige silt varves
5				4.8 - 5.2 Fine gray-beige sand
6			01	
7				5.2 - 6.8 CHIBOUGAMAU TILL -abrupt contact with overlying sand
8			02 bedrock	5.2-6.0 clast supported till; fine gray sand matrix, cobble clasts ~ 50% volcanics/sediments 50% granitoid.
12				6.0 - 6.8 matrix supported till
14				6.8 - 8.5 BEDROCK
				- light pink, mottled white and dark green
				- coarse grained, 0.5 to 4 mm
				- approx. 20% hornblende laths
				- << 1% dissem. carbonate
				- no evidence of shearing
				Syenite

8.5 EOH

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE January 24 19 89

HOLE NO PLS-89-162 LOCATION L4+00W ; 2+00N ELEVATION 302m

GEOLOGIST D. Holmes DRILLER R. Fournel BIT NO. CB70020 BIT FOOTAGE 34.0-51.0

SHIFT HOURS

____ TO ____

MOVE TO HOLE 9:00-9:30 AM

DRILL 9:30-10:30 AM

TOTAL HOURS

MECHANICAL DOWN TIME

DRILLING PROBLEMS

CONTRACT HOURS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1	N/R			0-1.5 No Return - probably clay
2–13				1.5-13.5 OJIBWAY II SEDIMENTS - clay; gray, non-gritty and soft with subtle beige silt varves.
13–15			01	13.5-15.5 CHIBOUGAMAU TILL - abrupt contact with overlying clay - matrix supported till; Fine gray sand-silt matrix, cobble clasts composition approx 60% volcanics/sediments and 40% granitoid
15.5–17			02 bedrock	15.5-17.0 BEDROCK (top 0.4m of bedrock may be fractured or there was some contamination from till - interval not sampled) - dark red-pink with light pink white and dk green mottling - hematite stained - coarse grained 0.5 to 3mm - 15-20% mafic minerals both hornblende laths and chlorite ~1% chlorite shears - 2-5% slow reacting carbonate (to HCl) - some shearing brecciation syenite
18–20				

17.0 EOH

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE January 24 19 89
HOLE NO PLS-89-163 LOCATION L 4+75W ; 4+50S ELEVATION 31.. m
GEOLOGIST D. Holmes DRILLER R. Fournier BIT NO. CB7020 BIT FOOTAGE 51.0 - 61.5
SHIFT HOURS ____ TO ____
MOVE TO HOLE 10:30 - 10:45 AM
DRILL 10:45 - 1:00 PM
TOTAL HOURS ____
MECHANICAL DOWN TIME ____
DRILLING PROBLEMS ____
CONTRACT HOURS ____
OTHER ____
MOVE TO NEXT HOLE ____

* Lost 2 rods and broke 1 rod in the hole.

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–3				0 – 3.0 OJIBWAY II SEDIMENTS - Fine beige-ochre sand - very poor return - rods do not seal
3–10			01, 02	3.0 - CHIBOUGAMAU TILL abrupt contact with sand 3.0 - 6.5 sandy matrix supported till Fine beige sand matrix ; cobble clast composition approx. 50% volcanics/sediments 50% granitoid 6.5 - 10.0 clast supported till ; - still very poor sample return therefore taking much longer sample intervals
10–10.5				10.0 - 10.5 boulder - syenite (not sampled) → possibly bedrock
				10.5 EOH . pull rods to change bit and discover broken rod - leave 2 rods, bitsub and bit in hole → move 75 m north and spot Hole PLS-89-164.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE January 24 19 89

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO PLS-89-164 LOCATION L5+00W; 4+00S ELEVATION 311 m
GEOLOGIST D. Holmes DRILLER R. Fournel BIT NO. CB70160 BIT FOOTAGE 0 - 30.0m
MOVE TO HOLE ______
DRILL 1:00 - 4:00PM
MECHANICAL DOWN TIME ______
DRILLING PROBLEMS ______
OTHER ______
MOVE TO NEXT HOLE ______

New Bit New Bit Sub page 1

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–1				0 - 5.5 OJIBWAY II SEDIMENTS
1–2				0 - 1.5 clay - beige, compact slightly gritty
3–4				1.5 - 5.5 Fine beige sand - very poor sample return
5				5.5 - 28.5 CHIBOUGAMAU TILL
6–7				- very poor sample return - most of the sample coming up the outside of the rods
8–10			01	5.5 - 10.0 matrix supported till; Fine beige to gray-beige sand matrix; cobble clasts 60% volcanics/sediments, 40% granitoid
11–13				10.0 - 24.0 clast supported till; Fine gray sand-silt matrix; cobble clasts still 60/40
14–16			02	- gradual improvement in sample recovery with depth after 16.0 m
19			03	
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE January 24 19 89

HOLE NO PLS-89-164 LOCATION ______ ELEVATION ______

GEOLOGIST ______ DRILLER ______ BIT NO. ______ BIT FOOTAGE ______

SHIFT HOURS

______ TO ______

MOVE TO HOLE ______

DRILL ______

TOTAL HOURS

______

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

CONTRACT HOURS

______

OTHER ______

MOVE TO NEXT HOLE ______

page 2

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21			03	24.0 - 28.5 clast supported till as above with gray to gray-green sand-silt matrix; clast composition still 60/40 - a few clasts have a coating of very hard gritty clay
22			04	
23				
24				
25				
26			05	28.5-30.0 BEDROCK
27				- light pink, mottled white and dark green
28				- minor hematite stain
29			06 bedrock	- coarse grained 0.5 to 3mm
30				- 20-25% hornblende laths and chlorite
31				~1-2% chlorite shears
32				~1% slow reacting carbonate
33				Syenite
34				
35				30.0 EOH
36				
37				
38				
39				
40				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE January 24/25 19 89

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO PLS-89-165 LOCATION L1+50W ; 1+50S ELEVATION 307 m

GEOLOGIST D. HOLMES DRILLER R. FOURNEL BIT NO. CB 70160 BIT FOOTAGE 30.0-53.0

MOVE TO HOLE Jan 24 4:00-4:15 PM

DRILL Jan 24 4:15-4:45 PM - clean tank Jan 25 10:00-11:00 AM , 1:00-5:00 PM

MECHANICAL DOWN TIME

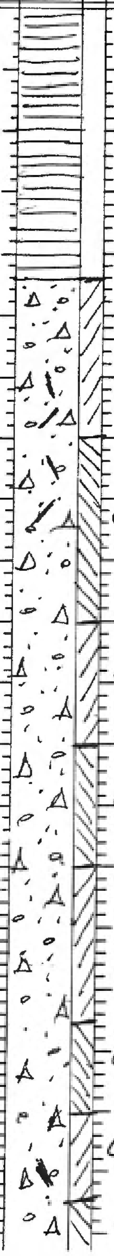
DRILLING PROBLEMS difficulty starting GT watercarrier Jan 25 7:00-9:00 AM ; 9:30-10:00 AM

~~OTHER~~ drill startup : 11:00-1:00 PM difficulty starting compressor - thaw waterlines

~~MOVE TO NEXT HOLE~~ and rods etc

travel : Jan 24 4:45-5:30 PM ; Jan 25 6:30-7:00 AM, 9:00-9:30 AM
5:00-5:30 PM

page 1

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–20			01, 02, 03, 04, 05, 06, 07, 08	see below

0 - 4.4 OJIBWAY II SEDIMENTS

0-3.0 clay - beige, compact and gritty

3.0-4.4 clay as above with fine gray-beige sand horizons approx 10 cm thick

4.4 - 21.5 CHIBOUGAMAU TILL
- abrupt contact

4.4-6.0 matrix supported till; fine gray-beige to gray sand matrix; cobble clasts approx. 50% volcanics/sediments 50% granitoid

6.0-6.5 clay - gray, compact - gritty

6.5-8.5 clast supported till; fine gray sand-silt matrix; cobbles approx 60% volcanics/sediments 40% granitoid
→ gritty - gray clay lumps in matrix

8.5-18.0 clast supported till as above without clay in matrix
- clast composition changes gradually to approx. 70/30 between 12.0 and 18.0 m

18.0-21.5 clast supported till with fine gray to gray-green sand-silt matrix; cobble clast composition approximately 50% granitoid 50% volcanics/sediments
- increase in ~~amount~~ amount of sample return after 18.0 m
- at 19.0 m clay in matrix for 0.2 m

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE January 25 19 89

HOLE NO PLS-89-165 LOCATION ______ ELEVATION ______

GEOLOGIST ______ DRILLER ______ BIT NO. ______ BIT FOOTAGE ______

SHIFT HOURS ______ TO ______

MOVE TO HOLE ______

DRILL ______

TOTAL HOURS ______

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

CONTRACT HOURS ______

OTHER ______

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			08	- several large cobbles in bottom 2 metres - mostly gabbro some of which contain upto 1% pyrite
21			09	
22			10 bedrock	
23				
24				21.5 - 23.0 BEDROCK
25				- light pink, mottled white and dark green
26				- coarse grained 0.5 to 2mm
27				20% hornblende laths
28				1% gray chlorite shears
29				- 10% fast reacting carbonate (to HCl) - calcite
30				Syenite
31				
32				23.0 EOH
33				
34				
35				
36				
37				
38				
39				
40				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 26 19 89

HOLE NO PLS-89-166 LOCATION 0+00 3+50S ELEVATION 305m

GEOLOGIST B. Bork DRILLER K. Fournell BIT NO. A000005 BIT FOOTAGE 0-34.5

SHIFT HOURS

____ TO ____

MOVE TO HOLE 7:15 - 7:45

DRILL 7:45 -

TOTAL HOURS

MECHANICAL DOWN TIME

DRILLING PROBLEMS

CONTRACT HOURS

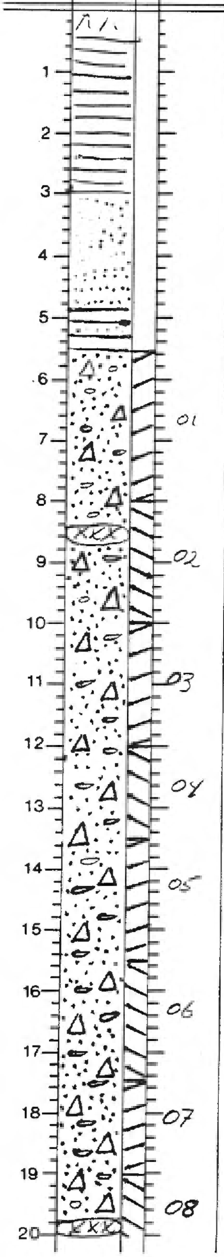
OTHER Travel 6:30 - 7:15

MOVE TO NEXT HOLE

New Bit.

page 1/2

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



0-0.5 Organics

0.5-5.5 OJIBWAY II SEDIMENTS

0.5-3.0 - gritty beige clay

3.0-4.8 - fine grained gray to gray-beige sand
- well sorted

4.8-5.5 - gritty gray clay with approximately 10cm silt varves every .3m.

5.5-22.8 Chibougamau Till

5.5-18.2 - abrupt contact with overlying Sediments
- matrix supported till
- fine grained gray sand silt matrix
- predominantly cobble clasts, approximately
70% Volcanic / Sediments
30% granitoid

8.5-8.7 Boulder (mafic Volcanic)

18.2-19.2 - matrix similiar as above
- clasts, predominantly cobbles with occassional pebbles, composition
60% Volcanic / Sediments
40% granitoid

19.8-20.0 Boulder (Rhyolite)

19.2-22.8 - clast supported till
- slow drilling

Change

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE __________ 19 __

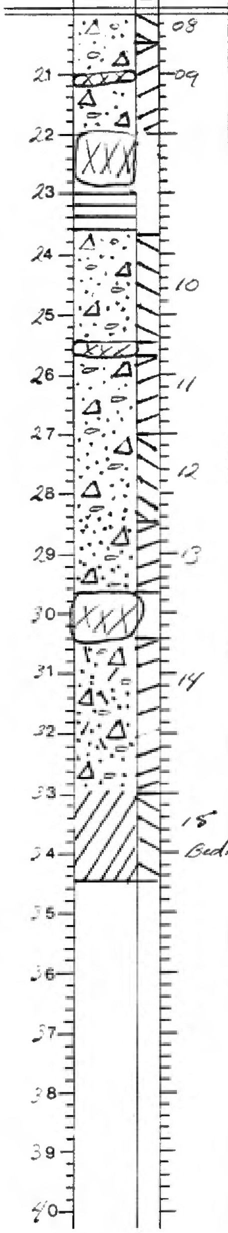
SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO PLS-88-166 LOCATION __________ ELEVATION __________
GEOLOGIST __________ DRILLER __________ BIT NO. __________ BIT FOOTAGE __________
MOVE TO HOLE __________
DRILL __________
MECHANICAL DOWN TIME __________
DRILLING PROBLEMS __________
OTHER __________
MOVE TO NEXT HOLE __________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



21.0-21.2 Boulder (mafic Volcanic)

22.0-22.8 Boulder (granite)

22.8-23.7 Missinabie Sediments
- dark gray hard clay
- very compact
- variably gritty - non-gritty
- lighter grey colour downsection
- occassional pebbles below 23.5

23.7-30.5 Lower Till
- fine grained gray sand silt matrix
- clasts, cobbly, approximately 50% Volcanic/Sediments 50% granitoid
- clast supported till

25.5-25.7 Boulder (granite)

29.7-30.5 Boulder (granite)

30.5-32.0 - light to medium gritty gray cloy rich till
- moderately hard to drill
- very few clast

32.0-32.3 - Similiar to above
- increase in clasts, approximate composition 20% Volcanic/Sediments 80% Granitoid

32.3-33.0 - as in 30.5-32.0

33.0-34.5 BEDROCK
- light to medium pink colour with mottled dark green hornblende
- coarse grained
- massive structure
- predominant mafic mineral is hornblende approximately 25%
- approximately 5% carbonate minerals (delayed reaction to HCl.)
- evidence of shearing
- Syenite

34.5 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE January 26 1989

SHIFT HOURS
_____ TO _____

TOTAL HOURS
_____

CONTRACT HOURS
_____

HOLE NO PLS-89-167 LOCATION L 25+00 W; 2+30S ELEVATION 307 m

GEOLOGIST D. Holmes DRILLER R. Fournel BIT NO. A000005 BIT FOOTAGE 34.5-61.7

MOVE TO HOLE 1:15 - 2:15

DRILL 2:15 - 3:15

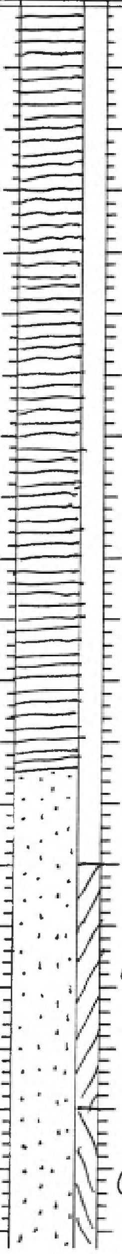
MECHANICAL DOWN TIME _____

DRILLING PROBLEMS _____

OTHER _____

MOVE TO NEXT HOLE _____

page 1

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG						
0–20 (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20)			01 (14–18); 02 (18–20)	0-22.5 OJIBWAY II SEDIMENTS 0-12.5 clay - gray, non-gritty and soft with beige silt varves - softer downsection 12.5-14.0 very fine grained gray sand 14.0-22.5 fine beige sand						

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE January 26 1989

HOLE NO PLS-89-167 LOCATION ______ ELEVATION ______

GEOLOGIST ______ DRILLER ______ BIT NO. ______ BIT FOOTAGE ______

SHIFT HOURS ______ TO ______

MOVE TO HOLE ______

DRILL ______

TOTAL HOURS ______

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

CONTRACT HOURS ______

OTHER ______

MOVE TO NEXT HOLE ______

page 2

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21			02	22.5-25.6 CHIBOUGAMAU TILL
22				-abrupt contact with overlying sand
23			03	-sandy matrix supported till. Fine grey-beige sand matrix;
24			04	cobble clast composition approx 40% Volcanics/Sediments 60% granitoid
25				
26			05 bedrock	25.6-27.2 BEDROCK
27				-light pink, mottled white and dark green
28				- coarse grained 0.5 to 2mm
29				- ~ 25% hornblende laths, predominant mafic mineral
30				~ 1% shears coated with epidote
11				- some clay along fracture/shear surfaces
12				- minor hematite staining
13				~ 1% carbonate
14				Syenite
15				27.2 EOH
16				
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan.26,27 19 89

SHIFT HOURS ____ TO ____

TOTAL HOURS ____

CONTRACT HOURS ____

HOLE NO PLS-89-168 LOCATION L22W 6+00? ELEVATION 307m

GEOLOGIST B. Bork DRILLER R. Fournel BIT NO. R000005 BIT FOOTAGE 61.7-88.0

MOVE TO HOLE 3:15-3:30

DRILL 3:30-5:00 P.M. Jan 26. 7:15-9:30 Jan. 27

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel 5:15-6:00 P.M Jan.26 6:30-7:15 A.M. Jan. 27

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0-3.0 No Return.
				3.0-15.0 OJIBWAY II SEDIMENTS
				3.0-10.8 - gray slightly gritty clay
				- very occassional thin beige silt beds (10cm thick) approximately every 1.5m.
				10.8-15.0 - fine grained gray sand
				- well sorted
				15.0-25.5 Chibougamau Till
				- abrupt contact with overlying Sediments
				15.0-16.7. - matrix supported till
				- fine grained gray sand silt matrix
				- clasts; cobbles, approximately 60% Volcanic/Sediments 40% Granitoid
			01	16.7-17.5 - gritty gray clay included in matrix
				- decrease in amount of clasts
			02	17.5-20.2 as in 15.0-16.7.
			03	
			04	

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 ___

HOLE NO PLS-89-168 LOCATION ________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

SHIFT HOURS ____ TO ____

MOVE TO HOLE ________

DRILL ________

TOTAL HOURS ________

MECHANICAL DOWN TIME ________

DRILLING PROBLEMS ________

CONTRACT HOURS ________

OTHER ________

MOVE TO NEXT HOLE ________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			04	20.2-25.5 - clast supported till
21			05	- very slow drilling
22	XXX		05	- decrease in amount of fine grained grey sand
23			06	- increase in cobbles, approximate composition 40% Volcanic/Sediments 60% granitoid
24				
25			07	
26			08	21.5-22.1 Boulder (Granite)
27			Bedrock	
28				25.5-27.0 BEDROCK
29				-dark pink with mottled dark green hornblende
10				- coarse grained, approximately .5-2mm.
11				- massive structure
12				- predominant mafic mineral is hornblende approximately 20% of rock
13				- approximately 5% carbonate minerals (delayed reaction with HCl)
14				
15				- Syenite
16				27.0 E.O.H.
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan 27 19 87

SHIFT HOURS
_____ TO _____

TOTAL HOURS
_____

CONTRACT HOURS
_____

HOLE NO PLS-87-169 LOCATION 20+00W 8+50S ELEVATION 307m.

GEOLOGIST B. Bock DRILLER R. Fournel BIT NO. CB70160 BIT FOOTAGE 53.0 - 88.0

MOVE TO HOLE 9:30-9:45

DRILL 9:45-1:00

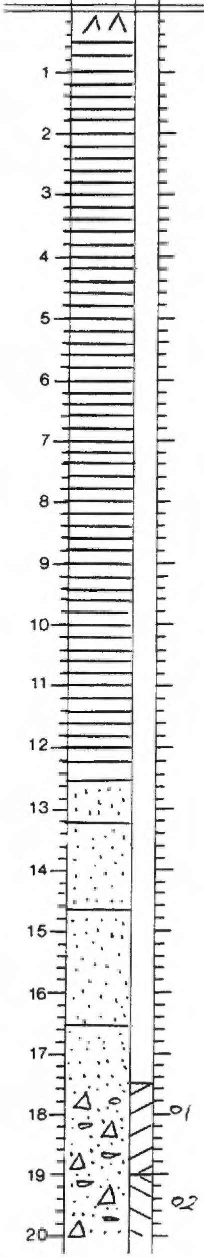
MECHANICAL DOWN TIME _____

DRILLING PROBLEMS _____

OTHER Bit CB70160 is a used bit from a previous hole

MOVE TO NEXT HOLE _____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



0-0.5 No Return

0.5-17.5 OJIBWAY II SEDIMENTS

0-12.5 - gray slightly gritty clay
- occassional thin beige silt varves (approximately 10cm thick every 1m.)
- clay becomes more beige colour below 8.2m.
- increase in silt varves, every .5m.
- softens downsection

12.5-17.5 - fine grained gray sand
- well sorted
- occassional interbeds of gray gritty clay, approximately 10-20cm thick every 1m.

17.5-23.6 Chibougamau Till
- abrupt contact with overlying Sediments
- fine grained gray sand silt matrix
- matrix supported till
- clasts; cobbles, approximate composition 60% Volcanic/Sediments 40% Granitoid

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 ___

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO *RS-89-169* LOCATION ____________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

MOVE TO HOLE ________________

DRILL ________________

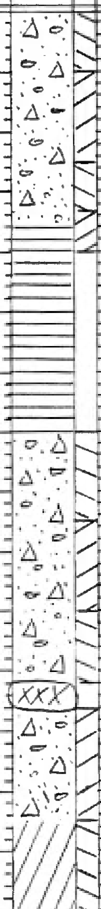
MECHANICAL DOWN TIME ________________

DRILLING PROBLEMS ________________

OTHER ________________

MOVE TO NEXT HOLE ________________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



Depth scale: 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40

Sample Nos.: 02 *, 03 *, 04 *, 05, 06, 07, 08, 09, 10

20.8-21.9 - clast supported till
- decrease in fine grained grey sand
- slow drilling
- clasts, cobbles, approximate composition
50% Volcanic/Sediments
50% Granitoid
- very similar characteristics of gravel

* sample 02, 03 & 04 recommended to have grain size analysis conducted in lab to determine proper classification

21.9-23.3 Gravel
- no fine grained sand
- predominantly medium to coarse grained sand matrix
- high percentage of pebble clasts

23.3-23.6 - Till similar to 17.5-20.8

23.6-27.0 Missinaibie Sediments
- dark grey hard clay
- variably gritty - non gritty
- very compact, hard drilling
- becomes lighter colour downsection
* - very similar to section intersected in hole #166

27.0-33.5 Lower Till
- fine grained grey to grey beige sand silt matrix
- matrix supported till
- cobbly, approximate composition
65% Volcanic/Sediments
35% Granitoid

31.2-31.6 Boulder (Mafic Volcanic)

33.0-33.5 - similar to 27.0-33.0 with grey gritty clay in matrix

33.5-35.0 BEDROCK
- dark to medium pink colour with mottled dark green hornblende, hematite staining
- coarse grained, approximately 1-2mm
- massive structure
- evidence of shearing
- predominant mafic mineral is hornblende
- approximately 5% carbonate minerals
Syenite

35.0 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 27 19 88

SHIFT HOURS
_______ TO _______

TOTAL HOURS
____

CONTRACT HOURS
____

HOLE NO PLS-88-170 LOCATION 30100W 5475S ELEVATION 307m.

GEOLOGIST B. Bork DRILLER R. Fournell BIT NO. CB10158 BIT FOOTAGE 0-18.0

MOVE TO HOLE 1:00-1:30

DRILL 1:30-2:15

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0				0-0.5 Organics
1				0.5-15.4 OJIBWAY II SEDIMENTS
2				0.5-12.2 - grey slightly gritty clay
3–4				- becomes grey-beige downsection due to silt varves about .5cm-10cm thick every .5m.
5				12.2-15.4 - fine grained grey sand - well sorted
7				15.4-16.7 Chibougamau Till
8				- abrupt contact with overlying sediments
9				- clast supported till
10				- fine grained grey sand silt matrix
11–13				- clasts, cobbles, approximate composition 20% Volcanic/Sediment 80% granitoid
14				16.7-18.0 BEDROCK
15–16			01	- medium pink colour with mottled dark green hornblende crystals
17			02 Bedrock	- coarse grained (1-2mm)
18				- massive structure
				- predominant mafic mineral is hornblende
19				- evidence of shearing
20				- Syenite

18.0 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan 27 19 88

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO PLS-89-171 LOCATION L28+00W 8+50S ELEVATION 307m
GEOLOGIST B.Bork DRILLER R. Fournel BIT NO. CB70158 BIT FOOTAGE 18.0-37.5
MOVE TO HOLE 2:15-2:30
DRILL 2:30-4:15
MECHANICAL DOWN TIME
DRILLING PROBLEMS
OTHER
MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–20			01, 02, 03, 04, 05, 06 Bedrock	0-0.5 Organics 0.5-10.2 OSTBWAY II SEDIMENTS 0.5-8.7 - slightly gritty gray clay - very poor return 8.7-10.2 · fine grained gray sand - well sorted 10.2-18.0 Chibougamau Till - abrupt contact with overlying sediments - matrix supported till - fine grained gray to gray-beige sand silt matrix - pebbles and predominantly cobbles approximately 60% Volcanic/Sediments 40% granitoid 12.4-18.0 - becomes clast supported till - decrease in matrix - clasts, cobbles, approximately 30% Volcanic/Sediments 70% granitoid 18.0-19.5 BEDROCK - medium pink colour with mottled dark green hornblende - coarse grained (1-2mm) - massive structure - predominant mafic mineral is hornblende - Syenite

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 26 19 89

SHIFT HOURS ____ TO ____

TOTAL HOURS ____

CONTRACT HOURS ____

HOLE NO PLS-89-172 LOCATION L5+50W 23+50N ELEVATION 308 m.

GEOLOGIST B. Bark DRILLER R. Fournel BIT NO. CB70158 BIT FOOTAGE 37.5-68.5

MOVE TO HOLE 7:00-8:00

DRILL 8:00-11:30

MECHANICAL DOWN TIME ____

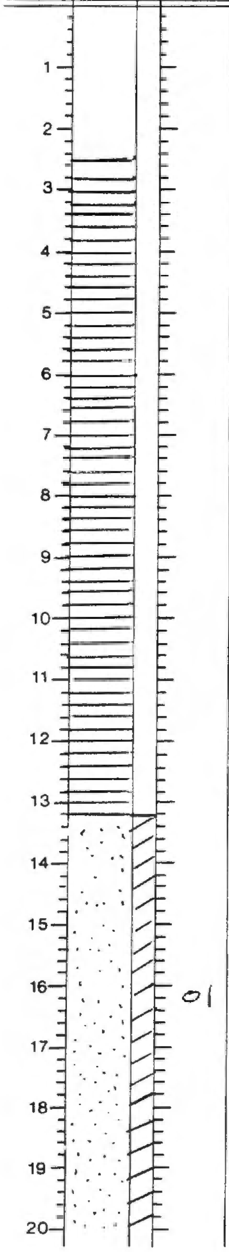
DRILLING PROBLEMS ____

OTHER Travel 6:30-7:00

MOVE TO NEXT HOLE ____

page 1 of 2

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–2.5				0-2.5 No Return
2.5–21.8				2.5-21.8 OJIBWAY II SEDIMENTS
2.5–13.2				2.5-13.2 - gray slightly gritty clay - 2-3 cm chunks - becomes beige colour downsection - softens downsection
13.2–21.8			01	13.2-21.8 - fine grained gray-beige sand - well sorted.



OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

SHIFT HOURS

______ TO ______

TOTAL HOURS

______

CONTRACT HOURS

______

HOLE NO PLS-89-172 LOCATION ________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

MOVE TO HOLE ________

DRILL ________

MECHANICAL DOWN TIME ________

DRILLING PROBLEMS ________

OTHER ________

MOVE TO NEXT HOLE ________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21			01	21.8-29.5 Chibougamau Till
				21.8-24.4 - abrupt contact with overlying Sediment
22				- matrix supported till
			02	- fine grained gray to gray-beige
23				sand silt matrix
				- clasts, predominantly cobbles,
24			03	approximate composition
				50% Volcanic/Sediments
25				50% granitoid
			04	
26				24.4-29.5 - becomes clast supported till
27			05	- decrease in matrix
				- clasts, as above
28				
			06	29.5-31.0 BEDROCK
29				- dark green to black colour
30			07	- fine to medium grained
			BEDROCK	- moderate foliation
31				- very hard to drill
12				- magnetic
				- Iron Formation
13				
14				31.0 E.O.H.
15				
16				
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 28 19 89

SHIFT HOURS

____ TO ____

TOTAL HOURS

CONTRACT HOURS

HOLE NO PLS 89-173 LOCATION L26+00W 11+00S ELEVATION 308m

GEOLOGIST B. Bork DRILLER R. Fournel BIT NO. B000007 BIT FOOTAGE 0-16.4

MOVE TO HOLE 11:30-11:45

DRILL 11:45-12:45

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0-2.5 No Return
				2.5-14.4 OJIBWAY II SEDIMENTS
				- gray slightly gritty clay
				- occassional thin beige silt
				· Varves approximately 10cm thick
				- large clay chunks, 3-5cm
				- softens downsection
				14.4-14.9 Chibougamau Till
				- abrupt contact with overlying Sediments
				- matrix supported till
				- fine grained gray to gray beige sand silt matrix
				- cobbles, approximate composition 50% Volcanic/Sediment 50% granitoid
14.4-14.9			01	14.9-16.4 BEDROCK
			02 Bedrock	- medium pink colour with mottled dark green hornblende
				- coarse grained 1.5-2mm
				- massive structure
				- predominant mafic mineral is hornblende
				- Syenite
				16.4 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 28 1989

SHIFT HOURS
_____ TO _____

TOTAL HOURS
_____

CONTRACT HOURS
_____

HOLE NO PLS-89-174 LOCATION L2400W 13450S ELEVATION 308m

GEOLOGIST B. Bark DRILLER R. Fournel BIT NO. A0000067 BIT FOOTAGE 16.4- 27.7

MOVE TO HOLE 12:45-1:00

DRILL 1:00-2:00

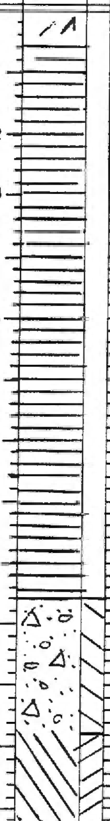
MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0-0.5 Organics
1				0.5-9.6 OJIBWAY II SEDIMENTS
2				- non-gritty gray clay
3				- soft
4				- frequent varves of beige silt (10cm thick every .5m)
5				
6				9.6-11.8 Chibougamau Till
7				- abrupt contact with overlying Sediment
8				- matrix supported till
9				- fine grained gray to gray-beige sand silt matrix
10			01	- cobbles, approximate composition 50% Volcanic/Sediments 50% granitoid
11				
12			02	11.8-13.3 BEDROCK
13			Bedrock	- light to medium pink colour with dark green hornblende
14				- coarse grained .5-2mm.
15				- massive structure
16				- predominant mafic mineral is hornblende, approximately 25% of rock
17				- evidence of shearing
18				- Syenite
19				13.3 E.O.H.
20				



OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 28 19 89

SHIFT HOURS ____ TO ____

TOTAL HOURS ____

CONTRACT HOURS ____

HOLE NO RLS-89-175 LOCATION L16+75W 12+00S ELEVATION 301m

GEOLOGIST B.Bark DRILLER R.Fournel BIT NO. A000007 BIT FOOTAGE 29.7-64.7

MOVE TO HOLE 2:00-2:15

DRILL 2:15-5:15

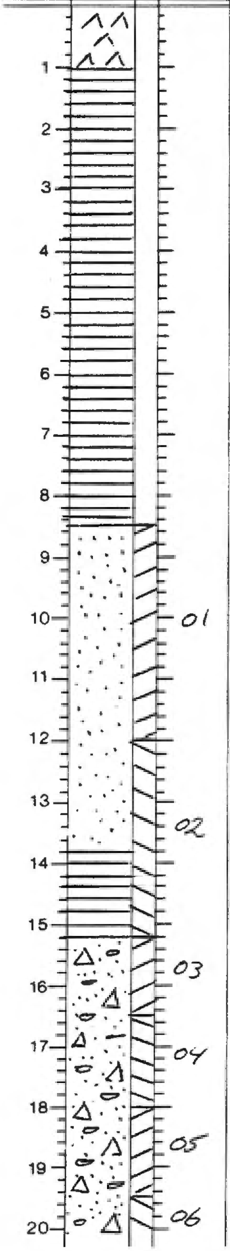
MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

OTHER Travel 5:15-6:00 P.M.

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



0-1.0 Organics

1.0-15.2 OJIBWAY II SEDIMENTS

1.0-8.5 - non gritty gray clay
- occassional thin beige silt varves (approximately .5cm thick every 1.0m)

8.5-13.8 - fine grained gray-beige sand
- well sorted
- occassional thin lamination (.5cm) of pebbles

13.8-15.2 - slightly gritty gray clay
- no clasts
- compact compared with upper clay

15.2-33.7 Chibougamau Till
- abrupt contact with overlying Sediments
- clast supported till
- fine grained gray sand silt matrix
- clasts, cobbles, approximate composition 60% Volcanic/Sediments 40% Granitoid

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE *Jan. 28* 19 *89*

HOLE NO *PLS-89-175* LOCATION ______ ELEVATION ______

GEOLOGIST ______ DRILLER ______ BIT NO. ______ BIT FOOTAGE ______

SHIFT HOURS ______ TO ______

MOVE TO HOLE ______

DRILL ______

TOTAL HOURS ______

MECHANICAL DOWN TIME ______

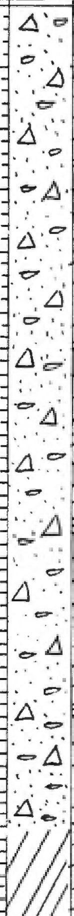
DRILLING PROBLEMS ______

CONTRACT HOURS ______

OTHER ______

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			06	
21			07	
22				28.3-30.1 - occassional gray gritty clay lumps in matrix, increasing downsection
23			08	
24			09	30.1-31.9 - clay rich till - decrease in clasts
25				
26			10	31.9-33.7 - as in 28.3-30.1
27			11	
28				33.7-35.0 Bedrock
29			12	- light pink colour with mottled dark green hornblende crystals
30			13	- coarse grained (.5-2mm)
31				- massive structure
32			14	- predominant mafic mineral is hornblende, approximately 20% of rock
33				- evidence of shearing
34			15 Bedrock	- 2-3% carbonate minerals - Syenite
35				35.0 E.O.H.
36				
37				
38				
39				
40				



OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 29 19 89

SHIFT HOURS

_____ TO _____

TOTAL HOURS

CONTRACT HOURS

HOLE NO PLS-89-176 LOCATION L 4400E 2245 oN ELEVATION 313m.

GEOLOGIST B. Bork DRILLER R. Fournel BIT NO. A000007 BIT FOOTAGE 64.7 - 73.2

MOVE TO HOLE 7.30 - 7.45

DRILL 7.45 - 9.15

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel 6.30 - 7.00 A.M.

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–2.5				0-2.5 OJIBWAY II SEDIMENTS - beige slightly gritty clay - Small lumps, approximately .5-1mm
2.5–7.0			01	2.5-7.0 Chibougamau Till - matrix supported till - fine grained gray to gray-beige sand silt matrix - clasts, cobbles, approximately 60% Volcanic / Sediment 40% granitoid . poor return above 4.5m. 5.5-5.9 Boulder (Mafic Volcanic)
5.5–5.9	XXX			
6–7			01	
7.0–8.5			02 bedrock	7.0-8.5 BEDROCK - light to medium pink colour with mottled dark green hornblende - coarse grained (.5-2mm) - massive structure - predominant mafic mineral is hornblende, approximately 20% of rock - 2-3% carbonate minerals - Syenite
				8.5 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 29 19 89

HOLE NO PLS-89-177 LOCATION LOT50W 21150N ELEVATION 312m.

GEOLOGIST B. Bark DRILLER R. Fournel BIT NO. K00966 BIT FOOTAGE 0-11.3

SHIFT HOURS
______ TO ______

MOVE TO HOLE 9:15-9:30

DRILL 9:30 - 10:30

TOTAL HOURS

MECHANICAL DOWN TIME

DRILLING PROBLEMS

CONTRACT HOURS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0-0.5 Organics
				0.5-8.8 OJIBWAY II SEDIMENTS
				0.5-7.7 - slightly gritty gray clay
				- beige silt varves, approximately 10cm thick every 1.0m.
				7.7-8.8 - fine grained gray sand - well sorted
				8.8-9.8 Chibougamau Till
				- abrupt contact with overlying Sediment
				- matrix supported till
				- fine grained gray to gray-beige sand silt matrix
9			01	- cobble clasts, approximately 60% Volcanic/Sediments 40% Granitoid
10			02	
11			bedrock	
				9.8-11.3 BEDROCK
				- light pink to white colour with mottled dark green hornblende crystals
				- coarse grained .5-2mm
				- massive structure
				- predominant mafic mineral is hornblende, approximately 25% of rock
				- evidence of shearing
				- Syenite, possibly diorite
				11.3 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 29 1989
SHIFT HOURS
____ TO ____
TOTAL HOURS
____
CONTRACT HOURS
____

HOLE NO PLS-89-178 LOCATION L4700 W 17+50N ELEVATION 313 m.
GEOLOGIST B. Bark DRILLER R. Fournel BIT NO. K000 966 BIT FOOTAGE 11.3-22.4
MOVE TO HOLE 10.30-10.75
DRILL 10.45-11.30
MECHANICAL DOWN TIME
DRILLING PROBLEMS
OTHER
MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–20			01 bedrock	0-2.5 No Return 2.5-9.4 OSIBWAY II SEDIMENTS - gray slightly gritty clay - very poor return, possibly bit plugged. 9.4-9.6 Chibougamau Till - abrupt contact with overlying Sediments - too thin a veneer to sample or log. 9.6-11.1 BEDROCK 9.6-10.4 - medium green and white colour - coarse grained (.5-2mm) - massive structure - predominant mafic mineral maybe hornblende - Gabbro 10.4-11.1 appear to contain more feldspar - possibly hit Syenite contact - light pink colour with mottled dark green hornblende - coarse grained - massive structure - predominant mafic mineral, hornblende - Syenite 11.1 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 29 1989

HOLE NO PLS-89-179 LOCATION L8+00W 18+50N ELEVATION 312m.

GEOLOGIST B. Bork DRILLER R. Fournel BIT NO. K000966 BIT FOOTAGE 22.4- 44.8

SHIFT HOURS
_____ TO _____

MOVE TO HOLE 11:30-11.45

DRILL 11.45- 1:00

TOTAL HOURS

MECHANICAL DOWN TIME

DRILLING PROBLEMS

CONTRACT HOURS

OTHER

MOVE TO NEXT HOLE

page 1 of 2

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG						
1–20				0-1.0 Organics 1.0-20.0 OJIBWAY II SEDIMENTS 1.0-17.6 -non-gritty gray clay - large chunks 2-3cm. - softens downsection - rods fall by themselves 17.6-20.0 - fine grained gray sand - well sorted.						

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

SHIFT HOURS ______ TO ______

TOTAL HOURS ______

CONTRACT HOURS ______

HOLE NO PLS-89-179 LOCATION ________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

MOVE TO HOLE ________

DRILL ________

MECHANICAL DOWN TIME ________

DRILLING PROBLEMS ________

OTHER ________

MOVE TO NEXT HOLE ________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			-01	20.0-20.9 Chibougamau Till
21				- abrupt contact with overlying Sediments
			-02	- matrix supported till
22			-bedrock	- fine grained gray to gray-beige sand silt matrix
23				- clasts, cobbles, approximate composition 60% Volcanic/Sediments 40% Granitoid
24				
25				
26				
27				20.9-22.4 BEDROCK
28				- medium green and white colour
29				- coarse grained (.5-1mm)
10				- massive structure
11				- predominant mafic mineral maybe chlorite
12				- no carbonate minerals (no reaction to HCl)
13				- Gabbro
14				
15				22.4 E.O.H.
16				
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 29 19 89

SHIFT HOURS

_____ TO _____

TOTAL HOURS

_____

CONTRACT HOURS

_____

HOLE NO PLS-89-180 LOCATION L1+25E 14+90N ELEVATION 316m.

GEOLOGIST B.Bork DRILLER R.Fournel BIT NO. K000966 BIT FOOTAGE 448-59.6

MOVE TO HOLE 1:00-1:30

DRILL 1:30-4:00

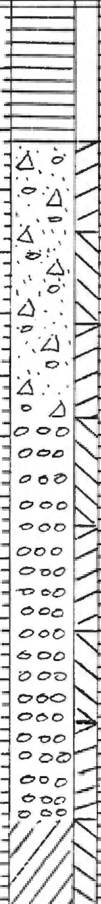
MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER clean mud tank prepare for move 4:00-4:30 Travel 4:30-5:00 P.M.

MOVE TO NEXT HOLE

Last hole on Boyuinet Property

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1–20			01, 02, 03, 04, 05, 06, 07, 08 bedrock	see below

0-2.2 OJIBWAY II SEDIMENTS

- beige non-gritty clay
- 1-2cm chunks

2.2-13.3 Chibougamau Till

- abrupt contact with overlying Sediments
- clast supported till
- fine grained gray to gray-beige sand silt matrix
- cobbles, approximate composition
  - 50% Volcanic/Sediment
  - 50% Granitoid

6.5-6.8 - matrix becomes very beige

6.8-13.3 Gravel

6.8-8.4 - no fine material in matrix
- medium to coarse grained sand matrix
- oxidized seams approximately 20cm thick
- pebbles and cobbles, approximate composition 50% Volcanic/Sediments 50% Granitoid
- water return is very clear.

8.4-10.6 - Gravel similar to above
- thin fine grained beige sand interbeds approximately 10cm thick

10.6-13.3 - as in 6.8-8.4

13.3-14.8 BEDROCK

- medium to dark green colour
- coarse grained
- moderately foliated
- predominant mafic mineral maybe chlorite
- no visible sulphides
- Gabbro

14.8 E.O.H

Note: An examination of the character splits of samples 01 to 07 by binocular microscope indicates that samples 01 to 04 are pebbly sand and 05 to 07 are confirmed to be gravel.
Thus, 2.2 to 13.3 is Ojibway II sand and gravel.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan 30 19 89

SHIFT HOURS

____ TO ____

TOTAL HOURS

CONTRACT HOURS

HOLE NO PLS-89-181 LOCATION Site #20 South of Lac Opawica on pininsula ELEVATION 303 m

GEOLOGIST D. Holmes DRILLER R. Fournel BIT NO. R 000966 BIT FOOTAGE 59.6 - 92.2

MOVE TO HOLE From Boyvinet Property 9:00 - 1:30 PM

DRILL 1:30 - 5:00 PM

MECHANICAL DOWN TIME

DRILLING PROBLEMS

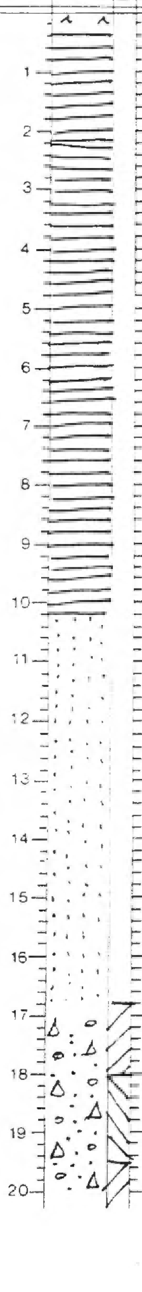
OTHER travel 6:30 - 7:00 AM move equip. to highway 7:00 - 9:00 AM

~~MOVE TO NEXT HOLE~~ travel 5:00 - 5:45 PM

First hole on Opawica Property.

page 1

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



0 - 0.2 Organics

0.2 - 16.8 OJIBWAY II SEDIMENTS

0.2 - 10.2 clay - gray, non-gritty and soft with beige silt varves less than 2 cm thick
- becomes softer downsection

10.2 - 10.5 very fine grained gray sand

10.5 - 15.0 Fine grained gray sand

15.0 - 16.8 Fine and medium gray sand interbeds with a few clay lenses less than 2 cm thick

16.8 - 30.8 CHIBOUGAMAU TILL
- abrupt contact with overlying sand

16.8 - 20.5 clast supported till; Fine gray sand-silt matrix; pebble and cobble clasts approx. 60% volcanics/~~sediments~~ 40% granitoid.

Sample no.: 01, 02, 03

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan 30 19 89

HOLE NO PLS-89-181 LOCATION ______ ELEVATION ______

GEOLOGIST ______ DRILLER ______ BIT NO. ______ BIT FOOTAGE ______

SHIFT HOURS ______ TO ______

MOVE TO HOLE ______

DRILL ______

TOTAL HOURS ______

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

CONTRACT HOURS ______

OTHER ______

MOVE TO NEXT HOLE ______

page 2

DEPTH IN METRES	SAMPLE NO.
21	03
22	04
23	05
24	06
25	
26	07
27	
28	08
29	09
30	10
31	
32	11 bedrock
33	
34	
35	
36	
37	
38	
39	
40	

DESCRIPTIVE LOG

20.5-21.5 matrix supported till. Fine gray sand-silt matrix; cobble clasts approx. 50% volcanics/sediments 50% granitoid

21.5-24.8 clast supported till; Fine gray sand-silt matrix with clast composition remaining 50/50

24.8-25.0 boulder - gabbro

25.0-30.8 clast supported till similar to 21.5 to 24.8, clast composition ranges from 60/40 to 50/50

30.8 - 32.6 BEDROCK

- light yellowish-green colour, orange from 31.8 to 32.0
- very fine grained
- predominant mafic mineral is bright green chlorite - difficult to estimate but probably ~ 10 % of rock
- < 1% chlorite shears
- between 1 and 5 % calcite disseminated
- < 1% calcite veinlets
- Bleached intermediate/mafic volcanic

32.6 EOH

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 31 19 89

HOLE NO PLS-89-182 LOCATION Site # 19 ELEVATION 302 m.

GEOLOGIST B. Bark DRILLER R. Fournel BIT NO. K000971 BIT FOOTAGE 0-32.1

SHIFT HOURS ______ TO ______

MOVE TO HOLE

DRILL 9:00-1:30 P.M.

TOTAL HOURS ______

MECHANICAL DOWN TIME

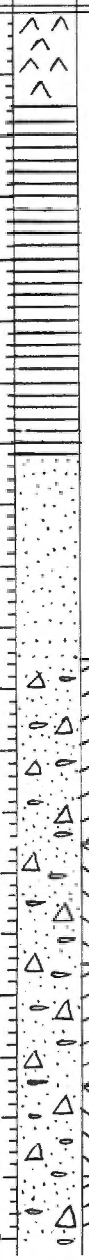
DRILLING PROBLEMS

CONTRACT HOURS ______

OTHER repair radiator on drillers truck 7:00-8:30 Travel 8:30-9:00 A.M.

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1–20			01, 02, 03, 04, 05	



0-1.5 Organics

1.5-10.5 OJIBWAY II SEDIMENTS

1.5-7.2 - non-gritty gray clay
- 2-3 cm clay chunks
- softens downsection

7.2-10.5 - fine grained gray sand
- occassional gray clay lenses less than 2cm thick
- well sorted

10.5-30.6 Chibougamau Till
- abrupt contact with overlying Sediments
- matrix supported till
- fine grained gray to gray-beige sand silt matrix
- pebbles and cobble clasts; predominantly cobbles, approximately
60% Volcanic/Sediments
40% granitoid

11.5-13.2 - becomes a clast supported till
- decrease in fine grained gray-beige sand
- slower drilling

13.2-25.3 - Similiar to 10.5-11.5

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

SHIFT HOURS
________ TO ________

TOTAL HOURS
____

CONTRACT HOURS
____

HOLE NO PLS-89-182 LOCATION ________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

MOVE TO HOLE ________

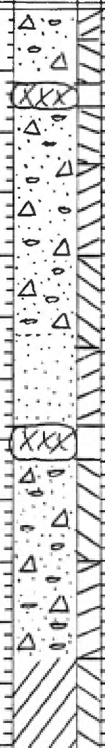
DRILL ________

MECHANICAL DOWN TIME ________

DRILLING PROBLEMS ________

OTHER ________

MOVE TO NEXT HOLE ________



DEPTH IN METRES	SAMPLE NO.	DESCRIPTIVE LOG
	05	21.2-21.6 Boulder (granite)
21	06	25.3-26.8 - fine grained gray-beige sand interbeds
22	06	- well sorted
23	07	- very occassional small clasts
24		26.8-27.4 Boulder (diorite)
25	08	27.4-30.6 - clast supported till
26	09	- slow drilling - clasts, predominantly cobbles, approximately 60% Volcanic/Sediments 40% granitoid
27		
28	10	30.6-32.1 BEDROCK
29		- very light green colour (Bleached)
30	11	- fine grained - weakly foliated
31	12 bedrock	- <1% carbonate minerals - predominant mafic mineral is chlorite
32		- Mafic/Intermediate Volcanic
33		
34		32.1 E.O.H.
35		
36		
37		
38		
39		
40		

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 31 19 89

SHIFT HOURS ____ TO ____

TOTAL HOURS ____

CONTRACT HOURS ____

HOLE NO PLS-89-183 LOCATION Site #21 ELEVATION 303m.

GEOLOGIST B. Bark DRILLER R. Fournel BIT NO. K000971 BIT FOOTAGE 32.1-58.2

MOVE TO HOLE 1:30-1:45

DRILL 1:45-3:15

MECHANICAL DOWN TIME ____

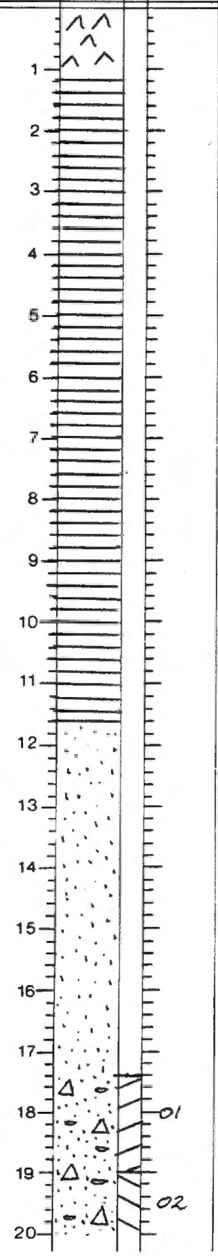
DRILLING PROBLEMS ____

OTHER ____

MOVE TO NEXT HOLE ____

page 1 of 2

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



0-1.0 Organics

1.0-17.4 OJIBWAY II SEDIMENTS

1.0-7.2 - non-gritty dark gray clay
- becomes lighter gray below 4.7m.
- 2-3cm chunks

7.2-11.6 - softer light gray clay
- beige silt varves approximately 10cm thick every 1m.

11.6-17.4 - fine grained grey-beige sand
- well sorted

17.4-24.1 Chibougamau Till
- abrupt contact with overlying Sediments
- fine grained gray to gray-beige sand silt matrix
- Cobble supported till
- clasts, predominantly cobbles, occassional pebbles, approximately
60% Volcanic/Sediments
40% Granitoid

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

HOLE NO ALS-89-183 LOCATION ____________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

SHIFT HOURS
______ TO ______

MOVE TO HOLE ____________

DRILL ____________

TOTAL HOURS
______

MECHANICAL DOWN TIME ____________

DRILLING PROBLEMS ____________

CONTRACT HOURS
______

OTHER ____________

MOVE TO NEXT HOLE ____________

page 2 of 2

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			02	20.4-23.5 - matrix supported till
21			03	- very easy drilling
22				- pebble clasts, occassional cobbles, approximately
23			04	60% Volcanic/Sediments
24			05	40% Granitoid
25			06	23.5-24.1 - clast supported till
			bedrock	- matrix as above
26				- cobbles, approximately
27				90% Volcanic/Sediment
28				10% granitoid - possibly subcrop.
29				24.1-26.1 BEDROCK
10				- bleached green and white colour
				- fine grained
11				- weak foliation
12				- >10% carbonate minerals (strong reaction to HCl)
13				- no visible sulphides - high percentage of quartz stringers
14				- very soft to drill - Intermediate to Mafic Volcanic
15				
16				26.1 E.O.H.
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Jan. 31, Feb 1 19 89

SHIFT HOURS ______ TO ______

TOTAL HOURS ______

CONTRACT HOURS ______

HOLE NO PLS-89-184 LOCATION Site #22 ELEVATION 303m.

GEOLOGIST B. Bock DRILLER R. Fournel BIT NO. K000971 BIT FOOTAGE 58.2-102.4

MOVE TO HOLE 3:15-3:30

DRILL Jan. 31 3:30 - 4:30 Feb. 1 - 1:30 P.M.

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel Jan. 31 4:30-5:30 Feb 1

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0-1.0 Organics
1				1.0-13.1 OJIBWAY II SEDIMENTS
2				1.0-11.2 - non-gritty dark gray clay
3				- slightly hard
				- becomes light gray below 3.4m.
4				- occassional beige silt varves, approximately 2cm thick every 1m.
5				
6				11.2-13.1 - fine grained gray-beige sand
7				- very well sorted
8				13.1-34.2 Chibougamau Till
9				- abrupt contact with overlying Sediments
				- matrix supported till
10				- fine grained gray sand silt matrix
11				- pebbles and predominantly cobbles, approximately
12				60% Volcanic/Sediments
				40% Granitoid
13				
14			01	19.7-22.2 - clast supported till
15				- decrease in fine grained sand silt matrix
16			02	- clast composition, cobbles, approximately
17				50% Volcanic/Sediments
				50% granitoid
18			03	
19				
20			04	

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

SHIFT HOURS

______ TO ______

TOTAL HOURS

______

CONTRACT HOURS

______

HOLE NO PLS-89-184 LOCATION ________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

MOVE TO HOLE ________

DRILL ________

MECHANICAL DOWN TIME ________

DRILLING PROBLEMS ________

OTHER ________

MOVE TO NEXT HOLE ________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40			04, 05, 06, 07, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16	see below

22.2-23.8 - matrix supported till
- appears partially sorted
- slow drilling
- clasts, cobbles approximately
60% Volcanic/Sediment
40% Granitoid

23.8-34.2 - till similar to 13.1-19.7

24.4-24.9 - Boulder (diorite)

34.2-37.4 Missinaibi Sediment

34.2-36.0 - Gravel
- medium to coarse grained matrix
- very high pebble content, approximate composition 60% Volcanic/Sediments
40% Granitoid
- occassional thin interbed (10cm) of fine grained beige sand

36.0-36.2 - medium grained sand
- well sorted, no clasts

36.2-36.5 - fine grained beige sand
- occassional thin pebble laminations

36.5-37.4 - fine grained beige sand, with interbedded gray clay (10-20cm thick)

37.4-42.7 Lower Till
- matrix supported till
- fine grained gray-beige sand silt matrix
- predominantly cobbles, with some pebbles
60% Volcanic/Sediments
40% Granitoid

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

HOLE NO PLS-89-184 LOCATION ________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

SHIFT HOURS ________ TO ________

MOVE TO HOLE ________

DRILL ________

TOTAL HOURS ________

MECHANICAL DOWN TIME ________

DRILLING PROBLEMS ________

CONTRACT HOURS ________

OTHER ________

MOVE TO NEXT HOLE ________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			16	
41			17	42.7-44.2 BEDROCK
42			18	- light to medium green colour with brownish orange staining
43			19	- fine grained
44			bedrock	- moderate foliation
45				- predominant mafic mineral is chlorite
46				- ≥10% carbonate minerals (strong reaction to HCL)
47				- 1-2% visible disseminated sulphides
48				- evidence of shearing
49				- Intermediate Volcanic
10				44.2 E.O.H.
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 1,2,3,4,5 1989

SHIFT HOURS ______ TO ______

TOTAL HOURS ______

CONTRACT HOURS ______

HOLE NO PLS-89-185 LOCATION Site #23 ELEVATION 302m.

GEOLOGIST B.Bork DRILLER R. Fournel BIT NO. A000011 / K000973 BIT FOOTAGE 0-13.5 (defective) / 0-36.8

MOVE TO HOLE 1:30-1:45

DRILL Feb 1 1:45-3:30 Feb 2 no drilling Feb 3 11:15-12:00 (no return) Feb 4 12:45-4:30 Feb 5 7:30-12:00

MECHANICAL DOWN TIME Feb 1 3:30-4:30 try repair pump Feb 2,3 all day Feb 4 7-1:00 AM.

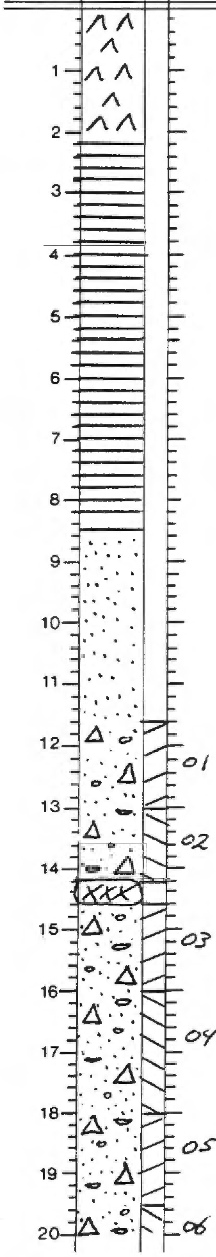
DRILLING PROBLEMS

OTHER Travel Feb 1 4:30-5:00 Feb 2 6:30-7:00 AM; 12:00-1:00 PM, Feb 3 6:30-7:00, 2:00-2:30,

MOVE TO NEXT HOLE Feb 4 - 6:30-7:00, 5:00-5:30 Feb 5 6:30-7:00

New Bit & Sub. page 1 of 3

DEPTH IN METRES / GRAPHIC LOG / INTERVAL / SAMPLE NO.	DESCRIPTIVE LOG						



0-2.0 Organics

2.0-11.6 OJIBWAY II SEDIMENTS

2.0-8.5 - non gritty dark gray clay
- moderately hard
- 2 3 cm cylindrical chunks
- poor return
- clay becomes beige colour below 5.4m, due to silt varves approximately 10cm thick every 1m.

8.5-11.6 - fine grained gray-beige sand
- well sorted

11.6-48.8 Chibougamau Till

11.6-13.2 - abrupt contact with overlying Sediments
- matrix supported till
- fine grained gray-beige sand silt matrix
- clasts, pebbles and predominantly cobbles approximate composition
60% Volcanic/Sediments
40% Granitoid

13.2-24.7 - clast supported till
- decrease in matrix
- slower drilling

14.2-14.6 Boulder (diorite)

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

HOLE NO PLS-89-185 LOCATION ____________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

SHIFT HOURS ______ TO ______

MOVE TO HOLE ________

DRILL ________

TOTAL HOURS ________

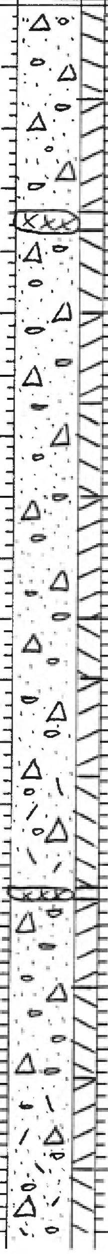
MECHANICAL DOWN TIME ________

DRILLING PROBLEMS ________

CONTRACT HOURS ________

OTHER ________

MOVE TO NEXT HOLE ________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21–40			06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18	

23.4-23.7 Boulder (granite)

24.7-32.7 - matrix supported till
- fine grained gray-beige sand silt matrix
- pebbles and predominantly cobble clasts approximate composition 60% Volcanic/Sediments 40% Granitoid

32.7-34.6 - light gray gritty clay lumps introduced into matrix
- flacky texture
- decrease in clasts
- significant fine grained gray-beige sand

34.4-34.6 Boulder (gabbro)

34.6-37.6 - no more clay
- similar to 24.7-32.7

37.6-40.1 - occassional gray gritty clay lumps as in 32.7-34.6

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO RS-89-185 LOCATION ________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

MOVE TO HOLE ________

DRILL ________

MECHANICAL DOWN TIME ________

DRILLING PROBLEMS ________

OTHER ________

MOVE TO NEXT HOLE ________

page 3 of 3

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			18	40.1-40.7 - clay rich till
41			19	- gray gritty clay lumps
42				- very few clasts
43			20	- significant fine grained gray-beige sand
44			21	40.7-42.8 - clast supported till
45				- no more clay
				- very cobbly, approximately
46			22	50% Volcanic/Sediments
47			23	50% granitoid
48				42.8-44.3 - clay in matrix
			24	- similar to 37.6-40.7
49			25	44.3-48.8 - as in 40.1-40.7
50			bedrock	
51				48.8-50.3 BEDROCK
52				- white to slightly green colour
53				- fine grained
				- weakly foliated
54				- high percentage of carbonate minerals (strong reaction to HCL)
55				- some evidence of shearing
56				- predominant mafic mineral is chlorite
57				- Intermediate Volcanic
58				50.3 E.O.H.
59				
60				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 5 1989

HOLE NO PLS-89-186 LOCATION Site #28 ELEVATION 303m.

GEOLOGIST B. Bork DRILLER R. Fournel BIT NO. K000973 BIT FOOTAGE 36.8-66.4

SHIFT HOURS ____ TO ____

MOVE TO HOLE 12:00-12:45

DRILL 12:45-4:15

TOTAL HOURS ____

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

CONTRACT HOURS ____

OTHER Travel 4:45-5:30

MOVE TO NEXT HOLE 4:15-4:45

page 1of2

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0-2.0 Organics
1				2.0-16.7 OJIBWAY II SEDIMENTS
2				2.0-10.7 - slightly gritty gray clay - 1-2cm cylindrical chunks - softens downsection, rods drop by themselves
3				
4				
5				10.7-14.7 - fine grained gray to gray-beige sand - well sorted - occassional interbed of non-gritty gray clay approximately 10cm thick every 1.5m.
6				
7				
8				
9				14.7-16.7 - medium to coarse grained sand - well sorted
10				
11				
12				16.7-28.1 Chibougamau Till - abrupt contact with overlying Sediments - fine grained gray-beige sand silt matrix - clast supported till - predominantly cobble clasts, approximately 60% Volcanic/Sediments 40% granitoid
13				
14				
15				
16				
17			01	
18			02	
19			03	
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO PLS-89-186 LOCATION ______ ELEVATION ______

GEOLOGIST ______ DRILLER ______ BIT NO. ______ BIT FOOTAGE ______

MOVE TO HOLE ______

DRILL ______

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

OTHER ______

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21			03	
22			04	
23			05	
24				
25			06	27.4-28.1 Boulder (diorite)
26			07	
27				28.1-28.2 - very thin veneer of till - to thin to log or sample
28	XXX		08	
29			bedrock	
10				28.2-29.6 BEDROCK - white colour with mottled green colour - fine to medium grained - massive to weak foliation - Some evidence of shearing - predominant mafic mineral is chlorite, approximately 25% of rock - >10% carbonate minerals - brown staining along some cleavage plains - Intermediate Volcanic
11				
12				
13				
14				
15				
16				
17				
18				29.6 E.O.H.
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE *Feb 6* 19*89*

SHIFT HOURS

_____ TO _____

TOTAL HOURS

_____

CONTRACT HOURS

_____

HOLE NO *PLS-89-187* LOCATION *Site #29* ELEVATION *305m.*

GEOLOGIST *B.Bark* DRILLER *R. Fournel* BIT NO. *K000968* *K000974* BIT FOOTAGE *0-33.0* *0-42.2*

MOVE TO HOLE _____

DRILL *7:00-5:00*

MECHANICAL DOWN TIME _____

DRILLING PROBLEMS _____

OTHER *Travel 6:30-7:00 A.M. 5:00-5:30 P.M.*

MOVE TO NEXT HOLE _____

2 New Bits and 1 Sub

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1–20			01, 02, 03, 04, 05, 06	

0-1.0 Organics

1.0-8.6 OJIBWAY II SEDIMENTS

1.0-4.7 - non-gritty beige clay
- approximately 1cm cylindrical chunks
- soft drilling

4.7-7.2 - fine grained gray-beige sand
- well sorted

7.2-8.2 - medium grained sand
- well sorted

8.6-34.2 Chibougamau Till
- abrupt contact with overlying sediments
- Clast supported till
- fine grained gray-beige sand silt matrix
- clasts: predominantly cobbles, approximately 60% Volcanic/Sediments 40% granitoid

11.8-26.4 - very little matrix
- very cobbly, slow drilling
- return is very poor
- sample intervals are 2.0-2.5m and still only obtaining approximately 4 Kg.
- drill is operating at very slow penetration

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 ___

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO PLS-89-187 LOCATION ____________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ______ BIT FOOTAGE ______

MOVE TO HOLE ____________

DRILL ____________

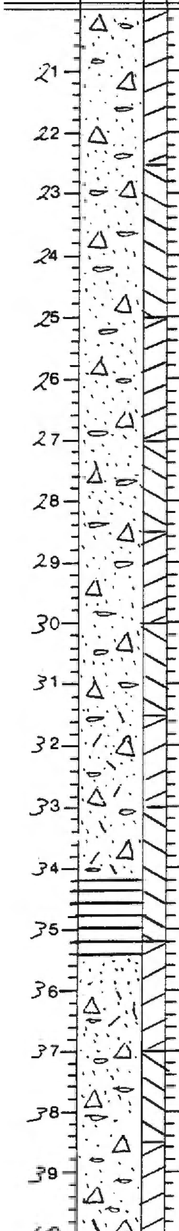
MECHANICAL DOWN TIME ____________

DRILLING PROBLEMS ____________

OTHER ____________

MOVE TO NEXT HOLE ____________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



26.4 → sample return improved making sample interval regular 1.5m.

31.7-34.2 - clay rich till
- gray slightly gritty clay
- flocky texture
- very few clasts
- significant fine grained gray sand

→ 33.0 pull rods due to plugged bit.

34.2-35.9 Missinaibi Sediments

34.2-35.4 - indistinct contact with overlying till
- non-gritty dark gray clay
- moderately hard drilling
- no clasts or sand

35.4-35.9 - fine grained gray sand
- well sorted
- occassional thin interbeds of pure gray clay

35.9-42.2 Lower Till

35.9-36.4 - fine grained gray sand silt matrix
- occassional gray gritty clay lumps
- occassional clasts; predominantly cobbles
60% Volcanic/Sediments
40% Granitoid

36.4-39.7 - till similar to above
- no gray gritty clay

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO PLS-89-187 LOCATION ________ ELEVATION ________
GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________
MOVE TO HOLE ________
DRILL ________
MECHANICAL DOWN TIME ________
DRILLING PROBLEMS ________
OTHER ________
MOVE TO NEXT HOLE ________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
41			18	39.7-40.7 - till, similar to 35.9-36.4
42			19	40.7-42.2 - till, with no clay - very sandy - fine grained gray sand - occassional cobbles, approximately 50% Volcanic/Sediments 50% Granitoid - Bedrock not reached. 42.2 → bit plugged, had to pull out of hole. Driller recommended not going down same hole for a third time, because return would be very poor. Moved drill back 6ft to West and drilled PLS-89-187A → see log for 187A.
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb. 7 1989

SHIFT HOURS ____ TO ____

TOTAL HOURS ____

CONTRACT HOURS ____

HOLE NO PLS-89-187A LOCATION 6ft west of hole 187 ELEVATION 305m.

GEOLOGIST B. Bock DRILLER R. Fournel BIT NO. K000970 BIT FOOTAGE 0-42.5m.

MOVE TO HOLE

DRILL 7:00 - 4.30

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel 6:30-7:00 A.M. 5:00-5:30 P.M.

MOVE TO NEXT HOLE 4:30-5:00 P.M.

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
41			20	* hole #187A was not logged or sampled until 41.0m. The stratigraphy is similior to hole # 187 which is located 6ft. to the east.
42			bedrock	
43				
44				→ bedrock was intersected 1.2m above farthest depth reached in hole #187. This would indicate that bedrock is very steeply plunging in this area.
5				
6				
7				
8				
9				
10				41.0-42.5 BEDROCK
11				-white colour with mottled green crystals comprising 50% of rock - coarse grained (.5-2mm) - massive structure - predominant mafic mineral is chlorite - <1% visible sulphides - approximately 5% carbonate minerals - Gabbro
12				
13				
14				
15				
16				
17				42.5 E.O.H.
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 8 1989

SHIFT HOURS

____ TO ____

TOTAL HOURS

CONTRACT HOURS

HOLE NO PLS-89-188 LOCATION Site #30 ELEVATION 305m.

GEOLOGIST B.Cook DRILLER R.Fennel BIT NO. K008970 BIT FOOTAGE 425-90.7

MOVE TO HOLE 100-200

DRILL

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel 6:30-7:00 A.M.

MOVE TO NEXT HOLE

DEPTH IN METRES	INTERVAL / SAMPLE NO.	DESCRIPTIVE LOG
0–1		0-1.0 Organics
1		1.0-11.4 OJIBWAY II SEDIMENTS
1–3		1.0-3.4 - beige slightly gritty clay - very small chunks
3.4–5.6		3.4-5.6 - fine grained, beige sand - well sorted
5.6–6.0		5.6-6.0 - medium to coarse grained beige sand - some thin laminations of pebbles approximately 20cm thick
6.0–10.4	01	6.0-10.4 - interbedded sand and Gravel - Gravel; medium and coarse grained beige matrix - thin 2cm interbeds of fine grained and medium grained beige sand approximately every .5m.
10.4–10.9		10.4-10.9 - fine grained gray sand
10.9–11.4		10.9-11.4 Boulder (mafic Volcanic)
11.4–18.2	02, 03, 04, 05	11.4-40.5 Chibougamau Till - fine grained gray sand silt matrix - clast supported till - clasts, predominantly cobbles, approximately 60% Volcanic/Sediments 40% Granitoid
18.2–19.0	06	18.2-19.0 - matrix supported till - decrease in clasts - matrix as above
19.0–20.1	07	19.0-20.1 - fine grained gray-beige sand interbed

20.1-20.7 - medium to coarse grained beige sand
- well sorted

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

HOLE NO PLS-89-188 LOCATION ________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

SHIFT HOURS ________ TO ________

MOVE TO HOLE ________

DRILL ________

TOTAL HOURS ________

MECHANICAL DOWN TIME ________

DRILLING PROBLEMS ________

CONTRACT HOURS ________

OTHER ________

MOVE TO NEXT HOLE ________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21–40			07–18	

Sample Nos.: 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18

20.7-23.4 Till, similior to 11.4-18.2

23.4-25.2- till similior to above
- very thin sections of gray slightly gritty clay in matrix
- clay is flaky and occurs as 10cm beds approximately

25.2-27.6 - fine grained gray sand
- no clasts, well sorted
- occassional flakes of gray clay
- sand becomes slightly coarser downsection

27.6-31.6 - Clay rich till
- predominantly slightly gritty gray clay lumps
- significant fine grained gray sand
- very little return
- very few clasts

31.6-37.1 Till similior to 20.7-23.4

37.1-38.2 - gray coarse grained sand
- very few clasts
- occassional wood chips

38.2-39.3 - fine grained gray-beige sand
- occassional small clasts
- appears well sorted.

39.3-40.2 - matrix supported till
- fine grained gray sand silt matrix
- clasts, predominantly cobbles
  60% Volcanic/Sediments
  40% Granitoid

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

SHIFT HOURS

____ TO ____

TOTAL HOURS

____

CONTRACT HOURS

____

HOLE NO PLS-89-188 LOCATION ________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

MOVE TO HOLE ________

DRILL ________

MECHANICAL DOWN TIME ________

DRILLING PROBLEMS ________

OTHER ________

MOVE TO NEXT HOLE ________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			18	40.2-40.5 - till becomes very cobbly
41				- decrease in matrix
42			19	- clast supported till
3				40.5-41.6 Missinabie Sediments
4			20	- dark gray coloured clay
			bedrock	
5				- non-gritty
				- hard drilling
6				- no clasts, no sand
7				41.6-43.2 Lower Till
8				- very cobbly till
9				- fine grained gray sand matrix
10				- cobbles, approximately
11				75% Volcanic / Sediments
				25% Granitoid
12				
13				43.2-45.2 BEDROCK
14				- light green colour
15				- medium grained
				- massive structure
16				- predominant mafic mineral is chlorite
17				- very sheared
				- soft drilling
18				- approximately 1% visible sulphides
19				- Gabbro.
20				45.2 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 8 1989

SHIFT HOURS ___ TO ___

TOTAL HOURS ___

CONTRACT HOURS ___

HOLE NO PLS-89-187 LOCATION L64E 26+50N ELEVATION 316

GEOLOGIST B.Beck DRILLER R.Fournel BIT NO. L670274 BIT FOOTAGE 0-5.1

MOVE TO HOLE 2:00-2:45 P.M.

DRILL 2:45-3:30

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0-2.0 No Return
				2.0-3.6 OJIBWAY II SEDIMENTS
				- slightly gritty beige clay
				- moderately hard to drill
				3.6-5.1 BEDROCK
			01 bedrock	- medium green colour
				- fine grained
				- well foliated
				- highly sheared
				- approximately 5% quartz stringers
				- 3-5% visible sulphides
				- predominant mafic mineral is chlorite
				- brown staining along some fracture surfaces
				- Mafic Volcanic
				5.1 E.O.H.

Depth scale: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 8 1989

HOLE NO PLS-89-190 LOCATION L58E 28450N ELEVATION 316

GEOLOGIST B.Bock DRILLER R.Fournel BIT NO. CB70274 BIT FOOTAGE 5.1-10.1

SHIFT HOURS ____ TO ____

MOVE TO HOLE 3:30-3:45

DRILL 3:45-5:00

TOTAL HOURS ____

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

CONTRACT HOURS ____

OTHER Travel 5:00-5:30

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0-0.5 Organics
1				0.5-3.1 OJIBWAY II SEDIMENTS
2				- slightly gritty beige clay - moderately hard to drill
3			01	
4			02	3.1-3.4 Chibougamau Till
			bedrock	- abrupt contact with overlying Sediments
5				
6				- fine grained beige sand silt matrix
7				- clasts, mainly pebbles, some cobbles, approximate composition
8				50% Volcanic/Sediment
9				50% Granitoid
10				* - sample 01 may be contaminated with bedrock
11				3.4-5.0 BEDROCK
12				- medium green colour, light green below 4.1m.
13				- fine grained - well foliated
14				- some brown staining along fracture surfaces
15				- predominant mafic mineral is chlorite
16				- approximately 5% visible sulphides - highly sheared
17				- Intermediate to Mafic Volcanic
18				
19				5.0 E.O.H.
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

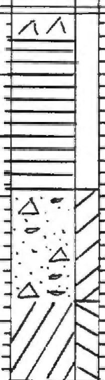
DATE Feb. 9 19 89

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO PLS-89-191 LOCATION L52E 28N ELEVATION 314m
GEOLOGIST B. Bork DRILLER R. Fournel BIT NO. CB70774 BIT FOOTAGE 10.1-16.1
MOVE TO HOLE 7:00-7:30
DRILL 7:30-10:30
MECHANICAL DOWN TIME ______
DRILLING PROBLEMS ______
OTHER Travel 6:30-7:00
MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG						
				0-0.5 Organics						
1				0.5-2.9 OJIBWAY II SEDIMENTS						
2				- slightly gritty beige clay						
				- 1cm cylindrical chunks						
3			01							
4				2.9-4.7 Chibougamau Till						
				- abrupt contact with overlying Sediments						
5			02 bedrock	- matrix supported till						
6				- fine grained grey-beige sand silt matrix						
7										
8				- clasts, predominantly cobbles approximate composition						
9				50% Volcanic/Sediments						
10				50% Granitoid						
11				4.7-6.0 BEDROCK						
12				- light green colour						
				- fine grained						
13				- well foliated (schistose)						
14				- predominant mafic mineral is chlorite						
15				- <1% visible sulphides						
16				- approximately 3-5% quartz stringers						
17				- Intermediate Volcanic						
18				6.0 E.O.H.						
19										
20										

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE *Feb. 9* 19*89*

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO *PS-89-192* LOCATION *L48E 28450N* ELEVATION *313m.*

GEOLOGIST *B.Bork* DRILLER *R.Fournel* BIT NO. *CB70274* BIT FOOTAGE *16.1-23.6*

MOVE TO HOLE *10:30-10:45*

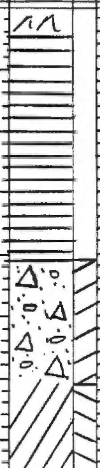
DRILL *10:45-11:30*

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

OTHER ______

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			01 (5)	0-0.5 Organics
			02 (6.5)	0.5-4.1 OJIBWAY II SEDIMENTS
			bedrock (7)	- gray slightly gritty clay
				- very poor return
				4.1-6.1 Chibougamau Till
				4.1-4.4 - fine grained beige sand silt matrix
				- very oxidized matrix and clasts
				- clasts, predominantly cobbles, approximately 50% Volcanic/Sediments 50% Granitoid
				4.4-6.1 - matrix becomes gray sand and silt
				- clasts, predominantly cobbles, 60% Volcanic/Sediments 40% Granitoid
				- matrix supported till
				6.1-7.5 BEDROCK
				- light green colour
				- fine grained
				- very well foliated (schistose)
				- predominant mafic mineral is chlorite
				- highly sheared
				- <1% visible sulphides
				- Intermediate Volcanic
				7.5 E.O.H.

Depth scale: 1–20 metres

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb. 9,10 1989

HOLE NO PLS-89-193 LOCATION L58E 2100N ELEVATION 319m.

GEOLOGIST B.Bark DRILLER R. Fournel BIT NO. CB70274 BIT FOOTAGE 23.6-53.1

SHIFT HOURS

____ TO ____

MOVE TO HOLE 11:30-12:15

DRILL Feb 9 12:15-5:00 P.M. Feb 10 7:00-9:30 A.M.

TOTAL HOURS

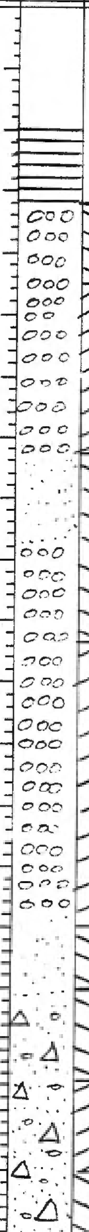
MECHANICAL DOWN TIME

DRILLING PROBLEMS

CONTRACT HOURS

OTHER Travel Feb 9 5:00-5:30 P.M. Feb. 10 6:30-7:00 A.M.

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1–20			01 (4 m), 02 (6 m), 03 (9 m), 04 (12.5 m), 05 (16 m), 06 (17 m), 07 (18 m), 08 (19.5 m)	see below

0-2.0 No Return

2.0-16.1 OJIBWAY II SEDIMENTS

2.0-3.2 - beige slightly gritty clay
- moderately compact

3.2-14.8 Gravel

3.2-5.3 - medium to coarse grained matrix
- clasts, predominantly pebbles, occassional cobbles, composition 50% Volcanic/Sediments 50% granitoid
- occassional interbeds of coarse grained beige sand with no clasts, approximately .3m thick

5.3-6.5 - gravel becomes slightly oxidized with beige to ochre coloured medium grained sand
- clasts as above

6.5-7.3 - matrix as above
- clast become very oxidized

7.3-8.8 - Coarse grained beige sand
- occassional small clasts

8.8-14.8 - Gravel as in 5.3-6.5
- predominantly cobbles, very poor return

14.8-16.1 - medium to coarse gray-beige sand as in 7.3-8.8

16.1-28.0 - Chibougamau Till

16.1-17.2 - fine grained gray sand silt matrix
- clasts, pebbles and predominantly cobbles
60% Volcanic/Sediments
40% Granitoid

17.2- See Next page.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO PLS-89-193 LOCATION ________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

MOVE TO HOLE ________

DRILL ________

MECHANICAL DOWN TIME ________

DRILLING PROBLEMS ________

OTHER ________

MOVE TO NEXT HOLE ________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			08	17.2 - 18.0 - matrix and clasts become oxidized
21				- thin sections approximately 10-20cm with no fine sand matrix
22				
23			09	18.0-20.4 - till similar to 16.1-17.2
24				- matrix supported, very few clasts.
25			10	20.4-27.0 - clast supported till
26			11	- decrease in fine grained gray-beige sand
27				- slower drilling
28			12	- clasts, predominantly cobbles 50% Volcanic/Sediments 50% Granitoid
29			13	
			bedrock	27.0-28.0 - similar to above - gray gritty clay lumps.
10				
11				
12				28.0-29.5 BEDROCK
13				- dark green colour - medium grained
14				- weakly foliated to massive structure - Some evidence of shearing
15				- predominant mafic mineral is hornblende - no visible sulphides
16				- Gabbro
17				
18				29.5 E.O.H.
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb. 10 1989

SHIFT HOURS

____ TO ____

TOTAL HOURS

____

CONTRACT HOURS

____

HOLE NO PLS 89-194 LOCATION L48E 15+50N ELEVATION 318m.

GEOLOGIST B. Bork DRILLER R. Fournel BIT NO. CB70274 BIT FOOTAGE 53.1-71.8

MOVE TO HOLE 9.30-10.00

DRILL 10.00-1.00

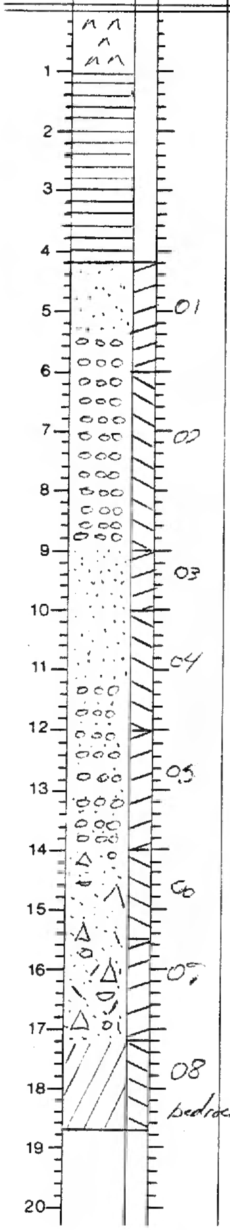
MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



0-1.0 Organics

1.0-13.8 OJIBWAY II SEDIMENTS

1.0-4.2 - beige slightly gritty clay

4.2-5.3 - medium grained beige sand
- well sorted

5.3-8.8 - Gravel
- medium and coarse grained sand matrix
- very cobbly, approximately
50% Volcanic/Sediments
50% Granitoid

8.8-9.8 - medium grained gray/beige sand
- well sorted

9.8-11.2 - coarse grained oxidized beige sand
- occassional pebbles

11.2-13.2 - similar to 5.3-8.8 with thin interbeds of medium grained beige sand approximately .2m thick

13.2-13.8 - Gravel, similar to 5.3-8.8

13.8-17.2 Chibougamau Till
- fine grained gray sand silt matrix
- pebbles and predominantly cobbles, approximately
60% Volcanic/Sediments
40% Granitoid
- clast supported till

15.5-17.2 - clay rich till
- gray gritty clay lumps
- significant fine grained gray sand
- clasts mostly cobbles, 60% Volcanic/Sediments
40% granitoid

17.2-18.7 BEDROCK
- dark green colour
- medium to coarse grained
- massive structure
- predominant mafic mineral is hornblende
- decrease in feldspar below 18.1 and becomes slightly magnetic
- Intrusive (possible Gabbro)

18.7 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 10, 11 19 89

SHIFT HOURS
____ TO ____

TOTAL HOURS
____

CONTRACT HOURS
____

HOLE NO FLS-89-195 LOCATION L64E 16+50N ELEVATION 310m

GEOLOGIST B.Bak DRILLER R.Furnel BIT NO. CB70274 BIT FOOTAGE 71.8-106.4

MOVE TO HOLE 1:00-1:30 P.M.

DRILL Feb.10 1:30-5:00 Feb 11 7:0-8:30 A.M.

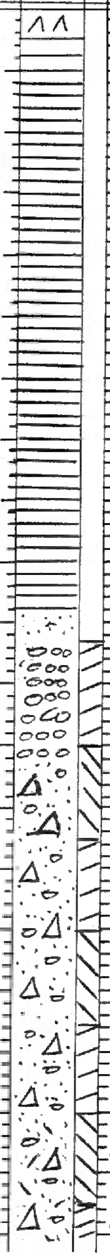
MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel Feb10 5:00-5:30 P.M. Feb. 11 :0-7:0 P.M.

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



Depth (metres): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

Sample No.: 01 (≈11 m), 02, 03, 04, 05, 06, 07 (≈20 m)

0-0.5 Organics

0.5-12.2 OJIBWAY II SEDIMENTS

0.5-3.4 - slightly gritty beige clay

3.4-9.8 - becomes gray beige colour
- softens downsection, to a soupy texture.

9.8-10.3 - fine grained gray-beige sand
- occassional thin interbeds of gray-beige clay

10.3-12.2 Gravel
- medium to coarse grained sand matrix
- lots of clasts, pebbles and occassional cobbles, approximate composition
60% Volcanic / Sediments
40% granitoid

12.2-33.1 Chibougamau Till
- fine grained gray to gray-beige sand silt matrix
- matrix supported till
- clasts, pebbles and cobbles, approximately
60% Volcanic / Sediments
40% Granitoid

15.1-18.3 - clast supported till
- becomes very cobbly, slow drilling
approximately 60% Volcanic / Sediments
40% granitoid
- decrease in matrix

18.2-22.1 - similar to above
- gray gritty clay lumps in matrix.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO PLS-89-195 LOCATION ____________ ELEVATION ________
GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________
MOVE TO HOLE ________
DRILL ________
MECHANICAL DOWN TIME ________
DRILLING PROBLEMS ________
OTHER ________
MOVE TO NEXT HOLE ________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21			07	22.1-25.3 - till as in 12.2-15.1
22			08	25.3-26.4 - occassional gray gritty clay lumps in matrix.
23				
24				28.1-31.2 - Clay rich till
25			09	- predominantly gray gritty clay lumps.
				- significant fine grained gray sand
26			10	- occassional small clasts.
27				31.2-33.1 - till similar to 25.3-26.4.
28			11	
29				33.1-34.6 BEDROCK
30			12	- medium green colour
31				- fine grained
				- moderate foliation
32			13	- predominant mafic mineral is chlorite
33			14	- some brown staining along fracture surfaces.
34			Bedrock	- Mafic Volcanic
35				
36				34.6 E.O.H.
37				
38				
39				
40				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 11 19 89

SHIFT HOURS

______ TO ______

TOTAL HOURS ______

CONTRACT HOURS ______

HOLE NO PLS-89-196 LOCATION L72E 14400N ELEVATION 312m.

GEOLOGIST B. Bork DRILLER R. Fournel BIT NO. CB70274 BIT FOOTAGE 706.4-1147

MOVE TO HOLE 8:30 - 9:00

DRILL 9:00 - 10:00

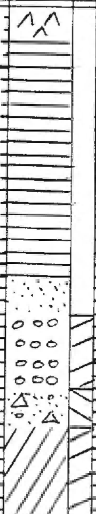
MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			01	
			02	
			03	
			bedrock	



Depth scale: 1–20

0-0.5 Organics

0.5-6.2 OJIBWAY II SEDIMENTS

0-4.4 - beige slightly gritty clay
- very poor return

4.4-5.0 - fine grained gray-beige sand
- well sorted

5.0-6.2 - Gravel
- medium to coarse grained beige sand matrix
- lots of clasts, predominantly cobbles, some pebbles, approximately
50% Volcanic/Sediments
50% Granitoid

6.2-6.8 Chibougamau Till
- fine grained gray sand silt matrix
- matrix supported till
- clasts, mainly cobbles approximately
60% Volcanic/Sediments
40% granitoid

6.8-8.3 BEDROCK
- medium green colour
- fine grained
- moderate foliation
- predominant mafic mineral is chlorite
- approximately 5% quartz stringers
- Mafic Volcanic

8.3 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb. 11 1989

SHIFT HOURS ____ TO ____

TOTAL HOURS ____

CONTRACT HOURS ____

HOLE NO PLS-89-197 LOCATION L72E 19475N ELEVATION 309m.

GEOLOGIST B.Bork DRILLER R.Fournel BIT NO. CB70274 / CB70275 BIT FOOTAGE 119.7-133.9 / 0-5.3

MOVE TO HOLE 10:00-10:30

DRILL 10:30-5:00

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel 5:00-5:30

MOVE TO NEXT HOLE

New Bit Page 1 of 2

DEPTH IN METRES	SAMPLE NO.	DESCRIPTIVE LOG
0–1		0-1.0 Organics
1		1.0-19.7 OJIBWAY II SEDIMENTS
1–2		1.0-5.2 - slightly gritty beige clay
		- becomes gray below 4.7
3		5.2-6.6 - very fine grained gray-beige sand
4		- occassional interbeds of gray clay approximately 10cm thick
5–6		6.6-7.2 - medium to coarse grained sand
6–7		- thin laminations of pebbles, approximately 5 to 10cm thick
7		7.2-19.7 Gravel
8	01	- medium to coarse grained beige sand matrix
9		- clasts, predominantly cobbles, approximately 50% Volcanic/Sediments 50% Granitoid
10		- slow to drill
11	02	12.2-12.6 - very thin layers of oxidized clasts (5-10cm)
12		12.6-13.4 - little or no matrix, water very clear
13		13.4-16.3 - Gravel similar to 7.2-12.2
14	03	16.3-19.7 - as in 12.6-13.4
		18.2-18.4 Boulder (Diorite)
15–16		19.7-23.7 Chibougamau Till
16		- fine grained gray sand silt matrix
17	04	- clasts, predominantly cobbles, approximately 70% Volcanic/Sediments 30% granitoid
19		- clast supported till
20	05	

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO PLS-89-197 LOCATION ________ ELEVATION ________

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE ________

MOVE TO HOLE ________

DRILL ________

MECHANICAL DOWN TIME ________

DRILLING PROBLEMS ________

OTHER ________

MOVE TO NEXT HOLE ________

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG						
21			05	20.0-21.3 - gray gritty clay in matrix. · similar to 19.7-20.0						
22										
23			06	21.3-23.7 - very cobbly, very little matrix · no more clay						
24			07 bedrock							
25				23.7 - 25.2 BEDROCK - dark green colour - fine grained - moderate foliation - predominant mafic mineral is chlorite - approximately 5% quartz stringers - no visible sulphides · Mafic Volcanic						
26										
27										
28										
29										
10										
11										
12				25.2 E.O.H.						
13										
14										
15										
16										
17										
18										
19										
20										

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 18 1989

SHIFT HOURS

_____ TO _____

TOTAL HOURS

_____

CONTRACT HOURS

_____

HOLE NO PLS-89-198 LOCATION L 80E 18+50N ELEVATION 310 m

GEOLOGIST P. Collins DRILLER R. Fournier BIT NO. CB70157 BIT FOOTAGE 0.0 - 14.5

MOVE TO HOLE 3:45 - 5:00 Feb 17.

DRILL 9:00 - 12:30

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel 6:30 - 7:15 7:15 - 8:00 startup. 8:00 - 9:00 wait for water - change swivel

MOVE TO NEXT HOLE

New bit; new sub; new rods; new swivel new chuck.

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1–20			01 (≈3), 02 (≈6), 03 (≈7.5), 03 (≈9), 04 (≈10), 04 (≈11), 04 (≈12.8), 05 (≈13.7)	see below

0.0 - 0.5 Organics

0.5 - 7.0 Ojibway II Sediments

(0.5 - 1.5) beige (oxidized) slightly gritty soft clay

(1.5 - 3.4) Gravel: matrix supported sorted beige medium to coarse sand matrix. Pebble clasts (subrounded to rounded) of composition: 45% Volcanics and sediments; 55% Granitoids

(3.4 - 4.0) clast supported gravel no matrix of similar composition to 1.5 - 3.4

(4.0 - 7.0) returns to matrix supported gravel with occasional thin fine sand bed

7.0 - 12.8 Chibougamau Till

gray beige fine sand / silt and grey gritty clay matrix (3-5%) Cobble clast supported till of composition: 50% Volcanics and sediments; 50% Granitoids

boulders at: 8.0 - 8.6 gabbro
9.6 - 9.8 "
10.6 - 10.9 mafic volcanic
12.3 - 12.6 granitoid

Till is very cobbly; abundant -10 mesh cuttings in matrix. Below 8.6 m there is up to 30% gray gritty clay in matrix which results in less matrix return. It was necessary to extend sample interval to approximately 2m to get 8 kg samples.

12.8 - 14.5 Bedrock - Mafic Volcanic - medium to dark; fine grained; mod. foliation; carbonatized ~3% diss & stringers; silicified; chloritic; <1% sulphides

14.5 - E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 18 19__

SHIFT HOURS ____ TO ____

TOTAL HOURS ____

CONTRACT HOURS ____

HOLE NO PLS-89-199 LOCATION L88E 17N ELEVATION 304m

GEOLOGIST P. Collins DRILLER R. Fournier BIT NO. SB70157 BIT FOOTAGE 14.5 - 26.5

MOVE TO HOLE 12:30 - 12:50

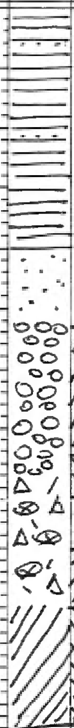
DRILL 12:50 - 2:00

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

OTHER ____

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–8				0.0-8.0 Ojibway II Sediments (0.0-4.0) beige (oxidized) slightly gritty, soft clay (4.0-5.0) beige fine grained sand (5.0-8.0) Gravel: medium sand matrix. Pebbles/cobbles clast supported of composition: 40% Volcanics and sediments; 60% Granitoids 7.0-8.0 occasional thin fine grained sand bed.
6			01	
8			02	8.0-10.0 Chibougamau Till gradational contact into till. beige grey fine sand/silt and grey gritty clay matrix (up to 20-25%) Clast supported: Cobble clasts of composition: 45% Volcanics and sediments; 55% Granitoid * sample 03 ≈ 4.0 kg; however, it was taken over 1.0m interval also matrix was clay rich which results in less sample return.
9.5			03	
10–12			04	10.0 - 12.0 Bedrock - dark green - fine grained - foliated - chloritic - 5% diss & veinlet carbonate - 3-5% quartz carbonate veinlets with trace hematite - below 11.0 occ. 2cm hematite rich bands - <1% sulphides Mafic Volcanic.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 19 19 89

HOLE NO PLS-89-202 LOCATION L48E 2+50N ELEVATION 326

GEOLOGIST P. Collins DRILLER R. Fournell BIT NO. CB70157 BIT FOOTAGE 59.8 - 67.8

SHIFT HOURS

____ TO ____

MOVE TO HOLE 11:45 - 12:15

DRILL 12:15 - 2:15

TOTAL HOURS

MECHANICAL DOWN TIME

DRILLING PROBLEMS

CONTRACT HOURS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			01	
			02	
			03	
			04	

0.0 - 1.0 Organics

1.0 - 11.6 Ojibway II Sediments

(1.0 - 3.0) beige (oxidized) slightly gritty soft clay

(3.0 - 3.5) beige fine grained sand

(3.5 - 6.0) interbeds of sand and gravel. Beige oxidized very fine to fine grained sand c occasional medium to coarse sand interbeds. Pebble and Cobble clasts of composition 40% Volcanics and Sediments; 60% Granitoids.

(6.0 - 7.5) Gravel: sorted coarse sand matrix. Cobble clast supported of composition: 30% Volcanics and sediments 70% Granitoids.

- less return on matrix during clast supported gravel (normal).

(7.5 - 9.3) sorted beige fine, medium and coarse sand interbeds

(9.3 - 10.7) similar to 6.0 - 7.5

(10.7 - 11.6) fine sand interbeds. initially appeared to be till yet too sorted.

11.6 - 13.0 Bedrock

- dark green
- fine grained
- foliated
- carbonatized (3-5%) both disseminated and stringer
- 2-3% qtz/carbonate veinlets
- < 1% sulphides
- Tr. hematite, epidote
- below 12.0 apple green bands (epidote!)
- c quartz/carbonate ≤ 1% sulphides

Mafic Volcanic

13.0 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 18 19 89

SHIFT HOURS ______ TO ______

TOTAL HOURS ______

CONTRACT HOURS ______

HOLE NO PLS-89-200 LOCATION L96E 17W ELEVATION 303m

GEOLOGIST P. Collins DRILLER R. Fournier BIT NO. CB70157 BIT FOOTAGE 26.5-46.0

MOVE TO HOLE 2:00 - 2:30

DRILL 2:30 - 4:00

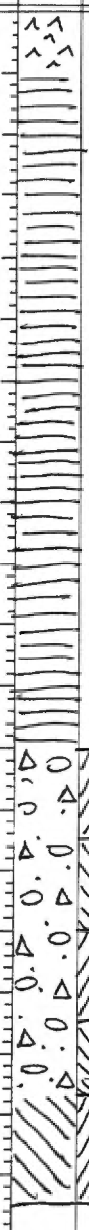
MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel to Camp. 5:00 - 5.45

MOVE TO NEXT HOLE 4:00 - 5:00

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



Depth (m): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

Sample No.: 01, 02, 03, 04, 05

0.0 - 1.0 Organics

1.0 - 11.8 Ojibway II Sediments

initially beige (oxidized) slightly gritty to non gritty grey soft clay (drumsection)

11.8 - 17.7 Chibougamau Till

beige grey slightly sorted (silt deficient) fine sand matrix up to 25% medium grained sand. → Matrix supported. Cobble clasts of composition: 45% Volcanics and Sediments; 55% Granitoids

- occasional thin medium grained sand bed.

below 16.2 till becomes clast supported resulting in less ~~most~~ return on matrix

17.7 - 19.5 Bedrock

- medium to dark green
- very fine to fine grained
- strong foliation; sheared
- chloritic
- carbonatized 5% diss. 15-20% carb/quartz veinlets
- < 1% disseminated sulphides

Mafic Volcanic.

19.5 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 19 19 89

SHIFT HOURS
____ TO ____

TOTAL HOURS
____

CONTRACT HOURS
____

HOLE NO PLS-89-201 LOCATION 57E 10N ELEVATION 319 m

GEOLOGIST P. Collins DRILLER R. Fournier BIT NO. 370157 BIT FOOTAGE 46.0-54.8

MOVE TO HOLE 4:00-5:00 Feb 18 (pm)

DRILL 10:15-11:45

MECHANICAL DOWN TIME Service brake band on water hauler 7:30-10:15

DRILLING PROBLEMS

OTHER Travel : 6:30-7:00

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–0.5				0.0 - 0.5 Organics
0.5–6.4				0.5 - 6.4 Ojibway II Sediments
0.5–4.5				0.5 - 4.5 beige (oxidized) slightly gritty soft clay (very little return on clay yet still can see small grains of clay on scoop).
4.5–6.4			01	4.5 - 6.4 beige (oxidized) sorted fine and medium grained sand
6.4–6.8				6.4 - 6.8 Chibougamau Till? appeared to be thin layer of till. Slightly unsorted beige fine sand matrix. Pebble / small cobble clasts of composition: 50% Volcanics and sediments; 50% Granitoids. Till is matrix supported.
6.8–8.8			02	6.8 - 8.8 Bedrock - dark green - fine grained - foliated - chloritic - 3-5% carbonate - <1% sulphides - hard to drill - ~1% hematite dissem. Mafic Volcanic
				8.8 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 19 19 89

SHIFT HOURS
____ TO ____

TOTAL HOURS

CONTRACT HOURS

HOLE NO PLS-89-202 LOCATION L 48E 2+50N ELEVATION 326
GEOLOGIST P. Collins DRILLER R. Fournell BIT NO. CB70157 BIT FOOTAGE 59.8 - 67.8
MOVE TO HOLE 11:45 - 12:15
DRILL 12:15 - 2:15
MECHANICAL DOWN TIME
DRILLING PROBLEMS
OTHER
MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–1				0.0 - 1.0 Organics
1–3				1.0 - 11.6 Ojibway II Sediments (1.0 - 3.0) beige (oxidized) slightly gritty soft clay (3.0 - 3.5) beige fine grained sand. (3.5 - 6.0) interbeds of sand and gravel. Beige oxidized very fine to fine grained sand c occasional medium to coarse sand interbeds.
4–6			01	
6–9			02	Pebble and Cobble clasts of composition. 40% Volcanics and Sediments; 60% Granitoids. (6.0 - 7.5) Gravel: sorted coarse sand matrix. Cobble clast supported of composition: 30% Volcanics and sediments 70% Granitoids. - less return on matrix during clast supported gravel (normal). (7.5 - 9.3) sorted beige fine, medium and coarse sand interbeds (9.3 - 10.7) similar to 6.0 - 7.5 (10.7 - 11.6) fine sand interbeds initially appeared to be till yet too sorted.
9–11.6			03	
11.6–13			04	11.6 - 13.0 Bedrock - dark green - fine grained - foliated - carbonatized (3-5%) both disseminated and stringer - 2-3% qtz/carbonate veinlets - < 1% sulphides - Tr. hematite, epidote - below 12.0 apple green bands (epidote!) - c quartz/carbonate ≤ 1% sulphides Mafic Volcanic 13.0 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 19 19 89

SHIFT HOURS ____ TO ____

TOTAL HOURS ____

CONTRACT HOURS ____

HOLE NO PLS-89-203 LOCATION L 40C 5N ELEVATION 330

GEOLOGIST P. Collins DRILLER R. Fournier BIT NO. CB70157 BIT FOOTAGE 67.8 - 80.8

MOVE TO HOLE 2:15 - 2:40

DRILL 2:40 - 4:30

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel 5:00 - 5:30

MOVE TO NEXT HOLE 4:30 - 5:00

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–13				0.0 - 0.5 Organics
				0.5 - 11.2 Ojibway II Sediments
				(0.5 - 3.3) beige, non gritty, pure soft clay
				(3.3 - 8.7) beige sorted fine grained sand; medium to coarse sand below 5.5m
				(8.7 - 11.2) Gravel: med to coarse sand matrix. Occasional beige fine sand bed. Cobble clast supported: 30% Volcanics and sediments; 70% Granitoids
7.5		6.1–9.0	01	
				11.2 - 13.0 Bedrock
				- dark green
				- fine to med. grained
				- foliated
10		9.0–11.2	02	- chloritic
				- carbonatized (3-5%)
				- below 12.0 5-7% quartz/carb veinlets with 0.5% sulphides
12		11.2–13.0	03	Mafic Volcanic
				13.0 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 20 19 89

HOLE NO PLS-89-204 LOCATION 36E 7+50N ELEVATION 326

GEOLOGIST P. Collins DRILLER R. Fournell BIT NO. CD70157 BIT FOOTAGE 80.8-90.3

SHIFT HOURS

____ TO ____

MOVE TO HOLE 4:30-5:00 feb 19

DRILL 7:15-10:00 wait for water 45 minutes.

TOTAL HOURS

MECHANICAL DOWN TIME

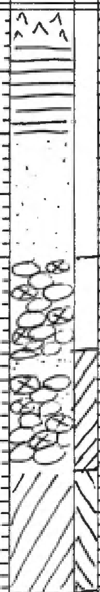
DRILLING PROBLEMS

CONTRACT HOURS

OTHER Travel 6:30-7:15

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0.0-0.5 Organics
				0.5-7.4 Ojibway II Sediments beige (oxidized) slightly gritty to non gritty soft clay.
				(2.0-4.0) beige (oxidized) fine grained sand
			N.R.	(4.0-5.5) Cobble clast supported gravel very little to no return this is due to the fact that there is no matrix; thus no seal around ~~sound~~ rods and sample washes away - mud tank empties quickly
			01	(5.5-6.0) beige sorted fine grained sand
			02	(6.0-7.4) Cobble clast supported gravel similar to 4.0-5.5 yet are able to get some return. Coarse sand matrix Cobble clast composition: 30% V/s and 70% Granitoids.
				7.4-9.5 Bedrock - Mafic Volcanic - dark green (initially ochre weathered surface) - fine grained - well foliated - chloritic; sericitized in places. - 5-7% carbonate; stringer & disseminated. - <1% Sulphides
				9.5 E.O.H.



Depth scale: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 20 19 89
SHIFT HOURS
____ TO ____
TOTAL HOURS
____
CONTRACT HOURS
____

HOLE NO PLS-89-205 LOCATION L32E 10N ELEVATION 322
GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. CB70157 BIT FOOTAGE 90.3 - 97.3
MOVE TO HOLE 10:00 - 10:15
DRILL 10:15 - 11:15
MECHANICAL DOWN TIME
DRILLING PROBLEMS
OTHER
MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0.0 - 0.5 Organics
1				0.5 - 5.5 Ojibway II Sediments
2				(0.5 - 2.5) beige-olive slightly gritty to non gritty soft clay
3				(2.5 - 5.0) very fine to fine beige-oxid grained sand with minor clay beds
4			01	
5				(5.0 - 5.5) Clast supported gravel bed Very little matrix. Cobbles of composition: 30% Volcanics and sediments; 70% Granitoids
6			02	
7				
8				* note sample 01 may appear to look like fill in character aplit as it is a good mixture - unsorted.
9				
10				5.5 to 7.0 Bedrock
11				Very similar to hole #204
12				Mafic Volcanic
13				7.0 E.O.H.
14				
15				
16				
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb.20 19 89

SHIFT HOURS ______ TO ______

TOTAL HOURS ______

CONTRACT HOURS ______

HOLE NO PLS-89-206 LOCATION 28E 11N ELEVATION 318

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. C870157 BIT FOOTAGE 97.3 - 105.3

MOVE TO HOLE 11:45 - 12:00

DRILL 12:00 - 1:15

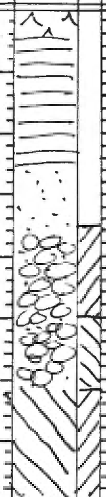
MECHANICAL DOWN TIME 3:00 - 5:00 service water hauler

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE Partway to highway 1:15 - 3:00

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0.0 - 0.5 Organics
1				0.5 - 6.2 Ojibway II Sediments
2				(0.5 - 2.5) beige (oxidized) slightly gritty soft clay
3				(2.5 - 3.5) very fine to fine grained beige sand
4			01	(3.5 - 5.0) matrix supported gravel Sorted fine to medium grained sand matrix. Cobble clasts of composition: 30% Volcanics & Sediments; 70% Granitoids
5			02	
6				
7			03	
8				(5.0 - 6.2) less matrix gravel becomes slightly clast supported. There are occasional sorted fine sand beds throughout interval
9				
10				
11				6.2 - 8.0 Bedrock
12				Mafic Volcanic very similar to 204.
13				
14				8.0 E.O.H.
15				
16				
17				
18				
19				
20				



OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 21 1989

HOLE NO PLS-89-207 LOCATION Site #12 ELEVATION 316

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. C870157 BIT FOOTAGE 105.3 - 128.8

SHIFT HOURS ____ TO ____

MOVE TO HOLE 7:50 - 8:45 Feb 21

DRILL 8:45 - 2:45 12:30 - 1:40 wait for water

TOTAL HOURS ____

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

CONTRACT HOURS ____

OTHER ____

MOVE TO NEXT HOLE ____

Pg. 1 of 2

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–20			01, 02, 03, 04, 05, 06, 07, 08, 09	see below

0.0 - 0.5 Organics

0.5 - 6.8 Ojibway II Sediments

(0.5 - 3.0) beige (oxidized) nongritty soft clay. Beige grey downsection

(3.0 - 6.8) beige to beige grey very fine to fine grained sand with clay interbeds.
- pebble bed at ~6.5 m

6.8 - 19.0 Chibougamau Till

gradational contact into slightly sorted coarse biased fine-medium sand matrix (minor silt). less sorted in appearance downsection. However, up to 40% medium grained sand in sections. (matrix supported) Cobble clasts of composition: 40% Volcanics and sediments; 60% Granitoids.

(8.3 - 9.0) boulder - gabbro

(9.0 - 9.2) boulder - granitoid

(9.3 - 10.9) Till is clast supported cobbles & small boulders; otherwise similar to 6.8 - 8.3

(10.9 - 11.1) boulder - granite

(11.1 - 11.7) Till matrix contains up to 30% gray gritty clay in matrix

(11.7 - 14.0) similar to 6.8 - 8.3

(14.0 - 15.0) minor grey gritty clay in matrix (<5%)

(15.0 - 15.2) boulder - granitoid.

(15.2 - 18.0) similar to above yet increase in percentage of volcanics and sediments to ~60%.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 21 19 89

HOLE NO PLS-89-207 LOCATION Site #12 ELEVATION ______

GEOLOGIST ______ DRILLER ______ BIT NO. ______ BIT FOOTAGE ______

SHIFT HOURS
______ TO ______

MOVE TO HOLE ______

DRILL ______

TOTAL HOURS
______

MECHANICAL DOWN TIME ______

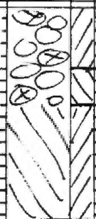
DRILLING PROBLEMS ______

CONTRACT HOURS
______

OTHER ______

MOVE TO NEXT HOLE ______

Pg 2 of 2

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			09	18.0 - 19.0 till becomes clast supported: very little matrix
21			10	abundant -10 mesh cuttings.
22				Composition of clasts similar to
			11	15.2-18.0
23				MISSINAIBI SEDIMENTS
				19.0 - 21.6 Gravel: Clast supported
24				sorted medium to coarse sand matrix
25				Pebble / cobble clasts of composition 50% Volcanics & sediments; 50%
26				Granitoids.
27				21.6 - 23.5 Bedrock
28				- light green & dark grey (bleached)
29				- aphanitic
				- sheared
30				- chloritic; dark grey siltstone
31				bands increase downsection up to 20%.
32				- carbonatized (3-5%); <1%
33				diss. sulphides
				Int. Volcanic / meta Sediment.
34				23.5 E.O.H.
35				
36				
37				
38				
39				
40				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 21/22 1989

SHIFT HOURS ____ TO ____

TOTAL HOURS ____

CONTRACT HOURS ____

HOLE NO PLS-89-208 LOCATION site #13 ELEVATION 317

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. CB70276 BIT FOOTAGE 0.0-31.0

MOVE TO HOLE 2:45-3:00 Feb 21st

DRILL 3:00-5:00 21st 8:00-10:30

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel 6:30-7:00 Feb22 startup 7:00-8:00

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1–20			01 (≈11 m), 02 (≈13.3 m), 03 (≈15.6 m), 04 (≈17.3 m), 05 (≈19 m), 06 (≈19.9 m)	see below

0.0 - 17.5 Ojibway II Sediments

(0.0-3.0) beige, oxidized slightly gritty to non gritty (below 1.0m) pure, soft clay

(3.0-10.0) beige very fine to fine grained sand. Occasional thin pebble bed and clay beds.
at 9.0 m coarse sand bed.

(10.0-14.5) Gravel: clast supported sorted medium and coarse sand matrix with ~25% fine sand in places
Cobble clasts of composition: 30% Volcanics and sediments; 70% Granitoids
below 12.5 Volcanics and sediments increase in composition to 50%

(14.5-15.0) sorted coarse sand & granules.

(15.0-17.5) matrix supported gravel with predominantly medium and fine sand matrix otherwise similar to 12.5 to 14.5.

17.5 - 24.0 Chibougamau Till

gradational contact into a slightly sorted somewhat coarse based ~~fine~~ fine sand matrix. There is approximately 1% gritty clay in matrix
Cobble clast supported of composition 50% Volcanics and sediments; 50% Granitoids.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 21/22 19 89

HOLE NO PLS-89-208 LOCATION Site 13 ELEVATION

GEOLOGIST DRILLER BIT NO. BIT FOOTAGE

SHIFT HOURS
TO

MOVE TO HOLE

DRILL

TOTAL HOURS

MECHANICAL DOWN TIME

DRILLING PROBLEMS

CONTRACT HOURS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG

Sample Nos.: 06, 07, 08, 09, 10, 11

Depths: 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40

20.0 – 24.0 Till is matrix supported
- there are sorted medium to coarse sand beds at 21.0m & 22.4m

24.0 – 29.5 Missinaibi Sediments?

(24.0-25.0) beige very fine to fine grained sand with grey nongritty pure, compact clay interbeds. Clay is dry but not tough

(25.0-25.5) sorted medium and coarse grained sand beds (non oxidized)

(25.5 - 25.7) Boulder - granite

(25.7 - 29.5) Gravel: clast supported very cobbly. 60% Volcanics & Sediments; 40% Granitoids. matrix consists of medium & coarse sand.

below 27.0 there is an increase in percentage of Volcanics and Sediments to 75%. 20% of which is siltstone

29.5 - 31.0 Bedrock

- greenish grey
- aphanitic; initially greenish white rock powder chips.
- well foliated & sheared
- 1-2% carbonate
- <0.5 % sulphides

Meta Sediment / Siltstone

31.0 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb. 22 19 89

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO PLS-89-209 LOCATION Site # 14 ELEVATION 320

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. CB70276 BIT FOOTAGE 31.0 - 78.5

MOVE TO HOLE 10:30 - 11:45

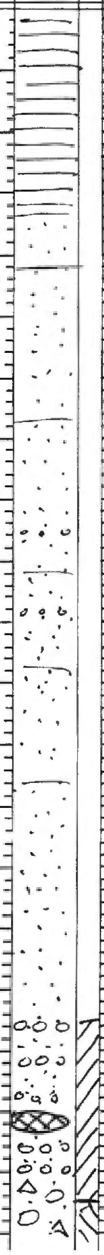
DRILL 11:45 - 4:45

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel : 5:00 - 5:30

MOVE TO NEXT HOLE 4:45 - 5:00 (part way)

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–20			01 (18), 02 (20)	see below

0.0 - 0.5 Organics

0.5 - 19.0 Ojibway II Sediments

(0.5 - 3.3) beige (oxidized) slightly gritty to non gritty (down section), pure, soft clay

(3.3 - 16.5) beige very fine to fine grained sand with occasional thin pebble & clay beds.

- there are medium grained sand interbeds below 14.0m (glacio fluvial in appearance)

(16.5 - 18.0) interbeds of medium & coarse sand and granules.

(18.0 - 18.3) boulder - granite

(18.3 - 19.0) sorted fine & medium grained sand with pebble interbeds

19.0 - 37.0 Chibougamau Till

slightly sorted (silt deficient) beige grey fine sand matrix. Up to 25% medium sand (matrix supported). Cobble clasts are present of composition: 45% Volcanics and Sediments; 55% Granitoids.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 22 19 89

HOLE NO PLS-89-209 LOCATION Site #14 ELEVATION ____

GEOLOGIST ____ DRILLER ____ BIT NO. ____ BIT FOOTAGE ____

SHIFT HOURS ____ TO ____

MOVE TO HOLE ____

DRILL ____

TOTAL HOURS ____

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

CONTRACT HOURS ____

OTHER ____

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21–40			02, 03, 04, 05, 06, 07, 07, 08, 09, 10, 11	see below

(22.0 - 24.0) minor grey gritty clay in matrix 2%

at 23.5 m pure, dry, compact clay partings.

(24.0 - 28.5) up to 30% grey gritty clay in matrix. Percentage increases substantially downsection. Moreover, compositional percentage of volcanics and sediments increases to 60%.

(28.5 - 28.9) Boulder - gabbro

(28.9 - 34.7) similar to 24.0 - 28.5

(34.7 - 35.4) boulder - monzonite

(35.4 - 35.9) boulder - granodiorite

(35.9 - 36.1) boulder - gabbro

(36.1 - 37.0) similar to 24.0 - 28.5

37.0 - 45.8 <u>Missinaibi Sediments</u>

(37.0 - 38.7) beige grey very fine to fine grained sand

(38.7 to 40.0) predominantly grey silt

(40.0 - 44.0) beige grey very fine sand with silt interbeds

between 37.0 & 44.0 very silty 2-3 inches of sample in number one bucket

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb. 22 19 89

SHIFT HOURS
_____ TO _____

TOTAL HOURS
_____

CONTRACT HOURS
_____

HOLE NO PLS-89-209 LOCATION Site 14 ELEVATION _____

GEOLOGIST _____ DRILLER _____ BIT NO. _____ BIT FOOTAGE _____

MOVE TO HOLE _____

DRILL _____

MECHANICAL DOWN TIME _____

DRILLING PROBLEMS _____

OTHER _____

MOVE TO NEXT HOLE _____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
41				44.0 - 45.8 Gravel: cobble clast supported of composition 60% Volcanics & sediments; 40% Granitoids. Very little matrix abundant -10 mesh cuttings
42				
43				
44				
45			12	45.8 - 47.5 Bedrock
46				- medium & light grey-green; bleached - very fine grained
47			13	- sheared; schistose - chloritic; sericitized
48				- silicified; mildly carbonatized
49				- 15-20% quartz/carbonate veinlets; slight increase in %age downsection
50				- 3% blue green fuschite
51				Altered Volc.?
52				47.5 E.O.H.
53				
54				
55				
56				
57				
58				
59				
60				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 23 19 89

SHIFT HOURS

____ TO ____

TOTAL HOURS

____

CONTRACT HOURS

____

HOLE NO PLS-89-210 LOCATION Site #17 ELEVATION 315

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. CR70276 BIT FOOTAGE 76.8 - 121.1

MOVE TO HOLE 7:00 - 8:00 (also start up machines -35 °C)

DRILL 8:00 - 1:45

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

OTHER Travel 6:30 - 7:00

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0.0 - 0.5 Organics
1				0.5 - 20.0 Ojibway II Sediments
2				(0.5 - 3.5) beige oxidized slightly gritty to non gritty, pure, soft clay.
3				
4				(3.5 - 5.0) beige very fine to fine grained sand with occasional clay bed
5				
6				(5.0 - 11.0) sorted beige fine to medium grained sand (glacio fluvial)
7				
8				(11.0 - 17.8) beige sorted medium grading to coarse grained sand with occasional fine sand interbeds
9				
10				(17.8 - 20.0) Pebbly sand; coarse biased matrix mostly med & coarse sand. Pebble beds 45% Volcanics & sediments 55% Granitoids
11				
12				
13				
14				
15				
16				
17				
18				
19			01	
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 23 19 89

HOLE NO PLS-89-210 LOCATION Site #17 ELEVATION ____

GEOLOGIST ____ DRILLER ____ BIT NO. ____ BIT FOOTAGE ____

SHIFT HOURS ____ TO ____

MOVE TO HOLE ____

DRILL ____

TOTAL HOURS ____

MECHANICAL DOWN TIME ____

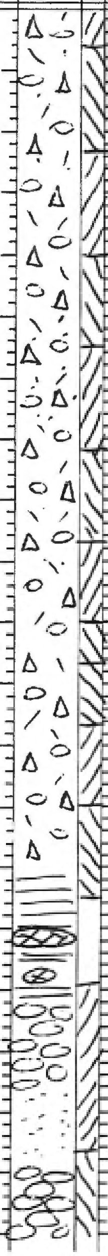
DRILLING PROBLEMS ____

CONTRACT HOURS ____

OTHER ____

MOVE TO NEXT HOLE ____

Pg 2 of 3

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
20–40			01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12	see below

20.0 - 34.2 Chibougamau Till

gradational contact. Slightly sorted fine sand matrix with 1-2% grey gritty clay. Cobble clasts of composition: 50% Volcanics and sediments; 50% granitoids

(21.4 - 25.7) Till matrix is clay rich up to 60% grey gritty clay; results in less matrix return

(25.7 - 28.0) similar to 20.0 to 21.4

(28.0 - 29.8) similar to above with about 15% grey gritty clay in matrix. Also composition of Volcanics & sediments increases to 60%.

(29.8 - 30.0) pure, grey, hard compact nongritty clay partings

(30.0 - 34.2) similar to 28.0 to 29.8

34.2 - 41.7 Missinaibi Sediments

34.2 - 36.2 pure, hard, grey compact slightly gritty to non gritty clay.

boulder (granite) at 35.0 - 35.3

gabbro cobble at 35.7.

36.2 - 37.5 Gravel: clast supported. Very cobbly with clast composition: 65% Volcanics and sediments; 35% Granitoids

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 23 19 89

HOLE NO PLS-89-210 LOCATION Site 17 ELEVATION ______

GEOLOGIST ______ DRILLER ______ BIT NO. ______ BIT FOOTAGE ______

SHIFT HOURS ______ TO ______

MOVE TO HOLE ______

DRILL ______

TOTAL HOURS ______

MECHANICAL DOWN TIME ______

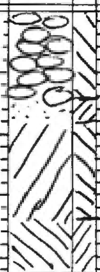
DRILLING PROBLEMS ______

CONTRACT HOURS ______

OTHER ______

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.
41			12
42			13
43			14
44			15
45			
46			
47			
48			
49			
50			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			



DESCRIPTIVE LOG

37.5 - 38.5 sorted coarse, medium and fine sand interbeds; dark greyish green colour.

38.5 - 41.5 similar to 36.2 to 37.5

41.5 - 41.7 sorted coarse sand

* sample 13 contains some bedrock chips.

41.7 - 44.3 <u>Bedrock</u>

- dark grey to black
- very fine grained to aphanitic
- well foliated; sheared
- silicified 15-20% quartz/ carbonate veinlets with assoc.
- sulphides
- initial 0.5m has up to 20% coarse chunks of sulphides.
- there are still 3-5% sulphides below this appear secondary
- graphitic mudstone band uncommon

Meta Sediment Siltstone

44.3 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb23/24 19 89

SHIFT HOURS

_____ TO _____

TOTAL HOURS

_____

CONTRACT HOURS

_____

HOLE NO PLS-89-211 LOCATION Site # 18 ELEVATION 313

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. CB70273 BIT FOOTAGE 0.0-29.7

MOVE TO HOLE 1:45 - 2:00

DRILL 2:00 - 4:15

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER 4:15-5:00 run out of water - clean mud tank Travel 5:00-5:30

MOVE TO NEXT HOLE

New bit.

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1–20				0.0 - 1.0 Organics 1.0 - 20.0 Ojibway II Sediments (1.0-6.0) grey, nongritty, pure, soft clay (6.0-9.5) grey silt with clay interbeds (9.5-13.5) grey beige fine grained sand (13.5 - 20.0) beige grey fine grained sand with occasional sorted med sand beds. Coarse sand bed at 19.5m. - clay bed at 16.0m

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 23/24 19 89

SHIFT HOURS

______ TO ______

TOTAL HOURS

______

CONTRACT HOURS

______

HOLE NO PLS-89-211 LOCATION Site # 18 ELEVATION ______

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. ______ BIT FOOTAGE ______

MOVE TO HOLE ______

DRILL ______

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

OTHER ______

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21			01	20.0 – 25.5 Chibougamau Till (20.0 – 22.0) appears to be a mix of till and sand. Often matrix appears sorted and coarse biased up to 60% medium and coarse sand in places. - Pebble and Cobble clasts: 50% Volcanics & Sediments 50% Granitoids.
22				
23			02	
24				
25			03	(22.0 – 25.5) Unsorted grey beige fine sand/silt with up to 80% grey gritty clay matrix. Clay rich matrix supported resulting in slightly less return; therefore sample 02 is taken over a 2m interval. Cobble clasts of composition: 60% Volcanics and sediments; 40% Granitoids
26			04	
27				
28			05	
29				
30				
31				25.5 – 27.5 Missinaibi Sediments
32				25.5 – 26.0 Sorted coarse sand bed
33				26.0 – 26.2 grey, compact, non gritty, dry clay parting
34				26.2 – 27.5 clast supported gravel: minor coarse sand matrix. Cobble clast composition: 45% Volcanics and Sediments; 55% Granitoids
35				
36				
37				27.5 – 29.7 Bedrock
38				- dark grey to black - very fine grained
39				- well foliated, sheared
40				- 5-7% quartz/carbonate veinlets - initial 0.5m had up to 5% sulphides; 1-2% overall (pyrite, arsenopyrite) - brownish grey sugary band at 9.5 m calcareous ≥ trace FeO & hematized Meta Sed. Siltstone

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 24 1989

SHIFT HOURS ______ TO ______

TOTAL HOURS ______

CONTRACT HOURS ______

HOLE NO PLS-89-212 LOCATION Site # 15 ELEVATION 326

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. 5870273 BIT FOOTAGE 27.7 - 77.7

MOVE TO HOLE 9:15 - 9:30

DRILL 9:30 - 4:30

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

OTHER 4:30 - 5:00 drain mud tank, hoses etc. Travel 5:00 - 5:30

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–12				0.0 - 0.5 Organics 0.5 - 41.7 Ojibway II Sediments (0.5 - 3.0) beige (oxidized), pure, nongritty soft clay (3.0 - 6.0) very fine grading to fine grained sand with occasional thin clay bed. (6.0 - 10.0) predominantly sorted beige fine grained sand (10.0 - 12.0) sorted medium grained sand (12.0 - 24.0) interbeds of medium, coarse and minor fine grained sand with granule interbeds
12–15			01	
15–19.5			02	
19.5–20			03	

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 24 19 89

SHIFT HOURS ____ TO ____

TOTAL HOURS ____

CONTRACT HOURS ____

HOLE NO PLS-89-212 LOCATION Site #15 ELEVATION ____

GEOLOGIST ____ DRILLER ____ BIT NO. ____ BIT FOOTAGE ____

MOVE TO HOLE ____

DRILL ____

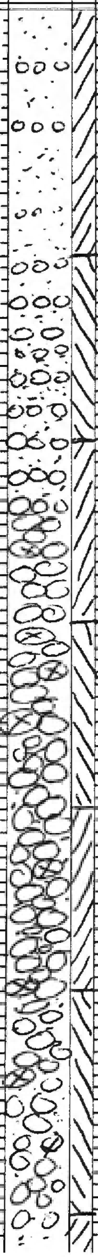
MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

OTHER ____

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21 – 24			03	24.0 - 28.0 Gravel: sorted coarse sand matrix => 'matrix supported' subrounded & rounded Pebble & cobble clasts of composition 30% Volcanics and sediments; 70% Granitoids.
24 – 27			04	28.0 - 35.5 Gravel becomes clast supported with very little matrix. Becomes very cobbly dominated = small boulders. Composition of clasts as above
27 – 30			05	- below 32.0 Volcanics & Sediments increase in composition to 60%
30 – 33			06	35.5 - 41.7 Slight increase in amount of matrix; predominantly medium and coarse grained sand
33 – 36			07	
36 – 39			08	
39 – 40			09	



OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 24 19 89

HOLE NO PCS-89-212 LOCATION Site # 15 ELEVATION ______

GEOLOGIST ______ DRILLER ______ BIT NO. ______ BIT FOOTAGE ______

SHIFT HOURS ______ TO ______

MOVE TO HOLE ______

DRILL ______

TOTAL HOURS ______

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

CONTRACT HOURS ______

OTHER ______

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
41			09	at 40.0–40.4 Boulder - granite
42			10	41.7 – 46.4 Chibougamau Till abrupt contact into very clay rich till matrix 60-70% Grey gritty clay and fine sand/silt matrix. Cobble clasts of composition: 60% Volcanics and sediments; 40% Granitoids
43			10	
44				
45			11	
46				42.0-42.4 Boulder - granodiorite
47			12	42.8 – 46.4 Till matrix becomes less clay rich (gradually) ~5% and clast supported; otherwise, similar to 41.7 - 42.8
48				
49				boulders at 44.0 – 44.2 Fe Formation 46.0 - 46.4 Granite
50				
51				46.4 – 48.0 Bedrock
52				- light greyish green
53				- very fine grained - well foliated
54				- carbonatized both disseminated and quartz/carbonate veinlets
55				~5%
56				- chloritic
57				- <0.5% sulphides Intermediate Volcanic
58				48.0 E.O.H.
59				
60				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 25 19 89

SHIFT HOURS ______ TO ______

TOTAL HOURS ______

CONTRACT HOURS ______

HOLE NO PLS-89-213 LOCATION Site #16 ELEVATION 319

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. UB70273 BIT FOOTAGE 77.7-102.7

MOVE TO HOLE 4:30 - 5:00 Feb 24

DRILL 7:30 -

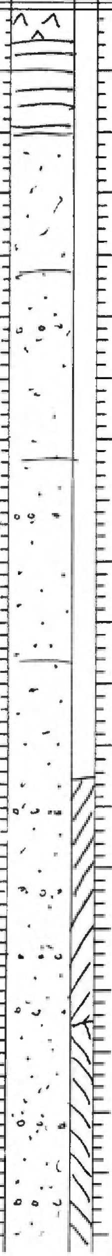
MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

OTHER Travel 6:30 - 7:10 7:10 - 7:30 startup

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG						
				0.0 - 0.5 Organics						
1				0.5 - 22.6 Ojibway II Sediments						
2				(0.5 - 2.0) beige (oxid), pure, nongritty soft clay						
3				(2.0 - 4.0) beige very fine to fine grained sand c occasional thin clay bed ; pebble bed						
4										
5				(4.0 - 9.0) sorted fine and medium grained sand						
6										
7				(9.0 - 10.0) similar to 2.0 - 4.0						
8				(10.0 - 21.2) predominantly sorted medium and coarse grained sand with occasional beige fine sand beds and granule beds.						
9										
10										
11										
12										
13										
14			01							
15										
16										
17										
18			02							
19										
20										



OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 25 19 89

HOLE NO PLS-89-213 LOCATION Site # 16 ELEVATION ____

GEOLOGIST ____ DRILLER ____ BIT NO. ____ BIT FOOTAGE ____

SHIFT HOURS ____ TO ____

MOVE TO HOLE ____

DRILL ____

TOTAL HOURS ____

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

CONTRACT HOURS ____

OTHER ____

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21–25			02, 03, 04	

Depth scale: 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40

Sample nos.: 02, 03, 04

21.2 - 21.6 Gravel: matrix supported. Sorted medium to coarse sand matrix. Cobble clasts of composition: 45% Volcanics and sediments; 55% Granitoids.

21.6 - 22.4 Boulder - Mafic Volcanic
22.4 - 22.6 medium grained sand with few pebble clasts.

22.6 - 25.0 Bedrock

- dark green
- medium grained
- initially slightly porphyritic texture
- foliated
- chloritic; 1% FeO stain downsec...
- 23.7-23.9 silicified band; mildly carbonatized
- ≤ 1% diss sulphide

Gabbro ?

25.0 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 26 1989

HOLE NO PLS-89-214 LOCATION Site # 22 ELEVATION 320

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. CB70273 BIT FOOTAGE 102.7-134.2

SHIFT HOURS ______ TO ______

MOVE TO HOLE 1:45-2:00

DRILL 2:00-5:00

TOTAL HOURS ______

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

CONTRACT HOURS ______

OTHER ______

MOVE TO NEXT HOLE ______

Pg 1 of 2

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–1				0.0 - 0.5 Organics
1–2				0.5 - 22.2 Ojibway II Sediments
3–4				(0.5 - 3.8) beige, soft, nongritty clay with silt interbeds.
4–5				(3.8 - 8.0) beige sorted very fine to fine grained sand.
6–9				(8.0 - 17.8) sorted fine to medium grained sand. - below 11.0 there are coarse sand / granule interbeds - at 14.5 grey soft clay bed.
11–14				(17.8 - 20.5) Matrix supported Gravel sorted medium to coarse grained sand matrix. Pebble / cobble clasts of composition: 40% Volcanics and sediments; 60% Granitoids
15–16			01	
18–20			02	

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 25 1989

SHIFT HOURS

____ TO ____

TOTAL HOURS

____

CONTRACT HOURS

____

HOLE NO PLS-89-214 LOCATION Site #22 ELEVATION ____

GEOLOGIST ____ DRILLER ____ BIT NO. ____ BIT FOOTAGE ____

MOVE TO HOLE ____

DRILL ____

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

OTHER ____

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			02	(20.5 - 22.2) matrix is slightly unsorted in places giving 'till' appearance.
21			03	yet still 60-70% of matrix is sorted medium and coarse grained sand
22				
23			04	22.2 - 30.2 <u>Chibougamau Till</u>
24				gradational contact into beige
25			05	grey fine sand/silt and grey gritty clay matrix (5%). Pebble
26			06	and cobble clasts of composition;
27				60% Volcanics and Sediments;
28			07	40% Granitoids.
29			08	below 26.0 till is clast supported with approximately 1% gritty clay
30				in matrix.
31			09	30.2 - 31.5 <u>Bedrock</u>
32				- dark green
33				- fine grained
34				- foliated
35				- chloritic
36				- carbonatized 2-3% disseminated
37				- 2% qtz/carb veinlets
38				- <1% sulphides
39				Mafic Volcanic
40				31.5 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 26 19 89

SHIFT HOURS

____ TO ____

TOTAL HOURS

____

CONTRACT HOURS

____

HOLE NO PLS-89-215 LOCATION Site # 21 ELEVATION 318

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. used bit BIT FOOTAGE ____

MOVE TO HOLE 7:15 - 7:30

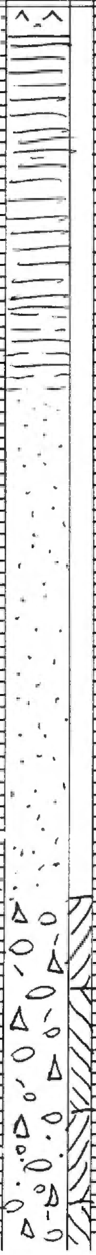
DRILL 7:30 - 10:15

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

OTHER Travel 6:30 - 7:00 7:00 - 7:15 startup

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1–14				0.0 - 0.5 Organics 0.5 - 14.5 Ojibway II Sediments (0.5-5.0) grey, non gritty, soft clay (5.0-6.0) grey silt with grey soft clay interbeds. (6.0-14.5) beige grey very fine to fine grained sand.
15			01	14.5 - 24.0 Chibougaman Till beige grey, fine sand/silt and grey gritty clay matrix (2-3 %) - matrix supported. Pebble and cobble clasts of composition: 55 % Volcanics and Sediments; 45 % Granitoids.
17			02	18.0 - 22.0 matrix is fairly sorted and coarse biased with no gritty clay. Otherwise similar to 14.5-18.0
19			03	
20			04	

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 26 19 89

HOLE NO PLS-89-215 LOCATION Site #21 ELEVATION ____

GEOLOGIST ____ DRILLER ____ BIT NO. ____ BIT FOOTAGE ____

SHIFT HOURS ____ TO ____

MOVE TO HOLE ____

DRILL ____

TOTAL HOURS ____

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

CONTRACT HOURS ____

OTHER ____

MOVE TO NEXT HOLE ____

Pg 2 of 2

IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21			04	at 20.5 grey, pure, non gritty, compact clay partings.
22			05	22.0 – 24.0 similar to 14.5-18.0
23			06	24.0 – 30.0 Missinaibi Sediments
24				(24.0-24.3) grey, pure, dry, compact, non gritty clay bed.
25–28				(24.3 – 29.3) dark grey, very fine sand / silt c̄ occasional thin compact clay partings.
29			07	(29.3 – 30.0) Gravel: Cobble clast supported with composition: 65% Volcanics & sediments; 35% Granitoids. Very little matrix abundant -10 mesh cuttings. There is a small amount of natural appearing matrix very fine sand/silt yet this is probably cave in from overlying glacio lacustrine sediments. Occasional pure compact clay partings.
30–31			08	30.0 – 31.5 Bedrock
32–40				- light greyish green (bleached) initially ochre - very fine grained; aphanitic in places - sheared - silicified: 15-20% quartz veinlets with minor carbonate - chloritic - <1% sulphides Altered Volcanic

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 26 19 89

SHIFT HOURS

______ TO ______

TOTAL HOURS

CONTRACT HOURS

HOLE NO PLS-89-216 LOCATION Site # 23 ELEVATION 318

GEOLOGIST P. Collins DRILLER Robouval BIT NO. CB30272 BIT FOOTAGE 0.0-41.5

MOVE TO HOLE 10:15-10:45

DRILL 10:45 - 2:45

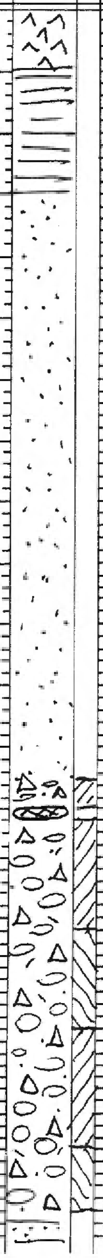
MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			01
14			01
15			
16			02
17			
18			03
19			04
20			



DESCRIPTIVE LOG

0.0 - 1.0 Organics

1.0 - 12.5 Ojibway II Sediments

(1.0 - 3.0) beige to beige grey nongritty soft clay

(3.0 - 10.5) beige grey very fine to fine grained sand

(10.5 - 12.5) fine sand with medium to coarse sand interbeds. Occasional thin granule bed

12.5 - 36.5 Chibougamau Till

till from beginning of interval is clast supported resulting in poor return on matrix. as a result samples 02, 03 are about 5-6 kg

grey beige fine sand/silt and minor grey gritty clay. Cobble clasts of composition: 60% Volcanics and sediments; 40% Granitoids

13.0 - 13.2 Boulder - granitoid

19.6 - 22.0 predominantly very fine to fine grained sand with occ. pure grey compact clay parting, ~~xx~~ & pebble bed

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 26 19 89

HOLE NO PLS-89-216 LOCATION Site #23 ELEVATION ______

GEOLOGIST ______ DRILLER ______ BIT NO. ______ BIT FOOTAGE ______

SHIFT HOURS ______ TO ______

MOVE TO HOLE ______

DRILL ______

TOTAL HOURS ______

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

CONTRACT HOURS ______

OTHER ______

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21–42			05 (~22.3), 06 (~24.4), 07 (~26.1), 08 (~27.7), 09 (~29.2), 10 (~30.9), 11 (~33.1), 12 (~35.2), 13 (~39.2), 14 (~40.5)	see below

22.0 - 24.5 similar to 12.5 - 19.6 yet also occasional pure grey compact clay partings up to 5% in places. Return on matrix is poor

24.5 - 30.3 Till similar to 12.5-19.6 yet is matrix supported (better return) There are occasional thin sorted medium grained sand beds

30.3 - 31.2 Sorted medium to coarse grained sand bed

31.2 - 32.0 similar to ~~24.5~~-30.3

32.0 - 32.2 pure grey, compact nongritty clay partings.

32.2 - 33.0 similar to 30.3-31.2

33.0 - 36.0 similar to 24.5-30.3 with approximately 10% grey gritty clay in matrix.

36.0 - 36.5 Boulder - gabbro

36.5 - 39.6 Missinaibi Sediments

36.5 - 39.0 dark grey silt

39.0 - 39.6 Gravel: Cobble clast supported. Composition of clasts is 65% Volcanics & Sediments; 35% Granitoids sorted fine to medium sand matrix.

39.6 - 41.5 BEDROCK Meta Sed. - Siltstone

- dark grey to black
- very fine grained; aphanitic in places
- well foliated
- 3-5% qtz/Emin carbonate veinlets
- occasional graphitic mudstone bands
- coarse chunks of sulphides 2-3% small
- below 20.5 thin bands of blue green altered and

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 26/27 19 89

HOLE NO PLS-89-217 LOCATION Site # 20 ELEVATION 316

GEOLOGIST E. Collins DRILLER R. Fournel BIT NO. 587627? BIT FOOTAGE 41.5 – 62.5

SHIFT HOURS ______ TO ______

MOVE TO HOLE 2:45 - 3:00 26th

DRILL 3:00 – 4:30 26th 7:30 - 9:00

TOTAL HOURS ______

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

CONTRACT HOURS ______

OTHER 4:30-5:00 26th clean mud tank 5:00-5:30 travel 26th 6:30-7:00 27th 7:00-7:30 startup.

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–21			01 (8.0–10.0), 02 (10.0–11.0), 03 (11–13), 04 (13–14.5), 05 (14.5–16), 06 (16–16.3), 06 (16.3–18), 07 (18–19), 08 (19–21)	see below

0.0 - 0.5 Organics

0.5 - 8.0 Ojibway II Sediments

(0.5 - 2.2) beige oxidized, pure soft clay (nongritty)

(2.2 - 8.0) beige to ochre very fine to fine grained sand with occasional thin clay bed.

8.0 - 19.0 Chibougamau Till

beige grey fine sand / silt matrix (matrix supported). Cobble clasts of composition: 55% Volcanics & sediments ; 45% Granitoids

(10.0 - 10.3) boulder - granitoid

(10.3 - 16.0) till becomes clast supported. Matrix appears slightly sorted and occasionally coarse biased. Composition of Volcanics & sediments increases to 60%.

(16.0 - 16.3) boulder - gabbro

(16.3 - 19.0) similar to 10.3 - 16.0

19.0 - 21.0 Bedrock

- dark brownish grey
- fine grained; initially very fine grained (siltstone)
- foliated
- biotitic
- carbonatized 3-5%; ≤1% sulphides

Meta Sed. Greywacke / siltstone

21.0 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 27 19 89

SHIFT HOURS

_____ TO _____

TOTAL HOURS

CONTRACT HOURS

HOLE NO PLS-89-218 LOCATION Site # 19 ELEVATION 315

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. CB70272 BIT FOOTAGE 62.5 – 77.8

MOVE TO HOLE 9:00 – 9:15

DRILL 9:15 – 11:00

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER 11:00 - 12:00 change oil in drill, takedown shack, tower prepare for move

MOVE TO NEXT HOLE 12:00 – 2:00 move portway for float loading

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–1				0.0 – 0.5 Organics
1–7				0.5 – 7.5 Ojibway II Sediments (0.5 – 2.5) beige (oxidized), nongritty soft clay. (2.5 – 7.5) beige to olive very fine to fine grained sand ē occasional soft clay bed
8			01	7.5 – 13.6 Chibougamau Till grey beige fine sand/silt & 2-3% grey gritty clay - Slightly clast supported. Cobbles of composition: 55% Volcanics and sediments; 45% Granitoids
10			02	
11			03	
12			04	
14			05	13.6 – 15.3 Bedrock - light greyish green - very fine to fine grained - strong foliation; sheared - ≤ 1% disseminated carbonate - 2-3% quartz stringers - < 1% sulphides Altered Volcanic 15.3 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 28 19 89

HOLE NO PLS-89-219 LOCATION L60W 40N West of Bay v. ELEVATION 323

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. CB70272 BIT FOOTAGE 77.8 - 85.8

SHIFT HOURS ____ TO ____

MOVE TO HOLE 8:30-9:15

DRILL 9:15-10:30

TOTAL HOURS ____

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

CONTRACT HOURS ____

OTHER 8:00-8:30 Float drill to Kruger road 7:30-8:00 travel

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–0.5				0.0 - 0.5 Organics
0.5–5.8				0.5 - 5.8 Ojibway II Sediments (0.5 - 3.8) beige (oxidized), pure, nongritty, soft clay (3.8 - 5.8) beige (oxid) very fine sand/silt to fine sand below 5.0m. Occasional thin clay beds (not enough return to sample seperately)
5.8–8.0			01	5.8 - 8.0 Bedrock - dark green - porphyritic texture; feld. phenos - silicified - massive - no visible sulphides Granitoid 8.0 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 28 19 89

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO PLS-89-220 LOCATION L44W 43N ELEVATION 317
GEOLOGIST P. Cullen DRILLER R. Fournell BIT NO. CB70272 BIT FOOTAGE 85.8 - 103.8
MOVE TO HOLE 10:30 - 11:00
DRILL 11:00 - 12:15
MECHANICAL DOWN TIME ______
DRILLING PROBLEMS ______
OTHER ______
MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1 – 20		15.0 – 18.0	01 (≈15.9), 02 (≈17.2)	see below

0.0 - 1.0 Organics

1.0 - 15.0 Ojibway II Sediments

1.0 - 8.0 grey, pure, nongritty silt clay

8.0 - 11.5 grey, very fine to fine grained sand = occasional clay bed

11.5 - 15.0 distinct & abrupt change in colour to ochre fine and medium grained sand

15.0 - 16.5 Chibougamau Till

gradational contact - initial 0.5m beige - ochre coloured matrix; there after, beige grey fine sand minor silt (mixture suggested) Cobble clasts of composition: 50% Volcanics and sediments; 50% granitoids

16.5 - 18.0 Bedrock

- dark red-ochre & grey
- massive
- porphyritic texture: feldspar quartz phenocrysts in a slightly magnetic dark grey groundmass
- phenocrysts of feld. are hematized & FeO
- 2-3% Fe Mg carbonate [illegible]
- no visible sulphides

Granitoid.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 28 1989

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO PLS-89-221 LOCATION 47w 48N ELEVATION 316

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. CB70272 BIT FOOTAGE 103.8-135.8

MOVE TO HOLE 12:15-12:30

DRILL 12:30-2:45

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0.0 - 1.0 Organics
				1.0 - 16.0 Ojibway II Sediments
				(1.0-10.5) grey, pure, nongritty soft clay
				(10.5-13.5) grey very fine sand/silt
				(13.5-16.0) grey beige fine grained sand
				16.0 - 30.4 Chibougamau Till
				grey beige fine sand/silt matrix. Cobble clasts of composition: 50% Volcanics and sediments; 50% Granitoids
				5-10% gritty clay in matrix between 16.0 & 18.0 m.
				18.0 - 30.4 Till is clast supported very little return on matrix especially between 18.0 to 21.0 as a result samples 02, 03 are smaller
16-17			01	
18-19			02	
19-20			03	

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 28 19 89

HOLE NO PLS-89-221 LOCATION 47w 48N ELEVATION ______

GEOLOGIST ______ DRILLER ______ BIT NO. ______ BIT FOOTAGE ______

SHIFT HOURS

______ TO ______

MOVE TO HOLE ______

DRILL ______

TOTAL HOURS ______

MECHANICAL DOWN TIME ______

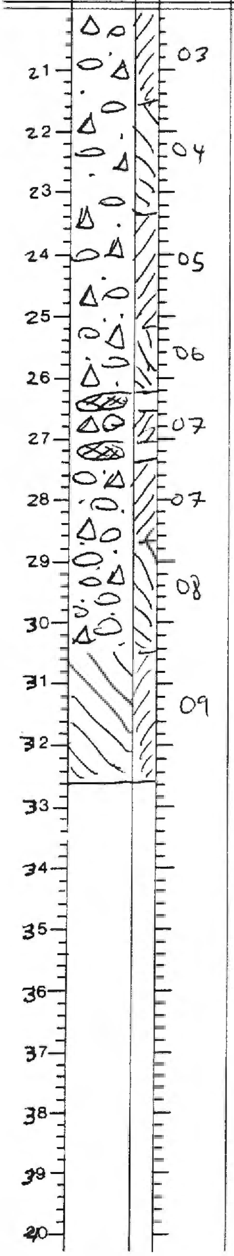
DRILLING PROBLEMS ______

CONTRACT HOURS ______

OTHER ______

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



22.0 – 30.4 matrix is slightly sandy & course biased abundant -10 mesh cuttings.

26.2 - 26.5 boulder - gabbro

26.5 - 27.0 similar to 22.0 - 30.4

27.0 - 27.3 boulder - granitic

27.3 - 30.4 similar to 22.0 - 30.4

30.4 - 32.6 Bedrock

- med. green
  bleached in places to light yellowish green
- medium grained
- strong foliation; sheared less distinct downsection
- chloritic
- 1% carb.

Granitoid

32.6 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE Feb 28 1989

SHIFT HOURS ______ TO ______

TOTAL HOURS ______

CONTRACT HOURS ______

HOLE NO PLS-89-222 LOCATION 55W 48N ELEVATION 316

GEOLOGIST P. Collins DRILLER R. Fournell BIT NO. ______ BIT FOOTAGE 0.0 - 19.5

MOVE TO HOLE 2:45 - 3:00

DRILL 3:00 - 4:15

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

OTHER 4:15 - 4:50 clean mud tank move drill to road 4:50-5:15 fuel

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1–20			01, 01, 02	0.0 - 0.5 Organics 0.5 - 14.6 Ojibway II Sediments (0.5 - 4.5) grey, pure, soft nongritty clay (4.5 - 8.5) grey very fine sand / silt with thin soft clay interbeds. (8.5) - pebble bed (8.6 - 14.6) grey beige fine grained sand - beige in colour below 10.0 m 14.6 - 17.7 Chibougamau Till (14.6 - 14.8) boulder - granitic beige grey fine sand minor silt matrix. Cobble clasts supported of composition: 50% volcanics & sediments; 50% Granitoids. (15.3 - 15.5) granitoid boulder 17.7 - 19.5 Bedrock - dark green & reddish violet - med to coarse grained - moderately foliated - hematized felsic bands 2-3% FeO in places - 1% FeMg carbonate - <1% disseminated sulphides hybrid granitoid. 19.5 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE March 1 19 89

SHIFT HOURS

_____ TO _____

TOTAL HOURS

CONTRACT HOURS

HOLE NO PGS-89-223 LOCATION Site #4 North Lesueur ELEVATION 316

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. H0000035 BIT FOOTAGE 19.5 - 36.5

MOVE TO HOLE 7:00 - 7:45

DRILL 7:45 - 9:15

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel 6:30 - 7:00

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–1				0.0 - 0.7 Organics
1–11				0.7 - 11.3 Ojibway II Sediments (0.7 - 8.0) grey, nongritty, soft clay (8.0 - 10.4) grey silt = clay interbeds (10.4 - 11.3) grey very fine grained sand
11.3–15.4			01, 02, 03	11.3 - 15.4 Chibougamau Till grey beige fine sand silt and grey gritty clay matrix (10%) Slightly clast supported: Cobbles of composition: 55% Volcanics & sediments; 45% Granitoids sample #03 ~4.0 kg
15.4–17.0			04	15.4 - 17.0 Bedrock - dark green - medium grained - massive to weak fol. - porphyritic texture in places / qtz feldspar phenos: trace ankerite (≤1%) - chloritic - < 0.5% sulphides Granitoid - diorite
17				17.0 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE March 1 1989

HOLE NO PLS-89-224 LOCATION Site #5 North [illegible] ELEVATION 314

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. H0000035 BIT FOOTAGE 36.6 - 47.2

SHIFT HOURS

______ TO ______

TOTAL HOURS

CONTRACT HOURS

MOVE TO HOLE 9:15 - 9:30

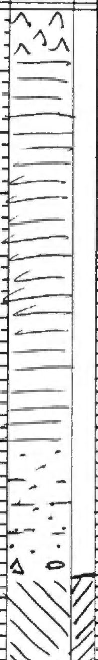
DRILL 9:30 - 10:30

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				
1–20			01 (at ~10)	0.0 - 0.7 Organics

0.0 - 0.7 **Organics**

0.7 - 9.0 **Ojibway II Sediments**

(0.7 - 7.0) grey, soft, non gritty clay

(7.0 - 9.0) grey, very fine sand & silt

9.0 - 9.2 **Chibougamau Till**

appeared to be thin veneer of till overlying bedrock. Too small to sample or log seperately.

9.2 - 10.5 **Bedrock**

- medium to olive green
- med & coarse grained
- porphyritic text.
- weak fol. to massive
- silicified
- phenos of feldspar, qtz are stained orange red hem, ankerite
- 1-2% Fe Mg carb
- 3-5% quartz/carb stringers

Grantoid - diorite

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE March 1 1989

HOLE NO PLS-89-225 LOCATION Site # 6 North Lemieux ELEVATION 317

GEOLOGIST P. Collins DRILLER R. Forand BIT NO. H00035 BIT FOOTAGE 47.2-68.7

SHIFT HOURS ______ TO ______

MOVE TO HOLE 10:30 - 10:45

DRILL 10:45 - 12:30

TOTAL HOURS ______

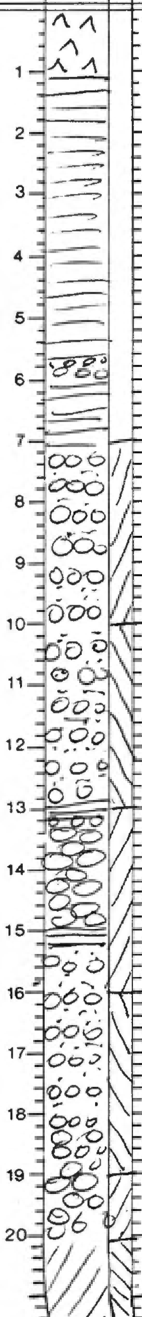
MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

CONTRACT HOURS ______

OTHER ______

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1–20			01, 02, 03, 04, 05, 06	0.0 - 1.0 organics 1.0 - 20.0 Ojibway II Sediments (1.0 - 5.7) grey, soft, non gritty clay (5.7 - 6.0) Gravel (matrix supported). medium & coarse sand matrix. +10 mesh granule & pebble clasts; 45% Volcanics & sediments; 55% Granitoids (6.0 - 7.0) similar to 1.0-5.7 (7.0 - 13.0) similar to 5.7-6.0 with cobble sized clasts below 10.5 (13.0 - 13.3) beige, soft, slightly gritty clay (13.3 - 15.0) Gravel is clast supported otherwise similar to 5.7-6.0 (15.0 - 15.3) Grey beige, soft nongritty clay bed (15.3 - 18.0) Gravel is matrix supported similar to (5.7-6.0) (18.0 - 20.0) once again clast supported gravel with abundance of +10 mesh well rounded pebble clasts of similar composition to 5.7-6.0 20.0 - 21.5 Bedrock Granitoid - diorite similar to #224 21.5 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE March 1 1989

HOLE NO PLS-89-226 LOCATION Site #7 North Lemieux ELEVATION 314

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. H0000035 BIT FOOTAGE 68.7 - 79.2

SHIFT HOURS ____ TO ____

MOVE TO HOLE 12:30 - 12:45

DRILL 12:45 - 1:45

TOTAL HOURS ____

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

CONTRACT HOURS ____

OTHER ____

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0.0 - 0.5 Organics
				0.5 - 8.0 Ojibway II Sediments
				(0.5 - 8.0) grey, soft, nongritty clay.
				8.0 - 9.0 Chibougamau Till
				grey beige fine sand / silt matrix. Pebble and cobble clasts of composition: 55% Volcanics and sediments; 45% Granitoids.
			01	9.0 - 10.5 Bedrock
			02	- dark green - coarse feldspar phenocrysts finer grained groundmass - well foliated to sheared; brittle def. in places - reddish stain FeMg carbonate ankerite - slow reaction to acid 1-2% - < 1% sulphides
				Granitoid - diorite
				10.5 E.O.H.

Depth scale: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE March 1 1989

HOLE NO P15-89-227 LOCATION Site # 8 North Lessieur ELEVATION 314

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. H00035 BIT FOOTAGE 79.2 - 88.7

SHIFT HOURS ____ TO ____

MOVE TO HOLE 1:45 - 2:00

DRILL 2:00 - 2:45

TOTAL HOURS ____

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

CONTRACT HOURS ____

OTHER ____

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0 – 0.7				0.0 - 0.7 Organics
0.7 – 7.5				0.7 - 7.5 Ojibway II Sediments grey, soft non gritty clay with silt inter-beds
7.5 – 8.2			01	7.5 - 8.2 Chibougamau Till grey beige fine sand/silt matrix. Pebble and cobble clasts of composition: 55% volcanics and sediments, 45% Granitoids Sample #01 is undersized
8.2 – 9.5			02	8.2 - 9.5 Bedrock - light to medium green (bleached in places) - coarse grained phenocrysts of feldspar (stretched) in a finer grained groundmass - strong foliation - 10% Fe/Mg carbonate Granitoid - diorite 9.5 E.O.H.

Depth scale: 1–20 metres.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE *March 1* 19 *89*

SHIFT HOURS

______ TO ______

TOTAL HOURS

______

CONTRACT HOURS

______

HOLE NO *PLS-228* LOCATION *L76+00W 44+50N* ELEVATION *320*

GEOLOGIST *P. Collin* DRILLER *R. Fournel* BIT NO. *H000003S* BIT FOOTAGE *88.7 - 98.7*

MOVE TO HOLE *2:45 - 3:30*

DRILL *3:30 - 4:40*

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER *4:40 - 5:00 move samples to road 5:00 - 5:30 travel*

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0.0 - 0.3 Organics
1				0.3 - 6.5 Ojibway II Sediments
2				(0.3 - 3.6) beige (oxidized) soft, non gritty clay
3				
4				(3.6 - 6.5) beige very fine sand and silt with clay interbeds
5				
6				6.5 - 8.6 Chibougamau Till
7			01	beige grey fine sand silt matrix Cobble clast supported: 45% Volcanics and sediments; 55% Granitoids
8			02	
9			03	Sample #02 undersized
10				8.6 - 10.0 Bedrock
11				- dark green
12				- coarse grained
13				- ~~massive~~ - porphyritic texture feld/qtz phenocrysts
14				- 1% carbonate
15				- no visible sulphides
16				Granitoid - diorite
17				10.0 E.O.H.
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE March 2 19 89

SHIFT HOURS ______ TO ______

TOTAL HOURS ______

CONTRACT HOURS ______

HOLE NO PCS-89-229 LOCATION Site #1 ELEVATION 314

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. 40000035 / CB70271 BIT FOOTAGE 98.6-124.5 / 0.0 -

MOVE TO HOLE 7:00 7:30

DRILL 7:30 - 12:15

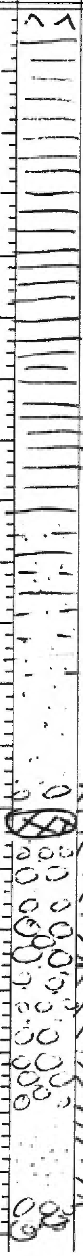
MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel 6:30 - 7:00

MOVE TO NEXT HOLE

Pg 1

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–20				0.0 - 0.5 Organics
				0.5 - 20.3 Ojibway II Sediments
				(0.5 - 8.0) grey, soft, non gritty clay
				(8.0 - 11.0) grey very fine sand/silt with thin clay interbeds.
				(11.0 - 12.6) greybeige fine grained sand
13			01	12.6 - 14.8 has till like matrix slightly unsorted yet becomes more sorted & coarser downsection. Original fine sand/silt may be cave in from overlying sediments. Cobble clasts 40% Volcanics & sediments; 60% Granitoids at 13.0 - 13.5 boulder - granitoid
14			01	14.8 - 15.6 Gravel: clast supported cobbles: 40% Volcanics & Seds; 60% Granitoids. Minor coarse sand matrix
15			02	15.6 - 17.0 again slightly unsorted matrix: similar to 12.6 - 14.8
16			03	17.5 - 18.0 Gravel similar to 14.8 - 15.6
18			04	18.0 - 19.3 predominantly sorted Beige fine grained sand c very fine sand interbeds.
20			N.R.	

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE March 2 1989

HOLE NO PLS-89-229 LOCATION Site #1 ELEVATION 314

GEOLOGIST ______ DRILLER ______ BIT NO. ______ BIT FOOTAGE ______

SHIFT HOURS ______ TO ______

MOVE TO HOLE ______

DRILL ______

TOTAL HOURS ______

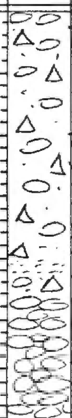
MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

CONTRACT HOURS ______

OTHER ______

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21–40			05, 06, 07	see below

Sample nos.: 05 (at about 21 m), 06 (at about 23 m), 07 (at about 24.5 m)

19.3 - 20.3 Gravel: cobble clast supported. No return due to sample washing away.
note: infer gravel by the way drill is behaving.

20.3 - 24.6 Chibougamau Till
beige grey fine sand / silt & min grey gritty clay matrix. (23%)
Cobble clast supported of composition: 45% Volcanics & Sediments; 65% Granitoids.

- below 23.0 matrix is slightly silted

24.0 - 24.2 sorted coarse sand bed

24.2 - 24.6 similar to 20.3 - 23.0

24.6 - 26.5 Missinaibi Seds ?
Gravel: cobble clast supported of composition: 60% Volcanics & sediments; 40% Granitoids.
Minor coarse sand matrix.

at 26.5 pull rods to change bit. Push rods down & start to sample at 26.5; however, did not get any return as sample was washing outside of rods to surface. Therefore move east 3m & redrill. See 229A

26.5 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE March 2 19 89

SHIFT HOURS

_____ TO _____

TOTAL HOURS

_____

CONTRACT HOURS

_____

HOLE NO PLS-89-229A LOCATION Site #1 3m east of 229 ELEVATION 314

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. CB70271 BIT FOOTAGE 0.0-

MOVE TO HOLE _____

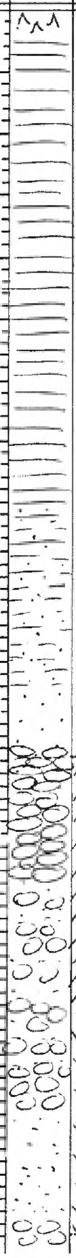
DRILL _____

MECHANICAL DOWN TIME _____

DRILLING PROBLEMS _____

OTHER _____

MOVE TO NEXT HOLE _____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–20				0.0 - 0.5 organics
				0.5 - 20.0 Ojibway II Sediments
				very similar to 229 see log for descriptions.
14			01	
18			02	

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE March 2 1989

HOLE NO PLS-89-229A LOCATION Site #1 3m east of 229 ELEVATION

GEOLOGIST DRILLER BIT NO. BIT FOOTAGE

SHIFT HOURS ___ TO ___

MOVE TO HOLE

DRILL

TOTAL HOURS

MECHANICAL DOWN TIME

DRILLING PROBLEMS

CONTRACT HOURS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	SAMPLE NO.
21	03
23	04
25	05
28	06
30	07

DESCRIPTIVE LOG

20.2 - 24.6 Chibougamau Till

For description see log for 229

24.6 - 29.0 Missinaibi Sediments?

24.6 - 25. Gravel : clast supported 60% Volcanics & sediments; 40% Granitoids. Very little matrix Sorted medium to coarse grained sand.

25.5 - 27.0 boulder - Iron Formation note initially thought to be bedrock as 25.0 - 25.5 contained abundant Fe Formation chips ie. fractured bedrock surface (≈ 25% of chips)

27.0 - 29.0 during this interval the drilling was fairly rapid & still getting Fe Formation chips (hematized). Also fine sand return; thus it is possible that the interval represents a fracture

29.0 - 31.0 Bedrock

- light to medium green (bleached)
- fine grained groundmass; feldspar phenos.
- highly altered-sheared; mylonitized
- 3-5% Fe/Mg Carbonate (ankerite)
- brick red banding below 29.5
- sericitized

highly altered granitoid

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE March 2/19 89

SHIFT HOURS ______ TO ______

TOTAL HOURS ______

CONTRACT HOURS ______

HOLE NO PLS-89-230 LOCATION Site # 2 ELEVATION 314

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. CB70271 BIT FOOTAGE 31-0-54.3

MOVE TO HOLE 2:45 - 3:00 (2nd)

DRILL 3:00 - 5:00 (2nd) 11:00 - 1:15 March 5/8

MECHANICAL DOWN TIME March 3 very cold tried to drill in moving rods & bit

DRILLING PROBLEMS kept Freezing. Air compressor broke down ~11:00

OTHER Tried to repair compressor 11:00-5:00. March 4 remove compressor

MOVE TO NEXT HOLE order new one From Timmins. Install March 5 7:00-11:00

Pg 1 of 2

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG							
				0.0 - 0.5 Organics							
1				0.5 - 12.2 Ojibway II Seds							
2				(0.5 - 8.0) grey beige, non gritty, soft clay							
3											
4				(8.0 - 11.0) grey, very fine sand and silt with thin clay interbeds							
5				(11.0 - 12.2) grey beige fine grained sand							
6											
7				12.2 - 21.5 Chibougamau Till							
8				beige grey slightly sorted fine sand minor silt matrix							
9				cobble clast supported of							
10				Composition: 50% volcanics and sediments; 50% Granitoids							
11											
12											
13			01	13.0 - 13.4 boulder gabbro							
14			01								
15			02								
16											
17			03								
18			← E.O.H. March 2								
19			04								
20											

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE March 2/6 19 89

HOLE NO PLS-89-230 LOCATION Site #2 ELEVATION ______

GEOLOGIST ______ DRILLER ______ BIT NO. ______ BIT FOOTAGE ______

SHIFT HOURS
______ TO ______

MOVE TO HOLE ______

DRILL ______

TOTAL HOURS
______

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

CONTRACT HOURS
______

OTHER ______

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
21			05	21.5 - 23.3 Bedrock
				- medium & light green (bleached)
22			06	- fine grained
				- strong foliation ; sheared
23				- carbonatized ~5% both
				diss & stringer
24				- sericitzed
				- ≤ 1% diss sulphides
25				
26				Altered Int. Volcanic
				23.3 E.O.H.
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE March 5 19 89
HOLE NO FLS-89-231 LOCATION Sido #11 ELEVATION 314
GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. CB70271 BIT FOOTAGE 54.3 - 69.8

SHIFT HOURS ____ TO ____
MOVE TO HOLE 1:15 - 1:45
DRILL 1:45 - 2:45

TOTAL HOURS ____
MECHANICAL DOWN TIME ____
DRILLING PROBLEMS ____

CONTRACT HOURS ____
OTHER ____
MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0.0 - 0.5 Organics
1				0.5 - 13.3 Ojibway II Sediments
2				(0.5 - 10.0) grey, soft, nongritty clay
3				
4				(10.0 - 12.0) grey silt with thin clay interbeds
5				(12.0 - 13.3) grey very fine grained sand
6				
7				13.3 - 14.2 Chibougamau Till
8				beige grey slightly sorted and coarse biased fine grained sand (silt deficient) Initially abundant medium to coarse sand then became unsorted downsection
9				
10				
11				Cobble clasts of composition:
12				45% Volcanics and Sediments
13				55% Granitoids.
14			01	14.2 - 15.5 Bedrock
15			02	- medium green
				- med - fine grained
16				- weak to mod. foliation
				- chloritized
17				- 2% carbonate
				- <1% sulphides
18				Int - Volcanic ?
19				15.5 E.O.H.
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE March 5/6 1989	HOLE NO PLS-89-232 LOCATION Site # 10 ELEVATION 314
	GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. GB30271 BIT FOOTAGE 69.8 –
SHIFT HOURS	MOVE TO HOLE 2:45 – 3:00
____ TO ____	DRILL 3:00 – 5:00 5th 9:30-10:30 6th
TOTAL HOURS	MECHANICAL DOWN TIME
____	DRILLING PROBLEMS 7:15-9:30 cold weather start
CONTRACT HOURS	OTHER Travel 5:00 – 5:30 5th 6:30 – 7:15 6th
____	MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0.0 – 1.5 Organics
				1.5 – 17.5 Ojibway II Sediments
				(1.5 – 9.4) grey non gritty, soft clay
				(9.4 – 11.5) Gravel: sorted medium and coarse sand matrix. Cobble clasts of composition: 40% Volcanics & sediments; 60% Granitoids (clast supported)
				11.5 – 11.7 Boulder – gabbro
				11.7 – 12.4 similar to 9.4 – 11.5
				12.4 – 13.5 Gravel becomes matrix supported. and slightly unsorted in places
10			01	13.5 – 17.5 Gravel is once again clast supported occasional small boulder otherwise similar to 9.4 – 11.5
12–13			02	17.5 – 18.5 Chibougamau Till
14–15			03	gradational contact into grey beige fine sand / silt matrix Cobble clasts of composition: 45% Volcanics & Sediments; 55% Granitoids.
17			04	* sample 05 undersized ~ 4 kg.
				18.5 – 20.0 Bedrock
18			05	– medium green
19			06	– fine to medium grained
				– moderately foliated; sheared in places
				– chloritic
20				– carbonatized 5–7%
				– 5% pinkish Felsic bands
				– <1% sulphides
				Granitoid – diorite.
				20.0 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE March 6 1989

SHIFT HOURS
_____ TO _____

TOTAL HOURS
_____

CONTRACT HOURS
_____

HOLE NO PLS-89-233 LOCATION SITE #9 ELEVATION 314

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. A000027 BIT FOOTAGE 2.0 - 24.0

MOVE TO HOLE 10:30 - 10:45

DRILL 10:45 - 12:30

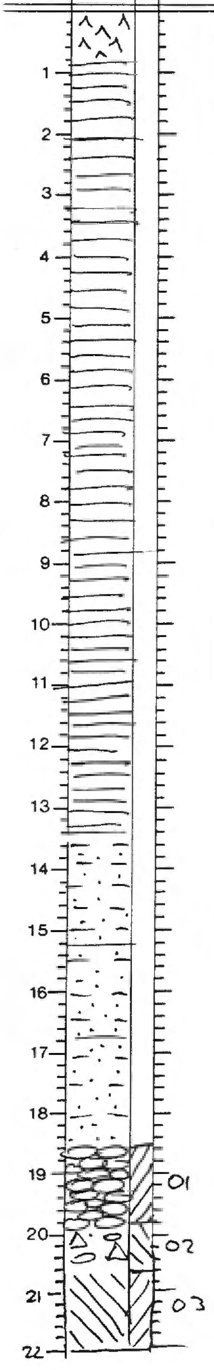
MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



0.0 - 0.7 Organics

0.7 - 19.8 Ojibway II Sediments

(0.7 - 13.4) grey, non gritty, soft clay

(13.4 - 18.5) grey very fine sand / silt with occasional thin clay bed.

(18.5 - 19.8) Gravel : clast supported sorted medium - & coarse grained sand matrix. Cobble clasts of composition: 40% Volcanics & sediments; 60% Granitoids.

19.8 - 20.7 Chibougamau Till

grey beige fine sand / silt and grey gritty clay matrix (10%) Cobble clast of composition: 50% Volcanics & sediments; 50% Granitoids

* Sample #02 undersized. ~ 4 kg.

20.7 - 22.0 Bedrock

- light & med. green (bleached in places)
- slightly porphyritic (coarse gr. feldspar phenos. : fine g. mass
- strong foliation; sheared in places
- chloritic
- carbonatized 5-7% Fe/Mg
- Tr. hematite
- ≤ 1% sulphides

Granitoid - Diorite.

22.0 E.O.H.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE March 6 19 89

HOLE NO PLS-89-234 LOCATION Site #3 ELEVATION 318

GEOLOGIST P. Collins DRILLER R. Fournel BIT NO. A000027 BIT FOOTAGE 24.0 - 38.0

SHIFT HOURS ______ TO ______

MOVE TO HOLE 12:30 - 1:00

DRILL 1:00 - 2:45

TOTAL HOURS ______

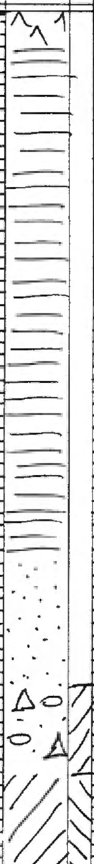
MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

CONTRACT HOURS ______

OTHER 2:45 - 4:30 change oil on drill; move to highway Kinger road intersection.

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1–20 (scale)			01 (≈12); 02 (≈13)	0.0 - 0.5 Organics 0.5 - 11.0 Ojibway II Sediments (0.5 - 8.8) beige (oxidised), non gritty soft clay. Grey beige below 3.0 m (8.8 - 11.0) beige fine grained sand 11.0 - 12.4 Chibougamau Till slightly sorted & coarse biased beige fine sand matrix. (matrix supported). Cobbles clasts of composition: 50% Volcanics & Sediments; 50% Granitoids. 12.4 - 14.0 Bedrock - medium green - coarse grained: porphyritic (feldspar phenos) - massive to weakly foliated - silicified (hard to drill) - 1% carbonate (diss.) - <1% sulphides Diorite - gabbro 14.0 - E.O.H.

APPENDIX B

SAMPLE WEIGHTS - HEAVY MINERAL CIRCUIT

OVERBURDEN DRILLING MANAGEMENT LIMITED - LABORATORY SAMPLE LOG

ABBREVIATIONS

DATA LOG

Clast:

Size of Clast:
- G: Granules
- P: Pebbles
- C: Cobbles
- BL: Boulder Chips
- BK: Bedrock Chips

% Clast Composition:
- V/S: Volcanics and Sediments
- GR: Granitics
- LS: Limestone
- OT: Other Lithologies (Refer to Footnotes Below)
- TR: Only Trace Present
- NA NOT APPLICABLE

Class:

- BLD: Boulder Chips
- BDK: Bedrock Chips

Matrix:

S/U: Sorted or Unsorted

SD:	Sand	Y:	Yes Fraction Present	F:	Fine
ST:	Silt	N:	Fraction Not Present	M:	Medium
CY:	Clay			C:	Coarse

Colour:

- B: Beige
- GY: Grey
- GB: Grey Beige
- GN: Green
- GG: Grey Green
- BN: Brown
- BK: Black
- OC: Ochre
- PK: Pink
- OE: Orange

GOLD LOG

Number of Grains:

- T: Number Found on Shaking Table
- P: Number Found After Panning

Thickness:

- C: Calculated Thickness of Grain
- M: Actual Measured Thickness of Grain

Footnotes:

A: Gritty Clay Lumps Present

B: Smooth Clay Lumps Present

C: Organics Present

D: Oxidized

MIPL1FEB.WR1

OVERBURDEN DRILLING MANAGEMENT LIMITED

TOTAL # OF SAMPLES IN THIS REPORT = 40

LABORATORY SAMPLE LOG

SAMPLE NO.	WEIGHT (KG.WET) TABLE SPLIT	WEIGHT (KG.WET) +10 CHIPS	WEIGHT (KG.WET) TABLE FEED	WEIGHT (GRAMS DRY) TABLE CONC	WEIGHT (GRAMS DRY) M.I. LIGHTS	M. I. CONC CONC. TOTAL	M. I. CONC NON MAG	M. I. CONC MAG	AU NO. V.G.	AU CALC PPB	DESCRIPTION CLAST SIZE	CLAST % V/S	CLAST % GR	CLAST % LS	CLAST % OT	MATRIX S/U	MATRIX SD	MATRIX ST	MATRIX CY	MATRIX COLOR SD	MATRIX COLOR CY	CLASS
PLS-89																						
151-01	8.8	0.6	8.2	274.7	232.8	41.9	30.3	11.6	5	338	P	70	30	NA	NA	U	Y	Y	Y	B	B	TILL
151-02	8.3	0.1	8.2	285.0	226.8	58.2	45.3	12.9	0	NA	P	70	30	NA	NA	S	M	Y	Y	B	B	SAND
151-03	8.1	0.0	8.1	154.6	102.6	52.0	38.0	14.0	1	17	TR	NA	NA	NA	NA	S	F	Y	Y	B	B	SAND
151-04	9.8	3.3	6.5	244.2	191.7	52.5	36.1	16.4	6	23	P	60	40	NA	NA	U	Y	Y	Y	B	B	TILL
151-05	9.6	2.0	7.6	211.9	161.6	50.3	34.4	15.9	6	154	P	70	30	NA	NA	U	Y	Y	Y	B	B	TILL
151-06	7.6	3.2	4.4	313.8	270.5	43.3	22.2	21.1	20	2051	C	20	80	NA	NA	U	Y	Y	Y	B	B	TILL
152-01	9.7	2.3	7.4	312.7	268.4	44.3	31.3	13.0	7	124	P	70	30	NA	NA	U	Y	Y	Y	B	B	TILL
152-02	8.9	3.0	5.9	202.1	148.7	53.4	36.4	17.0	3	105	C	80	20	NA	NA	U	Y	Y	Y	GG	GG	TILL
153-01	8.7	1.4	7.3	108.4	63.9	44.5	28.5	16.0	3	10	P,C	30	70	NA	NA	U	Y	Y	Y	GB	GB	TILL
154-01	6.4	1.1	5.3	120.1	93.9	26.2	18.0	8.2	3	67	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
155-01	7.9	0.0	7.9	168.4	113.0	55.4	35.7	19.7	0	NA	TR	NA	NA	NA	NA	S	F	Y	Y	GB	GB	SAND
155-02	8.5	1.5	7.0	287.4	236.1	51.3	32.0	19.3	4	209	P	40	60	NA	NA	U	Y	Y	Y	GB	GB	TILL
155-03	6.4	1.6	4.8	241.7	200.8	40.9	23.5	17.4	5	44	P,C	15	85	NA	NA	U	Y	Y	Y	GB	GB	TILL
156-01	8.4	0.6	7.8	168.4	114.4	54.0	36.2	17.8	7	188	P,C	35	65	NA	NA	U	Y	Y	Y	GB	GB	TILL
156-02	8.8	1.1	7.7	155.6	111.8	43.8	27.5	16.3	7	305	P	50	50	NA	NA	U	Y	Y	Y	GB	GB	TILL
156-03	4.2	0.6	3.6	106.5	76.5	30.0	20.9	9.1	5	67	P	20	80	NA	NA	U	Y	Y	Y	GB	GB	TILL
157-01	8.6	3.0	5.6	226.8	186.5	40.3	26.1	14.2	3	33	C	40	60	NA	NA	U	Y	Y	Y	GB	GB	TILL
158-01	6.0	1.2	4.8	213.7	178.2	35.5	21.7	13.8	3	35	C	60	40	NA	NA	U	Y	Y	Y	GG	GG	TILL
159-01	6.6	1.6	5.0	167.4	131.1	36.3	23.5	12.8	4	96	C	70	30	NA	NA	U	Y	Y	Y	B	B	TILL
161-01	6.7	1.7	5.0	204.4	168.9	35.5	22.3	13.2	4	195	C	70	30	NA	NA	U	Y	Y	Y	B	B	TILL
162-01	8.8	1.2	7.6	312.4	264.2	48.2	32.2	16.0	6	156	P	80	20	NA	NA	U	Y	Y	Y	GG	GG	TILL
163-01	6.4	0.4	6.0	189.0	154.6	34.4	22.3	12.1	9	179	P	70	30	NA	NA	U	Y	Y	Y	B	B	TILL
163-02	5.3	0.8	4.5	139.9	103.7	36.2	23.2	13.0	5	146	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
164-01	7.2	0.3	6.9	170.8	129.8	41.0	27.3	13.7	8	166	P	70	30	NA	NA	U	Y	Y	Y	B	B	TILL
164-02	9.2	1.5	7.7	262.0	200.3	61.7	35.0	26.7	2	16	P	80	20	NA	NA	U	Y	Y	Y	GG	GG	TILL
164-03	5.3	1.0	4.3	118.4	88.1	30.3	19.8	10.5	4	123	C	90	10	NA	NA	U	Y	Y	Y	GY	GY	TILL
164-04	6.8	1.1	5.7	157.2	125.9	31.3	20.5	10.8	4	80	C	90	10	NA	NA	U	Y	Y	Y	GG	GG	TILL
164-05	6.1	1.1	5.0	121.2	91.7	29.5	20.7	8.8	4	69	P	60	40	NA	NA	U	Y	Y	Y	GG	GG	TILL
165-01	6.8	1.5	5.3	196.5	156.0	40.5	28.3	12.2	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
165-02	9.1	2.2	6.9	330.1	267.3	62.8	40.4	22.4	3	92	P	90	10	NA	NA	S	C	Y	Y	GY	GY	GRAVEL
165-03	8.4	2.0	6.4	337.0	284.3	52.7	30.7	22.0	2	273	P	85	15	NA	NA	S	C	Y	Y	GB	GB	GRAVEL
165-04	4.7	0.5	4.2	249.6	214.4	35.2	24.5	10.7	2	76	P	80	20	NA	NA	U	Y	Y	Y	GY	GY	TILL
165-05	7.5	1.2	6.3	176.2	119.8	56.4	37.7	18.7	3	42	C	95	5	NA	NA	U	Y	Y	Y	GY	GY	TILL
165-06	5.1	1.1	4.0	106.3	70.1	36.2	24.3	11.9	4	23	C	95	5	NA	NA	U	Y	Y	Y	GY	GY	TILL
165-07	8.8	4.0	4.8	269.2	216.9	52.3	33.6	18.7	5	153	P	80	20	NA	NA	U	Y	Y	Y	GY	GY	TILL
165-08	9.2	3.1	6.1	291.3	238.1	53.2	25.2	28.0	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
165-09	7.1	1.4	5.7	295.1	251.1	44.0	25.6	18.4	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL & BDK
166-01	7.3	1.2	6.1	311.6	264.5	47.1	28.6	18.5	0	NA	P	90	10	NA	NA	U	Y	Y	Y	GY	GY	TILL
166-02	6.4	1.1	5.3	317.2	259.9	57.3	38.6	18.7	2	43	P	90	10	NA	NA	U	Y	Y	Y	GY	GY	TILL
166-03	8.9	2.0	6.9	399.3	334.4	64.9	38.2	26.7	4	190	P	90	10	NA	NA	U	Y	Y	Y	GY	GY	TILL

MIPL1MAR.WR1

OVERBURDEN DRILLING MANAGEMENT LIMITED

TOTAL # OF SAMPLES IN THIS REPORT = 40

LABORATORY SAMPLE LOG

SAMPLE NO.	WEIGHT (KG.WET) TABLE SPLIT	+10 CHIPS	TABLE FEED	WEIGHT (GRAMS DRY) TABLE CONC	M.I. CONC M.I. LIGHTS	CONC. TOTAL	NON MAG	MAG	AU NO. V.G.	CALC PPB	DESCRIPTION CLAST SIZE	% V/S	GR	LS	OT	MATRIX S/U	SD	ST	CY	COLOR SD	COLOR CY	CLASS
PLS-89																						
166-04	6.1	0.7	5.4	185.4	138.7	46.7	31.0	15.7	1	12	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
166-05	6.9	0.8	6.1	154.6	107.7	46.9	30.7	16.2	4	263	P	90	10	NA	NA	U	Y	Y	Y	GB	GB	TILL
166-06	9.1	2.0	7.1	210.3	148.3	62.0	41.4	20.6	5	44	P	95	5	NA	NA	U	Y	Y	Y	GB	GB	TILL
166-07	9.6	2.7	6.9	206.3	147.7	58.6	37.0	21.6	2	51	P	90	10	NA	NA	U	Y	Y	Y	GB	GB	TILL
166-08	9.6	3.5	6.1	168.6	116.4	52.2	31.7	20.5	1	12	P	85	15	NA	NA	U	Y	Y	Y	GB	GB	TILL
166-09	10.0	4.5	5.5	238.6	178.3	60.3	32.7	27.6	2	14	P	90	10	NA	NA	U	Y	Y	Y	GB	GB	TILL
166-10	10.0	3.0	7.0	183.4	147.4	36.0	23.0	13.0	4	40	C	50	50	TR	A	U	Y	Y	Y	GB	GB	TILL
166-11	9.9	2.6	7.3	240.1	194.6	45.5	29.2	16.3	1	7	C	50	50	NA	NA	U	Y	Y	Y	GB	GB	TILL
166-12	9.4	2.5	6.9	247.7	211.5	36.2	23.0	13.2	3	334	C	40	60	TR	NA	U	Y	Y	Y	GB	GB	TILL
166-13	10.0	2.3	7.7	322.2	279.8	42.4	26.6	15.8	3	76	C	50	50	TR	NA	U	Y	Y	Y	GB	GB	TILL
166-14	8.0	2.8	5.2	257.0	227.4	29.6	13.7	15.9	1	47	C.BK	5	95	NA	NA	U	Y	Y	Y	GY	GY	TILL
167-01	8.2	0.0	8.2	165.3	119.8	45.5	30.6	14.9	1	33	TR	NA	NA	TR	A	S	F	Y	Y	GB	NA	SAND
167-02	8.1	0.0	8.1	217.6	168.9	48.7	34.6	14.1	2	17	TR	NA	NA	NA	NA	S	F	Y	Y	GB	GB	SAND
167-03	8.9	1.5	7.4	258.3	221.1	37.2	21.2	16.0	10	319	C	15	85	NA	NA	U	Y	Y	Y	B	B	TILL
167-04	6.2	1.0	5.2	210.9	168.7	42.2	24.7	17.5	5	298	C	10	90	NA	NA	U	Y	Y	Y	B	B	TILL
168-01	8.8	2.5	6.3	239.7	195.8	43.9	27.7	16.2	7	265	C	40	60	NA	NA	U	Y	Y	Y	B	B	TILL
168-02	9.2	2.7	6.5	249.1	209.2	39.9	26.0	13.9	8	89	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
168-03	9.3	2.8	6.5	175.2	131.8	43.4	26.9	16.5	4	195	C	90	10	NA	NA	U	Y	Y	Y	GB	GB	TILL
168-04	9.2	2.9	6.3	324.5	276.6	47.9	30.6	17.3	4	260	C	90	10	NA	NA	U	Y	Y	Y	GB	GB	TILL
168-05	8.8	3.3	5.5	300.2	262.6	37.6	27.2	10.4	1	181	C	95	5	NA	NA	U	Y	Y	Y	GY	GY	TILL & BLD
168-06	8.8	2.2	6.6	410.9	372.6	38.3	25.6	12.7	2	108	C	50	50	NA	NA	U	Y	Y	Y	GY	GY	TILL & BLD
168-07	8.8	2.2	6.6	326.1	294.1	32.0	19.2	12.8	2	468	C	50	50	NA	NA	U	Y	Y	Y	GB	GB	TILL
169-01	9.0	2.5	6.5	303.0	245.4	57.6	37.0	20.6	5	685	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
169-02	9.5	3.6	5.9	295.6	248.7	46.9	30.4	16.5	1	6	C	30	70	NA	NA	U	Y	Y	Y	GB	GB	TILL
169-03	8.2	2.1	6.1	168.9	127.2	41.7	22.2	19.5	3	2333	C	10	90	NA	NA	S	C	Y	Y	GB	NA	GRAVEL
169-04	7.5	2.9	4.6	289.4	246.6	42.8	27.8	15.0	4	624	C	30	70	NA	NA	S	C	Y	Y	GB	NA	GRAVEL
169-05	2.9	0.9	2.0	222.9	212.3	10.6	6.6	4.0	4	222	P	50	50	NA	NA	U	Y	Y	Y	GB	GNB	TILL
169-06	8.3	2.1	6.2	219.9	178.2	41.7	28.6	13.1	2	443	C	95	5	NA	NA	U	Y	Y	Y	GY	GY	TILL
169-07	9.1	2.2	6.9	114.3	57.0	57.3	34.9	22.4	1	29	C	85	15	NA	NA	U	Y	Y	Y	GY	GY	TILL
169-08	8.3	1.5	6.8	338.7	293.2	45.5	31.4	14.1	3	71	C	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
169-09	8.3	2.7	5.6	121.8	84.5	37.3	20.8	16.5	5	1787	C	40	60	NA	NA	U	Y	Y	Y	GY	GY	TILL
170-01	4.2	1.6	2.6	241.5	221.8	19.7	12.6	7.1	1	51	C.BK	5	95	NA	NA	S	C	Y	Y	PKB	B	GRAVEL
171-01	8.5	1.2	7.3	151.3	99.5	51.8	31.8	20.0	2	53	P	70	30	NA	A	U	Y	Y	Y	GB	GB	TILL
171-02	8.1	1.3	6.8	197.6	139.7	57.9	37.0	20.9	8	37	C	20	80	NA	NA	U	Y	Y	Y	PKB	B	TILL
171-03	5.1	1.6	3.5	283.9	253.3	30.6	18.1	12.5	2	46	C	10	90	NA	NA	U	Y	Y	Y	PKB	B	TILL
171-04	8.8	2.0	6.8	181.7	130.7	51.0	31.0	20.0	10	690	C	20	80	NA	NA	U	Y	Y	Y	PKB	B	TILL
171-05	4.4	0.3	4.1	154.6	110.2	44.4	30.4	14.0	55	871	C	5	95	NA	NA	U	Y	Y	Y	PKB	B	TILL
172-01	8.5	0.0	8.5	269.9	222.2	47.7	29.6	18.1	10	160	TR	NA	NA	NA	A	U	Y	Y	Y	B	B	TILL
172-02	8.4	2.2	6.2	191.9	155.6	36.3	23.6	12.7	5	101	P	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
172-03	8.1	2.0	6.1	254.0	221.6	32.4	21.2	11.2	4	415	P	50	50	NA	NA	U	Y	Y	Y	GY	GY	TILL

MINNOVA

03/07/891

MIPL2MAR.WR1
TOTAL # OF SAMPLES IN THIS REPORT = 40

OVERBURDEN DRILLING MANAGEMENT LIMITED

LABORATORY SAMPLE LOG

SAMPLE NO.	WEIGHT (KG.WET)			WEIGHT (GRAMS DRY)		M. I. CONC			AU		DESCRIPTION											CLASS
											CLAST					MATRIX						
	TABLE SPLIT	+10 CHIPS	TABLE FEED	TABLE CONC	M.I. LIGHTS	CONC. TOTAL	NON MAG	MAG	NO. V.G.	CALC PPB	SIZE	% V/S	GR	LS	OT	S/U	SD	ST	CY	COLOR SD	COLOR CY	
PLS-89																						
172-04	8.2	2.3	5.9	211.5	172.7	38.8	21.9	16.9	1	1	P	80	20	NA	NA	S	C	Y	Y	GY	NA	GRAVEL
172-05	8.5	2.7	5.8	292.1	260.3	31.8	18.7	13.1	2	30	P	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
172-06	8.8	2.0	6.8	447.1	400.7	46.4	25.6	20.8	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
173-01	8.5	2.0	6.5	258.8	216.5	42.3	25.9	16.4	2	42	P	40	60	NA	NA	U	Y	Y	Y	GB	GB	T/BDK
174-01	7.9	6.0	1.9	345.1	305.4	39.7	23.5	16.2	12	1107	P	60	40	NA	NA	U	Y	Y	Y	GB	GB	T/BDK
175-01	7.9	0.1	7.8	320.1	295.0	25.1	19.1	6.0	3	77	P	100	NA	NA	NA	S	F	NA	NA	GB	NA	SAND
175-02	4.5	0.0	4.5	122.9	110.5	12.4	7.5	4.9	7	217	TR	NA	NA	NA	NA	S	F	NA	NA	GB	NA	SAND
175-03	8.5	2.0	6.5	240.6	188.6	52.0	32.4	19.6	7	1591	P	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
175-04	8.7	2.1	6.6	141.2	89.5	51.7	33.4	18.3	1	6	P	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
175-05	8.6	1.7	6.9	342.1	274.2	67.9	42.0	25.9	5	1412	P	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
175-06	8.4	1.9	6.5	103.6	58.7	44.9	28.3	16.6	1	7	P	80	20	NA	NA	U	Y	Y	Y	GY	GY	TILL
175-07	8.7	1.7	7.0	244.5	176.7	67.8	45.0	22.8	4	17	P	85	15	NA	NA	U	Y	Y	Y	GY	GY	TILL
175-08	8.6	1.1	7.5	314.7	273.3	41.4	27.2	14.2	1	7	P	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
175-09	9.0	2.5	6.5	272.7	223.6	49.1	32.1	17.0	5	64	P	80	20	NA	NA	U	Y	Y	Y	GY	GY	TILL
175-10	6.0	1.5	4.5	322.6	293.2	29.4	20.6	8.8	3	50	P	60	40	NA	NA	U	Y	Y	Y	GY	GY	T/BLD
175-11	5.7	1.6	4.1	203.3	174.0	29.3	19.7	9.6	1	10	P	60	40	NA	NA	U	Y	Y	Y	GY	GY	T/BLD
175-12	7.7	1.9	5.8	310.4	275.9	34.5	20.4	14.1	1	18	P	60	40	NA	NA	U	Y	Y	Y	GY	GY	TILL
175-13	6.9	1.1	5.8	354.2	317.8	36.4	22.2	14.2	2	298	P	60	40	NA	NA	U	Y	Y	Y	GY	GY	T/BLD
175-14	8.2	1.4	6.8	351.3	302.9	48.4	27.7	20.7	3	246	P	70	30	NA	NA	U	Y	Y	Y	GY	GY	T/BLD
176-01	8.4	1.5	6.9	204.6	162.1	42.5	26.4	16.1	5	240	P	70	30	NA	NA	U	Y	Y	Y	GY	GY	T/BDK
177-01	8.5	1.6	6.9	311.9	262.8	49.1	33.6	15.5	3	9	P	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
179-01	7.7	2.2	5.5	358.6	298.3	60.3	39.8	20.5	9	817	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
180-01	8.9	3.2	5.7	364.9	307.4	57.5	28.8	28.7	5	168	P	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
180-02	8.9	2.8	6.1	359.9	309.5	50.4	32.0	18.4	5	53	P	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
180-03	8.8	2.8	6.0	350.1	303.2	46.9	29.8	17.1	6	150	P	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
180-04	6.2	2.5	3.7	250.7	232.1	18.6	11.4	7.2	2	549	P	60	40	NA	NA	U	Y	Y	Y	B	B	TILL
180-05	9.0	2.4	6.6	327.2	279.0	48.2	32.4	15.8	6	26	P	60	40	NA	NA	U	Y	Y	Y	B	B	TILL
180-06	7.9	2.4	5.5	250.6	212.4	38.2	22.1	16.1	0	NA	P	70	30	NA	NA	S	C	Y	Y	B	B	TILL
180-07	8.4	2.5	5.9	281.1	236.3	44.8	24.7	20.1	2	132	P	70	30	NA	NA	S	M	Y	Y	GB	GB	GRAVEL
181-01	8.9	2.2	6.7	455.3	402.4	52.9	36.6	16.3	3	76	P	70	30	NA	NA	U	Y	Y	Y	GN	GN	GRAVEL
181-02	7.8	1.2	6.6	375.0	324.9	50.1	36.2	13.9	1	2	C	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
181-03	8.2	1.0	7.2	333.1	301.4	31.7	20.9	10.8	4	90	C	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
181-04	8.7	1.5	7.2	424.7	371.6	53.1	36.2	16.9	0	NA	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
181-05	8.9	1.5	7.4	317.1	270.5	46.6	32.6	14.0	0	NA	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
181-06	8.2	0.8	7.4	425.5	377.1	48.4	34.8	13.6	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
181-07	8.5	1.6	6.9	437.2	368.1	69.1	39.3	29.8	1	9	P	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
181-08	8.7	2.8	5.9	207.7	169.8	37.9	25.6	12.3	0	NA	P	80	20	NA	NA	U	Y	Y	Y	GY	GY	TILL
181-09	9.0	2.4	6.6	256.8	213.2	43.6	29.9	13.7	3	3	C	80	20	NA	NA	U	Y	Y	Y	GY	GY	TILL
181-10	5.5	0.5	5.0	174.1	148.4	25.7	19.0	6.7	0	NA	C	90	10	NA	NA	U	Y	Y	Y	GB	GB	TILL
182-01	9.3	1.8	7.5	287.4	232.4	55.0	36.1	18.9	0	NA	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL

MIPL3MAR.WR1

OVERBURDEN DRILLING MANAGEMENT LIMITED

TOTAL # OF SAMPLES IN THIS REPORT = 39

LABORATORY SAMPLE LOG

SAMPLE NO.	WEIGHT (KG.WET)			WEIGHT (GRAMS DRY)					AU		DESCRIPTION											CLASS
					M. I. CONC						CLAST					MATRIX						
	TABLE SPLIT	+10 CHIPS	TABLE FEED	TABLE CONC	M.I. LIGHTS	CONC. TOTAL	NON MAG	MAG	NO. V.G.	CALC PPB	SIZE	% V/S	% GR	% LS	% OT	S/U	SD	ST	CY	COLOR SD	COLOR CY	
PL3-89																						
182-02	8.6	2.1	6.5	248.9	201.2	47.7	31.9	15.8	0	NA	C	80	20	NA	NA	U	Y	Y	Y	B	B	TILL
182-03	9.1	1.8	7.3	259.6	204.7	54.9	36.9	18.0	0	NA	C	80	20	NA	NA	U	Y	Y	Y	B	B	TILL
182-04	9.6	1.9	7.7	223.2	172.4	50.8	34.1	16.7	2	20	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
182-05	9.1	2.6	6.5	220.8	169.5	51.3	27.6	23.7	1	413	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
182-06	8.8	2.1	6.7	182.5	137.6	44.9	30.0	14.9	2	13	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
182-07	8.7	1.5	7.2	186.8	144.1	42.7	27.3	15.4	0	NA	P	85	15	NA	NA	U	Y	Y	Y	GB	GB	TILL
182-08	8.8	2.0	6.8	235.7	189.3	46.4	32.5	13.9	1	11	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
182-09	8.2	0.6	7.6	246.7	195.3	51.4	36.8	14.6	6	44	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
182-10	8.6	1.0	7.6	216.7	178.3	38.4	25.4	13.0	1	59	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
182-11	8.3	1.3	7.0	336.4	295.8	40.6	27.0	13.6	1	107	P	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
183-01	8.3	1.4	6.9	361.7	318.1	43.6	28.4	15.2	5	39	P	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
183-02	8.9	1.2	7.7	237.5	189.5	48.0	30.4	17.6	1	12	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
183-03	8.9	2.2	6.7	352.6	286.6	66.0	46.7	19.3	1	22	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
183-04	8.6	2.0	6.6	298.6	236.3	62.3	43.4	18.9	3	113	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
183-05	8.5	1.4	7.1	281.0	227.4	53.6	34.8	18.8	0	NA	C	98	2	NA	NA	U	Y	Y	Y	B	B	TILL
184-01	8.4	1.3	7.1	238.7	198.2	40.5	27.3	13.2	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-02	7.6	1.3	6.3	194.6	153.3	41.3	26.0	15.3	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-03	5.3	0.8	4.5	324.0	296.4	27.6	17.3	10.3	1	547	C	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-04	8.4	1.8	6.6	196.3	152.0	44.3	28.1	16.2	1	13	C	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-05	8.5	1.3	7.2	244.5	208.1	36.4	24.7	11.7	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-06	8.9	1.2	7.7	404.7	300.3	104.4	71.3	33.1	0	NA	C	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-07	8.8	1.2	7.6	339.0	289.0	50.0	35.5	14.5	0	NA	C	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-08	8.2	0.7	7.5	178.3	147.1	31.2	22.7	8.5	0	NA	C	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-09	8.4	1.5	6.9	190.7	154.9	35.8	22.8	13.0	0	NA	C	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-10	8.4	1.4	7.0	161.8	135.2	26.6	18.1	8.5	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-11	8.9	2.1	6.8	224.6	186.4	38.2	26.3	11.9	0	NA	C	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-12	8.9	1.4	7.5	333.1	276.7	56.4	39.1	17.3	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-13	9.1	2.4	6.7	394.5	348.5	46.0	31.3	14.7	0	NA	C	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-14	8.8	1.8	7.0	186.8	156.6	30.2	20.5	9.7	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-15	8.9	2.5	6.4	415.4	363.2	52.2	36.2	16.0	3	404	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-16	9.2	1.2	8.0	253.3	205.2	48.1	32.8	15.3	0	NA	C	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-17	8.9	1.2	7.7	284.0	241.2	42.8	31.3	11.5	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
184-18	8.7	1.3	7.4	325.8	284.3	41.5	32.9	8.6	1	569	C	30	70	NA	NA	U	Y	Y	Y	GB	GB	TILL
185-01	8.6	1.4	7.2	274.8	227.8	47.0	33.3	13.7	0	NA	C	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
185-02	7.8	2.1	5.7	314.4	268.8	45.6	32.1	13.5	0	NA	C	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
185-03	6.0	1.6	4.4	348.1	306.9	41.2	29.5	11.7	0	NA	P	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
185-04	6.6	1.4	5.2	276.9	231.8	45.1	31.5	13.6	1	300	P	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
185-05	5.8	1.2	4.6	311.3	269.6	41.7	29.7	12.0	1	318	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
185-06	8.3	2.9	5.4	230.0	183.6	46.4	33.7	12.7	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
185-07	7.7	2.8	4.9	238.4	195.1	43.3	31.4	11.9	0	NA	C	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL

MIPL4MAR.WR1 OVERBURDEN DRILLING MANAGEMENT LIMITED
TOTAL # OF SAMPLES IN THIS REPORT = 40

LABORATORY SAMPLE LOG

SAMPLE NO.	WEIGHT (KG.WET) TABLE SPLIT	+10 CHIPS	TABLE FEED	WEIGHT (GRAMS DRY) TABLE CONC	M.I. LIGHTS	M. I. CONC CONC. TOTAL	NON MAG	MAG	AU NO. V.G.	CALC PPB	DESCRIPTION CLAST SIZE	% V/S	GR	LS	OT	MATRIX S/U	SD	ST	CY	COLOR SD	CY	CLASS
PLS-89																						
185-08	8.8	2.0	6.8	301.4	244.7	56.7	41.4	15.3	0	NA	C	50	50	NA	NA	U	Y	Y	Y	GB	GB	TILL
185-09	8.9	1.8	7.1	449.4	384.1	65.3	47.1	18.2	1	397	C	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
185-10	8.8	2.0	6.8	282.2	232.0	50.2	35.0	15.2	0	NA	C	65	35	NA	NA	U	Y	Y	Y	GB	GY	TILL
185-11	9.0	2.5	6.5	245.1	206.9	38.2	24.1	14.1	0	NA	C	60	40	NA	NA	U	Y	Y	Y	GB	GY	TILL
185-12	9.0	1.3	7.7	296.4	246.8	49.6	34.6	15.0	0	NA	C	60	40	NA	NA	U	Y	Y	Y	GB	GY	TILL
185-13	8.7	1.7	7.0	242.2	205.3	36.9	24.8	12.1	1	199	C	50	50	NA	NA	U	Y	Y	Y	GB	GY	TILL
185-14	8.7	1.8	6.9	169.6	138.5	31.1	20.8	10.3	0	NA	C	40	60	NA	NA	U	Y	Y	Y	GB	GY	TILL
185-15	8.8	1.6	7.2	262.3	217.0	45.3	30.4	14.9	0	NA	C	60	40	NA	NA	U	Y	Y	Y	GB	GY	TILL
185-16	8.4	1.3	7.1	212.4	165.3	47.1	30.5	16.6	5	329	C	60	40	NA	NA	U	Y	Y	Y	GB	GY	TILL
185-17	8.7	1.6	7.1	181.9	143.7	38.2	27.3	10.9	0	NA	C	55	45	NA	NA	U	Y	Y	Y	GB	GY	TILL
185-18	6.8	0.4	6.4	146.8	117.3	29.5	19.1	10.4	5	160	P	80	20	NA	A	U	Y	Y	Y	GY	GY	TILL
185-19	5.5	0.6	4.9	159.1	128.0	31.1	24.3	6.8	2	91	P	80	20	NA	NA	U	Y	Y	Y	GY	GY	TILL
185-20	7.4	0.8	6.6	212.9	183.6	29.3	20.1	9.2	0	NA	P	90	10	NA	NA	U	Y	Y	Y	GY	GY	TILL
185-21	6.5	0.9	5.6	118.4	98.4	20.0	12.7	7.3	0	NA	P	90	10	NA	A	U	Y	Y	Y	GY	GY	TILL
185-22	8.0	1.1	6.9	164.4	137.9	26.5	15.7	10.8	0	NA	P	85	15	NA	A	U	Y	Y	Y	GY	GY	TILL
185-23	8.3	0.9	7.4	176.9	143.9	33.0	21.0	12.0	2	61	P	90	10	NA	B	U	Y	Y	Y	GB	GY	TILL
185-24	8.3	0.7	7.6	219.8	184.7	35.1	23.2	11.9	0	NA	P	90	10	NA	NA	U	Y	Y	Y	GB	GY	TILL
186-01	8.4	1.4	7.0	187.9	143.5	44.4	26.5	17.9	1	1	P	80	20	NA	NA	U	Y	Y	Y	GY	GY	TILL
186-02	7.0	1.7	5.3	211.4	174.3	37.1	25.3	11.8	1	59	P	80	20	NA	NA	U	Y	Y	Y	GB	GY	TILL
186-03	5.7	1.7	4.0	169.8	141.7	28.1	18.5	9.6	2	125	C	75	25	NA	NA	U	Y	Y	Y	GB	GY	TILL
186-04	5.5	1.9	3.6	148.9	124.8	24.1	16.2	7.9	1	23	C	75	25	NA	NA	U	Y	Y	Y	GB	GY	TILL
186-05	8.2	1.8	6.4	204.9	169.0	35.9	24.5	11.4	3	10	C	70	30	NA	NA	U	Y	Y	Y	GB	GY	TILL
186-06	8.1	1.4	6.7	170.6	144.1	26.5	18.4	8.1	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GY	TILL
186-07	8.3	1.1	7.2	303.1	257.7	45.4	33.7	11.7	1	43	C	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
187-01	8.7	1.4	7.3	265.9	207.1	58.8	40.8	18.0	2	866	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
187-02	5.2	0.8	4.4	401.3	356.2	45.1	32.6	12.5	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
187-03	5.4	1.8	3.6	241.1	207.1	34.0	24.4	9.6	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
187-04	4.9	1.6	3.3	319.0	284.8	34.2	25.1	9.1	0	NA	C	50	50	NA	NA	U	Y	Y	Y	GB	GB	TILL
187-05	4.8	0.6	4.2	233.6	198.8	34.8	25.9	8.9	1	183	C	50	50	NA	NA	U	Y	Y	Y	GB	GB	TILL
187-06	3.0	0.4	2.6	283.0	260.9	22.1	16.0	6.1	0	NA	C	50	50	NA	NA	U	Y	Y	Y	GB	GB	TILL
187-07	4.6	0.6	4.0	289.5	256.1	33.4	23.2	10.2	1	63	C	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
187-08	5.6	1.5	4.1	314.1	282.6	31.5	22.3	9.2	1	29	C	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
187-09	7.0	1.3	5.7	341.6	309.9	31.7	22.6	9.1	3	204	C	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
187-10	8.8	1.9	6.9	275.4	236.1	39.3	26.7	12.6	3	95	P	50	50	NA	NA	U	Y	Y	Y	GB	GB	TILL
187-11	7.9	2.0	5.9	269.0	224.4	44.6	26.8	17.8	0	NA	P	30	70	NA	NA	U	Y	Y	Y	GPK	GB	TILL
187-12	6.4	0.3	6.1	263.1	221.4	41.7	23.5	18.2	0	NA	P	20	80	NA	NA	U	Y	Y	Y	GY	GY	TILL
187-13	5.7	0.3	5.4	151.0	130.5	20.5	16.0	4.5	0	NA	P	50	50	NA	B	U	Y	Y	Y	GY	GY	TILL
187-14	6.8	0.0	6.8	162.0	142.9	19.1	14.5	4.6	5	116	TR	NA	NA	NA	A	U	Y	Y	Y	GY	GY	TILL
187-15	8.9	1.5	7.4	232.2	195.8	36.4	27.7	8.7	4	28	P	98	2	NA	NA	U	Y	Y	Y	GY	GY	TILL
187-16	7.3	1.1	6.2	168.2	137.4	30.8	22.8	8.0	5	494	P	90	10	NA	NA	U	Y	Y	Y	GY	GY	TILL

MIPL5MAR.WR1 OVERBURDEN DRILLING MANAGEMENT LIMITED

TOTAL # OF SAMPLES IN THIS REPORT = 40

LABORATORY SAMPLE LOG

SAMPLE NO.	WEIGHT (KG.WET)			WEIGHT (GRAMS DRY)					AU		DESCRIPTION											CLASS
						M. I. CONC					CLAST					MATRIX						
	TABLE SPLIT	+10 CHIPS	TABLE FEED	TABLE CONC	M.I. LIGHTS	CONC. TOTAL	NON MAG	MAG	NO. V.G.	CALC PPB	SIZE	% V/S	% GR	% LS	% OT	S/U	SD	ST	CY	COLOR SD	COLOR CY	
PLS-89																						
187-17	7.4	1.3	6.1	152.4	123.6	28.8	21.2	7.6	0	NA	C	95	5	NA	NA	U	Y	Y	Y	GY	GY	TILL
187-18	5.2	0.0	5.2	169.3	146.4	22.9	17.1	5.8	8	319	TR	NA	NA	NA	NA	U	Y	Y	Y	GY	GY	TILL
187-19	8.6	0.0	8.6	254.5	220.3	34.2	24.1	10.1	9	287	TR	NA	NA	NA	NA	U	Y	Y	Y	GY	GY	TILL
188-01	8.0	3.5	4.5	254.7	232.0	22.7	16.9	5.8	0	NA	C	60	40	NA	NA	U	Y	Y	Y	B	B	TILL
188-02	8.8	2.1	6.7	298.3	250.1	48.2	34.1	14.1	1	2	C	60	40	NA	NA	U	Y	Y	Y	GB	GY	TILL
188-03	8.7	1.8	6.9	226.1	186.1	40.0	26.8	13.2	5	151	C	60	40	NA	NA	U	Y	Y	Y	GB	GY	TILL
188-04	8.9	1.6	7.3	229.0	183.6	45.4	29.8	15.6	1	13	C	60	40	NA	NA	U	Y	Y	Y	GB	GY	TILL
188-05	8.5	1.5	7.0	193.9	150.1	43.8	26.2	17.6	5	492	C	60	40	NA	NA	U	Y	Y	Y	GB	GY	TILL
188-06	8.6	1.4	7.2	169.9	134.6	35.3	24.5	10.8	0	NA	C	55	45	NA	NA	U	Y	Y	Y	GB	GY	TILL
188-07	8.4	0.6	7.8	231.8	186.0	45.8	33.9	11.9	3	47	C	60	40	NA	NA	U	Y	Y	Y	GB	GY	TILL
188-08	8.8	2.2	6.6	253.8	213.3	40.5	26.7	13.8	0	NA	C	60	40	NA	NA	U	Y	Y	Y	GB	GY	TILL
188-09	8.8	1.3	7.5	203.6	167.8	35.8	24.6	11.2	1	26	C	55	45	NA	NA	U	Y	Y	Y	GB	GY	TILL
188-10	8.7	1.2	7.5	220.3	179.5	40.8	27.2	13.6	0	NA	C	55	45	NA	NA	U	Y	Y	Y	GB	GY	TILL
188-11	8.3	0.1	8.2	148.1	119.5	28.6	20.5	8.1	0	NA	C	60	40	NA	NA	U	Y	Y	Y	GB	GY	TILL
188-12	7.6	1.6	6.0	188.1	161.0	27.1	18.1	9.0	0	NA	C	60	40	NA	NA	U	Y	Y	Y	GB	GY	TILL
188-13	9.0	2.1	6.9	200.9	161.9	39.0	25.4	13.6	5	84	C	70	30	NA	NA	U	Y	Y	Y	GB	GY	TILL
188-14	8.9	1.7	7.2	240.0	193.4	46.6	33.6	13.0	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GB	GY	TILL
188-15	8.6	1.9	6.7	418.0	348.5	69.5	50.7	18.8	1	719	C	80	20	NA	NA	U	Y	Y	Y	GB	GY	TILL
188-16	8.5	0.9	7.6	253.5	223.4	30.1	22.1	8.0	0	NA	C	95	5	NA	NA	U	Y	Y	Y	GB	GY	TILL
188-17	8.1	0.3	7.8	170.6	135.5	35.1	26.2	8.9	1	7	P	85	15	NA	NA	U	Y	Y	Y	GY	GY	TILL
188-18	8.3	2.1	6.2	176.5	128.3	48.2	33.3	14.9	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GY	NA	TILL
188-19	9.1	2.2	6.9	153.4	100.4	53.0	38.9	14.1	1	2	C	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
190-01	2.6	0.6	2.0	240.3	214.2	26.1	22.8	3.3	9	148	C	65	35	NA	NA	U	Y	Y	Y	B	B	TILL
191-01	4.3	0.6	3.7	175.1	147.3	27.8	20.7	7.1	5	49	C	85	15	NA	NA	U	Y	Y	Y	GB	GB	TILL
192-01	7.6	1.1	6.5	237.2	189.7	47.5	33.4	14.1	10	214	P	90	10	NA	NA	U	Y	Y	Y	GB	GB	TILL
193-01	5.5	2.8	2.7	195.5	183.1	12.4	9.0	3.4	1	21	P	80	20	NA	NA	U	Y	Y	Y	B	B	TILL
193-02	8.0	3.8	4.2	278.6	242.0	36.6	23.7	12.9	1	161	C	80	20	NA	NA	S	C	Y	NA	GB	NA	GRAVEL
193-03	7.7	2.1	5.6	208.1	178.1	30.0	19.2	10.8	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
193-04	5.0	2.0	3.0	195.2	177.1	18.1	12.3	5.8	0	NA	C	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
193-05	7.0	1.1	5.9	195.9	167.4	28.5	20.1	8.4	0	NA	C	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
193-06	5.2	1.4	3.8	174.8	154.5	20.3	14.2	6.1	1	45	C	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
193-07	7.6	0.8	6.8	127.4	107.3	20.1	12.7	7.4	1	228	C	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
193-08	6.5	1.5	5.0	144.8	122.5	22.3	13.6	8.7	0	NA	C	60	40	NA	NA	U	Y	Y	Y	GB	GY	TILL
193-09	6.6	3.0	3.6	139.8	112.1	27.7	19.5	8.2	1	109	C	70	30	NA	NA	U	Y	Y	Y	GB	GY	TILL
193-10	5.8	2.0	3.8	109.5	93.0	16.5	11.1	5.4	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
193-11	4.5	1.3	3.2	147.6	132.2	15.4	10.4	5.0	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GB	GY	TILL
193-12	4.3	1.1	3.2	107.0	95.3	11.7	7.7	4.0	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GGN	GB	TILL
194-01	8.0	2.0	6.0	240.9	202.4	38.5	27.0	11.5	4	958	C	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
194-02	8.1	1.2	6.9	336.6	302.6	34.0	24.5	9.5	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
194-03	7.9	0.2	7.7	231.0	182.1	48.9	34.7	14.2	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL

MIPL1APR.WR1

OVERBURDEN DRILLING MANAGEMENT LIMITED

TOTAL # OF SAMPLES IN THIS REPORT = 39

LABORATORY SAMPLE LOG

SAMPLE NO.	WEIGHT (KG.WET)			WEIGHT (GRAMS DRY)					AU		DESCRIPTION											CLASS
						M. I. CONC					CLAST					MATRIX						
	TABLE SPLIT	+10 CHIPS	TABLE FEED	TABLE CONC	M.I. LIGHTS	CONC. TOTAL	NON MAG	MAG	NO. V.G.	CALC PPB	SIZE	% V/S	% GR	% LS	% OT	S/U	SD	ST	CY	COLOR SD	COLOR CY	
PLS-89																						
194-04	8.2	1.3	6.9	300.6	279.7	20.9	13.6	7.3	0	NA	C	65	35	NA	NA	S	C	Y	N	GB	NA	GRAVEL
194-05	7.7	2.1	5.6	126.6	109.6	17.0	11.5	5.5	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
194-06	6.7	2.6	4.1	138.5	114.7	23.8	16.5	7.3	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GN	GY	TILL
194-07	6.0	1.8	4.2	153.3	133.1	20.2	13.5	6.7	1	2393	C	85	15	NA	A	U	Y	Y	Y	GYG	GY	TILL
195-01	8.2	2.2	6.0	264.0	231.5	32.5	22.4	10.1	0	NA	P	80	20	NA	NA	S	C	Y	N	GB	NA	GRAVEL
195-02	8.2	1.7	6.5	254.2	201.2	53.0	34.8	18.2	1	43	C	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
195-03	5.5	1.2	4.3	162.0	128.3	33.7	22.9	10.8	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
195-04	4.8	1.2	3.6	137.6	110.6	27.0	19.5	7.5	0	NA	C	60	40	NA	NA	U	Y	Y	Y	GY	GY	TILL
195-05	7.1	1.9	5.2	206.1	176.2	29.9	21.1	8.8	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
195-06	7.1	2.2	4.9	178.8	143.7	35.1	24.1	11.0	6	682	C	90	10	NA	NA	U	Y	Y	Y	GB	GB	TILL
195-07	4.7	0.8	3.9	142.6	116.4	26.2	18.5	7.7	0	NA	C	85	15	NA	NA	U	Y	Y	Y	GB	GB	TILL
195-08	6.4	1.5	4.9	179.9	148.7	31.2	20.8	10.4	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GB	GY	TILL
195-09	5.7	1.4	4.3	164.5	143.3	21.2	13.8	7.4	0	NA	C	75	25	NA	NA	U	Y	Y	Y	GB	GY	TILL
195-10	6.0	2.1	3.9	150.8	128.4	22.4	14.7	7.7	2	1417	C	70	30	NA	NA	U	Y	Y	Y	GB	GY	TILL
195-11	5.4	1.2	4.2	152.3	136.3	16.0	10.1	5.9	1	8	C	70	30	NA	A	U	Y	Y	Y	GB	GY	TILL
195-12	6.4	1.4	5.0	148.6	128.0	20.6	12.7	7.9	0	NA	C	80	20	NA	A	U	Y	Y	Y	GB	GY	TILL
195-13	5.1	1.5	3.6	142.4	125.6	16.8	10.6	6.2	0	NA	C	75	25	NA	NA	U	Y	Y	Y	GB	GY	TILL
196-01	8.1	2.6	5.5	289.3	260.0	29.3	19.6	9.7	0	NA	C	75	25	NA	NA	S	C	Y	N	GB	NA	GRAVEL
196-02	4.6	1.6	3.0	130.6	113.8	16.8	11.4	5.4	1	89	C	75	25	NA	NA	U	Y	Y	Y	GB	GY	TILL
197-01	8.4	2.9	5.5	271.7	245.6	26.1	17.5	8.6	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
197-02	7.4	3.8	3.6	276.3	261.5	14.8	10.9	3.9	2	717	C	45	55	NA	NA	S	C	Y	Y	GB	GB	GRAVEL
197-03	7.7	4.9	2.8	161.8	145.7	16.1	10.9	5.2	0	NA	P	80	20	NA	NA	S	C	Y	Y	GB	GB	GRAVEL
197-04	6.3	3.2	3.1	251.9	232.0	19.9	11.1	8.8	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
197-05	4.6	1.5	3.1	159.8	144.7	15.1	9.1	6.0	0	NA	P	20	80	NA	NA	U	Y	Y	Y	GB	GB	TILL
197-06	5.7	1.9	3.8	174.5	150.9	23.6	15.6	8.0	1	7788	P	40	60	NA	NA	U	Y	Y	Y	GB	GB	TILL
198-01	7.6	3.0	4.6	249.4	219.9	29.5	17.7	11.8	0	NA	P	90	10	NA	NA	U	Y	Y	Y	GB	GB	TILL
198-02	8.0	1.7	6.3	308.1	269.5	38.6	23.8	14.8	0	NA	P	50	50	NA	NA	U	Y	Y	Y	GB	GB	TILL
198-03	7.3	2.0	5.3	202.9	170.2	32.7	21.7	11.0	8	120	P	99	1	NA	NA	U	Y	Y	Y	GB	GB	TILL
198-04	9.1	3.1	6.0	302.5	263.9	38.6	26.4	12.2	1	110	C	97	3	NA	NA	U	Y	Y	Y	GGN	GGN	TILL
199-01	8.9	1.5	7.4	414.5	352.5	62.0	43.2	18.8	0	NA	C	50	50	NA	NA	U	Y	Y	Y	GB	GB	TILL
199-02	8.8	1.5	7.3	272.9	222.3	50.5	32.4	18.1	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
199-03	4.2	0.3	3.9	183.5	162.4	21.1	15.1	6.0	0	NA	C	90	1	NA	NA	U	Y	Y	Y	GB	GB	TILL
200-01	8.6	1.3	7.3	186.5	141.6	44.9	30.8	14.1	3	196	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
200-02	9.1	1.4	7.7	199.8	152.1	47.7	32.6	15.1	3	15	C	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
200-03	8.8	0.8	8.0	248.6	202.1	46.5	30.6	15.9	0	NA	C	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
200-04	7.6	2.3	5.3	158.7	129.1	29.6	21.3	8.3	0	NA	C	85	15	NA	NA	U	Y	Y	Y	GB	GB	TILL
201-01	8.0	0.7	7.3	175.5	134.6	40.9	28.4	12.5	1	7	P	70	30	NA	NA	U	Y	Y	Y	B	B	TILL
202-01	8.3	0.9	7.4	293.3	249.5	43.8	30.9	12.9	1	69	P	60	40	NA	NA	U	Y	Y	Y	B	B	TILL
202-02	8.3	1.5	6.8	364.3	328.4	35.9	25.1	10.8	1	377	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
202-03	9.2	2.4	6.8	256.4	204.8	51.6	34.7	16.9	0	NA	P	70	30	NA	NA	S	C	Y	N	GB	NA	GRAVEL

MIPL2APP.WR1

OVERBURDEN DRILLING MANAGEMENT LIMITED

TOTAL # OF SAMPLES IN THIS REPORT = 40

LABORATORY SAMPLE LOG

SAMPLE NO.	WEIGHT (KG.WET) TABLE SPLIT	+10 CHIPS	TABLE FEED	WEIGHT (GRAMS DRY) TABLE CONC	M.I. LIGHTS	M. I. CONC CONC. TOTAL	NON MAG	MAG	AU NO. V.G.	CALC PPB	DESCRIPTION CLAST SIZE	% V/S	% GR	% LS	% OT	MATRIX S/U	SD	ST	CY	COLOR SD	COLOR CY	CLASS
PLI-89																						
203-01	5.4	0.3	8.1	329.1	276.2	52.9	40.4	12.5	1	263	P	70	30	NA	NA	S	M	Y	N	GB	NA	SAND
203-02	8.7	3.0	5.7	275.0	242.2	32.8	23.0	9.8	0	NA	C	40	60	NA	NA	S	C	Y	N	GB	NA	GRAVEL
204-01	4.2	0.8	3.4	232.6	206.4	26.2	19.1	7.1	0	NA	P	50	50	NA	NA	U	Y	Y	Y	B	B	TILL
205-01	8.8	1.4	7.4	311.9	258.1	53.8	40.1	13.7	0	NA	C	30	70	NA	NA	U	Y	Y	Y	GB	GB	TILL
206-01	8.2	2.4	5.8	241.9	211.6	30.3	21.6	8.7	0	NA	C	40	60	NA	NA	S	C	Y	N	GB	NA	GRAVEL
206-02	5.7	1.4	4.3	246.5	223.7	22.8	12.6	10.2	0	NA	C	50	50	NA	NA	S	C	Y	N	GB	NA	GRAVEL
207-01	8.2	2.2	6.0	322.2	276.7	45.5	31.0	14.5	0	NA	C	85	15	NA	NA	U	Y	Y	Y	GB	GB	TILL
207-02	8.5	1.4	7.1	330.4	273.8	56.6	34.0	22.6	4	581	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
207-03	8.5	1.4	7.1	342.4	296.9	45.5	30.3	15.2	0	NA	C	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
207-04	8.6	2.0	6.6	392.7	341.3	51.4	32.1	19.3	0	NA	P	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
207-05	9.0	1.4	7.6	392.9	347.6	45.3	27.4	17.9	1	14	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
207-06	9.0	1.6	7.4	302.5	254.2	48.3	32.7	15.6	1	88	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
207-07	9.0	2.0	7.0	318.8	265.6	53.2	35.7	17.5	0	NA	P	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
207-08	8.9	2.7	6.2	263.0	202.2	60.8	37.8	23.0	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GYGN	GYGN	TILL
207-09	8.0	3.3	4.7	178.0	139.4	38.6	21.7	16.9	0	NA	P	70	30	NA	NA	S	C	Y	N	GB	NA	GRAVEL
207-10	7.0	1.9	5.1	176.4	140.6	35.8	20.6	15.2	0	NA	P	80	20	NA	NA	S	C	Y	N	GB	NA	GRAVEL
208-01	8.0	2.4	5.6	199.2	153.4	45.8	25.8	20.0	1	191	P	70	30	NA	NA	S	C	Y	N	GB	NA	GRAVEL
208-02	7.5	2.9	4.6	137.0	107.0	30.0	17.8	12.2	0	NA	P	75	25	NA	NA	S	C	Y	N	GB	NA	GRAVEL
208-03	6.5	1.3	5.2	316.1	273.0	43.1	26.6	16.5	0	NA	P	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
208-04	7.6	1.6	6.0	225.1	177.0	48.1	32.0	16.1	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
208-05	8.3	1.9	6.4	170.4	127.0	43.4	30.2	13.2	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
208-06	9.0	1.5	7.5	260.4	211.2	49.2	31.9	17.3	0	NA	C	70	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
208-07	6.8	1.5	5.3	190.1	171.4	18.7	13.3	5.4	1	1407	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
208-08	8.7	1.1	7.6	154.9	109.4	45.5	30.0	15.5	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
208-09	8.3	1.4	6.9	183.9	147.9	36.0	21.3	14.7	1	136	C	70	30	NA	NA	S	C	Y	N	GNB	NA	GRAVEL
208-10	9.0	1.7	7.3	286.6	222.1	64.5	30.2	34.3	0	NA	C	80	20	NA	NA	S	C	Y	N	GNB	NA	GRAVEL
209-01	9.1	0.8	8.3	280.9	224.8	56.1	37.5	18.6	0	NA	C	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
209-02	8.4	0.9	7.5	257.6	203.8	53.8	33.1	20.7	2	65	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
209-03	8.8	1.3	7.5	351.7	305.0	46.7	28.9	17.8	1	35	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
209-04	8.6	0.9	7.7	330.0	287.7	42.3	27.5	14.8	1	37	C	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
209-05	8.6	1.5	7.1	346.6	303.6	43.0	28.5	14.5	0	NA	C	60	40	NA	NA	U	Y	Y	Y	BB	GB	TILL
209-06	8.0	2.1	5.9	289.6	250.5	39.1	24.2	14.9	1	773	C	80	20	NA	NA	U	Y	Y	Y	GY	GB	TILL
209-07	9.3	2.2	7.1	300.5	250.9	49.6	29.8	19.8	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GY	GB	TILL
209-08	7.5	1.7	5.8	282.1	245.2	36.9	23.8	13.1	0	NA	C	75	25	NA	NA	U	Y	Y	Y	GY	GB	TILL
209-09	7.7	2.1	5.6	298.4	264.2	34.2	22.6	11.6	3	349	C	70	30	NA	NA	U	Y	Y	Y	GY	GB	TILL
209-10	8.1	1.9	6.2	225.6	185.4	40.2	24.8	15.4	13	278	C	70	30	NA	NA	U	Y	Y	Y	GN	GN	TILL
209-11	9.2	1.8	7.4	164.7	129.8	34.9	24.0	10.9	6	61	C	65	35	NA	NA	U	Y	Y	Y	GNB	GNB	TILL
209-12	9.1	1.9	7.2	184.6	117.2	67.4	44.3	23.1	5	61	C	75	25	NA	NA	U	Y	Y	Y	GNB	GNB	TILL
210-01	8.9	2.0	6.9	221.5	174.0	47.5	27.7	19.8	1	225	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
210-02	9.0	2.1	6.9	219.5	169.8	49.7	29.2	20.5	8	675	P	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL

MIPL3APR.WR1 OVERBURDEN DRILLING MANAGEMENT LIMITED
TOTAL # OF SAMPLES IN THIS REPORT = 40

LABORATORY SAMPLE LOG

SAMPLE NO.	WEIGHT (KG.WET) TABLE SPLIT	+10 CHIPS	TABLE FEED	WEIGHT (GRAMS DRY) TABLE CONC	M.I. LIGHTS	M. I. CONC CONC. TOTAL	NON MAG	MAG	AU NO. V.G.	CALC PPB	DESCRIPTION CLAST SIZE	% V/S	GR	LS	OT	MATRIX S/U	SD	ST	CY	COLOR SD	CY	CLASS
PLS-89																						
210-03	9.4	1.5	7.9	206.5	161.9	44.6	23.4	21.2	1	8	C	80	20	NA	NA	U	Y	Y	Y	GYG	GY	TILL
210-04	6.4	1.4	5.0	118.2	98.9	19.3	12.4	6.9	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GY	GY	TILL
210-05	8.7	2.5	6.2	154.8	124.0	30.8	19.3	11.5	1	33	C	75	25	NA	NA	U	Y	Y	Y	GY	GY	TILL
210-06	6.7	1.4	5.3	122.5	102.6	19.9	13.5	6.4	1	283	C	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
210-07	7.2	1.6	5.6	121.3	100.2	21.1	14.3	6.8	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GY	GY	TILL
210-08	8.6	1.9	6.7	122.9	88.4	34.5	23.0	11.5	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
210-09	8.5	1.7	6.8	151.0	115.9	35.1	22.5	12.6	1	67	C	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
210-10	8.1	0.6	7.5	118.5	88.1	30.4	20.5	9.9	1	141	C	85	15	NA	NA	U	Y	Y	Y	GY	GY	TILL
210-11	8.5	1.4	7.1	213.4	169.6	43.8	29.0	14.8	0	NA	C	80	20	NA	NA	S	M	N	N	GYG	NA	GRAVEL
210-12	8.8	1.9	6.9	189.0	115.3	73.7	55.7	18.0	0	NA	C	70	30	NA	NA	S	C	N	Y	GYG	GYG	GRAVEL
210-13	7.8	1.9	5.9	225.8	139.3	86.5	67.7	18.8	0	NA	C	70	30	NA	NA	S	C	N	Y	GY	GY	GRAVEL
211-01	8.9	2.2	6.7	195.4	146.9	48.5	26.3	22.2	3	217	C	70	30	NA	NA	S	C	N	Y	GY	GY	GRAVEL
211-02	8.4	1.2	7.2	219.1	184.8	34.3	22.2	12.1	0	NA	C	65	35	NA	NA	U	Y	Y	Y	GY	GY	TILL
211-03	6.3	1.0	5.3	126.7	100.0	26.7	17.3	9.4	1	87	C	65	35	NA	NA	U	Y	Y	Y	GYG	GY	TILL
211-04	6.9	2.3	4.6	169.8	117.7	52.1	39.4	12.7	6	158	C	60	40	NA	NA	S	C	N	Y	GYG	GYG	GRAVEL
212-01	8.1	0.0	8.1	180.4	153.5	26.9	16.9	10.0	0	NA	TR	NA	NA	NA	NA	S	M	N	N	B	NA	SAND
212-02	8.5	0.1	8.4	251.7	219.2	32.5	20.3	12.2	0	NA	C	40	60	NA	NA	S	M	N	N	B	NA	SAND
212-03	8.4	0.4	8.0	180.7	153.9	26.8	19.2	7.6	1	78	C	40	60	NA	NA	S	M	N	N	B	NA	SAND
212-04	8.6	1.8	6.8	167.2	144.6	22.6	15.4	7.2	0	NA	P	60	40	NA	NA	S	C	N	N	B	NA	GRAVEL
212-05	8.3	1.8	6.5	202.5	186.8	15.7	10.1	5.6	0	NA	P	40	60	NA	NA	S	C	N	N	GB	NA	GRAVEL
212-06	8.5	3.1	5.4	269.2	238.5	30.7	18.5	12.2	0	NA	P	50	50	NA	NA	S	C	N	N	GY	NA	GRAVEL
212-07	8.5	2.8	5.7	261.3	205.7	55.6	29.4	26.2	0	NA	P	70	30	NA	NA	S	C	N	N	GY	NA	GRAVEL
212-08	8.9	3.4	5.5	264.8	210.3	54.5	32.3	22.2	1	20	P	70	30	NA	NA	S	C	N	N	GY	NA	GRAVEL
212-09	8.6	2.3	6.3	244.5	194.3	50.2	29.0	21.2	0	NA	P	70	30	NA	NA	S	C	N	N	GY	NA	GRAVEL
212-10	8.9	1.4	7.5	221.7	186.5	35.2	24.2	11.0	0	NA	P	90	10	NA	NA	U	Y	Y	Y	GY	GY	TILL
212-11	8.5	1.6	6.9	205.5	171.4	34.1	24.2	9.9	0	NA	P	80	20	NA	NA	U	Y	Y	Y	GY	GY	TILL
213-01	8.0	0.0	8.0	180.8	156.4	24.4	18.1	6.3	0	NA	TR	NA	NA	NA	NA	S	F	Y	Y	B	NA	SAND
213-02	8.6	0.0	8.6	178.2	142.2	36.0	25.7	10.3	0	NA	TR	NA	NA	NA	NA	S	F	Y	Y	B	NA	SAND
213-03	8.2	2.6	5.6	132.1	99.6	32.5	20.4	12.1	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GN	GN	TILL
214-01	7.9	0.2	7.7	155.7	114.8	40.9	30.2	10.7	0	NA	P	50	50	NA	NA	U	Y	Y	Y	GB	GB	TILL
214-02	8.2	1.4	6.8	300.0	274.8	25.2	17.4	7.8	0	NA	P	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
214-03	8.3	1.6	6.7	134.8	95.7	39.1	24.5	14.6	0	NA	P	55	45	NA	NA	U	Y	Y	Y	GB	GB	TILL
214-04	9.1	1.5	7.6	166.5	125.4	41.1	23.9	17.2	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
214-05	8.9	1.8	7.1	189.1	148.6	40.5	23.1	17.4	0	NA	P	65	35	NA	NA	U	Y	Y	Y	GY	GY	TILL
214-06	8.9	1.9	7.0	159.7	129.1	30.6	18.5	12.1	5	169	P	75	25	NA	NA	U	Y	Y	Y	GY	GY	TILL
214-07	8.8	1.6	7.2	187.9	157.2	30.7	19.1	11.6	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
214-08	9.4	1.9	7.5	119.5	80.9	38.6	24.4	14.2	1	41	P	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
215-01	9.3	1.6	7.7	359.4	318.7	40.7	24.9	15.8	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
215-02	8.9	1.3	7.6	145.8	109.0	36.8	22.8	14.0	1	66	P	65	35	NA	NA	U	Y	Y	Y	GY	GY	TILL
215-03	9.2	1.2	8.0	214.5	172.0	42.5	28.9	13.6	0	NA	P	65	35	NA	NA	U	Y	Y	Y	GY	GY	TILL

MIPL4APR.WR1

OVERBURDEN DRILLING MANAGEMENT LIMITED

TOTAL # OF SAMPLES IN THIS REPORT = 40

LABORATORY SAMPLE LOG

SAMPLE NO.	WEIGHT (KG.WET) TABLE SPLIT	+10 CHIPS	TABLE FEED	WEIGHT (GRAMS DRY) TABLE CONC	M.I. LIGHTS	M. I. CONC CONC. TOTAL	NON MAG	MAG	AU NO. V.G.	CALC PPB	DESCRIPTION CLAST SIZE	% V/S	GR	LS	OT	MATRIX S/U	SD	ST	CY	COLOR SD	CY	CLASS
PLS-89																						
215-04	9.1	1.7	7.4	181.5	148.2	33.3	22.0	11.3	5	142	P	70	30	NA	NA	U	Y	Y	Y	GB	GY	TILL
215-05	8.8	1.7	7.1	162.1	142.6	19.5	12.6	6.9	0	NA	P	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
215-06	9.1	2.0	7.1	300.3	245.2	55.1	37.8	17.3	1	27	P	75	25	NA	NA	U	Y	Y	Y	GY	GY	TILL
215-07	8.6	2.8	5.8	290.4	218.3	72.1	51.7	20.4	1	56	P	90	10	NA	NA	S	C	Y	N	GY	NA	GRAVEL
216-01	9.5	1.3	8.2	255.3	196.9	58.4	35.9	22.5	3	202	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
216-02	5.9	0.7	5.2	330.8	292.0	38.8	25.2	13.6	1	25	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
216-03	5.0	1.0	4.0	233.2	206.8	26.4	16.4	10.0	0	NA	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
216-04	4.8	0.7	4.1	329.2	305.7	23.5	16.1	7.4	0	NA	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
216-05	6.9	1.3	5.6	318.8	293.8	25.0	16.2	8.8	0	NA	P	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
216-06	8.8	2.6	6.2	352.1	322.2	29.9	20.8	9.1	1	139	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
216-07	8.4	2.4	6.0	308.9	273.9	35.0	24.1	10.9	0	NA	P	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
216-08	9.3	2.0	7.3	337.5	299.4	38.1	26.7	11.4	1	56	P	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
216-09	9.3	2.0	7.3	373.4	343.2	30.2	19.8	10.4	0	NA	P	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
216-10	8.7	0.9	7.8	184.8	155.2	29.6	19.4	10.2	5	251	C	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
216-11	8.4	0.6	7.8	158.4	121.9	36.5	26.0	10.5	1	7	C	40	60	NA	NA	U	Y	Y	Y	GY	GY	TILL
216-12	6.4	1.2	5.2	159.4	130.5	28.9	18.6	10.3	0	NA	C	60	40	NA	NA	U	Y	Y	Y	GY	GY	TILL
216-13	9.0	2.8	6.2	226.9	167.4	59.5	33.7	25.8	1	1	C	70	30	NA	NA	S	C	Y	Y	GYG	GYG	GRAVEL
217-01	8.6	2.0	6.6	204.6	168.2	36.4	23.1	13.3	1	8	C	50	50	NA	NA	U	Y	Y	Y	GB	GB	TILL
217-02	8.1	3.0	5.1	219.4	201.6	17.8	10.2	7.6	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GYG	GYG	TILL
217-03	9.4	1.3	8.1	258.5	211.0	47.5	29.2	18.3	1	903	C	70	30	NA	NA	U	Y	Y	Y	GY	GY	TILL
217-04	8.6	0.9	7.7	165.7	129.4	36.3	22.2	14.1	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
217-05	8.3	1.6	6.7	216.3	177.8	38.5	25.2	13.3	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
217-06	9.0	2.4	6.6	225.4	185.6	39.8	22.0	17.8	0	NA	P	75	25	NA	NA	U	Y	Y	Y	GYG	GYG	TILL
217-07	6.1	1.8	4.3	245.9	215.6	30.3	19.6	10.7	1	77	P	80	20	NA	NA	U	Y	Y	Y	GY	GY	TILL
218-01	8.4	1.0	7.4	256.5	209.6	46.9	31.1	15.8	1	123	P	50	50	NA	NA	U	Y	Y	Y	GB	GB	TILL
218-02	8.7	0.9	7.8	311.7	263.6	48.1	30.1	18.0	2	417	P	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
218-03	8.7	1.3	7.4	279.5	239.0	40.5	27.1	13.4	1	106	C	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
218-04	9.3	1.6	7.7	301.8	255.6	46.2	30.4	15.8	1	850	C	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
220-01	9.3	1.9	7.4	278.7	238.5	40.2	26.4	13.8	0	NA	P	50	50	NA	NA	U	Y	Y	Y	GB	GB	TILL
221-01	7.9	2.1	5.8	280.3	239.5	40.8	27.3	13.5	1	14	P	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
221-02	3.8	1.1	2.7	225.9	205.1	20.8	15.1	5.7	1	97	P	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
221-03	4.9	0.9	4.0	326.0	294.2	31.8	23.1	8.7	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
221-04	7.3	2.3	5.0	308.6	284.6	24.0	15.5	8.5	0	NA	P	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
221-05	8.5	2.5	6.0	276.4	250.5	25.9	16.0	9.9	3	4143	C	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
221-06	9.0	1.6	7.4	248.5	211.9	36.6	22.8	13.8	1	44	C	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
221-07	9.1	1.4	7.7	215.2	175.7	39.5	22.9	16.6	0	NA	C	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
221-08	9.0	1.1	7.9	357.4	323.5	33.9	20.4	13.5	1	104	C	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
222-01	9.7	1.3	8.4	266.4	222.7	43.7	25.0	18.7	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
223-01	8.3	2.0	6.3	264.7	230.7	34.0	21.9	12.1	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
223-02	8.5	1.5	7.0	245.3	212.6	32.7	20.0	12.7	1	145	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL

MIPL5APR.WR1

OVERBURDEN DRILLING MANAGEMENT LIMITED

TOTAL # OF SAMPLES IN THIS REPORT = 37

LABORATORY SAMPLE LOG

SAMPLE NO.	WEIGHT (KG.WET) TABLE SPLIT	+10 CHIPS	TABLE FEED	WEIGHT (GRAMS DRY) TABLE CONC	M.I. LIGHTS	M. I. CONC CONC. TOTAL	NON MAG	MAG	AU NO. V.G.	CALC PPB	DESCRIPTION CLAST SIZE	% V/S	GR	LS	OT	MATRIX S/U	SD	ST	CY	COLOR SD	CY	CLASS
PLS-89																						
223-03	3.1	0.4	2.7	167.9	158.7	9.2	6.2	3.0	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
225-01	8.9	1.2	7.7	236.4	210.0	26.4	19.0	7.4	0	NA	P	65	35	NA	NA	S	C	N	N	GB	NA	GRAVEL
225-02	8.4	1.4	7.0	194.3	175.8	18.5	13.3	5.2	0	NA	P	65	35	NA	NA	S	C	N	N	GB	NA	GRAVEL
225-03	8.6	1.9	6.7	171.0	154.3	16.7	12.2	4.5	0	NA	C	80	20	NA	NA	S	C	N	N	GB	NA	GRAVEL
225-04	9.1	1.8	7.3	165.1	134.7	30.4	19.5	10.9	1	109	P	80	20	NA	NA	S	C	N	N	GB	NA	GRAVEL
225-05	7.5	2.4	5.1	219.9	197.4	22.5	13.6	8.9	0	NA	P	70	30	NA	NA	S	C	N	N	GB	NA	GRAVEL
226-01	6.5	1.8	4.7	161.5	132.9	28.6	18.7	9.9	0	NA	P	85	15	NA	NA	U	Y	Y	Y	GB	GB	TILL
227-01	4.8	1.6	3.2	213.2	191.0	22.2	15.6	6.6	0	NA	P	95	5	NA	NA	U	Y	Y	Y	GB	GB	TILL
228-01	8.8	2.6	6.2	179.5	152.7	26.8	16.6	10.2	0	NA	C	80	20	NA	NA	S	C	N	N	GB	NA	GRAVEL
228-02	4.9	1.1	3.8	225.4	204.1	21.3	13.8	7.5	0	NA	C	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
229-01	7.6	3.6	4.0	170.8	154.0	16.8	9.9	6.9	0	NA	C	75	25	NA	NA	S	C	N	N	GB	NA	GRAVEL
229-02	5.5	3.0	2.5	140.6	127.1	13.5	8.3	5.2	0	NA	C	70	30	NA	NA	S	C	N	N	GB	NA	GRAVEL
229-03	9.0	1.8	7.2	283.9	251.6	32.3	17.0	15.3	0	NA	P	80	20	NA	NA	U	Y	Y	Y	B	B	TILL
229-04	9.3	1.3	8.0	219.4	195.2	24.2	14.8	9.4	0	NA	P	60	40	NA	NA	U	Y	Y	Y	B	B	TILL
229-05	9.2	1.6	7.6	215.7	175.0	40.7	23.1	17.6	0	NA	P	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
229-06	9.3	2.1	7.2	219.6	185.0	34.6	19.4	15.2	0	NA	C	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
229-07	9.2	2.3	6.9	240.3	198.2	42.1	23.5	18.6	1	123	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
229A-01	8.6	1.6	7.0	238.2	204.8	33.4	20.5	12.9	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
229A-02	9.0	2.5	6.5	235.7	213.3	22.4	11.9	10.5	0	NA	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
229A-03	5.9	1.5	4.4	216.1	197.8	18.3	10.5	7.8	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
229A-04	9.2	2.7	6.5	309.1	275.8	33.3	21.1	12.2	0	NA	C	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
229A-05	6.7	2.8	3.9	204.7	172.9	31.8	19.7	12.1	0	NA	C	70	30	NA	C	S	C	Y	N	GB	NA	GRAVEL
229A-06	6.4	1.9	4.5	264.4	235.4	29.0	17.4	11.6	3	522	C	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
230-01	9.4	1.8	7.6	377.0	323.8	53.2	30.1	23.1	4	426	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
230-02	9.0	1.2	7.8	386.7	342.4	44.3	28.2	16.1	2	26	C	40	60	NA	NA	U	Y	Y	Y	GB	GB	TILL
230-03	8.6	1.8	6.8	362.0	307.2	54.8	30.1	24.7	0	NA	C	65	35	NA	NA	U	Y	Y	Y	GB	GB	TILL
230-04	8.7	2.0	6.7	305.5	264.2	41.3	27.2	14.1	3	1673	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
230-05	8.6	2.5	6.1	322.5	272.0	50.5	35.3	15.2	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
231-01	8.8	1.9	6.9	254.0	212.0	42.0	27.4	14.6	0	NA	C	70	30	NA	NA	S	C	Y	N	GB	NA	GRAVEL
232-01	8.7	1.3	7.4	223.9	186.5	37.4	26.1	11.3	0	NA	P	70	30	NA	NA	S	C	Y	N	GB	NA	GRAVEL
232-02	8.4	1.8	6.6	327.3	288.8	38.5	27.0	11.5	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
232-03	8.6	2.8	5.8	218.1	182.9	35.2	23.9	11.3	1	207	C	75	25	NA	NA	S	M/C	Y	N	GB	NA	GRAVEL
232-04	8.6	2.0	6.6	344.4	281.0	63.4	35.1	28.3	0	NA	C	65	25	NA	NA	S	M/C	Y	N	GB	NA	GRAVEL
232-05	2.6	0.6	2.0	194.1	176.2	17.9	11.8	6.1	0	NA	C	80	20	NA	NA	U	Y	Y	Y	GB	GB	TILL
233-01	6.9	1.5	5.4	278.5	253.5	25.0	16.8	8.2	0	NA	P	60	40	NA	NA	U	Y	Y	Y	GB	GB	TILL
233-02	4.0	1.0	3.0	172.6	155.0	17.6	12.0	5.6	0	NA	C	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
234-01	6.3	1.4	4.9	225.6	197.8	27.8	17.3	10.5	1	58	C	75	25	NA	NA	U	Y	Y	Y	B	B	TILL

APPENDIX C

GOLD GRAIN COUNTS AND CALCULATED VISIBLE GOLD ASSAYS

GOLD CLASSIFICATION
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VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL1FEB.WR1

TOTAL # OF PANNINGS 40

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
151-01	Y	25 X 25	5 C						2	2			EST. 0.5% PYRITE
		50 X 75	13 C						2	2			
		175 X 200	36 C	1						1			
										5	30.3	338	
151-02	Y	NO VISIBLE GOLD											EST. 3 GRAINS OF PYRITE
151-03	Y	75 X 75	15 C		1					1			NO SULPHIDES
										1	38.0	17	
151-04	Y	25 X 50	8 C		1		1		1	3			EST. 0.5% PYRITE
		50 X 50	10 C		1		2			3			
										6	36.1	23	
151-05	Y	50 X 50	10 C						2	2			EST. 10 GRAINS OF PYRITE
		50 X 75	13 C						1	1			
		50 X 100	15 C				1			1			
		75 X 100	18 C		1					1			
		100 X 150	25 C	1						1			
										6	34.4	154	
151-06	Y	25 X 25	5 C		1				1	2			EST. 0.5% PYRITE
		25 X 50	8 C						2	2			PHOTOMICROGRAPH AVAILABLE
		50 X 50	10 C				1		2	3			PICTURE REFERENCE #159
		50 X 75	13 C				2		3	5			
		75 X 100	18 C						2	2			
		75 X 100	50 M				1			1			
		100 X 100	20 C						1	1			
		100 X 125	22 C						1	1			
		100 X 200	29 C						1	1			
		150 X 200	34 C	1						1			
		225 X 275	46 C			1				1			
										20	22.2	2051	
152-01	Y	25 X 50	8 C						3	3			EST. 2% PYRITE
		50 X 50	10 C				2			2			
		50 X 75	13 C				1			1			
		75 X 100	50 M				1			1			
										7	31.3	124	
152-02	Y	50 X 50	10 C						1	1			EST. 10% PYRITE

GOLD CLASSIFICATION
===================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL1FEB.WR1
TOTAL # OF PANNINGS 40

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
		75 X 125	20 C		1					1			
		75 X 150	22 C		1					1			
										3	36.4	105	
153-01	Y	25 X 25	5 C						1	1			EST. 3% PYRITE
		25 X 50	8 C						1	1			
		50 X 50	10 C						1	1			
										3	28.5	10	
154-01	Y	50 X 50	10 C						1	1			EST. 1% PYRITE
		50 X 75	13 C				1			1			
		50 X 100	15 C				1			1			
										3	18.0	67	
155-01	Y	NO VISIBLE GOLD											EST. 0.5% PYRITE
155-02	Y	50 X 75	13 C				1			1			EST. 0.1% PYRITE
		50 X 125	18 C				1			1			
		75 X 100	75 M						1	1			
		75 X 100	18 C	1						1			
										4	32.0	209	
155-03	Y	25 X 25	5 C						1	1			NO SULPHIDES
		25 X 50	8 C				1			1			
		25 X 75	10 C				1			1			
		50 X 75	13 C		1				1	2			
										5	23.5	44	
156-01	Y	50 X 50	10 C				1			1			EST. 1% PYRITE
		50 X 75	13 C				3			3			
		50 X 100	15 C						1	1			
		75 X 100	18 C				1			1			
		100 X 175	27 C	1						1			
										7	36.2	188	
156-02	Y	25 X 75	10 C				1			1			EST. 2% PYRITE
		50 X 100	15 C				1			1			
		75 X 75	15 C	1						1			
		75 X 100	18 C	1						1			
		100 X 100	20 C	1			1			2			
		125 X 125	25 C	1						1			

GOLD CLASSIFICATION
===================

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL1FEB.WR1

TOTAL # OF PANNINGS 60

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
										7	27.5	305	
156-03	Y	25 X 50	8 C						1	1			EST. 1% PYRITE
		50 X 50	10 C	1						1			
		50 X 75	13 C		1		1		1	3			
										5	20.9	67	
157-01	Y	25 X 25	5 C						1	1			EST. 1% PYRITE
		50 X 50	10 C						1	1			
		75 X 75	15 C				1			1			
										3	26.1	33	
158-01	Y	50 X 50	10 C				2			2			EST. 5% PYRITE
		50 X 75	13 C		1					1			
										3	21.7	35	
159-01	Y	50 X 50	10 C				1		1	2			EST. 0.5% PYRITE
		50 X 75	13 C	1						1			
		75 X 125	20 C		1					1			
										4	23.5	96	
161-01	Y	25 X 50	8 C		1					1			NO SULPHIDES
		50 X 75	13 C				1			1			
		75 X 100	18 C		1					1			
		75 X 175	25 C	1						1			
										4	22.3	195	
162-01	Y	25 X 25	5 C		1					1			EST. 5% PYRITE
		25 X 50	8 C		1					1			
		50 X 50	8 C		2					2			
		75 X 75	50 M				1			1			
		250 X 250	27 C	1						1			
										6	32.2	156	
163-01	Y	50 X 50	8 C		1				3	4			EST. 1% PYRITE
		50 X 75	10 C			3			1	4			
		200 X 225	25 C	1						1			
										9	22.3	179	

GOLD CLASSIFICATION
===================

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL1FEB.WR1

TOTAL # OF PANNINGS 40

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
163-02	Y	25 X 50	8 C				2			2			EST. 1% PYRITE
		50 X 50	8 C		1					1			
		75 X 150	18 C	1						1			
		100 X 200	22 C	1						1			
										5	23.2	146	
164-01	Y	25 X 25	5 C						1	1			EST. 1% PYRITE
		25 X 50	8 C				2			2			
		50 X 50	10 C				1			1			
		50 X 75	13 C		1					1			
		75 X 75	15 C		1					1			
		75 X 100	18 C		1					1			
		100 X 125	22 C			1				1			
										8	27.3	166	
164-02	Y	25 X 75	10 C		1					1			EST. 5% PYRITE
		50 X 75	13 C		1					1			
										2	35.0	16	
164-03	Y	50 X 50	10 C				1			1			EST. 2% PYRITE
		50 X 75	13 C				2			2			
		75 X 125	20 C	1						1			
										4	19.8	123	
164-04	Y	25 X 25	5 C				2			2			EST. 2% PYRITE
		25 X 50	8 C				1			1			
		75 X 125	20 C	1						1			
										4	20.5	80	
164-05	Y	25 X 25	5 C				2			2			EST. 2% PYRITE
		50 X 75	13 C				1			1			
		75 X 100	18 C	1						1			
										4	20.7	69	
165-01	Y	NO VISIBLE GOLD											EST. 8% PYRITE
165-02	Y	50 X 50	10 C		1					1			EST. 2% PYRITE
		75 X 75	15 C		1					1			
		100 X 150	25 C		1					1			
										3	40.4	92	

GOLD CLASSIFICATION
===================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL1FEB.WR1
TOTAL # OF PANNINGS 40

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
165-03	Y	75 X 75	15 C		1					1			EST. 2% PYRITE
		150 X 200	34 C	1						1			1000 GRAINS OF MARCASITE
										2	30.7	273	
165-04	Y	50 X 75	13 C				1			1			EST. 5% PYRITE
		75 X 125	20 C	1						1			
										2	24.5	76	
165-05	Y	50 X 50	10 C						1	1			EST. 5% PYRITE
		50 X 75	13 C				1			1			
		75 X 100	18 C	1						1			
										3	37.7	42	
165-06	Y	25 X 25	5 C		1					1			EST. 10% PYRITE
		25 X 50	8 C				2			2			
		50 X 75	13 C				1			1			
										4	24.3	23	
165-07	Y	50 X 50	10 C		2					2			EST. 0.5% PYRITE
		50 X 75	13 C	1						1			
		75 X 100	50 M		1					1			
		100 X 100	20 C			1				1			
										5	33.6	153	
165-08	Y	NO VISIBLE GOLD											EST. 2% PYRITE
165-09	Y	NO VISIBLE GOLD											EST. 5% PYRITE
166-01	Y	NO VISIBLE GOLD											EST. 0.5% PYRITE
166-02	Y	75 X 75	15 C				1			1			EST. 2% PYRITE
		75 X 100	18 C				1			1			
										2	38.6	43	
166-03	Y	50 X 75	13 C		1	1				2			EST. 3% PYRITE
		50 X 100	15 C			1				1			
		100 X 150	50 M	1						1			
										4	38.2	190	

GOLD CLASSIFICATION
===================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL1MAR.WR1
TOTAL # OF PANNINGS 40

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
166-04	Y	50 X 75	13 C	1						1			EST. 3% PYRITE
													2 GRAINS OF ARSENOPYRITE
										1	31.0	12	
166-05	Y	50 X 50	10 C		1					1			EST. 2% PYRITE
		50 X 100	15 C		1					1			
		50 X 125	18 C	1						1			
		125 X 200	31 C		1					1			
										4	30.7	263	
166-06	Y	25 X 50	8 C		2				2	4			EST. 2.5% PYRITE
		75 X 125	20 C	1						1			
										5	41.4	44	
166-07	Y	50 X 75	13 C	1						1			EST. 1% PYRITE
		75 X 125	20 C	1						1			
										2	37.0	51	
166-08	Y	50 X 75	13 C	1						1			EST. 5% PYRITE
													500 GRAINS OF ARSENOPYRITE
										1	31.7	12	
166-09	Y	25 X 50	8 C	1						1			EST. 3% PYRITE
		50 X 75	13 C	1						1			3 GRAINS OF ARSENOPYRITE
										2	32.7	14	
166-10	Y	25 X 50	8 C	1	1					2			EST. 0.5% PYRITE
		50 X 75	13 C	1	1					2			
										4	23.0	40	
166-11	Y	50 X 50	10 C		1					1			EST. 8% PYRITE
										1	29.2	7	
166-12	Y	50 X 50	10 C						1	1			EST. 1% PYRITE
		50 X 75	13 C						1	1			
		75 X 150	75 M		1					1			
										3	23.0	334	
166-13	Y	50 X 75	13 C	1						1			EST. 1% PYRITE
		75 X 75	15 C						1	1			

GOLD CLASSIFICATION
===================

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL1MAR.WR1

TOTAL # OF PANNINGS 40

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
		75 X 100	18 C	1						1			
										3	26.6	76	
166-14	Y	75 X 75	15 C						1	1			EST. 1.% PYRITE
										1	13.7	47	
167-01	Y	75 X 100	18 C				1			1			TRACE OF PYRITE
										1	30.6	33	
167-02	Y	50 X 50	10 C				1			1			EST. 0.25% PYRITE
		52 X 75	13 C		1					1			
										2	34.6	17	
167-03	Y	25 X 25	5 C		1					1			EST. 1.5% PYRITE
		25 X 50	8 C		1					1			1 GRAIN OF ARSENOPYRITE
		25 X 75	10 C				1		1	2			
		50 X 50	10 C		1		2			3			
		50 X 75	13 C		1					1			
		75 X 125	20 C		1					1			
		100 X 175	27 C	1						1			
										10	21.2	319	
167-04	Y	50 X 50	10 C		1					1			EST. 2% PYRITE
		50 X 100	15 C		1					1			
		75 X 150	22 C		1					1			
		75 X 175	25 C	1						1			
		100 X 100	20 C	1						1			
										5	24.7	298	
168-01	Y	25 X 25	5 C				2			2			EST. 8% PYRITE
		25 X 75	10 C				1			1			
		50 X 50	10 C		1		1			2			
		100 X 150	25 C				1			1			
		100 X 175	27 C	1						1			
										7	27.7	265	
168-02	Y	25 X 25	5 C				1		1	2			EST. 10% PYRITE
		25 X 50	8 C				1		1	2			
		50 X 50	10 C				1			1			
		50 X 100	15 C	1			1			2			

GOLD CLASSIFICATION
===================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL1MAR.WR1
TOTAL # OF PANNINGS 40

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
		75 X 75	15 C				1			1			
										8	26.0	89	
168-03	Y	25 X 25	5 C				1			1			EST. 5% PYRITE
		50 X 75	13 C	1						1			1000 GRAINS OF ARSENOPYRITE
		75 X 100	18 C	1						1			
		100 X 175	27 C	1						1			
										4	26.9	195	
168-04	Y	25 X 50	8 C				1			1			EST. 8% PYRITE
		50 X 100	15 C				1			1			2000 GRAINS OF ARSENOPYRITE
		75 X 100	18 C				1			1			
		150 X 175	31 C	1						1			
										4	30.6	260	
168-05	Y	75 X 225	29 C	1						1			EST. 2% PYRITE
													100 GRAINS OF ARSENOPYRITE
										1	27.2	181	
168-06	Y	50 X 100	15 C				1			1			EST. 2% PYRITE
		100 X 125	22 C				1			1			0.1% ARSENOPYRITE
										2	25.6	108	
168-07	Y	50 X 50	10 C				1			1			EST. 5% PYRITE
		100 X 150	75 M				1			1			2000 GRAINS OF ARSENOPYRITE
										2	19.2	468	
169-01	Y	25 X 50	8 C				2		1	3			EST. 3% PYRITE
		100 X 125	22 C				1			1			200 GRAINS OF ARSENOPYRITE
		150 X 200	100 M	1						1			
										5	37.0	685	
169-02	Y	50 X 50	10 C				1			1			EST. 3% PYRITE
													200 GRAINS OF ARSENOPYRITE
										1	30.4	6	
169-03	Y	25 X 25	5 C						1	1			EST. 5% PYRITE
		25 X 50	8 C		1					1			300 GRAINS OF ARSENOPYRITE
		225 X 300	100 M	1						1			1 GRAIN OF GALENA
										3	22.2	2333	

GOLD CLASSIFICATION
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VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL1MAR.WR1
TOTAL # OF PANNINGS 40

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
169-04	Y	25 X 25	5 C						1	1			EST. 10% PYRITE
		25 X 50	8 C		1					1			100 GRAINS OF ARSENOPYRITE
		50 X 75	13 C						1	1			
		125 X 175	100 M		1					1			
										4	27.8	624	
169-05	Y	25 X 50	8 C				1			1			EST. 1% PYRITE
		50 X 75	13 C			1			1	2			
		50 X 100	15 C						1	1			
										4	6.6	222	
169-06	Y	25 X 25	5 C						1	1			EST. 5% PYRITE
		100 X 200	75 M		1					1			
										2	28.6	443	
169-07	Y	50 X 125	18 C		1					1			EST. 15% PYRITE
										1	34.9	29	
169-08	Y	25 X 25	5 C				1			1			EST. 15% PYRITE
		25 X 50	8 C		1					1			
		100 X 125	22 C		1					1			
										3	31.4	71	
169-09	Y	50 X 100	50 M				1			1			EST. 15% PYRITE
		50 X 175	22 C				1			1			
		75 X 75	15 C						1	1			
		125 X 150	27 C	1						1			
		225 X 325	50 C			1				1			
										5	20.8	1787	
170-01	Y	75 X 75	15 C				1			1			EST. 15% PYRITE
										1	12.6	51	
171-01	Y	50 X 50	10 C				1			1			EST. 5% PYRITE
		75 X 125	20 C		1					1			
										2	31.8	53	
171-02	Y	25 X 50	8 C				1		2	3			EST. 7% PYRITE

GOLD CLASSIFICATION
===================

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL1MAR.WR1
TOTAL # OF PANNINGS 40

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PL5-89													
		25 X 75	10 C						1	1			
		50 X 50	10 C				3			3			
		50 X 75	13 C				1			1			
										8	37.0	37	
171-03	Y	50 X 50	10 C				1			1			EST. 5% PYRITYE
		75 X 75	15 C				1			1			
										2	18.1	46	
171-04	Y	50 X 50	10 C		2		1		1	4			EST. 20% PYRITE
		50 X 75	13 C				1			1			10 GRAINS OF GALENA
		75 X 100	18 C				1		1	2			
		100 X 175	27 C						1	1			
		125 X 175	29 C						1	1			
		125 X 250	36 C			1				1			
										10	31	690	
171-05	Y	25 X 25	5 C						9	9			EST. 35% PYRITE
		25 X 50	8 C						13	13			200 GRAINS OF GALENA
		25 X 75	10 C						2	2			PHOTOMICROGRAPH AVAILABLE
		50 X 50	10 C				1		7	8			PICTURE REFERENCE # 159
		50 X 75	13 C				1		6	7			
		50 X 100	15 C				1		2	3			
		50 X 125	18 C						1	1			
		75 X 75	15 C						2	2			
		75 X 100	18 C				1		7	8			
		100 X 125	22 C				1			1			
		125 X 200	31 C						1	1			
										55	30.4	871	
172-01	Y	25 X 25	5 C						2	2			EST. 5% PYRITE
		25 X 50	8 C		1		1		2	4			
		50 X 75	13 C						2	2			
		75 X 125	20 C						1	1			
		100 X 125	22 C		1					1			
										10	29.6	160	
172-02	Y	25 X 50	8 C						2	2			EST. 3% PYRITE
		25 X 75	10 C						1	1			3 GRAINS OF GALENA
		75 X 100	18 C		1		1			2			
										5	23.6	101	

GOLD CLASSIFICATION
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VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL1MAR.WR1

TOTAL # OF PANNINGS 40

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
172-03	Y	25 X 25	5 C						1	1			EST. 1% PYRITE
		50 X 50	10 C						1	1			
		100 X 125	50 M	1						1			
		100 X 175	27 C			1				1			
										4	21.2	415	

GOLD CLASSIFICATION

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL2MAR.WR1

TOTAL # OF PANNINGS 32

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
172-04	Y	25 X 25	5 C		1					1			EST. 10% PYRITE
										1	21.9	1	
172-05	Y	50 X 50	10 C				1			1			EST. 2% PYRITE
		50 X 75	13 C						1	1			
										2	18.7	30	
172-06	Y	NO VISIBLE GOLD											EST. 2% PYRITE
173-01	Y	25 X 50	8 C		1					1			EST. 2% PYRITE
		75 X 100	18 C	1						1			50 GRAINS OF ARSENOPYRITE
										2	25.9	42	
174-01	Y	25 X 25	5 C			1				1			EST. 2% PYRITE
		25 X 50	8 C		1	1				2			PHOTOMICROGRAPH AVAILABLE
		25 X 100	13 C		1					1			PICTURE REFERENCE #160
		80 X 50	13 C			1				1			
		80 X 100	18 C		1					1			
		75 X 100	18 C		1					1			
		75 X 150	22 C		1					1			
		100 X 150	25 C		2					2			
		100 X 150	75 M		1					1			
		150 X 175	31 C		1					1			
										12	23.5	1107	
175-01	Y	25 X 50	8 C				1			1			EST. 1% PYRITE
		50 X 75	13 C				1			1			
		75 X 100	18 C		1					1			
										3	19.1	77	
175-02	Y	25 X 25	5 C			2	1			3			EST. 1% PYRITE
		25 X 50	8 C			1				1			
		25 X 75	10 C			1				1			
		75 X 75	15 C		1		1			2			
										7	7.5	217	
175-03	Y	25 X 25	5 C		1		1		1	3			EST. 2% PYRITE
		25 X 50	8 C				1			1			0.25% ARSENOPYRITE
		100 X 100	20 C	1						1			
		175 X 200	125 M	1						1			
		200 X 225	50 M	1						1			

GOLD CLASSIFICATION
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VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL2MAR.WR1

TOTAL # OF PANNINGS 32

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
										7	32.4	1591	
175-04	Y	25 X 75	10 C				1			1			EST. 5% PYRITE
										1	33.4	6	
175-05	Y	25 X 25	5 C		1					1			EST. 5% PYRITE
		25 X 50	8 C				1			1			
		50 X 75	13 C						1	1			
		100 X 125	22 C		1					1			
		200 X 350	100 M		1					1			
										5	42.0	1412	
175-06	Y	50 X 50	10 C		1					1			EST. 5% PYRITE
										1	28.3	7	
175-07	Y	25 X 25	5 C		1	1				2			EST. 7% PYRITE
		25 X 50	8 C				1			1			
		75 X 75	15 C			1				1			
										4	45.0	17	
175-08	Y	50 X 50	10 C		1					1			EST. 5% PYRITE
										1	27.2	7	
175-09	Y	25 X 25	5 C				1			1			EST. 2% PYRITE
		50 X 50	10 C	1		1				2			
		50 X 100	15 C	1						1			
		75 X 100	18 C	1						1			
										5	32.1	64	
175-10	Y	25 X 25	5 C		1					1			EST. 1% PYRITE
		50 X 75	13 C		1					1			
		50 X 100	15 C			1				1			
										3	20.6	50	
175-11	Y	50 X 50	10 C		1					1			EST. 0.5% PYRITE
										1	19.7	10	
175-12	Y	50 X 75	13 C		1					1			EST. 0.5% PYRITE

GOLD CLASSIFICATION
===================

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL2MAR.WR1

TOTAL # OF PANNINGS 32

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													5 GRAINS OF ARSENOPYRITE
										1	20.4	18	
175-13	Y	50 X 75	13 C	1						1			EST. 0.5% PYRITE
		125 X 200	31 C	1						1			
										2	22.2	298	
175-14	Y	50 X 50	10 C			1				1			EST. 0.5% PYRITE
		50 X 75	13 C		1					1			
		125 X 200	31 C			1				1			
										3	27.7	246	
176-01	Y	25 X 50	8 C	1						1			EST. 0.1% PYRITE
		50 X 75	13 C	1						1			
		100 X 100	20 C	1		1				2			
		125 X 125	25 C	1						1			
										5	26.4	240	
177-01	Y	25 X 25	5 C		1					1			EST. 5% PYRITE
		25 X 50	8 C						1	1			TRACE ARSENOPYRITE
		50 X 50	10 C		1					1			TRACE MARCASITE
										3	33.6	9	
179-01	Y	50 X 75	13 C		1					1			EST. 3% PYRITE
		75 X 75	15 C	1	2		1			4			TRACE ARSENOPYRITE
		75 X 100	18 C	1						1			
		75 X 125	20 C						1	1			
		100 X 125	22 C		1					1			
		225 X 300	48 C			1				1			
										9	39.8	817	
180-01	Y	25 X 25	5 C						1	1			EST. 1% PYRITE
		25 X 125	15 C		1					1			TRACE ARSENOPYRITE
		50 X 100	15 C	1						1			
		75 X 75	15 C						1	1			
		125 X 125	25 C	1						1			
										5	28.8	168	
180-02	Y	25 X 25	5 C						1	1			EST. 5% PYRITE
		50 X 50	10 C	1	1					2			TRACE ARSENOPYRITE
		75 X 75	15 C		1			1		2			

GOLD CLASSIFICATION
==================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL2MAR.WR1
TOTAL # OF PANNINGS 32

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
										5	32.0	53	
180-03	Y	25 X 25	5 C		1					1			EST. 1% PYRITE
		25 X 50	8 C		1				2	3			TRACE ARSENOPYRITE
		50 X 75	13 C				1			1			
		100 X 175	27 C						1	1			
										6	29.8	150	
180-04	Y	25 X 25	5 C						1	1			EST. 1% PYRITE
		125 X 200	31 C		1					1			TRACE ARSENOPYRITE
										2	11.4	549	
180-05	Y	25 X 25	5 C						3	3			TRACE PYRITE
		50 X 50	10 C		2					2			TRACE ARSNEOPYRITE
		50 X 75	13 C					1		1			
										6	32.4	26	
180-06	Y	NO VISIBLE GOLD											EST. 3% PYRITE TRACE ARSENOPYRITE
180-07	Y	50 X 75	13 C		1					1			EST. 2% PYRITE
		125 X 125	25 C			1				1			1% ARSENOPYRITE
										2	24.7	132	
181-01	Y	25 X 25	5 C		1					1			EST. 10% PYRITE
		50 X 100	15 C			1				1			30 GRAINS OF ARSENOPYRITE
		100 X 125	22 C	1						1			
										3	36.6	76	
181-02	N	50 X 75	13 C	1						1			
										1	36.2	2	
181-03	Y	50 X 50	10 C				1			1			EST. 5% PYRITE
		50 X 75	13 C	1						1			200 GRAINS OF ARSENOPYRITE
		75 X 100	75 M		1					1			
		100 X 125	18 C			1				1			
										4	20.9	90	
181-04	N	NO VISIBLE GOLD											

GOLD CLASSIFICATION
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VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL2MAR.WR1

TOTAL # OF PANNINGS 32

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
181-05	N	NO VISIBLE GOLD											
181-06	N	NO VISIBLE GOLD											
181-07	N	50 X 75	13 C			1				1			
										1	39.3	9	
181-08	N	NO VISIBLE GOLD											
181-09	Y	25 X 50	8 C				1			1			EST. 7% PYRITE
		75 X 100	18 1	2						2			50 GRAINS OF ARSENOPYRITE
										3	29.9	3	
181-10	N	NO VISIBLE GOLD											
182-01	N	NO VISIBLE GOLD											

GOLD CLASSIFICATION
===================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL3MAR.WR1
TOTAL # OF PANNINGS 6

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
182-02	N	NO VISIBLE GOLD											
182-03	N	NO VISIBLE GOLD											
182-04	Y	25 X 25	5 C	1						1			EST. 10% PYRITE
		50 X 100	15 C	1						1			20 GRAINS OF ARSENOPYRITE
										2	34.1	20	
182-05	N	200 X 200	38 C			1				1			
										1	27.6	413	
182-06	Y	25 X 25	5 C	1						1			EST. 7% PYRITE
		50 X 75	13 C	1						1			
										2	30.0	13	
182-07	N	NO VISIBLE GOLD											
182-08	N	50 X 75	13 C	1						1			
										1	32.5	11	
182-09	Y	25 X 25	5 C						2	2			EST. 3% PYRITE
		50 X 50	10 C		1					1			
		50 X 75	13 C	1	1					2			
		75 X 75	15 C	1						1			
										6	36.8	44	
182-10	N	100 X 100	20 C	1						1			
										1	25.4	59	
182-11	N	100 X 150	25 C	1						1			
										1	27.0	107	
183-01	Y	25 X 50	8 C	2						2			EST. 7% PYRITE
		50 X 50	10 C	1						1			25 GRAINS OF ARSENOPYRITE
		50 X 75	13 C	1	1					2			
										5	28.4	39	
183-02	N	50 X 75	13 C	1						1			

GOLD CLASSIFICATION
===================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL3MAR.WR1
TOTAL # OF PANNINGS 6

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
										1	30.4	12	
183-03	N	75 X 100	18 C	1						1			
										1	46.7	22	
183-04	Y	25 X 50	8 C				1			1			EST. 2% PYRITE
		75 X 100	18 C			1				1			
		125 X 150	27 C			1				1			
										3	43.4	113	
183-05	N	NO VISIBLE GOLD											
184-01	N	NO VISIBLE GOLD											
184-02	N	NO VISIBLE GOLD											
184-03	N	125 X 250	36 C	1						1			
										1	17.3	547	
184-04	N	50 X 75	13 C	1						1			
										1	28.1	13	
184-05	N	NO VISIBLE GOLD											
184-06	N	NO VISIBLE GOLD											
184-07	N	NO VISIBLE GOLD											
184-08	N	NO VISIBLE GOLD											
184-09	N	NO VISIBLE GOLD											
184-10	N	NO VISIBLE GOLD											
184-11	N	NO VISIBLE GOLD											
184-12	N	NO VISIBLE GOLD											
184-13	N	NO VISIBLE GOLD											
184-15	N	NO VISIBLE GOLD											
184-16	Y	75 X 100	18 C	1						1			EST. 5% PYRITE

GOLD CLASSIFICATION
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VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL3MAF.WR1
TOTAL # OF PANNINGS 6

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
		75 X 150	22 C	1						1			10 GRAINS OF ARSENOPYRITE
		175 X 175	50 M	1						1			
										3	36.2	404	
184-17	N	NO VISIBLE GOLD											
184-18	N	NO VISIBLE GOLD											
185-01	N	200 X 275	44 C	1						1			
										1	32.9	569	
185-02	N	NO VISIBLE GOLD											
185-03	N	NO VISIBLE GOLD											
185-04	N	NO VISIBLE GOLD											
185-05	N	175 X 200	36 C	1						1			
										1	29.7	318	
185-06	N	NO VISIBLE GOLD											
185-07	N	NO VISIBLE GOLD											

GOLD CLASSIFICATION
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VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL4MAR.WR1
TOTAL # OF PANNINGS 14

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PL8-89													
185-08	N	NO VISIBLE GOLD											
185-09	N	175 X 300	44 C	1						1			
										1	47.1	397	
185-10	N	NO VISIBLE GOLD											
185-11	N	NO VISIBLE GOLD											
185-12	N	NO VISIBLE GOLD											
185-13	N	150 X 150	29 C	1						1			
										1	24.8	199	
185-14	N	NO VISIBLE GOLD											
185-15	N	NO VISIBLE GOLD											
185-16	Y	25 X 50	8 C						2	2			EST. 15% PYRITE
		75 X 125	20 C		1					1			
		100 X 125	22 C	1						1			
		150 X 175	31 C	1						1			
										5	30.5	329	
185-17	N	NO VISIBLE GOLD											
185-18	Y	25 X 50	8 C		1					1			EST. 10% PYRITE
		50 X 50	10 C		1					1			
		50 X 100	15 C		1					1			
		75 X 75	15 C		1					1			
		100 X 100	20 C		1					1			
										5	19.1	160	
185-19	Y	25 X 50	8 C	1						1			EST. 5% PYRITE
		100 X 125	22 C				1			1			
										2	24.3	91	
185-20	N	NO VISIBLE GOLD											
185-21	N	NO VISIBLE GOLD											
185-22	N	NO VISIBLE GOLD											

GOLD CLASSIFICATION
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VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL4MAR.WR1
TOTAL # OF PANNINGS 14

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
185-23	Y	50 X 100	15 C	1						1			EST. 7% PYRITE
		75 X 75	15 C					1		1			
										2	21.0	61	
185-24	N	NO VISIBLE GOLD											
186-01	Y	25 X 25	5 C	1						1			EST. 15% PYRITE
										1	26.5	1	
186-02	N	75 X 125	20 C	1						1			
										1	25.3	59	
186-03	Y	50 X 50	10 C	1						1			EST. 5% PYRITE
		100 X 125	22 C					1		1			
										2	18.5	125	
186-04	N	50 X 75	13 C	1						1			
										1	16.2	23	
186-05	Y	25 X 25	5 C	1	1					2			EST. 5% PYRITE
		50 X 50	22 C	1						1			
										3	24.5	10	
186-06	N	NO VISIBLE GOLD											
186-07	N	50 X 100	15 C	1						1			
187-01	Y	50 X 50	10 C	1						1			EST. 8% PYRITE
		250 X 250	75 C	1						1			
										2	40.8	866	
187-02	N	NO VISIBLE GOLD											
187-03	N	NO VISIBLE GOLD											
187-04	N	NO VISIBLE GOLD											

GOLD CLASSIFICATION
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VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL4MAR.WR1
TOTAL # OF PANNINGS 14

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
187-05	N	100 X 125	50 C	1						1			
										1	25.9	183	
187-06	N	NO VISIBLE GOLD											
187-07	Y	50 X 75	50 M					1		1			EST. 2% PYRITE 1000 GRAINS ARSENOPYRITE
										1	23.2	63	
										1	33.7	43	
187-08	N	75 X 75	15 C	1						1			
										1	22.3	29	
187-09	Y	50 X 75	13 C		1					1			EST. 5% PYRITE 1000 ARSENOPYRITE
		50 X 100	50 M	1						1			
		100 X 125	22 C	1						1			
										3	22.6	204	
187-10	Y	25 X 25	5 C			1				1			EST. 5% PYRITE 1000 ARSENOPYRITE
		75 X 100	18 C			1				1			
		75 X 125	20 C	1						1			
										3	26.7	95	
187-11	N	NO VISIBLE GOLD											
187-12	N	NO VISIBLE GOLD											
187-13	N	NO VISIBLE GOLD											
187-14	Y	25 X 25	5 C			1				1			EST. 5% PYRITE 1000 GRAINS ARSENOPYRITE
		25 X 50	8 C	1						1			
		50 X 50	10 C	1						1			
		50 X 75	13 C		1					1			
		75 X 100	18 C	1						1			
										5	14.5	116	
187-15	Y	25 X 25	5 C		1					1			EST. 20% PYRITE 0.5% ARSENOPYRITE
		50 X 50	10 C	1	1					2			
		50 X 75	13 C	1						1			
										4	27.7	28	
187-16	Y	50 X 75	13 C		1					1			EST. 25% PYRITE

GOLD CLASSIFICATION
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VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL4MAR.WR1

TOTAL # OF PANNINGS 14

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
		50 X 100	15 C		1					1			50 GRAINS ARSENOPYRITE
		75 X 100	18 C		1					1			
		75 X 125	20 C	1						1			
		125 X 225	34 C	1						1			
										5	22.8	494	

GOLD CLASSIFICATION
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VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL5MAR.WR1

TOTAL # OF PANNINGS 12

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLE-99													
187-17	N	NO VISIBLE GOLD											
187-18	Y	25 X 25	5 C		1					1			EST. 15% PYRITE
		25 X 50	8 C		1					1			
		50 X 50	10 C	2	1					3			
		50 X 75	13 C		1					1			
		75 X 125	20 C		1					1			
		100 X 150	25 C	1						1			
										8	17.1	319	
187-19	Y	25 X 25	5 C		1		1			2			EST. 3% PYRITE
		25 X 50	8 C		3					3			
		25 X 75	10 C	1						1			
		50 X 50	10 C		1					1			
		75 X 125	20 C		1					1			
		100 X 125	50 M	1						1			
										9	24.1	287	
188-01	N	NO VISIBLE GOLD											
188-02	N	25 X 50	8 C	1						1			
										1	34.1	2	
188-03	Y	50 X 75	13 C		1					1			EST. 3% PYRITE
		50 X 100	15 C	1						1			
		75 X 100	18 C	2	1					3			
										5	26.8	151	
188-04	N	50 X 75	13 C	1						1			
										1	29.8	13	
188-05	Y	50 X 75	13 C	1	2		1			4			EST 5% PYRITE
		150 X 250	38 C	1						1			2 GRAINS OF GALENA
										5	26.2	492	
188-06	N	NO VISIBLE GOLD											
188-07	Y	50 X 50	10 C	1						1			EST. 2% PYRITE
		50 X 75	13 C		1					1			
		75 X 100	18 C			1				1			

GOLD CLASSIFICATION
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VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL5MAR.WR1
TOTAL # OF PANNINGS 12

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
										3	33.9	47	
188-08	N	NO VISIBLE GOLD											
188-09	N	75 X 75	15 C	1						1			
										1	24.6	26	
188-10	N	NO VISIBLE GOLD											
188-11	N	NO VISIBLE GOLD											
188-12	N	NO VISIBLE GOLD											
188-13	Y	25 X 25	5 C		1					1			EST. 40% PYRITE
		25 X 50	8 C				1			1			
		50 X 75	13 C		1					1			
		75 X 75	15 C		1					1			
		75 X 100	18 C		1					1			
										5	25.4	84	
188-14	N	NO VISIBLE GOLD											
188-15	N	225 X 375	54 C	1						1			
										1	50.7	719	
188-16	N	NO VISIBLE GOLD											
188-17	N	50 X 50	10 C	1						1			
										1	26.2	7	
188-18	Y	NO VISIBLE GOLD											EST. 50% PYRITE 500 GRAINS ARSENOPYRITE
188-19	Y	50 X 75	13 C		1					1			EST. 50% PYRITE 500 GRAINS ARSENOPYRITE
										1	38.9	2	
190-01	Y	25 X 25	8 C						2	2			EST. 70% PYRITE
		25 X 50	10 C		1				2	3			
		50 X 50	10 C						2	2			
		50 X 75	13 C						1	1			
		125 X 150	75 M		1					1			
										9	22.8	148	

GOLD CLASSIFICATION

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL5MAR.WR1

TOTAL # OF PANNINGS 12

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-59													
191-01	Y	25 X 25	8 C				1			1			EST. 15% PYRITE
		50 X 75	13 C	1						1			
		50 X 100	15 C				1			1			
		75 X 125	18 C				1			1			
		100 X 125	18 C	1						1			
										5	20.7	49	
192-01	Y	25 X 50	8 C		2					2			EST. 15% PYRITE
		50 X 50	10 C		2					2			
		50 X 75	13 C		1		2			3			
		50 X 100	15 C	1						1			
		75 X 100	18 C	1						1			
		75 X 200	27 C	1						1			
										10	33.4	214	
193-01	N	50 X 50	10 C	1						1			
										1	9.0	21	
193-02	N	125 X 150	27 C	1						1			
										1	23.7	161	
193-03	N	NO VISIBLE GOLD											
193-04	N	NO VISIBLE GOLD											
193-05	N	NO VISIBLE GOLD											
193-06	N	50 X 100	15 C	1						1			
										1	14.2	45	
193-07	N	100 X 150	25 C	1						1			
										1	12.7	228	
193-08	N	NO VISIBLE GOLD											
193-09	N	75 X 150	22 C	1						1			
										1	19.5	109	
193-10	N	NO VISIBLE GOLD											

GOLD CLASSIFICATION
===================

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL5MAR.WR1

TOTAL # OF PANNINGS 12

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLB-89													
193-11	N	NO VISIBLE GOLD											
193-12	N	NO VISIBLE GOLD											
194-01	Y	75 X 125	75 M						1	1			EST. 15% PYRITE
		100 X 150	50 M		1					1			
		125 X 175	29 C	1						1			
		150 X 225	36 C	1						1			
										4	27.0	958	
194-02	N	NO VISIBLE GOLD											
194-03	N	NO VISIBLE GOLD											

GOLD CLASSIFICATION
==================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL1APR.WP1
TOTAL # OF PANNINGS 6

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
194-04	N	NO VISIBLE GOLD											
194-05	N	NO VISIBLE GOLD											
194-06	N	NO VISIBLE GOLD											
194-07	N	200 X 375	52 C	1						1			
										1	13.5	2393	
195-01	N	NO VISIBLE GOLD											
195-02	N	100 X 100	20 C	1						1			
										1	34.8	43	
195-03	N	NO VISIBLE GOLD											
195-04	N	NO VISIBLE GOLD											
195-05	N	NO VISIBLE GOLD											
195-06	Y	25 X 50	8 C		2					2			EST. 10% PYRITE
		50 X 50	10 C		1					1			
		50 X 75	13 C		1					1			
		100 X 125	22 C	1						1			
		200 X 225	40 C	1						1			
										6	24.1	662	
195-07	N	NO VISIBLE GOLD											
195-08	N	NO VISIBLE GOLD											
195-09	N	NO VISIBLE GOLD											
195-10	Y	100 X 125	22 C	1						1			EST. 3% PYRITE
		200 X 275	44 C	1						1			
										2	14.7	1417	
195-11	N	25 X 50	8 C	1						1			
										1	10.1	8	
195-12	N	NO VISIBLE GOLD											

GOLD CLASSIFICATION
===================

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL1APP.WR1
TOTAL # OF PANNINGS 6

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PL3-89													
195-13	N	NO VISIBLE GOLD											
196-01	N	NO VISIBLE GOLD											
196-02	N	50 X 125	18 C	1						1			
										1	11.4	89	
197-01	N	NO VISIBLE GOLD											
197-02	Y	25 X 50	8 C		1					1			EST. 15% PYRITE
		150 X 200	34 C	1						1			
										2	10.9	717	
197-03	N	NO VISIBLE GOLD											
197-04	N	NO VISIBLE GOLD											
197-05	N	NO VISIBLE GOLD											
197-06	N	425 X 500	76 C	1						1			
										1	15.6	7788	
198-01	N	NO VISIBLE GOLD											
198-02	N	NO VISIBLE GOLD											
198-03	Y	25 X 50	8 C		1					1			EST. 5% PYRITE
		50 X 50	10 C						2	2			
		50 X 75	13 C		1		3			4			
		50 X 100	15 C					1		1			
										8	21.7	120	
198-04	Y	100 X 150	25 C	1						1			EST. 5% PYRITE
										1	26.4	110	
199-01	N	NO VISIBLE GOLD											
199-02	N	NO VISIBLE GOLD											
199-03	N	NO VISIBLE GOLD											
200-01		75 X 100	18 C		1					1			EST. 15% PYRITE

GOLD CLASSIFICATION
==================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL1APR.WR1
TOTAL # OF PANNINGS 6

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
		100 X 125	22 C	1						1			
		125 X 125	25 C	1						1			
										3	30.8	196	
200-02	Y	25 X 25	5 C		1					1			EST. 10% PYRITE
		25 X 50	8 C		1					1			
		50 X 75	13 C		1					1			
										3	32.6	15	
200-03	N	NO VISIBLE GOLD											
200-04	N	NO VISIBLE GOLD											
201-01	N	25 X 75	10 C	1						1			
										1	28.4	7	
202-01	N	75 X 150	22 C	1						1			
										1	30.9	69	
202-02	N	150 X 225	36 C	1						1			
										1	25.1	377	
202-03	N	NO VISIBLE GOLD											

GOLD CLASSIFICATION
==================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL2APR.WP1
TOTAL # OF PANNINGS 7

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PL9-89													
203-01	N	100 X 175	75 M	1						1			
										1	40.4	263	
203-02	N	NO VISIBLE GOLD											
204-01	N	NO VISIBLE GOLD											
205-01	N	NO VISIBLE GOLD											
206-01	N	NO VISIBLE GOLD											
206-02	N	NO VISIBLE GOLD											
207-01	N	NO VISIBLE GOLD											
207-02	Y	50 X 75	13 C	1						1			EST. 2% PYRITE
		50 X 100	15 C	1						1			
		75 X 125	20 C		1					1			
		100 X 250	75 M	1						1			
										4	34.0	581	
207-03	N	NO VISIBLE GOLD											
207-04	N	NO VISIBLE GOLD											
207-05	N	25 X 100	13 C	1						1			
										1	27.4	14	
207-06	N	75 X 100	50 M	1						1			
										1	32.7	88	
207-07	N	NO VISIBLE GOLD											
207-08	N	NO VISIBLE GOLD											
207-09	N	NO VISIBLE GOLD											
207-10	N	NO VISIBLE GOLD											
208-01	N	125 X 175	29 C	1						1			
										1	25.8	191	

GOLD CLASSIFICATION
==================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL2APR.WR1
TOTAL # OF PANNINGS 7

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
208-02	N	NO VISIBLE GOLD											
208-03	N	NO VISIBLE GOLD											
208-04	N	NO VISIBLE GOLD											
208-05	N	NO VISIBLE GOLD											
208-06	N	NO VISIBLE GOLD											
208-07	N	200 X 275	44 C	1						1			
										1	13.3	1407	
207-08	N	NO VISIBLE GOLD											
207-09	N	100 X 150	25 C	1						1			
										1	21.3	136	
208-10	N	NO VISIBLE GOLD											
209-01	N	NO VISIBLE GOLD											
209-02	Y	25 X 50	15 C			1				1			EST. 3% PYRITE
		100 X 100	20 C	1						1			
										2	33.1	65	
209-03	N	75 X 100	15 C	1						1			
										1	28.9	35	
209-04	N	150 X 25	18 C	1						1			
										1	27.5	37	
209-05	N	NO VISIBLE GOLD											
209-06	N	200 X 275	44 C	1						1			
										1	24.2	773	
209-07	N	NO VISIBLE GOLD											
209-08	N	NO VISIBLE GOLD											

GOLD CLASSIFICATION
===================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPLZAPR.WP1
TOTAL # OF PANNINGS 7

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
209-09	Y	25 X 50	8 C				1			1			EST. 2% PYRITE
		75 X 100	50 M	1						1			
		150 X 150	29 C	1						1			
										3	22.6	349	
209-10	Y	25 X 25	5 C				4		1	5			EST. 2% PYRITE
		25 X 50	8 C				1			1			
		50 X 50	10 C		1		1			2			
		50 X 75	13 C		1					1			
		75 X 100	18 C	1	1		1			3			
		100 X 150	25 C	1						1			
										13	24.8	278	
209-11	Y	25 X 25	5 C				3			3			EST. 2% PYRITE
		50 X 50	10 C		1		1			2			
		75 X 100	18 C				1			1			
										6	24.0	61	
209-12	Y	25 X 50	8 C				1			1			EST. 40% PYRITE 50 GRAINS ARSENOPYRITE
		50 X 75	13 C		3					3			
		75 X 125	20 C		1					1			
										5	44.3	61	
210-01	N	150 X 175	31 C	1						1			
										1	27.7	225	
210-02	Y	25 X 50	8 C						1	1			EST. 5% PYRITE
		50 X 50	10 C		2					2			
		75 X 75	15 C		2					2			
		75 X 125	20 C	1						1			
		100 X 150	25 C		1					1			
		175 X 250	40 C	1						1			
										8	29.2	675	

GOLD CLASSIFICATION
==================

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL3APR.WR1
TOTAL # OF PANNINGS 5

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
210-03	N	50 X 50	10 C	1						1			
										1	23.4	8.213141	
210-04	N	NO VISIBLE GOLD											
210-05	N	50 X 100	15 C	1						1			
										1	19.3	33	
210-06	N	125 X 150	27 C	1						1			
										1	13.5	283	
210-07	N	NO VISIBLE GOLD											
210-08	N	NO VISIBLE GOLD											
210-09	N	100 X 100	20 C	1						1			
										1	22.5	67	
210-10	N	125 X 125	25 C	1						1			
										1	20.5	141	
210-11	N	NO VISIBLE GOLD											
210-12	Y	NO VISIBLE GOLD											EST. 75% PYRITE
210-13	Y	NO VISIBLE GOLD											EST. 75% PYRITE
211-01	Y	50 X 75	13 C		1					1			EST. 10% PYRITE
		75 X 125	20 C	1						1			
		125 X 150	27 C	1						1			
										3	26.3	217	
211-02	N	NO VISIBLE GOLD											
211-03	N	75 X 125	20 C	1						1			
										1	17.3	87	
211-04	Y	25 X 25	5 C				1			1			EST. 60% PYRITE
		25 X 50	8 C		1					1			
		50 X 50	10 C		1					1			

GOLD CLASSIFICATION

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL3APR.WR1

TOTAL # OF PANNINGS 5

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
		75 X 75	15 C		1					1			
		75 X 75	75 M		1					1			
		100 X 125	22 C				1			1			
										6	39.4	158	
212-01	N	NO VISIBLE GOLD											
212-02	N	NO VISIBLE GOLD											
212-03	N	75 X 125	20 C	1						1			
										1	19.2	78	
212-04	N	NO VISIBLE GOLD											
212-05	N	NO VISIBLE GOLD											
212-06	N	NO VISIBLE GOLD											
212-07	N	NO VISIBLE GOLD											
212-08	N	50 X 100	15 C	1						1			
										1	32.3	20	
212-09	N	NO VISIBLE GOLD											
212-10	N	NO VISIBLE GOLD											
212-11	N	NO VISIBLE GOLD											
213-01	N	NO VISIBLE GOLD											
213-02	N	NO VISIBLE GOLD											
213-03	N	NO VISIBLE GOLD											
214-01	N	NO VISIBLE GOLD											
214-02	N	NO VISIBLE GOLD											
214-03	N	NO VISIBLE GOLD											
214-04	N	NO VISIBLE GOLD											
214-05	N	NO VISIBLE GOLD											

GOLD CLASSIFICATION

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL3APR.WR1
TOTAL # OF PANNINGS 5

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
214-06	Y	25 X 50	8 C		1					1			EST. 3% PYRITE
		50 X 50	10 C		1					1			
		50 X 75	13 C	1						1			
		50 X 75	50 M		1					1			
		75 X 100	18 C	1						1			
										5	18.5	169	
214-07	N	NO VISIBLE GOLD											
214-08	N	75 X 100	18 C	1						1			
										1	24.4	41	
215-01	N	NO VISIBLE GOLD											
215-02	N	100 X 100	20 C	1						1			
										1	22.8	66	
215-03	N	NO VISIBLE GOLD											

GOLD CLASSIFICATION

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL4APR.WR1
TOTAL # OF PANNINGS 8

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
215-04	Y	25 X 50	8 C		1					1			EST. 2% PYRITE
		50 X 50	10 C		1					1			
		50 X 75	13 C	1						1			
		50 X 75	50 M		1					1			
		75 X 100	18 C	1						1			
										5	22.0	142	
215-05	N	NO VISIBLE GOLD											
215-06	N	75 X 100	18 C	1						1			
										1	37.8	27	
215-07	Y	125 X 125	25 C	1						1			EST. 50% PYRITE
										1	51.7	56	
216-01	Y	50 X 75	13 C		1					1			EST. 2% PYRITE
		75 X 150	50 M			1				1			
		100 X 125	22 C			1				1			
										3	35.9	202	
216-02	N	50 X 100	15 C	1						1			
										1	25.2	25	
216-03	N	NO VISIBLE GOLD											
216-04	N	NO VISIBLE GOLD											
216-05	N	NO VISIBLE GOLD											
216-06	N	125 X 125	25 C	1						1			
										1	20.8	139	
216-07	N	NO VISIBLE GOLD											
216-08	N	75 X 125	20 C	1						1			
										1	26.7	56	
216-09	N	NO VISIBLE GOLD											
216-10	Y	25 X 25	5 C	1						1			EST. 1% PYRITE

GOLD CLASSIFICATION

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL4APR.WR1

TOTAL # OF PANNINGS 8

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
		25 X 50	8 C			1				1			
		50 X 75	13 C	1						1			
		75 X 125	20 C	1						1			
		125 X 125	25 C	1						1			
										5	19.4	251	
216-11	N	50 X 50	10 C	1						1			
										1	26.0	7	
216-12	N	NO VISIBLE GOLD											
216-13	Y	25 X 25	5 C		1					1			EST. 60% PYRITE
										1	33.7	1	
217-01	N	50 X 50	10 C	1						1			
										1	23.1	8	
217-02	N	NO VISIBLE GOLD											
217-03	N	150 X 225	100 M	1						1			
										1	29.2	903	
217-04	N	NO VISIBLE GOLD											
217-05	N	NO VISIBLE GOLD											
217-06	N	NO VISIBLE GOLD											
217-07	Y	100 X 100	20 C				1			1			EST. 40% PYRITE
										1	19.6	77	
218-01	N	100 X 175	27 C	1						1			
										1	31.1	123	
218-02	Y	100 X 100	50 M	1						1			EST. 2% PYRITE
		125 X 125	75 M	1						1			
										2	30.1	417	
218-03	N	75 X 100	50 M	1						1			

GOLD CLASSIFICATION

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL4APR.WR1

TOTAL # OF PANNINGS 8

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
										1	27.1	106	
218-04	N	225 X 300	50 M	1						1			
										1	30.4	850	
220-01	N	NO VISIBLE GOLD											
221-01	N	50 X 75	13 C	1						1			
										1	27.3	14	
221-02	N	50 X 75	50 M	1						1			
										1	15.1	97	
221-03	N	NO VISIBLE GOLD											
221-04	N	NO VISIBLE GOLD											
221-05	Y	150 X 200	50 M		1					1			EST. 3% PYRITE
		200 X 200	75 M	1						1			
		250 X 325	52 C	1						1			
										3	16.0	4143	
221-06	N	75 X 100	18 C	1						1			
										1	22.8	44	
221-07	N	NO VISIBLE GOLD											
221-08	N	100 X 125	22 C	1						1			
										1	20.4	104	
222-01	N	NO VISIBLE GOLD											
223-01	N	NO VISIBLE GOLD											
223-02	N	100 X 150	25 C			1				1			
										1	20.0	145	

GOLD CLASSIFICATION

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL5APR.WR1

TOTAL # OF PANNINGS 4

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
223-03	N	NO VISIBLE GOLD											
225-01	N	NO VISIBLE GOLD											
225-02	N	NO VISIBLE GOLD											
225-03	N	NO VISIBLE GOLD											
225-04	N	100 X 125	22 C	1						1			
										1	19.5	109	
225-05	N	NO VISIBLE GOLD											
226-01	N	NO VISIBLE GOLD											
227-01	N	NO VISIBLE GOLD											
228-01	N	NO VISIBLE GOLD											
228-02	N	NO VISIBLE GOLD											
229-01	N	NO VISIBLE GOLD											
229-02	N	NO VISIBLE GOLD											
229-03	N	NO VISIBLE GOLD											
229-04	N	NO VISIBLE GOLD											
229-05	N	NO VISIBLE GOLD											
229-06	N	NO VISIBLE GOLD											
229-07	N	125 X 125	25 C	1						1			
										1	23.5	123	
229A-01	N	NO VISIBLE GOLD											
229A-02	N	NO VISIBLE GOLD											
229A-03	N	NO VISIBLE GOLD											
229A-04	N	NO VISIBLE GOLD											
229A-05	N	NO VISIBLE GOLD											

GOLD CLASSIFICATION

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL5APR.WR1

TOTAL # OF PANNINGS 4

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
229A-06	Y	50 X 75	50 M	1						1			EST. 2% PYRITE
		75 X 100	50 M	1						1			
		75 X 150	50 M	1						1			
										3	17.4	522	
230-01	Y	25 X 50	8 C	1						1			EST. 1% PYRITE
		50 X 75	13 C					1		1			
		50 X 100	15 C	1						1			
		100 X 150	100 M				1			1			
										4	30.1	426	
230-02	Y	25 X 50	8 C	1						1			EST. 1% PYRITE
		50 X 100	15 C	1						1			
										2	28.2	26	
230-03	N	NO VISIBLE GOLD											
230-04	Y	25 X 50	8 C		1					1			EST. 2% PYRITE
		125 X 125	25 C	1						1			
		250 X 300	75 M	1						1			
										3	27.2	1673	
230-05	N	NO VISIBLE GOLD											
231-01	N	NO VISIBLE GOLD											
232-01	N	NO VISIBLE GOLD											
232-02	N	NO VISIBLE GOLD											
232-03	N	100 X 200	29 C	1						1			
										1	23.9	207	
232-04	N	NO VISIBLE GOLD											
234-05	N	NO VISIBLE GOLD											
233-01	N	NO VISIBLE GOLD											
233-02	N	NO VISIBLE GOLD											

GOLD CLASSIFICATION

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

MIPL5APR.WR1
TOTAL # OF PANNINGS 4

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89 234-01	N	75 X 100	18 C			1				1			
										1	17.3	58	

APPENDIX D

BONDAR-CLEGG HEAVY MINERAL ANALYSES

Bondar-Clegg & Company Ltd.
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Geochemical Lab Report

REPORT: 089-50693.0

PROJECT: LAC SHORT   PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au PPB	Testwt gms
PLS-89-151-01-3/4H		26	23	<0.1	4	368	18.00
PLS-89-151-02-3/4H		19	18	<0.1	3	136	30.00
PLS-89-151-03-3/4H		19	17	<0.1	6	37	25.00
PLS-89-151-04-3/4H		42	25	<0.1	9	140	23.00
PLS-89-151-05-3/4H		28	26	<0.1	4	194	21.00
PLS-89-152-01-3/4H		104	36	0.1	39	314	20.00
PLS-89-152-02-3/4H		155	33	<0.1	59	82	23.00
PLS-89-153-01-3/4H		102	44	0.1	22	206	17.00
PLS-89-154-01-3/4H		33	24	<0.1	6	50	9.00
PLS-89-155-01-3/4H		74	31	<0.1	23	26	22.00
PLS-89-155-02-3/4H		33	20	<0.1	8	195	20.00
PLS-89-155-03-3/4H		29	23	<0.1	4	35	13.00
PLS-89-156-01-3/4H		60	30	<0.1	9	317	23.00
PLS-89-156-02-3/4H		65	29	<0.1	17	674	17.00
PLS-89-156-03-3/4H		104	55	0.2	35	458	12.00
PLS-89-157-01-3/4H		129	50	0.2	58	358	15.00
PLS-89-158-01-3/4H		214	45	0.5	36	648	12.00
PLS-89-159-01-3/4H		23	19	<0.1	3	138	13.00
PLS-89-161-01-3/4H		34	25	<0.1	5	97	13.00
PLS-89-162-01-3/4H		121	48	0.2	380	1133	21.00
PLS-89-163-01-3/4H		95	22	0.1	7	766	13.00
PLS-89-163-02-3/4H		53	29	<0.1	6	159	14.00
PLS-89-164-01-3/4H		29	32	<0.1	5	255	16.00
PLS-89-164-02-3/4H		150	42	<0.1	75	35	22.00
PLS-89-164-03-3/4H		111	31	0.2	22	185	11.00
PLS-89-164-04-3/4H		107	48	<0.1	31	134	11.00
PLS-89-164-05-3/4H		111	26	<0.1	21	160	12.00
PLS-89-165-01-3/4H		173	25	0.1	13	28	17.00
PLS-89-165-02-3/4H		79	22	<0.1	5	183	26.00
PLS-89-165-03-3/4H		56	25	<0.1	17	38	19.00
PLS-89-165-04-3/4H		184	44	<0.1	72	60	14.00
PLS-89-165-05-3/4H		203	61	<0.1	96	65	25.00
PLS-89-165-06-3/4H		175	60	0.1	80	101	14.00
PLS-89-165-07-3/4H		180	54	<0.1	104	333	21.00
PLS-89-165-08-3/4H		94	30	<0.1	30	<5	14.00
PLS-89-165-09-3/4H		149	49	0.7	59	30	18.00
PLS-89-166-01-3/4H		139	54	<0.1	70	212	17.00
PLS-89-166-02-3/4H		242	57	0.2	77	234	25.00
PLS-89-166-03-3/4H		258	61	0.5	118	229	24.00

2g retest Au = 311 ppb

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REPORT: 089-50694.0

PROJECT: LAC SHORT

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au-150 PPM	Au+150 PPM	Au Av PPM	TestWt grs	-150Wt grs	+150Wt grs
PLS-89-151-06-3/4H		73	41	0.5	3	0.99	17.25	4.34	9.00	12.97	3.37

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REPORT: 089-50759.0

PROJECT: LAC SHORT PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au PPB	Testwt gms
PLS-89-166-04-3/4H		181	55	0.1	126	95	19.00
PLS-89-166-05-3/4H		183	59	0.3	86	137	20.00
PLS-89-166-06-3/4H		184	53	0.1	98	281	27.00
PLS-89-166-07-3/4H		250	66	<0.1	112	89	24.00
PLS-89-166-08-3/4H		250	75	0.3	74	105	20.00
PLS-89-166-09-3/4H		201	55	0.2	108	100	21.00
PLS-89-166-10-3/4H		141	42	<0.1	49	156	14.00
PLS-89-166-11-3/4H		129	47	0.2	50	47	18.00
PLS-89-166-12-3/4H		176	69	0.9	45	480	14.00
PLS-89-166-13-3/4H		149	44	<0.1	58	411	16.00
PLS-89-166-14-3/4H		117	84	<0.1	41	163	7.00
PLS-89-167-01-3/4H		27	22	<0.1	3	56	20.00
PLS-89-167-02-3/4H		32	22	<0.1	4	50	22.00
PLS-89-167-03-3/4H		114	52	0.3	43	1209	13.00
PLS-89-167-04-3/4H		124	58	1.0	45	640	15.00
PLS-89-168-01-3/4H		147	92	<0.1	38	1154	17.00
PLS-89-168-02-3/4H		157	61	0.2	57	128	16.00
PLS-89-168-03-3/4H		176	52	<0.1	73	223	16.00
PLS-89-168-04-3/4H		284	48	0.2	68	194	19.00
PLS-89-168-05-3/4H		154	94	0.1	43	265	17.00
PLS-89-168-06-3/4H		154	49	0.1	55	834	16.00
PLS-89-168-07-3/4H		191	42	<0.1	50	2081	11.00
PLS-89-169-01-3/4H		159	57	0.1	46	916	24.00
PLS-89-169-03-3/4H		181	75	0.5	64	6653	13.00
PLS-89-169-04-3/4H		216	81	0.1	54	794	17.00
PLS-89-169-05-3/4H		192	78	<0.1	48	<5	20.00
PLS-89-169-06-3/4H		160	50	<0.1	97	68	18.00
PLS-89-169-07-3/4H		206	56	0.4	153	131	22.00
PLS-89-169-08-3/4H		179	59	0.2	65	290	20.00
PLS-89-170-01-3/4H		153	115	4.2	87	10515	6.00
PLS-89-171-01-3/4H		173	50	0.1	51	444	20.00
PLS-89-171-02-3/4H		116	41	0.1	42	1225	24.00
PLS-89-171-03-3/4H		133	47	0.7	47	1329	10.00
PLS-89-171-04-3/4H		98	41	7.4	52	14420	20.00
PLS-89-171-05-3/4H		70	59	7.1	63	18321	19.00
PLS-89-172-01-3/4H		161	52	0.1	45	369	29.00
PLS-89-172-02-3/4H		215	70	0.5	38	669	14.00
PLS-89-172-03-3/4H		156	32	0.1	43	718	12.00

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Geochemical Lab Report

REPORT: 089-50760.0

PROJECT: LAC SHORT

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au-150 PPM	Au+150 PPM	Au Av PPM	TestWt grs	-150Wt grs	+150Wt grs
PLS-89-169-02-3/4H		161	57	0.2	43	0.20	0.13	0.20	18.00	20.50	1.10
PLS-89-169-09-3/4H		274	69	0.9	76	0.36	11.64	2.37	10.00	12.14	2.64

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REPORT: 089-50789.0

PROJECT: LAC SHORT

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au PPB	Testwt gms
PLS-89-172-04		241	55	0.2	58	373	12.00
PLS-89-172-05		50	37	0.2	15	207	10.00
PLS-89-172-06		63	28	<0.1	11	90	16.00
PLS-89-173-01		128	52	0.3	50	274	15.00
PLS-89-175-01		120	54	0.2	23	30	10.00
PLS-89-175-02		161	59	0.1	43	195	2.00
PLS-89-175-04		154	57	0.3	82	101	20.00
PLS-89-175-06		168	58	0.4	88	88	17.00
PLS-89-175-07		149	56	0.4	60	105	18.00
PLS-89-175-08		162	74	0.1	80	137	7.00
PLS-89-175-09		152	67	0.1	78	195	12.00
PLS-89-175-10		145	57	0.1	50	138	12.00
PLS-89-175-11		162	48	0.2	58	80	12.00
PLS-89-175-12		143	48	0.6	86	68	12.00
PLS-89-175-13		152	56	0.4	61	284	13.00
PLS-89-175-14		122	96	<0.1	56	220	18.00
PLS-89-176-01		49	31	<0.1	24	177	10.00
PLS-89-177-01		99	42	<0.1	21	207	9.00
PLS-89-179-01		126	66	0.2	41	790	3.00
PLS-89-180-01		116	50	0.3	47	392	13.00
PLS-89-180-02		127	47	<0.1	41	339	18.00
PLS-89-180-03		37	24	0.1	6	133	19.00
PLS-89-180-04		36	27	0.1	5	2964	5.00
PLS-89-180-05		26	22	<0.1	2	85	17.00
PLS-89-180-06		111	31	0.1	11	53	13.00
PLS-89-180-07		213	35	0.2	27	220	15.00
PLS-89-181-01		154	104	0.7	141	442	11.00
PLS-89-181-02		93	25	0.2	64	71	20.00
PLS-89-181-03		77	25	0.1	51	405	12.00
PLS-89-181-04		109	77	1.6	52	109	14.00
PLS-89-181-05		76	24	0.1	43	113	16.00
PLS-89-181-06		113	32	0.5	61	70	15.00
PLS-89-181-07		82	34	<0.1	35	360	18.00
PLS-89-181-08		127	54	0.4	69	174	15.00
PLS-89-181-09		104	55	0.1	51	195	16.00
PLS-89-181-10		129	39	0.1	32	35	11.00
PLS-89-182-01		173	55	0.5	180	197	14.00

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REPORT: 089-50790.0

PROJECT: LAC SHORT PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au-150 PPM	Au+150 PPM	Au Av PPM	TestWt gms	-150Wt gms	+150Wt gms
PLS-89-174-01		184	52	0.4	93	1.19	0.06	1.07	11.00	15.26	1.87
PLS-89-175-03		187	46	0.2	110	0.10	3.08	0.53	17.00	20.51	3.49
PLS-89-175-05		209	56	0.1	100	0.42	5.36	1.31	22.00	25.13	5.54

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Geochemical Lab Report

REPORT: 089-50845.0

PROJECT: LAC SHORT PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au PPB	Testwt grs
PLS-89-182-02		106	32	<0.1	82	125	20.00
PLS-89-182-03		114	46	<0.1	83	321	24.00
PLS-89-182-04		123	42	0.2	77	65	22.00
PLS-89-182-05		202	35	0.3	71	1554	17.00
PLS-89-182-06		295	33	<0.1	69	141	19.00
PLS-89-182-07		141	151	<0.1	75	154	17.00
PLS-89-182-08		98	28	0.5	42	221	21.00
PLS-89-182-09		96	24	<0.1	34	92	25.00
PLS-89-182-10		107	45	0.2	51	81	16.00
PLS-89-182-11		98	26	0.1	45	295	16.00
PLS-89-183-01		124	43	0.2	244	183	18.00
PLS-89-183-02		125	38	<0.1	150	134	19.00
PLS-89-183-03		116	28	<0.1	150	110	30.00
PLS-89-183-04		101	25	<0.1	75	80	30.00
PLS-89-183-05		229	32	1.2	51	1962	23.00
PLS-89-184-01		141	42	<0.1	60	325	18.00
PLS-89-184-02		96	43	<0.1	146	137	16.00
PLS-89-184-03		108	43	<0.1	114	820	9.00
PLS-89-184-04		201	37	0.3	122	152	18.00
PLS-89-184-05		87	33	<0.1	66	26	16.00
PLS-89-184-06		120	25	<0.1	60	64	30.00
PLS-89-184-07		89	29	<0.1	54	162	22.00
PLS-89-184-08		94	31	<0.1	68	145	13.00
PLS-89-184-09		98	29	0.5	108	166	13.00
PLS-89-184-10		99	26	0.2	116	156	10.00
PLS-89-184-11		124	31	<0.1	87	101	16.00
PLS-89-184-12		144	39	<0.1	138	433	25.00
PLS-89-184-13		158	48	0.1	157	273	20.00
PLS-89-184-14		136	35	<0.1	118	113	12.00
PLS-89-184-15		121	31	<0.1	113	429	23.00
PLS-89-184-16		161	34	0.3	50	637	21.00
PLS-89-184-17		127	33	<0.1	76	72	20.00
PLS-89-184-18		645	29	0.1	32	173	21.00
PLS-89-185-01		107	33	<0.1	112	711	21.00
PLS-89-185-02		151	44	0.5	78	78	20.00
PLS-89-185-03		137	27	<0.1	65	113	18.00
PLS-89-185-04		89	25	<0.1	83	104	20.00
PLS-89-185-05		82	24	<0.1	62	930	18.00
PLS-89-185-06		74	29	<0.1	43	54	21.00
PLS-89-185-07		92	22	<0.1	51	120	20.00

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REPORT: 089-50866.0

PROJECT: LAC SHORT PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au PPB	Testwt gms
PLS-89-185-08-3/4H		140	44	<0.1	66	20	25.00
PLS-89-185-09-3/4H		144	39	<0.1	69	640	28.00
PLS-89-185-10-3/4H		138	45	<0.1	91	221	20.00
PLS-89-185-11-3/4H		200	61	0.2	92	404	13.00
PLS-89-185-12-3/4H		121	39	<0.1	56	131	20.00
PLS-89-185-13-3/4H		95	42	<0.1	51	118	14.00
PLS-89-185-14-3/4H		123	42	<0.1	46	284	11.00
PLS-89-185-15-3/4H		123	39	<0.1	75	141	17.00
PLS-89-185-16-3/4H		135	44	0.4	75	2084	17.00
PLS-89-185-17-3/4H		92	38	<0.1	44	298	15.00
PLS-89-185-18-3/4H		225	61	<0.1	250	315	10.00
PLS-89-185-19-3/4H		201	97	<0.1	296	302	13.00
PLS-89-185-20-3/4H		240	128	<0.1	352	225	10.00
PLS-89-185-21-3/4H		158	78	0.1	358	246	5.00
PLS-89-185-22-3/4H		188	98	0.2	592	163	7.00
PLS-89-185-23-3/4H		145	71	<0.1	356	314	11.00
PLS-89-185-24-3/4H		127	61	<0.1	230	122	13.00
PLS-89-186-01-3/4H		232	49	0.1	97	127	13.00
PLS-89-186-02-3/4H		164	50	<0.1	93	133	14.00
PLS-89-186-03-3/4H		137	43	<0.1	88	120	9.00
PLS-89-186-04-3/4H		163	43	<0.1	79	137	7.00
PLS-89-186-05-3/4H		112	88	<0.1	85	129	13.00
PLS-89-186-06-3/4H		98	35	<0.1	54	50	9.00
PLS-89-186-07-3/4H		91	32	<0.1	21	20	20.00
PLS-89-187-01-3/4H		209	62	<0.1	83	135	25.00
PLS-89-187-02-3/4H		205	52	<0.1	70	248	19.00
PLS-89-187-03-3/4H		219	78	<0.1	71	98	12.00
PLS-89-187-04-3/4H		236	61	<0.1	80	64	14.00
PLS-89-187-05-3/4H		152	56	<0.1	42	208	14.00
PLS-89-187-06-3/4H		129	52	<0.1	50	30	7.00
PLS-89-187-07-3/4H		150	54	<0.1	48	92	13.00
PLS-89-187-08-3/4H		169	265	<0.1	51	150	11.00
PLS-89-187-09-3/4H		120	46	<0.1	31	33	12.00
PLS-89-187-10-3/4H		141	49	<0.1	43	70	15.00
PLS-89-187-11-3/4H		161	77	<0.1	41	49	14.00
PLS-89-187-12-3/4H		135	46	0.1	37	28	13.00
PLS-89-187-13-3/4H		170	95	<0.1	220	73	7.00
PLS-89-187-14-3/4H		198	102	0.5	496	163	5.00
PLS-89-187-15-3/4H		202	94	0.6	840	772	15.00
PLS-89-187-16-3/4H		266	144	0.5	616	933	12.00

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Geochemical Lab Report

REPORT: 089-50908.0

PROJECT: NONE PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au PPB	TestWt gms
PLS-89-187-17-3/4H		197	146	0.5	515	750	10.00
PLS-89-187-18-3/4H		119	57	0.2	286	843	9.00
PLS-89-187-19-3/4H		113	49	<0.1	322	582	13.00
PLS-89-188-01-3/4H		52	38	0.1	32	<10	9.00
PLS-89-188-02-3/4H		69	33	0.1	56	344	19.00
PLS-89-188-03-3/4H		88	28	8.0	62	492	15.00
PLS-89-188-04-3/4H		74	27	0.2	59	96	16.00
PLS-89-188-05-3/4H		110	25	0.3	64	253	14.00
PLS-89-188-06-3/4H		89	48	0.3	65	72	13.00
PLS-89-188-07-3/4H		106	26	0.6	43	95	18.00
PLS-89-188-08-3/4H		120	31	0.5	53	109	14.00
PLS-89-188-09-3/4H		83	36	2.9	74	43	14.00
PLS-89-188-10-3/4H		86	26	0.5	86	404	15.00
PLS-89-188-11-3/4H		52	22	0.2	34	109	11.00
PLS-89-188-12-3/4H		108	35	0.6	124	60	8.00
PLS-89-188-13-3/4H		282	74	0.7	130	1004	13.00
PLS-89-188-14-3/4H		200	66	1.0	672	363	20.00
PLS-89-188-15-3/4H		167	65	0.8	342	4580	30.00
PLS-89-188-16-3/4H		138	68	0.6	250	330	11.00
PLS-89-188-17-3/4H		133	44	0.3	74	200	15.00
PLS-89-188-18-3/4H		545	55	1.0	274	383	18.00
PLS-89-188-19-3/4H		940	57	1.1	280	385	22.00
PLS-89-190-01-3/4H		356	27	0.6	85	671	14.00
PLS-89-191-01-3/4H		788	49	0.9	105	1299	13.00
PLS-89-192-01-3/4H		784	64	1.3	123	766	22.00
PLS-89-193-01-3/4H		91	27	0.4	13	368	4.00
PLS-89-193-02-3/4H		122	27	0.2	16	582	15.00
PLS-89-193-03-3/4H		59	23	0.2	7	74	11.00
PLS-89-193-04-3/4H		66	24	<0.1	7	606	7.00
PLS-89-193-05-3/4H		50	22	0.1	16	385	13.00
PLS-89-193-06-3/4H		112	36	0.3	752	323	8.00
PLS-89-193-07-3/4H		42	24	0.2	68	210	7.00
PLS-89-193-08-3/4H		123	49	0.2	68	105	8.00
PLS-89-193-09-3/4H		220	54	0.7	192	538	12.00
PLS-89-193-10-3/4H		403	32	1.8	145	180	5.00
PLS-89-193-11-3/4H		204	44	0.9	145	270	5.00
PLS-89-193-12-3/4H		289	34	0.7	90	300	3.00
PLS-89-194-01-3/4H		48	21	<0.1	11	<5	18.00
PLS-89-194-02-3/4H		107	22	0.1	6	<5	16.00
PLS-89-194-03-3/4H		52	19	0.5	7	71	24.00

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Geochemical Lab Report

REPORT: 089-51117.0

PROJECT: LAC SHORT PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au PPB	Testwt grs
PLS-89-194-04-3/4H		49	29	<0.1	5	25	6.00
PLS-89-194-05-3/4H		72	38	<0.1	16	158	4.00
PLS-89-194-06-3/4H		254	45	0.2	143	116	8.00
PLS-89-195-01-3/4H		266	48	0.4	214	238	13.00
PLS-89-195-02-3/4H		199	49	0.5	135	329	22.00
PLS-89-195-03-3/4H		144	41	0.3	95	249	13.00
PLS-89-195-04-3/4H		272	70	<0.1	123	270	10.00
PLS-89-195-05-3/4H		255	61	<0.1	102	343	12.00
PLS-89-195-06-3/4H		284	67	0.2	168	1131	14.00
PLS-89-195-07-3/4H		122	52	<0.1	137	153	10.00
PLS-89-195-08-3/4H		148	55	0.1	179	218	12.00
PLS-89-195-09-3/4H		124	42	0.2	142	125	6.00
PLS-89-195-11-3/4H		192	47	0.2	129	225	4.00
PLS-89-195-12-3/4H		250	30	0.4	81	110	6.00
PLS-89-195-13-3/4H		225	31	0.9	78	75	4.00
PLS-89-196-01-3/4H		74	46	<0.1	12	16	11.00
PLS-89-196-02-3/4H		352	48	0.3	129	1038	5.00
PLS-89-197-01-3/4H		90	28	0.3	43	97	9.00
PLS-89-197-02-3/4H		57	22	0.7	170	135	4.00
PLS-89-197-03-3/4H		65	28	0.5	19	263	4.00
PLS-89-197-04-3/4H		231	42	0.2	21	24	4.00
PLS-89-197-05-3/4H		359	42	0.5	50	120	2.50
PLS-89-198-01-3/4H		161	28	0.3	100	43	9.00
PLS-89-198-02-3/4H		52	24	<0.1	8	71	14.00
PLS-89-198-03-3/4H		169	75	0.5	126	238	12.00
PLS-89-198-04-3/4H		241	72	0.4	117	160	15.00
PLS-89-199-01-3/4H		51	21	0.1	15	78	27.00
PLS-89-199-02-3/4H		112	31	0.3	158	500	20.00
PLS-89-199-03-3/4H		147	39	<0.1	114	223	7.00
PLS-89-200-01-3/4H		202	33	0.6	142	235	19.00
PLS-89-200-02-3/4H		85	33	<0.1	82	80	20.00
PLS-89-200-03-3/4H		107	23	0.4	134	307	18.00
PLS-89-200-04-3/4H		266	48	0.6	160	158	12.00
PLS-89-201-01-3/4H		78	25	<0.1	25	311	17.00
PLS-89-202-01-3/4H		38	16	0.1	3	159	19.00
PLS-89-202-02-3/4H		35	21	<0.1	3	36	14.00
PLS-89-202-03-3/4H		74	21	<0.1	17	87	22.00

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Geochemical Lab Report

REPORT: 089-51118.0

PROJECT: LAC SHORT PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au-150 PPM	Au+150 PPM	Au Av PPM	TestWt gms	-150Wt gms	+150Wt gms
PLS-89-194-07-3/4H		350	26	0.5	56	0.05	3.15	1.16	4.93	6.17	3.44
PLS-89-195-10-3/4H		200	37	0.7	208	0.50	0.26	0.45	7.44	8.10	2.31
PLS-89-197-06-3/4H		193	34	0.9	99	0.34	17.93	5.65	7.05	7.73	3.34

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Geochemical Lab Report

REPORT: 089-51138.0

PROJECT: NONE PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au PPB	Testwt gms
PLS-89-203-01-3/4H		24	17	0.3	4	<5	18.00
PLS-89-203-02-3/4H		167	26	0.2	9	32	13.00
PLS-89-204-01-3/4H		38	21	0.2	3	<5	10.00
PLS-89-205-01-3/4H		85	18	0.4	6	68	16.00
PLS-89-206-01-3/4H		32	23	0.6	3	297	11.00
PLS-89-206-02-3/4H		66	22	<0.1	7	140	12.00
PLS-89-207-01-3/4H		54	18	<0.1	3	207	18.00
PLS-89-207-02-3/4H		257	25	0.2	21	258	20.00
PLS-89-207-03-3/4H		88	25	0.1	22	413	17.00
PLS-89-207-04-3/4H		176	26	0.1	19	24	19.00
PLS-89-207-05-3/4H		310	25	<0.1	24	28	15.00
PLS-89-207-06-3/4H		116	29	0.6	17	112	19.00
PLS-89-207-07-3/4H		97	32	<0.1	22	153	21.00
PLS-89-207-08-3/4H		174	41	0.5	107	313	23.00
PLS-89-207-09-3/4H		127	79	0.1	101	985	12.00
PLS-89-207-10-3/4H		132	95	0.3	112	775	11.00
PLS-89-208-01-3/4H		153	39	0.2	73	73	14.00
PLS-89-208-02-3/4H		172	36	0.4	44	34	8.00
PLS-89-208-03-3/4H		143	37	0.7	31	24	15.00
PLS-89-208-04-3/4H		95	23	1.1	17	54	19.00
PLS-89-208-05-3/4H		167	31	<0.1	29	42	17.00
PLS-89-208-06-3/4H		282	30	<0.1	32	74	19.00
PLS-89-208-08-3/4H		142	37	<0.1	32	16	17.00
PLS-89-208-09-3/4H		86	28	0.2	11	641	11.00
PLS-89-208-10-3/4H		235	59	0.6	160	68	18.00
PLS-89-209-01-3/4H		158	38	<0.1	30	73	23.00
PLS-89-209-02-3/4H		143	33	0.1	49	128	20.00
PLS-89-209-03-3/4H		115	33	0.1	54	42	17.00
PLS-89-209-04-3/4H		134	43	<0.1	27	32	16.00
PLS-89-209-05-3/4H		120	48	0.3	27	30	17.00
PLS-89-209-06-3/4H		149	41	0.1	53	1288	13.00
PLS-89-209-07-3/4H		129	38	0.3	26	51	17.00
PLS-89-209-08-3/4H		128	33	0.2	32	42	13.00
PLS-89-209-09-3/4H		219	36	<0.1	34	423	12.00
PLS-89-209-10-3/4H		124	31	0.2	20	388	13.00
PLS-89-209-11-3/4H		81	35	0.3	15	115	13.00
PLS-89-209-12-3/4H		250	112	0.8	268	89	27.00
PLS-89-210-01-3/4H		149	35	0.3	53	79	16.00
PLS-89-210-02-3/4H		182	36	<0.1	43	533	17.00

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REPORT: 089-51139.0

PROJECT: NONE

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au-150 PPM	Au+150 PPM	Au Av PPM	TestWt gms	-150Wt gms	+150Wt gms
PLS-89-208-07-3/4H		111	33	0.1	16	0.06	4.07	1.42	5.00	6.23	3.18

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Geochemical Lab Report

REPORT: 089-51181.0

PROJECT: LAC SHORT PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au PPB
PLS-89-210-03-3/4H		185	37	0.2	87	83
PLS-89-210-04-3/4H		151	45	<0.1	65	158
PLS-89-210-05-3/4H		134	38	<0.1	59	189
PLS-89-210-06-3/4H		101	44	0.1	34	384
PLS-89-210-07-3/4H		126	37	0.4	61	230
PLS-89-210-08-3/4H		140	44	<0.1	44	111
PLS-89-210-09-3/4H		147	43	<0.1	50	148
PLS-89-210-10-3/4H		120	36	<0.1	60	414
PLS-89-210-11-3/4H		173	41	0.1	34	71
PLS-89-210-12-3/4H		198	316	0.9	164	295
PLS-89-210-13-3/4H		180	197	1.2	258	605
PLS-89-211-01-3/4H		292	40	0.3	63	616
PLS-89-211-02-3/4H		208	52	1.1	240	230
PLS-89-211-03-3/4H		155	51	0.2	45	349
PLS-89-211-04-3/4H		165	78	0.6	177	562
PLS-89-212-01-3/4H		20	23	<0.1	5	334
PLS-89-212-02-3/4H		27	21	0.5	4	21
PLS-89-212-03-3/4H		38	19	<0.1	2	<6
PLS-89-212-04-3/4H		64	24	<0.1	4	<7
PLS-89-212-05-3/4H		101	37	0.2	17	<17
PLS-89-212-06-3/4H		326	38	0.2	67	100
PLS-89-212-07-3/4H		297	52	<0.1	66	43
PLS-89-212-08-3/4H		635	36	0.1	44	58
PLS-89-212-09-3/4H		200	34	0.1	47	306
PLS-89-212-10-3/4H		242	60	<0.1	33	32
PLS-89-212-11-3/4H		183	41	<0.1	37	23
PLS-89-213-01-3/4H		25	20	<0.1	<2	<6
PLS-89-213-02-3/4H		23	17	<0.1	3	28
PLS-89-213-03-3/4H		761	33	<0.1	59	51
PLS-89-214-01-3/4H		92	28	0.3	19	25
PLS-89-214-02-3/4H		176	36	<0.1	36	49
PLS-89-214-03-3/4H		136	36	7.0	34	16
PLS-89-214-04-3/4H		132	32	<0.1	33	99
PLS-89-214-05-3/4H		311	33	<0.1	32	45
PLS-89-214-06-3/4H		173	35	0.3	52	165
PLS-89-214-07-3/4H		91	24	0.2	34	150
PLS-89-214-08-3/4H		136	52	0.5	94	332
PLS-89-215-01-3/4H		144	29	0.1	32	81
PLS-89-215-02-3/4H		84	23	0.1	16	130
PLS-89-215-03-3/4H		72	21	0.1	20	461

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Geochemical Lab Report

REPORT: 089-51193.0

PROJECT: LAC SHORT

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au PPB	Testwt gms
PLS-89-215-04-3/4H		82	28	0.5	19	<5	10.00
PLS-89-215-05-3/4H		129	36	0.5	23	30	5.00
PLS-89-215-06-3/4H		196	36	0.3	37	79	28.00
PLS-89-215-07-3/4H		281	188	1.5	338	119	22.00
PLS-89-216-01-3/4H		115	36	0.7	21	66	20.00
PLS-89-216-02-3/4H		104	36	2.7	30	46	13.00
PLS-89-216-03-3/4H		167	52	0.5	22	69	7.00
PLS-89-216-04-3/4H		110	36	0.2	18	<7	7.00
PLS-89-216-05-3/4H		99	36	0.6	16	43	7.00
PLS-89-216-06-3/4H		137	57	0.5	28	99	10.00
PLS-89-216-07-3/4H		412	64	0.8	32	25	13.00
PLS-89-216-08-3/4H		89	35	0.5	38	99	13.00
PLS-89-216-09-3/4H		167	53	0.6	30	84	10.00
PLS-89-216-10-3/4H		112	45	0.6	32	837	9.00
PLS-89-216-11-3/4H		103	47	0.4	22	346	13.00
PLS-89-216-12-3/4H		160	42	0.6	22	195	8.00
PLS-89-216-13-3/4H		298	191	1.6	302	96	
PLS-89-217-01-3/4H		156	44	0.4	39	25	12.00
PLS-89-217-02-3/4H		332	56	0.4	66	60	3.00
PLS-89-217-03-3/4H		169	41	<0.1	21	1270	15.00
PLS-89-217-04-3/4H		95	38	<0.1	20	888	10.00
PLS-89-217-05-3/4H		126	62	<0.1	24	32	13.00
PLS-89-217-06-3/4H		233	59	0.7	308	122	11.00
PLS-89-217-07-3/4H		328	491	1.1	300	300	9.00
PLS-89-218-01-3/4H		129	46	0.3	47	25	18.00
PLS-89-218-02-3/4H		89	35	0.1	58	165	16.00
PLS-89-218-03-3/4H		121	32	<0.1	27	77	14.00
PLS-89-218-04-3/4H		232	45	0.1	65	69	16.00
PLS-89-220-01-3/4H		60	44	0.5	5	18	15.00
PLS-89-221-01-3/4H		125	39	0.2	29	144	14.00
PLS-89-221-02-3/4H		71	39	0.5	17	225	6.00
PLS-89-221-03-3/4H		54	27	<0.1	27	297	10.00
PLS-89-221-04-3/4H		115	33	0.1	19	47	7.00
PLS-89-221-06-3/4H		129	37	0.3	50	58	12.00
PLS-89-221-07-3/4H		123	40	<0.1	32	57	10.00
PLS-89-221-08-3/4H		121	48	<0.1	31	1350	10.00
PLS-89-222-01-3/4H		40	29	0.7	2	875	12.00
PLS-89-223-01-3/4H		165	40	<0.1	41	256	11.00
PLS-89-223-02-3/4H		147	72	<0.1	35	198	10.00

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Geochemical Lab Report

REPORT: 089-51194.0

PROJECT: LAC SHORT PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Zn PPM	Ag PPM	As PPM	Au-150 PPM	Au+150 PPM	Au Av PPM	TestWt gms	-150Wt gms	+150Wt gms	Cu PPM
PLS-89-221-05-3/4H		36	0.4	39	0.26	31.16	3.20	5.00	10.45	1.10	148

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Geochemical Lab Report

REPORT: 089-51204.0

PROJECT: LAC SHORT

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au PPB	Testwt gms
PLS-89-223-03-3/4H		191	49	0.1	35	<25	2.00
PLS-89-225-01-3/4H		167	42	0.3	44	243	9.00
PLS-89-225-02-3/4H		153	37	0.2	47	48	5.00
PLS-89-225-03-3/4H		114	48	<0.1	12	<13	4.00
PLS-89-225-04-3/4H		65	27	<0.1	3	123	10.00
PLS-89-225-05-3/4H		96	37	<0.1	11	<10	5.00
PLS-89-226-01-3/4H		163	39	0.3	51	71	8.00
PLS-89-227-01-3/4H		233	52	1.6	37	115	6.00
PLS-89-228-01-3/4H		39	25	0.1	9	381	7.00
PLS-89-228-02-3/4H		38	29	<0.1	5	708	5.00
PLS-89-229-01-3/4H		76	21	0.1	4	<17	3.00
PLS-89-229-02-3/4H		56	26	<0.1	6	210	2.00
PLS-89-229-03-3/4H		26	22	0.2	2	293	8.00
PLS-89-229-04-3/4H		43	24	0.1	4	<8	6.00
PLS-89-229-05-3/4H		91	27	<0.1	36	225	12.00
PLS-89-229-06-3/4H		166	42	<0.1	22	147	9.00
PLS-89-229-07-3/4H		195	43	0.5	34	5289	13.00
PLS-89-229A-01-3/4H		94	23	<0.1	4	39	10.00
PLS-89-229A-02-3/4H		65	31	0.3	8	383	4.00
PLS-89-229A-03-3/4H		218	42	0.2	26	120	3.00
PLS-89-229A-04-3/4H		159	49	0.5	28	44	11.00
PLS-89-229A-05-3/4H		189	38	0.1	25	90	10.00
PLS-89-229A-06-3/4H		100	34	<0.1	10	1050	8.00
PLS-89-230-01-3/4H		72	25	<0.1	17	259	17.00
PLS-89-230-02-3/4H		57	25	<0.1	8	38	15.00
PLS-89-230-03-3/4H		204	160	<0.1	18	27	18.00
PLS-89-230-05-3/4H		176	20	0.2	14	28	18.00
PLS-89-231-01-3/4H		207	41	0.6	54	102	15.00
PLS-89-232-01-3/4H		136	37	0.2	35	30	14.00
PLS-89-232-02-3/4H		168	56	0.2	30	92	15.00
PLS-89-232-03-3/4H		182	41	0.3	40	430	12.00
PLS-89-232-04-3/4H		196	48	0.2	64	181	23.00
PLS-89-232-05-3/4H		85	32	0.3	37	400	3.00
PLS-89-233-01-3/4H		154	52	0.2	32	30	7.00
PLS-89-233-02-3/4H		97	35	<0.1	21	113	4.00
PLS-89-234-01-3/4H		47	37	<0.1	4	383	8.00

Bondar-Clegg & Company Ltd.
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BONDAR-CLEGG

Geochemical Lab Report

REPORT: 089-51205.0

PROJECT: LAC SHORT PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	Ag PPM	As PPM	Au-150 PPM	Au+150 PPM	Au Av PPM	TestWt gms	-150Wt gms	+150Wt gms
PLS-89-230-04-3/4H		430	26	0.1	20	0.09	0.52	0.26	8.00	12.32	7.73

APPENDIX E

HEAVY MINERAL ABSOLUTE METAL CONTENTS

OVERBURDEN DRILLING MANAGEMENT LIMITED

Absolute Metal Content of Heavy Mineral Concentrates

SAMPLE NUMBER	WEIGHT (g) NON-MAG	Au ASSAY PPB	ABSOLUTE METAL CONTENT Au (nanograms)	Cu ASSAY PPM	ABSOLUTE METAL CONTENT Cu (micrograms)	Zn ASSAY PPM	ABSOLUTE METAL CONTENT Zn (micrograms)	As ASSAY PPM	ABSOLUTE METAL CONTENT As (micrograms)	Ag ASSAY PPM	ABSOLUTE METAL CONTENT Ag (micrograms)
PLS-89-151-01-3/4H	30.3	368.0	11150.4	26.0	787.8	23.0	696.9	4.0	121.2	-0.1	-3.0
PLS-89-151-02-3/4H	45.3	136.0	6160.8	19.0	860.7	18.0	815.4	3.0	135.9	-0.1	-4.5
PLS-89-151-03-3/4H	38.0	37.0	1406.0	19.0	722.0	17.0	646.0	6.0	228.0	-0.1	-3.8
PLS-89-151-04-3/4H	36.1	140.0	5054.0	42.0	1516.2	25.0	902.5	9.0	324.9	-0.1	-3.6
PLS-89-151-05-3/4H	34.4	194.0	6673.6	28.0	963.2	26.0	894.4	4.0	137.6	-0.1	-3.4
PLS-89-151-06-3/4H	22.2	4340.0	96348.0	73.0	1620.6	41.0	910.2	3.0	66.6	0.5	11.1
PLS-89-152-01-3/4H	31.3	314.0	9828.2	104.0	3255.2	36.0	1126.8	39.0	1220.7	0.1	3.1
PLS-89-152-02-3/4H	36.4	82.0	2984.8	155.0	5642.0	33.0	1201.2	59.0	2147.6	-0.1	-3.6
PLS-89-153-01-3/4H	28.5	206.0	5871.0	102.0	2907.0	44.0	1254.0	22.0	627.0	0.1	2.9
PLS-89-154-01-3/4H	18.0	50.0	900.0	33.0	594.0	24.0	432.0	6.0	108.0	-0.1	-1.8
PLS-89-155-01-3/4H	35.7	26.0	928.2	74.0	2641.8	31.0	1106.7	23.0	821.1	-0.1	-3.6
PLS-89-155-02-3/4H	32.0	195.0	6240.0	33.0	1056.0	20.0	640.0	8.0	256.0	-0.1	-3.2
PLS-89-155-03-3/4H	23.5	35.0	822.5	29.0	681.5	23.0	540.5	4.0	94.0	-0.1	-2.4
PLS-89-156-01-3/4H	36.2	317.0	11475.4	60.0	2172.0	30.0	1086.0	9.0	325.8	-0.1	-3.6
PLS-89-156-02-3/4H	27.5	674.0	18535.0	65.0	1787.5	29.0	797.5	17.0	467.5	-0.1	-2.8
PLS-89-156-03-3/4H	20.9	458.0	9572.2	104.0	2173.6	55.0	1149.5	35.0	731.5	0.2	4.2
PLS-89-157-01-3/4H	26.1	358.0	9343.8	129.0	3366.9	50.0	1305.0	58.0	1513.8	0.2	5.2
PLS-89-158-01-3/4H	21.7	648.0	14061.6	214.0	4643.8	45.0	976.5	36.0	781.2	0.5	10.9
PLS-89-159-01-3/4H	23.5	138.0	3243.0	23.0	540.5	19.0	446.5	3.0	70.5	-0.1	-2.4
-89-161-01-3/4H	22.3	97.0	2163.1	34.0	758.2	25.0	557.5	5.0	111.5	-0.1	-2.2
-89-162-01-3/4H	32.2	1133.0	36482.6	121.0	3896.2	48.0	1545.6	380.0	12236.0	0.2	6.4
PLS-89-163-01-3/4H	22.3	766.0	17081.8	95.0	2118.5	22.0	490.6	7.0	156.1	0.1	2.2
PLS-89-163-02-3/4H	23.2	159.0	3688.8	53.0	1229.6	29.0	672.8	6.0	139.2	-0.1	-2.3
PLS-89-164-01-3/4H	27.3	255.0	6961.5	29.0	791.7	32.0	873.6	5.0	136.5	-0.1	-2.7
PLS-89-164-02-3/4H	35.0	35.0	1225.0	150.0	5250.0	42.0	1470.0	75.0	2625.0	-0.1	-3.5
PLS-89-164-03-3/4H	19.8	185.0	3663.0	111.0	2197.8	31.0	613.8	22.0	435.6	0.2	4.0
PLS-89-164-04-3/4H	20.5	134.0	2747.0	107.0	2193.5	48.0	984.0	31.0	635.5	-0.1	-2.1
PLS-89-164-05-3/4H	20.7	160.0	3312.0	111.0	2297.7	26.0	538.2	21.0	434.7	-0.1	-2.1
PLS-89-165-01-3/4H	28.3	28.0	792.4	173.0	4895.9	25.0	707.5	13.0	367.9	0.1	2.8
PLS-89-165-02-3/4H	40.4	183.0	7393.2	79.0	3191.6	22.0	888.8	5.0	202.0	-0.1	-4.0
PLS-89-165-03-3/4H	30.7	38.0	1166.6	56.0	1719.2	25.0	767.5	17.0	521.9	-0.1	-3.1
PLS-89-165-04-3/4H	24.5	60.0	1470.0	184.0	4508.0	44.0	1078.0	72.0	1764.0	-0.1	-2.5
PLS-89-165-05-3/4H	37.7	65.0	2450.5	203.0	7653.1	61.0	2299.7	96.0	3619.2	-0.1	-3.8
PLS-89-165-06-3/4H	24.3	101.0	2454.3	175.0	4252.5	60.0	1458.0	80.0	1944.0	0.1	2.4
PLS-89-165-07-3/4H	33.6	333.0	11188.8	180.0	6048.0	54.0	1814.4	104.0	3494.4	-0.1	-3.4
PLS-89-165-08-3/4H	25.2	-5.0	-126.0	94.0	2368.8	30.0	756.0	30.0	756.0	-0.1	-2.5
PLS-89-165-09-3/4H	25.6	30.0	768.0	149.0	3814.4	49.0	1254.4	59.0	1510.4	0.7	17.9
PLS-89-166-01-3/4H	28.6	212.0	6063.2	139.0	3975.4	54.0	1544.4	70.0	2002.0	-0.1	-2.9
PLS-89-166-02-3/4H	38.6	234.0	9032.4	242.0	9341.2	57.0	2200.2	77.0	2972.2	0.2	7.7
PLS-89-166-03-3/4H	38.2	229.0	8747.8	258.0	9855.6	61.0	2330.2	118.0	4507.6	0.5	19.1
PLS-89-166-04-3/4H	31.0	95.0	2945.0	181.0	5611.0	55.0	1705.0	126.0	3906.0	0.1	3.1
PLS-89-166-05-3/4H	30.7	137.0	4205.9	183.0	5618.1	59.0	1811.3	86.0	2640.2	0.3	9.2
PLS-89-166-06-3/4H	41.4	281.0	11633.4	184.0	7617.6	53.0	2194.2	98.0	4057.2	0.1	4.1
PLS-89-166-07-3/4H	37.0	89.0	3293.0	250.0	9250.0	66.0	2442.0	112.0	4144.0	-0.1	-3.7
-89-166-08-3/4H	31.7	105.0	3328.5	250.0	7925.0	75.0	2377.5	74.0	2345.8	0.3	9.5
-89-166-09-3/4H	32.7	100.0	3270.0	201.0	6572.7	55.0	1798.5	108.0	3531.6	0.2	6.5
PLS-89-166-10-3/4H	23.0	156.0	3588.0	141.0	3243.0	42.0	966.0	49.0	1127.0	-0.1	-2.3
PLS-89-166-11-3/4H	29.2	47.0	1372.4	129.0	3766.8	47.0	1372.4	50.0	1460.0	0.2	5.8
PLS-89-166-12-3/4H	23.0	480.0	11040.0	176.0	4048.0	69.0	1587.0	45.0	1035.0	0.9	20.7

OVERBURDEN DRILLING MANAGEMENT LIMITED

Absolute Metal Content of Heavy Mineral Concentrates

SAMPLE NUMBER	WEIGHT (g) NON-MAG	Au ASSAY PPB	ABSOLUTE METAL CONTENT Au (nanograms)	Cu ASSAY PPM	ABSOLUTE METAL CONTENT Cu (micrograms)	Zn ASSAY PPM	ABSOLUTE METAL CONTENT Zn (micrograms)	As ASSAY PPM	ABSOLUTE METAL CONTENT As (micrograms)	Ag ASSAY PPM	ABSOLUTE METAL CONTENT Ag (micrograms)
PLS-89-166-13-3/4H	26.6	411.0	10932.6	149.0	3963.4	44.0	1170.4	58.0	1542.8	-0.1	-2.7
PLS-89-166-14-3/4H	13.7	163.0	2233.1	117.0	1602.9	84.0	1150.8	41.0	561.7	-0.1	-1.4
PLS-89-167-01-3/4H	30.6	56.0	1713.6	27.0	826.2	22.0	673.2	3.0	91.8	-0.1	-3.1
PLS-89-167-02-3/4H	34.6	50.0	1730.0	32.0	1107.2	22.0	761.2	4.0	138.4	-0.1	-3.5
PLS-89-167-03-3/4H	21.2	1209.0	25630.8	114.0	2416.8	52.0	1102.4	43.0	911.6	0.3	6.4
PLS-89-167-04-3/4H	24.7	640.0	15808.0	124.0	3062.8	58.0	1432.6	45.0	1111.5	1.0	24.7
PLS-89-168-01-3/4H	27.7	1154.0	31965.8	147.0	4071.9	92.0	2548.4	38.0	1052.6	-0.1	-2.8
PLS-89-168-02-3/4H	26.0	128.0	3328.0	157.0	4082.0	61.0	1586.0	57.0	1482.0	0.2	5.2
PLS-89-168-03-3/4H	26.9	223.0	5998.7	176.0	4734.4	52.0	1398.8	73.0	1963.7	-0.1	-2.7
PLS-89-168-04-3/4H	30.6	194.0	5936.4	284.0	8690.4	48.0	1468.8	88.0	2692.8	0.2	6.1
PLS-89-168-05-3/4H	27.2	265.0	7208.0	154.0	4188.8	94.0	2556.8	43.0	1169.6	0.1	2.7
PLS-89-168-06-3/4H	25.6	834.0	21350.4	154.0	3942.4	49.0	1254.4	55.0	1408.0	0.1	2.6
PLS-89-168-07-3/4H	19.2	2081.0	39955.2	191.0	3667.2	42.0	806.4	50.0	960.0	-0.1	-1.9
PLS-89-169-01-3/4H	37.0	916.0	33892.0	159.0	5883.0	57.0	2109.0	46.0	1702.0	0.1	3.7
PLS-89-169-02-3/4H	30.4	200.0	6080.0	161.0	4894.4	57.0	1732.8	43.0	1307.2	0.2	6.1
PLS-89-169-03-3/4H	22.2	6653.0	147696.6	181.0	4018.2	75.0	1665.0	64.0	1420.8	0.5	11.1
PLS-89-169-04-3/4H	27.3	794.0	22073.2	216.0	6004.3	81.0	2251.8	54.0	1501.2	0.1	2.8
PLS-89-169-05-3/4H	6.6	-5.0	-33.0	192.0	1267.2	78.0	514.8	48.0	316.8	-0.1	-0.7
PLS-89-169-06-3/4H	28.6	68.0	1944.8	160.0	4576.0	50.0	1430.0	97.0	2774.2	-0.1	-2.9
-89-169-07-3/4H	34.9	131.0	4571.9	206.0	7189.4	56.0	1954.4	153.0	5339.7	0.4	14.0
-89-169-08-3/4H	31.4	290.0	9106.0	179.0	5620.6	59.0	1852.6	65.0	2041.0	0.2	6.3
PLS-89-169-09-3/4H	20.8	2370.0	49296.0	274.0	5699.2	69.0	1435.2	76.0	1580.8	0.9	18.7
PLS-89-170-01-3/4H	12.6	10515.0	132489.0	153.0	1927.8	115.0	1449.0	87.0	1096.2	4.2	52.9
PLS-89-171-01-3/4H	31.8	444.0	14119.2	173.0	5501.4	50.0	1590.0	51.0	1621.8	0.1	3.2
PLS-89-171-02-3/4H	37.0	1225.0	45325.0	116.0	4292.0	41.0	1517.0	42.0	1554.0	0.1	3.7
PLS-89-171-03-3/4H	18.1	1329.0	24054.9	133.0	2407.3	47.0	850.7	47.0	850.7	0.7	12.7
PLS-89-171-04-3/4H	31.0	14420.0	447020.0	98.0	3038.0	41.0	1271.0	52.0	1612.0	7.4	229.4
PLS-89-171-05-3/4H	30.4	18321.0	556958.4	70.0	2128.0	59.0	1793.6	63.0	1915.2	7.1	215.8
PLS-89-172-01-3/4H	29.6	369.0	10922.4	161.0	4765.6	52.0	1539.2	45.0	1332.0	0.1	3.0
PLS-89-172-02-3/4H	23.6	669.0	15788.4	215.0	5074.0	70.0	1652.0	38.0	896.8	0.5	11.8
PLS-89-172-03-3/4H	21.2	718.0	15221.6	156.0	3307.2	32.0	678.4	43.0	911.6	0.1	2.1
PLS-89-172-04	21.9	373.0	8168.7	241.0	5277.9	55.0	1204.5	58.0	1270.2	0.2	4.4
PLS-89-172-05	18.7	207.0	3870.9	50.0	935.0	37.0	691.9	15.0	280.5	0.2	3.7
PLS-89-172-06	25.6	90.0	2304.0	63.0	1612.8	28.0	716.8	11.0	281.6	-0.1	-2.6
PLS-89-173-01	25.9	274.0	7096.6	128.0	3315.2	52.0	1346.8	50.0	1295.0	0.3	7.8
PLS-89-174-01	23.5	1070.0	25145.0	184.0	4324.0	52.0	1222.0	93.0	2185.5	0.4	9.4
PLS-89-175-01	19.1	30.0	573.0	120.0	2292.0	54.0	1031.4	23.0	439.3	0.2	3.8
PLS-89-175-02	7.5	195.0	1462.5	161.0	1207.5	59.0	442.5	43.0	322.5	0.1	0.8
PLS-89-175-03	32.4	530.0	17172.0	187.0	6058.8	46.0	1490.4	110.0	3564.0	0.2	6.5
PLS-89-175-04	33.4	101.0	3373.4	154.0	5143.6	57.0	1903.8	82.0	2738.8	0.3	10.0
PLS-89-175-05	42.0	1310.0	55020.0	209.0	8778.0	56.0	2352.0	100.0	4200.0	0.1	4.2
PLS-89-175-06	28.3	88.0	2490.4	168.0	4754.4	58.0	1641.4	88.0	2490.4	0.4	11.3
PLS-89-175-07	45.0	105.0	4725.0	149.0	6705.0	56.0	2520.0	80.0	3600.0	0.4	18.0
PLS-89-175-08	27.2	137.0	3726.4	162.0	4406.4	74.0	2012.8	80.0	2176.0	0.1	2.7
-89-175-09	32.1	195.0	6259.5	152.0	4879.2	67.0	2150.7	78.0	2503.8	0.1	3.2
-89-175-10	20.6	138.0	2842.8	145.0	2987.0	57.0	1174.2	50.0	1030.0	0.1	2.1
PLS-89-175-11	19.7	80.0	1576.0	162.0	3191.4	48.0	945.6	58.0	1142.6	0.2	3.9
PLS-89-175-12	20.4	68.0	1387.2	143.0	2917.2	48.0	979.2	86.0	1754.4	0.6	12.2
PLS-89-175-13	22.2	284.0	6304.8	152.0	3374.4	56.0	1243.2	61.0	1354.2	0.4	8.9

OVERBURDEN DRILLING MANAGEMENT LIMITED

Absolute Metal Content of Heavy Mineral Concentrates

SAMPLE NUMBER	WEIGHT (g) NON-MAG	Au ASSAY PPB	ABSOLUTE METAL CONTENT Au (nanograms)	Cu ASSAY PPM	ABSOLUTE METAL CONTENT Cu (micrograms)	Zn ASSAY PPM	ABSOLUTE METAL CONTENT Zn (micrograms)	As ASSAY PPM	ABSOLUTE METAL CONTENT As (micrograms)	Ag ASSAY PPM	ABSOLUTE METAL CONTENT Ag (micrograms)
PLS-89-175-14	27.7	220.0	6094.0	122.0	3379.4	96.0	2659.2	56.0	1551.2	-0.1	-2.8
PLS-89-176-01	26.4	177.0	4672.8	49.0	1293.6	31.0	818.4	24.0	633.6	-0.1	-2.6
PLS-89-177-01	33.6	207.0	6955.2	99.0	3326.4	42.0	1411.2	21.0	705.6	-0.1	-3.4
PLS-89-179-01	39.8	790.0	31442.0	126.0	5014.8	66.0	2626.8	41.0	1631.8	0.2	8.0
PLS-89-180-01	28.8	392.0	11289.6	116.0	3340.8	50.0	1440.0	47.0	1353.6	0.3	8.6
PLS-89-180-02	32.0	339.0	10848.0	127.0	4064.0	47.0	1504.0	41.0	1312.0	-0.1	-3.2
PLS-89-180-03	29.8	133.0	3963.4	37.0	1102.6	24.0	715.2	6.0	178.8	0.1	3.0
PLS-89-180-04	11.4	2964.0	33789.6	36.0	410.4	27.0	307.8	5.0	57.0	0.1	1.1
PLS-89-180-05	32.4	85.0	2754.0	26.0	842.4	22.0	712.8	2.0	64.8	-0.1	-3.2
PLS-89-180-06	22.1	53.0	1171.3	111.0	2453.1	31.0	685.1	11.0	243.1	0.1	2.2
PLS-89-180-07	24.7	220.0	5434.0	213.0	5261.1	35.0	864.5	27.0	666.9	0.2	4.9
PLS-89-181-01	36.6	442.0	16177.2	154.0	5636.4	104.0	3806.4	141.0	5160.6	0.7	25.6
PLS-89-181-02	36.2	71.0	2570.2	93.0	3366.6	25.0	905.0	64.0	2316.8	0.2	7.2
PLS-89-181-03	20.9	405.0	8464.5	77.0	1609.3	25.0	522.5	51.0	1065.9	0.1	2.1
PLS-89-181-04	36.2	109.0	3945.8	109.0	3945.8	77.0	2787.4	52.0	1882.4	1.6	57.9
PLS-89-181-05	32.6	113.0	3683.8	76.0	2477.6	24.0	782.4	43.0	1401.8	0.1	3.3
PLS-89-181-06	34.8	70.0	2436.0	113.0	3932.4	32.0	1113.6	61.0	2122.8	0.5	17.4
PLS-89-181-07	39.3	360.0	14148.0	82.0	3222.6	34.0	1336.2	35.0	1375.5	-0.1	-3.9
PLS-89-181-08	25.6	174.0	4454.4	127.0	3251.2	54.0	1382.4	69.0	1766.4	0.4	10.2
-89-181-09	29.9	195.0	5830.5	104.0	3109.6	55.0	1644.5	51.0	1524.9	0.1	3.0
-89-181-10	19.0	35.0	665.0	129.0	2451.0	39.0	741.0	32.0	608.0	0.1	1.9
PLS-89-182-01	36.1	197.0	7111.7	173.0	6245.3	55.0	1985.5	180.0	6498.0	0.5	18.1
PLS-89-182-02	31.9	125.0	3987.5	106.0	3381.4	32.0	1020.8	82.0	2615.8	-0.1	-3.2
PLS-89-182-03	36.9	321.0	11844.9	114.0	4206.6	46.0	1697.4	83.0	3062.7	-0.1	-3.7
PLS-89-182-04	34.1	65.0	2216.5	123.0	4194.3	42.0	1432.2	77.0	2625.7	0.2	6.8
PLS-89-182-05	27.6	1564.0	43166.4	202.0	5575.2	35.0	966.0	71.0	1959.6	0.3	8.3
PLS-89-182-06	30.0	141.0	4230.0	295.0	8850.0	33.0	990.0	69.0	2070.0	-0.1	-3.0
PLS-89-182-07	27.3	154.0	4204.2	141.0	3849.3	151.0	4122.3	75.0	2047.5	-0.1	-2.7
PLS-89-182-08	32.5	221.0	7182.5	98.0	3185.0	28.0	910.0	42.0	1365.0	0.5	16.3
PLS-89-182-09	36.8	92.0	3385.6	96.0	3532.8	24.0	883.2	34.0	1251.2	-0.1	-3.7
PLS-89-182-10	25.4	81.0	2057.4	107.0	2717.8	45.0	1143.0	51.0	1295.4	0.2	5.1
PLS-89-182-11	27.0	296.0	7992.0	98.0	2646.0	26.0	702.0	45.0	1215.0	0.1	2.7
PLS-89-183-01	28.4	183.0	5197.2	124.0	3521.6	43.0	1221.2	244.0	6929.6	0.2	5.7
PLS-89-183-02	30.4	134.0	4073.6	125.0	3800.0	38.0	1155.2	150.0	4560.0	-0.1	-3.0
PLS-89-183-03	46.7	110.0	5137.0	116.0	5417.2	28.0	1307.6	150.0	7005.0	-0.1	-4.7
PLS-89-183-04	43.4	80.0	3472.0	101.0	4383.4	25.0	1085.0	75.0	3255.0	-0.1	-4.3
PLS-89-183-05	34.8	1962.0	68277.6	229.0	7969.2	32.0	1113.6	51.0	1774.8	1.2	41.8
PLS-89-184-01	27.3	325.0	8872.5	141.0	3849.3	42.0	1146.6	60.0	1638.0	-0.1	-2.7
PLS-89-184-02	26.0	137.0	3562.0	96.0	2496.0	43.0	1118.0	146.0	3796.0	-0.1	-2.6
PLS-89-184-03	17.3	820.0	14186.0	108.0	1868.4	43.0	743.9	114.0	1972.2	-0.1	-1.7
PLS-89-184-04	28.1	152.0	4271.2	201.0	5648.1	37.0	1039.7	122.0	3428.2	0.3	8.4
PLS-89-184-05	24.7	26.0	642.2	87.0	2148.9	33.0	815.1	66.0	1630.2	-0.1	-2.5
PLS-89-184-06	71.3	64.0	4563.2	120.0	8556.0	25.0	1782.5	60.0	4278.0	-0.1	-7.1
PLS-89-184-07	35.5	162.0	5751.0	89.0	3159.5	29.0	1029.5	54.0	1917.0	-0.1	-3.6
-89-184-08	22.7	145.0	3291.5	94.0	2133.8	31.0	703.7	68.0	1543.6	-0.1	-2.3
-89-184-09	22.8	166.0	3784.8	98.0	2234.4	29.0	661.2	108.0	2462.4	0.5	11.4
PLS-89-184-10	18.1	156.0	2823.6	99.0	1791.9	26.0	470.6	116.0	2099.6	0.2	3.6
PLS-89-184-11	26.3	101.0	2656.3	124.0	3261.2	31.0	815.3	87.0	2288.1	-0.1	-2.6
PLS-89-184-12	39.1	433.0	16930.3	144.0	5630.4	39.0	1524.9	138.0	5395.8	-0.1	-3.9

OVERBURDEN DRILLING MANAGEMENT LIMITED

Absolute Metal Content of Heavy Mineral Concentrates

SAMPLE NUMBER	WEIGHT (g) NON-MAG	Au ASSAY PPB	ABSOLUTE METAL CONTENT Au (nanograms)	Cu ASSAY PPM	ABSOLUTE METAL CONTENT Cu (micrograms)	Zn ASSAY PPM	ABSOLUTE METAL CONTENT Zn (micrograms)	As ASSAY PPM	ABSOLUTE METAL CONTENT As (micrograms)	Ag ASSAY PPM	ABSOLUTE METAL CONTENT Ag (micrograms
PLS-89-184-13	31.3	273.0	8544.9	158.0	4945.4	48.0	1502.4	157.0	4914.1	0.1	3.1
PLS-89-184-14	20.5	113.0	2316.5	136.0	2788.0	35.0	717.5	118.0	2419.0	-0.1	-2.1
PLS-89-184-15	36.2	429.0	15529.8	121.0	4380.2	31.0	1122.2	113.0	4090.6	-0.1	-3.6
PLS-89-184-16	32.8	637.0	20893.6	161.0	5280.8	34.0	1115.2	90.0	2952.0	0.3	9.8
PLS-89-184-17	31.3	72.0	2253.6	127.0	3975.1	33.0	1032.9	76.0	2378.8	-0.1	-3.1
PLS-89-184-18	32.9	173.0	5691.7	645.0	21220.5	29.0	954.1	32.0	1052.8	0.1	3.3
PLS-89-185-01	33.3	711.0	23676.3	107.0	3563.1	33.0	1098.9	112.0	3729.6	-0.1	-3.3
PLS-89-185-02	32.1	78.0	2503.8	151.0	4847.1	44.0	1412.4	78.0	2503.8	0.5	16.1
PLS-89-185-03	29.5	113.0	3333.5	137.0	4041.5	27.0	796.5	66.0	1947.0	-0.1	-3.0
PLS-89-185-04	31.5	104.0	3276.0	89.0	2803.5	25.0	787.5	83.0	2614.5	-0.1	-3.2
PLS-89-185-05	29.7	930.0	27621.0	82.0	2435.4	24.0	712.8	62.0	1841.4	-0.1	-3.0
PLS-89-185-06	33.7	54.0	1819.8	74.0	2493.8	29.0	977.3	43.0	1449.1	-0.1	-3.4
PLS-89-185-07	31.4	120.0	3768.0	92.0	2888.8	22.0	690.8	51.0	1601.4	-0.1	-3.1
PLS-89-185-08-3/4H	41.4	20.0	828.0	140.0	5796.0	44.0	1821.6	66.0	2732.4	-0.1	-4.1
PLS-89-185-09-3/4H	47.1	640.0	30144.0	144.0	6782.4	39.0	1836.9	69.0	3249.9	-0.1	-4.7
PLS-89-185-10-3/4H	35.0	221.0	7735.0	138.0	4830.0	45.0	1575.0	91.0	3185.0	-0.1	-3.5
PLS-89-185-11-3/4H	24.1	404.0	9736.4	200.0	4820.0	61.0	1470.1	92.0	2217.2	0.2	4.8
PLS-89-185-12-3/4H	34.6	131.0	4532.6	121.0	4186.6	39.0	1349.4	56.0	1937.6	-0.1	-3.5
PLS-89-185-13-3/4H	24.8	118.0	2926.4	95.0	2356.0	42.0	1041.6	51.0	1264.8	-0.1	-2.5
PLS-89-185-14-3/4H	20.8	284.0	5907.2	123.0	2558.4	42.0	873.6	46.0	956.8	-0.1	-2.1
PLS-89-185-15-3/4H	30.4	141.0	4286.4	123.0	3739.2	39.0	1185.6	75.0	2280.0	-0.1	-3.0
PLS-89-185-16-3/4H	30.5	2084.0	63562.0	135.0	4117.5	44.0	1342.0	75.0	2287.5	0.4	12.2
PLS-89-185-17-3/4H	27.3	298.0	8135.4	92.0	2511.6	38.0	1037.4	44.0	1201.2	-0.1	-2.7
PLS-89-185-18-3/4H	19.1	315.0	6016.5	225.0	4297.5	61.0	1165.1	250.0	4775.0	-0.1	-1.9
PLS-89-185-19-3/4H	24.3	302.0	7338.6	201.0	4884.3	97.0	2357.1	296.0	7192.8	-0.1	-2.4
PLS-89-185-20-3/4H	20.1	225.0	4522.5	240.0	4824.0	128.0	2572.8	352.0	7075.2	-0.1	-2.0
PLS-89-185-21-3/4H	12.7	246.0	3124.2	158.0	2006.6	78.0	990.6	358.0	4546.6	0.1	1.3
PLS-89-185-22-3/4H	15.7	163.0	2559.1	188.0	2951.6	98.0	1538.6	592.0	9294.4	0.2	3.1
PLS-89-185-23-3/4H	21.0	314.0	6594.0	145.0	3045.0	71.0	1491.0	356.0	7476.0	-0.1	-2.1
PLS-89-185-24-3/4H	23.2	122.0	2830.4	127.0	2946.4	61.0	1415.2	230.0	5336.0	-0.1	-2.3
PLS-89-186-01-3/4H	26.5	127.0	3365.5	232.0	6148.0	49.0	1298.5	97.0	2570.5	0.1	2.7
PLS-89-186-02-3/4H	25.3	133.0	3364.9	164.0	4149.2	50.0	1265.0	93.0	2352.9	-0.1	-2.5
PLS-89-186-03-3/4H	18.5	120.0	2220.0	137.0	2534.5	43.0	795.5	88.0	1628.0	-0.1	-1.9
PLS-89-186-04-3/4H	16.2	137.0	2219.4	163.0	2640.6	43.0	696.6	79.0	1279.8	-0.1	-1.6
PLS-89-186-05-3/4H	24.5	129.0	3160.5	112.0	2744.0	88.0	2156.0	85.0	2082.5	-0.1	-2.5
PLS-89-186-06-3/4H	18.4	50.0	920.0	98.0	1803.2	35.0	644.0	54.0	993.6	-0.1	-1.8
PLS-89-186-07-3/4H	33.7	20.0	674.0	91.0	3066.7	32.0	1078.4	21.0	707.7	-0.1	-3.4
PLS-89-187-01-3/4H	40.8	135.0	5508.0	209.0	8527.2	62.0	2529.6	83.0	3386.4	-0.1	-4.1
PLS-89-187-02-3/4H	32.6	248.0	8084.8	205.0	6683.0	52.0	1695.2	70.0	2282.0	-0.1	-3.3
PLS-89-187-03-3/4H	24.4	98.0	2391.2	219.0	5343.6	78.0	1903.2	71.0	1732.4	-0.1	-2.4
PLS-89-187-04-3/4H	25.1	64.0	1606.4	236.0	5923.6	61.0	1531.1	80.0	2008.0	-0.1	-2.5
PLS-89-187-05-3/4H	25.9	208.0	5387.2	152.0	3936.8	56.0	1450.4	42.0	1087.8	-0.1	-2.6
PLS-89-187-06-3/4H	16.0	30.0	480.0	129.0	2064.0	52.0	832.0	50.0	800.0	-0.1	-1.6
PLS-89-187-07-3/4H	23.2	92.0	2134.4	150.0	3480.0	54.0	1252.8	48.0	1113.6	-0.1	-2.3
PLS-89-187-08-3/4H	22.3	150.0	3345.0	169.0	3768.7	265.0	5909.5	51.0	1137.3	-0.1	-2.2
PLS-89-187-09-3/4H	22.6	33.0	745.8	120.0	2712.0	46.0	1039.6	31.0	700.6	-0.1	-2.3
PLS-89-187-10-3/4H	26.7	70.0	1869.0	141.0	3764.7	49.0	1308.3	43.0	1148.1	-0.1	-2.7
PLS-89-187-11-3/4H	26.8	49.0	1313.2	161.0	4314.8	77.0	2063.6	41.0	1098.8	-0.1	-2.7
PLS-89-187-12-3/4H	23.5	28.0	658.0	136.0	3196.0	46.0	1081.0	37.0	869.5	0.1	2.4

OVERBURDEN DRILLING MANAGEMENT LIMITED

Absolute Metal Content of Heavy Mineral Concentrates

SAMPLE NUMBER	WEIGHT (g) NON-MAG	Au ASSAY PPB	ABSOLUTE METAL CONTENT Au (nanograms)	Cu ASSAY PPM	ABSOLUTE METAL CONTENT Cu (micrograms)	Zn ASSAY PPM	ABSOLUTE METAL CONTENT Zn (micrograms)	As ASSAY PPM	ABSOLUTE METAL CONTENT As (micrograms)	Ag ASSAY PPM	ABSOLUTE METAL CONTENT Ag (micrograms)
PLS-89-187-13-3/4H	16.0	73.0	1168.0	170.0	2720.0	95.0	1520.0	220.0	3520.0	-0.1	-1.6
PLS-89-187-14-3/4H	14.5	168.0	2436.0	198.0	2871.0	102.0	1479.0	496.0	7192.0	0.5	7.3
PLS-89-187-15-3/4H	27.7	772.0	21384.4	202.0	5595.4	94.0	2603.8	840.0	23268.0	0.6	16.6
PLS-89-187-16-3/4H	22.8	998.0	22754.4	266.0	6064.8	144.0	3283.2	616.0	14044.8	0.5	11.4
PLS-89-187-17-3/4H	21.2	750.0	15900.0	197.0	4176.4	146.0	3095.2	515.0	10918.0	0.5	10.6
PLS-89-187-18-3/4H	17.1	843.0	14415.3	119.0	2034.9	57.0	974.7	286.0	4890.6	0.2	3.4
PLS-89-187-19-3/4H	24.1	582.0	14026.2	113.0	2723.3	49.0	1180.9	322.0	7760.2	-0.1	-2.4
PLS-89-188-01-3/4H	16.9	-10.0	-169.0	52.0	878.8	38.0	642.2	32.0	540.8	0.1	1.7
PLS-89-188-02-3/4H	34.1	344.0	11730.4	69.0	2352.9	33.0	1125.3	56.0	1909.6	0.1	3.4
PLS-89-188-03-3/4H	26.8	492.0	13185.6	88.0	2358.4	28.0	750.4	62.0	1661.6	8.0	214.4
PLS-89-188-04-3/4H	29.8	96.0	2860.8	74.0	2205.2	27.0	804.6	59.0	1758.2	0.2	6.0
PLS-89-188-05-3/4H	26.2	253.0	6628.6	110.0	2882.0	25.0	655.0	64.0	1676.8	0.3	7.9
PLS-89-188-06-3/4H	24.5	72.0	1764.0	89.0	2180.5	48.0	1176.0	65.0	1592.5	0.3	7.4
PLS-89-188-07-3/4H	33.9	95.0	3220.5	106.0	3593.4	26.0	881.4	43.0	1457.7	0.6	20.3
PLS-89-188-08-3/4H	26.7	109.0	2910.3	120.0	3204.0	31.0	827.7	53.0	1415.1	0.5	13.4
PLS-89-188-09-3/4H	24.6	43.0	1057.8	83.0	2041.8	36.0	885.6	74.0	1820.4	2.9	71.3
PLS-89-188-10-3/4H	27.2	404.0	10988.8	86.0	2339.2	26.0	707.2	86.0	2339.2	0.5	13.6
PLS-89-188-11-3/4H	20.5	109.0	2234.5	52.0	1066.0	22.0	451.0	34.0	697.0	0.2	4.1

OVERBURDEN DRILLING MANAGEMENT LIMITED

Absolute Metal Content of Heavy Mineral Concentrates

SAMPLE NUMBER	WEIGHT (g) NON-MAG	Au ASSAY PPB	ABSOLUTE METAL CONTENT Au (nanograms)	Cu ASSAY PPM	ABSOLUTE METAL CONTENT Cu (micrograms)	Zn ASSAY PPM	ABSOLUTE METAL CONTENT Zn (micrograms)	As ASSAY PPM	ABSOLUTE METAL CONTENT As (micrograms)	Ag ASSAY PPM	ABSOLUTE METAL CONTENT Ag (micrograms)
PLS-89-188-12-3/4H	18.1	60.0	1086.0	108.0	1954.8	35.0	633.5	124.0	2244.4	0.6	10.9
PLS-89-188-13-3/4H	25.4	1004.0	25501.6	282.0	7162.8	74.0	1879.6	130.0	3302.0	0.7	17.8
PLS-89-188-14-3/4H	33.6	363.0	12196.8	200.0	6720.0	66.0	2217.6	672.0	22579.2	1.0	33.6
PLS-89-188-15-3/4H	50.7	4580.0	232206.0	167.0	8466.9	65.0	3295.5	342.0	17339.4	0.8	40.6
PLS-89-188-16-3/4H	22.1	330.0	7293.0	138.0	3049.8	68.0	1502.8	250.0	5525.0	0.6	13.3
PLS-89-188-17-3/4H	26.2	200.0	5240.0	133.0	3484.6	44.0	1152.8	74.0	1938.8	0.3	7.9
PLS-89-188-18-3/4H	33.3	383.0	12753.9	545.0	18148.5	55.0	1831.5	274.0	9124.2	1.0	33.3
PLS-89-188-19-3/4H	38.9	385.0	14976.5	940.0	36566.0	57.0	2217.3	280.0	10892.0	1.1	42.8
PLS-89-190-01-3/4H	22.8	671.0	15298.8	356.0	8116.8	27.0	615.6	85.0	1938.0	0.6	13.7
PLS-89-191-01-3/4H	20.7	1299.0	26889.3	788.0	16311.6	49.0	1014.3	105.0	2173.5	0.9	18.6
PLS-89-192-01-3/4H	33.4	766.0	25584.4	784.0	26185.6	64.0	2137.6	123.0	4108.2	1.3	43.4
PLS-89-193-01-3/4H	9.0	368.0	3312.0	91.0	819.0	27.0	243.0	13.0	117.0	0.4	3.6
PLS-89-193-02-3/4H	23.7	582.0	13793.4	122.0	2891.4	27.0	639.9	16.0	379.2	0.2	4.7
PLS-89-193-03-3/4H	19.2	74.0	1420.8	59.0	1132.8	23.0	441.6	7.0	134.4	0.2	3.8
PLS-89-193-04-3/4H	12.3	806.0	9913.8	66.0	811.8	24.0	295.2	7.0	86.1	-0.1	-1.2
PLS-89-193-05-3/4H	20.1	385.0	7738.5	50.0	1005.0	22.0	442.2	16.0	321.6	0.1	2.0
PLS-89-193-06-3/4H	14.2	323.0	4586.6	112.0	1590.4	36.0	511.2	752.0	10678.4	0.3	4.3
PLS-89-193-07-3/4H	12.7	210.0	2667.0	42.0	533.4	24.0	304.8	68.0	863.6	0.2	2.5
PLS-89-193-08-3/4H	13.6	105.0	1428.0	123.0	1672.8	49.0	666.4	68.0	924.8	0.2	2.7
-89-193-09-3/4H	19.5	538.0	10491.0	220.0	4290.0	54.0	1053.0	192.0	3744.0	0.7	13.7
-89-193-10-3/4H	11.1	180.0	1998.0	403.0	4473.3	32.0	355.2	145.0	1609.5	1.8	20.0
PLS-89-193-11-3/4H	10.4	270.0	2808.0	204.0	2121.6	44.0	457.6	145.0	1508.0	0.9	9.4
PLS-89-193-12-3/4H	7.7	300.0	2310.0	289.0	2225.3	34.0	261.8	90.0	693.0	0.7	5.4
PLS-89-194-01-3/4H	27.0	-5.0	-135.0	48.0	1296.0	21.0	567.0	11.0	297.0	-0.1	-2.7
PLS-89-194-02-3/4H	24.5	-5.0	-122.5	107.0	2621.5	22.0	539.0	6.0	147.0	0.1	2.5
PLS-89-194-03-3/4H	34.7	71.0	2463.7	52.0	1804.4	19.0	659.3	7.0	242.9	0.5	17.4
PLS-89-194-04-3/4H	13.6	25.0	340.0	49.0	666.4	29.0	394.4	5.0	68.0	-0.1	-1.4
PLS-89-194-05-3/4H	11.5	158.0	1817.0	72.0	828.0	38.0	437.0	16.0	184.0	-0.1	-1.2
PLS-89-194-06-3/4H	16.5	116.0	1914.0	254.0	4191.0	45.0	742.5	143.0	2359.5	0.2	3.3
PLS-89-194-07-3/4H	13.5	1160.0	15660.0	350.0	4725.0	26.0	351.0	56.0	756.0	0.5	6.8
PLS-89-195-01-3/4H	22.4	238.0	5331.2	266.0	5958.4	48.0	1075.2	214.0	4793.6	0.4	9.0
PLS-89-195-02-3/4H	34.8	329.0	11449.2	199.0	6925.2	49.0	1705.2	135.0	4698.0	0.5	17.4
PLS-89-195-03-3/4H	22.9	249.0	5702.1	144.0	3297.6	41.0	938.9	95.0	2175.5	0.3	6.9
PLS-89-195-04-3/4H	19.5	270.0	5265.0	272.0	5304.0	70.0	1365.0	123.0	2398.5	-0.1	-2.0
PLS-89-195-05-3/4H	21.1	343.0	7237.3	255.0	5380.5	61.0	1287.1	102.0	2152.2	-0.1	-2.1
PLS-89-195-06-3/4H	24.1	1131.0	27257.1	284.0	6844.4	67.0	1614.7	168.0	4048.8	0.2	4.8
PLS-89-195-07-3/4H	18.5	153.0	2830.5	122.0	2257.0	52.0	962.0	137.0	2534.5	-0.1	-1.9
PLS-89-195-08-3/4H	20.8	218.0	4534.4	148.0	3078.4	55.0	1144.0	179.0	3723.2	0.1	2.1
PLS-89-195-09-3/4H	13.8	125.0	1725.0	124.0	1711.2	42.0	579.6	142.0	1959.6	0.2	2.3
PLS-89-195-10-3/4H	14.7	450.0	6615.0	200.0	2940.0	37.0	543.9	208.0	3057.6	0.7	10.3
PLS-89-195-11-3/4H	10.1	225.0	2272.5	192.0	1939.2	47.0	474.7	129.0	1302.9	0.2	2.0
PLS-89-195-12-3/4H	12.7	110.0	1397.0	250.0	3175.0	30.0	381.0	81.0	1028.7	0.4	5.1
PLS-89-195-13-3/4H	10.6	75.0	795.0	225.0	2385.0	31.0	328.6	78.0	826.8	0.9	9.5
PLS-89-196-01-3/4H	19.6	16.0	313.6	74.0	1450.4	46.0	901.6	12.0	235.2	-0.1	-2.0
-89-196-02-3/4H	11.4	1038.0	11833.2	352.0	4012.8	48.0	547.2	129.0	1470.6	0.3	3.4
-89-197-01-3/4H	17.5	97.0	1697.5	90.0	1575.0	28.0	490.0	43.0	752.5	0.3	5.3
PLS-89-197-02-3/4H	10.9	135.0	1471.5	57.0	621.3	22.0	239.8	170.0	1853.0	0.7	7.6
PLS-89-197-03-3/4H	10.9	263.0	2866.7	65.0	708.5	28.0	305.2	19.0	207.1	0.5	5.5
PLS-89-197-04-3/4H	11.1	24.0	266.4	231.0	2564.1	42.0	466.2	21.0	233.1	0.2	2.2

OVERBURDEN DRILLING MANAGEMENT LIMITED

Absolute Metal Content of Heavy Mineral Concentrates

SAMPLE NUMBER	WEIGHT (g) NON-MAG	Au ASSAY PPB	ABSOLUTE METAL CONTENT Au (nanograms)	Cu ASSAY PPM	ABSOLUTE METAL CONTENT Cu (micrograms)	Zn ASSAY PPM	ABSOLUTE METAL CONTENT Zn (micrograms)	As ASSAY PPM	ABSOLUTE METAL CONTENT As (micrograms)	Ag ASSAY PPM	ABSOLUTE METAL CONTENT Ag (micrograms)
PLS-89-197-05-3/4H	9.1	120.0	1092.0	359.0	3266.9	42.0	382.2	50.0	455.0	0.5	4.6
PLS-89-197-06-3/4H	15.6	5650.0	88140.0	193.0	3010.8	34.0	530.4	99.0	1544.4	0.9	14.0
PLS-89-198-01-3/4H	17.7	43.0	761.1	161.0	2849.7	28.0	495.6	100.0	1770.0	0.3	5.3
PLS-89-198-02-3/4H	23.8	71.0	1689.8	52.0	1237.6	24.0	571.2	8.0	190.4	-0.1	-2.4
PLS-89-198-03-3/4H	21.7	238.0	5164.6	169.0	3667.3	75.0	1627.5	126.0	2734.2	0.5	10.9
PLS-89-198-04-3/4H	26.4	160.0	4224.0	241.0	6362.4	72.0	1900.8	117.0	3088.8	0.4	10.6
PLS-89-199-01-3/4H	43.2	78.0	3369.6	51.0	2203.2	21.0	907.2	15.0	648.0	0.1	4.3
PLS-89-199-02-3/4H	32.4	500.0	16200.0	112.0	3628.8	31.0	1004.4	158.0	5119.2	0.3	9.7
PLS-89-199-03-3/4H	15.1	223.0	3367.3	147.0	2219.7	39.0	588.9	114.0	1721.4	-0.1	-1.5
PLS-89-200-01-3/4H	30.8	235.0	7238.0	202.0	6221.6	33.0	1016.4	142.0	4373.6	0.6	18.5
PLS-89-200-02-3/4H	32.6	80.0	2608.0	85.0	2771.0	33.0	1075.8	82.0	2673.2	-0.1	-3.3
PLS-89-200-03-3/4H	30.6	307.0	9394.2	107.0	3274.2	23.0	703.8	134.0	4100.4	0.4	12.2
PLS-89-200-04-3/4H	21.3	158.0	3365.4	266.0	5665.8	48.0	1022.4	160.0	3408.0	0.6	12.8
PLS-89-201-01-3/4H	28.4	311.0	8832.4	78.0	2215.2	25.0	710.0	25.0	710.0	-0.1	-2.8
PLS-89-202-01-3/4H	30.9	159.0	4913.1	38.0	1174.2	16.0	494.4	3.0	92.7	0.1	3.1
PLS-89-202-02-3/4H	25.1	36.0	903.6	35.0	878.5	21.0	527.1	3.0	75.3	-0.1	-2.5
PLS-89-202-03-3/4H	34.7	87.0	3018.9	74.0	2567.8	21.0	728.7	17.0	589.9	-0.1	-3.5
PLS-89-203-01-3/4H	40.4	-5.0	-202.0	24.0	969.6	17.0	686.8	4.0	161.6	0.3	12.1
PLS-89-203-02-3/4H	23.0	32.0	736.0	167.0	3841.0	26.0	598.0	9.0	207.0	0.2	4.6
-89-204-01-3/4H	19.1	-5.0	-95.5	38.0	725.8	21.0	401.1	3.0	57.3	0.2	3.8
-89-205-01-3/4H	40.1	68.0	2726.8	85.0	3408.5	18.0	721.8	6.0	240.6	0.4	16.0
PLS-89-206-01-3/4H	21.6	297.0	6415.2	32.0	691.2	23.0	496.8	3.0	64.8	0.6	13.0
PLS-89-206-02-3/4H	12.6	140.0	1764.0	66.0	831.6	22.0	277.2	7.0	88.2	-0.1	-1.3
PLS-89-207-01-3/4H	31.0	207.0	6417.0	54.0	1674.0	18.0	558.0	3.0	93.0	-0.1	-3.1
PLS-89-207-02-3/4H	34.0	258.0	8772.0	257.0	8738.0	25.0	850.0	21.0	714.0	0.2	6.8
PLS-89-207-03-3/4H	30.3	413.0	12513.9	88.0	2666.4	25.0	757.5	22.0	666.6	0.1	3.0
PLS-89-207-04-3/4H	32.1	24.0	770.4	176.0	5649.6	26.0	834.6	19.0	609.9	0.1	3.2
PLS-89-207-05-3/4H	27.4	28.0	767.2	310.0	8494.0	25.0	685.0	24.0	657.6	-0.1	-2.7
PLS-89-207-06-3/4H	32.7	112.0	3662.4	116.0	3793.2	29.0	948.3	17.0	555.9	0.6	19.6
PLS-89-207-07-3/4H	35.7	153.0	5462.1	97.0	3462.9	32.0	1142.4	22.0	785.4	-0.1	-3.6
PLS-89-207-08-3/4H	37.8	313.0	11831.4	174.0	6577.2	41.0	1549.8	107.0	4044.6	0.5	18.9
PLS-89-207-09-3/4H	21.7	985.0	21374.5	127.0	2755.9	79.0	1714.3	101.0	2191.7	0.1	2.2
PLS-89-207-10-3/4H	20.6	775.0	15965.0	132.0	2719.2	95.0	1957.0	112.0	2307.2	0.3	6.2
PLS-89-208-01-3/4H	25.8	73.0	1883.4	153.0	3947.4	39.0	1006.2	73.0	1883.4	0.2	5.2
PLS-89-208-02-3/4H	17.8	34.0	605.2	172.0	3061.6	36.0	640.8	44.0	783.2	0.4	7.1
PLS-89-208-03-3/4H	26.6	24.0	638.4	143.0	3803.8	37.0	984.2	31.0	824.6	0.7	18.6
PLS-89-208-04-3/4H	32.0	54.0	1728.0	95.0	3040.0	23.0	736.0	17.0	544.0	1.1	35.2
PLS-89-208-05-3/4H	30.2	42.0	1268.4	167.0	5043.4	31.0	936.2	29.0	875.8	-0.1	-3.0
PLS-89-208-06-3/4H	31.9	74.0	2360.6	282.0	8995.8	30.0	957.0	32.0	1020.8	-0.1	-3.2
PLS-89-208-07-3/4H	13.3	1420.0	18886.0	111.0	1476.3	33.0	438.9	16.0	212.8	0.1	1.3
PLS-89-208-08-3/4H	30.0	16.0	480.0	142.0	4260.0	37.0	1110.0	32.0	960.0	-0.1	-3.0
PLS-89-208-09-3/4H	21.3	641.0	13653.3	86.0	1831.8	28.0	596.4	11.0	234.3	0.2	4.3
PLS-89-208-10-3/4H	30.2	68.0	2053.6	235.0	7097.0	59.0	1781.8	160.0	4832.0	0.6	18.1
PLS-89-209-01-3/4H	37.5	73.0	2737.5	158.0	5925.0	38.0	1425.0	30.0	1125.0	-0.1	-3.8
-89-209-02-3/4H	33.1	128.0	4236.8	143.0	4733.3	33.0	1092.3	49.0	1621.9	0.1	3.3
-89-209-03-3/4H	28.9	42.0	1213.8	115.0	3323.5	33.0	953.7	54.0	1560.6	0.1	2.9
PLS-89-209-04-3/4H	27.5	32.0	880.0	134.0	3685.0	43.0	1182.5	27.0	742.5	-0.1	-2.8
PLS-89-209-05-3/4H	28.5	30.0	855.0	120.0	3420.0	48.0	1368.0	27.0	769.5	0.3	8.6
PLS-89-209-06-3/4H	24.2	1288.0	31169.6	149.0	3605.8	41.0	992.2	53.0	1282.6	0.1	2.4

OVERBURDEN DRILLING MANAGEMENT LIMITED

Absolute Metal Content of Heavy Mineral Concentrates

SAMPLE NUMBER	WEIGHT (g) NON-MAG	Au ASSAY PPB	ABSOLUTE METAL CONTENT Au (nanograms)	Cu ASSAY PPM	ABSOLUTE METAL CONTENT Cu (micrograms)	Zn ASSAY PPM	ABSOLUTE METAL CONTENT Zn (micrograms)	As ASSAY PPM	ABSOLUTE METAL CONTENT As (micrograms)	Ag ASSAY PPM	ABSOLUTE METAL CONTENT Ag (micrograms)
PLS-89-209-07-3/4H	29.8	51.0	1519.8	129.0	3844.2	38.0	1132.4	26.0	774.8	0.3	8.9
PLS-89-209-08-3/4H	23.8	42.0	999.6	128.0	3046.4	33.0	785.4	32.0	761.6	0.2	4.8
PLS-89-209-09-3/4H	22.6	423.0	9559.8	219.0	4949.4	36.0	813.6	34.0	768.4	-0.1	-2.3
PLS-89-209-10-3/4H	24.8	388.0	9622.4	124.0	3075.2	31.0	768.8	20.0	496.0	0.2	5.0
PLS-89-209-11-3/4H	24.0	115.0	2760.0	81.0	1944.0	35.0	840.0	15.0	360.0	0.3	7.2
PLS-89-209-12-3/4H	44.3	89.0	3942.7	250.0	11075.0	112.0	4961.6	288.0	12758.4	0.8	35.4
PLS-89-210-01-3/4H	27.7	79.0	2188.3	149.0	4127.3	35.0	969.5	53.0	1468.1	0.3	8.3
PLS-89-210-02-3/4H	29.2	533.0	15563.6	182.0	5314.4	36.0	1051.2	43.0	1255.6	-0.1	-2.9
PLS-89-210-03-3/4H	23.4	83.0	1942.2	185.0	4329.0	37.0	865.8	87.0	2035.8	0.2	4.7
PLS-89-210-04-3/4H	12.4	158.0	1959.2	151.0	1872.4	45.0	558.0	65.0	806.0	-0.1	-1.2
PLS-89-210-05-3/4H	19.3	189.0	3647.7	134.0	2586.2	38.0	733.4	59.0	1138.7	-0.1	-1.9
PLS-89-210-06-3/4H	13.5	384.0	5184.0	101.0	1363.5	44.0	594.0	34.0	459.0	0.1	1.4
PLS-89-210-07-3/4H	14.3	230.0	3289.0	126.0	1801.8	37.0	529.1	61.0	872.3	0.4	5.7
PLS-89-210-08-3/4H	23.0	111.0	2553.0	140.0	3220.0	44.0	1012.0	44.0	1012.0	-0.1	-2.3
PLS-89-210-09-3/4H	22.5	148.0	3330.0	147.0	3307.5	43.0	967.5	50.0	1125.0	-0.1	-2.3
PLS-89-210-10-3/4H	20.5	414.0	8487.0	120.0	2460.0	36.0	738.0	60.0	1230.0	-0.1	-2.1
PLS-89-210-11-3/4H	29.0	71.0	2059.0	173.0	5017.0	41.0	1189.0	34.0	986.0	0.1	2.9
PLS-89-210-12-3/4H	55.7	295.0	16431.5	198.0	11028.6	316.0	17601.2	164.0	9134.8	0.9	50.1
PLS-89-210-13-3/4H	67.7	605.0	40958.5	180.0	12186.0	197.0	13336.9	258.0	17466.6	1.2	81.2
PLS-89-211-01-3/4H	26.3	616.0	16200.8	292.0	7679.6	40.0	1052.0	63.0	1656.9	0.3	7.9
PLS-89-211-02-3/4H	22.2	230.0	5106.0	208.0	4617.6	52.0	1154.4	240.0	5328.0	1.1	24.4
PLS-89-211-03-3/4H	17.3	349.0	6037.7	155.0	2681.5	51.0	882.3	45.0	778.5	0.2	3.5
PLS-89-211-04-3/4H	39.4	562.0	22142.8	165.0	6501.0	78.0	3073.2	177.0	6973.8	0.6	23.6
PLS-89-212-01-3/4H	16.9	334.0	5644.6	20.0	338.0	23.0	388.7	5.0	84.5	-0.1	-1.7
PLS-89-212-02-3/4H	20.3	21.0	426.3	27.0	548.1	21.0	426.3	4.0	81.2	0.5	10.2
PLS-89-212-03-3/4H	19.2	-6.0	-115.2	38.0	729.6	19.0	364.8	2.0	38.4	-0.1	-1.9
PLS-89-212-04-3/4H	15.4	-7.0	-107.8	64.0	985.6	24.0	369.6	4.0	61.6	-0.1	-1.5
PLS-89-212-05-3/4H	10.1	-17.0	-171.7	101.0	1020.1	37.0	373.7	17.0	171.7	0.2	2.0
PLS-89-212-06-3/4H	18.5	100.0	1850.0	326.0	6031.0	38.0	703.0	67.0	1239.5	0.2	3.7
PLS-89-212-07-3/4H	29.4	43.0	1264.2	297.0	8731.8	52.0	1528.8	66.0	1940.4	-0.1	-2.9
PLS-89-212-08-3/4H	32.3	58.0	1873.4	635.0	20510.5	36.0	1162.8	44.0	1421.2	0.1	3.2
PLS-89-212-09-3/4H	29.0	306.0	8874.0	200.0	5800.0	34.0	986.0	47.0	1363.0	0.1	2.9
PLS-89-212-10-3/4H	24.2	32.0	774.4	242.0	5856.4	60.0	1452.0	33.0	798.6	-0.1	-2.4
PLS-89-212-11-3/4H	24.2	23.0	556.6	183.0	4428.6	41.0	992.2	37.0	895.4	-0.1	-2.4
PLS-89-213-01-3/4H	18.1	-6.0	-108.6	25.0	452.5	20.0	362.0	-2.0	-36.2	-0.1	-1.8
PLS-89-213-02-3/4H	25.7	28.0	719.6	23.0	591.1	17.0	436.9	3.0	77.1	-0.1	-2.6
PLS-89-213-03-3/4H	20.4	51.0	1040.4	761.0	15524.4	33.0	673.2	59.0	1203.6	-0.1	-2.0
PLS-89-214-01-3/4H	30.2	25.0	755.0	92.0	2778.4	28.0	845.6	19.0	573.8	0.3	9.1
PLS-89-214-02-3/4H	17.4	49.0	852.6	176.0	3062.4	36.0	626.4	36.0	626.4	-0.1	-1.7
PLS-89-214-03-3/4H	24.5	16.0	392.0	136.0	3332.0	36.0	882.0	34.0	833.0	7.0	171.5
PLS-89-214-04-3/4H	23.9	99.0	2366.1	132.0	3154.8	32.0	764.8	33.0	788.7	-0.1	-2.4
PLS-89-214-05-3/4H	23.1	45.0	1039.5	311.0	7184.1	33.0	762.3	32.0	739.2	-0.1	-2.3
PLS-89-214-06-3/4H	18.5	165.0	3052.5	173.0	3200.5	35.0	647.5	52.0	962.0	0.3	5.6
PLS-89-214-07-3/4H	19.1	150.0	2865.0	91.0	1738.1	24.0	458.4	34.0	649.4	0.2	3.8
PLS-89-214-08-3/4H	24.4	332.0	8100.8	136.0	3318.4	52.0	1268.8	94.0	2293.6	0.5	12.2
PLS-89-215-01-3/4H	24.9	81.0	2016.9	144.0	3585.6	29.0	722.1	32.0	796.8	0.1	2.5
PLS-89-215-02-3/4H	22.8	130.0	2964.0	84.0	1915.2	23.0	524.4	16.0	364.8	0.1	2.3
PLS-89-215-03-3/4H	28.9	461.0	13322.9	72.0	2080.8	21.0	606.9	20.0	578.0	0.1	2.9
PLS-89-215-04-3/4H	22.0	-5.0	-110.0	82.0	1804.0	28.0	616.0	19.0	418.0	0.5	11.0

OVERBURDEN DRILLING MANAGEMENT LIMITED

Absolute Metal Content of Heavy Mineral Concentrates

SAMPLE NUMBER	WEIGHT (g) NON-MAG	Au ASSAY PPB	ABSOLUTE METAL CONTENT Au (nanograms)	Cu ASSAY PPM	ABSOLUTE METAL CONTENT Cu (micrograms)	Zn ASSAY PPM	ABSOLUTE METAL CONTENT Zn (micrograms)	As ASSAY PPM	ABSOLUTE METAL CONTENT As (micrograms)	Ag ASSAY PPM	ABSOLUTE METAL CONTENT Ag (micrograms)
PLS-89-215-05-3/4H	121.6	30.0	3648.0	129.0	15686.4	36.0	4377.6	23.0	2796.8	0.5	60.8
PLS-89-215-06-3/4H	37.8	79.0	2986.2	196.0	7408.8	36.0	1360.8	37.0	1398.6	0.3	11.3
PLS-89-215-07-3/4H	51.7	119.0	6152.3	281.0	14527.7	188.0	9719.6	338.0	17474.6	1.5	77.6
PLS-89-216-01-3/4H	35.9	66.0	2369.4	115.0	4128.5	36.0	1292.4	21.0	753.9	0.7	25.1
PLS-89-216-02-3/4H	25.2	46.0	1159.2	104.0	2620.8	36.0	907.2	30.0	756.0	2.7	68.0
PLS-89-216-03-3/4H	16.4	69.0	1131.6	167.0	2738.8	52.0	852.8	22.0	360.8	0.5	8.2
PLS-89-216-04-3/4H	16.1	-7.0	-112.7	110.0	1771.0	36.0	579.6	18.0	289.8	0.2	3.2
PLS-89-216-05-3/4H	16.2	43.0	696.6	99.0	1603.8	36.0	583.2	16.0	259.2	0.6	9.7
PLS-89-216-06-3/4H	20.8	99.0	2059.2	137.0	2849.6	57.0	1185.6	28.0	582.4	0.5	10.4
PLS-89-216-07-3/4H	24.1	25.0	602.5	412.0	9929.2	64.0	1542.4	32.0	771.2	0.8	19.3
PLS-89-216-08-3/4H	26.7	99.0	2643.3	89.0	2376.3	35.0	934.5	38.0	1014.6	0.5	13.4
PLS-89-216-09-3/4H	19.8	84.0	1663.2	167.0	3306.6	53.0	1049.4	30.0	594.0	0.6	11.9
PLS-89-216-10-3/4H	19.4	837.0	16237.8	112.0	2172.8	45.0	873.0	32.0	620.8	0.6	11.6
PLS-89-216-11-3/4H	26.0	346.0	8996.0	103.0	2678.0	47.0	1222.0	22.0	572.0	0.4	10.4
PLS-89-216-12-3/4H	18.6	195.0	3627.0	160.0	2976.0	42.0	781.2	22.0	409.2	0.6	11.2
PLS-89-216-13-3/4H	33.7	96.0	3235.2	298.0	10042.6	191.0	6436.7	302.0	10177.4	1.6	53.9
PLS-89-217-01-3/4H	23.1	25.0	577.5	156.0	3603.6	44.0	1016.4	39.0	900.9	0.4	9.2
PLS-89-217-02-3/4H	10.2	60.0	612.0	332.0	3386.4	56.0	571.2	66.0	673.2	0.4	4.1
PLS-89-217-03-3/4H	29.2	1270.0	37084.0	169.0	4934.8	41.0	1197.2	21.0	613.2	-0.1	-2.9
-89-217-04-3/4H	22.2	888.0	19713.6	95.0	2109.0	38.0	843.6	20.0	444.0	-0.1	-2.2
-89-217-05-3/4H	25.2	32.0	806.4	126.0	3175.2	62.0	1562.4	24.0	604.8	-0.1	-2.5
PLS-89-217-06-3/4H	22.0	122.0	2684.0	233.0	5126.0	59.0	1298.0	308.0	6776.0	0.7	15.4
PLS-89-217-07-3/4H	19.6	300.0	5880.0	328.0	6428.8	491.0	9623.6	300.0	5880.0	1.1	21.6
PLS-89-218-01-3/4H	31.1	25.0	777.5	129.0	4011.9	46.0	1430.6	47.0	1461.7	0.3	9.3
PLS-89-218-02-3/4H	30.1	165.0	4966.5	89.0	2678.9	35.0	1053.5	58.0	1745.8	0.1	3.0
PLS-89-218-03-3/4H	27.1	77.0	2086.7	121.0	3279.1	32.0	867.2	27.0	731.7	-0.1	-2.7
PLS-89-218-04-3/4H	30.4	69.0	2097.6	232.0	7052.8	45.0	1368.0	65.0	1976.0	0.1	3.0
PLS-89-220-01-3/4H	26.4	18.0	475.2	60.0	1584.0	44.0	1161.6	5.0	132.0	0.5	13.2
PLS-89-221-01-3/4H	27.3	144.0	3931.2	125.0	3412.5	39.0	1064.7	29.0	791.7	0.2	5.5
PLS-89-221-02-3/4H	15.1	225.0	3397.5	71.0	1072.1	39.0	588.9	17.0	256.7	0.5	7.6
PLS-89-221-03-3/4H	23.1	297.0	6860.7	54.0	1247.4	27.0	623.7	27.0	623.7	-0.1	-2.3
PLS-89-221-04-3/4H	15.5	47.0	728.5	115.0	1782.5	33.0	511.5	19.0	294.5	0.1	1.6
PLS-89-221-05-3/4H	16.0	3200.0	51200.0	36.0	576.0	0.4	6.4	0.3	4.2	39.0	624.0
PLS-89-221-06-3/4H	22.8	58.0	1322.4	129.0	2941.2	37.0	843.6	50.0	1140.0	0.3	6.8
PLS-89-221-07-3/4H	22.9	57.0	1305.3	123.0	2816.7	40.0	916.0	32.0	732.8	-0.1	-2.3
PLS-89-221-08-3/4H	20.4	1350.0	27540.0	121.0	2468.4	48.0	979.2	31.0	632.4	-0.1	-2.0
PLS-89-222-01-3/4H	25.0	875.0	21875.0	40.0	1000.0	29.0	725.0	2.0	50.0	0.7	17.5
PLS-89-223-01-3/4H	21.9	256.0	5606.4	165.0	3613.5	40.0	876.0	41.0	897.9	-0.1	-2.2
PLS-89-223-02-3/4H	20.0	198.0	3960.0	147.0	2940.0	72.0	1440.0	35.0	700.0	-0.1	-2.0
PLS-89-223-03-3/4H	6.2	-25.0	-155.0	191.0	1184.2	49.0	303.8	35.0	217.0	0.1	0.6
PLS-89-225-01-3/4H	19.0	243.0	4617.0	167.0	3173.0	42.0	798.0	44.0	836.0	0.3	5.7
PLS-89-225-02-3/4H	13.3	48.0	638.4	153.0	2034.9	37.0	492.1	47.0	625.1	0.2	2.7
PLS-89-225-03-3/4H	12.2	-13.0	-158.6	114.0	1390.8	48.0	585.6	12.0	146.4	-0.1	-1.2
PLS-89-225-04-3/4H	19.5	123.0	2398.5	65.0	1267.5	27.0	526.5	3.0	58.5	-0.1	-2.0
-89-225-05-3/4H	13.6	-10.0	-136.0	96.0	1305.6	37.0	503.2	11.0	149.6	-0.1	-1.4
-89-226-01-3/4H	18.7	71.0	1327.7	163.0	3048.1	39.0	729.3	51.0	953.7	0.3	5.6
PLS-89-227-01-3/4H	15.6	115.0	1794.0	233.0	3634.8	52.0	811.2	37.0	577.2	1.6	25.0
PLS-89-228-01-3/4H	16.6	381.0	6324.6	39.0	647.4	25.0	415.0	9.0	149.4	0.1	1.7
PLS-89-228-02-3/4H	13.8	708.0	9770.4	38.0	524.4	29.0	400.2	5.0	69.0	-0.1	-1.4

OVERBURDEN DRILLING MANAGEMENT LIMITED

Absolute Metal Content of Heavy Mineral Concentrates

SAMPLE NUMBER	WEIGHT (g) NON-MAG	Au ASSAY PPB	ABSOLUTE METAL CONTENT Au (nanograms)	Cu ASSAY PPM	ABSOLUTE METAL CONTENT Cu (micrograms)	Zn ASSAY PPM	ABSOLUTE METAL CONTENT Zn (micrograms)	As ASSAY PPM	ABSOLUTE METAL CONTENT As (micrograms)	Ag ASSAY PPM	ABSOLUTE METAL CONTENT Ag (micrograms)
PLS-89-229-01-3/4H	9.9	-17.0	-168.3	76.0	752.4	21.0	207.9	4.0	39.6	0.1	1.0
PLS-89-229-02-3/4H	8.3	210.0	1743.0	56.0	464.8	26.0	215.8	6.0	49.8	-0.1	-0.8
PLS-89-229-03-3/4H	17.0	293.0	4981.0	26.0	442.0	22.0	374.0	2.0	34.0	0.2	3.4
PLS-89-229-04-3/4H	14.8	-8.0	-118.4	43.0	636.4	24.0	355.2	4.0	59.2	0.1	1.5
PLS-89-229-05-3/4H	23.1	225.0	5197.5	91.0	2102.1	27.0	623.7	36.0	831.6	-0.1	-2.3
PLS-89-229-06-3/4H	19.4	147.0	2851.8	166.0	3220.4	42.0	814.8	22.0	426.8	-0.1	-1.9
PLS-89-229-07-3/4H	23.5	5289.0	124291.5	195.0	4582.5	43.0	1010.5	34.0	799.0	0.5	11.8
PLS-89-229A-01-3/4	20.5	39.0	799.5	94.0	1927.0	23.0	471.5	4.0	82.0	-0.1	-2.1
PLS-89-229A-02-3/4	11.9	383.0	4557.7	65.0	773.5	31.0	368.9	8.0	95.2	0.3	3.6
PLS-89-229A-03-3/4	10.5	120.0	1260.0	218.0	2289.0	42.0	441.0	26.0	273.0	0.2	2.1
PLS-89-229A-04-3/4	21.1	44.0	928.4	159.0	3354.9	49.0	1033.9	28.0	590.8	0.5	10.6
PLS-89-229A-05-3/4	19.7	90.0	1773.0	189.0	3723.3	38.0	748.6	25.0	492.5	0.1	2.0
PLS-89-229A-06-3/4	17.4	1050.0	18270.0	100.0	1740.0	34.0	591.6	10.0	174.0	-0.1	-1.7
PLS-89-230-01-3/4H	30.1	259.0	7795.9	72.0	2167.2	25.0	752.5	17.0	511.7	-0.1	-3.0
PLS-89-230-02-3/4H	28.2	38.0	1071.6	57.0	1607.4	25.0	705.0	8.0	225.6	-0.1	-2.8
PLS-89-230-03-3/4H	30.1	27.0	812.7	204.0	6140.4	160.0	4816.0	18.0	541.8	-0.1	-3.0
PLS-89-230-04-3/4H	27.2	260.0	7072.0	430.0	11696.0	26.0	707.2	20.0	544.0	0.1	2.7
PLS-89-230-05-3/4H	35.3	28.0	988.4	176.0	6212.8	20.0	706.0	14.0	494.2	0.2	7.1
PLS-89-231-01-3/4H	27.4	102.0	2794.8	207.0	5671.8	41.0	1123.4	54.0	1479.6	0.6	16.4
PLS-89-232-01-3/4H	26.1	30.0	783.0	136.0	3549.6	37.0	965.7	35.0	913.5	0.2	5.2
PLS-89-232-02-3/4H	27.0	92.0	2484.0	168.0	4536.0	56.0	1512.0	30.0	810.0	0.2	5.4
PLS-89-232-03-3/4H	23.9	430.0	10277.0	182.0	4349.8	41.0	979.9	40.0	956.0	0.3	7.2
PLS-89-232-04-3/4H	35.1	181.0	6353.1	196.0	6879.6	48.0	1684.8	64.0	2246.4	0.2	7.0
PLS-89-232-05-3/4H	11.8	400.0	4720.0	85.0	1003.0	32.0	377.6	37.0	436.6	0.3	3.5
PLS-89-233-01-3/4H	16.8	30.0	504.0	154.0	2587.2	52.0	873.6	32.0	537.6	0.2	3.4
PLS-89-233-02-3/4H	12.0	113.0	1356.0	97.0	1164.0	35.0	420.0	21.0	252.0	-0.1	-1.2
PLS-89-234-01-3/4H	17.3	383.0	6625.9	47.0	813.1	37.0	640.1	4.0	69.2	-0.1	-1.7

APPENDIX F

ONE-QUARTER CONCENTRATE EXAMINATIONS, PANNINGS AND INA ANALYSES

GOLD CLASSIFICATION
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VISIBLE GOLD FROM SHAKING TABLE AND PANNING

KEVIN.WR1
TOTAL # OF PANNINGS

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS: ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
151-06	Y	25 X 50	8 C						1	1			EST. 0.25% PYRITE
		50 X 50	10 C				1			1			
										2	5.0	55	
167-03	Y	25 X 50	8 C		1					1			EST. 2% PYRITE
		50 X 75	13 C		1					1			
		50 X 125	18 C		1					1			
										3	5.5	267	
168-01	Y	50 X 50	10 C		1					1			EST. 2% PYRITE
		50 X 75	13 C		1					1			
										2	7.1	80	
168-07	Y	NO VISIBLE GOLD											EST. 5% PYRITE
169-03	Y	NO VISIBLE GOLD											EST. 7% PYRITE
170-01	Y	50 X 75	13 C		1					1			EST. 50% PYRITE
										1	3.3	113	
171-02	Y	25 X 25	5 C						1	1			EST. 5% PYRITE
		25 X 50	8 C		1					1			
		50 X 50	10 C		1		1			2			
		50 X 75	13 C		1				1	2			
		50 X 100	15 C						1	1			
										7	10.0	188	
171-03	Y	125 X 200	31 C				1			1			EST. 5% PYRITE
										1	5.0	1247	
171-04	Y	25 X 25	5 C						1	1			EST. 20% PYRITE
		25 X 50	8 C		1		1			2			100 GRAIN GALENA
		50 X 50	10 C						1	1			V.G. IS DELICATE CRYSTALLINE
		50 X 75	13 C						1	1			MAKING PANNING RECOVERY VERY
		50 X 100	15 C						1	1			INEFFICIENT.
		50 X 125	18 C				1			1			
		75 X 75	15 C						2	2			
		75 X 100	18 C						1	1			
		100 X 100	20 C						1	1			
		100 X 125	22 C						1	1			

GOLD CLASSIFICATION
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VISIBLE GOLD FROM SHAKING TABLE AND PANNING

KEVIN.WR1
TOTAL # OF PANNINGS

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
										12	8.4	990	
171-05	Y	25 X 50	8 C				1			1			EST. 30% PYRITE
		50 X 50	10 C		1					1			
		50 X 75	13 C		1		2		1	4			
		50 X 100	15 C				1		1	2			
		75 X 100	18 C		3		1		1	5			
		75 X 125	20 C		2					2			
		75 X 250	31 C						1	1			
		100 X 100	20 C		1		1			2			
										18	8.3	2450	
180-04	Y	NO VISIBLE GOLD											EST. 0.25% PYRITE
182-05	Y	NO VISIBLE GOLD											EST. 3% PYRITE
183-05	Y	25 X 50	8 C		1					1			EST. 2% PYRITE
		25 X 75	10 C		1					1			500 GRAINS MARCASITE
		50 X 50	10 C				1		1	2			
		50 X 75	13 C				1		1	2			
										6	7.9	178	
185-16	Y	50 X 50	10 C		1					1			EST. 7% PYRITE
										1	7.7	25	
188-13	Y	25 X 50	8 C				1			1			EST. 30% PYRITE
		50 X 75	13 C		1					1			
										2	6.4	71	
188-15	Y	NO VISIBLE GOLD											EST. 10% PYRITE
191-01	Y	50 X 50	10 C		1					1			EST. 15% PYRITE
		75 X 125	20 C		1					1			
										2	5.1	332	
196-02	Y	50 X 50	10 C				1			1			EST. 5% PYRITE
													10 GRAINS ARSENOPYRITE
										1	2.7	71	
221-08	Y	NO VISIBLE GOLD											EST. 3% PYRITE
229-07	Y	NO VISIBLE GOLD											EST. 7% PYRITE

GOLD CLASSIFICATION
===================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

KEVIN.WR1
TOTAL # OF PANNINGS

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
PLS-89													
229A-06	Y	NO VISIBLE GOLD											20 GRAINS FINE ARSENOPYRITE EST. 2% PYRITE

(NUMBER OF GRAINS: ABRADED, IRREGULAR, DELICATE, TOTAL)

Bondar-Clegg & Company Ltd.
5420 Canotek Road
Ottawa, Ontario
K1J 8X5
(613) 749-2220 Telex 053-3233

BONDAR-CLEGG

Geochemical Lab Report

REPORT: 089-51329.0

PROJECT: NONE

SAMPLE NUMBER	ELEMENT UNITS	Au PPB	WT g
PLS-89-151-06-1/4H		504	4.99
PLS-89-167-03-1/4H		839	5.46
PLS-89-168-01-1/4H		260	7.01
PLS-89-168-07-1/4H		78	4.76
PLS-89-169-03-1/4H		714	6.01
PLS-89-169-09-1/4H		480	5.52
PLS-89-170-01-1/4H		9030	3.18
PLS-89-171-02-1/4H		1030	9.89
PLS-89-171-03-1/4H		2770	4.76
PLS-89-171-04-1/4H		5230	8.18
PLS-89-171-05-1/4H		15300	8.17
PLS-89-180-04-1/4H		<16	2.73
PLS-89-182-05-1/4H		47	6.06
PLS-89-183-05-1/4H		1200	7.87
PLS-89-185-16-1/4H		1020	7.70
PLS-89-188-13-1/4H		641	6.41
PLS-89-188-15-1/4H		490	13.24
PLS-89-191-01-1/4H		1060	5.31
PLS-89-196-02-1/4H		539	2.65
PLS-89-221-08-1/4H		40	5.44
PLS-89-229-07-1/4H		29	5.22
PLS-89-229A-06-1/4H		<5	4.07

1/4 Concentrate Examinations for Arsenic, Copper and Silver Anomalies

Sample No.	Anomaly (in ppm)	Observations
170-01	Ag=4.2	No silver minerals 65 to 70% pyrite 10% sphene trace galena
171-04	Ag=7.4	No silver minerals 20% pyrite Abundant sphene 0.1% galena
-05	Ag=7.1	No silver minerals 40% pyrite Abundant sphene 0.1% galena Trace of apple green, soft mineral in syenite lithic grains (lead sulphate?)
187-15	As=840	0.5% arsenopyrite in table conc. 20% pyrite in table conc.
188-03	Ag=8.0	No silver minerals 5% pyrite
-19	Cu=940	No chalcopyrite No brass contamination 50% pyrite (200 grains arsenopyrite in table conc; 3/4 As assay = 280 ppm)
214-03	Ag=7.0	No silver minerals 5% pyrite

APPENDIX G

BINOCULAR LOGS - BEDROCK CHIP SAMPLES

Re-logs of 1988 holes

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-88 117-09	Variable dark green to pink to red-brown	Chilled. 60% shear foliated, 40% shear mylonitized causing fragmentation + destruction of phenos (May simply mylonitize an original contact gneiss banding)	Where not mylonitized feld. phenos = 0.5-1.5 Groundmass aphanitic to 0.1	Strongly porphyritic with aphanitic to equigranular groundmass	30-40% white to rarely pink-stained feld. phenos. Groundmass (60%) = 30% chl. from hb. 60-70% plag <10% qtz.	7% fracture + schistosity calcite	Mylonite hosts trace cubic py.	Mylonite averages 1% finely dissem. spec. hem. (causes preferential rusting)	DIORITE
115-02	(a) 60% sample - dark green (b) 40% sample dark brown	Hybrid apparently consisting of (a) being digested in (b) (a) is a well foliated amphibolite (b) is massive but contacts are diffuse. No shear def'n.	(a) 0.1-0.2 locally with 5% feld. phenos to 1.0 (b) Feld. phenos 0.2-1.0 Groundmass aphanitic-0.05	(a) sugary to lineated locally feldspar metaporphyritic (b) porphyritic with aphanitic to sugary groundmass; chilled	(a) 60% hb/actinolite (locally chl.) 40% plag (locally 5% as phenos). (b) 30% feld phenos (locally only 5%). 70% gmass = 70% plag, 30% amph. (or chl), <10% quartz	Nil. Reflects amphibolite grade metamorphism	<0.1% py. conc. in porphyritic contacts	Nil	(a) BASALT (xenoliths - 60%) (b) DIORITE (40%)
119-04	90% dark gn. flecked white + black 10% pink bands	Gneiss-banded; bands coarser than chip scale Also well foliated within bands. Chilled.	Feld. phenos 0.5-2 mm long Gmass. variable <0.05-0.1	Strongly porphyritic with equigranular interlocking groundmass	30% oriented white feld phenos 70% groundmass = Av. 50% plag. + 40% hb. (often chlorite; falls to <10% in pink bands); <10% qtz but >10% in pink bands. tr. sphene		0.2% py. conc. in most mafic portions of groundmass (indicates py. is primary)	0.1% magnetite conc. in most mafic portions of gmass.	DIORITE
120-08	25% chips dk. gn. flecked black + white 25% chips med. gn. due to chilling	(a) Chilled. Locally well fol. to gneissic Either dyke or rooted phase of (b). (b) Chilled. Mod. brittle shear def. manifested by slickensided chl.-carb. partings @ 2-3 mm intervals	(a) Feld. phenos 0.5-1 Gmass variable <0.05-0.1 (b) <0.05	(a) Strongly porphyritic with equigranular interlocking but variably chilled gmass. (b) Aphanitic, non porphyritic	(a) 30% white feld. phenos, locally oriented 70% gmass = 60% plag. av. 40% hb (variable 10-70%, often chl.), <10% qtz. (b) soft indicating mafics abundant (not visible due chilling)	(a) 1% fracture calcite (b) 10% fracture + dissem calcite	(a) tr. dissem. py. (b) 0.1% fracture-hosted cubic py.	(a) tr. magnetite (b) tr. fuchsite on shear	(a) DIORITE (25%) (b) BASALT (75%)
121-11	Variable brown (as #115) to black (both hb-bearing) to green (chloritic)	Chilled. Possibly volc. but appears to represent heterogeneous chilled phases of intrusive possibly in bands coarser than chip scale (feld. phenos locally flreated) No brittle shear def.	Feld. phenos 0.3-1 Variable <0.05 to 0.1	Variably porphyritic with variably aphanitic to equigranular interlocking	Variably 5-30% white feld phenos (av. 10%) locally aligned. 90% groundmass = 30% hb (variably chl) 70% plag	1% fracture calcite	0.1% dissem. py.	tr. magnetite	DIORITE

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 150-01	Pink to brick red with dark green chlorite shear surfaces	No flow foliation. Strong shear deformation manifested by pervasive carbonatized microfractures and 5% slickensided chloritic shears.	Feld. phenos mainly 1-3 (boundaries obscured by stain) Groundmass 0.1-1	Strongly feldspar-porphyritic with inequigranular interlocking groundmass (apatite, sphene coarsest)	85% white to red-stained feld. phenos 15% groundmass = 30% chl. (assumed from hb.), 30% feld, 5-10% sphene (alt. completely to leucoxene)	7% fracture-hosted calcite.	Groundmass in 1/4 of chips contains 5-10% hydrothermal cubic py.	Groundmass contains 20% apatite (bleached) 5-10% magnetite + ilmenite (both) now 1/2 alt. to spec. hem. + 1/4 replaced by py.	SYENITE
151-07	Medium pink flecked green	Massive. No flow foliation No significant shear deformation.	Feld. 0.5-2 Hb., sphene 0.3-1 Mt. 0.1	Inequigranular interlocking	80% white to pink stained feld. 12% hb. (chlorite in 2/3 sample) 2% qtz 2% sphene	Groundmass contains 5-10% dissem. calcite	Nil	0.5% dissem. magnetite. No apatite	SYENITE
152-03	Medium to dark pink flecked green	Massive. No flow foliation. Weak shear deformation manifested by locally pervasive microfractures hosting calcite	Px. 1-4 Feld. 0.5-3 Other 0.1-0.3	Inequigranular interlocking	85% white to pink-stained feldspar 5% dk. gn. px. 5% chlorite probably from px. 1% quartz 0.1% sphene	2-3% fracture hosted calcite	Trace py. related to fracturing	2% dissem. specular hem. (variably magnetite)	SYENITE
153-02	White to pale purple flecked black	Weak trachytic flow foliation. Moderate shear deformation manifested by 3% slickensided chloritic shears + local pervasive carbonatized + pyritized microfractures	Feld. 0.5-3 Px. 0.2-2 Accessories 0.1-0.2	Inequigranular interlocking. Pyroxene locally has ophitic habit.	90% white to pale purple-stained feld. 8% dark green px. (locally chl.) 1% quartz 0.5% leucoxene from sphene	5% fracture hosted calcite	10% of chips contain 5% microfracture-hosted hydrothermal pyrite	0.5% specular hem., no mt.	SYENITE
154-02	Medium pink flecked black	Massive. No flow foliation. No shear deformation	Major minerals 0.5-2	Atypically equigranular interlocking	80% white to mostly pink-stained feld. 15% hb (no chl.) 2% quartz 2% epidote 0.5% sphene	1% dissem. cal. concentrated with hb.	Nil	0.3% dissem. magnetite	SYENITE

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 155-04	Mottled pink + gray-green	Massive -- no flow or metamorphic fol'n. Moderate shear deformation manifested by pervasive calcite-lined microfractures	Feld. phenos 1-3 Apatite phenos 1-2 Groundmass 0.1-0.3	Strongly porphyritic w. inequigranular inter-locking groundmass that often merges with apatite phenos.	80% white to mostly pink-stained feld phenos. 15% groundmass = 30 40% gray feld, 30% dk. gn. chlorite, 10% qtz, 10% sphene	3% fracture calcite Groundmass contains 10% dissem. calcite	Nil Groundmass contains 5-10% magnetite to mainly specular hematite →	5% phenos of gray mineral with pyroxene-like cleavage + hardness of 5, assumed to be apatite	SYENITE
156-04	White flecked black, locally stained pink	Local weak flow fol'n, otherwise massive Moderate shear deformation manifested by calcite lining pervasive microfractures	Feld. phenos 1-3 Hb. phenos 0.5-2 Groundmass 0.1-0.2	Strongly porphyritic with equigranular interlocking groundmass	85% white to locally pink-stained feld. phenos. 3-5% partly chloritized hb. phenos 10% groundmass = 40% dk. gn. chlorite, no qtz., 10-20% feld, 2% sphene	3% fracture calcite Groundmass contains 10% dissem. calcite	Nil	Groundmass contains 10% magnetite to mostly spec. hem., also 30% green granular mineral, probably apatite	SYENITE
157-02	(a) Pink (10% sample) (b) Medium green mottled pink (90% sample)	(a) Massive (b) Chilled, Massive with 10% aphanitic/leucocratic glass patches to 2mm size Weak shear deformation defined by 2% joint like hematite-stained fractures	(a) 0.2-0.5 (b) Feld. phenos. 0.5-1. Glass patches aphanitic Matrix 0.05-0.3	(a) Inequigranular interlocking (b) Very heterogeneous -- 10% aphanitic/leucocratic glass patches + 20% feld phenos irregularly distributed through a chilled inequigranular interlocking groundmass	(a) 80% pink-stained feld, 10% hb, 5-10% qtz. (b) 20% feld phenos, 10% glass patches 80% groundmass = 60% gray feld, 20% chl. + chloritized hb., 10-20% qtz	(a) Nil (b) 1% dissem cal. Also 1% fracture calcite	(a) Nil (b) 1% dissem cubic py. -- observed replacing magnetite	(a) Nil (b) 0.5-1%. dissem mt.	SYENITE (10%) QTZ DIORITE (90%)
158-02	White to pale pink, flecked black	Massive. No flow or met. foliation. No shear deformation	Plag. 0.3-3 Hb. 0.3-1 Sphene + mt. 0.2-0.3	Inequigranular interlocking to diabasic	85% white to pale pink-stained feld. 10% hb. (no chlorite) 1% qtz. 1-2% sphene	2% dissem. calcite concentrated near hornblende	Nil	0.5% specular hem. (rarely magnetite)	SYENITE
159-02	Pink due to post-glacial weathering (near surface -- hill)	Massive. No significant shear deformation	Plag. 0.4-3 Hb. 0.3-2 Sphene + mt. 0.1-0.3	Inequigranular interlocking	80-85 white to pink-stained (weathered) feld. 10-15% hb. (no chl.) 2% qtz. 1% sphene	1% dissem cal. concentrated near hb. 1% calcite in isolated fractures	Nil	1-2% dissem. magnetite (rarely specular hem.)	SYENITE

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 160-01	Pale pink flecked black. Locally slightly rusty due to surface weathering	Massive with local trachytic flow fol'n. Very weak shear deformation manifested by 1% crush zones + locally pervasive microfracturing	Feld. 0.5-4 Hb.=0.5-2 Accessories 0.2-0.3	Inequigranular interlocking	85-90% white to pink-stained feld. 8-10% hb. (no chl.) 1% qtz. 0.5-1% sphene	1% fracture calcite	Nil	1-2% specular hematite (rarely mt.) both dissem. and concentrated in crush zones	SYENITE
161-02	Pink-stained flecked black. 15% gray-purple crush zones	Massive, no flow foliation. 15% weakly crushed zones record weak shear deformation	Feld. 0.5-3 Hb. 0.5-2 Accessories 0.1-0.3	Inequigranular interlocking to diabasic	85% white to pink stained feld. 10-12% hb. (no chl.) 1% sphene	No dissem cal. in host. Crush zones contain 5% fracture + dissem. cal.	Nil	0.5-1% dissem. magnetite. Crush zones contain 2-3% specular hematite dust	SYENITE
162-02	Pink flecked black. 30% deep red-stained zones.	Pronounced trachytic flow fol'n but no metamorphic fol'n. No significant shear deformation	Feld. phenos. 0.5-3 mm long. Groundmass 0.1-1.0	Strongly porphyritic with inequigranular interlocking groundmass.	85% white to red-stained feld phenos. Groundmass = 50% hb (no chl.) 30% gray feld 10-20% qtz no sphene	3% dissem + fracture cal	Nil	Groundmass contains 5% magnetite (locally specular hematite)	SYENITE
163	NO	BEDROCK SAMPLE							
164-06	Pale pink-stained, flecked black	Weak to moderate trachytic flow foliation. No shear deformation	Feld.=0.5-4 Hb., apatite 0.5-2 Magnetite ≤0.1	Inequigranular interlocking	85% white to pink-stained feld 8% hb (no chlorite) 2% qtz. <0.1% sphene	1% dissem. cal., plus 3-5% vugs where same calcite leached out	Nil	2% dissem mt. 0.2% apatite	SYENITE

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 165-10	Pale pink flecked black	Massive with local trachytic flow fol'n. 3% mylonite zones with sharply defined walls record moderate shear deformation	Feld. phenos 0.5-4 Amph. phenos = 1-2 long (acicular) Groundmass = 0.1-0.5	Porphyritic to diabasic with inequigranular interlocking groundmass	80% white to pink-stained feld phenos 5% amphibole phenos (hb. : riebeckite = 2:1) 15% groundmass = 40% hb/riebeckite, 30% grey feld., 10% qtz., 3% sphene Mylonite contains 50% qtz, 25% green clay, has sericitic walls.	Groundmass contains 10% cal. Mylonite contains 20% calcite	Nil	Groundmass contains 5% magnetite + specular hem. (both present)	SYENITE
166-15	Medium pink flecked black	Massive w. local weak trachytic flow fol'n. Weak shear deformation manifested as 3% vuggy chloritic crush zones	Feld. phenos 1-5 Groundmass = 0.1-0.5	Strongly porphyritic with inequigranular interlocking groundmass.	85 white to pink stained feld. phenos 15% groundmass = 50% chlorite from hb. 10% qtz. 1% sphene	Groundmass contains 10% calcite Crush zones have 30% vugs previously filled with calcite	Crush zone vugs hold 1%. amorphous marcasite	Groundmass contains 10%. mt. + spec. hem, and 25% soft green-brown granular mineral -- prob. apatite Vugs contain 10%. white needles - gypsum ?	SYENITE
167-05	Medium pink flecked black	Massive. No flow foliation. Few joints. No significant shear deformation	Feld. 0.5-3 Hb. 0.5-2 Sphene 0.3-0.5 Oxides 0.1	Inequigranular interlocking	85% white to pink-stained feld. 8-10% hb. (no chl.) 1-2% quartz 2-3% epidote 3% sphene	1% dissem calcite clustered with hb.	Nil	1% dissem. magnetite or locally specular hematite	SYENITE
168-08	Brick red due to shear controlled hematitization	Originally massive with little or no flow foliation. Now very pervasively microfractured by strong shearing but little mylonitized	Feld. Phenos range approx 0.5-3 mm (outlines obscured by hem. stain) Groundmass 0.1-0.5	Strongly feldspar-porphyritic with inequigranular interlocking groundmass (hb. coarsest, magnetite finest)	85% red-stained feld. phenos 15% groundmass = originally hb-dominated (hb. now all carbonatized) 3% sphene (now leucoxene) Hb outlines still visible, also sphene wedges.	Groundmass contains 85% mixed Fe/Mg carb. + subord. calcite (i.e. 10% of total sample) Also 2% fracture hosted carb. of same mix.	15% py. replacing mt. in groundmass of half of sample	Groundmass contains 15% dissem. mt. which is completely replaced by spec. hem. in 30% of chips + py. in 50% of chips	SYENITE
169-10	Medium pink	Massive, no flow foliation. Moderate shear deformation manifested by pervasive calcite-bearing microfractures.	Feld. phenos mostly 1-4 Groundmass = 0.1-1	Strongly feldspar-porphyritic with inequigranular interlocking groundmass (hb. coarsest, mt. finest)	85% white to pink-stained feld phenos. 15% groundmass = 70% completely chloritized hornblende 10% sphene No significant feld. or qtz. (also no intersertal qtz.)	Groundmass contains 10% dissem. calcite. Fractures host 5% calcite	Nil	Groundmass contains 15%. oxide -- mostly specular hem., locally mt.	SYENITE

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 170-02	Pale to deep pink, flecked gn. + black	Massive, no flow foliation. Weak-moderate shear deformation manifested by semi-pervasive fracturing in chloritic half of sample	Feld. 0.5-4 Hb. = 0.3-1 Accessories = 0.1-0.3	Inequigranular interlocking	80-85% white to pink-stained feld. 10-15% hb. (completely alt. to chl. in half of sample) 3% qtz. 0.5-1% sphene	3-5% fracture-hosted calcite in chloritized half of sample only.	0.1% fracture-hosted cubic py. in chloritized half of sample only	1% dissem. mt. (locally spec. hem. in both hb. + chlorite bearing host)	SYENITE
171-06	Pink to brick red.	Massive, no flow foliation. Strong shear deformation manifested by pervasive microfracturing + assoc. alt. 2% qtz. veinlets	Feld. phenos. mostly 1-4 (boundaries obscured by hem. stain) Groundmass 0.1-1	Strongly feldspar porphyritic with inequigranular interlocking groundmass (hb. coarsest, mt. finest)	85% white to red-staining feld. phenos. 2% [illegible] qtz. 15% Groundmass is originally hb.-dominated but hb. chloritized in half sample + carbonatized in other half. Originally 3% sphene now leucoxene	In half sample, groundmass contains 80% Fe/Mg carb (replaces Hb.) Pervasive fractures host 5% calcite	In 1/4 sample, mt. of groundmass is replaced by cubic py. (1/4 x 10% x 15% = 0.3-0.4% py. overall)	Groundmass contains 15% dissem mt. which is completely replaced by spec. hem. in 1/2 sample + py. in 1/4 sample	SYENITE
172-07	(a) Dark gn. (50% sample) (b) Black (50% sample)	Cumulate layered. Massive. Unmetamorphosed No significant shearing 5% qtz. veins	(a) 0.3-1 (b) 0.05-0.2	(a) Inequigranular interlocking with intercertal mt. (b) Equigranular interlocking	(a) 60% pale gn. px. 30% dk. gn. px. (b) 60% px.	(a) 2% dissem Fe/Mg carb (b) nil Also 1% fracture calcite	(a) nil (b) 0-5% interstitial py. (average 1%)	(a) 10% intersertal magnetite (b) 40% interstitial magnetite	PYROXENITE
173-02	Medium pink flecked green	Weak trachytic flow foliation. Moderate shear deformation recorded by 5% chlorite zones, locally pervasive microfracturing, also chloritization of all hb.	Feld. phenos mostly 1-3 Gmass. = 0.1-1	Strongly feldspar porphyritic with inequigranular interlocking groundmass (hb. + feld coarsest, mt. + sphene finest)	85% white to pink-stained feld. phenos. 15% groundmass = 50% completely chloritized hornblende 30% gray feld 3% sphene Also 2% intersertal qtz.	Groundmass contains 10-15% dissem calcite. Also 2-3% microfracture calcite	Nil	Groundmass contains 5% magnetite (rarely specular hematite)	SYENITE
174-02	Pale pink flecked black + green	Massive. No flow fol'n. No significant shear deformation	Feld = 0.5-3 Hb = 0.5-2 Qtz = 0.5-1 Accessories = 0.1-0.3	Inequigranular interlocking	80% white to pink-stained feld 12-15% hb. (half alt. to chl.) 5% qtz. 1% sphene	3% dissem. calcite	Nil	1% magnetite	SYENITE

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-87 175-15	Medium pink flecked black	Massive. No flow fol'n. Zero shear deformation	Feld. 0.5-3 Hb. 0.5-2 Accessories 0.1-0.2	A good example of inequigranular interlocking texture	80-85% white to pink-stained feld 12% hb. (rarely chl.) 3% epidote 1-2% qtz 1% sphene	1% dissem. cal.	Nil	1% magnetite	SYENITE
176-02	Pale pink flecked black + gn.	Weak trachytic flow foliation. <1% pyroxene xenocrysts from adjacent gabbro. Weak shear deformation manifested as 15% crush zones & assoc. qtz. veinlets	Feld. 0.5-2.5 Hb. 0.5-1.5 Accessories 0.1-0.2 Px. xenocrysts to 3.0	Inequigranular interlocking w. sparse pyroxene xenocrysts	80% white to pink stained feld. 15% hb. (half alt. to chlorite) 2% qtz. 0.5% sphene 1% epidote 1% px. xenocrysts	1% dissem. cal. Crush zones host 10% calcite	Very rare py. cubes in qtz veinlets assoc. w. crush zones	0.5% dissem. magnetite Crush zones contain 2% spec. hematite	SYENITE
177-02	Pale pink flecked black	Moderate trachytic flow foliation. Zero shear deformation	Feld. phenos 1-2 Gmass 0.1-1	Strongly feld. porphyritic with inequigranular interlocking groundmass (hb. coarsest, accessories finest)	80% white to pink stained feld. phenos. 20% groundmass = 60% hb. (rarely chl.) 20% gray feld. 10% qtz 2% sphene	Groundmass contains <5% calcite (i.e. <1% of sample)	Nil	Groundmass contains 3% dissem. mt.	SYENITE
178-01	Variable pale green to pale pink flecked black	Chilled, hybridized. Massive. No significant shear deformation Rare px. xenocrysts inherited from gabbro	Coarsest phase 1-2 mm feld. phenos in 0.2-0.4 mm gmass. Finest 0.2-0.5 mm phenos in 0.05-0.1 gmass.	Heterogeneous. Both sharp + gradational variations from strongly porphyritic (50% feld phenos) with equigranular interlocking gmass. to weakly porphyritic (10% feld. phenos) with aplitic groundmass	Average: (locally dioritic w. no quartz): 60-70% white to pink-stained feld 20% quartz 15% hb. (variably chl.) Trace sphene <<1% px. xenocrysts	1% fracture calcite	Nil	0.5-1% dissem. magnetite	QUARTZ DIORITE
179-02	Pale green with pink mottling	Uniformly chilled. Massive, with 5% gabbro xenoliths locally larger than chip scale. 5% epidote-filled hairline fractures probably represent cooling structure not shear effects	Feld. phenos. 0.5-1 Groundmass 0.05-0.1 Xenoliths 0.5	Microporphyritic with sugary to aplitic groundmass. Gabbro xenoliths are diabasic	40% gray to pink stained feld. phenos. 60% groundmass = 60% gray to pink feld. 30% quartz 10% chlorite, no sphene Xenoliths 50% plag., 50% px.	Nil	<0.1% finely dissem. py. (probably primary)	No oxides	QUARTZ DIORITE (5% gabbro xenoliths)

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 180-08	Dark green	Gneissic flow banded in felsic + mafic layers 0.5-5 mm thick. No brittle shear deformation. Chilled.	Feld. phenos 0.3-1.5 Groundmass 0.05-0.1	Microporphyritic with aplitic to sugary groundmass.	20-30% feld phenos, white, rarely pink 75% groundmass = 60% plag. 30% chl. <10% quartz no sphene	No dissem. carb. Trace fracture calcite	Nil	0.5% dissem. magnetite locally conc. in gneissic bands grading 10% wt. -- indicating banding is primary	DIORITE
181-11	Pale buff-green 10% buff bleached zones adjoin carb. veins	Unfoliated Unsheared 1% carb. veins	Feld. phenos 0.5-2 Qtz. phenos 0.3-0.5 Gmass 0.05-0.2	Strongly feldspar-porphyritic w. inequigranular interlocking groundmass	30% plag. phenos 1% qtz. phenos 70% hard groundmass = 60-70% colourless albite 30-40% qtz 5% chlorite irregularly distributed	<1% dissem. calcite in groundmass 1% vein calcite	NIL	NIL	RHYOLITE
182-12	Buff due to low mafics + bleaching. Pervasive ochre stain due to weathering	Unfoliated. Strong brittle shear recorded by pervasive microfracturing, bleaching of all chl. + sufficient permeability for pervasive weathering	Qtz. + feld. phenos 1-4 Groundmass 0.05-0.2	Strongly qtz-feld. porphyritic with inequigranular interlocking groundmass. Feld. phenos vague due to effects of bleaching + weathering, qtz.-phenos prominent	20% plag. phenos 5-10% qtz phenos 70% groundmass = 30% qtz } hard 60-70% albite } hard 2% bleached + limonite stained chl.	2% microfracture-hosted calcite	Nil	Nil	RHYOLITE
183-06	Pale buff-gray with white veins + ochre weath.-zones	Massive (unfoliated) 20% q.c.v. Strong shearing manifested by slickensided fractures spaced > chip scale, + advanced bleaching + alt.	Feld. + qtz. phenos 0.4-1.0, rarely 2.0 Gmass 0.05-0.2	Strongly porphyritic with inequigranular interlocking groundmass but these relationships now vague due to bleaching	50-60% plag. phenos 1% qtz. phenos 40% groundmass = 40% qtz. 40% feld. 10% completely bleached chl. Tr. fuchsite on slickensides	Veins contain 10% calcite Rock hosts 1% microfracture calcite	Groundmass contains 10% xlline hydrothermal py.	Nil	RHYOLITE
184-19	Buff with strong ochre overprint due to weathering	Unfoliated. Strong shear deformation recorded by bleaching and pervasive carbonate-lined micro-fractures (these provide permeability for weathering)	Feld. + qtz. phenos 0.5-2.0 Groundmass 0.05-0.2	Strongly porphyritic with inequigranular interlocking groundmass but these relationships now vague (except qtz. phenos) due to bleaching + limonite stain	Probably 30% plag phenos 2-3% qtz phenos 70% groundmass = 30% qtz } very hard 60% albite } very hard 2% buff bleached chl. 1% sericite	3% calcite lining microfractures	0.1 percent limonitized pyrite cubes	5% crusty limonite in groundmass	RHYOLITE

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS- 89 185-25	Pale green-buff	Massive with local sericitic shears (unfoliated) weak shear deformation manifested by pervasive microfracturing in 20% of sample	Plag and qtz. phenos upto 3mm groundmass 0.05 to 0.2	strongly Porphyritic, plag and qtz phenos in inequigranular groundmass - very hard.	5% qtz phenos. 25% plag phenos. 75% groundmass consists of 2% gn chlorite 3% sericite 40% qtz 45% plag	2% microfracture infill calcite in 20% of rock	Nil	Nil	RHYOLITE
186-08	Green and white with 10% ochre colour chips due to weathering	Unfoliated with pervasive microfracturing - brecciation indicating strong shear deformation - calcite and chlorite along microfractures	Plag phenos upto 4mm qtz phenos up to 3mm groundmass 0.05 to 2mm	strongly Porphyritic, plag and qtz phenos in inequigranular groundmass	5% qtz. phenos 45% plag phenos. 50% groundmass = 40% qtz 50% plag 10% gn chl. (also along fractures)	3% microfracture infill calcite	Nil	Nil	RHYOLITE
187A-01	White to pale pink stained, flecked gn.	Chilled (small intrusive) Unfoliated. Weak brittle shear deformation recorded by locally pervasive microfractures w. carbonate	Plag. phenos 0.5-1.5 Groundmass 0.1-0.4	Strongly feldspar porphyritic with anhedral to subhedral white to pink-stained feld. phenos in inequigranular inter-locking groundmass	40% plag. phenos 60% groundmass = 30% qtz. 40% plag 25% chl. from hb. 1% epidote no sphene	1% microfracture hosted cal	Trace coarse cubic py	Nil	QUARTZ DIORITE
188-20	Green and white	Unfoliated with sericitic slickenslides and fracture lozenges with dislocation - shear partings 2-3mm apart - hydrothermal minerals include radiating amphibole (cummingtonite) and Fuchsite . strong shear deformation	plag. phenos .5 to 4 qtz phenos .5 to 2 groundmass 0.05 to 0.2	Strongly porphyritic, plag and qtz phenos in inequigranular interlocking groundmass	5% qtz. phenos. 45% plag. phenos. 50% groundmass = 5-10% gn - chlorite 5% sericite 40% qtz, 45% plag 5% brown-black amphibole - cummingtonite	< 1% microfracture calcite	Nil	tr. fuchsite	RHYOLITE
189-01	(a) Pale gray - white (60% sample) (b) Dk. green (40% sample)	Bedded overall on 0.5 to 10+mm scale (a) laminated (bedding), unsheared (b) schistose and lineated due to shearing Moderate overall shearing	(a) < 0.1 (b) < 0.1, mostly < 0.05	(a) cherty to equigranular with cottoform stringer py.; hard (b) silty with about 10% fine sand; overprinted by schistosity	(a) 40% chert in a carbonate matrix (pyritic matrix in sulphide stringers) (b) 10% quartz silt 40-50% green chl. 40-50% plag + lithic silt	(a) 60% calcite matrix -- probably replaces original siderite (b) 10% dissem. calcite	(a) 10% syngenetic amorphous py. stringers + local laminae (b) nil	(a) Nil (b) nil (no leucoxene)	(a) CHERT (60% sample) (b) SILTSTONE (40% sample)

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 190-02	Pale green to buff-bleached	Schistose due to shearing separation of partings 2-3 mm 20% shear-parallel brecciated qtz-carb-chl-py veins Chilled variety of volcanic. Strong shear deformation and alteration	≤ 0.05 mm	Equigranular, interlocking grains visible between shear partings. Overall rock is soft.	50% bleached chlorite 50% plag	20% veins contain 30% calcite 60% qtz. 8% dissem calcite	10% infill py. within brecciated veins. 0.1% dissem py	Nil	BASALT
191-02	Pale gray-green to locally buff-bleached	Chilled. Shear related undulating schistosity around phenocrysts Moderate shear deformation 5% schistosity-parallel q.c.v.	Feldspar phenos. 0.2 to 2 mm Groundmass < 0.05	Porphyrytic with upto 30% plag. phenos. in very hard aphanitic, leucocratic groundmass. No qtz eyes	0-30% feld. phenos, white (fuzzy) 70-100% groundmass = 2% green chlorite 2-3% sericite 95% quartz-feldspar (hard)	5% schistosity-parallel quartz-carbonate vein contains 30% calcite, 60% qtz 3% Fracture calcite	10% pyrite in the quartz-carbonate veins <0.1% dissem. py throughout	Nil	RHYOLITE
192-02	Pale gray-green to buff-bleached	Shear related undulating schistosity - shear laminated and lozenged Strong shear deformation with chlorite and sericite alteration	aphanitic rare qtz eyes 0.5 mm	Aphanitic - (Feldspar phenos either absent or obscured by deformation) - very hard and leucocratic between shears	2% green chlorite 10% sericite 80% quartz-feldspar (hard)	5-10% dissem calcite	Nil	Nil	RHYOLITE
193-13	Dark green	No significant shear deformation: unsheared Unfoliated. 3% epidotized Fractures	px. phenos upto 1.2 mm Groundmass 0.2 to 0.6	Large px. phenos display ophitic texture in groundmass of diabasic texture - px. phenos. enclose Feldspar	est. 5% dk. gn. px. phenos. groundmass: 55-60% med to dk. gn. px. 35-40% plag. 1% epidote - Fracture controlled.	0.5% fracture Calcite	<0.1% dissem. pyrite	3% leucoxene	GABBRO
194-08	Dark green and pink	Massive, unsheared <1% quartz veinlets veinlets and Feldspar stained pink (hematite)	px. laths 0.3 X 1 mm plag crystals 0.2 X .5	Diabasic texture - px laths enclose Feldspar	45%-50% chloritised green px. 15% dk. gn. chlorite 35-40% white (stained pink) Feldspar	< 1% dissem. calcite	< 0.1% dissem. py	<0.1% dissem. magnetite <1% leucoxene.	GABBRO

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 195-14	Medium to dark green	weakly Foliated Unchilled No significant shear deformation (unsheared)	0.1 to 0.2	Equigranular interlocking.	60-65% plagioclase partly epidotized. 30-35% green chlorite 5% epidote.	Trace fracture lining calcite	NIL	NIL	BASALT
196-03	Medium to dark green	weakly foliated unchilled No significant shear deformation	0.1 to 0.3	Equigranular, interlocking	45-50% dk. gn. chl. to medium gn. chl. 50-55% plag. 2% qtz 1% saussurite	7% calcite veinlets 1% qtz. veinlets	<0.1% dissem py.	NIL	BASALT
197-07	Dark green	Weak to moderate Foliation, Unchilled volcanic variety No significant shear deformation; Moderate calcite alteration 5% cross-cutting calcite veinlets	0.1mm	Equigranular, interlocking	50% dk. gn. chl. 45-50% plag. est. 2% qtz 2% saussurite	5% calcite veins 3% dissem. calcite	<0.1% dissem. py.	NIL	BASALT
198-05	Medium to dark green	Unfoliated No significant shear deformation (unsheared) Unchilled	0.1 to 0.2	Equigranular interlocking	60-65% plagioclase 30-35% green chlorite 2% qtz.	3% dissem. and 2% fracture filling calcite	<0.1% dissem pyrite	NIL	BASALT
199-04	Dark green	weakly Foliated No significant shear deformation (unsheared)	0.1 to 0.3 qtz eyes 0.1 to 0.3	Equigranular interlocking with rare qtz "eyes" of same grain size as other minerals	50% dark green chlorite 50% plagioclase < 1% blue qtz. eyes	5% calcite veinlets 1% dissem calcite	tr. dissem. py.	NIL	BASALT

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 200-05	Medium to dark green	Well foliated to shiotose. Weak shear deformation indicated by 3% dark green chloritic shearplanes parallel to foliation. Chilled. 10% q.c.v.	0.05 (max)	aphanitic to equigranular interlocking.	55-60% plagioclase partly saussuritized. 35-40% green chlorite 5% saussurite Few grains tourmaline on shear plane.	1% dissem. calcite 6-7% vein calcite	0.1% dissem. pyrite	Nil.	BASALT
201-02	Dark green	Well foliated chilled no significant shear deformation or alteration (unsheared)	0.05 to 0.1	Equigranular interlocking	50-55% plagioclase partly epidotized 45-50% dark green chlorite	3% fracture filling calcite	0.5% dissem. pyrite with few patchy concentrations	2% dissem. magnetite with few patchy concentrations	BASALT
202-04	Dark green	Weakly foliated unsheared. unchilled	0.1 to 0.3	Equigranular interlocking	60% dk. gn. chlorite 40% plag 1% qtz.	2% calcite vein 3% dissem. calcite	<0.1% dissem py.	Nil	BASALT
203-03	Dark green	Unchilled. Weak shear def. defined by well foliated to sub-schistose fabric + 5% foliation-parallel q.c.v.	0.15-0.3	Equigranular interlocking	60% pale to dk. gn. chlorite (locally still px.) 35% plag. <1% qtz.	2% dissem. + fol'n calcite 3% veinlet calcite	<0.1% dissem. py.	2% leucoxene	BASALT
204-02	Dark green	Unchilled. Moderately sheared -- chloritic partings at 1mm intervals, often with coarse flake chl. on slickensides, but no bleaching + little related alteration	0.15-0.3	Equigranular interlocking overprinted by shearing	50-60% pale to dark green chl. (locally still px.) 30-40% plag 2% qtz.	8% dissem + schistosity calcite 3% veinlet calcite	<0.1% dissem pyrite	3% dissem crystalline mat. often remnant to schistose chloritic partings	BASALT

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 205-02	Dark green	Weak to moderate foliation - unchilled volcanic moderate shear deformation 1% quartz-carbonate vein	0.1 to 0.2	Equigranular interlocking locally, grains are shredded obscuring texture and grain size.	70% dark green chlorite 30% plag. 1% quartz	1% quartz-carbonate vein contains 30% calcite 10% dissem. calcite	< 0.1% dissem. PY.	trace dissem. magnetite	BASALT
206-03	Dark green	weak to moderate foliation - unchilled volcanic - weak shear effects manifested by minor chloritic shear partings and pink hematitic stain on qtz-carb veinlets 1% quartz-carbonate vein	0.1 to 0.4	Equigranular interlocking	60% dark green chlorite 40% plag. 2% quartz	1% quartz-carbonate vein contains 30% calcite 2% dissem. calcite	< 0.1% dissem PY.	trace dissem. magnetite	BASALT
207-11	Medium gray-green (partially bleached)	well foliated to schistose - shear laminated Bedded. moderate shear control 5% qtz- calcite veinlets parallel to schistosity	0.05 to 0.2	fine grained sandy texture with secondary Fine grained matrix	10% qtz sand 15% gray-green chlorite 75% undifferentiable plag and aphanitic volcanic lithics.	5% qtz-carbonate veinlets contains 30% calcite	0.1% dissem py.	Nil	GREYWACKE
208-11	Gray-green	Well foliated to schistose, bedded. 5% of chips chloritic Flakes weak shear control.	silt grains < 0.05	silty	est. 20% gn. chlorite 80% undifferentiated plag and qtz sand grains + lithics (due fine size)	1% vein calcite	< 0.1% dissem py cubes	Nil	SILTSTONE
209-13	Bleached pale buff-grey mottled bright green by fuchsite Also 40% grey-white q.c.v.	No bedding visible, probably due to very strong shearing causing strong schistosity w. bleached chl. shear lamination surfaces 0.1-0.5 mm apart. Q.C.V. are brecciated also.	0.1-0.2 (rarely retained)	Fine sandy texture rarely retained due to shear lamination, bleaching + carbonate replacement along schistosity.	10% qtz sand 15% buff-bleached chl. (remob. to shear partings) 5% sericite 5% fuchsite 40-50% undifferentiable plag. + aphanitic volc. lithic sand	20% dissem. + foliation-hosted Fe/Mg carb. in wacke. 10% same carb. in fractures in qtz veins.	< 0.1% dissem py. in host Only trace py. in veins	0.3% dissem tourmaline in host; none in veins	GREYWACKE

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 210-14	(a) Dark grey (90%) (b) Light grey (10%)	Bedded (a) mudstone well foliated to schistose with some chips displaying crenulations and hosting syngenitic py. (b) greywacke (10%) - weak shearing 2% qtz-calcite veins.	(a) mudstone <0.05 to aphanitic (b) greywacke .05 to .2 Bedded at scale of <0.05 to 1mm	(a) mudstone has aphanitic texture (b) greywacke has very fine sandy to sandy texture	(a) mudstone consists of: upto 60-70% dk. grey chlorite (est) and 30-40% undifferentiated plag - qtz - lithics (b) greywack consists of: 10-15% qtz sand 20% grey chlorite 65-70% undifferentiable plag and volc lithic sand	<1% dissem calcite 2% qtz-carbonate veinlets. which contain 30% calcite.	est. 5% cubic syngenitic py in beds upto 0.5 to 1mm thick	2% graphite in mudstone.	MUDSTONE (90%) GREYWACKE (10%)
210-15	(a) Dark grey (90%) (b) Light grey (10%)	Bedded. similar to 210-14	grain sizes similar to 210-14 but beds are upto 2mm	similar to 210-14	similar to 210-14	Similar to 210-14	est. 1% syngenitic py.	Similar to 210-14	MUDSTONE (90%) GREYWACKE (10%)
211-05	(a) 85% of sample is dark gray to pale gray in gradational beds	Schistose mainly due to bedding & metamorphism. Weak shearing manifested by minor dislocation & veining with no lamination	Gradational in beds <0.05 to 0.2	Mainly silty to locally fine sandy (30-40%)	10% qtz. sand 80% undifferentiable plag. sand & aphanitic volc. lithic sand 20% gray chl (rises to 60-70% in same siltstone beds)	10% dissem & fracture calcite 5% veinlet calcite	0.1% dissem. py 1% vein-hosted coarse cubic py.	Nil	SILTSTONE (60%) GREYWACKE (40%)
	(b) 15% of sample is medium gray-brown spotted blue-green. Local orange stain on serpentine.	Massive. No foliation & no shear effects indicating post-Archean age. No significant xenoliths.	Groundmass 0.05-0.1 Olivine phenos 0.2-2.0 Phlogopite phenos. 0.2-1.0	Strongly porphyritic with equigranular interlocking to felted groundmass. Olivine	15% olivine phenos (now serpentine) 3% phlogopite book phenos 80% groundmass = 30% phlogopite 20% serpentine	Groundmass contains 50% primary calcite	Nil	Trace ilmenite phenos of 0.2 mm. No magnetite from serpentinization of olivine	ULTRAMAFIC LAMPROPHYRE or KIMBERLITE
212-12	Pale green, partially bleached	Lineated, schistose with chloritic shear slips approx 0.05 upto 1mm apart - moderate shearing.	volc. lithics qtz, chlorite & plag sand grains 0.1 to 0.15	very fine to Fine grained sandy texture	20-25% green chlorite 10% qtz sand 65 to 70% undifferentiable volcanic lithics and plag sand.	2% veinlet calcite 5% dissem and Fracture calcite	trace dissem. py.	Nil	GREYWACKE

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 213-04	Dark green	well foliated, locally sheared with shredding of primary minerals moderate shear deformation	Qtz & leucoxene between .2 to 1.5 chlorite planes to 2.0 mm locally chlorite and plag. shredded <0.2 mm to .3	Ophitic chloritized px. diabasic groundmass, locally shredded by shearing. blue quartz due to strain	2% blue to colourless qtz. est. 60% dk. gn. chlorite 35% plag.	2-3% veinlet calcite 1% dissem. calcite	< .1% py.	5% leucoxene - grey-orange	GABBRO
214-09	Dark green	well foliated, locally sheared with shredding of primary minerals moderate shear deformation	Qtz & leucoxene between .2 to 1.5 chlorite and plag shredded <0.2 mm to 0.3	Texture masked by structure. shredded chlorite, plag. blue quartz due to strain.	2-5% blue to colourless qtz. est. 60% dk gn. chl. 35% plag.	1% veinlet calcite 2-3% dissem. calcite.	< .1% py	2-3% leucoxene grey colour	GABBRO
215-08	Bleached pale buff-green.	No bedding visible, strong pervasive micro shearing and lineation around granules and matrix grains preserves grain size. shearing also manifested by silicification - variably blue (strained) to colourless	plag crystals (granules) up to 5 mm Sand 0.3 to 1 mm	medium to coarse sorted sandy textured groundmass containing granules (plag. crystals)	30% plag. granules 10% chlorite locally replaced by tabular chloritoid approx. 60% silicification (blue and colourless) 1% visible qtz. sand grains	1% calcite 'spots' 8% Fe/Mg carb. along shear surfaces and selectively replacing lithic grains.	0.2% cubic to dodecahedral py.	trace fuchsite < 1% secondary(?) coarse leucoxene grains.	GREYWACKE
216-14	Dark grey 5% buff-brown beds	Bedded. well foliated to schistose with graphitic & sericitic shear slips. parallel to bedding. - some chips display micro folds 1% qtz-calcite veinlets moderate shear deformation	grainsize < 0.05 beds typically 0.05 to .4 with sulphide (py) beds up to 1 mm	aphanitic Buff-brown beds are granular	very soft 30-40% gray chlorite 50% plag., lithics, qtz	Buff-brown leucocratic beds are Fe/Mg carbonate (siderite) est 3-5% of rock 1% qtz-carbonate veinlets contain 30% calcite	Syngenetic py. beds est. 1% of rock.	trace fuchsite. 10% graphite, mostly along shear slips. (bedding).	Mudstone (graphitic)
217-08	a) 60% of sample is medium gray-green	No visible bedding (ie. uniform grain size). Schistose. Moderate shear effects -- strong deformation manifested by ductile lineation but only weakly bleached and little altered	<0.05	Silty.	Mod. soft. 50% mostly green to partly buff bleached chlorite 40-50% undifferentiable plag. + volc. lithics + qtz.	No dissem. calcite 3-5% schistosity-hosted veinlet calcite	<0.1% dissem. py. and po. (both present)	Nil	SILTSTONE

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 217-08 cont'd b)	40% of sample: Dark gray-brown spotted blue-green	Massive, no foliation contrasting with schistose host and indicating post-Archean age. No significant xenoliths.	Groundmass 0.1-0.2 Olivine phenos 0.3-2.0 Phlogopite phenos 0.3-1.5	Strongly porphyritic with equigranular interlocking chilled groundmass. Olivine phenos rounded, phlogopite phenos are books.	Variably 20-60% serpentinized olivine phenos (average 50%.) 3-5% phlogopite book phenos Av. 50% groundmass = 50-60% phlogopite 10-20% serpentine	Groundmass contains 30-40% primary calcite	Groundmass portion contains 0.5% py.	No magnetite despite serpentinization of olivine. No ilmenite either as phenos or in groundmass. No pyrope.	ULTRAMAFIC LAMPROPHYRE or KIMBERLITE
218-05	a) 90% of sample is bleached pale buff grey	No visible bedding. Strong shearing manifested by bleached chlorite shear laminations at 0.1-0.2 mm intervals + by Fe/Mg carb. alt. 5% schistosity // veinlets	Mostly 0.2-0.4 rare cherty resistant grains to 1.0	Medium sandy with sparse coarse sand grains. This relationship vague due to close spacing of shear partings	10% quartz sand 60-70% undifferentiable plag. sand + aphanitic int. volc. lithics 20% buff-bleached chl. remob. to shear partings	5% schistosity-parallel Fe/Mg carb. veinlets 3% dissem. Fe/Mg carb	0.3% dissem. framboidal to mostly recryst. cubic py. Tr. pyrrhotite Rare trace red sphalerite + dust colour galena	Nil	GREYWACKE
	b) 10% of sample is pale grey-brown w. dark gn. spots.	Massive, unfoliated. 10-20% non-porphyritic chill bands 0.5-2 mm wide, parallel, 2-5 mm apart, record intrusive flow fol'n. Few slickensided slips record post-dyke shearing. Few mm-	Phenos (all types) 0.15-1.5 Groundmass aphanitic sized turbid	Alternating porphyritic bands having aphanitic groundmass) and aphanitic non-porphyritic bands. to xenolith plates	25% olivine phenos alt. to 50% serp.; near slips replaced by calcite & sphalerite, leaving vugs. (red-brown, vitreous; H=3½) Tr. bt./phlog. phenos. 75% aphanitic gmass. -- brown colour indicates abundant phlogopite, locally	Olivine phenos contain 30% secondary calcite. Groundmass contains 50% primary calcite gn. indicating serp.	Tr. py. Olivine phenos near slips partly replaced by sphalerite + trace galena. Est. 0.5% sphalerite overall	No magnetite from alt. of olivine. << 0.1% ilmenite phenos.	ULTRAMAFIC LAMPROPHYRE or KIMBERLITE
219-01	Dark grey with white spots	Massive, unfoliated groundmass chilled. 1% grey white, equant, aphanitic xenoliths to 10 mm, obviously comagmatic (good visible hb. + mt.) No shear effects	Plag. phenos 0.3-1.5 Hb. phenos 0.2-0.5 Groundmass evenly 0.05	Porphyritic, plag. phenos (mostly euhedral) & hb. microphenos in chilled fine grained groundmass (very hard), equigranular	35% white plag. phenos. 1% hbld phenos groundmass: 10% gn chlorite 90% undiff. qtz and plag. (not more than 10% quartz)	Nil	Nil	0.1% dissem. magnetite	QUARTZ DIORITE
220-02	Hematite stained brick red with patchy ochre weathering overprint)	Unfoliated. Chilled. Intensely and pervasively microbrecciated by strong shearing, yet feld. phenos well preserved (ie. not mylonitized). Contains	Feld. phenos 0.5-2, qtz to 0.5 Groundmass -- aphanitic, cherty Xenoliths -- aphanitic, cherty 2-3% equant	Porphyritic with very hard cherty, silicified groundmass. Xenoliths are aphanitic. xenoliths (assumed autogenous)	1-2% qtz phenos 15-20% plag. phenos 80% groundmass -- hard, silicified all mafics leached out. Xenoliths similar to groundmass	10% fracture and breccia infill calcite	1% dissem cubic hydrothermal pyrite	1-2% magnetite 5% specular hematite	QUARTZ DIORITE (based mainly on mt. as sample very altered)

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SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 221-09	Medium green	Foliation and lineation of coarse ash fragments - stretched 3:1 in two directions → ductile shear deformation - shear intensity is weak as there is no bleaching or carbonatization	Fine to coarse ash 0.15 to 1.0 mm Very coarse ash 1.0 to 1.5 mm	Fine to medium ash texture, partially welded; sparse very coarse ash	All ash is pale gn aphanitic int. volcanic often with welded contacts No qtz grains or plag grains 90-95% fine to medium ash 1% coarse ash 5-10% dk gn chlorite	Nil	0.05% dissem py.	Nil	LITHIC ASH TUFF (INTERMEDIATE)
222-02	Medium green-brown heavily mottled brick red	Chilled. Strong shearing both as brittle micro-breccia to mylonite zones & coarse, uneven schistosity with pronounced lineation and flattening of plag. phenos. 5% equant relatively unscathed xenoliths with same phenos, to 10 mm size.	Plag. phenos: 0.5-1.5 Xenoliths aphanitic with similar phenos. Groundmass 0.05-0.15	Porphyritic with equigranular interlocking groundmass (where not mylonitized) and 5% autogenous glass xenoliths having same phenos.	10% plag phenos 85% groundmass = 80% plag. 10% quartz locally 10% chl. (mostly leached out) Xenoliths assumed to be glass of same comp.	5% calcite as fracture & breccia infill	0.1% dissem. pyrite	1-2% dissem magnetite to hematite (either or both variably present)	QUARTZ DIORITE
223-04	Dark green spotted white to pink	Massive. No flow or metamorphic foliation. Chilled. No significant shear deformation.	Feld. phenos 0.5-2 Groundmass 0.15-0.3	Strongly porphyritic with chilled equigranular interlocking groundmass	15% white to pink stained feld. phenos. 85% groundmass = 60-70% white feld 30-40% hb. (ptly-chl.) <5% qtz no sphene	<1% dissem calcite 1% megafracture (joint?) calcite	Tr. py. Tr. cpy.	<0.1% dissem magnetite	DIORITE
224-01	Green with white spots, stained pink	Massive, unfoliated but fractured and locally brecciated with red (pink) hematite alteration - chilled groundmass. (moderate shear effects) 10% xenoliths (autogenous glass) to 1.5 mm diameter (equant)	plag phenos. 0.3-0.5 Groundmass mostly aphanitic (locally 0.05-0.15) Xenoliths: aphanitic	Porphyritic, white and pink plag phenos in chilled very hard groundmass, generally aphanitic to patchily equigranular	10-15% plag-phenos. white to stained pink 85% groundmass, where coarsest consists of: 30% chl. from hb. 5-10% qtz 60% plag. (often strongly epidote-altered) Xenoliths are assumed to be glass of same comp.	2% fracture-hosted calcite	0.1% fracture-hosted py.	<0.1% dissem. magnetite or ilmenite (not differentiable)	QUARTZ DIORITE
225-06	Dark green overprinted with red hematite stain	Weakly foliated due to shearing. Chilled. Moderate shearing recorded by red stain and local slickensided chloritic fractures	Plag. phenos 0.5-4 Groundmass 0.1-0.2	Porphyritic with euhedral feld. phenos in equigranular interlocking chilled groundmass	15% plag. phenos 85% groundmass = 60% plag. 10% qtz 30% completely chloritized hb.	1% fracture calcite 1% veinlet calcite	Tr. py. hosted in chloritic fractures	<0.1% dissem ilmenite, mainly alt. to leucoxene	QUARTZ DIORITE

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 226-02	Dark. green with pink stain confined to volc. glass zones	Chilled, 30% vesicular volc. glass chips & zones probably represent pillow selvage. Strong shear deformation has brecciated & reddened glass and produced a slickensided – but little alt. schist from balance of sample	Feld. phenos 0.5 - 2 Groundmass <0.05 Glass zones aphanitic	Feldspar-porphyritic with aphanitic groundmass and 30% vesicular, glassy pillow selvages	10% plag. phenos 90% groundmass = 20% green chl. 80% plag. with little qtz (only moderately hard)	5% fracture calcite	Nil	No magnetite or hbld.	ANDESITE
227-02	Dark and Pale green (bleached buff)	Foliation and lineation of ash fragments and lapilli; Moderate shear effects	Fine to coarse ash 0.1 to 1.0mm Very coarse ash 1.0 - 2mm Few lapilli >4mm	Fine to medium ash texture, partially welded contacts	All ash is pale gn aphanitic int. volcanics 80% fine to medium ash 5% coarse ash 1% lapilli 10% dk gn chlorite.	1% dissem and fracture Fe/Mg. carb.	<0.05% dissem PY	1% leucoxene.	LITHIC LAPILLI TUFF (INTERMEDIATE)
228-03	Medium green-brown spotted white. Weak shearing recorded in localized micro-breccia zones →	No flow or metamorphic foliation. Chilled. 10% leucocratic glass xenoliths of 0.2 - 3 mm roughly equant, locally show visible ilmenite hornblende indicating they are autogenous intrusion breccia.	Groundmass 0.05 - 0.3 Plag. phenos 0.4 - 1.5 Xenoliths aphanitic	Porphyritic -- feld. phenos often euhedral, groundmass inequigranular interlocking xenoliths glassy	10% white feld phenos 80% groundmass = 70% plag. 10% qtz 10-15% hb. (ptly. chl.) 2% pale epidote 10% xenoliths of assumed same comp.	1% fracture calcite No dissem. calcite	<0.05% cubic hydrothermal py. localized in fracture zones	<0.1% ilmenite	QUARTZ DIORITE
229A-07	Medium green and red to purple in alternating shear bands	Chilled. Strong schistosity with local slickenslides sericitic slips. surviving plag phenos lineated – alteration by hematitization – strong shear effects	plag phenos upto 3mm in length groundmass <0.05mm	Porphyritic, stretched plag phenos in shredded chloritic groundmass.	10% plag phenos (pink) groundmass: 15% gn chlorite 5-10% qtz 75% plag	5% dissem and fracture calcite	Nil	1% leucoxene No hbld or magnetite	ANDESITE
230-06	Medium green	- moderate foliation, locally sheared - moderate shear effects - rare large qtz amygdules of lobate shape	Plag phenos. 1 to 2mm groundmass 0.05mm	Porphyritic, plag phenos in equigranular interlocking groundmass. Rare large qtz amygdules upto 2mm	20% plag. phenos. groundmass: 15% gn chlorite 5-10% qtz 75% plag. <1% blue cherty, rafted fragments	5% dissem calcite. 1% calcite veinlets	0.5% dissem PY.	1% leucoxene trace fuchsite No hbld or magnetite.	ANDESITE

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
PLS-89 231-02	Medium green	Foliation and lineation of ash fragments - ductile shear deformation - Shear intensity is moderate to weak	Fine to coarse ash 0.1 to 1.0 very coarse ash up to 1.5	fine to medium ash texture, partially welded.	All ash is aphanitic into volcanic, often with welded contacts No qtz grains 90-95% fine to medium ash 5-10% dk gn chl. 1% coarse ash	1% calcite veinlets	0.05% dissem py	Nil	LITHIC ASH TUFF (INTERMEDIATE)
232-06	Dark green with pink stain in glass zones	Chilled. Little foliated or alt. but moderate shear intensity recorded by pervasive brecciation. 20% of sample is amygdaloidal volc. glass - probably pillow selvage rather than fragments or xenoliths but relationships obscured by brecciation.	plag phenos. 0.5 to 1.5 groundmass <0.05	porphyritic, plag phenos in equigranular interlocking to aphanitic groundmass	15% plag phenos. groundmass: 15% gn chlorite 5-10% qtz 75% plag.	5% fracture calcite	<0.05% dissem py.	1% leucoxene No hbld or magnetite.	ANDESITE
233-02	Dark green	moderate foliation locally schistose but little alteration (some red hematization) - Moderate shear effects	plag phenos 1 to 2mm groundmass 0.05 to 0.1	Porphyritic, plag. phenos. in equigranular interlocking groundmass	5-10% plag phenos. groundmass: 15% gn chlorite 5-10% qtz 75% plag <1% blue cherty frags.	2% fracture calcite	Nil	1% leucoxene No hbld or magnetite	ANDESITE
234-02	Medium green with white spots (groundmass is grey-brown under binocular)	Massive unfoliated chilled groundmass no shear effects 1-2% leucocratic aphanitic autogenous xenoliths (ie. equant, contain visible hb + mt.)	plag phenos 0.5 to 3mm hb. phenos 0.1-0.3 groundmass <0.1mm (mostly aphanitic)	Porphyritic, plag phenos (mostly euhedral) and hb. microphenos in chilled groundmass (very hard) generally aphanitic to patchily equigranular	25% white plag. phenos. 5% hbld (chloritised) phenos groundmass: 10% gn chlorite/hb 10% quartz 80% plag 2% epidote (xenoliths assumed to be glass of same comp.)	Nil	tr. py.	0.1% dissem magnetite	QUARTZ DIORITE

APPENDIX H

BONDAR-CLEGG BEDROCK ANALYSES

Bondar-Clegg & Company Ltd.
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BONDAR-CLEGG

Geochemical Lab Report

REPORT: 089-50389.0

PROJECT: LAC SHORT PAGE 1A

SAMPLE NUMBER	ELEMENT UNITS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3* PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	K2O PCT	P2O5 PCT	LOI PCT
PLS-150-01-B		61.70	0.10	16.10	3.27	0.05	1.65	3.17	6.13	2.61	0.16	3.19
PLS-151-07-B		60.90	0.36	16.50	3.98	0.07	1.86	3.91	6.26	2.80	0.19	2.15
PLS-152-03-B		62.80	0.29	17.20	2.80	0.04	1.25	2.21	7.53	3.08	<0.01	1.65
PLS-153-02-B		59.90	0.23	16.90	3.18	0.05	1.27	4.11	9.47	0.36	<0.01	2.51
PLS-154-02-B		61.40	0.37	17.00	3.21	0.05	1.85	3.33	7.61	1.98	<0.01	1.00
PLS-155-04-B		60.00	0.10	15.60	3.68	0.06	1.63	4.16	5.77	2.69	0.15	3.61
PLS-156-04-B		61.80	0.18	15.70	3.10	0.05	1.21	4.05	8.42	0.53	0.04	2.76
PLS-157-02-B		59.90	0.51	14.50	5.82	0.09	2.98	4.88	5.27	1.49	0.17	1.45
PLS-158-02-B		62.00	0.39	16.10	3.47	0.06	1.81	4.11	8.03	0.83	0.09	1.44
PLS-159-02-B		62.30	0.35	18.00	3.44	0.07	1.48	3.18	8.58	1.74	0.07	1.19
PLS-160-01-B		61.20	0.41	17.40	3.54	0.06	1.56	3.47	9.15	0.79	<0.01	1.45
PLS-161-02-B		61.30	0.38	18.50	3.39	0.06	1.71	3.25	9.18	1.07	0.12	1.00
PLS-162-02-B		60.90	0.39	16.00	3.31	0.06	1.51	4.21	8.22	3.41	0.11	1.90
PLS-164-06-B		62.40	0.36	18.20	3.31	0.06	1.54	3.15	7.42	3.17	<0.01	1.10
PLS-165-10-B		63.40	0.33	15.40	3.22	0.06	1.48	3.62	8.50	2.51	0.08	1.90
PLS-166-15-B		62.20	0.17	16.90	3.20	0.05	1.53	2.58	7.09	3.24	0.24	2.20
PLS-167-05-B		60.80	0.42	17.10	3.79	0.07	1.74	3.41	6.98	3.28	0.09	1.00
PLS-168-08-B		58.10	0.06	15.90	3.88	0.08	1.86	4.30	7.49	1.36	0.30	4.84
PLS-169-10-B		59.80	0.27	15.50	3.73	0.06	1.57	4.56	7.24	1.63	0.23	3.58
PLS-170-02-B		59.60	0.25	16.10	3.60	0.08	1.71	4.41	5.63	2.38	0.12	3.29
PLS-171-06-B		61.60	0.12	14.90	3.25	0.07	1.51	4.15	5.83	2.42	0.11	4.05
PLS-172-07-B		42.70	0.61	1.81	31.70	1.28	8.76	9.99	1.44	0.26	0.09	0.05
PLS-173-02-B		59.30	0.19	17.10	3.41	0.07	1.63	3.76	6.82	2.46	0.10	3.60
PLS-174-02-B		58.10	0.28	17.30	3.58	0.07	1.71	4.26	6.36	2.77	0.09	3.30

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REPORT: 089-50389.0

PROJECT: LAC SHORT

SAMPLE NUMBER	ELEMENT UNITS	Total PCT	Cu PPM	Zn PPM	Ag PPM	As PPM	Zr PPM	Au PPB
PLS-150-01-B		98.13	15	53	0.2	2	124	497
PLS-151-07-B		98.97	16	51	<0.1	2	93	7
PLS-152-03-B		98.86	5	41	0.1	5	91	83
PLS-153-02-B		97.98	10	31	<0.1	2	105	29
PLS-154-02-B		97.80	8	21	<0.1	3	88	<5
PLS-155-04-B		97.46	9	56	0.2	4	120	7
PLS-156-04-B		97.84	6	40	<0.1	<2	120	74
PLS-157-02-B		97.06	29	34	<0.1	2	110	<5
PLS-158-02-B		98.33	14	8	<0.1	4	89	<5
PLS-159-02-B		100.40	14	24	0.2	2	112	<5
PLS-160-01-B		99.02	9	11	<0.1	<2	113	<5
PLS-161-02-B		99.95	11	15	<0.1	4	112	<5
PLS-162-02-B		100.02	4	22	<0.1	2	114	<5
PLS-164-06-B		100.70	4	32	<0.1	<2	88	<5
PLS-165-10-B		100.50	4	19	<0.1	2	87	<5
PLS-166-15-B		99.41	5	53	<0.1	2	102	6
PLS-167-05-B		98.68	12	35	<0.1	3	99	<5
PLS-168-08-B		98.17	15	38	0.3	10	110	43
PLS-169-10-B		98.17	12	54	<0.1	7	117	<5
PLS-170-02-B		97.16	10	45	<0.1	2	103	27
PLS-171-06-B		98.01	13	50	<0.1	<2	148	129
PLS-172-07-B		98.69	115	27	<0.1	3	13	<5
PLS-173-02-B		98.44	11	51	<0.1	<2	103	<5
PLS-174-02-B		97.82	10	51	<0.1	5	92	19

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[illegible]

PROJECT: LAC [illegible] PAGE [illegible]

SAMPLE NUMBER	ELEMENT UNITS	CO2 PCT
[illegible]		2.15
[illegible]		1.08
PLS-152-03-B		0.04
[illegible]		[illegible]
PLS-154-02-B		0.07
PLS-155-04-B		2.72
PLS-156-04-B		2.50
PLS-157-02-B		0.79
PLS-158-02-B		1.10
PLS-159-02-B		0.82
PLS-160-01-B		1.09
[illegible]		0.50
[illegible]		1.32
PLS-164-02-B		0.60
[illegible]		1.07
PLS-166-15-B		1.36
[illegible]		0.54
PLS-168-08-B		4.55
PLS-169-10-B		3.94
PLS-170-04-B		2.52
PLS-171-06-B		3.77
PLS-172-07-B		0.83
PLS-173-02-B		2.20
PLS-174-02-B		4.09

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REPORT: 089-50467.0

PROJECT: LAC SHORT

SAMPLE NUMBER	ELEMENT UNITS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3* PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	K2O PCT	P2O5 PCT	LOI PCT
PLS-88-175-15-B		60.70	0.40	17.50	3.68	0.06	1.77	3.59	7.18	2.98	0.44	1.73
PLS-88-176-02-B		62.30	0.34	16.40	3.43	0.06	1.74	3.58	7.40	1.14	0.21	2.60
PLS-88-177-02-B		63.70	0.43	14.80	3.53	0.05	2.22	2.86	8.15	1.42	<0.01	0.86
PLS-88-178-01-B		63.40	0.34	15.40	3.85	0.07	1.99	4.15	5.29	1.68	<0.01	1.35
PLS-88-179-02-B		61.10	0.44	16.40	4.86	0.12	2.49	4.84	4.86	1.42	0.19	1.19
PLS-88-180-08-B		60.30	0.66	13.90	5.06	0.08	3.58	7.78	4.53	1.44	<0.01	1.38

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PROJECT: LAC SHORT

SAMPLE NUMBER	ELEMENT UNITS	Total PCT	Cu PPM	Zn PPM	Ag PPM	As PPM	Zr PPM	Au PPB
PLS-88-175-15-B		100.03	18	49	<0.1	<2	79	<5
PLS-88-176-02-B		99.19	6	52	0.2	<2	107	25
PLS-88-177-02-B		98.02	9	30	<0.1	<2	82	<5
PLS-88-178-01-B		97.52	25	26	<0.1	2	78	<5
PLS-88-179-02-B		97.91	28	34	<0.1	<2	68	<5
PLS-88-180-08-B		98.71	22	19	<0.1	<2	63	<5

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REPORT: 089-50467.4

PROJECT: LAC SHORT PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	CO2 PCT
PLS-88-175-15-B		1.02
PLS-88-176-02-B		1.78
PLS-88-177-02-B		0.34
PLS-88-178-01-B		0.54
PLS-88-179-02-B		0.13
PLS-88-180-08-B		0.35

Joe German, Chief Assayer

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Geochemical Lab Report

REPORT: 089-50639.0

PROJECT: LAC SHORT PAGE 1A

SAMPLE NUMBER	ELEMENT UNITS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3* PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	K2O PCT	P2O5 PCT	LOI PCT
PLS-89-181-11-B		64.70	0.11	18.20	1.75	0.01	1.39	2.66	6.20	1.16	0.10	1.94
PLS-89-182-12-B		65.90	0.12	16.60	0.82	0.01	0.69	2.95	5.76	0.73	<0.01	4.04
PLS-89-183-06-B		66.70	0.02	15.80	1.18	0.04	0.50	3.18	6.15	0.74	<0.01	3.17
PLS-89-184-19-B		64.40	0.03	17.90	1.58	0.02	0.39	2.90	6.68	1.34	0.11	3.23
PLS-89-185-25-B		65.50	0.02	17.70	0.64	<0.01	0.56	3.71	6.35	0.87	<0.01	3.48
PLS-89-186-08-B		62.40	0.03	17.90	1.53	0.02	1.14	4.34	5.62	1.08	0.16	4.77
PLS-89-187A-20-B		57.50	0.24	18.70	3.27	0.05	3.50	5.34	4.77	1.28	0.08	3.52
PLS-89-188-20-B		66.10	0.02	18.80	1.77	0.02	1.51	0.95	5.29	1.11	<0.01	2.23

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REPORT: 089-50639.0

PROJECT: LAC SHORT

SAMPLE NUMBER	ELEMENT UNITS	Total PCT	Cu PPM	Zn PPM	Ag PPM	As PPM	Zr PPM	Au PPB
PLS-89-181-11-B		98.23	44	12	0.1	<2	41	<5
PLS-89-182-12-B		97.62	10	8	<0.1	<2	38	<5
PLS-89-183-06-B		97.48	8	14	<0.1	<2	30	39
PLS-89-184-19-B		98.58	158	12	<0.1	4	40	8
PLS-89-185-25-B		98.83	8	7	<0.1	<2	36	<5
PLS-89-186-08-B		98.99	8	13	0.1	<2	37	<5
PLS-89-187A-20-B		98.25	6	24	<0.1	<2	38	<5
PLS-89-188-20-B		97.80	95	15	<0.1	<2	37	5

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REPORT: 089 56609.4

PROJECT: LAC SHORT

SAMPLE NUMBER	ELEMENT UNITS	CO2 PCT
PLS-89-101-11-B		0.75
PLS-89-102-12-B		2.99
PLS-89-103-06-B		2.64
PLS-89-104-19-B		1.75
PLS-89-105-35-B		2.40
PLS-89-106-09-B		3.06
PLS-89-107A-20-B		1.30
PLS-89-108-20-B		0.44

Joe Herman, Chief Assayer

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Geochemical Lab Report

REPORT: 089-50751.0

PROJECT: LAC SHURT PAGE 1A

SAMPLE NUMBER	ELEMENT UNITS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3* PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	K2O PCT	P2O5 PCT	LOI PCT
PLS89-189-01-B		40.70	0.06	8.70	18.20	0.80	4.14	11.00	0.22	0.07	0.10	13.66
PLS89-190-02-B		47.60	0.04	10.60	14.20	0.43	2.75	10.00	1.25	0.29	<0.01	11.64
PLS89-191-02-B		65.10	0.02	14.50	1.81	0.05	0.91	6.01	4.04	1.31	<0.01	5.82
PLS89-192-02-B		63.00	0.08	16.00	2.60	0.07	0.81	4.55	2.73	1.64	0.09	5.62
PLS89-193-13-B		49.20	0.93	13.90	13.80	0.21	6.69	9.35	1.81	0.04	<0.01	2.36
PLS89-194-08-B		50.20	1.38	14.60	10.10	0.15	7.43	6.55	3.54	1.40	0.78	3.90
PLS89-195-14-B		50.80	0.74	16.60	13.10	0.61	5.62	8.34	0.73	0.01	0.04	3.67
PLS89-196-03-B		44.70	0.65	15.10	11.80	0.21	8.11	9.93	0.50	0.05	0.04	8.01
PLS89-197-07-B		45.30	0.09	13.60	11.30	0.32	2.67	11.10	2.53	0.32	0.16	10.53
PLS89-198-05-B		49.90	0.98	14.10	8.85	0.21	6.26	10.40	0.71	0.01	<0.01	6.97
PLS89-199-04-B		45.30	0.21	13.30	12.10	0.22	6.04	9.57	0.75	0.62	<0.01	10.88
PLS89-200-05-B		41.00	0.09	13.50	10.30	0.25	3.68	13.20	1.02	0.17	0.15	14.22
PLS89-201-02-B		49.50	1.09	13.50	14.50	0.22	5.54	6.55	2.89	0.26	0.01	3.96
PLS89-202-04-B		48.30	0.89	14.50	10.60	0.16	6.44	8.71	3.20	1.11	0.30	6.05
PLS89-203-03-B		46.40	0.68	14.00	10.90	0.19	6.88	7.83	3.14	0.06	0.08	9.07
PLS89-204-02-B		46.00	0.81	12.10	11.40	0.17	7.11	9.70	3.29	0.20	0.22	9.37

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PROJECT: LAC SHORT

SAMPLE NUMBER	ELEMENT UNITS	Total PCT	Cu PPM	Zn PPM	Ag PPM	As PPM	Zr PPM	Au PPB
PLS89-189-01-B		97.65	67	97	<0.1	15	27	12
PLS89-190-02-B		98.81	115	100	0.2	22	31	6
PLS89-191-02-B		99.58	153	20	0.3	2	40	<5
PLS89-192-02-B		97.19	53	35	0.1	3	71	<5
PLS89-193-13-B		98.29	116	62	<0.1	3	47	<5
PLS89-194-08-B		100.02	73	82	<0.1	5	242	<5
PLS89-195-14-B		100.26	103	82	0.3	13	34	<5
PLS89-196-03-B		99.11	78	73	<0.1	<2	34	<5
PLS89-197-07-B		97.92	105	87	<0.1	<2	54	<5
PLS89-198-05-B		98.38	120	69	<0.1	2	59	<5
PLS89-199-04-B		98.98	29	86	0.3	<2	58	<5
PLS89-200-05-B		97.57	84	69	<0.1	2	36	<5
PLS89-201-02-B		98.01	88	102	<0.1	3	60	<5
PLS89-202-04-B		100.27	76	81	<0.1	4	93	<5
PLS89-203-03-B		99.24	63	102	<0.1	2	47	<5
PLS89-204-02-B		100.38	104	89	<0.1	4	68	<5

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REPORT: 089-50751.4

PROJECT: LAC SHORT

PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	CO2 PCT
PLS89-189-01-B		12.96
PLS89-190-02-B		12.11
PLS89-191-02-B		4.55
PLS89-192-02-B		3.74
PLS89-193-13-B		0.32
PLS89-194-08-B		0.97
PLS89-195-14-B		0.04
PLS89-196-03-B		4.10
PLS89-197-07-B		8.57
PLS89-198-05-B		3.34
PLS89-199-04-B		6.73
PLS89-200-05-B		10.82
PLS89-201-02-B		1.36
PLS89-202-04-B		3.46
PLS89-203-03-B		5.45
PLS89-204-02-B		6.39

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Geochemical Lab Report

REPORT: 089-50891.0

PROJECT: LAC SHORT

SAMPLE NUMBER	ELEMENT UNITS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3* PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	K2O PCT	P2O5 PCT	LOI PCT
PLS-89-205-02-B		46.00	0.89	14.10	13.20	0.35	7.62	7.49	3.26	0.18	0.06	7.43
PLS-89-206-03-B		46.90	0.93	14.70	12.80	0.20	7.60	9.87	2.76	0.18	0.12	3.00
PLS-89-207-11-B		57.40	0.09	15.00	5.09	0.09	3.01	5.76	3.12	1.58	0.18	7.23
PLS-89-208-11-B		53.30	0.66	13.90	8.50	0.10	9.85	2.00	5.09	0.54	0.31	4.15
PLS-89-209-13-B		36.00	0.04	7.25	8.62	0.16	14.10	8.43	0.60	0.60	0.13	22.08
PLS-89-210-14-B		57.80	0.04	9.87	15.60	0.10	1.27	4.60	1.98	0.94	0.14	5.44
PLS-89-210-15-B		56.70	0.04	12.90	9.47	0.12	2.09	6.20	3.21	1.24	0.08	5.16
PLS-89-211-05-B		61.80	0.08	9.68	6.97	0.18	1.83	9.86	2.25	0.67	0.32	6.71
PLS-89-212-12-B		54.60	0.12	14.10	7.60	0.15	1.56	7.21	3.93	1.33	0.16	7.52
PLS-89-213-04-B		45.40	0.25	13.40	11.60	0.24	4.92	9.23	2.34	0.65	0.20	12.69
PLS-89-214-09-B		51.00	1.85	13.40	12.60	0.26	4.38	7.72	3.10	0.24	0.22	6.13
PLS-89-215-08-B		60.00	0.08	15.10	3.81	0.07	2.77	4.92	5.31	1.86	0.16	6.27
PLS-89-216-14-B		65.00	0.09	12.80	6.68	0.05	0.75	3.89	2.66	2.41	0.14	4.47
PLS-89-217-08-B		48.30	0.98	11.30	8.75	0.15	9.15	8.16	2.39	2.60	0.59	8.32
PLS-89-218-05-B		53.60	0.13	13.40	6.77	0.10	4.75	6.55	3.94	1.13	0.18	9.35
PLS-89-219-01-B		60.10	0.65	16.00	6.20	0.07	2.85	4.57	5.50	1.51	0.19	1.00
PLS-89-220-02-B		52.00	0.15	13.00	7.11	0.16	1.80	7.55	6.03	2.56	0.19	6.79
PLS-89-221-09-B		61.90	0.31	15.20	5.76	0.09	2.33	3.90	2.97	2.33	0.23	4.33
PLS-89-222-02-B		64.80	0.09	14.40	5.01	0.10	1.90	4.19	4.36	2.23	0.17	4.10
PLS-89-223-04-B		57.40	0.65	15.30	7.58	0.11	4.41	4.55	3.58	2.81	0.19	2.85
PLS-89-224-01-B		60.40	0.59	14.00	6.02	0.15	2.75	5.59	4.84	1.43	0.27	2.64
PLS-89-225-06-B		58.40	0.57	15.60	6.96	0.09	4.16	4.99	3.67	2.57	0.16	3.83
PLS-89-226-02-B		57.50	0.55	14.50	6.95	0.16	2.73	5.46	4.25	1.48	0.31	3.79
PLS-89-227-02-B		62.90	0.59	14.30	5.85	0.09	2.70	4.60	3.69	1.29	0.20	2.63
PLS-89-228-03-B		63.70	0.56	14.30	5.49	0.09	2.15	5.73	3.89	1.33	0.19	1.90
PLS-89-229A-07-B		60.20	0.08	13.90	5.60	0.09	2.52	6.21	3.11	1.93	0.18	6.23
PLS-89-230-06-B		54.40	0.11	14.90	7.26	0.19	2.57	9.11	1.55	2.19	0.13	8.97
PLS-89-231-02-B		60.50	0.10	15.20	5.64	0.09	2.65	5.76	3.55	1.52	0.09	6.21
PLS-89-232-06-B		61.70	0.10	14.10	5.62	0.08	2.87	4.34	4.66	1.48	0.12	4.57
PLS-89-233-03-B		64.10	0.54	13.80	5.40	0.10	2.64	5.09	3.90	1.18	0.04	3.72
PLS-89-234-02-B		62.60	0.63	16.20	5.02	0.08	2.86	4.49	4.12	1.47	0.28	1.50
LS-89-01-01-B		49.00	0.26	11.60	16.50	0.30	2.48	5.32	5.61	2.32	0.23	4.70
LS-89-02-03-B		51.80	0.37	13.20	6.34	0.11	5.60	8.14	5.39	1.08	0.17	7.39
LS-89-03-03-B		41.30	0.08	13.30	9.96	0.14	8.94	11.60	0.28	1.66	<0.01	13.24

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Geochemical Lab Report

REPORT: 089-50891.0

PROJECT: LAC SHORT

SAMPLE NUMBER	ELEMENT UNITS	Total PCT	Cu PPM	Zn PPM	Ag PPM	As PPM	Zr PPM	Au PPB
PLS-89-205-02-B		100.58	129	365	<0.1	<2	68	<5
PLS-89-206-03-B		99.06	113	58	<0.1	2	66	<5
PLS-89-207-11-B		98.55	45	71	<0.1	79	124	<5
PLS-89-208-11-B		98.40	70	51	<0.1	24	118	<5
PLS-89-209-13-B		98.01	26	48	<0.1	366	54	<5
PLS-89-210-14-B		97.78	50	113	0.1	77	90	<5
PLS-89-210-15-B		97.21	50	81	<0.1	40	115	<5
PLS-89-211-05-B		100.35	30	94	<0.1	15	110	<5
PLS-89-212-12-B		98.28	46	65	<0.1	<2	147	<5
PLS-89-213-04-B		100.92	52	89	<0.1	3	98	78
PLS-89-214-09-B		100.90	118	106	0.2	<2	142	<5
PLS-89-215-08-B		100.35	26	65	0.1	4	132	<5
PLS-89-216-14-B		98.94	72	67	0.2	70	124	<5
PLS-89-217-08-B		100.69	70	91	<0.1	20	208	5
PLS-89-218-05-B		99.90	49	325	0.3	59	148	<5
PLS-89-219-01-B		98.64	33	57	<0.1	<2	170	<5
PLS-89-220-02-B		97.34	32	56	0.1	2	147	<5
PLS-89-221-09-B		99.35	32	60	<0.1	<2	157	<5
PLS-89-222-02-B		101.35	25	49	0.1	<2	156	5
PLS-89-223-04-B		99.43	74	55	<0.1	<2	131	<5
PLS-89-224-01-B		98.68	17	74	<0.1	<2	157	<5
PLS-89-225-06-B		101.00	10	39	0.2	<2	124	<5
PLS-89-226-02-B		97.68	35	72	0.1	<2	154	<5
PLS-89-227-02-B		98.84	33	68	0.1	<2	148	<5
PLS-89-228-03-B		99.33	31	54	0.3	<2	156	<5
PLS-89-229A-07-B		100.05	38	66	<0.1	<2	136	<5
PLS-89-230-06-B		101.38	29	74	0.2	4	137	<5
PLS-89-231-02-B		101.31	29	65	<0.1	<2	152	<5
PLS-89-232-06-B		99.64	2	76	0.2	<2	155	<5
PLS-89-233-03-B		100.51	32	68	<0.1	<2	169	<5
PLS-89-234-02-B		99.25	33	64	0.2	<2	159	<5
LS-89-01-01-B		98.32	30	179	<0.1	5	135	26
LS-89-02-03-B		99.59	49	79	<0.1	4	125	33
LS-89-03-03-B		100.50	105	56	<0.1	3	49	<5

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REPORT: 089-50891.4

PROJECT: LAC SHORT PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	CO2 PCT
PLS-89-205-02-B		4.12
PLS-89-206-03-B		1.08
PLS-89-207-11-B		6.46
PLS-89-208-11-B		1.05
PLS-89-209-13-B		16.04
PLS-89-210-14-B		4.15
PLS-89-210-15-B		7.07
PLS-89-211-05-B		7.40
PLS-89-212-12-B		6.69
PLS-89-213-04-B		11.48
PLS-89-214-05-B		3.75
PLS-89-215-08-B		5.30
PLS-89-216-14-B		2.90
PLS-89-217-08-B		5.44
PLS-89-218-05-B		8.12
PLS-89-219-01-B		0.11
PLS-89-220-02-B		6.45
PLS-89-221-09-B		2.15
PLS-89-222-02-B		3.11
PLS-89-223-04-B		1.16
PLS-89-224-01-B		1.52
PLS-89-225-06-B		1.56
PLS-89-226-02-B		2.08
PLS-89-227-02-B		1.30
PLS-89-228-03-B		0.92
PLS-89-229A-07-B		4.18
PLS-89-230-06-B		6.55
PLS-89-231-02-B		4.34
PLS-89-232-06-B		2.90
PLS-89-233-03-B		1.98
PLS-89-234-02-B		0.16
PLS-89-01-01-B		5.32
PLS-89-02-03-B		6.30
PLS-89-03-03-B		9.31

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Geochemical Lab Report

REPORT: 089-50865.0

PROJECT: LAC SHORT PAGE 1A

SAMPLE NUMBER	ELEMENT UNITS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3* PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	K2O PCT	P2O5 PCT	LOI PCT
PLS-89-211-05A		65.80	0.03	9.24	6.72	0.17	1.10	8.50	2.35	0.45	0.14	5.39
PLS-89-211-05B		22.70	1.17	2.98	8.35	0.38	14.20	22.30	0.27	1.57	1.53	26.02
PLS-89-217-08A		54.50	0.15	15.20	8.50	0.09	5.95	4.14	3.56	2.21	0.19	6.13
PLS-89-217-08B		30.40	2.73	4.34	10.40	0.26	17.20	16.40	0.14	3.62	1.62	13.63
PLS-89-218-05A		54.90	0.04	14.20	6.26	0.09	4.02	5.81	4.08	1.22	0.27	9.04
PLS-89-218-05B		26.00	1.20	5.03	12.60	0.28	13.40	17.70	0.17	0.51	0.80	23.25

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Geochemical Lab Report

REPORT: 089-50865.0

PROJECT: LAC SHORT

SAMPLE NUMBER	ELEMENT UNITS	Total PCT	Cu PPM	Zn PPM	Ag PPM	As PPM	Zr PPM	Au PPB	TestWt gms
PLS-89-211-05A		99.89	22	77	<0.1	13	101	<5	30.00
PLS-89-211-05B		101.47	70	63	<0.1	4	15	<5	15.00
PLS-89-217-08A		100.62	53	102	<0.1	28	133	5	30.00
PLS-89-217-08B		100.74	100	40	0.2	3	351	<5	30.00
PLS-89-218-05A		99.93	45	181	0.1	52	142	<5	30.00
PLS-89-218-05B		100.94	92	4375	1.1	28	248	<5	30.00

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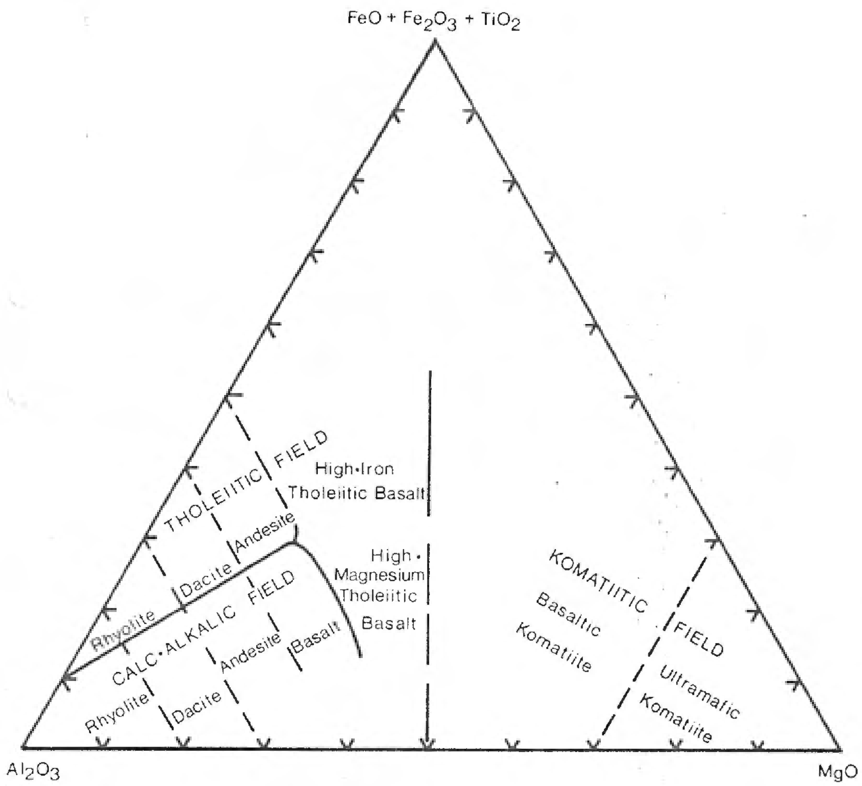
REPORT: 089-50865.4

PROJECT: LAC SHORT

SAMPLE NUMBER	ELEMENT UNITS	CO2 PCT
PLS-89-211-05A		6.03
PLS-89-211-05B		25.38
PLS-89-217-08A		2.79
PLS-89-217-08B		10.44
PLS-89-218-05A		7.64
PLS-89-218-05B		20.17

Joe German, Chief Assayer



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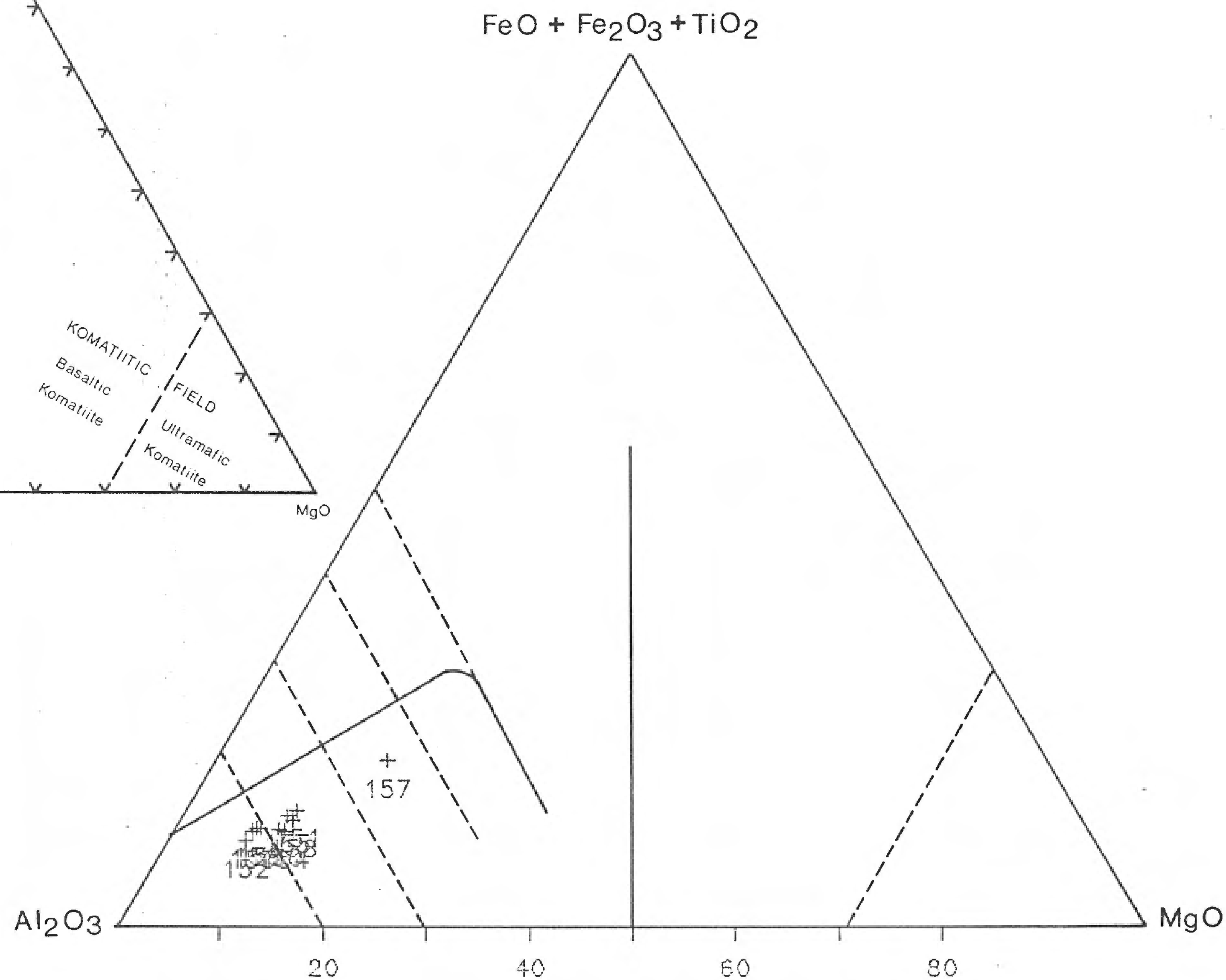

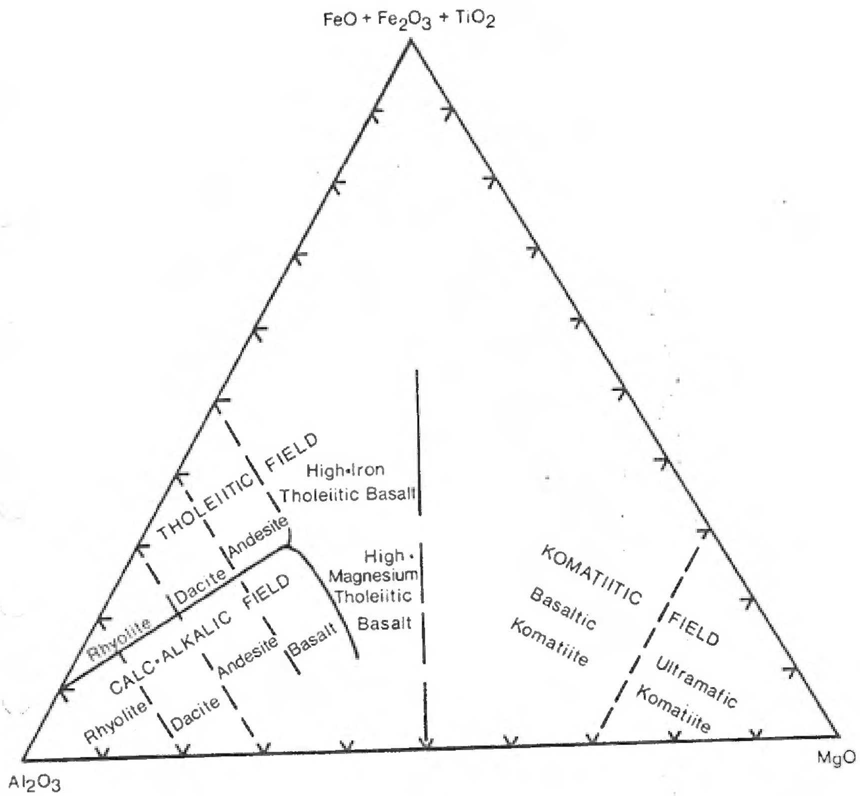

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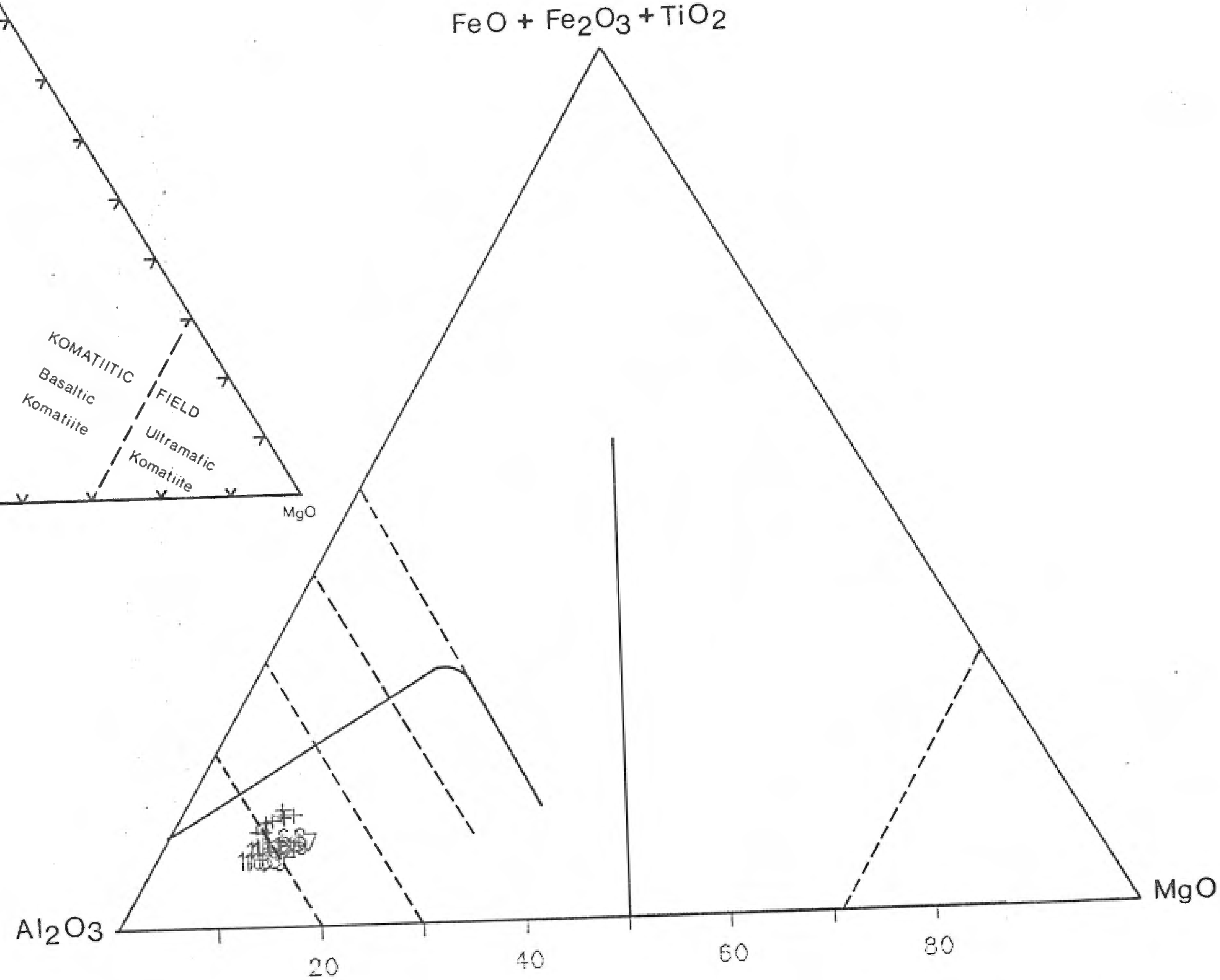

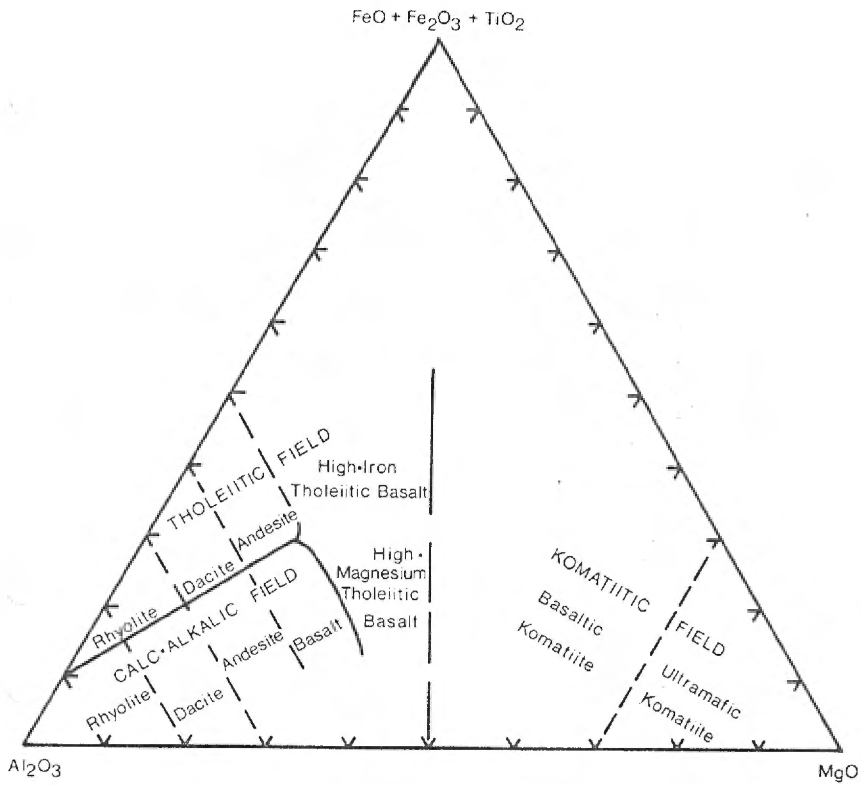

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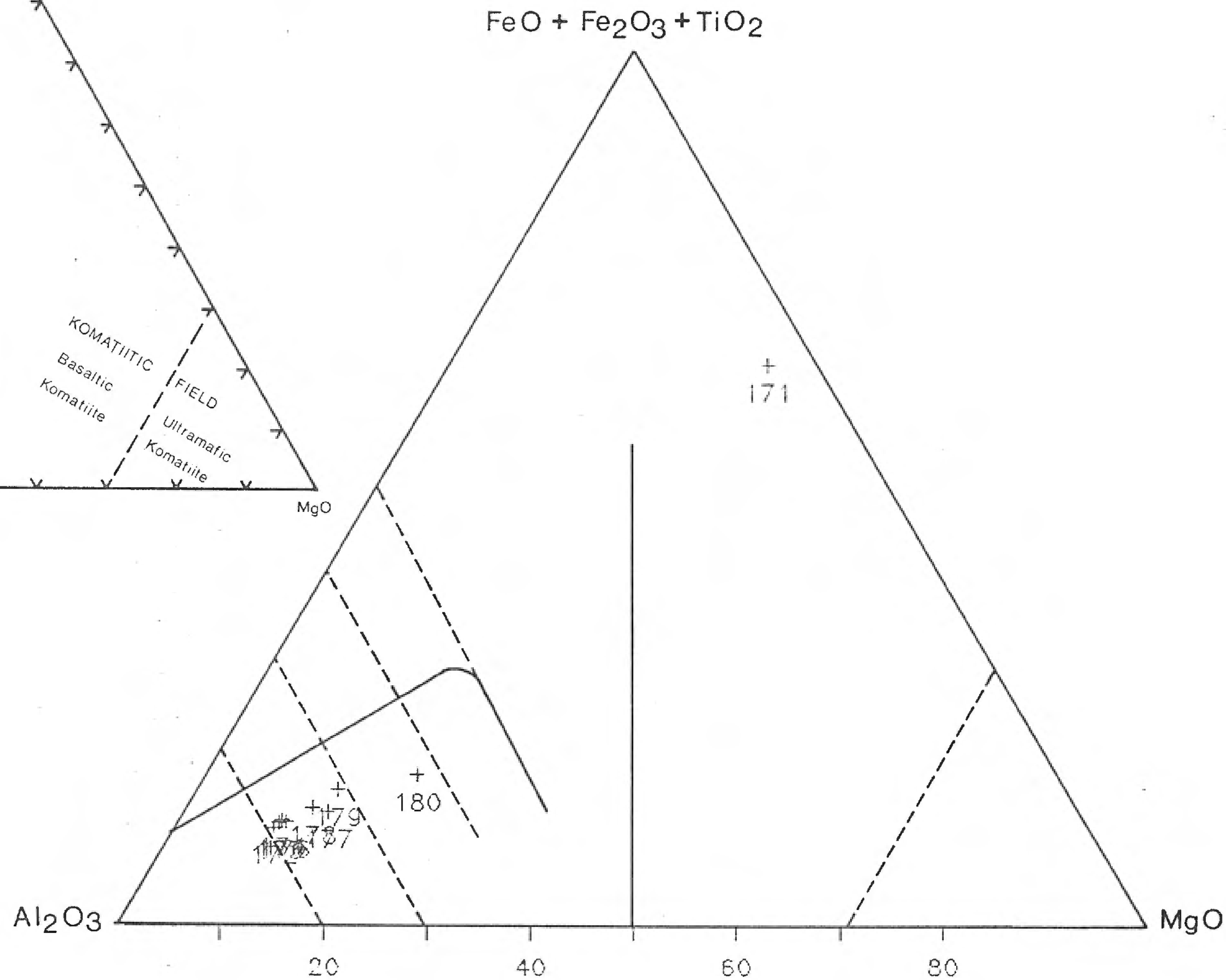

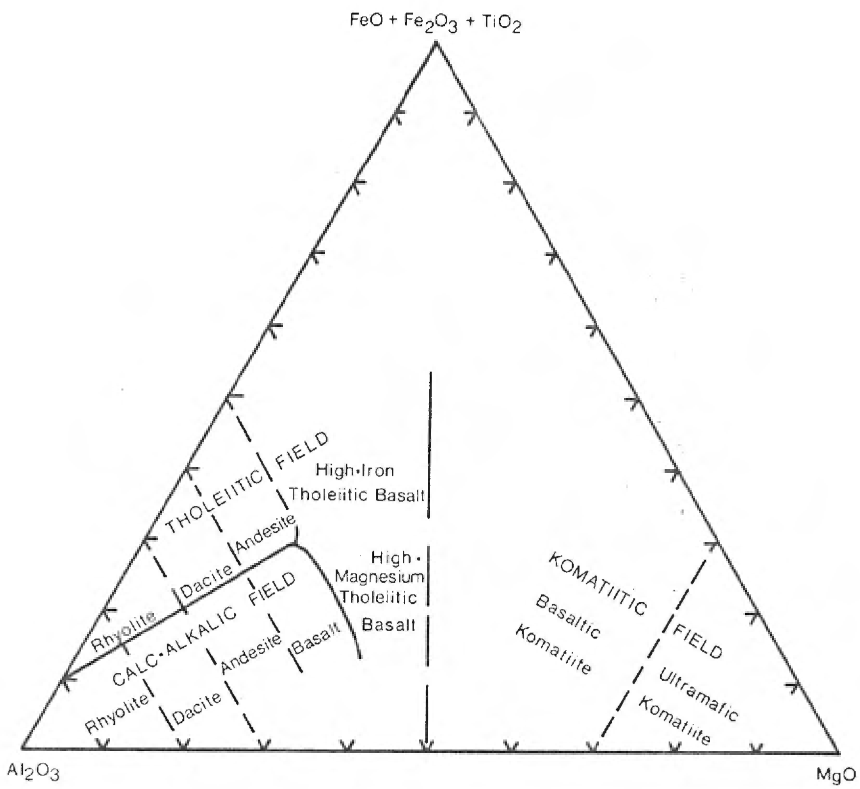

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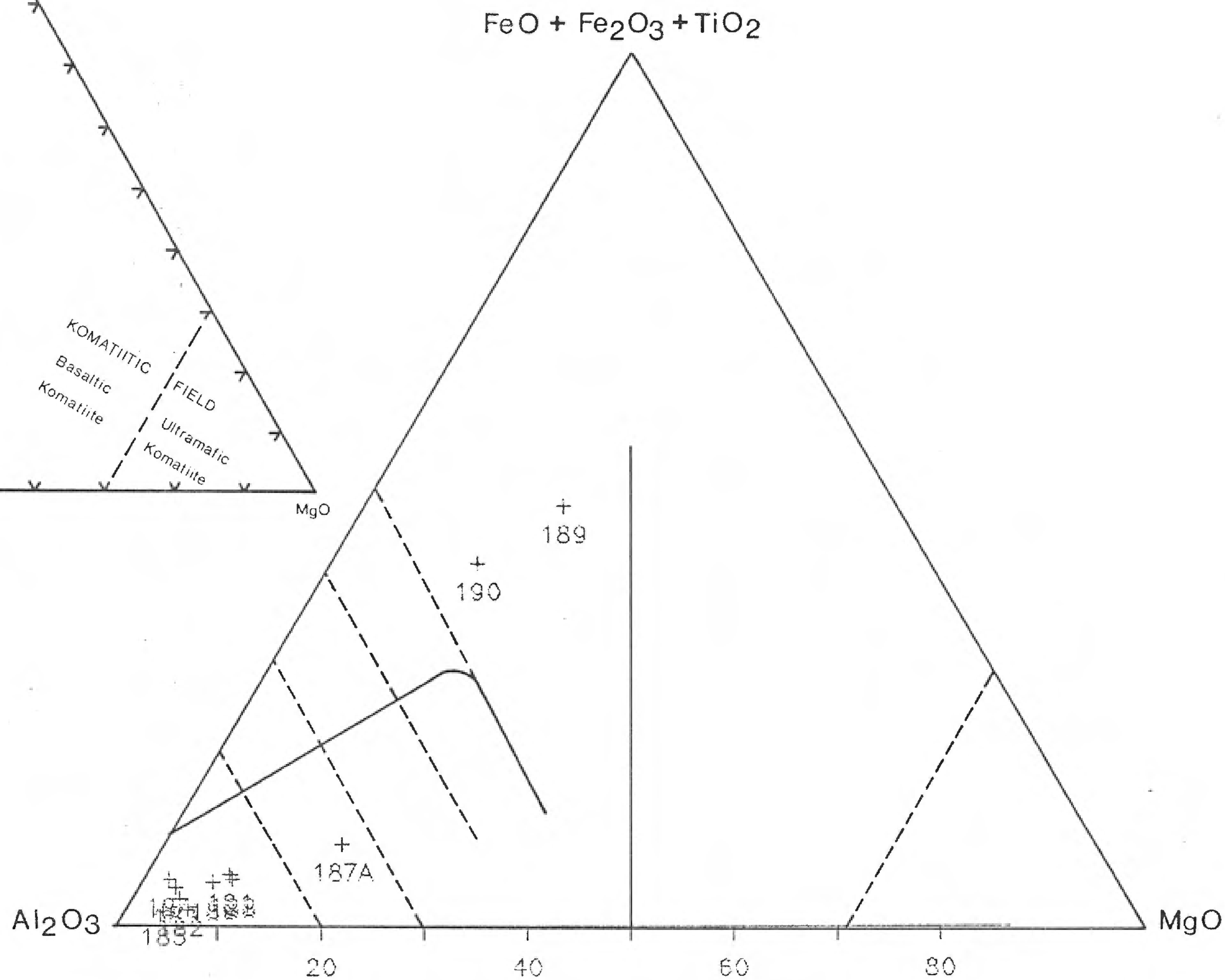

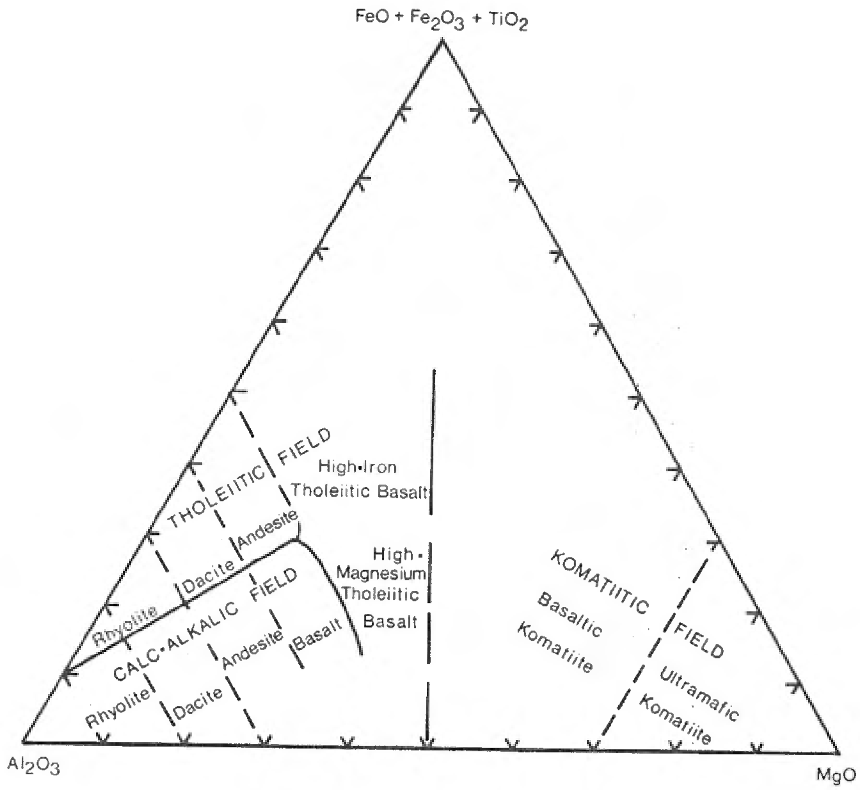

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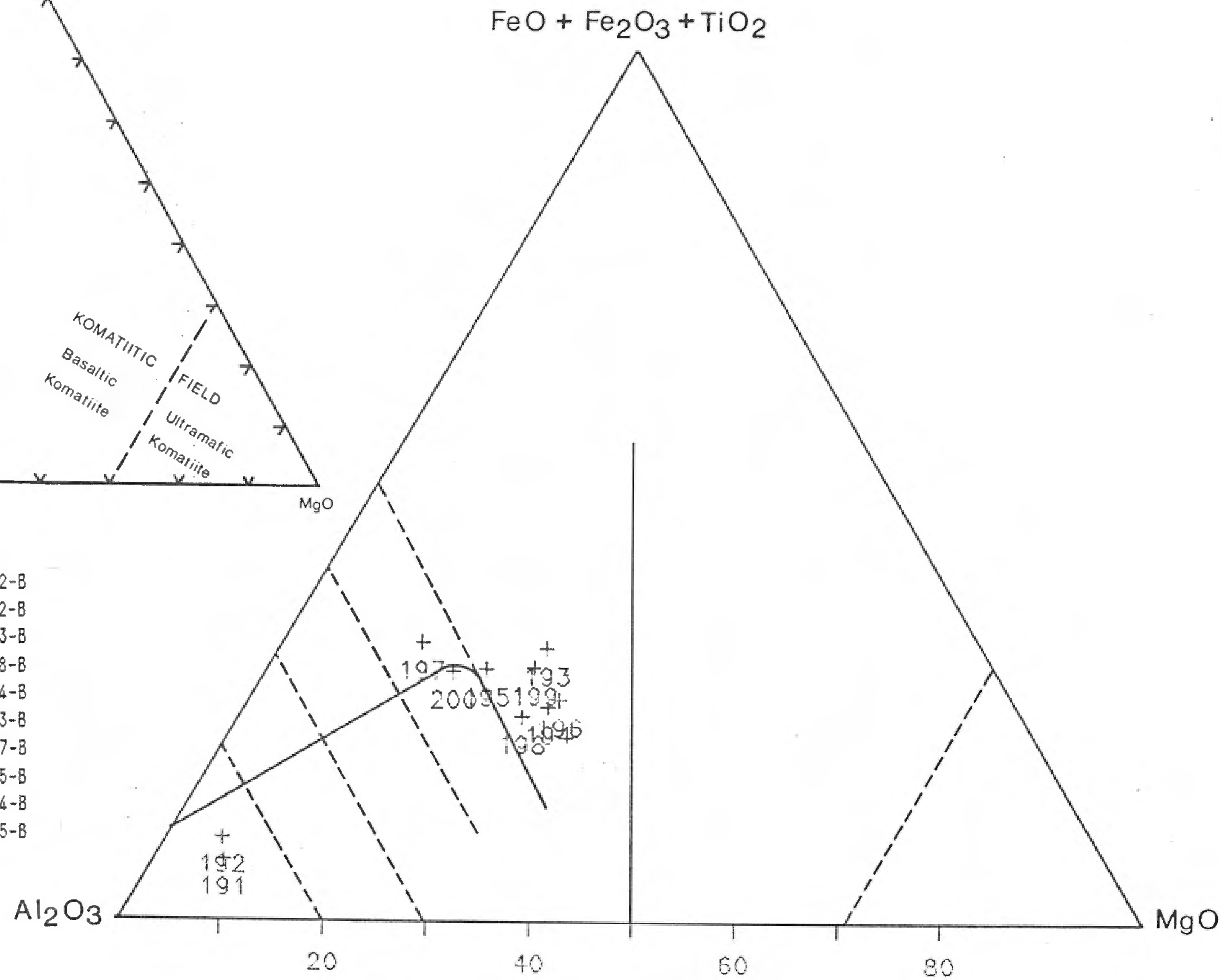

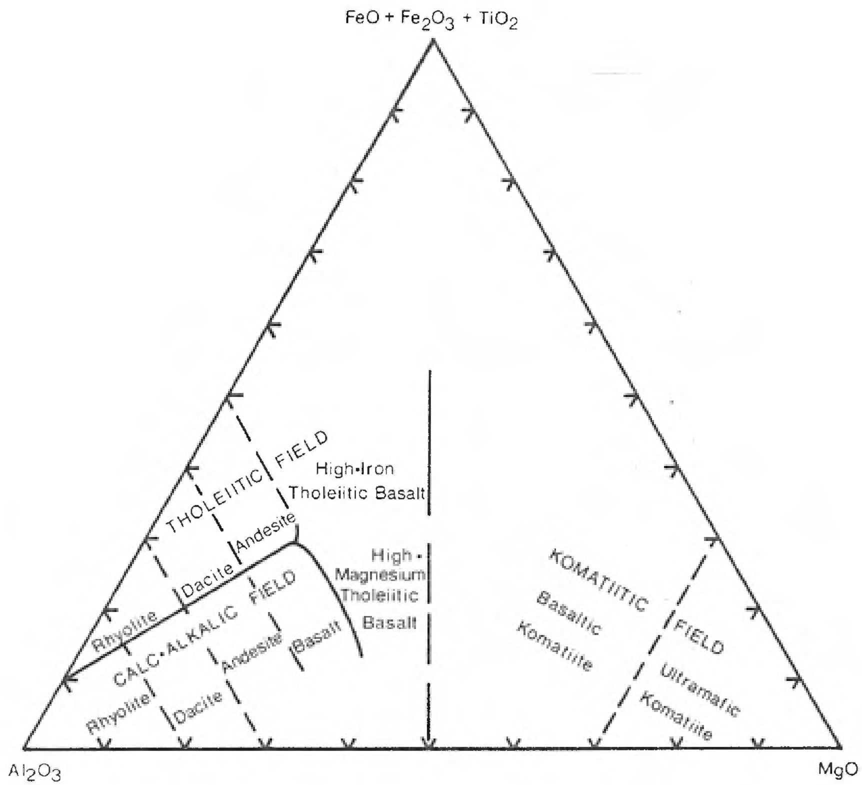

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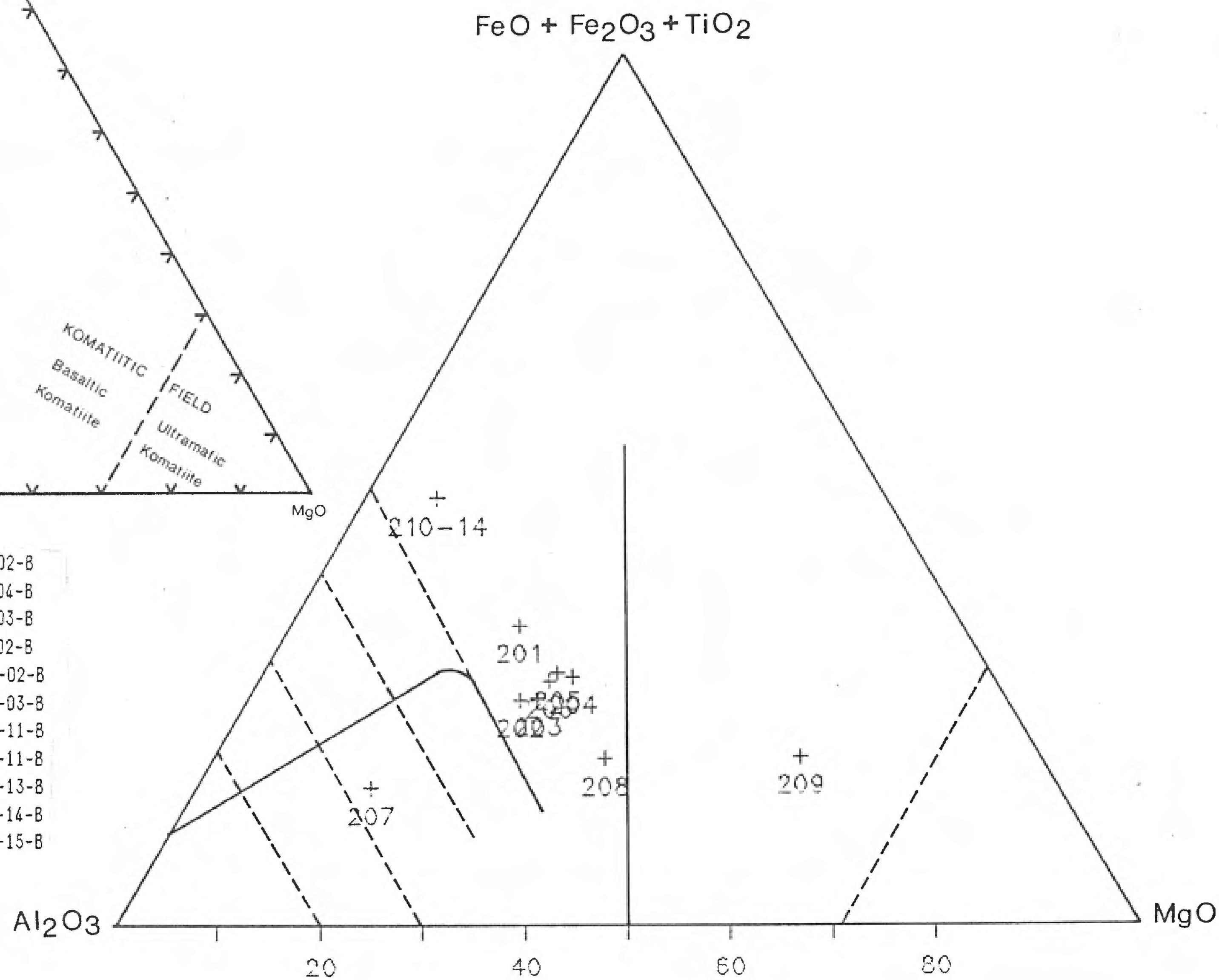

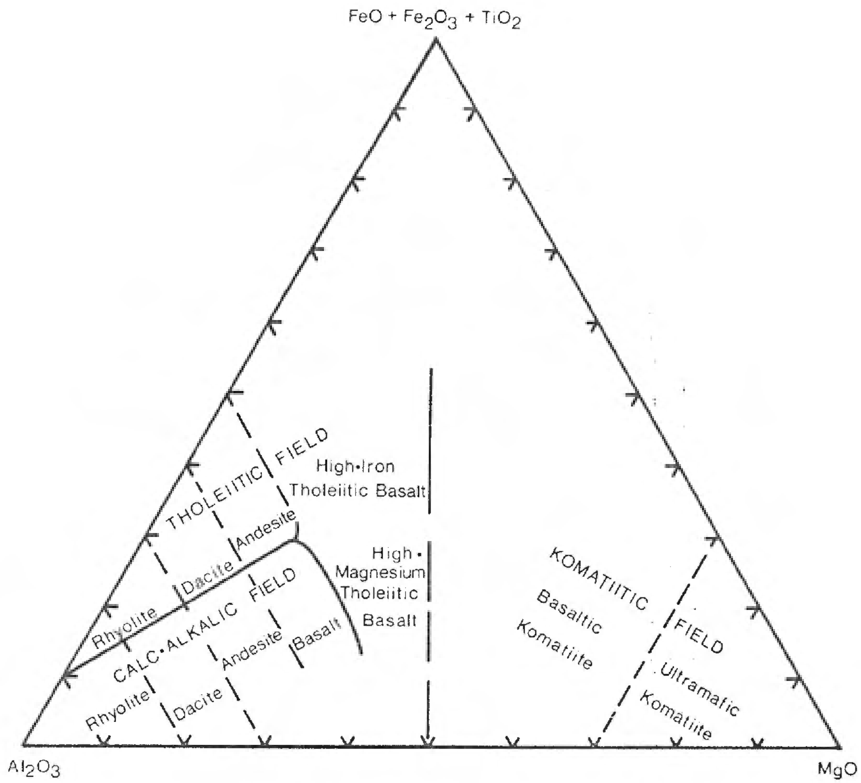

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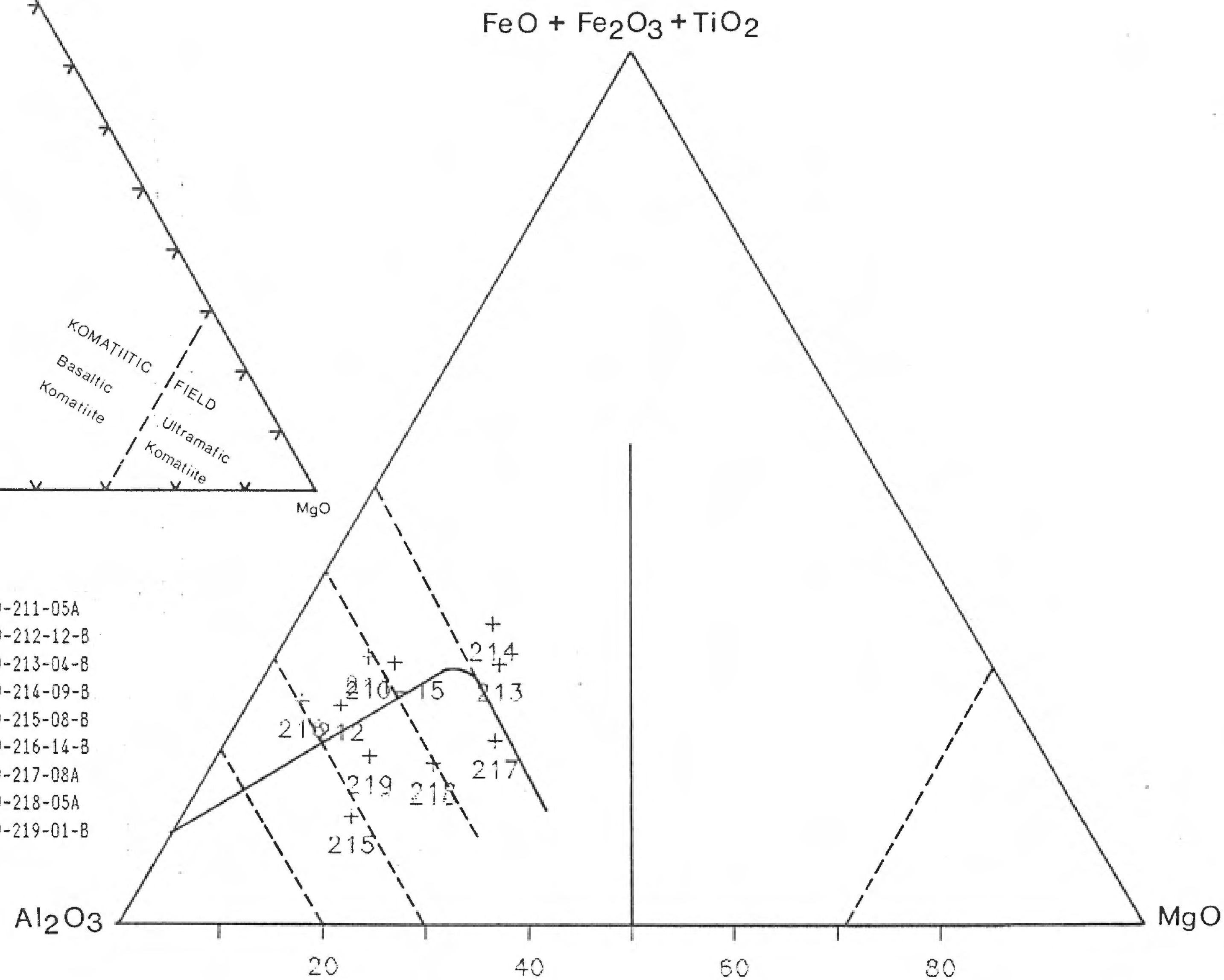

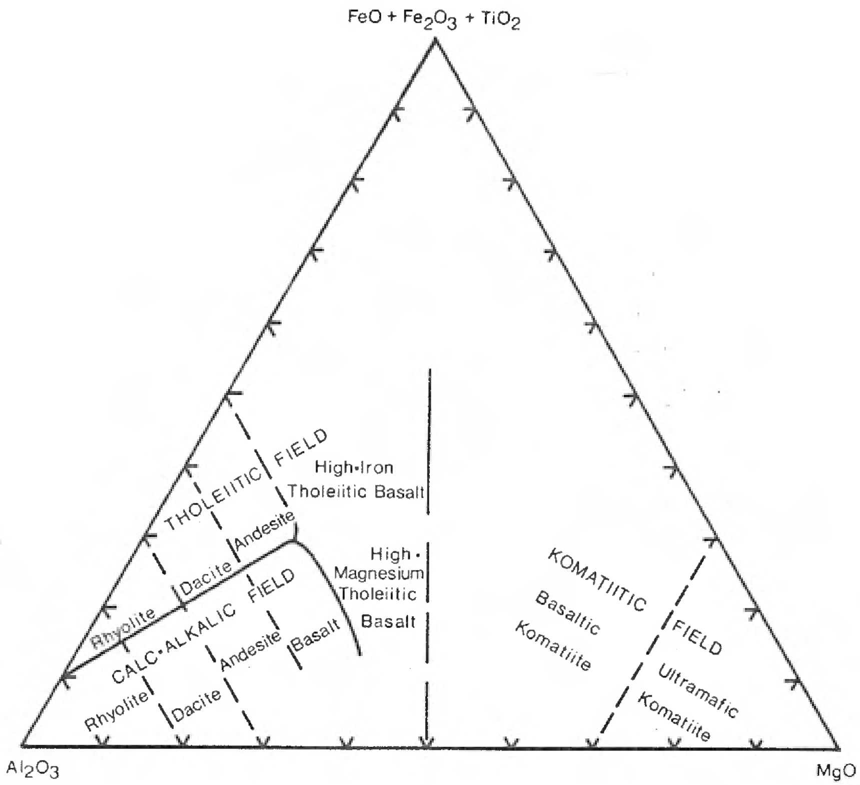

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PLS-89-234-02-B
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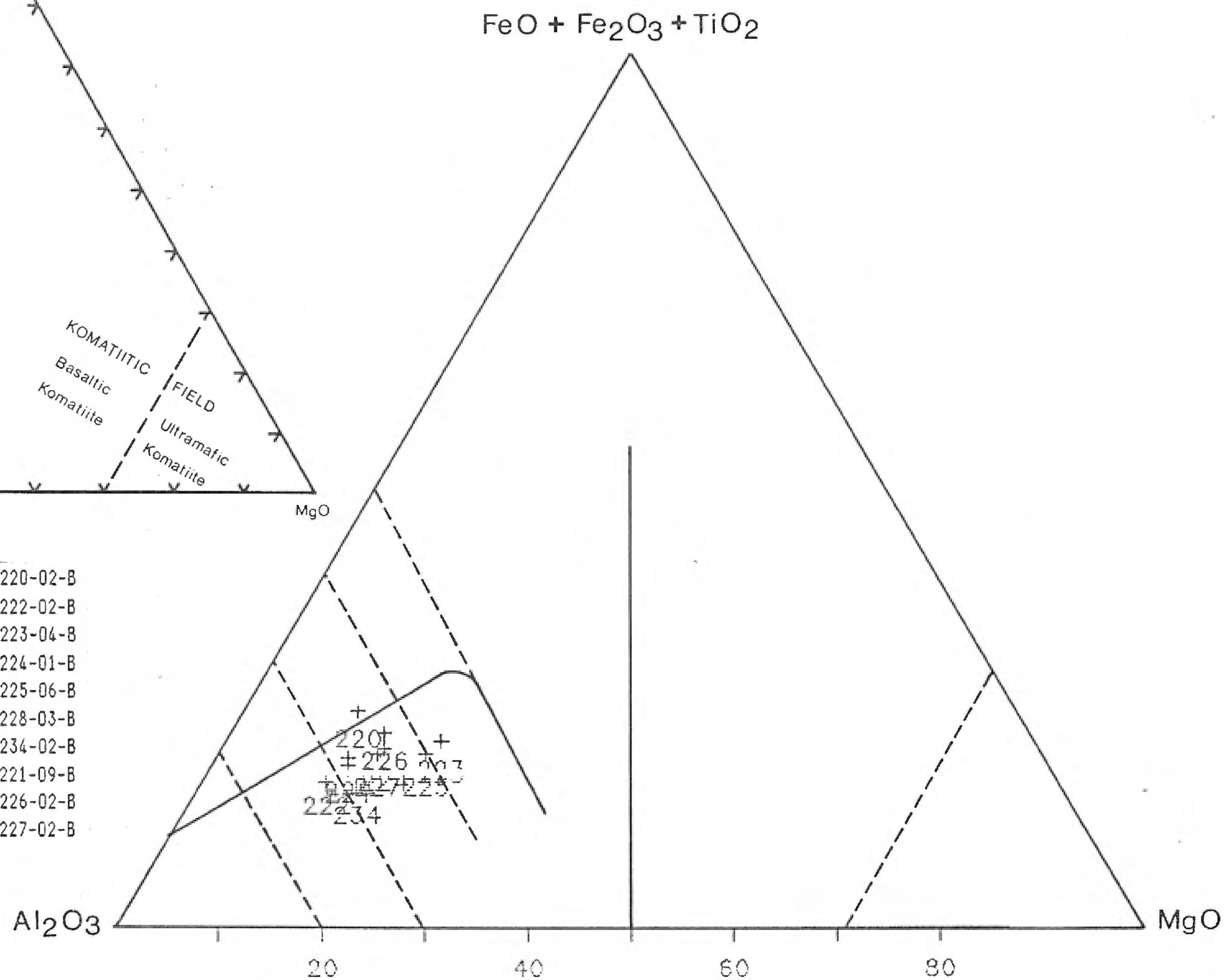
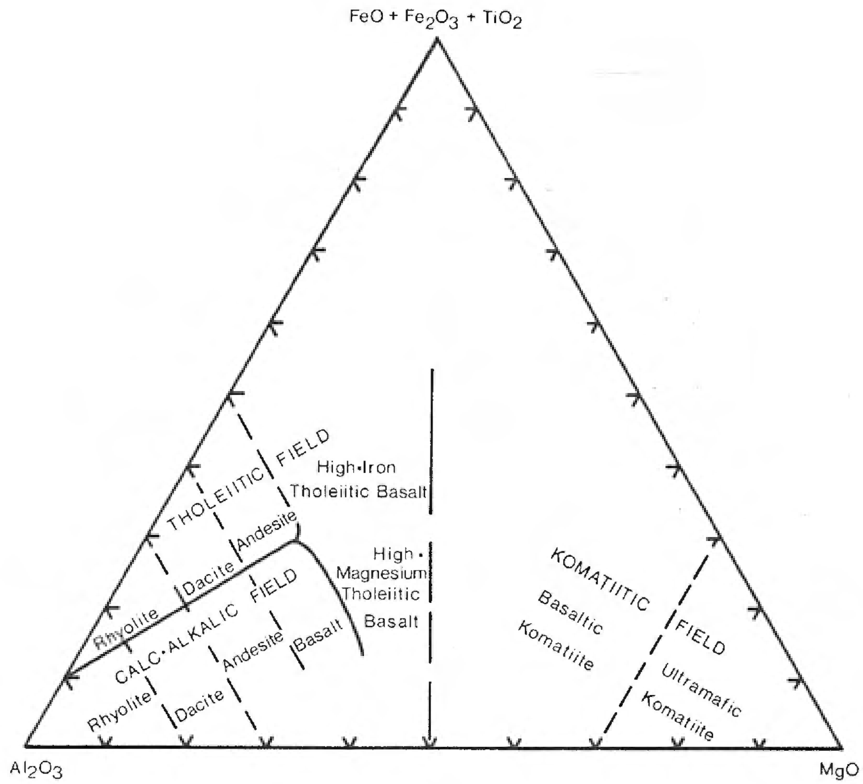
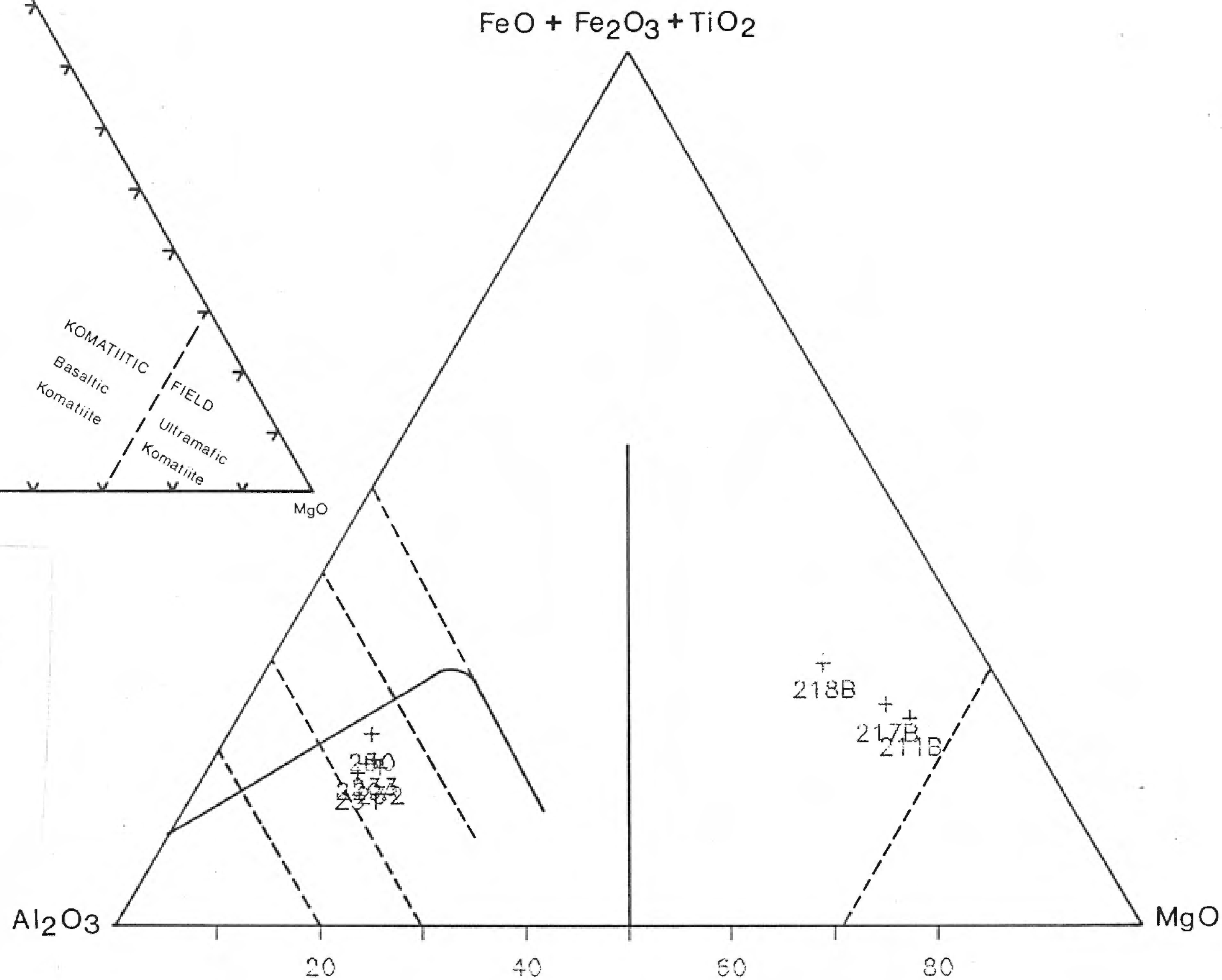
PLS-89-226-02-B
PLS-89-227-02-B





PLS-89-229A-07-
PLS-89-230-06-B
PLS-89-231-02-B
PLS-89-232-06-B
PLS-89-233-03-B
PLS-89-211-05B
PLS-89-217-08B
PLS-89-218-05B



APPENDIX I

BINOCULAR DESCRIPTIONS OF HEAVY MINERAL CONCENTRATES FROM KIMBERLITE-BEARING BEDROCK SAMPLES

Sample No.	Concentrate Mineralogy
PLS-89	
211-08	Large 30 g concentrate. Essentially 100% pyrite grains and composite pyrite-wacke rock chips. Rare stray almandine grains (and other heavy minerals such as epidote) represent lab carryover. No pyrope.
217-08	Small 2 g concentrate. 60% pyrite grains and composite pyrite-sediment rock chips. 30% medium green mineral with or without pyrite -- probably chloritoid. 5-10% phlogopite grains and composite phlogopite-kimberlite rock chips. 2-3% black oxides associated with kimberlite -- includes ilmenite but grains locally have octahedral shape suggesting spinel. Stray almandine more obvious than in No. 211 due to small size of concentrate. No pyrope.
218-05	Small 1 g concentrate. 60% pyrite grains and pyritic rock chips. 20% sphalerite grains and sphalerite-bearing rock chips. 15% black oxide, appears to include both ilmenite and octahedral spinel. 5% stray almandine-epidote-pyroxene -hornblende contamination. No pyrope.