SILVERTIP PROJECT

1997 Summary Report

Volume 4

Geological Mapping, Seismic Surveying, and Diamond Drilling

56°56'N and 130°15'W
NTS sheet 104/O/16W
Liard Mining Division, British Columbia

BULL 1,2,4,7,8,10-12,15-28
CLIMAX 1-16
POST 1-5, 11-16
WAY 1-12, 16-27, 29-35Fr
BETH 1-4, RENEE 1, STAR 2-3, TOOTS 4

Owner: Silvertip Mining Corporation
Operator: Imperial Metals Corporation

April 9, 1998 **Chris Rees**

This report consists of the following Volumes;

Volume 1: Text (including Tables, Figures, Photos and Maps)

Volume 2: Appendix A - 1997 Diamond and Reverse Circulation Drill Core Logs

Volume 3: Appendix B - Silvertip Project Assay Certificates

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Appendix D - Silvertip Seismic - Final Report
Appendix E - Geology and Resource Estimation
Appendix F - Rock Quality Data
Appendix G - A Preliminary Analysis of Lithogeochemical Data from the Silvertip Project
Appendix H - Silvertip Project Quality Control Data
Appendix I - Silvertip Project History of Previous Work

Appendix C

Silvertip Petrographic Analysis

Vancouver Petrographics Ltd.

8080 GLOVER ROAD, LANGLEY, B.C. V3A 4P9
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Report # 970890 for:

Chris Rees,
Imperial Metals Corporation,
420 - 355 Burrard Street,
Vancouver B.C.,

December, 1997

Project: **Silvertip**

Samples: **7-1, 23-5, 27-3, 33-1, 83-40, 84-154, 85-144A, 85-144B, 85-177, 85-245, 90-321, 97-14, 97-15, 97-39**

Summary:

Mineral Identification

Jim McLeod of Cominco (who has worked on this deposit for Cominco and others) briefly examined two sections in reflected light. His previous studies indicated that the major sulfosalts in the deposit are boulangerite ($Pb_5Sb_4S_{11}$) and jamesonite ($Pb_4FeSb_5S_{14}$). This was confirmed by this study. The presence of stannite, pyrargyrite, and minor freibergite were confirmed by S.E.M. analysis.

Summary Descriptions

A: Host Rocks

Sample 23-5 is a quartz-rich wacke containing subrounded, somewhat recrystallized fine, detrital quartz grains, much less abundant ones of chert, and minor ones of quartz-sericite in a patchy matrix dominated by extremely fine grained quartz, with much less abundant sericite and minor pyrite. Metamorphism is in the greenschist facies.

Sample 27-3 is a pebble conglomerate containing pebbles of chert, mudstone, quartz-rich metamorphic rocks, minor quartz grains, and abundant fine sand grains in a foliated groundmass of quartz and minor sericite and limonite. Pyrite forms disseminated porphyroblasts, many of which were leached from the rock.

Sample 33-1 is a slightly metamorphosed mudstone containing minor, extremely fine detrital quartz grains in a groundmass dominated by sericite with lesser quartz/plagioclase. A few bands (beds) are dominated by extremely fine grained quartz with lesser sericite. Disseminated pyrite grains are replaced by jarosite. Sericite-rich beds were recrystallized along closely spaced seams subparallel to the compositional banding.

Sample 97-14 has a slightly foliated texture and relatively uniform silicate texture, suggesting that it is an altered high-level dyke. No distinctive original textures were recognized. The rock is dominated by sericite with much less abundant quartz and disseminated pyrite, and moderately abundant lenses and patches of Ti-oxide/leucoxene. The abundance of the latter suggests that the original rock was andesite. Pyrite is concentrated strongly in lenses parallel to foliation; in some it is associated with moderately abundant quartz. A few veinlets are of quartz with minor limonite.

Sample 97-15 is a micritic, light to medium grey limestone which was recrystallized in irregular patches and veinlike zones to white to cream, fine to medium grained aggregates. It contains several recrystallized, stylolitic veinlets of calcite-limonite.

B: Massive Sulfides and Related Rocks

Sample 7-1 is well banded, with a few, finer grained bands dominated by quartz interlayered with more abundant, coarser grained bands of sphalerite-quartz with much less abundant, disseminated pyrite and patches of galena. Chalcopyrite forms exsolution blebs in some sphalerite grains. Galena is concentrated in one layer. A few subparallel veinlets of sphalerite-(galena-chalcopyrite) cut the two widest quartz-rich bands at a high angle to compositional banding. In the hand sample, the widest quartz-rich band is discontinuous, and may have been offset along a shear parallel to the sphalerite-rich veinlets which cut it. No barite was identified.

Sample 83-40 is dominated by replacement patches of sphalerite and of pyrite intergrown with interstitial calcite and minor quartz. Minor sulfides include chalcopyrite and galena, mainly as inclusions in pyrite and sphalerite. Veinlets of pyrite cut sphalerite. The rock was brecciated moderately in irregular patches and seams, and fragments healed by calcite.

Sample 84-154 contains fragments averaging 1-2 mm in size of cherty argillite and fragments up to several mm across of massive, pyrite-sphalerite-rich sulfide. These are set in a matrix dominated by quartz and locally by calcite, with disseminated patches of pyrite and lesser sphalerite and galena. A late replacement or vein zone is of quartz-galena-pyrite-(sphalerite-calcite).

Sample 85-144A is a complex massive sulfide dominated by galena with less abundant pyrite, boulangerite, and sphalerite, and much less abundant stannite, jamesonite, arsenopyrite, and quartz.

Sample 85-144B is a complex massive sulfide dominated by pyrite with patches of sphalerite-(pyrite) and others dominated by boulangerite and lesser jamesonite. One large patch is of galena. Gangue is quartz and calcite. One patch contains elongate jamesonite grains disseminated in calcite.

Sample 85-177 is a massive sulfide dominated by pyrite galena, and sphalerite, with lesser patches of boulangerite, and minor stannite and jamesonite. Gangue minerals include interstitial patches of quartz and minor calcite.

Sample 85-245 is a coarse massive sulfide dominated by patches of galena and of sphalerite, and finer grained zones containing these minerals intergrown with pyrite and quartz. Minor to trace minerals include stannite, pyrargyrite, chalcopyrite, tetrahedrite, and freibergite.

Sample 90-321 contains elongate patches in one-third of the section of extremely fine grained limestone. Bordering the limestone are replacement zones rich in pyrite, commonly showing a sieve-textured intergrowth with relic calcite. A discontinuous band between the pyrite-rich zone and the main sulfide replacement zone is characterized by recrystallized calcite and sulfide patches dominated by galena with much less pyrite, chalcopyrite, and sphalerite, and trace stannite. The main replacement zone is dominated by fine to coarse grained patches of sphalerite with lesser patches of galena and pyrite/marcasite. Gangue minerals include quartz and calcite. Veinlets are of pyrite (possibly secondary after marcasite). A few veinlets and patches in galena are of pyrargyrite.

Sample 97-39 is a massive sulfide which is dominated by pyrite with lesser sphalerite and patches of boulangerite, galena, and jamesonite. Quartz forms anhedral patches interstitial to pyrite and sphalerite, and subhedral to euhedral grains intergrown with galena and sulfosalts.

Photographs were taken to illustrate typical and unusual textures. The list of photographs is at the end of the detailed descriptions.

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Sample 7-1 Banded Quartz-Sphalerite-(Pyrite-Galena-Chalcopyrite) Exhalite; Veinlets of Sphalerite-(Galena-Chalcopyrite)

The sample is well banded, with a few, finer grained bands dominated by quartz interlayered with more abundant, coarser grained bands of sphalerite-quartz with much less abundant, disseminated pyrite and patches of galena. Chalcopyrite forms exsolution blebs in some sphalerite grains. Galena is concentrated in one layer. A few subparallel veinlets of sphalerite-(galena-chalcopyrite) cut the two widest quartz-rich bands at a high angle to compositional banding. In the hand sample, the widest quartz-rich band is discontinuous, and may have been offset along a shear parallel to the sphalerite-rich veinlets which cut it. No barite was identified.

quartz	50-55%
sphalerite	40-45
pyrite	3- 4
galena	1- 2
muscovite	0.5
chalcopyrite	0.2
tetrahedrite	trace

Quartz-rich bands up to 1 mm wide are dominated by slightly interlocking quartz grains averaging 0.01-0.03 mm in size. These grade into coarser grained layers containing very variable amounts of quartz and sphalerite. In these, quartz forms grains averaging 0.05-0.1 mm in size and a few elongate subhedral to euhedral prismatic grains averaging 0.15-0.25 mm long.

Sphalerite forms equant, anhedral grains averaging 0.05-0.2 mm in size, and a few up to 0.5 mm across. Several sphalerite grains contain 5-7% disseminated, exsolution blebs of chalcopyrite averaging 0.01-0.02 mm in size, and a few contain minor irregular inclusions of galena of similar size. Sphalerite is colourless to locally pale to light orange, with the darkest colour being in the cores of sphalerite grains which contain chalcopyrite exsolution blebs.

Pyrite forms equant, subhedral to euhedral grains averaging 0.05-0.1 mm in size, mainly intergrown with sphalerite. A few patches up to 0.8 mm in size consists of intergrowths of pyrite grains averaging 0.1-0.5 mm in size and irregular patches of galena. A few skeletal pyrite grains at one end of the section are up to 1.5 mm across.

Galena is concentrated moderately to strongly in one layer as patches up to 1 mm in size commonly associated with pyrite, and intergrown coarsely with pyrite, quartz, and sphalerite.

Muscovite forms disseminated, very slender, unoriented flakes averaging 0.1 mm long, mainly intergrown with sphalerite.

Tetrahedrite forms scattered grains averaging 0.03-0.1 mm in size intergrown with sphalerite.

A few veinlike zones up to 0.3 mm wide of sphalerite cut across the widest quartz-rich band at a high angle. These contain minor patches containing exsolution blebs of chalcopyrite and minor patches of galena. Cutting the next quartz-rich widest band are a few veinlets up to 0.15 mm wide of sphalerite and galena.

Sample 23-5 Quartz-rich Wacke (Greenschist Facies)

The sample contains subrounded, somewhat recrystallized fine, detrital quartz grains, much less abundant ones of chert and minor ones of quartz-sericite in a patchy matrix dominated by extremely fine grained quartz, with much less abundant sericite and minor pyrite.

detrital grains	
quartz	55-60%
chert	3- 5
quartz-sericite	1
plagioclase	trace
groundmass	
quartz	25-30
sericite	5- 7
pyrite	0.5
leucoxene	0.2
tourmaline	minor
zircon	trace

Quartz forms equant, subangular to rounded grains averaging 0.25-0.5 mm in size and a few up to 0.9 mm in size. Most are single grains which have uniform to slightly strained extinction. A few detrital grains have overgrowths of quartz up to 0.02 mm wide in optical continuity with the core.

Scattered detrital fragments of chert up to 1.2 mm in size are of slightly interlocking quartz grains averaging 0.01-0.015 mm in size. Textures are similar to those of quartz-rich patches in the groundmass.

A few fragments 0.2-0.3 mm in size are of very fine grained quartz with minor to moderately abundant sericite; these may be secondary after plagioclase. .

Plagioclase forms a subrounded grain 0.4 mm in size. Alteration is slight to sericite.

The groundmass has a variable composition, both in grain size and mineralogy. Some patches up to 1 mm in size are of interlocking quartz grains averaging 0.01 mm in size. These grade into other patches of finer grained quartz with minor to moderately abundant sericite flakes, mainly less than 0.01 mm in size. A few patches up to 0.2 mm in size are dominated by sericite flakes averaging 0.02-0.03 mm in size. A few elongate patches up to 1 mm long are dominated by extremely fine grained sericite.

Opaque (pyrite) forms disseminated anhedral to euhedral grains averaging 0.07-0.1 mm in size and a few up to 0.2 mm across. Some of the opaque appears to be altered to hematite. Some cubic casts probably are after pyrite.

:Leucoxene forms ragged patches and discontinuous seams averaging 0.05-0.1 mm in size.

Tourmaline forms a subhedral grain 0.18 mm long. Pleochroism is weak from pale to light yellowish green. A few patches up to 0.15 mm in size contain minor, anhedral tourmaline.

Zircon forms disseminated anhedral to subhedral, equant grains averaging 0.04-0.06 mm in size.

Sample 27-3 Conglomerate: Pebbles of Chert, Quartz, and Mudstone in quartz-rich matrix

Pebbles of chert, mudstone, quartz-rich metamorphic rocks quartz grains, and fine sand grains are set in a foliated groundmass of quartz and minor sericite and limonite. Pyrite forms disseminated porphyroblasts, many of which were leached from the rock.

detrital fragments		
chert	12-15%	
mudstone	3- 4	
quartz		
pebbles	1- 2	
sand grains	35-40	
quartz-(sericite)	5- 7	
groundmass		
quartz	25-30	
sericite	5- 7	
pyrite	2- 3	(including casts)
limonite	1	
zircon	trace	

Elongate chert pebbles up to several mm long are dominated by intergrown quartz grains ranging between fragments from 0.003-0.01 mm in size. Some fragments have a moderate foliation defined by elongation of quartz and minor to moderately abundant, disseminated flakes of sericite. One fragment has an equant patch 0.5 mm across of kaolinite flakes averaging 0.01 mm in size and minor limonite.

One foliated, elongate fragment 5 mm long is dominated by cryptocrystalline sericite with much less abundant quartz.

Quartz forms an equant pebble 2.5 mm across. It also forms equant sand-sized grains averaging 0.2-0.5 mm in size, and a few up to 1 mm across. A few sand-sized grains have overgrowths up to 0.03 mm wide of secondary quartz in optical continuity with the detrital core.

Several fragments up to a few mm across are of slightly to moderately foliated, metamorphic rocks dominated by very fine grained quartz and much less abundant sericite.

One fragment or replacement patch 2 mm across is of equant quartz grains averaging 0.2-0.3 mm in size and 5% disseminated clusters of muscovite flakes averaging 0.05-0.1 mm in size.

The groundmass contains interlocking, equant quartz grains averaging 0.005-0.01 mm in size intergrown with minor to moderately abundant flakes of sericite averaging 0.01-0.02 mm in size. A few patches up to 0.2 mm in size are of muscovite flakes up to 0.15 mm long. Pyrite forms disseminated, subhedral to euhedral grains averaging 0.05-0.1 mm in size. A few euhedral casts after pyrite are form 0.2-0.7 mm in size. Zircon forms a subhedral grain 0.07 mm long.

Limonite forms disseminated dusty patches

Sample 33-1 Mudstone: Sericite-Quartz-(Pyrite)

Minor, extremely fine detrital quartz grains are set in a groundmass dominated by sericite with lesser quartz/plagioclase. A few bands (beds) are dominated by extremely fine grained quartz with lesser sericite. Disseminated pyrite grains are replaced by jarosite. Sericite-rich beds were recrystallized along closely spaced seams subparallel to the compositional banding.

coarser detrital grains		
quartz	1- 2%	
groundmass		
sericite	60-65	
quartz	30-35	
opaque	1- 2	(pyrite?)
jarosite	1	
tourmaline	minor	

Quartz forms disseminated grains averaging 0.03-0.07 mm in size, and a few up to 0.12 mm across.

In much of the sample, the groundmass is dominated by extremely fine grained sericite with much less abundant cryptocrystalline to extremely fine grained quartz (possibly including some plagioclase). A moderate foliation is defined by wispy seams of sericite. One band 1-1.5 mm wide is of sericite with no granular quartz. A few bands up to 3.5 mm wide are dominated by extremely fine grained quartz and lesser sericite.

Pyrite forms disseminated grains averaging 0.05-0.1 mm in size. In some grains, alteration is strong to complete to cryptocrystalline jarosite. Some grains are represented by casts. Some are represented by dense patches of dark brown limonite(?).

Tourmaline forms disseminated grains averaging 0.03-0.07 mm in size and a few up to 0.1 mm long. Pleochroism is from nearly colourless to light olive green.

Sample 83-40 **Sphalerite-Pyrite-Calcite Replacement; Brecciated Patches of Sulfides with Calcite Matrix**

The sample is dominated by patches of sphalerite and of pyrite intergrown with interstitial calcite and minor quartz. Minor sulfides include chalcopyrite and galena, mainly as inclusions in pyrite and sphalerite. Veinlets of pyrite cut sphalerite. The rock was brecciated moderately in irregular patches and seams, and fragments healed by calcite.

sphalerite	35-40%	(deep brownish red)
pyrite	30-35	
calcite	17-20	(including breccia matrix)
quartz	4- 5	
galena	0.7	
chalcopyrite	0.5	
tetrahedrite	trace	
pyrrhotite	trace	
stannite	trace	
veinlets		
pyrite	0.3	

Sphalerite forms patches up to a few cm across of fine to very coarse grains with a deep red colour. Most contain 2-3% disseminated inclusions averaging 0.02-0.05 mm in size of chalcopyrite. A few inclusions of chalcopyrite also contain a grain of pyrrhotite averaging 0.01-0.03 mm in size. A few patches contain 1-2% exsolution inclusions of chalcopyrite averaging 1-2 microns in size. In a few patches up to 2 mm across, sphalerite grains were brecciated strongly and finely. Sphalerite is deep brownish red in colour in the much of the section, and medium orange in thinner parts near some of the margins.

Pyrite forms anhedral grains up to a few mm across in patches up to several mm across. Some grains contain up to 5% inclusions of galena up to 0.5 mm in size, up to 2% inclusions of sphalerite and/or chalcopyrite up to 0.1 mm in size, and minor inclusions of pyrrhotite up to 0.05 mm in size. Other pyrite grains of similar size are free of inclusions.

Chalcopyrite forms scattered patches up to 0.5 mm in size interstitial to pyrite. Some of these contain abundant cryptocrystalline inclusions of non-reflective material of unknown composition, which give the chalcopyrite grains a dull surface and reduced reflectivity.

Tetrahedrite forms a few grains up to 0.05 mm in size associated with coarse galena patches in pyrite.

Stannite forms an irregular patch 0.05 mm long on the border of a sphalerite grain.

A few veinlike zones of pyrite cut patches of sphalerite. Bordering these veinlets, sphalerite commonly contains abundant exsolution inclusions of chalcopyrite averaging 2-3 microns in size.

Quartz forms subhedral to euhedral grains averaging 0.15-0.5 mm in size and locally up to 2 mm long, mainly bordering a few sulfide-rich patches, and a few patches of anhedral, very fine grains.

Calcite forms interstitial grains ranging widely in grain size. The mineral is not reactive immediately with cold dilute HCl, but in a few seconds begins to effervesce strongly. The strong effervescence is more typical of calcite than dolomite, but no explanation is available for why the reaction is delayed.

Sample 84-154 **Breccia: Fragments of Cherty Argillite and Massive Sulfide in Matrix of Quartz-Pyrite-Calcite-Sphalerite-Galena Vein/Replacement of Quartz-Galena-Pyrite-(Sphalerite-Calcite)**

Fragments averaging 1-2 mm in size of cherty argillite and fragments up to several mm across of massive, pyrite-sphalerite-rich sulfide are set in a matrix dominated by quartz and locally by calcite, with disseminated patches of pyrite and lesser sphalerite and galena. A late replacement or vein zone is of quartz-galena-pyrite-(sphalerite-calcite).

fragments			
cherty argillite	4- 5%	massive sulfide	5- 7
groundmass			
quartz	55-60	galena	3- 4
pyrite	12-15	chalcopyrite	trace
calcite	5- 7	stannite	trace
sphalerite	3- 4		
late replacement or vein			
quartz-galena-pyrite-(calcite)	5- 7		

Fragments of cherty argillite range from well foliated to massive. Most are dominated by cryptocrystalline quartz. Some contain moderately abundant carbonaceous opaque, mainly concentrated in seams and wispy lenses along foliation planes. A few contain up to 1% flakes of sericite. A few contain ellipsoids averaging 0.1 mm long of extremely fine grained quartz; the ellipsoids are flattened slightly in the foliation plane. .

Massive sulfide fragments up to 1 cm across are dominated by very fine grained pyrite. Some of these have minor, interstitial sphalerite and many contain moderately abundant interstitial cavities (which may represent leached carbonate). One fragment 2 mm across is of massive pyrite with 5-7% disseminated patches of sphalerite averaging 0.05-0.1 mm in size. Another pyrite-rich massive sulfide fragment has slightly less abundant sphalerite, and minor interstitial quartz and galena. A fragment 1.2 mm long is of sphalerite with slightly less abundant patches of very fine grained pyrite. One fragment 1.5 mm across is dominated by a very fine grained intergrowth of light to medium orange sphalerite and lesser pyrite.

Disseminated in quartz are patches of each of pyrite, sphalerite, and galena averaging 0.05-0.3 mm in size and locally up to 0.8 mm across. Some pyrite grains contain up to 5% irregular inclusions of galena averaging 0.03-0.1 mm in size. A few sphalerite fragments contain 1-2% exsolution blebs of chalcopyrite averaging 0.005-0.015 mm in size.

In the matrix, quartz forms submosaic grains averaging 0.05-0.15 mm in size. A few patches and seams are of finer grained quartz; these may have formed by deformation and recrystallization. A few subhedral to euhedral grains are from 0.2-0.4 mm in size.

Galena is concentrated strongly in one interstitial patch 2.5 mm cross in which it is intergrown with quartz and pyrite.

Calcite forms patches up to several mm across of grains ranging from cryptocrystalline to 0.3 mm across; it is concentrated strongly near one end of the section.

Stannite forms a patch 0.04 mm in size in the core of a sphalerite grain.

A late replacement patch or vein along one side of the section up to 3 mm wide is of anhedral to locally euhedral, medium grained quartz and pyrite with interstitial patches up to a few mm across of galena. Some pyrite grains contain abundant inclusions of galena. Calcite forms an anhedral grain 0.9 mm across.

Sample 85-144A **Massive Sulfide: Galena-Pyrite-Boulangerite-Sphalerite-Stannite-Jamesonite-Arsenopyrite-Quartz**

The sample is a massive sulfide dominated by galena with less abundant pyrite, boulangerite, and sphalerite, and much less abundant stannite, jamesonite, arsenopyrite, and quartz.

galena	35-40%
boulangerite	12-15
pyrite	12-15
quartz	10-12
sphalerite	7- 8
stannite	3- 4
jamesonite	2- 3
arsenopyrite	1- 2

Galena forms patches up to several mm across. Some show characteristic cubic cleavage pits, which along with its isotropic character, distinguish it from boulangerite.

Boulangerite forms anhedral grains averaging 0.05-0.2 mm in size intergrown intimately with galena. It is very slightly browner than galena, with a reflectivity slightly lower than that of galena, a hardness equal to or slightly greater than that of galena, and moderately anisotropic with no distinctive colours.

Pyrite forms clusters up to a few mm across of extremely fine grains. It also forms disseminated, subhedral to euhedral grains averaging 0.1-0.2 mm in size, mainly enclosed in galena and boulangerite.

Sphalerite forms anhedral patches up to 1.5 mm in size. Most is pale to light orange in colour and grains commonly show diffuse growth zones of slightly different colour intensities. A few grains have medium orange cores. Sphalerite contains 10-15% inclusions of pyrite averaging 0.02-0.03 mm in size.

Quartz forms subhedral to euhedral grains enclosed in galena, and patches up to 2.5 mm across of anhedral to subhedral grains elsewhere. Grain size is mainly in the range from 0.1-0.7 mm, with a few prismatic grains up to 2 mm long.

Stannite forms rounded grains, mainly intergrown with boulangerite, and commonly in intimate intergrowths.

Jamesonite is concentrated in a few patches up to 1.5 mm in size, commonly as elongate grains from 0.2-0.5 mm in length. It is slightly browner and has slightly lower reflectivity than boulangerite, and is weakly anisotropic.

Arsenopyrite forms disseminated, subhedral grains averaging 0.1-0.3 mm in size, and locally up to 0.8 mm long. It has a similar habit to pyrite and the minerals commonly occur in clusters together. It is white compared to pyrite, which is light cream.

Sample 85-144B **Massive Sulfide: Pyrite-Sphalerite-Boulangerite-Quartz-Calcite-Galena-Jamesonite-(Tetrahedrite)**

The sample is a complex massive sulfide dominated by pyrite with patches of sphalerite-(pyrite) and others dominated by boulangerite and lesser jamesonite. One large patch is of galena. Gangue is quartz and calcite. One patch contains elongate jamesonite grains disseminated in calcite.

pyrite	50-55%	
quartz	15-17	
sphalerite	10-12	(colourless to pale orange)
boulangerite	8-10	
galena	4- 5	
calcite	2- 3	
jamesonite	1- 2	
tetrahedrite	0.3	

Pyrite forms patches up to a few mm across of grains averaging 0.1-0.3 mm in size. On borders of patches, pyrite commonly is coarser grained and has subhedral to euhedral outlines against quartz and sphalerite. Some pyrite grains contain moderately abundant to abundant inclusions of galena and sphalerite.

Sphalerite is concentrated in patches up to a few mm across, commonly bordering patches of pyrite. Some patches of sphalerite contain minor to moderately abundant, commonly elongate inclusions of jamesonite (and lesser boulangerite and galena) mainly ranging from 0.02-0.1 mm in size.

Patches up to several mm across are of very fine to medium grained boulangerite, with less abundant patches up to 1.5 mm across of jamesonite, the latter mainly along borders of the patches. Many jamesonite patches consist of subparallel, elongate grains. In a zone of coarse grained calcite, jamesonite forms abundant, elongate, slightly curved grains averaging 0.15-0.5 mm long.

Quartz forms anhedral grains averaging 0.05-0.1 mm in size interstitial to euhedral pyrite. Associated with calcite and sulfosalts, most quartz grains are euhedral and average 0.2-0.7 mm in size, with a few prismatic grains up to 1.5 mm long.

Calcite forms a few patches up to a few mm across of anhedral grains containing abundant elongate grains of jamesonite averaging 0.2-0.5 mm long and scattered quartz grains up to 1 mm long. Elsewhere, calcite forms interstitial grains up to 1 mm in size intergrown with sphalerite and lesser pyrite.

Galena forms one patch several mm across intergrown along the margins with very fine grained quartz and pyrite. It contains minor inclusions of boulangerite.

Tetrahedrite forms a few equant grains averaging 0.1-0.2 mm in size and one elongate grain up 1 mm long intergrown coarsely with boulangerite, sphalerite, and calcite. It forms an equant grain 0.6 mm in size intergrown coarsely with sphalerite and subhedral to euhedral quartz.

Sample 85-177 **Massive Sulfide: Pyrite-Galena-Sphalerite-Quartz-(Boulangerite - Stannite-Jamesonite-Calcite)**

The sample is dominated by pyrite galena, and sphalerite, with lesser patches of boulangerite, and minor stannite and jamesonite. Gangue minerals include interstitial patches of quartz and minor calcite.

pyrite	35-40%	
galena	25-30	
sphalerite	17-20	(pale to light orange)
boulangerite	5- 7	
stannite	0.5	
jamesonite	0.5	
quartz	8-10	
calcite	0.7	
tetrahedrite/tennantite	minor	

Pyrite forms clusters up to several mm across of equant to elongate grains. Anisotropism is weak; this and the elongate nature of many of the aggregates suggests that the mineral may be secondary after marcasite. Some patches contain moderately abundant inclusions of quartz, sphalerite, or galena. Some of these are intergrown coarsely with patches of sphalerite and others are included in coarse patches of galena.

Sphalerite forms patches up to several mm across. Most contain moderately abundant disseminated grains of pyrite averaging 0.01-0.05 mm in size and minor interstitial inclusions of galena or boulangerite averaging 0.02-0.05 mm in size. A few contain moderately abundant anhedral to subhedral prismatic quartz grains averaging 0.07-0.15 mm in size.

Galena forms patches up to several mm across, commonly containing minor patches of sphalerite-(pyrite) and minor inclusions averaging 0.03-0.05 mm in size of boulangerite and tetrahedrite/tennantite. Some elongate patches of galena are interstitial to elongate aggregates of pyrite and some contain inclusions (in part skeletal) of elongate pyrite.

A few patches up to 1.5 mm in size are dominated by very fine to fine grained boulangerite. On the border of some are intimate intergrowths of extremely fine to very fine grained boulangerite and stannite. Stannite also forms a few anhedral grains averaging 0.1-0.2 mm in size between patches of boulangerite and those of sphalerite. Jamesonite forms a few patches of grains up to 0.5 mm in size intergrown with boulangerite and along borders of boulangerite-rich patches.

Quartz forms patches of interstitial, anhedral to locally subhedral grains averaging 0.1-0.3 mm in size and locally up to 1 mm long. A few grains are subhedral to euhedral prismatic grains from 0.3-1.7 mm long; many of these are associated with patches of galena or boulangerite.

Calcite forms interstitial patches averaging 0.3-0.8 mm in size.

Sample 85-245 Coarse Massive Sulfide: Sphalerite-Galena-(Pyrite-Quartz)

The sample is a massive sulfide dominated by coarse patches of galena and of sphalerite, and finer grained zones containing these minerals intergrown with pyrite and quartz. Minor to trace minerals include stannite, pyrargyrite, chalcopyrite, tetrahedrite, and freibergite.

sphalerite (deep red brown)	40-45%	stannite	1
galena	35-40	pyrargyrite	0.1
pyrite	10-12	chalcopyrite	minor
marcasite	4- 5	tetrahedrite	trace
quartz	4- 5	freibergite	trace
veinlets			
a) marcasite	2- 3	b) calcite	4- 5
pyrargyrite	0.1		

Galena is concentrated strongly in a major patch up to 2 cm across.

Sphalerite forms patches up to several mm across of fine to coarse grains with a deep brownish red colour.

Pyrite forms patches up to a few mm across of anhedral to locally subhedral grains. A few subhedral to euhedral pyrite grains averaging 0.07-0.1 mm in size occur in quartz.

Patches up to 1.5 mm in size are of cryptocrystalline to extremely fine grained marcasite, probably secondary after pyrrhotite or pyrite. Many are included in the coarse galena patch.

Quartz forms clusters of anhedral to subhedral grains averaging 0.1-0.5 mm in size. Bordering galena, many quartz grains are euhedral in outline.

Stannite occurs in irregular patches averaging 0.1-0.2 mm across intergrown with sphalerite and a few patches from 0.3-1 mm in size. Smaller patches grade into extremely fine grained to cryptocrystalline, exsolution intergrowths of stannite in sphalerite. S.E.M. analysis confirmed the composition as Cu_2SnFeS_4.

Pyrargyrite forms scattered patches averaging 0.05-0.1 mm in size included in galena. It is light grey with moderate reflectivity, moderately harder than galena, and has a reddish orange internal reflection (slightly to moderately more reddish than that of sphalerite), and is anisotropic (in contrast to sphalerite). S.E.M. examination confirmed a composition of (Ag, S)>Sb which fits the pyrargyrite composition of Ag_3SbS_3. (*Note: The colour of pyrargyrite in transmitted light is not as deep a red as normal. A second mineral with a yellowish brown internal reflection with the same composition as pyrargyrite is pyrostilpnite. However, Jim McLeod prefers pyrargyrite for this mineral.*)

Chalcopyrite forms disseminated patches averaging 0.05-0.1 mm in size in sphalerite and galena.

Tetrahedrite forms a few grains averaging 0.02-0.03 mm in size on borders of sphalerite and galena.

Freibergite forms a few grains up to 0.01 mm in size associated with a patch of chalcopyrite and pyrargyrite. Grains have a pink colour. The composition was confirmed by S.E.M. analysis.

Veinlets ranging from 0.005-0.15 mm wide are dominated by cryptocrystalline marcasite. Many are braided and some form interlocking networks. Some contain patches of pyrargyrite. Some discontinuous, fracture-filling lenses in galena are of pyrargyrite.

The rock was fractured coarsely to locally finely along a few veinlike zones up to a few mm wide. Fragments of sphalerite and galena (including some with marcasite veins) are included in a matrix of very fine to medium grained calcite.

Sample 90-321 **Limestone: Zoned Replacement: a) pyrite, b) calcite-rich, c) sphalerite-galena-pyrite-(pyrrhotite-quartz); Veinlets of pyrite and minor pyrargyrite**

Elongate patches in one-third of the section are of extremely fine grained limestone. Bordering the limestone are replacement zones rich in pyrite, commonly showing a sieve-textured intergrowth with relic calcite. A discontinuous band between the pyrite-rich zone and the main sulfide replacement zone is characterized by recrystallized calcite and sulfide patches dominated by galena with much less pyrite, chalcopyrite, and sphalerite, and trace stannite. The main replacement zone is dominated by fine to coarse grained patches of sphalerite with lesser patches of galena and pyrite/marcasite. Gangue minerals include quartz and calcite. Veinlets are of pyrite (possibly secondary after marcasite). A few veinlets and patches in galena are of pyrargyrite.

limestone		20-25%
replacement		
a) border zone		
	pyrite	15-17
	calcite	8 -10
	marcasite/pyrrhotite	1- 2
b) inner band		
	calcite	3- 4
	galena	0.5
	sphalerite	0.1
	chalcopyrite	minor
	stannite	trace
b) main zone		
	sphalerite	35-40% (medium brownish red)
	galena	5- 7
	pyrite	7- 8
	pyrrhotite/marcasite	2
	quartz	2- 3
	calcite	0.3
	chalcopyrite	0.1
	pyrargyrite	trace
veinlets		
	pyrite/marcasite	2- 3
	pyrargyrite	minor

The limestone is dominated by extremely fine grained to locally very fine grained aggregates. A few patches are of very fine to fine grains, and one replacement grain is 3.5 mm across. A veinlet 0.1 mm wide of very fine grained calcite cuts the limestone.

Bordering the largest limestone patch and in a band included in it are replacement bands up to a few mm wide consisting of an extremely fine, sieve-like intergrowth of pyrite and interstitial calcite. One patch 2.5 mm long is a dense aggregate of very fine grained pyrite. Some patches are of cryptocrystalline marcasite, possibly after pyrrhotite. Chalcopyrite and galena form minor grains averaging 0.05-0.08 mm in size. Cutting these patches are a few veinlike zones up to 0.05 mm wide of pyrite.

(continued)

Adjacent to this zone is a discontinuous band up to 1 5 mm wide of very fine grained calcite containing replacement patches of galena, sphalerite, and chalcopyrite, and minor stannite.

The core of the replacement patch is dominated by sphalerite. Some areas contain minor to moderately abundant inclusions of pyrite averaging 0.01-0.03 mm in size.

Galena forms irregular patches up to a few mm across.

Pyrite forms clusters up to 1.5 mm in size of very fine grains.

Quartz forms disseminated, euhedral, stubby to elongate prismatic grains averaging 0.2-0.5 mm in size enclosed in galena and sphalerite.

Chalcopyrite forms minor disseminated grains averaging 0.02-0.03 m in size in sphalerite.

Pyrrhotite forms patches averaging 0.2-0.7 mm in size intergrown with pyrite. These are replaced by cryptocrystalline marcasite. A few, fresh, equant grains averaging 0.03-0.05 mm in size occur on the borders of galena and sphalerite.

Pyrargyrite forms disseminated grains up to 0.1 mm in size.

Numerous veinlets, some of which are braided, averaging 0.01-0.05 mm wide are of cryptocrystalline to extremely fine grained marcasite/pyrite. Some contain patches and lenses of very fine grained calcite. Along the contact of the coarse calcite grain and a sphalerite grain are patches of secondary pyrite associated with pyrite/marcasite veinlets.

Pyrargyrite forms a few discontinuous veinlets in fracture-filling zones along cleavage planes in galena.

Sample 97-14 **Sericite-Pyrite-Quartz-Ti-oxide Alteration of Andesite(?) Dyke; Quartz-(Limonite) Veinlets**

The sample has a slightly foliated texture and relatively uniform silicate texture, suggesting that it is an altered high-level dyke rock. No distinctive original textures were recognized. The rock is dominated by sericite with much less abundant quartz and disseminated pyrite, and moderately abundant lenses and patches of Ti-oxide/leucoxene. The abundance of the latter suggests that the original rock was andesite. Pyrite is concentrated strongly in lenses parallel to foliation; in some it is associated with moderately abundant quartz. A few veinlets are of quartz with minor limonite.

sericite	70-75%
quartz	10-12
pyrite	7- 8
Ti-oxide/leucoxene	2- 3
veinlets	
quartz-(limonite)	2- 3

Sericite forms flakes averaging 0.01-0.02 mm in size, and are only slightly preferentially oriented parallel to a weak foliation. It probably is secondary after very fine to extremely fine grained plagioclase. It is possible that some extremely fine grained, relic plagioclase remains in some of the sericite-rich zones, but its presence could not be confirmed.

Quartz forms disseminated equant grains averaging 0.05-0.07 mm in size and a few up to 0.15 mm long.. It is concentrated moderately with pyrite in a few replacement and veinlike zones up to 2 mm wide. In the largest of these, quartz forms aggregates up to 1.5 mm across of very fine to extremely fine grained aggregates, which locally have a comb-texture of elongate grains oriented perpendicular to pyrite crystal faces. One quartz-pyrite replacement zone contains a few patches up to 0.5 mm in size of extremely fine grained ankerite

Pyrite forms disseminated grains averaging 0.05-0.1 mm in size, with a few up to 0.12 mm across. It is concentrated moderately to strongly in irregular patches and seams up to several mm across as grains averaging 0.03-0.07 mm in size intergrown intimately with sericite. In a few pyrite-rich patches, quartz forms moderately abundant interstitial grains averaging 0.03-0.05 mm in size intergrown with sericite.

Ti-oxide is concentrated in wispy seams averaging 0.15-0.2 mm long, oriented parallel to a weak foliation. It also forms disseminated patches averaging 0.03-0.05 mm in size, probably secondary after ilmenite. One lens parallel to foliation 2 x 0.3 mm in size contains abundant cryptocrystalline Ti-oxide intergrown with minor sericite.

This grades texturally with increasing sericite content into replacement patches of sericite-pyrite-quartz.

A few veinlets from 0.1-0.7 mm wide are of extremely fine to very fine grained, slightly interlocking quartz grains with minor patches of dusty limonite.

Sample 97-15 Recrystallized Limestone; Stylolitic Veinlets

The rock is a micritic, light to medium grey limestone which was recrystallized in irregular patches and veinlike zones to white to cream, fine to medium grained aggregates. It contains several recrystallized, stylolitic veinlets of calcite-limonite.

calcite		
original	45-50%	
recrystallized	45-50	(patches and veinlike zones)
pyrite	0.3	
stylolitic veinlets		
calcite-limonite	2- 3	

The least recrystallized zones consist of cryptocrystalline to extremely fine grained calcite. some of these have a weak to moderate foliation. These zones have a turbid appearance and higher relief than the recrystallized zones, probably because of the presence of dusty inclusions.

Recrystallized patches up to a few mm across and veinlike zones up to 0.6 mm wide are of recrystallized, very fine to locally medium grained, slightly interlocking calcite grains. Textures suggest that more than one stage of recrystallization occurred. Later-formed patches and veinlike zones are of calcite grains which are free of dusty inclusions.

Pyrite forms disseminated subhedral to anhedral grains averaging 0.02-0.05 mm in size and a few subhedral to euhedral grains up to 0.15 mm across. It is concentrated in a few elongate clusters of grains averaging 0.015-0.025 mm in size, mainly intergrown with cryptocrystalline to extremely fine grained calcite.

A few irregular, stylolitic veinlets up to 0.2 mm wide are of very fine grained calcite and minor to moderately abundant dusty limonite.

Sample 97-39 **Massive Sulfide: Pyrite-Sphalerite-Boulangerite-Galena-Jamesonite-Quartz**

The sample is a massive sulfide which is dominated by pyrite with lesser sphalerite and patches of boulangerite, galena, and jamesonite. Quartz forms anhedral patches interstitial to pyrite and sphalerite, and subhedral to euhedral grains intergrown with galena and sulfosalts.

pyrite	55-60%
sphalerite	17-20
boulangerite	7- 8
galena	4- 5
jamesonite	3- 4
quartz	5- 7

Pyrite forms patches up to several mm across of extremely fine to very fine grains, commonly containing irregular interstitial patches of sphalerite and quartz and much less abundant galena and sulfosalts.

Sphalerite is concentrated moderately in patches up to a few mm across, some of which are intergrown with quartz. It also forms elongate intergrowths interstitial to patches of pyrite. Most patches contain inclusions of pyrite averaging 0.02-0.05 mm in size, and some are intergrown with pyrite grains averaging 0.05-0.15 mm in size.

Boulangerite forms patches up to a few mm across of equant, anhedral grains averaging 0.1-0.5 mm in size.

Jamesonite forms patches up to a few mm across of elongate grains averaging 0.3-0.5 mm long, commonly intergrown with boulangerite and less commonly with sphalerite.

Galena occurs in patches up to a few mm across intergrown intimately with boulangerite and lesser jamesonite.

Quartz forms patches of anhedral grains interstitial to pyrite and sphalerite. It forms prismatic, subhedral to euhedral grains averaging 0.1-0.5 mm in size and a few up to 1.3 mm long intergrown with galena and sulfosalts.

List of Photographs

Photo	Sample	Description
1	7-1	veinlets of sphalerite-(chalcopyrite-galena) cutting obliquely across a thick band of extremely fine grained quartz-rich exhalite. Reflected light. Length of photo 2.85 mm.
2	7-1	galena-rich band showing patch of galena intergrown with pyrite, quartz, and sphalerite. Sphalerite contains a few patches with abundant exsolution inclusions of chalcopyrite. Lathy inclusions in galena and sphalerite are slender muscovite flakes. Reflected light. Length of photo 1.6 mm.
3	7-1	intergrowth of sphalerite with much less abundant quartz (in part as elongate, subhedral prismatic grains, pyrite (equant, euhedral opaque), chalcopyrite (clusters of blebs of opaque in sphalerite), with minor flakes and clusters of flakes of muscovite. Transmitted light. Length of photo 1.6 mm.
4	83-40	veinlet of pyrite cutting sphalerite, with abundant exsolution blebs of chalcopyrite in sphalerite along the vein. Sphalerite contains coarser exsolution blebs of chalcopyrite-(pyrrhotite). The sulfides were brecciated and fragments healed by a matrix of very fine to fine grained calcite (dark grey). Reflected light. Length of photo 1.6 mm.
5	83-40	fractured pyrite bordered by patches of chalcopyrite containing abundant dusty non-reflective inclusions, surrounded by calcite. Reflected light. Length of photo 1.6 mm.
6	83-40	brecciated zones in coarse grained, sphalerite-rich massive sulfide with minor pyrite and chalcopyrite. Breccia matrix is calcite. Reflected light. Length of photo 2.85 mm.
7	83-40	irregular extremely fine breccia zone in pyrite, bordered by brecciated sphalerite (in dark corner of photo. Reflected light. Length of photo 2.85 mm.
8	85-144A	complex assemblage: patch of sphalerite with abundant inclusions of pyrite containing pyrite-rich zone with lesser sphalerite and boulangerite/jamesonite. Adjacent to this is an intimate intergrowth of boulangerite (silvery grey) and stannite (brownish grey) with minor pyrite. Minor dark grey grains are quartz. . Reflected light. Length of photo 1.6 mm.
9	85-144A	complex assemblage: galena-boulangerite intergrowth (difficult to distinguish these minerals in photo, some boulangerite shows weak bireflectance) containing a cluster of subhedral, in part skeletal pyrite and arsenopyrite, patches of sphalerite with abundant tiny pyrite inclusions, and patches of greyish brown stannite, minor quartz. Reflected light. Length of photo 1.6 mm.

List of Photographs

10	85-144A	complex assemblage: subhedral, skeletal arsenopyrite intergrown with anhedral patches of boulangerite, stannite, sphalerite-(pyrite), and minor elongate jamesonite and equant to irregular pyrite, euhedral quartz grain on edge of photo, scattered, small, anhedral quartz grains. Reflected light. Length of photo 1.6 mm.
11	85-154	fragment of pyrite-(sphalerite-dusty non-reflective material) in matrix of very fine grained quartz with patches of galena, pyrite, and minor sphalerite. Reflected light. Length of photo 2.85 mm.
12	85-154	Cherty argillite fragment with ellipsoidal quartz patches, enclosed in matrix of quartz with patches of pyrite, sphalerite, and lesser galena. The angular nature of some of the sulfide patches suggests that they may be fragments. Reflected and transmitted light. Length of photo 2.85 mm.
13	85-154	Interstitial or replacement patch of galena-quartz-pyrite with unusual, banded texture. Reflected light. Length of photo 1.6 mm.
14	85-144B	subhedral pyrite with patches of sphalerite-(pyrite), interstitial patches of boulangerite, with inclusions of euhedral quartz grains and anhedral calcite. Moderately abundant boulangerite inclusions in pyrite near margins of grains. Reflected light. Length of photo 2.85 mm.
15	85-144B	boulangerite (silvery grey) with elongate inclusions of jamesonite (slightly darker grey) and an elongate quartz grain adjacent to zone of euhedrally-terminated pyrite with interstitial sphalerite and minor boulangerite and quartz. Reflected light. Length of photo 1.6 mm.
16	85-144B	elongate jamesonite grains and minor equant pyrite grains in coarse calcite, euhedral quartz grains in calcite are free of jamesonite. Patch of sphalerite-(pyrite) at one side of photo, which grades sharply into a core of extremely fine grained pyrite (on edge of photo). Anhedral grain of tetrahedrite on contact of sphalerite and calcite near one corner of photo. Reflected light. Length of photo 2.85 mm.
17	85-177	patch of galena with minor inclusions of boulangerite/jamesonite; containing elongate, in part skeletal clusters of pyrite and patch of sphalerite (with inclusions of pyrite and galena), minor quartz. Reflected light. Length of photo 2.85 mm.
18	85-177	complex assemblage: intimate intergrowth of boulangerite and stannite grades into more massive boulangerite; patches of sphalerite (with inclusions of pyrite), zone of subhedral pyrite (with inclusions of sphalerite and boulangerite), disseminated quartz. Reflected light. Length of photo 1.6 mm.

List of Photographs

19	85-245	sphalerite with large patch and smaller exsolution patches of stannite adjacent to patch of galena. Veinlets of marcasite. Late brecciation seam in sphalerite near contact with galena. Reflected light. Length of photo 2.85 mm.
20	85-245	galena with fracture-filling veinlet of pyrargyrite; dark fractures are cavities. Reflected light. Length of photo 1.6 mm.
21	90-321	intergrowth of pyrite and pyrrhotite (altered to banded marcasite and dusty non-reflective material) in sphalerite, with minor galena in pyrite and in interstitial patches; minor euhedral quartz. Reflected light. Length of photo 1.6 mm.
22	90-321	zoned replacement: a) sieve-textured pyrite-(calcite), b) calcite with irregular replacement patches of galena-chalcopyrite-(pyrite) and minor extremely finely intergrown galena-stannite, and c) coarse sphalerite. Reflected light. Length of photo 1.6 mm.
23	90-321	contact of coarse calcite and sphalerite; patches of pyrite along contact; minor patches of galena and chalcopyrite with galena inclusions; veinlets of pyrite-marcasite-(calcite) cutting sphalerite and galena. Reflected light. Length of photo 1.6 mm.
24	97-39	patch of subhedral pyrite-quartz at one side of photo; adjacent to it is a zone of light grey boulangerite, which in turn is adjacent to a zone of elongate jamesonite grains with a euhedral quartz grain at the edge of the photo. Other dark grey patches are cavities. Reflected light. Length of photo 1.6 mm.
25	97-39	elongate pyrite aggregates with interstitial patches of sphalerite, with lesser boulangerite-galena, and quartz.

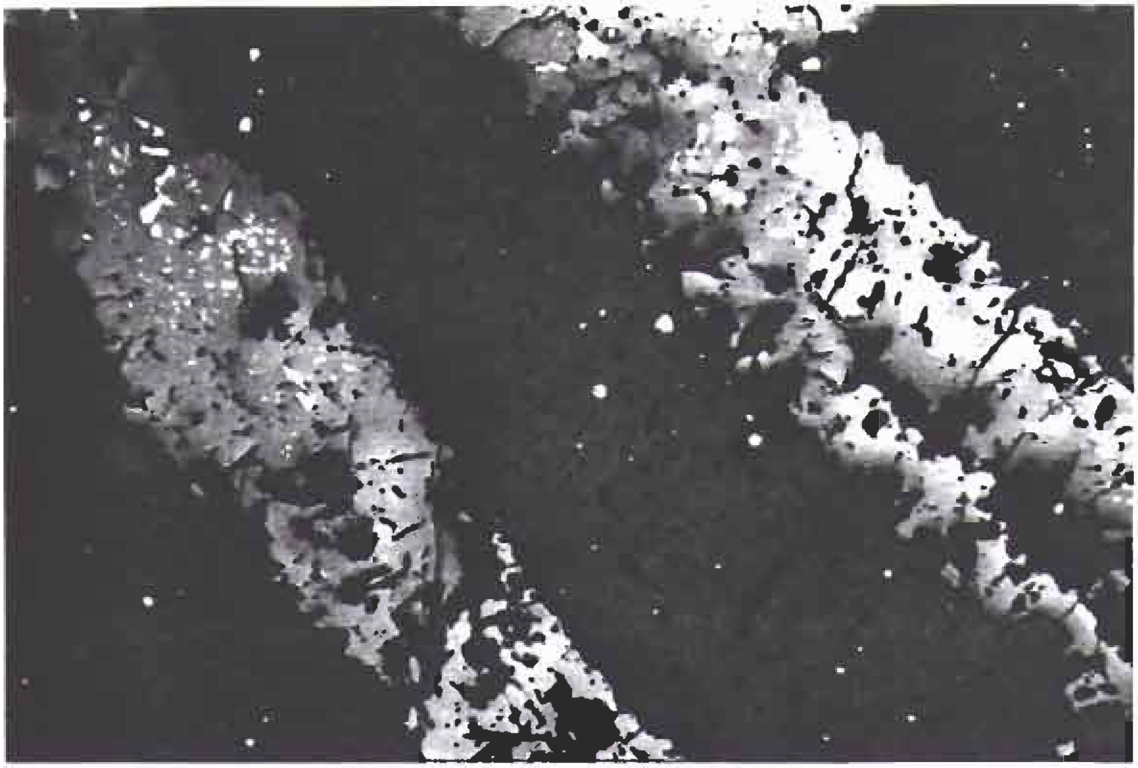

Photo 1. Sample 7-1.
Reflected light. Length of photo 2.85 mm.

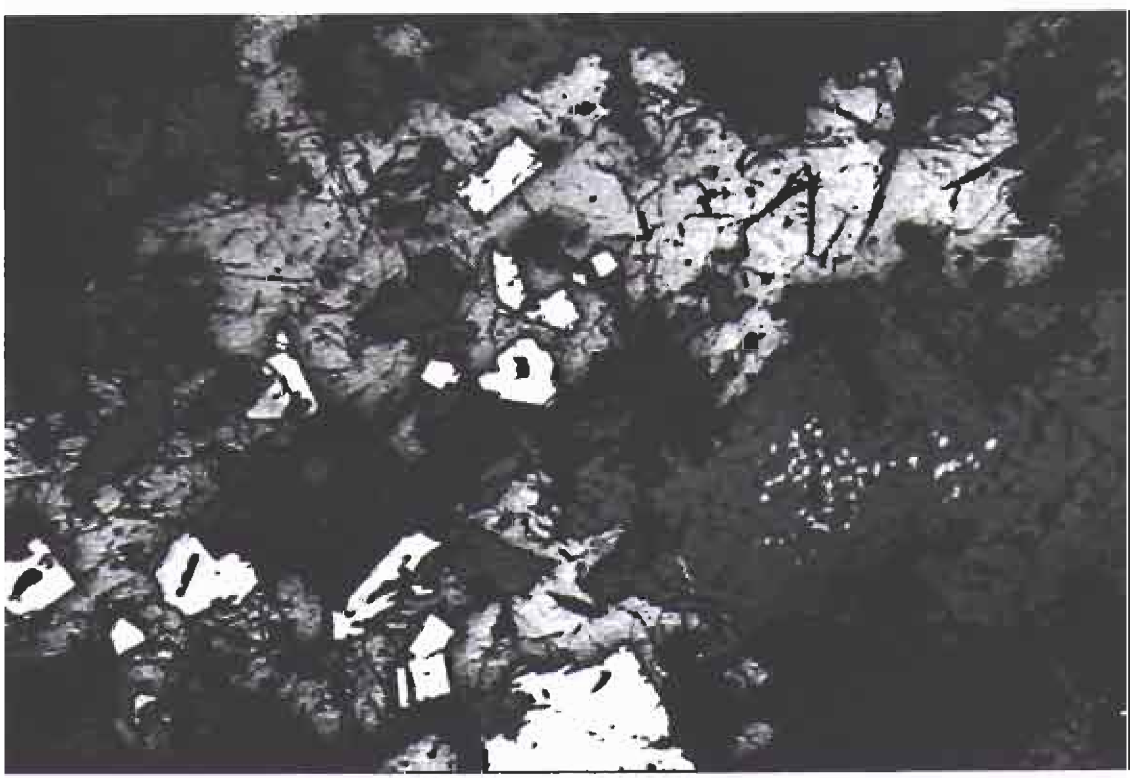

Photo 2. Sample 7-1.
Reflected light. Length of photo 1.6 mm.

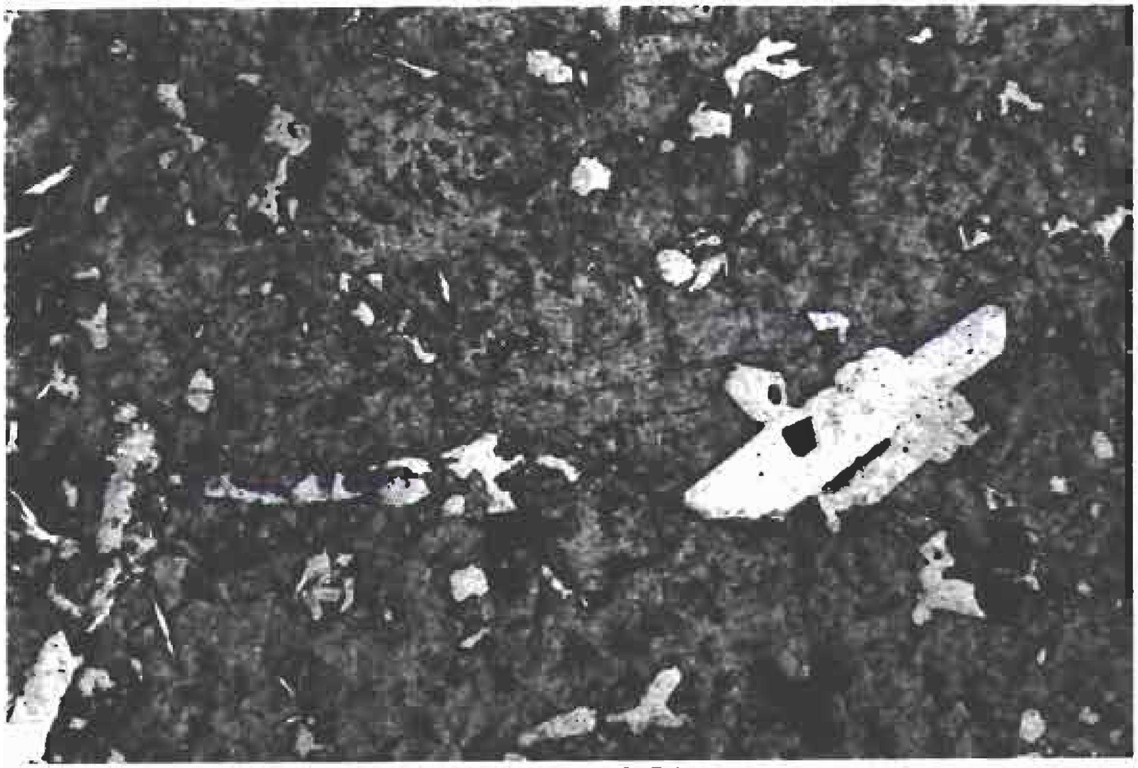

Photo 3. Sample 7-1.
Transmitted light. Length of photo 1.6 mm.

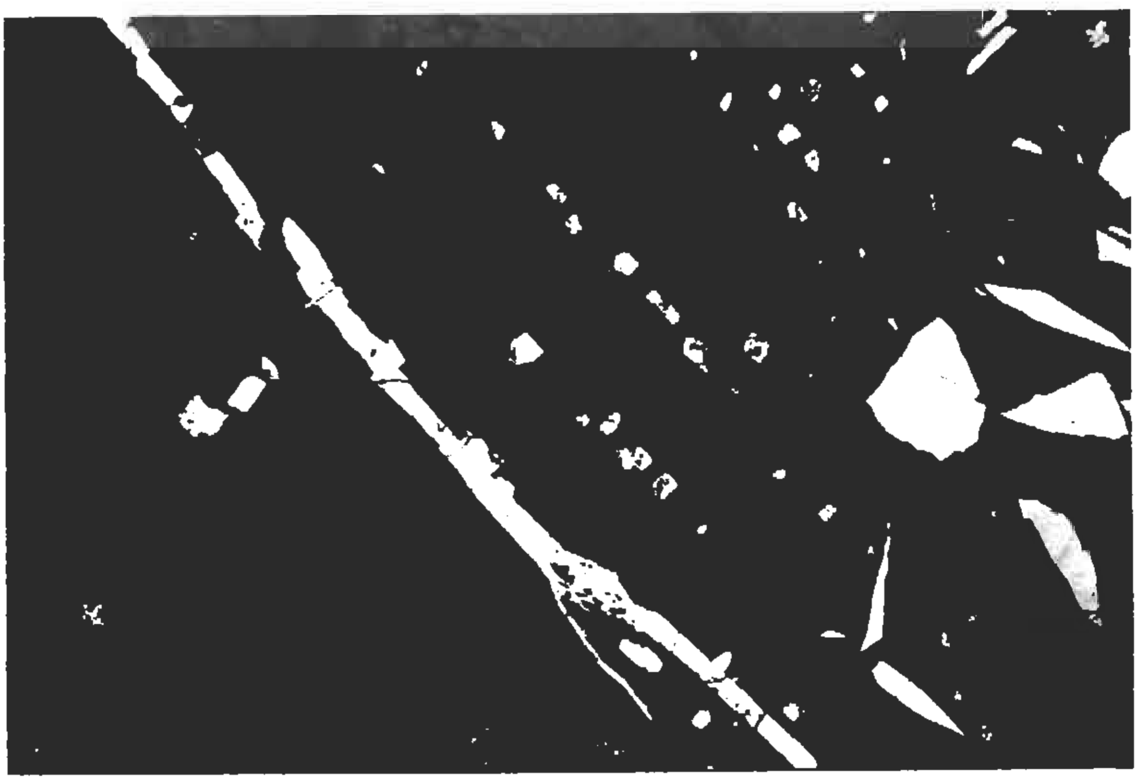

Photo 4. Sample 83-40.
Reflected light. Length of photo 1.6 mm.

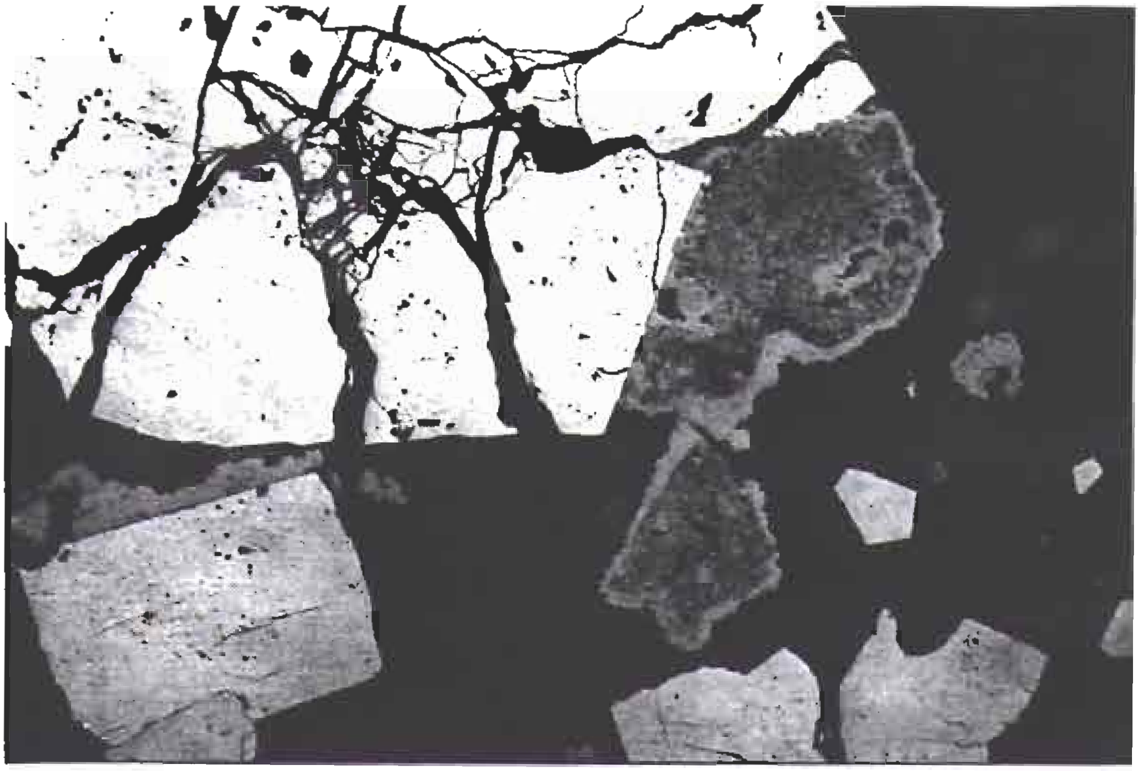

Photo 5. Sample 83-40.
Reflected light. Length of photo 1.6 mm.

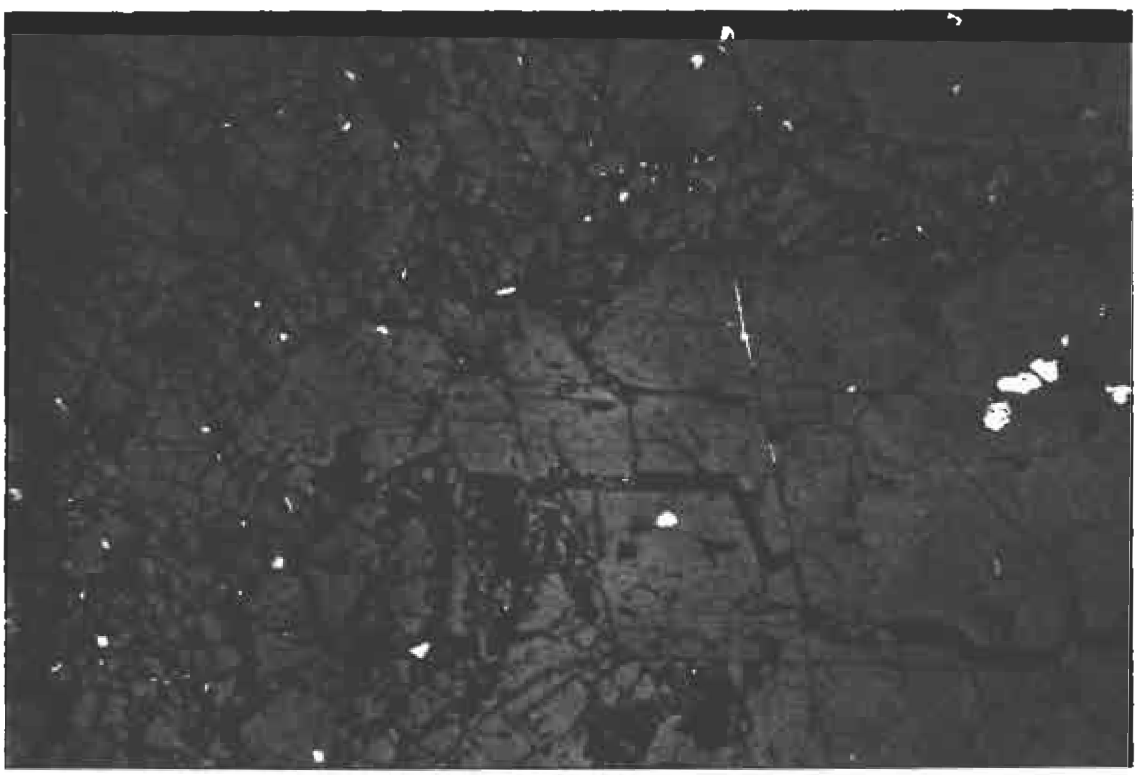

Photo 6. Sample 83-40.
Reflected light. Length of photo 2.85 mm.

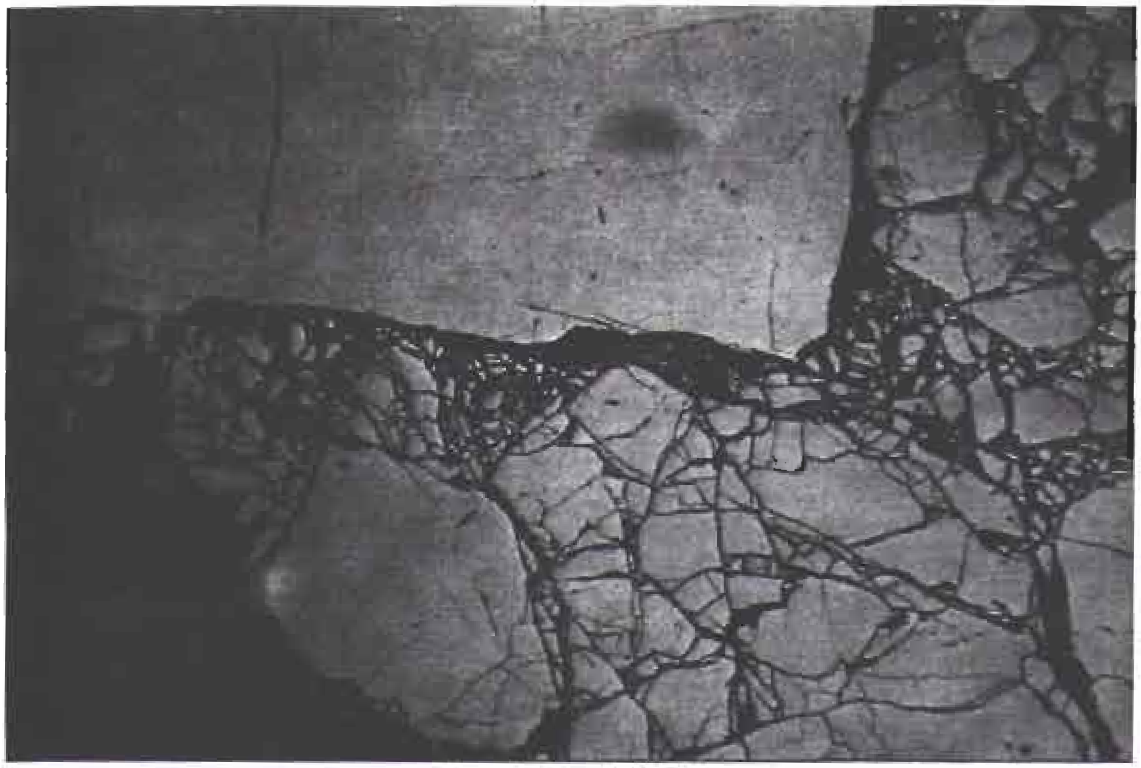

Photo 7. Sample 83-40.
Reflected light. Length of photo 2.85 mm.

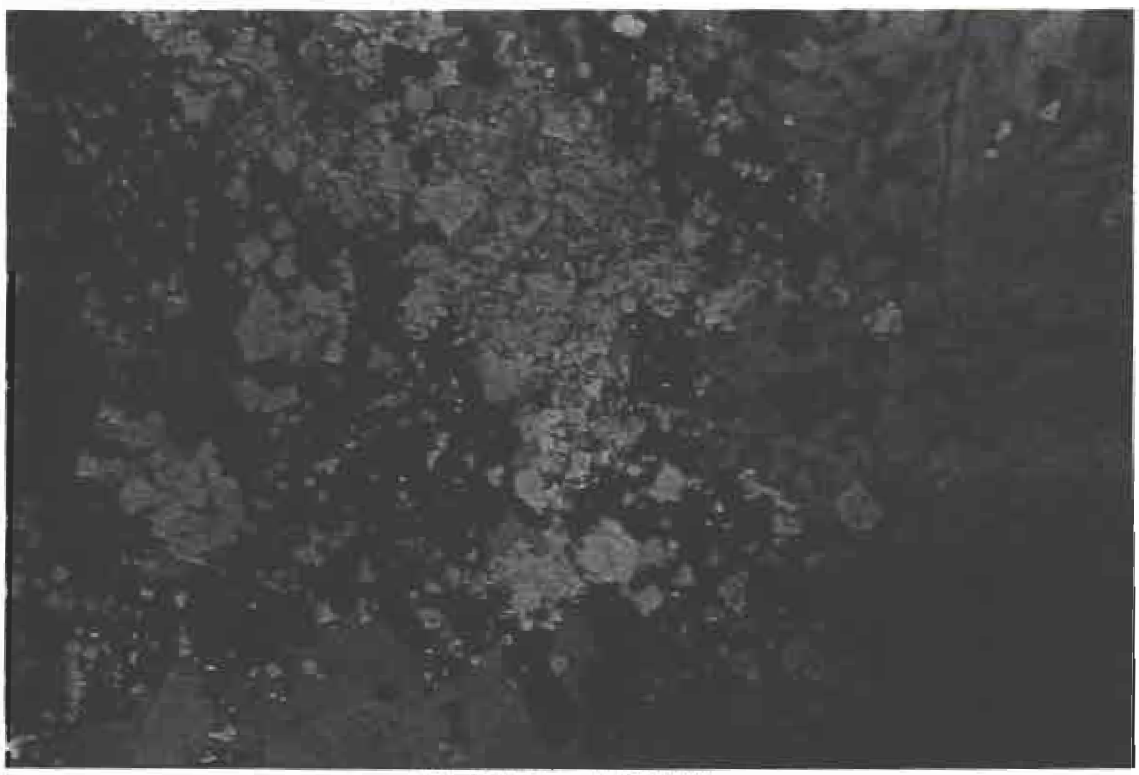

Photo 8. Sample 85-144A.
Reflected light. Length of photo 1.6 mm.

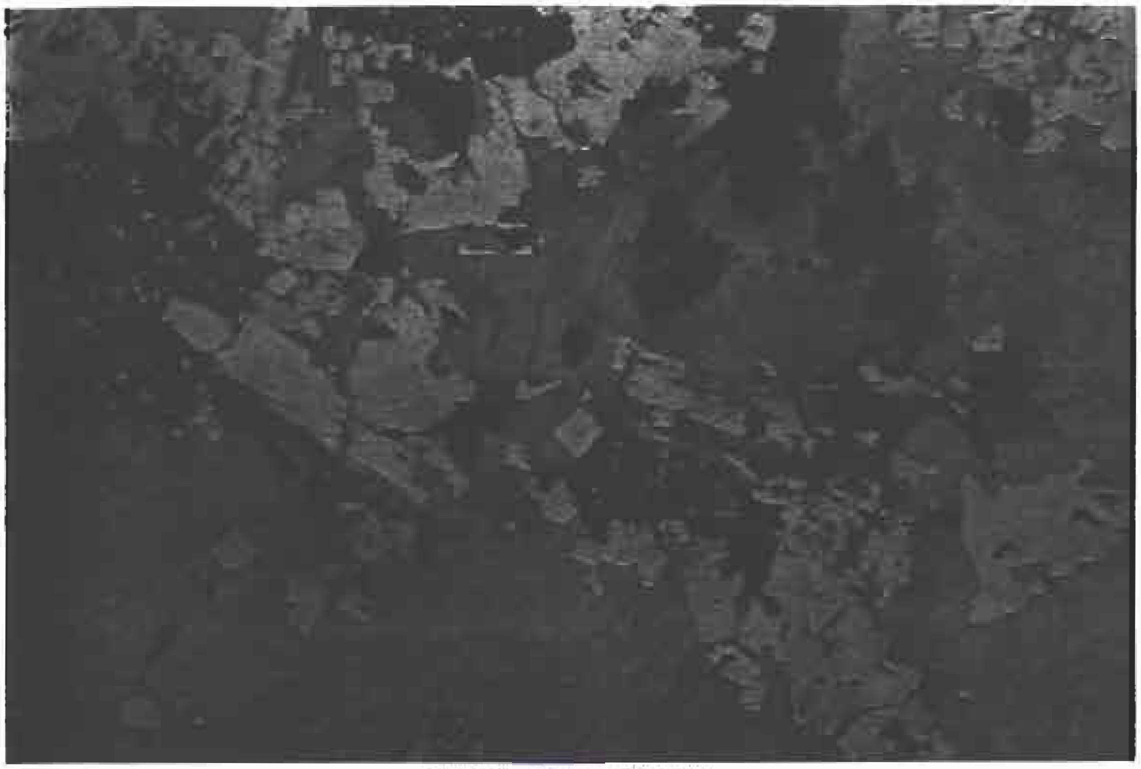

Photo 9. Sample 85-144A.
Reflected light. Length of photo 1.6 mm.

Photo 10. Sample 85-144A.
Reflected light. Length of photo 1.6 mm.

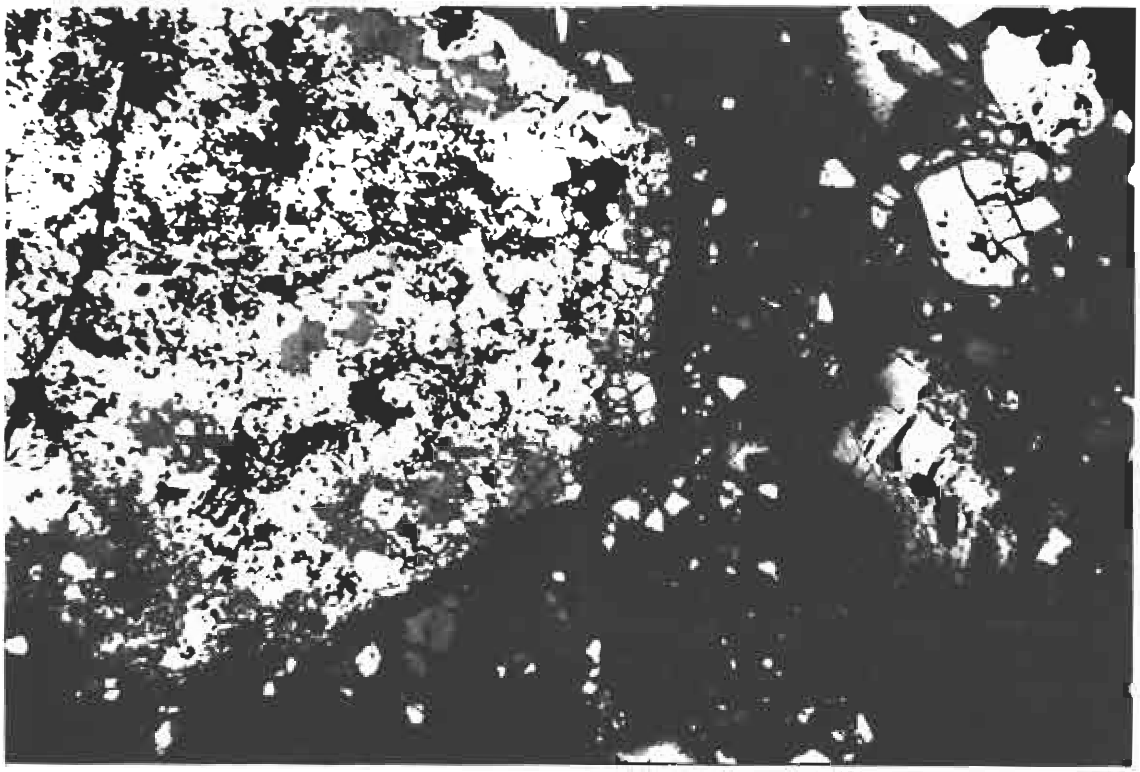

Photo 11. Sample 85-154.
Reflected light. Length of photo 2.85 mm.

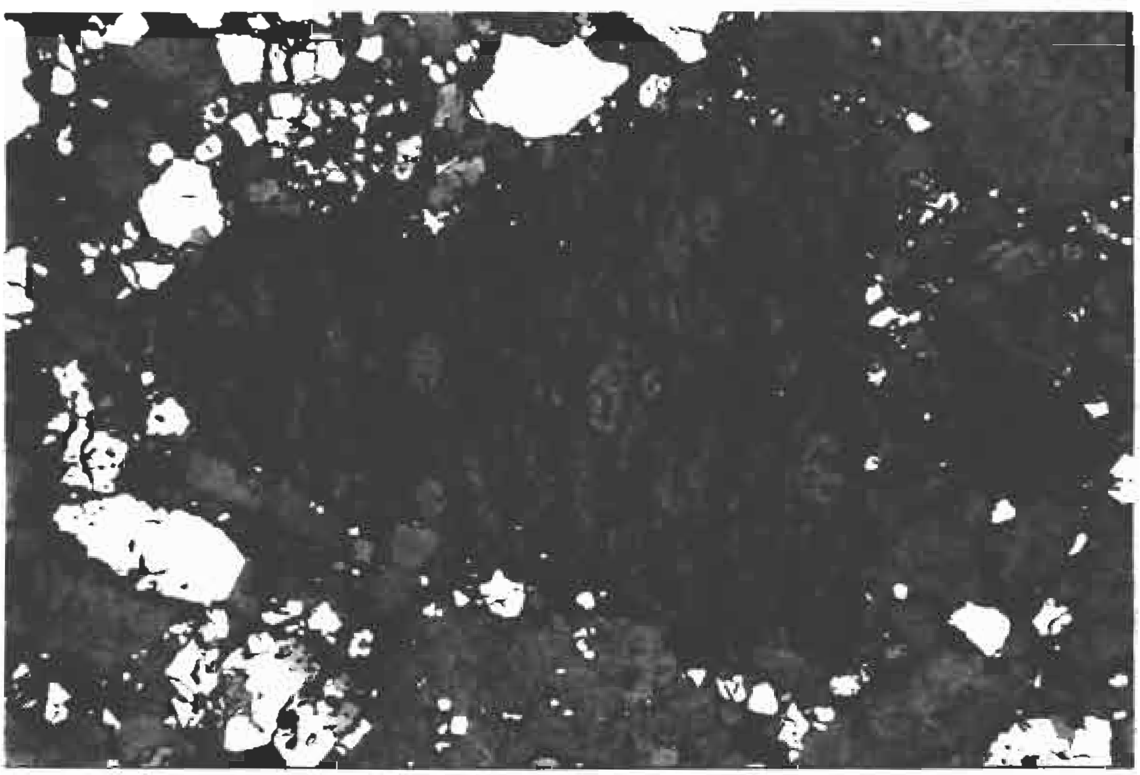

Photo 12. Sample 85-154.
Reflected and transmitted light. Length of photo 2.85 mm.

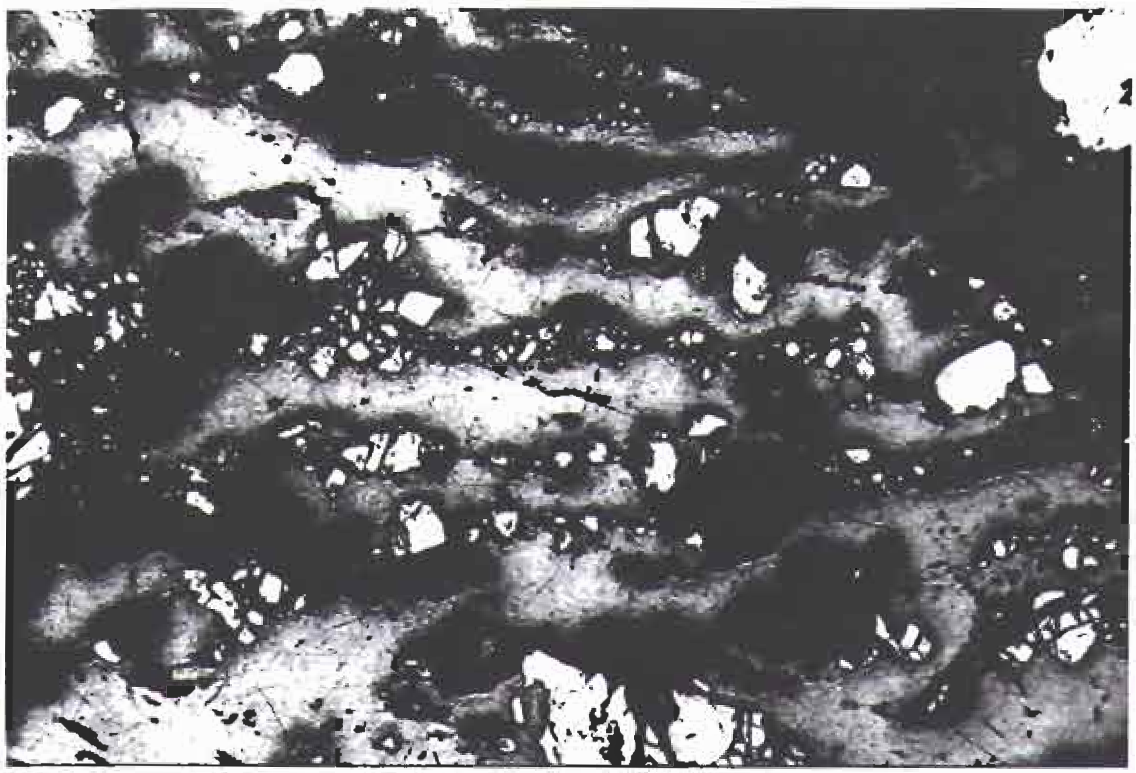

Photo 13. Sample 85-154.
Reflected light. Length of photo 1.6 mm.

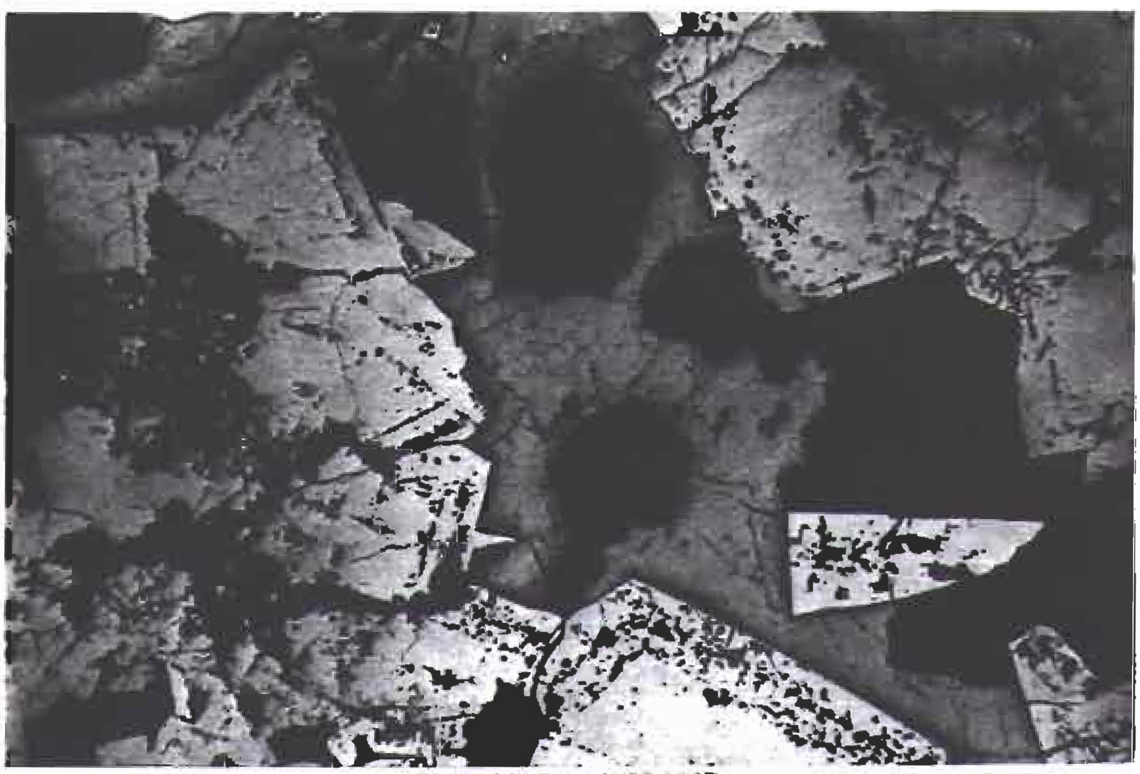

Photo 14. Sample 85-144B.
Reflected light. Length of photo 2.85 mm.

Photo 15. Sample 85-144B.
Reflected light. Length of photo 1.6 mm.

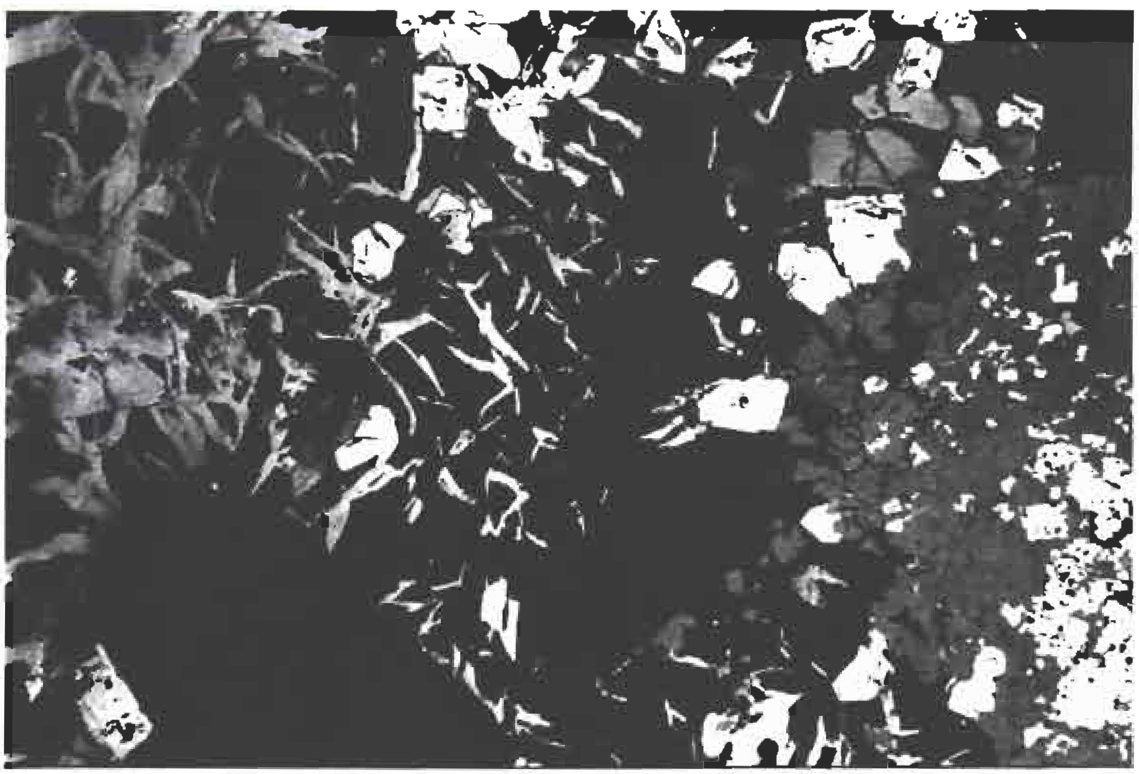

Photo 16. Sample 85-144B.
Reflected light. Length of photo 2.85 mm.

Photo 17. Sample 85-177.
Reflected light. Length of photo 2.85 mm.

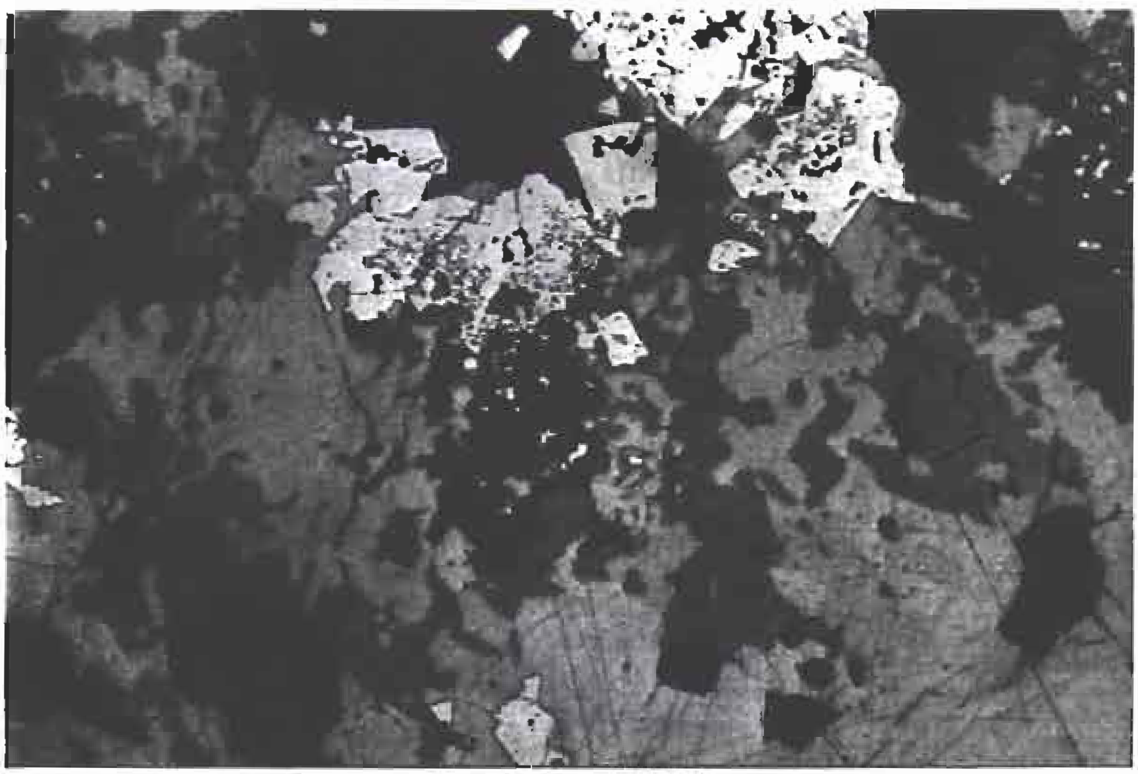

Photo 18. Sample 85-177.
Reflected light. Length of photo 1.6 mm.

Photo 19. Sample 85-245.
Reflected light. Length of photo 2.85 mm.

Photo 20. Sample 85-245.
Reflected light. Length of photo 1.6 mm.

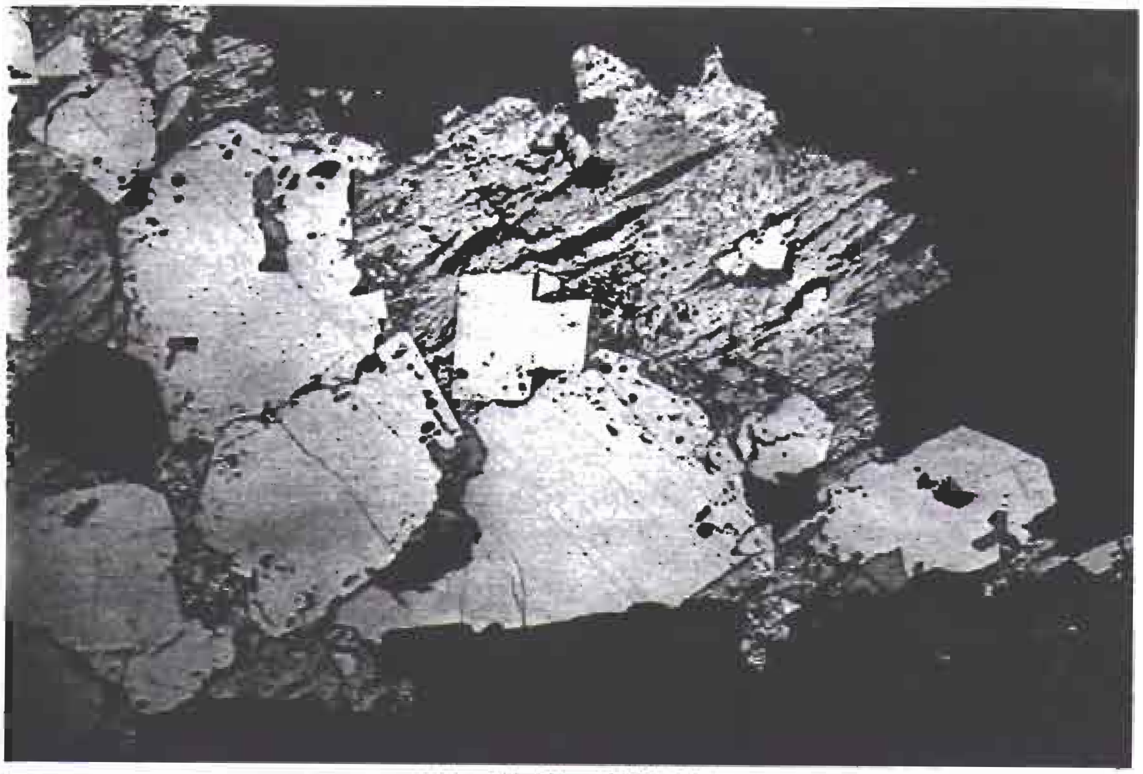

Photo 21. Sample 90-321.
Reflected light. Length of photo 1.6 mm.

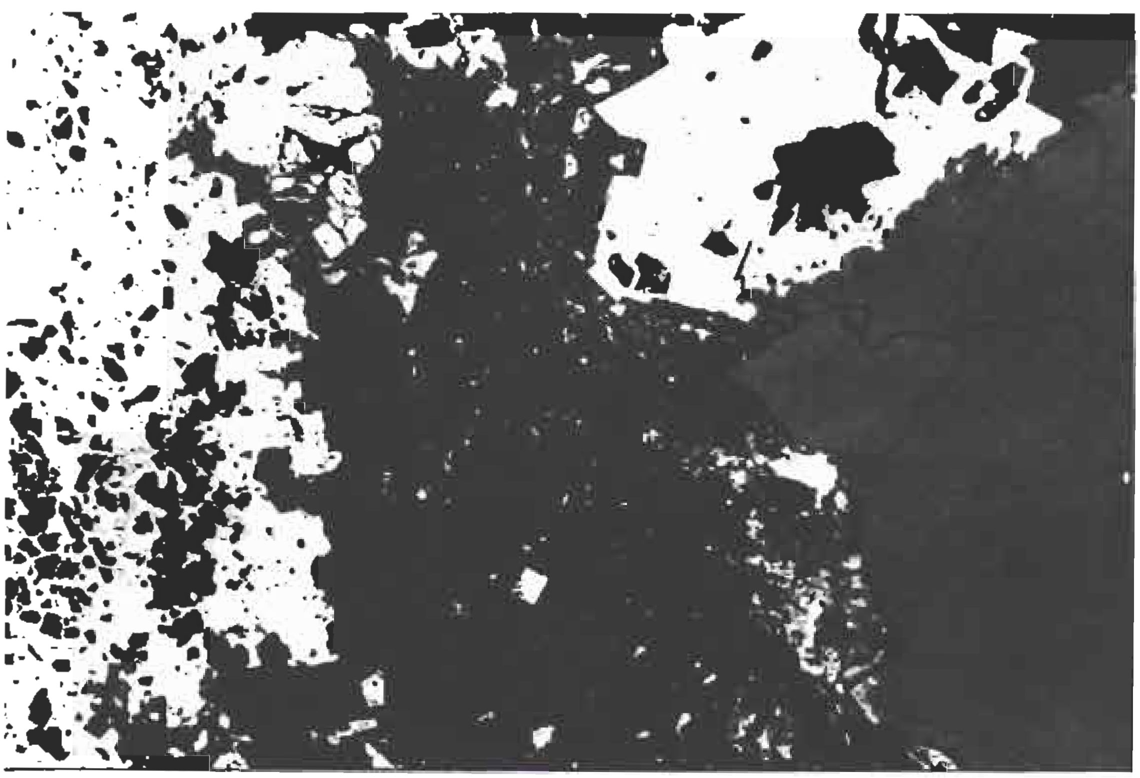

Photo 22. Sample 90-321.
Reflected light. Length of photo 1.6 mm.

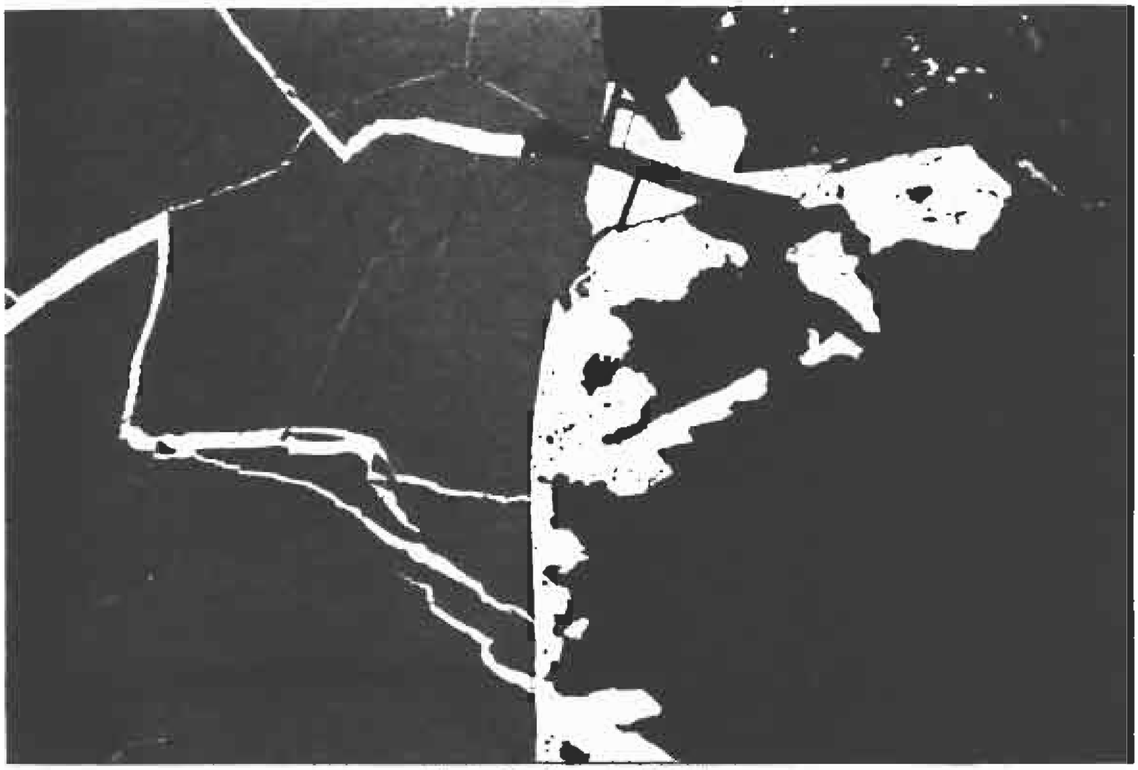

Photo 23. Sample 90-321.
Reflected light. Length of photo 1.6 mm.

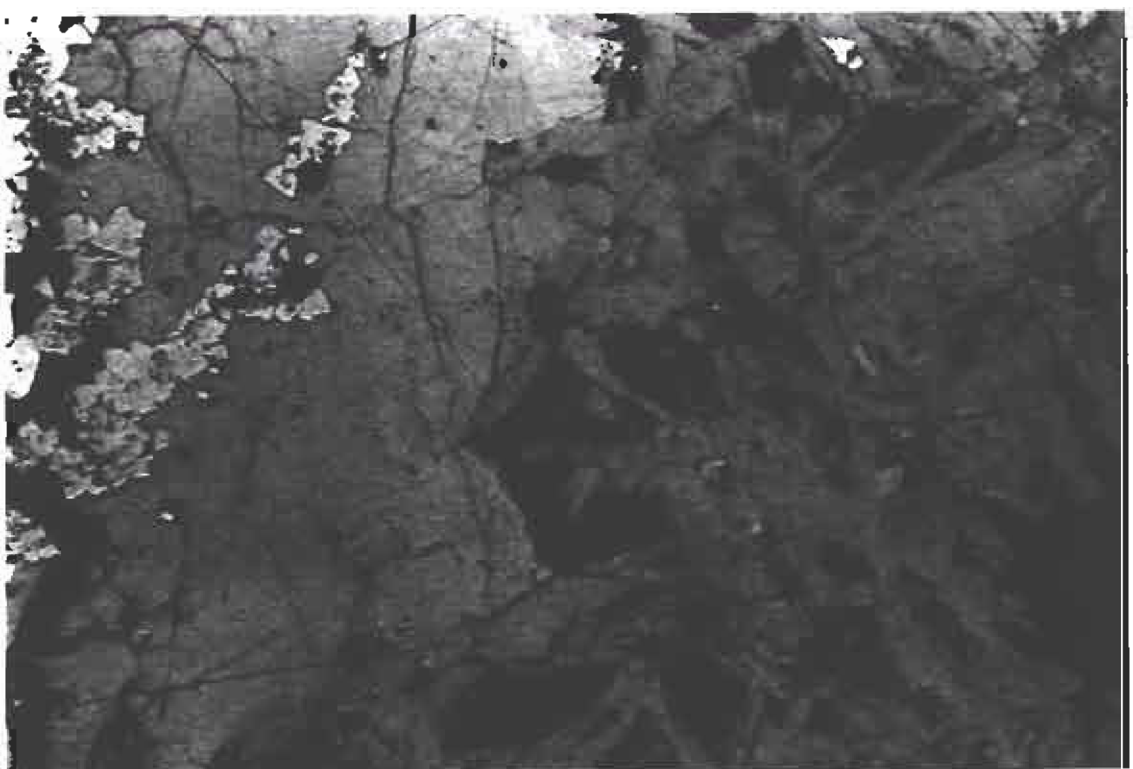

Photo 24. Sample 97-39.
Reflected light. Length of photo 1.6 mm.

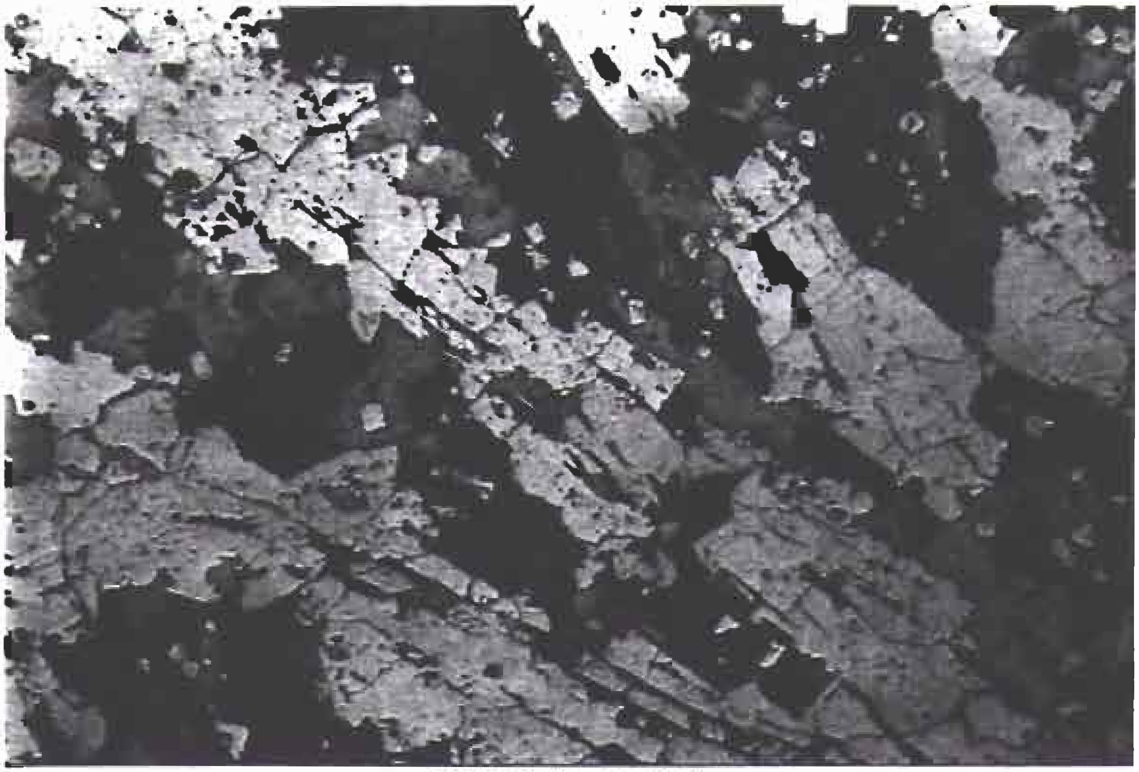

Photo 25. Sample 97-39.

Appendix D

Silvertip Seismic - Final Report

Silvertip Seismic

Final Report

♦

Whytecliff Consultants

Partners: D.B. Butler and K.D.G. Jarvis

September 12, 1997

By
Kevin D.G. Jarvis, P.Geo., M.Sc.

Prepared for
Silvertip Mining Corporation

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- **Line B** 12
- **Line C** 15
- **Line D** 19
- **Line E** 22
- **Line G** 27
- **Line H** 30
- **Line I** 33
- **Line J** 36
- **Line L** 39
- **Line M** 42
- **Line N** 46

Conclusions 49

Executive Summary

The seismic technique has proven to be a successful exploration method for the identification of massive sulfides. 12 seismic lines have been acquired on the Silvertip property. In areas where there are known sulfide deposits the seismic clearly identifies the sulfide distribution. A total of six drill holes have targeted seismic anomalies. Drill hole 97-25 intersected 4 m of sulfide and drill hole 97-24 intersected 2 m of sulfide. Of the remaining four drill holes one has intersected a more disseminated sulfide (97-26), two have identified what may be the oxidized remnants of massive sulfide (97-11 and 97-12), and the final drill hole (97-13) was abandoned due to bad ground, but a clay zone intersection with high nickel and cobalt assay values may have interesting implications. A number of untested seismic anomalies remain which have been tabulated below.

#	Basis	Risk	Depth (m)	Coord. of Vertical Drill Hole	
				Easting (m)	Northing (m)
1	Line B stn. 1150 @ 0.38 s Line D stn. 1222 @ 0.50 s	3	500-540	24928	43356
2	Line B stn. 1150 @ 0.38 s Line D stn. 1275 @ 0.52 s	3	550-600	24928	43254
3	Line B stn. 1185 @ 0.26 s	1	230-260	24978	43413
4	Line C stn. 1410 @ 0.20 s	1	220-260	25214	44128
5	Line C stn. 1210 @ 0.36 s	3	400-450	25414	44128
6	Line D stn. 1272 @ 0.44 s	2	330-370	24960	43260
7	Line E stn. 1660 @ 0.07 s	1	40-70	24824	43660
8	Line G stn. 1380 @ 0.15 s (Deeper 97-13)	3	250-300	24684	42357
9	Line H stn. 1148 @ 0.09 s	2	130-160	24835	42442
10	Line L stn. 1050 @ 0.45 s	3	540-580	25020	42644
11	Line L stn. 1120 @ 0.40 s Line N stn. 1150 @ 0.28 s	2	350-400	24905	42792
12	Line N stn. 1260 @ 0.40 s	3	400-450	24900	43009

Note: Risk ranges from 1 to 3 (low to high).

Introduction

The Silvertip seismic project started out as a test to determine whether seismic techniques, which are relatively unknown in the mining industry, can be successfully used to detect massive sulfides. After the successful acquisition of two test lines a more extensive program consisting of ten additional seismic lines was laid out, acquired, processed and interpreted. This report documents the work performed on the project. It describes the reasoning for suspecting that seismic techniques may be successful, the locations of the lines, and the field procedures. As well, it discusses the data processing and interpretation of the data, which includes the identification of additional untested seismic anomalies.

Geologic Setting and Seismic Hypothesis

Massive sulfides exist at the Silvertip property as manto deposits in karsted limestone. The McDame limestone and dolostone, approximately 350 m thick, is overlain by the Earn, which consists of sandstone, siltstone and conglomerate. The Earn thickness varies from 0 m to greater than 800 m in the Brinco Hill area. Above the Earn is 0 to 40 m of overburden, which consists primarily of broken Earn and organic soil. The differing thicknesses of both overburden and Earn are important in the quality of the seismic data acquired and ultimately in how much can be interpreted from the data. The sulfides exist as small pockets within the McDame, usually at the contact with the Earn. They are approximately 15 to 50 m in areal extent and up to 25 m thick.

Seismic techniques bounce sound waves off rock boundaries, and listen to the resulting reflections (echoes) at the surface. The behavior of these waves is governed by two rock properties: the speed of sound within each rock unit, and the density of each unit. Waves refract (bend) wherever they encounter changes in the sound speed. They reflect wherever there is a change in seismic impedance, which is the product of sound speed and density. Measurements of the speeds of sound in each unit can be made in the field. By recording the time it takes for the sound waves to travel from the surface to a boundary and reflect back to the surface, one can obtain an estimate of the depth to the boundary. By recording the amplitudes of the returning reflections, one can estimate the relative changes in sound speeds and densities across the boundary.

Seismic techniques are virtually unknown in the mining industry. The techniques work well in areas of planar, layered geology that have large contrasts in seismic impedance. In the mining industry, the geology is usually much more complicated, and seismic impedance contrasts are small. However, the Silvertip deposit does not follow this rule. Aside from faults, the unconformity between the McDame limestone and the overlying Earn can be considered to be grossly planar. As well, the contrasts between the McDame and the Earn are large enough that discernible reflections should occur at the boundary. The faults ultimately show up quite well on the seismic data and are evident on every seismic line even when no other reflections are obvious.

The key to the potential usefulness of seismic techniques at the Silvertip property lies with the seismic properties of the three main rock types. Rough estimates of the seismic velocities in the siltstone, limestone, and sulfide are 2000, 4000, and 5000 m/s, respectively. The densities of these rocks are approximately 2.6, 2.9, and 4.5 g/cm^3. This leads to seismic impedances of 5.2, 12, and 22 x 10^6 kg/m^2 s for the siltstone, limestone, and sulfide. The amplitudes of the reflections are directly related to the contrasts in impedance across a boundary. Where the siltstone overlies the limestone, the impedance contrast is a factor of 2.3. This factor is reduced in areas where the Earn is highly silicified or altered. Where the siltstone overlies the massive sulfide, the impedance contrast is a factor of 4.2. The reflection created at the siltstone-sulfide contact should be much stronger than the one from the siltstone-limestone contact. This leads to two important hypotheses. First, one should be able to seismically image the siltstone-limestone contact from the surface. Second, large seismic amplitudes along this imaged boundary should correspond to massive sulfides.

There is an inherent risk in using seismic techniques, as certain geologic conditions can cause the method to fail. First, if the ratio of the size of an ore body to its depth is very small, the ore may be impossible to image. Second, certain types of overburden can hamper the technique, by grossly attenuating high frequency, fine-resolution signals, and passing only low frequency, poor-resolution signals. Therefore the surface conditions may make it more difficult to detect small ore bodies. A priori predictions of the resolution limit are predictions only. Accurate estimates of the resolution can only be made after field data have been collected.

The purpose of this project, therefore, is to apply seismic techniques to the detection of massive sulfides at the Silvertip deposit. The following summarizes the locations of the lines, describes our field procedures and data processing, and gives interpretations of the data.

Locations of Seismic Lines

The 12 seismic lines acquired in 1997 are illustrated in Figure 1. The lines are distributed across the property and can be grouped according to location. Lines A, B, D and E fall in the extensively drilled area known as Silver Creek. Lines G, H, L, M and N fall in an area known as Silvertip Hill. Lines I and J fall in an area known as Brinco Hill and finally line C falls in an area known as Discovery. Each area is unique in terms of the amount of overburden and the thickness and characteristics of the Earn overlying the McDame.

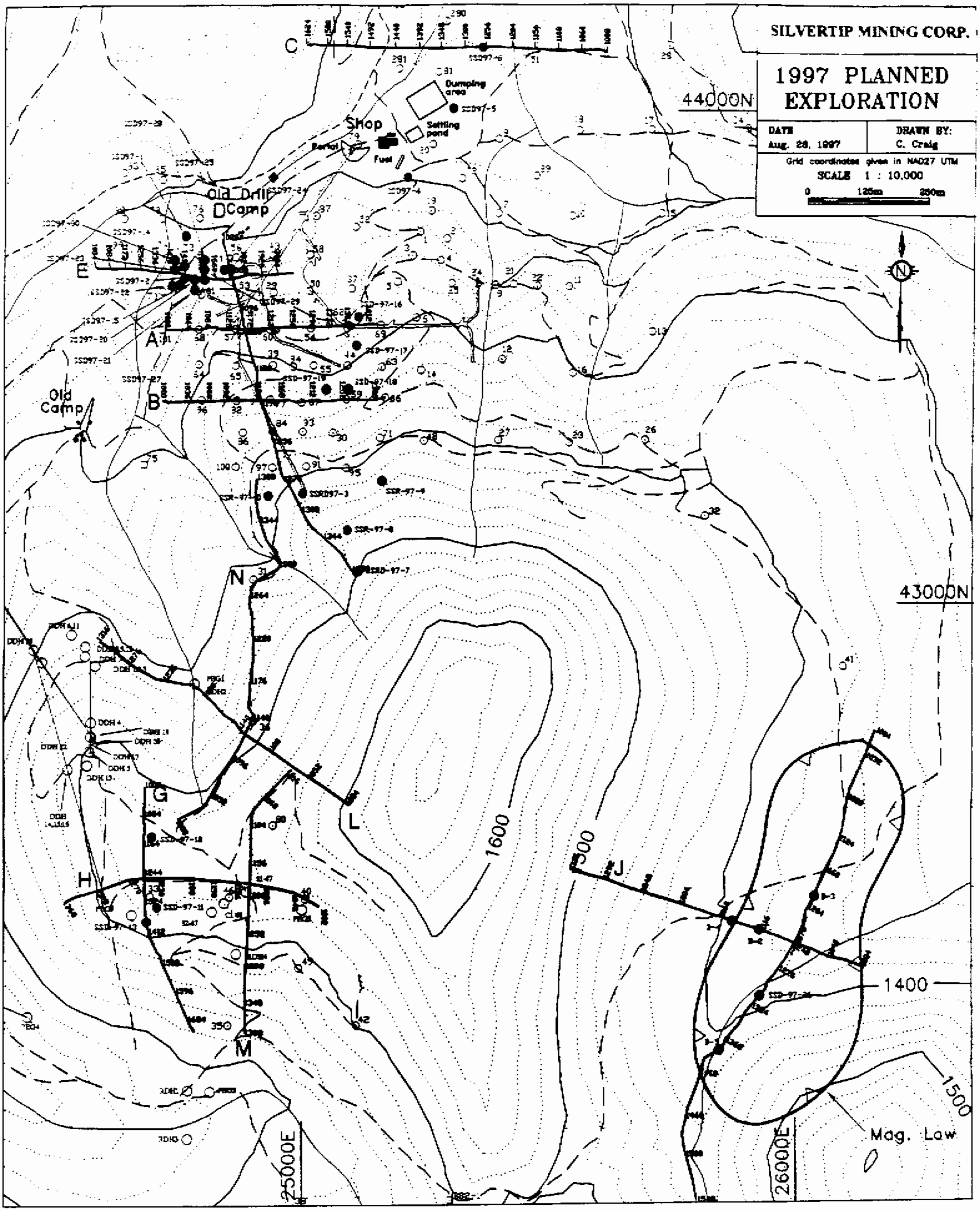


Figure 1. Seismic Location Map

Field Procedures

The equipment used was obtained from various rental companies from across Canada. The seismograph had 48 channels, which means it was capable of listening to 48 geophones simultaneously and recording the resultant signals (Geometrics StrataView R48). The geophones were in groups of six, allowing for the signal from six geophones to be summed together and recorded as one trace on the seismograph (Oyo model GS-20DX – 14 Hz). The roll box (I/O model RLS 100) was capable of accepting 96 input channels and selectively outputting 48 channels to the seismograph. The cables were standard CDP seismic cables with 48 pairs of wires and a takeout spacing of 16.5 m. The cable and geophone configurations, although unwieldy at times, provided the optimum flexibility in line parameter selection.

The field procedures used during the acquisition of the 12 lines varied somewhat in order to obtain the best quality data to accomplish the objectives of the project. Initially, shallow shot holes were used with a depth of 1 to 1.5 m. The shallow holes were drilled with both a power auger and a Bobcat mounted auger. The shallow holes were not deep enough to contain the blast from larger charge sizes, so in the end 3 m holes were drilled. The deeper holes worked extremely well for charge sizes as large as ½ kg. To drill the 3 m holes an air track drill rig was used. After the holes were drilled they were then cased with plastic pipe to keep them from caving in before the holes could be loaded.

Geophones were planted over the entire line between the shot holes. The spacing of the geophones varied from 1.5 m to 8.0 m, depending on the depth of the target at a specific location. The geophones were planted as firmly as possible. The lines along the established roads resulted in significantly better geophone plants than those along cut lines through the trees. The better quality geophone plants contributed to improved data quality and better images of the subsurface. The geophones were surveyed after being planted. For single geophones (lines A and B) the coordinates of the geophones were directly determined and for the geophone groups the coordinates of the ground midway between the 3rd and 4th geophones were determined. Geophone receiver cables were laid out end-to-end over the entire line, and the geophones hooked into the cables. All cables were connected to a roll box at the centre of the line, where the seismograph was located. Prior to shooting, the line was tested for electronic integrity.

The process of loading the shot holes with explosives varied during the course of the project. Initially, the holes were loaded one at a time. This proved to be extremely time consuming, especially with the deeper holes, which required additional time to stem properly. In the end the entire line was loaded prior to shooting so the line could be shot as quickly as possible. The shooting phase tends to be the most expensive in terms of personnel time, especially if the weather is questionable, so the minimization of delays during acquisition results in the best overall production rate.

A summary of the data acquisition parameters for the 12 lines is shown in Table 1.

Line	# of Shots	Chg. (kg)	# of Days	Subsurface Coverage
A	114	1/8	5 (2)	424 m @ 2 m
B	77	1/4	4 (2)	462 m @ 3 m
C	157	1/2	6 (3)	618 m @ 2 m
D	101	1/2	4 (1)	780 m @ 4 m
E	135	1/8	6 (4)	400 m @ 0.75 m
G	91	1/4	5 (2)	540 m @ 1.5 m
H	82	1/4	4 (1)	528 m @ 3 m
I	89	1/2	5 (2)	904 m @ 4 m
J	73	1/2	4 (1)	612 m @ 4 m
L	63	1/2	3 (1)	620 m @ 4 m
M	96	1/2	2 (1)	567 m @ 3 m
N	75	1/2	2 (1)	660 m @ 4 m
Totals:	1153	421	50 (21)	7115 m

Note: The bracketed term under # of Days indicates the number of recording days when the seismograph was on the line.

Table 1. Seismic Acquisition Summary

Data Processing

At the end of each day of acquisition, the seismic data were transferred on to the computer, and backed up on zip disks. When the test lines A and B were acquired the data was shipped to Calgary to be professionally processed. The data was also processed in the camp on a PC using the simplified SU processing system. The results from Calgary were both time consuming and of questionable quality so it was decided that for the other lines the processing would be done in the field.

The processing steps used on the SU processing system are as follows:

1. Convert data from seismograph format (SEG2) to processing-language format (SEGY).
2. Strip data of inappropriate header information.
3. Merge surveyed geophone and shot locations with seismic data.
4. Apply a gain correction to compensate for the decay of the seismic signal as it travels farther through the earth.
5. Filter data to remove low-frequency ground-roll.
6. Edit recorded data, shot record by shot record, to remove traces contaminated by electronic noise and air blast.

7. Apply a normal moveout correction to compensate for varying line geometries and subsurface velocities (i.e. arrival time of reflections depends on the distance from source to receiver and the velocity of the underlying rocks).
8. Perform statics corrections to account for elevation variations along the line.
9. Stack data (sum traces which sample identical ground locations) to improve signal-to-noise ratio.
10. Plot section.

There are a number of processing steps which were not applied which affect the data quality. A surface consistent deconvolution program was not available in the SU processing software. This program improves the vertical resolution of the data by adjusting the higher frequencies in a statistically reasonable manner. A residual statics program was also not available. The residual statics calculation compensates for variations in the near surface, which are not dealt with adequately by the elevation statics program. This often occurs due to rapid near surface velocity variations. The application of both of these programs on future processing of the data will invariably have a significant impact.

Analysis & Interpretation

The interpreted seismic data reveals a number of amplitude anomalies, which may be associated with the presence of sulfide mineralization. A number of drill holes have tested some of these anomalies, identifying massive sulfide in at least 3 cases. There are a number of points, which apply to all the interpretations that should be made clear.

The seismic waveform represents a snapshot of the propagating seismic wave in both frequency and time. When the seismic waves reflect off a boundary the final processed section will show a series of seismic waveforms lining up to represent the boundary in time. A simple seismic waveform consisting of a single, compact peak is the most desirable. With a simple waveform, the variations along an interface are easily identified. As well, the identification of variations within a layer becomes possible because there is reduced interference or overlap of reflecting events. The seismic waveform on all of the Silvertip seismic lines consists of a series of peaks and troughs (approximately two of each). This makes the precise identification of boundaries difficult. The relative amplitudes should be maintained, however, and can still be used to identify large impedance contrasts.

Some of the seismic reflections are interpreted as fault plane reflections. This may not seem plausible at first considering most of the faults consist of a fault gouge, which is probably less than 2 m in thickness. The wavelength of the propagating seismic waves is probably close to 50 m. Normally, a wavelength to thickness ratio of 20 or greater will not result in a noticeable seismic reflection. This is a result of the fact that reflections of opposite polarity are generated from the top and bottom of the layer and will cancel each other out. The key reason for believing that a 2 m fault gouge will create a significant reflection is the large contrast in impedance across such an interface. The loose broken rock characteristic of fault gouge will have an impedance similar to loose soil or overburden material. Very large reflections will be generated from both the top and bottom of the fault gouge and will not completely cancel each other out, leaving a noticeable reflection. This ability to image small features with large contrasts in impedance is also one of the reasons that sulfides can be detected on some of lines.

When reflections on the stack sections are coming from features with any amount of dip, they will not be shown in their true subsurface locations. A dipping seismic reflection will always appear downdip from its true location. This is due to the geometry of propagating waves, where a path perpendicular to a reflecting horizon is usually favored. The correction of the dipping reflections is normally done using a processing step called migration. Unfortunately, a good migration algorithm is not available in the processing software that is being used. When reflections are coming from features at the same subsurface location but with two very different dips the interpretation can be quite complex. This situation arises when you have steeply dipping faults cutting across gently dipping lithologic contacts. It is believed that most of the faults at Silvertip have dips, which are probably greater than 50 degrees. Even if a migration program were available such steeply dipping features are extremely sensitive to the velocity model used to migrate the data. Migration programs capable of properly migrating reflections with a true dip of greater than 45 degrees are very specialized and require a detailed velocity model to work properly. The lack of good velocity control on most of the lines suggests that the application of such a program may not be possible. It must certainly be kept in mind that on stack sections where there are two overlapping, dipping reflectors, the source of the reflections is not within the same region in the subsurface.

A simple formula can be used to understand the sensitivity of migration programs to velocity and dip. The formula is referred to as the migrator's formula and is given by

$$\sin\theta = \tan\alpha$$

where θ is the true dip and α is the apparent dip. The apparent dip is what you "see" on a stack section in time converted to depth by using the "true" rock velocities. The maximum apparent dip is 45 degrees which corresponds to a vertical reflecting horizon (something which is almost impossible to image). An apparent dip of 41 degrees corresponds to a true dip of 60 degrees. A 15% increase in velocity will take a reflector with a true dip of 60 degrees and make it appear to have a dip of 90 degrees. If a velocity model is used that "stretches" a reflection so that its dip is beyond 45 degrees then it is physically impossible and would be eliminated by a migration program. These examples illustrate the sensitivity that a migration program would have to velocity and dip and they should be kept in mind when reflectors with dips greater than 45 degrees are interpreted.

The interpretation of each line will now be detailed with suitable sulfide anomalies identified. The same color scheme is used on all of the lines. The McDame is colored blue, correlatable Earn reflections are colored green, faults are colored black (dashed black is used on fault plane reflections) and hypothesized sulfide is colored red.

Line A

The interpretation of line A is shown in Figure 2, with an uninterpreted section shown in Figure 3. This line is the first test seismic line acquired at Silvertip. It ties a series of good sulfide intersections in a depth range of 70 to 120 m. The identification of a clear link between seismic amplitude and sulfide distribution on this line is one of the main justifications for the expanded seismic program. The drill hole control on the line is reasonably extensive, which enables a detailed correlation to be made.

The sulfide distribution based on drill hole intersections can be broken down into five main sections. From the start of the line to station 1095 there are no sulfide intersections. A continuous zone of sulfide exists from station 1116 to station 1220. From station 1240 to 1280 there are no sulfide intersections. From station 1300 to 1380 are what appears to be a more discontinuous, patchy distribution of sulfide, and then there is a lack of drill hole control until station 1420 where there is no sulfide.

A series of amplitude anomalies from 0.05 to 0.12 s appear to correlate extremely well with the location of sulfides along the line. The first high amplitude event starts very close to station 1095 at a time of 0.09 s (where no sulfide was identified) and continues to station 1120. At this point the event becomes fuzzy, but still correlatable. The reflection appears to flatten out until station 1170, then drops down in time to 0.12 s where it continues until it appears to terminate at station 1230. From station 1230 to 1300 the amplitudes are insignificant suggesting either poor data quality or a lack of any significant reflectors. From station 1300 to 1340 at a time of 0.08 s, there is an obvious amplitude anomaly, which then fades out around station 1350 before continuing from stations 1360 to 1390 at a time of 0.07 s where it appears to end. The seismic coverage is also decreasing at this point because it is close to the end of the line and the overburden is becoming thicker as the line moves up the slope, so a decrease in data quality may also explain the amplitude termination.

The structural trends and interpreted depths tie the drill hole control extremely well. The data has been processed to a flat datum at an elevation of 1380 m. Using a velocity of 2000 m/s for the Earn the depth to the sulfide can be estimated. The sulfide from stations 1100 to 1230 has an interpreted depth range of 90 to 120 m. The sulfide at the east end of the line appears to be faulted upwards with a depth range of 80 m at station 1320 and 70 m at station 1370.

There does not appear to be a good reflection from the Earn-McDame interface except when massive sulfide is present. This is probably a function of the simplified processing used on the line. West of station 1100, the disordered high amplitude peaks and troughs will probably align and correlate with the unconformity surface. The match of seismic amplitudes with sulfide distribution on line A is a clear indication that surface seismic techniques can detect the presence of massive sulfides in the subsurface.

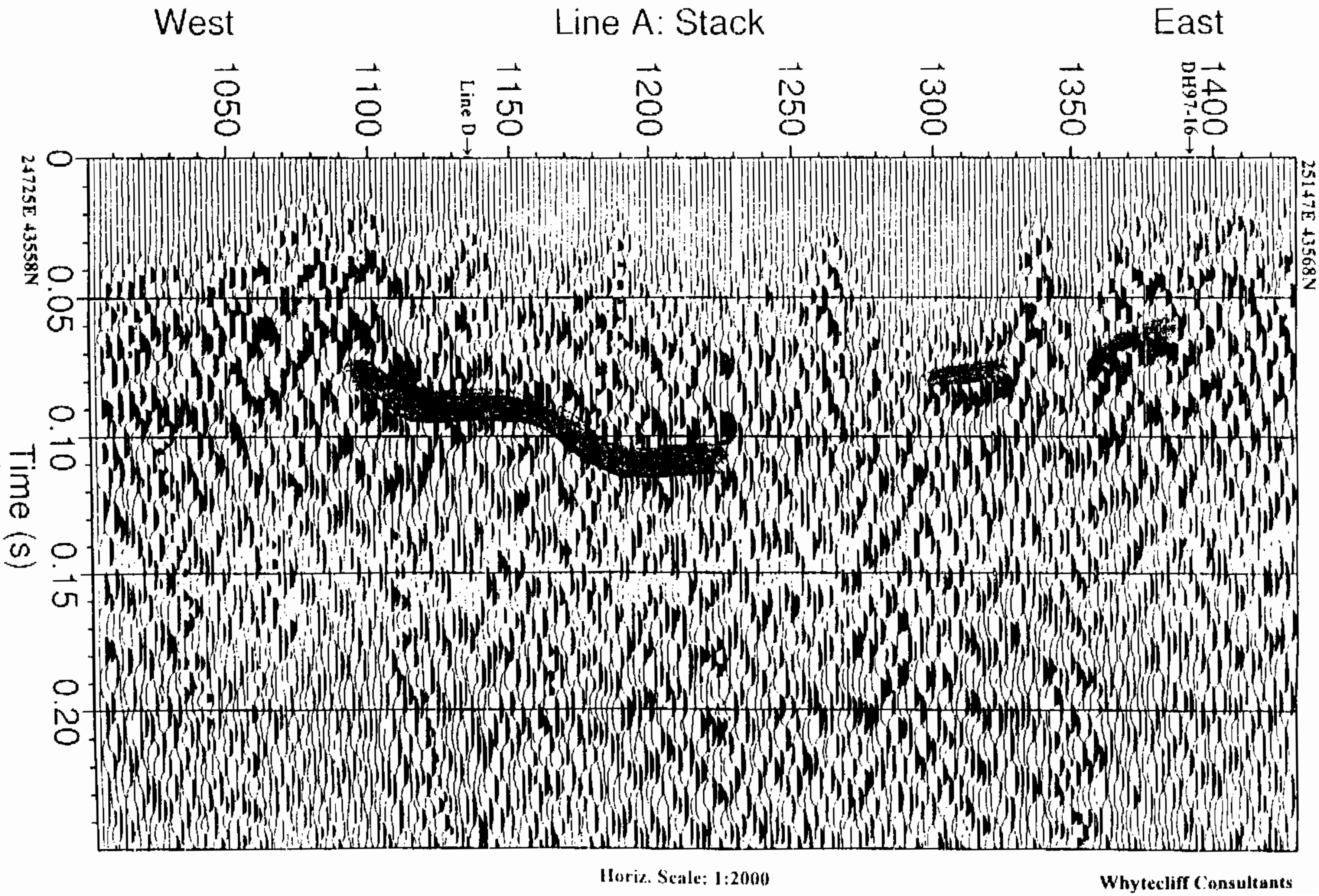
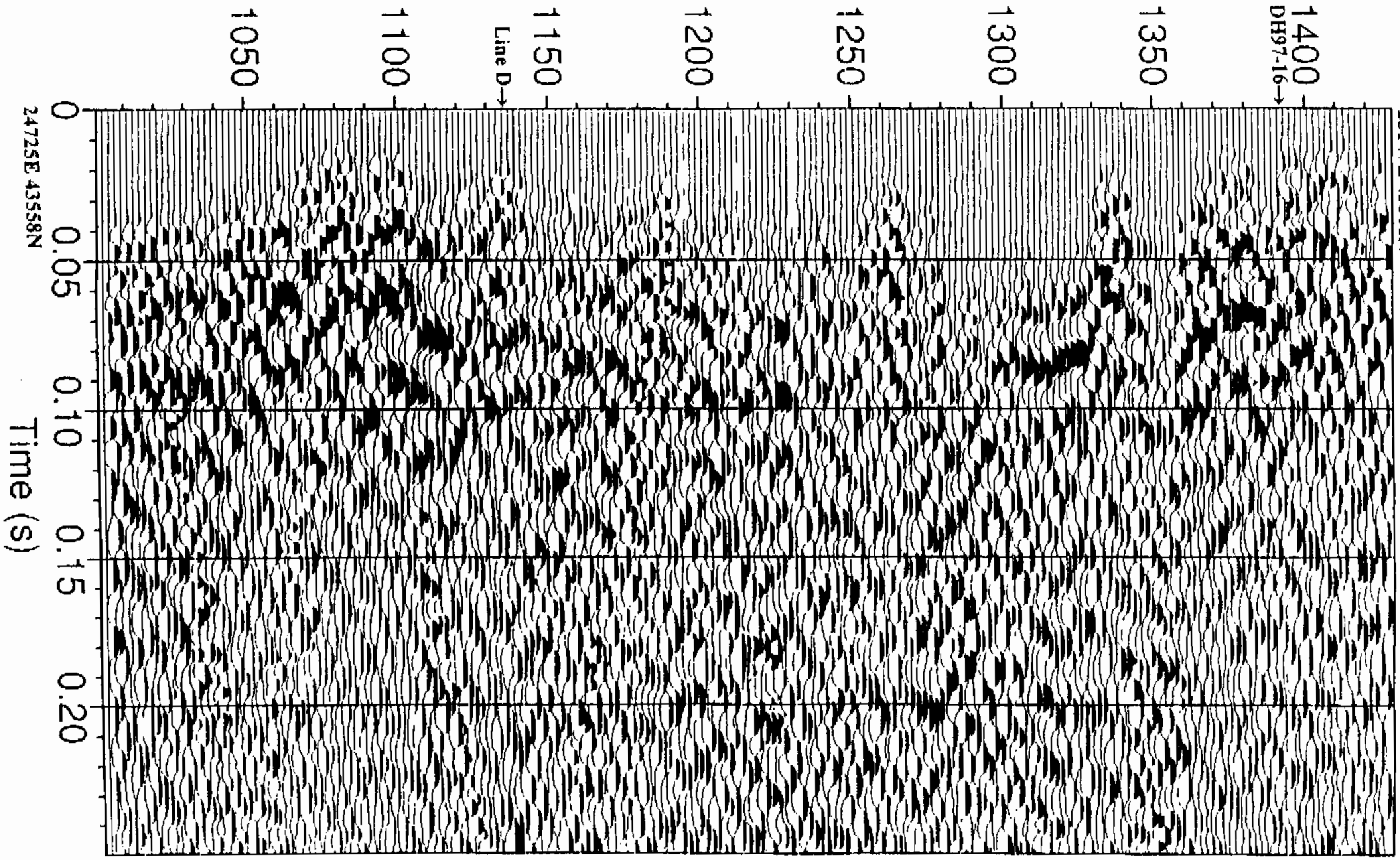

West
Line A: Stack
East
1050
1100
Line D→
1150
1200
1250
1300
1350
DH97-16→
1400
24725E 43558N
25147E 43568N
0
0.05
0.10
0.15
0.20
Time (s)
Horiz. Scale: 1:2000
Whytecliff Consultants

Figure 2

West Line A: Stack East



Horiz. Scale: 1:2000

Whytecliff Consultants

Figure 3

Line B

The interpretation of line B is shown in Figure 4 with an uninterpreted section shown in Figure 5. This line is the second test line acquired at Silvertip. It also ties a series of sulfide intersections, which are not quite as extensive as those on line A. The known sulfide does not show up particularly well on line B. This can be explained in part by the smaller size of the deposits and also by the thicker Earn which overlies the McDame. The overburden is thicker on this line (at places as thick as 15 m) with shallow shot holes and ¼ kg dynamite charges. The result is a significant increase in the source-generated noise, which obscures the subsurface reflections.

The sulfide mineralization on this line that should be visible on good quality seismic data falls between stations 1114 and 1144. In particular, drill hole 77 at station 1127 has a good 15 m intersection of sulfide. Smaller pockets of sulfide exist at stations 1082, 1241 and 1291. These smaller deposits are typically only 1 to 3 m thick, which is significantly less than the seismic wavelength of 50 m so probably will not be visible.

The processing datum on this line is at an elevation of 1330 m. Assuming an Earn velocity of 2000 m/s the unconformity should fall at a time around 0.2 s. This will vary due to the structural relief on the unconformity. The interpreted depth to the McDame has been placed on the line as a dashed blue line. There is no good coherent reflection to base this interpretation on, but there are a series of more discontinuous reflections, which have a rough correlation. At station 1127 where drill hole 77 has 15 m of sulfide there is a hint of increased amplitude with maximum lateral dimensions of approximately 5 traces which translates to 12 m. A smaller, more subtle amplitude anomaly exists at station 1080, but this anomaly would never be identified without having the drill hole information as a guide.

A number of other amplitude anomalies that have not been tested are obvious on the line. The most significant falls beneath station 1150 at a time of approximately 0.4 s. The series of peaks and troughs have an interpreted depth range from 500 to 600 m, which places them in the lower part of the McDame. The precise location of the anomaly cannot be determined from one seismic line because the event could be coming from out of the plane of the section. If the anomaly is north of line B it would make it shallower and if south of the line it would be even deeper. The other untested amplitude anomaly falls at the unconformity or within the upper 100 m of the McDame. The location is from station 1180 to 1190 at a time of 0.26 s. The estimated depth range is from 230 to 260 m.

Although amplitude anomalies have been identified on this line, the inability to obtain a good image of the unconformity surface suggests that the seismic technique may not always work as well as expected.

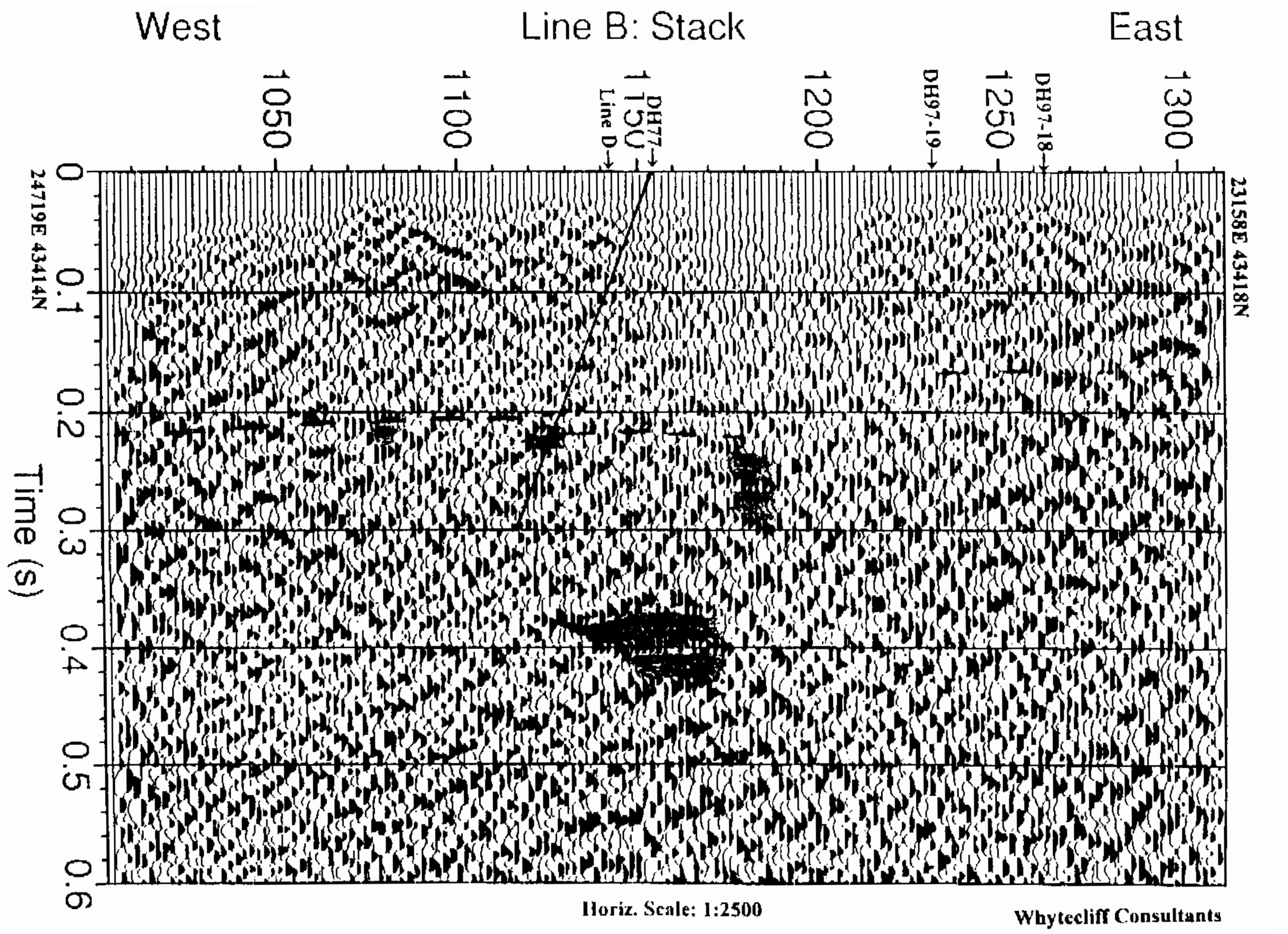

West
Line B: Stack
East
1050
1100
1150
1200
1250
1300
Line D
DH77
DH97-19
DH97-18
24719E 43414N
23158E 43418N
Time (s)
0
0.1
0.2
0.3
0.4
0.5
0.6
Horiz. Scale: 1:2500
Whytecliff Consultants

Figure 4

West Line B: Stack East

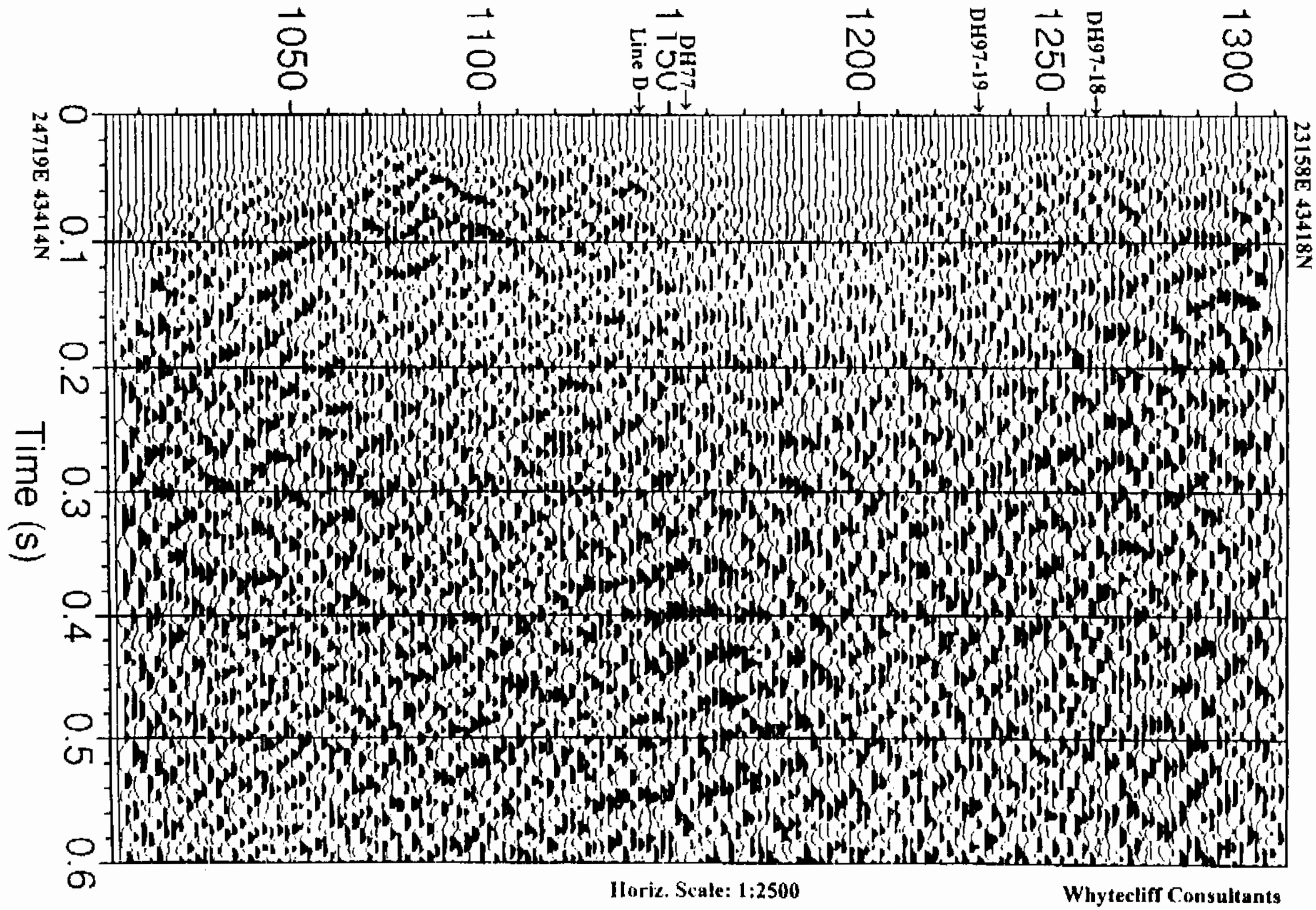


Figure 5

Line C

The interpretation of line C is shown in Figure 6 and the uninterpreted section is shown in Figure 7. Line C identifies two potential drill targets. The data are of good to excellent quality. As a result, a clear structural interpretation can be made which matches very closely the available drill hole data. The drill targets are on trend with known sulfide deposits and seem to be directly related to the faulting of the McDame.

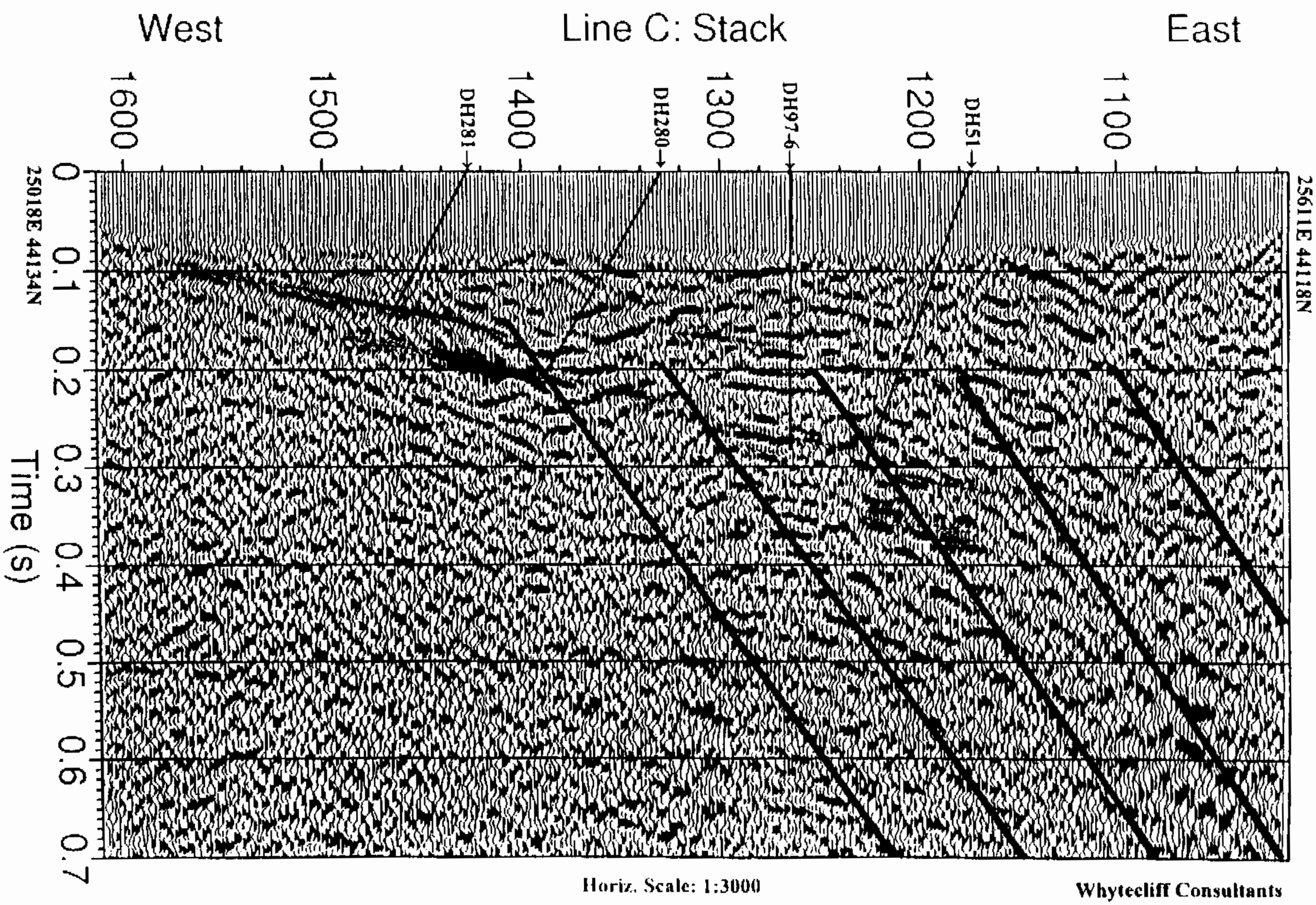
The interpreted section consists of a series of reflections, which are dipping to the east at approximately 20 to 30 degrees. A series of eastward dipping normal faults cut across the McDame from stations 1050 to 1400. The interpretation of these faults is based on an analysis of the reflection patterns, not on the actual imaging of the fault planes. The reflections are arranged in vertically coherent groups separated by discontinuities. These discontinuities have linear trends and have been interpreted as normal faults. This model also matches a cross section put together by Chris Rees for the area. The drill targets are colored red and are associated with the higher amplitude reflections within the McDame limestone.

A previous interpretation of line C had the base of the McDame limestone interpreted. The reflections at a time of 0.25 s beneath station 1450 had been interpreted as the base of the McDame. It is now believed that these reflections represent either fault plane reflections or multiples. A simple analysis reveals that if a velocity greater than 2500 m/s is used to stretch the section to depth then these reflections cannot represent fault plane reflections within the McDame which has a velocity closer to 4000 m/s. It is believed that these reflections represent multiples which result when seismic energy bounces from a large impedance contrast in the subsurface and back to the surface "multiple" times.

From stations 1250 to 1400, between 0.1 and 0.2 sec, a series of westward dipping reflections are obvious. These reflections cut across the interpreted unconformity, but do not seem to go deeper than the base of the McDame. One possibility is a fault dipping to the west, however, a fault should result in a continuous reflection which is not truncated at any point. The truncation can be explained by a degradation in the data quality as you go further west. This does make sense given that the western end of the line is through the trees and up a slope with significant moss and loose soil. Drill holes numbered 81 and 280 indicate overburden as thick as 40 m localized at the same part of the line as the westward dipping reflections. The thicker overburden will act to amplify any source-generated noise (i.e. groundroll) which would only be apparent where the overburden exceeded a certain thickness.

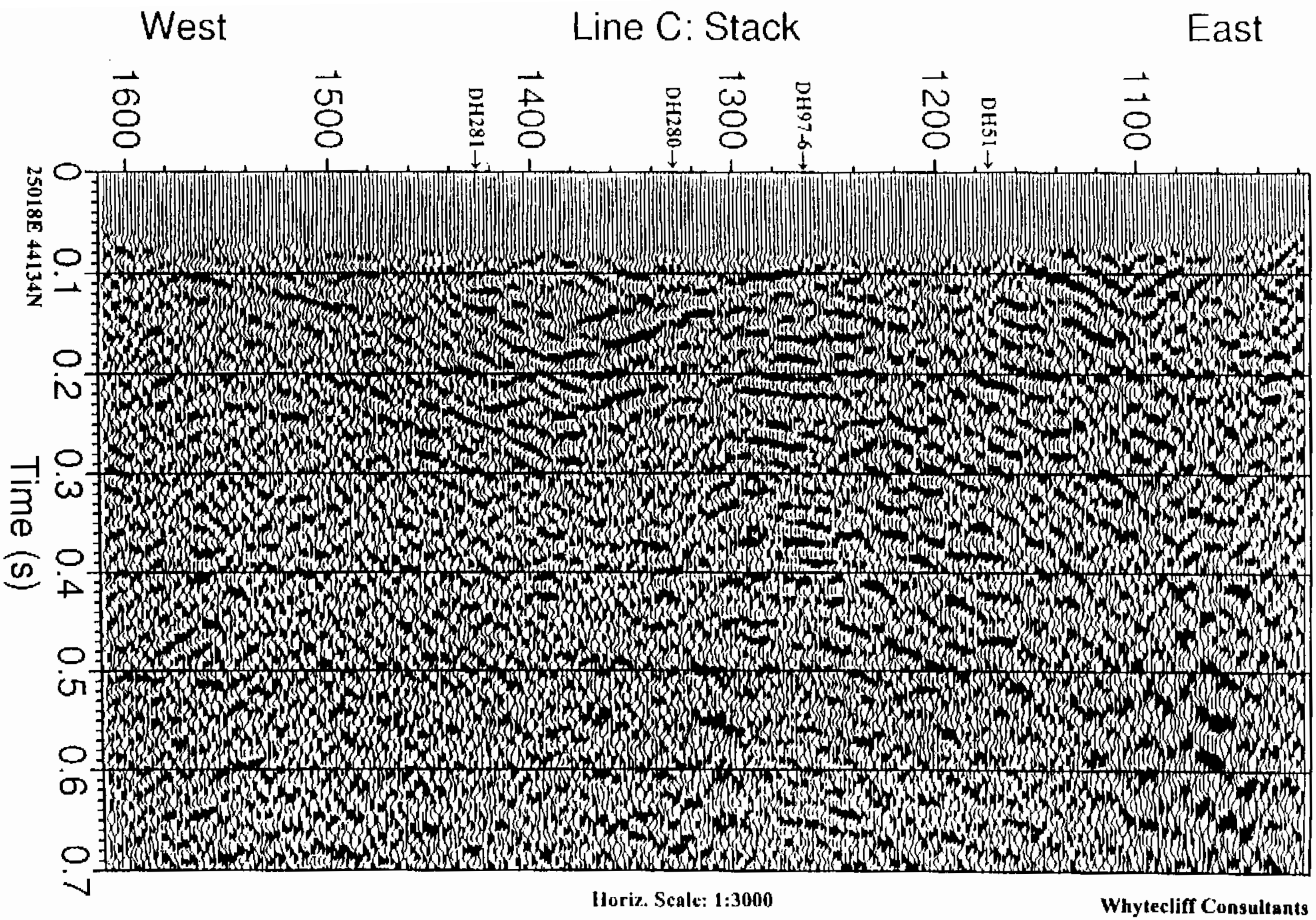
The first drill target is apparently located beneath station 1400. There are a series of reflecting horizons within the McDame, which have limited lateral extent. The amplitude appears to be strongest closest to the fault and then decreases as you get further away. This is consistent with having a thick sulfide zone close to the fault that decreases in thickness to the west. The faults have presumably acted as conduits for both the dissolution of the limestone and the emplacement of the sulfide. Alternatively, the reflections could be associated with karst features in the limestone. The actual nature of the reflecting horizons cannot be uniquely resolved using the seismic data alone. The migration correction is based on the depth of the target and the dip of the reflector. The drill target apparently beneath station 1400 at a time of 0.2 sec is actually beneath station 1416, a correction of 16 m (the station spacing on this line is exactly 1 m). The fault zone itself also looks interesting, so a drill hole could be placed to intercept both. The estimated depth to the unconformity beneath station 1400 is 150 m. The depth to the potential sulfide reflection is approximately 230 m.

The second drill target is apparently located beneath station 1180. It falls in the middle of the McDame at a time of 0.36 sec, with an estimated depth of 400 m. The amplitude of the associated reflection is significant and shows both truncation and offset by the nearby faults. The actual migrated location is station 1210, placing it very close to the unconformity intersection of drill hole 51 (at station 1228). Drill hole 51 reached a total depth of 361 m without any significant mineralization encountered. The location is favorable because it is north of known sulfide deposits. The risk is high because of the depth and the potential for the highlighted reflection to be caused by some other seismic event. The nearby faults will both scatter and diffract the seismic energy that may be influencing the amplitude and character of the reflection.



West
Line C: Stack
East
1600
1500
DH281
1400
DH280
1300
DH97-6
1200
DH51
1100
25018E 44134N
25611E 44118N
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Time (s)
Horiz. Scale: 1:3000
Whytecliff Consultants

Figure 6



West
Line C: Stack
East
1600
1500
DH281→
1400
DH280→
1300
DH97-6→
1200
DH51→
1100
25018E 44134N
25611E 44118N
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Time (s)
Horiz. Scale: 1:3000
Whytecliff Consultants

Figure 7

Line D

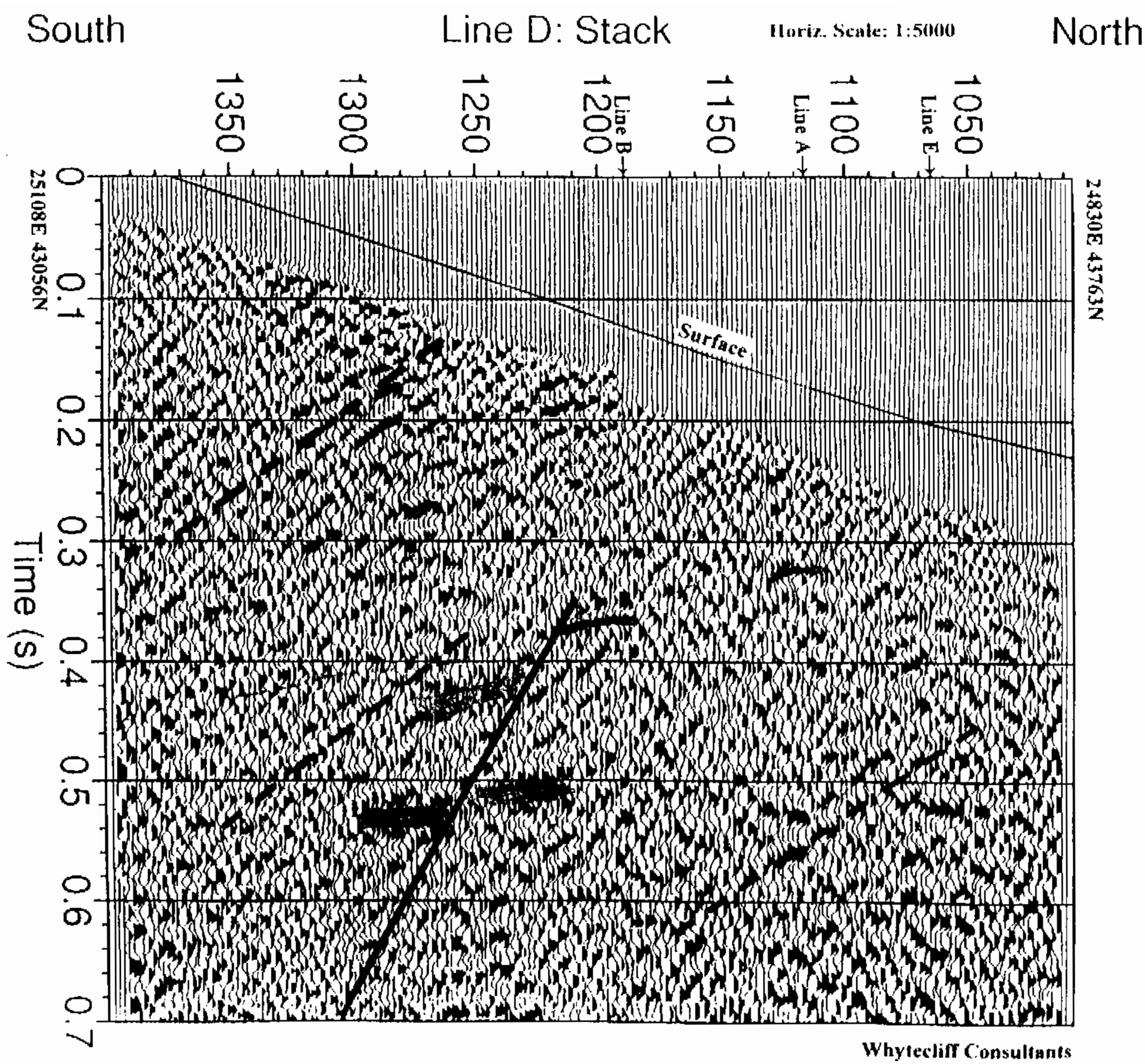
The interpretation of line D is shown in Figure 8, with the uninterpreted section in Figure 9. The blank zone at the top of the section indicates the significant topographic change along the line (approximately 300 m). The data has been corrected to a flat datum at an elevation of 1500 m, corresponding to the elevation at the south end of the line.

This line has been located to follow the gable of the main ore body to the south. As a result, there are numerous drill hole intersections of sulfide underlying the line. From station 1088 to 1120 is a thick zone of sulfide. From 1120 to 1176 the sulfide becomes more patchy and discontinuous. A thick zone exists from station 1176 to 1200. From 1200 to 1240 there is very little in the way of sulfide and from station 1240 to 1251 the sulfide appears at different levels as much as 40 m below the unconformity. Beyond station 1251 insignificant amounts of sulfide have been identified. One of the objectives of line D was to extend the sulfide further to the south, presumably beyond drill hole 97.

The top of the McDame appears to be identifiable, with amplitude variations along it, which roughly correspond to the known distribution of sulfides. The amplitudes from stations 1088 to 1120 are not particularly significant, even though there is significant underlying sulfide. This is a good example of the effect of the line geometry on the depth of investigation. The farthest offset on a single shot profile is close to 400 m. Offsets beyond approximately 100 m will not be useful for imaging reflections originating from the upper 100 m (where the sulfide is present). This means that only the first quarter of the shot profile can be used, which greatly reduces the number of traces which are stacked together to enhance the reflections.

The amplitudes from stations 1190 to 1280 suggest the presence of sulfide. In particular, the reflection at a time of 0.44 s below station 1272 looks very interesting. There are numerous drill holes targeting the same general location, which do not show sulfide. It is possible the sulfide exists off to one side of the seismic line. If there are drill holes, which have sulfide intersections in this area (i.e. drill hole 97), but do not have much control to the south, there is a good possibility the sulfide extends further south in accordance with the seismic anomaly.

There are a series of deeper high amplitude reflections, from station 1200 to 1290 at a time of 0.50 to 0.54 s. The estimated depth range of these reflections is from 500 to 600 m. These reflections may be linked to the high amplitude anomaly seen on line B. The interpretation of this line is complicated because there are known structural complexities paralleling the line. With north-south faults close to the line the origin of reflections can be ambiguous. There does not appear to be an obvious extension of sulfide south of station 1300. This is based on the lack of high amplitude seismic reflections. The greater depth of the McDame at the south end of the line will definitely have an impact on the ability to resolve any small sulfide bodies. Very large sulfide bodies should still be identifiable.



South
Line D: Stack
Horiz. Scale: 1:5000
North
1350
1300
1250
1200
Line B
1150
Line A
1100
Line E
1050
2510SE 43056N
24830E 43763N
Surface
Time (s)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Whytecliff Consultants

Figure 8

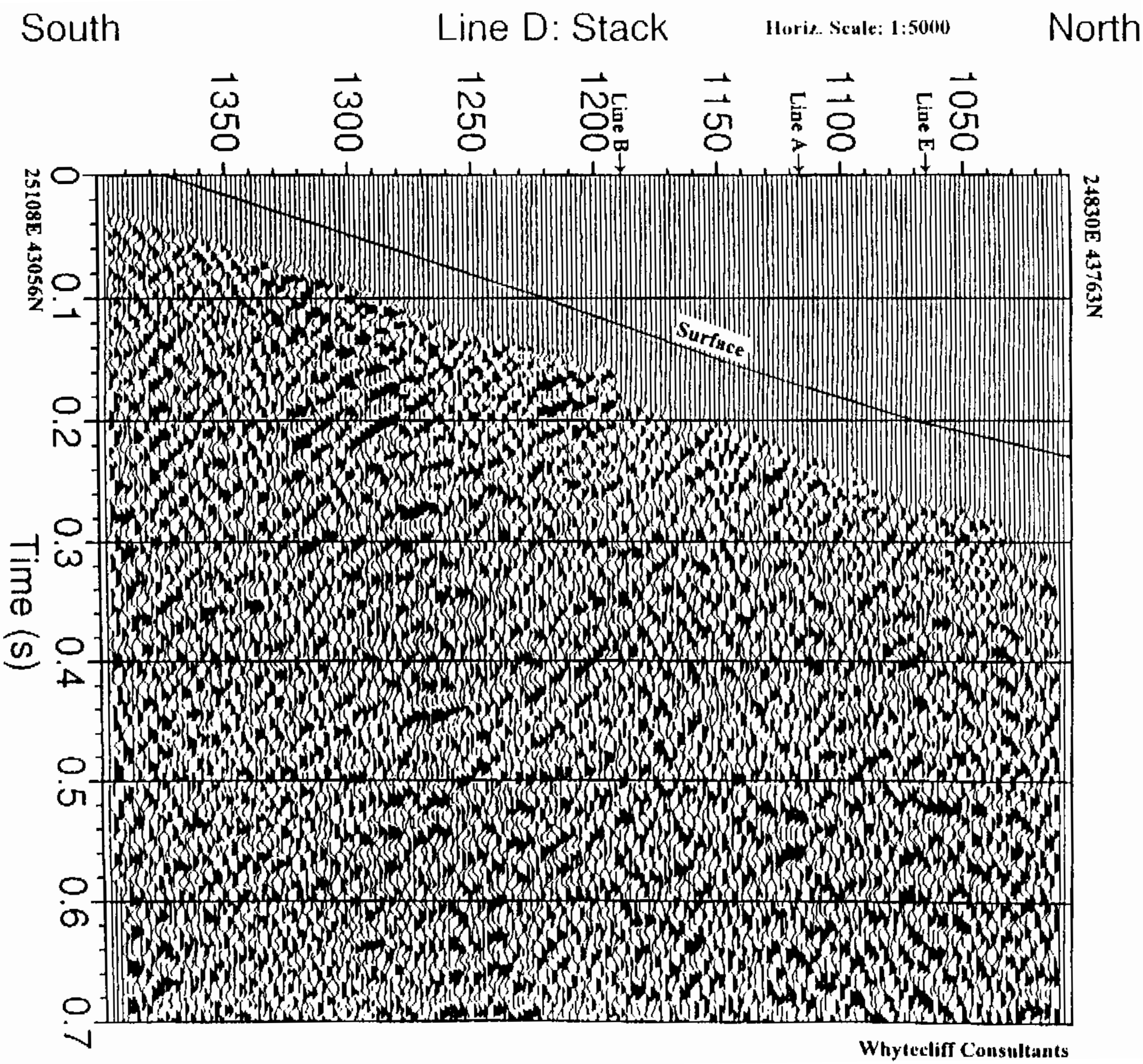

South
Line D: Stack
Horiz. Scale: 1:5000
North
1350
1300
1250
1200
Line B
1150
Line A
1100
Line E
1050
25108E 43056N
24830E 43763N
Surface
Time (s)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Whytecliff Consultants

Figure 9

Line E

The interpretation of line E is shown in Figure 10 with the uninterpreted section in Figure 11. This line overlies sulfide deposits at a relatively shallow depth of 50 m. The drill hole control on this line is quite extensive and dates from the 1997 drilling program. A significant amount of core in these drill holes has yet to be logged, so a final interpretation may not be possible until all of the drill logs becomes available.

There are a number of drill holes, which tie the line which do have logs available. Drill hole 97-31 ties the line at station 1434 (7 m south), had limited sulfide mineralization and intersected the Camp Creek fault at a depth of 100 m. Drill hole 97-2 ties the line at station 1482 (8 m south) and has a 15 m intersection of sulfide, primarily below the unconformity. Drill hole 97-20 ties the line at station 1540 (3 m south) with a more patchy distribution of sulfide than 97-2. Drill hole 97-27 ties the line at station 1594 (3 m south) and intersected a large cavern at the unconformity. Drill hole 97-24 ties the line at station 1746 and intersected a series of caverns as well as a 2 m sulfide intersection. Drill hole 97-25 ties the line at station 1690 and intersected a 3 m sulfide zone at the unconformity, with an additional 1 m of sulfide below it. A number of other drill hole ties have been indicated on the section for future reference when the logging has been completed.

The amplitude anomalies on the line have a good correspondence to the sulfide distribution. At a time of 0.11 s from station 1440 to 1560 a high amplitude event is obvious. This correlates well with 97-2 and 97-20. Even the patchy sulfide mineralization found in 97-20 ties the anomaly, which seems to change character and is close to the edge. Drill hole 97-2 is 8 m south of the line. Due to the often-limited extent of the sulfide mineralization it is possible the anomaly on the line does not represent sulfide directly underneath the seismic line. The subsequent drilling of 97-35 (9 m north of line E) and the identification of significant sulfide mineralization confirms the continuity of the sulfide beneath the line.

The time associated with this anomaly seems unusual at first glance. Using a velocity of 2000 m/s the sulfide should come in at a time of 0.6 s. The fact that the time is delayed can be explained by a thicker overburden. An examination of the first arrivals on the section shows regions of thick and thin overburden. Up to station 1260 there is a near surface limestone layer, but from station 1260 to the end of the line the Earn is relatively uniform in thickness and the only explanation for the delayed arrivals is a thicker overburden. Around station 1600 it was obvious in the field that the overburden was thin, because most of the geophone plants were in broken bedrock, with almost no soil present.

Drill holes 97-24 and 97-25 were located to test a seismic anomaly. This feature is shown in Figure 12 on shot profile 11075. The first breaks on this profile show a significant "bump" which is interpreted as a region of higher velocity. A thinner overburden or a high velocity zone within the Earn could create this anomaly. Another possibility is a high velocity zone at the unconformity created by the presence of sulfide or some combination of the above scenarios. The identification of sulfide at the unconformity in drill hole 97-25 is an indication that the sulfide hypothesis is at least partly correct.

Another amplitude anomaly exists west of drill hole 97-20 from stations 1640 to 1760 at a time of 0.08 s. This also ties drill holes 97-24 and 97-25 which are 20 m north of the line. Numerous caves have been identified in the immediate area of this anomaly so it is possible the reflection is a result of a large cavern. A large cavern was detected in drill hole 97-27 at station 1594. The character of the reflections at this point on the line seems different from the character further east. In particular, the amplitude is not as great and there is a suggestion of a slight time delay in the reflections, indicative of a low velocity zone. With drill holes 97-24 and 97-25 being a reasonable distance north of the line it is possible the cavern does not extend to this point on the line and a thick zone of sulfide is present instead.

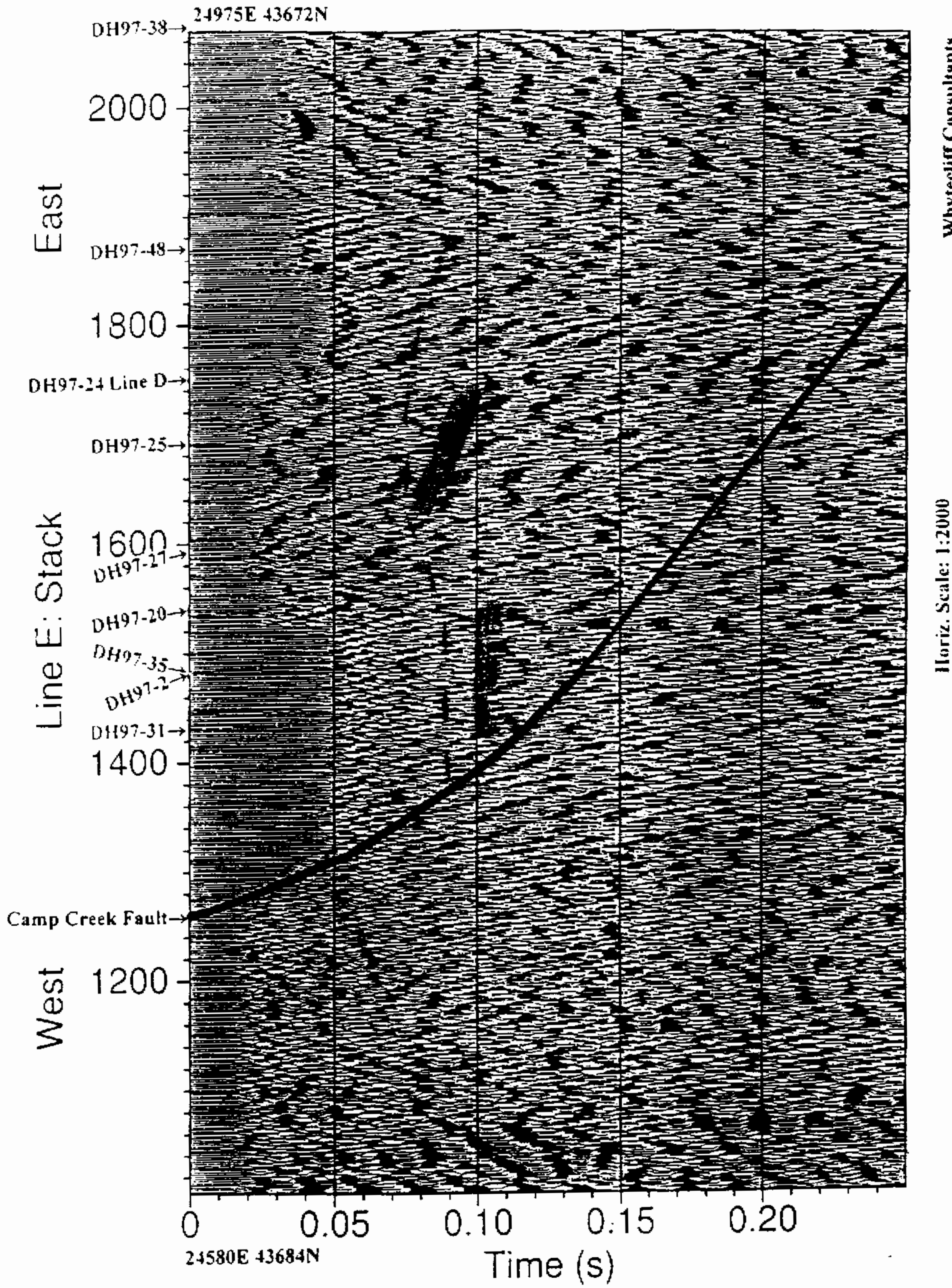
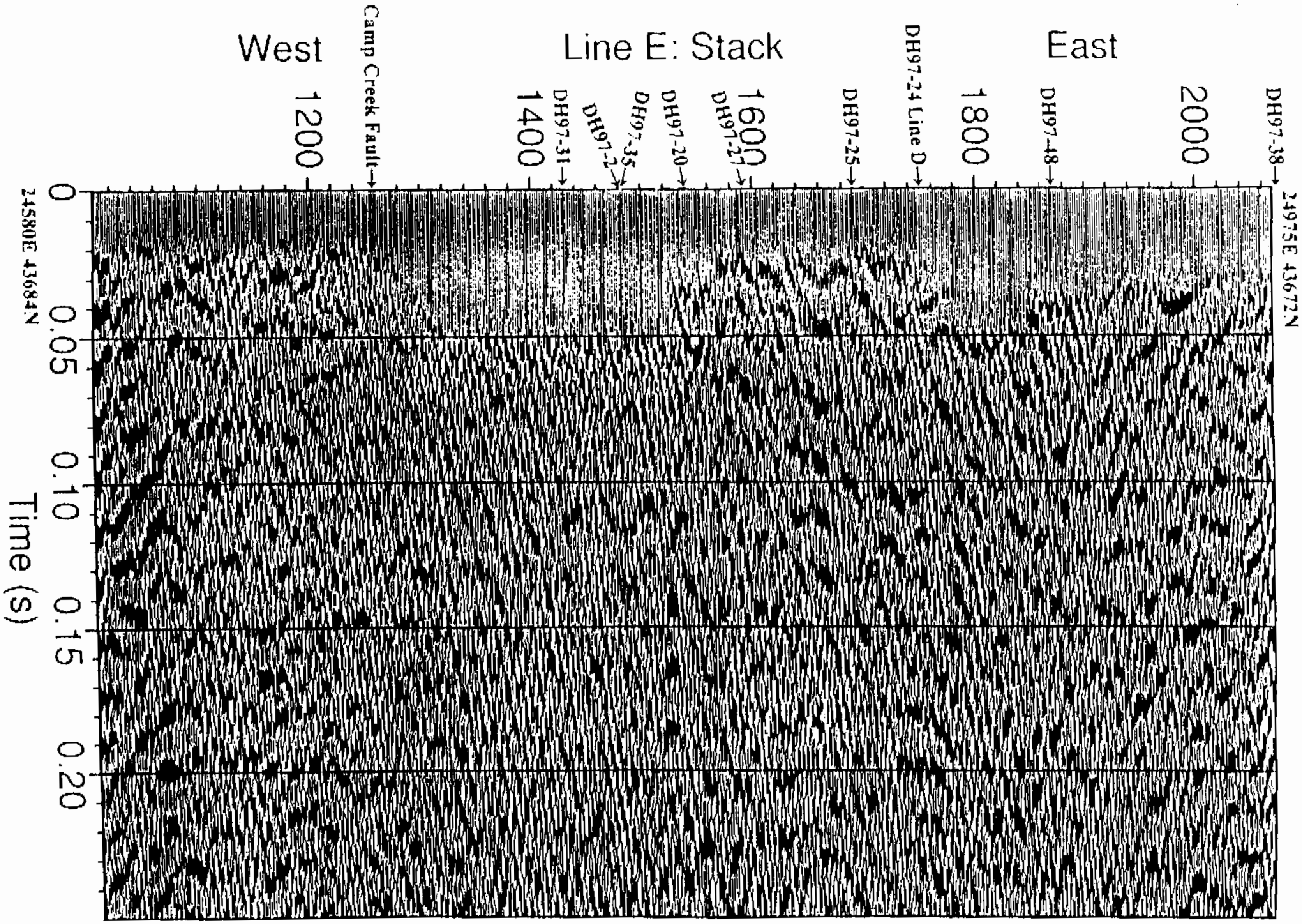

West
Line E: Stack
East
Camp Creek Fault
1200
1400
1600
1800
2000
DH97-31
DH97-2
DH97-35
DH97-20
DH97-21
DH97-25
DH97-24 Line D
DH97-48
DH97-38
24975E 43672N
24580E 43684N
0
0.05
0.10
0.15
0.20
Time (s)
Horiz. Scale: 1:2000
Whytecliff Consultants

Figure 10



Horiz. Scale: 1:2000

Whytecliff Consultants

Figure 11

Line E Shot Record 11075

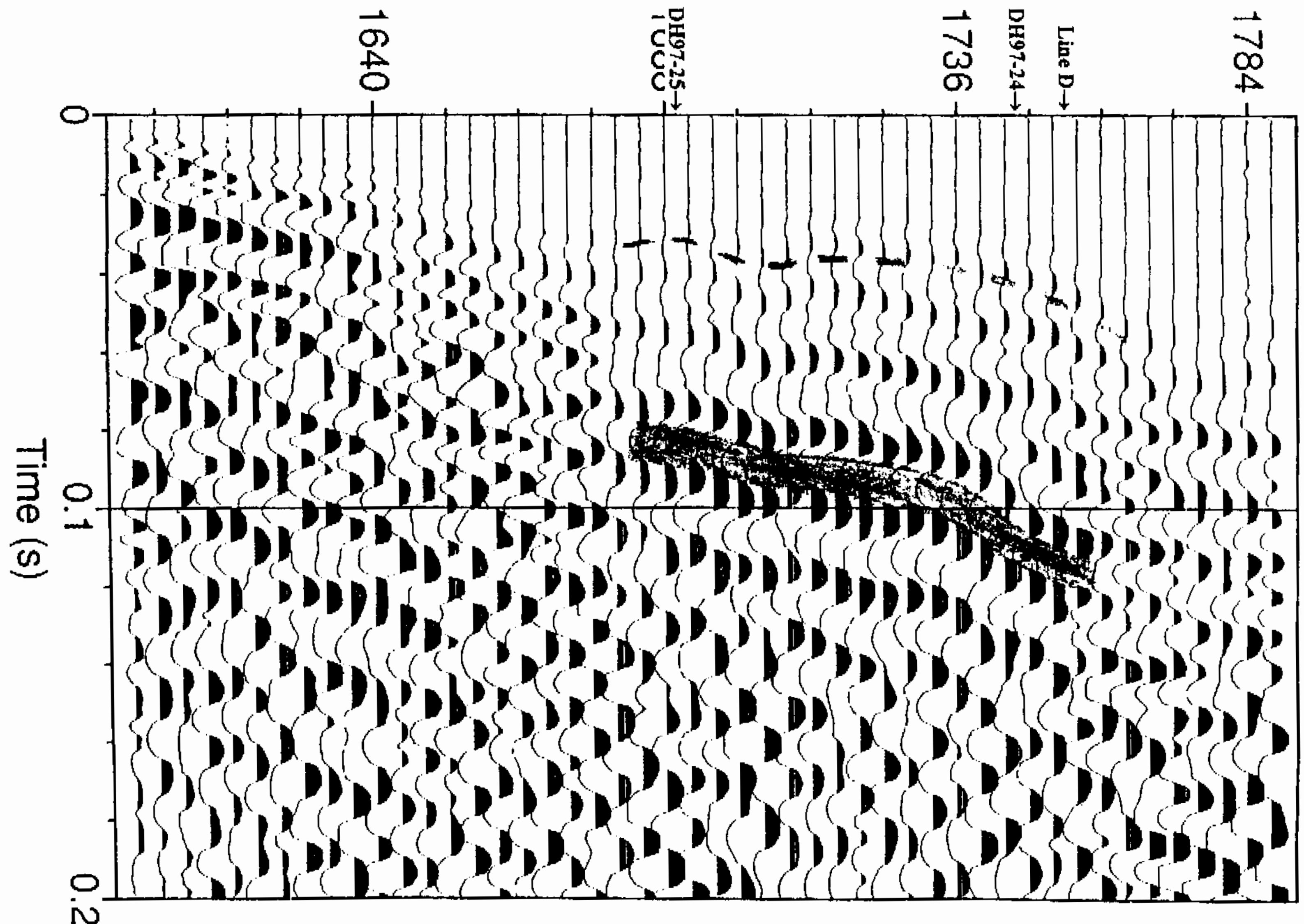


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Figure 12

Line G

The interpretation of line G is shown in Figure 13 with the uninterpreted section in Figure 14. Three drill holes have targeted anomalies on this line. None of the drill holes identified significant sulfide mineralization. Holes 97-11 and 97-12 were drilled on seismic diffractions, which turned out to be caused by pockets of clay, possibly the remnant of oxidized sulfide. Drill hole 97-13 encountered a layer of clay, which assayed out with high nickel and cobalt. At this point it is uncertain where the nickel and cobalt originated. The data are generally of good quality and the interpretation corresponds with a geologic cross section prepared by Chris Rees.

The McDame is identified as a strong high amplitude reflector at a time of approximately 0.04 sec on the northern end of the section (station number 1100). This reflector dips to the south and at station 1500 the reflector comes in at a time of approximately 0.06 s. The strong peak and trough above this reflector are related to "first break" energy which is the energy travelling directly from the shot to the geophones through the overburden and energy refracted from the top of the Earn. There is definite interference between the first break energy and the reflection from the top of the McDame. This can be seen at the north end of the line where the apparent northward dip of the McDame reflection is due to an elevation drop at the end of the line that results in the McDame reflection coming in earlier. The higher amplitude first breaks overwhelm the McDame reflection and the dipping event thus has no relationship with the structure on the McDame. The same thing can be seen on the south end of the line, starting at station 1450. The strong peaks and trough that track the elevation change have nothing to do with the subsurface structure. The interference between the first break energy and the McDame reflection makes it difficult to directly interpret amplitude variations as indicators of sulfide. The first break energy cannot be muted (as is done with most seismic processing) because muting the first breaks will also mute the McDame reflection.

The other obvious feature on the seismic line are a series of dipping reflectors which can be seen at a time of 0.2 sec beneath station 1150 trending up to a time of 0.1 sec beneath station 1270. It is believed this reflection corresponds to a fault zone. Another similar feature appears "deeper" in time, parallel to the other fault zone. This feature can be seen at a time of 0.4 sec beneath station 1150 trending upwards to a time of 0.24 sec beneath station 1450. Then there is a "kink" in the reflection and the apparent dip decreases so it ends up at approximately 0.2 sec beneath station 1700. The kink in the fault zone reflection can be explained by the bend in the line. As the line becomes sub-parallel to the fault the apparent dip decreases. The horizontal dashed line at a time of 0.17 s is interpreted as a reflection from the Camp Creek fault. Another fault zone is less obvious and appears at a time of 0.1 sec beneath station 1050 trending upwards to a time of 0.07 sec beneath station 1150.

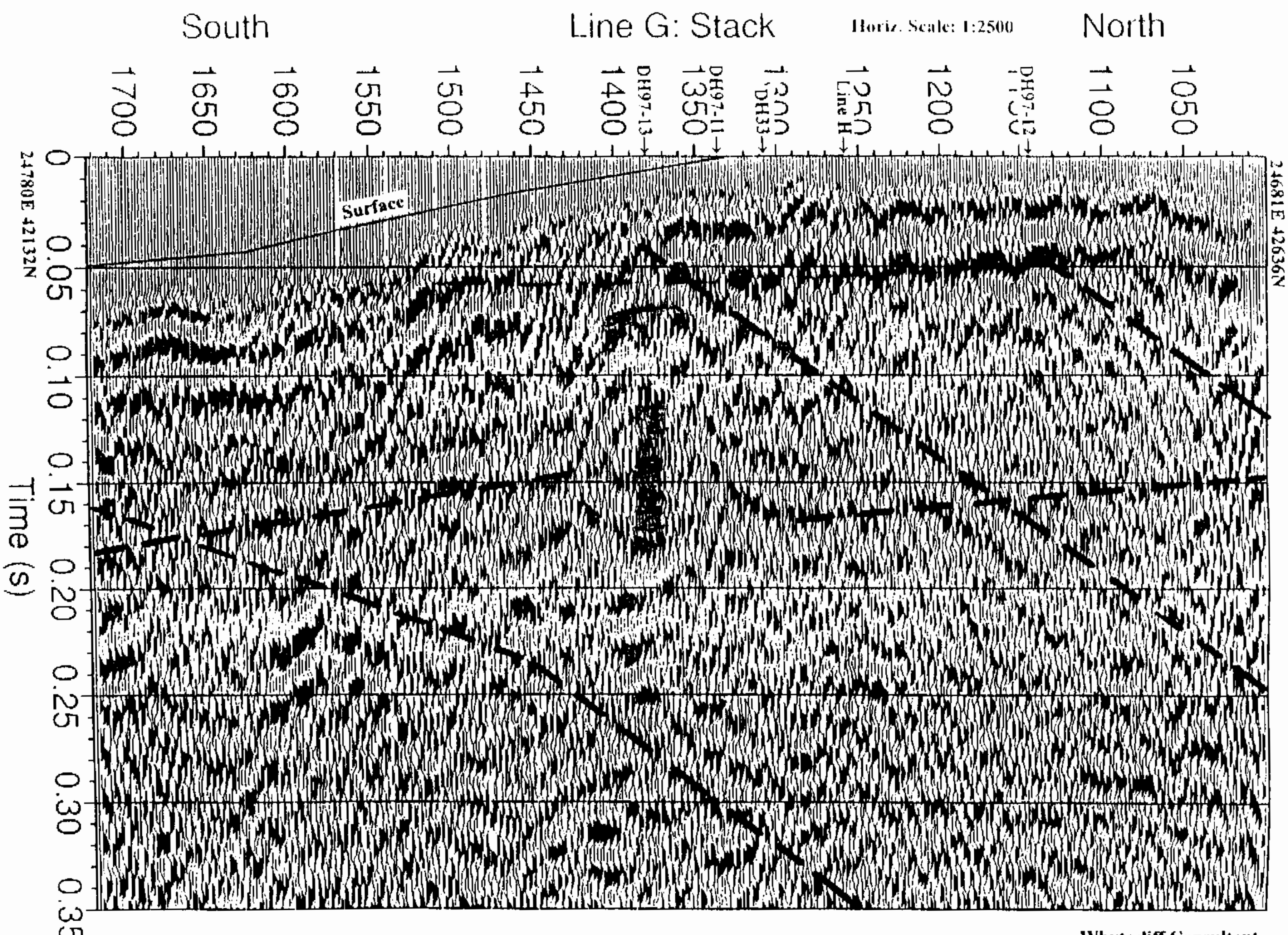


Figure 13

Whytecliff Consultants

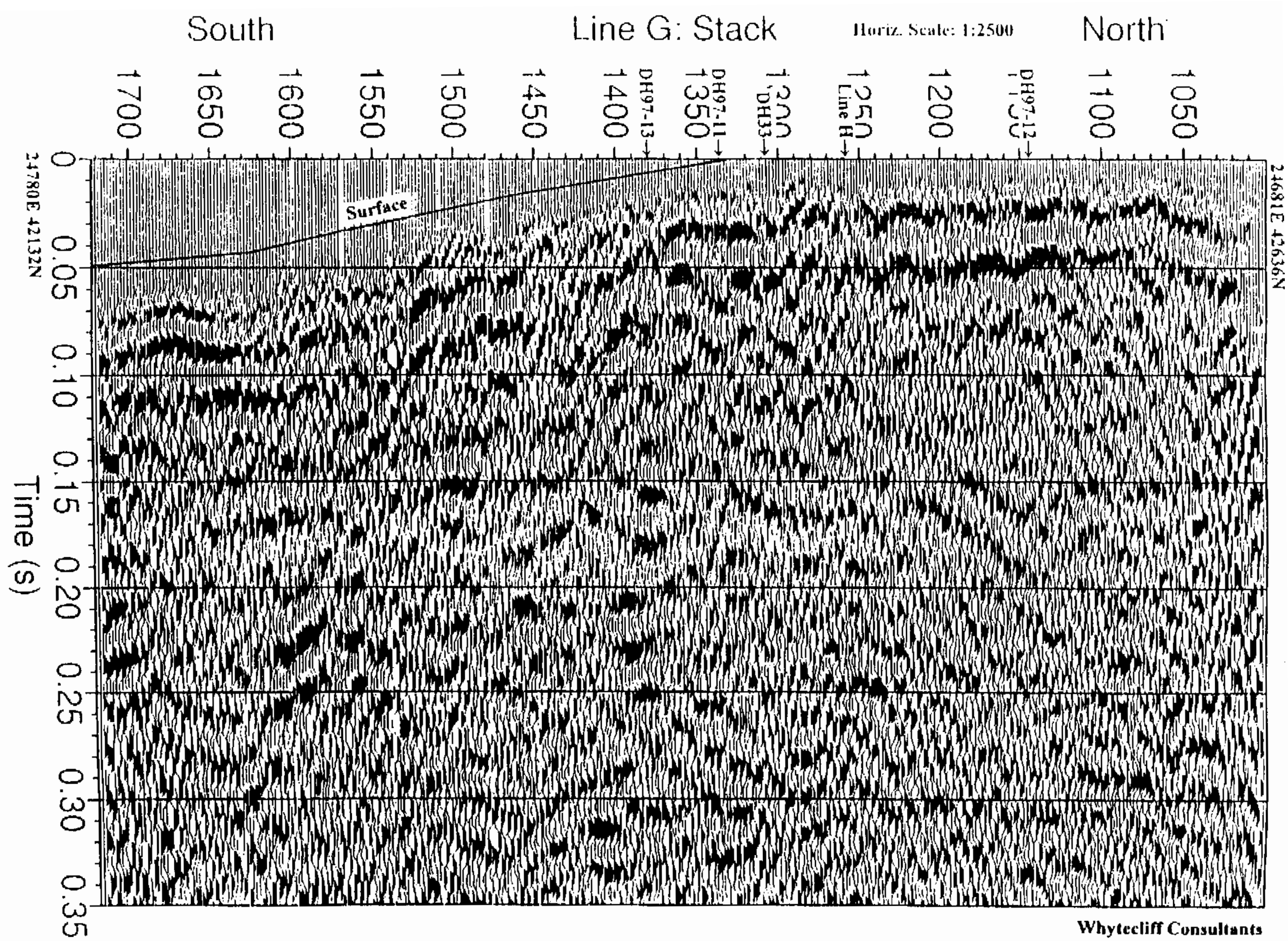

South
Line G: Stack
Horiz. Scale: 1:2500
North
1700
1650
1600
1550
1500
1450
1400
1350
1200
1100
1050
DH97-13→
DH97-11→
DH33→
Line H→
DH97-12→
Surface
2478OE 42132N
2468IE 42636N
0
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Time (s)
Whytecliff Consultants

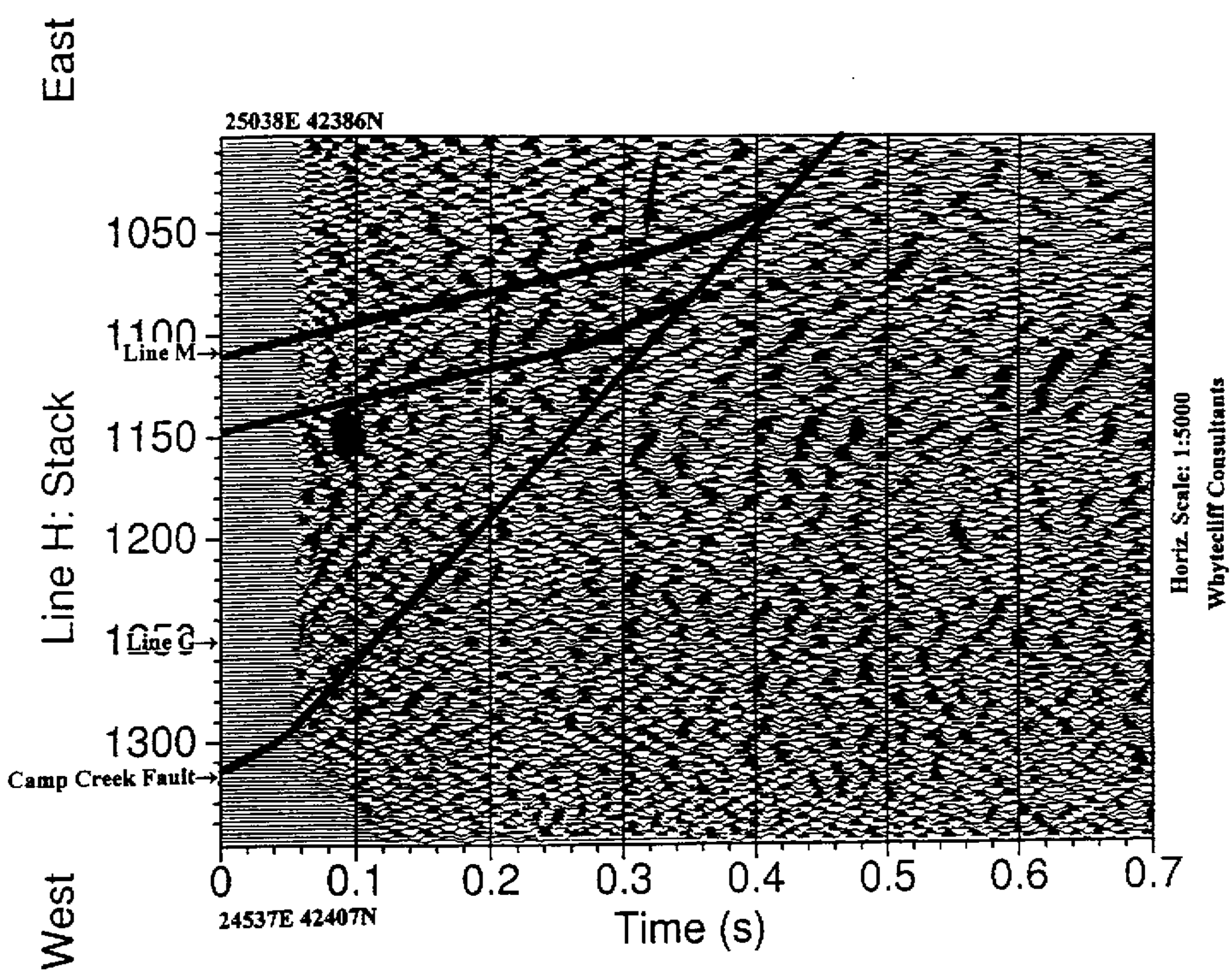
Figure 14

Line H

The interpretation of line H is shown in Figure 15 and the uninterpreted section in Figure 16. The McDame is not well resolved on this line. This is due in part to the shooting parameters chosen for this line with a group interval of 6 m. The relatively shallow depth to the McDame of less than 110 m requires a smaller group interval to properly image. This was acknowledged when line G was acquired by reducing the group interval to 3 m. Line H does image some significant fault plane reflections and deeper reflections at depths approaching 1000 m.

A key fault plane, which has been interpreted on the section, is the Camp Creek fault, which outcrops at the western end of the line. The fault is shown with an approximate 60-degree dip to the east. A series of more shallow dipping reflections are thought to represent fault plane reflections parallel to the Camp Creek fault. There is a strong suggestion of significant numbers of faults on top of Silvertip Hill, a hypothesis, which was corroborated by the drill holes 97-11, 97-12 and 97-13.

There does appear to be a significant diffraction within the McDame at a depth of approximately 150 m beneath station 1148. Considering the absence of any other appreciable reflection in the area from the unconformity, this diffraction should represent a significant change in impedance. It appears to be much larger than the diffractions drilled on line G, but could possibly represent a similar zone of oxidized sulfide.



East
Line H: Stack
West
25038E 42386N
1050
Line M→
1150
1200
Line G→
1300
Camp Creek Fault→
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
24537E 42407N
Time (s)
Horiz. Scale: 1:5000
Whytecliff Consultants

Figure 15

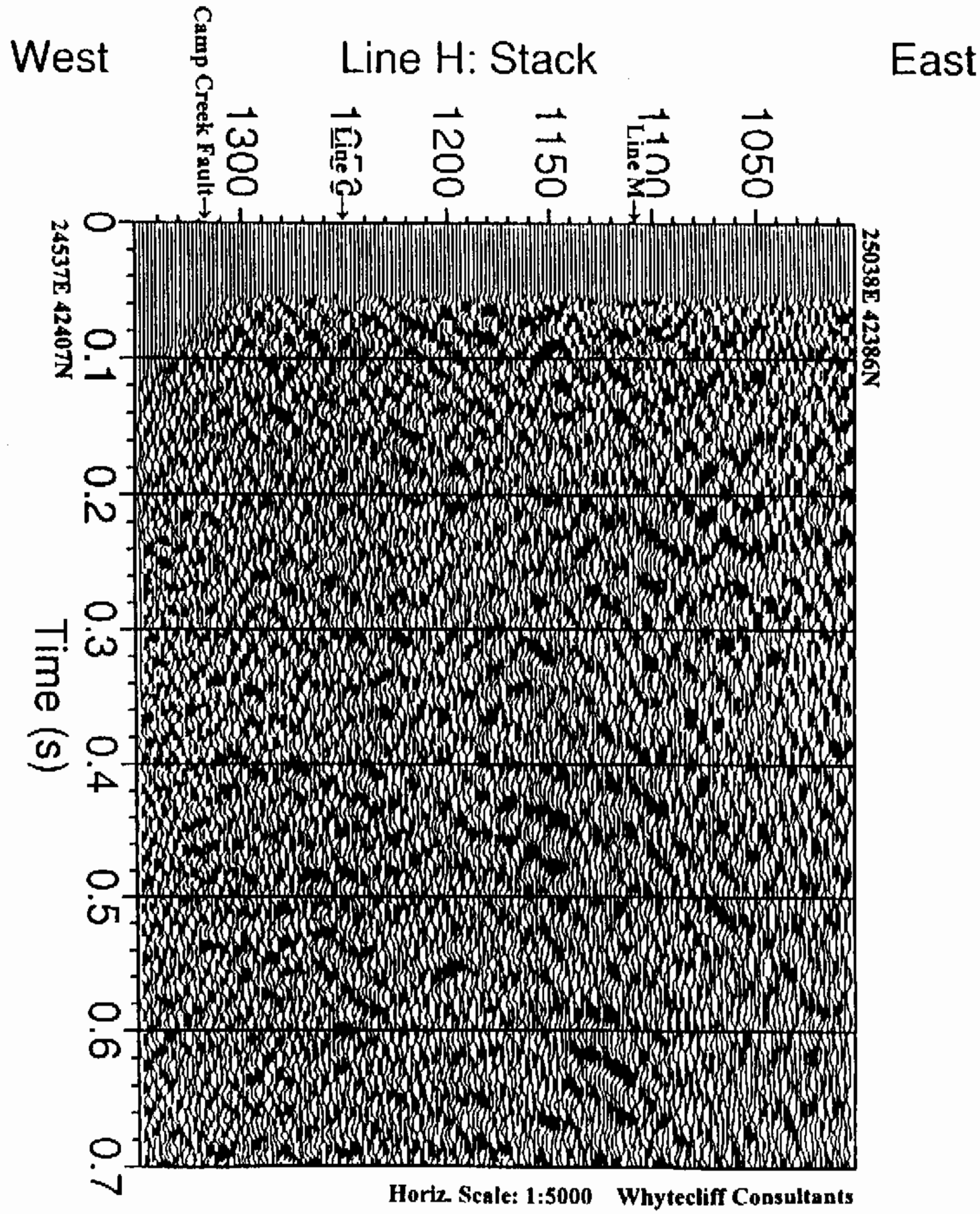

West
Line H: Stack
East
Camp Creek Fault→
1300
1250
Line G→
1200
1150
1100
Line M→
1050
2453TE 4240TN
25038E 42386N
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Time (s)
Horiz. Scale: 1:5000
Whytecliff Consultants

Figure 16

Line I

The interpretation of line I is shown in Figure 17 and the uninterpreted section in Figure 18. The original interpretation of this line identified three potential drill targets associated with shallow high amplitude reflections. Drill hole 97-26 went to a depth of 371 m and tested one of these features and encountered altered Earn with approximately 5% sulfide. It is now felt that the high amplitude events on both line I and line J are representative of this altered Earn. The data are generally of good to excellent quality with good reflections obvious at depths exceeding 1000 m. Some high amplitude reflections at depth may be associated with manto deposits of sulfide within the McDame.

The near surface rocks can be interpreted based on the first breaks on the raw shot records (seismic refractions). The first breaks appear in a series of linear segments with slopes corresponding to the velocity of the underlying rocks. Two factors, which affect the accurate determination of true earth velocities from first breaks, are refractor dip and the presence of low velocity zones (which do not appear as first breaks). The first break interpretation suggests the presence of a lower velocity (2000 m/s) layer with a slightly higher velocity (3000 to 4000 m/s) layer below. Based on the processing of the other lines in the area, this suggests a near surface layer of low velocity shale with a higher velocity shale beneath. This higher velocity shale is most likely altered Earn, which was also noted on top of Silvertip hill. Given the geometry of the survey, the first breaks can only be used to estimate velocities to a depth of approximately 80 m.

Lines I and J together indicate that the main geological trend in the area is a series of normal fault blocks which are downthrown to the east. There are two distinct dips obvious on the line. As with the other lines, the more steeply dipping events most likely represent fault plane reflections. The solid lines indicate possible locations of these fault planes at locations represented by shallow dipping reflector terminations. The presence of these normal fault blocks suggests that the McDame is not at the 850 m depth identified in drill hole 41, but possibly much shallower. The displacement on the faults is not clearly defined on this version of the data. A higher resolution image is required to properly quantify the fault displacements and the depth to the McDame. The excellent lateral coherence on this line suggests that reprocessing the line will greatly improve the interpretability of fault locations and displacements.

The high amplitude reflections on Line I seem to be restricted to the same area as the magnetic low. This suggests that the magnetic minerals within the disseminated sulfide regions are also the cause of the magnetic anomaly. If the assays from drill hole 97-26 are promising, then the areal extent of the mineralization would be quite extensive. A lighter shade of red has been used to represent the disseminated sulfide region.

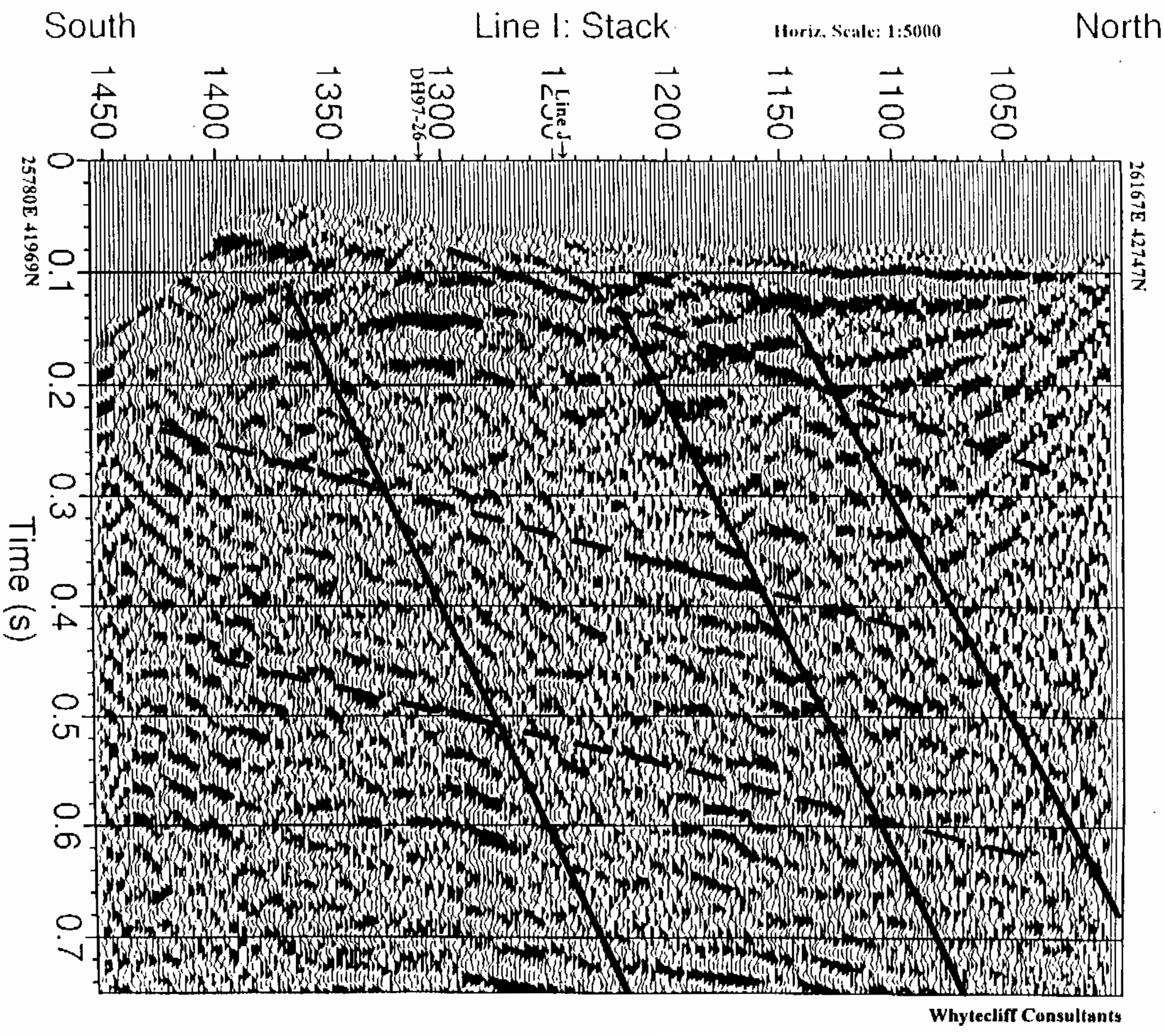
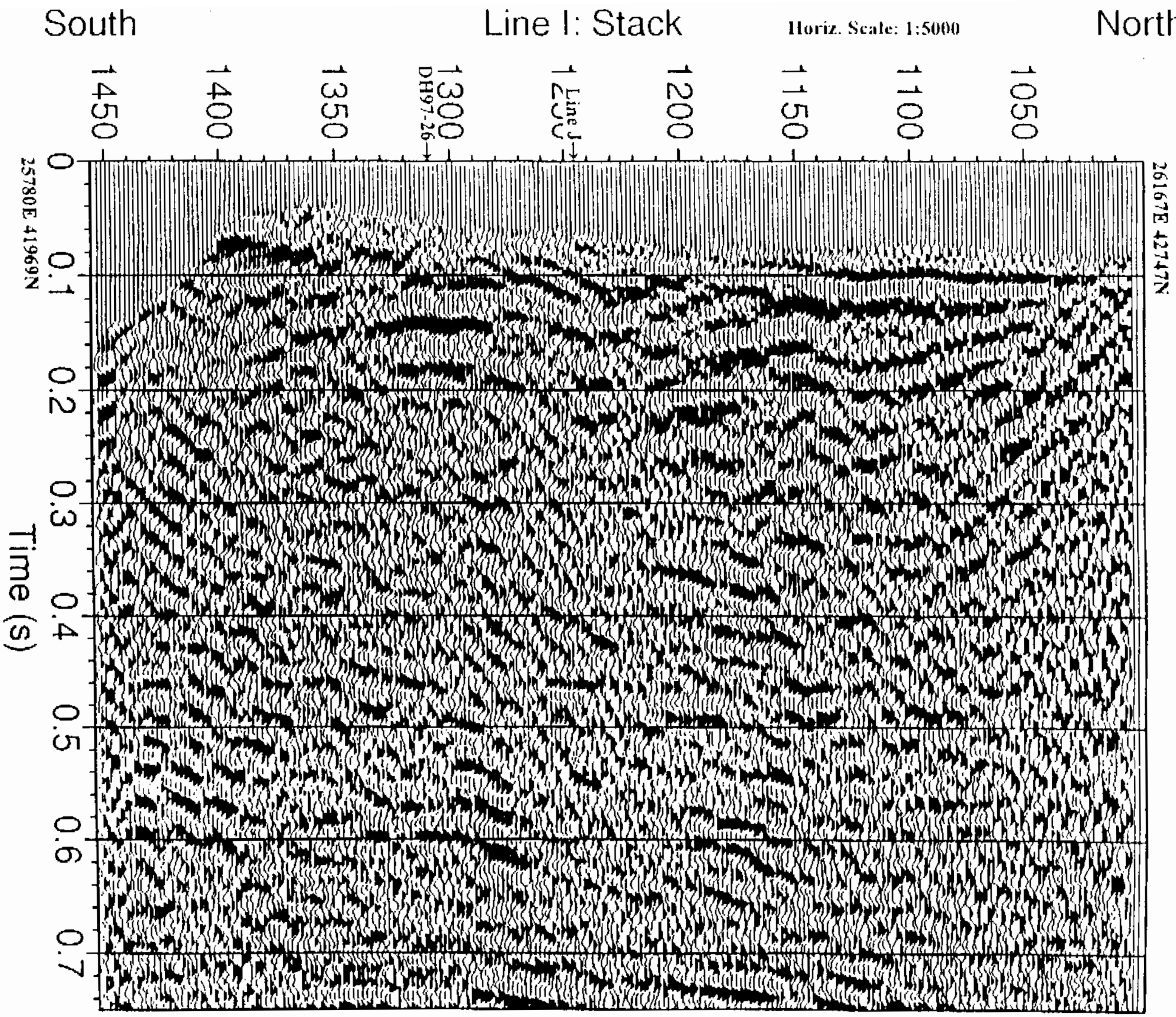

South
Line I: Stack
Horiz. Scale: 1:5000
North
1450
1400
1350
1300
DH97-26
1250
Line J
1200
1150
1100
1050
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Time (s)
25780E 4196N
26167E 4274N
Whytecliff Consultants

Figure 17



Whytecliff Consultants

Figure 18

Line J

The interpretation of line J is shown in Figure 19 with the uninterpreted section in Figure 20. The original interpretation of this line identified two potential drill targets. After the drilling of 97-26 it is now felt these drill targets represent altered Earn with insignificant amounts of sulfide. The data are not of the same quality as on line I due to significant differences in the near surface conditions. As a result, the deep reflections are not as obvious on line J.

The data of line J is not of the same quality as the data on line I for the following reasons. The central part of line J is through a wooded area, while the central part of line I is along a well-compacted roadbed. The roadbed results in improved geophone coupling without the interference from moss and roots typical in the wooded area. A significant effort was put into planting the geophones in the wooded areas by digging holes below the moss and roots. There is a reasonable limit to this effort, however, and the possibility remains of having poorly consolidated material underlying the geophones. The looser material has the effect of absorbing the seismic energy, especially the higher frequencies, resulting in a decrease in seismic data quality.

The prominent reflections on line J have distinct terminations, which would most likely result from faulting. One of these potential faults is displayed below stations 1110 to 1150. This may be the same fault, which has been interpreted on line I from station 1290 to 1320. The strike of this fault would then be NNW. On both lines there are high amplitude reflections which are similarly terminated by the fault. The target tested by drill hole 97-26 below station 1310 would thus correspond with the high amplitude event on line J below station 1120.

As with line I, the high amplitude reflections have been shaded a light red to represent the disseminated sulfide region. The normal faulting suggests that it may be possible to intersect the McDame at a much shallower depth than drill hole 41, by drilling as far to the west as possible.

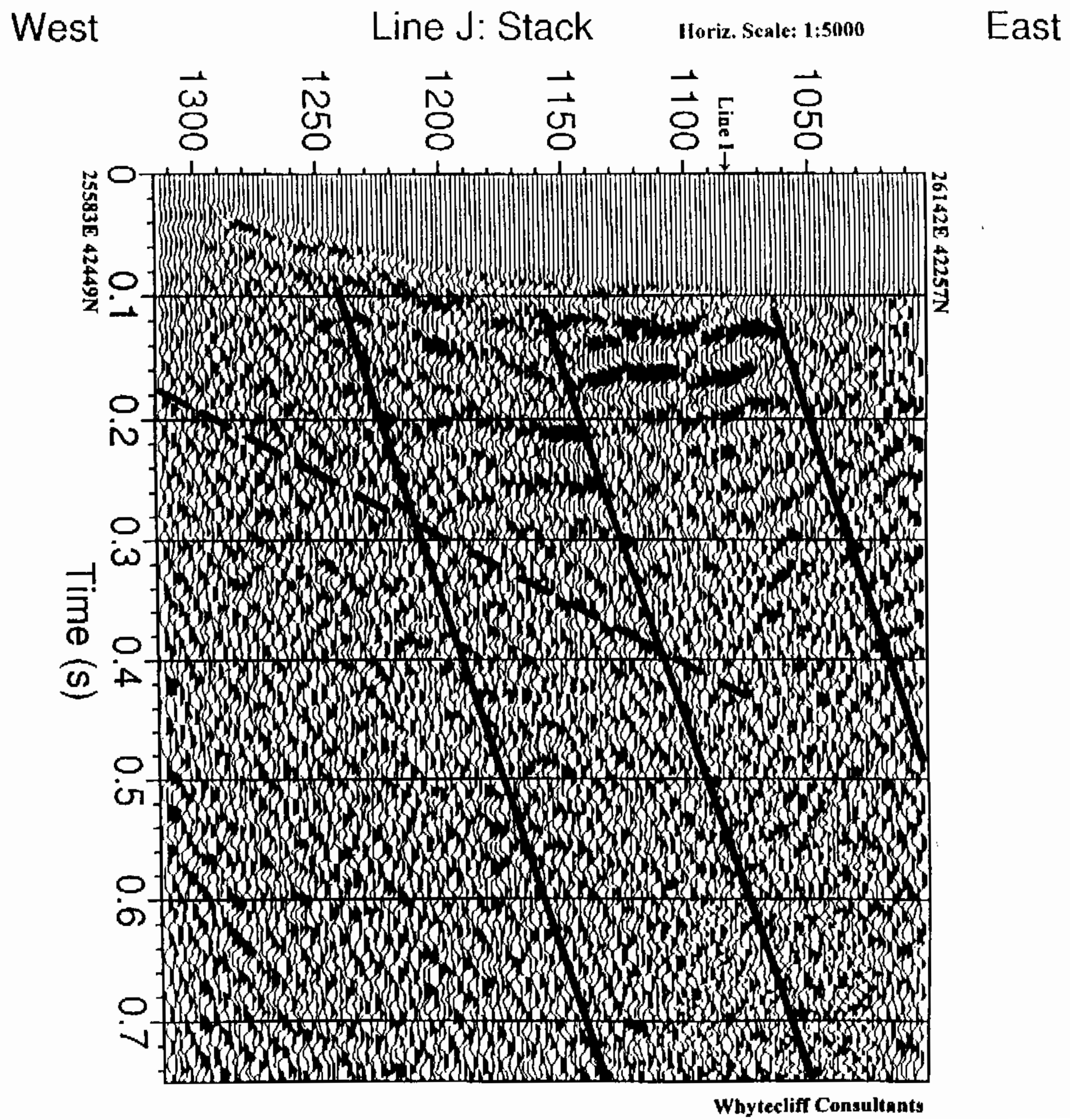

West
Line J: Stack
Horiz. Scale: 1:5000
East
1300
1250
1200
1150
1100
Line I→
1050
25583E 42449N
26142E 42257N
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Time (s)
Whytecliff Consultants

Figure 19

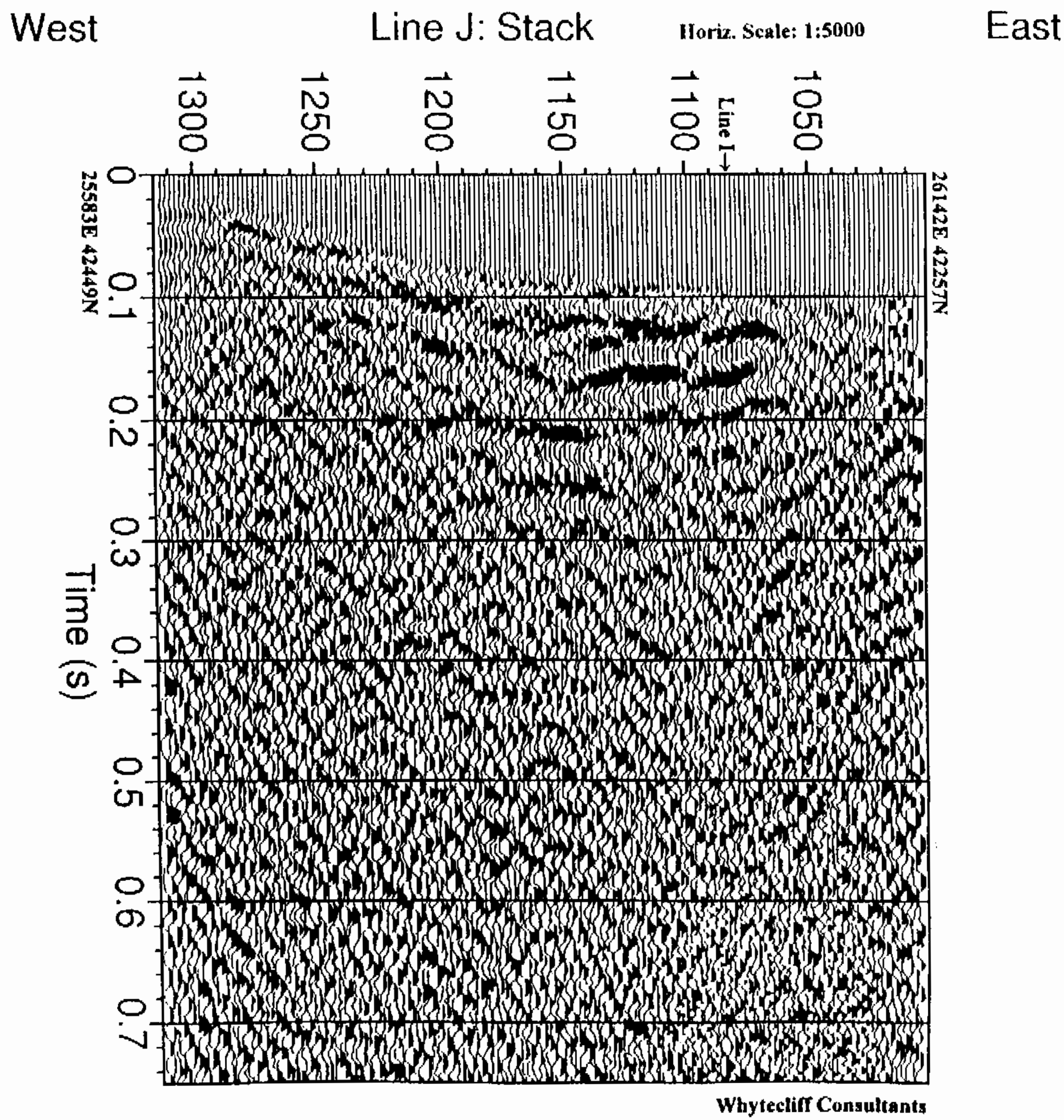

West
Line J: Stack
Horiz. Scale: 1:5000
East
1300
1250
1200
1150
1100
Line I→
1050
25583E 42449N
26142E 42257N
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Time (s)
Whytecliff Consultants

Figure 20

Line L

The interpretation of line L is shown in Figure 21 with the uninterpreted section in Figure 22. The east end of the line has significant topographic relief, which flattens out west of station 1200. The processing datum is 1600 m. Line L has two drill targets on it which are east of the intersection with line N and drill hole 36. Reflections from within the Earn as well as fault plane reflections are obvious on the stack data.

The Camp Creek fault has been interpreted based on the surface intersection at station 1240. A dip of approximately 60 degrees has been projected onto the section. The dashed fault plane reflections will more than likely migrate close to the solid interpreted faults. Drill hole 36 can be seen at its subsurface intersection with the McDame. There is no appreciable amplitudes within the McDame at this point, which explains the lack of sulfide mineralization within the drill hole. The amplitudes are more significant further to the east, also apparently within the McDame. These high amplitudes also seem to correspond to the amplitude anomaly seen on line N. The biggest risk is the proximity of all the fault plane reflections. A fault zone noted in drill hole 36 just above the unconformity, more than likely parallels the Camp Creek fault and falls in the same region of the McDame as the amplitude anomalies. Line N also seems to suggest the possibility of southward dipping faults, which would most likely intersect line L at a highly oblique angle. The possibility exists that the high amplitudes are solely fault gouge related or possibly a combination of sulfide mineralization and fault gouge. Another risk is that the fault will also act as a conduit for oxidizing groundwater as was seen on Silvertip Hill just to the south.

The identified amplitude anomalies fall below stations 1050 and 1120. The depth is quite significant due to the elevation gain and eastward dip of the unconformity, compared to drill hole 36. A vertical hole at station 1120 would intersect the unconformity at a depth of 300 m with the sulfides possibly as much as 100 m within the McDame. A vertical drill hole at station 1050 would intersect the unconformity at a depth of 460 m with sulfides possibly as deep as 580 m.

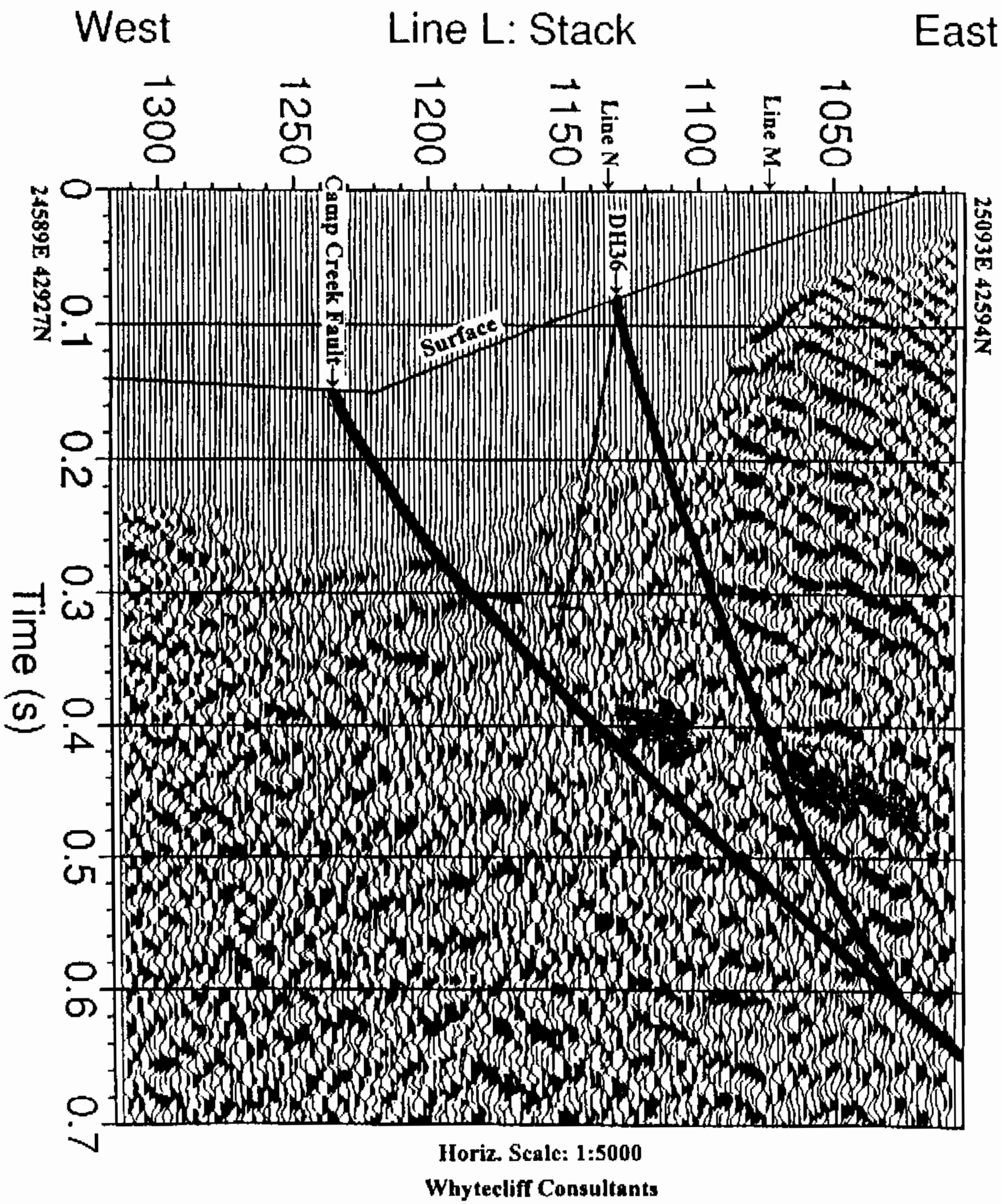

West
Line L: Stack
East
1300
1250
1200
1150
Line N
1100
Line M
1050
Camp Creek Fault
DH36
Surface
24589E 42927N
25093E 42594N
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Time (s)
Horiz. Scale: 1:5000
Whytecliff Consultants

Figure 21

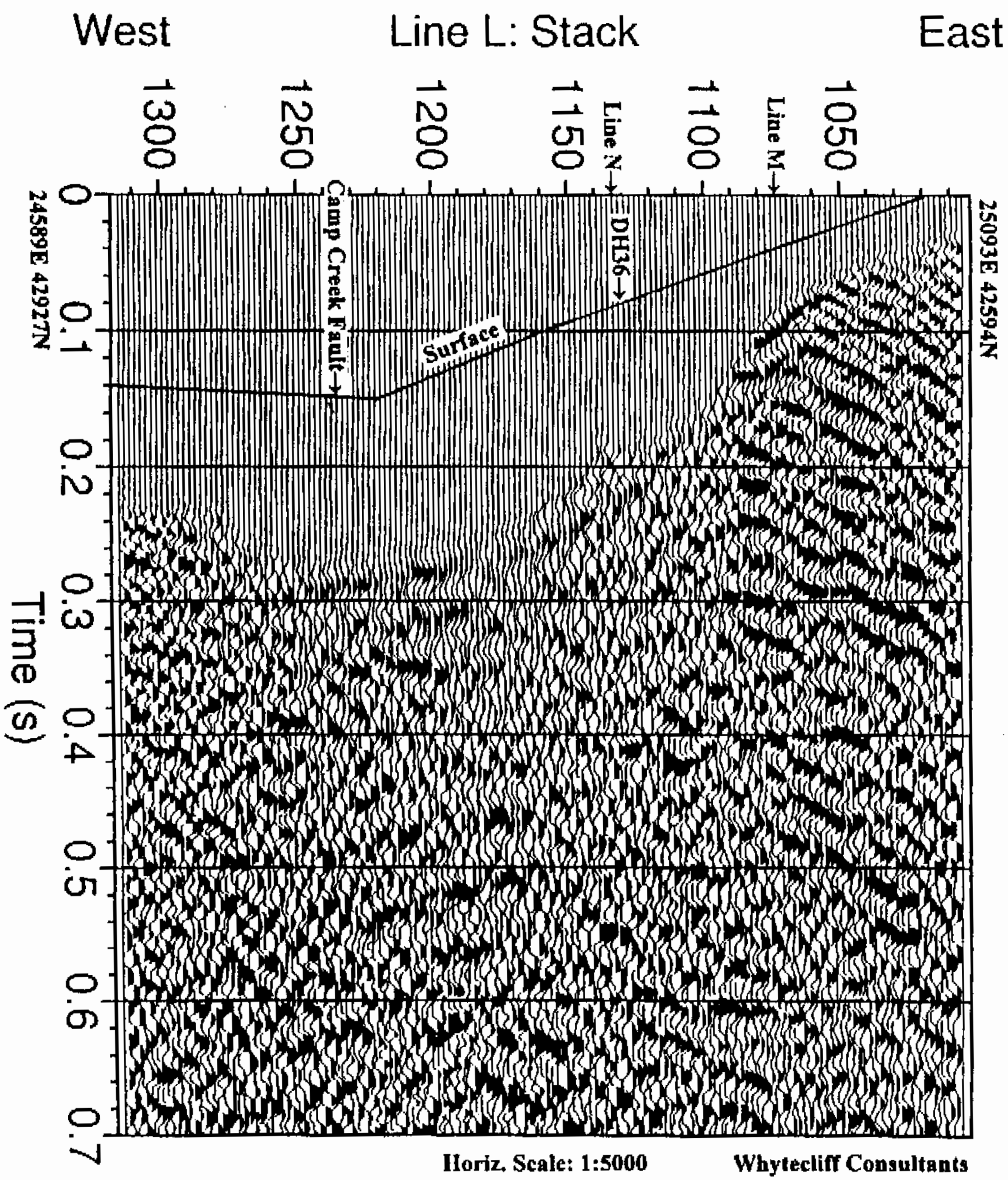

West
Line L: Stack
East
1300
1250
1200
1150
Line N→
1100
Line M→
1050
Camp Creek Fault→
DH36→
Surface
24589E 42927N
25093E 42594N
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Time (s)
Horiz. Scale: 1:5000
Whytecliff Consultants

Figure 22

Line M

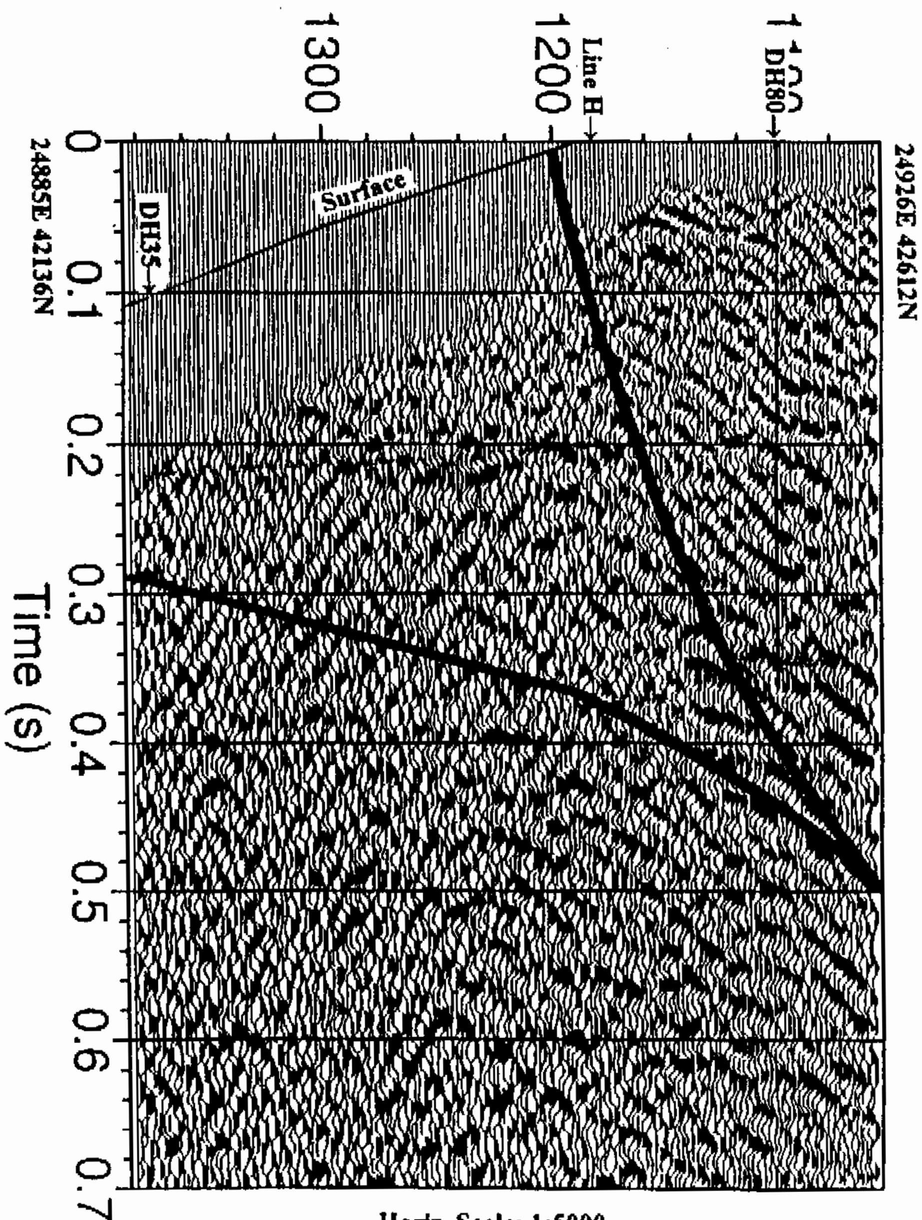
The interpretation of line M is shown in Figure 23, with the uninterpreted section in Figure 24. The line has been truncated to avoid smearing of the reflections at the northern end. The bend in the line spreads the sampled subsurface data points to the east, which due to the geologic dip to the east has the effect of smearing the reflections. The stack section with all data included is shown in Figure 25. A comparison of similar stations on the two lines clearly shows the truncated stack with the better subsurface image. There is also ambiguity on the unedited stack as to which direction the faults are dipping, either north or in the direction of the bend.

The northward dipping events on the truncated stack are interpreted as fault plane reflections. This northward dip corresponds with the northward dipping fault planes interpreted on line G. The significant number of these dipping events suggests that the strata is heavily faulted. There also appears to be a change in the character of these events north and south of the intersection of line H. It almost seems like the reflector dip changes from north to south at this point. The southward dipping reflections are more likely to be coherent noise events due to the thicker overburden on the south end of the line.

The interpretation of the McDame is quite complicated on this line. This is partly due to the higher velocity, altered and silicified Earn, which is on the surface, and also due to the large number of fault plane reflections, which seem to have significant amplitude. The higher velocity Earn will reduce the impedance contrast at the unconformity, thereby reducing the amplitude of the associated reflection. The repeated section, which was identified in drill hole 40, should also fall beneath this line. Perhaps the complicated reflection pattern at the unconformity is representative of this fact. The large offset normal fault in the middle of the line was necessary in order to tie drill hole 80. This fault is interpreted to be nearly vertical and should also correspond with the fault on line H just beyond the intersection with this line.

There does appear to be some high amplitude diffractions at depth on this line, most notably beneath station 1340. These diffractions may be associated with a deep intrusive which would be below the McDame and therefore not very prospective for manto deposits.

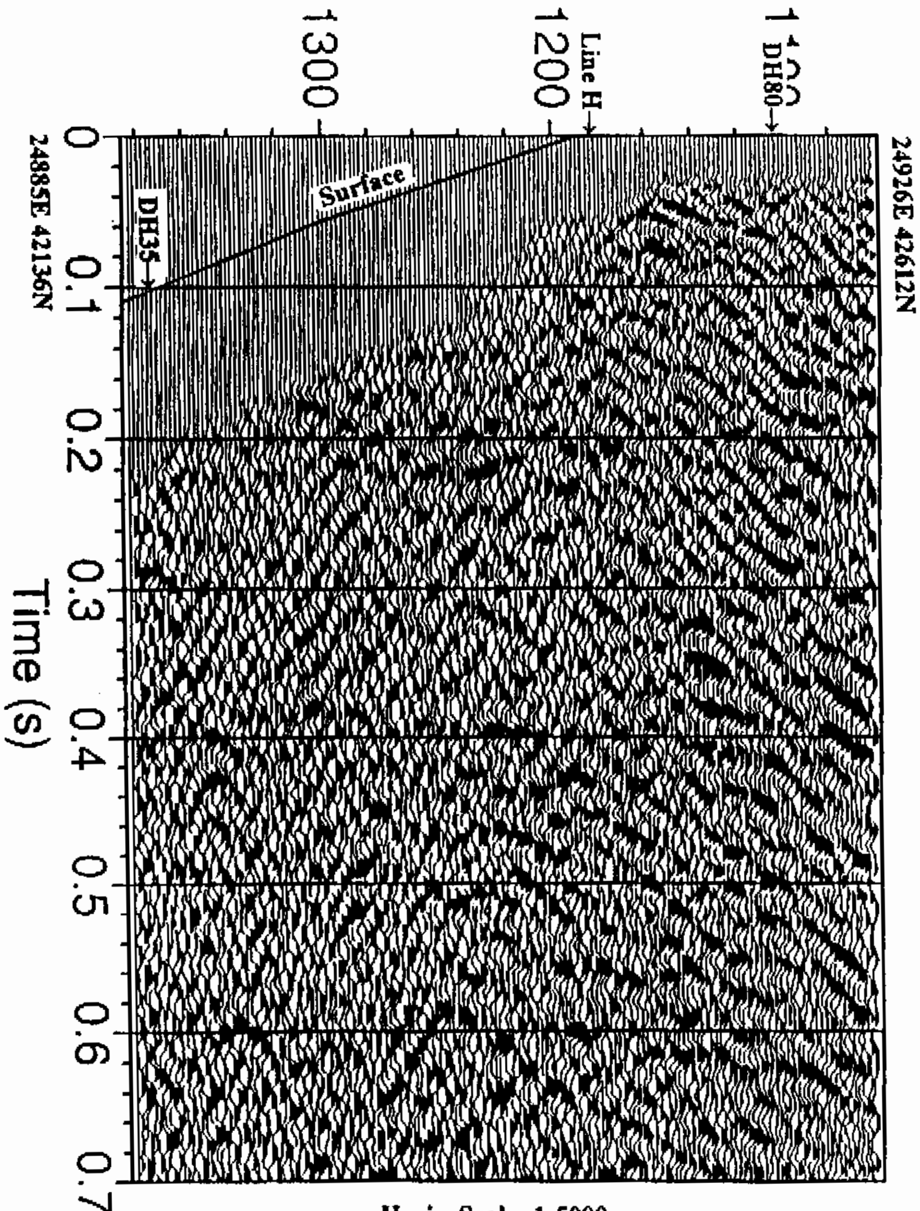
South Line M: Truncated Stack North



Horiz. Scale: 1:5000
Whytecliff Consultants

Figure 23

South Line M: Truncated Stack North



Horiz. Scale: 1:5000
Whytecliff Consultants

Figure 24

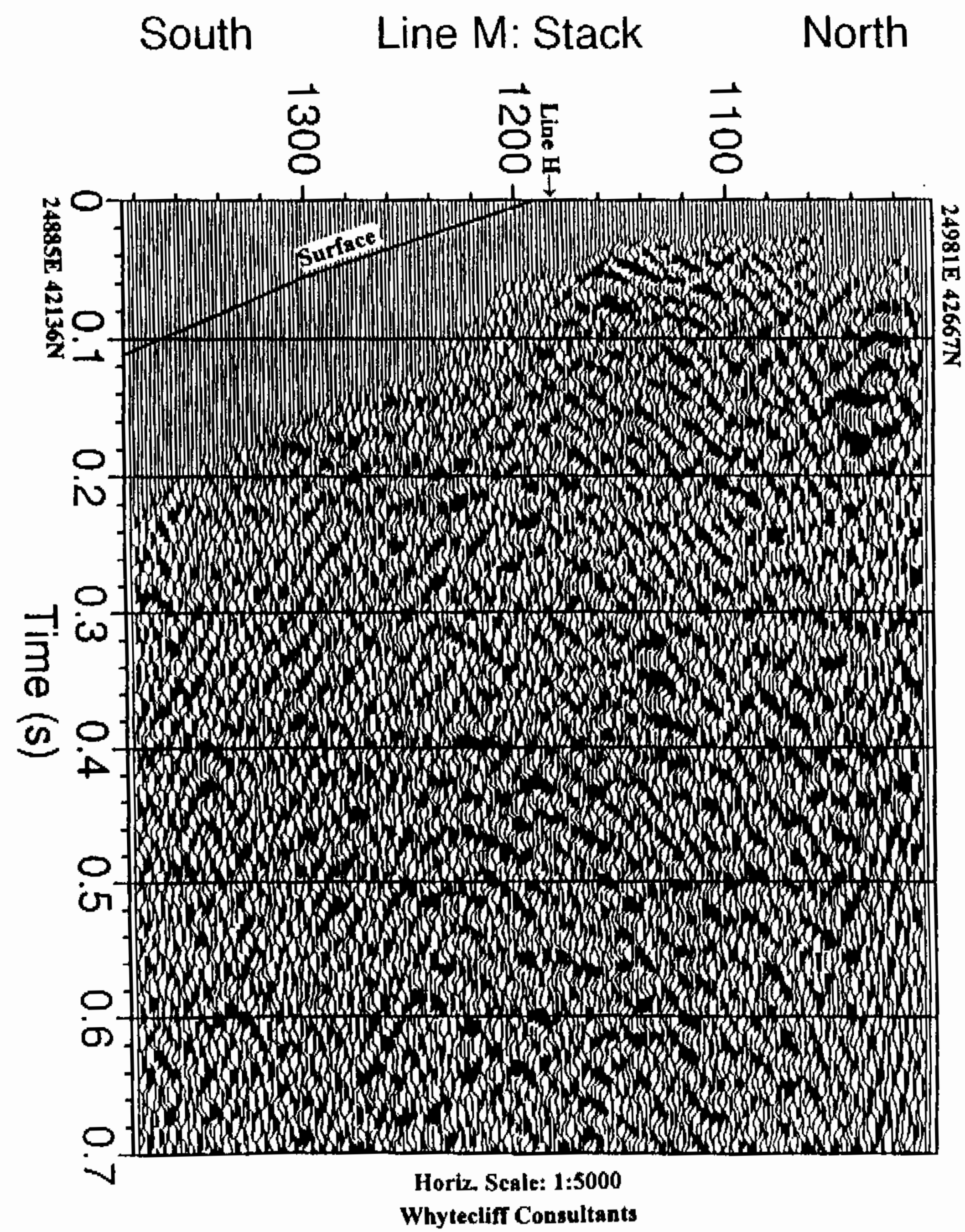

South
Line M: Stack
North
1300
1200
Line H→
1100
Surface
2488SE 42136N
2498IE 42667N
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Time (s)
Horiz. Scale: 1:5000
Whytecliff Consultants

Figure 25

Line N

The interpretation of line N is shown in Figure 26 and the uninterpreted section is shown in Figure 27. Line N is a key seismic line in that it links the interpretation of the Silver Creek seismic lines with the Silvertip Hill seismic lines. Chris Rees hypothesized some type of normal faulting to drop the unconformity the significant amount seen in drill holes 36 and 31. The interpretation honors this hypothesis reasonably well and possibly identifies prospective sulfide amplitude anomalies at two locations.

The change in direction of this line has a noticeable effect on the observed reflection patterns. South of drill hole 36 the line trends to the west and thus identifies the eastward component of dip on both the strata and the fault planes. The most steeply dipping events are interpreted as fault planes, which corresponds with the reflectivity within the Earn identified on line L. The McDame has been interpreted based on the depth ties with drill holes 31 and 36 as well as the observed reflection patterns which seem to correlate reasonably well. The offset of the one large fault hypothesized by Chris Rees seems to be distributed on two faults, resulting in a central block at an intermediate depth.

Two amplitude anomalies have been identified on this line associated with the two fault blocks. Both amplitude anomalies trend in a similar direction, which seems to coincide with another possible fault orientation, this time dipping to the south. The first anomaly appears to fall below station 1150 not too far away from drill hole 36. Drill hole 36 was directed at –80 degrees to the west, however, and when it intersects the McDame is well off the line. If this amplitude anomaly is the same as the ones identified on line L then the best place to drill would be east of station 1150. The second drill target appears to fall below station 1260 at a depth of approximately 420 m. The depths may not be as great as line L suggests because the reflections are coming from off of the line and they appear on line L deeper than they actually are.

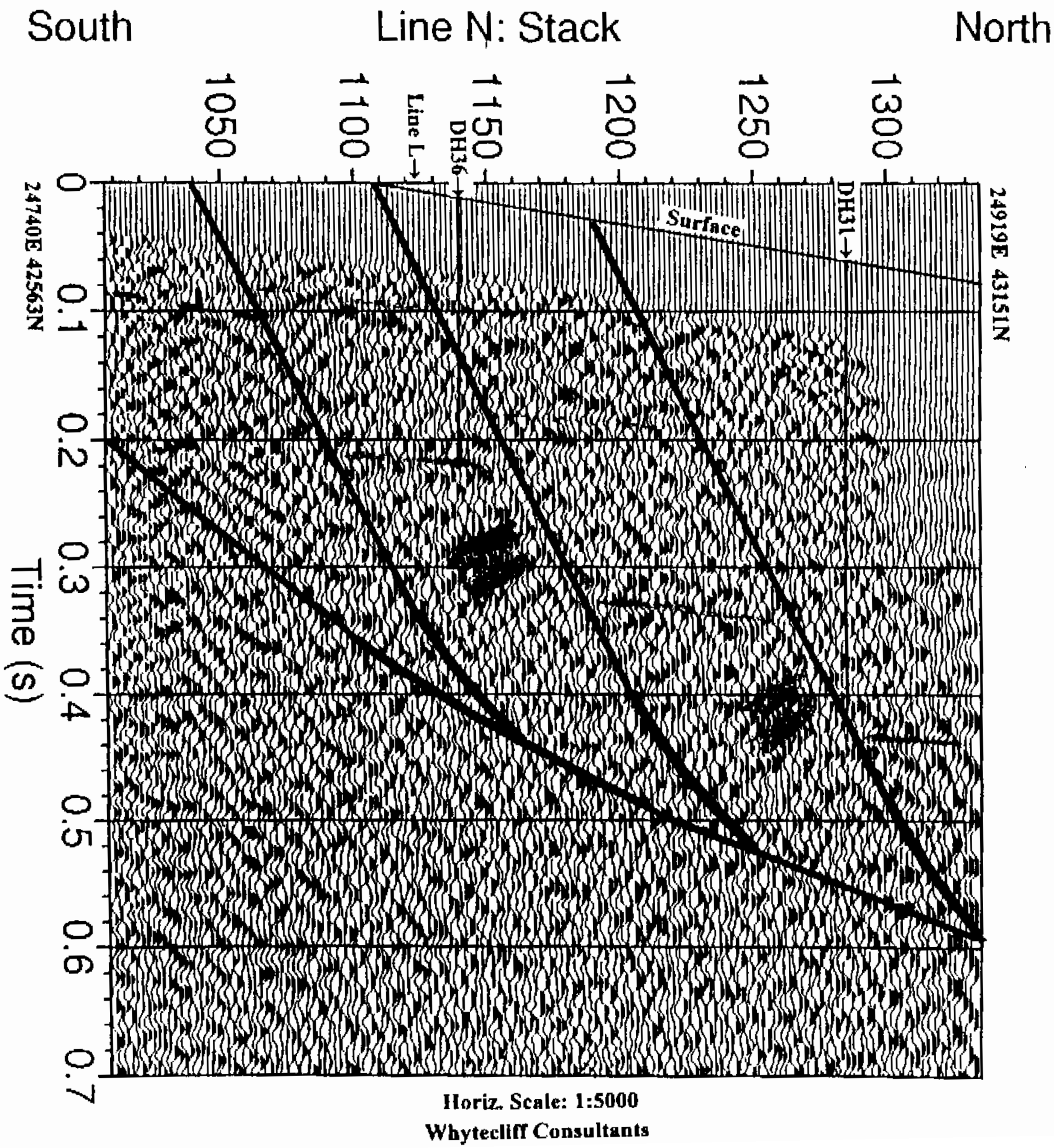

South
Line N: Stack
North
1050
1100
Line L→
DH36
1150
1200
1250
1300
Surface
DH31→
24740E 42563N
24919E 43151N
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Time (s)
Horiz. Scale: 1:5000
Whytecliff Consultants

Figure 26

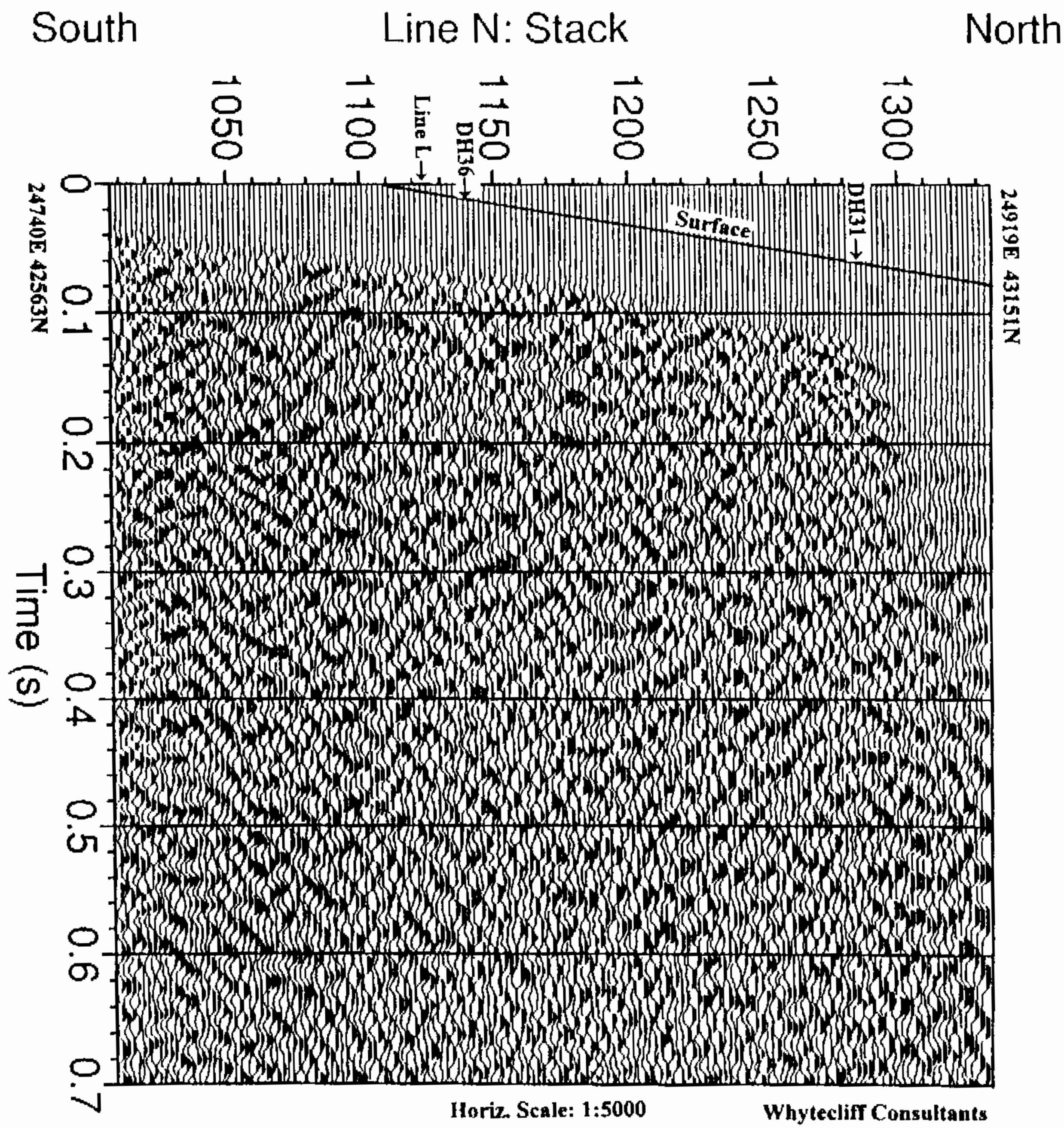

South
Line N: Stack
North
1050
1100
1150
1200
1250
1300
Line L→
DH36→
DH31→
Surface
24740E 42563N
24919E 43151N
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Time (s)
Horiz. Scale: 1:5000
Whytecliff Consultants

Figure 27

Conclusions

The seismic technique has proven to be successful at identifying sulfide mineralization on the Silvertip property. A total of 12 seismic lines were acquired on the property. The lines with reasonable data quality that tie known sulfide deposits show that higher amplitude anomalies are associated with the sulfide. In addition, drill holes 97-24, 97-25 and 97-26 were located based on seismic anomalies and resulted in the intersection of sulfide mineralization. A number of additional seismic amplitude anomalies have been identified that remain to be tested.

The processing performed on the seismic data was very basic. Additional processing will undoubtedly have a significant impact on the interpretability of the sections. The 2D seismic method has many pitfalls, which should be fully understood before making critical drilling decisions. The successful identification of sulfide mineralization using seismic techniques on the Silvertip property bodes well for the future of seismic techniques within the mining industry.

Appendix E

Geology and Resource Estimation

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GEOLOGY AND RESOURCE ESTIMATION

1. REGIONAL AND PROPERTY GEOLOGY

1.1 Regional Geology

Silvertip is a silver-lead-zinc, high temperature, carbonate-replacement massive sulphide deposit. It is situated in the Cassiar Terrane of the northern Omineca Belt, in Palaeozoic sedimentary rocks that were formed in a mainly shallow marine setting on the ancient continental margin of western North America. In the Silvertip region, these sedimentary rocks were thrust-faulted and folded in the Jurassic, and intruded by large and small plutons in the Cretaceous, the largest being the Cassiar Batholith, 8 to 10 km to the west of Silvertip. The region was cut by steep, mainly dip-slip faults in the Late Cretaceous to early Tertiary, probably related to major transcurrent fault systems in the northern Cordillera.

1.2 Property Geology

The main geological units on the property are the McDame Group and the Earn Group. The Middle to Upper Devonian McDame is dominantly fossiliferous limestone, deposited in a carbonate platform setting. Deposition was curtailed by uplift, followed by surface and subsurface karst erosion forming a system of caves, many filled with breccias. In the Late Devonian to Mississippian, the Earn Group, comprising carbonaceous shale, sandstone and conglomerate, was deposited on the McDame, some of its basal mudstone filling karst cavities within the limestone. Presently, strata dip gently to moderately east to Southeast, possibly due to doming caused by the Cassiar Batholith. The main faults on the property strike north and dip steeply east or west. A belt of strong hydrothermal alteration (sericitization) is present in Earn Group rocks 1 to 2 km south of the main deposit area, and has been dated as Late Cretaceous.

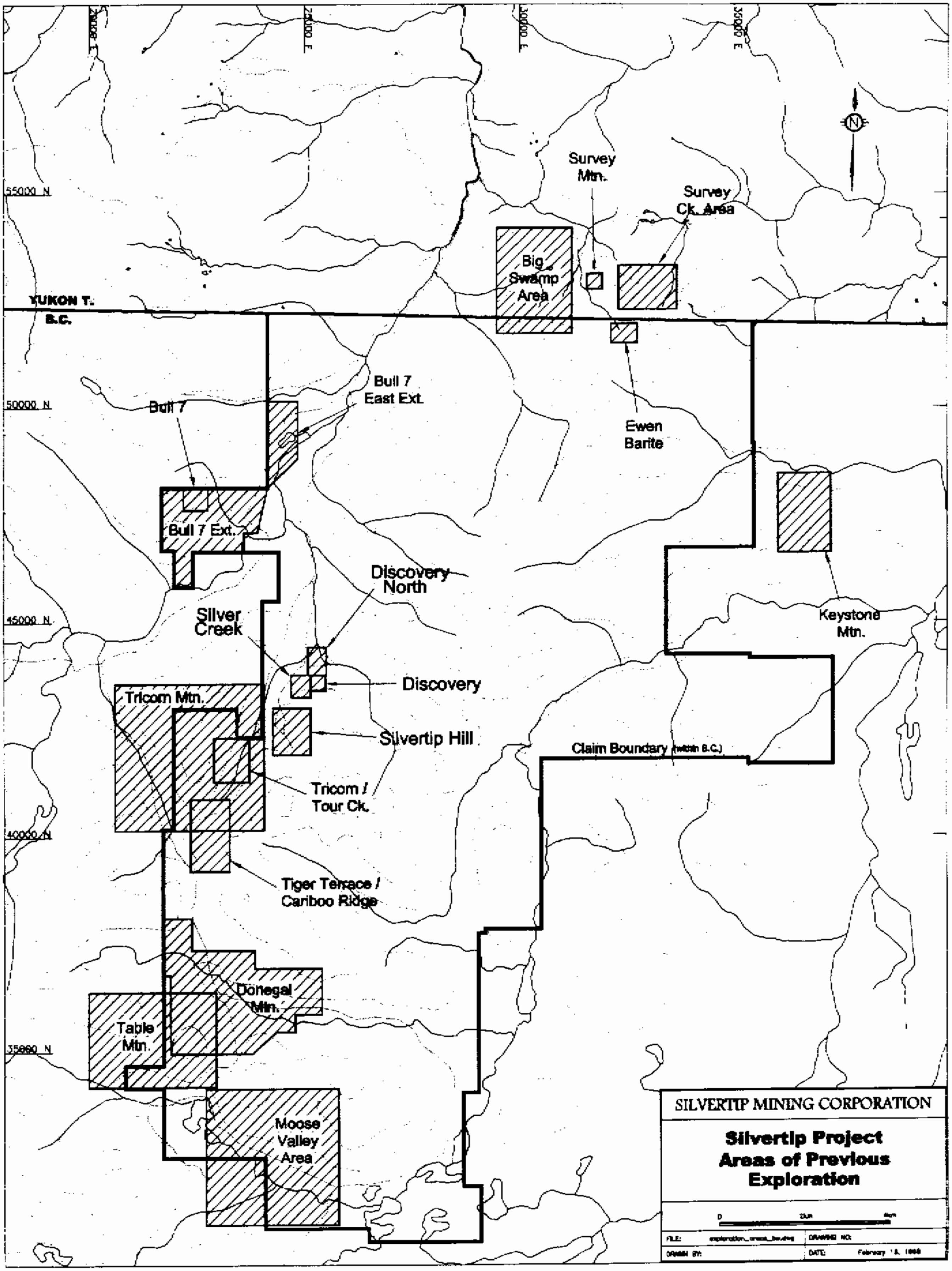
The hypothesis is that the Silvertip area was intruded by an (unexposed) felsic intrusion(s) at about 70 Ma, indicated by lead isotope data and radiometric dating of the hydrothermal alteration. This event generated magmatic fluids enriched in base metals which migrated up through the McDame limestone, perhaps channelled by north-trending fault zones, until they were capped by the relatively impervious Earn shales. Deposition of sulphides occurred preferentially at or near the unconformity, many zones exploiting porosity created by solution collapse features, especially breccias of paleokarst origin and those produced much later by fracturing and dissolution related to the hot, acidic mineralising fluids themselves. The result is at least two known sub-areas on the property (Silver Creek and Discovery) containing roughly strata-bound bodies or 'mantos' of pyrite-sphalerite-galena massive sulphide, intermittently following the gently-undulating and moderately-faulted McDame-Earn contact.

In the early 1980s, the mineralisation was thought to consist of a semi-continuous 'blanket' at the unconformity, but more recently has been modelled as transgressive, irregular, stratabound tubes. Replacement mineralisation is known to occur much deeper in the limestone, and may represent subvertical feeders or 'chimneys' to the higher tubes and mantos.

2. EXPLORATION HISTORY

The Silvertip Property has been intermittently explored since 1955, when argentiferous galena was discovered on Silvertip Hill. The following chapter outlines the physical work performed on the property throughout its history, as well as tracing some of the thoughts on the whereabouts and genesis of the mineralisation.

The initial discovery of mineralisation on the Silvertip Property was made in **1955**, by government grubstakers about 1 km Southwest of the Silvertip. A. Zborovsky, V. Alfody, S. Meszaros, and S. Papp found gossanous float that was rich in galena. This gossan was thought to be a surface expression of silver-bearing galena mineralisation filling steeply dipping cross-cutting fractures found in the McDame limestone on Silvertip Hill.


SILVERTIP MINING CORPORATION
Silvertip Project
Areas of Previous Exploration
YUKON T.
B.C.
55000 N
50000 N
45000 N
40000 N
35000 N
30000 E
35000 E
Survey Mtn.
Survey Ck. Area
Big Swamp Area
Ewen Barite
Bull 7
Bull 7 East Ext.
Bull 7 Ext.
Discovery North
Silver Creek
Discovery
Silvertip Hill
Tricom Mtn.
Tricom / Tour Ck.
Tiger Terrace / Cariboo Ridge
Donegal Mtn.
Table Mtn.
Moose Valley Area
Keystone Mtn.
Claim Boundary (within B.C.)
N

Thirty-two claims were staked on the Silvertip Hill Property in 1956, and held by A. Zborovsky in good standing until 1962. In late autumn of 1956, the claims were optioned to Conwest Exploration Company Limited of Toronto. Exploration of the property began in 1957. Two geologic models were in favour at that point - 1) vein related deposit, 2) semi-conformable replacement deposit.

Following the theory that the oxidised surface showings represent a series of steeply dipping fractures, Conwest engaged in both surface and underground activities during the summer of 1957. Eight zones were found. Surface trenching of six 'veins' gave anomalous values in silver, lead, and zinc. Surficial exploration also involved plane table mapping and diamond drilling. Eleven holes totalling 582m were drilled in an attempt to delimit 'veins' 1-5. The results of this drill program were extremely discouraging, as no sulphide mineralisation, oxides, or cavities were encountered. Surface drilling was dismissed as unreliable (due to drilling problems), and an underground program was initiated.

Underground exploration began on March 21, 1957, when an upper adit was cut 76m below the crest of Silvertip Hill. The total advance of the upper adit was 155m. Hoping to intersect zone Nos. 1-4, the adit only intersected minor galena mineralisation. Three holes were drilled from the upper adit, and all three were barren. Wanting to intersect the No. 4 zone downdip, Conwest drove another lower adit into Silvertip Hill. Collared on June 19, 1957, approximately 180m lower than the upper adit and 393m long, this adit showed more promise. Three zones were outlined, one was cut by the drift while the other two were intercepted by drilling from the drift. Galena was found associated with fractures, but grades of silver within the galena were not economic. Underground drilling in six diamond drill holes totalled 786m.

Development of the property in this season included building a 27.2 km sleigh road to the Alaska Highway, and six wood frame buildings. Following this year, Conwest relinquished their option on the claims, and concluded that there was not an ore body present.

In **1958**, a Joint Venture was set-up between Noranda Mines Limited, Canex Aerial Exploration Limited, and Bralorne Mines Limited. The fractures were reinterpreted to be related to faulting, not leaching. The gossan was thought to be late fault breccia. Under this option, 3 holes (972m) were drilled from the lower adit in an effort to find sulphides at depth or sulphides that had been displaced along fault zones (formerly known as 'veins'). Drilling started on August 27, and ended November 17, 1958. Following the unsuccessful drill program (no mineralisation was encountered), it was proposed that the mineralisation was flat dipping, controlled by bedding and stratigraphic traps, and sliced by faulting.

The recommendation after this program was to drop the option. This was done in the summer of 1960, after the property lay dormant for the full year of 1959.

Peerless Oil and Gas obtained a lease agreement for the property in **1960**, and enlisted Chapman, Wood, and Griswold Limited to run an AFMAG survey over the claims. No suitable drill targets were found. However, they did outline three conductive zones and suggested IP, EM, or resistivity surveys for clarification of the anomalies. Peerless withdrew from the option in early 1961.

For the years **1961 to 1963**, the property was optioned to Pegasus Exploration Limited with Chapman, Wood, and Griswold Limited managing the exploration programs.

In **1961**, McPhar Geophysics Limited ran an 8.3 km IP survey covering 2.55 hectares of property in an attempt to locate at depth, the continuation of high-grade lead-silver mineralisation found at the surface of Silvertip Hill. The survey did not locate mineralisation at depth, however, two anomalies were defined on Silvertip Hill near the

Camp Fault. The strength and extent of the anomalies indicated the probability of large, massive sulphide deposits.

Four diamond drill holes (495m) were executed in 1961 and in 1962 (two each year), to test the IP anomalies. Graphite on fracture planes was interpreted for being responsible for resistivity anomalies and sulphides were present in sufficient abundance to explain the IP results. However, no minerals of economic interest were present.

A number of activities were performed on the property during June 14 to August 31, 1963:

- photogeologic study of Silvertip claims and adjoining areas
- geologic mapping
- geochemical soil (THM survey; 1650 samples) and rock analysis
- trenching
- diamond drilling (one hole)
- mercury vapour tests (80 rock samples)
- magnetometer traversing

The photogeologic study inferred intense faulting that correlated with IP anomalies and sulphide zones. Trenching discovered that the gossan zones were in fact continuous for as long as 500m. This was interpreted as a surface expression of a 'fault' zone. Sampling of the gossan revealed that there was not enough ore in the gossan to be economic. The one and only drill hole intercepted oxidation, but no fresh mineralisation. Magnetometer surveys turned out negative results.

A new theory was emerging from this property, even though fresh mineralisation was never found or exposed so it could be studied. The new theory interpreted the gossan at the siltstone/limestone contact as evidence of a fault. This fault was associated with mineralisation, and by reconstructing the faulting, one could focus exploration on the truncated ore body. However, the recommendation after this year was exploration costs were proving too expensive for further activities to be justified. In 1964 and in 1965, the property lay inactive.

Silverknife Mines Limited owned the Silvertip Property from **1966** (exact date of transaction unconfirmed), into the early 1980's, when Regional Resources Limited gained control. In 1966, Silverknife Mines Limited acquired the property that at this time consisted of 96 British Columbia claims, and optioned it to Rodstrom Yellowknife Mines Limited. They drilled four rotary holes (684m) to test IP anomalies outlined in the early 1960's. An early winter terminated the program that had budgeted for over 1200m of drilling. One hole did intercept pyrite and galena mineralisation that correlated with the IP anomaly.

In **1967**, exploration continued on a regional scale. Claims held on the property at this time included: Silvertip Group (30 claims), Ruby Group (62 claims), Rod Group (16 claims), Ex. H, Ex. 1, 2, and 3. An airborne EM survey was conducted to outline any new targets, and to collect data on known areas. The EM survey gave good correspondence with the geochemical survey of 1963, and on the basis of this survey, two drill targets were proposed and executed. Two holes were drilled (152m), but neither hole was deep enough (due to drilling problems) to penetrate the material thought to be causing the anomalies.

The theory that silver-lead ore is a result of replacement of limestone had emerged from this years' program. That was the first year that a concrete reserve estimate was released. Calculations predicted 1.8 million tons of 98 oz/ton Ag, 50.3% Pb, and 1.22% Zn. However, later in the year this calculation was dismissed due to large errors in calculated assumptions.

In **1968**, the property was optioned by Northern Comstock Mining Limited who performed a gravity survey, a seismic survey (GeoCal Ltd.), and two vertical diamond drill holes (388m). They began the exploration program on the premises that there was 1.8

million tons of ore. The plan was to utilise a bulldozer with the intention of mining and milling the No. 2 zone. However, soon after the initiation of the program, the realisation was made that there was not enough ore body to justify any type of mining practices in the area. The holes drilled were to test anomalous highs that were outlined in the gravity survey. The first hole was drilled, surveyed, and found to be 61m off the desired target. The second hole was drilled in an effort to correct the mistakes made with the first hole. The second hole encountered weak mineralisation in limestone before being shut down. The property was then relinquished, and remained inactive until Regional Resources Limited began exploration in 1980.

Bralorne Mines Limited restaked the property in the spring of **1973**, under the name Tam. Agilis Engineering was contracted to conduct an assessment of the property. The summary report recommended a grassroots exploration to assess the future potential of the property. This advice was not taken.

In **1980**, Cordilleran Engineering on behalf of Regional Resources Limited, began a regional assessment of the Midway Property in southern Yukon and in northern British Columbia, the first exploration in the Silvertip Mountain area since the late 1960's. Stream sediment sampling indicated anomalous values for lead, zinc, silver and/or barite, and prospecting and mapping found scattered outcrops of exhalites, both baritic and pyretic-siliceous. Also discovered was a showing of exhalative massive sulphides north of the old Silvertip camp (on Silvertip Hill) in what is called the Discovery Trench.

Regional surveys and exploration were continued and expanded in **1981**, by Cordilleran Engineering for Amax of Canada Limited (optioned property from Regional Resources Limited). The terms of this agreement expected that Amax of Canada Limited make annual instalments to Regional Resources Limited of $600,000, and perform $4,000,000 worth of exploration. If this was fulfilled, Amax of Canada Limited would earn 49% of the Silvertip property. Once completed, Amax of Canada Limited then had the option to acquire an additional 11% of the company through further exploration expenditures

The exploration performed in this year can be outlined in two phases:

1) airborne EM survey (841 claims, 778 line km)
   line cutting (435 km)
   soil sampling (8000 samples)
2) trenching (19 dug)
   3 areas were surveyed for PEM (8.5 line km) and gravity (8.9 line km)
   6 (NQ size, 857m) diamond drill holes in the Discovery area

Seven target areas were proposed following the aforementioned work and surveys performed. The seven targets were: Discovery showing, Porcupine Ridge to Silvertip Hill, Tiger Terrace to Caribou Ridge, Moose Valley, Big Swamp, Survey Creek, and Tour Creek. No reserve estimates were calculated following this exploration program.

Targeted intercepts in **1981** were still the Upper Zone and Discovery Zone exhalites. The Lower Zone was also thought to be exhalative in origin, although it was considered too thin and barren to be economic. Of the six diamond drill holes of 1981, four intersected Lower Zone massive sulphides ranging in thickness between 1.0 to 1.43m. These drill holes signalled a shift in the targeted mineralised areas on the Midway Property.

The relevant stratigraphy of the area comprises two groups; the Earn group, and the McDame group. Within the Earn Group are two narrow, barite-rich, siliceous horizons interpreted as exhalite deposits. These are known as the Upper and Discovery Zones. Within the limestone of the McDame Group is the Lower Zone. The Lower Zone is a massive sulphide replacement body. However, sometimes the Lower Zone is extremely oxidised, and any economic value it may have had has been leached away. This oxidisation proved discouraging to the early explorers. After drilling for the Upper and Discovery Zones, the focus of exploration was once again on the Lower Zone. This transition occurred between 1981, and 1982.

Ownership and management in **1982** continued on in the same manner as in 1981. The 1982 field season focused on:

1) assessing the mineral claims
2) refining the shape and size of previously located targets
3) increasing the known mineralisation in the Discovery area as outlined in 1981

The result of the airborne EM survey on the Way and Post claims, and the continued exploration (prospecting, mapping, soil sampling, pulse EM, and gravity surveys, trenching and packsack drilling) was that 166 BC units were allowed to lapse, and 153 BC units were staked (Bull 7-14, Climax 12-14, Post 11-14).

Diamond drilling consisted of 19 holes (5283m) on a 150m by 150m grid eastward of the 1981 diamond drill holes, focusing on the Discovery (14 holes), Silvertip Hill (1 hole), and Ewen Barite (29.6m in 4 holes) areas.

Drilling was performed from July 3 to October 3, 1982. Thirteen of the fifteen holes intercepted the Lower Zone mineralisation. The drill program expanded the geologic knowledge of the Discovery and Upper Zones, and outlined two new sulphide-rich zones - the Lower Zone, and minor lenses below the Lower Zone. This resulted in a shift of the target focus from the Earn Group shale exhalites, to massive sulphide mineralisation hosted mainly in the breccias and cavities of the McDame Group limestone. Also discovered, was that the pulse EM tests helped distinguish between high grade Lower Zone massive sulphide, and conductive graphitic zones or shale hosted sulphides. The reserve calculations for the Lower Zone after the 1982 summer drill program predicted 3.6 million tons of 13.2 oz/t Ag, 12.5% Zn, and 6.7% Pb.

In **1983**, Cordilleran Engineering Limited (for Canamax Resource Limited, formerly known as Amax of Canada Limited), drilled a total of 32 diamond drill holes (11 734m) on a 150m by 150m grid with the following allocations: Discovery area (12 holes); Silvertip Hill (8 holes); Brinco Creek (1 hole); and Tour Ridge (1 hole). Once again, the focus of the drill program was to 1) delimit the extent and reserves of the massive sulphides in the Discovery area; 2) explore the variability in massive sulphide thickness; 3) outline the potential for massive sulphide occurrences between Discovery and Tour Ridge areas, and 4) to find the ideal location for a portal and decline.

Conclusions following the 1983 field season were:

- feasibility of massive sulphide occurrences north and west of the Discovery area as defined in 1982
- increased potential for massive sulphides on the south side of the Discovery area as defined in 1982
- the Lower Zone massive sulphides vary in thickness from 0-11 meters thick, with common lateral increases and decreases in thickness (this is the first indication of the application of the manto model to the mineralisation on the property)
- the optimum location for the portal and decline was chosen

A number of other surveys and studies (petrographical, mineralogical, and metallurgical) were done in 1983, all focusing on expanding resources (5 areas were drilled), and delimiting the Lower Zone. Reserve calculations estimated 4.7 million tons 10.2 oz/ton Ag, 5.1% Pb, and 12.3% Zn.

Surface and underground exploration were both the focus of the **1984** field season. No change of ownership occurred. From the surface, the definition of the Silver Creek deposit was first and foremost. A total of 50 diamond drill holes in four different locations (see below) were drilled to a final 10,981 meters.

Number of Holes	Total Metres	Area Drilled
43	8,995	Silver Creek
4	961	Discovery
1	437	Silvertip Hill
1	498	Tour Ridge

Of the 43 holes drilled in the Silver Creek area, 20 intersected Lower Zone massive sulphides. With this information, the Silver Creek North and South areas were defined. Also noteworthy was that the holes drilled on Silvertip Hill and Tour Ridge were barren.

Other surface exploration included mapping and prospecting of the Ewen Barite, Spider Swamp, Bull 7 claim, and southern property areas. To better define drill targets, the shape of sulphide mineralisation and the local controls on mineralisation, extensive research studies were contracted. For instance, the McDame limestone was interpreted into biofacies (D.J.C. Mundy), breccias were classified, facies of the Earn clastics were determined, and petrographic and cathodoluminesence studies were performed on a suite of samples. Diagenetic controls on the sulphide deposits found at the contact between the McDame limestone, and the Earn Group clastics were investigated.

In order to accommodate the heavy machinery for underground exploration, the access road to the highway was upgraded. Infrastructure for a winter drill crew was also installed including a 40 man trailer camp, two bridges, a dry, a shop, a powerhouse, water wells, and a satellite telephone system. Hydrological data was collected to assist in underground planning. Underground mining began on October 11, 1984 when Canadian Mine Development collared a 4.27m by 4.57m portal to gain access to Silver Creek North. Drift construction was completed May 15, 1985 with a total of 1453m of advance.

Drilling from underground began on April 24, and finished on October 20, 1985, by Adtec Mining Consultants under the management of Strathcona Mineral Services Limited (taking over from this point on from Cordilleran Engineering Limited). The underground workings exposed the Silver Creek North area that allowed for extensive chip sampling and metallogenetic testing. The main object of the underground workings was to fan drill (at 20m intervals) into the Silver Creek North (120 holes) and South (50 holes) areas in an effort to constrain the shape, size, and continuity of the sulphide mineralisation in addition to the grade, and mineability of the sulphide zone. Another hole was drilled near the surface of the portal to determine conditions for the proposed decline. From the 171 underground holes (12,383m) drilled between the years of 1984 and 1985, the reserves of the Silver Creek and Discovery areas were estimated to be 5.4 million tons of 11.39 oz/ton Ag, 6.4% Pb, and 12.3% Zn, with 0.019 oz/ton Au. This is the first year that computers were implemented to manipulate drill logs, and other data associated with the drill program.

The year **1986** was a year to attempt the discovery of additional deposits to augment the reserves outlined in the Silver Creek area. Strathcona Mineral Services Limited managed the 1986 summer drill program for Regional Resources Limited. Soil geochemistry, line cutting, pulse EM, and magnetometer geophysical surveys were performed in 7 target areas in the hopes that they would provide information for choosing drill targets. The seven areas were: Bull 7, Donegal Mountain, Keystone Mountain, NW Discovery/Silver Creek North, Spider Swamp, Survey Creek, and Tricorn/Tour Creek. Fourteen diamond-drill holes (2660m), and 9 reverse circulation holes (984m) constituted the entire drilling (surface and/or underground) for the 1986 program which resulted in the reduction of targets from seven to two. All save the Spider Swamp, and NW Discovery/Silver Creek North areas were discounted. Underground workings were allowed to flood.

At Survey Creek, one diamond-drill hole was drilled which intersected faulted repetitions of the McDame limestone within the Earn siltstone. Neither intersection with sulphides nor the Earn/McDame unconformity was recorded. Geological mapping helped to define the structural setting of the area. The pulse EM survey was expanded in this area.

At Spider Swamp, prospecting in the Northeast corner of the property during 1984 located silver bearing galena veins (91844.57 g/t Pb). Following this discovery, grids were cut, and soil sampling lines were flagged and sampled for Ba, Pb, Zn, and Ag. This process defined geochemical anomalies, and finally drill targets. Of the two holes drilled in this area, neither intersected the unconformity. The holes were terminated in gouge or in barren limestone due to drilling difficulties.

Reserve calculations after the 1986 field season predicted 1.185 million tons of 410 g/t Ag, 7.0% Pb, and 9.6% Zn.

The property was on care-and-maintenance during **1987** and **1988**, due to the huge costs of the needed underground exploration and low metal prices.

In **1989**, exploration on the Midway Property resumed, with ownership still dominated by Regional Resources Limited, and management under Strathcona Mineral Services. The focus of the new exploration was to evaluate mining conditions, and to define mineralisation.

General upgrades on the property were done in 1989, including rehabilitation of underground workings, installation of a new shop and generator, and institution of a mine water treatment plant.

The primary goals of the **1990** fall/winter/summer season were to test for additional mineralisation below the Earn Group/McDame Group contact to evaluate the shape, extent, and continuity of the mineralisation, and to estimate the potential mining conditions in the central Discovery area in a region 200m by 500m large.

To fulfil the goals of this season, Strathcona Mineral Services (for Regional Resources Limited) managed the property, and provided camp facilities and power generation while Canadian Mine Development provided mining equipment, personnel, and underground service work. Exploration began with an intense underground drilling program. After the underground workings were restored, Canadian Mine Development extended the decline and hangingwall drift another 765m trying to access the deeper Discovery mineralisation. The work took from January 5 to June 11 to complete. A total of 68 holes (NQ size, 9620m) were drilled in this season.

Exploration efforts aimed at testing for additional mineralisation below the Earn Group/McDame Group were unsuccessful.

A better understanding of the ore body confirmed that the ore was distributed in a series of pods, tubes, and manto-like bodies which displayed great irregularity in shape and continuity. The recognition of two different types of mineralisation was made in an attempt to define controls, and narrow possibilities for mining. The distinction of contact-related and limestone-hosted mineralisation inferred a difference in shapes and distributions. Drill hole spacing was found to be too large to determine the fine details that would be needed for accurate volume and reserve calculations.

The potential for mining the ore was interpreted to be very difficult due to poor ground conditions. The best targets for underground mining were thought to be those which were the thickest, and farthest below the Earn Group shale and siltstone.

In conclusion, the 1990 exploration year was devastating because of the definition of the ore body caused a severe reduction in the calculated reserve estimate. The property lay dormant from 1991, until late 1996 when Imperial Metals Corporation acquired Regional Resources Limited and its properties. Regional Resources Limited then changed its name to Silvertip Mining Corporation. Silvertip Mining Corporation budgeted $2 million for the 1997 exploration program which is outlined in this report.

3. GEOLOGICAL INTERPRETATION

This document presents the methodology employed in part of the current resource evaluation of the Silvertip property. It is concerned with the geological interpretation of information compiled from previous operators' work and Imperial's 1997 exploration program, for the purpose of obtaining a reasonably accurate estimate of the tonnage and grade of the mineralisation as we understand it. The intent of this section is to set out definitions and criteria governing our interpretations, and a basic description of the formats and procedures we followed.

Essentially, the interpretation of the size and shape of the Silvertip massive sulphide bodies (hereafter "blocks") is based on surface and underground diamond drilling. Note that Strathcona also utilised down-hole geophysics to guide some of their interpretation.

3.1 Sections

The first interpretation of blocks by Imperial was done by Linda Lewis and Chris Rees in the spring of 1997 purely for the construction of the model. EAST-WEST vertical sections, at 20-metre spacing and using a 10-metre search distance, were used as the framework of the model, because east-west was assumed to be a better perspective to 'map' the unconformity below surface. Note that this interpretation was not intended for a formal evaluation of the resource, and we set out only very general criteria for defining the blocks. The blocks were indeed used by Clay Craig during the summer when he did his independent and preliminary appraisal of development costs, but we do not feel that comparisons made between this original exercise and any future effort would be appropriate, even if they turn out to be not that different.

The most recent interpretation by Linda Lewis and Chris Rees (fall 1997) is on NORTH-SOUTH sections, using the same 20-metre spacing and 10-metre search distance. This is much more appropriate because the 1985 and most of the 1990 underground fan drilling, which provides the best control, is predominantly in north-south planes in the Silver Creek area, because the unconformity generally dips to the south there. Fan drilling in the Discovery area (1990) was done in a variety of directions, and there is probably no preferable perspective for the interpretation of blocks in that area, and hence no particular disadvantage in using north-south over east-west sections, even though the geological dip is to the east.

The latest, north-south sections were plotted at 1:750 scale, using geology from previous operators' work and from the preliminary "quicklogs" from the 1997 drilling program (detailed logging and computer input could not be completed in time to be incorporated into the sections).

Assay values were plotted against the drillholes using a colour scheme based on the following cut-offs:

> 1500	grams per tonne silver equivalent
500 - 1500	grams per tonne silver equivalent
100 - 500	grams per tonne silver equivalent
< 100	grams per tonne silver equivalent

Assumptions: Silver equivalents were derived on the basis of $5 per ounce silver, $0.70 per pound zinc and $0.25 per pound lead. In addition, assumed recoveries and smelter transport and treatment costs were all factored in. Gold values were not included.

N.B. Strathcona Mineral Services Limited did their 1991 mineral resource estimates from interpretations on north-south sections.

3.2 Blocks: Geological Types - LZ, LZOX, and CAVE

While most of the mineralisation is pristine massive sulphide, some of it is oxidised. Oxidation occurs mainly at shallow levels at the north end of Silver Creek North, and is due to the relatively recent action of near-surface, oxidising groundwaters. Oxidised mineralisation was recorded in the geological logs and so is displayed in the sections. LZ is the geological code for normal Lower Zone massive sulphide, and LZOX is its oxidised equivalent. We did outline blocks for LZOX as well as LZ because even though they would be excluded from the main tonnage and grade calculations, they do provide some insight into the original extent of replacement mineralisation, and we wanted to retain that information.

Note that some mineralised intersections were coded MINL (or something else), as logged by Cordilleran Engineering or Strathcona. We dealt with them on a case by case basis, but those near the unconformity were usually treated as LZ. Because of time constraints, we rarely looked into what type of mineralisation MINL actually represented, specifically whether it was oxidised or why it was not coded LZ. Usually this information was not in the logs anyway.

Some drillholes intersected caves or intervals of very low recovery, coded CAVE. A small number of these are relevant because they evidently contained mineralised material which assayed more than 100 g/t and locally more than 500 g/t silver equivalent. They were consistently treated as were LZOX, and excluded from the resource calculations.

3.3 Definition of Blocks

In delineating blocks, our guiding objective was to interpret the three-dimensional geometry of 'significant mineralisation' using our geological and core-logging experience, and not be distracted by concerns about grade (above the minimum cut-off value), minor internal dilution, or mineability, all of which will be taken into account in subsequent stages of the overall evaluation. This way, this part of the exercise can be used for geological modelling and future exploration as well as for the current assessment of the resource.

Under these terms, therefore, we consider that we have outlined an overall *Mineral Resource* based on our present state of knowledge (CIM definition). Further qualification of this resource will become apparent in this document.

In the following, "field" implies the two-dimensional shape interpreted on a given section, and "block" implies its three-dimensional form.

Two categories of fields and blocks were outlined on the sections for both LZ and LZOX: **indicated** and **inferred**. The 'inferred' fields extend beyond the 'indicated', and are distinguished mainly by a lower level of confidence of extrapolation. This and other aspects of these two categories are explained in a later section. The following criteria governing the definition of blocks apply primarily to '**indicated**' fields and blocks.

3.3.1 Grade

(a) Most LZ (and MINL) intersections were captured in our 'indicated' blocks. The remaining few were excluded by some other criterion (mainly, too thin). Values less than 100 grams per tonne silver equivalent are arguably economically insignificant, and indeed we used this value as a cut-off for other, non-LZ mineralised intersections (see (b), below). However, we rarely rejected any LZ even if it assayed below 100 grams because of its potential geological significance (fluid-pathway indicator, for example), and because it may have been artificially undervalued by excessive sample width. Some of these sub-100 gram LZ fields we designated indicated and others inferred, depending on the local circumstances.

(b) Many mineralised intervals in McDame Group limestone (MLS) and Earn Group (1AA or 1AC) which assayed **100 grams per tonne silver equivalent or greater** were also captured, in inferred fields if not indicated. Such intervals are quite common at the top and bottom margins of many LZ, or laterally close to LZ. However if they were less than a few metres thick and some distance from the main mineralised blocks, they were usually ignored. This may sound ruthless, but if the mineralisation was at all significant, presumably it would have been coded LZ or MINL in the first place.

The actual grade or weighted average assigned to an indicated or inferred block is obviously a function of the contained drill intersection(s). This aspect is more appropriately dealt with in the context of the computer-processing of the data, which is not covered in this section.

3.3.2 Non or Poorly Mineralised Sub-Intervals

Many mineralised drill intersections contain one or more sub-intervals of LZ or host rock which assayed below the 100 gram cut-off. The question is: is this merely internal dilution due to remnants of host rock or 'dropouts' of sphalerite and galena, or an extensive barrier between two discrete sheets or pipes of massive sulphide? The dilemma is whether to include it in one large indicated field or block, or make two separate indicated fields, which has potentially significant consequences for resulting volumes. In general, we included the sub-100 gram sub-interval in the overall indicated field if it is:

a) logged as LZ or MINL
b) MLS or 1AA that is only about 2 m thick or less, or
c) somewhat more than 2 m thick but adjacent drilling suggests that it is only a localised feature within a large higher grade body. (In support, underground mapping in Silver Creek North shows large blocks of limestone floating in massive sulphide.)

Otherwise, we tended to be conservative, and isolated the surrounding >100 gram fields, or bifurcated them around the low grade interval. The latter we either relegated to the inferred category or ignored altogether.

3.3.3 Thickness

This criterion is somewhat arbitrary and discretionary. In general, we did not outline or extend an indicated field around >100 gram mineralisation that is thinner than 1 metre (rarely 2 m), unless it could be reasonably connected to another, preferably larger field. Such rejected intervals occur mainly in relatively isolated holes at some depth below the unconformity.

3.3.4 Depth

We did not exclude any qualifying interval on the basis of depth alone.

3.4 Blocks: Resource Categories - Indicated and Inferred

Essentially, 'indicated' fields or blocks have a reasonably high level of confidence, whereas 'inferred' fields and blocks are more speculative. These terms have been used intentionally to correspond with the formulized *Indicated Resource* and *Inferred Resource* categories, respectively. We have not distinguished a 'measured' category, because of certain limitations of our method (see later under 'Construction of Blocks'). However, certain zones within our indicated blocks, where there is high density drilling or underground confirmation, would probably be upgradeable to 'measured', although we have not done so at this stage.

(a) No indicated field was outlined on a given section without at least one qualifying drillhole intersection passing through it. Conversely, we did not envelope the space between two good, close intersections within a single indicated field if there was a condemnation hole in the way, unless the drill plan showed that the apparent condemnation hole did not, in fact, intervene.

(b) For isolated qualifying intersections, indicated fields were generally drawn as ellipses with a length roughly 5 to 10 times the interval's thickness, up to a maximum of about 10 to 15 metres. We were more conservative with thicker intersections, making them more circular than elliptical, in order to stay close to our self-imposed 10- to 15-metre confidence limit.

(c) Isolated inferred fields were also drawn as ellipses, concentric on and outside the associated indicated field, and with the same general orientation. The short axis of these elliptical shapes, corresponding to the base drill intersection, is the same length for both indicated and inferred ellipses, as obviously we could not exaggerate the known thickness, only speculate on its lateral extent. The inferred fields usually extend considerably beyond the 10- to 15-metre confidence limit that we exercised for the indicated fields.

(d) We generally judged two qualifying intersections which were more than about 20 to 25 metres apart too far away from each other to be included within a single indicated field, unless they were sufficiently thick to imply a major massive sulphide body. They might be close enough, however, for two smaller indicated fields to be bridged by an inferred field.

(e) Some inferred fields occur on sections with no supporting drill intersections. That is, they have been extrapolated from an indicated field on an adjacent section. Obviously this was done only if the indicated block was deemed large enough to have an east-west component extending more than 20 metres off its section (less if the indicated block was actually intermediate between the two sections). We decided that the *indicated* block must be downgraded to an *inferred* field by virtue of no independent support for the latter.

3.5 Construction of Blocks

3.5.1 Indicated Blocks

Being not proficient in the MEDSystem program Minesight, we worked by manually drawing fields on paper, overlaying consecutive sections in an attempt to maintain the integrity of general shapes as they emerged. Usually, the larger shapes appear to change quite markedly even within 20 metres, illustrating the irregularity of this type of mineralisation. The smaller shapes tended to be quite independent, although this is partly an artefact of our reluctance to extrapolate them very far.

A practical shortcoming of using serial sections this way (*versus* Minesight) is the constraint imposed by the 10-metre search distance, which is actually too high for tracking this kind of erratic and irregular mineralisation. It is particularly important to recognise oblique horizontal trends from the drill plan in order to make the appropriate offsets when extrapolating blocks between sections, or to make certain allowances within sections. For instance, drill intersections that appear to lie next to one another on the nominal section plane could in fact be over 20 metres apart (theoretically) along a north-easterly or north-westerly-trend. This can lead to erroneous interpretations, and is probably the explanation for otherwise perplexing incongruencies in some sections. Making the necessary adjustments was quite difficult using our method, if only because of the poor legibility of the accompanying drill plan (the drillholes and numbers overlap); nevertheless, horizontal trends were certainly taken into account wherever possible.

To avoid this and other perceptual handicaps, and if possible and practical in the future, this kind of geological interpretation should be done using Minesight directly. It should be mentioned that many of these shortcomings arising out of our manual methods were corrected or ameliorated by the painstaking linking in Minesight done by Clay Craig in the next stage of the process.

Another very frequent interpretational problem is whether to draw inequant blocks with a generally horizontal or vertical orientation (as in manto *versus* chimney), where there is no discriminating information. We assumed a generally stratabound form at or near the unconformity, for obvious reasons. This assumption is far less constrained at depth, although we tended to do the same (it probably does not matter with respect to the block's volume, only to its implied geological significance). It is noteworthy that Strathcona's interpretation involved the projection of many vertical 'chimneys' downwards from their unconformity blocks, and they were also biased towards this orientation with their deeper isolated blocks. Apparently they were influenced by the down-hole geophysics, and possibly by their observations of the mineralisation when they went underground in 1989-90.

3.5.2 Inferred Blocks

In December, 1997 it was decided that a tonnage/grade block model based on the inferred fields as defined above would not be constructed at this time.

Instead, a more speculative inferred category was created in order to get a better impression of the upside potential of the deposit rather than one limited by the geologists' natural tendency to be conservative in the face of insufficient data. The resulting "low confidence inferred" interpretation is by no means geologically unreasonable, but it is very speculative and we trust that the ensuing tonnage and grade numbers are regarded with due caution.

The "low confidence inferred" model ("low-inferred", hereafter) was constructed directly in Minesight by Clay Craig and Chris Rees. The original inferred fields ("high-inferred", hereafter) were used as a starting point, but were frequently modified. The main difference between the low-inferred blocks and the high-inferred blocks (as they were originally perceived, anyway) is a greater willingness to envelope widely spaced, indicated blocks within continuous, roughly stratabound sheets or tubes, which we assigned as low-inferred. This strategy is defensible for the thicker indicated blocks, but definitely tenuous for the more isolated ones or those less than 1 or 2 metres thick.

Indicated blocks were enveloped by low-inferred blocks providing that they were within 50 metres of one another, with no condemnation drilling in the vicinity. If the distance between mineralised drillholes was greater than 50 metres, or if there was a condemnation hole in the vicinity, the 'point dissipation' technique was used to establish the limits of the low-inferred block. In these cases, the linking was done by dissipating the thickness of the base drill intersection to a point 50 metres away in the direction of the condemnation drillhole, or to a point 150% of the distance to the condemnation hole, whichever is closer. The shape was then cropped at 20 metres or halfway to the condemnation hole, whichever is closer.

4. THREE-DIMENSIONAL SOLID MODELLING

The geological interpretation as defined in Section 3.0 was used to create three-dimensional solids in MEDSystem software Minesight. The interpreted mineralised outlines were draped or snapped directly onto the drillholes from which they were defined. Therefore, when these shapes are linked together from section to section, they form three dimensional bodies passing through the drillholes at the appropriate intervals - as opposed to "projections" on the section lines.

In the case no mineralised outline could be defined on adjacent sections, the solid body was clipped or "pinched out" using the following methodology:

1) The outline was linked to a point located at 30 metres (perpendicular projection) from the approximate centroid of the mineralised section or a point determined by the distance to the closest barren drillhole intercept, whichever was closer.

2) The resultant solid was then cut off at a 10 metres distance from the original outline.

5. DATABASE

The database comprises a total of 467 holes from underground and surface. Table 5.1 below provides the number of holes completed during the different drilling campaigns for which the data was available.

TABLE 5.1

Year	Surface	Underground
1997	63	0
1990	0	68
1980	126	170

A total of 5066 assay intervals are included in the database. For each of the drilling program the number of samples, assays, and average length of the assays intervals are given in table 5.2.

TABLE 5.2

Year	Samples	Assays	Average Length (m)
1980	3,696	2,876	1.46
1990	515	336	1.28
1997	855	726	1.07

6. QUALITY CONTROL

A quality control program (QC) was established during the 1997 exploration program under the supervision of Dr. Barry Smee, a Consulting Geochemist. The QC program was designed to monitor precision and contamination. Blanks and field duplicates were inserted amongst the samples shipped to the laboratory. However, field standards were not available and the standards from Bondar-Clegg were relied upon for accuracy.

In his summary of findings, Dr. Smee states that "these data suggest that the sampling and analytical methods used at Silvertip are acceptable according to industry standard." Dr. Smee's full report can be found in Appendix I.

7. EXPLORATION DATA ANALYSIS

7.1 Basic Statistics

Basic statistics including the mean, percentage above given cut-offs and standard deviation were calculated for silver (Ag), lead (Pb), zinc (Zn) and gold (Au). The holes were sampled and assayed at irregular intervals. Thus, the table below provides length weighted statistics for the various elements.

Table 7.1.1
Silver Assay Statistics

CUT-OFF	WEIGHT	% ABOVE	AVERAGE	STD DEV
0.00	3,897.4	100.00	195.67	400.28
100.00	1,356.6	34.81	521.19	544.63
200.00	968.3	24.85	672.51	579.008
300.00	737.8	18.93	805.24	604.82
500.00	463.2	11.89	1,051.01	647.01
1,550.00	79.6	2.04	2,105.93	817.44
1,850.00	40.0	1.03	2,520.56	993.68

The silver grade distribution is lognormal with a mean of 195.67 g/t, a minimum of 0.01, a maximum of 6 206.8 g/t and a coefficient of variation (standard deviation/mean) equal to 2.05. The 99th percentile of the grade distribution is approximately defined by a silver value of 1 850 g/t.

Table 7.1.2
Zinc Assay Statistics

CUT-OFF	WEIGHT	% ABOVE	AVERAGE	STD DEV
0.00	3,852.4	100.00	5.182	6.71
1.00	2,166.7	56.24	9.004	6.82
2.00	1,852.9	48.097	10.280	6.57
4.00	1,505.9	39.091	11.996	6.107
6.00	1,264.9	32.833	13.762	5.624
10.00	838.2	21.757	16.093	5.52
12.00	653.3	16.957	17.549	4.935
15.00	386.6	10.035	20.267	4.728
20.00	155.2	4.029	24.578	4.710
27.00	40.2	1.044	31.011	4.553

The average zinc grade in the database is 5.182 % with a minimum of 0.01% and maximum of 46.80%. The coefficient of variation (standard deviation/mean) is 1.30.

Table 7.1.3
Lead Assay Statistics

CUT-OFF	WEIGHT	% ABOVE	AVERAGE	STD DEV
0.00	3,801.8	100	3.86	7.674
2.00	1,278.9	33.64	10.71	10.196
3.00	1,077.4	28.34	12.25	10.408
4.00	930.7	24.48	13.63	10.55
5.00	810.4	21.32	14.99	10.661
7.00	645.2	16.98	17.31	10.78
10.00	443.8	11.67	21.35	10.79
12.00	353.3	9.29	23.97	10.58
15.00	263.3	6.93	27.64	9.87
20.00	190.0	5.00	31.64	8.76
38.50	37.8	0.995	45.56	6.34

The histogram computed for lead presents a lognormal distribution with a mean of 3.86%, a minimum of 0.01% Pb and a maximum of 59.7% Pb with 1% of the samples with lead grade greater than 38.50% Pb.

Table 7.1.4
Gold Assay Statistics

CUT-OFF	WEIGHT	% ABOVE	AVERAGE	STD DEV
0.00	3,113.0	100	0.534	0.764
0.10	1,685.3	54.14	0.935	0.854
0.50	1,018.7	32.72	1.383	0.830
0.70	810.8	26.05	1.583	0.819
1.00	628.4	20.19	1.796	0.812
1.50	334.3	10.74	2.300	0.875
2.00	185.5	5.96	2.774	0.840
2.50	95.0	3.051	3.296	0.896
3.20	32.7	1.050	4.243	0.939

Gold also presents a lognormal distribution. However, the gold distribution may not be representative of the area as a whole as gold was not systematically assayed. The minimum assay is 0.01 g/t and the maximum is 7.11 g/t.

7.2 Cumulative Probability Plots and Correlation

Cumulative probability plots were also produced to determine if different populations exist within the four grade distributions. For silver, lead and zinc at least two different populations were observed: a predominant pervasive massive sulphide mineralisation and a more localised high-grade mineralisation that is probably controlled by structure and/or lithologies. Indications are that the gold distribution also includes two populations.

Finally, correlation coefficients were calculated to establish the presence of any strong correlation between elements - a strong correlation being defined by a correlation coefficient between 0.80-1.00. A very strong correlation exists between silver and lead with a correlation coefficient of 0.96. It is attributable to inclusions of pyrargyrite (Ag_3SbS_2) in galena, documented at Silvertip from polished sections and SEM-X-ray study (Marthe Archambault, M.Sc. thesis). Silver is also known to position itself in the lattice structure of lower temperature lead sulphosalts. Lead and zinc show a moderate correlation with a coefficient of 0.48. Silver and zinc show a comparable correlation with a correlation coefficient of 0.48.

8. COMPOSITES

Compositing was performed on 1 metre interval with the x and y co-ordinates of each composite being stored at the mid-point elevation. The composite length was chosen based on two assumptions:

1) it may be possible to mine some of the Silvertip material by open-pit which is to the west of the Discovery Zone, Silver Creek Extension. An underground operation may be combined with the open-pit or may follow; but it would occur further to the east - Discovery Zone.

2) waste could be mined in 10 metre benches. The relatively thin mineralised zone may be selectively mined in 1 metre benches.

It should be noted that at the time the resource estimation work was undertaken MEDSystem could not properly handle a three-dimensional model with variable bench height. As a compromise, a block model with 2 metre bench height was created. It is recommended that the actual model be adjusted to reflect the size of the mining units envisaged for mining production.

The composites were coded to determine which ones belong to the mineralised envelope as defined by the three-dimensional solid model. The statistics for the 1 metre composites inside the mineralised zone are provided in table 8.1 - 8.4

Table 8.1
Silver Composites Statistics

CUT-OFF	COMPOSITES	% ABOVE	AVERAGE	STD DEV
0.00	2,097	100.00	343.85	458.79
1.00	1,371	65.38	500.62	500.55
2.00	1,007	48.02	629.50	527.56
3.00	755	36.00	756.72	553.45
500.00	450	21.46	1,003.39	601.12
1,500.00	66	3.15	2,064.16	845.06
1,800.00	36	1.72	2,428.16	1,010.72

The average silver grade for the composites inside the mineralised zone is 343.85 g/t with a minimum of 0.00 g/t and a maximum of 6 206.8 g/t.

Table 8.2
Zinc Composites Statistics

CUT-OFF	COMPOSITES	% ABOVE	AVERAGE	STD DEV
0.00	2,097	100.00	8.68	6.48
1.00	1,943	92.66	9.34	6.28
2.00	1,772	84.51	10.10	6.06
4.00	1,469	70.05	11.59	5.59
6.00	1,235	58.89	12.86	5.19
10.00	809	38.58	15.46	4.55
12.00	599	28.57	17.02	4.30
15.00	358	17.07	19.43	4.02
20.00	121	5.77	23.83	3.79
30.00	7.0	0.33	34.68	3.29

Minimum = 0.00
Maximum = 40.000

Table 8.3
Lead Composites Statistics

CUT-OFF	COMPOSITES	% ABOVE	AVERAGE	STD DEV
0.00	2,097	100.00	6.69	8.54
2.00	1,332	63.52	10.06	9.13
3.00	1,131	53.93	11.41	9.28
4.00	979	46.69	12.64	9.39
5.00	853	40.68	13.85	9.48
7.00	646	30.81	16.38	9.59
10.00	451	21.51	19.80	9.63
12.00	360	17.17	22.02	9.58
15.00	253	12.07	25.73	9.15
20.00	173	8.25	29.72	8.44
25.00	111	5.29	33.85	7.91
35.00	37	1.76	42.92	6.83

Minimum = 0.00
Maximum = 59.70

Table 8.4
Gold Composites Statistics

CUT-OFF	COMPOSITES	% ABOVE	AVERAGE	STD DEV
0.00	2,097	100.00	0.726	0.793
0.10	1,557	74.25	0.962	0.794
0.50	1,014	48.36	1.333	0.752
0.70	811	38.67	1.518	0.732
1.00	616	29.38	1.732	0.716
1.50	312	14.88	2.227	0.702
2.00	162	7.73	2.697	0.689
2.50	87	4.15	3.116	0.699
3.00	37	1.76	3.692	0.740

Minimum = 0.000
Maximum = 5.72

9. VARIOGRAPHY

Variograms were computed in different directions excluding the composites falling outside the 3-D solid model defining the mineralisation. Because of limited amount of samples in some directions no significant anisotropies were detected. The omni-directional variogram was modelled for the four elements and used to interpolate grades in each block. It should be noted that in all cases the variogram chosen is a pairwise relative variogram. The models fitted are exponential variograms with very short range in all cases: 3 to 5 metres depending on the elements.

9.1 Variogram Models

The experimental variograms were fitted with the following models for the four elements.

9.1.1 Silver Variogram

Type:	Pairwise Relative
Model:	Exponential
Nugget:	0.1235
Sill:	0.5556
Range:	4 metres

9.1.2 Lead Variogram

Type:	Pairwise Relative
Model:	Exponential
Nugget:	0.08477
Sill:	0.6041
Range:	3 metres

9.1.3 Zinc Variogram

Type:	Pairwise Relative
Model:	Exponential
Nugget:	0.01365
Sill:	0.3645
Range:	3 metres

9.1.4 Gold Variogram

Type:	Pairwise Relative
Model:	Exponential
Nugget:	0.0039
Sill:	0.5852
Range:	3.5 metres

10. BLOCK MODEL AND GRADE ESTIMATION

10.1 Block Model Definition

The block model was defined as a 3-D matrix with block size of 5 metres in the north-south and east-west direction and a bench height of 2 metres. The model has its origin at 24500 Easting, 43000 Northing, and 1380 metres Elevation.

Minimum easting :	24500 E
Maximum easting :	25500 E
Number of blocks (x) :	200
Minimum northing :	43000 N
Maximum northing :	44300 N
Number of blocks (y) :	260
Minimum elevation :	900 Elevation
Maximum elevation :	1380 Elevation
Number of benches :	240

10.2 Inverse Distance Interpolation

Grades were first estimated by IDS (inverse distance square) using only relevant and neighbouring data that had been especially coded to match the geology code for each block. In this first estimate silver, lead, zinc and gold grades were assigned using the following parameters and a quadrant search.

Search distance along x : 30 metres

Search distance along y : 30 metres

Search distance along z : 15 metres

Minimum number of composites : 2

Maximum number of composites : 16

Maximum distance to project a composite : 30 composites

No limit on the number of composites from one hole. A second interpolation by IDS was performed including some restriction on how far the highest grade values could be projected. Cutting or setting the highest silver, lead, zinc, and gold grades to maximum values - as defined by the 99th percentile on the cumulative probability plots, for example -

was deemed too conservative considering the tightly constrained geological interpretation and that these values correspond to known mineralisation. Grades were instead estimated again by IDS with the highest 1% values projected no further than 7 metres which is equivalent to the range for the silver, lead, zinc, and gold modelled variograms.

10.3 Kriging Interpolation

Finally, the blocks inside the solid model were assigned silver, lead, zinc and gold grades by kriging using the same interpolation parameters as detailed for the IDS. It includes only the material defined by the mineralised three-dimensional model but may include a small quantity of internal dilution which has not been assessed to this date.

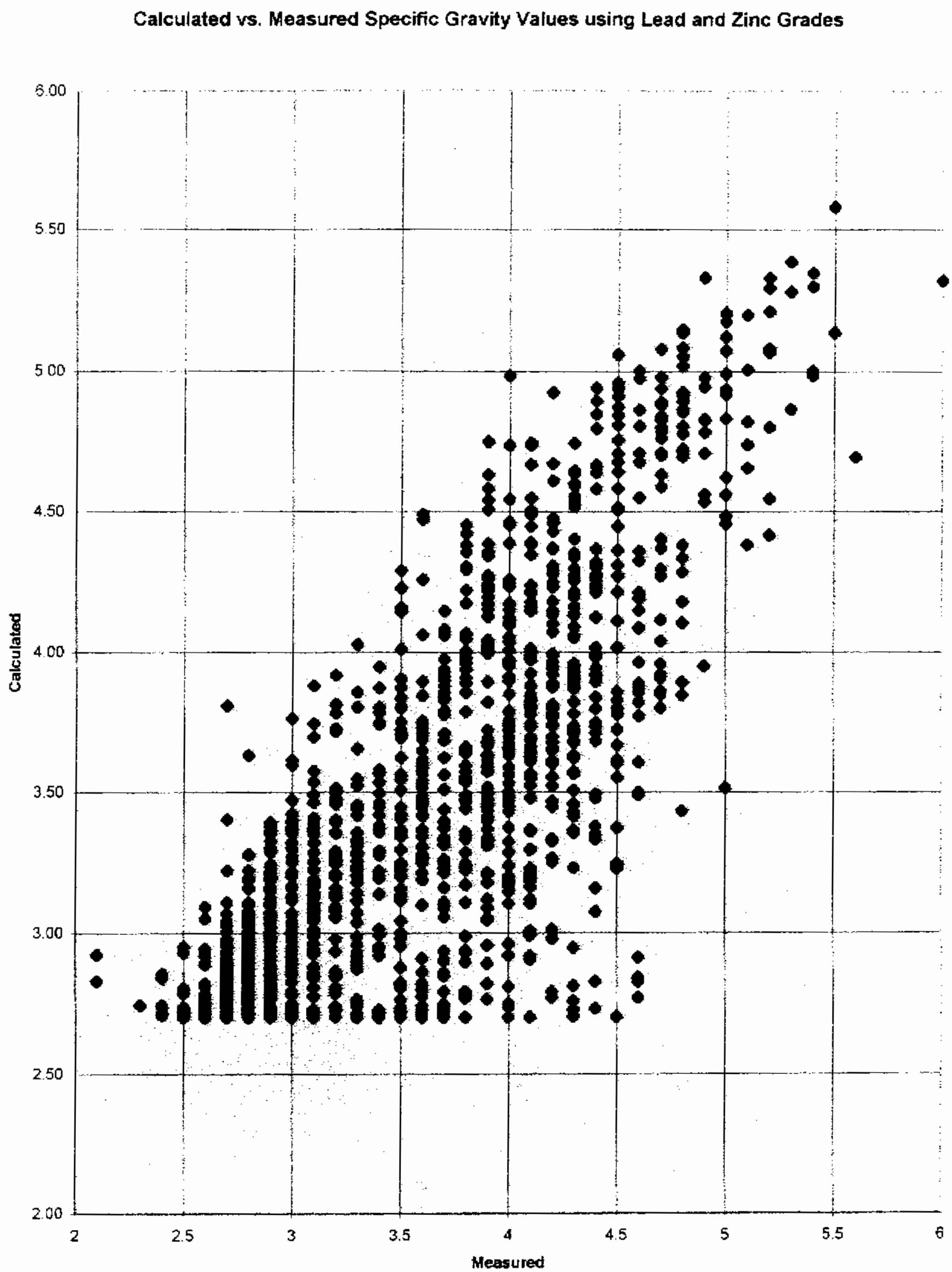
10.4 Block Specific Gravity

Specific gravity (SG) was estimated for blocks based on lead and zinc content. A relationship between lead, zinc, iron and SG was calculated based on SG measurements done during drilling in the 1980's. When iron assays were present, the correlation was excellent; this is almost certainly due to the increased ability to estimate pyrite content. A total of 2064 SG measurements were used in the derivation of formulae for estimating SG, 1281 of which had assays of iron in percent (Figure 10.1). However, since iron assays were not performed during drilling in 1990, and only ICP iron assays were done in 1997, a relation using only lead and zinc was applied to the block modelling of SG. The variable presence of pyrite necessitated the use of a formula involving cubic polynomial values for lead and zinc.

The formula used for block modelling of SG values for the 1997 in-house resource estimate is as follows:

$$SG=2.7+ (0.0907*Pb) - (0.0447*Pb)^2 + (0.0273.*Pb)^3 + (0.0777*Zn) - (0.0519*Zn)^2+(0.034*Zn)^3$$

Where Pb is percent lead (%Pb) and Zn is percent zinc (%Zn) from assayed values. A scatterplot of calculated versus measured values follows.


Calculated vs. Measured Specific Gravity Values using Lead and Zinc Grades
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
Calculated
2
2.5
3
3.5
4
4.5
5
5.5
6
Measured

11. GEOLOGICAL RESOURCE AND RESOURCE CLASSIFICATION

11.1 Geological Resource

The overall geologic resource calculated by the three different methods as explained below are given in Table 11.1.1 and Table 11.2.1.

11.1.1 Measured/Indicated Resource

METHOD	TONNAGE	GRADES			
	(million tonnes)	Ag	Zn	Pb	Au
		(g/t)	(%)	(%)	(g/t)
IDS	1.12	378	9.5	7.7	0.85
IDS**	1.11	362	9.4	7.4	0.83
Kriging	1.11	365	9.4	7.4	0.83

IDS indicates inverse distance square combined with limiting the distance for projecting the highest 1% grade.**

11.2 Resource Classification

The resource model defined followed the guidelines established by the Canadian Institute of Mining and Metallurgy. The geology model was tightly controlled as were the interpolation parameters. The measured/indicated resource was defined with a great degree of certainty.

11.2.1 Measured/Indicated and Inferred

METHOD	TONNAGE	GRADES			
	(million tonnes)	Ag	Zn	Pb	Au
		(g/t)	(%)	(%)	(g/t)
IDS	2.57	325	8.8	6.4	0.63
IDS**	2.55	309	8.5	6.1	0.57
Kriging	2.56	322	8.7	6.3	0.60

Note: Inferred resource represents 1.45 million tonnes at 284 g/t Ag, 8.3% Zn, 5.4% Pb, and 0.46 g/t Au.

<u>OUTSTANDING ISSUES</u>

1. **Confidence level for the Inferred Resource**
2. **Volumetrics - Underground workings**
3. **Specific gravity calculations including the pyrite content (Fe)**

APPENDIX I

QUALITY CONTROL

SMEE & ASSOCIATES CONSULTING LTD.
consulting geochemistry / geology

December 29, 1997

Imperial Metals Corp.
#420, 355 Burrard Street
Vancouver, BC
V6L 2G8

Attention: Mr. Steve Robertson

Dear Steve:

RE: SILVERTIP PROJECT
QUALITY CONTROL DATA

I have captured, reviewed and plotted the laboratory and field quality control data for the 1997 drill program on the Silvertip Project, British Columbia. The data is grouped according to element, with the plots attached to this letter. Each element group begins with the blank results, to monitor contamination in the analytical process. This is followed by the laboratory pulp duplicates, the laboratory preparation duplicates, and the field duplicates.

The Pb field blank shows possible contamination at blank #9, 14 and 15. Either the blank was mineralized, or the laboratory did not clean equipment properly from sample to sample. The Pb pulp duplicates repeat extremely well, with only minor differences showing at the higher concentrations. This is clearly illustrated on the difference vs. mean of duplicate plot. The preparation duplicates show one high grade sample not reporting well. This could be a sampling discrepancy created by a massive sulphide particle at the initial splitting stage, or a numbering problem when the duplicate is actually not in the correct analytical order. I suspect the former to be the likely problem, as the other QC samples repeated well. The field duplicates, which consisted of two quartered core samples show the poorest precision, with differences between duplicates up to 40%. This is not unusual when dealing with coarse-grained massive sulphides, and illustrates that care must be taken when selecting core samples.

The field blanks for Zn shows a potential problem at blanks 14 and 15: the same as the Pb samples. The pulp duplicates reproduce well, and the pulp difference vs. mean plot shows a constant variation with increasing grade. This is indicative of a lack of nugget or other sampling errors. The preparation duplicates show an increase in variation between duplicates. The field duplicates show the largest variation; again, indicative that the majority of the error introduced in the sampling and analysis is in the selection of the core sample.

Ag shows potential contamination at field blanks 14 and 15. The pulp duplicates show that the pulps are comparatively homogeneous, with the exception of one sample. The preparation duplicates illustrate a

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slight decrease in precision, while the field duplicates show a substantial decrease in precision (compare the difference vs. mean graph scales).

The Au field blank chart shows potential contamination at blank #7. As none of the other elements appear to be contaminated in this sample, perhaps the blank chosen contained Au and does not reflect a laboratory problem. Pulp duplicates for Au repeated fairly well, but the preparation duplicates begin to exhibit a potential nugget effect pattern, with increasing differences with increasing Au grade. This is also exhibited by the few higher grade field duplicates, and suggests that the Au may occur both as disseminated and free gold at the Silvertip deposit.

These data suggest that the sampling and analytical methods used at Silvertip were acceptable according to industry standard. The two anomalous blank samples (14 and 15) should be examined closely. Should laboratory contamination be suspected, the entire work order should be reanalyzed from reject material. Similarly, blank #7 should be examined for Au. This analytical batch should be reanalyzed for Au if the blank is unlikely to contain naturally occurring Au.

One preparation duplicate does not repeat well for Pb, Zn or Ag. This sample (140046) should be examined in the context of geology to determine if the poor reproducibility could be expected. The laboratory should then be asked to examine the worksheets for a possible sample misnumbering problem.

The QC data on the Silvertip Project monitored potential contamination and the precision of sampling and analysis. Accuracy, using standard samples as controls, was not monitored. The next round of drilling should use standards to provide an estimate of accuracy.

Yours sincerely,

Barry W. Smee, Ph.D., P.Geo.

Attach.

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Imperial Metals Corp.
Silvertip Project
Bondar Clegg Quality Control Data

PULP DUPLICATES

WO #	SAMPLE	PB1	PB2	PB MEAN	PB DIF	ZN1	ZN2	ZN MEAN	ZN DIF	AG 1	AG2	AG MEAN	AG DIF	AU1	AU2
9701551.0	139501	0.05	0.03	0.04	0.02	0.43	0.42	0.425	0.01						
9701551.0	136502													2	6
9701551.0	139506					4	3.8	3.9	0.2						
9701551.0	139520									123	120.6	121.8	2.4		
9701551.0	139525	0.01	0.01	0.01	0	0.01	0.01	0.01	0					2	11
9701551.0	139527									525.6	519.7	522.65	5.9		
9701551.0	139530	5.32	5.4	5.36	0.08	9.93	9.72	9.825	0.21						
9701551.0	139535	13.46	13.41	13.435	0.05	10.19	10.61	10.4	0.42						
9701551.0	139539									551.1	543.4	547.25	7.7		
9701551.0	139540	12.52	12.78	12.65	0.26										
9701658.0	139578	0.04	0.04	0.04	0	0.09	0.09	0.09	0						
9701658.0	139583									569.4	543.7	556.55	25.7		
9701661.0	139545	1.7	1.72	1.71	0.02	1.18	1.2	1.19	0.02						
9701661.0	139546	0.054	0.055	0.0545	0.001	0.065	0.064	0.0645	0.001	2.4	2.4	2.4	0	2	2
9701661.0	139550									2	1.5	1.75	0.5		
9701661.0	139552														
9701661.0	139554	11.68	11.72	11.7	0.04	11.88	11.74	11.81	0.14						
9701663.0	139562	0.51	0.5	0.505	0.01	0.82	0.8	0.81	0.02	23.6	23.3	23.45	0.3	22	18
9701663.0	139564									868.2	890.3	879.25	22.1		
9701663.0	139568	0.59	0.62	0.605	0.03	0.38	0.39	0.385	0.01						
9701663.0	139573	0.05	0.04	0.045	0.01	0.01	0.01	0.01	0						
9701663.0	139576									237.1	246	241.55	8.9		
9701664.0	140951					0.41	0.4	0.405	0.01						
9701664.0	140955	0.059	0.052	0.0555	0.007	0.003	0.001	0.002	0.002	5.1	4.6	4.85	0.5	2	22
9701664.0	140956									0.3	0.3	0.3	0		
9701664.0	140960	0.05	0.06	0.055	0.01	2.26	2.28	2.27	0.02						
9701975.0	139663	0.03	0.04	0.035	0.01	0.09	0.1	0.095	0.01						
9701975.0	139668	0.222	0.243	0.2325	0.021	0.48	0.512	0.496	0.032	14.1	14	14.05	0.1	24	18
9701975.0	139680									285.7	285.2	285.45	0.5		
9701975.0	139685									183.7	185.6	184.65	1.9		
9701975.0	139690													1164	1166
9701975.0	139691									15.7	15.8	15.75	0.1		
9701975.0	139672	6.5	6.56	6.53	0.06	6	6.22	6.11	0.22						
9701975.0	139677	13.07	12.71	12.89	0.36	6.49	6.53	6.51	0.04						

Imperial Metals Corp.
Silvertip Project
Bondar Clegg Quality Control Data

PULP DUPLICATES

WO #	SAMPLE	PB1	PB2	PB MEAN	PB DIF	ZN1	ZN2	ZN MEAN	ZN DIF	AG 1	AG2	AG MEAN	AG DIF	AU1	AU2
9701975.0	139678														
9701975.0	139682	4.3	4.31	4.305	0.01										
9701975.0	139692	0.06	0.06	0.06	0	0.07	0.07	0.07	0						
9702119.0	140970									79.6	76.6	78.1	3		
9702119.0	140974	4.58	4.54	4.56	0.04	1.84	1.83	1.835	0.01	99.6	101.9	100.75	2.3	273	284
9702119.0	140965	0.51	0.52	0.515	0.01	0.25	0.26	0.255	0.01						
9702189.0	139770									2.3	2.7	2.5	0.4		
9702189.0	139774	0.2	0.2	0.2	0	3.67	3.58	3.625	0.09	212	219	215.5	7	25	25
9702189.0	139782									30.1	28.7	29.4	1.4		
9702189.0	139711	0.03	0.03	0.03	0	0.3	0.31	0.305	0.01						
9702189.0	139779	0.04	0.04	0.04	0	0.83	0.83	0.83	0						
9702189.0	139784	0.4	0.4	0.4	0	0.5	0.5	0.5	0						
9702212.0	139697					0.822	0.804	0.813	0.018	68.1	58.9	63.5	9.2	50	56
9702212.0	139700									53.7	58.1	55.9	4.4		
9702212.0	139695	0.02	0.02	0.02	0	0.23	0.23	0.23	0						
9702212.0	139709	0.06	0.06	0.06	0	0.08	0.08	0.08	0						
9702213.0	139754	0.003	0.003	0.003	0	0.17	0.169	0.1695	0.001	0.3	0.3	0.3	0	8	8
9702213.0	139756									10.1	12.9	11.5	2.8		
9702213.0	139768	0.01	0.01	0.01	0	0.01	0.01	0.01	0	0.5	0.5	0.5	0		
9702213.0	139760	0.23	0.23	0.23	0	3.21	3.14	3.175	0.07						
9702213.0	139765	0.19	0.19	0.19	0	10.12	9.95	10.035	0.17						
9702281.0	140980					0.991	0.934	0.9625	0.057	13.5	13.8	13.65	0.3	67	67
9702281.0	139788									3.3	3.3	3.3	0		
9702281.0	139790	0.011	0.012	0.0115	0.001	0.033	0.036	0.0345	0.003	2.8	2.8	2.8	0		
9702281.0	139803													48	26
9702281.0	139818	0.001	0.001	0.001	0	0.016	0.011	0.0135	0.005	2.2	2.3	2.25	0.1		
9702281.0	140979	4.21	4.17	4.19	0.04	2.35	2.2	2.275	0.15						
9702281.0	139738														
9702281.0	139743	2.21	2.21	2.21	0										
9702281.0	139748	5.38	5.32	5.35	0.06	9.29	9.22	9.255	0.07						
9702281.0	139809	0.23	0.24	0.235	0.01	0.42	0.4	0.41	0.02						
9702281.0	139813	5.52	5.48	5.5	0.04	6.41	6.44	6.425	0.03						
9702282.0	139718									63.6	53.9	58.75	9.7	916	974
9702282.0	139721									200.3	221.9	211.1	21.6		

Imperial Metals Corp.
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PULP DUPLICATES

WO #	SAMPLE	PB1	PB2	PB MEAN	PB DIF	ZN1	ZN2	ZN MEAN	ZN DIF	AG 1	AG2	AG MEAN	AG DIF	AU1	AU2
9702282.0	139726									43.4	46.1	44.75	2.7		
9702282.0	139735	0.004	0.004	0.004	0	0.051	0.053	0.052	0.002						
9702282.0	139716	0.03	0.03	0.03	0	0.1	0.1	0.1	0						
9702282.0	139719														
9702282.0	139725	4.51	4.5	4.505	0.01	5.36	5.42	5.39	0.06						
9702282.0	139730	0.01	0.02	0.015	0.01	1.71	1.75	1.73	0.04						
9702377.0	139797									120.4	121.4	120.9	1		
9702377.0	139799	0.221	0.234	0.2275	0.013	0.195	0.205	0.2	0.01	101.2	104.3	102.75	3.1	65	64
9702377.0	139853									160.2	149.7	154.95	10.5		
9702377.0	139792	0.41	0.38	0.395	0.03	0.2	0.2	0.2	0						
9702377.0	139819	0.03	0.02	0.025	0.01	0.12	0.12	0.12	0						
9702377.0	139824	0.001	0.001	0.001	0	0.001	0.001	0.001	0						
9702377.0	139855	0.44	0.42	0.43	0.02	0.71	0.71	0.71	0						
9702378.0	139825	0.001	0.001	0.001	0	0.001	0.001	0.001	0						
9702378.0	139830									8.8	8.9	8.85	0.1		
9702378.0	139833	0.033	0.035	0.034	0.002	0.102	0.108	0.105	0.006	2.2	2.2	2.2	0	6	2.5
9702378.0	139842									133.2	133.5	133.35	0.3		
9702378.0	139850	0.042	0.041	0.0415	0.001	0.823	0.802	0.8125	0.021	6.8	4.7	5.75	2.1		
9702378.0	139861									0.35	0.35	0.35	0		
9702378.0	139834	0.05	0.05	0.05	0	0.09	0.1	0.095	0.01						
9702378.0	139839	5.53	5.57	5.55	0.04	10.95	10.95	10.95	0						
9702378.0	139844	0.63	0.63	0.63	0	6.91	7.01	6.96	0.1						
9702378.0	139849	0.005	0.005	0.005	0	0.005	0.005	0.005	0						
9702378.0	139862	0.005	0.005	0.005	0	0.1	0.09	0.095	0.01						
9702378.0	139866	0.005	0.005	0.005	0	0.005	0.005	0.005	0						
9702378.0	140001	0.002	0.002	0.002	0	0.024	0.026	0.025	0.002	0.1	0.1	0.1	0		
9702433.0	139877	0.005	0.02	0.0125	0.015	0.06	0.06	0.06	0						
9702433.0	139880	0.026	0.029	0.0275	0.003	0.934	0.954	0.944	0.02	2.1	2.1	2.1	0	17	15
9702433.0	139882									8.4	8.8	8.6	0.4		
9702433.0	139894									5.7	5.2	5.45	0.5		
9702433.0	139897	0.826	0.927	0.8765	0.101										
9702433.0	139902													490	495
9702433.0	140003									9.7	9.1	9.4	0.6		
9702433.0	140014	0.004	0.004	0.004	0	0.004	0.006	0.005	0.002	0.035	0.035	0.035	0		

Imperial Metals Corp.
Silvertip Project
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PULP DUPLICATES

WO #	SAMPLE	PB1	PB2	PB MEAN	PB DIF	ZN1	ZN2	ZN MEAN	ZN DIF	AG 1	AG2	AG MEAN	AG DIF	AU1	AU2
9702433.0	139886	2.63	2.71	2.67	0.08										
9702433.0	139896					13.64	13.76	13.7	0.12						
9702433.0	140004	0.33	0.33	0.33	0	0.18	0.19	0.185	0.01						
9702433.0	140008	0.2	0.2	0.2	0	1.15	1.17	1.16	0.02						
9702433.0	140016	10.57	10.45	10.51	0.12	8	7.81	7.905	0.19						
9702433.0	140025													79	35
9702433.0	140031	0.005	0.005	0.005	0	9.27	9.34	9.305	0.07						
9702433.0	140021	8.99	9.18	9.085	0.19	9.61	9.52	9.565	0.09						
9702433.0	140026	1.29	1.29	1.29	0	4.45	4.31	4.38	0.14						
9702501.0	139910									1645.8	1649.5	1647.65	3.7		
9702501.0	139913	0.015	0.014	0.0145	0.001	0.045	0.052	0.0485	0.007	1.7	1.3	1.5	0.4	7	8
9702501.0	139922									116.2	119.2	117.7	3		
9702501.0	139930									82.7	89.2	85.95	6.5		
9702501.0	139933									1224.8	1238.4	1231.6	13.6		
9702501.0	139944					0.198	0.29	0.244	0.092	83.7	85.4	84.55	1.7		
9702501.0	139905	0.005	0.005	0.005	0	0.005	0.005	0.005	0						
9702501.0	139914	9.17	9.07	9.12	0.1	8.54	8.45	8.495	0.09						
9702501.0	139919	2.01	2.08	2.045	0.07	8.91	8.71	8.81	0.2						
9702501.0	139924	3.2	3.26	3.23	0.06	6.92	6.84	6.88	0.08						
9702501.0	139929	0.9	0.88	0.89	0.02	0.78	0.76	0.77	0.02						
9702501.0	139934	1	0.98	0.99	0.02	0.52	0.51	0.515	0.01						
9702501.0	139938	6.98	7.05	7.015	0.07	5.24	5.21	5.225	0.03						
9702501.0	139946	6.5	6.56	6.53	0.06	7.67	7.64	7.655	0.03						
9702501.0	139949	0.032	0.031	0.0315	0.001	0.395	0.414	0.4045	0.019	3.3	3.5	3.4	0.2		
9702535.0	139978	5.86	5.91	5.885	0.05	13.04	13.21	13.125	0.17	1195.9	1193.5	1194.7	2.4	1504	1445
9702535.0	140081									22.7	29.7	26.2	7		
9702535.0	140086									352.9	237	294.95	115.9		
9702535.0	140091													96	92
9702535.0	140092									3.2	3.8	3.5	0.6		
9702535.0	140103									8.5	9.5	9	1		
9702535.0	139973	0.01	0.01	0.01	0	0.05	0.05	0.05	0						
9702535.0	139982														
9702535.0	140083	11.12	11.33	11.225	0.21										
9702535.0	140088	1.41	1.34	1.375	0.07	3.64	3.73	3.685	0.09						

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PULP DUPLICATES

WO #	SAMPLE	PB1	PB2	PB MEAN	PB DIF	ZN1	ZN2	ZN MEAN	ZN DIF	AG 1	AG2	AG MEAN	AG DIF	AU1	AU2
9702535.0	140093	0.005	0.005	0.005	0	0.03	0.03	0.03	0						
9702535.0	140097	0.46	0.46	0.46	0	0.79	0.81	0.8	0.02						
9702535.0	140105	0.04	0.04	0.04	0	0.23	0.24	0.235	0.01						
9702536.0	6410									64.4	61.3	62.85	3.1		
9702536.0	6412	0.007	0.007	0.007	0	0.015	0.015	0.015	0	2.9	2.7	2.8	0.2		
9702536.0	6465	0.003	0.003	0.003	0	0.055	0.057	0.056	0.002	1.7	1.7	1.7	0		
9702536.0	6553	0.001	0.001	0.001	0	0.005	0.006	0.0055	0.001	2.7	3.1	2.9	0.4		
9702536.0	6498														
9702565.0	139955	0.18	0.19	0.185	0.01	0.07	0.08	0.075	0.01	430.9	415.9	423.4	15	2317	2315
9702565.0	139967									10.7	12.2	11.45	1.5		
9702565.0	139972	0.006	0.006	0.006	0	0.012	0.011	0.0115	0.001	0.1	0.1	0.1	0		
9702565.0	140038													4531	4652
9702565.0	140039									221.9	220.1	221	1.8		
9702565.0	140050									0.35	0.35	0.35	0		
9702565.0	140052	0.008	0.009	0.0085	0.001	0.06	0.061	0.0605	0.001	0.1	0.1	0.1	0		
9702565.0	139956														
9702565.0	139969	5.07	5.09	5.08	0.02	4.9	4.98	4.94	0.08						
9702565.0	140035	3.03	3.08	3.055	0.05	13.55	13.67	13.61	0.12						
9702565.0	140040					8.84	8.76	8.8	0.08						
9702565.0	140044	12.47	12.51	12.49	0.04										
9702565.0	140059													1686	1652
9702565.0	140061									10.5	10.4	10.45	0.1		
9702565.0	140073									737.1	727.3	732.2	9.8		
9702565.0	140057	7.88	7.9	7.89	0.02	12.62	12.47	12.545	0.15						
9702565.0	140062	0.01	0.01	0.01	0	0.01	0.02	0.015	0.01						
9702565.0	140067	9.51	9.45	9.48	0.06										
9702565.0	140068														
9702565.0	140072					9.4	9.46	9.43	0.06						
9702717.0	140249									0.35	0.35	0.35	0		
9702717.0	140251	0.002	0.002	0.002	0	0.028	0.028	0.028	0	0.3	0.3	0.3	0	2.5	6
9702717.0	140261									7	7	7	0		
9702717.0	140268	0.977	0.926	0.9515	0.051	0.004	0.004	0.004	0	20.9	20.9	20.9	0		
9702717.0	140272									99.8	99.7	99.75	0.1		
9702717.0	140287	0.003	0.003	0.003	0	0.002	0.002	0.002	0	0.35	0.5	0.425	0.15		

Imperial Metals Corp.
Silvertip Project
Bondar Clegg Quality Control Data

PULP DUPLICATES

WO #	SAMPLE	PB1	PB2	PB MEAN	PB DIF	ZN1	ZN2	ZN MEAN	ZN DIF	AG 1	AG2	AG MEAN	AG DIF	AU1	AU2
9702717.0	140981	0.41	0.42	0.415	0.01										
9702717.0	140253	0.005	0.005	0.005	0	0.005	0.005	0.005	0						
9702717.0	140258	0.41	0.4	0.405	0.01	0.54	0.51	0.525	0.03						
9702717.0	140263	0.01	0.005	0.0075	0.005	0.5	0.49	0.495	0.01						
9702717.0	140273	5.53	5.54	5.535	0.01	0.98	0.97	0.975	0.01						
9702717.0	140277	0.01	0.02	0.015	0.01	0.005	0.01	0.0075	0.005						
9702717.0	140285	0.005	0.005	0.005	0	0.005	0.005	0.005	0						
9702717.0	140294									1.9	2	1.95	0.1		
9702717.0	140304	0.001	0.001	0.001	0	0.015	0.014	0.0145	0.001	0.035	0.03	0.0325	0.005		
9702717.0	140306									0.035	0.035	0.035	0		
9702717.0	140360	0.06	0.06	0.06	0	0.202	0.207	0.2045	0.005	1.3	1.3	1.3	0		
9702717.0	140290	0.79	0.81	0.8	0.02	0.65	0.69	0.67	0.04						
9702717.0	140295	0.005	0.005	0.005	0	0.36	0.36	0.36	0						
9702717.0	140300	0.005	0.01	0.0075	0.005	0.55	0.56	0.555	0.01						
9702717.0	140305	0.005	0.005	0.005	0	0.01	0.005	0.0075	0.005						
9702717.0	140309	0.005	0.005	0.005	0	0.005	0.005	0.005	0						
9702717.0	140355	0.005	0.005	0.005	0	0.02	0.02	0.02	0						
9702717.0	140359	0.13	0.13	0.13	0	0.13	0.15	0.14	0.02						
9702717.0	140364	0.02	0.02	0.02	0	0.14	0.13	0.135	0.01						
9702717.0	140369	0.03	0.03	0.03	0	0.64	0.64	0.64	0						

WO #	SAMPLE	AU MEAN	AU DIF	SN 1	SN 2	SN MEAN	SN DIF
9701551.0	139501						
9701551.0	136502	4	4				
9701551.0	139506			4334	4339	4336.5	5
9701551.0	139520						
9701551.0	139525	6.5	9	9	9	9	0
9701551.0	139527						
9701551.0	139530						
9701551.0	139535						
9701551.0	139539						
9701551.0	139540						
9701658.0	139578						
9701658.0	139583						
9701661.0	139545						
9701661.0	139546	2	0				
9701661.0	139550						
9701661.0	139552			284	276	280	8
9701661.0	139554						
9701663.0	139562	20	4	317	303	310	14
9701663.0	139564						
9701663.0	139568						
9701663.0	139573						
9701663.0	139576						
9701664.0	140951						
9701664.0	140955	12	20	10	10	10	0
9701664.0	140956						
9701664.0	140960						
9701975.0	139663						
9701975.0	139668						
9701975.0	139680						
9701975.0	139685						
9701975.0	139690						
9701975.0	139691						
9701975.0	139672						
9701975.0	139677						

WO #	SAMPLE	AU MEAN	AU DIF	SN 1	SN 2	SN MEAN	SN DIF
9701975.0	139678			792	739	765.5	53
9701975.0	139682						
9701975.0	139692						
9702119.0	140970						
9702119.0	140974			244	246	245	2
9702119.0	140965						
9702189.0	139770						
9702189.0	139774			10	10	10	0
9702189.0	139782						
9702189.0	139711						
9702189.0	139779						
9702189.0	139784						
9702212.0	139697			10	10	10	0
9702212.0	139700						
9702212.0	139695						
9702212.0	139709						
9702213.0	139754			10	10	10	0
9702213.0	139756						
9702213.0	139768						
9702213.0	139760						
9702213.0	139765						
9702281.0	140980			10	10	10	0
9702281.0	139788			10	10	10	0
9702281.0	139790			10	10	10	0
9702281.0	139803						
9702281.0	139818			10	10	10	0
9702281.0	140979						
9702281.0	139738			130	126	128	4
9702281.0	139743						
9702281.0	139748						
9702281.0	139809						
9702281.0	139813						
9702282.0	139718			10	10	10	0
9702282.0	139721						

WO #	SAMPLE	AU MEAN	AU DIF	SN 1	SN 2	SN MEAN	SN DIF
9702282.0	139726						
9702282.0	139735			10	10	10	0
9702282.0	139716						
9702282.0	139719			102	117	109.5	15
9702282.0	139725						
9702282.0	139730						
9702377.0	139797						
9702377.0	139799			10	10	10	0
9702377.0	139853						
9702377.0	139792						
9702377.0	139819						
9702377.0	139824						
9702377.0	139855						
9702378.0	139825						
9702378.0	139830						
9702378.0	139833			10	10	10	0
9702378.0	139842						
9702378.0	139850			10	10	10	0
9702378.0	139861						
9702378.0	139834			14	14	14	0
9702378.0	139839						
9702378.0	139844						
9702378.0	139849						
9702378.0	139862						
9702378.0	139866						
9702378.0	140001			10	10	10	0
9702433.0	139877						
9702433.0	139880			10	10	10	0
9702433.0	139882						
9702433.0	139894						
9702433.0	139897			10	10	10	0
9702433.0	139902						
9702433.0	140003						
9702433.0	140014			10	10	10	0

WO #	SAMPLE	AU MEAN	AU DIF	SN 1	SN 2	SN MEAN	SN DIF
9702433.0	139886			1554	1638	1596	84
9702433.0	139896						
9702433.0	140004						
9702433.0	140008						
9702433.0	140016			1046	1155	1100.5	109
9702433.0	140025						
9702433.0	140031			10	10	10	0
9702433.0	140021						
9702433.0	140026						
9702501.0	139910						
9702501.0	139913			6	11	8.5	5
9702501.0	139922						
9702501.0	139930			316	324	320	8
9702501.0	139933						
9702501.0	139944						
9702501.0	139905						
9702501.0	139914						
9702501.0	139919						
9702501.0	139924						
9702501.0	139929						
9702501.0	139934						
9702501.0	139938						
9702501.0	139946						
9702501.0	139949			10	10	10	0
9702535.0	139978			10	10	10	0
9702535.0	140081						
9702535.0	140086			47	27	37	20
9702535.0	140091			162	151	156.5	11
9702535.0	140092						
9702535.0	140103						
9702535.0	139973						
9702535.0	139982						
9702535.0	140083						
9702535.0	140088						

WO #	SAMPLE	AU MEAN	AU DIF	SN 1	SN 2	SN MEAN	SN DIF
9702535.0	140093						
9702535.0	140097						
9702535.0	140105						
9702536.0	6410						
9702536.0	6412			10	10	10	0
9702536.0	6465			10	10	10	0
9702536.0	6553			10	10	10	0
9702536.0	6498			10	10	10	0
9702565.0	139955			342	299	320.5	43
9702565.0	139967						
9702565.0	139972			10	10	10	0
9702565.0	140038			565	677	621	112
9702565.0	140039						
9702565.0	140050						
9702565.0	140052			10	10	10	0
9702565.0	139956			4485	4300	4392.5	185
9702565.0	139969						
9702565.0	140035						
9702565.0	140040						
9702565.0	140044						
9702565.0	140059						
9702565.0	140061						
9702565.0	140073						
9702565.0	140057						
9702565.0	140062						
9702565.0	140067						
9702565.0	140068			2728	2774	2751	46
9702565.0	140072						
9702717.0	140249						
9702717.0	140251			10	10	10	0
9702717.0	140261						
9702717.0	140268			10	10	10	0
9702717.0	140272			422	389	405.5	33
9702717.0	140287			10	10	10	0

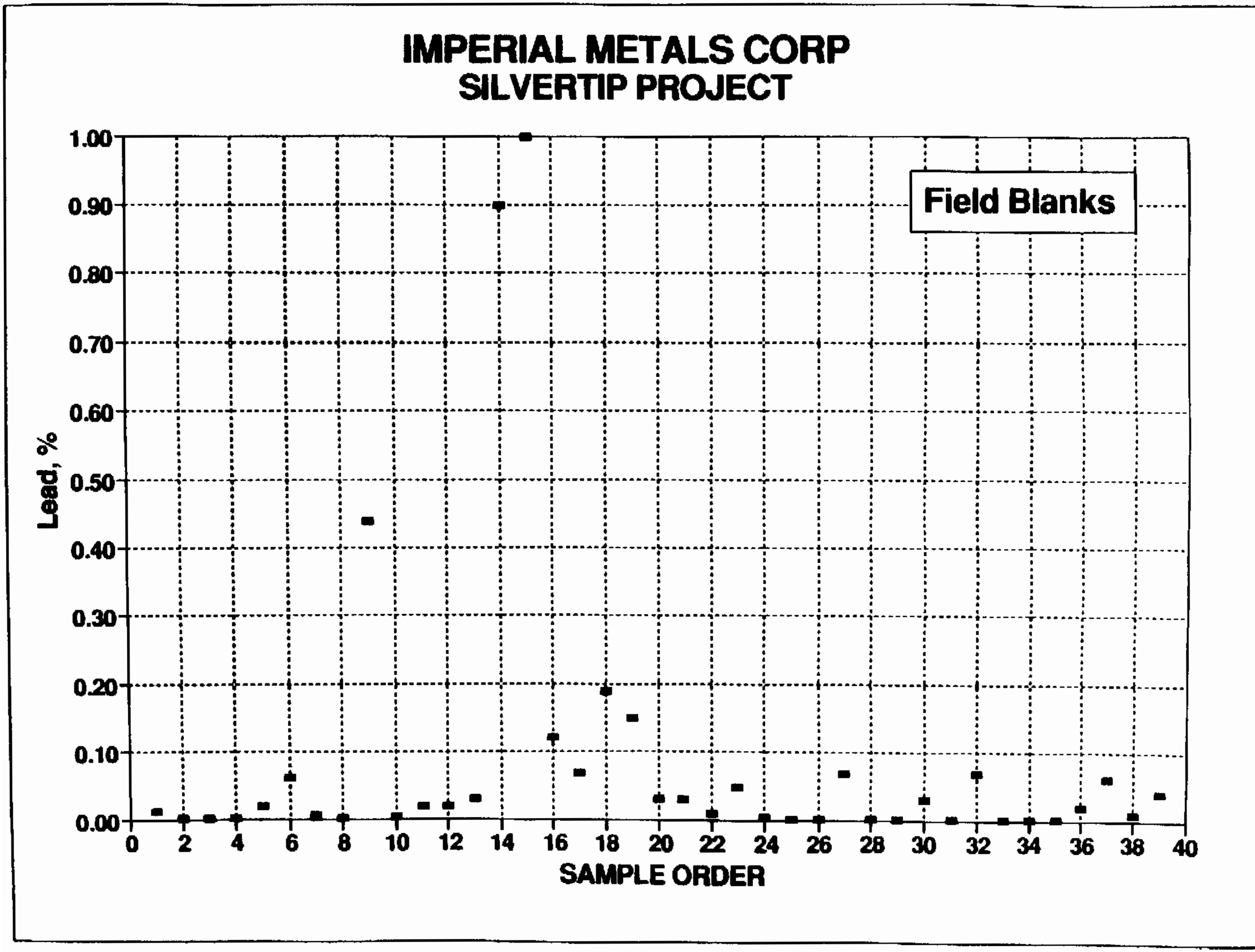
WO #	SAMPLE	AU MEAN	AU DIF	SN 1	SN 2	SN MEAN	SN DIF
9702717.0	140981						
9702717.0	140253						
9702717.0	140258						
9702717.0	140263						
9702717.0	140273						
9702717.0	140277						
9702717.0	140285						
9702717.0	140294						
9702717.0	140304			10	10	10	0
9702717.0	140306						
9702717.0	140360			10	10	10	0
9702717.0	140290						
9702717.0	140295						
9702717.0	140300						
9702717.0	140305						
9702717.0	140309						
9702717.0	140355						
9702717.0	140359						
9702717.0	140364						
9702717.0	140369						

Imperial Metals Corp.
Silvertip Project
Bondar Clegg Quality Control Data

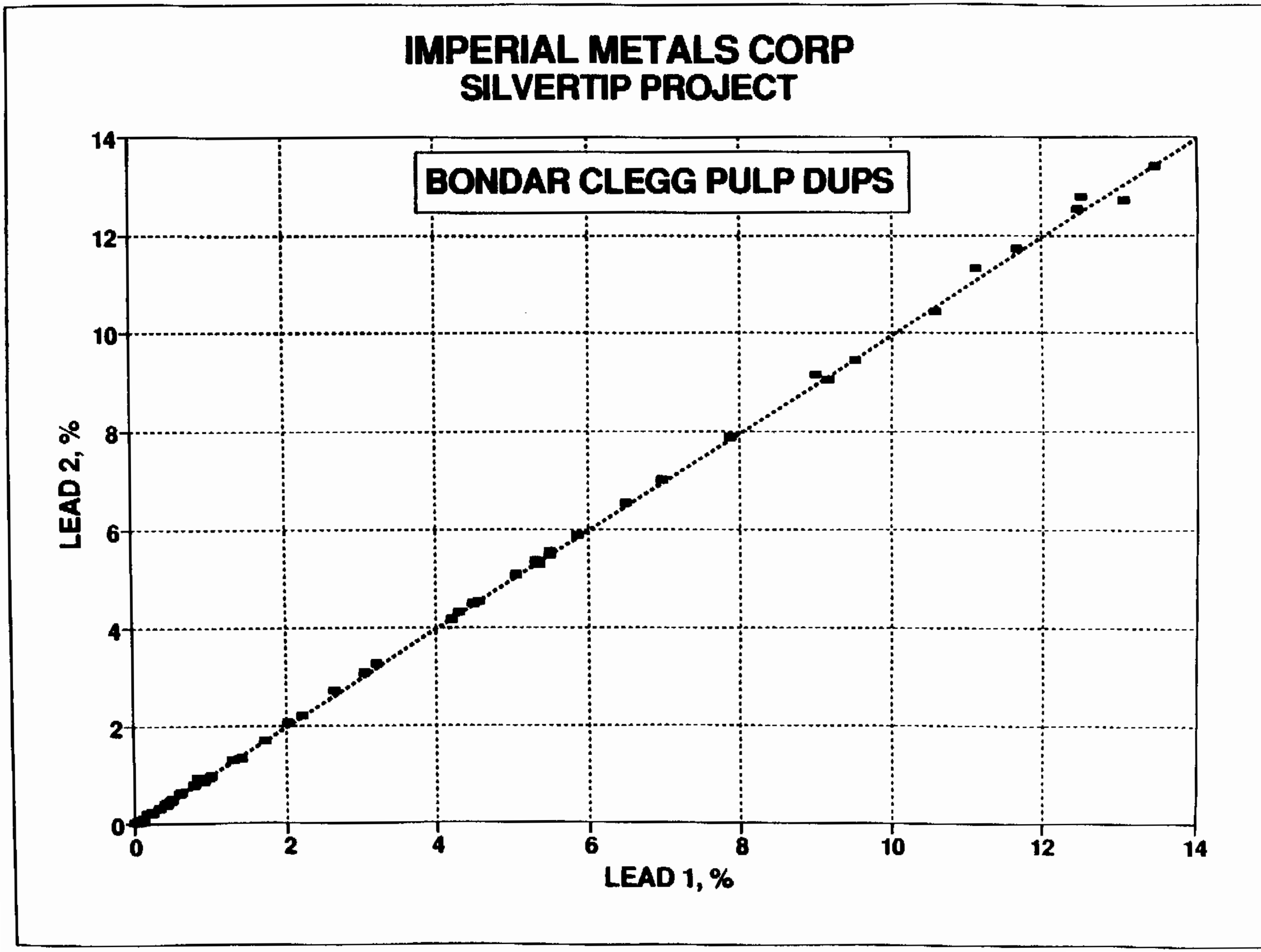
PREP DUPLICATES

WO #	SAMPLE	PB1	PB2	PB MEAN	PB DIF	ZN1	ZN2	ZN MEAN	ZN DIF	AG 1	AG2	AG MEAN	AG DIF	AU1	AU2
9701551.0	139533	1.72	1.83	1.775	0.11	2.2	2.16	2.18	0.04	54.3	62	58.15	7.7		
9701551.0	139543	0.06	0.05	0.055	0.01	0.06	0.04	0.05	0.02	2.8	2.7	2.75	0.1	2	7
9701661.0	139549	0.006	0.007	0.0065	0.001	0.05	0.07	0.06	0.02	1.1	0.9	1	0.2	27	2
9701663.0	139560	1.24	1.26	1.25	0.02	2.88	2.82	2.85	0.06	51.7	51.7	51.7	0	30	38
9701664.0	140954	7.57	7.39	7.48	0.18	1.43	1.42	1.425	0.01	367.7	390.8	379.25	23.1	1368	1489
9701975.0	139687	0.009	0.007	0.008	0.002	0.017	0.013	0.015	0.004	1	0.6	0.8	0.4	0.25	0.25
9701975.0	139678	0.01	0.02	0.015	0.01	0.01	0.02	0.015	0.01						
9702189.0	139776	0.84	0.97	0.905	0.13	6.52	6.03	6.275	0.49	35.1	35	35.05	0.1	28	24
9702212.0	139704	2.82	2.73	2.775	0.09	9.62	9.36	9.49	0.26	101.3	104.5	102.9	3.2	1931	1975
9702213.0	139751	0.035	0.038	0.0365	0.003	0.557	0.615	0.586	0.058	2.2	2.2	2.2	0	15	11
9702281.0	139749					12.24	12.85	12.545	0.61	192.6	179.9	186.25	12.7	2398	3434
9702282.0	139728	0.083	0.07	0.0765	0.013	0.394	0.33	0.362	0.064	4.2	4.7	4.45	0.5	30	38
9702377.0	139823	0.002	0.003	0.0025	0.001	0.014	0.015	0.0145	0.001	3.8	3.6	3.7	0.2		
9702378.0	139835	0.011	0.012	0.0115	0.001	0.047	0.047	0.047	0					15	2.5
9702378.0	139876	0.004	0.004	0.004	0	0.001	0.006	0.0035	0.005	0.1	0.1	0.1	0	2.5	2.5
9702433.0	140021													361	269
9702433.0	140023	0.106	0.094	0.1	0.012	0.417	0.423	0.42	0.006	10.6	8.1	9.35	2.5	15	38
9702501.0	139917									99.2	117.5	108.35	18.3	2170	2731
9702501.0	139948	0.031	0.037	0.034	0.006	0.078	0.08	0.079	0.002	1.5	1.8	1.65	0.3	2.5	7
9702535.0	139982	0.043	0.046	0.0445	0.003	0.445	0.476	0.4605	0.031	0.2	0.2	0.2	0		
9702535.0	140104	0.347	0.289	0.318	0.058	3.8	3.6	3.7	0.2	15.6	12.9	14.25	2.7	115	124
9702565.0	140046	9.17	7.22	8.195	1.95	14.23	16.85	15.54	2.62	338	267	302.5	71	1686	2119
9702717.0	140248	0.255	0.264	0.2595	0.009					12.3	10.9	11.6	1.4	13	12
9702717.0	140354									3.5	3.5	3.5	0	2.5	2.5
9702717.0	140367	0.003	0.003	0.003	0	0.116	0.124	0.12	0.008	0.3	0.3	0.3	0	2.5	2.5

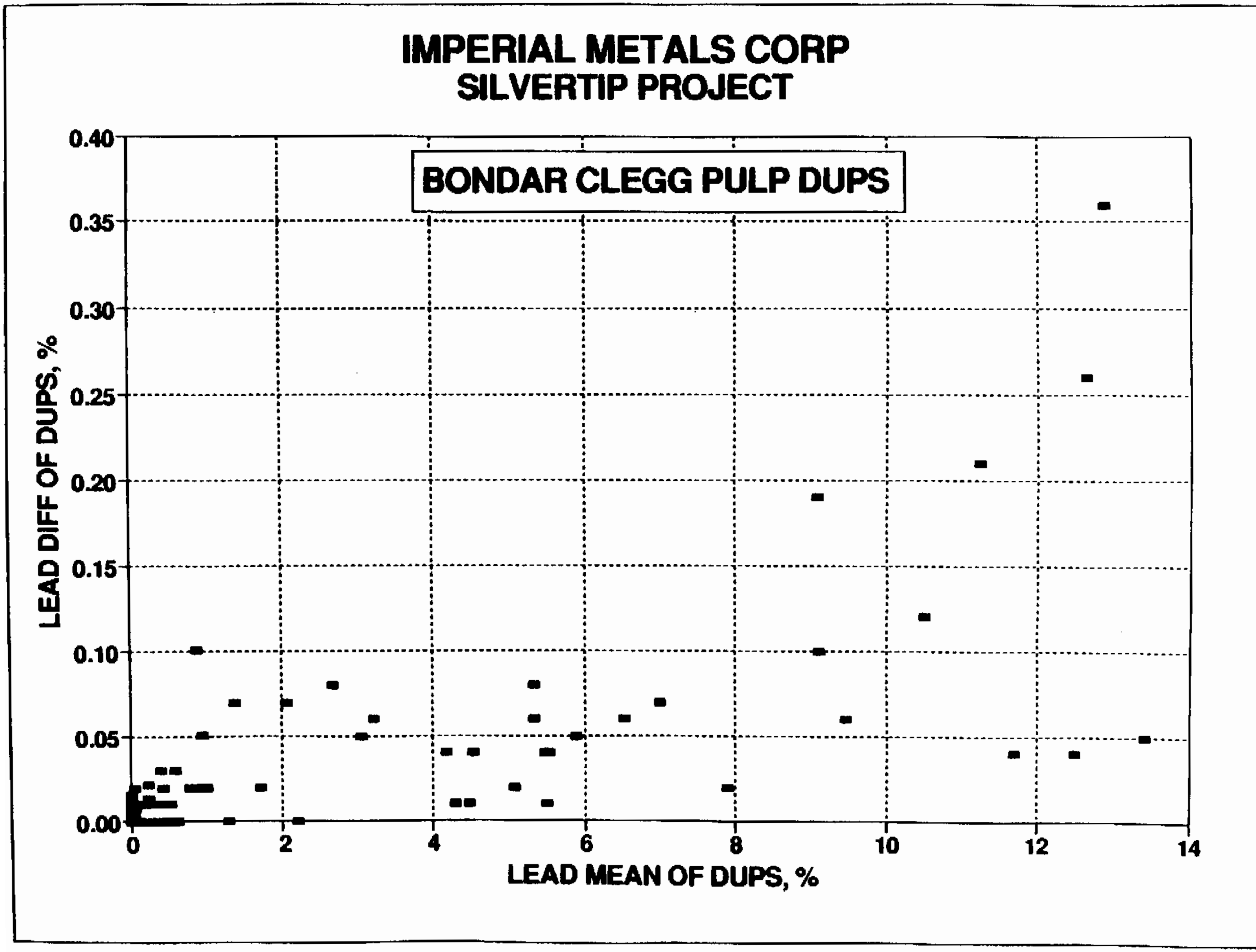
WO #	SAMPLE	AU MEAN	AU DIF	SN 1	SN 2	SN MEAN	SN DIF
9701551.0	139533			219	238	228.5	19
9701551.0	139543	4.5	5				
9701661.0	139549	14.5	25				
9701663.0	139560	34	8	250	225	237.5	25
9701664.0	140954	1428.5	121	154	187	170.5	33
9701975.0	139687	0.25	0				
9701975.0	139678						
9702189.0	139776	26	4	10	10	10	0
9702212.0	139704	1953	44	10	10	10	0
9702213.0	139751	13	4	10	10	10	0
9702281.0	139749	2916	1036				
9702282.0	139728	34	8	10	10	10	0
9702377.0	139823			10	10	10	0
9702378.0	139835	8.75	12.5	10	10	10	0
9702378.0	139876	2.5	0	10	10	10	0
9702433.0	140021	315	92				
9702433.0	140023	26.5	23	16	16	16	0
9702501.0	139917	2450.5	561	864	2259	1561.5	1395
9702501.0	139948	4.75	4.5	10	10	10	0
9702535.0	139982			10	10	10	0
9702535.0	140104	119.5	9				
9702565.0	140046	1902.5	433	295	333	314	38
9702717.0	140248	12.5	1				
9702717.0	140354	2.5	0				
9702717.0	140367	2.5	0	10	10	10	0

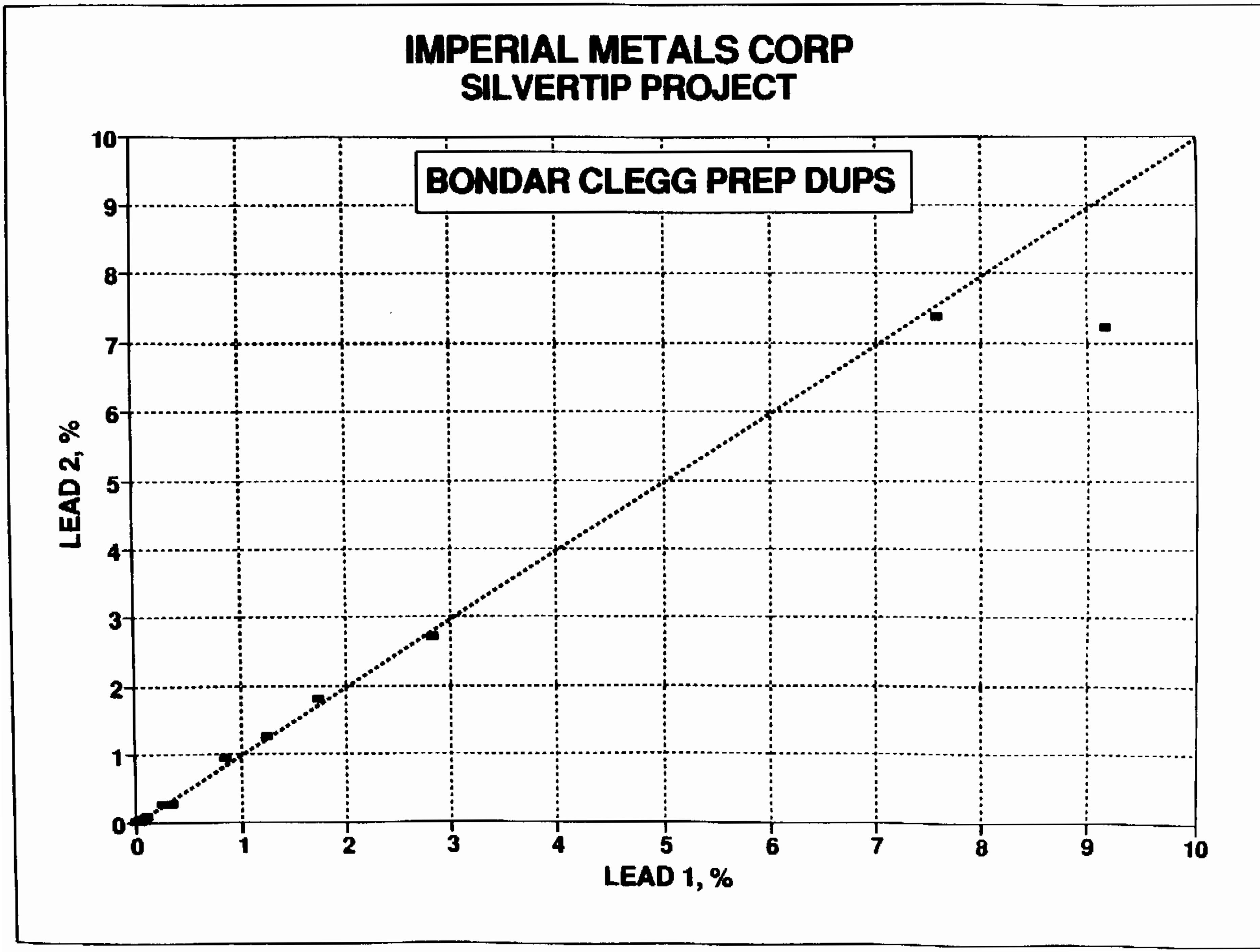


IMPERIAL METALS CORP
SILVERTIP PROJECT
Field Blanks
Lead, %
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
SAMPLE ORDER

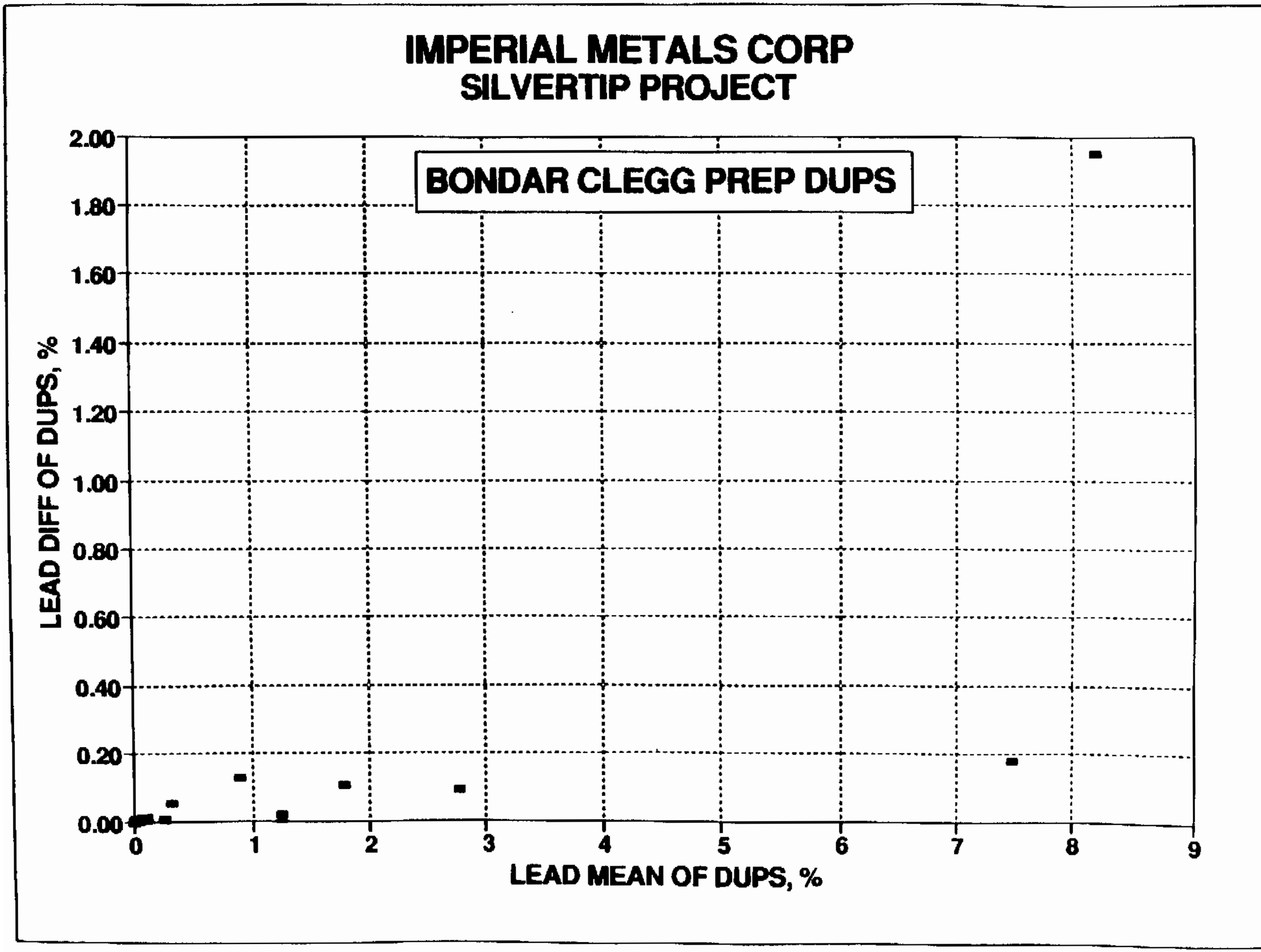


IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
LEAD 2, %
LEAD 1, %
0
2
4
6
8
10
12
14

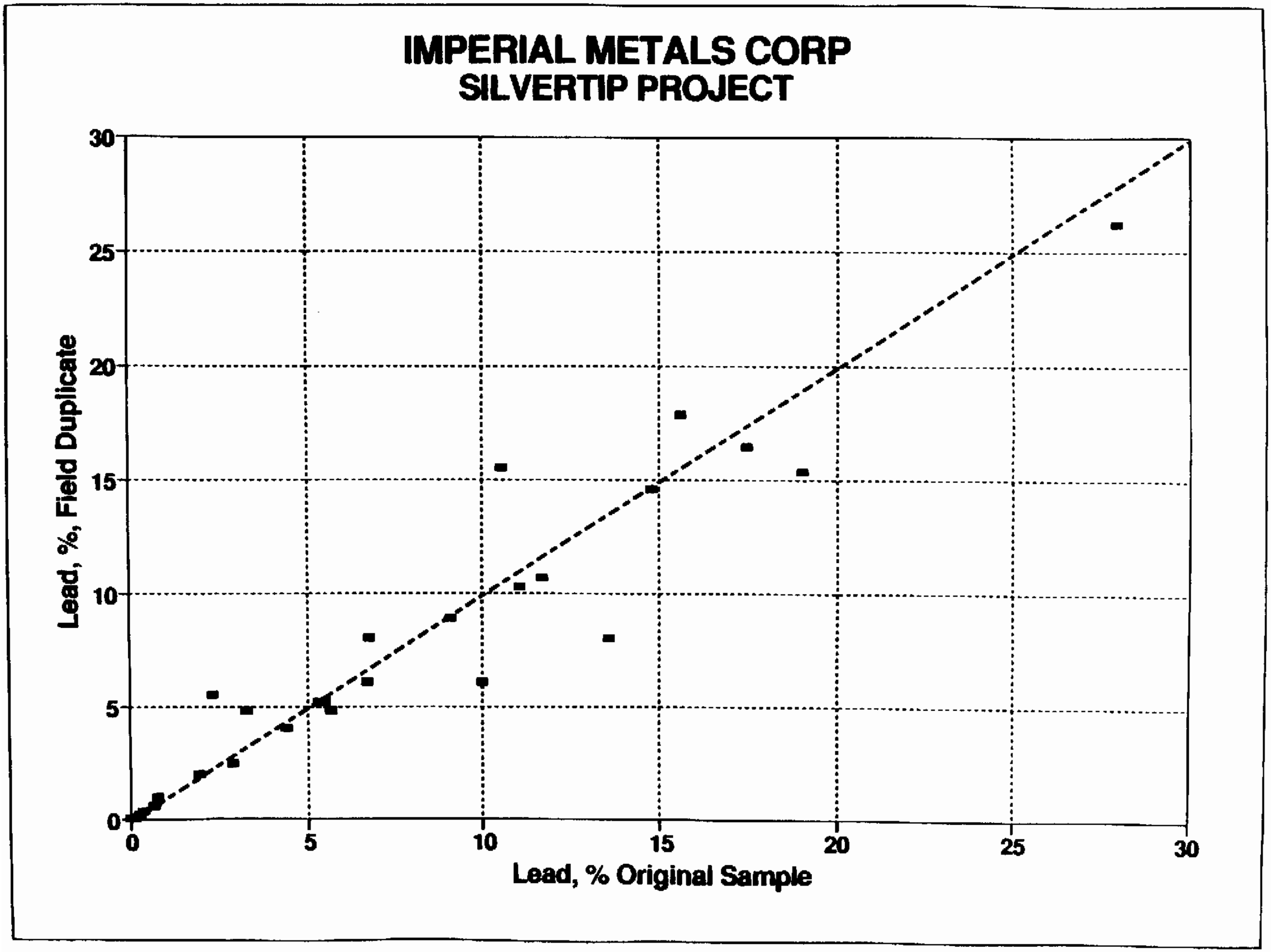

IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
LEAD DIFF OF DUPS, %
LEAD MEAN OF DUPS, %
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
2
4
6
8
10
12
14



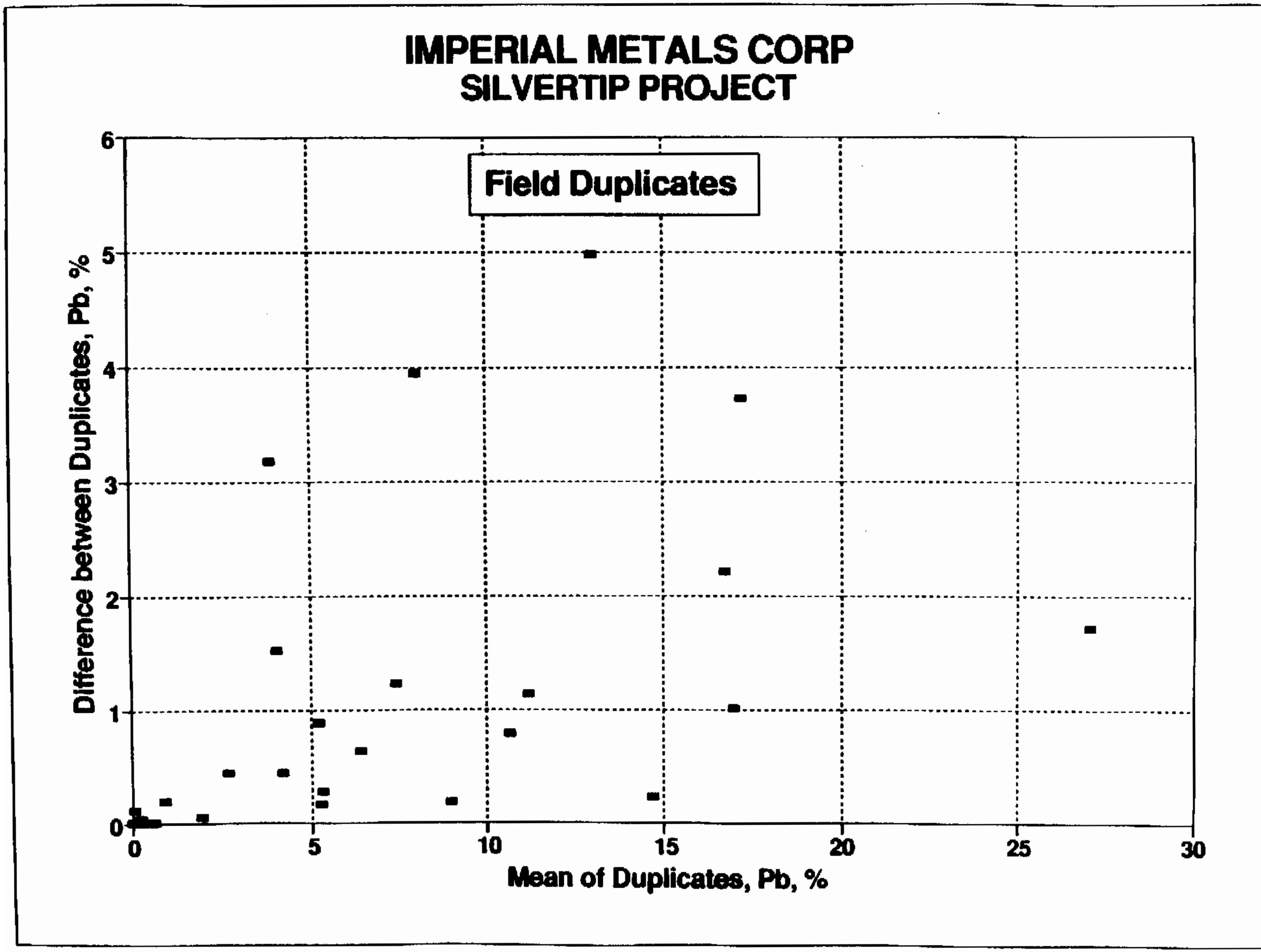
IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
LEAD 2, %
LEAD 1, %
0
1
2
3
4
5
6
7
8
9
10

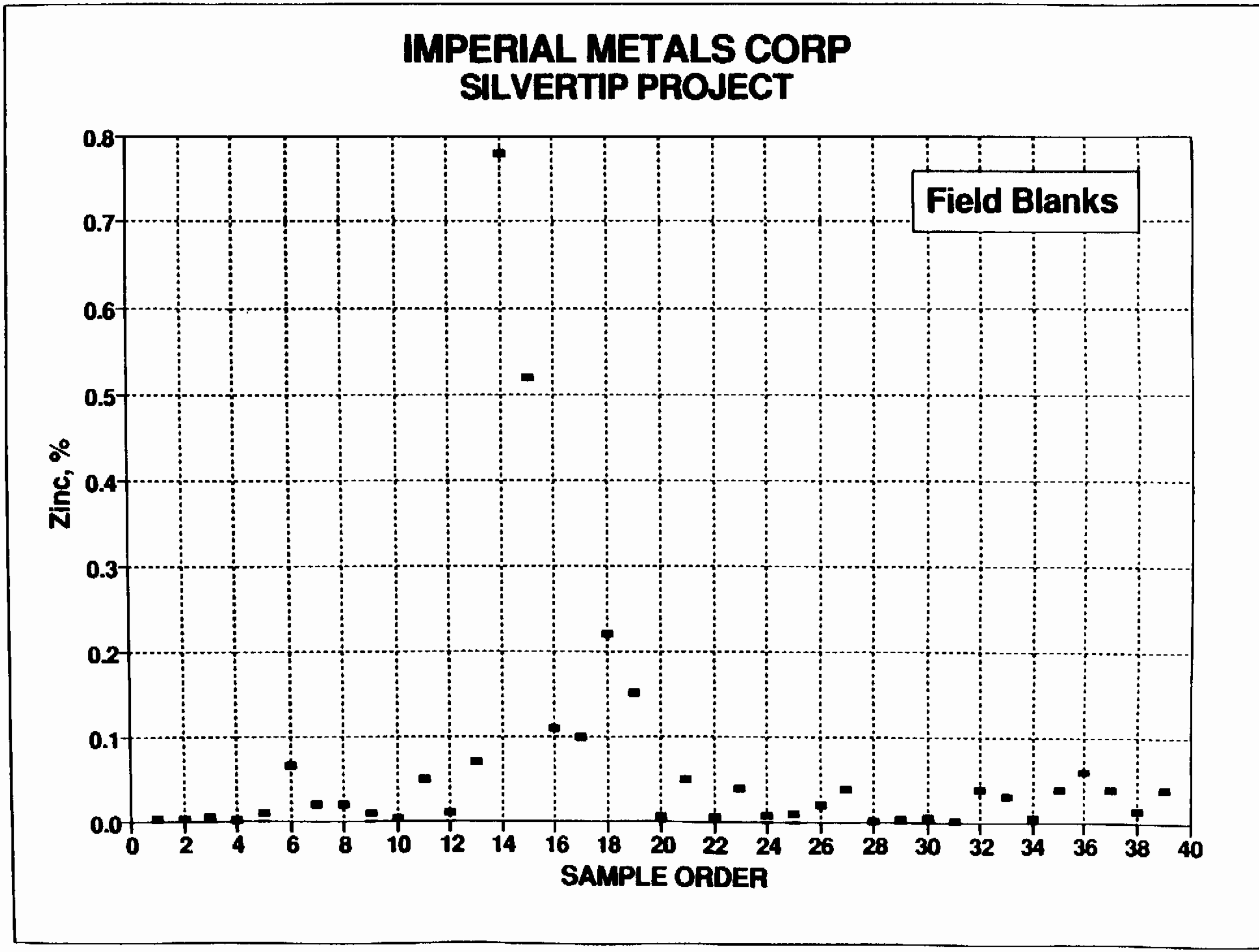


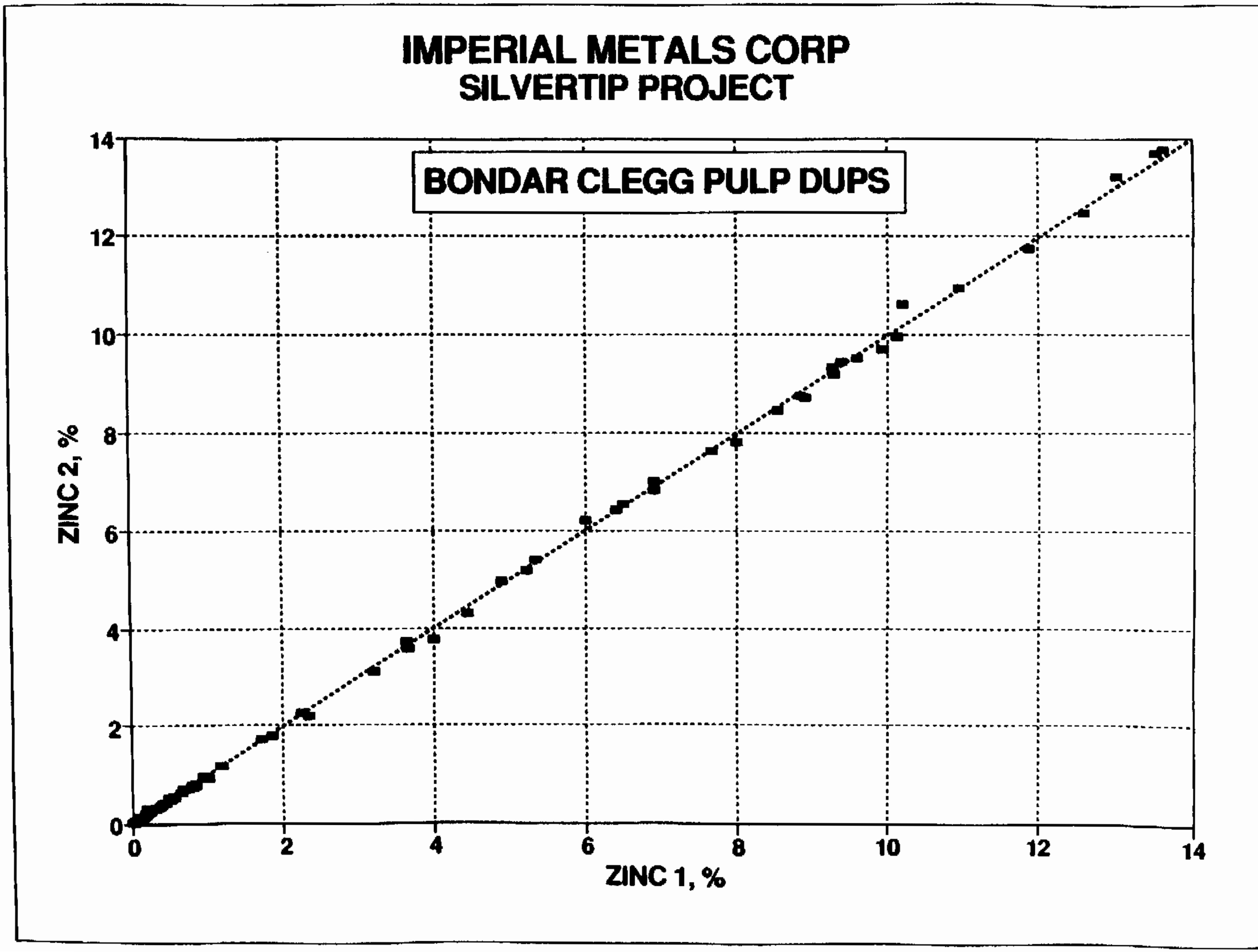
IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
LEAD DIFF OF DUPS, %
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0
1
2
3
4
5
6
7
8
9
LEAD MEAN OF DUPS, %

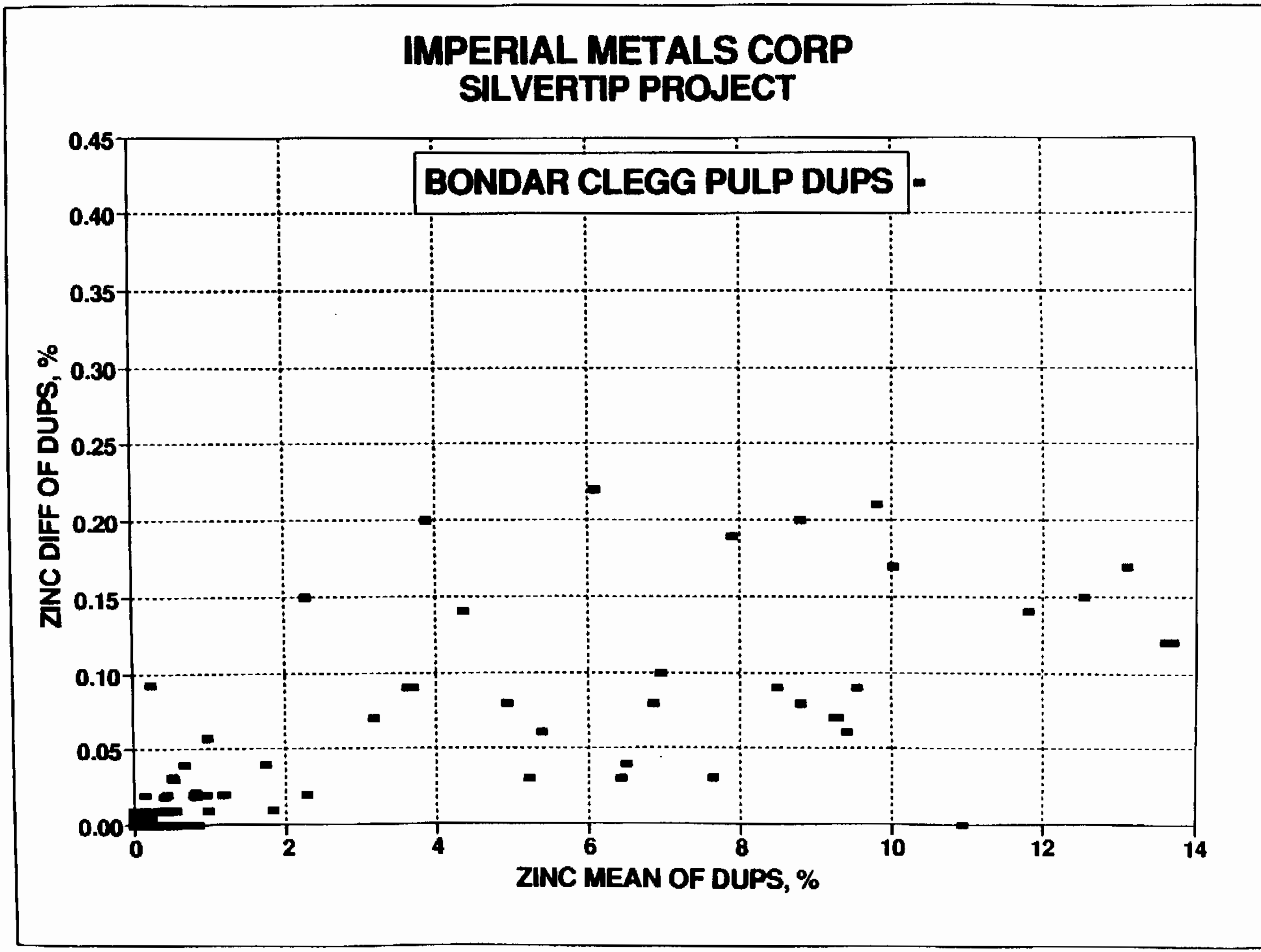


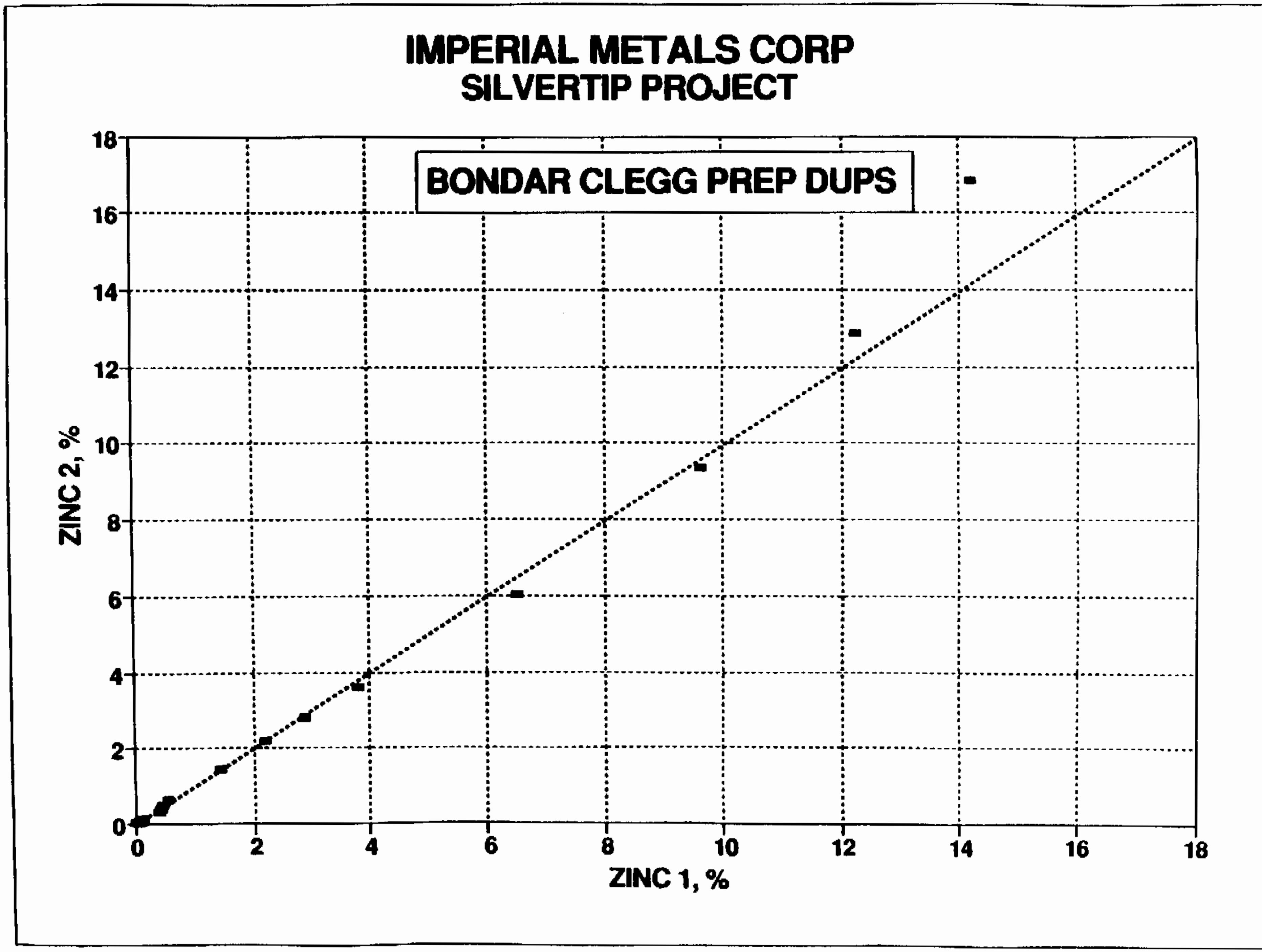
IMPERIAL METALS CORP
SILVERTIP PROJECT
Lead, %, Field Duplicate
Lead, % Original Sample
0
5
10
15
20
25
30

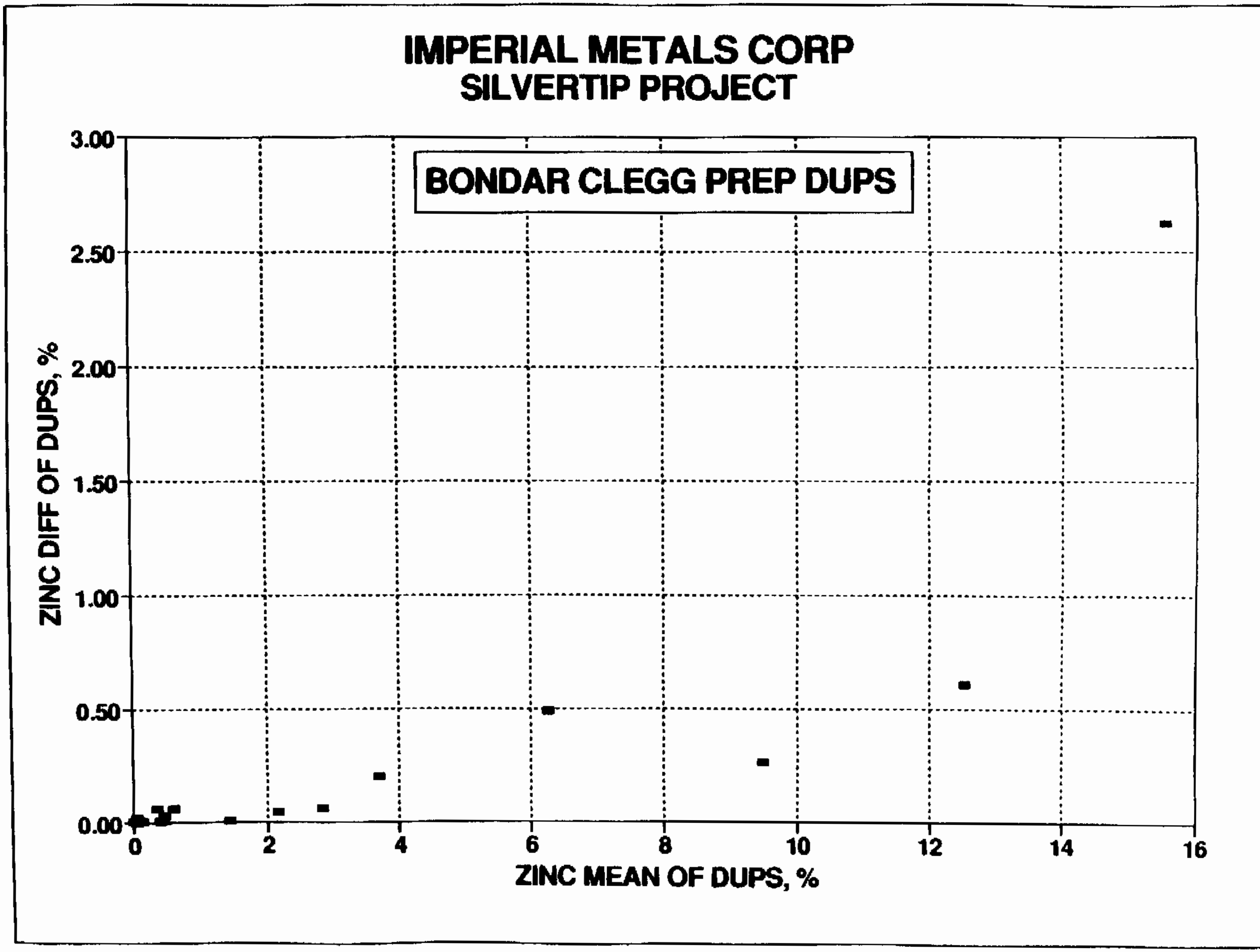

IMPERIAL METALS CORP
SILVERTIP PROJECT
Field Duplicates
Difference between Duplicates, Pb, %
Mean of Duplicates, Pb, %
0
1
2
3
4
5
6
0
5
10
15
20
25
30

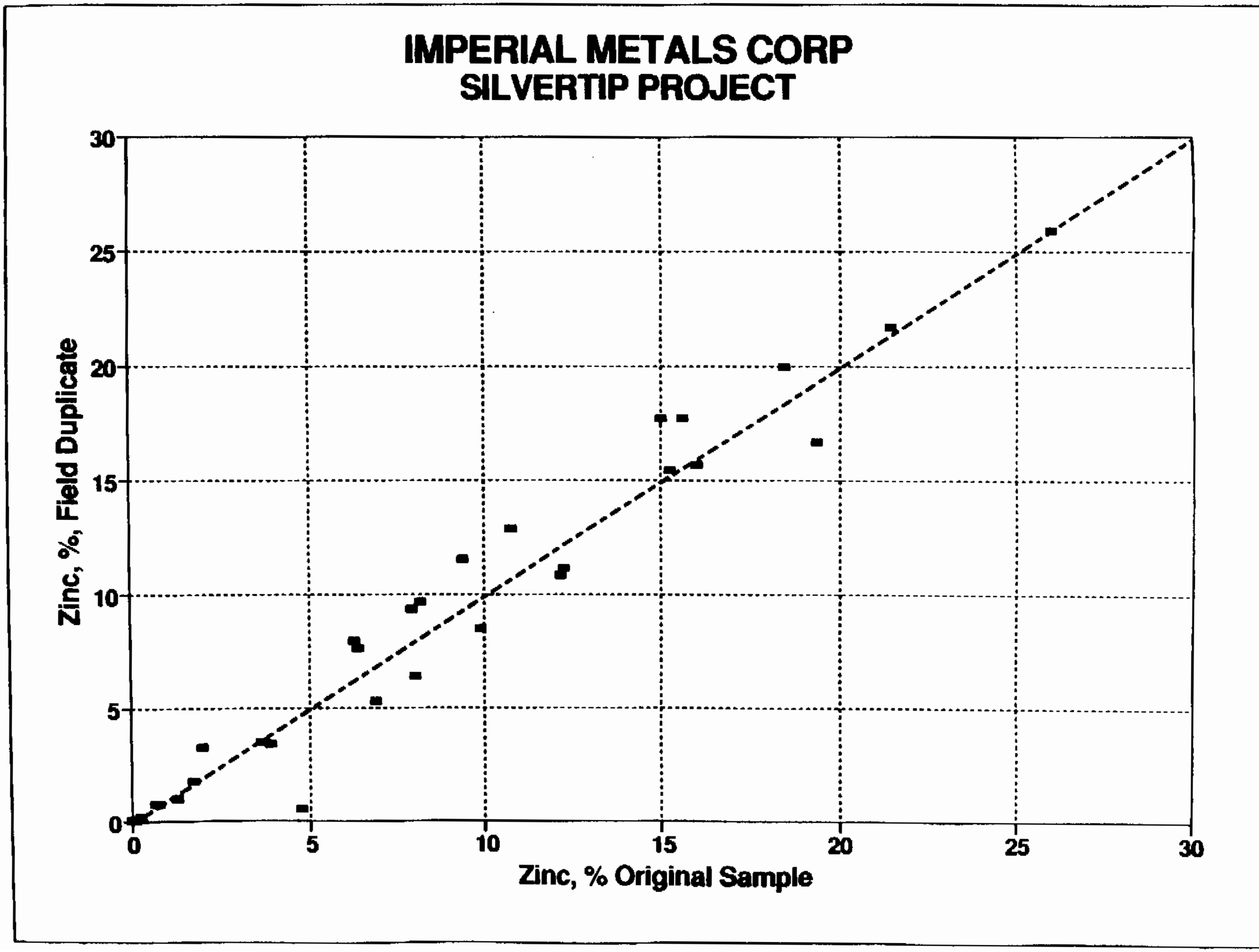

IMPERIAL METALS CORP
SILVERTIP PROJECT
Field Blanks
Zinc, %
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
SAMPLE ORDER

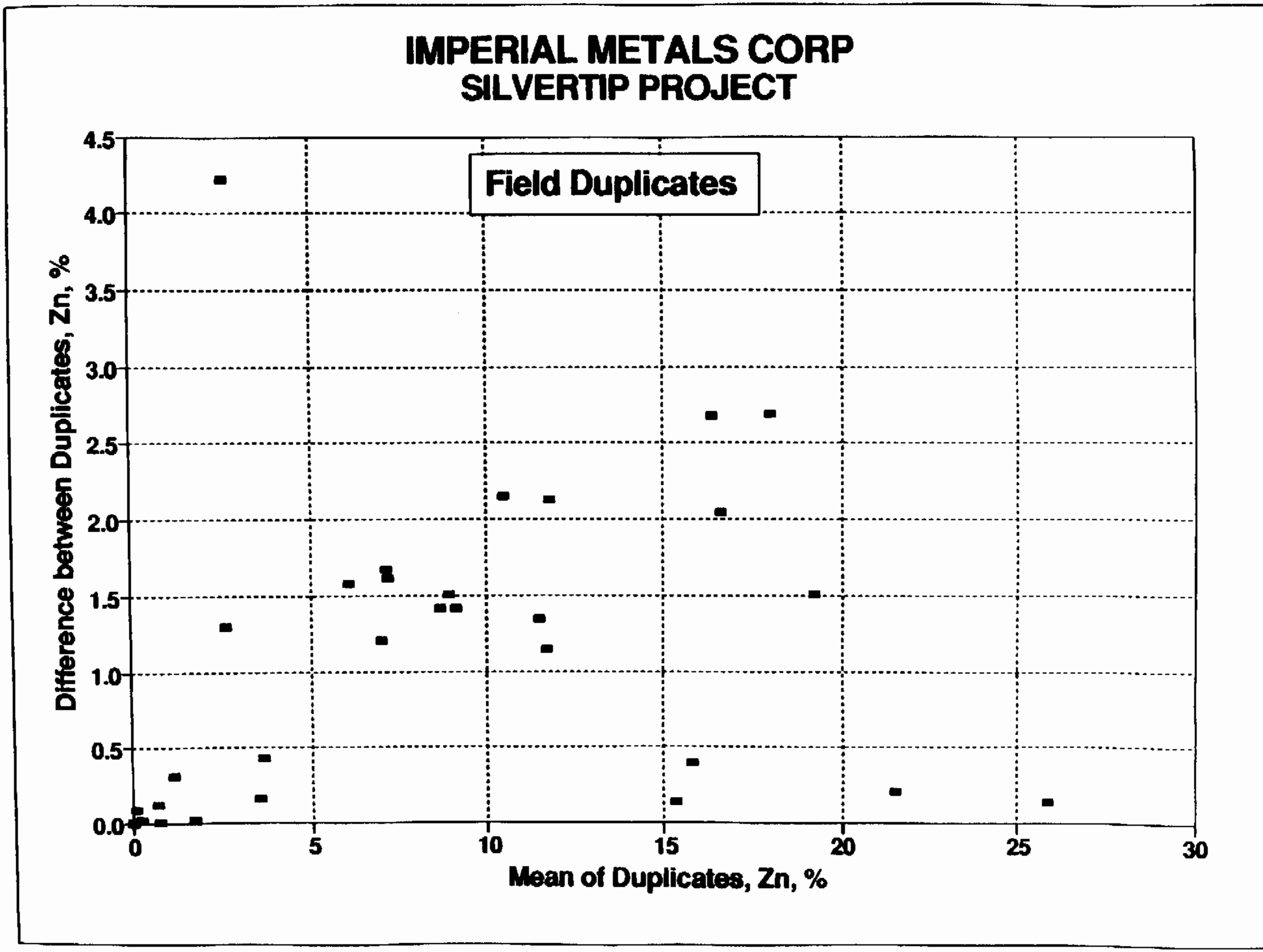

IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
ZINC 2, %
ZINC 1, %
0
2
4
6
8
10
12
14

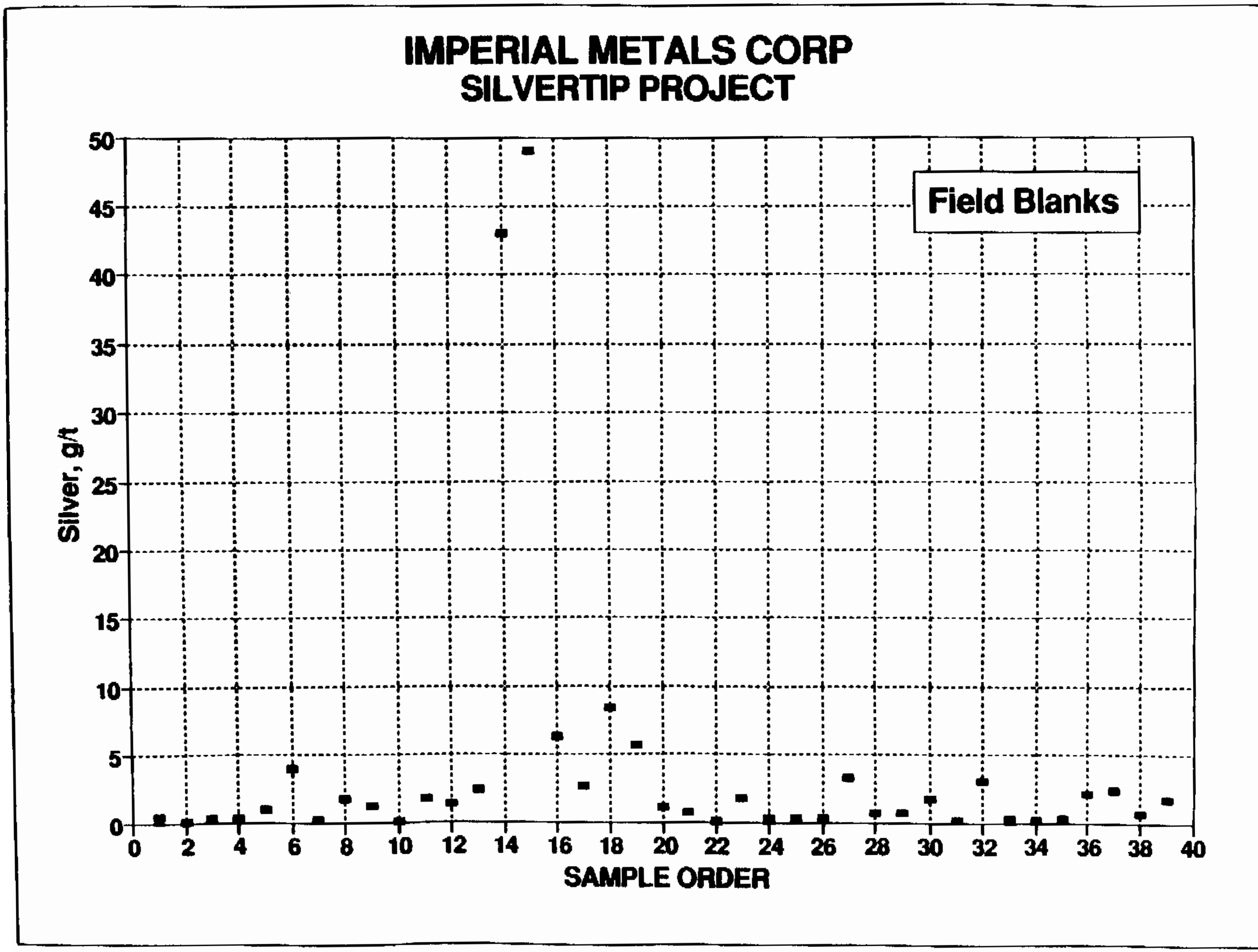

IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
ZINC DIFF OF DUPS, %
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
2
4
6
8
10
12
14
ZINC MEAN OF DUPS, %

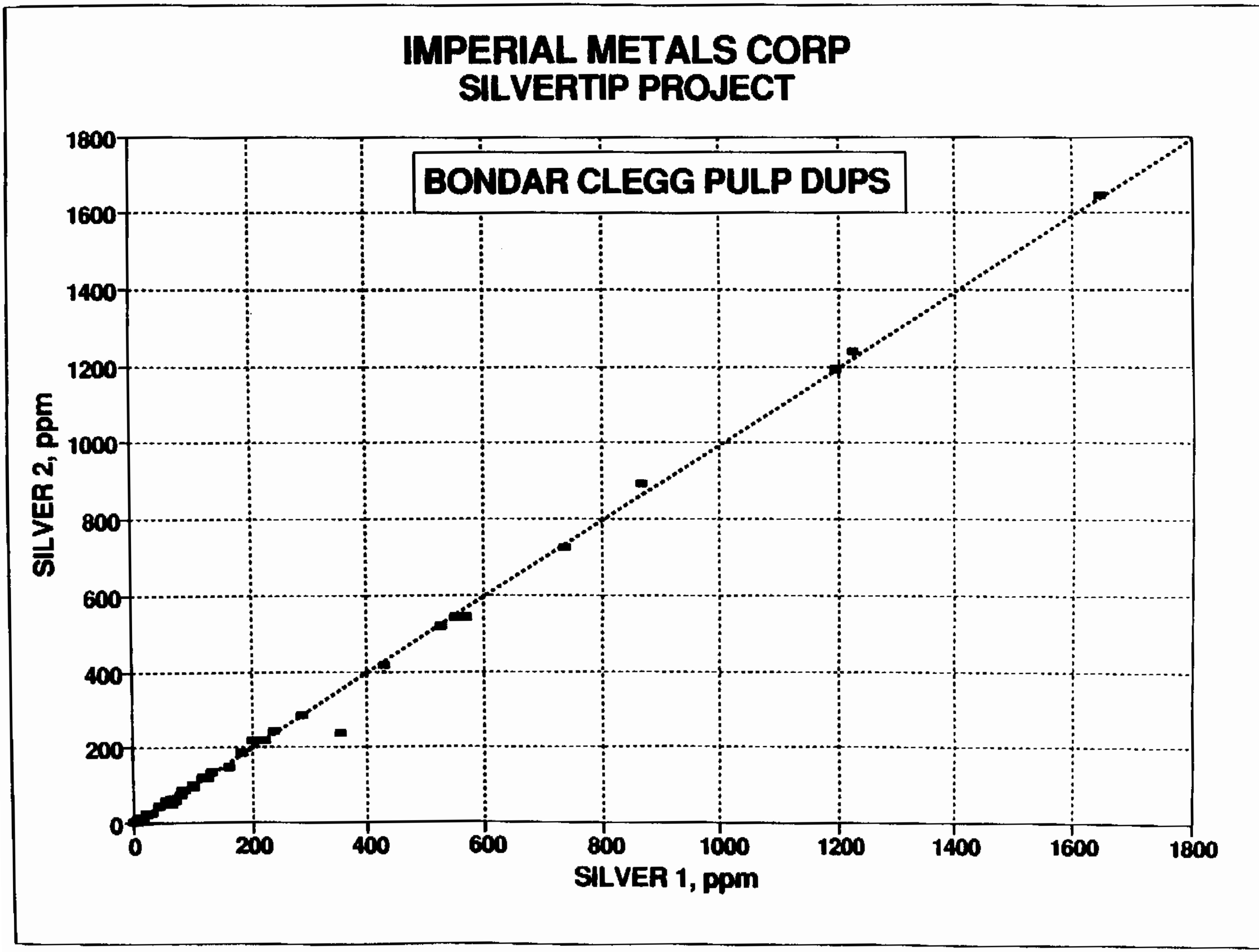

IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
ZINC 2, %
ZINC 1, %
0
2
4
6
8
10
12
14
16
18

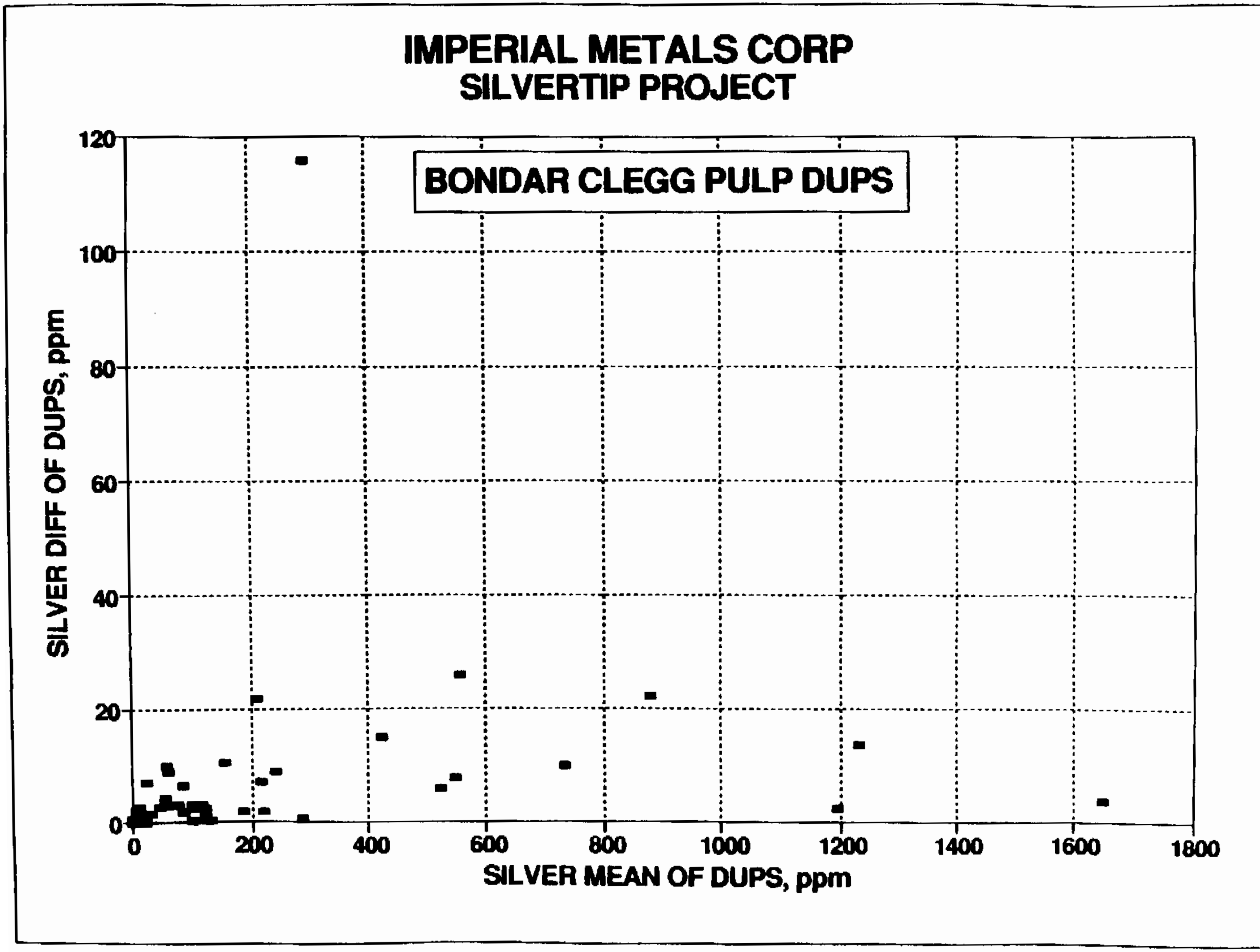

IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
ZINC DIFF OF DUPS, %
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0
2
4
6
8
10
12
14
16
ZINC MEAN OF DUPS, %

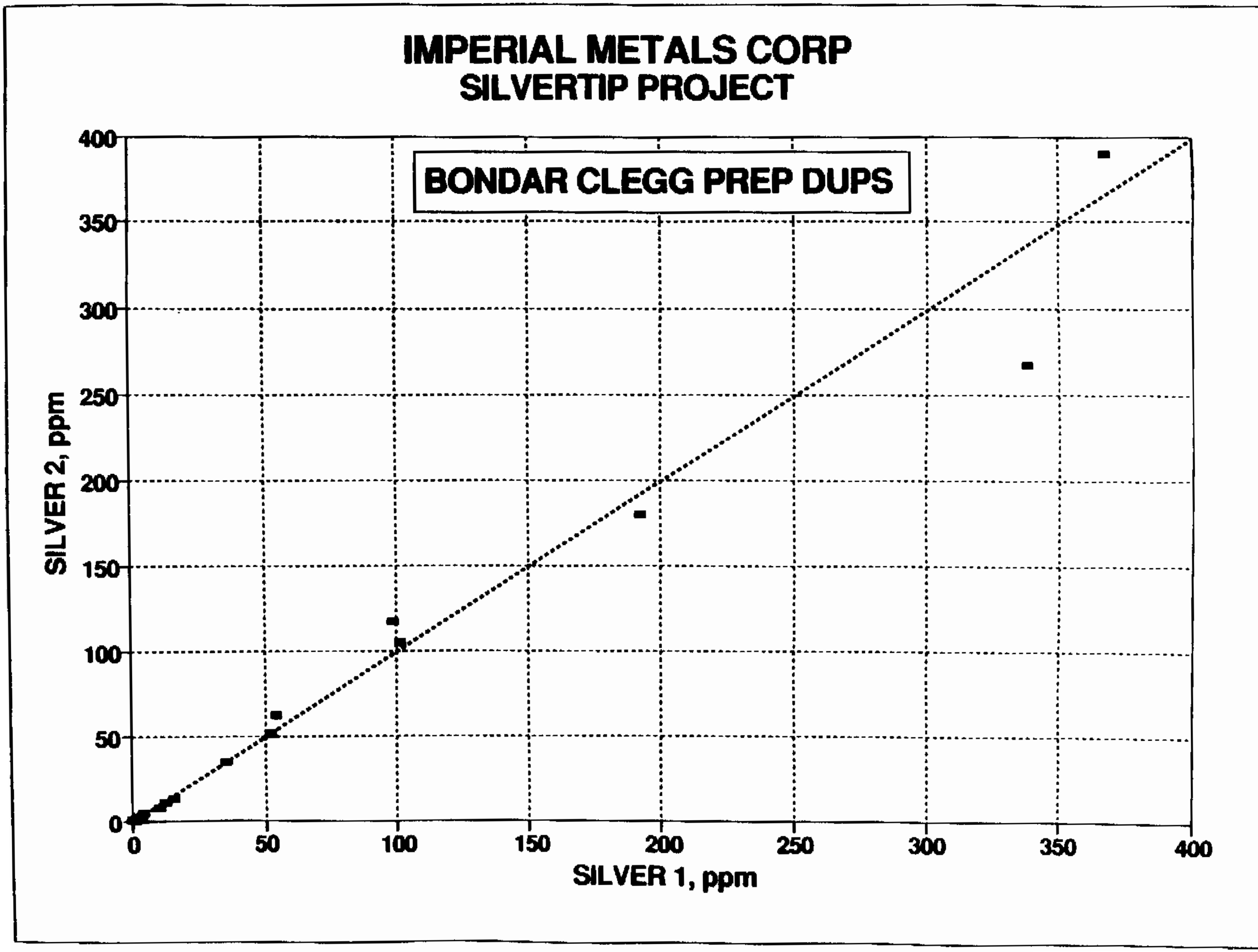

IMPERIAL METALS CORP
SILVERTIP PROJECT
Zinc, %, Field Duplicate
Zinc, % Original Sample
0
5
10
15
20
25
30


IMPERIAL METALS CORP
SILVERTIP PROJECT
Field Duplicates
Difference between Duplicates, Zn, %
Mean of Duplicates, Zn, %
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
0
5
10
15
20
25
30

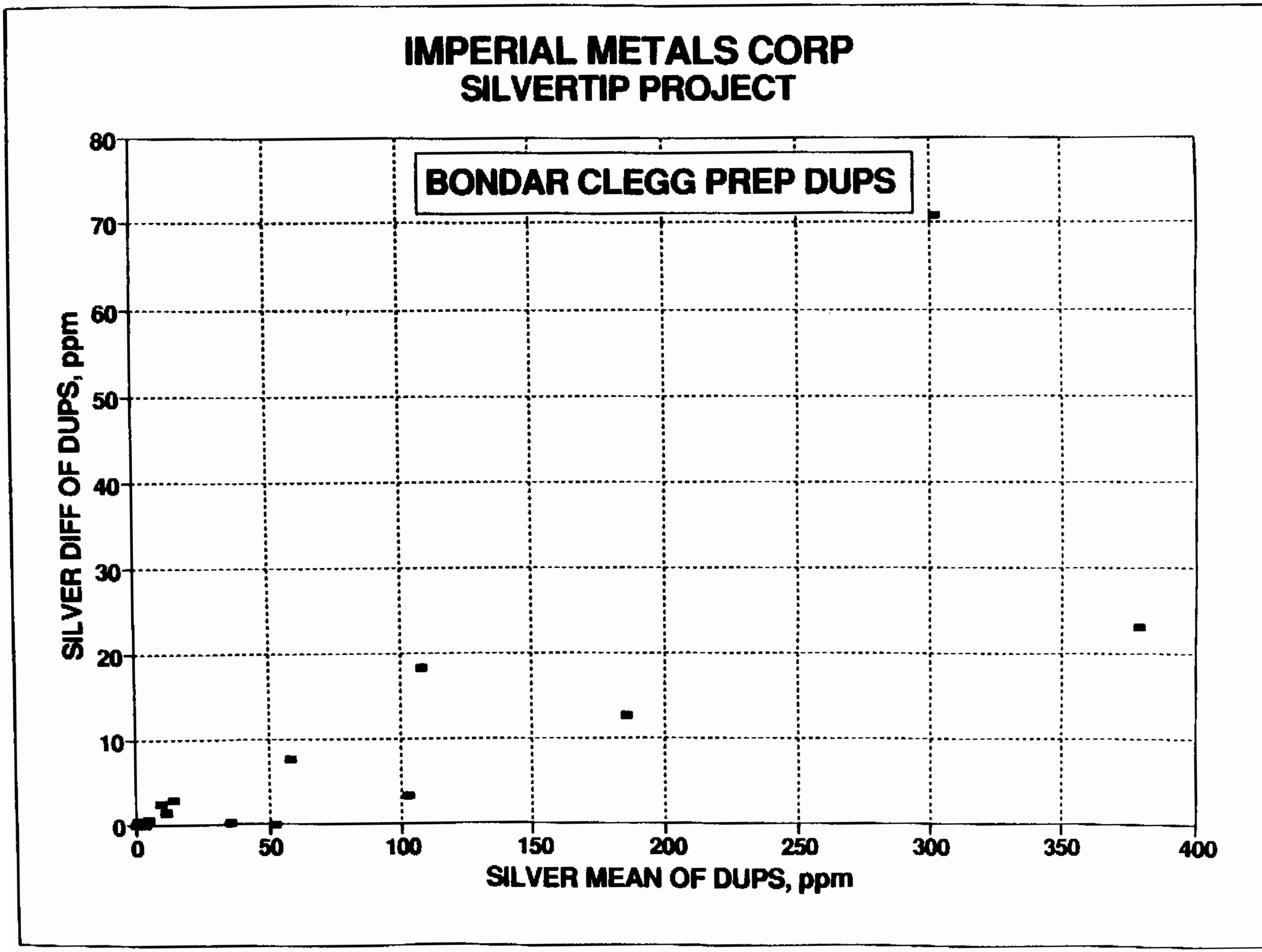

IMPERIAL METALS CORP
SILVERTIP PROJECT
Field Blanks
Silver, g/t
SAMPLE ORDER
0
5
10
15
20
25
30
35
40
45
50
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40

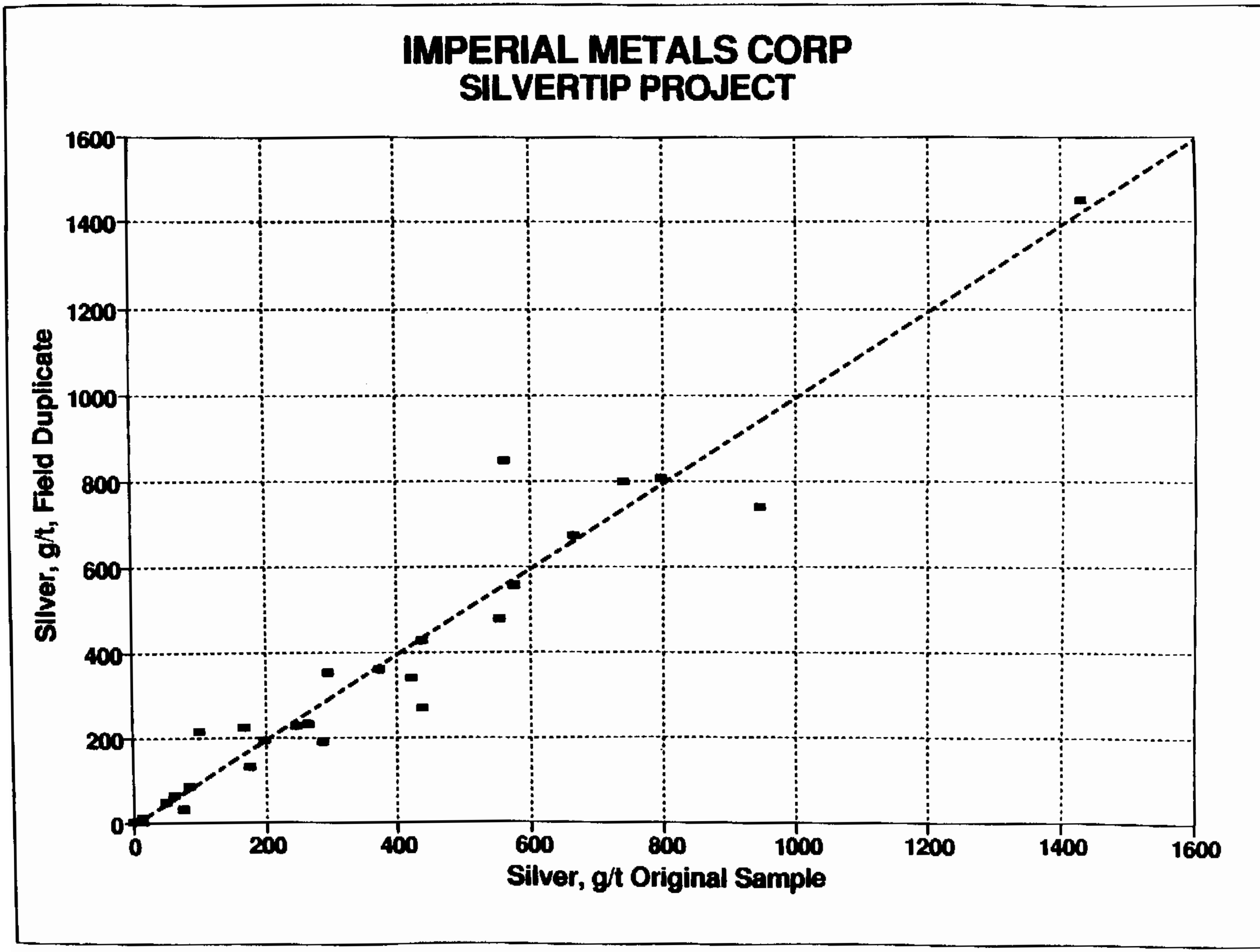

IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
SILVER 2, ppm
SILVER 1, ppm
0
200
400
600
800
1000
1200
1400
1600
1800

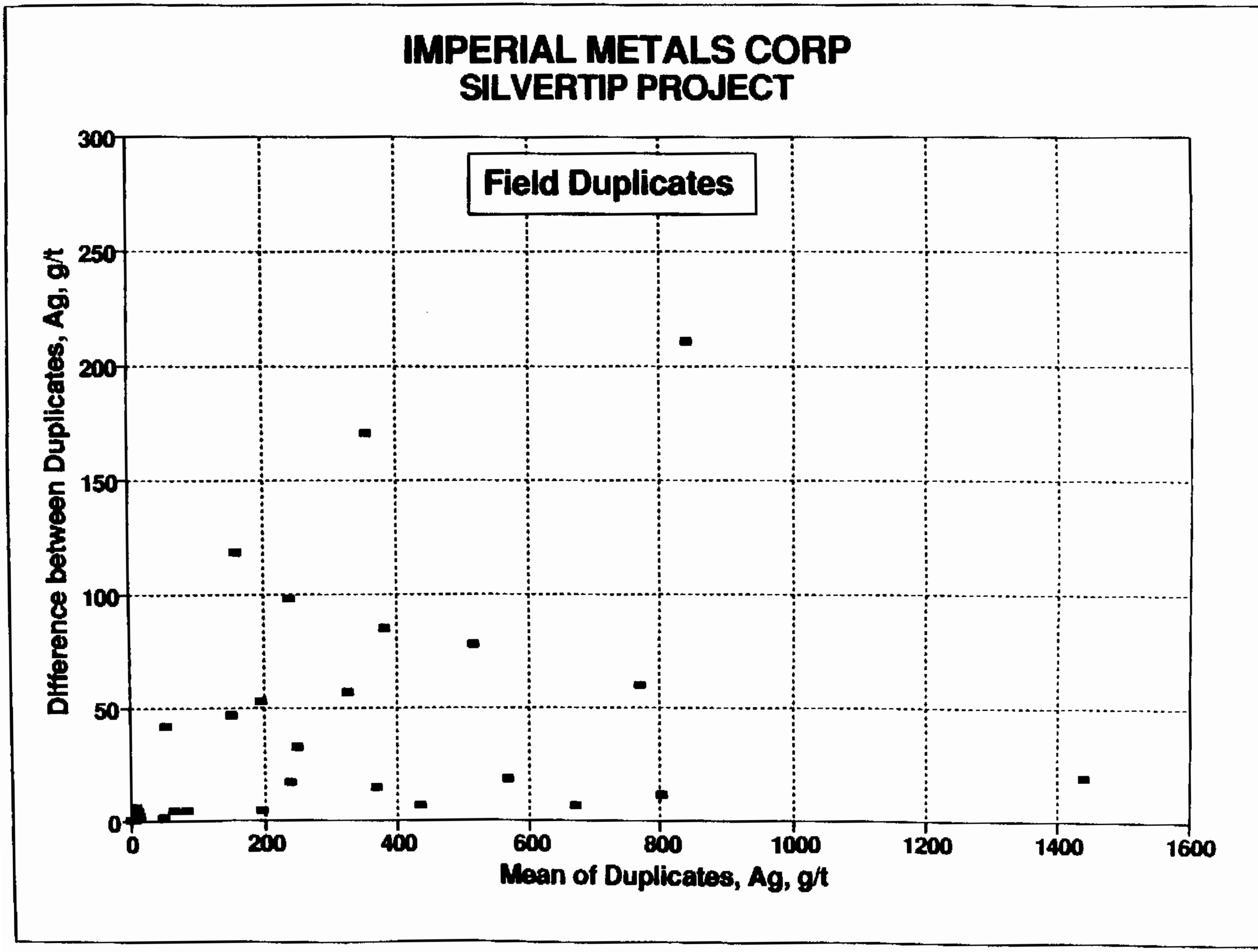

IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
SILVER DIFF OF DUPS, ppm
SILVER MEAN OF DUPS, ppm
0
20
40
60
80
100
120
0
200
400
600
800
1000
1200
1400
1600
1800

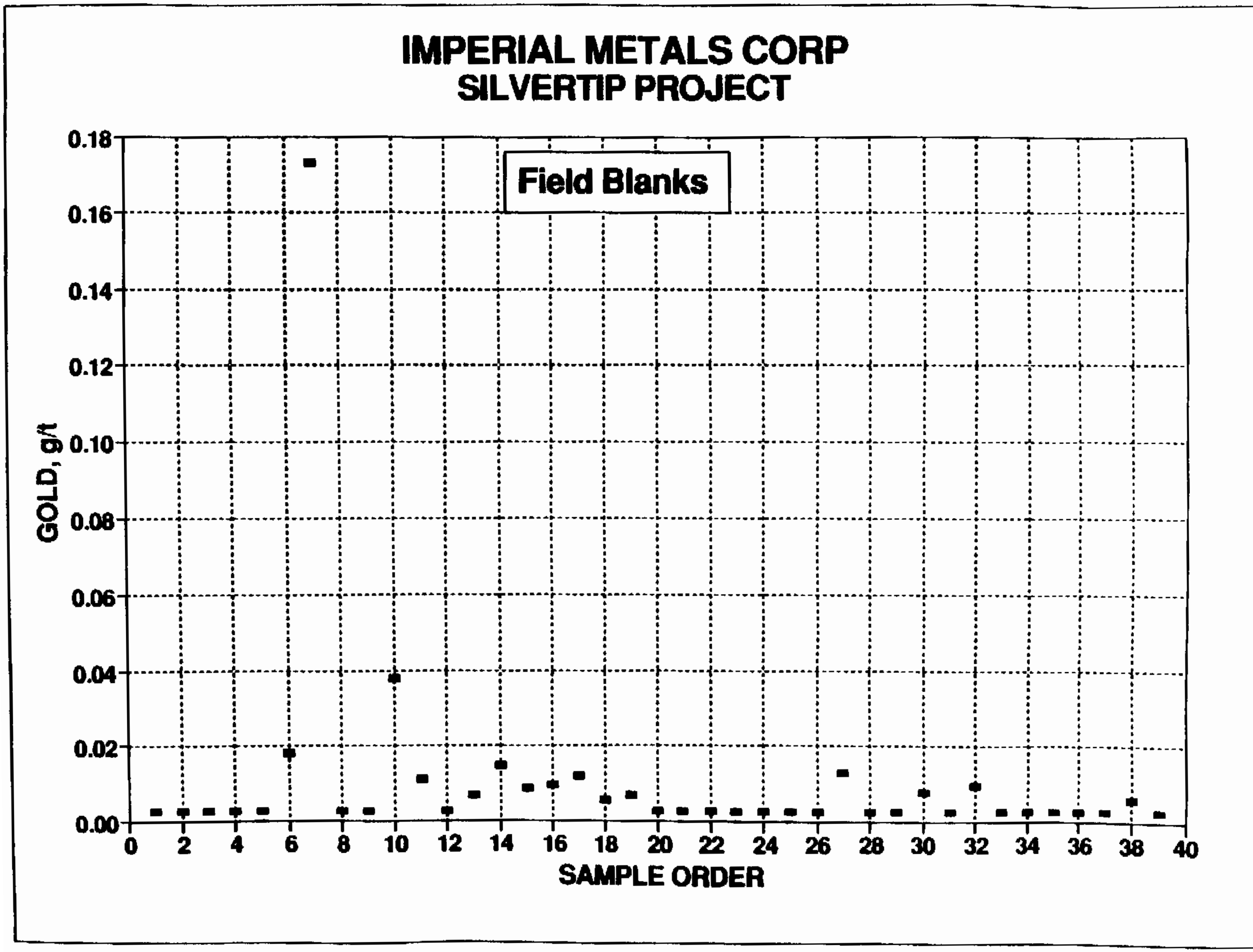


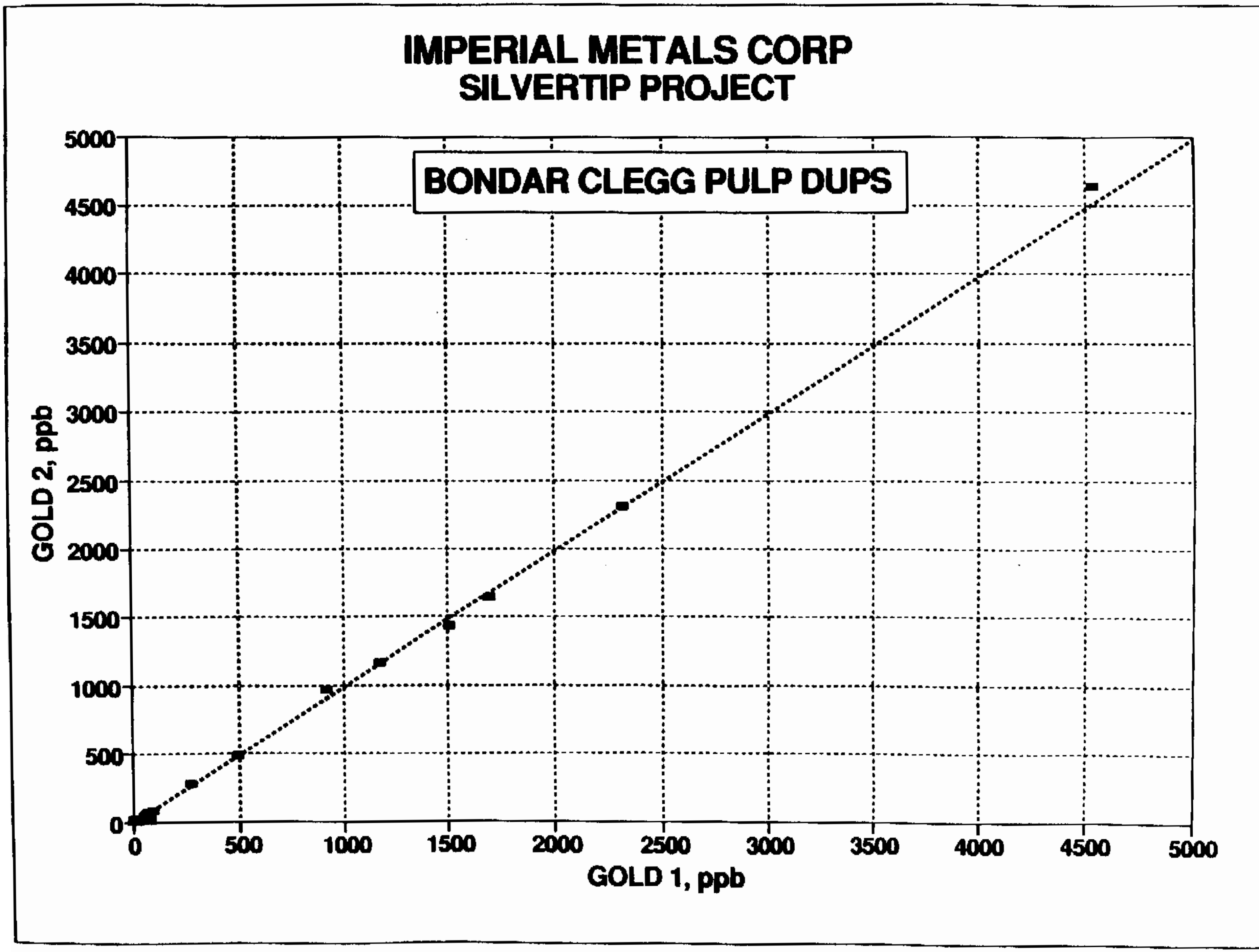
IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
SILVER 2, ppm
400
350
300
250
200
150
100
50
0
0
50
100
150
200
250
300
350
400
SILVER 1, ppm


IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
SILVER DIFF OF DUPS, ppm
SILVER MEAN OF DUPS, ppm
0
10
20
30
40
50
60
70
80
0
50
100
150
200
250
300
350
400

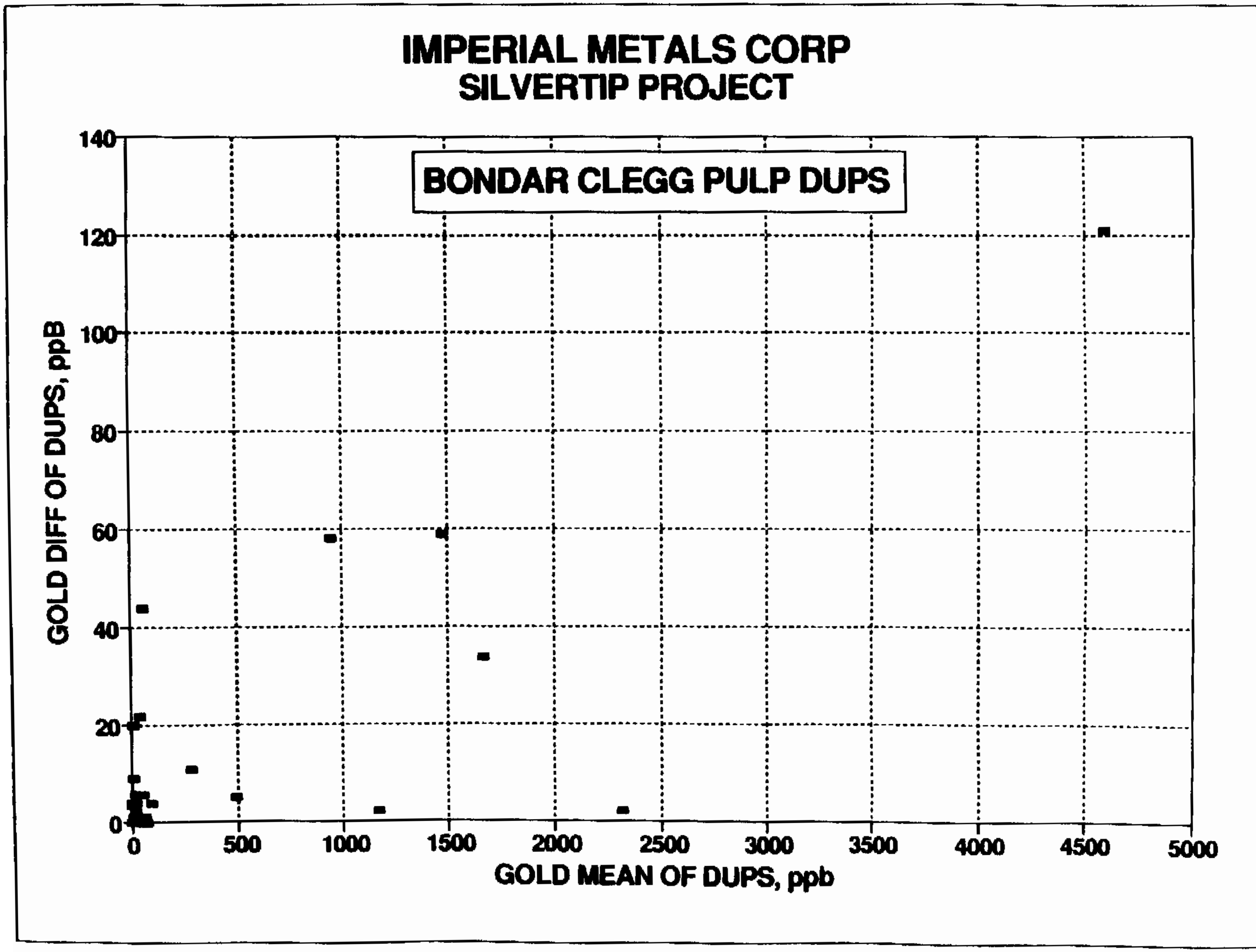

IMPERIAL METALS CORP
SILVERTIP PROJECT
Silver, g/t, Field Duplicate
Silver, g/t Original Sample
0
200
400
600
800
1000
1200
1400
1600


IMPERIAL METALS CORP
SILVERTIP PROJECT
Field Duplicates
Difference between Duplicates, Ag, g/t
0
50
100
150
200
250
300
0
200
400
600
800
1000
1200
1400
1600
Mean of Duplicates, Ag, g/t

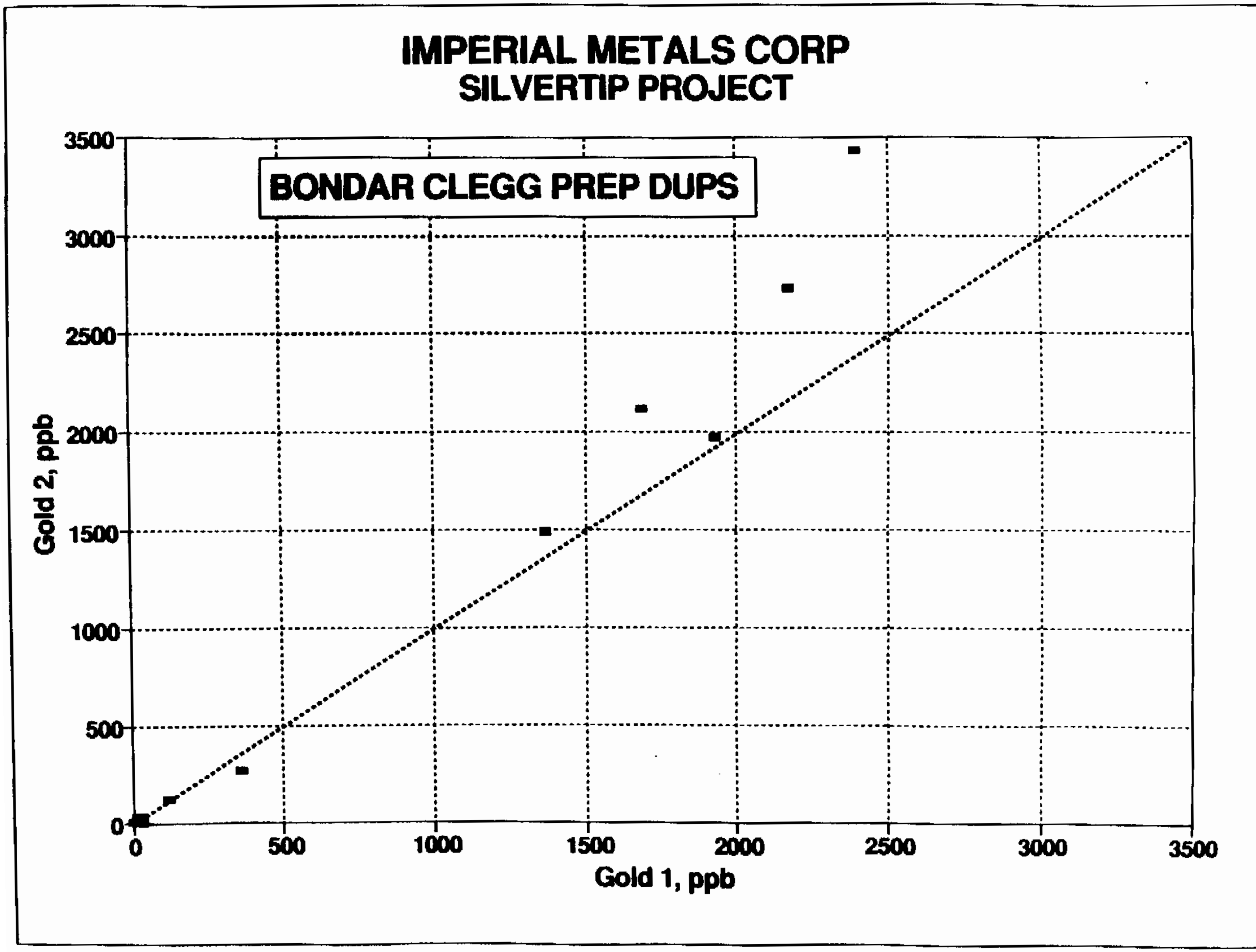

IMPERIAL METALS CORP
SILVERTIP PROJECT
Field Blanks
GOLD, g/t
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
SAMPLE ORDER

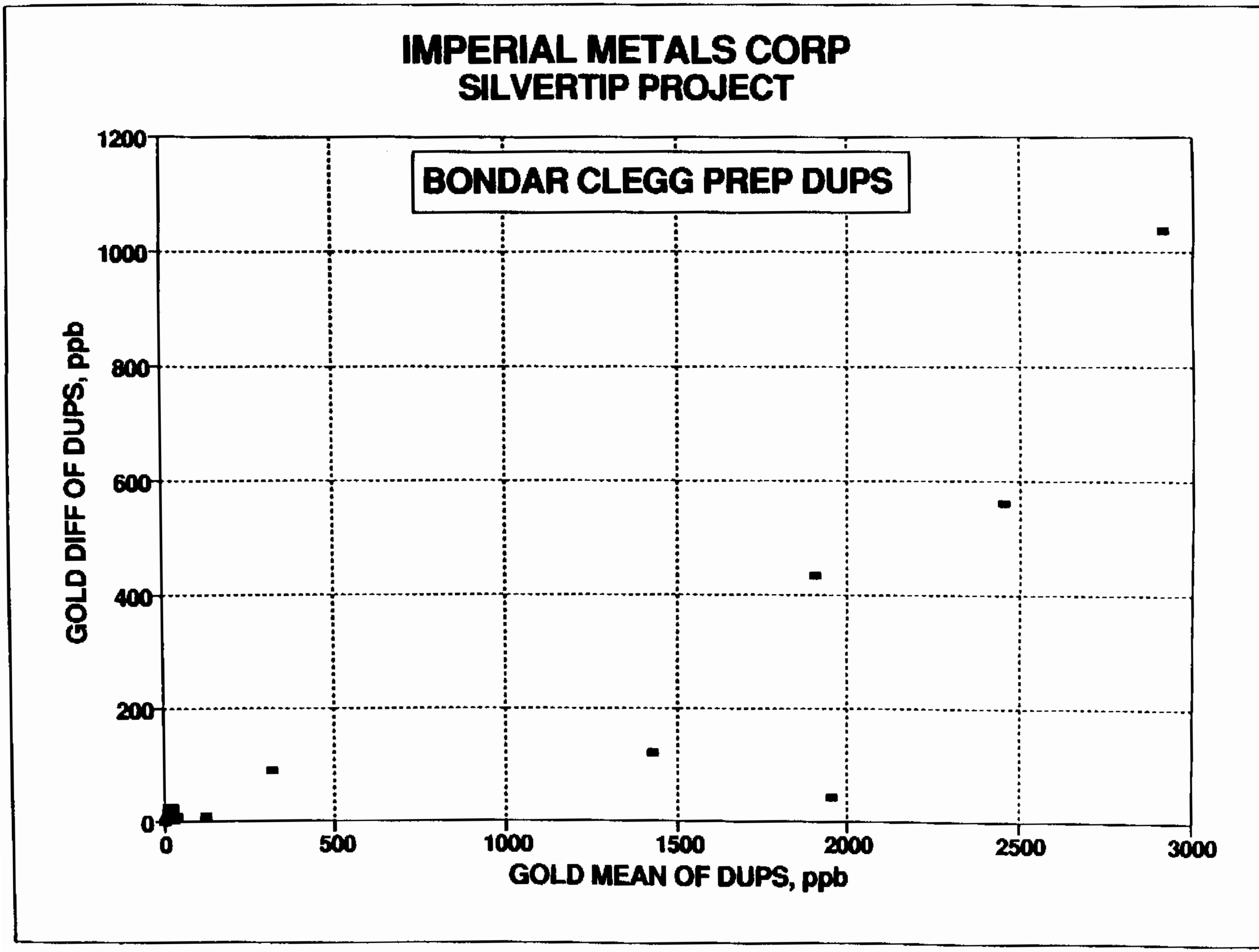


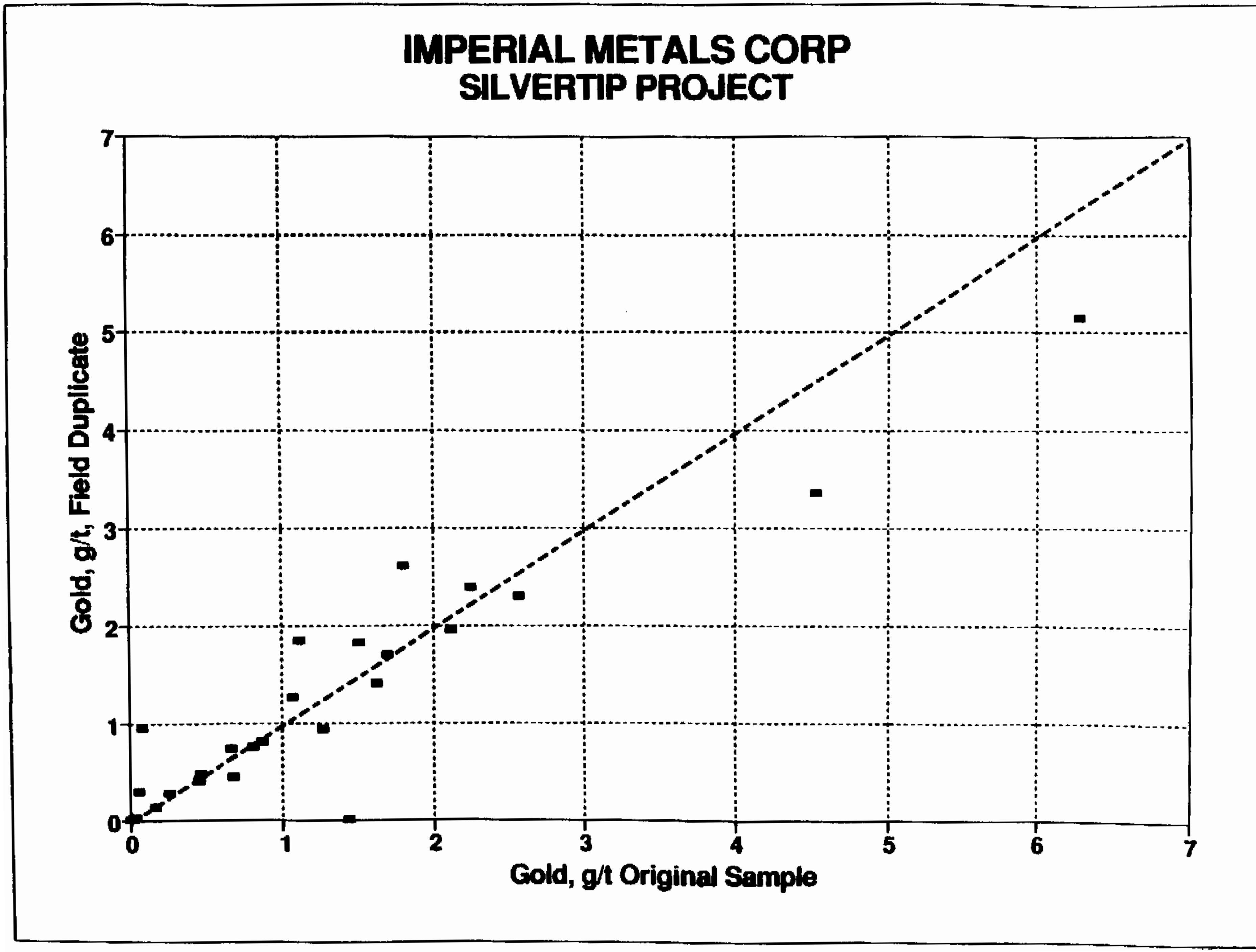
IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
GOLD 2, ppb
GOLD 1, ppb
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000

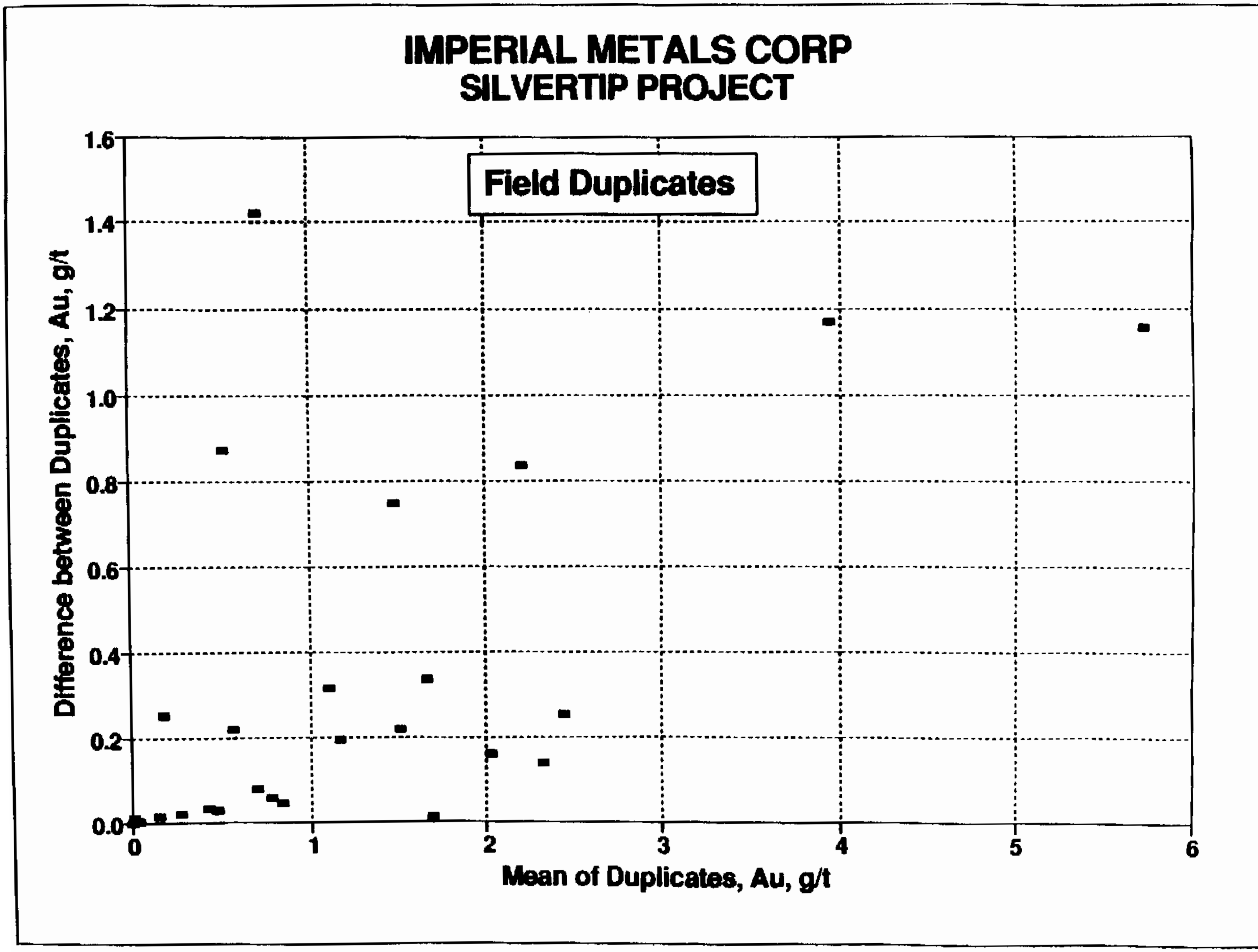


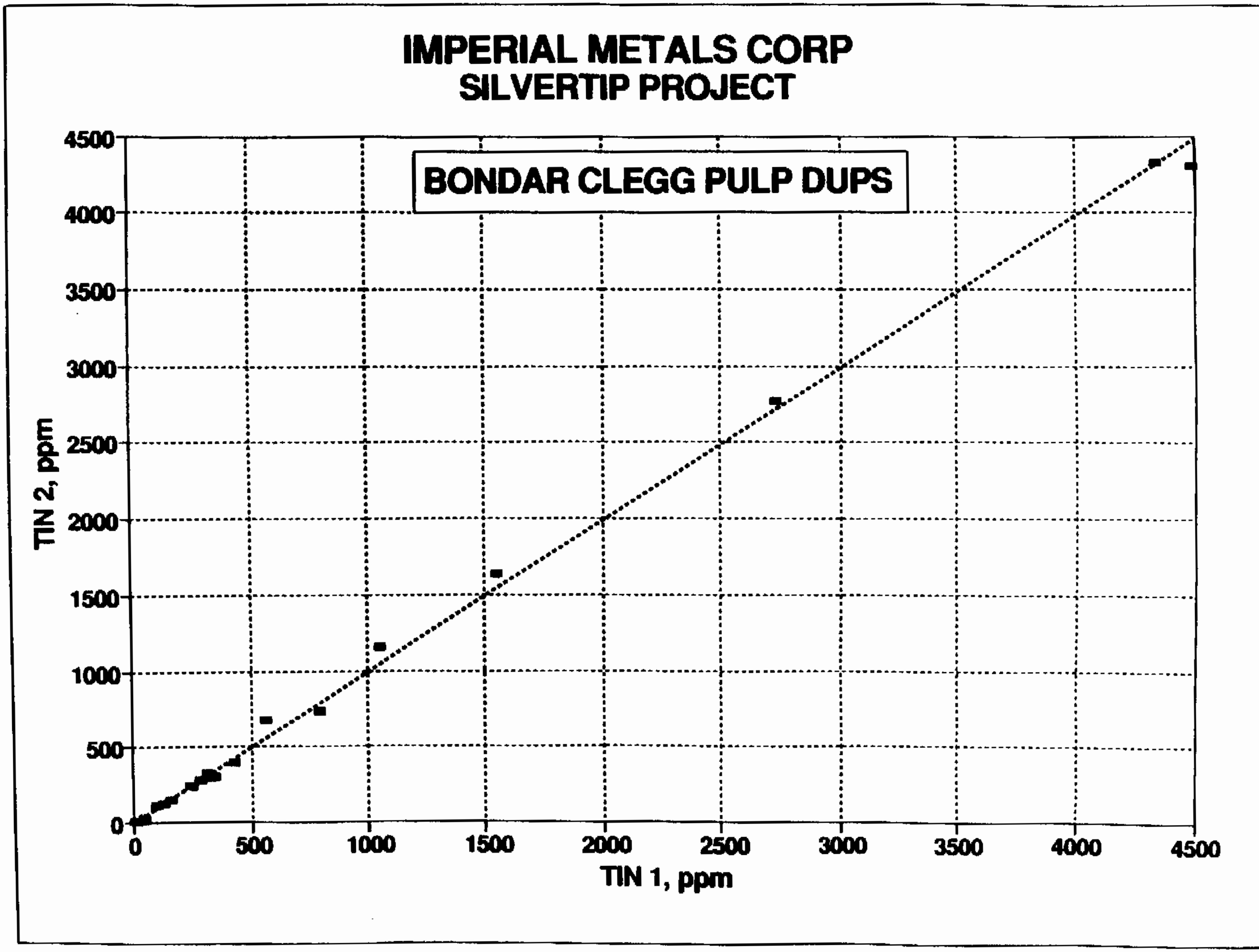
IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
GOLD DIFF OF DUPS, ppB
GOLD MEAN OF DUPS, ppb
0
20
40
60
80
100
120
140
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000


IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
Gold 2, ppb
Gold 1, ppb
0
500
1000
1500
2000
2500
3000
3500


IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
GOLD DIFF OF DUPS, ppb
0
200
400
600
800
1000
1200
GOLD MEAN OF DUPS, ppb
0
500
1000
1500
2000
2500
3000

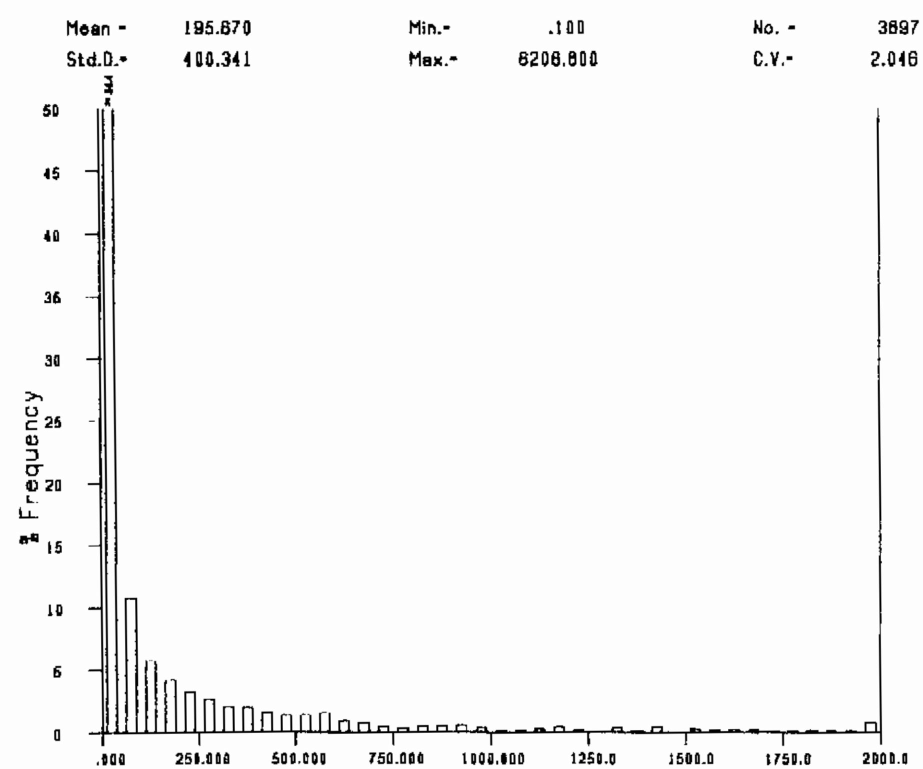

IMPERIAL METALS CORP
SILVERTIP PROJECT
Gold, g/t, Field Duplicate
Gold, g/t Original Sample
0
1
2
3
4
5
6
7


IMPERIAL METALS CORP
SILVERTIP PROJECT
Field Duplicates
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
1
2
3
4
5
6
Difference between Duplicates, Au, g/t
Mean of Duplicates, Au, g/t

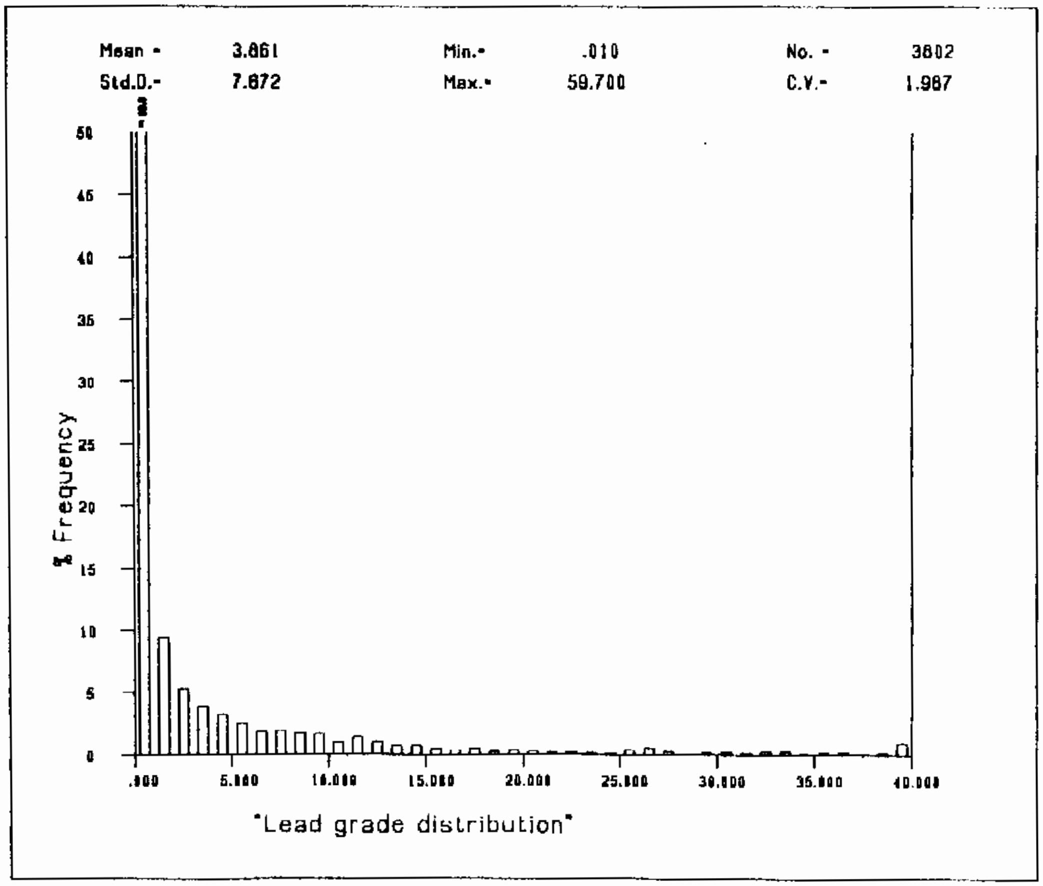

IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
TIN 2, ppm
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
TIN 1, ppm

APPENDIX II

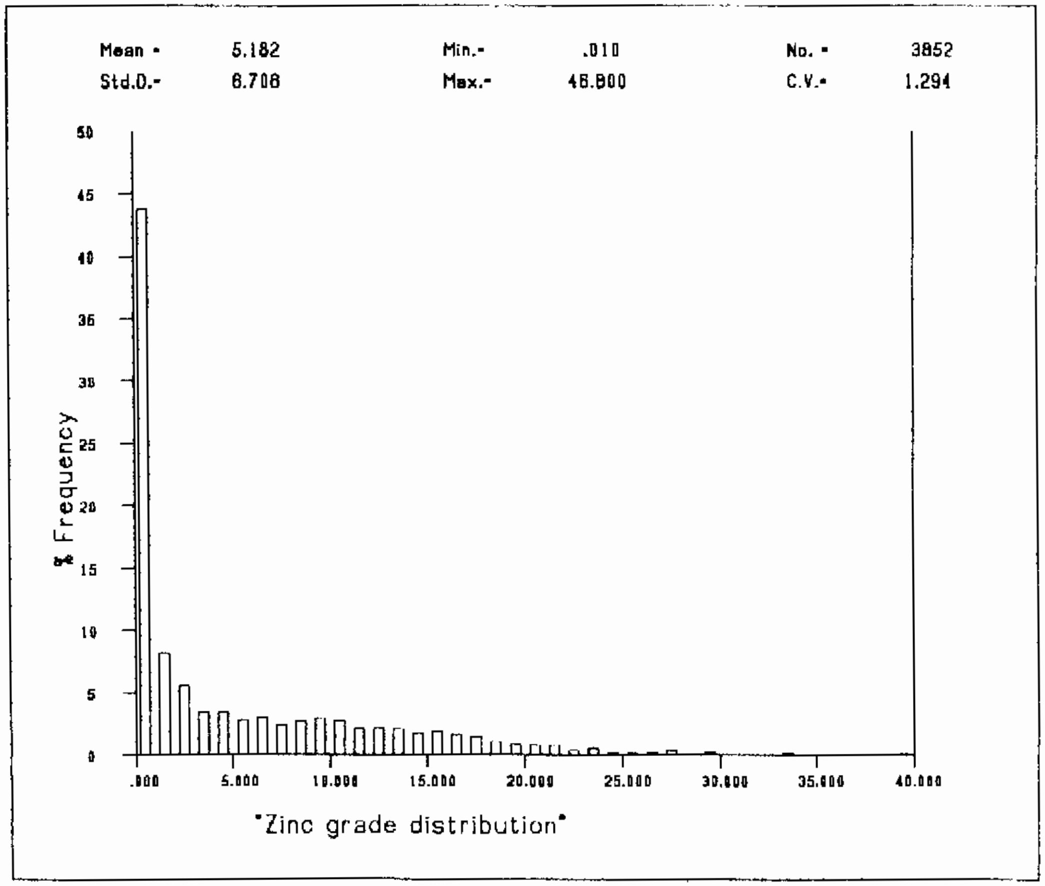
HISTOGRAMS
CUMULATIVE PROBABILITY PLOTS

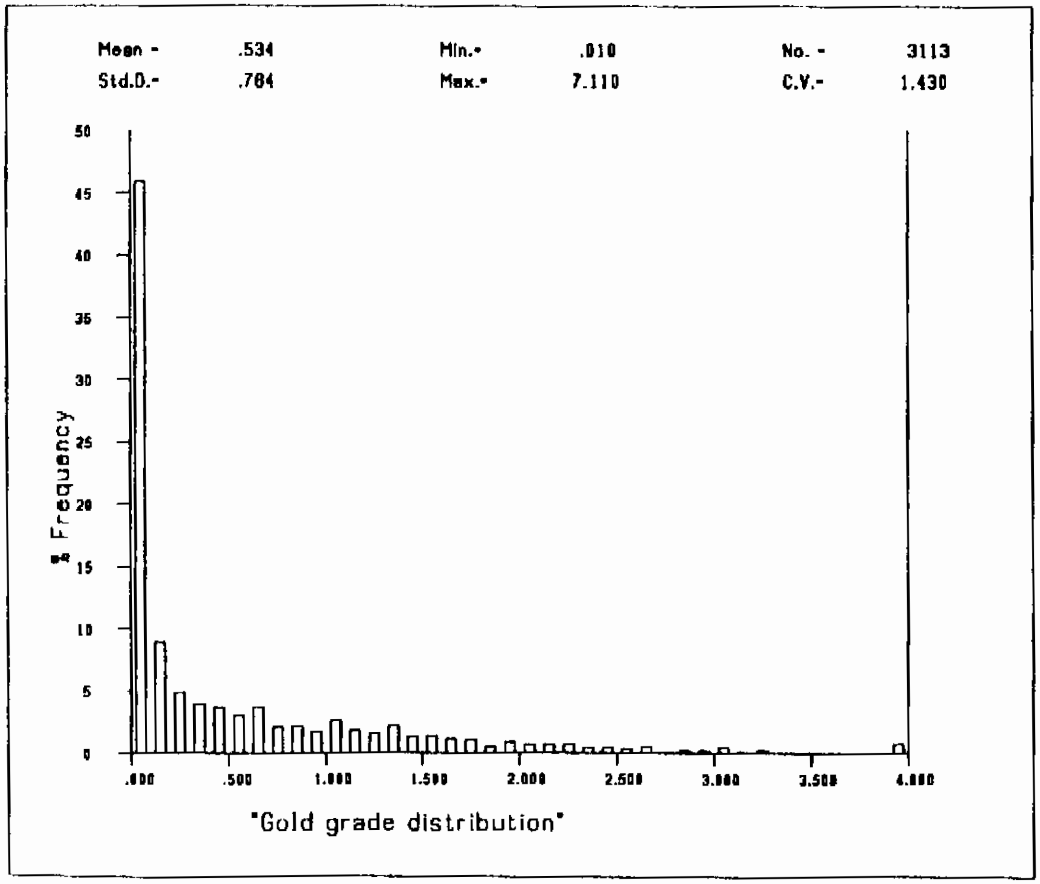


"Silver grade distribution"

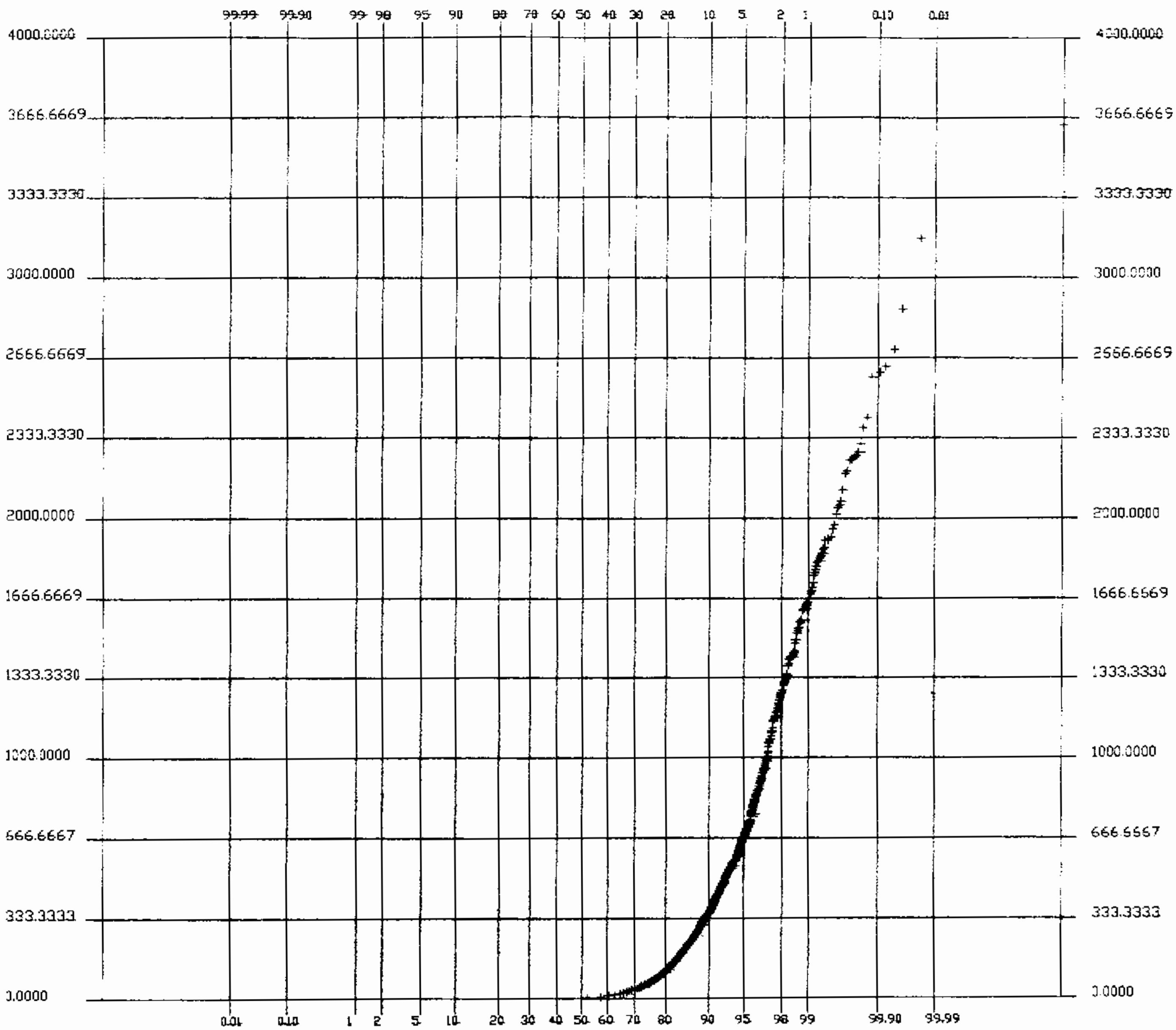


Mean = 3.861
Std.D.= 7.872
Min.= .010
Max.= 59.700
No. = 3802
C.V.= 1.987
% Frequency
50
45
40
35
30
25
20
15
10
5
0
.000
5.000
10.000
15.000
20.000
25.000
30.000
35.000
40.000
"Lead grade distribution"


Mean = 5.182
Std.D.= 6.706
Min.= .010
Max.= 46.800
No. = 3852
C.V.= 1.294
% Frequency
0
5
10
15
20
25
30
35
40
45
50
.000
5.000
10.000
15.000
20.000
25.000
30.000
35.000
40.000
"Zinc grade distribution"

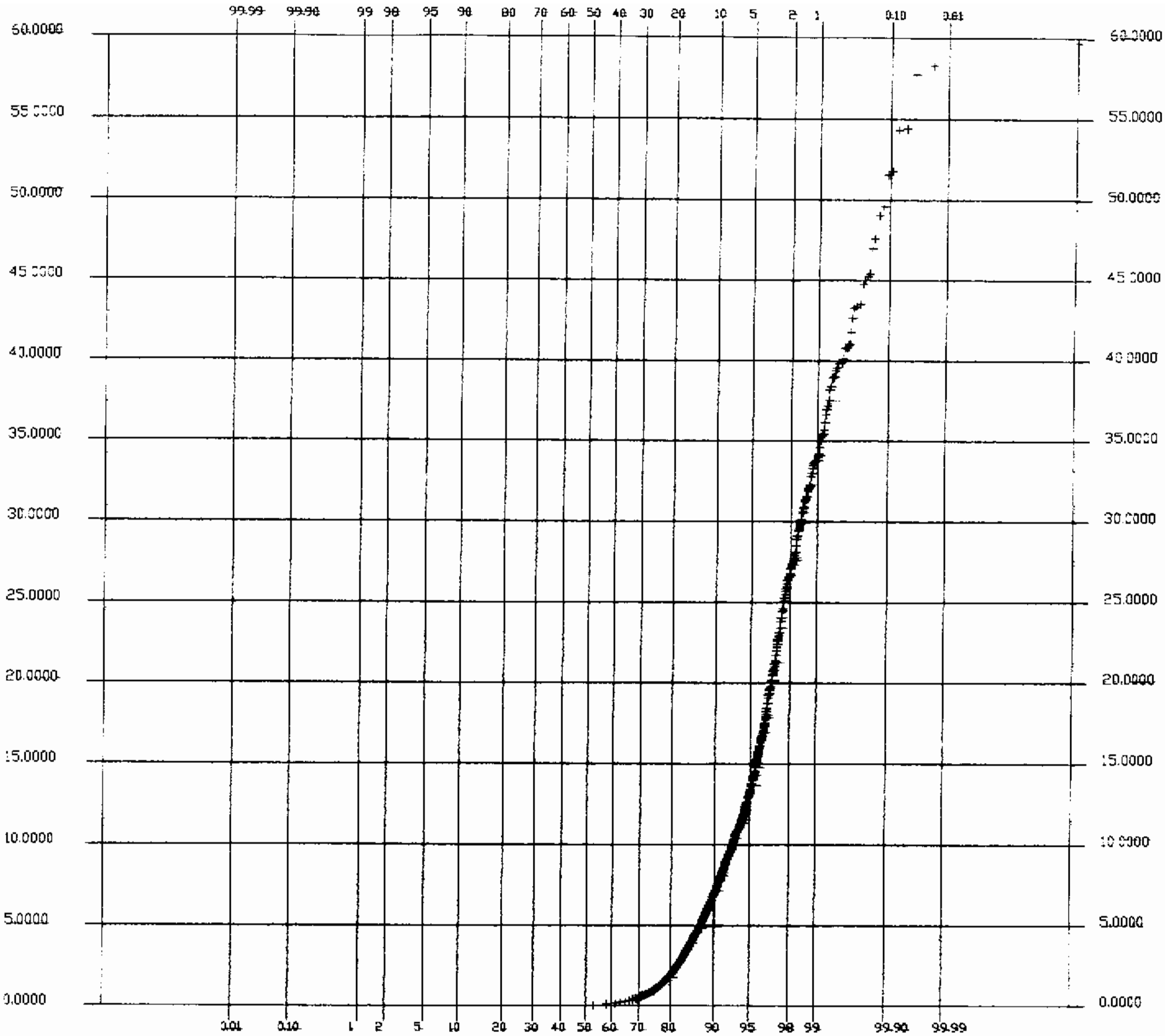


Mean = .534
Std.D.= .784
Min.= .010
Max.= 7.110
No. = 3113
C.V.= 1.430
% Frequency
50
45
40
35
30
25
20
15
10
5
0
.000
.500
1.000
1.500
2.000
2.500
3.000
3.500
4.000
"Gold grade distribution"



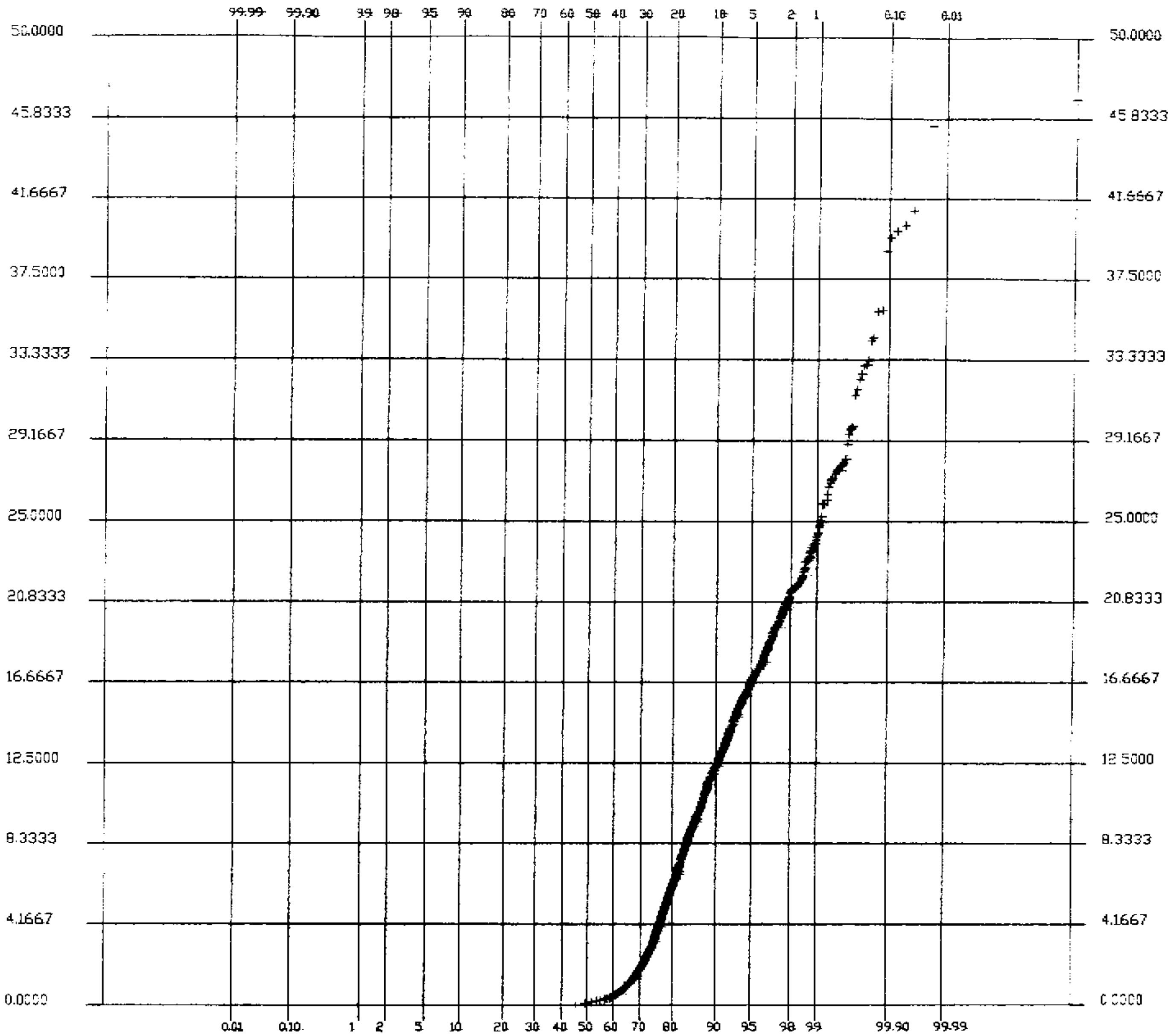
** PROBABILITY DISTRIBUTION PLOT OF AGI **

ITEM	AGI
NUMBER	5329
MEAN	121.0440
MINIMUM	0.0000
MAXIMUM	3636.1000
VARIANCE	98720.9609
ST.DEV	314.1990



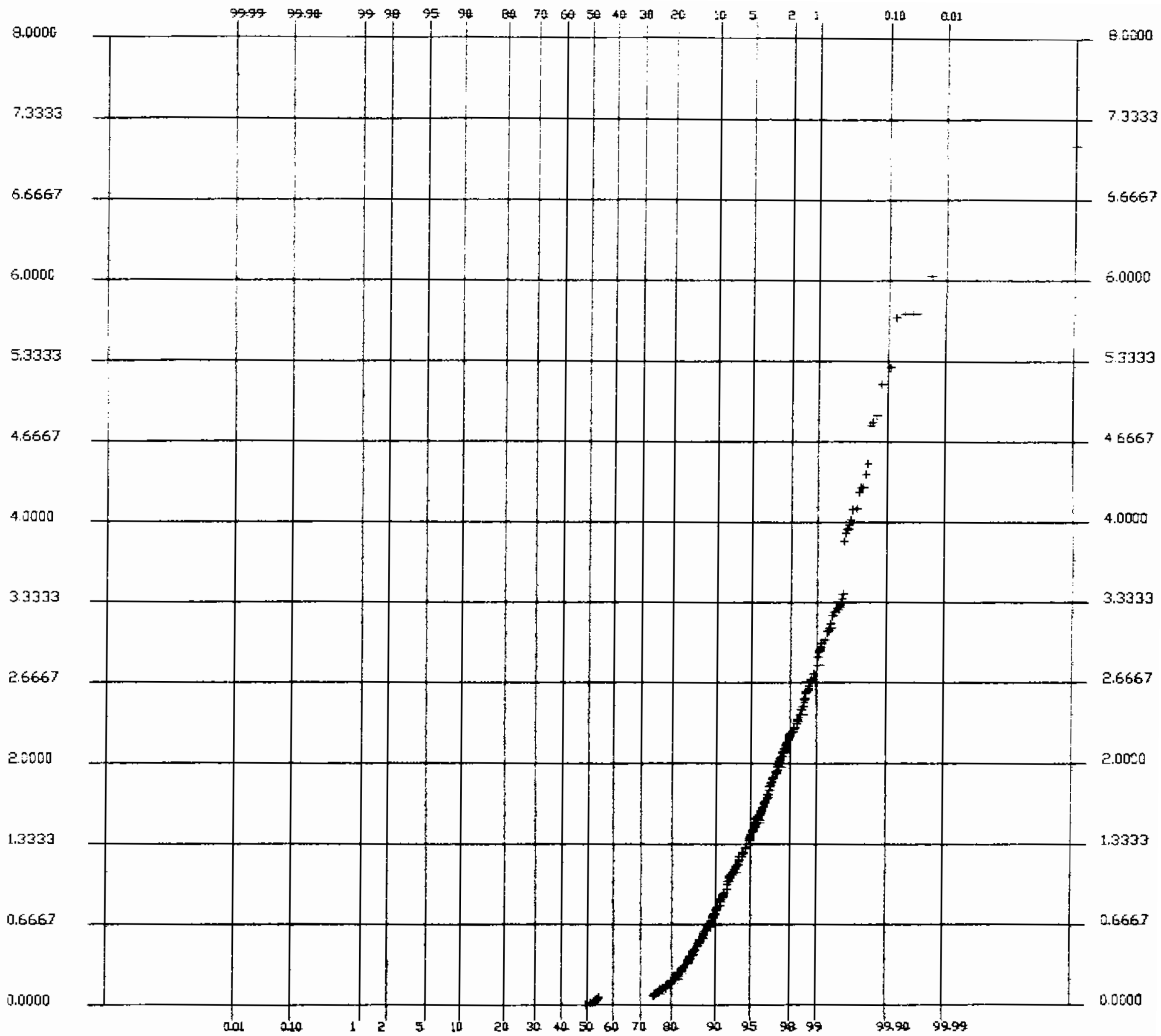
** PROBABILITY DISTRIBUTION PLOT OF PBI **

ITEM	PBI
NUMBER	5331
MEAN	2.3660
MINIMUM	0.0000
MAXIMUM	59.7000
VARIANCE	40.9370
ST.DEV.	6.3980



** PROBABILITY DISTRIBUTION PLOT OF ZNI **

ITEM	ZNI
NUMBER	5331
MEAN	3.2560
MINIMUM	0.0000
MAXIMUM	46.8000
VARIANCE	35.8130
ST.DEV	5.9840



** PROBABILITY DISTRIBUTION PLOT OF AUI **

ITEM	AUI
NUMBER	5331
MEAN	0.2390
MINIMUM	0.0000
MAXIMUM	7.1100
VARIANCE	0.3480
ST.DEV.	0.5900

APPENDIX III

NSV CALCULATIONS

LEAD ZINC COPPER SMELTER MODEL					2204.6		
(only alter figures in boxes, all other numbers are calcuated)							
FEED GRADE	ASSAY			METAL PRICES	($Can/tonne)	US$	Cent US/lb
%Copper	0.00			Copper	1587.31		100
%Lead	6.30			Zinc	1837.17	1322.76	60
%Zinc	8.40	oz/mt		Lead	765.49	551.15	25
Silver (g/t)	336	10.80		Silver ($/oz)		5.00	
Gold (g/t)	1	0.03		Gold ($/oz)		340.00	
Tonnage (Tonnes)	100						
				EXCHANGE RATE		0.72	

SEPARATE CONCS	$/t ROM	Can$/t ROM	COPPER + BULK	$/t ROM	an$/t ROM
COPPER	0.00	0.00	COPPER	0.00	0.00
ZINC	45.10	62.64	BULK	0.00	0.00
LEAD	45.35	62.98			
TOTAL	90.45	125.63	TOTAL	0.00	0.00

METALLURGICAL BALANCE

% RECOVERIES	COPPER CONC	ZINC CONC.	LEAD CONC.	TOTAL	BULK CONC
Copper	0.00	0.00	0.00	0.0	0.00
Zinc	0.00	83.00	10.00	93.0	0.00
Lead	0.00	5.00	90.00	95.0	0.00
Silver	0.00	5.00	77.00	82.0	0.00
Gold	0.00	25.00	25.00	50.0	0.00

CONCENTRATE GRADES %

	COPPER CONC.	ZINC CONC.	LEAD CONC.	BULK CONC
Copper	0.00	0.00	0.00	0.00
Zinc	#DIV/0!	54.50	3.50	0.00
Lead	#DIV/0!	1.80	61.80	0.00
Silver	#DIV/0!	5.37	97.19	0.00
Gold	#DIV/0!	0.00	0.00	0.00

							$	$/t Conc	$/t ROM Ore
Zn Conc	ZINC CONC								
Zn Conc			UNIT DEDUCT						
Zn Conc	RECOVERIES (%)		Copper	1.50	REVENUE	Copper	0.00	0.00	0.00
Zn Conc	Copper	0.00	Zinc	8.00		Zinc	8141.16	612.77	81.41
Zn Conc	Zinc	86.20	Lead	0.00		Lead	0.00	0.00	0.00
Zn Conc	lead	2.80	Iron	0.00		Iron	0.00	0.00	0.00
Zn Conc	Silver	6.60	Silver	3.00		Silver	117.90	8.87	1.18
Zn Conc	Gold	25.00	Gold	0.03		Gold	0.00	0.00	0.00
Zn Conc									
Zn Conc			% PAY			TOTAL	8259.06	621.64	82.59
Zn Conc	CONC. GRADE		Copper	0.00					
Zn Conc	Copper	0.00	Zinc	85.00	REFINING	Copper	0.00	0.00	0.00
Zn Conc	Zinc	54.50	Lead	0.00		Zinc	0.00	0.00	0.00
Zn Conc	Lead	1.80	Iron	0.00		Lead	0.00	0.00	0.00
Zn Conc	Silver	5.37	Silver	75.00		Iron	0.00	0.00	0.00
Zn Conc	Gold	0.000	Gold	75.00		Silver	9.43	0.71	0.09
Zn Conc						Gold	0.00	0.00	0.00
Zn Conc			REFINING($/UNIT)						
Zn Conc	CONC. TONNAGE	13.29	Copper	0.00		TOTAL	9.43	0.71	0.09
Zn Conc			Zinc	0.000					
Zn Conc			Lead	0.00	TRANSPORT		1195.73	90.00	11.96
Zn Conc			Iron	0.00					
Zn Conc			Silver	0.30	TREATMENT		2543.55	191.45	25.44
Zn Conc			Gold	6.00					
Zn Conc					PENALTIES		0.00	0.00	0.00
Zn Conc									
Zn Conc									
					NSR		4510.35	339.48	45.10
	LEAD CONC								
Pb Conc	RECOVERIES (%)						$	$/t Conc	$/t ROM Ore
Pb Conc	Copper	0.00	UNIT DEDUCT						
Pb Conc	Zinc	5.10	Copper	1.50	REVENUE	Copper	0.00	0.00	0.00
Pb Conc	Lead	90.50	Zinc	8.00		Zinc	0.00	0.00	0.00
Pb Conc	Silver	83.00	Lead	3.00		Lead	2985.26	323.58	29.85
Pb Conc	Gold	25.00	Iron	0.00		Iron	0.00	0.00	0.00
Pb Conc			Silver	1.60		Silver	4258.94	461.64	42.59
Pb Conc			Gold	0.03		Gold	0.00	0.00	0.00
Pb Conc	CONC. GRADE								
Pb Conc	Copper	0.00	% PAY			TOTAL	7244.20	785.22	72.44
Pb Conc	Zinc	3.50	Copper	25.00					
Pb Conc	Lead	61.80	Zinc	0.00	REFINING	Copper	0.00	0.00	0.00
Pb Conc	Silver	97.19	Lead	95.00		Zinc	0.00	0.00	0.00
Pb Conc	Gold	0.000	Iron	0.00		Lead	0.00	0.00	0.00
Pb Conc			Silver	95.00		Iron	0.00	0.00	0.00
Pb Conc			Gold	25.00		Silver	264.56	28.68	2.65
Pb Conc	CONC. TONNAGE	9.23				Gold	0.00	0.00	0.00
Pb Conc			REFINING($/UNIT)						
Pb Conc			Copper	0.00		TOTAL	264.56	28.68	2.65
Pb Conc			Zinc	0.000					
Pb Conc			Lead	0.00	TRANSPORT		830.32	90.00	8.30
Pb Conc			Iron	0.00					
Pb Conc			Silver	0.30	TREATMENT		1614.50	175.00	[illegible]6.15
Pb Conc			Gold	6.00					
Pb Conc					PENALTIES		0.00	0.00	0.00
Pb Conc									
					NSR		4534.83	491.54	45.35

Appendix F

Rock Quality Data

Field Estimation of Rock Hardness

Grade	Description	First Identification	Approximate Range of Uniaxial Compressive Strength (Mpa)
R0	Extremely weak rock	Indented by thumbnail	0.25-1.0
R1	Very weak rock	Crumbles under firm blow with the point of geological hammer.	1.0-5.0
R2	Weak rock	Can be peeled with a pocket knife	5-25
R3	Medium strong rock	Can be peeled with a pocket knife with difficult, shallow indentations made by a firm blow with the point of a geological hammer	25-50
R4	Strong rock	Cannot be scraped or peeled with a pocket knife. Specimen can be fractured with a single firm blow of geological hammer	50-100
R5	Very strong rock	Specimen requires more than one blow of a geological hammer to fracture it	100-250
R6	Extremely strong rock	Specimen requires many blow of the geological hammer to fracture it. Specimen can only be chipped with a geological hammer	> 250

Degree of Breakage - Classification Scheme

Category	Mean Spacing of Breaks (mm)	Qualitative Description
1	<15	Mostly fault gouge
2	<15	Gouge with crushed rock fragments
3	<15	Crushed rock with minor gouge
4	15-50	Crushed rock with no gouge
5	15-50	Crushed rock - diameter of pieces <25 mm
6	15-50	Crushed rock - diameter of pieces <50 mm
7	50-75	Intact rock - mean spacing 50-75 mm
8	75	Intact rock - mean spacing 75 mm
9	75-100	Intact rock - mean spacing 75-100 mm
10	100-150	Intact rock - mean spacing 100-150 mm
11	150	Intact rock - mean spacing 150 mm
12	150-200	Intact rock - mean spacing 150-200 mm
13	200-300	Intact rock - mean spacing 200-300 mm
14	300-600	Intact rock - mean spacing 300-600 mm
15	>600	Intact rock - mean spacing >600 mm

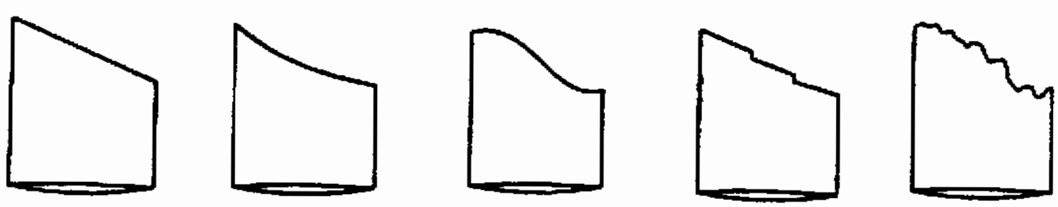
Joint Description

<u>Angles</u> - Measure of joints relative to the core axis.

<u>Number</u> - The number of joints in each drill run is used to determine the joint frequency.

<u>Surface</u> - The joint surface is assigned a roughness number utilizing the following shapes and roughness.

<u>Shape</u> -



Planar - P   Curved - C   Undulating - U   Stepped - S   Irregular - I

<u>Roughness</u> -

Polished - P
Slickensided - K   Smooth - S   Rough - R   Very Rough - V

Degree of Weathering - Classification Scheme

Degree of Weathering	Abbreviation	Mineralogical Description	Mechanical Description	Appearance
Fresh	Fr	No limonite staining on joints or in rock fabric, but coatings of chlorite, quartz, biotite, sulphides or clay on joints are common.	Rock not affected by weathering.	The rock shows no discoloration or loss of strength due to weathering.
Fresh Stained	PS	All minerals are fresh; some staining on joints.	Rock has original strength.	Fresh with weathered joints.
Slightly Weathered	SW	Some feldspar minerals show signs of decomposition. Limonite staining on joints and, in places, throughout the rock. The rock may have a bleached appearance.	Rings when struck with hammer; the strength approaches that of fresh rock.	The rock is slightly discolored and noticeably weakened or lower in strength than fresh rock.
Moderately Weathered	MW	Rock fabric is visible; some minerals partly decomposed into clay minerals; the rock is often limonite stained throughout its fabric.	Cannot be broken by hand; when struck with rock hammer, sound of impact is dull.	The rock is discolored and noticeably weakened, but 5 cm drill core cannot be broken by hand across the rock fabric.
Highly Weathered	HW	Original rock fabric observed; many minerals decomposed into clay minerals.	Can be broken and crumbled by hand. The material does not readily disintegrate in water.	The rock is usually discolored and weakened so that 5 cm drill core can be broken up readily by hand across the fabric. Wet strength usually much lower than dry strength.
Extremely Weathered	EW	Original rock fabric largely obscured. Most minerals, other than quartz, have decomposed into clays.	Can be broken and crumbled by hand; disintegrates in water.	The rock is discolored and completely changed to soil.

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: July 4th, 1997 | **Hole:** SSD -97- 4 | **Coordinates:** 43864.31 N, 25209.18 E | **Bearing:** 0
Core Size: HQ | **Dip:** -90
Logged By: Linda Lewis | **Total Depth:** 137.16 m | **Collar Elevation:** 1194.35 m

Depth (Metres)		Length	ecovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Plane		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
68.76	70.10	1.34	1.30	97	0.00	0	R0	3	PS	0, 60	1, 6	CR	50	100	Extremely fractured graphitic argillite + siltstone
70.10	71.63	1.53	1.49	97	0.00	0	R0	1	PS	60	3	CR			fractured + broken
71.63	73.15	1.52	1.45	95	0.00	0	R0	4	PS	20, 60	3, 2	CR			fractured + broken
73.15	74.68	1.53	1.48	97	0.00	0	R0	2	PS	0, 60	1, 1	CR			fractured + broken
74.68	76.20	1.52	1.52	100	0.00	0	R1	3	PS	25, 0, 60	1, 3, 3	IR			fractured + broken
76.20	77.42	1.22	0.99	81	0.00	0	R1	3	PS	20, 60	2, 1	IR			Fault gauge + fractured rock
77.42	78.33	0.91	0.65	71	0.00	0	R1	3	PS						Fault gauge + fractured rock
78.33	79.25	0.92	0.81	88	0.00	0	R0-R1	2	PS	0	1	IR			Crushed rock
79.25	80.77	1.52	0.95	63	0.00	0	R1	4	PS						
80.77	82.30	1.53	1.70	78	0.00	0	R2	5	PS	60	6	IR			
82.30	83.82	1.62	1.45	90	0.41	25	R3	6	PS	85	2	CR			
83.82	85.34	1.52	1.52	100	1.35	89	R3	8	PS						
85.34	86.87	1.53	1.36	89	0.70	46	R3	8	PS	35	6	PR			
86.87	88.39	1.52	1.52	100	0.72	47	R3	8	PS	60, 90, 70	5, 2, 1	IR			
88.39	89.92	1.53	1.53	100	1.20	78	R3	9	PS	90, 40, 60	1, 2, 2	IR			
89.92	91.44	1.52	1.49	97	1.40	92	R3	10	PS	90, 60	1, 1	IR			
91.44	92.96	1.52	1.52	100	1.02	67	R3	8	PS	40, 60, 90	1, 1, 4	IR			
92.96	96.01	3.05	3.05	100	2.47	81	R3	11	PS	65, 90	4, 3	IR			
96.01	99.06	3.05	3.05	100	2.39		R3	11	FR	60	4	PR			
99.06	102.11	3.05	3.05	100	2.12		R3	9	FR	60, 0, 35	4, 1, 2	PR			
102.11	105.16	3.05	3.05	100	2.74		R3	12	FR	25, 60, 85	2, 1, 1	PS, PR			
105.16	108.20	3.04	3.04	100	2.57		R3	11	FR	40, 60, 90	2, 5, 2	PR			
108.20	111.25	3.05	2.86	94	2.60		R3	12	FR	60, 70, 80	2, 2, 3	PR			
111.25	114.30	3.05	3.05	100	2.25		R3	10	FR	60, 35, 0	3, 1, 1	PR			
114.30	117.35	3.05	3.03	99	2.33		R3	12	FR	60, 90	3, 1	PR			
117.35	120.40	3.05	3.05	100	2.48		R3	13	FR	90, 80, 70	4, 2, 2	PR			
120.40	123.44	3.04	3.00	99	2.25		R3	10	FR	60, 90	6, 3	PR			
123.44	126.49	3.05	3.05	100	2.47		R3	10	FR	90, 60	3, 7	PR			
126.49	129.54	3.05	3.05	100	2.33		R3	9	FR	40, 60	2, 2	PR			
129.54	132.59	3.05	3.05	100	2.54		R3	12	FR	60, 40	3, 2	PR - PS			
132.59	135.64	3.05	3.05	100	2.76		R3	13	FR	60, 90	2, 3				
135.64	137.16	1.52	1.52	100	1.51		R3	11	FR	60, 90	3, 1				

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: July 8th, 1997 **Hole:** SSD -97- 5 **Coordinates:** 44003.59 N **Collar Elevation:** 1172.3 m
Core Size: HQ 25301.29 E **Bearing:** 0
Logged By: Linda Lewis **Total Depth** 228.6 m **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
16.76	17.07	0.31	0.23	74%											
17.07	19.20	2.13	0.81	38%											
19.20	20.42	1.22	0.45	37%											
20.42	21.34	0.92	0.35	38%											
21.34	22.86	1.52	0.04	3%											
22.86	24.38	1.52	0.10	7%											
24.38	25.91	1.53	0.20	13%											
25.91	28.04	2.13	0.25	12%											
28.04	28.96	0.92	0.36	39%											
28.96	32.00	3.04	0.38	13%											
32.00	34.44	2.44	0.85	35%											
34.44	35.20	0.76	0.78	103%											
35.20	38.10	2.90	1.44	50%											
38.10	41.15	3.05	1.82	60%											
41.15	43.43	2.28	0.83	36%											
43.43	44.20	0.77	0.90	117%											
44.20	47.24	3.04	1.82	60%											
47.24	48.76	1.52	0.46	30%											
48.76	50.29	1.53	0.00	0%											
50.29	51.21	0.92	0.32	35%											
51.21	52.43	1.22	0.40	33%											
52.43	53.34	0.91	0.48	53%											
53.34	53.95	0.61	0.59	97%											
53.95	55.17	1.22	1.10	90%											
55.17	56.34	1.17	0.20	17%											
56.34	57.30	0.96	0.00	0%											
57.30	57.91	0.61	0.00	0%											
57.91	58.83	0.92	0.10	11%											
58.83	59.44	0.61	0.18	30%											
59.44	60.05	0.61	0.34	56%											
60.05	60.35	0.30	0.10	33%											
60.35	60.96	0.61	0.30	49%											
60.96	61.87	0.91	0.29	32%											
61.87	62.48	0.61	0.27	44%											
62.48	63.09	0.61	0.18	30%											
63.09	64.31	1.22	0.56	46%											
64.31	65.53	1.22	0.63	52%											
65.53	68.58	3.05	0.00	0%											
68.58	70.10	1.52	0.35	23%											
70.10	71.63	1.53	0.00	0%											
71.63	72.54	0.91	0.45	49%											
72.54	73.46	0.92	0.63	68%											
73.46	74.37	0.91	1.07	118%											
74.37	75.59	1.22	0.80	66%											

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: July 8th, 1997
Hole: SSD-97-5
Core Size: HQ
Total Depth: 228.6 m
Coordinates: 44003.59 N, 25301.29 E
Collar Elevation: 1172.3 m
Bearing: 0
Dip: -90
Logged By: Linda Lewis

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
75.59	76.81	1.22	0.98	80%											
76.81	77.72	0.91	0.82	90%											
77.72	78.33	0.61	0.54	89%											
78.33	79.25	0.92	0.68	74%											
79.25	80.16	0.91	0.82	90%											
80.16	80.77	0.61	0.60	98%											
80.77	81.38	0.61	0.42	69%											
81.38	82.30	0.92	0.90	98%											
82.30	83.82	1.52	1.12	74%											
83.82	84.43	0.61	0.41	67%											
84.43	85.34	0.91	0.90	99%											
85.34	86.87	1.53	1.37	90%											
86.87	88.09	1.22	0.42	34%											
88.09	89.00	0.91	0.69	76%											
89.00	89.92	0.92	0.54	59%											
89.92	91.44	1.52	1.53	101%											
91.44	92.05	0.61	0.45	74%											
92.05	93.27	1.22	1.08	89%											
93.27	94.49	1.22	0.81	66%											
94.49	96.01	1.52	1.42	93%											
96.01	96.93	0.92	0.93	101%											
96.93	97.84	0.91	0.81	89%											
97.84	99.06	1.22	1.03	84%											
99.06	99.67	0.61	0.58	95%											
99.67	101.50	1.83	1.67	91%											
101.50	103.02	1.52	1.24	82%											
103.02	103.63	0.61	0.38	62%											
103.63	105.16	1.53	0.86	56%											
105.16	106.07	0.91	0.27	30%											
106.07	107.59	1.52	0.30	20%											
107.59	108.36	0.77	0.63	82%											
108.36	109.13	0.77	0.61	79%											
109.13	110.03	0.90	0.85	94%											
110.03	110.79	0.76	0.55	72%											
110.79	111.56	0.77	0.75	97%											
111.56	113.08	1.52	1.16	76%											
113.08	114.30	1.22	1.09	89%											
114.30	115.21	0.91	0.84	92%											
115.21	116.74	1.53	1.24	81%											
116.74	117.81	1.07	0.99	93%											
117.81	119.48	1.67	1.36	81%											
119.48	120.40	0.92	0.88	96%											
120.40	121.92	1.52	1.30	86%											
121.92	123.44	1.52	1.46	96%											

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*

Date: *July 8th, 1997* | *Hole:* *SSD-97-5* | *Coordinates:* *44003.59 N* | *Collar Elevation:* *1172.3 m*
Core Size: *HQ* | *25301.29 E* | *Bearing:* *0*
Logged By: *Linda Lewis* | *Total Depth* *228.6 m* | *Dip:* *-90*

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
123.44	124.97	1.53	1.48	97%											
124.97	126.49	1.52	1.52	100%											
126.49	128.02	1.53	1.33	87%											
128.02	129.54	1.52	1.34	88%											
129.54	131.06	1.52	1.13	74%											
131.06	132.59	1.53	1.43	93%											
132.59	135.03	2.44	1.37	56%											
135.03	135.64	0.61	0.61	100%											
135.64	136.55	0.91	1.32	145%											
136.55	137.46	0.91	0.92	101%											
137.46	138.68	1.22	1.04	85%											
138.68	140.21	1.53	1.53	100%											
140.21	141.73	1.52	1.48	97%											
141.73	143.26	1.53	0.53	35%											
143.26	144.48	1.22	1.23	101%											
144.48	145.39	0.91	0.96	105%											
145.39	146.61	1.22	1.21	99%											
146.61	147.83	1.22	1.22	100%											
147.83	149.35	1.52	1.50	99%											
149.35	150.88	1.53	1.45	95%											
150.88	151.79	0.91	0.83	91%											
151.79	153.92	2.13	1.95	92%											
153.92	156.51	2.59	2.59	100%											
156.51	157.89	1.38	1.13	82%											
157.89	159.41	1.52	1.55	102%											
159.41	160.93	1.52	1.52	100%											
160.93	162.46	1.53	1.52	99%											
162.46	164.13	1.67	1.24	74%											
164.13	164.90	0.77	0.98	127%											
164.90	165.81	0.91	0.91	100%											
165.81	167.34	1.53	1.54	101%											
167.34	168.86	1.52	1.38	91%											
168.86	170.38	1.52	1.48	97%											
170.38	171.91	1.53	1.40	92%											
171.91	172.21	0.30	0.49	163%											
172.21	173.74	1.53	1.42	93%											
173.74	174.65	0.91	0.74	81%											
174.65	175.56	0.91	0.42	46%											
175.56	176.78	1.22	1.00	82%											
176.78	178.31	1.53	1.55	101%											
178.31	179.22	0.91	0.76	84	0.00	0	R2	4	FR						Very brittle rocks
179.22	180.44	1.22	1.15	94	0.00	0	R2	4	FR						minor gouge at 179.22, brittle rock
180.44	181.97	1.53	1.53	100	0.10	6.5	R2	5	FR	50	1	IR			brittle rock
181.97	182.88	0.91	0.91	100	0.10	11	R2	5	FR	60	1	PR			

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*

Date: *July 8th, 1997* | *Hole:* *SSD-97-5* | *Coordinates:* *44003.59 N* / *25301.29 E* | *Collar Elevation:* *1172.3 m*
Core Size: *HQ* | *Bearing:* *0*
Logged By: *Linda Lewis* | *Total Depth* *228.6 m* | *Dip:* *-90*

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
182.88	184.40	1.52	1.51	99	0.14	9.2	R2	5	FR	60, 85	2, 2	PS, IR			brittle rock, breaks along [illegible] planes
184.40	185.93	1.53	1.53	100	0.00	0	R2	4	FR						weak argillite
185.93	188.06	2.13	2.13	100	0.00	0	R2	4	FR	60, 0	1	IR			
188.06	189.28	1.22	1.07	88	0.10	8.2	R1	3	FR						very broken up rock with gouge
189.28	190.50	1.22	0.87	71	0.00	0	R1	3	FR	0	1, 2	IR			
190.50	192.02	1.52	1.26	83	0.00	0	R2	5	FR	60, 40		PS, IR			
192.02	193.55	1.53	1.27	83	34.00	22	R3	6	FR	40, 0	1	PR			34cm of interval is intact medium rock
193.55	195.07	1.52	1.23	81	0.82	54	R3	7	FR	40	1, 1	PS			32cm of interval is fault gouge
195.07	196.60	1.53	1.29	84	1.00	65	R2	11	FR	60, 85	1, 1	PR			first 40cm hs strength of R3
196.60	197.82	1.22	0.97	80	0.22	18	R2	3	FR	60, 85	3	PR			final 30cm of interval is sulphide gouge
197.82	199.49	1.67	1.57	94	0.91	54	R3	10	FR	85, 60, 40	1, 4	PR			limestone sulphide content in interval / limestone with stylolites along which rock
199.49	201.02	1.53	1.52	99	1.29	84	R3	12	FR	0, 85, 90, 40	4, 2, 1	PR			may break / limestone with stylolites along which rock
201.02	202.69	1.67	1.55	93	1.25	75	R3	12	FR	85, 95, 40, 70	2, 3, 2, 1	IR			may break
202.69	204.22	1.53	1.53	100	1.32	86	R3	13	FR	85, 90, 60	2, 1, 3, 1	PS			within interval there are fractures at 0° to
204.22	205.74	1.52	1.52	100	1.00	66	R3	12	FR	35, 85, 60	1, 1, 3	PS, IR			core axis
205.74	207.26	1.52	1.52	100	0.73	48	R3	9	FR	60, 35, 0	3, 2, 2	IR, PR			final 160cm of interval is broken up dolomite
207.26	208.78	1.52	1.50	99	0.34	22	R3	7	FR	0, 60, 75	1, 1, 1	IR, PR			the rock in this interval is broken up dolomite
208.78	210.31	1.53	1.53	100	1.21	79	R3	12	FR	45, 90	1, 1, 1	PS, IR			
210.31	211.84	1.53	1.53	100	1.30	85	R3	14	FR	90, 20	2, 5	IR			limestone with stylolites along union rock
211.84	213.36	1.52	1.52	100	1.02	67	R3	12	FR	40, 20, 90	2, 1	PR			breaks
213.36	214.88	1.52	1.49	98	0.99	65	R3	12	FR	30, 40, 90, 60	3, 1, 1,	PR			
214.88	216.41	1.53	1.53	100	0.87	57	R3	12	FR	30, 40, 60, 50	3, 3, 2, 1	PR, IR			at bottom of interval there is a verse joint at
216.41	217.93	1.52	1.49	98	0.77	51	R3	10	FR	0, 90, 30, 85	1, 2, 1, 1	IR, PR			0°
217.93	219.46	1.53	1.52	99	0.62	41	R3	10	FR	60, 0, 20, 40	6, 1, 1, 1	IR, PR			
219.46	222.50	3.04	3.04	100	7.85	94	R3	14	FR	60, 90	3, 5	PR, IR			
222.50	224.03	1.53	1.37	90	1.24	81	R3	14	FR	80, 75	2, 1	PR			stylolites in rock may cause it to break
224.03	225.55	1.53	1.52	100	1.20	78	R3	12	FR	60, 40, 90	3, 1, 1	PS, IR			
225.55	227.07	1.52	1.31	86	1.05	69	R3	12	FR	90, 0, 80	3, 1, 1	PR, IR			
227.07	228.60	1.53	1.53	100	1.26	82	R3	13	FR	50, 30, 80	3, 1, 2	PS, IR			

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*														
Date:					***Hole:***		***SSRD-97-6***		***Coordinates:***	***44127.04 N***			***Collar Elevation:***		***1160.70 m***
					Core Size:					***25360.37 E***			***Bearing:***	***0***	
Logged By:		***Linda Lewis***			***Total Depth:***		***288.04 m***						***Dip:***	***-90***	
Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
10.67	12.50	1.83	1.50	82%											
12.50	13.72	1.22	0.50	41%											
13.72	15.54	1.82	0.82	45%											
15.54	17.07	1.53	0.40	26%											
17.07	18.29	1.22	0.97	80%											
18.29	19.81	1.52	0.76	50%											
19.81	21.34	1.53	0.42	27%											
21.34	22.86	1.52	0.71	47%											
22.86	24.99	2.13	0.64	30%											
24.99	25.91	0.92	0.22	24%											
25.91	26.52	0.61	0.15	25%											
26.52	27.43	0.91	0.57	63%											
27.43	28.96	1.53	0.82	54%											
28.96	29.87	0.91	0.64	70%											
29.87	30.78	0.91	0.10	11%											
30.78	31.39	0.61	0.08	13%											
31.39	32.00	0.61	0.60	98%											
32.00	32.92	0.92	0.67	73%											
32.92	34.44	1.52	1.49	98%											
34.44	35.05	0.61	0.15	25%											
35.05	36.58	1.53	0.73	48%											
36.58	37.49	0.91	0.48	53%											
37.49	38.10	0.61	0.45	74%											
38.10	38.71	0.61	0.16	26%											
38.71	39.93	1.22	0.79	65%											
39.93	41.15	1.22	1.16	95%											
41.15	42.06	0.91	0.62	68%											
42.06	43.59	1.53	1.11	73%											
43.59	45.11	1.52	1.12	74%											
45.11	46.63	1.52	0.64	42%											
46.63	48.16	1.53	0.37	24%											
48.16	48.77	0.61	0.19	31%											
48.77	49.38	0.61	0.34	56%											

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*

Date: **Hole:** SSRD-97-6 **Coordinates:** 44127.04 N **Collar Elevation:** 1160.70 m
Core Size: 25360.37 E **Bearing:** 0
Logged By: Linda Lewis **Total Depth:** 288.04 m **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
49.38	50.29	0.91	0.36	40%											
50.29	50.60	0.31	0.24	77%											
50.60	51.82	1.22	0.73	60%											
51.82	53.34	1.52	0.40	26%											
53.34	53.65	0.31	0.13	42%											
53.65	54.86	1.21	0.72	60%											
54.86	56.39	1.53	0.30	20%											
56.39	57.61	1.22	0.51	42%											
57.61	58.83	1.22	0.48	39%											
58.83	59.44	0.61	0.52	85%											
59.44	60.96	1.52	0.64	42%											
60.96	62.48	1.52	0.00	0%											
62.48	64.01	1.53	0.50	33%											
64.01	65.53	1.52	1.49	98%											
65.53	68.58	3.05	1.73	57%											
68.58	71.63	3.05	1.96	64%											
71.63	74.37	2.74	1.90	69%											
74.37	76.20	1.83	1.10	60%											
76.20	77.72	1.52	1.15	76%											
77.72	80.77	3.05	2.50	82%											
80.77	83.82	3.05	2.56	84%											
83.82	86.87	3.05	2.45	80%											
86.87	89.92	3.05	2.06	68%											
89.92	92.96	3.04	3.04	100%											
92.96	96.01	3.05	2.43	80%											
96.01	98.45	2.44	1.98	81%											
98.45	99.06	0.61	0.67	110%											
99.06	99.36	0.3	0.28	93%											
99.36	99.67	0.31	0.28	90%											
99.67	100.89	1.22	0.24	20%											
100.89	101.80	0.91	0.74	81%											
101.80	102.41	0.61	0.47	77%											
102.41	103.33	0.92	0.91	99%											

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***														
Date:					***Hole:***	***SSRD-97-6***		***Coordinates:***		***44127.04 N***			***Collar Elevation:***	***1160.70 m***	
					Core Size:					***25360.37 E***			***Bearing:***	***0***	
Logged By:		***Linda Lewis***			***Total Depth:***	***288.04 m***							***Dip:***	***-90***	
Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
103.33	104.85	1.52	1.30	86%											
104.85	106.38	1.53	1.36	89%											
106.38	106.98	0.6	0.57	95%											
106.98	107.90	0.92	0.87	95%											
107.90	108.81	0.91	0.48	53%											
108.81	109.73	0.92	0.46	50%											
109.73	110.64	0.91	0.68	75%											
110.64	111.25	0.61	0.59	97%											
111.25	112.17	0.92	0.78	85%											
112.17	113.08	0.91	0.43	47%											
113.08	114.30	1.22	1.07	88%											
114.30	114.90	0.6	0.48	80%											
114.90	115.82	0.92	0.89	97%											
115.82	117.04	1.22	1.05	86%											
117.04	117.96	0.92	0.88	96%											
117.96	119.18	1.22	0.62	51%											
119.18	120.09	0.91	0.86	95%											
120.09	121.00	0.91	0.92	101%											
121.00	122.53	1.53	1.53	100%											
122.53	123.44	0.91	0.67	74%											
123.44	124.36	0.92	0.91	99%											
124.36	125.27	0.91	0.75	82%											
125.27	126.49	1.22	1.18	97%											
126.49	128.02	1.53	1.67	109%											
128.02	129.54	1.52	1.34	88%											
129.54	131.06	1.52	1.51	99%											
131.06	132.60	1.54	1.54	100%											
132.60	134.11	1.51	1.46	97%											
134.11	135.64	1.53	1.38	90%											
135.64	137.16	1.52	1.42	93%											
137.16	138.68	1.52	1.44	95%											
138.68	141.73	3.05	2.53	83%											
141.73	144.78	3.05	3.05	100%											

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*

Date: | *Hole:* SSRD-97-6 | *Coordinates:* 44127.04 N, 25360.37 E | *Collar Elevation:* 1160.70 m
Core Size: | *Bearing:* 0
Logged By: Linda Lewis | *Total Depth:* 288.04 m | *Dip:* -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
144.78	147.83	3.05	3.06	100%											
147.83	150.27	2.44	2.55	105%											
150.27	153.01	2.74	2.26	82%											
153.01	153.92	0.91	0.84	92%											
153.92	156.97	3.05	2.93	96%											
156.97	160.02	3.05	2.82	92%											
160.02	166.17	6.15	5.10	83%											
166.17	168.86	2.69	2.05	76%											
168.86	172.21	3.35	2.27	68%											
172.21	175.26	3.05	2.92	96%											
175.26	178.31	3.05	3.05	100%											
178.31	179.22	0.91	1.06	116%											
179.22	181.05	1.83	1.97	108%											
181.05	182.58	1.53	1.60	105%											
182.58	183.18	0.6	0.54	90%											
183.18	183.95	0.77	0.84	109%											
183.95	184.40	0.45	0.60	133%											
184.40	185.32	0.92	0.76	83%											
185.32	188.06	2.74	2.45	89%											
188.06	189.28	1.22	1.02	84%											
189.28	190.50	1.22	1.08	89%											
190.50	192.02	1.52	1.77	116%											
192.02	193.24	1.22	1.22	100%											
193.24	194.77	1.53	1.18	77%											
194.77	196.29	1.52	1.43	94%											
196.29	196.60	0.31	0.31	100%											
196.60	198.12	1.52	1.38	91%											
198.12	199.64	1.52	1.43	94%											
199.64	200.86	1.22	0.95	78%											
200.86	202.39	1.53	1.58	103%											
202.39	203.91	1.52	1.43	94%											
203.91	205.44	1.53	1.48	97%											
205.44	206.96	1.52	1.43	94%											

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: | ***Hole:*** ***SSRD-97-6*** | ***Coordinates:*** ***44127.04 N*** ***25360.37 E*** | ***Collar Elevation:*** ***1160.70 m***
Core Size: | ***Bearing:*** ***0***
Logged By: *Linda Lewis* | ***Total Depth:*** ***288.04 m*** | ***Dip:*** ***-90***

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
206.96	208.48	1.52	1.56	103%											
208.48	210.01	1.53	1.38	90%											
210.01	210.62	0.61	0.54	89%											
210.62	210.92	0.3	0.23	77%											
210.92	211.83	0.91	0.55	60%											
211.83	212.45	0.62	0.52	84%											
212.45	217.93	5.48	4.03	74%											
217.93	220.98	3.05	2.74	90%											
220.98	224.03	3.05	2.80	92%											
224.03	227.08	3.05	2.48	81%											
227.08	230.12	3.04	2.90	95%											
230.12	233.17	3.05	2.66	87%											
233.17	236.22	3.05	2.66	87%											
236.22	239.27	3.05	2.20	72%											
239.27	242.32	3.05	2.80	92%											
242.32	244.75	2.43	2.39	98%											
244.75	245.36	0.61	0.46	75%											
245.36	246.28	0.92	0.60	65%											
246.28	246.89	0.61	0.44	72%	0	0%	R2	4	FR	?	?	?	30		
246.89	248.02	1.13	1.06	94%	0	0%	R2	3	FR	?	?	?	20, 5		
248.02	249.94	1.92	0.61	32%	0	0%	R2	4	FR	?	?	?	85		
249.94	251.46	1.52	1.04	68%	0	0%	R2	4	FR	85	5	PS	75		
251.46	252.68	1.22	0.36	30%	0	0%	R2	3	FR	?	?	?	?		
252.68	254.51	1.83	0.52	28%	0	0%	R2	4	FR	85	5	PS	85		
254.51	256.03	1.52	1.05	69%	0	0%	R2	4	FR	85, 75	3, 3	PS	75		
256.03	257.75	1.72	1.02	59%	0	0%	R2	4	FR	0, 90	1, 2	PS	85		
257.75	258.78	1.03	1.39	135%	0	0%	R2	5	FR	10, 0, 85, 70	1, 3, 1, 1	PS	80		
258.78	260.30	1.52	1.27	84%	0	0%	R2	6	FR	80, 70	4, 1	PS	80		
260.30	263.65	3.35	2.80	84%	1.27	38%	R3	10	FR	70, 60, 40	2, 2, 7	PR	89		
263.65	265.18	1.53	1.40	92%	0.31	20%	R3	10	FR	35, 70, 0	1, 1, 1	PR			limestone
265.18	266.70	1.52	1.45	95%	1.15	76%	R3	11	FR	45, 60, 75	2, 1, 1	PR			
266.70	269.75	3.05	2.94	96%	2.4	79%	R3	14	FR	80, 90, 70	2, 1, 1	PR, IR			
269.75	271.27	1.52	1.52	100%	0.71	47%	R3	11	FR	50, 60, 10, 0	2, 1, 2, 1	PR			

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: ***Hole:*** ***SSRD-97-6*** ***Coordinates:*** ***44127.04 N*** ***Collar Elevation:*** ***1160.70 m***

Core Size: ***25360.37 E*** ***Bearing:*** ***0***

Logged By: ***Linda Lewis*** ***Total Depth:*** ***288.04 m*** ***Dip:*** ***-90***

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
271.27	272.80	1.53	1.49	97%	1.35	88%	R3	13	FR	80, 75, 50	2, 1, 1	PR			
272.80	274.32	1.52	1.52	100%	1.4	92%	R3	13	FR	80, 60	3, 2	PS, PR			
274.32	275.84	1.52	1.43	94%	0.93	61%	R3	12	FR	50, 85, 20	1, 4, 1	PR, IR			
275.84	278.89	3.05	2.96	97%	1.69	55%	R3	12	FR	40, 75, 60, 85	4, 1, 1, 4	PR, IR			
278.89	281.94	3.05	2.74	90%	1.7	56%	R3	11	FR	40, 85, 60, 70	1, 7, 3, 1	PR, IR			
281.94	284.99	3.05	2.93	96%	0.94	31%	R3	11	FR	35, 0, 80, 60, 50	2, 1, 4, 3, 1	PR, IR			
284.99	288.04	3.05	2.70	89%	0.93	30%	R3	9	FR	60, 75, 85	1, 2, 8	PR, IR			dolomitic rock

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*

Date: | **Hole:** SSRD -97- 7 | **Coordinates:** 43067.00 N, 25113.00 E | **Collar Elevation:** 1500.00 m
Core Size: | **Bearing:** 0
Logged By: Linda Lewis | **Total Depth:** 213.36 m | **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
214.65	216.41	1.76	1.66	94%											
216.41	217.78	1.37	1.02	74%											
217.78	219.00	1.22	0.51	42%											
219.00	220.98	1.98	1.24	63%											
220.98	221.59	0.61	0.63	103%											
221.59	224.64	3.05	0.60	20%											
224.64	225.55	0.91	0.40	44%											
225.55	228.60	3.05	1.90	62%											
228.60	231.34	2.74	1.91	70%											
231.34	237.13	5.79	2.84	49%											
237.13	240.18	3.05	2.89	95%											
240.18	241.86	1.68	1.42	85%											
241.86	243.84	1.98	1.61	81%											
243.84	246.89	3.05	2.97	97%											
246.89	249.94	3.05	2.90	95%											
249.94	251.46	1.52	1.28	84%											
251.46	255.73	4.27	3.45	81%											
255.73	258.78	3.05	3.03	99%											
258.78	260.91	2.13	1.88	88%											
260.91	263.96	3.05	2.97	97%											
263.96	265.18	1.22	0.88	72%											
265.18	267.80	2.62	2.30	88%											
267.80	270.36	2.56	2.35	92%											
270.36	273.28	2.92	2.74	94%											
273.28	274.62	1.34	1.33	99%											
274.62	275.54	0.92	0.99	108%											
275.54	276.64	1.10	0.79	72%											
276.64	277.37	0.73	0.43	59%											
277.37	278.89	1.52	1.14	75%											
278.89	281.94	3.05	2.16	71%											

281.94	283.46	1.52	1.20	79%											
283.46	286.51	3.05	2.85	93%											
286.51	289.56	3.05	3.05	100%											
289.56	292.61	3.05	3.00	98%											
292.61	295.35	2.74	1.80	66%											
295.35	298.40	3.05	2.90	95%											
298.40	301.14	2.74	2.85	104%											
301.14	303.58	2.44	1.79	73%											
303.58	305.10	1.52	0.59	39%											
305.10	306.32	1.22	1.01	83%											
306.32	308.91	2.59	2.38	92%											
308.91	310.90	1.99	1.98	99%											
310.90	313.94	3.04	2.89	95%											
313.94	315.77	1.83	1.63	89%											
315.77	317.60	1.83	1.93	105%											
317.60	319.74	2.14	1.57	73%											
319.74	321.26	1.52	1.33	88%											
321.26	323.09	1.83	1.83	100%											
323.09	326.14	3.05	3.00	98%											
326.14	329.18	3.04	2.90	95%											
329.18	330.71	1.53	1.16	76%											
330.71	332.54	1.83	1.75	96%											
332.54	333.76	1.22	0.89	73%											
333.76	335.28	1.52	1.30	86%											
335.28	336.80	1.52	1.52	100%											
336.80	340.46	3.66	3.20	87%											
340.46	341.07	0.61	0.65	107%											
341.07	341.99	0.92	0.90	98%											
341.99	343.66	1.67	1.60	96%											
343.66	344.58	0.92	0.80	87%											
344.58	347.17	2.59	1.90	73%											
347.17	350.22	3.05	2.00	66%											
350.22	352.65	2.43	1.80	74%											
352.65	354.18	1.53	1.25	82%											
354.18	355.85	1.67	1.40	84%											
355.85	356.92	1.07	1.00	93%											
356.92	358.14	1.22	0.95	78%											
358.14	359.66	1.52	1.40	92%											
359.66	360.58	0.92	0.85	92%											
360.58	361.80	1.22	1.20	98%											
361.80	363.78	1.98	1.35	68%											
363.78	364.85	1.07	1.00	93%											
364.85	366.06	1.21	1.05	87%											

366.06	366.83	0.77	0.70	91%											
366.83	367.89	1.06	0.98	92%											
367.89	369.72	1.83	1.69	92%											
369.72	371.86	2.14	0.60	28%											
371.86	373.38	1.52	0.75	49%											
373.38	375.51	2.13	1.95	92%											
375.51	376.73	1.22	1.10	90%											
376.73	378.26	1.53	1.50	98%											
378.26	379.78	1.52	1.52	100%											
379.78	382.83	3.05	3.05	100%											
382.83	385.57	2.74	2.70	99%											
385.57	388.77	3.20	3.15	98%											
388.77	390.14	1.37	1.35	99%											
390.14	391.52	1.38	1.38	100%											
391.52	393.19	1.67	1.65	99%											
393.19	395.32	2.13	2.13	100%											
395.32	398.37	3.05	3.00	98%											
398.37	401.42	3.05	3.05	100%											
401.42	402.34	0.92	0.90	98%											
402.34	404.16	1.82	1.80	99%											
404.16	405.99	1.83	1.80	98%											
405.99	408.13	2.14	2.10	98%											
408.13	410.87	2.74	2.74	100%											
410.87	413.31	2.44	2.40	98%											
413.31	416.36	3.05	3.05	100%											
416.36	418.80	2.44	2.35	96%											
418.80	421.84	3.04	3.04	100%											
421.84	424.89	3.05	3.02	99%											
424.89	427.94	3.05	3.00	98%											
427.94	430.99	3.05	2.95	97%											
430.99	433.43	2.44	2.40	98%											
433.43	435.56	2.13	2.05	96%											
435.56	437.39	1.83	1.75	96%											
437.39	439.52	2.13	2.05	96%											
439.52	441.96	2.44	2.10	86%											
441.96	443.18	1.22	1.20	98%											
443.18	443.23	0.05	3.00	6000%											
443.23	447.75	4.52	1.50	33%											
447.75	450.80	3.05	2.90	95%											
450.80	452.93	2.13	1.45	68%	0.00	0%	R2	6	FR	40, 60	1, 5	PS	80		weak rck w/clvg along bedding
452.93	454.76	1.83	1.63	89%	0.00	0%	R2	6	FR	25, 80	1, 4	PS, IR	70		weak rck w/clvg along bedding
454.76	457.20	2.44	1.98	81%	0.00	0%	R2	6	FR	40, 30, 80	3, 1, 5	IR	60		weak rck w/clvg along bedding
457.20	460.25	3.05	1.90	62%	0.00	0%	R2	6	FR	90, 80	7, 1	PR	60		weak rck w/clvg along bedding

460.25	462.08	1.83	0.70	38%	0.00	0%	R2	4	FR	90	2	IR	50		weak rck w/clvg along bedding
462.08	464.82	2.74	1.88	69%	0.00	0%	R2	6	FR	50, 80	2, 2	PR	50		
464.82	466.34	1.52	0.95	63%	0.00	0%	R2	4	FR	85	1	PR			very broken up rock
466.34	469.39	3.05	2.95	97%	1.40	46%	R2	8	FR	80, 60, 40, 25	4, 2, 1, 2	IR	50		contact btw arg and lst
469.39	472.44	3.05	3.05	100%	1.72	56%	R3	10	FR	80, 90, 50, 0	4, 3, 1, 1	IR			limestone
472.44	475.18	2.74	2.46	90%	0.87	32%	R3	9	FR	60, 30, 80	3, 1, 5	PR			
475.18	478.23	3.05	3.05	100%	2.35	77%	R3	12	FR	0, 90, 80	1, 5, 2	PR, IR			
478.23	481.28	3.05	3.05	100%	2.09	69%	R3	12	FR	30, 90, 80, 70	2, 3, 6, 2	PR, IR			
481.28	484.33	3.05	3.05	100%	2.07	68%	R3	12	FR	50, 60, 80, 90	1, 1, 5, 4	PR, IR			
484.33	487.38	3.05	3.05	100%	2.91	95%	R3	13	FR	90, 70, 80, 50	1, 3, 4, 1	PR, IR			
487.38	490.42	3.04	3.00	99%	2.80	92%	R3	12	FR	80, 70	8, 1	PR, IR			
490.42	493.47	3.05	3.03	99%	2.61	86%	R3	12	FR	80, 70, 50	4, 1, 2	PR, IR			
493.47	496.52	3.05	3.05	100%	2.60	85%	R3	13	FR	80, 70	7, 2	PR, IR			
496.52	499.57	3.05	3.05	100%	2.35	77%	R3	12	FR	90, 80, 70, 40	5, 2, 2, 2	PR, IR			
499.57	502.62	3.05	2.92	96%	1.63	53%	R3	12	FR	50, 40, 20	2, 3, 2	PR, IR			
502.62	502.92	0.30	0.30	100%	0.15	50%	R3	8	FR	70, 90, 80	1, 1, 1	IR			
502.92	505.97	3.05	2.93	96%	2.24	73%	R3	11	FR	50, 60, 80, 40	1, 3, 5, 2	IR			
505.97	509.02	3.05	3.05	100%	2.22	73%	R3	12	FR	80, 30, 20, 90	5, 1, 2, 4	PR, IR			
509.02	510.54	1.52	1.52	100%	1.38	91%	R3	14	FR	70, 30, 90	2, 1, 1	PR, IR			
510.54	512.06	1.52	1.34	88%	0.91	60%	R3	12	FR	85, 0	1, 1	IR			
512.06	515.11	3.05	2.69	88%	1.57	51%	R3	9	FR	70, 30, 50, 90	5, 1, 1, 6	IR			
515.11	518.16	3.05	2.99	98%	2.47	81%	R3	12	FR	90, 70, 40, 80	5, 4, 1, 1	IR			
518.16	520.29	2.13	2.10	99%	1.10	52%	R3	10	FR	80, 60, 70	2, 2, 1	IR			
520.29	523.34	3.05	2.94	96%	1.03	34%	R3	10	FR	70, 40, 50	5, 3, 1	IR			
523.34	526.39	3.05	3.05	100%	2.81	92%	R3	14	FR	90, 80, 70, 50	2, 2, 1, 1	IR			
526.39	529.44	3.05	3.05	100%	2.34	77%	R3	12	FR	80, 90, 20, 50	5, 1, 1, 1	IR, PR			
529.44	532.49	3.05	3.05	100%	2.20	72%	R3	12	FR	, 60, 40, 30, 0	3, 1, 1, 1	IR, PR			
532.49	535.53	3.04	2.92	96%	1.24	41%	R3	12	FR	40, 80, 0, 70	3, 3, 1, 1	IR			
535.53	538.58	3.05	3.05	100%	1.58	52%	R3	11	FR	70, 0, 50, 45	7, 3, 2, 2	PR, IR			

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: **Hole:** SSD - 97 - 11 **Core Size:** HQ **Coordinates:** 42387.32 N, 24708.36 E **Collar Elevation:** 1521.77 m
Bearing: 270
Logged By: Linda Lewis **Total Depth:** 116.43 m **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weatherin	Angle	Number	Surface	Angle	Number	
2.8	3.05	0.25	0.2	80%											
3.05	6.1	3.05	1.2	39%											
6.1	7.62	1.52	1.3	86%											
7.62	9.14	1.52	1.45	95%											
9.14	10.67	1.53	1.05	69%											
10.67	12.19	1.52	0.9	59%											
12.19	14.33	2.14	2.1	98%											
14.33	15.24	0.91	0.6	66%											
15.24	17.07	1.83	1.7	93%											
17.07	18.09	1.02	1	98%											
18.09	21.95	3.86	1.25	32%											
21.95	24.38	2.43	2.35	97%											
24.38	29.11	4.73	4.37	92%											
29.11	31.09	1.98	1.7	86%											
31.09	32.61	1.52	0.8	53%											
32.61	35.66	3.05	2.95	97%											
35.66	36.88	1.22	0.75	61%											
36.88	42.52	5.64	4.47	79%	1.79	32%	R3	9	MW	80, 90, 60, 0	4, 6, 3, 9	PR	80		
42.52	45.11	2.59	2.20	85%	0.63	24%	R3	9	MW	70, 0, 10, 60, 5	14, 1, 1, 1, 7	PR	60		
45.11	46.63	1.52	1.25	82%	0.11	7%	R3	8	MW	80, 0, 70, 60	3, 1, 7, 5	PS, PR	70		
46.63	48.77	2.14	1.43	67%	0.33	15%	R3	8	MW	0, 70, 90	2, 8, 2	PR	70		
48.77	50.29	1.52	1.40	92%	0.00	0%	R3	8	MW	0, 30, 80	1, 1, 5	PR	75		
50.29	54.86	4.57	0.35	8%	0.00	0%	R3	7	MW	90	1	PS, PR	75		
54.86	57.91	3.05	0.93	30%	0.00	0%	R3	5	MW	90	1	IR	70		
57.91	59.13	1.22	0.23	19%	0.00	0%	R2	2	MW						
59.13	61.87	2.74	1.16	42%	0.36	13%	R3	9	PS	0, 45, 80, 60	1, 3, 9, 1	PR			limestone
61.87	64.01	2.14	1.92	90%	1.10	51%	R3	10	PS	80, 70, 60, 0, 10	2, 1, 2, 2, 2	PR			
64.01	67.06	3.05	2.45	80%	0.44	14%	R3	8	PS	0, 70, 20, 85	2, 1, 1, 2	?			
67.06	70.10	3.04	2.58	85%	0.60	20%	R3	7	PS	0, 70, 60, 40	2, 4, 3, 1	?			
70.10	71.93	1.83	1.70	93%	0.30	16%	R3	9	PS	45, 55, 60, 75	1, 5, 1, 4	?			
71.93	73.15	1.22	1.12	92%	0.38	31%	R3	10	PS	30, 50, 10, 5	2, 2, 1, 1	PR			
73.15	76.20	3.05	2.90	95%	1.39	46%	R3	11	PS	40, 90, 70, 80, 60	2, 14, 2, 1, 1	PR			
76.20	79.25	3.05	1.13	37%	0.93	30%	R3	12	PS	75, 60	2, 1	PR			
79.25	81.99	2.74	2.39	87%	1.12	41%	R3	12	PS	60, 30, 70, 90	3, 3, 1, 2	PR			
81.99	85.04	3.05	3.05	100%	2.10	69%	R3	13	PS	15, 70, 40, 50	4, 1, 1, 1	PR			
85.04	85.95	0.91	0.91	100%	0.50	55%	R3	12	PS	0, 40, 35	1, 1,	PR			
85.95	88.39	2.44	2.11	86%	1.71	70%	R3	13	PS	60, 80, 90, 70, 30	1, 3, 1, 1, 2	PR			
88.39	89.00	0.61	0.51	84%	0.20	33%	R3	10	PS	25, 90	1, 1,	PR			
89.00	91.44	2.44	1.79	73%	1.14	47%	R3	12	PS	30, 80, 70, 60	1, 1, 1, 1	PR			

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*

Date: **Hole:** SSD - 97 - 11 **Core Size:** HQ **Coordinates:** 42387.32 N 24708.36 E **Collar Elevation:** 1521.77 m

Bearing: 270

Logged By: Linda Lewis **Total Depth:** 116.43 m **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weatherin	Angle	Number	Surface	Angle	Number	
91.44	93.57	2.13	1.26	59%	0.25	12%	R3	6	PS	50, 60, 70, 90	2, 1, 1, 2	PR			
93.57	94.49	0.92	0.57	62%	0.10	11%	R3	6	PS	40	1	PR			
94.49	97.54	3.05	1.90	62%	0.67	22%	R3	7	PS	80, 40, 70	1, 1, 1	PR			
97.54	100.58	3.04	2.72	89%	0.89	29%	R3	10	PS	90, 10, 60, 70, 80	3, 1, 2, 1, 1	PR			
100.58	101.50	0.92	0.76	83%	0.35	38%	R3	10	PS	0, 90, 5	1, 1, 1	PR			
101.5	103.63	2.13	1.73	81%	0.39	18%	R3	10	PS	30, 50, 60, 70	1, 1, 2, 2	PR			
103.63	106.68	3.05	3.02	99%	2.17	71%	R3	13	PS	40, 20, 80, 70	3, 2, 2, 2	PR			
106.68	109.73	3.05	3.05	100%	2.65	87%	R3	12	PS	80, 30, 50	4, 1, 1	PR			
109.73	112.78	3.05	3.05	100%	2.57	84%	R3	13	PS	45, 80, 60, 25	1, 3, 2, 1	PR, IR			
112.78	115.82	3.04	2.83	93%	1.69	56%	R3	12	PS	60, 30, 40, 70	4, 1, 1, 1	PR, IR			
115.82	116.43	0.61	0.45	74%	0.13	21%	R3	9	PS	20, 60, 30	2, 1, 1	PR, IR			

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: | **Hole:** SSD - 97 - 12 | **Core Size:** NQ | **Coordinates:** 42528.50 N, 24696.68 E | **Collar Elevation:** 1531.23 m | **Bearing:** 270

Logged By: | **Total Depth:** 108.39 metres | **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weatherin	Angle	Number	Surface	Angle	Number	
6.10	10.97	4.87	2.55	52%											
10.97	12.19	1.22	0.52	43%											
12.19	15.24	3.05	2.23	73%											
15.24	17.07	1.83	1.23	67%											
17.07	19.20	2.13	1.65	77%											
19.20	21.34	2.14	1.22	57%											
21.34	24.38	3.04	1.77	58%											
24.38	27.43	3.05	2.28	75%											
27.43	30.48	3.05	3.05	100%											
30.48	33.53	3.05	0.99	32%											
33.53	36.58	3.05	2.47	81%											
36.58	39.62	3.04	2.95	97%											
39.62	42.67	3.05	1.80	59%											
42.67	45.72	3.05	0.75	25%											
45.72	48.77	3.05	0.14	5%											
48.77	51.82	3.05	2.02	66%											
51.82	54.86	3.04	1.23	40%											
54.86	56.08	1.22	0.35	29%											
56.08	57.91	1.83	0.70	38%											
57.91	59.44	1.53	0.39	25%											
59.44	60.96	1.52	0.71	47%											
60.96	62.48	1.52	0.61	40%											
62.48	64.00	1.52	0.54	36%											
64.00	66.14	2.14	0.35	16%											
66.14	67.06	0.92	0.69	75%											
67.06	68.58	1.52	0.63	41%	0	0%	R1	7	MW	55	4	IR	40	4	
68.58	70.10	1.52	0.21	14%	0	0%	R1	5	MW	55	2	PS	45	4	
70.10	71.02	0.92	0.81	88%	0	0%	R1	7	MW	45, 25	2, 1	IR, SR	55	16	
71.02	73.15	2.13	0.16	8%	0	0%	R1	3	MW						rubble with minor gouge
73.15	74.98	1.83	0.15	8%	0	0%	R1	5	MW						rubble
74.98	76.20	1.22	0.21	17%	0	0%	R1	5	MW	50, 65	3, 1	PS, PS	35	6	blocky
76.20	79.25	3.05	0.20	7%	0	0%	R1	4	MW						rubble
79.25	82.30	3.05	1.38	45%	0	0%	R0	3	HW						gouge zone (clay/mud)
82.30	84.43	2.13	1.57	74%	0	0%	R0	2	HW						gouge zone (clay/mud)
84.43	85.34	0.91	0.37	41%	0	0%	R0	2	HW						gouge zone (clay/mud)
85.34	88.40	3.06	0.31	10%	0	0%	R0	2	HW						gouge zone (clay/mud)
88.40	90.53	2.13	1.80	85%	0	0%	R0	1	HW						gouge zone (clay/mud)
90.53	93.57	3.04	2.64	87%	0	0%	R0	1	HW						gouge zone (clay/mud)
93.57	94.49	0.92	0.50	54%	0	0%	R0	2	HW						gouge zone (clay/mud)

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: ***Hole:*** ***SSD - 97 - 12*** ***Core Size:*** ***NQ*** ***Coordinates:*** ***42528.50 N*** ***24696.68 E*** ***Collar Elevation:*** ***1531.23 m***
Bearing: ***270***
Logged By: ***Total Depth:*** ***108.39 metres*** ***Dip:*** ***-90***

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weatherin	Angle	Number	Surface	Angle	Number	
94.49	97.54	3.05	1.50	49%	0	0%	R0	2	HW						gouge zone (clay/mud)
97.54	98.45	0.91	0.03	3%	0	0%	R0	2	HW						gouge zone (clay/mud)
98.45	100.58	2.13	2.28	107%	1.81	85%	R3	9	SW	20, 50, 85	1, 2, 15	PR, IR, IR			limestone
100.58	103.63	3.05	2.77	91%	2.22	73%	R3	12	SW	50, 85	1, 15	IR, IR			limestone
103.63	106.68	3.05	3.05	100%	2.17	71%	R3	10	SW	55, 70, 85	3, 5, 11	IR, IR, IR			limestone
106.68	108.39	1.71	1.71	100%	1.65	96%	R3	13	SW	50, 85	4, 4	IR, IR			limestone

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date:

Hole: *SSD-97-13* — *Coordinates:* *42356.36 N* / *24684.14 E* — *Collar Elevation:* *1613.29 m*

Core Size: *HQ* — *Bearing:* *0*

Logged By: *Linda Lewis* — *Total Depth:* *149.35 m* — *Dip:* *-90*

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	eatherin	Angle	Number	Surface	Angle	Number	
0.00	3.05	3.05	0.00	0%	0										
3.05	4.57	1.52	1.20	79%											
4.57	6.10	1.53	1.53	100%											
6.10	7.62	1.52	1.46	96%											
7.62	9.14	1.52	1.38	91%											
9.14	10.67	1.53	1.53	100%											
10.67	12.19	1.52	1.52	100%											
12.19	13.72	1.53	1.50	98%											
13.72	15.24	1.52	1.50	99%											
15.24	16.76	1.52	1.43	94%											
16.76	18.29	1.53	1.48	97%											
18.29	19.81	1.52	1.52	100%											
19.81	21.34	1.53	1.48	97%											
21.34	22.86	1.52	1.48	97%											
22.86	24.38	1.52	1.52	100%											
24.38	25.91	1.53	1.52	99%											
25.91	27.43	1.52	1.52	100%											
27.43	28.96	1.53	1.53	100%											
28.96	30.48	1.52	1.50	99%											
30.48	32.00	1.52	1.30	86%											
32.00	33.53	1.53	1.52	99%											
33.53	35.05	1.52	1.52	100%											
35.05	36.58	1.53	1.52	99%											
36.58	38.10	1.52	1.50	99%											
38.10	39.62	1.52	1.52	100%											
39.62	41.15	1.53	1.53	100%											
41.15	42.67	1.52	1.48	97%											
42.67	44.20	1.53	1.49	97%											
44.20	45.72	1.52	1.50	99%											
45.72	47.24	1.52	1.45	95%											
47.24	50.29	3.05	2.88	94%											
50.29	53.34	3.05	2.95	97%											
53.34	55.78	2.44	2.65	109%											
55.78	58.98	3.20													
58.98	60.60	1.62	1.37	85%	0.52	32%	R3	7	MW	40	2	PR	80	150	
60.60	62.18	1.58	1.10	70%	0.00	0%	R3	7	MW	0, 50	1, 1	PS,PR	80	100	
62.18	65.53	3.35	1.90	57%	0.00	0%	R0	2	EW						broken up rock in large fault zone
65.53	68.58	3.05	3.05	100%	0.00	0%	R0	2	EW						broken up rock in large fault zone
68.58	71.67	3.09	2.62	85%	0.00	0%	R0	2	EW						broken up rock in large fault zone
71.67	74.68	3.01	2.66	88%	0.00	0%	R0	2	EW						broken up rock in large fault zone
74.68	77.72	3.04	2.65	87%	0.00	0%	R0	2	EW						broken up rock in large fault zone
77.72	80.16	2.44	1.33	55%	0.00	0%	R0	2	EW						broken up rock in large fault zone
80.16	82.30	2.14	0.76	36%	0.00	0%	R2	3	MW						broken up rock in large fault zone
82.30	83.82	1.52	0.69	45%	0.00	0%	R1	2	MW						broken up rock in large fault zone

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date:		Hole:	SSD-97-13	Coordinates:	42356.36 N	Collar Elevation: 1613.29 m
		Core Size:	HQ		24684.14 E	Bearing: 0
Logged By:	Linde Lewis	Total Depth:	149.35 m			Dip: -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	eatherin	Angle	Number	Surface	Angle	Number	
83.82	86.87	3.05	2.27	74%	0.92	30%	R3	11	SW	15, 40	2, 3	PR, IR			limestone with minor gouge
86.87	89.92	3.05	2.42	79%	0.82	27%	R3	10	SW	20, 25, 60	3, 1, 1	PR			limestone
89.92	91.44	1.52	1.41	93%	0.39	26%	R3	9	SW	0	1	PR			
91.44	92.96	1.52	0.14	9%	0.00	0%	R3	3	SW						
92.96	93.57	0.61	0.20	33%	0.00	0%	R3	6	PS	0	1	PR			
93.57	94.79	1.22	1.47	120%	0.74	61%	R3	9	PS	15, 50, 0	1, 1, 1	IR, PR			
94.79	96.01	1.22	1.20	98%	0.77	63%	R3	11	PS	50, 0, 25	2, 1, 1	PR			limestone with minor gouge intervals
96.01	97.54	1.53	1.06	69%	0.67	44%	R3	11	PS	70	2	PR			limestone with minor gouge intervals
97.54	98.15	0.61	0.36	59%	0.10	16%	R3	7	PS	40	1	PR			limestone with minor gouge intervals
98.15	99.06	0.91	0.56	62%	0.16	18%	R3	9	PS	60, 80	1, 1	PR			limestone with minor gouge intervals
99.06	99.97	0.91	1.03	113%	0.63	69%	R3	9	PS	60, 80	1, 1	PR			limestone with minor gouge intervals
99.97	103.02	3.05	2.52	83%	0.81	27%	R3	12	PS	25, 60, 30, 0	1, 1, 1, 1	PR, IR			limestone with minor gouge intervals
103.02	104.55	1.53	1.31	86%	0.55	36%	R2	10	PS	70, 50	2, 1	PR			limestone with minor gouge intervals
104.55	104.85	0.30	0.30	100%	0.00	0%	R3	8	PS	20	1	PR			
104.85	105.46	0.61	0.58	95%	0.00	0%	R0	1	MW						fault gouge
105.46	106.38	0.92	0.78	85%	0.49	53%	R3	11	PS	30, 50, 0	1, 1, 1	IR, PR			
106.38	107.59	1.21	0.97	80%	0.87	72%	R3	13	PS	40, 50	1, 1	PR			
107.59	109.12	1.53	1.33	87%	1.00	65%	R3	13	PS	70, 80	1, 2	PR			
109.12	110.64	1.52	1.51	99%	1.46	96%	R3	13	PS	70, 80	2, 1	PR, IR			
110.64	111.25	0.61	0.60	98%	0.40	66%	R3	12	PS	90, 70	1, 1	PR, IR			
111.25	112.78	1.53	1.59	104%	1.47	96%	R3	13	PS	80	6	PR, IR			
112.78	114.30	1.52	1.39	91%	1.31	86%	R3	13	PS	90, 80, 50	2, 1, 1	PR			
114.30	114.91	0.61	0.69	113%	0.53	87%	R3	13	PS	80	1	PR			
114.91	115.37	0.46	0.66	143%	0.27	59%	R3	8	PS	60, 40	2, 2	PR, IR			
115.37	117.04	1.67	1.58	95%	1.31	78%	R3	13	PS	60, 80, 70	1, 2, 2	PR			
117.04	120.40	3.36	3.02	90%	2.21	66%	R3	12	PS	0, 70, 80	1, 5, 5	PR			
120.40	123.44	3.04	2.90	95%	2.35	77%	R3	13	PS	60, 80, 40, 20	2, 4, 1, 1	PR, IR			
123.44	126.49	3.05	3.05	100%	2.61	86%	R3	13	PS	80, 60, 90, 70,40	3, 2, 1, 1, 1	PR, IR			
126.49	129.54	3.05	2.99	98%	2.40	79%	R3	10	PS	50, 80, 70, 60	1, 5, 1, 1	PR			
129.54	132.59	3.05	3.05	100%	2.71	89%	R3	13	PS	10, 80, 70	1, 4, 1	PR			
132.59	135.64	3.05	2.89	95%	1.96	64%	R3	10	PS	70, 10, 60, 20, 50	1, 1, 1, 1, 1	PR			
135.64	138.68	3.04	2.70	89%	1.48	49%	R3	8	PS	50, 70, 80, 0	1, 2, 5, 1	PR			
138.68	139.90	1.22	0.91	75%	0.61	50%	R3	10	PS	80, 90	2, 1	PR			
139.90	143.26	3.36	2.72	81%	1.26	38%	R3	11	PS	40, 20, 90	2, 1, 6	PR, IR			
143.26	145.06	1.80	1.50	83%	0.89	49%	R3	12	PS	80, 70	2, 3	PR			
145.06	149.35	4.29	0.68	16%	0.10	2%	R3	7	PS	80, 90	1, 1	PR			fault zone is also present

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date:		***Hole:***	***SSD-97-14***	***Coordinates:***	***43689.51 N***	***Collar Evelation:*** ***1217.76 m***
		Core Size:	***HQ***		***24759.26 E***	***Bearing:*** ***0***
Logged By:	***Linda Lewis***	***Total Depth:***	***106.68 m***			***Dip:*** ***-90***

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	eatherin	Angle	Number	Surface	Angle	Number	
3.05	6.09	3.04	0.13	4%	0.00	0%	R3	4	PS						
6.09	12.19	6.10	0.76	12%	0.00	0%	R3	4	SW						
12.19	18.29	6.10	0.10	2%	0.00	0%	R3	4	SW						
18.29	27.43	9.14	1.22	13%	0.00	0%	R0	1	PS						
27.43	30.48	3.05	0.26	9%	0.00	0%	R0	1	PS						
30.48	33.53	3.05	0.24	8%	0.00	0%	R0	3	SW						
33.53	35.97	2.44	0.61	25%	0.00	0%	R3	1	SW						
35.97	36.58	0.61	0.17	28%	0.00	0%	R0	4	MW						
36.58	39.62	3.04	2.05	67%	1.57	52%	R2	12	PS	80, 70, 60	3, 2, 3	PR, IR			
39.62	42.67	3.05	2.87	94%	2.57	84%	R3	13	FR	70, 80, 60, 50, 40	5, 1, 2, 1, 1	PS, PR			
42.67	45.72	3.05	2.60	85%	1.67	55%	R3	13	FR	80, 60, 40, 20	3, 2, 1, 2	PR, IR			
45.72	48.77	3.05	2.82	92%	2.13	70%	R3	12	FR	60, 70	3, 8	PR, IR			
48.77	51.82	3.05	2.88	94%	1.86	61%	R3	12	FR	70, 40, 60, 80	3, 3, 1, 1	PR			
51.82	54.86	3.04	2.77	91%	1.45	48%	R3	12	FR	70, 50, 60, 40	3, 2, 1, 1	PR			
54.86	57.91	3.05	2.60	85%	1.87	61%	R3	12	FR	80, 70, 60	4, 3, 2	PR			
57.91	60.96	3.05	2.68	88%	2.12	70%	R3	12	FR	80, 50, 40	3, 3, 2	PR			
60.96	61.57	0.61	0.61	100%	0.40	66%	R3	12	FR	80, 70, 50	2, 1, 1	PR			
61.57	63.40	1.83	1.83	100%	0.85	46%	R3	10	FR	40, 20, 80, 90	3, 1, 1, 4	PR			
63.4	64.01	0.61	0.41	67%	0.00	0%	R3	6	FR						
64.01	67.06	3.05	2.51	82%	0.98	32%	R3	9	FR	80, 70, 40, 60	3, 2, 3, 3	IR, PR			
67.06	70.10	3.04	2.45	81%	0.45	15%	R3	9	FR	40, 80	3, 4	IR, PR			
70.1	73.15	3.05	2.60	85%	1.61	53%	R3	10	FR	90, 50, 20, 80	2, 1, 1, 3	PR, IR			
73.15	76.20	3.05	2.80	92%	0.67	22%	R3	9	FR	70, 80, 60, 20	3, 5, 2, 2	PR, IR			
76.2	79.25	3.05	2.21	72%	0.57	19%	R3	9	FR	0, 30, 70, 90	1, 2, 1, 3	PR, IR			
79.25	72.30	-6.95	2.70	-39%	1.53	-22%	R3	12	FR	60, 80, 50	2, 2, 2	PR			
72.3	85.34	13.04	2.52	19%	0.68	5%	R3	10	FR	70, 0, 60	1, 2, 1	PR			
85.34	88.39	3.05	2.70	89%	1.18	39%	R3	10	FR	20, 50, 60	3, 3, 3	PR			
88.39	91.44	3.05	3.05	100%	2.17	71%	R3	12	FR	40, 70, 80, 50	1, 3, 3, 4	PR, IR			
91.44	94.49	3.05	2.84	93%	1.87	61%	R3	12	FR	40, 20, 80	1, 1, 6	PR, IR			
94.49	97.54	3.05	2.45	80%	0.50	16%	R3	9	FR	60, 20, 70, 80	2, 1, 3, 3	PR, IR			
97.54	100.58	3.04	2.41	79%	1.13	37%	R3	10	FR	70, 60, 40, 80	2, 1, 1, 4	PR, IR			
100.58	103.63	3.05	2.07	68%	0.12	4%	R1	9	FR	80, 50, 60	4, 3, 2	PR			
103.63	106.68	3.05	2.12	70%	0.55	18%	R1	6	FR	40, 50, 70, 60	1, 2, 3, 1	PR, IR			

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*														
				Hole:		*SSD-97-15*		*Coordinates:*	*43651.4 N*			*Collar Elevation:*		*1223.75 m*	
				Core Size:		*HQ*			*24751.2 E*			*Bearing:*	*0*		
Logged By:		*Linda Lewis*		*Total Depth:*		*92.66 m*						*Dip:*	*-90*		
Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	eatherin	Angle	Number	Surface	Angle	Number	
30.48	33.53	3.05	1.48	49%	0.00	0%	R2	6	FR						
33.53	36.58	3.05	1.82	60%	0.00	0%	R3	6	FR	50, 60, 0	1, 2, 1	PR, IR	90	50	
36.58	39.62	3.04	2.2	72%	0.00	0%	R2	6	FR	55, 70	1, 2	PR	75	200	
39.62	42.67	3.05	1.92	63%	0.00	0%	R3	7	FR	80, 0, 20	1, 1, 1	PR	70	200	
42.67	45.72	3.05	0.93	30%	0.00	0%	R1	2	FR						
45.72	48.77	3.05	1.79	59%	0.91	30%	R2	9	FR	70, 50	2, 1	PR			
48.77	51.82	3.05	2.76	90%	1.47	48%	R2	11	FR	60, 30, 50	7, 2, 1	RR, IR			
51.82	54.86	3.04	1.62	53%	0.87	29%	R3	11	FR	80, 70	2, 1	IR			
54.86	57.91	3.05	3.05	100%	1.41	46%	R3	12	FR	60, 50, 0, 80	3, 3, 1, 5	IR			
57.91	60.96	3.05	2.72	89%	0.98	32%	R3	10	FR	60, 80, 30, 70	2, 9, 2, 4	IR, PR			
60.96	64.01	3.05	0.43	14%	0.00	0%	R1	3	FR						
64.01	67.06	3.05	1.76	58%	0.33	11%	R3	8	FR	40, 70, 50, 0	2, 7, 1, 1	PR, IR			
67.06	70.10	3.04	2.75	90%	1.12	37%	R1	13	FR	0, 80	1, 7	PR, IR			
70.10	73.15	3.05	2.34	77%	1.38	45%	R3	10	FR	50, 40, 30, 20	3, 1, 1, 2	PR, IR			
73.15	76.20	3.05	2.47	81%	1.27	42%	R3	12	FR	0, 60, 20, 30	1, 2, 4, 1	PR, IR			
76.20	79.25	3.05	2.59	85%	1.55	51%	R3	13	FR	80, 30, 20, 50	1, 3, 1, 3	PR			
79.25	82.30	3.05	2.77	91%	0.66	22%	R3	10	FR	40, 20, 60, 0	2, 2, 3, 2	PR			
82.30	85.34	3.04	2.84	93%	1.50	49%	R3	12	FR	0, 20, 30, 50, 60	1, 2, 1, 1, 1	PR			
85.34	88.34	3.00	3.05	102%	2.13	71%	R3	12	FR	15, 10, 50, 30, 80	1, 2, 1, 1, 4,	PR			
88.34	91.44	3.10	3.05	98%	2.25	73%	R3	12	FR	30, 10, 20, 60	2, 2, 1, 3	PR			
91.44	92.66	1.22	1.22	100%	0.53	43%	R3	11	FR	50, 40, 0	2, 1, 1	PR			

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: *August 3rd, 1997* **Hole:** *SSD-97-16* **Coordinates:** *43582.93 N* *25112.04 E* **Collar Elevation:** *1268.73 m*
Core Size: *HQ* **Bearing:** *0*
Logged By: *Linda Lewis* **Total Depth:** *128.02 m* **Dip:** *-90*

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weatherin	Angle	Number	Surface	Angle	Number	
11.00	15.25	4.25	2.82	66%											
15.25	18.30	3.05	2.74	90%											
18.30	21.30	3.00	2.70	90%											
21.30	24.40	3.10	2.40	77%											
24.40	27.40	3.00	2.46	82%											
27.40	30.50	3.10	2.62	85%											
30.50	33.50	3.00	2.36	79%											
33.50	36.60	3.10	2.83	91%											
36.60	39.60	3.00	1.85	62%											
39.60	42.70	3.10	2.52	81%											
42.70	45.70	3.00	2.06	69%											
45.70	48.80	3.10	2.32	75%											
48.80	51.80	3.00	2.67	89%	0.57	19%	R2	7	FR	50	2	PR	65	150	mainly intact rock with some fault gouge
51.80	54.90	3.10	1.53	49%	0.00	0%	R2	6	FR						minor gouge present
54.90	57.90	3.00	2.65	88%	0.52	17%	R2	6	FR	50, 60, 70, 80	3, 2, 1, 1	PR	85	30	mixture intact rock and gouge
57.90	60.10	2.20	2.20	100%	1.04	47%	R2	9	FR	30, 50, 60	4, 2, 1	PR			
60.10	64.00	3.90	2.53	65%	0.80	21%	R1	9	PS	40, 50	2, 1	IR, PR			
64.00	65.80	1.80	1.55	86%	0.58	32%	R1	9	PS	40, 30, 10	1, 1, 2	IR			
65.80	70.10	4.30	4.16	97%	2.68	62%	R3	12	PS	30, 50, 60, 70	3, 1, 1, 1	PR			
70.10	73.10	3.00	2.81	94%	1.80	60%	R3	12	PS	60, 0, 80	1, 1, 2	IR, PR			
73.10	76.20	3.10	3.01	97%	1.32	43%	R3	12	PS	0, 10, 60, 50	1, 1, 1, 1	IR, PR			
76.20	79.25	3.05	3.05	100%	1.48	49%	R3	13	PS	80, 70, 15, 0	2, 2, 1, 2	PR, IR			
79.25	82.30	3.05	2.96	97%	2.27	74%	R3	13	PS	60, 30, 0, 80	1, 1, 1, 5	PR, IR			
82.30	85.35	3.05	3.00	98%	2.13	70%	R3	13	PS	25, 80, 50, 70	2, 3, 2, 2	PR, IR			
85.35	88.40	3.05	3.00	98%	2.57	84%	R3	12	PS	40, 60, 70	2, 4, 5	PR			
88.40	91.44	3.04	2.85	94%	1.03	34%	R3	10	PS	20, 80, 70, 60	2, 1, 2, 2	PR			
91.44	94.50	3.06	3.00	98%	2.48	81%	R3	13	PS	20, 40, 70, 50	2, 1, 1, 2	PR			
94.50	97.50	3.00	3.00	100%	2.54	85%	R3	12	PS	60, 80, 70, 0	2, 2, 5, 1	PR			
97.50	100.60	3.10	2.92	94%	1.99	64%	R3	12	PS	60, 80, 10, 20	3, 3, 1, 1	PR, IR			
100.60	103.60	3.00	3.00	100%	2.09	70%	R3	13	PS	10, 20, 80	1, 4, 1	PR, PS			
103.60	106.70	3.10	3.02	97%	2.58	83%	R3	13	PS	80, 40, 70	3, 1, 2	PR			
106.70	109.73	3.03	2.92	96%	2.12	70%	R3	11	PS	40, 70, 50, 20	2, 3, 1, 1	PR			
109.73	112.80	3.07	2.86	93%	1.29	42%	R3	11	PS	80, 15, 70, 10	1, 1, 1, 1	PR			
112.80	115.80	3.00	2.88	96%	1.41	47%	R3	10	PS	40, 60, 30	3, 2, 1	PR			
115.80	118.90	3.10	3.05	98%	1.72	55%	R3	11	PS	70, 25, 60	3, 2, 3	PR, IR			
118.90	121.90	3.00	3.00	100%	2.55	85%	R3	12	PS	70, 60	6, 2	PR			
121.90	125.00	3.10	3.10	100%	2.36	76%	R3	13	FR	40, 30, 20, 60	2, 2, 1, 4	PR, IR			
125.00	128.00	3.00	3.00	100%	0.65	22%	R3	10	FR	30, 50, 20, 60	5, 2, 2, 2	PR, IR			

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: August 3rd, 1997	**Hole:** SSD-97-16	**Coordinates:**	43582.93 N	**Collar Elevation:**	1268.73 m
	Core Size: HQ		25112.04 E	**Bearing:**	0
Logged By: Linda Lewis	**Total Depth:** 128.02 m			**Dip:**	-90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weatherin	Angle	Number	Surface	Angle	Number	
11.00	15.25	4.25	2.82	66%											
15.25	18.30	3.05	2.74	90%											
18.30	21.30	3.00	2.70	90%											
21.30	24.40	3.10	2.40	77%											
24.40	27.40	3.00	2.46	82%											
27.40	30.50	3.10	2.62	85%											
30.50	33.50	3.00	2.36	79%											
33.50	36.60	3.10	2.83	91%											
36.60	39.60	3.00	1.85	62%											
39.60	42.70	3.10	2.52	81%											
42.70	45.70	3.00	2.06	69%											
45.70	48.80	3.10	2.32	75%											
48.80	51.80	3.00	2.67	89%	0.57	19%	R2	7	FR	50	2	PR	65	150	mainly intact rock with some fault gouge
51.80	54.90	3.10	1.53	49%	0.00	0%	R2	6	FR						minor gouge present
54.90	57.90	3.00	2.65	88%	0.52	17%	R2	6	FR	50, 60, 70, 80	3, 2, 1, 1	PR	85	30	mixture intact rock and gouge
57.90	60.10	2.20	2.20	100%	1.04	47%	R2	9	FR	30, 50, 60	4, 2, 1	PR			
60.10	64.00	3.90	2.53	65%	0.80	21%	R1	9	PS	40, 50	2, 1	IR, PR			
64.00	65.80	1.80	1.55	86%	0.58	32%	R1	9	PS	40, 30, 10	1, 1, 2	IR			
65.80	70.10	4.30	4.16	97%	2.68	62%	R3	12	PS	30, 50, 60, 70	3, 1, 1, 1	PR			
70.10	73.10	3.00	2.81	94%	1.80	60%	R3	12	PS	60, 0, 80	1, 1, 2	IR, PR			
73.10	76.20	3.10	3.01	97%	1.32	43%	R3	12	PS	0, 10, 60, 50	1, 1, 1, 1	IR, PR			
76.20	79.25	3.05	3.05	100%	1.48	49%	R3	13	PS	80, 70, 15, 0	2, 2, 1, 2	PR, IR			
79.25	82.30	3.05	2.96	97%	2.27	74%	R3	13	PS	60, 30, 0, 80	1, 1, 1, 5	PR, IR			
82.30	85.35	3.05	3.00	98%	2.13	70%	R3	13	PS	25, 80, 50, 70	2, 3, 2, 2	PR, IR			
85.35	88.40	3.05	3.00	98%	2.57	84%	R3	12	PS	40, 60, 70	2, 4, 5	PR			
88.40	91.44	3.04	2.85	94%	1.03	34%	R3	10	PS	20, 80, 70, 60	2, 1, 2, 2	PR			
91.44	94.50	3.06	3.00	98%	2.48	81%	R3	13	PS	20, 40, 70, 50	2, 1, 1, 2	PR			
94.50	97.50	3.00	3.00	100%	2.54	85%	R3	12	PS	60, 80, 70, 0	2, 2, 5, 1	PR			
97.50	100.60	3.10	2.92	94%	1.99	64%	R3	12	PS	60, 80, 10, 20	3, 3, 1, 1	PR, IR			
100.60	103.60	3.00	3.00	100%	2.09	70%	R3	13	PS	10, 20, 80	1, 4, 1	PR, PS			
103.60	106.70	3.10	3.02	97%	2.58	83%	R3	13	PS	80, 40, 70	3, 1, 2	PR			
106.70	109.73	3.03	2.92	96%	2.12	70%	R3	11	PS	40, 70, 50, 20	2, 3, 1, 1	PR			
109.73	112.80	3.07	2.86	93%	1.29	42%	R3	11	PS	80, 15, 70, 10	1, 1, 1, 1	PR			
112.80	115.80	3.00	2.88	96%	1.41	47%	R3	10	PS	40, 60, 30	3, 2, 1	PR			
115.80	118.90	3.10	3.05	98%	1.72	55%	R3	11	PS	70, 25, 60	3, 2, 3	PR, IR			
118.90	121.90	3.00	3.00	100%	2.55	85%	R3	12	PS	70, 60	6, 2	PR			
121.90	125.00	3.10	3.10	100%	2.36	76%	R3	13	FR	40, 30, 20, 60	2, 2, 1, 4	PR, IR			
125.00	128.00	3.00	3.00	100%	0.65	22%	R3	10	FR	30, 50, 20, 60	5, 2, 2, 2	PR, IR			

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: August 8th, 1997 **Hole:** SSD-97-17 **Coordinates:** 43523.45 N / 25109.60 E **Collar Elevation:** 1293.96 m
Core Size: HQ **Bearing:** 0
Logged by: Linda Lewis **Total Depth:** 128.02 m **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weatherin	Angle	Number	Surface	Angle	Number	
19.00	21.34	2.34	1.80	77%											
21.34	24.38	3.04	0.11	4%											
24.38	27.43	3.05	0.47	15%											
27.43	30.48	3.05	0.97	32%											
30.48	33.53	3.05	2.16	71%											
33.53	36.58	3.05	0.07	2%											
36.58	38.10	1.52	0.32	21%											
38.10	39.62	1.52	1.30	86%											
39.62	41.45	1.83	1.50	82%											
41.45	44.50	3.05	0.80	26%											
44.50	45.72	1.22	1.45	119%											
45.72	48.77	3.05	1.30	43%											
48.77	49.99	1.22	0.70	57%											
49.99	52.12	2.13	1.61	76%											
52.12	54.86	2.74	1.80	66%											
54.86	57.19	2.33	2.46	106%											
57.19	59.74	2.55	0.46	18%											
59.74	60.96	1.22	0.99	81%											
60.96	64.01	3.05	2.00	66%											
64.01	67.06	3.05	1.43	47%											
67.06	70.10	3.04	2.13	70%											
70.10	73.15	3.05	2.92	96%											
73.15	76.28	3.13	1.02	33%											
76.28	79.25	2.97	2.97	100%											
79.25	82.30	3.05	1.50	49%											
82.30	85.34	3.04	2.61	86%	0	0%	R2	6	FR	80	4	IR	85	100	
85.34	88.39	3.05	2.55	84%	0	0%	R2	8	FR	40, 60, 50	1, 1, 1	IR, PR	75	100	
88.39	91.44	3.05	2.80	92%	0	0%	R3	8	FR	60, 70	2, 1	IR, PR	77	100	
91.44	94.49	3.05	1.41	46%	0	0%	R2	6	FR	40, 60, 80	1, 1, 1	IR, PR	85	80	
94.49	97.54	3.05	2.77	91%	1.24	41%	R3	9	FR	70, 60, 50	3, 2, 1	IR, PR			
97.54	100.58	3.04	3.04	100%	1.88	62%	R3	12	FR	0, 60, 70, 10	1, 1, 2, 1	IR, PR			
100.58	103.63	3.05	2.80	92%	2.18	71%	R3	12	FR	80, 70, 40, 60	2, 2, 1, 1	IR, PR			
103.63	106.68	3.05	2.74	90%	1.93	63%	R3	12	FR	20, 60, 50, 40	3, 2, 1, 1	IR, PR			
106.68	109.73	3.05	2.84	93%	1.4	46%	R3	11	FR	50, 40, 20, 10	1, 1, 4, 1	IR, PR			
109.73	112.78	3.05	2.91	95%	1.86	61%	R3	11	FR	0, 20, 30, 50	1, 2, 1, 3	IR, PR			
112.78	115.82	3.04	2.79	92%	2.01	66%	R3	13	FR	30, 40, 60	4, 5, 1	IR, PR			
115.82	118.87	3.05	3.05	100%	2.09	69%	R3	13	FR	30, 50, 70	1, 1, 4	IR, PR			
118.87	121.92	3.05	3.01	99%	2.22	73%	R3	12	FR	70, 40, 50, 60	3, 2, 1, 2	IR, PR			
121.92	124.97	3.05	2.91	95%	1.89	62%	R3	11	FR	60, 20, 10	2, 2, 1	IR, PR			
124.97	128.02	3.05	3.05	100%	2.28	75%	R3	12	FR	60, 20, 30, 40	1, 2, 1, 1	IR, PR			

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: *August 18th, 1997*
Hole: *SSD -97- 18*
Coordinates: *43433.22 N* / *25088.45 E*
Collar Elevation: *1324.32 m*
Core Size: *HQ*
Bearing: *0*
Logged By: *Linda Lewis*
Total Depth: *184.40 m*
Dip: *-90*

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description		Bedding Planes			Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	eatherin	Angle	Number	Surface	Angle	Number	
26.24	27.43	1.19	1.09	92%											
27.43	30.48	3.05	2.66	87%											
30.48	33.53	3.05	0.97	32%											
33.53	36.58	3.05	2.73	90%											
36.58	39.62	3.04	2.64	87%											
39.62	42.67	3.05	2.45	80%											
42.67	45.72	3.05	2.85	93%											
45.72	48.77	3.05	2.40	79%											
48.77	51.82	3.05	1.57	51%											
51.82	54.86	3.04	1.20	39%											
54.86	57.91	3.05	0.82	27%											
57.91	60.05	2.14	1.62	76%											
60.05	61.26	1.21	1.30	107%											
61.26	63.40	2.14	0.78	36%											
63.40	65.23	1.83	1.70	93%											
65.23	67.06	1.83	0.85	46%											
67.06	70.10	3.04	2.47	81%											
70.10	73.15	3.05	2.99	98%											
73.15	76.20	3.05	2.72	89%											
76.20	79.25	3.05	2.87	94%											
79.25	82.30	3.05	2.97	97%											
82.30	85.34	3.04	2.69	88%											
85.34	88.39	3.05	2.27	74%											
88.39	91.44	3.05	1.91	63%											
91.44	94.49	3.05	2.75	90%											
94.49	96.01	1.52	1.55	102%											
96.01	97.54	1.53	1.60	105%											
97.54	100.58	3.04	3.04	100%											
100.58	103.63	3.05	2.94	96%											
103.63	105.77	2.14	1.75	82%											
105.77	107.59	1.82	1.56	86%											
107.59	109.27	1.68	1.20	71%											
109.27	111.25	1.98	1.53	77%											
111.25	114.00	2.75	1.43	52%											
114.00	118.87	4.87	4.20	86%											
118.87	120.70	1.83	1.69	92%											
120.70	123.75	3.05	2.68	88%											
123.75	126.19	2.44	1.67	68%											
126.19	128.02	1.83	1.60	87%											
128.02	129.84	1.82	1.56	86%											
129.84	132.89	3.05	2.88	94%											
132.89	135.33	2.44	1.86	76%											
135.33	137.16	1.83	1.62	89%											

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***														
Date:	*August 18th, 1997*					*Hole:*		*SSD -97- 18*			*Coordinates:*	*43433.22 N*		*Collar Elevation:*	*1324.32 m*
						Core Size:		*HQ*				*25088.45 E*		*Bearing:*	*0*
Logged By:		*Linda Lewis*				*Total Depth:*		*184.40 m*						*Dip:*	*-90*
Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	eatherin	Angle	Number	Surface	Angle	Number	
137.16	140.21	3.05	2.88	94%											
140.21	142.19	1.98	2.30	116%											
142.19	144.48	2.29	1.70	74%											
144.48	147.52	3.04	2.91	96%	1.46	48%	R2	9	FR	65, 40, 70, 80	1, 1, 2, 2	PR	80	50	half broken rock
147.52	149.96	2.44	2.01	82%	0.13	5%	R2	7	FR	0, 10, 80	3, 1, 1	PR, IR	80	45	
149.96	152.40	2.44	1.92	79%	0.00	0%	R2	6	FR	0	1	PR	80	30	
152.40	155.45	3.05	2.54	83%	1.35	44%	R2	9	FR	40, 70, 60	1, 7, 2	PR, IR			brecciated argillite
155.45	158.50	3.05	2.38	78%	0.20	7%	R2	6	FR	70, 50, 0	4, 1, 1	PR, IR			
158.50	161.54	3.04	2.98	98%	1.90	63%	R2	10	FR	70, 40, 50, 10	4, 2, 2, 1	PR, IR			
161.54	164.59	3.05	3.02	99%	2.36	77%	R3	12	FR	60, 50, 40, 30	2, 3, 1, 4	PR, IR			limestone
164.59	167.64	3.05	3.05	100%	1.63	53%	R3	11	FR	60, 50, 40, 30	1, 2, 7, 2	PR, IR			
167.64	170.69	3.05	2.73	90%	1.00	33%	R3	9	FR	50, 40, 30, 80	2, 2, 1, 3	PR			
170.69	173.74	3.05	3.05	100%	2.65	87%	R3	13	FR	50, 40, 80	4, 2, 1	PR, IR			
173.74	176.78	3.04	3.04	100%	2.84	93%	R3	14	FR	50, 10, 40, 80	1, 1, 1, 2	PR			
176.78	179.83	3.05	3.05	100%	2.75	90%	R3	13	FR	60, 40, 30, 80	1, 1, 1, 3	PR, IR			
179.83	182.88	3.05	2.93	96%	2.22	73%	R3	12	FR	25, 30, 60, 40	2, 1, 3, 1	PR, IR			
182.88	184.40	1.52	1.61	106%	0.63	41%	R3	11	FR	40, 70, 60, 30	1, 1, 1, 4	PR, IR			

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*														
Date:			*Hole:*	*SSD -97- 19*		*Coordinates:*	*43433.22 N*					*Collar Elevation:*	*1315.41 m*		
			Core Size:	*HQ*			*26043.77 E*					*Bearing:*	*0*		
Logged By:	*Linda Lewis*		*Total Depth:*	*222.5 m*								*Dip:*	*-90*		
Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
22.80	24.38	1.58	1.30	82%											
24.38	27.43	3.05	1.91	63%											
27.43	30.48	3.05	1.30	43%											
30.48	33.53	3.05	1.72	56%											
33.53	36.58	3.05	1.96	64%											
36.58	39.62	3.04	2.47	81%											
39.62	42.67	3.05	2.18	71%											
42.67	45.72	3.05	1.94	64%											
45.72	48.77	3.05	2.50	82%											
48.77	51.82	3.05	2.76	90%											
51.82	53.95	2.13	0.92	43%											
53.95	56.08	2.13	1.65	77%											
56.08	59.44	3.36	2.70	80%											
59.44	62.48	3.04	2.55	84%											
62.48	65.53	3.05	2.28	75%											
65.53	67.06	1.53	1.35	88%											
67.06	69.49	2.43	2.52	104%											
69.49	72.54	3.05	2.93	96%											
72.54	75.59	3.05	2.45	80%											
75.59	78.03	2.44	1.67	68%											
78.03	79.25	1.22	1.26	103%											
79.25	81.69	2.44	2.61	107%											
81.69	84.73	3.04	2.62	86%											
84.73	86.87	2.14	1.98	93%											
86.87	89.91	3.04	2.68	88%											
89.91	92.66	2.75	2.75	100%											
92.66	95.40	2.74	2.55	93%											
95.40	97.54	2.14	2.02	94%											
97.54	100.58	3.04	2.75	90%											
100.58	103.63	3.05	1.37	45%											
103.63	106.68	3.05	3.05	100%											
106.68	109.73	3.05	2.95	97%											
109.73	112.78	3.05	2.98	98%											
112.78	115.82	3.04	2.95	97%											
115.82	118.87	3.05	2.76	90%											
118.87	121.92	3.05	2.23	73%											
121.92	124.97	3.05	3.05	100%											
124.97	128.02	3.05	2.82	92%											
128.02	131.06	3.04	2.85	94%											
131.06	134.11	3.05	2.63	86%											
134.11	137.16	3.05	2.60	85%											
137.16	140.21	3.05	2.23	73%											
140.21	143.26	3.05	3.02	99%											

Imperial Metals Corporation															
								Geotechnical Core Log							
								Silvertip Property							
Date:				*Hole:*		*SSD-97-19*			*Coordinates:*		*43433.22 N*		*Collar Elevation:*		*1315.41 m*
				Core Size:		*HQ*					*25043.77 E*		*Bearing:*	*0*	
Logged By:		*Linda Lewis*		*Total Depth:*		*222.6 m*							*Dip:*	*-90*	
Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
143.26	146.30	3.04	2.96	97%											
146.30	148.74	2.44	1.63	67%											
148.74	150.57	1.83	0.92	50%											
150.57	151.79	1.22	0.81	66%											
151.79	154.23	2.44	2.03	83%	0.00	0%	R3	6	FR	20	1	PR	80	130	
154.23	156.36	2.13	1.36	64%	0.00	0%	R3	5	FR	?			?		broken up rock
156.36	157.89	1.53	0.90	59%	0.00	0%	R3	5	FR	?			80		
157.89	160.93	3.04	1.93	63%	0.00	0%	R3	3	FR	?			?		
160.93	162.27	1.34	0.22	16%	0.00	0%	R3	4	FR	?			?		
162.27	164.54	2.27	0.00	0%	0.00	0%									
164.54	167.03	2.49	1.46	59%	0.00	0%	R1	3	FR	?			?		
167.03	169.16	2.13	1.50	70%	0.00	0%	R1	3	FR	?			?		
169.16	170.69	1.53	1.53	100%	1.24	81%	R3	13	FR	70, 50, 80	1, 1, 2	PR, IR			limestone
170.69	173.74	3.05	2.93	96%	2.15	70%	R3	11	FR	70, 50, 30, 10	2, 1, 1, 1	PR, IR			
173.74	176.78	3.04	2.52	83%	0.95	31%	R3	9	FR	60, 40	2, 1	PR, IR			
176.78	179.83	3.05	2.83	93%	1.72	56%	R3	11	FR	60, 30	3, 3	IR, PR			
179.83	182.88	3.05	2.37	78%	0.44	14%	R3	9	FR	60, 40, 20, 0	2, 3, 1, 1	IR, PR			
182.88	185.93	3.05	3.05	100%	2.76	90%	R3	12	FR	60, 10, 50, 70	2, 2, 1, 3	IR, PR			
185.93	188.98	3.05	3.02	99%	2.37	78%	R3	12	FR	0, 50, 70, 0, 10	1, 2, 3, 1, 1	IR, PR			
188.98	192.02	3.04	2.97	98%	2.03	67%	R3	12	FR	70, 20, 30, 60	4, 3, 1, 1	IR, PR			
192.02	195.07	3.05	2.87	94%	1.27	42%	R3	10	FR	70, 0, 50, 30	4, 1, 2, 3	IR, PR			
195.07	198.12	3.05	2.87	94%	1.25	41%	R3	10	FR	10, 70, 0	4, 2, 1	IR, PR			
198.12	201.17	3.05	2.88	94%	1.28	42%	R3	10	FR	10, 70, 50, 30	2, 4, 1, 1	IR, PR			
201.17	204.22	3.05	2.94	96%	1.86	61%	R3	12	FR	10, 20, 60, 70	1, 3, 1, 3	IR, PR			
204.22	207.26	3.04	2.96	97%	1.81	60%	R3	12	FR	70, 15, 60, 30	1, 3, 1, 1	IR, PR			
207.26	210.31	3.05	3.05	100%	2.20	72%	R3	11	FR	50, 10, 60, 70	3, 1, 6, 2	IR, PR			
210.31	213.36	3.05	3.01	99%	1.71	56%	R3	11	FR	20, 10, 60, 70	2, 1, 2, 5	PR			
213.36	213.41	3.05	2.99	98%	1.77	58%	R3	11	FR	60, 70, 0	5, 2, 1	PR			
213.41	219.46	6.05	3.05	50%	2.04	34%	R3	11	FR	60, 70	3, 6	PR			
219.46	222.50	3.04	3.04	100%	1.94	64%	R3	12	FR	60, 70, 30, 0	2, 3, 1, 1	PR			

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*															
Date:				Hole:		SSD-97-20		Coordinates	43660.12 N			Collar Elevation:		1220.35 m		
				Core Size:		HQ			24778.86 E			Bearing:	0			
Logged By:		Linda Lewis		Total Depth:		103.63 m						Dip:	-90			
Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments	
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number		
8.95	9.14	0.19	0.19	100%	0.00	0%	R3	8	PS	60, 50	1, 1	PR	?			
9.14	13.41	4.27	0.12	3%	0.00	0%	R3	7	PS	60	1	PR	?			
13.41	15.24	1.83	0.78	43%	0.00	0%	R3	5	PS	?			?			
15.24	18.29	3.05	1.06	35%	0.00	0%	R0	1	PS	?			?			
18.29	21.34	3.05	0.98	32%	0.00	0%	R1	3	PS	?			?			
21.34	24.38	3.04	0.27	9%	0.00	0%	R2	3	PS	?			?			
24.38	27.43	3.05	0.12	4%	0.00	0%	R2	5	PS	?			?			
27.43	30.48	3.05	0.00	0%	0.00	0%										
30.48	33.53	3.05	0.00	0%	0.00	0%										
33.53	36.58	3.05	2.02	66%	0.00	0%	R2	6	PS	50	2	IR	80	90		
36.58	39.62	3.04	2.46	81%	0.00	0%	R2	6	PS	?			80	100		
39.62	42.06	2.44	1.08	44%	0.17	7%	R2	8	PS	20	1	IR	80	150		
42.06	45.42	3.36	2.52	75%	1.91	57%	R3	12	FR	20, 60, 40, 70	1, 1, 1, 3	IR			limestone	
45.42	48.16	2.74	2.44	89%	1.50	55%	R3	11	FR	80, 40, 60	4, 3, 2	PR				
48.16	51.21	3.05	3.05	100%	2.35	77%	R3	12	FR	50, 30, 20, 60	1, 1, 1, 2	PR				
51.21	54.25	3.04	2.87	94%	1.94	64%	R3	10	FR	70, 60, 50, 20	6, 2, 2, 1	PR, IR				
54.25	57.30	3.05	2.63	86%	1.19	39%	R3	10	FR	20, 60, 55, 80	1, 3, 1, 4	PR, IR				
57.30	57.61	0.31	0.31	100%	0.31	100%	R3	13	FR	?						
57.61	60.66	3.05	3.05	100%	2.33	76%	R3	12	FR	60, 50, 10, 80	1, 2, 1, 4	PR				
60.66	60.96	0.30	0.21	70%	0.11	37%	R3	9	FR	30	1	PR				
60.96	64.01	3.05	2.85	93%	2.28	75%	R3	13	FR	35, 70, 50, 15	1, 2, 2, 1	PR				
64.01	67.06	3.05	3.01	99%	2.55	84%	R3	12	FR	30, 50, 60	1, 3, 1	PR				
67.06	70.10	3.04	2.58	85%	0.74	24%	R3	9	FR	70, 0, 45, 25	1, 1, 1, 2	PR				
70.10	76.20	6.10	2.74	45%	0.63	10%	R3	9	FR	30, 70, 50, 55	1, 1, 1, 1	PR				
76.20	79.25	3.05	2.83	93%	1.70	56%	R3	10	FR	60, 20, 50, 40	3, 2, 2, 2	PR				
79.25	82.30	3.05	2.83	93%	0.78	26%	R3	9	FR	0, 10, 20, 60	1, 1, 1, 2	PR				
82.30	85.34	3.04	3.04	100%	1.59	52%	R3	12	FR	15, 25, 50	3, 2, 2	PR				
85.34	88.39	3.05	3.05	100%	2.07	68%	R3	12	FR	60, 40, 50, 0	1, 1, 1, 1	PR				
88.39	91.44	3.05	2.77	91%	2.12	70%	R3	12	FR	80, 70, 20, 50	5, 2, 1, 1	PR				
91.44	94.49	3.05	3.05	100%	1.94	64%	R3	12	FR	80, 60, 50	2, 2, 2	PR				
94.49	97.54	3.05	3.05	100%	2.53	83%	R3	12	FR	40, 60, 80, 20	4, 2, 3, 1	PR, IR				
97.54	100.58	3.04	2.78	91%	1.80	59%	R3	11	FR	20, 45, 30, 80	1, 2, 1, 5	PR, IR				
100.58	103.63	3.05	2.83	93%	2.00	66%	R3	12	FR	40, 70, 50, 30	1, 4, 2, 1	PR				

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: August 20th, 1997 **Hole:** SSD-97-21 **Coordinates:** 43641.57 N **Collar Elevation:** 1231.65 m

Core Size: HQ 24781.12 E **Bearing:** 0

Logged By: Linda Lewis **Total Depth:** 109.73 m **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
6.10	9.14	3.04	2.06	68%											
9.14	12.19	3.05	2.65	87%											
12.19	15.24	3.05	2.64	87%											
15.24	18.29	3.05	2.34	77%											
18.29	20.12	1.83	1.64	90%											
20.12	21.64	1.52	1.30	86%											
21.64	22.86	1.22	1.22	100%											
22.86	24.69	1.83	1.49	81%											
24.69	27.43	2.74	2.25	82%											
27.43	29.57	2.14	2.16	101%											
29.57	31.70	2.13	1.62	76%											
31.70	32.61	0.91	0.53	58%											
32.61	33.53	0.92	0.62	67%			R1	6	FR	?			70	90	
33.53	35.66	2.13	0.53	25%			R0	1	FR	?			?		
35.66	38.40	2.74	0.36	13%			R0	1	FR	?			?		
38.40	39.62	1.22	0.78	64%	0.20	16%	R1	5	FR	50	5	PR	?		many cleavages ...
39.62	41.15	1.53	0.93	61%	0.00	0%	R1	3	FR	?			82		
41.15	42.67	1.52	0.58	38%	0.00	0%	R2	3	FR	?			?		
42.67	44.81	2.14	0.17	8%	0.00	0%	R2	5	FR	?			?		
44.81	45.27	0.46	0.08	17%	0.00	0%	R2	6	FR	?			?		
45.27	47.24	1.97	0.50	25%	0.00	0%	R2	6	FR	?			78	5	
47.24	48.77	1.53	0.35	23%	0.00	0%	R2	6	FR	?			75	3	
48.77	51.82	3.05	1.11	36%	0.10	3%	R2	7	FR	0	1	PR	70	55	
51.82	54.86	3.04	1.55	51%	0.11	4%	R2	7	FR	0, 65	1, 1	PR, IR	70	60	
54.86	57.91	3.05	2.90	95%	2.36	77%	R3	12	FR	70, 60, 40, 0	1, 1, 1, 1	PR, IR			limestone
57.91	60.96	3.05	3.05	100%	2.20	72%	R3	12	FR	40, 60, 70, 50	2, 1, 1, 2	PR			
60.96	64.01	3.05	3.00	98%	2.67	88%	R4	12	FR	70, 65	3, 1	PR			
64.01	67.06	3.05	2.43	80%	1.96	64%	R4	12	FR	30, 0, 70, 45	1, 2, 3, 2	PR, PS			
67.06	70.10	3.04	3.04	100%	2.25	74%	R4	12	FR	60, 30, 20, 70	1, 1, 1, 3	PR			
70.10	73.15	3.05	2.80	92%	1.93	63%	R3	12	FR	80, 70, 60	1, 3, 3	PR, IR			
73.15	76.20	3.05	2.95	97%	2.18	71%	R3	13	FR	50, 55, 40, 60	2, 1, 1, 2	PR			
76.20	79.25	3.05	3.05	100%	2.52	83%	R3	13	FR	55, 20, 35, 70	1, 1, 1, 2	PR			
79.25	82.30	3.05	3.05	100%	2.49	82%	R3	12	FR	70, 60, 50	3, 2, 1	PR			
82.30	85.34	3.04	2.94	97%	2.56	84%	R3	13	FR	40, 50	1, 1	PR			
85.34	88.39	3.05	3.05	100%	2.10	69%	R3	12	FR	50, 20, 30, 45	3, 2, 1, 2	PR, IR			
88.39	91.44	3.05	2.80	92%	1.69	55%	R3	10	FR	60, 40, 10	4, 1, 1	PR, PS			
91.44	94.49	3.05	3.05	100%	1.38	45%	R3	10	FR	50, 10, 20	4, 1, 1	PR, IR			
94.49	97.54	3.05	2.52	83%	0.43	14%	R3	9	FR	10, 5	2, 1	PR			
97.54	100.58	3.04	3.04	100%	2.44	80%	R3	12	FR	60, 85	1, 4	IR, PR			
100.58	103.63	3.05	2.92	96%	2.36	77%	R3	12	FR	30, 60, 80	2, 1, 4	IR, PR			
103.63	106.68	3.05	3.05	100%	2.24	73%	R3	13	FR	15, 60, 80	3, 1, 4	PR, IR			
106.68	109.73	3.05	2.87	94%	2.44	80%	R3	13	FR	60, 70, 40	4, 3, 2	PR, IR			

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*														
Date:	August 22nd, 1997			Hole:	SSD -97- 22			Coordinates:_	43648.56 N			Collar Elevation:	1225.87 m		
				Core Size:	HQ				24733.46 E			Bearing:	0		
Logged By: C. A.				Total Depth:	109.73 m							Dip:	-90		
Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
13.30	13.72	0.42	0.15	36%											
13.72	15.24	1.52	0.41	27%											
15.24	18.29	3.05	1.21	40%											
18.29	21.34	3.05	0.89	29%											
21.34	22.25	0.91	0.31	34%											
22.25	24.38	2.13	1.70	80%											
24.38	26.82	2.44	2.44	100%											
26.82	29.87	3.05	2.58	85%											
29.87	32.00	2.13	2.24	105%											
32.00	35.05	3.05	2.66	87%											
35.05	36.58	1.53	1.20	78%											
36.58	39.62	3.04	2.94	97%											
39.62	42.67	3.05	2.98	98%											
42.67	45.72	3.05	2.56	84%											
45.72	48.77	3.05	0.53	17%	0.11	4%	R3	6	FR	?			?		Qtz vein
48.77	49.99	1.22	0.80	66%	0.13	11%	R4	9	FR	60, 50	4, 1	PS			Qtz vein
49.99	51.82	1.83	0.80	44%	0.28	15%	R4	9	FR	55, 60, 70	1, 1, 1	PS, PR			Qtz vein
51.82	53.04	1.22	0.04	3%	0.00	0%	R2	4	FR	?			?		
53.04	54.86	1.82	0.79	43%	0.18	10%	R3	9	FR	50, 70, 10, 55	1, 2, 1, 1	PR, IR			
54.86	57.00	2.14	0.91	43%	0.00	0%	R1	2	FR	?			?		
57.00	59.44	2.44	0.56	23%	0.18	7%	R1	3	FR	50	1	PR			
59.44	60.96	1.52	0.32	21%	0.00	0%	R2	3	FR	?			?		
60.96	62.48	1.52	0.05	3%	0.00	0%	R2	4	FR	?			?		
62.48	64.01	1.53	0.60	39%	0.15	10%	R2	6	FR	?			?		
64.01	67.06	3.05	2.76	90%	1.89	62%	R2	12	FR	60, 40, 70	2, 4, 5		25	50	
67.06	70.10	3.04	2.90	95%	2.20	72%	R3	13	FR	60, 30, 40, 70	4, 1, 1, 2	PR	80	10	
70.10	73.15	3.05	2.86	94%	1.78	58%	R3	11	FR	80, 60, 70	2, 3, 2	PR, IR			lst and bx Earn
73.15	76.20	3.05	3.05	100%	2.67	88%	R3	13	FR	70, 60, 50	5, 1, 1	PR, PS			limestone
76.20	79.25	3.05	3.05	100%	2.49	82%	R3	13	FR	60, 50, 35, 30	4, 2, 1, 1	PR, IR			
79.25	82.30	3.05	3.05	100%	2.21	72%	R3	13	FR	60, 30, 15, 40	3, 2, 1, 1	PS, PR			
82.30	85.34	3.04	3.04	100%	2.86	94%	R3	13	FR	65, 70, 50	2, 2, 2	PR, PS			
85.34	88.39	3.05	2.98	98%	2.28	75%	R3	12	FR	0, 30, 70, 60	1, 1, 4, 6	PR, PS			
88.39	91.44	3.05	3.05	100%	2.10	69%	R3	12	FR	60, 50, 40, 20	5, 3, 2, 1	PR, PS			
91.44	94.49	3.05	2.73	90%	0.92	30%	R3	10	FR	40, 0, 60, 15	4, 1, 2, 2	PR, PS			
94.49	97.50	3.01	2.98	99%	1.99	66%	R3	12	FR	10, 30, 15, 50	1, 2, 1, 2	PR, IR			
97.50	100.58	3.08	3.02	98%	2.66	86%	R3	13	FR	70, 30, 50	1, 1, 3	PR			
100.58	103.63	3.05	3.05	100%	2.11	69%	R3	12	FR	40, 50, 20, 60	3, 3, 2, 2	PR, IR			
103.63	106.68	3.05	2.71	89%	1.34	44%	R0	10	FR	70, 60, 40	5, 3, 4	PR, IR			
106.68	109.73	3.05	3.05	100%	2.44	80%	R3	12	FR	30, 70, 50	1, 4, 2	PR, IR			

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*														
Date:	August 22nd, 1997			Hole:		SSD-97-23		Coordinates:		43680.43 N			Collar Elevation:		1220.64 m
				Core Size:		HQ				24740.56 E			Bearing:	0	
Logged By:				Total Depth:		115.82 m							Dip:	-90	
Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
15.24	18.29	3.05	2.14	70%	0.20	7%	R3	9	PS	0, 40	2, 1	PR, IR	70	100	many cleavages along bedding
18.29	18.61	0.32	0.32	99%	0.00	0%	R3	6	PS	0	1	PR	80	60	
18.61	21.34	2.73	0.33	12%	0.00	0%	R1	6	FR	?			?		
21.34	23.16	1.82	0.20	11%	0.00	0%	R1	6	FR	?			?		
23.16	24.38	1.22	0.26	21%	0.00	0%	R1	6	FR	?			?		
24.38	24.99	0.61	0.35	57%	0.00	0%	R1	6	FR	?			?		
24.99	27.43	2.44	0.45	18%	0.00	0%	R1	6	FR	?			?		
27.43	28.96	1.53	0.03	2%	0.00	0%	R1	6	FR	?			?		
28.96	30.48	1.52	0.00	0%	0.00	0%				?			?		
30.48	31.09	0.61	0.00	0%	0.00	0%				?			?		
31.09	33.53	2.44	0.13	5%	0.00	0%	R1	5	FR	?			?		
33.53	35.36	1.83	0.16	9%	0.00	0%	R0	1	FR						rubble fault gouge
35.36	36.58	1.22	0.08	7%	0.00	0%	R0	1	FR						rubble fault gouge
36.58	37.49	0.91	0.03	3%	0.00	0%	R1	5	FR						rubble fault gouge
37.49	39.62	2.13	0.50	23%	0.00	0%	R0	1	FR						rubble fault gouge
39.62	41.45	1.83	1.42	78%	0.12	7%	R1	8	FR	70, 15	2, 1	PR			rubble fault gouge
41.45	42.98	1.53	1.20	78%	0.46	30%	R1	7	FR	80, 70	1, 2	PR			rubble fault gouge
42.98	45.42	2.44	0.45	18%	0.21	9%	R1	6	FR	?					rubble fault gouge
45.42	47.55	2.13	0.50	23%	0.14	7%	R1	8	FR	70	1	IR			rubble fault gouge
47.55	48.77	1.22	1.07	88%	0.00	0%	R1	8	FR	50, 80	1, 1	PR			rubble fault gouge
48.77	51.21	2.44	1.50	61%	0.15	6%	R1	8	FR	30	1	PR			rubble fault gouge
51.21	54.25	3.04	0.55	18%	0.00	0%	R1	1	FR	?					rubble fault gouge
54.25	55.78	1.53	0.28	18%	0.00	0%	R1	6	FR	50	1	PR			rubble fault gouge
55.78	57.91	2.13	0.73	34%	0.26	12%	R3	9	FR	60, 30, 40	1, 1, 1	PR			limestone
57.91	60.96	3.05	2.88	94%	1.56	51%	R3	11	FR	40, 70, 15	2, 4, 1	PR			
60.96	64.01	3.05	2.40	79%	1.11	36%	R3	10	FR	60, 80	1, 3	PR			
64.01	67.06	3.05	0.22	7%	0.00	0%	R3	6	SW	?					
67.06	68.28	1.22	0.70	57%	0.00	0%	R3	6	SW	?					
68.28	70.10	1.82	1.42	78%	0.49	27%	R3	9	PS	70, 30, 15, 40	1, 1, 1, 1	PR			
70.10	73.15	3.05	2.33	76%	0.50	16%	R3	9	FR	50, 30, 20, 60	2, 1, 1, 1	PR			
73.15	76.20	3.05	2.65	87%	0.96	31%	R3	9	FR	50, 0, 40, 70	2, 1, 1, 4	PR, IR			
76.20	79.25	3.05	2.31	76%	1.26	41%	R2	10	FR	70, 60, 10	2, 1, 1	PR, IR			
79.25	82.30	3.05	2.10	69%	1.05	34%	R3	9	FR	55, 40, 60, 30	2, 2, 1, 1	PR, IR			
82.30	85.34	3.04	2.96	97%	0.87	29%	R3	10	FR	50, 30, 10	1, 1, 3	PR			
85.34	88.39	3.05	3.05	100%	1.38	45%	R3	9	FR	30, 10, 70, 50	1, 4, 2, 1	PR			
88.39	91.44	3.05	1.95	64%	0.77	25%	R3	8	PS	80, 10, 60, 40	1, 1, 2, 1	PR			
91.44	94.49	3.05	2.53	83%	1.30	43%	R3	10	PS	40, 50, 30, 60	4, 2, 1, 1	PR, IR			
94.49	97.54	3.05	2.73	90%	1.53	50%	R0	11	FR	30, 80, 40, 50	2, 3, 1, 1	PR			clay?

SSD-97-23

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: *August 22nd, 1997* — ***Hole:*** *SSD-97-23* — ***Coordinates:*** *43680.43 N* / *24740.54 E* — ***Collar Elevation:*** *1220.64 m*

Core Size: *HQ* — ***Bearing:*** *0*

Logged By: — ***Total Depth:*** *115.82 m* — ***Dip:*** *-90*

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
97.54	100.58	3.04	3.04	100%	1.66	55%	R0	12	FR	30, 50, 70, 60	2, 3, 1, 2	PR			
100.58	103.63	3.05	2.72	89%	1.45	48%	R0	11	FR	30, 60, 50, 20	2, 2, 2, 1	PR			
103.63	106.68	3.05	2.51	82%	0.45	15%	R0	10	FR	60, 70, 35	2, 1, 2	PR			
106.68	109.73	3.05	2.24	73%	0.00	0%	R3	6	FR	50, 60	1, 1	PR			broken up rock
109.73	112.78	3.05	1.91	63%	0.00	0%	R3	6	FR	?					broken up rock
112.78	115.82	3.04	2.90	95%	0.00	0%	R3	6	FR	?					

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: August 23rd, 1997 — **Hole:** SSD-97-24 — **Coordinates:** 43680.39 N, 24854.77 E — **Collar Elevation:** 1215.93 m
Core Size: HQ — **Bearing:** 0
Logged By: C.A. — **Total Depth:** 121.92 m — **Dip:** -90

Depth (Metres) From	To	Length (Metres)	Recovery (Metres)	Recovery (%)	RQD (Metres)	RQD (%)	Deg of Hard	Degree of Breakage	Degree of Weathering	Joint Description Angle	Joint Description Number	Joint Description Surface	Bedding Planes Angle	Bedding Planes Number	Comments
12.19	15.24	3.05	0.35	11%	0.00	0%	R3	3	PS						broken up sandstone with no visible joints
15.24	16.46	1.22	0.00	0%	0.00	0%									
16.46	18.29	1.83	0.99	54%	0.00	0%	R2	4	PS	?			80	60	
18.29	19.81	1.52	0.53	35%	0.00	0%	R2	6	PS	15, 40	1, 1	PR	80	70	
19.81	21.34	1.53	0.55	36%	0.00	0%	R2	6	PS	?			80	60	rock is too broken to see joints
21.34	22.25	0.91	0.06	7%	0.00	0%	R1	3	PS	?			?		rock is too broken to see joints
22.25	24.38	2.13	0.11	5%	0.00	0%	R2	5	PS	?			?		rock is too broken to see joints
24.38	25.91	1.53	0.08	5%	0.00	0%	R2	6	PS	?			?		rock is too broken to see joints
25.91	27.43	1.52	0.00	0%	0.00	0%									
27.43	29.26	1.83	0.00	0%	0.00	0%									
29.26	30.48	1.22	0.06	5%	0.00	0%	R3	7	PS	70	1	PR			limestone
30.48	33.53	3.05	0.39	13%	0.00	0%	R0	1	HW						oxide mud
33.53	36.58	3.05	0.25	8%	0.00	0%	R0	1	HW						oxide mud
36.58	38.40	1.82	0.00	0%	0.00	0%									
38.40	39.62	1.22	0.33	27%	0.12	10%	R3	9	SW	40	1	PR			limestone
39.62	40.84	1.22	0.13	11%	0.00	0%	R1	3	HW	?					mixture of oxide mud and intact rock
40.84	42.67	1.83	0.64	35%	0.00	0%	R1	6	SW	?					massive sulphide zone
42.67	45.72	3.05	0.51	17%	0.41	13%	R1	11	MW	?					no joints visible
45.72	48.77	3.05	0.05	2%	0.00	0%	R1	4	MW	?					
48.77	51.82	3.05	0.01	0%	0.00	0%	R1	4	MW	?					
51.82	54.86	3.04	1.68	55%	1.06	35%	R3	12	PS	50, 80	4, 1	PS, PR			
54.86	57.91	3.05	2.83	93%	1.83	60%	R3	11	PS	50, 60, 40	4, 2, 1	PR			
57.91	60.96	3.05	3.05	100%	1.43	47%	R3	11	PS	50, 40, 30, 15, 10	2, 2, 2, 1, 1	PR, IR			
60.96	64.01	3.05	3.02	99%	1.69	55%	R3	11	FR	0, 60, 50, 40	2, 2, 1, 1	PR, IR			
64.01	67.06	3.05	3.05	100%	1.85	61%	R3	12	FR	70, 40, 30, 20	2, 3, 3, 1	PR, IR			
67.06	70.10	3.04	3.04	100%	1.44	47%	R3	10	FR	20, 10, 30, 40	2, 3, 1, 1	PR, IR			
70.10	73.15	3.05	3.00	98%	1.61	53%	R3	11	FR	40, 30, 20, 50	3, 1, 1, 1	PR, IR			
73.15	76.20	3.05	3.05	100%	1.75	57%	R3	10	FR	10, 60, 40, 70	2, 2, 3, 1	PR, IR			
76.20	79.25	3.05	2.96	97%	1.13	37%	R3	9	FR	40, 60, 20	5, 1, 3	PR, IR			
79.25	82.30	3.05	2.93	96%	2.00	66%	R3	10	FR	50, 30, 60, 10	2, 2, 3, 1	PR, IR			
82.30	85.34	3.04	3.02	99%	2.55	84%	R3	12	FR	70, 30, 60	2, 1, 3	PR, IR			
85.34	88.39	3.05	3.05	100%	2.00	66%	R3	10	FR	60, 50, 30, 20	2, 2, 1, 1	PR, PS			
88.39	91.44	3.05	3.00	98%	1.72	56%	R3	10	FR	70, 50, 40, 30	5, 2, 1, 1	PR, PS			
91.44	94.49	3.05	3.05	100%	1.60	52%	R3	10	FR	30, 70, 10	2, 2, 3	PR, PS			
94.49	97.54	3.05	3.05	100%	2.55	84%	R3	12	FR	80, 30, 10, 50	5, 2, 2, 1	PR, UR			
97.54	100.58	3.04	3.04	100%	2.52	83%	R3	11	FR	70, 40, 60, 30	3, 1, 2, 1	CR, PR			
100.58	103.63	3.05	2.98	98%	2.24	73%	R3	12	FR	80, 70, 60, 20	1, 5, 3, 2	CR, PR			
103.63	106.68	3.05	3.05	100%	2.07	68%	R3	11	FR	70, 10	4, 2	CR, PR			

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*

Date: August 23rd, 1997 **Hole:** SSD -97- 24 **Coordinates:** 43680.39 N **Collar Elevation:** 1215.93 m
Core Size: HQ 24854.77 E **Bearing:** 0
Logged By: C.A. **Total Depth:** 121.92 m **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
106.68	109.73	3.05	3.00	98%	2.24	73%	R3	12	FR	70, 60, 40, 20	1, 3, 1, 1	CR, IR			
109.73	112.78	3.05	3.05	100%	2.69	88%	R3	12	FR	40, 50, 60, 70	1, 1, 2, 2	CR, IR			
112.78	115.82	3.04	2.95	97%	2.10	69%	R3	12	FR	70, 0, 40	2, 1, 1	CR, PR			
115.82	118.87	3.05	3.02	99%	2.89	95%	R3	13	FR	60, 80	1, 5	CR, UR			
118.87	121.92	3.05	3.05	100%	2.79	91%	R3	12	FR	60, 80, 70, 40	1, 3, 2, 1	CR			

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: August 29th, 1997   **Hole:** SSD -97- 25   **Coordinates:** 43679.58 N, 24835.12 E   **Collar Elevation:** 1201.22 m
Core Size: HQ   **Bearing:** 0
Logged By: JML   **Total Depth:** 79.25 metres   **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
15.24	18.29	3.05	0.16	5%	0.12	4%	R4	10	SW	15	1	Surface	NA		slightly iron stained
18.29	19.80	1.51	0.00	0%		0%									
19.80	21.34	1.54	0.00	0%		0%									
21.34	24.38	3.04	0.00	0%		0%									
24.38	27.43	3.05	0.10	3%	0.00	0%	R3	7	SW	15	1	R	NA		brecciated iron staining in clasts and matrix
27.43	29.26	1.83	0.00	0%		0%									
29.26	30.38	1.12	0.06	5%	0.00	0%									dry hole/cavern?
30.38	31.39	1.01	0.57	56%	0.44	44%	R3	9-10	SW	0-5, 65	1, 1	R, I	NA		
31.39	33.53	2.14	2.10	98%	1.80	84%	R3-R4	8	FR-SW	30, 50, 85	2, 1, 9	S, S, I	NA		
33.53	35.66	2.13	1.51	71%	1.26	59%	R3	9	FR	65, 75	6, 2	I, R	60	1	
35.66	38.10	2.44	1.37	56%	1.00	41%	R3	9	FR	45, 80	3, 1	RI, R	45	1	
38.10	39.62	1.52	1.40	92%	1.30	86%	R3	11	FR	80	3	I, R	NA		sulphides
39.62	42.67	3.05	3.00	98%	2.99	98%	R4-R5	12	FR	85, 10, 20	7, 1, 1	R, R, I	NA		
42.67	45.72	3.05	2.95	97%	2.63	86%	R4-R5	12	FR	85, 20-30	8, 3	R, I	50, 60	2	
45.72	48.77	3.05	3.05	100%	2.93	96%	R3-R4	11	FR	20, 75	5, 9	R, I	65	1	
48.77	51.82	3.05	3.00	98%	2.67	88%	R3	9-10	SW	85, 25	12, 2	I, R	65, 75	2	
51.82	54.86	3.04	2.85	94%	2.44	80%	R3	9-10	FR	40-50, 75	9, 5	I, R	65	2	
54.86	57.91	3.05	2.75	90%	2.63	86%	R3	8-10	FR	80, 5-20	9, 10	R, R	60	1	
57.91	60.96	3.05	3.05	100%	2.71	89%	R4	10	FR	5, 70, 30	3, 10, 3	IR, R, R	75	2	
60.96	64.00	3.04	2.90	95%	2.28	75%	R4	8	FR	5, 45, 80	12, 2, 9	S, R, I	65, 70	2	
64.00	67.06	3.06	3.06	100%	2.23	73%	R4	8-10	FR	70, 20	11, 4	I, R	60	1	
67.06	70.10	3.04	3.02	99%	2.35	77%	R4	9	FR	75, 5	14, 4	R+S, I	NA		
70.10	73.15	3.05	3.04	100%	2.53	83%	R5	9	FR	75, 5	11, 2	I, I	65	10	
73.15	76.20	3.05	3.05	100%	2.55	84%	R5	8	FR	75, 5, 70	16, 7, 3	I, R, R	70	2	
76.20	79.25	3.05	3.05	100%	2.89	95%	R5	7	FR	50, 75, 50	3, 8, 4	I, R, R	60	25	

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***														
Date:				**Hole:**		**SSD -97-26**		**Coordinates:**	**42200.00 N**			**Collar Elevation:**		**1392.00 m**	
				Core Size:		**HQ**			**25929.00 E**			**Bearing:**	**0**		
Logged By:	**JML**			**Total Depth:**		**371.86 metres**						**Dip:**	**-90**		
Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
32.00	33.53	1.53	1.34	88%											
33.53	36.58	3.05	3.05	100%											
36.58	39.62	3.04	3.04	100%											
39.62	42.67	3.05	3.05	100%											
42.67	45.72	3.05	3.05	100%											
45.72	48.77	3.05	3.05	100%											
48.77	51.82	3.05	2.80	92%											
51.82	54.86	3.04	2.85	94%											
54.86	57.91	3.05	2.85	93%											
57.91	60.96	3.05	3.05	100%											
60.96	64.01	3.05	3.05	100%											
64.01	67.06	3.05	3.05	100%											
67.06	70.10	3.04	3.05	100%											
70.10	73.15	3.05	3.05	100%											
73.15	76.20	3.05	3.05	100%											
76.20	79.25	3.05	3.05	100%											
79.25	82.30	3.05	3.05	100%											
82.30	85.34	3.04	3.04	100%											
85.34	88.39	3.05	3.05	100%											
88.39	91.44	3.05	3.05	100%											
91.44	94.49	3.05	3.05	100%											
94.49	97.54	3.05	3.05	100%											
97.54	100.58	3.04	3.04	100%											
100.58	103.63	3.05	3.05	100%											
103.63	106.68	3.05	3.05	100%											
106.68	109.73	3.05	3.05	100%											
109.73	112.78	3.05	3.05	100%											
112.78	115.82	3.04	3.04	100%											
115.82	118.87	3.05	3.05	100%											
118.87	121.92	3.05	3.05	100%											
121.92	124.97	3.05	3.05	100%											
124.97	128.02	3.05	3.05	100%											
128.02	131.06	3.04	3.04	100%											
131.06	134.11	3.05	3.05	100%											
134.11	137.16	3.05	3.05	100%											
137.16	140.21	3.05	3.05	100%											
140.21	143.26	3.05	3.05	100%											
143.26	146.30	3.04	3.04	100%											

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date:		***Hole:***	***SSD -97-26***
		Core Size:	***HQ***
Logged By:	***JML***	***Total Depth:***	***371.86 metres***
Coordinates:	***42200.00 N***	***Collar Elevation:***	***1392.00 m***
	25929.00 E	***Bearing:***	***0***
		Dip:	***-90***

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
146.30	149.35	3.05	3.05	100%											
149.35	152.40	3.05	3.05	100%											
152.40	155.45	3.05	3.05	100%											
155.45	158.50	3.05	3.05	100%											
158.50	161.54	3.04	2.80	92%											
161.54	164.59	3.05	2.65	87%											
164.59	167.74	3.15	2.80	89%											
167.74	170.65	2.91	3.01	103%											
170.65	173.74	3.09	2.95	95%											
173.74	176.78	3.04	3.05	100%											
176.78	182.88	6.10	3.10	51%											
182.88	185.93	3.05	3.05	100%											
185.93	188.98	3.05	3.00	98%											
188.98	192.62	3.64	3.04	84%											
192.62	195.07	2.45	3.00	122%											
195.07	198.12	3.05	3.00	98%											
198.12	201.17	3.05	3.05	100%											
201.17	204.22	3.05	3.05	100%											
204.22	207.26	3.04	3.04	100%											
207.26	210.31	3.05	3.05	100%											
210.31	213.36	3.05	3.05	100%											
213.36	216.41	3.05	3.05	100%											
216.41	219.46	3.05	3.00	98%											
219.46	222.50	3.04	3.04	100%											
222.50	225.55	3.05	2.55	84%											
225.55	228.60	3.05	3.05	100%											
228.60	231.65	3.05	3.05	100%											
231.65	234.74	3.09	3.05	99%											
234.74	237.74	3.00	3.04	101%											
237.74	240.79	3.05	3.03	99%											
240.79	243.84	3.05	3.01	99%											
243.84	246.89	3.05	3.05	100%											
246.89	249.94	3.05	3.05	100%											
249.94	252.98	3.04	2.98	98%											
252.98	256.04	3.06	2.95	96%											
256.04	259.08	3.04	3.04	100%											
259.08	262.13	3.05	3.05	100%											
262.13	265.18	3.05	3.05	100%											

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date:
Logged By: JML

Hole: SSD-97-26
Core Size: HQ
Total Depth: 371.86 metres

Coordinates: 42200.00 N
25929.00 E

Collar Elevation: 1392.00 m
Bearing: 0
Dip: -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
265.18	268.22	3.04	3.05	100%											
268.22	271.27	3.05	3.00	98%											
271.27	274.32	3.05	3.05	100%											
274.32	277.37	3.05	3.05	100%											
277.37	280.42	3.05	3.00	98%											
280.42	283.46	3.04	3.04	100%											
283.46	286.51	3.05	3.05	100%											
286.51	289.56	3.05	3.05	100%											
289.56	292.61	3.05	3.05	100%											
292.61	295.66	3.05	3.05	100%											
295.66	298.70	3.04	3.04	100%											
298.70	301.75	3.05	3.05	100%											
301.75	303.58	1.83	1.83	100%											
303.58	304.80	1.22	1.22	100%											
304.80	307.85	3.05	3.05	100%											
307.85	310.90	3.05	2.98	98%											
310.90	313.94	3.04	3.04	100%											
313.94	316.99	3.05	2.95	97%											
316.99	320.04	3.05	2.93	96%											
320.04	321.87	1.83	1.83	100%											
321.87	322.60	0.73	0.73	100%											
322.60	326.14	3.54	3.20	90%											
326.14	329.18	3.04	3.04	100%											
329.18	332.23	3.05	3.00	98%											
332.23	335.28	3.05	3.05	100%											
335.28	338.33	3.05	3.05	100%											
338.33	341.38	3.05	3.05	100%											
341.38	344.42	3.04	3.05	100%											
344.42	347.47	3.05	3.05	100%											
347.47	350.52	3.05	3.01	99%											
350.52	353.57	3.05	3.05	100%											
353.57	356.62	3.05	3.05	100%											
356.62	359.05	2.43	2.36	97%											
359.05	362.71	3.66	3.53	96%											
362.71	365.76	3.05	2.90	95%											
365.76	368.81	3.05	2.95	97%											
368.81	371.86	3.05	2.91	95%											

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date:	*August 29th, 1997*	*Hole:*	*SSD -97-27*	*Coordinates:*	*43660.36 N*
		Core Size:	*HQ*		*24799.84 E*
Logged By:	*JML*	*Total Depth:*	*91.44 metres*		

Collar Elevation: *1223.02 m*
Bearing: *0*
Dip: *-90*

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
9.14	12.19	3.05	0.97	32%	0.14	5%	R2	4-5	SW	60	2	I	85-90	3880	iron staining
12.19	14.63	2.44	1.64	67%	0.74	30%	R2-R3	5	SW	0, 95, 30	2, 20, 3	I, P, I	70	4000	iron staining along bedding and fractures
14.63	16.46	1.83	0.99	54%	0.48	26%	R2	3	SW	75-85, 35	5, 1	I, I	breccia w/	no bedding	iron staining w/in matrix + clasts
16.46	17.98	1.52	0.15	10%	0.00	0%	R2-R3	4	SW	just fragments					fault/cavern
17.98	19.51	1.53	0.61	40%	0.70	46%	R2-R3	4	SW	90	4	I	breccia w/	no bedding	iron staining w/in matrix + clasts
19.51	21.34	1.83	0.09	5%	0.00	0%	R2	4	PS	limited recovery					**fault/cavern
21.34	22.86	1.52	0.17	11%	0.00	0%	R2	4	PS	limited recovery					
22.86	24.36	1.50	0.00	0%		0%									
24.36	26.82	2.46	0.00	0%		0%									
26.82	28.96	2.14	0.05	2%	0.00	0%	R2	4	PS	limited recovery					
28.96	30.48	1.52	0.00	0%		0%									
30.48	32.92	2.44	0.00	0%		0%									
32.92	35.36	2.44	0.00	0%		0%									
35.36	39.62	4.26	0.00	0%		0%									
39.62	42.67	3.05	0.00	0%		0%									
42.67	45.72	3.05	0.20	7%	0.00	0%	R3-R4	4	SW						iron staining along bedding planes
45.72	48.77	3.05	0.10	3%	0.00	0%	R3	4	SW						iron staining along bedding planes
48.77	51.82	3.05	0.50	16%	0.10	3%	R3-R4	6	SW	45	1	I	N/A		
51.82	54.87	3.05	0.00	0%		0%									
54.87	57.91	3.04	1.72	57%	1.54	51%	R4	12	PS	85, 50	3, 4	U, R	85	40	iron staining along fractures
57.91	60.96	3.05	3.05	100%	2.75	90%	R4-R5	12	FR	85-90, 60	12, 1	P, R	75-80	30	
60.96	64.00	3.04	3.04	100%	3.03	100%	R4-R5	12	FR	15, 30, 90	1, 1, 6	R, R, P	70		stylolites
64.00	67.06	3.06	3.06	100%	2.63	86%	R4-R5	12	FR	15, 50, 85	1, 1, 11	R, U, P	N/A	2	
67.06	70.10	3.04	3.04	100%	2.50	82%	R4	12	FR	0, 85, 60	6, 5, 2	R, R, R	50	5	lots of calcite on fractures
70.10	73.15	3.05	3.04	100%	2.43	80%	R4	12	FR	85-90, 10-20	10, 5	RR	55	2	
73.15	76.20	3.05	3.05	100%	2.87	94%	R5	13	FR	0, 90, 65, 35	5, 1, 1	RU, R, R	40-45		
76.20	79.25	3.05	3.05	100%	2.46	81%	R5-R6	14	FR	90, 0, 10-20	7, 5, 2	S-R, R	N/A		
79.25	82.30	3.05	3.05	100%	2.10	69%	R4-R5	12	SW	85, 15, 0	6, 5, 2	R, R, R	N/A		
82.30	85.34	3.04	3.04	100%	2.42	80%	R4-R6	13	FR	85, 0, 30	9, 3, 2	R, R, R	N/A		
85.34	88.39	3.05	3.05	100%	2.83	93%	R5	12	SW	75-85, 0, 40	10, 6, 3	I, R, S	60	1	
88.39	91.44	3.05		0%		0%	R5	12	FR	75-85, 10	9, 4	I, R	55	1	

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: August 31st, 1997 | **Hole:** SSD -97- 28 | **Coordinates:** 43699.41 N, 24798.97 E | **Collar Elevation:** 1211.04 m
Core Size: HQ | **Bearing:** 0
Logged By: JML | **Total Depth:** 91.44 m | **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
19.80	21.33	1.53	1.53	100%	0.78	51%	R3	4-7	SW	75, 35	5, 3	R, I	70	25	Fe-stains on fractures
21.33	22.90	1.57	1.53	97%	1.29	82%	R3-R4	6-7	SW	20, 75	1, 3	R, IR	N/A	Bx	Fe-stains on fractures
22.90	23.80	0.90	0.90	100%	0.80	89%	R4	6	SW	70	4	R	N/A		
23.80	25.30	1.50	1.50	100%	1.14	76%	R4	7	SW	25	3	R	50	100	
25.30	27.40	2.10	1.73	82%	1.27	60%	R3	8	FR	25	3	R	85	1	
27.40	30.50	3.10	3.10	100%	2.27	73%	R3-R4	8	FR	15	6	I	85	2	
30.50	33.50	3.00	3.00	100%	2.67	89%	R4	7-9	FR	65-70	15	R	N/A		
33.50	36.60	3.10	3.10	100%	2.81	91%	R4	9	FR	70	9	S-R	70	150	
36.60	39.60	3.00	3.00	100%	2.78	93%	R3	10	FR	65-70	12	R-I	60	50	
39.60	42.70	3.10	3.05	98%	2.80	90%	R4	9-10	FR	70	8	I	65	10	
42.70	45.70	3.00	3.00	100%	2.49	83%	R4	6-9	FR	45	5	S, R	N/A		
45.70	48.80	3.10	3.10	100%	1.30	42%	R3	6	FR	65-70	21	I, R	N/A	Bx	
48.80	51.80	3.00	2.93	98%	2.46	82%	R3	7-8	FR	75	7	I, R	60	10	
51.80	54.90	3.10	3.00	97%	2.52	81%	R3	7	FR	30, 5	11, 2	S-I, R	60	5	green clay on fractures
54.90	57.90	3.00	3.00	100%	2.29	76%	R5	7-8	FR	30, 5	12, 2	I, R	85	25	green clay on fractures
57.90	61.00	3.10	3.10	100%	2.53	82%	R4	5-7	FR	25-30	17	R	85	20	green clay on fractures
61.00	64.00	3.00	3.00	100%	2.67	89%	R4	5-7	FR	30	6	I	75	3	green clay on fractures
64.00	67.00	3.00	3.00	100%	2.36	79%	R4	5-6	FR	5-10	11	I, R	90	100	green clay on fractures
67.00	70.10	3.10	3.10	100%	2.30	74%	R4	5-6	FR	5-1, 20	8, 2	I, R	80	50	green clay on fractures
70.10	73.15	3.05	3.05	100%	2.76	90%	R4-R5	8-9	FR	65-70, 5	9, 2	I, R	75	2	green clay on fractures
73.15	76.20	3.05	3.05	100%	2.60	85%	R4	9-10	FR	10-20	6	S-R	75	3	green clay on fractures
76.20	79.25	3.05	3.05	100%	2.71	89%	R4	12	FR	5	3	I	65	10	
79.25	82.30	3.05	3.05	100%	2.97	97%	R4	13-14	FR	75	7	R	75	500	
82.30	85.35	3.05	3.03	99%	3.02	99%	R4	14	FR	45	4	R	60	500	
85.35	88.40	3.05	3.05	100%	2.88	94%	R4	13	FR	10	3	I	65	200	
88.40	91.44	3.04	3.04	100%	2.89	95%	R4	12	FR	75, 45	9, 3	I, R	85	200	

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*														
Date:	August 29th, 1997			Hole:	SSD-97-29		Coordinates:	43680.20 N			Collar Elevation:		1215.14 m		
				Core Size:	HQ/NQ			24800.38 E			Bearing:	0			
Logged By:	JML			Total Depth:	89.92 metres						Dip:	-90			

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
9.14	12.19	3.05	2.20	72%	0.00	0%	R2	4	SW						iron staining, *all fragments
12.19	13.14	0.95	0.00	0%		0%									
13.14	15.20	2.06	0.45	22%	0.00	0%	R2	4	SW						iron staining, *all fragments
15.20	17.07	1.87	0.00	0%		0%									more iron staining than above 2 intervals. *all
17.07	18.29	1.22	0.86	70%	0.00	0%	R2	4	SW						fragments
18.29	21.34	3.05	0.00	0%		0%									
21.34	22.56	1.22	0.00	0%		0%									
22.56	24.38	1.82	0.10	5%	0.00	0%	R2	4	SW						all fragments iron staining
24.38	27.43	3.05	0.33	11%	0.00	0%	R2	4	SW						all fragments iron staining
27.43	30.48	3.05	0.00	0%		0%									
30.48	33.53	3.05	0.12	4%	0.00	0%	R2	4	SW						all fragments iron staining
33.53	35.05	1.52	0.35	23%	0.00	0%	R2-R3	3	SW						matrix completely iron stained
35.05	36.58	1.53	0.80	52%	0.18	12%	R3	6	FR	45	5	R+I	35	1	
36.58	39.62	3.04	2.90	95%	2.60	86%	R4	11	SW	45, 70	4, 5	I, R	55	10	some iron on fracture surfaces
39.62	42.67	3.05	3.05	100%	2.49	82%	R4	14	SW-FR	70, 20	7, 5	R, RI	85	20	minor iron stains on fracture surfaces, BX in veins
42.67	45.72	3.05	3.05	100%	2.80	92%	R4	12	SW-FR	55, 5-15	2, 6	R, RI	55	5	veins/styolites
45.72	48.77	3.05	3.05	100%	2.56	84%	R4	9-11	SW-FR	50-60, 5	6, 2	R, I	50	20	
48.77	51.82	3.05	3.05	100%	2.48	81%	R4	8-9	FR	80, 5	15, 4	R, RI	85-80	30	
51.82	54.86	3.04	3.04	100%	2.40	79%	R4	9	FR	25, 60	10, 6	I, R	50	20	green clay on fracture surfaces
54.86	57.91	3.05	3.05	100%	2.53	83%	R4	8-10	FR	75, 5	12, 3	I, R	N/A		
57.91	60.96	3.05	3.03	99%	2.84	93%	R5	8	FR	80, 20	8, 3	R, RI	N/A		
60.96	64.01	3.05	3.05	100%	1.81	59%	R5	7	FR	5, 80	4, 11	R, I	85	20	*many long fractures @ low angles to core axes
64.01	67.06	3.05	3.05	100%	1.81	59%	R5	6-7	FR	20, 70	12, 7	R, I	70	50	
67.06	70.10	3.04	3.04	100%	2.22	73%	R5	8	FR	75, 10	8, 6	R, R	80	20	
70.10	73.15	3.05	3.05	100%	2.86	94%	R4	8-10	FR-SW	5-20, 70	13, 90	R, R	60-80	5	**ch[illegible] some iron stains - could [illegible]
73.15	76.20	3.05	2.54	83%	0.97	32%	R3	4-7	FR	80	12	I	80	5	bottom of interval
76.20	77.11	0.91	0.98	108%	0.36	40%	R3	4-7	FR	20	1	R	N/A		mostly fragmented
77.11	79.25	2.14	2.14	100%	0.24	11%	R3	4	FR	20	3	I	N/A		very fragmented
79.25	82.30	3.05	3.05	100%	1.06	35%	R3	4-5	FR	10	13	R	80-85	10	
82.30	85.34	3.04	3.04	100%	1.90	62%	R3	5	FR	20	12	R-S	75	2	
85.34	88.39	3.05	3.05	100%	1.55	51%	R3	5	FR	15	20	R	50-55	10	Bx
88.39	89.92	1.53	1.53	100%	0.26	17%	R3	5	FR						too rubbled and brecciated

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: August 31st, 1997 **Hole:** SSD-97-30 **Coordinates:** 43700.06 N **Collar Elevation:** 1217.96 m
Core Size: HQ 24739.22 E **Bearing:** 0
Logged By: JML **Total Depth:** 94.49 metres **Dip:** -90

Depth (Metres) From	Depth (Metres) To	Length (Metres)	Recovery (Metres)	Recovery (%)	RQD (Metres)	RQD (%)	Deg of Hard	Degree of Breakage	Degree of Weathering	Joint Description Angle	Joint Description Number	Joint Description Surface	Bedding Planes Angle	Bedding Planes Number	Comments
14.33	15.24	0.91	0.91	100%											
15.24	16.46	1.22	1.15	94%											
16.46	17.68	1.22	0.95	78%											
17.68	18.90	1.22	0.00	0%											
18.90	21.34	2.44	0.00	0%											
21.34	24.38	3.04	0.00	0%											
24.38	27.43	3.05	0.50	16%											
27.43	28.96	1.53	0.30	20%											
28.96	30.48	1.52	0.55	36%											
30.48	31.70	1.22	0.15	12%											
31.70	33.53	1.83	0.75	41%											
33.53	35.05	1.52	1.52	100%											
35.05	36.58	1.53	0.85	56%											
36.58	38.40	1.82	0.35	19%	0.00	0%	R4	4	SW						50ft above sulphide zone
38.40	39.62	1.22	0.45	37%	0.00	0%	R3	4-5	SW-FR						Fragments
39.62	42.67	3.05	0.40	13%	0.00	0%	R4	4-5	SW-FR						Fragments
42.67	45.72	3.05	0.10	3%	0.00	0%	R3	4	FR						Fragments
45.72	48.77	3.05	0.20	7%	0.00	0%	R4	4	FR						Fragments
48.77	49.38	0.61	0.00	0%	0.00	0%									
49.38	50.29	0.91	0.55	60%	0.00	0%	R4	4-5	FR						Fragments
50.29	51.82	1.53	0.21	14%	0.00	0%	R4	4	FR						Fragments
51.82	54.86	3.04	3.04	100%	2.41	79%	R4-R5	5, 13	FR	75	14	R	65	40	
54.86	57.91	3.05	3.05	100%	1.98	65%	R3	6	FR	75, 45	14, 3	R, S	55	2	
57.91	60.96	3.05	3.05	100%	1.92	63%	R3	9	FR	75-80	24	R-S	60	40	
60.96	64.01	3.05	3.05	100%	2.40	79%	R4	8-9	FR	75, 50	15, 3	R, R	N/A		
64.01	67.06	3.05	3.05	100%	1.08	35%	R3-R4	6-7	FR	65, 80	5, 8	S, R	N/A		Bx. coa
67.06	70.10	3.04	3.00	99%	2.21	73%	R3-R4	5-6	FR	10, 75	6, 10	R, R	60-90	5	
70.10	73.15	3.05	1.70	56%	1.21	40%	R3	6	FR	25	3	R	65	20	cave @ 72.54
73.15	76.20	3.05	3.05	100%	2.31	76%	R3	6-7	FR	30, 5	3, 4	R	60	20	
76.20	79.25	3.05	3.05	100%	2.79	91%	R3-R4	12	FR	0-5, 50	2, 4	I, R	60	5	
79.25	82.30	3.05	3.05	100%	2.65	87%	R3	9-12	FR	50, 5	5, 2	I, I	N/A		
82.30	85.34	3.04	3.04	100%	2.77	91%	R3-R4	11-12	FR	5-10, 75	3, 5	I, R	60	10	
85.34	88.39	3.05	3.05	100%	2.23	73%	R3-R4	9-1	FR-SW	45, 5	2, 8	R, I	N/A		
88.39	91.44	3.05	3.05	100%	2.71	89%	R3	8	FR	5, 75-80	6, 11	I, R	N/A		
91.44	94.49	3.05	3.03	99%	1.53	50%	R2	2	FR	20	20	S	N/A		fault zone

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*

Date: September 3rd, 1997 — Hole: SSD-97-31 — Coordinates: 43668.70 N, 24741.24 E — Collar Elevation: 1222.54 m

Core Size: HQ — Bearing: 0

Logged By: JML — Total Depth: 109.63 metres — Dip: -90

Depth (Metres) From	Depth (Metres) To	Length (Metres)	Recovery (Metres)	Recovery (%)	RQD (Metres)	RQD (%)	Deg of Hard	Degree of Breakage	Degree of Weathering	Joint Description Angle	Joint Description Number	Joint Description Surface	Bedding Planes Angle	Bedding Planes Number	Comments
13.72	15.24	1.52	1.52	100%	0.22	14%	R2	5-6	MW	25	5	S	60	100	iron staining
15.24	16.76	1.52	1.32	87%	0.42	28%	R2	6	MW	15	3	S w/calcite	60	400	iron staining
16.76	17.68	0.92	0.92	100%	0.00	0%	R2	6-7	SW	5	3	S w/calcite	60	400	iron staining
17.68	19.20	1.52	1.52	100%	0.40	26%	R2	5	SW	5-20	3	S w/calcite	60	400	
19.20	20.12	0.92	0.75	82%	0.00	0%	R3	4-5	SW	5-20	10	S w/calcite			too rubbled +
20.12	21.03	0.91	0.80	88%	0.00	0%	R2	4-5	FR				60	100	
21.03	22.25	1.22	1.00	82%	0.00	0%	R2	4-5	FR						fragmented
22.25	24.38	2.13	2.13	100%	0.51	24%	R2	4-6	FR	70-80	20	S w/calc +PY	N/A		PY
24.38	26.82	2.44	1.44	59%	0.00	0%	R2	4-5	FR	60	15	S w/calc +PY	55-60	400	en echelon fractures
26.82	29.26	2.44	0.50	20%	0.00	0%	R2	4	FR						
29.26	31.39	2.13	0.50	23%	0.00	0%	R2	4	FR				70-75	50	
31.39	32.92	1.53	0.80	52%	0.00	0%	R2-R3	4	FR				60-70	?	
32.92	35.36	2.44	1.00	41%	0.00	0%	R2	4	FR				N/A		
35.36	36.27	0.91	0.50	55%	0.00	0%	R2-R3	4	FR						
36.27	38.10	1.83	0.20	11%	0.00	0%	R3	4	FR						
38.10	39.32	1.22	0.73	60%	0.00	0%	R3	4	FR						
39.32	41.45	2.13	0.15	7%	0.00	0%	R3	3	FR						
41.45	42.67	1.22	0.18	15%	0.00	0%	R3	2	FR						
42.67	43.58	0.91	0.60	66%	0.00	0%	R2	3	FR						gouge
43.58	45.72	2.14	2.14	100%	0.10	5%	R2	3-5	FR				50	100	fault?
45.72	46.94	1.22	1.22	100%	0.10	8%	R2	3	FR						
46.94	48.77	1.83	0.00	0%	0.00	0%									
48.77	50.29	1.52	0.19	13%	0.00	0%	R3	4	FR						
50.29	51.21	0.92	0.88	96%	0.57	62%	R3	9	FR						breccia
51.21	53.34	2.13	1.21	57%	0.26	12%	R3	4, 8	FR	10	20	S w/calc			breccia
53.34	54.86	1.52	0.25	16%	0.00	0%	R3-R4	3	FR						
54.86	56.39	1.53	1.70	111%	0.73	48%	R4	4, 8	FR				55	100	breccia
56.39	57.91	1.52	1.68	111%	0.67	44%	R3	4, 8	FR				60	100	breccia
57.91	60.96	3.05	3.05	100%	1.37	45%	R3	8	FR	5-20	20	S w/calc			breccia
60.96	62.48	1.52	1.52	100%	0.00	0%	R3	3, 4, 5	FR						breccia
62.48	63.40	0.92	0.92	100%	0.21	23%	R3	4-5	FR						Bx + fragment
63.40	64.31	0.91	0.91	100%	0.00	0%	R3	3, 4, 5	FR						Bx + fragment
64.31	67.06	2.75	2.40	87%	0.34	12%	R3-R4	4-5	FR	5	3	R			Bx/est contact
67.06	70.10	3.04	3.04	100%	2.44	80%	R4	9	FR	45	6	R+I	75	2	
70.10	73.15	3.05	1.60	52%	1.16	38%	R4	10	FR	5	2	S w/calc	N/A		
73.15	76.20	3.05	3.05	100%	1.40	46%	R5	8-10	FR	20	5	R	N/A		
76.20	79.25	3.05	3.05	100%	2.08	68%	R5-R6	8-9	FR	35, 65	3, 4	R, R	N/A		
79.25	82.30	3.05	3.05	100%	2.31	76%	R5	9	FR	10, 60	3, 5	R, I	N/A		
82.30	85.34	3.04	3.04	100%	2.19	72%	R5	9-10	FR	35	8	R	N/A		
85.34	88.39	3.05	3.05	100%	2.15	70%	R5	8-10	FR	5, 55	3, 5	R, I	N/A		

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date:	September 3rd, 1997	Hole:	SSD -97- 31	Coordinates: 43686.70 N	Collar Elevation: 1222.64 m
		Core Size:	HQ	24741.24 E	Bearing: 0
Logged By:	JML	Total Depth:	109.63 metres		Dip: -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
88.39	91.44	3.05	3.06	100%	2.40	79%	R6	10	FR	60	9	I	N/A		breccia
91.44	94.49	3.05	3.05	100%	2.26	74%	R5	10-12	FR	30, 45	3, 5	R, S	N/A		
94.49	97.54	3.05	3.05	100%	1.58	52%	R5-R6	4, 11	FR-SW	40	8	I	N/A		small zone w/clay breccia
97.54	100.58	3.04	3.04	100%	2.75	90%	R5	10, 12	FR	50	6	R	55	1	breccia
100.58	103.63	3.05	3.05	100%	3.01	99%	R5	14-15	FR	35	3	I	N/A		
103.63	106.68	3.05	3.05	100%	0.91	30%	R1, R5	3, 9	FR	45	20	R	N/A		fault gouge
106.68	109.73	3.05	3.05	100%	0.95	31%	R5	4, 8	FR	25	16	R	N/A		

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 4th, 1997 | Hole: SSD-97-32 | Coordinates: 43800.44 N, 24800.41 E | Collar Elevation: 1258.97 m

Core Size: HQ | Bearing: 0

Logged By: JML | Total Depth: 118.87 metres | Dip: -80

Depth (Metres) From	To	Length (Metres)	Recovery (Metres)	Recovery (%)	RQD (Metres)	RQD (%)	Deg of Hard	Degree of Breakage	Degree of Weathering	Joint Description Angle	Joint Description Number	Joint Description Surface	Bedding Planes Angle	Bedding Planes Number	Comments
9.15	12.20	3.05	2.43	80%	0.00	0%	R4-R5	5-7	MW	85	21	S	80	300	Fe-oxide stains
12.20	14.63	2.43	2.43	100%	0.96	40%	R6	7, 8	MW	15	6	R-I	70-80	$1x10^{8}$	Fe-oxide stains
14.63	16.50	1.87	1.87	100%	0.45	24%	R6	6-7	MW	25, 60	5, 4	R, R	65	100	Fe-oxide stains
16.50	18.30	1.80	1.80	100%	0.85	47%	R6	6-7	SW-MW	20, 45	1, 3	R, R	75	2000	Fe-oxide stains
18.30	21.30	3.00	3.00	100%	1.10	37%	R6	5-7	SW-MW	50, 5	6, 4	R, I	60	500	Fe-oxide stains
21.30	24.40	3.10	3.10	100%	0.40	13%	R0, R5	5-6	SW	75	70	S	75	3002	Fe-oxide stains
24.40	27.40	3.00	3.00	100%	0.46	15%	R5	5-6	SW				75	3002	Fe-oxide stains
27.40	30.50	3.10	2.20	71%	0.24	8%	R5	5	SW				75	4368	Fe-oxide stains
30.50	33.50	3.00	3.00	100%	0.33	11%	R5	5	SW-FR				95	4368	
33.50	36.60	3.10	3.10	100%	1.97	64%	R5	7	FR	80, 10	21, 5	S, S	85	1000	
36.60	39.60	3.00	3.00	100%	0.78	26%	R5	8	FR	10, 60	5, 4	I, S	85	2013	
39.60	42.70	3.10	3.10	100%	1.34	43%	R5	8-9	FR	25, 5	9, 3	R, I	50	2014	
42.70	45.70	3.00	2.90	97%	2.21	74%	R5	9-10	FR	35	9	I	85	2010	
45.70	48.80	3.10	3.10	100%	1.10	35%	R4	5, 6	FR	45, 80	6, 10	R, S	80-90	$11x10^{16}$	
48.80	51.80	3.00	3.00	100%	1.49	50%	R6	3, 4, 8	FR	50, 75	6, 12	R, S	75	1000	
51.80	54.90	3.10	3.10	100%	1.75	56%	R6	5, 12	FR	10, 30	4, 6	S, S	65-70	lots (i.e. 800)	
54.90	57.90	3.00	3.00	100%	1.07	36%	R5-R6	8-10	FR	50	9	I	60	100	
57.90	61.00	3.10	3.10	100%	0.17	5%	R5	8-10	FR	20-30	12	I	65	10000	extremely low angle fractures - lots
61.00	64.00	3.00	3.00	100%	0.38	13%	R5	3, 9	FR	20, 75	5, 15	R, R	70-75	10000	fault zones
64.00	67.05	3.05	3.00	98%	0.00	0%	R4	4-6	FR	5	3	I	75	10	hockey puck and gouge interval
67.05	69.20	2.15	2.15	100%	0.21	10%	R3	7	FR	5-10	3	S	85	100	
69.20	70.40	1.20	1.20	100%	0.42	35%	R3-R4	7	FR	35	2	S	60	2	some gouge present
70.40	72.55	2.15	2.15	100%	0.11	5%	R3-R4	3, 7	FR	55	3	S			some gouge present
72.55	73.60	1.05	1.00	95%	0.00	0%	R3	4	FR						too broken up
73.60	73.75	0.15	0.00	0%		0%			FR						
73.75	76.20	2.45	1.10	45%	0.00	0%	R3	4-5	FR						
76.20	79.25	3.05	1.10	36%	0.00	0%	R3	4-5	FR						
79.25	82.30	3.05	1.35	44%	0.00	0%	R0, R5	2-4	FR						
82.30	85.30	3.00	2.98	99%	0.10	3%	R2	4-5	FR						minor Fe-oxide stains
85.30	88.40	3.10	1.43	46%	0.43	14%	R3	5, 1	FR	5, 30	2, 2	S, R			
88.40	91.45	3.05	3.05	100%	2.53	83%	R4	12	SW-FR	55	2	S	65	200	rare Fe-oxide stains
91.45	94.50	3.05	3.00	98%	2.80	92%	R4-R5	12, 14	FR	30, 5	2, 8	I, S	65	3	
94.50	97.55	3.05	3.05	100%	1.90	62%	R3	9-10	FR	20	2	I	N/A		sulphides
97.55	100.60	3.05	2.43	80%	0.79	26%	R3-R4	3, 6	FR	25	3	I	45	2	sulphides
100.60	103.65	3.05	2.85	93%	1.18	39%	R3	4, 6	FR	25	4	I	N/A		
103.65	106.70	3.05	3.05	100%	1.70	56%	R4	4, 8	FR	30	5	I	N/A		
106.70	109.75	3.05	3.05	100%	3.04	100%	R5	13, 14	FR	75	4	R	65	10	
109.75	112.80	3.05	3.05	100%	2.89	95%	R5	13, 14	FR	80	8	R, I	70	10	
112.80	115.80	3.00	3.00	100%	3.00	100%	R6	13, 14	FR	10	6	S w/calc	85	10	en echelon fractures
115.80	118.90	3.10	3.05	98%	2.77	89%	R6	13, 14	FR	35, 10	3, 5	I, R	N/A		

Imperial Metals Corporation

Geotechnical Core Log

Silvertip Property

Date:	September 3rd, 1997	Hole:	SSD -97- 33	Coordinates:	43698.07 N
		Core Size:	HQ		26019.62 E
Logged By:	JML	Total Depth:	84.12 metres		
Collar Elevation:	1249.79 m	Bearing:	0	Dip:	-90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
23.90	24.40	0.50	0.45	90%	0.00	0%	R3	4	MW						
24.40	27.45	3.05	2.60	85%	0.21	7%	R3	4-5	SW				60, 85	2, 10	
27.45	30.50	3.05	3.05	100%	0.00	0%	R3	5	SW						
30.50	33.50	3.00	2.10	70%	0.27	9%	R3	6	FR	5	20		80	100	
33.50	36.58	3.08	3.08	100%	0.13	4%	R3	5	FR				75	1000	hockey puck shale, rainbow staining
36.58	39.62	3.04	3.05	100%	0.10	3%	R3	4-5	FR				80	4000	hockey puck shale, rainbow staining
39.62	42.67	3.05	2.70	89%	0.12	4%	R2-R3	5	FR				80	3500	hockey puck shale, rainbow staining
42.67	45.75	3.08	2.10	68%	0.10	3%	R2	5	FR						
45.75	48.77	3.02	2.20	73%	0.58	19%	R3-R4	6	SW				N/A		breccia
48.77	51.80	3.03	3.03	100%	1.02	34%	R3-R4	6-7	SW	15	3	R	65	600	Fe-oxide on fracture surfaces
51.80	54.85	3.05	2.91	95%	2.16	71%	R4-R5	10-12	FR	40	4	R	85	1	ls
54.85	57.90	3.05	3.05	100%	2.57	84%	R5	12-13	FR	5	3	I	60	20	
57.90	61.00	3.10	3.10	100%	2.13	69%	R5-R6	12	SW	60, 5	3, 4	R, R	N/A		some Fe-oxide stains
61.00	64.01	3.01	3.00	100%	2.52	84%	R5	12	SW	65	3	R	N/A		some Fe-oxide stains
64.01	67.06	3.05	3.05	100%	2.43	80%	R5	11	SW	55, 70	7, 5	S, R	N/A		some Fe-oxide stains
67.06	70.10	3.04	3.04	100%	2.88	95%	R5	12-13	SW	25, 75	4, 10	RI, R	N/A		some Fe-oxide stains
70.10	73.15	3.05	3.05	100%	1.62	53%	R5	11	SW-MW	25	6	I	N/A		some Fe-oxide stains
73.15	76.20	3.05	3.00	98%	2.15	70%	R5-R6	10	SW	50, 70	5, 12	R, R	65	10	rare Fe-oxide stains
76.20	79.25	3.05	2.90	95%	2.19	72%	R5	8-12	SW	5, 50	2, 2	I, R	N/A		common Fe-oxide stains
79.25	82.23	2.98	2.90	97%	2.70	91%	R4-R5	11	SW	50	4	I	N/A		rare Fe-oxide stains
82.23	84.13	1.90	1.90	100%	1.72	91%	R4	12	FR	75	6	R	N/A		

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: September 3rd, 1997 | *Hole:* SSD -97- 34 | *Coordinates:* 43678.50 N, 24780.57 E | *Collar Elevation:* 1216.61 m

Core Size: HQ | *Bearing:* 0

Logged By: JML | *Total Depth:* 88.39 metres | *Dip:* -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
10.67	12.19	1.52	0.40	26%	0.00	0%	R0	2	FR						overburden?
12.19	15.24	3.05	0.00	0%		0%									
15.24	16.76	1.52	0.00	0%		0%									
16.76	18.29	1.53	0.13	8%	0.00	0%	R0	2	FR				70	50	
18.29	19.51	1.22	0.20	16%	0.00	0%	R0	3	FR						Fe oxide stains
19.51	20.73	1.22	1.00	82%	0.00	0%	R3	4	SW-MW	hockey					Fe oxide stains
20.73	22.56	1.83	1.10	60%	0.00	0%	R3	4	MW	puck shale hockey					Fe oxide stains
22.56	24.38	1.82	1.30	71%	0.00	0%	R0	4	MW	puck shale					Fe oxide stains
24.38	28.04	3.66	0.14	4%	0.00	0%	R0	4	MW						Fe oxide stains
28.04	30.48	2.44	0.30	12%	0.00	0%	R1	4	MW	fragmented					Fe oxide stains
30.48	33.53	3.05	0.00	0%		0%									
33.53	35.36	1.83	0.00	0%		0%									
35.36	36.58	1.22	0.00	0%		0%									
36.58	39.62	3.04	0.00	0%		0%									
39.62	42.67	3.05	1.10	36%	0.91	30%	R3	8, 13	MW	5	15	I	N/A		Fe oxide stains
42.67	45.72	3.05	3.05	100%	2.63	86%	R4-R5	9, 14	SW	35, 10	3, 6	I, S	75	3	Fe oxide stains
45.72	48.77	3.05	3.05	100%	2.52	83%	R5	8, 12	FR	30	1	I	N/A		sulphides
48.77	51.82	3.05	3.05	100%	2.72	89%	R5	9, 13	FR	30	7	Surface	N/A		sulphides
51.82	54.86	3.04	3.04	100%	1.97	65%	R4	9-10	FR	65	6	I	N/A		
54.86	57.91	3.05	3.05	100%	2.85	93%	R5	13, 14	FR	40	13	I	N/A		
57.91	60.96	3.05	3.05	100%	2.90	95%	R5	12	FR	30	2	I	N/A		
60.96	64.01	3.05	3.05	100%	2.70	89%	R4	12, 13	FR	30, 5	4, 2	I, S	N/A		
64.01	67.06	3.05	3.05	100%	2.97	97%	R4	13	FR	40, 5	2, 5	I, S	N/A		
67.06	70.10	3.04	3.04	100%	2.69	88%	R4	12	FR	5	10	I	N/A		
70.10	73.15	3.05	3.05	100%	1.95	64%	R3-R4	10	FR	5, 30	5, 2	S, R	N/A		
73.15	76.20	3.05	3.05	100%	2.00	66%	R4	8	FR	20	5	I	N/A		
76.20	79.25	3.05	3.05	100%	2.03	67%	R4	8, 9	FR	35	5	I	N/A		
79.25	82.30	3.05	3.05	100%	2.68	88%	R4	10-12	FR	40	4	I	75	3	
82.30	85.34	3.04	3.04	100%	2.90	95%	R4	12	FR	70	12	R	70	50	
85.34	88.39	3.05	3.05	100%	1.79	59%	R4	9	FR	30	5	R	55	100	

[redacted]

SSD-97-35

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date:	September 5th, 1997	Hole:	SSD -97- 35	Coordinates:	43680.20 N
		Core Size:	HQ		24761.97 E
Logged By:	JML	Total Depth:	91.44 metres		

Collar Elevation: 1218.26 m
Bearing: 0
Dip: -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
13.72	15.24	1.52	1.52	100%	0.00	0%	R1	6	PS-SW	5	5	R	N/A		Fe oxide stains
15.24	18.29	3.05	3.05	100%	0.30	10%	R1	5-6	PS				85	20	Fe oxide stains
18.29	21.34	3.05	1.90	62%	0.00	0%	R1	4-6	SW-FR	5	20	R	65	25	rare Fe oxide stains
21.34	21.95	0.61	0.61	100%	0.00	0%	R2	2, 5	FR						
21.95	23.77	1.82	0.00	0%		0%									
23.77	24.99	1.22	0.00	0%		0%									
24.99	27.43	2.44	0.60	25%	0.00	0%	R2	2, 5	FR						
27.43	29.87	2.44	1.50	61%	0.00	0%	R0-R1	2, 5	SW-FR						minor Fe oxide stains
29.87	32.00	2.13	0.20	9%	0.00	0%	R2	4	SW-FR						rare Fe oxide stains
32.00	33.53	1.53	0.00	0%		0%									
33.53	35.97	2.44	0.68	28%	0.41	17%	R3	4, 9	SW-MW	40	1	I	70	30	Fe oxide stains
35.97	36.58	0.61	0.58	95%	0.15	25%	R3	5-7	MW-HW	45	1	I	N/A		Fe oxide stains
36.58	38.71	2.13	1.75	82%	1.56	73%	R4	12-13	SW-MW	75	6	R	70-75	100	Fe oxide stains
38.71	41.76	3.05	2.97	97%	2.26	74%	R3-R5	13	PS-FR	10	1	U	65-70	63	rare Fe oxide stains
41.76	44.81	3.05	3.05	100%	2.91	95%	R4	9, 13	FR	80	12	UR	75	301	
44.81	46.94	2.13	1.73	81%	1.52	71%	R4	13-14	FR	55	2	IR	70	297	
46.94	48.16	1.22	1.22	100%	0.98	80%	R2	5, 10	FR	80	4	IR	N/A		
48.16	51.21	3.05	3.00	98%	2.70	89%	R4	9-10	FR	65	3	I	N/A		
51.21	54.25	3.04	3.04	100%	2.39	79%	R4	13	FR	50	3	IR	N/A		
54.25	55.78	1.53	1.53	100%	1.16	76%	R4	10, 13	FR	70	3	U, R	N/A		
55.78	57.61	1.83	1.75	96%	1.14	62%	R3-R4	10	FR	60, 40	2, 2	I, R	N/A		
57.61	60.66	3.05	3.05	100%	2.30	75%	R3-R4	13	FR	50, 75	9, 10	R, I	80	3	
60.66	60.96	0.30	0.30	100%	0.30	100%	R4	12	FR	70	1	IR	N/A		
60.96	64.01	3.05	3.05	100%	1.98	65%	R4	4, 12	FR	0-70, 30	5, 2	I, R	65	47	
64.01	67.06	3.05	3.05	100%	2.11	69%	R4-R5	12-13	PS-FR	10, 30	6, 2	I, I	60	100	
67.06	70.10	3.04	3.04	100%	2.51	83%	R3, R5	13	FR	35	5	UR	80	7	
70.10	73.15	3.05	3.05	100%	2.69	88%	R5	13	FR	70, 5	4, 3	CS, I	N/A		
73.15	76.20	3.05	3.05	100%	2.78	91%	R6	13-14	FR	10, 40	4, 2	I, K	50	2	
76.20	79.25	3.05	3.05	100%	2.49	82%	R4-R5	12-13	FR	45	2	S	N/A		
79.25	82.30	3.05	2.87	94%	2.51	82%	R5	13	FR	65, 30	6, 1	IR	N/A		
82.30	85.34	3.04	3.01	99%	2.82	93%	R5-R6	13	FR	20	6	I	N/A		
85.34	88.39	3.05	2.94	96%	2.59	85%	R5	12	SW-PS	35, 80	6, 3	I, R	N/A		green clay stains
88.39	91.44	3.05	3.05	100%	2.59	85%	R5	11-12	PS-FR	50, 10	6, 3	S, I	N/A		

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date:	September 6th, 1997	Hole:	SSD-97-36
Coordinates:	43620.74 N / 24940.01 E	Collar Elevation:	1241.33 m
Core Size:	HQ	Bearing:	0
Logged By:	JML	Total Depth:	75.29 metres
Dip:	-90		

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
7.62	9.14	1.52	1.30	86%	0.00	0%	R0	4-5	SW-MW						Fe oxide stains
9.14	12.19	3.05	0.90	30%	0.00	0%	R0	4-5	SW						Fe oxide stains
12.19	15.24	3.05	0.16	5%	0.00	0%	R0	4	SW						Fe oxide stains
15.24	18.29	3.05	0.50	16%	0.00	0%	R0	4-5	SW						Fe oxide stains
18.29	21.34	3.05	2.10	69%	0.00	0%	R0-R1	5	PS-SW	75-85	5	S	55	100	minor Fe oxide stains
21.34	24.38	3.04	2.96	97%	0.00	0%	R0-R1	5	PS	70	lots	St-I	75	100	minor Fe oxide stains
24.38	27.43	3.05	2.06	68%	0.00	0%	R1	5-6	PS-SW	75	23	stepped	80	100	
27.43	30.48	3.05	3.06	100%	0.10	3%	R0-R1	6-7	PS-SW	75	100	I	75	100	hockey puck shale
30.48	33.53	3.05	2.22	73%	0.00	0%	R1	6-7	PS	85	27	slick'd smooth	80	100	hockey puck shale
33.53	36.58	3.05	2.10	69%	0.20	7%	R1-R2	6-8	PS	85	30	slick'd smooth	80	100	hockey puck shale
36.58	39.62	3.04	1.37	45%	0.52	17%	R2-R3	9	FR	60	8	slick'd smooth	60	1200	
39.62	42.67	3.05	2.58	85%	0.10	3%	R0-R1	6-7	FR	80	9	slick'd smooth	80	200	hockey puck shale
42.67	45.72	3.05	1.00	33%	0.00	0%	R0	4-5	FR						
45.72	48.77	3.05	2.10	69%	0.00	0%	R0-R1	4-6	FR	85	20	smooth	N/A		hockey puck shale
48.77	51.82	3.05	2.70	89%	0.00	0%	R2-R3	5-6	FR	80	32	smooth	N/A		hockey puck shale
51.82	54.86	3.04	2.10	69%	0.00	0%	R2-R3	5-6	FR	75	90	smooth	80	100	hockey puck shale
54.86	57.91	3.05	3.01	99%	0.13	4%	R1-R2	5-6	FR	80	21	smooth	N/A		
57.91	60.96	3.05	3.05	100%	0.65	21%	R3-R4	5-7	FR	60, 5	3, 2	I-Sm, I	N/A		sulphides begin
60.96	64.01	3.05	3.05	100%	2.14	70%	R5	8-12	PS-FR	5	5	slicked	N/A		
64.01	66.75	2.74	1.60	58%	0.38	14%	R5	4-6	MW-HW	30	2	I	75, 90	3, 1	
66.75	75.29	8.54	0.00	0%											

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: August 7th, 1997	Hole:	SSD -97-37	Coordinates: 43609.15 N	Collar Elevation:	1255.96 m
	Core Size:	HQ	24782.85 E	Bearing: 0	
Logged By: JML	Total Depth:	131.76 metres		Dip: -90	

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
8.50	9.14	0.64	0.64	100%	0.30	47%	R4	5	PS-SW	45, 20	2, 1	RI	N/A		Fe oxide stains on fractures
9.14	12.19	3.05	2.84	93%	1.83	60%	R4-R5	4-5	PS-SW	5	2	I	65	10	Fe oxide stains on fractures
12.19	15.24	3.05	3.05	100%	1.28	42%	R5	5-6	SW-MW	20	7	R	60-65	100	Fe oxide stains on fractures
15.24	18.29	3.05	2.90	95%	0.55	18%	R4	4, 5, 6	SW-MW	5	6	I	80	400	Fe oxide stains on fractures
18.29	21.34	3.05	3.05	100%	0.21	7%	R3-R4	4, 5, 6	PS-SW	75	12	S	75	408	Fe oxide stains on fractures
21.34	24.38	3.04	2.79	92%	0.38	13%	R3-R4	5-6	SW	70, 05	9, 3	S, I	80	200	Fe oxide stains on fractures
24.38	27.43	3.05	3.01	99%	0.23	8%	R3-R4	5-6	PS	80	21	Slicked	80	2000	rare Fe oxide stains on fractures
27.43	30.48	3.05	3.03	99%	0.71	23%	R3-R4	7	PS-FR	80	21	I	80	10000	
30.48	33.53	3.05	3.02	99%	0.27	9%	R3-R4	5-6	FR	80, 5	28, 2	I, R	80	200	
33.53	36.58	3.05	2.58	85%	0.55	18%	R4	6-7	FR	5-10, 75	4, 16	I, R	75	200	
36.58	39.62	3.04	3.01	99%	0.81	27%	R3-R4	7	FR	5, 80	6, 26	I, R	75	400	
39.62	41.15	1.53	1.20	78%	0.69	45%	R0, R3	7	FR	85, 5	4, 3	R, S	N/A		
41.15	44.20	3.05	3.05	100%	2.60	85%	R4-R5	12	FR	30-35, 5	5, 2	I, R	70	10	
44.20	47.24	3.04	3.04	100%	1.56	51%	R5	12	FR	10	4	Sm	70	11	
47.24	50.29	3.05	2.90	95%	1.80	59%	R5	10-12	FR	30	4	Sm	N/A		
50.29	53.34	3.05	3.01	99%	1.82	60%	R5	8, 12	FR	35, 5	3, 4	I, Sm	70	100	
53.34	54.56	1.22	1.20	98%	0.00	0%	R5	6-8	FR	15	3	U	N/A		
54.56	57.61	3.05	2.97	97%	1.91	63%	R5	12	FR	15	4	U	60	50	
57.61	58.83	1.22	2.00	164%	0.71	58%	R5	10-11	FR	5	5	Sm	N/A		
58.83	60.96	2.13	1.83	86%	0.75	35%	R5	8-9	FR	35	3	I	N/A		
60.96	64.01	3.05	3.02	99%	1.20	39%	R5	8-9	FR	85-90, 20	17, 1	I, R	85	20	
64.01	67.06	3.05	3.05	100%	0.40	13%	R0, R5	5-7	FR	85	21	Sm	85	50	
67.06	70.10	3.04	2.53	83%	0.14	5%	R0, R5	4-6	FR				80	2	
70.10	73.15	3.05	2.83	93%	0.23	8%	R3-R4	4-6	FR						
73.15	76.20	3.05	2.89	95%	0.12	4%	R4	4-5	FR				80	50	
76.20	78.03	1.83	1.63	89%	0.18	10%	R3-R4	7-8	FR	10	3	I	80	3	
78.03	79.55	1.52	1.51	99%	0.10	7%	R3-R4	6-7	FR				85	2	
79.55	81.60	2.05	0.83	40%	0.22	11%	R3-R4	5-6	FR	45	3		N/A		
81.60	82.91	1.31	0.30	23%	0.00	0%	R2	4	FR						
82.91	85.65	2.74	1.50	55%	0.11	4%	R0, R5	3, 4, 7	FR	30	6	I filled w/calc	80	20	
85.65	86.87	1.22	0.80	66%	0.10	8%	R1, R4	5, 7	FR	10	3	Sm - filled	80	20	
86.87	88.39	1.52	1.39	91%	0.19	13%	R3-R4	7, 8	FR	75	20	Sm - filled	N/A		
88.39	90.83	2.44	2.10	86%	0.13	5%	R4	4, 6, 8	FR	bedding	parallel		75	100	
90.83	93.57	2.74	2.74	100%	1.73	63%	R4	4, 10	FR						crumbly sulphides
93.57	96.01	2.44	2.44	100%	1.36	56%	R4	10-11	FR	10	3	I	N/A		
96.01	98.15	2.14	2.14	100%	1.34	63%	R5-R6	8-10	FR	45	2	U	N/A		
98.15	100.58	2.43	2.29	94%	1.51	62%	R6	12	FR	5, 45	2, 3	I, I	N/A		
100.58	103.63	3.05	3.05	100%	2.73	90%	R6	12-13	FR	10	8	I	N/A		
103.63	106.68	3.05	2.98	98%	2.92	96%	R6	13-15	FR	only induced			N/A		good stick core
106.68	109.73	3.05	3.05	100%	2.61	86%	R6	12	FR	45	7	Smooth	N/A		lst/sulphide breccia
109.73	112.78	3.05	2.90	95%	2.39	78%	R6	6, 12	FR	45	2	I	N/A		
112.78	115.82	3.04	3.04	100%	2.65	87%	R5-R6	12	FR	50	3	I	N/A		
115.82	118.87	3.05	3.05	100%	3.03	99%	R5	12-13	FR	5, 10	2	R - calc filled	N/A		
118.87	121.92	3.05	3.00	98%	2.94	96%	R5	12-13	FR	20, 5	5, 2	R, I	N/A		
121.92	124.97	3.05	3.05	100%	2.93	96%	R5	12-13	FR	5-10	6	I	60	3	

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: August 7th, 1997 | **Hole:** SSD-97-37 | **Coordinates:** 43609.16 N, 24782.86 E | **Collar Elevation:** 1255.96 m
Logged By: JML | **Core Size:** HQ | **Bearing:** 0
Total Depth: 131.76 metres | **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
124.97	128.02	3.05	3.05	100%	2.83	93%	R5	12-13	FR	20-25	3	R	60	40	
128.02	131.06	3.04	3.05	100%	2.76	91%	R4-R5	12-13	FR	30	4	Smooth	N/A		
131.06	134.12	3.06	3.06	100%	2.74	90%	R5	12-13	FR	20	4	R - calc filled	70		
134.12	137.16	3.04	3.04	100%	2.77	91%	R5	11-13	FR	20, 75	2, 8	I, R	70	60	

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 8th, 1997 | *Hole:* SSD-97-38 | *Coordinates:* 43679.96 N, 24979.48 E | *Collar Elevation:* 1223.90 m
Core Size: HQ | *Bearing:* 0
Logged By: JML | *Total Depth:* 33.53 metres | *Dip:* -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
18.29	21.34	3.05	0.72	24%	0.00	0%	R2-R3	4	SW						broken + rubbled Fe oxide stains
21.34	24.38	3.04	2.17	71%	0.40	13%	R5	4, 8	MW	60	2	U			Fe oxide stains
24.38	27.43	3.05	2.82	92%	0.51	17%	R5	5-8	MW-SW	75	5	R			Fe oxide stains
27.43	30.48	3.05	2.86	94%	1.40	46%	R5	8-9	MW	25, 75	2, 6	I, R			Fe oxide stains
30.48	33.53	3.05	3.05	100%	0.22	7%	R5	4-5, 8	MW	5	3	Sm - calc			Fe oxide stains

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 8th, 1997
Hole: SSD -97- 39
Core Size: HQ
Total Depth: 137.16 metres
Coordinates: 43609.15 N, 24782.85 E
Collar Elevation: 1255.96 m
Bearing: 270
Dip: -77
Logged By: JML

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
6.71	9.14	2.43	2.00	82%	0.71	29%	R1, R5	6, 9	MW	65	2	R	75	15	Fe oxide stains
9.14	12.19	3.05	3.05	100%	0.28	9%	R4	6-8	MW	15	5	I	70	50	Fe oxide stains
12.19	15.24	3.05	2.98	98%	1.01	33%	R4-R5	7-8	MW	35, 5	6, 5	R, I	50	50	Fe oxide stains
15.24	18.29	3.05	1.90	62%	0.32	10%	R5	6-7-8	MW	35-40	3	Sm			Fe oxide stains
18.29	21.34	3.05	2.40	79%	0.21	7%	R4-R5	6-8	MW	45	3	I	80	100	Fe oxide stains
21.34	24.38	3.04	2.30	76%	0.00	0%	R4	5-7	MW	30	2	U	60	20	Fe oxide stains
24.38	24.69	0.31	0.31	100%	0.00	0%	R4	5-6	MW-SW	too	broken		70	20	Fe oxide stains
24.69	27.43	2.74	2.74	100%	0.26	9%	R4	6-8	SW-PS	75	16+	stepped	65	100	minor Fe oxide stains
27.43	30.48	3.05	2.93	96%	0.84	28%	R0, R3	6-8	PS-FR	70	18+	stepped	70	100	rare Fe oxide stains
30.48	33.53	3.05	2.80	92%	0.44	14%	R3	6-8	PS-FR	5, 70	4, 12	I, St	65	100	rare Fe oxide stains
33.53	36.58	3.05	3.01	99%	0.29	10%	R4	6-8	FR	too	broken		65	4	rare Fe oxide stains
36.58	37.80	1.22	1.18	97%	0.25	20%	R0, R5	3, 9	FR	5	3	I	75	30	
37.80	39.62	1.82	1.53	84%	0.82	45%	R5	8-9	FR	45	3	U	70	100	
39.62	42.06	2.44	2.31	95%	0.95	39%	R5	8	FR	65	6	I	65	201	
42.06	42.98	0.92	0.91	99%	0.32	35%	R4-R5	6-8	FR	10	3	I	N/A		
42.98	45.72	2.74	2.74	100%	1.79	65%	R5	10-11	FR	35	6	I	65	30	
45.72	47.85	2.13	2.13	100%	1.05	49%	R5	11-12	FR	30	7	R	65	2	
47.85	49.38	1.53	1.53	100%	0.75	49%	R5	9-11	FR	40, 10	6, 3	R, Sm	70	1	
49.38	51.82	2.44	1.96	80%	0.93	38%	R5	10-11	FR	45, 15	10, 2	I, R	75	3	
51.82	53.64	1.82	1.52	84%	1.00	55%	R5	13, 14	FR	5	3	I	75	10	
53.64	54.86	1.22	1.03	84%	0.00	0%	R5	6-9	FR	10	1	I	N/A		very broken
54.86	55.78	0.92	0.92	100%	0.36	39%	R5	6-8	FR	30, 10	1, 2	I, R	80	2	
55.78	57.91	2.13	1.80	85%	0.29	14%	R5	6-7	FR	25	5	R, U	80	10	
57.91	59.74	1.83	1.83	100%	0.44	24%	R5	6-7	FR	5, 30	2, 3	R, I	N/A		very broken
59.74	60.96	1.22	1.22	100%	0.35	29%	R5	8-10	FR	5	2	I	N/A		
60.96	63.09	2.13	2.13	100%	0.24	11%	R5	9-10	FR	10	4	R, U	80	3	
63.09	65.23	2.14	2.03	95%	0.00	0%	R5	9-10	FR	65	3	I	60	5	
65.23	67.06	1.83	0.50	27%	0.00	0%	R5	4	FR						
67.06	69.49	2.43	1.89	78%	0.00	0%	R5	4-6	FR						bx
69.49	71.32	1.83	1.78	97%	0.30	16%	R0-R5	4, 8	FR	60	10	Smooth	65	100	
71.32	73.15	1.83	1.20	66%	0.00	0%	R3	3, 5	FR	5	2	U	70	20	
73.15	76.20	3.05	3.05	100%	0.40	13%	R3	4, 6-8	FR				80	30	too broken to do a joint description
76.20	79.25	3.05	3.05	100%	0.00	0%	R2-R3	4, 5, 7	FR				75	50	
79.25	82.30	3.05	3.05	100%	0.00	0%	R1-R2	4	FR				40	50	Joints are everywhere, most are slicked
82.30	85.34	3.04	3.04	100%	0.00	0%	R1-R2	4-5	FR						
85.34	88.39	3.05	2.81	92%	0.00	0%	R0-R2	3, 4, 5	FR						

SSD-97-39

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: ***September 8th, 1997*** | ***Hole:*** ***SSD -97- 39*** | ***Coordinates:*** ***43609.15 N*** ***24782.85 E*** | ***Collar Elevation:*** ***1255.96 m***
Core Size: ***HQ*** | ***Bearing:*** ***270***
Logged By: ***JML*** | ***Total Depth:*** ***137.16 metres*** | ***Dip:*** ***-77***

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
88.39	90.53	2.14	1.73	81%	0.52	24%	R2-R3	6, 8	FR	90	7	Sm, U	80	20	
90.53	92.66	2.13	1.60	75%	0.54	25%	R3	6-7	FR	5	13	I	85	10	
92.66	94.49	1.83	1.70	93%	0.21	11%	R3	6-7	FR	5	2	I	N/A		
94.49	96.62	2.13	2.13	100%	0.99	46%	R4	5, 8-9	FR	30	3	U, I	N/A		sulfides
96.62	97.84	1.22	0.90	74%	0.40	33%	R4	6-9	FR	25	3	I	N/A		sulfides
97.84	100.28	2.44	1.60	66%	0.78	32%	R4	9-10	FR	5	3	R	N/A		sulfides
100.28	101.50	1.22	1.22	100%	0.00	0%	R4	4-6	FR						sulfides
101.50	103.63	2.13	1.50	70%	0.21	10%	R4	4-6	FR						sulfides
103.63	106.68	3.05	2.30	75%	1.21	40%	R4	6, 12	FR	70	6	I, R			sulfides
106.68	109.12	2.44	2.44	100%	2.12	87%	R4	11-12	FR	30	5	I			sulfides
109.12	112.17	3.05	2.89	95%	2.52	83%	R5-R6	12-13	FR	75	10	RIU			Lst. breccia
112.17	115.52	3.35	3.10	93%	3.01	90%	R5	13-14	FR	75	6	R			Lst. breccia
115.52	118.87	3.35	3.10	93%	2.85	85%	R5-R6	13-14	FR	30	2	U			
118.87	121.92	3.05	3.05	100%	3.00	98%	R6	13-14	FR	70	6	R			
121.92	124.97	3.05	3.05	100%	2.95	97%	R6	13-14	FR	60	3	R			
124.97	128.02	3.05	3.05	100%	2.12	70%	R6	10-12	FR	30, 5	3, 6	R, U			
128.02	131.06	3.04	3.00	99%	2.09	69%	R6	10-12	FR	55	7	R			
131.06	134.12	3.06	3.06	100%	2.67	87%	R6	12-13	FR	45	3	I	75	2	
134.12	137.16	3.04	3.03	100%	2.91	96%	R6	11-13	FR	70	6	R	75	10	

*HQ core is in NQ-modified boxes, so RQD's and recovery and fractures are very modified by transport. (I've done my best)

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 22nd, 1997 | **Hole:** SSD -97- 40 | **Coordinates:** 43598.07 N, 25019.52 E | **Collar Elevation:** 1249.79 m
Core Size: HQ | **Bearing:** 350
Logged By: JML | **Total Depth:** 114.91 metres | **Dip:** -75

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
13.41	14.33	0.92	0.71	77%	0.00	0%									
14.33	17.37	3.04	3.00	99%		0%									Fe oxide stains
17.37	20.42	3.05	1.40	46%		0%									Fe oxide stains
20.42	23.47	3.05	1.65	54%		0%									Fe oxide stains
23.47	26.52	3.05	0.27	9%		0%									Fe oxide stains
26.52	29.57	3.05	0.53	17%		0%									
29.57	32.61	3.04	0.86	28%		0%									
32.61	35.66	3.05	0.26	9%		0%									
35.66	38.71	3.05	0.49	16%	0.23	8%	R1	8	FR-PS	60, 5	10, 1	Slicked	60	20	50' above zone
38.71	41.76	3.05	2.33	76%	0.00	0%	R0	4-5	FR-PS				70	6	
41.76	44.81	3.05	1.30	43%	0.12	4%	R1	4-5	FR-PS	70	5	Slicked	70	13	
44.81	47.85	3.04	2.03	67%	0.10	3%	R2	4-6	FR-PS	70	6	Slicked	70	50	
47.85	50.90	3.05	3.05	100%	1.45	48%	R3	5, 8	PS	70	8	Slicked	70	18	minor Fe oxide stains
50.90	53.95	3.05	2.98	98%	1.04	34%	R3	8, 10	PS-SW	25	3	I	60-65	10	Fe oxide stains
53.95	57.00	3.05	0.57	19%	0.00	0%	R3	4	HW						extreme oxidation
57.00	60.05	3.05	0.20	7%	0.00	0%	R3	4	HW						extreme oxidation
60.05	63.09	3.04	0.87	29%	0.13	4%	R2	4	HW						extreme oxidation
63.09	66.14	3.05	2.10	69%	0.00	0%	R2	4, 8	HW	5	1	I	N/A		extreme oxidation
66.14	69.19	3.05	3.05	100%	1.23	40%	R2, R4	4, 10	HW, SW	50	6	I	N/A		top 90cm is extremely oxidised
69.19	72.24	3.05	3.05	100%	2.63	86%	R4	12	SW	60	3	UR	75	2	Fe oxide stains on fracture surfaces
72.24	75.29	3.05	3.05	100%	2.61	86%	R4-R5	12-13	SW-PS	65	2	UR	N/A		75.09-75.19 is extremely oxidised
75.29	78.33	3.04	3.04	100%	2.94	97%	R5	12-14	SW-PS	5	3	UR	85	3	Fe oxide stains on fracture surfaces
78.33	81.38	3.05	3.04	100%	2.30	75%	R5	14	PS	0-5	3	U, VR	N/A		Fe oxide stains on fracture surfaces
81.38	84.43	3.05	3.05	100%	2.87	94%	R5	14	PS-FR	15, 60	3, 3	IR, R	N/A		rare Fe oxide stains on fractures
84.43	87.48	3.05	3.05	100%	1.96	64%	R5	6, 14	FR	30	1	I	N/A		
87.48	90.53	3.05	3.05	100%	1.57	51%	R4	6, 12	FR	90, 50	14, 3	IR, R	N/A		almost all calcite (recrystallised)
90.53	93.57	3.04	3.05	100%	2.64	87%	R4-R5	6, 14	FR	35, 70	1, 2	I, R	N/A		
93.57	96.62	3.05	3.05	100%	3.02	99%	R5-R6	14-15	FR	60	3	RU	N/A		
96.62	99.67	3.05	3.05	100%	3.05	100%	R5-R6	14	FR	65	4	UR	N/A		
99.67	102.72	3.05	3.05	100%	2.38	78%	R5	12-413	FR	35, 5	3, 4	IR	N/A		
102.72	105.77	3.05	3.05	100%	2.76	90%	R5	13-14	FR	65	5	R, P	N/A		
105.77	108.81	3.04	3.04	100%	3.04	100%	R5	13-14	FR	65,. 5	3, 2	PR, I	55	10	
108.81	111.86	3.05	3.05	100%	2.67	88%	R5	13	FR	30, 5	8, 2	PR	N/A		
111.86	114.91	3.05	3.05	100%	2.70	89%	R5	13	FR	60	2	IR	70	1	

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 19th, 1997 | **Hole:** SSD-97-41 | **Coordinates:** 43596.03 N, 24780.94 E | **Collar Elevation:** 1256.19 m
Core Size: HQ | **Bearing:** 225
Logged By: JML | **Total Depth:** 121.92 metres | **Dip:** -78

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
6.10	9.14	3.04	2.43	80%	0.14	5%	R3-R4	6-8	MW	5	3	I	75-80	90	Fe oxide stains
9.14	12.19	3.05	2.58	85%	1.17	38%	R4	6-8	MW	5, 30	3, 5	R, R	80	2	Fe oxide stains
12.19	15.24	3.05	2.76	90%	0.82	27%	R4	4, 7-9	MW-HW	20	5	R	55	20	Fe oxide stains
15.24	17.37	2.13	1.83	86%	1.46	69%	R5	4, 12	MW-HW	30, 5	3, 1	RI, RI	70	20	Fe oxide stains
17.37	18.29	0.92	0.81	88%	0.00	0%	R5	4-7	MW-HW						Fe oxide stains
18.29	20.42	2.13	0.83	39%	0.32	15%	R6	4, 8	MW	30	2	I	60-80	20	Fe oxide stains
20.42	21.34	0.92	0.22	24%	0.00	0%	R3-R5	4-5	SW-MW						Fe oxide stains
21.34	24.38	3.04	1.40	46%	0.00	0%	R3-R4	4, 7	SW	5	1	Smooth	80	20	Fe oxide stains
24.38	27.43	3.05	2.69	88%	0.20	7%	R3, R6	3-4, 6	SW-PS	5, 75	2, 10	R, I	70	100	minor Fe oxide stains
27.43	29.57	2.14	1.07	50%	0.69	32%	R5	7-8	PS	70	9	Sm	70	300	rare Fe oxide stains
29.57	31.09	1.52	1.52	100%	0.90	59%	R5	8-10	FR	20, 70	2, 17	I, Sm	70	1000	
31.09	33.53	2.44	2.37	97%	1.02	42%	R5	10-12	FR	35, 80	3, 8	U, Sm	70	300	
33.53	35.66	2.13	1.87	88%	0.31	15%	R5	4-5, 8	FR	30	6	Sm	75	6	
35.66	36.86	1.20	1.20	100%	0.37	31%	R5	6-8	FR	70, 30	8, 3	I, I	70	20	
36.86	39.62	2.76	2.58	93%	1.82	66%	R5	10-12	FR	40, 30	4, 2	U, U	75	30	
39.62	42.67	3.05	1.63	53%	0.32	10%	R5	6-9	FR	20	5	UR	60	100	
42.67	45.72	3.05	2.76	90%	1.69	55%	R5	7, 12	FR	25	3	R	75	10	
45.72	47.55	1.83	1.83	100%	0.90	49%	R5-R6	9-11	FR	5, 20	4, 3	R, U	85	10	
47.55	49.07	1.52	1.52	100%	0.76	50%	R6	8-11	FR	5	6	I	N/A		
49.07	50.90	1.83	1.45	79%	0.41	22%	R5	8-10	FR	5, 30	3, 1	I, R	N/A		
50.90	52.43	1.53	1.53	100%	0.64	42%	R5	4, 9-10	FR	15	2	U	N/A		
52.43	53.95	1.52	1.52	100%	0.10	7%	R5	5-6-7	FR	30	3	R	N/A		
53.95	56.08	2.13	2.06	97%	0.77	36%	R5	11-12	FR	15	3	U	75	2	
56.08	59.13	3.05	3.05	100%	2.55	84%	R6	11-12	FR	20	3	I	75	3	
59.13	60.96	1.83	1.83	100%	1.03	56%	R6	6, 11-12	FR	25, 80	1, 3	U, Slicked	N/A		
60.96	64.01	3.05	3.05	100%	2.51	82%	R6	13, 14	FR	5	3	I, U	80	30	
64.01	67.06	3.05	3.05	100%	1.75	57%	R4-R6	10-13	FR	30, 75	2, 6	R, Sm	75	60	
67.06	69.19	2.13	2.13	100%	0.51	24%	R4-R5	10-11	FR	75, 20	8, 3	U, Sm	70	30	
69.19	70.10	0.91	0.73	80%	0.18	20%	R5	9-10	FR	70	6	Sm, slicked	75	40	
70.10	73.15	3.05	2.94	96%	0.75	25%	R4-R5	5-8	FR	75	11	slicked	75	30	
73.15	76.20	3.05	2.12	70%	0.26	9%	R4	3, 6-7	FR	5, 75	2, 8	U, Slicked	75	50	
76.20	79.25	3.05	2.98	98%	0.00	0%	R3-R4	5-6, 7	FR				70	2	too broken
79.25	82.30	3.05	2.62	86%	0.14	5%	R2-R3	2, 3-5	FR						fault gouge present
82.30	85.34	3.04	3.04	100%	1.57	52%	R0	2-3	FR						almost all fault gouge
85.34	88.39	3.05	0.25	8%	0.00	0%	R0-R1	3	FR						
88.39	91.44	3.05	1.30	43%	0.00	0%	R1-R2	3-4	FR						
91.44	93.88	2.44	2.44	100%	0.43	18%	R0-R2	3-4	FR						
93.88	94.79	0.91	0.91	100%	0.00	0%	R1-R2	5-6	FR						

SSD-97-41

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 19th, 1997 | **Hole:** SSD -97- 41 | **Coordinates:** 43596.03 N, 24780.94 E | **Collar Elevation:** 1256.19 m
Core Size: HQ | **Bearing:** 225
Logged By: JML | **Total Depth:** 121.92 metres | **Dip:** -78

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
94.79	96.32	1.53	1.10	72%	0.00	0%	R1-R2	345	FR						
96.32	97.54	1.22	0.87	71%	0.00	0%	R0-R1	3-5	FR						fault
97.54	100.58	3.04	2.40	79%	1.10	36%	R0, R5	4, 10	FR	60	2	I	N/A		sulphides
100.58	103.63	3.05	3.01	99%	1.03	34%	R4	6-10	FR	15	2	R	N/A		sulphides
103.63	106.68	3.05	3.05	100%	1.69	55%	R4	7-10	FR	10	4	RU	N/A		
106.68	109.73	3.05	2.21	72%	1.33	44%	R4-R6	12	FR	50	2	RI, RI	N/A		
109.73	112.78	3.05	3.05	100%	1.78	58%	R5	4-5, 11	FR	25	3	Sm	N/A		
112.78	115.82	3.04	3.04	100%	1.54	51%	R6	4, 12	FR	10, 75	2, 6	Sm, R	N/A		
115.82	118.87	3.05	3.05	100%	2.25	74%	R6	10-12	FR	40, 10	2, 3	RU, R	75	2	
118.87	121.92	3.05	3.05	100%	3.05	100%	R6	12-13	FR	50	9	U	70	2	

**This hole is put into NQ-core boxes, with 3 rows. However, the core is pretty abused. It has affected the RQDs in a lot of areas.

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 16th, 1997
Hole: SSD -97-42
Coordinates: 43598.54 N, 25018.59 E
Collar Elevation: 1249.45 m
Core Size: HQ
Bearing: 90
Logged By: JML
Total Depth: 111.25 metres
Dip: -70

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
17.37	20.42	3.05	2.07	68%											
20.42	23.47	3.05	2.98	98%											
23.47	26.52	3.05	3.04	100%											
26.52	29.57	3.05	2.86	94%											
29.57	32.61	3.04	2.05	67%											
32.61	35.66	3.05	3.05	100%											
35.66	38.71	3.05	3.05	100%											
38.71	41.76	3.05	2.36	77%											
41.76	44.81	3.05	3.05	100%	0.14	5%	R0	5-7	FR				65	10	soft above sone, broken shales
44.81	47.85	3.04	1.30	43%	0.00	0%	R0	4-5	FR						
47.85	50.90	3.05	3.05	100%	0.21	7%	R0-R1	5-7	FR	65	10	Slicked	65	20	extremely broken
50.90	53.95	3.05	2.76	90%	0.89	29%	R2	5-8	FR	60	12	Slicked	40	8	
53.95	57.00	3.05	3.05	100%	1.76	58%	R2	9-10	FR	75	10	Rough	N/A		*no Fe-oxide stains
57.00	60.05	3.05	2.61	86%	1.82	60%	R3-R4	11-12	FR-SW	75	6	Rough	N/A		Fe oxide stains
60.05	63.09	3.04	2.73	90%	1.43	47%	R4	9-10	MW-HW	5, 70	3, 4	R, R	N/A		Fe oxide stains in bottom 80cm of interval
63.09	66.14	3.05	3.05	100%	2.72	89%	R4	10-12	MW-SW	50	5	I	N/A		Fe oxide stains thru
66.14	69.19	3.05	2.96	97%	1.35	44%	R3-R4	5, 8-10	MW-SW	70	2	R	N/A		Fe oxide stains thru
69.19	72.24	3.05	3.05	100%	1.90	62%	R3-R4	8-9	MW-HW	65	4	I	85	3	a lot Fe oxide stains thru
72.24	75.29	3.05	3.05	100%	1.51	50%	R3-R4	8-9	MW	70	6	I	70	4	a lot Fe oxide stains thru
75.29	78.33	3.04	3.04	100%	2.43	80%	R4	12-13	MW-SW	70	5	R	N/A		a lot Fe oxide stains thru
78.33	81.38	3.05	3.05	100%	2.03	67%	R5	11-12	SW	30	3	UI	N/A		Fe oxide stains
81.38	84.43	3.05	3.04	100%	2.30	75%	R5	10-11	SW	65	2	R	N/A		Fe oxide stains
84.43	87.48	3.05	3.05	100%	2.63	86%	R5	12	SW	35	3	R	N/A		Fe oxide stains
87.48	90.53	3.05	3.05	100%	2.61	86%	R5	13	SW-PS	5	3	I	N/A		Fe oxide stains
90.53	93.57	3.04	3.04	100%	2.07	68%	R5	11-12	SW-PS	15, 75	3, 2	I, R	N/A		Fe oxide stains
93.57	96.62	3.05	3.05	100%	2.49	82%	R4	10-11	FR	50	2	R	N/A		*no Fe-oxide stains
96.62	96.67	0.05	3.05	6100%	2.59	5180%	R5	11-12	FR	75	4	R, U	N/A		*no Fe-oxide stains
96.67	102.71	6.04	3.04	50%	2.34	39%	R5	12	FR	75	5	RU	N/A		
102.71	105.77	3.06	3.06	100%	2.73	89%	R5	11-12	FR	75	6	RU	N/A		
105.77	108.81	3.04	3.04	100%	2.48	82%	R5	11-13	FR	75, 5	3, 7	I, Sm	60	80	
108.81	111.25	2.44	2.44	100%	2.04	84%	R5	12-13	FR	30, 65	4, 2	R, R	65-80	20	

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 22nd, 1997 **Hole:** SSD -97- 43 **Coordinates:** 43595.61 N, 24781.69 E **Collar Elevation:** 1256.34 m
Core Size: HQ **Bearing:** 180
Logged By: JML **Total Depth:** 149.35 metres **Dip:** -78

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
6.09	9.14	3.05	2.97	97%											Fe oxide stains
9.14	12.19	3.05	2.98	98%											Fe oxide stains
12.19	15.24	3.05	3.05	100%											Fe oxide stains
15.24	18.29	3.05	3.05	100%											Fe oxide stains
18.29	21.34	3.05	2.68	88%											Fe oxide stains
21.34	24.38	3.04	1.53	50%											rare Fe oxide stains
24.38	25.30	0.92	0.92	100%											rare Fe oxide stains
25.30	27.43	2.13	1.62	76%											fresh (no Fe stains)
27.43	29.87	2.44	2.44	100%											
29.87	30.48	0.61	0.61	100%											
30.48	32.92	2.44	2.44	100%											
32.92	33.53	0.61	0.52	85%											
33.53	36.58	3.05	2.88	94%											
36.58	39.62	3.04	3.05	100%											
39.62	42.67	3.05	3.05	100%											
42.67	45.72	3.05	3.05	100%											
45.72	48.77	3.05	2.81	92%											
48.77	51.82	3.05	2.39	78%											
51.82	54.86	3.04	3.04	100%											
54.86	57.91	3.05	3.05	100%											
57.91	60.96	3.05	3.05	100%											
60.96	64.01	3.05	3.05	100%											
64.01	67.06	3.05	3.05	100%											
67.06	70.10	3.04	3.05	100%											
70.10	73.15	3.05	3.05	100%											
73.15	76.20	3.05	3.05	100%											
76.20	79.25	3.05	3.05	100%											
79.25	82.30	3.05	3.05	100%	0.54	18%	R3	6-8	FR	45, 85	2, 8	PR	90	20	50' above u/c
82.30	84.13	1.83	1.46	80%	0.00	0%	R1	3-5	FR						gouge, mostly
84.13	86.56	2.43	1.16	48%	0.00	0%	R3	3-5	FR						gouge, mostly
86.56	88.39	1.83	1.37	75%	0.00	0%	R2	3-4	FR						gouge, mostly
88.39	90.53	2.14	0.28	13%	0.00	0%	R2	4-5	FR						gouge, mostly

SSD-97-43

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 22nd, 1997 | *Hole:* SSD -97- 43 | *Coordinates:* 43595.61 N, 24781.69 E | *Collar Elevation:* 1256.34 m
Core Size: HQ | *Bearing:* 180
Logged By: JML | *Total Depth:* 149.35 metres | *Dip:* -78

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
90.53	92.66	2.13	1.03	48%	0.00	0%	R1-R2	3-4	FR						gouge, mostly
92.66	93.88	1.22	0.44	36%	0.00	0%	R1	3-5	FR						gouge, mostly
93.88	95.10	1.22	1.22	100%	0.18	15%	R2	4	FR						gouge, mostly
95.10	97.54	2.44	2.38	98%	2.05	84%	R3	11-12	FR	90	5	RI	65	16	lst
97.54	100.58	3.04	3.04	100%	2.82	93%	R4-R5	12	FR	35, 75	2, 3	IR	65	20	lst
100.58	103.63	3.05	3.05	100%	2.80	92%	R5	13	FR	35, 75	11, 4	RI	N/A		lst
103.63	106.68	3.05	3.05	100%	2.07	68%	R5	6, 12	FR	5, 30	3, 3	I, IVR	N/A		
106.68	109.73	3.05	3.05	100%	1.70	56%	R5	4, 13	FR	45	2,	UR	N/A		very broken intervals
109.73	112.78	3.05	3.05	100%	1.08	35%	R5	4, 13	FR	35	3	I	70	40	
112.78	115.82	3.04	3.05	100%	2.93	96%	R5	13-14	FR	10	1	VR, P	N/A		
115.82	118.87	3.05	3.05	100%	2.77	91%	R5	14	FR	75	5	I, VR	N/A		
118.87	121.92	3.05	3.05	100%	2.93	96%	R5-R6	14	FR	45	3	I, R	N/A		
121.92	124.97	3.05	3.05	100%	3.05	100%	R6	13	FR	50	2	I	70	30	
124.97	128.02	3.05	3.05	100%	3.05	100%	R6	13-14	FR	80	5	I	85	3	
128.02	131.06	3.04	3.04	100%	3.05	100%	R6	12-13	FR	5, 75	2, 3	UR, IR	N/A		
131.06	134.11	3.05	3.05	100%	2.51	82%	R5	12	FR	5, 45	6, 2	RI, I	N/A		
134.11	137.16	3.05	3.05	100%	2.45	80%	R5	12	FR	30	3	VR, P	N/A		
137.16	140.21	3.05	3.05	100%	3.02	99%	R5	14-15	FR	30	2	I	N/A		
140.21	143.26	3.05	3.05	100%	2.78	91%	R5	12-13	FR	60	6	RU	60	30	
143.26	146.30	3.04	3.04	100%	3.04	100%	R5	12-13	FR	60	5	P, R	70	150	
146.30	149.35	3.05	3.05	100%	2.71	89%	R5	13	FR	60, 75	6, 3	P, R, I	70	150	

SSD-97-44

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 19th, 1997
Hole: SSD -97- 44
Core Size: HQ
Total Depth: 108.81 metres
Logged By: JML
Coordinates: 43597.27 N, 25017.19 E
Collar Elevation: 1249.62 m
Bearing: 225
Dip: -68

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
17.59	20.42	2.83	2.83	100%											very broken shales
20.42	23.47	3.05	2.89	95%											
23.47	26.52	3.05	2.65	87%											
26.52	29.57	3.05	2.91	95%											
29.57	32.61	3.04	3.04	100%											
32.61	35.66	3.05	2.98	98%											
35.66	38.71	3.05	3.05	100%											
38.71	41.76	3.05	2.58	85%											
41.76	44.81	3.05	2.63	86%											
44.81	47.85	3.04	1.80	59%											
47.85	50.90	3.05	1.65	54%	0.00	0%	R2	4	FR						50' above zone rubbly shales
50.90	53.95	3.05	1.46	48%	0.00	0%	R2	4-5	FR						poker chip shales
53.95	57.00	3.05	2.10	69%	0.00	0%	R1	5	FR				55	5	poker chip shales
57.00	60.05	3.05	3.00	98%	0.34	11%	R1	5	FR				50	10	poker chip shales
60.05	63.09	3.04	3.01	99%	0.78	26%	R2-R3	5, 7	FR	35, 10	2, 3	R, U	35	20	
63.09	66.14	3.05	2.80	92%	0.94	31%	R3, R5	5, 12	FR	65	3	Undulatory	60	3	
66.14	69.19	3.05	3.05	100%	2.32	76%	R5	13	FR	60	4	Smooth	55	10	
69.19	72.24	3.05	3.05	100%	2.70	89%	R5	12-13	FR	60	5	Smooth	60	200	
72.24	75.79	3.55	3.05	86%	2.50	70%	R5	13	FR	60	6	Smooth	60	150	
75.79	78.33	2.54	3.04	120%	2.42	95%	R5	12	FR	60	12	Smooth	45	20	
78.33	81.38	3.05	3.05	100%	2.01	66%	R5	10-,11	FR	45	4	I	15	100	
81.38	84.43	3.05	0.58	19%	0.16	5%	R5	5	SW						Fe oxide stains
84.43	87.48	3.05	3.05	100%	1.49	49%	R5	5, 12	SW	60	3	R	45	100	Fe oxide stains in top 30cm
87.48	90.53	3.05	3.05	100%	2.46	81%	R5	14	FR	60, 5	3, 2	R, I	55	2	
90.53	93.57	3.04	3.04	100%	3.04	100%	R6	14	FR	65	4	R	N/A		
93.57	96.62	3.05	3.05	100%	3.05	100%	R6	14	FR	55	12	I	N/A		
96.62	99.67	3.05	3.05	100%	2.13	70%	R6	12	FR	30	6	R	60	20	
99.67	102.72	3.05	3.05	100%	2.86	94%	R6	12-13	FR	20	4	I	N/A		
102.72	105.77	3.05	3.05	100%	3.02	99%	R5	13-14	FR	20	5	R	N/A		
105.77	108.81	3.04	3.05	100%	2.80	92%	R5	12-13	FR	35	10	U	N/A		

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: *September 23rd, 1997*   *Hole:* *SSD -97- 45*   *Coordinates:* *43621.20 N* / *24742.40 E*   *Collar Elevation:* *1230.60 m*

Core Size: *HQ*   *Bearing:* *0*

Logged By: *JML*   *Total Depth:* *126.49 metres*   *Dip:* *-90*

Depth (Metres)		Length	Recovery		RQD		Deg of Hard	Degree of Breakage	Degree of Weathering	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)				Angle	Number	Surface	Angle	Number	
12.19	15.24	3.05	3.05	100%											Fe oxide stains
15.24	18.29	3.05	2.84	93%											Fe oxide stains
18.29	21.34	3.05	3.05	100%											Fe oxide stains
21.34	24.38	3.04	3.00	99%											Fe oxide stains
24.38	27.43	3.05	3.05	100%											Fe oxide stains
27.43	30.48	3.05	3.05	100%											fresh
30.48	33.53	3.05	2.93	96%											
33.53	36.58	3.05	3.74	123%											
36.58	37.19	0.61	0.61	100%											
37.19	39.62	2.43	2.43	100%											
39.62	42.67	3.05	2.87	94%											
42.67	45.72	3.05	2.09	69%											
45.72	48.16	2.44	1.51	62%											
48.16	48.77	0.61	0.61	100%											
48.77	51.82	3.05	3.05	100%											
51.82	54.86	3.04	3.05	100%											
54.86	57.91	3.05	2.61	86%											
57.91	60.96	3.05	3.05	100%											broken core
60.96	64.01	3.05	0.36	12%											gouge
64.01	65.53	1.52	0.00	0%											
65.53	67.06	1.53	0.00	0%											
67.06	68.28	1.22	0.00	0%											
68.28	69.80	1.52	0.00	0%											
69.80	71.63	1.83	0.00	0%											
71.63	73.15	1.52	0.30	20%	0.00	0%	R3	3-4	FR						
73.15	74.68	1.53	0.30	20%	0.00	0%	R3	3-4	FR						
74.68	76.20	1.52	0.18	12%	0.00	0%	R3	4, 6	FR				65	1	
76.20	78.03	1.83	1.69	92%	0.66	36%	R0	2-4	FR			Slicked			
78.03	79.25	1.22	1.21	99%	0.37	30%	R2-R3	5, 7	FR	70	3	P, R	N/A		breccia
79.25	81.99	2.74	2.74	100%	0.62	23%	R2	4-6	FR	80	4	Slicked	N/A		breccia
81.99	85.04	3.05	3.05	100%	1.12	37%	R4	6-8	FR	80	5	I, R	25	20	

SSD-97-45

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*

Date: September 23rd, 1997 **Hole:** SSD -97- 45 **Coordinates:** 43621.20 N, 24742.40 E **Collar Elevation:** 1230.60 m
Core Size: HQ **Bearing:** 0
Logged By: JML **Total Depth:** 126.49 metres **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
85.04	88.09	3.05	3.05	100%	0.84	28%	R4	4, 9	FR	5	2	Sw	N/A		
88.09	91.14	3.05	3.05	100%	1.43	47%	R4-R5	9-10	FR	5	6	Sm, I	50	2	bdg=dubious
91.14	93.88	2.74	2.74	100%	1.20	44%	R4	4, 10	FR	5	2	Sm	60	32	broken core
93.88	95.10	1.22	1.19	98%	0.22	18%	R3	6-7	FR	5	3	Sm, I	55	20	broken core
95.10	97.54	2.44	2.44	100%	0.65	27%	R4	4-6	FR	5	4	Sm, I	65	2	broken core
97.54	100.58	3.04	2.93	96%	1.17	38%	R4	4, 10	FR	5, 70	2, 4	Sm, IR	50	2	broken core
100.58	103.63	3.05	3.05	100%	1.45	48%	R5	9-10	FR	5	4	PR	N/A		
103.63	106.68	3.05	3.05	100%	1.69	55%	R5	6, 10	FR	50	3	PR	N/A		
106.68	109.73	3.05	3.05	100%	2.16	71%	R5	12	FR	35, 15	6, 3	PVR, I	N/A		
109.73	112.78	3.05	3.05	100%	0.38	12%	R5	7-8	FR	5	4	Sm, I	N/A		
112.78	115.82	3.04	3.04	100%	1.76	58%	R5	10	FR	65	3	P, Sm	N/A		
115.82	118.87	3.05	3.05	100%	2.03	67%	R5	12	FR	35	4	IR	N/A		
118.87	121.31	2.44	2.44	100%	1.82	75%	R5	10-11	FR	35	2	R	N/A		
121.31	123.44	2.13	2.13	100%	0.47	22%	R3-R4	10	FR	5	3	R	N/A		gouge
123.44	126.49	3.05	3.05	100%	2.54	83%	R3	1-2	FR	25	2	R	N/A		gouge

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 24th, 1997
Hole: SSD -97-46
Coordinates: 43620.79 N, 25050.32 E
Collar Elevation: 1245.02 m
Core Size: HQ
Bearing: 0
Logged By: JML
Total Depth: 117.96 metres
Dip: -90

Depth (Metres) From	To	Length (Metres)	Recovery (Metres)	Recovery (%)	RQD (Metres)	RQD (%)	Deg of Hard	Degree of Breakage	Degree of Weathering	Joint Description Angle	Joint Description Number	Joint Description Surface	Bedding Planes Angle	Bedding Planes Number	Comments
	20.42	20.42		0%											
20.42	23.47	3.05	3.05	100%	0.00	0%	R1	4	SW						Fe oxide stains, rubbled core
23.47	26.52	3.05	1.31	43%	0.00	0%	R1	4	PS						Fe oxide stains, rubbled core
26.52	29.57	3.05	1.58	52%	0.00	0%	R1-R2	4	FR						rubbled core
29.57	32.61	3.04	2.08	68%	0.00	0%	R1-R2	4	FR-PS						minor Fe oxide stains, rubbled core
32.61	35.66	3.05	1.12	37%	0.14	5%	R2	4, 8	PS-SW						minor Fe oxide stains, rubbled core
35.66	38.71	3.05	3.05	100%	1.02	33%	R2-R3	4, 10	SW, MW	75	8	P, Slicked	10, 75	15, 100	extreme red oside stains (hematite?)
38.71	41.76	3.05	3.05	100%	0.93	30%	R3	4, 9	SW-HW	75	6	P, Smooth	10, 75	10, 60	Fe oxide stains
41.76	44.81	3.05	3.05	100%	1.25	41%	R3	4, 10	HW	5, 75	4, 3	UR, P	50	20	extreme Fe oxide stains
44.81	47.85	3.04	3.05	100%	0.72	24%	R3	4, (10)	HW	15	1	UR	N/A		extreme Fe oxide stains
47.85	50.90	3.05	3.05	100%	0.87	29%	R3-R4	4	HW-EW	5	3	UR	N/A		extreme Fe oxide stains
50.90	53.95	3.05	1.39	46%	0.43	14%	R3	4	HW-EW				N/A		extreme Fe oxide stains
53.95	57.00	3.05	1.29	42%	0.48	16%	R3	7-9	EW	5	3	Sm	65	2	@42cm, SW. all above is extremely weathered
57.00	60.05	3.05	3.05	100%	1.56	51%	R4	5, 11	EW, SW	5	3	Sm	N/A		Fe oxide stains
60.05	63.09	3.04	3.04	100%	1.94	64%	R4	12	SW-PS	5	4	U, VR	N/A		Fe oxide stains
63.09	66.14	3.05	3.05	100%	2.75	90%	R4-R5	13	SW-PS	40	2	RI	N/A		Fe oxide stains
66.14	69.19	3.05	3.05	100%	2.93	96%	R4	13	SW-PS	20	3	I, VR	N/A		Calcite with sulphides
69.19	72.24	3.05	3.05	100%	2.96	97%	R4-R5	13	SW	5, 40	3, 40	R, I	N/A		Fe oxide stains
72.24	75.29	3.05	3.05	100%	2.95	97%	R5	13	SW	5	4	I, VR	N/A		Fe oxide stains
75.29	78.33	3.04	3.04	100%	2.51	83%	R5	13	SW	0, 35	2, 2	VR, I	N/A		Fe oxide stains
78.33	81.38	3.05	3.05	100%	2.75	90%	R5	13	PS	35, 5	2, 2	P, R	N/A		stain free!
81.38	84.34	2.96	3.05	103%	2.81	95%	R5	14	PS-FR	15, 75	1, 2	I, UR	N/A		still calcite
84.34	87.48	3.05	3.05	100%	2.74	90%	R5	12-13	PS	5, 60	2, 3	I, UR	N/A		yellow (sericite?) on fractures
87.48	90.53	3.05	3.05	100%	2.96	97%	R5	12-13	PS	30, 5	3, 2	I, VR	N/A		yellow (sericite?) on fractures
90.53	93.57	3.04	3.04	100%	2.14	70%	R5	12	SW	5	2	VR, I	N/A		grungy on and around fractures
93.57	96.62	3.05	3.05	100%	2.45	80%	R5	12-13	PS	15, 35	3, 2	UR, I	60	2	
96.62	99.67	3.05	3.05	100%	2.60	85%	R5	11-12	PS-FR	35	2	U, VR	N/A		
99.67	102.72	3.05	3.05	100%	2.91	95%	R5	13	FR	60	2	P, Sm	75	3	
102.72	105.77	3.05	3.05	100%	2.66	87%	R5	12-13	FR	35, 75	2, 4	I, UR	75-80	200	
105.77	108.81	3.04	3.04	100%	3.01	99%	R5	12-13	FR	70	4	RU	70	3	
108.81	111.86	3.05	3.05	100%	2.74	90%	R5	13	FR	05, 70	2, 3	P,Sm, UR	75	80	
111.86	114.91	3.05	3.05	100%	2.80	92%	R5	12-14	FR	45	3	U	70	150	
114.91	117.96	3.05	3.05	100%	3.05	100%	R5	13	FR	30	1	R	65	30	

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 17th, 1997 | **Hole:** SSD -97- 47 | **Coordinates:** 43700.89 N, 24759.63 E | **Collar Elevation:** 1216.50 m
Core Size: HQ | **Bearing:** 0
Logged By: JML | **Total Depth:** 89.31 metres | **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
14.98	15.24	0.26	0.26	100%											overburden
15.24	18.29	3.05	0.13	4%		0%	R1	4	SW-PS						overburden
18.29	19.20	0.91	0.91	100%		0%	R0	2	FR						gouge
19.20	21.34	2.14	0.00	0%											
21.34	22.56	1.22	0.00	0%											
22.56	23.47	0.91	0.00	0%											
23.47	24.38	0.91	0.00	0%											
24.38	25.91	1.53	0.00	0%											
25.91	26.52	0.61	0.00	0%											
26.52	27.43	0.91	0.00	0%											
27.43	30.48	3.05	0.00	0%											
30.48	31.39	0.91	0.00	0%											
31.39	33.53	2.14	0.00	0%											
33.53	36.58	3.05	1.00	33%	0.10	3%	R0, R5	2, 8	HW-SW						
36.58	39.62	3.04	2.00	66%	1.12	37%	R4-R5	11-12	FR, SW	45	2	I	N/A		sulphides
39.62	42.67	3.05	3.05	100%	2.46	81%	R5	10-12	FR	55, 30	3, 2	R, I	75	2	sulphides
42.67	45.72	3.05	3.05	100%	3.02	99%	R5	12	PS	55, 5	3, 1	R, U	N/A		no Fe oxide, except for one 10cm zone in Ist
45.72	48.77	3.05	3.05	100%	2.30	75%	R5-R6	12-13	SW-PS	55, 75	2, 4	R, R	45	2	minor Fe oxide stains
48.77	51.82	3.05	3.05	100%	3.01	99%	R5-R6	13	FR	75, 5	4, 2	R, I	60	20	minor Fe oxide stains
51.82	54.86	3.04	3.04	100%	2.14	70%	R5-R6	11-12	FR	20	2	I	60	15	
54.86	57.91	3.05	3.05	100%	2.34	77%	R5	13	FR	65	3	U	N/A		
57.91	60.96	3.05	3.05	100%	2.65	87%	R5	13	FR	15	4	UR	N/A		
60.96	64.01	3.05	3.05	100%	1.87	61%	R5	10	FR	40, 5	3, 10	I, VR	N/A		
64.01	67.06	3.05	3.05	100%	1.88	62%	R5	9, 11	FR	5, 35	8, 4	U, R	N/A		very broken
67.06	70.10	3.04	3.04	100%	2.16	71%	R5	11-12	FR	50, 55	5	Smooth	55	10	very broken
70.10	73.15	3.05	3.05	100%	2.12	70%	R5	11-12	FR	45	3	Slicked	90	5	
73.15	76.20	3.05	3.05	100%	2.29	75%	R5	12	FR	50	4	U	N/A		
76.20	79.25	3.05	3.05	100%	2.60	85%	R5	11-12	FR	20, 5	2,3	I, U	N/A		
79.25	81.38	2.13	2.13	100%	1.57	74%	R5	10-11	FR	5,20	2, 1	I, Slicked	N/A		
81.38	84.12	2.74	2.71	99%	2.10	77%	R5	10	FR	30	2	R	N/A		
84.12	86.56	2.44	2.44	100%	1.40	57%	R5	11	FR	5	4	I	50	20	
86.56	89.31	2.75	2.75	100%	2.53	92%	R5	12	FR	50	3	UR	40	10	

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: *September 25th, 1997* ***Hole:*** *SSD-97-48* ***Coordinates:*** *43656.10 N* ***Collar Elevation:*** *1224.60 m*
Core Size: *HQ* *24899.20 E* ***Bearing:*** *0*
Logged By: *JML* ***Total Depth:*** *91.45 metres* ***Dip:*** *-90*

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
6.10	9.14	3.04	0.26	9%											Fe oxide stains
9.14	12.19	3.05	0.00	0%											
12.19	13.41	1.22	0.31	25%											
13.41	15.24	1.83	0.24	13%											
15.24	15.85	0.61	0.61	100%											
15.85	17.68	1.83	0.88	48%											
17.68	18.29	0.61	0.28	46%											
18.29	21.34	3.05	1.41	46%											
21.34	24.38	3.04	2.08	68%											
24.38	30.48	6.10	2.83	46%	0.00	0%	R2	4-5	PS-SW				85	3	broken core
30.48	33.53	3.05	0.12	4%	0.00	0%	R2	4	FR						broken core
33.53	34.75	1.22	0.31	25%	0.00	0%	R2	4	FR						broken core
34.75	36.85	2.10	0.00	0%											
36.85	39.62	2.77	1.46	53%	0.21	8%	R3	4, 9	SW	70	3	I, VR	65	20	broken core
39.62	42.67	3.05	0.49	16%	0.00	0%	R3	4	SW-MW						broken core
42.67	43.28	0.61	0.00	0%		0%									cave
43.28	44.81	1.53	0.00	0%		0%									
44.81	45.72	0.91	0.65	71%	0.31	34%	R3	9	SW	5	1	U, R	N/A		
45.72	48.77	3.05	2.74	90%	1.21	40%	R1, R3	4, 9	SW-MW	30, 70	1, 4	I, UR	N/A		1ft cave
48.77	51.82	3.05	2.93	96%	1.52	50%	R1-R3	7, 10	SW	50, 15	2, 1	I, U	N/A		bx
51.82	54.86	3.04	3.04	100%	2.23	73%	R4	8	PS-SW	5	2	U, UR	70	3	
54.86	57.91	3.05	3.05	100%	1.84	60%	R5	8-9	FR	15, 65	3, 6	Sm, I	70	30	
57.91	60.96	3.05	3.05	100%	0.96	31%	R5	5, 9	FR	75	20	U, VR	N/A		hockey puck lst
60.96	64.01	3.05	3.05	100%	0.99	32%	R5	5, 9	FR	75, 5	16, 3	U, VR, Sm	N/A		hockey puck lst
64.01	67.06	3.05	3.05	100%	2.28	75%	R5	10-11	FR	20, 70	3, 6	Sm, IR	65	6	
67.06	70.10	3.04	3.04	100%	1.58	52%	R4-R5	7 ,12	FR	75	4	P, VR	60	111	lots of hockey puck
70.10	73.15	3.05	3.05	100%	2.25	74%	R5	7, 12	FR	90	20	P, VR	60	2	limestone lots of hockey puck
73.15	76.20	3.05	3.05	100%	1.14	37%	R5	7, 10	FR	90	21	U, VR	N/A		limestone
76.20	78.03	1.83	1.83	100%	1.22	67%	R5	10	FR	65	3	R, I	60	2	
78.03	80.77	2.74	2.74	100%	2.61	95%	R5	10-12	FR	70	4	R, I	60	10	
80.77	83.82	3.05	3.05	100%	2.72	89%	R5	12	FR	60	4	P, VR	70	30	
83.82	86.87	3.05	3.05	100%	2.63	86%	R5	12	FR	25	2	P, R	75	3	
86.87	89.92	3.05	3.05	100%	2.84	93%	R5	12	FR	45, 70	2, 6	P, U, R	85-90	20	
89.92	91.44	1.52	1.34	88%	1.13	74%	R5	11-12	FR	50	3	U, R	80	100	

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 26th, 1997 | **Hole:** SSD -97- 49 | **Coordinates:** 43624.50 N, 24741.43 E | **Collar Elevation:** 1230.78 m
Core Size: HQ | **Bearing:** 180
Logged By: JML | **Total Depth:** 116.43 metres | **Dip:** -76

Depth (Metres)		Length	Recovery		RQD		Deg of Hard	Degree of Breakage	Degree of Weathering	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)				Angle	Number	Surface	Angle	Number	
11.28	14.33	3.05	3.01	99%											Fe oxide stains
14.33	17.37	3.04	3.05	100%											Fe oxide stains
17.37	20.42	3.05	3.05	100%											Fe oxide stains
20.42	23.47	3.05	3.05	100%											
23.47	26.52	3.05	3.05	100%											
26.52	29.57	3.05	3.05	100%											
29.57	32.61	3.04	3.04	100%											
32.61	35.66	3.05	3.05	100%											
35.66	38.71	3.05	3.05	100%											
38.71	41.76	3.05	3.05	100%											
41.76	44.81	3.05	32.87	1078%											
44.81	47.85	3.04	3.04	100%											
47.85	50.90	3.05	3.05	100%											
50.90	53.95	3.05	3.05	100%											
53.95	57.00	3.05	2.07	68%											
57.00	60.05	3.05	2.61	86%											
60.05	63.09	3.04	2.79	92%											
63.09	66.14	3.05	2.86	94%											
66.14	69.19	3.05	2.69	88%											
69.19	72.24	3.05	2.96	97%	0.00	0%	R0	3-4	FR	5	1	Sm			50ft above u/c, rubbled core zone
72.24	75.29	3.05	2.98	98%	0.00	0%	R0	3-4	FR						rubbled core
75.29	78.33	3.04	0.94	31%	0.00	0%	R0	3	FR						rubbled core
75.29	81.38	6.09	0.94	15%	0.00	0%	R0	3	FR						rubbled core
81.38	84.43	3.05	0.63	21%	0.00	0%	R0-R1	3, 7	FR						rubbled core
84.43	87.48	3.05	2.81	92%	0.00	0%	R1	3, 7	FR						rubbled core, hockey pucks
87.48	90.53	3.05	2.98	98%	0.00	0%	R0, R4	2-3, 6	FR	55, 70	?, ?	Sm, R			rubbled core, hockey pucks
90.53	93.57	3.04	3.05	100%	0.00	0%	R4	3, 5	FR	5, 75	?, ?	Sm, R			rubbled core, hockey pucks
93.57	96.62	3.05	3.04	100%	0.45	15%	R3, R4	4, 5-6	FR	75	21	IR	60	4	hockey pucks
96.62	99.67	3.05	3.05	100%	0.70	23%	R4, R3	5, 9	FR	85, 10	11, 6	IR, Sm	N/A		hockey puck core
99.67	102.72	3.05	3.05	100%	0.91	30%	R3-R4	7, 9	FR	75, 5	6, 4	IR, Sm	N/A		minor hockey puck core
102.72	105.77	3.05	3.05	100%	1.08	35%	R3-R4	4, 9	FR	5, 20	6, 8	I, Sm	35	20	
105.77	108.81	3.04	3.04	100%	0.57	19%	R3-R4	4, 9	FR	70	12	Slicked	N/A		
108.81	111.86	3.05	3.05	100%	0.27	9%	R3	4, 7	FR	70, 5	6, 1	K, U	N/A		sheared lst., altered too
111.86	114.91	3.05	3.05	100%	0.45	15%	R3-R4	4, 7	FR	70	8	K, U	N/A		
114.91	116.43	1.52	1.52	100%	1.02	67%	R3	10	FR	70, 5	8, 3	K, RI	N/A		

SSD-97-49

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 26th, 1997 **Hole:** SSD -97- 49 **Coordinates:** 43624.50 N / 24741.43 E **Collar Elevation:** 1230.78 m

Core Size: HQ **Bearing:** 180

Logged By: JML **Total Depth:** 116.43 metres **Dip:** -76

Depth (Metres) From	To	Length (Metres)	Recovery (Metres)	Recovery (%)	RQD (Metres)	RQD (%)	Deg of Hard	Degree of Breakage	Degree of Weathering	Joint Description Angle	Joint Number	Joint Surface	Bedding Planes Angle	Bedding Number	Comments
11.28	14.33	3.05	3.01	99%											Fe oxide stains
14.33	17.37	3.04	3.05	100%											Fe oxide stains
17.37	20.42	3.05	3.05	100%											Fe oxide stains
20.42	23.47	3.05	3.05	100%											
23.47	26.52	3.05	3.05	100%											
26.52	29.57	3.05	3.05	100%											
29.57	32.61	3.04	3.04	100%											
32.61	35.66	3.05	3.05	100%											
35.66	38.71	3.05	3.05	100%											
38.71	41.76	3.05	3.05	100%											
41.76	44.81	3.05	32.87	1078%											
44.81	47.85	3.04	3.04	100%											
47.85	50.90	3.05	3.05	100%											
50.90	53.95	3.05	3.05	100%											
53.95	57.00	3.05	2.07	68%											
57.00	60.05	3.05	2.61	86%											
60.05	63.09	3.04	2.79	92%											
63.09	66.14	3.05	2.86	94%											
66.14	69.19	3.05	2.69	88%											
69.19	72.24	3.05	2.96	97%	0.00	0%	R0	3-4	FR	5	1	Sm			50ft above u/c, rubbled core zone
72.24	75.29	3.05	2.98	98%	0.00	0%	R0	3-4	FR						rubbled core
75.29	78.33	3.04	0.94	31%	0.00	0%	R0	3	FR						rubbled core
75.29	81.38	6.09	0.94	15%	0.00	0%	R0	3	FR						rubbled core
81.38	84.43	3.05	0.63	21%	0.00	0%	R0-R1	3, 7	FR						rubbled core
84.43	87.48	3.05	2.81	92%	0.00	0%	R1	3, 7	FR						rubbled core, hockey pucks
87.48	90.53	3.05	2.98	98%	0.00	0%	R0, R4	2-3, 6	FR	55, 70	?, ?	Sm, R			rubbled core, hockey pucks
90.53	93.57	3.04	3.05	100%	0.00	0%	R4	3, 5	FR	5, 75	?, ?	Sm, R			rubbled core, hockey pucks
93.57	96.62	3.05	3.04	100%	0.45	15%	R3, R4	4, 5-6	FR	75	21	IR	60	4	hockey pucks
96.62	99.67	3.05	3.05	100%	0.70	23%	R4, R3	5, 9	FR	85, 10	11, 6	IR, Sm	N/A		hockey puck core
99.67	102.72	3.05	3.05	100%	0.91	30%	R3-R4	7, 9	FR	75, 5	6, 4	IR, Sm	N/A		minor hockey puck core
102.72	105.77	3.05	3.05	100%	1.08	35%	R3-R4	4, 9	FR	5, 20	6, 8	I, Sm	35	20	
105.77	108.81	3.04	3.04	100%	0.57	19%	R3-R4	4, 9	FR	70	12	Slicked	N/A		
108.81	111.86	3.05	3.05	100%	0.27	9%	R3	4, 7	FR	70, 5	6, 1	K, U	N/A		sheared lst., altered too
111.86	114.91	3.05	3.05	100%	0.45	15%	R3-R4	4, 7	FR	70	8	K, U	N/A		
114.91	116.43	1.52	1.52	100%	1.02	67%	R3	10	FR	70, 5	8, 3	K, RI	N/A		

SSD-97-50

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: ***September 12th, 1997*** ***Hole:*** ***SSD -97- 50*** ***Coordinates:*** ***43598.60 N*** ***24940.70 E*** ***Collar Elevation:*** ***1252.40 m***

Core Size: ***HQ*** ***Bearing:*** ***0***

Logged By: ***JML*** ***Total Depth:*** ***109.73 metres*** ***Dip:*** ***-90***

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
6.10	9.14	3.04	2.31	76%	0.12	4%	R1-R2	5	MW				N/A		Fe oxide stains
9.14	12.19	3.05	2.10	69%	0.16	5%	R1-R2	6-7	MW				70	30	Fe oxide stains
12.19	14.63	2.44	1.41	58%	0.14	6%	R2-R3	3, 6	MW				75	20	Fe oxide stains
14.63	16.46	1.83	1.08	59%	0.10	5%	R2, R4	5-7	SW-MW	80	4	Slicked	65	2	Fe oxide stains
16.46	17.68	1.22	0.02	2%	0.00	0%	R1-R2	4	MW						Fe oxide stains
17.68	21.34	3.66	0.70	19%	0.00	0%	R0-R1	4-5	MW						Fe oxide stains
21.34	23.16	1.82	0.51	28%	0.00	0%	R1	4-5	SW-MW			Slicked			minor Fe oxide stains
23.16	24.38	1.22	0.15	12%	0.00	0%	R1	4	SW-MW						minor Fe oxide stains
24.38	25.91	1.53	0.00	0%	0.00	0%									
25.91	27.43	1.52	0.00	0%	0.00	0%									
27.43	30.48	3.05	0.00	0%	0.00	0%									
30.48	32.00	1.52	0.28	18%	0.00	0%	R1	4	PS			Slicked			minor Fe oxide stains
32.00	33.53	1.53	1.28	84%	0.10	7%	R3	5-7	SW	65	3	Slicked	60	50	minor Fe oxide stains
33.53	35.05	1.52	0.44	29%	0.00	0%	R3	5-6	SW						minor Fe oxide stains
35.05	36.58	1.53	1.28	84%	0.15	10%	R2-R3	6-7	SW-PS	85	5	Slicked	60	20	rare Fe oxide stains, hockey puck shale
36.58	39.62	3.04	3.00	99%	0.24	8%	R2-R3	7	PS	80	30	Slicked	60	200	rare Fe oxide stains, hockey puck shale
39.62	42.67	3.05	3.05	100%	0.74	24%	R3	7-8	FR	75	26	Slicked	65	201	
42.67	45.72	3.05	2.84	93%	0.00	0%	R2	3, 7	FR			Slicked	70	2	
45.72	48.77	3.05	3.05	100%	0.73	24%	R3	7-8	FR	80	20	Slicked	75	200	
48.77	51.82	3.05	3.05	100%	0.75	25%	R3	5, 7-8	FR	80, 5	14, 3	Slicked	75	300	
51.82	54.86	3.04	3.04	100%	0.24	8%	R3	5, 7	FR	45, 75	2, 20	Slicked	70	200	
54.86	57.91	3.05	0.35	11%	0.00	0%	R1	4	FR						
57.91	60.96	3.05	3.05	100%	0.10	3%	R2	6-7	FR	80	20	Slicked	80	200	hockey puck shale
60.96	64.01	3.05	3.05	100%	0.26	9%	R2-R3	6-7	FR	5, 80	2, 21	Slicked	75	300	hockey puck shale
64.01	67.06	3.05	2.79	91%	0.12	4%	R2-R3	5-7	FR	75	6	Slicked	70	30	
67.06	70.10	3.04	2.91	96%	0.11	4%	R2	5	FR	75	8	Slicked	70	40	
70.10	73.15	3.05	3.05	100%	1.56	51%	R4	7-10	FR	80, 50	9, 2	Slicked, I	70	40	sulphides
73.15	76.20	3.05	3.05	100%	2.04	67%	R4-R5	12-13	FR	5, 60	2, 3	I, R	45	10	limestone
76.20	79.25	3.05	3.05	100%	2.80	92%	R5	13-14	FR	15, 75	2, 3	R, R	85	5	limestone
79.25	82.30	3.05	3.05	100%	3.05	100%	R6	14-15	FR	20, 75	2, 3	Sm, R	70	20	limestone
82.30	85.34	3.04	3.04	100%	3.01	99%	R6	13-14	FR	45	2	I	70	100	limestone
85.34	88.39	3.05	3.05	100%	2.89	95%	R6	12-14	FR	5, 20	2, 2	R, I	75	100	limestone
88.39	91.44	3.05	3.05	100%	2.96	97%	R6	12-13	FR	5, 20	2, 3	R, I	N/A		limestone
91.44	94.49	3.05	3.05	100%	2.77	91%	R6	11-13	FR	20	4	I	65	3	limestone
94.49	97.54	3.05	3.05	100%	2.86	94%	R6	12-14	FR	20	5	R	70	10	limestone
97.54	100.58	3.04	3.04	100%	2.98	98%	6R	13-14	FR	65	6	I	65	20	limestone

SSD-97-50

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*

Date: *September 12th, 1997* **Hole:** *SSD -97- 50* **Coordinates:** *43598.60 N* / *24940.70 E* **Collar Elevation:** *1252.40 m*

Core Size: *HQ* **Bearing:** *0*

Logged By: *JML* **Total Depth:** *109.73 metres* **Dip:** *-90*

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
100.58	103.63	3.05	3.01	99%	2.65	87%	R5-R6	11-12	FR	65	2	R	55-60	2	limestone
103.63	106.68	3.05	3.05	100%	2.82	92%	R5	11-12	FR	75	4	R	70	2	limestone
106.68	109.73	3.05	3.05	100%	3.03	99%	R6	12-13	FR	75	4	I	N/A		

SSD-97-52

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: September 28th, 1997 **Hole:** SSD -97-52 **Coordinates:** 43720.38 N, 24759.81 E **Collar Elevation:** 1214.46 m
Core Size: HQ **Bearing:** 0
Logged By: JML **Total Depth:** 78.33 metres **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
6.10	8.23	2.13		0%											
8.23	11.28	3.05		0%											
11.28	14.33	3.05		0%											
14.33	17.37	3.04		0%											
17.37	18.29	0.92		0%											casing overburden
18.29	20.42	2.13	1.10	52%	0.00	0%	R3	4	EW				65	2	extreme Fe oxide staining
20.42	23.47	3.05	0.45	15%	0.00	0%	R2	4	SW						extreme Fe oxide staining
23.47	26.52	3.05	0.48	16%	0.00	0%	R2	4	EW						extreme Fe oxide staining
26.52	29.57	3.05	0.11	4%	0.00	0%	R2	4	MW						extreme Fe oxide staining
29.57	32.61	3.04	0.36	12%	0.00	0%	R0	3-4	EW						extreme Fe oxide staining
32.61	35.66	3.05	0.68	22%	0.00	0%	R0	4	EW						extreme Fe oxide staining
35.66	38.71	3.05	1.26	41%	0.94	31%	R4	10	SW-FR	5	2	Ism	N/A		top 32cm is quite weathered
38.71	41.76	3.05	3.05	100%	2.87	94%	R4	10-12	FR	65	3	UR	N/A		
41.76	44.81	3.05	3.05	100%	1.52	50%	R4-R5	9-12	FR	65	4	IUR	N/A		
44.81	47.85	3.04	3.04	100%	1.51	50%	R5	7, 12	FR	55	4	PSm	N/A		
47.85	50.90	3.05	3.05	100%	2.54	83%	R5	9, 12	FR	45, 10	4, 2	K, PR	70	8	
50.90	53.95	3.05	3.05	100%	2.60	85%	R5	12	FR	50	3	UR	N/A		
53.95	57.00	3.05	3.05	100%	2.15	70%	R5	10, 12	FR	70, 30	2, 3	UR, IR	N/A		
57.00	60.05	3.05	3.05	100%	2.65	87%	R5	13-14	FR	20, 5	2, 2	PSm,	N/A		
60.05	63.09	3.04	3.04	100%	0.75	25%	R3	4, 8	FR, MW	50	2	PR	N/A		lower 1.5cm = rubbled + highly oxidized
63.09	66.14	3.05	3.05	100%	0.74	24%	R2-R3	4, 7	SW, HW	5	4	PR	N/A		rubbled core, highly oxidised
66.14	69.19	3.05	2.25	74%	1.17	38%	R3, R5	7, 12	SW, FR	5, 30	3, 2	Sm, PR	75	30	top 70cm = low recovery and highly oxidised
69.19	72.24	3.05	3.05	100%	2.46	81%	R4-R5	10, 14	SW	65-70, 30	6, 2	PR, UR	65	30	Fe oxide stains
72.24	75.29	3.05	3.05	100%	2.25	74%	R4	9-10	SW	50-60, 25	8, 3	UR, IR	60	21	Fe oxide stains
75.29	78.33	3.04	3.04	100%	2.44	80%	R3-R4	7, 12	SW-MW	65, 45	3, 2	RP	85	32	Fe oxide stains

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*															
Date: September 9th, 1997			Hole: SSD -97- 53			Coordinates: 43617.93 N						Collar Elevation: 1244.00 m				
			Core Size: HQ			24900.26 E						Bearing: 180				
Logged By: JML			Total Depth: 97.54 metres									Dip: -75				
Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments	
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number		
7.62	9.14	1.52	0.00	0%		0%									Fe oxide stains	
9.14	11.89	2.75	0.35	13%	0.00	0%	R4	4	SW						Fe oxide stains	
11.89	13.11	1.22	0.50	41%	0.00	0%	R4	4-5	SW-MW						Fe oxide stains	
13.11	15.24	2.13	0.75	35%	0.00	0%	R3	4-5	SW-MW						Fe oxide stains	
15.24	18.29	3.05	0.00	0%		0%										
18.29	20.42	2.13	0.60	28%	0.00	0%	R0-R1	4-5	SW						Fe oxide stains	
20.42	21.34	0.92	0.63	68%	0.00	0%	R0-R1	4-5	SW						Fe oxide stains	
21.34	24.38	3.04	0.13	4%	0.00	0%	R1	4	PS-SW						minor Fe oxide stains	
24.38	26.21	1.83	1.03	56%	0.00	0%	R2	4-5	PS				70	3	minor Fe oxide stains	
26.21	27.43	1.22	0.00	0%		0%										
27.43	30.18	2.75	0.39	14%	0.00	0%	R1	4-5	PS						rare Fe oxide stains	
30.18	31.70	1.52	0.00	0%		0%										
31.70	34.14	2.44	0.88	36%	0.00	0%	R1	4-5	PS-FR						rare Fe oxide stains	
34.14	35.05	0.91	0.36	40%	0.00	0%	R0-R1	4	PS-FR						rare Fe oxide stains	
35.05	35.97	0.92	0.63	68%	0.00	0%	R2	4-5	FR	5	3	Sm, calcite	N/A			
35.97	38.10	2.13	2.13	100%	0.35	16%	R2	6-7	PS-FR	30	6	Sm, calcite	70	400	rare Fe oxide stains	
38.10	39.62	1.52	1.52	100%	0.50	33%	R2	6-8	PS-FR	70	12	Slicked	65	2000		
39.62	41.76	2.14	2.14	100%	0.53	25%	R2	6-8	FR	15	3	Smooth	80	2001		
41.76	42.67	0.91	0.91	100%	0.56	62%	R2	6-9	FR	75	4	Slicked	60	1003		
42.67	44.81	2.14	2.14	100%	0.74	35%	R3	5-8	FR	65	10	Slicked	70	2000		
44.81	47.24	2.43	2.43	100%	0.50	21%	R1	6-7	FR	60	8	Slicked	65	200		
47.24	48.77	1.53	1.53	100%	0.00	0%	R1	3, 6-7	FR	60	9	Slicked	N/A			
48.77	51.21	2.44	1.18	48%	0.00	0%	R1	5-7	FR							
51.21	53.34	2.13	1.71	80%	0.00	0%	R1	5-8	FR							
53.34	54.86	1.52	1.52	100%	0.22	14%	R2	4-7	FR	70	3	Slicked	65	10		
54.86	57.30	2.44	1.13	46%	0.00	0%	R2	4-5	FR							
57.30	59.13	1.83	0.00	0%		0%										
59.13	60.96	1.83	0.00	0%		0%										
60.96	62.48	1.52	0.50	33%	0.00	0%	R2	4	FR							
62.48	63.09	0.61	0.18	30%	0.00	0%	R2	4-5	FR						hockey puck shale	
63.09	64.01	0.92	0.68	74%	0.00	0%	R1-R0	4-5	FR							
64.01	65.23	1.22	1.22	100%	0.13	11%	R2-R3	4-6	FR	20	2	calcite, Smooth	60	4		
65.23	67.67	2.44	1.34	55%	0.00	0%	R3	4-5	FR							

SSD-97-53

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***															
Date:	***September 9th, 1997***				***Hole:***	***SSD -97- 53***			***Coordinates:***	***43617.93 N***			***Collar Elevation:***		***1244.00 m***	
					Core Size:	***HQ***				***24900.26 E***			***Bearing:***	***180***		
Logged By:	***JML***				***Total Depth:***	***97.54 metres***							***Dip:***	***-75***		
Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments	
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number		
67.67	69.49	1.82	0.30	16%	0.00	0%	R3	4-5	FR							
69.49	70.10	0.61	0.40	66%	0.00	0%	R3	4-5	FR							
70.10	73.15	3.05	2.43	80%	0.00	0%	R3	5-6-7	FR	20	4	calcite, Smooth	70	30		
73.15	76.20	3.05	3.05	100%	2.86	94%	R6	12-14	FR	70	5	I	70	2	sulphides	
76.20	78.33	2.13	2.09	98%	0.57	27%	R5-R6	4, 12	FR	5	2	U	N/A		sulphides	
78.33	79.25	0.92	0.92	100%	0.34	37%	R5	4, 11	FR				70	3	sulphides	
79.25	82.30	3.05	2.92	96%	2.53	83%	R5-R6	12-13	FR	20	2	I	N/A		sulphides	
82.30	85.34	3.04	2.98	98%	2.56	84%	R6	11-13	FR	10	4	U, I	60	1	limestone	
85.34	88.39	3.05	2.79	91%	2.50	82%	R6	10-12	FR	35	2	I	N/A			
88.39	91.44	3.05	2.83	93%	2.88	94%	R5-R6	11-15	FR	20, 5	5, 3	I, R	N/A			
91.44	94.49	3.05	3.05	100%	3.00	98%	R6	13-14	FR	20, 5	3, 8	I, I	60	2		
94.49	97.54	3.05	2.98	98%	3.00	98%	R6	12-13	FR	20, 5	6, 3	U, R	60	3		

Imperial Metals Corporation

Geotechnical Core Log

Silvertip Property

Date: September 26th, 1997
Hole: SSD -97- 54
Core Size: HQ
Total Depth: 93.57 metres
Coordinates: 43785.42 N, 24744.54 E
Collar Elevation: 119.06 m
Bearing: 0
Dip: -90
Logged By: JML

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
23.15	23.47	0.32	0.32	100%	0.11	34%	R3	4, 9	SW-MW						Fe oxide stains
23.47	26.50	3.03	0.91	30%	0.00	0%	R3	4	SW						Fe oxide stains
26.50	29.56	3.06	2.24	73%	0.86	28%	R3	4, 9	SW	30	4	U, VR	N/A		Fe oxide stains
29.56	32.60	3.04	3.04	100%	1.94	64%	R3	7-10	SW-MW	15, 30	4, 3	IR, PVR	N/A		Fe oxide stains
32.60	35.66	3.06	3.06	100%	1.89	62%	R3	10-12	MW	25, 45	3, 5	IR, UR	N/A		Fe oxide stains
35.66	38.71	3.05	3.05	100%	2.53	83%	R3	12	MW	20, 50	4, 3	IR, UR	N/A		Fe oxide stains
38.71	41.76	3.05	3.05	100%	2.74	90%	R4	12	SW	50, 25	2, 2	U, VR	N/A		Fe oxide stains
41.76	44.80	3.04	3.04	100%	1.77	58%	R3-R4	10-12	PS	70	3	UR	N/A		minor Fe oxide stain
44.80	47.85	3.05	3.05	100%	2.70	89%	R4	12	PS-FR	25, 75	2, 3	UR, I	N/A		rare Fe oxide strains
47.85	50.90	3.05	3.05	100%	3.05	100%	R4	12-13	FR	30	2	IR	N/A		
50.90	53.95	3.05	3.05	100%	2.57	84%	R4-R5	12	FR	60, 20	4, 3	IR, PR	N/A		
53.95	57.00	3.05	3.05	100%	3.02	99%	R4	12-13	FR	40, 60	3, 2	IR,UR	N/A		56.10 - 56.17 - extremely oxidised and rubbled zo
57.00	60.05	3.05	3.05	100%	2.68	88%	R4-R5	10, 13	FR	60	6	P, R	N/A		
60.05	63.10	3.05	3.05	100%	2.04	67%	R4-R5	10-12	FR	35	3	P, UR	60	20	
63.10	66.15	3.05	3.05	100%	2.21	72%	R0, R5	2, 12	FR	50	3	Stepped	N/A		
66.15	69.20	3.05	3.05	100%	0.45	15%	R0	2-3	FR						gouge
69.20	72.24	3.04	1.52	50%	1.52	50%	R5	12-13	FR	50	4	Slicked	40	60	
72.24	75.30	3.06	3.06	100%	1.80	59%	R5	4, 12	FR	60, 15	3, 20	IR, Sm	N/A		
75.30	78.33	3.03	3.03	100%	2.34	77%	R5	12	FR	5, 80	4, 6	PR, PR	N/A		
78.33	81.40	3.07	3.07	100%	2.45	80%	R5	10-12	FR	75, 5	6, 10	PR, Sm	N/A		
81.40	84.43	3.03	3.03	100%	1.77	58%	R4	5, 10	PS-SW	5	16	Sm	N/A		Fe oxide stains
84.43	87.48	3.05	3.05	100%	1.58	52%	R4	5, 10	PS	5	12	Sm	80	20	Fe oxide stains
87.48	90.52	3.04	3.05	100%	0.38	13%	R4	4, 9	PS	5	7	Sm	N/A		Fe oxide stains, rubbled cor
90.52	93.57	3.05	3.05	100%	2.21	72%	R4-R5	12	PS-SW	5, 50	6, 2	UR, P	N/A		

SSD-97-55

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: ***September 10th, 1997*** ***Hole:*** ***SSD -97- 55*** ***Coordinates:*** ***43619.34 N*** ***Collar Elevation:*** ***1244.24 m***

Core Size: ***HQ*** ***24898.66 E*** ***Bearing:*** ***270***

Logged By: ***JML*** ***Total Depth:*** ***106.68 metres*** ***Dip:*** ***-87***

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
15.24	18.29	3.05	0.00	0%											
18.29	21.34	3.05	0.00	0%											
21.34	24.38	3.04	0.00	0%											
24.38	27.43	3.05	0.10	3%	0.00	0%	R3	4	?						
27.43	29.26	1.83	0.15	8%	0.00	0%	R3	4	MW						Fe oxide stains
29.26	30.48	1.22	1.20	98%	0.00	0%	R2	4-5	SW	10	3	Smooth	85	5	Fe oxide stains
30.48	32.31	1.83	1.46	80%	0.00	0%	R2	5-7	SW				80	10	Fe oxide stains
32.31	33.53	1.22	0.15	12%	0.00	0%	R2	4	SW-PS						Fe oxide stains
33.53	35.36	1.83	1.10	60%	0.00	0%	R3	5-6	SW						Fe oxide stains
35.36	36.27	0.91	0.91	100%	0.23	25%	R3	5-7	SW				85	10	Fe oxide stains
36.27	39.01	2.74	2.75	100%	0.41	15%	R3	6-8	SW-PS	25	2	Stepped	85	30	Fe oxide stains rare Fe oxide stains
39.01	41.45	2.44	2.29	94%	0.13	5%	R3	6-8	PS	75	10	Smooth	N/A		hockey puck shale
41.45	43.89	2.44	2.32	95%	0.13	5%	R3	6-8	PS	5	3	Smooth	N/A		rare Fe oxide stains
43.89	45.72	1.83	1.53	84%	0.16	9%	R3	6-9	FR	5	2	Smooth	85		
45.72	47.24	1.52	1.29	85%	0.00	0%	R3	4-6	FR						
47.24	48.77	1.53	1.53	100%	0.39	25%	R3	6-8	FR	75	10		75	35	
48.77	51.21	2.44	2.18	89%	0.00	0%	R3	4-6	FR						
51.21	52.73	1.52	0.96	63%	0.00	0%	R3	4-5	FR						
52.73	54.86	2.13	0.09	4%	0.00	0%	R3	4	FR						
54.86	56.39	1.53	0.00	0%		0%									
56.39	57.91	1.52	1.28	84%	0.00	0%	R3	4-5	FR						hockey puck shale
57.91	59.13	1.22	0.30	25%	0.00	0%	R2	5-6	FR						poker chip shale
59.13	60.96	1.83	1.69	92%	0.00	0%	R2-R3	4-6	FR						poker chip shale
60.96	62.48	1.52	0.50	33%	0.00	0%	R2	4-5	FR						poker chip shale
62.48	63.70	1.22	0.98	80%	0.00	0%	R2	4-5	FR						poker chip shale
63.70	66.45	2.75	1.04	38%	0.00	0%	R2-R3	4-6	FR						poker chip shale
66.45	69.49	3.04	3.04	100%	1.98	65%	R2	8-10	FR	30	4	I	80-85	25	
69.49	72.54	3.05	3.05	100%	2.53	83%	R4	9-11	FR	70	3	R	70	3	
72.54	75.59	3.05	3.05	100%	2.97	97%	R5	10-12	FR	65	4	I	N/A	20	
75.59	78.64	3.05	3.05	100%	2.96	97%	R3-R4	10-12	FR	5	3	R	55-60		
78.64	81.69	3.05	3.01	99%	2.72	89%	R5	10-12	FR	30, 5	4, 3	I, U	N/A	30	
81.69	84.73	3.04	3.04	100%	1.90	62%	R5-R6	9-11	FR	5	6	I	70		

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*

Date: ***September 10th, 1997*** — *Hole:* ***SSD -97- 55*** — *Coordinates:* ***43819.34 N*** ***24898.86 E*** — *Collar Elevation:* ***1244.24 m***

Core Size: ***HQ*** — *Bearing:* ***270***

Logged By: ***JML*** — *Total Depth:* ***106.68 metres*** — *Dip:* ***-87***

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
84.73	85.04	0.31	0.31	100%	0.13	42%	R5	9-10	FR	65	1	R	N/A		
85.04	88.09	3.05	2.78	91%	1.30	43%	R5	4, 6-8	FR-PS	35	4	I	N/A		
88.09	91.14	3.05	3.05	100%	1.36	45%	R5	6-9	FR	5	6	Stepped	N/A		
91.14	94.49	3.35	3.21	96%	2.38	71%	R5-R6	8-9	SW	10	8	I	N/A		Fe oxide stains
94.49	97.54	3.05	3.05	100%	2.61	86%	R6	8-9	FR	10, 30	2, 3	I, R	N/A		
97.54	100.58	3.04	3.04	100%	2.93	96%	R6	9-11	FR	5, 75	7, 4	R, R	85	3	
100.58	103.63	3.05	3.05	100%	2.95	97%	R5-R6	10-13	FR	45	2	I	60	4	
103.63	106.68	3.05	3.05	100%	3.03	99%	R5	12-13	FR	5	10	Sm, Calcite	55	10	

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 10th, 1997 | **Hole:** SSD -97- 56 | **Coordinates:** 43720.31 N, 24800.20 E | **Collar Elevation:** 1209.30 m
Core Size: HQ | **Bearing:** 0
Logged By: JML | **Total Depth:** 84.43 metres | **Dip:** -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
14.00	14.33	0.33	0.33	100%	0.00	0%	R3	4	SW-MW						Fe oxide stains, lsl
14.33	17.37	3.04	1.90	63%	0.43	14%	R5	4, 10	SW-MW	30	1	U, I			Fe oxide stains, lsl
17.37	20.42	3.05	2.98	98%	1.94	64%	R5	11-12	SW-PS	5, 65	6, 4	Sm, I	N/A		Fe oxide stains, lsl on fractures
20.42	23.47	3.05	3.02	99%	2.46	81%	R5	10-11	PS	15-20	3	U, I	N/A		Fe oxide stains, lsl on fractures
23.47	26.52	3.05	3.05	100%	2.67	88%	R5-R6	12-13	PS-SW	10	2	I	N/A		Fe oxide stains, lsl
26.52	29.57	3.05	3.03	99%	2.67	88%	R6	11-12	PS-SW	10	3	R	65	2	
29.57	32.61	3.04	3.05	100%	2.73	90%	R5	10-12	PS	5	4	Sm, U	N/A		
32.61	35.66	3.05	3.05	100%	3.02	99%	R5-R6	11-13	FR-PS	5	5	U	N/A		
35.66	38.71	3.05	3.05	100%	1.96	64%	R5	9-12	FR-PS	35	8	Smooth	70	4	
38.71	41.77	3.06	3.06	100%	2.79	91%	R5	9-11	FR-PS	40, 5	5, 8	I, Sm	80	3	
41.77	44.81	3.04	3.04	100%	2.53	83%	R5-R6	9-12	FR	10, 75	3, 6	I, R	N/A		
44.81	47.85	3.04	3.04	100%	2.52	83%	R6	9-11	FR	5	3	I	N/A		
47.85	50.90	3.05	3.04	100%	2.83	93%	R6	9-12	FR	30	2	R	N/A		
50.90	53.95	3.05	3.04	100%	3.01	99%	R6	11-13	FR	75	10	I	N/A		
53.95	57.00	3.05	3.05	100%	2.42	79%	R6	11-12	FR	75	9	R	N/A		
57.00	60.05	3.05	2.98	98%	2.78	91%	R6	10-12	FR	5, 75	2, 6	I	N/A		
60.05	63.09	3.04	3.01	99%	0.94	31%	R6	10-11	FR	5	1	U	N/A		5° fracture is 2m long, calcite
63.09	66.14	3.05	3.04	100%	2.47	81%	R5-R6	12	FR	5	2	I	85-90	35	
66.14	69.19	3.05	3.05	100%	1.99	65%	R5-R6	9-12	FR	5	3	I	75	20	
69.19	72.24	3.05	3.05	100%	2.70	89%	R6	10-12	FR	30	4	R	N/A		
72.24	75.29	3.05	3.05	100%	2.99	98%	R6	11-13	FR	5	6	Smooth	N/A		
75.29	78.33	3.04	3.04	100%	3.02	99%	R5-R6	10-11	FR	45	5	I	75	6	
78.33	81.38	3.05	3.05	100%	2.89	95%	R6	12-13	FR	25	4	R	N/A		
81.38	84.43	3.05	3.05	100%	2.98	98%	R5-R6	12-11	FR	30	5	I	N/A		

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*															
Date:	September 27th, 1997			**Hole:**	SSD-97-57			**Coordinates:**	43660.75 N				**Collar Elevation:**	1224.30 m		
				Core Size:	HQ				24820.00 E				**Bearing:**	0		
Logged By:	JML			**Total Depth:**	73.15 metres								**Dip:**	-90		
Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments	
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number		
12.19	15.24	3.05	0.65	21%	0.10	3%	R2	4	SW						Fe oxide stains	
15.24	18.29	3.05	0.18	6%	0.00	0%	R2	4	SW						Fe oxide stains	
18.29	21.34	3.05	0.00	0%		0%										
21.34	24.38	3.04	0.89	29%	0.00	0%	R3	4, 6	SW	85	3	K	90	20	Fe oxide stains	
24.38	27.43	3.05	2.34	77%	0.56	18%	R3	6, 9	SW-MW	5	18	I	N/A		Fe oxide stains	
27.43	30.48	3.05	2.05	67%	2.79	91%	R3-R4	14	FR-PS	70	8	U, R	80	20	fractures along stylolites	
30.48	33.53	3.05	3.05	100%	2.81	92%	R4	12-13	FR	50, 70	2, 4	PR, UR	60	100		
33.53	36.58	3.05	3.05	100%	2.88	94%	R4	12	FR	40, 70	2, 3	K, UR	80	20		
36.58	39.62	3.04	3.05	100%	2.84	93%	R4-R5	11-12	FR	50	6	PK	80	16		
39.62	42.67	3.05	3.05	100%	2.74	90%	R5	12	FR	75	7	IR	65	2		
42.67	45.72	3.05	3.05	100%	1.19	39%	R5	7, 12	FR	20, 40	6, 5	IR, PR	65	26		
45.72	48.77	3.05	3.05	100%	1.97	65%	R5	8, 12	FR	10	8	PR	N/A			
48.77	51.82	3.05	3.05	100%	1.46	48%	R4-R5	8, 12	PS-FR	10, 20	6, 5	PR, I	75	3	Fe oxide stains on fractures, zone very fractured	
51.82	54.86	3.04	3.04	100%	2.32	76%	R4-R5	7, 10	PS	20	7	PR	70	4	Fe oxide stains on fractures, zone very fractured	
54.86	57.91	3.05	3.05	100%	1.73	57%	R4	7, 9	PS-SW	5, 40	8, 4	Curved, RI	N/A		Fe oxide stains on fractures, zone very fractured	
57.91	59.74	1.83	1.83	100%	0.72	39%	R4	6, 9	SW	5, 30	8, 3	RI, CR	N/A		Fe oxide stains on fractures, zone very fractured	
59.74	62.79	3.05	3.05	100%	1.42	47%	R4	6, 9	SW-PS	5, 50	6, 2	RI, UR	75	30	Fe oxide stains on fractures, zone very fractured	
62.79	65.84	3.05	3.05	100%	2.14	70%	R4	9	FR	70	6	PR	80	2	fractures along stylolites	
65.84	68.88	3.04	3.04	100%	2.65	87%	R4	13	FR	5, 50	6, 3	Sm, UR	75-80	30	fractures along stylolites	
68.88	71.93	3.05	3.05	100%	3.05	100%	R4	13	FR	85	8	UR	60	20	fractures along stylolites	
71.93	73.15	1.22	0.54	44%	0.33	27%	R4, R5	13, 5	FR, HW				60	16	@72.27 = contact from fresh Lst into highly oxidized stuff, then cavity	

SSD-97-58

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: ***September 28th, 1997*** ***Hole:*** ***SSD-97-58*** ***Coordinates:*** ***43660.38 N*** ***Collar Elevation:*** ***1224.25 m***
Core Size: ***HQ*** ***24820.93 E*** ***Bearing:*** ***90***
Logged By: ***JML*** ***Total Depth:*** ***51.82 metres*** ***Dip:*** ***-54***

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
15.00	15.24	0.24	0.00	0%		0%									overburden
15.24	18.29	3.05	0.37	12%	0.00	0%	R1	4	SW						Fe oxide stains on fractures
18.29	21.34	3.05	0.00	0%		0%									
21.34	24.38	3.04	0.29	10%	0.00	0%	R0-R1	4	PS						Fe oxide stains on fractures
24.38	25.91	1.53	0.69	45%	0.00	0%	R1	4	PS						Fe oxide stains on fractures
25.91	27.43	1.52	0.00	0%		0%									
27.43	29.62	2.19	0.52	24%	0.10	5%	R1	4	PS						Fe oxide stains on fractures
29.62	30.48	0.86	0.37	43%	0.00	0%	R1	4	PS-FR						minor Fe oxide stains on fractures
30.48	32.30	1.82	0.00	0%		0%									
32.30	33.53	1.23	0.20	16%	0.00	0%	R1	4	PS						minor Fe oxide stains on fractures
33.53	36.57	3.04	0.11	4%	0.00	0%	R1	4	PS						minor Fe oxide stains on fractures
36.57	39.62	3.05	0.00	0%		0%									
39.62	42.67	3.05	0.50	16%	0.00	0%	R1	4	FR						minor Fe oxide stains on fractures
42.67	45.72	3.05	2.31	76%	0.23	8%	R3	4, 7	HW	40	3	PR	40	30	extreme Fe oxide stains on fractures
45.72	48.77	3.05	0.34	11%	0.00	0%	R2	4	EW						extreme Fe oxide stains on fractures
48.77	51.82	3.05	0.38	12%	0.12	4%	R2	4, 9	EW						extreme Fe oxide stains on fractures

SSD-97-59

Geotechnical Core Log
Silvertip Property

Imperial Metals Corporation

Date:	September 21st, 1997	Hole:	SSD-97-59	Coordinates:	43680.90 N
		Core Size:	HQ		24820.00 E
Logged By:	JML	Total Depth:	76.20 metres		
Collar Elevation:	1208.60 m	Bearing:	0	Dip:	-90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
7.85	9.15	1.30	1.20	92%	0.64	49%	R4	4, 9	SW-PS	45	2	Smooth	N/A		Fe oxide stain
9.15	12.19	3.04	3.00	99%	1.47	48%	R4	7-8	PS	10, 80	4, 9	Slicked, UR	N/A		Fe oxide stain
12.19	15.24	3.05	2.97	97%	2.37	78%	R3-R4	10	PS-FR	80	10	UR	N/A		rare Fe oxide stains, bx
15.24	18.29	3.05	3.05	100%	2.06	68%	R4	10-12	FR-PS	55, 75	3, 4	R, I	N/A		bx
18.29	21.33	3.04	2.08	68%	0.72	24%	R3-R4	10	MW-PS	50, 5	2, 3	R, I	N/A		Fe oxide stain
21.33	24.38	3.05	1.80	59%	1.56	51%	R4	4, 13	HW, PS	10	2	UR	N/A		top 40cm + bottom 30cm are extremely oxidised, Lst in btw is fresh
24.38	27.43	3.05	2.40	79%	1.58	52%	R1, R4	8, 12	HW, SW	10	2	UR	N/A		bottom 70 cm are extremely oxidised
27.43	30.48	3.05	3.05	100%	3.00	98%	R3	12	HW-MW	70, 30	4, 2	I, I	N/A		
30.48	33.53	3.05	3.05	100%	2.59	85%	R3	12	MW	25	3	PVR	N/A		
33.53	36.58	3.05	3.05	100%	2.78	91%	R3-R4	13-14	MW, FR	5	2	R, I	N/A		top 1m of interval extremely oxidised
36.58	39.62	3.04	3.05	100%	2.66	88%	R4-R5	13	FR	30, 5	4, 10	S, U, I	N/A		
39.62	42.67	3.05	3.05	100%	2.94	96%	R5	13	FR	5, 45	15, 4	Sm, Sm	N/A		
42.67	45.72	3.05	3.05	100%	2.78	91%	R5	11-12	FR	80, 25	4, 4	U, I	70	2	bdg not very reliable, dubious
45.72	48.77	3.05	3.05	100%	2.85	93%	R5	13-14	FR	25, 5	2, 4	U, I	N/A		
48.77	51.82	3.05	3.05	100%	2.20	72%	R5	12	FR	5-10, 45	9, 1	I, R	N/A		long fracture @ low angle to CA split the core
51.82	54.86	3.04	3.05	100%	2.80	92%	R5	12-13	FR	35, 5	2, 4	I	70	20	bdg is a fabric
54.86	57.90	3.04	3.04	100%	2.34	77%	R5	12-13	FR	5	2	Sm	80	10	
57.90	61.00	3.10	3.10	100%	2.58	83%	R5	12	FR	5, 75	3, 6	Sm, IR	N/A		
61.00	64.00	3.00	3.00	100%	2.19	73%	R5	11	FR	45, 10	3, 2	R, I	85-90	20	
64.00	67.05	3.05	3.05	100%	2.89	95%	R5	13	FR	65	3	IR	80	3	
67.05	70.10	3.05	3.05	100%	2.49	82%	R5	13	FR	35	3	R, I	80	100	
70.10	73.15	3.05	3.05	100%	2.89	95%	R5	13-14	FR	45	2	I	60	50	
73.15	76.20	3.05	3.05	100%	3.05	100%	R5	14	FR	40	1	UR	60	30	

SSD-97-60

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 19th, 1997 | **Hole:** SSD-97-60 | **Coordinates:** 44041.58 N, 25310.61 E | **Collar Elevation:** 1168.92 m
Core Size: HQ | **Bearing:** 270
Logged By: JML | **Total Depth:** 237.74 metres | **Dip:** -47

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
11.28	14.33	3.05	0.10	3%											
14.33	17.37	3.04	0.94	31%											
17.37	20.42	3.05	2.30	75%											
20.42	23.47	3.05	2.02	66%											
23.47	26.52	3.05	1.65	54%											
26.52	29.57	3.05	1.59	52%											
29.57	32.61	3.04	2.21	73%											
32.61	35.66	3.05	1.39	46%											
35.66	38.71	3.05	1.44	47%											
38.71	41.76	3.05	2.35	77%											
41.76	44.81	3.05	0.62	20%											
44.81	47.85	3.04	0.67	22%											
47.85	49.38	1.53	0.76	50%											
49.38	50.90	1.52	1.10	72%											
50.90	52.43	1.53	0.51	33%											
52.43	53.95	1.52	0.78	51%											
53.95	55.78	1.83	0.43	23%											
55.78	57.00	1.22	0.35	29%											
57.00	60.05	3.05	1.65	54%											
60.05	63.09	3.04	2.78	91%											
63.09	64.01	0.92	0.92	100%											
64.01	64.62	0.61	0.51	84%											
64.62	66.14	1.52	1.17	77%											
66.14	68.88	2.74	1.83	67%											
68.88	69.19	0.31	0.41	132%											
69.19	72.24	3.05	2.15	70%											
72.24	73.76	1.52	1.52	100%											
73.76	75.29	1.53	1.29	84%											
75.29	76.81	1.52	1.28	84%											
76.81	78.33	1.52	0.61	40%											
78.33	81.38	3.05	2.01	66%											
81.38	84.43	3.05	3.01	99%											
84.43	87.48	3.05	3.05	100%											
87.48	90.53	3.05	3.05	100%											
90.53	93.57	3.04	2.86	94%											
93.57	96.62	3.05	0.84	28%											
96.62	102.72	6.10	4.38	72%											

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 19th, 1997
Logged By: JML
Hole: SSD -97-60
Core Size: HQ
Total Depth: 237.74 metres
Coordinates: 44041.56 N, 25310.61 E
Collar Elevation: 1168.92 m
Bearing: 270
Dip: -87

Depth (Metres) From	Depth (Metres) To	Length (Metres)	Recovery (Metres)	Recovery (%)	RQD (Metres)	RQD (%)	Deg of Hard	Degree of Breakage	Degree of Weathering	Joint Description Angle	Joint Description Number	Joint Description Surface	Bedding Planes Angle	Bedding Planes Number	Comments
102.72	105.77	3.05	3.05	100%											
105.77	108.81	3.04	3.05	100%											
108.81	111.86	3.05	3.05	100%											
111.86	114.91	3.05	3.05	100%											
114.91	117.96	3.05	3.05	100%											
117.96	121.00	3.04	3.04	100%											
121.00	124.05	3.05	3.05	100%											
124.05	127.10	3.05	3.05	100%											
127.10	130.15	3.05	3.05	100%											
130.15	133.20	3.05	3.05	100%											
133.20	139.29	6.09	6.01	99%											
139.29	142.34	3.05	1.24	41%											
142.34	145.39	3.05	2.40	79%											
145.39	148.44	3.05	3.05	100%											
148.44	150.47	2.03	2.03	100%											
150.47	151.49	1.02	1.02	100%											
151.49	152.10	0.61	0.61	100%											
152.10	154.53	2.43	2.43	100%											
154.53	156.06	1.53	1.53	100%											
156.06	157.28	1.22	1.22	100%											
157.28	157.58	0.30	0.30	100%											
157.58	160.63	3.05	3.05	100%											
160.63	166.73	6.10	6.10	100%											
166.73	169.77	3.04	3.04	100%											
169.77	172.82	3.05	3.05	100%											
172.82	175.87	3.05	3.05	100%											
175.87	178.92	3.05	2.70	89%	0.00	0%	R1	5	FR	70	50	slicked	70	100	50' above zone, hockey puck shale
178.92	181.97	3.05	2.40	79%	0.39	13%	R1	5-6	FR	50	63	slicked	50	200	hockey puck shale
181.97	185.01	3.04	2.68	88%	0.00	0%	R1	5-6	FR	70	lots	slicked	70	163	hockey puck shale
185.01	188.06	3.05	2.16	71%	0.00	0%	R1	4, 5	FR	-			75	3	very broken
188.06	191.11	3.05	2.80	92%	0.11	4%	R1	4-5	FR	85	40	slicked	85	200	shale + sulphides
191.11	194.16	3.05	3.01	99%	1.90	62%	R3-R4	11-12	FR	30	3	rough	N/A		sulphides
194.16	197.21	3.05	3.05	100%	1.83	60%	R4-R5	11	FR	45	2	I	N/A		
197.21	200.25	3.04	3.04	100%	1.98	65%	R5	11-12	FR	40, 20	3, 2	I, R	N/A		
200.25	203.30	3.05	3.05	100%	1.91	63%	R5	12	FR	30, 5	4, 2	R,	60	2	
203.30	206.35	3.05	3.05	100%	1.50	49%	R5	4, 12	FR	5	5	U	N/A		
206.35	209.40	3.05	3.05	100%	2.41	79%	R5	4, 12	FR	5, 40	10, 4	Smooth,	N/A		

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 19th, 1997 **Hole:** SSD-97-60 **Coordinates:** 44041.58 N **Collar Elevation:** 1168.92 m
Core Size: HQ 25310.61 E **Bearing:** 270
Logged By: JML **Total Depth:** 237.74 metres **Dip:** -87

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
209.40	212.45	3.05	3.04	100%	1.99	65%	R5	4, 12	FR	5	3	Smooth,	N/A		
212.45	215.49	3.04	3.05	100%	2.37	78%	R5	10-12	FR	40	2	R	70	5	
215.49	218.54	3.05	3.05	100%	2.48	81%	R5	12	FR	40	2	R	N/A		
218.54	221.59	3.05	3.05	100%	2.66	87%	R5	12	FR	30	3	R	N/A		
221.59	224.64	3.05	3.05	100%	2.82	92%	R5	12-13	FR	35	2	I	80	2	
224.64	227.69	3.05	3.05	100%	2.35	77%	R5	11-13	FR	45, 5	5, 2	U, R	N/A		
227.69	230.73	3.04	3.05	100%	2.33	77%	R5	11	FR	15	4	I	N/A		
230.73	233.17	2.44	2.44	100%	1.87	77%	R5	11	FR	15	3	I	N/A		
233.17	233.78	0.61	0.55	90%	0.14	23%	R5	11	FR	45	4	Smooth	N/A		
233.78	235.31	1.53	1.53	100%	0.57	37%	R5	11-12	FR	40-45	4	Smooth	N/A		
235.31	237.74	2.43	2.43	100%	1.44	59%	R5	12	FR	40	3	Smooth,	N/A		

SSD-97-61

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*														
Date:	**September 11th, 1997**			**Hole:**	**SSD -97- 61**		**Coordinates:**	**43639.56 N**				**Collar Elevation:**	**1228.04 m**		
				Core Size:	**HQ**			**24759.20 E**				**Bearing:**	**0**		
Logged By:	**JML**			**Total Depth:**	**109.73 metres**							**Dip:**	**-90**		
Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
13.41	15.24	1.83	1.55	85%	0.38	21%	R5	8-9	SW	45	2	I	65	10	Fe oxide stains
15.24	17.37	2.13	2.13	100%	0.95	45%	R5	5-8	SW	45, 5	4, 1	I, R	65	1	Fe oxide stains
17.37	20.42	3.05	3.05	100%	2.23	73%	R5	11-12	SW-PS	45	3	I	75	2	Fe oxide stains
20.42	21.95	1.53	1.00	65%	0.12	8%	R5	7-8	PS	70	4	R	65-70	3	
21.95	23.74	1.79	1.61	90%	0.87	49%	R5	10-12	FR	5, 25	2, 2	Smooth, R	N/A		
23.74	24.99	1.25	1.00	80%	0.23	18%	R5	8-9	FR	75	4	R	N/A		
24.99	27.13	2.14	2.14	100%	0.93	43%	R5	9-11	FR	25	3	R	N/A		
27.13	29.26	2.13	2.13	100%	0.72	34%	R4-R5	8-9	FR	40	5	R	N/A		
29.26	32.31	3.05	2.95	97%	2.05	67%	R5	12	FR	45	3	I	N/A		
32.31	35.36	3.05	3.05	100%	1.86	61%	R5	10-11	FR	75	6	R	N/A		
35.36	37.49	2.13	1.43	67%	0.00	0%	R5	3-5	FR						
37.49	38.71	1.22	1.22	100%	0.00	0%	R5	5-7	FR	5, 30	2, 1	R, U	N/A		
38.71	40.23	1.52	1.52	100%	0.45	30%	R4-R5	6-8	FR	5	2	Smooth, R	70	5	
40.23	42.67	2.44	2.44	100%	0.23	9%	R4-R5	6-8	FR	65	8	Slicked	65	150	
42.67	45.72	3.05	1.40	46%	0.32	10%	R5	7-8	FR	5	2	R	N/A		
45.72	48.77	3.05	1.36	45%	0.00	0%	R0	2	FR						
48.77	50.29	1.52	1.06	70%	0.00	0%	R1	5-6	FR						poker ship shale
50.29	51.82	1.53	1.53	100%	0.00	0%	R1-R2	5-6	FR						poker ship shale
51.82	54.86	3.04	1.49	49%	0.00	0%	R1	5-7	FR						
54.86	56.08	1.22	0.08	7%	0.00	0%	R1	3	FR						
56.08	57.91	1.83	1.62	89%	0.32	17%	R3-R5	4, 8	FR	40	2	I	70	2	
57.91	60.66	2.75	1.73	63%	0.88	32%	R4	9	FR	30	1	R	N/A		sulphides
60.66	61.87	1.21	1.01	83%	0.30	25%	R5	9	FR				N/A		sulphides
61.87	64.01	2.14	1.64	77%	1.28	60%	R5	12	FR	45	3	R	N/A		sulphides
64.01	67.06	3.05	3.05	100%	3.05	100%	R6	13-14	FR	50	4	I	N/A		sulphides
67.06	70.10	3.04	3.04	100%	2.73	90%	R5-R6	12	FR	35	3	I	N/A		sulphides
70.10	72.54	2.44	2.44	100%	1.46	60%	R4-R5	12	FR	75	6	RU	N/A		sulphides
72.54	76.20	3.66	2.60	71%	1.92	52%	R5	11	FR						cavity, sulphides
76.20	79.25	3.05	3.05	100%	2.65	87%	R5	12-13	FR	75	4	I	70	2	limestone
79.25	82.30	3.05	3.05	100%	2.88	94%	R5	12-14	FR	25	3	U	N/A		limestone
82.30	85.34	3.04	3.04	100%	2.30	76%	R5	12-13	FR	60	3	RI	N/A		limestone
85.34	88.39	3.05	3.05	100%	1.49	49%	R5	11-12	FR	5	2	Smooth, R	85-90	2	core dropped

SSD-97-61

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 11th, 1997
Hole: SSD -97- 61
Coordinates: 43639.56 N, 24759.20 E
Collar Elevation: 1228.04 m
Core Size: HQ
Bearing: 0
Logged By: JML
Total Depth: 109.73 metres
Dip: -90

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
88.39	91.44	3.05	3.05	100%	1.99	65%	R5	9-11	FR	30	3	I	85	2	
91.44	94.49	3.05	3.05	100%	1.31	43%	R5	9-11	FR	75, 5	4, 6	R, I	N/A		
94.49	97.54	3.05	3.05	100%	2.52	83%	R5	12-13	FR	35	2	R	80	2	
97.54	100.58	3.04	3.04	100%	2.30	76%	R5	12	FR	45	2	R	N/A		
100.58	103.63	3.05	3.05	100%	2.43	80%	R5	13	FR	35	2	U	N/A		
103.63	106.68	3.05	3.05	100%	2.89	95%	R5	13-14	FR	35	5	R	N/A		
106.68	109.73	3.05	3.05	100%	2.36	77%	R5	13	FR	5	6	I	70	20	

SSD-97-62

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 12th, 1997 | **Hole:** SSD-97-62 | **Coordinates:** 43639.83 N, 24759.36 E | **Collar Elevation:** 1228.03 m

Logged By: JML | **Core Size:** HQ | **Total Depth:** 98.72 metres | **Bearing:** 44 | **Dip:** -76

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
16.76	18.29	1.53	1.53	100%	0.32	21%	R3-R4	6-7	SW	20	4	R	80	1	Fe oxide stains
18.29	21.34	3.05	3.01	99%	1.04	34%	R4	9-10	SW	25	4	I	85	20	Fe oxide stains
21.34	23.77	2.43	2.43	100%	1.09	45%	R4	10-11	PS	5, 75	2, 4	R, I	85	20	rare Fe oxide stains
23.77	25.91	2.14	2.14	100%	0.85	40%	R4	9-10	FR	20, 75	2, 6	I, Slicked	N/A		
25.91	27.74	1.83	1.83	100%	1.23	67%	R4	10	FR	40, 80	2, 4	I, Slicked	70	2	
27.74	30.48	2.74	2.16	79%	0.87	32%	R4	3, 10	FR	40, 75	2, 3	I, Slicked	80	10	
30.48	33.53	3.05	2.02	66%	0.00	0%	R2	3-4	FR						
33.53	36.58	3.05	0.29	10%	0.00	0%	R1-R3	4	FR						
36.58	37.80	1.22	0.70	57%	0.26	21%	R3	4, 8	FR	15	3	Smooth	70	1	
37.80	39.62	1.82	0.50	27%	0.00	0%	R2	2, 4	FR						
39.62	42.67	3.05	0.35	11%	0.00	0%	R2	2	FR						cavity
42.67	45.72	3.05	0.60	20%	0.00	0%	R0	2	FR						
45.72	48.77	3.05	0.73	24%	0.00	0%	R2	4-6	FR				85	3	
48.77	51.82	3.05	2.48	81%	0.00	0%	R2	4-5	FR						
51.82	54.86	3.04	1.79	59%	0.00	0%	R2	4-5	FR						
54.86	57.91	3.05	2.81	92%	1.89	62%	R4	10-12	FR	5	10	I	65, 80	2, 1	
57.91	60.96	3.05	3.05	100%	2.25	74%	R4-R5	9-11	FR	30	4	I	85	2	
60.96	64.01	3.05	3.05	100%	2.44	80%	R4-R5	12	FR	75	5	R	N/A		sulphides
64.01	66.45	2.44	2.44	100%	1.08	44%	R4	12-13	FR	75	3	IU	N/A		
66.45	67.67	1.22	1.22	100%	0.53	43%	R4	10-11	FR	30	3	R	N/A		
67.67	68.89	1.22	1.10	90%	0.63	52%	R4	9-11	FR	30	2	UR	N/A		
68.89	70.10	1.21	1.06	88%	0.89	74%	R3	9	FR	75	3	I	N/A		
70.10	73.15	3.05	3.01	99%	1.65	54%	R3	9	FR	80	4	R	N/A		
73.15	76.20	3.05	3.05	100%	2.53	83%	R4	10-11	FR				70	2	limestone
76.20	79.25	3.05	3.05	100%	2.85	93%	R5	12	FR	45	3	I	N/A		
79.25	82.30	3.05	3.05	100%	2.40	79%	R5	11	FR	50	2	IR	N/A		
82.30	85.34	3.04	3.04	100%	1.69	56%	R5	10	FR	30	4	R	N/A		
85.34	88.39	3.05	3.05	100%	2.20	72%	R5	12-13	FR	35	2	R	N/A		
88.39	91.44	3.05	3.05	100%	2.76	90%	R5	13	FR	5	4	Sm	N/A		
91.44	94.49	3.05	3.00	98%	1.58	52%	R5	4, 10	FR	5	8	I	70	3	
94.49	97.54	3.05	3.05	100%	1.93	63%	R5	4, 12	FR	30	3	R	75	2	

SSD-97-62

Imperial Metals Corporation	Geotechnical Core Log ***Silvertip Property***

Date: *September 12th, 1997* ***Hole:*** *SSD-97-62* ***Coordinates:*** *43639.83 N* ***Collar Elevation:*** *1228.03 m*
Core Size: *HQ* *24759.36 E* ***Bearing:*** *44*
Logged By: *JML* ***Total Depth:*** *98.72 metres* ***Dip:*** *-76*

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
97.54	98.72	1.18	1.18	100%	0.79	67%	R5	10-11	FR	25	1	R	N/A		

SSD-97-63

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*

Date: September 21st, 1997 | **Hole:** SSD -97- 63 | **Coordinates:** 44040.71 N, 25309.71 E | **Collar Elevation:** 1168.97 m
Core Size: HQ | **Bearing:** 270
Logged By: JML | **Total Depth:** 215.49 metres | **Dip:** -75

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
17.37	20.42	3.05	0.46	15%											
20.42	23.47	3.05	0.89	29%											
23.47	26.52	3.05	1.53	50%											
26.52	29.57	3.05	1.75	57%											
29.57	32.61	3.04	1.28	42%											
32.61	35.66	3.05	1.26	41%											
35.66	38.71	3.05	3.05	100%											
38.71	40.84	2.13	2.13	100%											
40.84	41.76	0.92	0.65	71%											
41.76	44.81	3.05	1.01	33%											
44.81	47.85	3.04	2.86	94%											
47.85	49.38	1.53	1.53	100%											
49.38	50.90	1.52	1.30	86%											
50.90	53.95	3.05	2.88	94%											
53.95	57.00	3.05	1.81	59%											
57.00	60.05	3.05	2.85	93%											
60.05	62.48	2.43	2.43	100%											
62.48	63.09	0.61	0.61	100%											
63.09	64.92	1.83	1.83	100%											
64.92	66.14	1.22	1.22	100%											
66.14	69.19	3.05	2.03	67%											
69.19	71.02	1.83	0.43	23%											
71.02	72.24	1.22	0.53	43%											
72.24	72.85	0.61	0.37	61%											
72.85	75.29	2.44	1.06	43%											
75.29	77.42	2.13	2.13	100%											
77.42	78.33	0.91	0.91	100%											
78.33	79.25	0.92	0.92	100%											
79.25	80.77	1.52	1.43	94%											
80.77	81.38	0.61	0.61	100%											
81.38	84.43	3.05	3.05	100%											

SSD-97-63

Imperial Metals Corporation	Geotechnical Core Log *Silvertip Property*														
Date: September 21st, 1997			Hole: SSD-97-63			Coordinates: 44040.71 N					Collar Elevation: 1168.97 m				
			Core Size: HQ			25309.71 E					Bearing: 270				
Logged By: JML			Total Depth: 215.49 metres								Dip: -75				
Depth (Metres)		Length	Recovery		RQD		Deg of Hard	Degree of Breakage	Degree of Weathering	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)				Angle	Number	Surface	Angle	Number	
84.43	86.87	2.44	2.44	100%											
86.87	87.48	0.61	0.61	100%											
87.48	88.09	0.61	0.61	100%											
88.09	90.53	2.44	2.44	100%											
90.53	93.57	3.04	2.51	83%											
93.57	96.62	3.05	2.63	86%											
96.62	99.67	3.05	1.92	63%											
99.67	102.72	3.05	3.05	100%											
102.72	105.77	3.05	1.61	53%											
105.77	108.81	3.04	1.49	49%											
108.81	111.86	3.05	3.05	100%											
111.86	114.91	3.05	3.05	100%											
114.91	117.96	3.05	2.78	91%											
117.96	121.01	3.05	3.05	100%											
121.01	124.05	3.04	2.08	68%											
124.05	127.10	3.05	3.05	100%											
127.10	130.15	3.05	3.05	100%											
130.15	133.20	3.05	3.05	100%											
133.20	136.25	3.05	3.05	100%											
136.25	139.29	3.04	3.04	100%											
139.29	142.34	3.05	3.05	100%											
142.34	145.39	3.05	2.83	93%											
145.39	148.44	3.05	3.05	100%											
148.44	151.49	3.05	3.05	100%											
151.49	154.53	3.04	3.05	100%											
154.53	157.58	3.05	3.05	100%											
157.58	159.49	1.91	1.56	82%											
159.49	160.63	1.14	1.14	100%											
160.63	163.68	3.05	1.48	49%											
163.68	166.73	3.05	2.81	92%	0.00	0%	R0-R1	2-4	FR				55	10	50' above zone
166.73	169.77	3.04	2.52	83%	0.00	0%	R1	2-4	FR						

SSD-97-63

Imperial Metals Corporation

Geotechnical Core Log
Silvertip Property

Date: September 21st, 1997 | **Hole:** SSD-97-63 | **Coordinates:** 44040.71 N, 25309.71 E | **Collar Elevation:** 1168.97 m

Core Size: HQ | **Bearing:** 270

Logged By: JML | **Total Depth:** 215.49 metres | **Dip:** -75

Depth (Metres)		Length	Recovery		RQD		Deg of	Degree of	Degree of	Joint Description			Bedding Planes		Comments
From	To	(Metres)	(Metres)	(%)	(Metres)	(%)	Hard	Breakage	Weathering	Angle	Number	Surface	Angle	Number	
169.77	172.82	3.05	3.00	98%	0.10	3%	R1	4-6	FR	70	30	Slicked	75	100	
172.82	175.87	3.05	2.76	90%	0.14	5%	R1	6, 8	FR	60, 80	2, 10	R, Slicked	85	100	
175.87	178.92	3.05	3.05	100%	2.83	93%	R4	10	FR	15, 80	3, 6	Sm, R	N/A		limestone
178.92	181.97	3.05	3.05	100%	2.12	70%	R4-R5	9-10	FR	45, 30	2, 5	I, R	70	2	sulphides
181.97	185.01	3.04	2.83	93%	0.79	26%	R3	6, 10	FR	75	15	Slicked	75	100	
185.01	188.06	3.05	2.98	98%	1.73	57%	R3-R4	12	FR	30	2	Sm	N/A		
188.06	191.11	3.05	3.05	100%	2.47	81%	R4	10-12	FR	5, 80	4, 5	Sm,	N/A		
191.11	194.16	3.05	3.61	118%	1.96	64%	R4	5, 11	FR	35	12	Sm	N/A		
194.16	197.21	3.05	3.05	100%	1.27	42%	R4	5, 10	FR	35	8	I	70	50	
197.21	200.25	3.04	3.04	100%	1.11	37%	R4	5, 8-10	FR	20, 5	3, 4	I, R	70	3	
200.25	203.30	3.05	3.05	100%	1.99	65%	R4	10	FR	5	4	U	N/A		
203.30	206.35	3.05	3.05	100%	1.69	55%	R4	8-9	FR	90	11	I	N/A		
206.35	209.40	3.05	3.05	100%	1.67	55%	R4-R5	9-10	FR	10, 80	6, 9	U, I	N/A		
209.40	212.45	3.05	3.05	100%	1.80	59%	R5	8-9	FR	50, 5	3, 2	Sm, I	75	3	
212.45	214.58	2.13	2.13	100%	0.96	45%	R4	8-9	FR	25	3	I	50	40	
214.58	215.49	0.91	0.91	100%	0.32	35%	R3-R4	6, 8	FR	5	3	I	N/A		

Appendix G

A Preliminary Analysis of Lithogechemical Data from the Silvertip Project

A Preliminary Analysis of Lithogeochemical Data

from the

Silvertip Project

for

Imperial Metals Corporation
Suite 420 - 355 Burrard Street
Vancouver, B.C.

by

Hans E. Madeisky PhD PGeo
HEMAC Exploration Ltd.
Vancouver, BC

February 1998

Summary

This work was undertaken at the request of Steve Robertson of Imperial Metals Corporation of Vancouver, BC. The purpose of collecting and analyzing this data was to see whether the Zn-Pb-Ag mineralization of the Silvertip orebodies, emplaced in McDame Group carbonates below an unconformity, has recognizable geochemical signatures or expressions in the overlying mudstones, siltstones, and sandstones of the Earn Group, and if so, whether such signatures might be exploited to target additional mineralization in the project area.

The result of this study suggests that there appear to be geochemically detectable alteration facies in the shales and siltstones overlying the Silvertip mineralization, but these are not always sufficiently unique to permit easy recognition of hydrothermal alteration without resorting to additional geological information, such as structural and lithofacies mapping. There are several hydrothermally introduced elements in the hangingwall rocks of the mineralization which may be useful in identifying prospective structures along which mineralizing fluids may have travelled. There are also a number of elements which reside in different minerals in unaltered and altered rocks, whose differing solubility in aqua-regia may be exploitable as alteration indicators.

Samples

Ninety five (95) samples, 5 - 10 cm long splits of drill core, were taken from Earn Group siliciclastics, more or less immediately above the Earn Group - McDame Group unconformity. These rocks are variably carbonaceous and calcareous mudstones, siltstones and sandstones, locally containing calcareous and cherty nodules. Some of these samples appear to have been sericitized.

These samples were analyzed at Bondar-Clegg Inc. in North Vancouver by Fusion XRF method for major and some trace elements, and by aqua-regia ICP method for 32 major and trace elements, and hydrothermally mobile metals. Approximately half of these samples were also analyzed by LECO method for CO_2 content.

The sample lay-out is approximately a 100 m x 100 m grid, occupying an area of about three square kilometres. With a few exceptions, only one sample was taken from each drill hole. The collars of these drill holes are plotted on Figure 1.1, with the area of the Silvertip deposit(s) shown in greater detail in Figure 1.2. Four E-W sections (labelled 1, 2, 3, and 4) are also indicated on this figure. The locations of samples on these sections is shown on Figures 2.1, 2.2, 2.3, and 2.4. For the purpose of this examinations it is assumed that the sampled drill holes are vertical.

Analysis of the Lithogeochemical Data

These rocks are sediments representing a variety of chemical compositions and depositional facies. Some of the rocks appear to be hydrothermally altered. It is reasonable to expect the geochemistry of the rocks to be quite variable, even in their unaltered state. To identify the geochemical signature, and quantify the effect of hydrothermal alteration on these rocks requires that the pre-alteration geochemical variability in these rocks be removed from the data. This can be accomplished through the use of linear molar ratio models, provided such models can be constructed for the rocks in question. The basis and application of this method is similar to one applied to Carlin rocks (Madeisky, 1995, 1996).

The analytical data, sample locations, sample descriptions, and calculations, along with models, plans and sections are contained in the attached spreadsheet file (SILVRTIP.WQ1). This is a Quattro Pro v.4.0 for DOS file which is easily converted to other spreadsheet formats. However, this file contains a number of bubble plots which will not convert, but which can be re-constructed by the EXCEL spreadsheet program contained in MS OFFICE 97.

Models for the Carbonate Fraction

Although these rocks are dominantly siliciclastic, they can contain significant amounts of carbonate material as cement and as detrital material. To see whether Ca and Mg are present in carbonates and silicates the model CO_2/Ti mol vs. (Ca+Mg)/Ti mol is used. The model requires the use of CO_2 analyses, however only about half of the samples were analyzed for CO_2. The carbonate model is shown on Figure 3.1, and the detail near the origin of this model on Figure in 3.2. With very few exceptions thai data plot along or very near the model line (slope = 1) for calcite ($CaCO_3$) and dolomite ($CaMg2CO_3$). This suggest that virtually all of the Ca and Mg in these rocks is bound up in carbonates, and that the carbonate and silicate fractions can be modelled separately. One must assume that this is also true of the samples not analyzed for CO_2. This model however cannot distinguish between calcite, dolomite and other carbonates. This may be important, because carbonate bearing rocks in many hydrothermal regimes become progressively de-calcified and de-carbonated with increasing intensity of hydrothermal alteration. For individual carbonate species the model CO_2/Ti mol vs. Ca/Ti mol can be used (see Figure 4.1). Ca bearing silicates plot along the X-axis of the model, while calcite plots along a line with slope 1, and dolomite and ankerite plot along a line with slope 2. The dat distribution suggests that carbonate compositions of these rocks range from calcite to dolomite. But his model also requires the use of CO_2 analyses. However, the model Ca/Ti mol vs. Mg/Ti mol does not. On this model all of the samples can be plotted (see Figure 4.2). Here calcite and Ca bearing silicates plot along the Y-axis, dolomite plots along the model line with slope 1, and Mg bearing silicate plot along the X-axis. De-calcification displaces sample compositions downward vertically until the dolomite model line is reached, and then de-carbonation (loss of dolomite) displaces sample compositions toward the origin along the model line. As in the previous model, the samples exhibit a range of carbonate compositions ranging from calcite to dolomite. What cannot be determined at this point is whether this range in carbonate compositions is a consequence of diagenetic processes or a result of hydrothermal alteration. This can be accomplished by plotting hydrothermally introduced metals (either individually or as a sum) onto these two models. Figure 4.3 is a "bubble plot" of a sum of metals typically mobile in hydrothermal fluids (100Ag+Cu+Pb+Zn+As+10Sb+Sn+W) on the model CO_2/Ti mol vs. Ca/Ti mol. Although there appears to be a tendency for these metals to be associated with dolomite, they are also present with calcite. This can also be seen on the model Ca/Ti mol vs. Mg/Ti mol (see Figure 4.4). This data distribution suggests that while hydrothermal de-calcification and/or dolomitization is likely present among these samples, there may also be hydrothermal calcification, or these metals have been introduced into calcite bearing rocks without dolomitization, or as detritus. The pointy is that there are no metals which uniquely represent a particular carbonate (alteration) facies.

Models for the Alumino-Silicate Fraction

The alumino-silicate fraction of these rocks can be modelled by the alkali feldspar - biotite model (Na+K)/Ti mol vs. Al/Ti mol (see Figure 5.1). On this model unaltered rocks containing mixtures of alkali feldspars and/or biotite plot along the model line with slope 1. Alkali depleted rocks (altered and/or weathered) plot below this model line depending on the degree of alkali depletion. Sericitic rocks plot along a line with slope 1/3, illitic rocks plot along a slope of 0.2 and fully alkali depleted rocks (clay bearing rocks) plot along the X-axis. On this model most of the samples plot between sericite and illite. The effect of alkali metasomatism, and especially substitution of K for Na cannot be determined on this model. The Ternary Diagram K/Al mol vs. (Na+K)/Al mol (see Figure 5.2) is used to examine the role of K and Na. On this diagram fully alkali depleted rocks (containing kaolinite, smectite, or chlorite) plot at the origin of the triangle. Orthoclase and Biotite plot at the top of the triangle, and albite plots on the bottom right. Sericite and illite plot at their respective K/Al molar ratios along the diagonal line from Ch to Or, Bt. Most of the samples plot between illite and sericite along the diagonal line, suggesting that potassium is the only alkali present in the alumino-silicate fraction of these rocks. Whether this is a consequence of diagenetic processes or hydrothermal alteration cannot be determined without reference to hydrothermally mobile metals. On Figure 5.3 the hydrothermally mobile metals are plotted. They are present mainly in the range of sericite to illite, with some higher values in rocks with higher alkali/aluminum ratios. On Figure 5.4 higher metal values are found in rocks with (relatively) elevated K/Al and (Na+K)/Al ratios, suggesting the possibility of hydrothermal feldspar.

Combined Carbonate and Alumino-Silicate Models

The models for the carbonate and alumino-silicate fraction of these rocks can be combined in order to determine whether there are any correlations between carbonate and alkali alteration facies. Figure 6.1 plots the alkali/aluminum ratio against the Magnesium Number, (Na+K)/Al mol vs. Mg/(Mg+Ca). On this diagram chlorite and kaolinite (and other alkali deficient clays) plot at 0 on the Y-axis, illite plots at 0.2, sericite at 0.33 and orthoclase and biotite at 1. Calcite plots at 0 (Cal) on the X-Axis, dolomite plots at 0.5 (Dol) and fully de-carbonated rocks plot at 1 (Sil).

In many silty carbonates (as at Carlin) the broadest range of alkali/aluminum ratios is usually found in unaltered rocks, the ones containing calcite as the dominant carbonate species. As such rocks become hydrothermally de-calcified, their alkali/aluminum ratios converge on sericite-illite with the dominantly clay-bearing rocks gaining alkalis, whilst the dominantly feldspar-bearing rocks lose alkalis.

This does not appear to be the case at Silvertip. Most of the samples from Silvertip plot in the sericite-illite range (0.33 - 0.20 on the Y-Axis), with only a few samples outside above or below this range. About half of the samples plot in the vicinity of dolomite (0.4 - 0.6 on the X-axis), a third plot near calcite, with the remainder plotting mainly between calcite and dolomite, and a few at the fully-decarbonated end of the spectrum. Figure 6.2 plots the hydrothermal metals on this diagram. Most of the higher values plot between calcite and dolomite (with the highest near dolomite), and above the sericite line. This suggests once more the possibility of hydrothermal feldspar in dolomitized rocks.

Metals and Alteration Facies in the Mine Area

There is a range of carbonate and alumino-silicate species present in these rocks, but this may as easily be due to diagenetic processes as it may be a consequence of hydrothermal alteration. To resolve this, hydrothermally mobile metals were plotted on various carbonate and alumino-silicate models. And while there appears to be a tendency for these metals to be more abundant in dolomitic and sericitic rocks, there is no unequivocal evidence that these facies represent hydrothermal alteration in these rocks. To settle the issue of whether hydrothermal alteration or diagenetic processes are involved, it is necessary to look at the spatial distribution of the data, both in plan and in section.

Figures 7.1 - 7.19 are bubble plots of metal concentrations and alteration index scores on the detail sample plan of the Sivertip mine area. The bubble plot function in the spreadsheet plots a third variable as a scaled circle (bubble) on an X-Y scatterplot. The plot function scale these bubbles from 0 to the largest value in thai data range. This can result in an attenuation of contrast in values where the minimum value is significantly greater than 0, and where the rand from 0 to the minimum value is greater than the range from minimum to maximum value. This can be overcome by normalizing the data (sample - minimum / maximum - minimum).

Ag - The maximum value plots in the immediate vicinity of the mine, and the array of intermediate values suggests a NE linear trend, possibly the geochemical expression of a fault or shear zone along which acted as a fluid conduit.

Cu - The higher values are arranged in a NW trend perhaps indicative of a fault or shearzone which served as a conduit for Cu bearing fluids. The NW trend visible in the Ag values is also discernible in the intermediate Cu values.

Pb - The pattern evident in Ag is repeated here, presumably because both silver and lead are present in galena. The highest Pb value is coincident with the highest Ag value, and the NE trend is more clearly recognizable.

Zn - The zinc distribution is much less focused along apparent structures than the Ag, Cu, and Pb values. Although present along these trends, higher Zn values are also found considerable distances away from them. This may be due to the fact that Zn is geochemically far more mobile than Ag, Cu, or Pb.

Bi - The array of higher values again suggests two distinct linear trends. These probably represent fault or shear zones which acted as conduits for hydrothermal fluids related to the nearby granitic (?) intrusion, about 3 km to the SE.

La - The higher Lanthanum values have a similar spatial distribution as the Bi values, and probably for much the same reason.

As - The spatial distribution of the higher As values again highlights the NW and NE linear trends, with the highest values in the immediate vicinity of the discovery trench.

Sb - The higher Sb values are found above the SE extension zone, along the NE linear trend, and SE the discovery trench along the NW linear.

Sn - The higher Sn values (i.e., the ones above the detection limit) ar coincident with the higher Sb values, and also lie along the NW and NE linear trends. The most likely source of the tin is the intrusion to the SE.

W - The two W value s above the detection limit are coincident with the highest Sb values, and also lie along the NW and Ne linears. The likely source of the tungsten is are hydrothermal fluids related to the intrusion to the SE.

Ba - Barium values are low over the mineralized areas, and higher along the edge of the sample array. A possible explanation for this behaviour is that Ba in the mineralized area is present as relatively insoluble barite ($BaSO_4$), while at the margins of this area it is, at least in part, present in much more soluble witherite ($BaCO_3$).

Cr - Chrome exhibits essentially the inverse behaviour of barium. The higher values are concentrated over the mineralized areas, with the highest values lying along the two linears. A possible explanation for this distribution is that chrome is present as insoluble detritus (chromite?) in the unaltered mud-, silt-, and sandstones, but becomes incorporated into more soluble micas in hydrothermally altered rocks.

Metals - The sum of metals, 100Ag+Cu+Pb+Zn+10Sb+Sn+W, typically mobile in hydrothermal fluids is plotted on the sample plan covering the area of the Silvertip mine. The high scores identify the two linear trends and the highest values are found in the vicinity of the discovery trench and the SW Extension zone, respectively.

Cr/Ba - The inverse behaviour of Ba and Cr can be exploited as an alteration indicator (assuming that hydrothermal alteration plays a role in this). The higher Cr/Ba mass ratios are essentially coincident with the high Metals values, and the highest ratios once again identify the two linears.

Mg/(Mg+Ca) - The Magnesium Number (from XRF analyses) suggests that the distribution of dolomitic rocks lies along two parallel NW linear trends, about 1 km apart.It also suggests the Ne linear tend. Whether the spatial distribution of dolomitic rocks (containing dolomitic detritus and/or dolomitic cement) is a function of the sampling array or is due to a hydrothermal plume emanating from several NW trending fault, shear or fracture zones may be determined with the aid of additional geological information.

Al/(Al + Ca) - High scores in the Aluminum Number (from XRF analyses) identify de-calcified siliciclastic rocks. The distribution of these rocks is similar to that of the dolomitic rocks.

Na/(Na + K) - Elevated Sodium Numbers (from XRF analyses) could be the result of hydrothermal albitization. This interpretation is suggested by the spatial array of the high Na Numbers, along the NW and the NE linear trends, and would be consistent with albitization related to the intrusive to the SE.

Alteration Index - This score is derived by multiplying the Mg Number with the Al Number. Its spatial distribution is reasonably consistent with the spatial distribution of the mineralization below the Discovery Trench and the SW Extension Zone.

Figures 8.1 - 8.8 are bubble plots of Metals and Cr/Ba ratios, respectively, on the for E-W sections. Additional plots of individual elements and various alteration indices (using XRF, as well as ICP data) are in the spreadsheet. These sections look north, the surface trace is plotted from the drill hole collar elevations, and the sample locations are plotted assuming vertical drill holes, more accurate locations can be calculated from the project database.

Metals - On sections EW-1 and EW-2 the trace of the proposed NE linear can be recognized by the high values plotting nearest to the surface trace. On both sections these values attenuate away from this structure. On sections EW-3 and EW-4 the NW trending structure is identified. Here too the values attenuate away from the structure.

Cr/Ba - On sections EW-1 and EW-2 the NE structure is recognizable in higher ratios, but here the near surface expression on section EW-1 is more subdued. Also, on section EW-1 the NW trending structure can be seen. The Cr/Ba ratios attenuate away from these structures. On sections EW-3 and EW-4 the NW trending linear can be recognized, and here too the ratios attenuate away from the structure.

Discussion

Through the use of molar ratio linear covariation models, variations in the bulk chemistry of the Earn Group silicilastics due to rock-forming processes can be observed, and to some extent further modification of the chemistry of these rocks due to interaction with hydrothermal fluids can also be recognized. Modelling sediments is inherently more difficult than modelling igneous rocks because there are no theoretically predictable bulk mineralogies or chemistries.

The results of this study suggest that the Earn Group rocks have reacted with the hydrothermal plume responsible for the Zn-Pb-Ag mineralization hosted in underlying McDame Group limestones. Presumably the hydrothermal plume(s) rose along permissive structures (fault-, shear- and fracture zones) and entered the more permeable of the Earn Group rocks to form semi-conformable alteration haloes. Alteration of these rocks probably resulted in potassium metasomatism of the mica and clay fraction of these rocks, along with minor albitization and incorporation of chrome into hydrothermal micas. The carbonate fraction of these rocks may have become more dolomitic, either through Mg metasomatism or through progressive de-calcification of calcite and dolomite (ankerite) bearing rocks. Hydrothermal fluids certainly introduced a suite of metals into the Earn Group rocks, which is not significantly present in unaltered rocks. Some of these metals (Bi, La, Sn, and W) are characteristic of fluids derived from or associated with granitic intrusions.

Although analyses employing total digestion methods, such as Fusion-XRF, along with CO_2 and S analyses are essential for a meaningful pilot study, and to develop reliable alteration indicators, analyses from partial digestion techniques, such as the ubiquitous 32-element aqua-regia ICP procedure can be used to identify altered rocks and new exploration targets.

Recommendations

First of all, integrate the results of this study with the geological database for the project. Plot the analytical data for the hydrothermally mobile metals and the scores of the alteration indices identified in this study on geological plans, and where appropriate on sections, and then re-examine the lithogeochemical data. If it becomes apparent that most of the samples used in this study were collected within the alteration halo (or manto) overlying the Silvertip mineralization, then collect additional samples from less altered and unaltered Earn Group rocks just above the unconformity. Analyze these samples in the same manner as the previous batch, and incorporate these into the database used for this study. Then repeat the modelling process outlined in this report.

Secondly, as the 32-element ICP analyses can provide meaningful geochemical and geological information relatively inexpensively, extend the lithogeochemical sampling coverage to areas of the Silvertip property not yet sampled. Also, consider repeating the sampling campaign already undertaken at a greater distance above the McDame - Earn unconformity, say 50 m - 100 m.

Statement of Qualifications

I, Hans Eberhard Madeisky, President of HEMAC Exploration Ltd., do hereby certify that:

1. I am a Consulting Geologist, and my address is P.O. Box 4850, Station Terminal, Vancouver, B.C., V6B 4A4, Canada.
2. I am a graduate of the University of Ottawa, 1980, with a degree of Bachelor of Science in Geology; the Royal School of Mines, Imperial College, University of London, U.K., 1990, with a degree of Master of Science in Mineral Exploration and a Diploma of Imperial College; and the University of London, 1996, with degree of Doctor of Philosophy in Geology.
3. I have been a practising geologist since 1967. I have been a Registered Member in good standing of the British Columbia Association of Professional Engineers and Geoscientists since 1992. I am a Fellow of the Geological Association of Canada and the Association of Exploration Geochemists, and a Member of the Society of Economic Geologists.
4. This report is based on a field visit I made to the property in September 1997, and material and data which were made available to me Imperial Metals Corporation.
5. I neither have nor beneficially own any direct or indirect interest, nor do I expect to receive any direct or indirect interest, in the properties or securities of Imperial Metals Corporation or any affiliate.
6. I consent to the use of this report in any manner which Imperial Metals Corporation deems appropriate, including but not limited to an Assessment Report.

Signed at Vancouver, British Columbia, this 13th day of February, 1998.

PROFESSIONAL PROVINCE OF H. E. MADEISKY BRITISH COLUMBIA GEOSCIENTIST

Hans E. Madeisky, PhD DIC PGeo

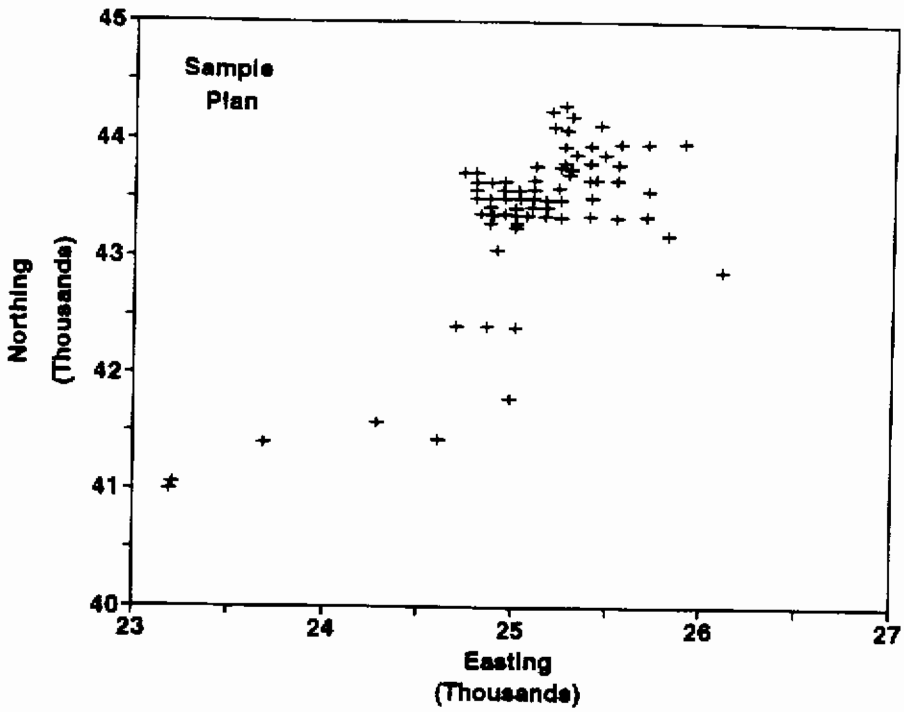


Figure 1.1 - Sample Location Map

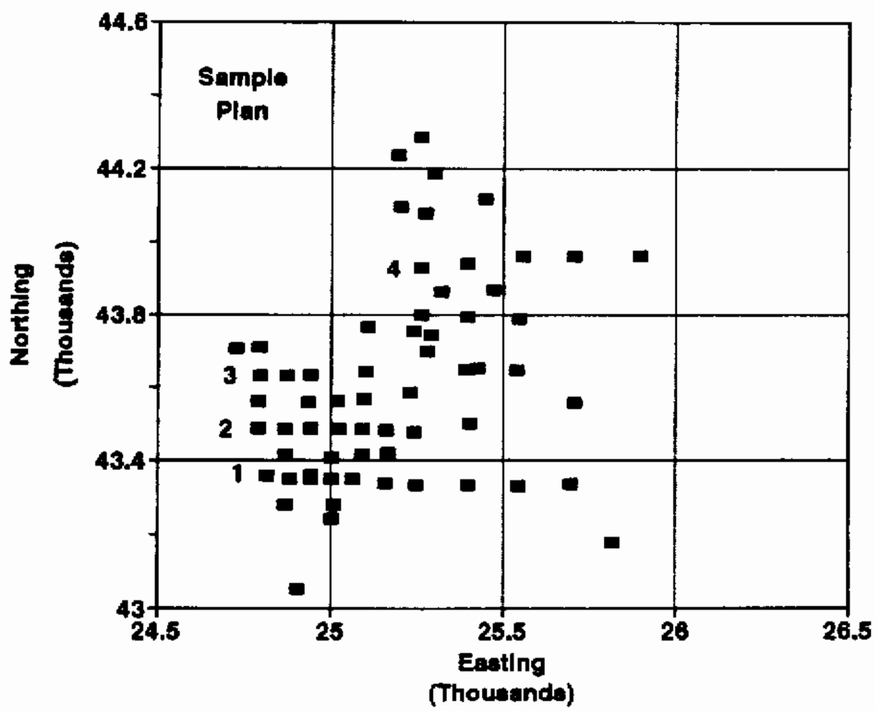


Figure 1.2 - Sample Locations (Detail of Silvertip mine area)

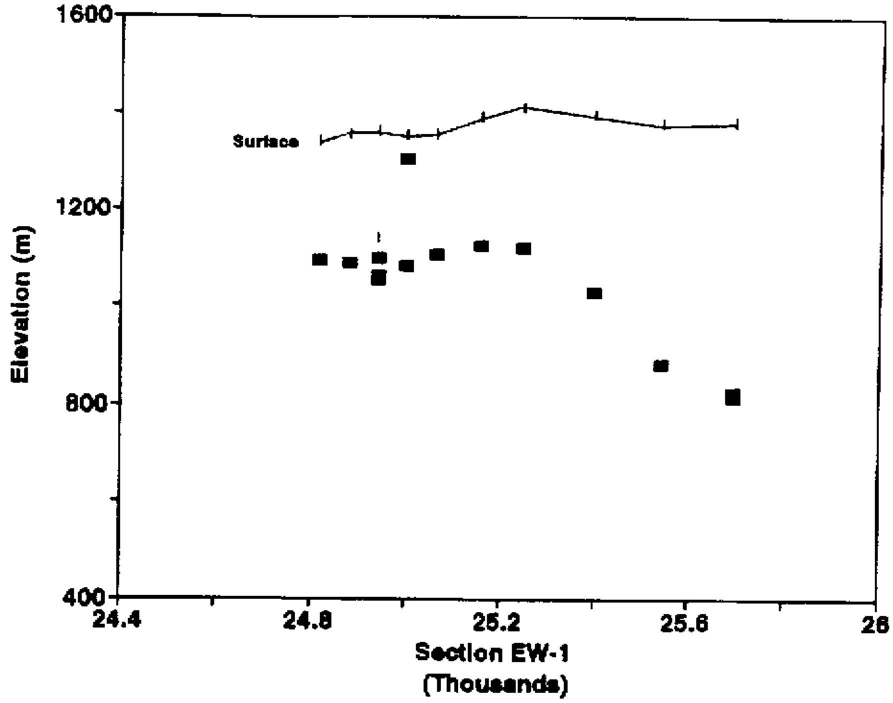


Figure 2.1 - Section EW-1, Sample Locations

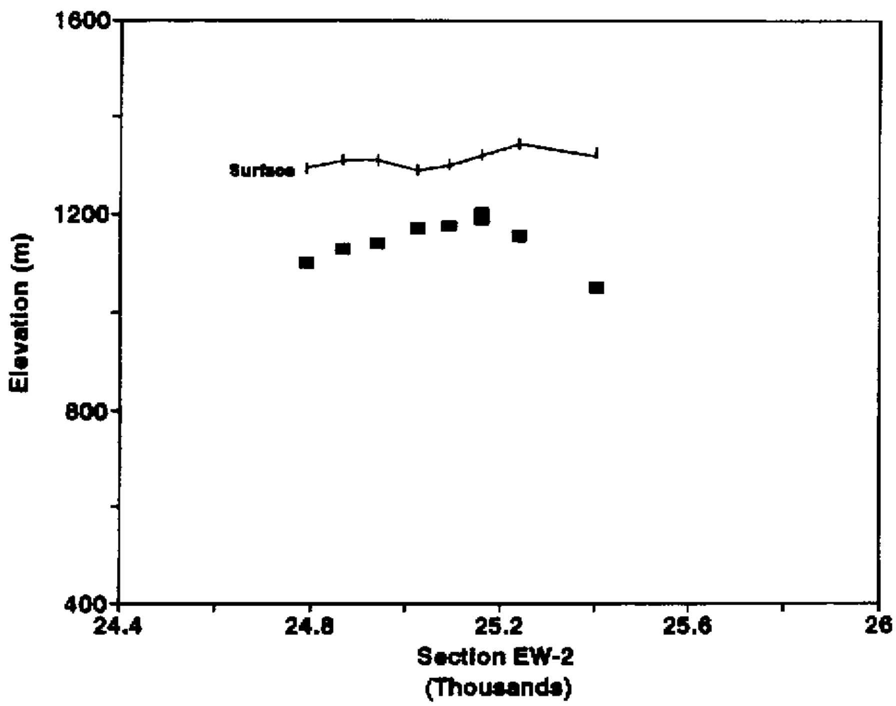


Figure 2.2 - Section EW-2, Sample Locations

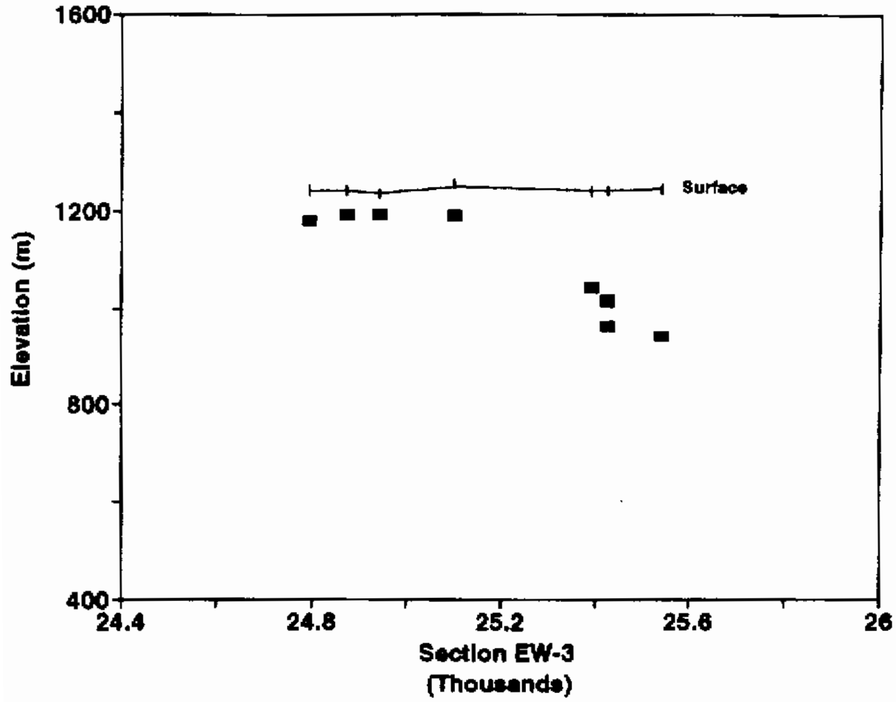


Figure 2.3 - Section EW-3, Sample Locations

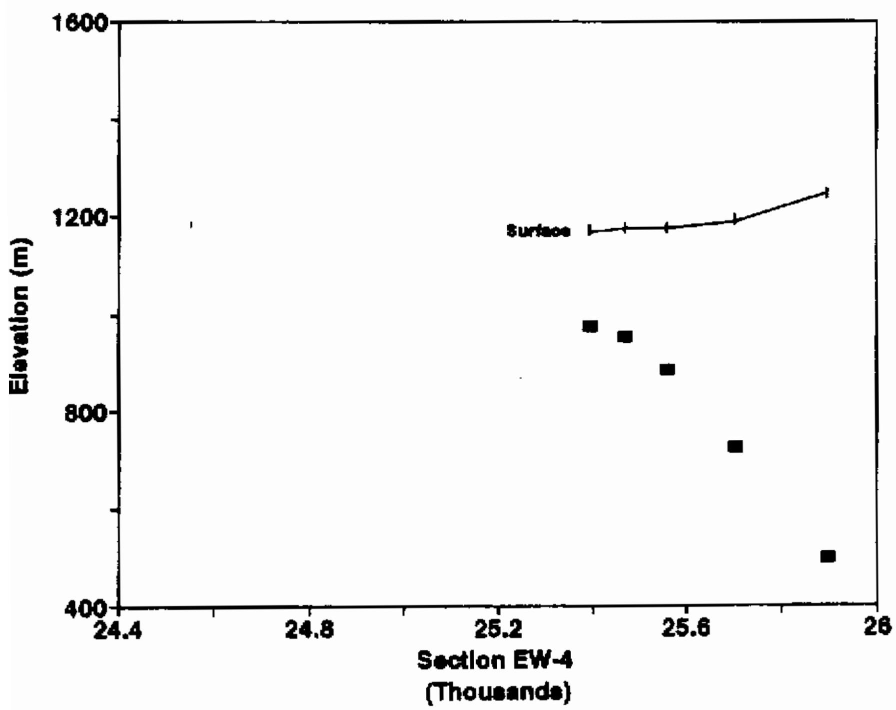


Figure 2.4 - Section EW-4, Sample Locations

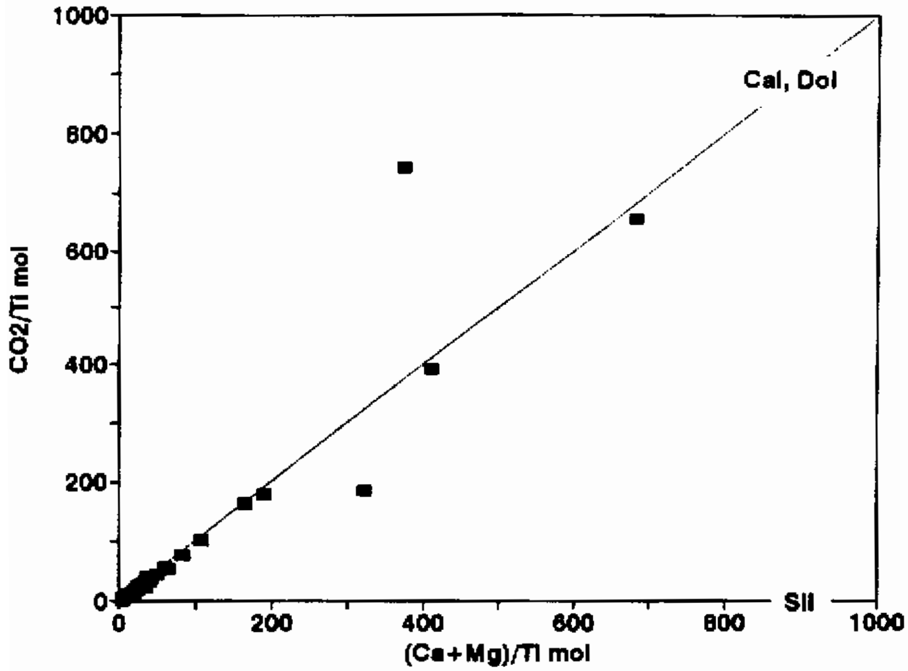


Figure 3.1 - Carbonate Model

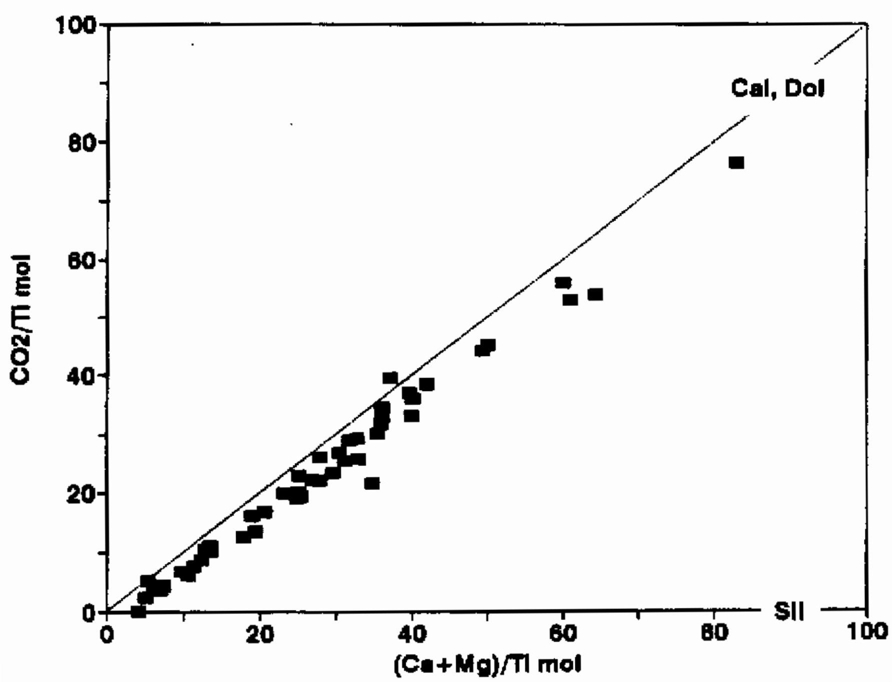


Figure 3.2 - Carbonate Model (detail)

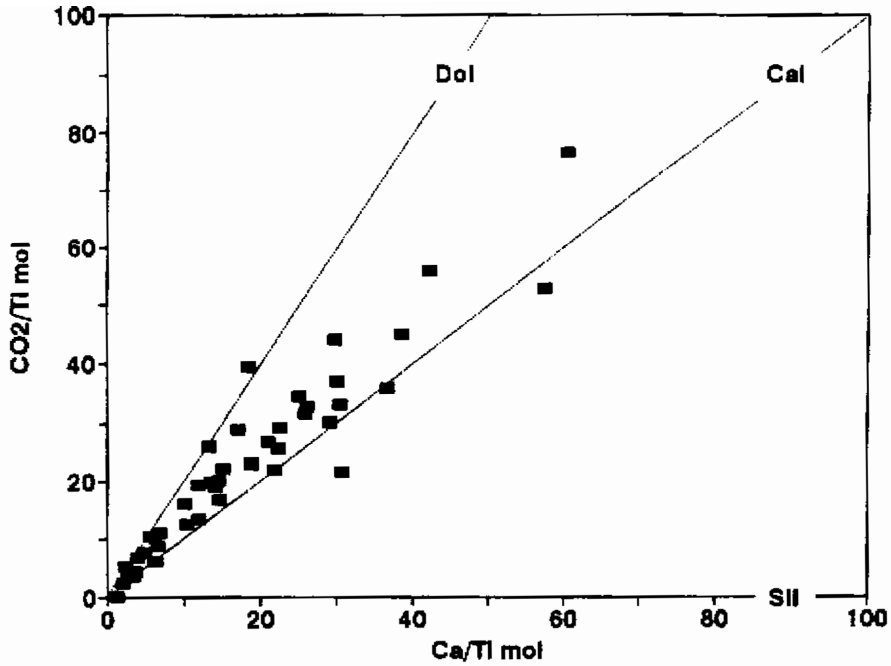


Figure 4.1 - Carbonate Model

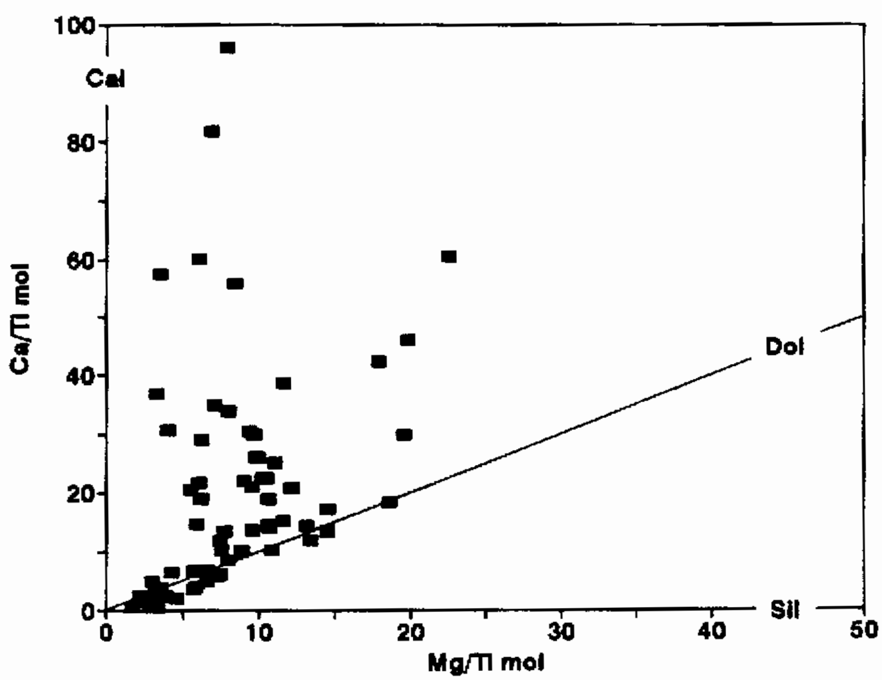


Figure 4.2 - Carbonate Model

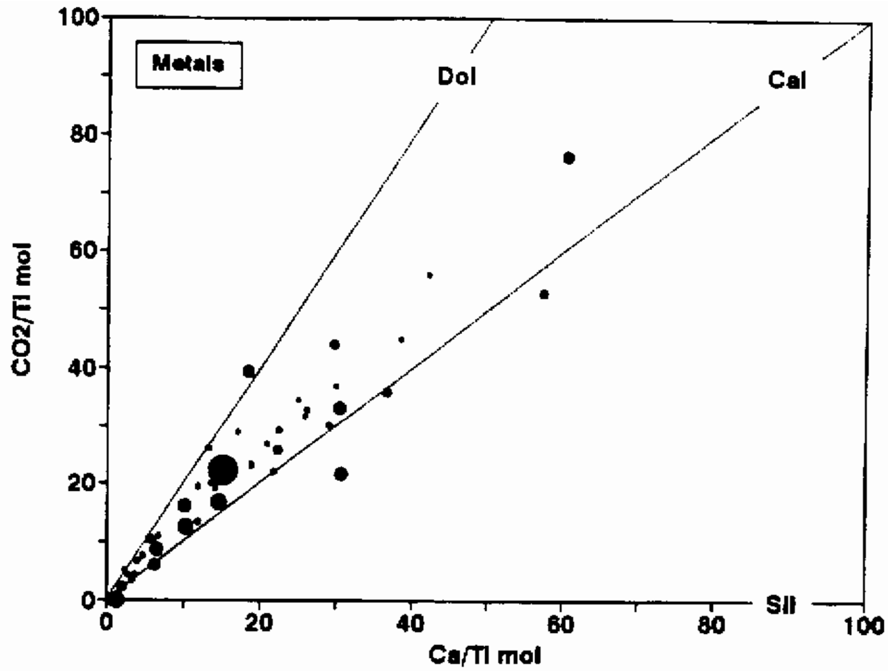


Figure 4.3 - Metals on Carbonate Model

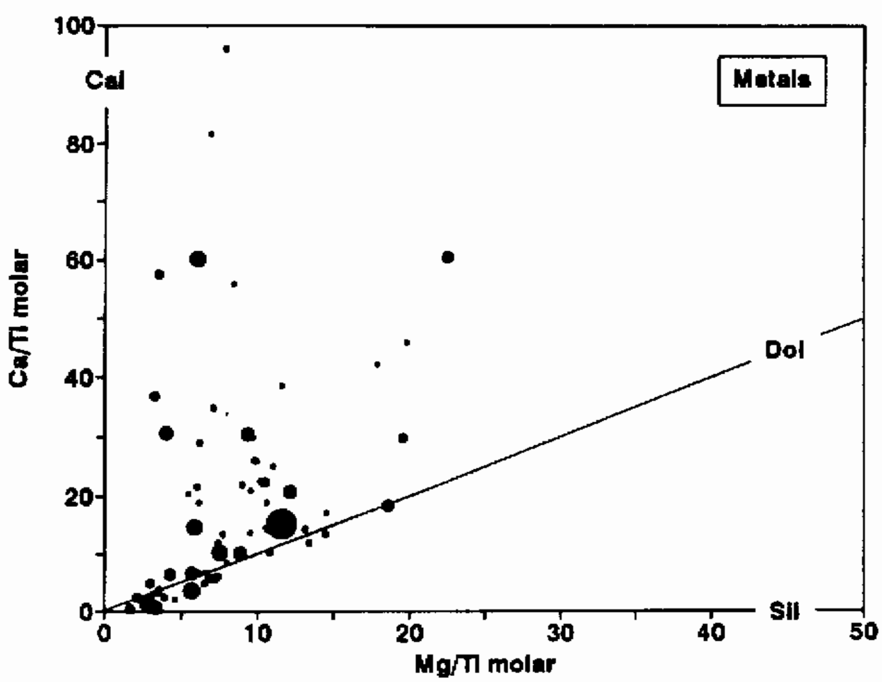


Figure 4.4 - Metals on Carbonate Model

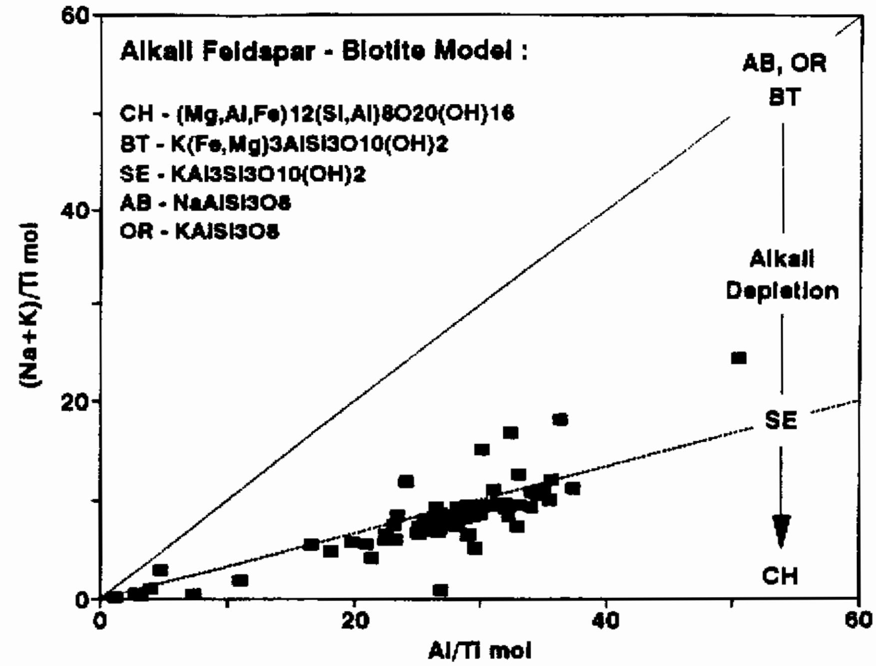


Figure 5.1 - Alkali Feldspar - Biotite Model

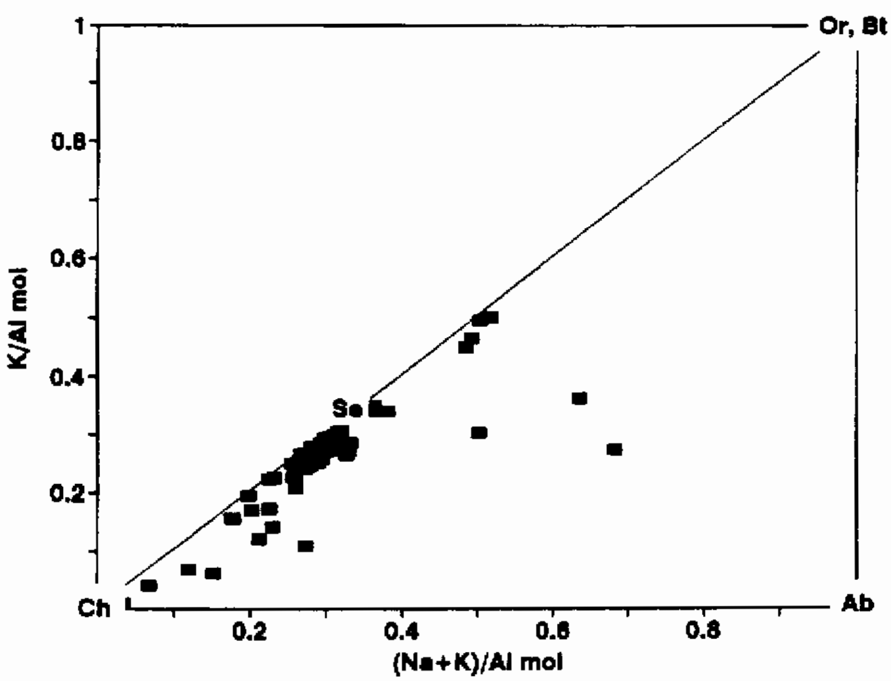


Figure 5.2 - Ternary Diagram

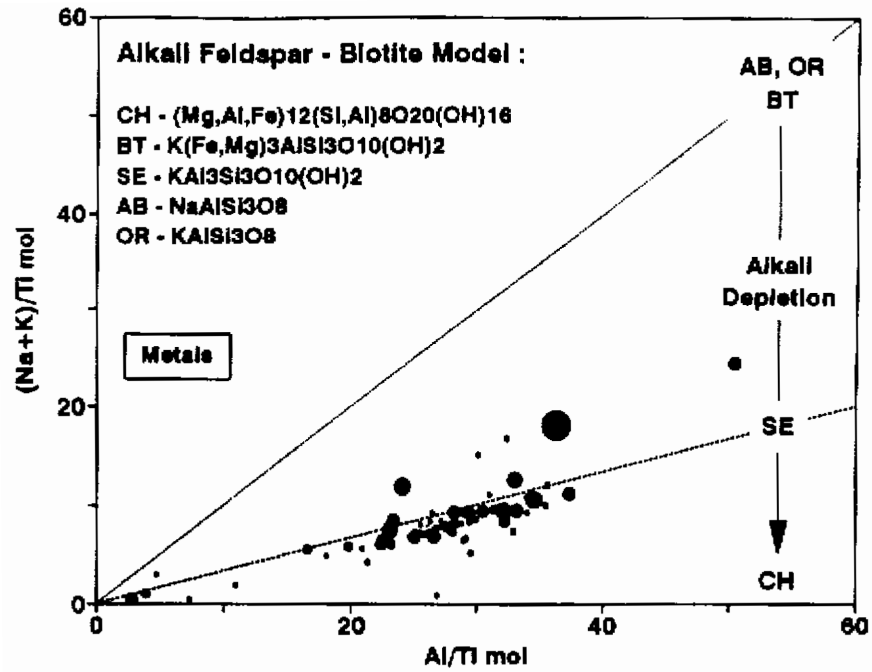


Figure 5.3 - Metals on Alkali Feldspar - Biotite Model

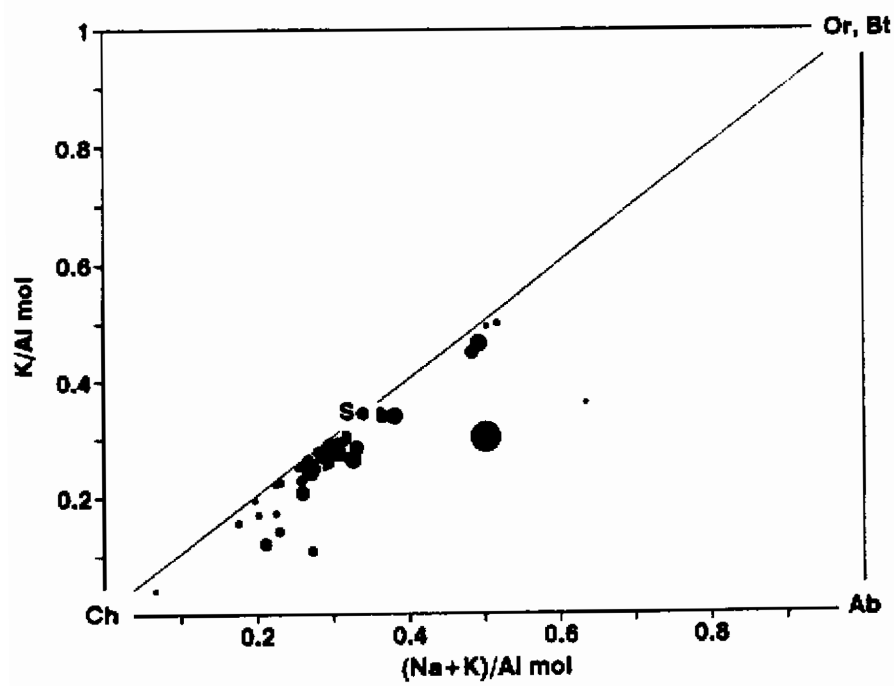


Figure 5.4 - Metals on Ternary Diagram

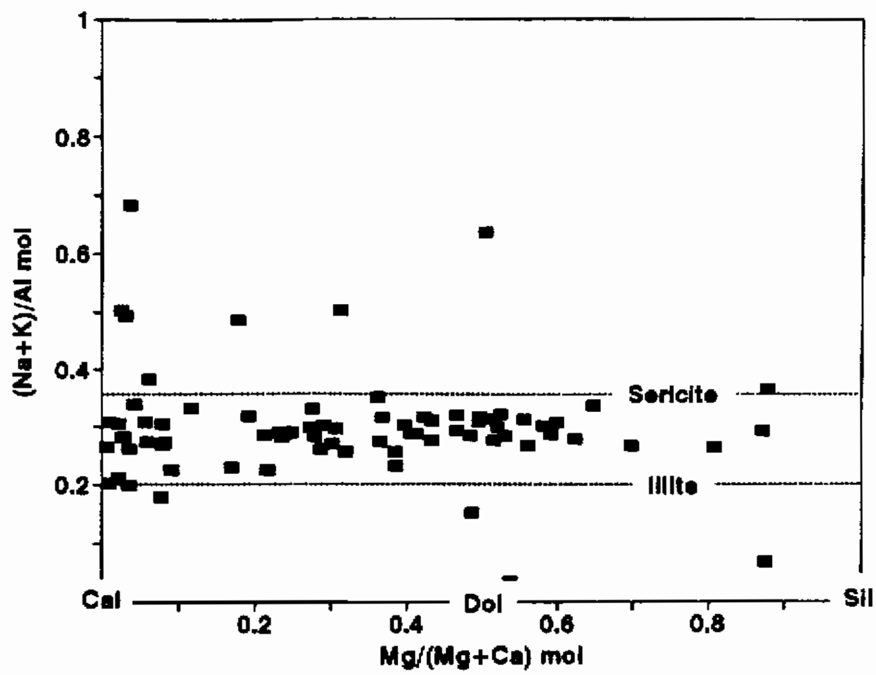


Figure 6.1 - Alteration Facies Diagram

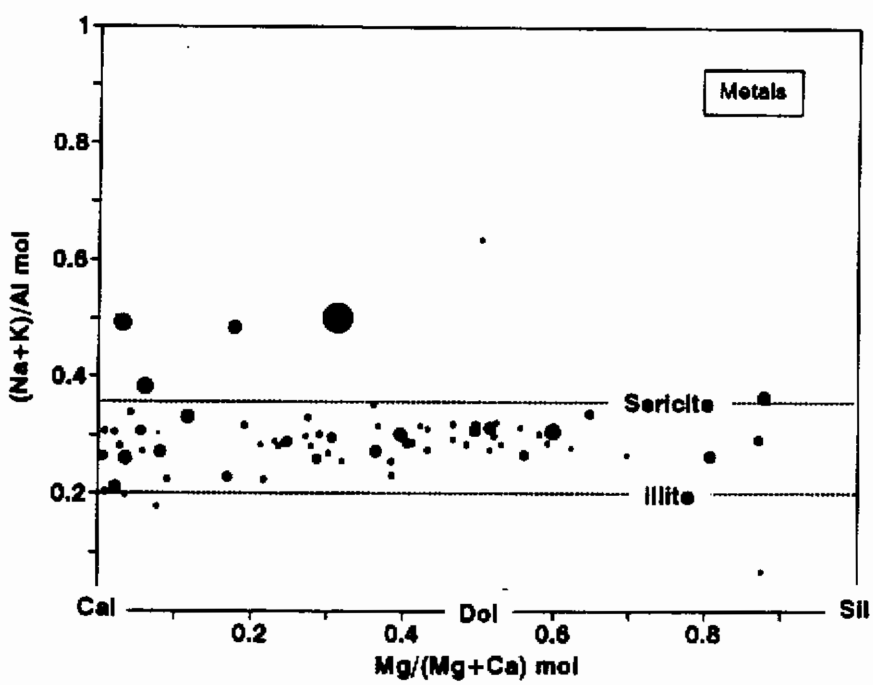


Figure 6.2 - Metals on Alteration Facies Diagram

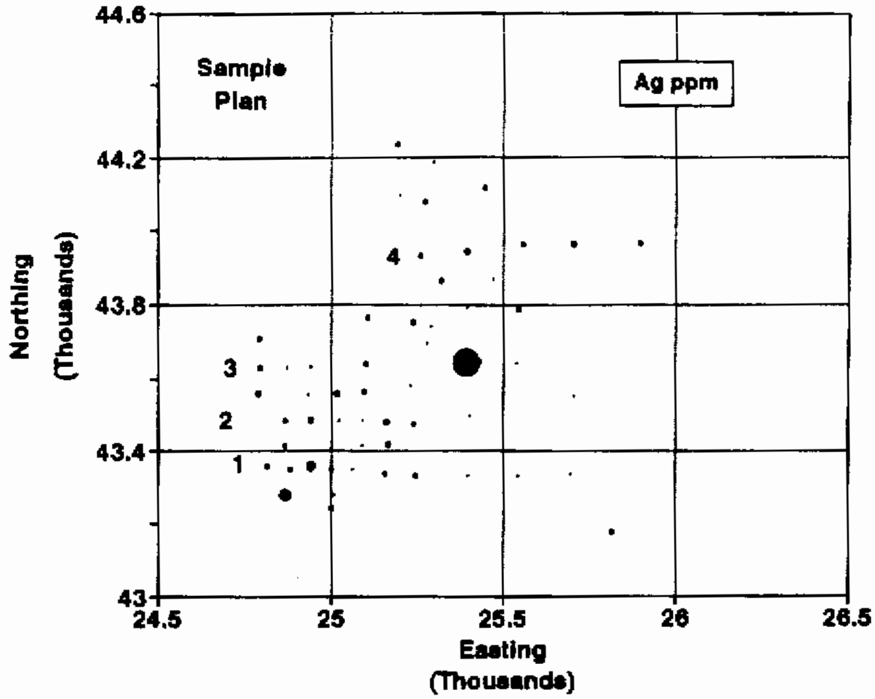


Figure 7.1

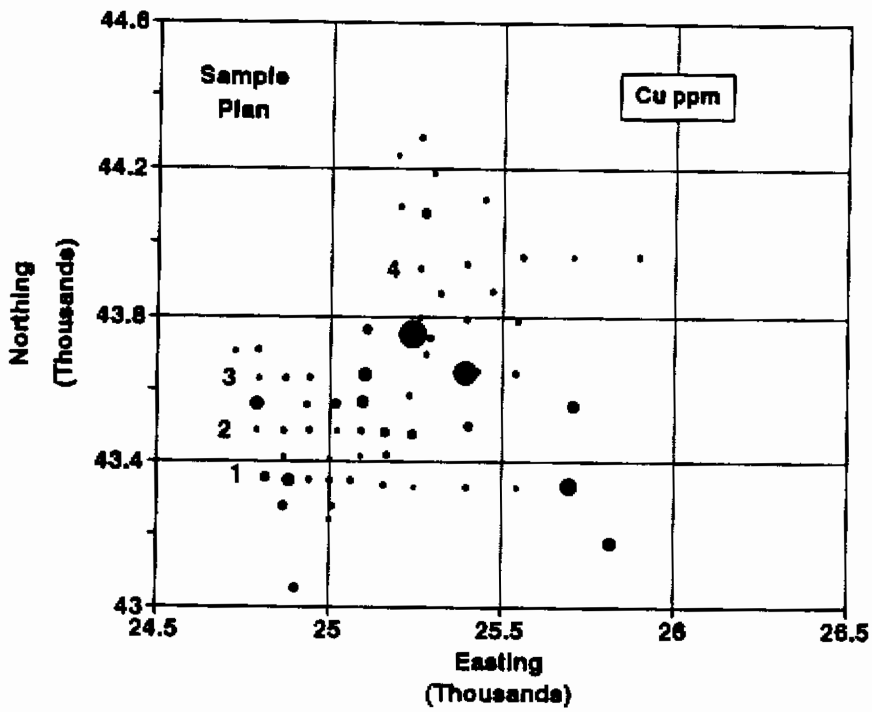


Figure 7.2

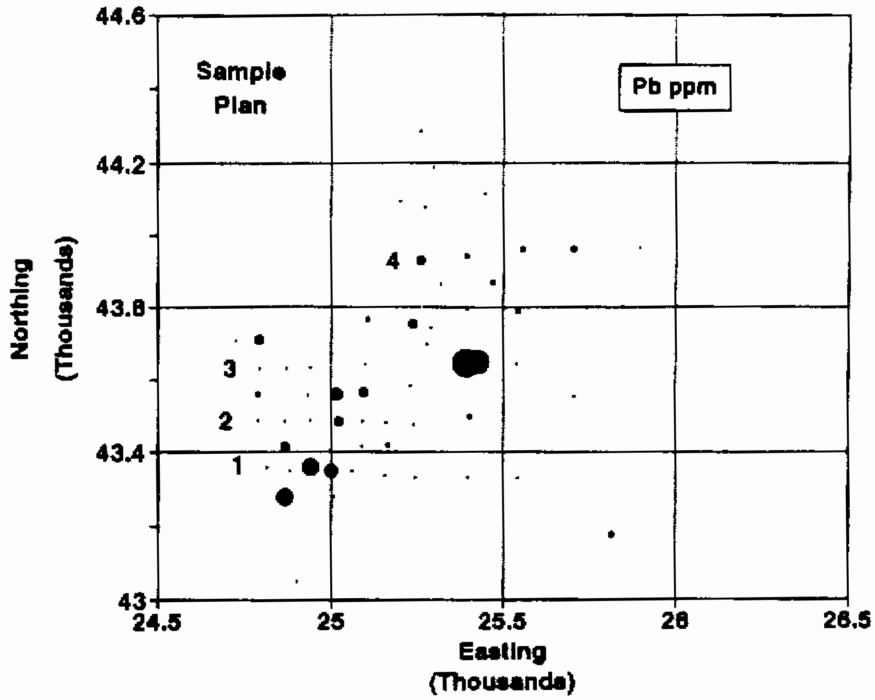


Figure 7.3

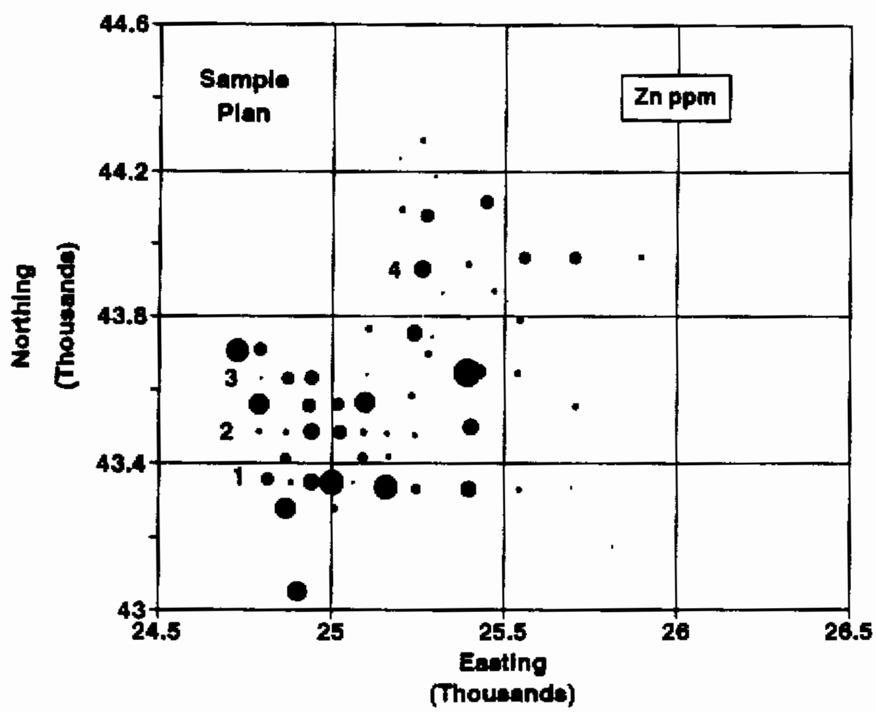


Figure 7.4

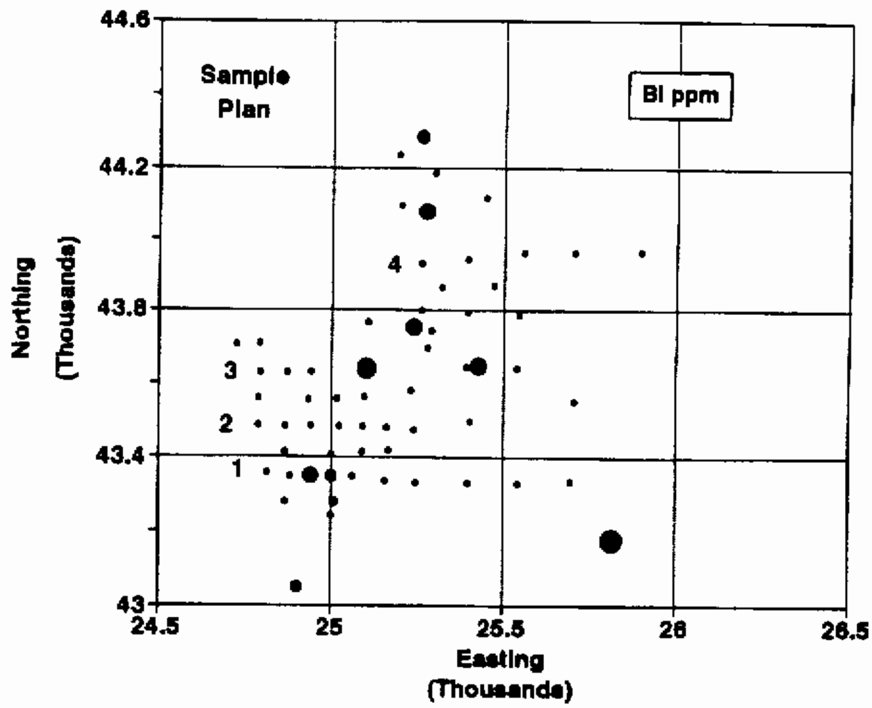
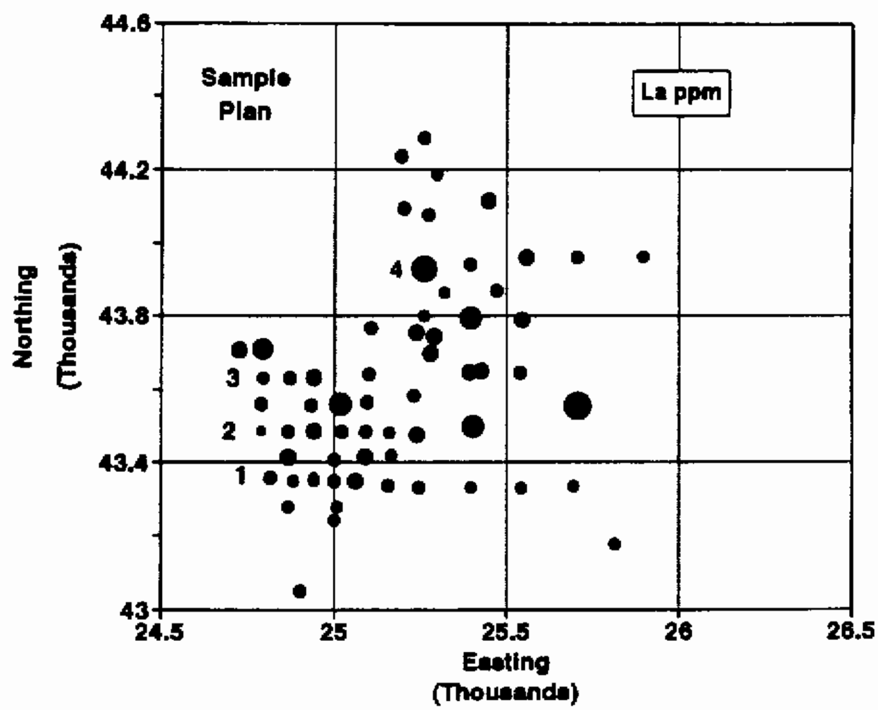


Figure 7.5



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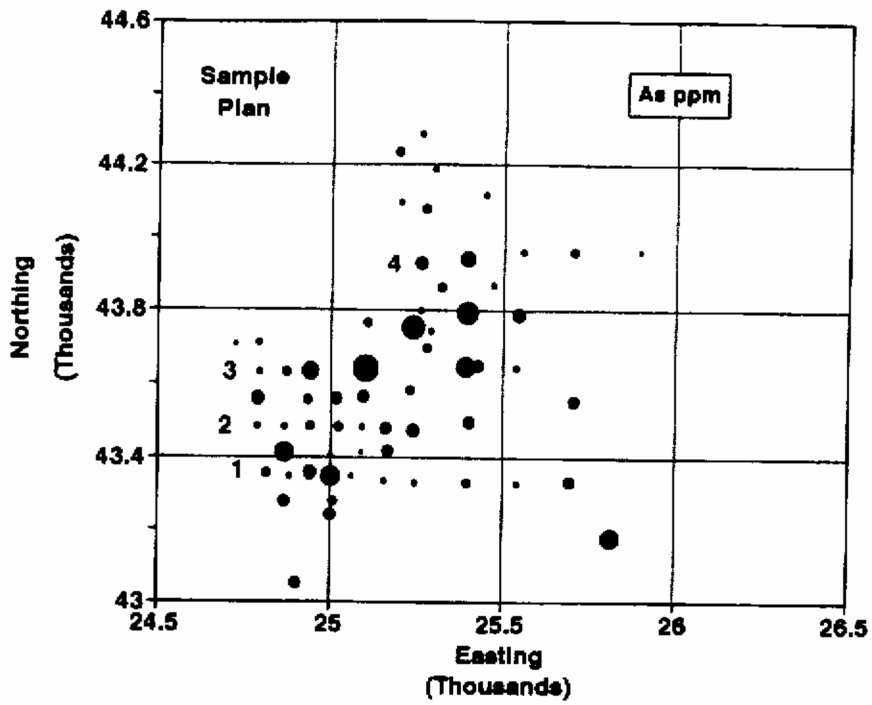


Figure 7.7

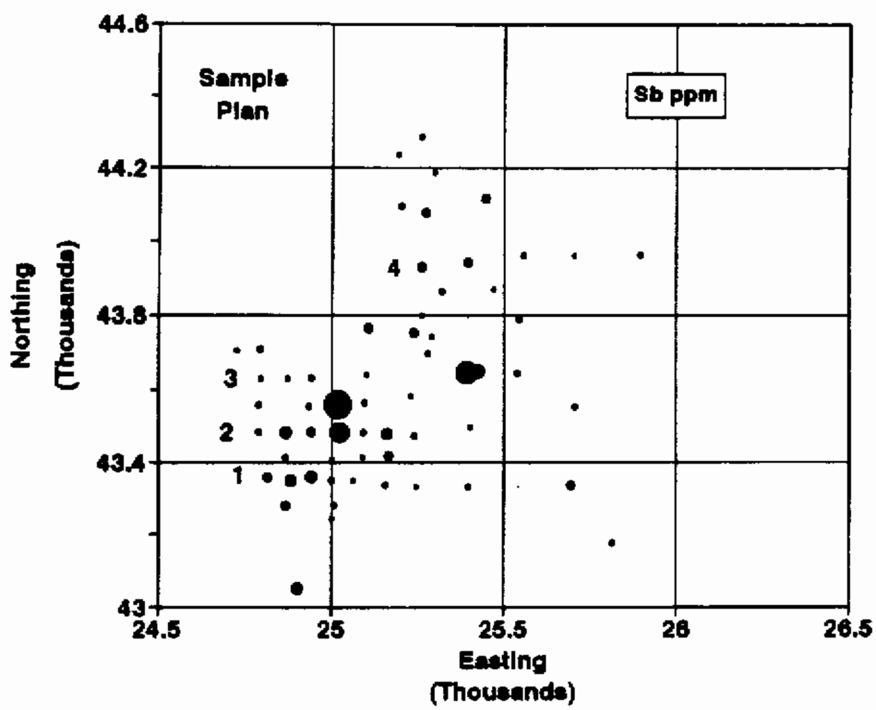


Figure 7.8

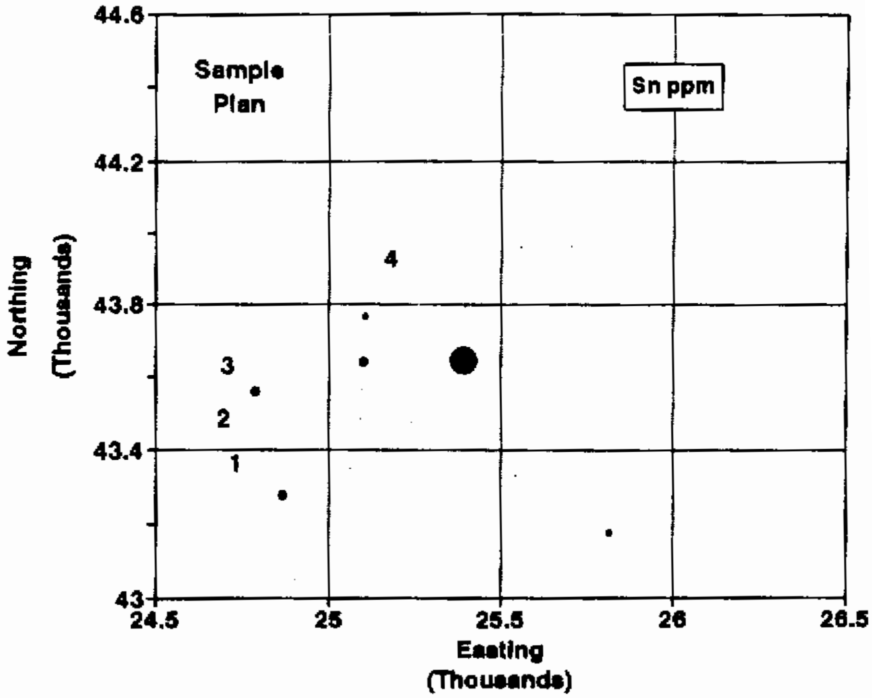


Figure 7.9

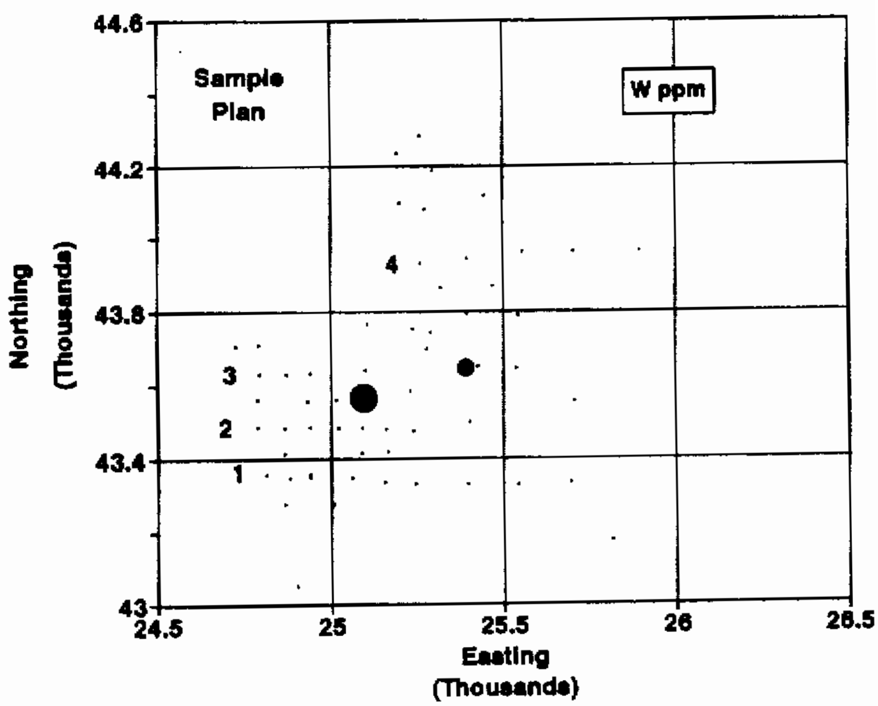


Figure 7.10

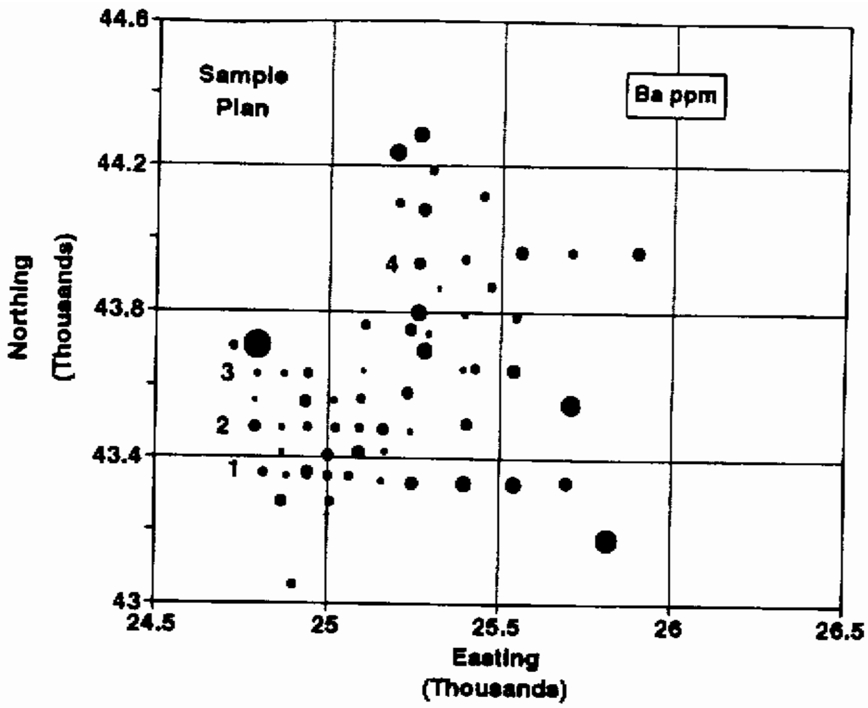


Figure 7.11

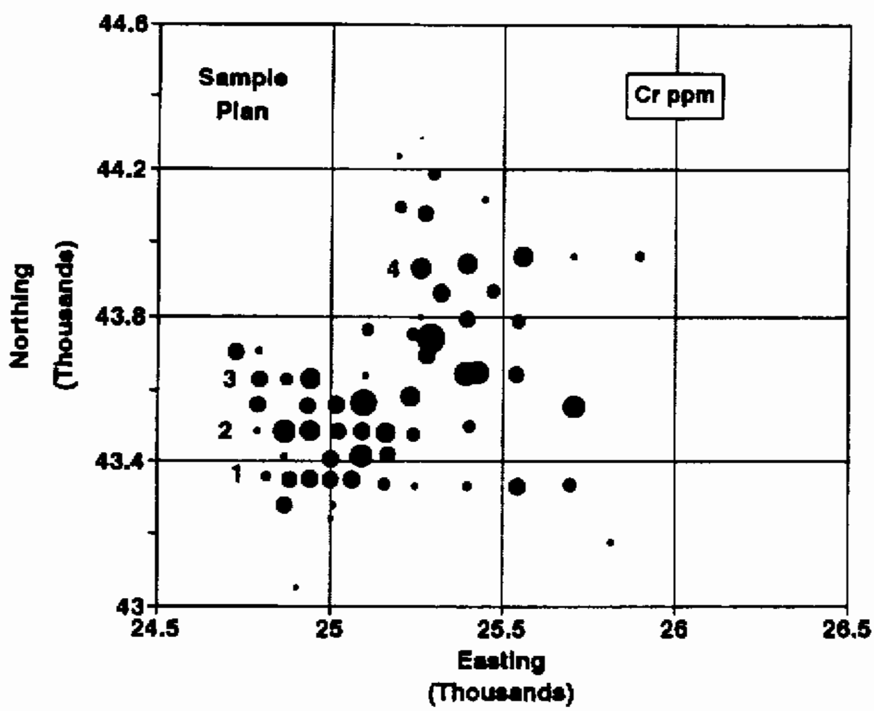


Figure 7.12

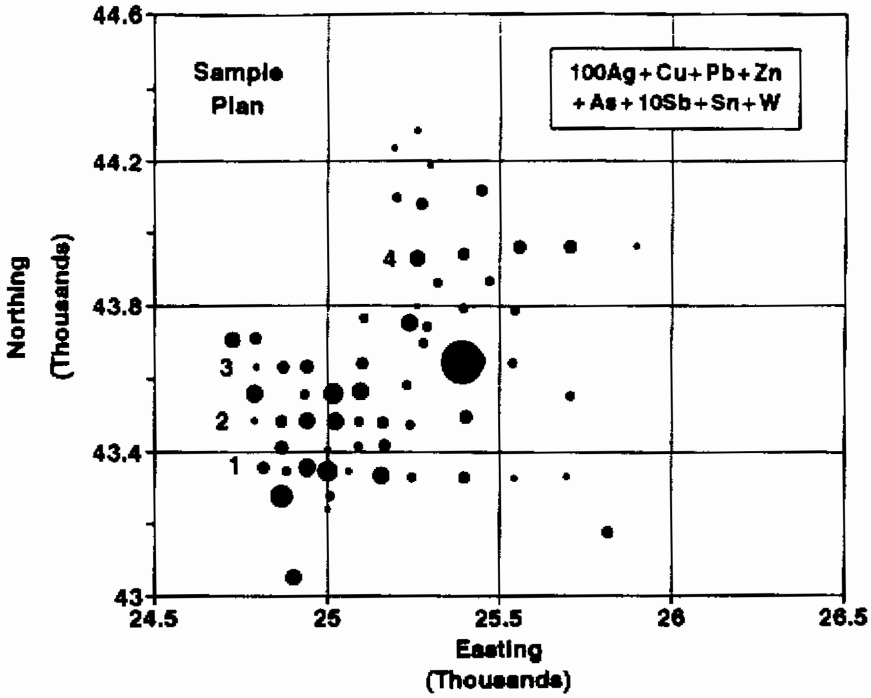


Figure 7.13

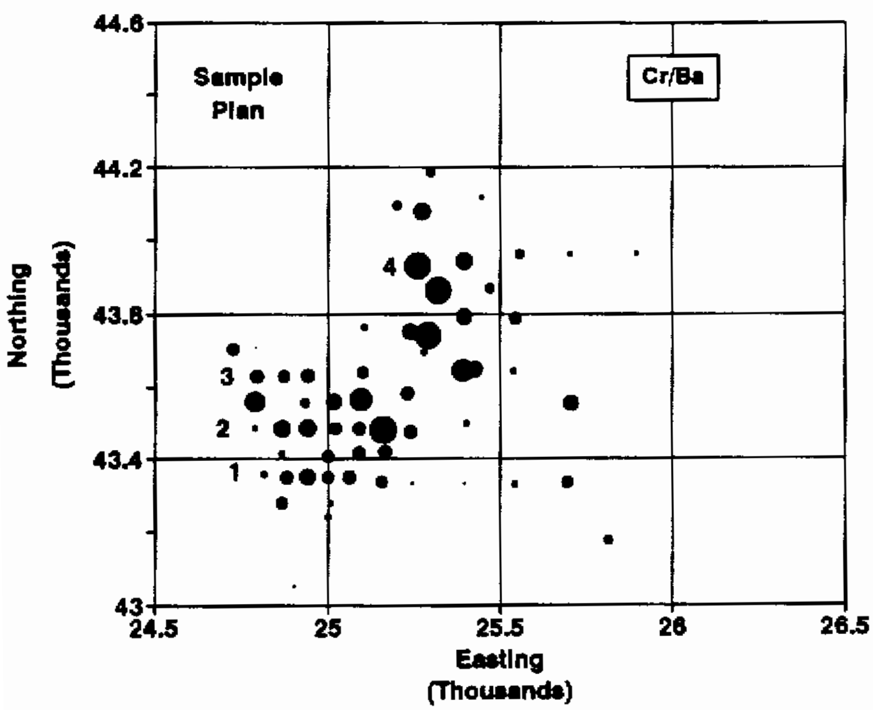


Figure 7.14

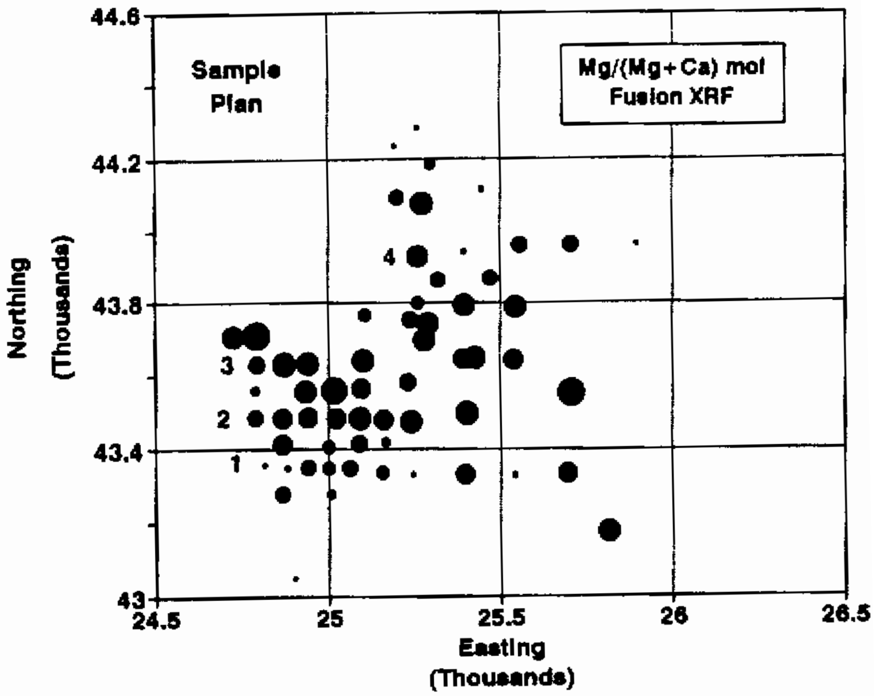


Figure 7.15

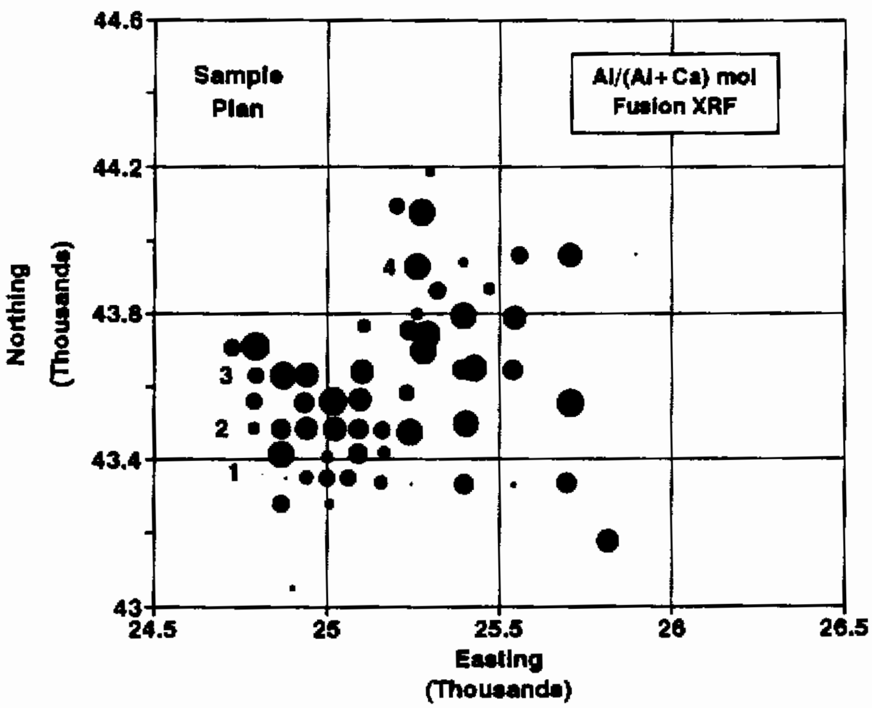


Figure 7.16

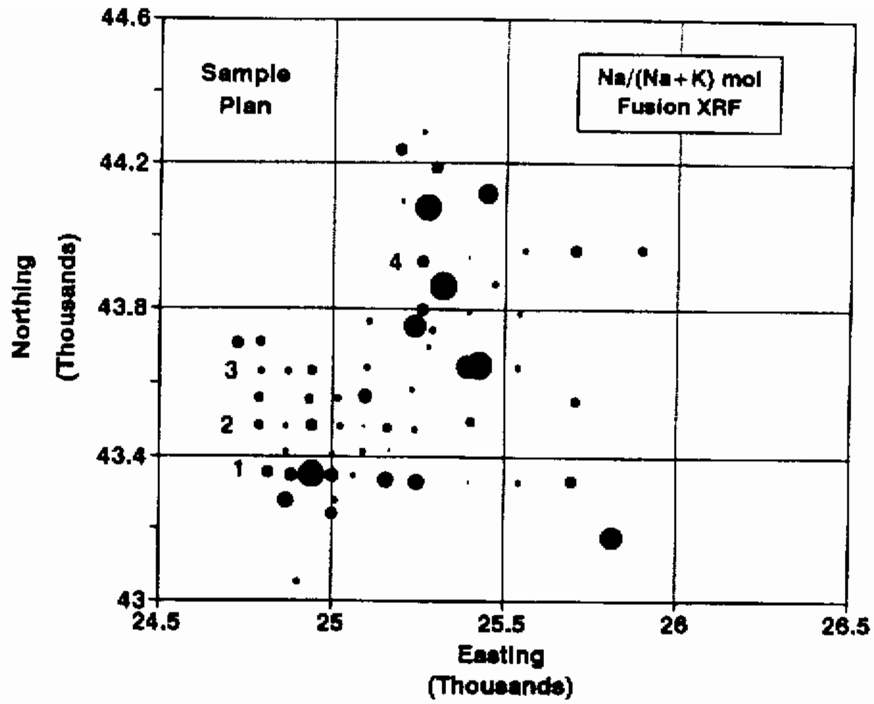


Figure 7.17

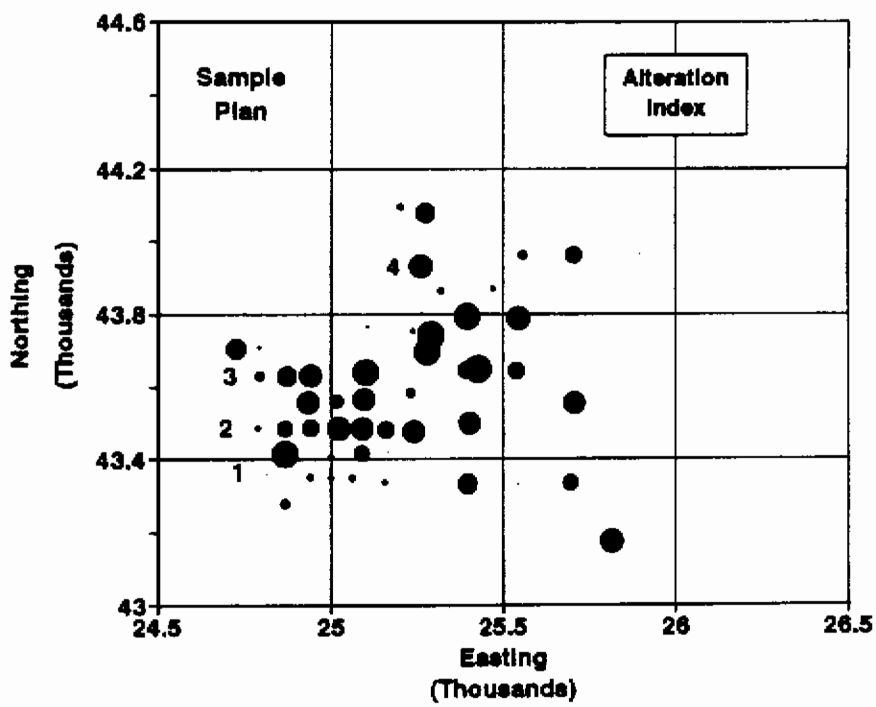
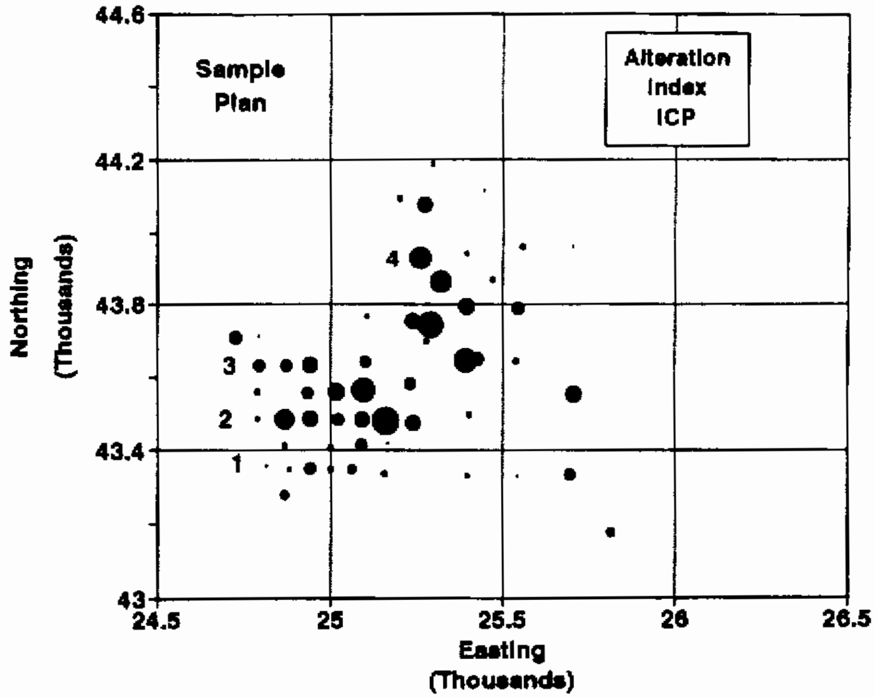


Figure 7.18



Sample
Plan
Alteration
Index
ICP
44.6
44.2
43.8
43.4
43
Northing
(Thousands)
4
3
2
1
24.5
25
25.5
26
26.5
Easting
(Thousands)

Figure 7.19

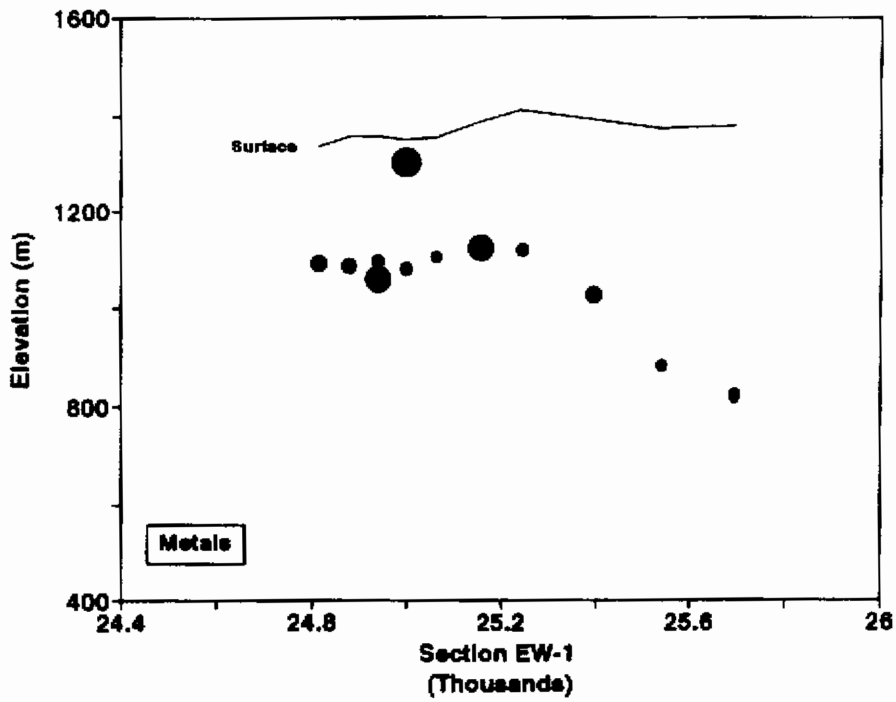


Figure 8.1

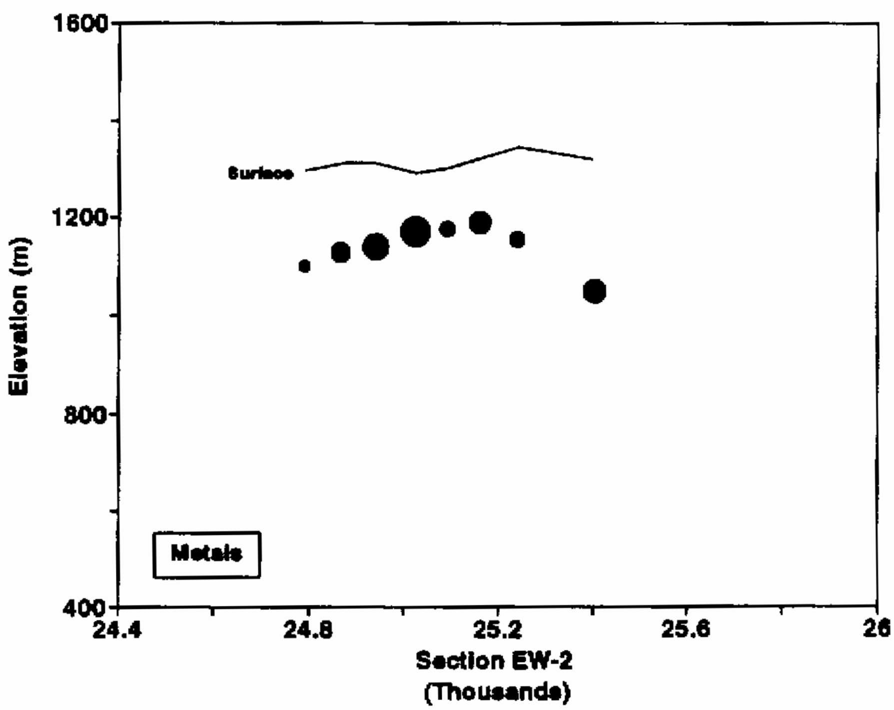


Figure 8.2

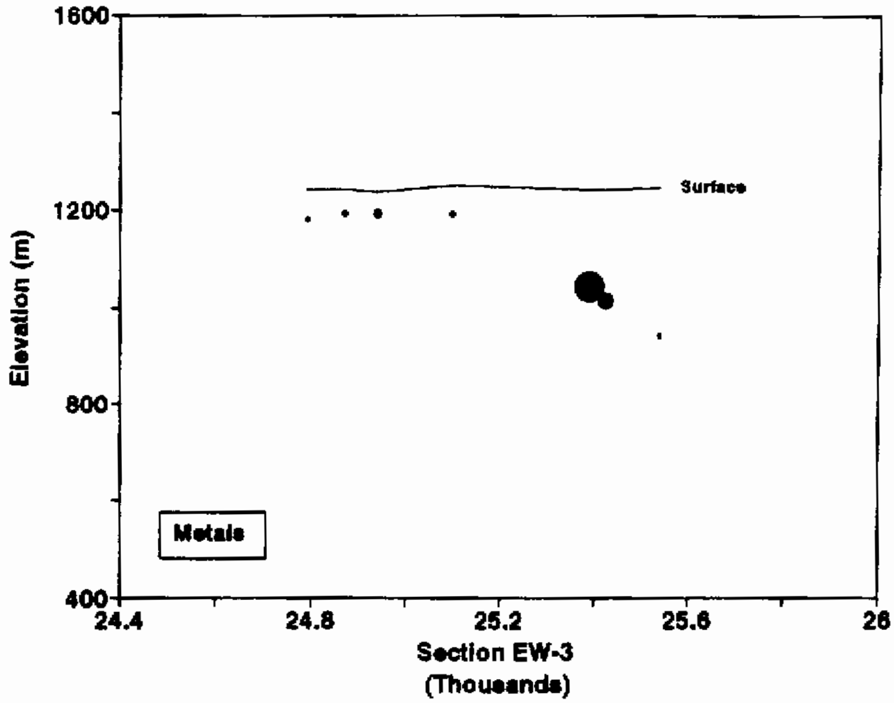


Figure 8.3

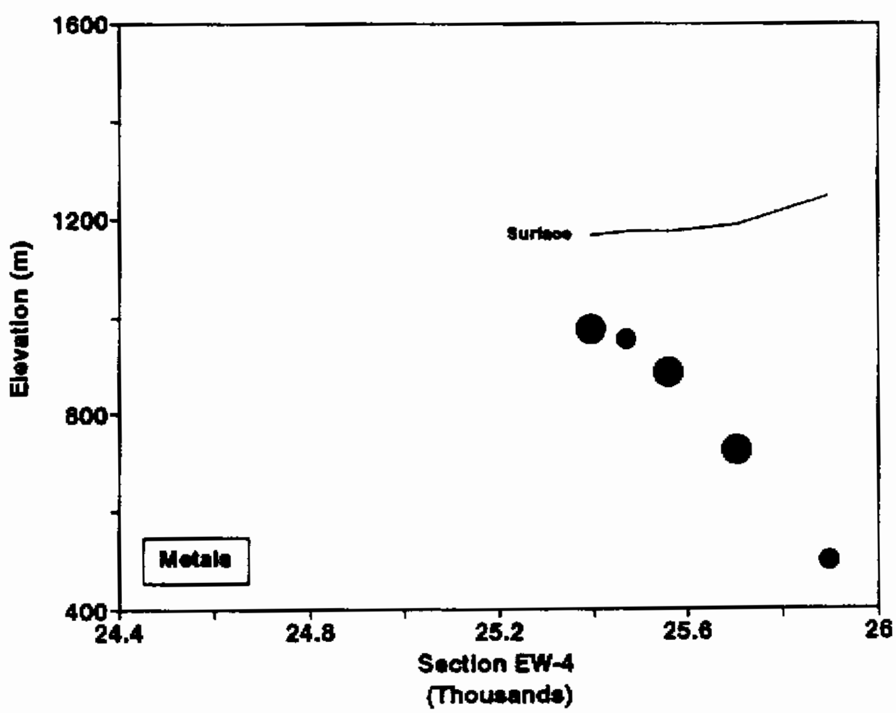


Figure 8.4

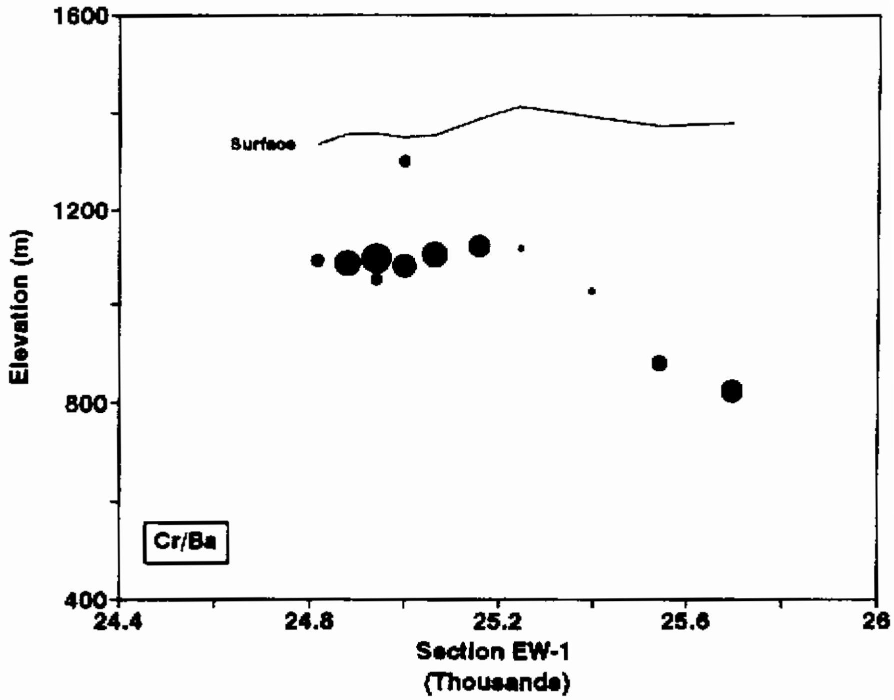


Figure 8.5

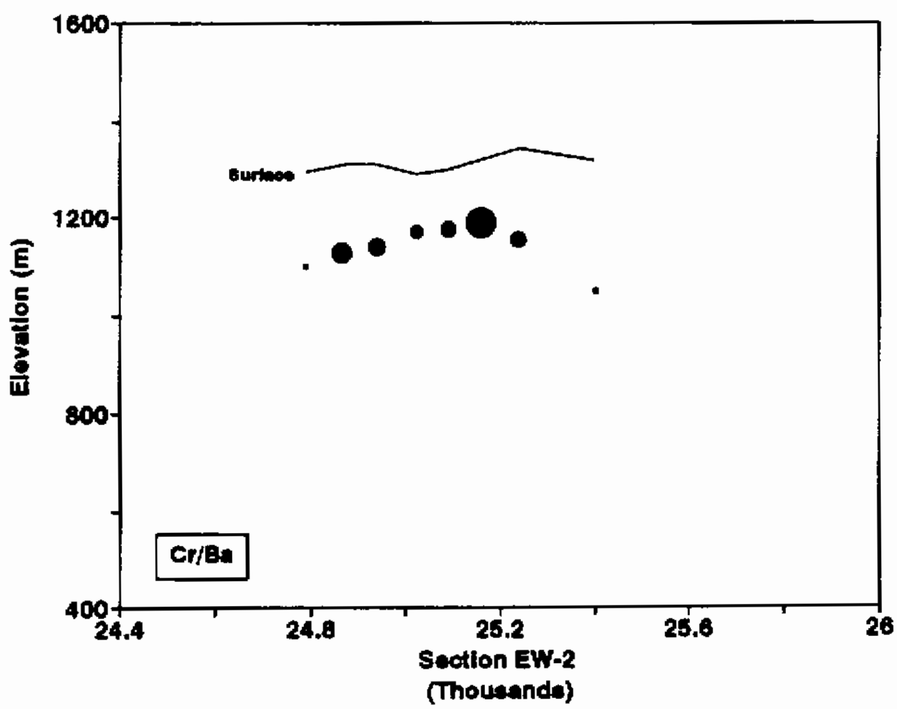


Figure 8.6

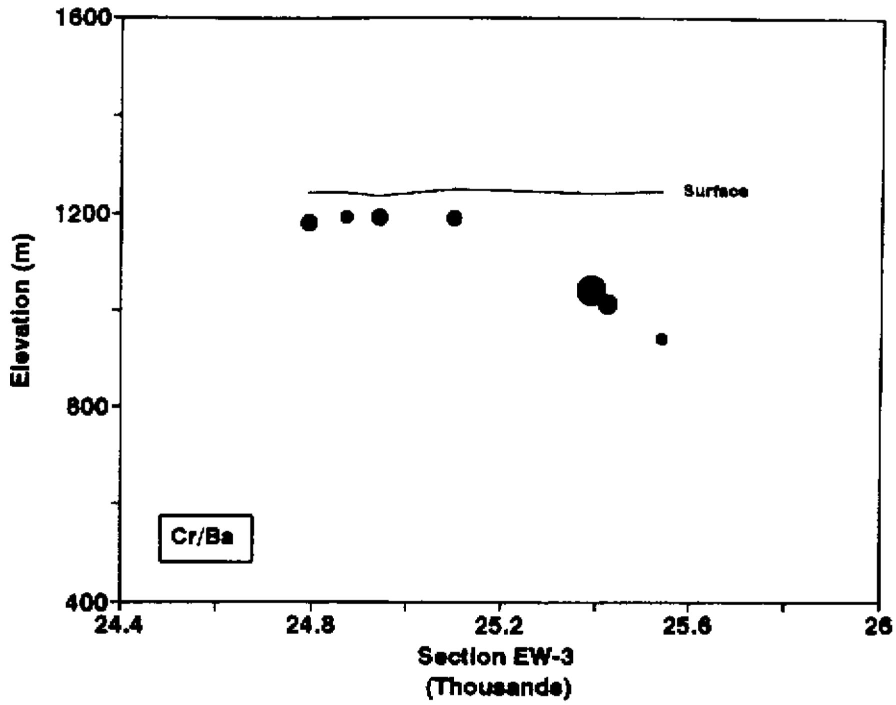


Figure 8.7

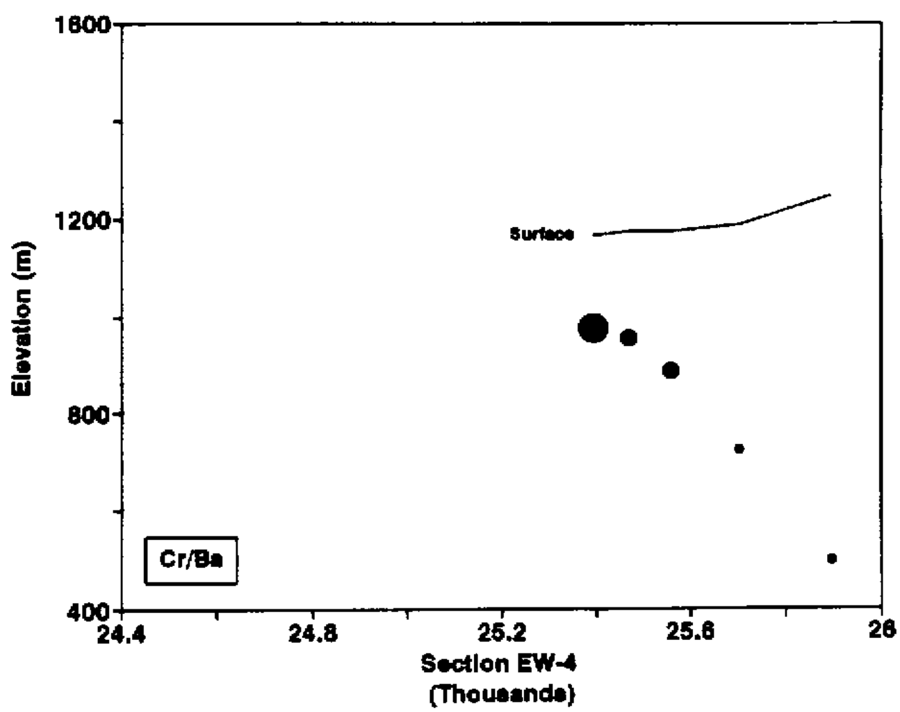


Figure 8.8

ITS Intertek Testing Services
Bondar Clegg

Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP.
REPORT: V97-01348.1 (COMPLETE)

PROJECT: SILVERTIP
DATE RECEIVED: 10-JUN-97 DATE PRINTED: 25-JUN-97

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	Total PCT	Cr2O3 PCT	Ba PPM	Sr PPM	Y PPM	Nb PPM	Zr PPM	Rb PPM
6414		70.56	0.58	7.76	5.55	0.08	2.35	3.48	0.08	1.79	0.21	6.67	99.25	0.02	796	74	25	22	197	88
6420		82.66	0.32	4.58	1.61	0.02	0.48	1.07	0.08	1.11	0.08	5.35	97.90	0.01	5051	54	17	22	45	65
6426		71.76	0.17	5.48	7.86	0.26	1.04	2.48	0.12	2.27	0.11	4.68	97.11	0.02	8290	72	27	7	47	158
6430		69.39	0.16	3.01	1.80	0.05	0.75	12.12	0.04	0.43	0.06	9.55	97.42	<0.01	207	213	16	17	34	69
6431		0.55	0.01	0.03	3.55	0.03	0.39	52.91	<.01	0.01	0.01	39.79	97.31	<0.01	45	206	<5	<5	<5	<5
6433		73.19	0.27	4.50	1.39	0.03	1.09	6.41	0.09	1.12	0.08	8.76	97.21	<0.01	2565	90	20	22	44	61
6436		73.83	0.58	10.06	4.07	0.02	0.93	1.22	0.10	2.74	0.14	4.68	98.64	0.02	2067	46	24	26	247	125
6444		82.75	0.23	3.85	1.60	0.01	0.64	3.29	0.07	0.89	0.08	4.63	98.22	0.01	1504	32	15	25	43	75
6445		76.86	0.32	5.91	2.79	0.04	2.12	3.22	0.01	1.21	0.10	5.96	98.75	0.01	1756	46	13	23	54	73
6449		39.79	0.27	5.54	3.14	0.03	0.79	24.75	0.04	1.29	0.27	20.70	97.60	<0.01	9555	207	15	<5	49	47
6450		73.46	0.35	7.96	3.66	0.09	1.91	2.50	0.07	2.38	0.08	5.23	97.91	0.01	1652	50	22	25	60	206
6451		78.70	0.34	5.07	9.66	0.01	0.58	0.13	0.08	1.58	0.15	2.93	99.48	0.02	2014	14	9	18	62	197
6455		67.31	0.47	9.71	6.72	0.04	1.46	2.16	0.11	4.47	0.21	5.39	98.54	0.02	4265	63	30	16	89	256
6458		14.48	0.17	2.15	1.30	0.03	0.98	42.46	0.05	0.51	0.17	34.67	97.05	<0.01	514	226	7	<5	21	17
6462		66.80	0.75	14.84	4.51	0.04	1.75	1.05	0.14	4.72	0.21	4.90	99.96	0.02	1693	40	38	28	219	274
6463		57.78	0.99	15.21	5.52	0.03	2.84	2.44	0.27	6.51	0.37	5.83	98.32	0.03	4105	101	28	23	315	411
6466		86.75	0.56	5.92	1.65	0.01	0.48	0.16	<.01	1.83	0.23	1.57	99.32	0.03	780	22	29	32	240	150
6467		88.21	0.33	5.94	0.29	<.01	0.57	0.11	0.08	1.36	0.02	1.16	98.80	0.01	6930	14	20	37	78	84
6485		64.03	0.28	5.34	2.23	0.04	2.80	9.02	0.06	1.33	0.10	11.78	97.33	0.01	2833	128	20	22	58	65
6493		88.28	0.27	4.83	1.53	0.01	0.40	0.08	0.06	1.09	0.04	1.35	98.55	<0.01	5888	<5	20	32	49	68
6497		68.74	0.60	9.86	7.15	0.02	1.20	1.01	0.09	3.17	0.27	6.75	99.24	0.02	3173	37	24	24	172	105
6499		56.76	0.23	4.38	1.87	0.06	0.91	15.50	0.09	1.08	0.17	15.74	97.14	<0.01	3216	148	17	10	51	55
6500		70.54	0.57	11.44	5.45	0.02	0.63	0.98	0.11	3.07	0.14	5.97	99.21	0.02	2192	65	24	25	223	143
6502		18.50	0.16	0.40	0.77	0.07	0.86	42.35	0.04	0.04	0.01	33.84	97.05	<0.01	48	81	<5	<5	7	<5
6506		85.29	0.27	4.30	4.51	0.01	0.37	0.28	0.06	0.99	0.11	2.04	98.65	0.02	3741	146	14	20	65	62
6507		53.72	0.28	6.08	3.24	0.03	0.98	16.04	0.06	1.45	0.21	15.23	97.85	0.01	4817	257	18	13	64	59
6516		59.22	0.32	6.73	4.70	0.22	0.97	13.48	0.18	2.10	0.28	9.90	98.33	0.01	1790	230	31	13	80	104
6523		71.90	0.42	6.83	2.68	0.01	1.64	3.98	0.07	1.67	0.10	7.76	97.82	0.01	7158	114	20	21	74	78
6524		51.44	0.68	12.78	6.12	<.01	2.34	2.68	0.14	3.16	0.43	16.04	s	0.02	>10000	125	26	12	105	107
6531		25.54	0.13	1.68	1.85	0.05	0.99	35.59	<.01	0.30	0.09	30.65	97.02	<0.01	1285	206	7	<5	17	14

ITS Intertek Testing Services
Bondar Clegg

Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP. PROJECT: SILVERTIP

REPORT: V97-01348.1 (COMPLETE) DATE RECEIVED: 10-JUN-97 DATE PRINTED: 25-JUN-97

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	Total PCT	Cr2O3 PCT	Ba PPM	Sr PPM	Y PPM	Nb PPM	Zr PPM	Rb PPM
6539		67.32	0.87	15.25	4.04	0.01	1.32	0.27	0.08	3.99	0.22	4.88	98.57	0.02	2571	47	33	29	185	177
6554		0.18	0.08	0.16	1.04	0.04	3.06	50.17	<.01	0.01	<.01	42.24	97.12	<0.01	1306	74	<5	<5	<5	<5
6555		0.03	0.12	0.09	0.07	0.01	0.29	55.15	<.01	<.01	<.01	43.36	99.13	<0.01	47	89	<5	<5	<5	<5
6556		<0.01	0.12	0.02	0.03	0.01	0.38	55.42	<.01	<.01	0.01	43.00	99.01	<0.01	62	134	<5	<5	<5	<5

ITS Intertek Testing Services
Bondar Clegg

Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP. PROJECT: SILVERTIP
REPORT: V97-01348.1 (COMPLETE) DATE RECEIVED: 10-JUN-97 DATE PRINTED: 25-JUN-97

STANDARD NAME	ELEMENT UNITS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3* PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	K2O PCT	P2O5 PCT	LOI PCT	Total PCT	Cr2O3 PCT	Ba PPM	Sr PPM	Y PPM	Nb PPM	Zr PPM	Rb PPM
CANMET STREAM-SED		54.20	0.80	15.90	7.24	0.13	3.11	4.16	1.76	2.13	0.32	10.08	89.90	0.02	543	418	36	24	184	105
Number of Analyses		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mean Value		54.20	0.80	15.90	7.24	0.13	3.11	4.16	1.76	2.13	0.32	10.08	89.90	0.02	543	418	36	24	184	105
Standard Deviation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value		53.70	0.79	15.75	7.25	0.14	3.11	4.00	1.72	2.12	0.32	10.30	-	0.01	540	400	37	20	185	104
CANMET SO-2 REF STD		-	-	-	-	-	-	-	-	-	-	14.21	-	-	-	-	-	-	-	-
Number of Analyses		-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Mean Value		-	-	-	-	-	-	-	-	-	-	14.21	-	-	-	-	-	-	-	-
Standard Deviation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value		51.70	1.38	14.75	7.69	0.09	0.87	2.64	2.48	2.85	0.67	14.26	-	0.001	967	340	40	22	760	78

ITS Intertek Testing Services
Bondar Clegg

Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP. PROJECT: SILVERTIP
REPORT: V97-01348.1 (COMPLETE) DATE RECEIVED: 10-JUN-97 DATE PRINTED: 25-JUN-97

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	Total PCT	Cr2O3 PCT	Ba PPM	Sr PPM	Y PPM	Nb PPM	Zr PPM	Rb PPM
6445		76.86	0.32	5.91	2.79	0.04	2.12	3.22	0.01	1.21	0.10	5.96	98.75	0.01	1756	46	13	23	54	73
Duplicate		75.87	0.40	5.38	2.71	0.04	2.03	3.18	0.01	1.16	0.09	6.10		0.01	1734	47	14	20	49	64
6507		53.72	0.28	6.08	3.24	0.03	0.98	16.04	0.06	1.45	0.21	15.23	97.85	0.01	4817	257	18	13	64	59
Duplicate		52.83	0.33	5.91	3.12	0.03	0.94	15.73	0.04	1.46	0.21	16.09		0.01	4639	247	15	7	62	59

Intertek Testing Services
Bondar Clegg

Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP. PROJECT: SILVERTIP
REPORT: V97-01348.2 (COMPLETE) DATE RECEIVED: 26-AUG-97 DATE PRINTED: 29-AUG-97

SAMPLE ELEMENT	Ag	Cu	Pb	Zn	Mo	Ni	Co	Cd	Bi	As	Sb	Fe	Mn	Te	Ba	Cr	V	Sn	W	La	Al	Mg	Ca	Na	K	Sr	Y	Ga	Li	Nb	Sc	Ta	Ti	Zr
NUMBER UNITS	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PCT	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PCT	PCT	PCT	PCT	PCT	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PCT	PPM
6414	<0.2	49	9	56	4	62	11	<0.2	<5	89	11	4.06	644	<10	92	60	54	<20	<20	4	0.98	1.27	2.45	<.01	0.18	56	10	<2	9	3	<5	<10	<.01	5
6420	5.1	23	192	562	24	65	5	3.7	<5	65	8	1.23	121	<10	76	26	37	<20	<20	4	0.20	0.07	0.76	<.01	0.08	19	4	<2	<1	2	<5	<10	<.01	3
6426	3.7	551	379	978	3	22	18	6.1	16	420	<5	5.97	1978	<10	21	79	40	<20	<20	1	0.50	0.43	1.71	<.01	0.21	17	9	<2	5	2	<5	<10	<.01	5
6430	0.3	194	26	41	15	76	5	0.7	12	184	23	1.49	370	<10	39	17	89	<20	<20	7	0.22	0.33	8.34	<.01	0.04	212	5	<2	3	6	<5	<10	<.01	4
6431	<0.2	32	20	10	<1	11	<1	0.5	17	201	<5	2.26	339	<10	102	<1	13	<20	<20	<1	<.01	0.20	>10.00	<.01	<.01	365	1	<2	<1	7	<5	<10	<.01	<1
6433	0.4	18	11	14	16	60	6	<0.2	<5	39	8	1.11	232	<10	200	21	19	<20	<20	3	0.24	0.49	4.87	<.01	0.11	85	9	<2	1	2	<5	<10	<.01	7
6436	0.7	15	31	27	4	45	9	0.3	<5	102	8	3.11	166	<10	69	55	12	<20	<20	7	0.44	0.33	0.93	<.01	0.25	21	6	<2	<1	<1	<5	<10	<.01	8
6444	<0.2	48	2	4	13	59	6	<0.2	<5	28	21	1.28	81	<10	154	37	55	<20	<20	3	0.26	0.21	2.56	<.01	0.10	23	5	<2	1	3	<5	<10	<.01	5
6445	0.5	29	23	817	23	69	7	3.9	<5	59	10	2.30	317	<10	220	47	132	<20	<20	3	0.87	1.16	2.54	<.01	0.18	35	4	<2	5	8	<5	<10	<.01	9
6449	<0.2	66	32	1604	43	144	12	8.5	8	95	28	2.41	269	<10	62	12	49	<20	<20	5	0.35	0.27	>10.00	0.01	0.15	229	16	<2	2	6	<5	<10	<.01	9
6450	3.1	121	182	57	21	65	3	1.1	29	264	11	2.93	776	<10	30	35	20	22	<20	3	0.51	0.73	1.89	<.01	0.19	41	5	<2	6	1	<5	<10	<.01	9
6451	2.9	146	582	296	26	10	2	3.2	47	583	104	7.50	49	<10	800	51	33	<20	<20	4	0.38	0.03	0.04	<.01	0.21	14	2	<2	3	<1	<5	<10	<.01	8
6455	1.7	117	62	56	53	191	9	1.8	21	516	6	5.46	305	<10	24	39	94	41	<20	5	0.46	0.52	1.60	0.01	0.24	29	10	<2	6	4	<5	<10	<.01	13
6458	0.7	22	23	1179	23	46	5	6.6	14	59	16	1.02	286	<10	118	9	39	<20	<20	5	0.19	0.47	>10.00	0.01	0.10	321	13	<2	1	8	<5	<10	<.01	5
6462	<0.2	78	9	298	4	58	12	<0.2	<5	<5	<5	2.95	277	<10	90	16	9	<20	<20	7	0.41	0.46	0.83	<.01	0.25	39	8	<2	3	<1	<5	<10	<.01	15
6463	10.8	1153	825	2205	7	39	5	11.3	41	165	6	4.32	269	<10	36	78	142	<20	<20	17	1.49	1.26	1.79	<.01	0.83	49	14	<2	66	8	6	<10	<.01	28
6466	4.8	33	346	313	2	23	3	3.1	8	324	13	1.20	20	<10	339	83	18	<20	<20	13	0.47	0.07	0.10	<.01	0.25	17	6	<2	2	1	<5	<10	<.01	5
6467	<0.2	3	21	50	7	9	<1	<0.2	<5	6	6	0.22	3	<10	1484	30	42	<20	<20	17	0.42	0.03	0.03	<.01	0.13	11	1	<2	2	2	<5	<10	<.01	9
6485	0.3	21	24	104	21	39	7	0.5	<5	37	15	1.63	272	<10	112	36	14	<20	<20	2	0.35	1.40	6.01	<.01	0.17	114	7	<2	2	3	<5	<10	<.01	7
6493	2.2	43	312	492	14	11	1	1.5	<5	41	15	1.18	65	<10	706	34	32	<20	<20	10	0.35	0.03	0.03	0.02	0.11	2	5	<2	2	2	<5	<10	<.01	8
6497	1.7	46	53	517	7	85	11	2.7	<5	68	18	5.40	153	<10	15	59	34	<20	<20	5	0.58	0.25	0.74	<.01	0.35	34	7	<2	1	<1	<5	<10	<.01	20
6499	1.3	43	43	698	33	106	9	3.7	<5	56	14	1.36	448	<10	156	18	49	<20	<20	3	0.27	0.31	>10.00	0.02	0.12	143	11	<2	1	5	<5	<10	<.01	8
6500	2.8	25	368	339	7	45	9	2.4	<5	285	15	3.87	156	<10	43	31	15	<20	<20	7	0.43	0.08	0.68	<.01	0.20	21	6	<2	1	<1	<5	<10	<.01	16
6502	1.6	7	265	876	1	4	<1	5.0	15	67	9	0.59	674	<10	14	6	2	<20	<20	2	0.02	0.45	>10.00	<.01	<.01	112	3	<2	<1	7	<5	<10	<.01	<1
6506	1.1	61	65	1009	18	118	6	1.8	<5	111	47	3.43	63	<10	974	56	80	<20	<20	11	0.54	0.04	0.18	<.01	0.17	135	6	<2	3	4	<5	<10	<.01	15
6507	0.5	44	28	250	36	118	11	1.3	5	59	17	2.44	214	<10	86	27	51	<20	<20	3	0.47	0.32	>10.00	<.01	0.19	248	10	<2	2	5	<5	<10	<.01	11
6516	2.9	23	629	2219	<1	61	17	6.0	8	318	10	3.71	1743	<10	59	23	9	<20	<20	3	0.54	0.28	9.20	<.01	0.32	249	15	<2	2	2	5	<10	<.01	7
6523	0.4	45	49	300	24	112	13	1.6	<5	44	14	2.33	130	<10	44	45	72	<20	<20	4	0.67	0.78	3.23	<.01	0.29	93	7	<2	5	5	<5	<10	<.01	13
6524	0.6	135	57	115	104	337	30	1.2	<5	146	20	5.67	96	<10	19	32	153	<20	<20	3	1.16	0.95	2.16	0.01	0.44	50	16	<2	10	8	<5	<10	<.01	17
6531	<0.2	40	24	122	14	39	4	0.5	12	29	14	1.25	488	<10	187	5	26	<20	<20	4	0.16	0.50	>10.00	<.01	0.06	281	13	<2	<1	6	<5	<10	<.01	3

Intertek Testing Services
Bondar Clegg

Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP. PROJECT: SILVERTIP

REPORT: V97-01348.2 (COMPLETE) DATE RECEIVED: 26-AUG-97 DATE PRINTED: 29-AUG-97

SAMPLE NUMBER	ELEMENT UNITS	Ag PPM	Cu PPM	Pb PPM	Zn PPM	Mo PPM	Ni PPM	Co PPM	Cd PPM	Bi PPM	As PPM	Sb PPM	Fe PCT	Mn PPM	Te PPM	Ba PPM	Cr PPM	V PPM	Sn PPM	W PPM	La PPM	Al PCT	Mg PCT	Ca PCT	Na PCT	K PCT	Sr PPM	Y PPM	Ga PPM	Li PPM	Nb PPM	Sc PPM	Ta PPM	Ti PCT	Zr PPM
6539		0.3	87	38	168	5	38	6	0.6	<5	32	<5	2.84	37	<10	344	23	44	<20	<20	20	1.71	0.37	0.21	0.01	0.41	33	5	<2	11	2	<5	<10	<.01	11
6554		<0.2	9	<2	1	<1	<1	<1	<0.2	15	16	<5	0.90	480	<10	391	<1	2	<20	<20	1	0.07	1.72	>10.00	<.01	0.02	119	3	<2	1	7	<5	<10	<.01	<1
6555		<0.2	<1	<2	<1	<1	<1	<1	<0.2	17	<5	<5	0.04	99	<10	71	<1	1	<20	<20	1	0.01	0.16	>10.00	<.01	<.01	145	2	<2	<1	8	<5	<10	<.01	<1
6556		<0.2	<1	<2	2	<1	<1	<1	<0.2	17	<5	<5	0.02	105	<10	129	<1	1	<20	<20	<1	<.01	0.20	>10.00	<.01	<.01	222	2	<2	<1	8	<5	<10	<.01	<1

Intertek Testing Services
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Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP. PROJECT: SILVERTIP

REPORT: V97-01348.2 (COMPLETE) DATE RECEIVED: 26-AUG-97 DATE PRINTED: 29-AUG-97

STANDARD NAME	ELEMENT UNITS	Ag PPM	Cu PPM	Pb PPM	Zn PPM	Mo PPM	Ni PPM	Co PPM	Cd PPM	Bi PPM	As PPM	Sb PPM	Fe PCT
BCC GEOCHEM STD 5		0.6	86	7	75	2	35	22	<0.2	<5	8	<5	4.92
Number of Analyses		1	1	1	1	1	1	1	1	1	1	1	1
Mean Value		0.6	86	7	75	2	35	22	0.1	3	8	3	4.92
Standard Deviation		-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value		0.7	90	11	80	2	40	18	0.1	1	8	1	4.74
ANALYTICAL BLANK		<0.2	<1	<2	<1	<1	<1	<1	<0.2	<5	<5	<5	<.01
Number of Analyses		1	1	1	1	1	1	1	1	1	1	1	1
Mean Value		0.1	0.5	1	0.5	0.5	0.5	0.5	0.1	3	3	3	.005
Standard Deviation		-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value		0.2	1	2	1	1	1	1	0.1	2	5	5	0.05

STANDARD NAME	ELEMENT UNITS	Mn PPM	Te PPM	Ba PPM	Cr PPM	V PPM	Sn PPM	W PPM	La PPM	Al PCT	Mg PCT
BCC GEOCHEM STD 5		737	<10	213	50	127	<20	<20	7	3.38	1.68
Number of Analyses		1	1	1	1	1	1	1	1	1	1
Mean Value		737	5	213	50	127	10	10	7	3.38	1.68
Standard Deviation		-	-	-	-	-	-	-	-	-	-
Accepted Value		720	0.2	200	54	133	4	2	5	3.09	1.83
ANALYTICAL BLANK		<1	<10	<1	<1	<1	<20	<20	<1	<.01	<.01
Number of Analyses		1	1	1	1	1	1	1	1	1	1
Mean Value		0.5	5	0.5	0.5	0.5	10	10	0.5	.005	.005
Standard Deviation		-	-	-	-	-	-	-	-	-	-
Accepted Value		1	.01	.005	1	1	.01	.01	.01	<.01	<.01

STANDARD NAME	ELEMENT UNITS	Ca PCT	Na PCT	K PCT	Sr PPM	Y PPM	Ga PPM	Li PPM	Nb PPM	Sc PPM	Ta PPM	Ti PCT	Zr PPM
BCC GEOCHEM STD 5		1.09	0.06	0.35	43	8	<2	26	7	11	<10	0.22	12
Number of Analyses		1	1	1	1	1	1	1	1	1	1	1	1
Mean Value		1.09	0.06	0.35	43	8	1	26	7	11	5	0.22	12
Standard Deviation		-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value		1.08	0.06	0.32	39	9	4	-	1	18	1	-	9
ANALYTICAL BLANK		0.03	<.01	<.01	<1	<1	<2	<1	<1	<5	<10	<.01	<1
Number of Analyses		1	1	1	1	1	1	1	1	1	1	1	1
Mean Value		0.03	.005	.005	0.5	0.5	1	0.5	0.5	3	5	.005	0.5
Standard Deviation		-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value		<.0001	<.01	<.01	.01	.01	.01	.01	.01	.01	.01	<.01	.01

ITS Intertek Testing Services
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Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP. PROJECT: SILVERTIP
REPORT: V97-01348.2 (COMPLETE) DATE RECEIVED: 26-AUG-97 DATE PRINTED: 29-AUG-97

SAMPLE NUMBER	ELEMENT UNITS	Ag PPM	Cu PPM	Pb PPM	Zn PPM	Mo PPM	Ni PPM	Co PPM	Cd PPM	Bi PPM	As PPM	Sb PPM	Fe PCT	Mn PPM	Te PPM	Ba PPM	Cr PPM	V PPM
6445		0.5	29	23	817	23	69	7	3.9	<5	59	10	2.30	317	<10	220	47	132
Duplicate		0.4	32	22	810	22	66	7	3.7	<5	59	9	2.30	315	<10	161	46	127
6507		0.5	44	28	250	36	118	11	1.3	5	59	17	2.44	214	<10	86	27	51
Duplicate		0.4	47	29	259	37	122	11	1.4	6	63	17	2.55	222	<10	83	28	50

SAMPLE NUMBER	Sn PPM	W PPM	La PPM	Al PCT	Mg PCT	Ca PCT	Na PCT	K PCT	Sr PPM	Y PPM	Ga PPM	Li PPM	Nb PPM	Sc PPM	Ta PPM	Ti PCT	Zr PPM
6445	<20	<20	3	0.87	1.16	2.54	<.01	0.18	35	4	<2	5	8	<5	<10	<.01	9
Duplicate	<20	<20	3	0.86	1.14	2.48	<.01	0.17	34	4	<2	5	8	<5	<10	<.01	9
6507	<20	<20	3	0.47	0.32	>10.00	<.01	0.19	248	10	<2	2	5	<5	<10	<.01	11
Duplicate	<20	<20	3	0.46	0.33	>10.00	<.01	0.19	263	10	<2	2	5	<5	<10	<.01	11

ITS Intertek Testing Services

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Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP.

PROJECT: SILVERTIP

REPORT: V97-02536.0 (COMPLETE)

DATE RECEIVED: 22-SEP-97 DATE PRINTED: 14-OCT-97 PAGE 1A(1/14)

SAMPLE	ELEMENT	SiO2	TiO2	Al2O3	Fe2O3*	MnO	MgO	CaO	Na2O	K2O	P2O5	LOI	Total
NUMBER	UNITS	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT
6402		75.10	0.36	8.02	4.18	0.01	0.66	0.94	0.06	2.17	0.06	6.15	97.81
6404		82.15	0.33	6.59	1.54	0.01	0.60	0.76	0.04	1.80	0.09	4.64	98.59
6407		73.25	0.32	6.04	3.25	0.03	1.65	5.05	0.02	1.63	0.09	5.94	97.32
6409		62.33	0.93	15.17	5.36	0.06	1.50	1.80	0.10	4.27	0.19	6.76	98.51
6410		68.07	0.26	6.03	5.34	0.07	1.52	2.78	0.73	1.68	0.07	7.30	93.91s
6411		67.07	0.24	3.85	3.10	0.12	0.43	9.67	<.01	0.94	0.14	8.68	94.29s
6412		67.20	0.51	11.31	4.18	0.03	1.92	2.19	0.06	3.22	0.10	7.00	97.75
6413		78.37	0.27	6.03	1.79	0.03	1.46	2.67	0.06	1.63	0.07	5.59	98.00
6415		80.06	0.25	5.09	2.41	0.02	1.69	2.09	0.04	1.29	0.08	4.93	98.00
6416		63.06	0.61	13.26	6.28	0.03	2.02	2.03	0.12	3.71	0.13	6.97	98.25
6422		80.08	0.21	4.42	1.96	0.03	1.11	3.30	0.03	1.13	0.08	5.24	97.63
6432		1.66	0.06	0.28	0.09	0.01	0.86	51.38	<.01	0.01	0.01	41.37	95.73s
6434		61.47	0.99	16.61	5.25	0.03	1.49	1.62	0.14	4.69	0.19	5.98	98.49
6435		62.98	0.19	3.70	6.05	0.04	2.16	8.06	0.08	0.93	0.08	6.75	91.06s
6437		74.95	0.35	7.72	2.95	0.03	1.33	2.54	0.14	1.97	0.09	6.36	98.48
6440		63.78	0.20	3.52	2.00	0.03	0.61	14.27	0.03	0.87	0.08	10.94	96.36
6443		67.45	0.43	8.25	4.57	0.03	2.07	4.11	0.05	3.76	0.10	4.05	94.90s
6447		79.65	0.31	5.43	2.61	0.06	1.12	1.25	0.08	1.34	0.10	5.88	97.87
6448		73.54	0.28	5.04	2.11	0.02	1.41	5.08	0.02	1.28	0.08	7.45	96.35s
6452		48.12	0.20	3.29	1.76	0.02	0.60	22.43	0.04	0.77	0.14	19.02	96.40
6456		71.15	0.34	5.73	2.29	0.03	1.89	5.96	0.04	1.79	0.08	7.68	97.00
6457		82.49	0.25	3.57	2.97	0.02	0.54	1.11	0.07	0.79	0.19	5.85	97.89
6464		80.48	0.36	4.15	2.21	0.02	1.21	1.71	0.01	1.02	0.08	6.19	97.47
6465		39.64	0.15	2.22	1.74	0.03	0.54	33.09	0.04	0.47	0.17	18.34	96.43
6468		54.28	0.06	1.26	0.85	0.02	0.28	15.32	0.04	0.20	0.08	24.91	97.30
6471		15.23	0.09	1.85	2.68	0.06	2.07	40.25	0.10	0.24	0.16	31.27	94.00s
6472		72.16	0.30	5.00	2.07	0.03	0.95	6.13	0.05	1.19	0.10	8.33	96.33
6473		76.50	0.36	8.16	2.77	0.04	1.07	1.00	0.07	2.03	0.06	6.92	99.00
6474		73.12	0.37	7.57	3.13	0.01	0.53	0.32	0.05	2.00	0.18	10.95	98.26
6475		80.95	0.28	5.92	2.46	0.06	0.81	1.29	0.06	1.48	0.07	5.52	98.93

SAMPLE	Cr2O3	AgGrav	Ag	Cu	Pb	Zn	ZnOL	Mo	Ni	Co	Cd
NUMBER	PCT	PPM	PPM	PPM	PPM	PPM	PCT	PPM	PPM	PPM	PPM
6402	0.10		0.6	26	30	56		23	73	10	0.4
6404	0.04		1.2	33	36	170		23	53	7	0.9
6407	0.05		1.2	29	36	150		17	69	7	0.6
6409	0.04		0.4	30	26	25		3	48	14	<0.2
6410	0.06	64.4	70.0	402	>10000	>10000	1.3	28	57	8	68.1
6411	0.05		4.3	35	93	149		34	96	8	0.4
6412	0.03		2.9	35	67	151		17	77	10	0.7
6413	0.03		1.0	28	37	194		19	51	5	0.8
6415	0.05		0.4	23	38	154		20	72	7	0.8
6416	0.03		1.6	47	33	113		9	63	14	0.5
6422	0.04		3.2	36	137	543		20	63	6	3.3
6432	<0.01		3.5	<1	10	33		1	2	<1	<0.2
6434	0.03		<0.2	23	23	58		3	57	17	<0.2
6435	0.04		2.2	29	282	1078		13	64	4	5.4
6437	0.05		5.9	39	2096	653		16	56	7	3.1
6440	0.03		1.1	14	18	74		14	52	5	<0.2
6443	0.03		0.6	194	14	29		24	70	10	<0.2
6447	0.04		1.3	41	42	758		20	99	11	8.3
6448	0.04		0.6	27	23	31		16	70	8	<0.2
6452	0.01		1.8	29	21	120		26	89	5	0.4
6456	0.02		0.6	36	16	30		17	73	8	<0.2
6457	0.04		4.3	41	41	866		33	105	11	1.7
6464	0.03		0.7	27	28	172		27	71	8	0.8
6465	<0.01		1.7	55	31	550		46	190	14	2.1
6468	<0.01		2.3	13	17	335		21	70	6	1.1
6471	<0.01		2.9	33	36	630		31	75	10	2.7
6472	0.02		1.6	45	93	169		27	76	7	1.2
6473	0.02		1.5	26	49	570		20	63	10	2.7
6474	0.03		3.6	58	440	439		52	170	15	2.6
6475	0.03		1.5	21	376	734		19	58	7	1.1

SAMPLE	Bi	As	Sb	Fe	Mn	Te	Ba	Cr	V	Sn	W
NUMBER	PPM	PPM	PPM	PCT	PPM	PPM	PPM	PPM	PPM	PPM	PPM
6402	<5	47	6	3.37	102	<10	47	461	76	<20	<20
6404	<5	70	11	1.18	110	<10	204	185	36	<20	<20
6407	<5	67	9	2.60	267	<10	92	238	50	<20	<20
6409	<5	327	<5	4.18	542	<10	42	151	52	<20	<20
6410	<5	275	129	4.46	609	10	46	325	26	307	36
6411	<5	165	23	2.49	1052	<10	58	244	92	<20	<20
6412	<5	133	11	3.33	232	<10	58	122	37	<20	<20
6413	<5	36	10	1.42	199	<10	162	143	31	<20	<20
6415	<5	40	8	1.94	149	<10	86	270	96	<20	<20
6416	<5	128	13	4.97	235	<10	39	112	31	<20	<20
6422	<5	39	11	1.64	263	<10	154	209	69	<20	<20
6432	<5	<5	<5	0.05	107	<10	19	<1	1	<20	<20
6434	<5	86	<5	4.04	289	<10	99	90	19	<20	<20
6435	<5	154	26	4.78	313	<10	27	246	47	<20	<20
6437	<5	86	48	2.23	288	<10	90	266	50	<20	<20
6440	<5	34	<5	1.61	224	<10	185	176	35	<20	<20
6443	<5	111	<5	3.65	195	<10	75	119	84	<20	<20
6447	<5	244	11	2.08	533	<10	82	206	95	<20	<20
6448	<5	28	7	1.68	180	<10	89	199	79	<20	<20
6452	<5	27	13	1.33	196	<10	145	58	50	<20	<20
6456	<5	35	<5	1.78	197	<10	130	103	52	<20	<20
6457	<5	72	26	2.35	208	<10	61	244	73	<20	<20
6464	<5	35	11	1.79	158	<10	69	177	30	<20	<20
6465	<5	70	24	2.72	168	<10	69	49	58	<20	<20
6468	<5	35	7	1.11	184	<10	168	25	21	<20	<20
6471	<5	39	18	2.14	558	<10	78	26	47	<20	<20
6472	<5	53	23	1.56	204	<10	82	77	53	23	<20
6473	<5	60	7	2.18	363	<10	54	84	30	<20	<20
6474	<5	112	199	2.53	49	<10	45	163	144	<20	<20
6475	<5	67	108	1.86	496	<10	67	143	33	<20	<20

ITS Intertek Testing Services
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Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP. PROJECT: SILVERTIP

REPORT: V97-02536.0 (COMPLETE) DATE RECEIVED: 22-SEP-97 DATE PRINTED: 14-OCT-97 PAGE 1B(2/14)

SAMPLE NUMBER	ELEMENT UNITS	La PPM	Al PCT	Mg PCT	Ca PCT	Na PCT	K PCT	Sr PPM	Y PPM	Ga PPM	Li PPM	Nb PPM	Sc PPM	Ta PPM	Ti PCT	CO2 PCT	Zr PPM
6402		7	1.54	0.26	0.71	0.02	0.74	17	5	3	5	1	<5	<10	<.01	0.85	13
6404		7	0.45	0.21	0.60	<.01	0.25	26	4	<2	<1	<1	<5	<10	<.01	0.65	11
6407		5	0.64	0.96	4.10	<.01	0.33	72	9	<2	2	1	<5	<10	<.01	5.14	9
6409		12	2.28	0.70	1.51	0.03	1.17	53	8	5	3	3	<5	<10	<.01	2.32	16
6410		7	0.76	0.88	2.34	<.01	0.41	20	11	6	5	1	<5	<10	<.01	3.17	13
6411		5	0.59	0.11	7.63	0.01	0.26	36	9	<2	3	<1	<5	<10	<.01	7.00	9
6412		6	0.83	0.89	1.78	0.01	0.47	45	11	<2	3	<1	<5	<10	<.01	2.89	16
6413		4	0.48	0.65	2.19	<.01	0.26	23	8	<2	2	2	<5	<10	<.01	2.82	7
6415		7	0.97	0.90	1.69	0.01	0.44	28	8	<2	5	1	<5	<10	<.01	2.66	8
6416		6	0.82	0.78	1.75	0.01	0.44	58	10	<2	2	<1	<5	<10	<.01	2.54	18
6422		7	0.47	0.60	2.89	0.01	0.23	35	7	<2	2	<1	<5	<10	<.01	2.98	6
6432		2	0.04	0.44	>10.00	<.01	<.01	183	1	<2	<1	3	<5	<10	<.01	41.63	<1
6434		18	0.76	0.67	1.41	0.01	0.42	67	9	<2	2	<1	<5	<10	<.01	2.84	17
6435		5	0.63	1.40	6.36	0.01	0.28	126	8	<2	4	<1	<5	<10	<.01	7.97	9
6437		7	0.86	0.65	1.97	0.02	0.38	32	6	<2	3	1	<5	<10	<.01	2.42	9
6440		3	0.41	0.26	>10.00	<.01	0.19	120	5	<2	3	1	<5	<10	<.01	11.16	5
6443		3	0.88	1.09	3.30	<.01	0.44	86	8	<2	9	2	<5	<10	<.01	4.70	17
6447		7	0.76	0.53	0.97	0.01	0.30	41	8	<2	4	<1	<5	<10	<.01	1.78	11
6448		6	0.79	0.76	4.04	0.01	0.36	93	10	<2	3	2	<5	<10	<.01	4.88	10
6452		3	0.28	0.24	>10.00	<.01	0.13	283	11	<2	2	<1	<5	<10	<.01	17.80	5
6456		4	0.53	1.00	4.73	<.01	0.26	73	8	<2	6	2	<5	<10	<.01	6.44	12
6457		6	0.46	0.28	0.86	<.01	0.20	23	5	<2	3	<1	<5	<10	<.01	0.83	10
6464		5	0.56	0.66	1.38	<.01	0.26	25	6	<2	3	<1	<5	<10	<.01	2.18	10
6465		4	0.50	0.22	>10.00	0.02	0.21	193	12	<2	2	1	<5	<10	<.01	15.18	15
6468		4	0.15	0.21	>10.00	<.01	0.07	346	11	<2	<1	2	<5	<10	<.01	24.47	4
6471		7	0.40	1.18	>10.00	<.01	0.16	218	9	<2	3	4	<5	<10	<.01	32.48	4
6472		5	0.42	0.39	4.65	<.01	0.18	55	11	<2	3	1	<5	<10	<.01	4.98	9
6473		4	0.57	0.40	0.75	0.01	0.27	22	4	<2	3	<1	<5	<10	<.01	1.35	10
6474		13	1.15	0.10	0.21	0.01	0.54	11	6	3	5	<1	<5	<10	<.01	0.02	16
6475		4	0.36	0.35	0.99	<.01	0.18	14	4	<2	1	<1	<5	<10	<.01	1.33	7

ITS Intertek Testing Services
Bondar Clegg

Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP.
REPORT: V97-02536.0 (COMPLETE)

PROJECT: SILVERTIP
DATE RECEIVED: 22-SEP-97 DATE PRINTED: 14-OCT-97 PAGE 2A(3/14)

SAMPLE NUMBER	SiO2	TiO2	Al2O3	Fe2O3*	MnO	MgO	CaO	Na2O	K2O	P2O5	LOI	Total	Cr2O3	AgGrav	Ag	Cu	Pb	Zn	ZnOL	Mo	Ni	Co	Cd	Bi	As	Sb	Fe	Mn	Te	Ba	Cr	V	Sn	W
UNITS	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PPM	PPM	PPM	PPM	PPM	PCT	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PCT	PPM	PPM	PPM	PPM	PPM	PPM	PPM
6477	78.77	0.30	5.12	2.18	0.02	1.13	2.51	0.04	1.30	0.09	6.48	98.00	0.06		0.4	25	50	357		19	75	6	1.4	<5	23	9	1.58	126	<10	133	292	107	<20	<20
6479	71.67	0.33	6.75	3.36	0.05	2.41	3.09	0.08	1.76	0.06	7.64	97.22	0.02		0.4	29	16	675		19	58	7	1.2	<5	41	5	2.40	354	<10	70	97	15	<20	<20
6480	75.67	0.25	4.47	1.90	0.10	1.22	5.26	0.02	1.15	0.07	7.48	97.62	0.03		1.2	20	18	113		13	66	6	0.4	<5	74	12	1.37	847	<10	114	147	49	<20	<20
6481	74.28	0.31	5.28	2.52	0.07	1.49	4.56	0.04	1.32	0.09	6.74	96.73	0.03		1.8	23	26	34		17	71	7	<0.2	<5	29	8	1.87	575	<10	55	142	29	<20	<20
6483	79.88	0.25	4.50	3.08	0.02	1.12	1.78	0.13	1.18	0.09	4.78	96.90	0.09		2.2	72	283	1600		16	73	9	7.5	<5	90	14	2.20	191	<10	66	424	74	<20	82
6484	69.75	0.20	3.60	7.38	0.06	1.97	4.18	0.03	0.91	0.06	7.32	95.51s	0.05		4.0	51	56	115		18	112	7	0.5	<5	109	31	5.24	462	<10	20	217	36	<20	<20
6486	78.24	0.25	4.64	2.68	0.02	1.34	2.54	0.02	0.96	0.08	5.77	96.59	0.05		1.9	38	30	93		20	76	7	0.5	<5	46	30	2.11	212	<10	55	263	58	<20	<20
6487	73.56	0.25	4.43	3.62	0.05	0.41	6.44	0.01	1.13	0.13	6.90	96.96	0.03		4.8	40	77	109		27	110	9	0.6	<5	95	22	2.72	372	<10	48	133	49	<20	<20
6488	74.37	0.23	4.23	1.84	0.03	1.34	6.21	0.02	1.08	0.07	7.69	97.15	0.04		0.5	17	20	58		12	56	5	<0.2	<5	25	7	1.26	234	<10	99	178	39	<20	<20
6489	46.26	0.48	11.45	6.04	0.02	0.98	10.33	0.15	2.95	0.31	11.41	90.42s	0.04		3.6	105	84	1614		93	275	15	7.7	<5	119	17	4.47	154	<10	26	144	128	33	<20
6491	70.77	0.29	4.92	3.15	0.06	1.37	6.20	0.16	0.94	0.21	8.44	96.53	0.02		2.1	34	29	2125		39	120	11	11.0	<5	45	17	2.20	462	<10	52	86	89	<20	<20
6492	63.43	0.31	5.31	2.56	<.01	0.97	4.10	0.08	0.05	0.16	7.31	84.31s	0.03		1.6	32	28	54		31	120	11	<0.2	<5	56	10	2.12	281	<10	20	192	244	<20	<20
6494	75.57	0.24	4.51	3.26	0.10	2.25	3.10	0.11	1.13	0.08	7.34	97.72	0.03		0.2	25	56	1831		16	95	16	11.0	<5	28	7	2.40	813	<10	86	147	68	<20	<20
6498	75.48	0.25	4.19	2.02	0.03	0.90	6.11	0.04	1.03	0.08	7.07	97.23	0.03		1.3	25	18	242		20	80	6	1.1	<5	38	5	1.46	212	<10	102	150	53	<20	<20
6501	72.29	0.32	5.46	2.51	0.04	1.59	5.86	0.03	1.30	0.08	7.50	97.02	0.04		1.3	34	28	165		18	80	10	0.7	<5	32	8	1.94	294	<10	61	200	51	<20	<20
6503	55.68	0.15	2.04	1.40	0.04	0.87	18.71	0.04	0.32	0.05	16.10	95.43s	0.03		2.2	78	27	94		9	39	2	<0.2	<5	34	34	1.04	399	<10	53	124	36	<20	<20
6504	16.04	0.15	2.21	1.32	0.06	0.90	41.84	0.04	0.46	0.13	33.57	96.72	<0.01		2.5	12	12	26		21	54	3	<0.2	<5	56	5	0.89	506	<10	289	11	64	<20	<20
6505	70.52	0.24	3.84	2.70	0.04	2.16	7.11	0.03	1.01	0.08	9.09	96.84	0.02		1.5	26	89	117		17	72	7	0.4	<5	47	9	1.95	319	<10	70	93	39	<20	<20
6508	78.31	0.24	4.43	1.87	0.02	0.73	3.66	0.16	1.10	0.11	6.50	97.16	0.03		0.6	30	23	367		23	87	7	1.9	<5	30	12	1.36	111	<10	79	157	67	<20	<20
6509	35.45	0.27	4.94	2.90	0.10	0.87	26.54	0.07	1.27	0.22	22.08	94.72s	0.01		3.7	43	69	471		33	123	12	1.9	<5	81	51	2.21	818	<10	120	44	46	<20	<20
6510	66.37	0.46	8.45	3.98	0.01	0.76	2.97	0.07	2.11	0.23	11.93	97.37	0.03		0.6	67	29	316		60	198	15	1.4	<5	61	10	2.70	74	<10	30	112	79	<20	<20
6511	77.74	0.35	6.79	2.33	0.02	1.51	1.91	0.07	1.76	0.05	6.09	98.65	0.03		0.4	19	14	18		21	51	6	<0.2	<5	27	<5	1.54	134	<10	87	121	17	<20	<20
6512	73.96	0.36	6.88	2.27	0.03	1.88	2.84	0.07	1.76	0.08	6.34	96.52	0.05		0.5	20	27	61		19	55	7	0.2	<5	28	<5	1.61	231	<10	62	192	30	<20	<20
6513	80.99	0.28	4.13	2.29	0.04	0.83	2.88	0.16	1.00	0.08	4.84	97.56	0.04		10.9	51	1233	1373		16	67	5	6.2	<5	101	20	1.55	312	<10	96	155	36	37	<20
6519	74.13	0.31	5.74	2.17	0.04	2.27	3.72	0.08	1.55	0.06	7.33	97.43	0.03		0.7	21	17	28		16	38	4	<0.2	<5	43	<5	1.43	268	<10	117	102	13	<20	<20
6526	68.80	0.24	4.42	2.16	0.04	1.02	9.41	0.09	1.00	0.07	9.35	96.62	0.02		1.4	22	25	62		16	54	4	<0.2	<5	44	9	1.44	329	<10	62	76	27	<20	<20
6528	76.18	0.30	5.35	2.06	0.02	1.36	4.63	0.02	1.23	0.08	7.76	99.01	0.02		0.9	32	30	258		15	73	7	1.3	<5	32	14	1.49	179	<10	74	81	38	<20	<20
6532	74.59	0.32	5.57	2.34	0.01	1.72	4.24	0.13	1.29	0.10	6.80	97.13	0.02		0.3	34	21	153		19	87	9	0.7	<5	32	7	1.75	108	<10	47	82	41	<20	<20
6538	68.36	0.70	15.40	2.42	0.01	1.05	1.01	0.19	4.22	0.12	5.26	98.77	0.03		1.4	52	113	878		6	47	9	4.2	<5	101	8	1.42	97	<10	99	75	33	<20	<20
6552	0.60	<.01	0.09	0.88	0.03	1.35	51.54	<.01	0.01	0.03	40.92	95.45s	<0.01		6.7	2	1190	139		9	4	<1	<0.2	<5	129	34	0.59	241	<10	93	<1	2	<20	<20

ITS Intertek Testing Services
Bondar Clegg

Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP. PROJECT: SILVERTIP
REPORT: V97-02536.0 (COMPLETE) DATE RECEIVED: 22-SEP-97 DATE PRINTED: 14-OCT-97 PAGE 2B(4/14)

SAMPLE NUMBER	ELEMENT UNITS	La PPM	Al PCT	Mg PCT	Ca PCT	Na PCT	K PCT	Sr PPM	Y PPM	Ga PPM	Li PPM	Nb PPM	Sc PPM	Ta PPM	Ti PCT	CO2 PCT	Zr PPM
6477		6	0.58	0.53	1.66	<.01	0.28	38	6	<2	2	2	<5	<10	<.01	2.21	8
6479		3	0.40	1.24	2.23	<.01	0.21	94	5	<2	2	2	<5	<10	<.01	4.72	9
6480		4	0.44	0.60	3.99	<.01	0.21	102	8	<2	2	2	<5	<10	<.01	5.08	8
6481		3	0.48	0.77	3.43	<.01	0.22	103	7	<2	3	<1	<5	<10	<.01	4.57	12
6483		5	0.68	0.60	1.33	0.01	0.33	28	6	<2	3	<1	<5	<10	<.01	2.21	8
6484		3	0.42	1.06	2.96	<.01	0.19	27	6	<2	2	<1	<5	<10	<.01	4.85	9
6486		5	0.69	0.77	2.04	<.01	0.23	30	6	<2	3	<1	<5	<10	<.01	2.76	11
6487		3	0.47	0.07	5.02	<.01	0.22	64	6	<2	3	<1	<5	<10	<.01	4.94	9
6488		4	0.52	0.65	4.50	<.01	0.24	61	7	<2	3	<1	<5	<10	<.01	5.70	5
6489		4	0.90	0.21	7.52	0.01	0.40	170	11	<2	4	2	<5	<10	<.01	5.70	17
6491		4	0.73	0.67	4.38	<.01	0.17	41	7	2	3	2	<5	<10	<.01	5.28	9
6492		3	0.70	0.58	3.01	<.01	<.01	81	7	<2	10	<1	<5	<10	0.06	3.90	10
6494		6	0.65	1.29	2.33	0.02	0.28	65	6	<2	4	<1	<5	<10	<.01	5.21	6
6498		3	0.42	0.41	4.63	<.01	0.19	193	6	<2	2	1	<5	<10	<.01	5.29	7
6501		3	0.50	0.85	4.42	<.01	0.21	111	7	<2	2	1	<5	<10	<.01	5.77	10
6503		3	0.26	0.47	>10.00	<.01	0.07	130	6	<2	2	1	<5	<10	<.01	14.74	4
6504		5	0.22	0.38	>10.00	<.01	0.09	361	10	<2	1	4	<5	<10	<.01	32.23	4
6505		4	0.34	1.14	5.21	<.01	0.16	86	8	<2	2	<1	<5	<10	<.01	7.39	7
6508		4	0.53	0.28	2.73	<.01	0.22	60	6	<2	3	<1	<5	<10	<.01	2.92	8
6509		5	0.41	0.32	>10.00	<.01	0.20	432	15	<2	2	2	<5	<10	<.01	20.92	10
6510		3	0.67	0.14	2.06	0.01	0.29	49	8	<2	2	<1	<5	<10	<.01	1.63	14
6511		4	0.39	0.69	1.31	<.01	0.20	64	3	<2	1	<1	<5	<10	<.01	2.36	7
6512		5	0.66	0.97	2.04	<.01	0.31	68	8	<2	2	1	<5	<10	<.01	3.49	9
6513		3	0.25	0.34	1.99	<.01	0.12	20	4	<2	1	<1	<5	<10	<.01	2.58	6
6519		3	0.32	1.20	2.58	<.01	0.17	109	5	<2	1	1	<5	<10	<.01	4.94	6
6526		3	0.39	0.41	6.34	<.01	0.14	68	6	<2	2	1	<5	<10	<.01	7.11	5
6528		4	0.44	0.58	3.43	<.01	0.16	60	7	<2	2	<1	<5	<10	<.01	4.19	7
6532		3	0.51	0.85	3.19	<.01	0.20	142	5	<2	4	<1	<5	<10	<.01	4.11	9
6538		13	0.89	0.27	0.67	0.01	0.45	31	6	2	2	<1	<5	<10	<.01	0.91	12
6552		2	<.01	0.68	>10.00	<.01	<.01	119	3	<2	<1	3	<5	<10	<.01	40.61	<1

Intertek Testing Services
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Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP. PROJECT: SILVERTIP
REPORT: V97-02536.0 (COMPLETE) DATE RECEIVED: 22-SEP-97 DATE PRINTED: 14-OCT-97 PAGE 3A(5/14)

SAMPLE NUMBER	ELEMENT UNITS	SiO_2 PCT	TiO_2 PCT	Al_2O_3 PCT	Fe_2O_3* PCT	MnO PCT	MgO PCT	CaO PCT	Na_2O PCT	K_2O PCT	P_2O_5 PCT	LOI PCT	Total PCT	Cr_2O_3 PCT	AgGrav PPM
6553		15.45	0.05	0.35	1.11	0.05	0.31	44.25	<.01	0.05	0.01	33.86	95.49s	<0.01	

SAMPLE NUMBER	Ag PPM	Cu PPM	Pb PPM	Zn PPM	ZnOL PCT	Mo PPM	Ni PPM	Co PPM	Cd PPM	Bi PPM	As PPM	Sb PPM	Fe PCT	Mn PPM	Te PPM	Ba PPM	Cr PPM	V PPM	Sn PPM	W PPM
6553	2.7	16	13	52		1	3	<1	<0.2	<5	114	9	0.77	465	<10	16	12	2	<20	<20

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Geochemical Lab Report

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REPORT: V97-02536.0 (COMPLETE) DATE RECEIVED: 22-SEP-97 DATE PRINTED: 14-OCT-97 PAGE 3B(6/14)

SAMPLE NUMBER	ELEMENT UNITS	La PPM	Al PCT	Mg PCT	Ca PCT	Na PCT	K PCT	Sr PPM	Y PPM	Ga PPM	Li PPM	Nb PPM	Sc PPM	Ta PPM	Ti PCT	CO2 PCT	Zr PPM
6553		3	0.06	0.13	>10.00	<.01	0.02	149	3	<2	<1	2	<5	<10	<.01	33.71	<1

ITS Intertek Testing Services
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Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP. PROJECT: SILVERTIP

REPORT: V97-02536.0 (COMPLETE) DATE RECEIVED: 22-SEP-97 DATE PRINTED: 14-OCT-97 PAGE 4A(7/14)

STANDARD NAME	ELEMENT UNITS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3* PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	K2O PCT	P2O5 PCT	LOI PCT	Total PCT	Cr2O3 PCT
CANMET STREAM-SED		53.56	0.83	15.55	6.97	0.13	2.96	4.10	1.71	2.03	0.31	-	88.17	0.02
CANMET STREAM-SED		54.03	0.79	15.58	7.12	0.13	3.02	4.20	1.73	2.11	0.31	-	89.04	0.02
Number of Analyses		2	2	2	2	2	2	2	2	2	2	-	2	2
Mean Value		53.80	0.81	15.57	7.05	0.13	2.99	4.15	1.72	2.07	0.31	-	88.60	0.02
Standard Deviation		0.33	0.03	0.02	0.11	-	0.04	0.07	0.01	0.06	-	-	0.62	.0006
Accepted Value		53.70	0.79	15.75	7.25	0.14	3.11	4.00	1.72	2.12	0.32	10.30	-	0.01
BCC GEOCHEM STD 4		-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Analyses		-	-	-	-	-	-	-	-	-	-	-	-	-
Mean Value		-	-	-	-	-	-	-	-	-	-	-	-	-
Standard Deviation		-	-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value		-	-	-	-	-	-	-	-	-	-	-	-	-
CANMET MRG-1 REF STD		-	-	-	-	-	-	-	-	-	-	-	-	-
CANMET MRG-1 REF STD		-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Analyses		-	-	-	-	-	-	-	-	-	-	-	-	-
Mean Value		-	-	-	-	-	-	-	-	-	-	-	-	-
Standard Deviation		-	-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value		-	-	4.48	-	-	-	-	-	-	-	-	-	-
ANALYTICAL BLANK		-	-	-	-	-	-	-	-	-	-	-	-	-
ANALYTICAL BLANK		-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Analyses		-	-	-	-	-	-	-	-	-	-	-	-	-
Mean Value		-	-	-	-	-	-	-	-	-	-	-	-	-
Standard Deviation		-	-	-	-	-	-	-	-	-	-	-	-	-

STANDARD NAME	AgGrav PPM	Ag PPM	Cu PPM	Pb PPM	Zn PPM	ZnOL PCT	Mo PPM	Ni PPM	Co PPM	Cd PPM	Bi PPM	As PPM	Sb PPM	Fe PCT	Mn PPM	Te PPM	Ba PPM	Cr PPM	V PPM	Sn PPM	W PPM
CANMET STREAM-SED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CANMET STREAM-SED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Analyses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean Value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Standard Deviation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value	-	0.5	43	66	216	-	13	47	17	0.8	-	32	3	4.10	720	-	-	50	58	-	-
BCC GEOCHEM STD 4	-	1.2	313	32	292	-	3	41	8	1.1	<5	31	<5	2.79	590	<10	65	72	8	<20	<20
Number of Analyses	-	1	1	1	1	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mean Value	-	1.2	313	32	292	-	3	41	8	1.1	3	31	3	2.79	590	5	65	72	8	10	10
Standard Deviation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value	-	1.1	290	33	255	0.03	4	42	9	0.8	1	30	1	2.60	600	0.1	55	80	9	5	1
CANMET MRG-1 REF STD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CANMET MRG-1 REF STD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Analyses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean Value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Standard Deviation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value	-	-	134	10	191	-	-	-	-	-	-	-	0.9	-	-	-	-	-	-	-	-
ANALYTICAL BLANK	<0.7	<0.2	<1	<2	<1	-	<1	<1	<1	<0.2	<5	<5	<5	<.01	<1	<10	<1	<1	<1	<20	<20
ANALYTICAL BLANK	-	<0.2	<1	<2	<1	-	<1	<1	<1	<0.2	<5	<5	<5	<.01	<1	<10	<1	<1	<1	<20	<20
Number of Analyses	1	2	2	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mean Value	0.4	0.1	0.5	1	0.5	-	0.5	0.5	0.5	0.1	3	3	3	.005	0.5	5	0.5	0.5	0.5	10	10
Standard Deviation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CLIENT: IMPERIAL METALS CORP. PROJECT: SILVERTIP

REPORT: V97-02536.0 (COMPLETE) DATE RECEIVED: 22-SEP-97 DATE PRINTED: 14-OCT-97 PAGE 4B(8/14)

STANDARD NAME	ELEMENT UNITS	La PPM	Al PCT	Mg PCT	Ca PCT	Na PCT	K PCT	Sr PPM	Y PPM	Ga PPM	Li PPM	Nb PPM	Sc PPM	Ta PPM	Ti PCT	CO2 PCT	Zr PPM
CANMET STREAM-SED		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CANMET STREAM-SED		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Analyses		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean Value		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Standard Deviation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BCC GEOCHEM STD 4		5	0.83	1.21	1.46	0.06	0.16	40	3	<2	7	2	<5	<10	<.01	-	11
Number of Analyses		1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	1
Mean Value		5	0.83	1.21	1.46	0.06	0.16	40	3	1	7	2	3	5	.005	-	11
Standard Deviation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value		4	0.77	1.34	1.43	0.04	0.14	39	4	2	7	1	12	1	0.01	3.15	8
CANMET MRG-1 REF STD		-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.04	-
CANMET MRG-1 REF STD		-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.04	-
Number of Analyses		-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
Mean Value		-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.04	-
Standard Deviation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value		-	4.48	8.17	-	-	-	-	-	-	-	-	-	-	-	1.04	-
ANALYTICAL BLANK		<1	<.01	<.01	<0.01	<.01	<.01	<1	<1	<2	<1	<1	<5	<10	<.01	-	<1
ANALYTICAL BLANK		<1	<.01	<.01	<0.01	<.01	<.01	<1	<1	<2	<1	<1	<5	<10	<.01	-	<1
Number of Analyses		2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	2
Mean Value		0.5	.005	.005	0.005	.005	.005	0.5	0.5	1	0.5	0.5	3	5	.005	-	0.5
Standard Deviation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP. PROJECT: SILVERTIP
REPORT: V97-02536.0 (COMPLETE) DATE RECEIVED: 22-SEP-97 DATE PRINTED: 14-OCT-97 PAGE 5A(9/14)

STANDARD NAME / ELEMENT UNITS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3* PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	K2O PCT	P2O5 PCT	LOI PCT	Total PCT	Cr2O3 PCT	AgGrav PPM	Ag PPM	Cu PPM	Pb PPM	Zn PPM	ZnOL PCT	Mo PPM	Ni PPM	Co PPM	Cd PPM	Bi PPM	As PPM	Sb PPM	Fe PCT	Mn PPM	Te PPM	Ba PPM	Cr PPM	V PPM	Sn PPM	W PPM
Accepted Value	<.001	<.01	<.001	<.0001	<.01	<.01	<.001	<.01	<.01	<.01	<.001	<.001	<.001	0.005	0.2	1	2	1	<.01	1	1	1	0.1	2	5	5	0.05	1	.01	.01	1	1	.01	.01
CANMET SO-2 REF STD	52.44	1.42	14.83	7.44	0.09	0.85	2.63	2.48	2.81	0.68	-	85.67	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CANMET SO-2 REF STD	52.30	1.37	14.72	7.39	0.09	0.86	2.64	2.44	2.77	0.67	-	85.25	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Analyses	2	2	2	2	2	2	2	2	2	2	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean Value	52.37	1.40	14.78	7.42	0.09	0.86	2.64	2.46	2.79	0.68	-	85.46	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Standard Deviation	0.10	0.04	0.08	0.04	-	.007	0.007	0.03	0.03	.007	-	0.30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value	51.70	1.38	14.75	7.69	0.09	0.87	2.64	2.48	2.85	0.67	14.26	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BCC GEOCHEM STD 6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	120	12	150	-	2	131	29	0.2	<5	123	<5	6.45	1258	<10	6	159	42	<20	<20
Number of Analyses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mean Value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	120	12	150	-	2	131	29	0.2	3	123	3	6.45	1258	5	6	159	42	10	10
Standard Deviation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	140	18	140	0.01	4	135	35	0.2	1	145	1	6.50	1450	-	6	170	50	5	12

ITS Intertek Testing Services
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Geochemical Lab Report

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STANDARD NAME	ELEMENT UNITS	La PPM	Al PCT	Mg PCT	Ca PCT	Na PCT	K PCT	Sr PPM	Y PPM	Ga PPM	Li PPM	Nb PPM	Sc PPM	Ta PPM	Ti PCT	CO2 PCT	Zr PPM
Accepted Value		.01	<.01	<.01	<.0001	<.01	<.01	.01	.01	.01	.01	.01	.01	.01	<.01	<.001	.01
CANMET SO-2 REF STD		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CANMET SO-2 REF STD		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of Analyses		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean Value		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Standard Deviation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BCC GEOCHEM STD 6		3	1.66	2.33	3.42	0.01	0.04	70	3	4	20	3	7	<10	<.01	-	7
Number of Analyses		1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	1
Mean Value		3	1.66	2.33	3.42	0.01	0.04	70	3	4	20	3	7	5	.005	-	7
Standard Deviation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accepted Value		-	1.80	2.70	4.00	0.01	0.04	70	3	-	24	2	6	1	.003	-	5

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SAMPLE NUMBER	ELEMENT	SiO2	TiO2	Al2O3	Fe2O3*	MnO	MgO	CaO	Na2O	K2O	P2O5	LOI	Total	Cr2O3	AgGrav	Ag	Cu	Pb	Zn	ZnOL	Mo	Ni	Co	Cd	Bi	As	Sb	Fe	Mn	Te	Ba	Cr	V	Sn	W
	UNITS	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PPM	PPM	PPM	PPM	PPM	PCT	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PCT	PPM	PPM	PPM	PPM	PPM	PPM	PPM
6402		75.10	0.36	8.02	4.18	0.01	0.66	0.94	0.06	2.17	0.06	6.15	97.81	0.10		0.6	26	30	56		23	73	10	0.4	<5	47	6	3.37	102	<10	47	461	76	<20	<20
Duplicate																																			
6410		68.07	0.26	6.03	5.34	0.07	1.52	2.78	0.73	1.68	0.07	7.30	93.91s	0.06	64.4	70.0	402	>10000	>10000	1.3	28	57	8	68.1	<5	275	129	4.46	609	10	46	325	26	307	36
Duplicate															61.3																				
6412		67.20	0.51	11.31	4.18	0.03	1.92	2.19	0.06	3.22	0.10	7.00	97.75	0.03		2.9	35	67	151		17	77	10	0.7	<5	133	11	3.33	232	<10	58	122	37	<20	<20
Duplicate		67.27	0.51	11.26	4.16	0.03	1.90	2.19	0.08	3.23	0.10			0.03		2.7	32	66	149		15	78	9	0.6	<5	124	9	3.10	216	<10	43	114	35	<20	<20
6416		63.06	0.61	13.26	6.28	0.03	2.02	2.03	0.12	3.71	0.13	6.97	98.25	0.03		1.6	47	33	113		9	63	14	0.5	<5	128	13	4.97	235	<10	39	112	31	<20	<20
Duplicate																																			
6437		74.95	0.35	7.72	2.95	0.03	1.33	2.54	0.14	1.97	0.09	6.36	98.48	0.05		5.9	39	2096	653		16	56	7	3.1	<5	86	48	2.23	288	<10	90	266	50	<20	<20
Duplicate																																			
6452		48.12	0.20	3.29	1.76	0.02	0.60	22.43	0.04	0.77	0.14	19.02	96.40	0.01		1.8	29	21	120		26	89	5	0.4	<5	27	13	1.33	196	<10	145	58	50	<20	<20
Duplicate																																			
6465		39.64	0.15	2.22	1.74	0.03	0.54	33.09	0.04	0.47	0.17	18.34	96.43	<0.01		1.7	55	31	550		46	190	14	2.1	<5	70	24	2.72	168	<10	69	49	58	<20	<20
Duplicate		41.25	0.21	2.56	1.86	0.02	0.63	32.97	0.03	0.50	0.18			0.02		1.7	50	29	567		44	184	13	1.9	<5	68	25	2.48	154	<10	68	48	57	<20	<20
6468		54.28	0.06	1.26	0.85	0.02	0.28	15.32	0.04	0.20	0.08	24.91	97.30	<0.01		2.3	13	17	335		21	70	6	1.1	<5	35	7	1.11	184	<10	168	25	21	<20	<20
Duplicate																																			
6475		80.95	0.28	5.92	2.46	0.06	0.81	1.29	0.06	1.48	0.07	5.52	98.93	0.03		1.5	21	376	734		19	58	7	1.1	<5	67	108	1.86	496	<10	67	143	33	<20	<20
Duplicate																																			
6481		74.28	0.31	5.28	2.52	0.07	1.49	4.56	0.04	1.32	0.09	6.74	96.73	0.03		1.8	23	26	34		17	71	7	<0.2	<5	29	8	1.87	575	<10	55	142	29	<20	<20
Duplicate																																			
6494		75.57	0.24	4.51	3.26	0.10	2.25	3.10	0.11	1.13	0.08	7.34	97.72	0.03		0.2	25	56	1831		16	95	16	11.0	<5	28	7	2.40	813	<10	86	147	68	<20	<20
Duplicate																																			
6498		75.48	0.25	4.19	2.02	0.03	0.90	6.11	0.04	1.03	0.08	7.07	97.23	0.03		1.3	25	18	242		20	80	6	1.1	<5	38	5	1.46	212	<10	102	150	53	<20	<20
Duplicate		74.89	0.24	4.14	2.01	0.03	0.90	6.08	0.05	1.04	0.08			0.03		1.2	24	17	250		20	80	6	1.1	<5	37	5	1.44	208	<10	83	150	54	<20	<20

ITS Intertek Testing Services
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Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP.
REPORT: V97-02536.0 (COMPLETE)

PROJECT: SILVERTIP
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SAMPLE NUMBER	ELEMENT UNITS	La PPM	Al PCT	Mg PCT	Ca PCT	Na PCT	K PCT	Sr PPM	Y PPM	Ga PPM	Li PPM	Nb PPM	Sc PPM	Ta PPM	Ti PCT	CO2 PCT	Zr PPM
6402		7	1.54	0.26	0.71	0.02	0.74	17	5	3	5	1	<5	<10	<.01	0.85	13
Duplicate																0.83	
6410		7	0.76	0.88	2.34	<.01	0.41	20	11	6	5	1	<5	<10	<.01	3.17	13
Duplicate																	
6412		6	0.83	0.89	1.78	0.01	0.47	45	11	<2	3	<1	<5	<10	<.01	2.89	16
Duplicate		5	0.80	0.84	1.65	<.01	0.44	40	10	<2	3	1	<5	<10	<.01		15
6416		6	0.82	0.78	1.75	0.01	0.44	58	10	<2	2	<1	<5	<10	<.01	2.54	18
Duplicate																2.65	
6437		7	0.86	0.65	1.97	0.02	0.38	32	6	<2	3	1	<5	<10	<.01	2.42	9
Duplicate																2.39	
6452		3	0.28	0.24	>10.00	<.01	0.13	283	11	<2	2	<1	<5	<10	<.01	17.80	5
Duplicate																17.95	
6465		4	0.50	0.22	>10.00	0.02	0.21	193	12	<2	2	1	<5	<10	<.01	15.18	15
Duplicate		4	0.47	0.20	>10.00	0.02	0.19	175	11	<2	2	<1	<5	<10	<.01		13
6468		4	0.15	0.21	>10.00	<.01	0.07	346	11	<2	<1	2	<5	<10	<.01	24.47	4
Duplicate																24.02	
6475		4	0.36	0.35	0.99	<.01	0.18	14	4	<2	1	<1	<5	<10	<.01	1.33	7
Duplicate																1.37	
6481		3	0.48	0.77	3.43	<.01	0.22	103	7	<2	3	<1	<5	<10	<.01	4.57	12
Duplicate																4.61	
6494		6	0.65	1.29	2.33	0.02	0.28	65	6	<2	4	<1	<5	<10	<.01	5.21	6
Duplicate																5.26	
6498		3	0.42	0.41	4.63	<.01	0.19	193	6	<2	2	1	<5	<10	<.01	5.29	7
Duplicate		3	0.42	0.40	4.52	<.01	0.19	189	6	<2	2	<1	<5	<10	<.01		7

ITS Intertek Testing Services
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PROJECT: SILVERTIP

REPORT: V97-02536.0 (COMPLETE) DATE RECEIVED: 22-SEP-97 DATE PRINTED: 14-OCT-97 PAGE 7A(13/14)

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	Total PCT	Cr2O3 PCT	AgGrav PPM
6505		70.52	0.24	3.84	2.70	0.04	2.16	7.11	0.03	1.01	0.08	9.09	96.84	0.02	
Duplicate															
6512		73.96	0.36	6.88	2.27	0.03	1.88	2.84	0.07	1.76	0.08	6.34	96.52	0.05	
Duplicate															
6532		74.59	0.32	5.57	2.34	0.01	1.72	4.24	0.13	1.29	0.10	6.80	97.13	0.02	
Duplicate															
6553		15.45	0.05	0.35	1.11	0.05	0.31	44.25	<.01	0.05	0.01	33.86	95.49s	<0.01	
Duplicate		15.78	0.07	0.39	1.09	0.05	0.32	43.98	<.01	0.06	0.01			<0.01	

SAMPLE NUMBER	Ag PPM	Cu PPM	Pb PPM	Zn PPM	ZnOL PCT	Mo PPM	Ni PPM	Co PPM	Cd PPM	Bi PPM	As PPM	Sb PPM	Fe PCT	Mn PPM	Te PPM	Ba PPM	Cr PPM	V PPM	Sn PPM	W PPM
6505	1.5	26	89	117		17	72	7	0.4	<5	47	9	1.95	319	<10	70	93	39	<20	<20
Duplicate																				
6512	0.5	20	27	61		19	55	7	0.2	<5	28	<5	1.61	231	<10	62	192	30	<20	<20
Duplicate																				
6532	0.3	34	21	153		19	87	9	0.7	<5	32	7	1.75	108	<10	47	82	41	<20	<20
Duplicate																				
6553	2.7	16	13	52		1	3	<1	<0.2	<5	114	9	0.77	465	<10	16	12	2	<20	<20
Duplicate	3.1	19	13	55		2	5	<1	<0.2	<5	130	11	0.87	505	<10	18	13	2	<20	<20

ITS Intertek Testing Services
Bondar Clegg

Geochemical Lab Report

CLIENT: IMPERIAL METALS CORP.
PROJECT: SILVERTIP
REPORT: V97-02536.0 (COMPLETE)
DATE RECEIVED: 22-SEP-97 DATE PRINTED: 14-OCT-97

SAMPLE NUMBER	ELEMENT UNITS	La PPM	Al PCT	Mg PCT	Ca PCT	Na PCT	K PCT	Sr PPM	Y PPM	Ga PPM	Li PPM	Nb PPM	Sc PPM	Ta PPM	Ti PCT	CO2 PCT	Zr PPM
6505		4	0.34	1.14	5.21	<.01	0.16	86	8	<2	2	<1	<5	<10	<.01	7.39	7
Duplicate																7.08	
6512		5	0.66	0.97	2.04	<.01	0.31	68	8	<2	2	1	<5	<10	<.01	3.49	9
Duplicate																3.56	
6532		3	0.51	0.85	3.19	<.01	0.20	142	5	<2	4	<1	<5	<10	<.01	4.11	9
Duplicate																4.13	
6553		3	0.06	0.13	>10.00	<.01	0.02	149	3	<2	<1	2	<5	<10	<.01	33.71	<1
Duplicate		3	0.06	0.15	>10.00	<.01	0.03	166	3	<2	<1	2	<5	<10	<.01		<1

Appendix H

Silvertip Project Quality Control Data

SMEE & ASSOCIATES CONSULTING LTD.
consulting geochemistry / geology

December 29, 1997

Imperial Metals Corp.
#420, 355 Burrard Street
Vancouver, BC
V6L 2G8

Attention: Mr. Steve Robertson

Dear Steve:

RE: SILVERTIP PROJECT
QUALITY CONTROL DATA

I have captured, reviewed and plotted the laboratory and field quality control data for the 1997 drill program on the Silvertip Project, British Columbia. The data is grouped according to element, with the plots attached to this letter. Each element group begins with the blank results, to monitor contamination in the analytical process. This is followed by the laboratory pulp duplicates, the laboratory preparation duplicates, and the field duplicates.

The Pb field blank shows possible contamination at blank #9, 14 and 15. Either the blank was mineralized, or the laboratory did not clean equipment properly from sample to sample. The Pb pulp duplicates repeat extremely well, with only minor differences showing at the higher concentrations. This is clearly illustrated on the difference vs. mean of duplicate plot. The preparation duplicates show one high grade sample not reporting well. This could be a sampling discrepancy created by a massive sulphide particle at the initial splitting stage, or a numbering problem when the duplicate is actually not in the correct analytical order. I suspect the former to be the likely problem, as the other QC samples repeated well. The field duplicates, which consisted of two quartered core samples show the poorest precision, with differences between duplicates up to 40%. This is not unusual when dealing with coarse-grained massive sulphides, and illustrates that care must be taken when selecting core samples.

The field blanks for Zn shows a potential problem at blanks 14 and 15: the same as the Pb samples. The pulp duplicates reproduce well, and the pulp difference vs. mean plot shows a constant variation with increasing grade. This is indicative of a lack of nugget or other sampling errors. The preparation duplicates show an increase in variation between duplicates. The field duplicates show the largest variation; again, indicative that the majority of the error introduced in the sampling and analysis is in the selection of the core sample.

Ag shows potential contamination at field blanks 14 and 15. The pulp duplicates show that the pulps are comparatively homogeneous, with the exception of one sample. The preparation duplicates illustrate a

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slight decrease in precision, while the field duplicates show a substantial decrease in precision (compare the difference vs. mean graph scales).

The Au field blank chart shows potential contamination at blank #7. As none of the other elements appear to be contaminated in this sample, perhaps the blank chosen contained Au and does not reflect a laboratory problem. Pulp duplicates for Au repeated fairly well, but the preparation duplicates begin to exhibit a potential nugget effect pattern, with increasing differences with increasing Au grade. This is also exhibited by the few higher grade field duplicates, and suggests that the Au may occur both as disseminated and free gold at the Silvertip deposit.

These data suggest that the sampling and analytical methods used at Silvertip were acceptable according to industry standard. The two anomalous blank samples (14 and 15) should be examined closely. Should laboratory contamination be suspected, the entire work order should be reanalyzed from reject material. Similarly, blank #7 should be examined for Au. This analytical batch should be reanalyzed for Au if the blank is unlikely to contain naturally occurring Au.

One preparation duplicate does not repeat well for Pb, Zn or Ag. This sample (140046) should be examined in the context of geology to determine if the poor reproducibility could be expected. The laboratory should then be asked to examine the worksheets for a possible sample misnumbering problem.

The QC data on the Silvertip Project monitored potential contamination and the precision of sampling and analysis. Accuracy, using standard samples as controls, was not monitored. The next round of drilling should use standards to provide an estimate of accuracy.

Yours sincerely,

BW Smee

Barry W. Smee, Ph.D., P.Geo.

Attach.

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Imperial Metals Corp.
Silvertip Project
Bondar Clegg Quality Control Data

PULP DUPLICATES

WO #	SAMPLE	PB1	PB2	PB MEAN	PB DIF	ZN1	ZN2	ZN MEAN	ZN DIF	AG 1	AG2	AG MEAN	AG DIF	AU1	AU2
9701551.0	139501	0.05	0.03	0.04	0.02	0.43	0.42	0.425	0.01						
9701551.0	136502													2	6
9701551.0	139506					4	3.8	3.9	0.2						
9701551.0	139520									123	120.6	121.8	2.4		
9701551.0	139525	0.01	0.01	0.01	0	0.01	0.01	0.01	0					2	11
9701551.0	139527									525.6	519.7	522.65	5.9		
9701551.0	139530	5.32	5.4	5.36	0.08	9.93	9.72	9.825	0.21						
9701551.0	139535	13.46	13.41	13.435	0.05	10.19	10.61	10.4	0.42						
9701551.0	139539									551.1	543.4	547.25	7.7		
9701551.0	139540	12.52	12.78	12.65	0.26										
9701658.0	139578	0.04	0.04	0.04	0	0.09	0.09	0.09	0						
9701658.0	139583									569.4	543.7	556.55	25.7		
9701661.0	139545	1.7	1.72	1.71	0.02	1.18	1.2	1.19	0.02						
9701661.0	139546	0.054	0.055	0.0545	0.001	0.065	0.064	0.0645	0.001	2.4	2.4	2.4	0	2	2
9701661.0	139550									2	1.5	1.75	0.5		
9701661.0	139552														
9701661.0	139554	11.68	11.72	11.7	0.04	11.88	11.74	11.81	0.14						
9701663.0	139562	0.51	0.5	0.505	0.01	0.82	0.8	0.81	0.02	23.6	23.3	23.45	0.3	22	18
9701663.0	139564									868.2	890.3	879.25	22.1		
9701663.0	139568	0.59	0.62	0.605	0.03	0.38	0.39	0.385	0.01						
9701663.0	139573	0.05	0.04	0.045	0.01	0.01	0.01	0.01	0						
9701663.0	139576									237.1	246	241.55	8.9		
9701664.0	140951					0.41	0.4	0.405	0.01						
9701664.0	140955	0.059	0.052	0.0555	0.007	0.003	0.001	0.002	0.002	5.1	4.6	4.85	0.5	2	22
9701664.0	140956									0.3	0.3	0.3	0		
9701664.0	140960	0.05	0.06	0.055	0.01	2.26	2.28	2.27	0.02						
9701975.0	139663	0.03	0.04	0.035	0.01	0.09	0.1	0.095	0.01						
9701975.0	139668	0.222	0.243	0.2325	0.021	0.48	0.512	0.496	0.032	14.1	14	14.05	0.1	24	18
9701975.0	139680									285.7	285.2	285.45	0.5		
9701975.0	139685									183.7	185.6	184.65	1.9		
9701975.0	139690													1164	1166
9701975.0	139691									15.7	15.8	15.75	0.1		
9701975.0	139672	6.5	6.56	6.53	0.06	6	6.22	6.11	0.22						
9701975.0	139677	13.07	12.71	12.89	0.36	6.49	6.53	6.51	0.04						

Imperial Metals Corp.
Silvertip Project
Bondar Clegg Quality Control Data

PULP DUPLICATES

WO #	SAMPLE	PB1	PB2	PB MEAN	PB DIF	ZN1	ZN2	ZN MEAN	ZN DIF	AG 1	AG2	AG MEAN	AG DIF	AU1	AU2
9701975.0	139678														
9701975.0	139682	4.3	4.31	4.305	0.01										
9701975.0	139692	0.06	0.06	0.06	0	0.07	0.07	0.07	0						
9702119.0	140970									79.6	76.6	78.1	3		
9702119.0	140974	4.58	4.54	4.56	0.04	1.84	1.83	1.835	0.01	99.6	101.9	100.75	2.3	273	284
9702119.0	140965	0.51	0.52	0.515	0.01	0.25	0.26	0.255	0.01						
9702189.0	139770									2.3	2.7	2.5	0.4		
9702189.0	139774	0.2	0.2	0.2	0	3.67	3.58	3.625	0.09	212	219	215.5	7	25	25
9702189.0	139782									30.1	28.7	29.4	1.4		
9702189.0	139711	0.03	0.03	0.03	0	0.3	0.31	0.305	0.01						
9702189.0	139779	0.04	0.04	0.04	0	0.83	0.83	0.83	0						
9702189.0	139784	0.4	0.4	0.4	0	0.5	0.5	0.5	0						
9702212.0	139697					0.822	0.804	0.813	0.018	68.1	58.9	63.5	9.2	50	56
9702212.0	139700									53.7	58.1	55.9	4.4		
9702212.0	139695	0.02	0.02	0.02	0	0.23	0.23	0.23	0						
9702212.0	139709	0.06	0.06	0.06	0	0.08	0.08	0.08	0						
9702213.0	139754	0.003	0.003	0.003	0	0.17	0.169	0.1695	0.001	0.3	0.3	0.3	0	8	8
9702213.0	139756									10.1	12.9	11.5	2.8		
9702213.0	139768	0.01	0.01	0.01	0	0.01	0.01	0.01	0	0.5	0.5	0.5	0		
9702213.0	139760	0.23	0.23	0.23	0	3.21	3.14	3.175	0.07						
9702213.0	139765	0.19	0.19	0.19	0	10.12	9.95	10.035	0.17						
9702281.0	140980					0.991	0.934	0.9625	0.057	13.5	13.8	13.65	0.3	67	67
9702281.0	139788									3.3	3.3	3.3	0		
9702281.0	139790	0.011	0.012	0.0115	0.001	0.033	0.036	0.0345	0.003	2.8	2.8	2.8	0		
9702281.0	139803													48	26
9702281.0	139818	0.001	0.001	0.001	0	0.016	0.011	0.0135	0.005	2.2	2.3	2.25	0.1		
9702281.0	140979	4.21	4.17	4.19	0.04	2.35	2.2	2.275	0.15						
9702281.0	139738														
9702281.0	139743	2.21	2.21	2.21	0										
9702281.0	139748	5.38	5.32	5.35	0.06	9.29	9.22	9.255	0.07						
9702281.0	139809	0.23	0.24	0.235	0.01	0.42	0.4	0.41	0.02						
9702281.0	139813	5.52	5.48	5.5	0.04	6.41	6.44	6.425	0.03						
9702282.0	139718									63.6	53.9	58.75	9.7	916	974
9702282.0	139721									200.3	221.9	211.1	21.6		

Imperial Metals Corp.
Silvertip Project
Bondar Clegg Quality Control Data

PULP DUPLICATES

WO #	SAMPLE	PB1	PB2	PB MEAN	PB DIF	ZN1	ZN2	ZN MEAN	ZN DIF	AG 1	AG2	AG MEAN	AG DIF	AU1	AU2
9702282.0	139726									43.4	46.1	44.75	2.7		
9702282.0	139735	0.004	0.004	0.004	0	0.051	0.053	0.052	0.002						
9702282.0	139716	0.03	0.03	0.03	0	0.1	0.1	0.1	0						
9702282.0	139719														
9702282.0	139725	4.51	4.5	4.505	0.01	5.36	5.42	5.39	0.06						
9702282.0	139730	0.01	0.02	0.015	0.01	1.71	1.75	1.73	0.04						
9702377.0	139797									120.4	121.4	120.9	1		
9702377.0	139799	0.221	0.234	0.2275	0.013	0.195	0.205	0.2	0.01	101.2	104.3	102.75	3.1	65	64
9702377.0	139853									160.2	149.7	154.95	10.5		
9702377.0	139792	0.41	0.38	0.395	0.03	0.2	0.2	0.2	0						
9702377.0	139819	0.03	0.02	0.025	0.01	0.12	0.12	0.12	0						
9702377.0	139824	0.001	0.001	0.001	0	0.001	0.001	0.001	0						
9702377.0	139855	0.44	0.42	0.43	0.02	0.71	0.71	0.71	0						
9702378.0	139825	0.001	0.001	0.001	0	0.001	0.001	0.001	0						
9702378.0	139830									8.8	8.9	8.85	0.1		
9702378.0	139833	0.033	0.035	0.034	0.002	0.102	0.108	0.105	0.006	2.2	2.2	2.2	0	6	2.5
9702378.0	139842									133.2	133.5	133.35	0.3		
9702378.0	139850	0.042	0.041	0.0415	0.001	0.823	0.802	0.8125	0.021	6.8	4.7	5.75	2.1		
9702378.0	139861									0.35	0.35	0.35	0		
9702378.0	139834	0.05	0.05	0.05	0	0.09	0.1	0.095	0.01						
9702378.0	139839	5.53	5.57	5.55	0.04	10.95	10.95	10.95	0						
9702378.0	139844	0.63	0.63	0.63	0	6.91	7.01	6.96	0.1						
9702378.0	139849	0.005	0.005	0.005	0	0.005	0.005	0.005	0						
9702378.0	139862	0.005	0.005	0.005	0	0.1	0.09	0.095	0.01						
9702378.0	139866	0.005	0.005	0.005	0	0.005	0.005	0.005	0						
9702378.0	140001	0.002	0.002	0.002	0	0.024	0.026	0.025	0.002	0.1	0.1	0.1	0		
9702433.0	139877	0.005	0.02	0.0125	0.015	0.06	0.06	0.06	0						
9702433.0	139880	0.026	0.029	0.0275	0.003	0.934	0.954	0.944	0.02	2.1	2.1	2.1	0	17	15
9702433.0	139882									8.4	8.8	8.6	0.4		
9702433.0	139894									5.7	5.2	5.45	0.5		
9702433.0	139897	0.826	0.927	0.8765	0.101										
9702433.0	139902													490	495
9702433.0	140003									9.7	9.1	9.4	0.6		
9702433.0	140014	0.004	0.004	0.004	0	0.004	0.006	0.005	0.002	0.035	0.035	0.035	0		

Imperial Metals Corp.
Silvertip Project
Bondar Clegg Quality Control Data

PULP DUPLICATES

WO #	SAMPLE	PB1	PB2	PB MEAN	PB DIF	ZN1	ZN2	ZN MEAN	ZN DIF	AG 1	AG2	AG MEAN	AG DIF	AU1	AU2
9702433.0	139886	2.63	2.71	2.67	0.08										
9702433.0	139896					13.64	13.76	13.7	0.12						
9702433.0	140004	0.33	0.33	0.33	0	0.18	0.19	0.185	0.01						
9702433.0	140008	0.2	0.2	0.2	0	1.15	1.17	1.16	0.02						
9702433.0	140016	10.57	10.45	10.51	0.12	8	7.81	7.905	0.19						
9702433.0	140025													79	35
9702433.0	140031	0.005	0.005	0.005	0	9.27	9.34	9.305	0.07						
9702433.0	140021	8.99	9.18	9.085	0.19	9.61	9.52	9.565	0.09						
9702433.0	140026	1.29	1.29	1.29	0	4.45	4.31	4.38	0.14						
9702501.0	139910									1645.8	1649.5	1647.65	3.7		
9702501.0	139913	0.015	0.014	0.0145	0.001	0.045	0.052	0.0485	0.007	1.7	1.3	1.5	0.4	7	8
9702501.0	139922									116.2	119.2	117.7	3		
9702501.0	139930									82.7	89.2	85.95	6.5		
9702501.0	139933									1224.8	1238.4	1231.6	13.6		
9702501.0	139944					0.198	0.29	0.244	0.092	83.7	85.4	84.55	1.7		
9702501.0	139905	0.005	0.005	0.005	0	0.005	0.005	0.005	0						
9702501.0	139914	9.17	9.07	9.12	0.1	8.54	8.45	8.495	0.09						
9702501.0	139919	2.01	2.08	2.045	0.07	8.91	8.71	8.81	0.2						
9702501.0	139924	3.2	3.26	3.23	0.06	6.92	6.84	6.88	0.08						
9702501.0	139929	0.9	0.88	0.89	0.02	0.78	0.76	0.77	0.02						
9702501.0	139934	1	0.98	0.99	0.02	0.52	0.51	0.515	0.01						
9702501.0	139938	6.98	7.05	7.015	0.07	5.24	5.21	5.225	0.03						
9702501.0	139946	6.5	6.56	6.53	0.06	7.67	7.64	7.655	0.03						
9702501.0	139949	0.032	0.031	0.0315	0.001	0.395	0.414	0.4045	0.019	3.3	3.5	3.4	0.2		
9702535.0	139978	5.86	5.91	5.885	0.05	13.04	13.21	13.125	0.17	1195.9	1193.5	1194.7	2.4	1504	1445
9702535.0	140081									22.7	29.7	26.2	7		
9702535.0	140086									352.9	237	294.95	115.9		
9702535.0	140091													96	92
9702535.0	140092									3.2	3.8	3.5	0.6		
9702535.0	140103									8.5	9.5	9	1		
9702535.0	139973	0.01	0.01	0.01	0	0.05	0.05	0.05	0						
9702535.0	139982														
9702535.0	140083	11.12	11.33	11.225	0.21										
9702535.0	140088	1.41	1.34	1.375	0.07	3.64	3.73	3.685	0.09						

Imperial Metals Corp.
Silvertip Project
Bondar Clegg Quality Control Data

PULP DUPLICATES

WO #	SAMPLE	PB1	PB2	PB MEAN	PB DIF	ZN1	ZN2	ZN MEAN	ZN DIF	AG 1	AG2	AG MEAN	AG DIF	AU1	AU2
9702535.0	140093	0.005	0.005	0.005	0	0.03	0.03	0.03	0						
9702535.0	140097	0.46	0.46	0.46	0	0.79	0.81	0.8	0.02						
9702535.0	140105	0.04	0.04	0.04	0	0.23	0.24	0.235	0.01						
9702536.0	6410									64.4	61.3	62.85	3.1		
9702536.0	6412	0.007	0.007	0.007	0	0.015	0.015	0.015	0	2.9	2.7	2.8	0.2		
9702536.0	6465	0.003	0.003	0.003	0	0.055	0.057	0.056	0.002	1.7	1.7	1.7	0		
9702536.0	6553	0.001	0.001	0.001	0	0.005	0.006	0.0055	0.001	2.7	3.1	2.9	0.4		
9702536.0	6498														
9702565.0	139955	0.18	0.19	0.185	0.01	0.07	0.08	0.075	0.01	430.9	415.9	423.4	15	2317	2315
9702565.0	139967									10.7	12.2	11.45	1.5		
9702565.0	139972	0.006	0.006	0.006	0	0.012	0.011	0.0115	0.001	0.1	0.1	0.1	0		
9702565.0	140038													4531	4652
9702565.0	140039									221.9	220.1	221	1.8		
9702565.0	140050									0.35	0.35	0.35	0		
9702565.0	140052	0.008	0.009	0.0085	0.001	0.06	0.061	0.0605	0.001	0.1	0.1	0.1	0		
9702565.0	139956														
9702565.0	139969	5.07	5.09	5.08	0.02	4.9	4.98	4.94	0.08						
9702565.0	140035	3.03	3.08	3.055	0.05	13.55	13.67	13.61	0.12						
9702565.0	140040					8.84	8.76	8.8	0.08						
9702565.0	140044	12.47	12.51	12.49	0.04										
9702565.0	140059													1686	1652
9702565.0	140061									10.5	10.4	10.45	0.1		
9702565.0	140073									737.1	727.3	732.2	9.8		
9702565.0	140057	7.88	7.9	7.89	0.02	12.62	12.47	12.545	0.15						
9702565.0	140062	0.01	0.01	0.01	0	0.01	0.02	0.015	0.01						
9702565.0	140067	9.51	9.45	9.48	0.06										
9702565.0	140068														
9702565.0	140072					9.4	9.46	9.43	0.06						
9702717.0	140249									0.35	0.35	0.35	0		
9702717.0	140251	0.002	0.002	0.002	0	0.028	0.028	0.028	0	0.3	0.3	0.3	0	2.5	6
9702717.0	140261									7	7	7	0		
9702717.0	140268	0.977	0.926	0.9515	0.051	0.004	0.004	0.004	0	20.9	20.9	20.9	0		
9702717.0	140272									99.8	99.7	99.75	0.1		
9702717.0	140267	0.003	0.003	0.003	0	0.002	0.002	0.002	0	0.35	0.5	0.425	0.15		

Imperial Metals Corp.
Silvertip Project
Bondar Clegg Quality Control Data

PULP DUPLICATES

WO #	SAMPLE	PB1	PB2	PB MEAN	PB DIF	ZN1	ZN2	ZN MEAN	ZN DIF	AG 1	AG2	AG MEAN	AG DIF	AU1	AU2
9702717.0	140981	0.41	0.42	0.415	0.01										
9702717.0	140253	0.005	0.005	0.005	0	0.005	0.005	0.005	0						
9702717.0	140258	0.41	0.4	0.405	0.01	0.54	0.51	0.525	0.03						
9702717.0	140263	0.01	0.005	0.0075	0.005	0.5	0.49	0.495	0.01						
9702717.0	140273	5.53	5.54	5.535	0.01	0.98	0.97	0.975	0.01						
9702717.0	140277	0.01	0.02	0.015	0.01	0.005	0.01	0.0075	0.005						
9702717.0	140285	0.005	0.005	0.005	0	0.005	0.005	0.005	0						
9702717.0	140294									1.9	2	1.95	0.1		
9702717.0	140304	0.001	0.001	0.001	0	0.015	0.014	0.0145	0.001	0.035	0.03	0.0325	0.005		
9702717.0	140306									0.035	0.035	0.035	0		
9702717.0	140360	0.06	0.06	0.06	0	0.202	0.207	0.2045	0.005	1.3	1.3	1.3	0		
9702717.0	140290	0.79	0.81	0.8	0.02	0.65	0.69	0.67	0.04						
9702717.0	140295	0.005	0.005	0.005	0	0.36	0.36	0.36	0						
9702717.0	140300	0.005	0.01	0.0075	0.005	0.55	0.56	0.555	0.01						
9702717.0	140305	0.005	0.005	0.005	0	0.01	0.005	0.0075	0.005						
9702717.0	140309	0.005	0.005	0.005	0	0.005	0.005	0.005	0						
9702717.0	140355	0.005	0.005	0.005	0	0.02	0.02	0.02	0						
9702717.0	140359	0.13	0.13	0.13	0	0.13	0.15	0.14	0.02						
9702717.0	140364	0.02	0.02	0.02	0	0.14	0.13	0.135	0.01						
9702717.0	140369	0.03	0.03	0.03	0	0.64	0.64	0.64	0						

WO #	SAMPLE	AU MEAN	AU DIF	SN 1	SN 2	SN MEAN	SN DIF
9701551.0	139501						
9701551.0	136502	4	4				
9701551.0	139506			4334	4339	4336.5	5
9701551.0	139520						
9701551.0	139525	6.5	9	9	9	9	0
9701551.0	139527						
9701551.0	139530						
9701551.0	139535						
9701551.0	139539						
9701551.0	139540						
9701658.0	139578						
9701658.0	139583						
9701661.0	139545						
9701661.0	139546	2	0				
9701661.0	139550						
9701661.0	139552			284	276	280	8
9701661.0	139554						
9701663.0	139562	20	4	317	303	310	14
9701663.0	139564						
9701663.0	139568						
9701663.0	139573						
9701663.0	139576						
9701664.0	140951						
9701664.0	140955	12	20	10	10	10	0
9701664.0	140956						
9701664.0	140960						
9701975.0	139663						
9701975.0	139668						
9701975.0	139680						
9701975.0	139685						
9701975.0	139690						
9701975.0	139691						
9701975.0	139672						
9701975.0	139677						

WO #	SAMPLE	AU MEAN	AU DIF	SN 1	SN 2	SN MEAN	SN DIF
9701975.0	139678			792	739	765.5	53
9701975.0	139682						
9701975.0	139692						
9702119.0	140970						
9702119.0	140974			244	246	245	2
9702119.0	140965						
9702189.0	139770						
9702189.0	139774			10	10	10	0
9702189.0	139762						
9702189.0	139711						
9702189.0	139779						
9702189.0	139784						
9702212.0	139697			10	10	10	0
9702212.0	139700						
9702212.0	139695						
9702212.0	139709						
9702213.0	139754			10	10	10	0
9702213.0	139756						
9702213.0	139768						
9702213.0	139760						
9702213.0	139765						
9702281.0	140980			10	10	10	0
9702281.0	139786			10	10	10	0
9702281.0	139790			10	10	10	0
9702281.0	139803						
9702281.0	139818			10	10	10	0
9702281.0	140979						
9702281.0	139738			130	126	128	4
9702281.0	139743						
9702281.0	139748						
9702281.0	139809						
9702281.0	139813						
9702282.0	139718			10	10	10	0
9702282.0	139721						

WO #	SAMPLE	AU MEAN	AU DIF	SN 1	SN 2	SN MEAN	SN DIF
9702282.0	139726						
9702282.0	139735			10	10	10	0
9702282.0	139716						
9702282.0	139719			102	117	109.5	15
9702282.0	139725						
9702282.0	139730						
9702377.0	139797						
9702377.0	139799			10	10	10	0
9702377.0	139853						
9702377.0	139792						
9702377.0	139819						
9702377.0	139824						
9702377.0	139855						
9702378.0	139825						
9702378.0	139830						
9702378.0	139833			10	10	10	0
9702378.0	139842						
9702378.0	139850			10	10	10	0
9702378.0	139861						
9702378.0	139834			14	14	14	0
9702378.0	139839						
9702378.0	139844						
9702378.0	139849						
9702378.0	139862						
9702378.0	139866						
9702378.0	140001			10	10	10	0
9702433.0	139877						
9702433.0	139880			10	10	10	0
9702433.0	139882						
9702433.0	139894						
9702433.0	139897			10	10	10	0
9702433.0	139902						
9702433.0	140003						
9702433.0	140014			10	10	10	0

WO #	SAMPLE	AU MEAN	AU DIF	SN 1	SN 2	SN MEAN	SN DIF
9702433.0	139886			1554	1638	1596	84
9702433.0	139896						
9702433.0	140004						
9702433.0	140008						
9702433.0	140016			1046	1155	1100.5	109
9702433.0	140025						
9702433.0	140031			10	10	10	0
9702433.0	140021						
9702433.0	140026						
9702501.0	139910						
9702501.0	139913			6	11	8.5	5
9702501.0	139922						
9702501.0	139930			316	324	320	8
9702501.0	139933						
9702501.0	139944						
9702501.0	139905						
9702501.0	139914						
9702501.0	139919						
9702501.0	139924						
9702501.0	139929						
9702501.0	139934						
9702501.0	139938						
9702501.0	139946						
9702501.0	139949			10	10	10	0
9702535.0	139978			10	10	10	0
9702535.0	140081						
9702535.0	140086			47	27	37	20
9702535.0	140091			162	151	156.5	11
9702535.0	140092						
9702535.0	140103						
9702535.0	139973						
9702535.0	139982						
9702535.0	140083						
9702535.0	140088						

WO #	SAMPLE	AU MEAN	AU DIF	SN 1	SN 2	SN MEAN	SN DIF
9702535.0	140093						
9702535.0	140097						
9702535.0	140105						
9702536.0	6410						
9702536.0	6412			10	10	10	0
9702536.0	6465			10	10	10	0
9702536.0	6553			10	10	10	0
9702536.0	6498			10	10	10	0
9702565.0	139955			342	299	320.5	43
9702565.0	139967						
9702565.0	139972			10	10	10	0
9702565.0	140038			565	677	621	112
9702565.0	140039						
9702565.0	140050						
9702565.0	140052			10	10	10	0
9702565.0	139956			4485	4300	4392.5	185
9702565.0	139969						
9702565.0	140035						
9702565.0	140040						
9702565.0	140044						
9702565.0	140059						
9702565.0	140061						
9702565.0	140073						
9702565.0	140057						
9702565.0	140062						
9702565.0	140067						
9702565.0	140068			2728	2774	2751	46
9702565.0	140072						
9702717.0	140249						
9702717.0	140251			10	10	10	0
9702717.0	140261						
9702717.0	140268			10	10	10	0
9702717.0	140272			422	389	405.5	33
9702717.0	140287			10	10	10	0

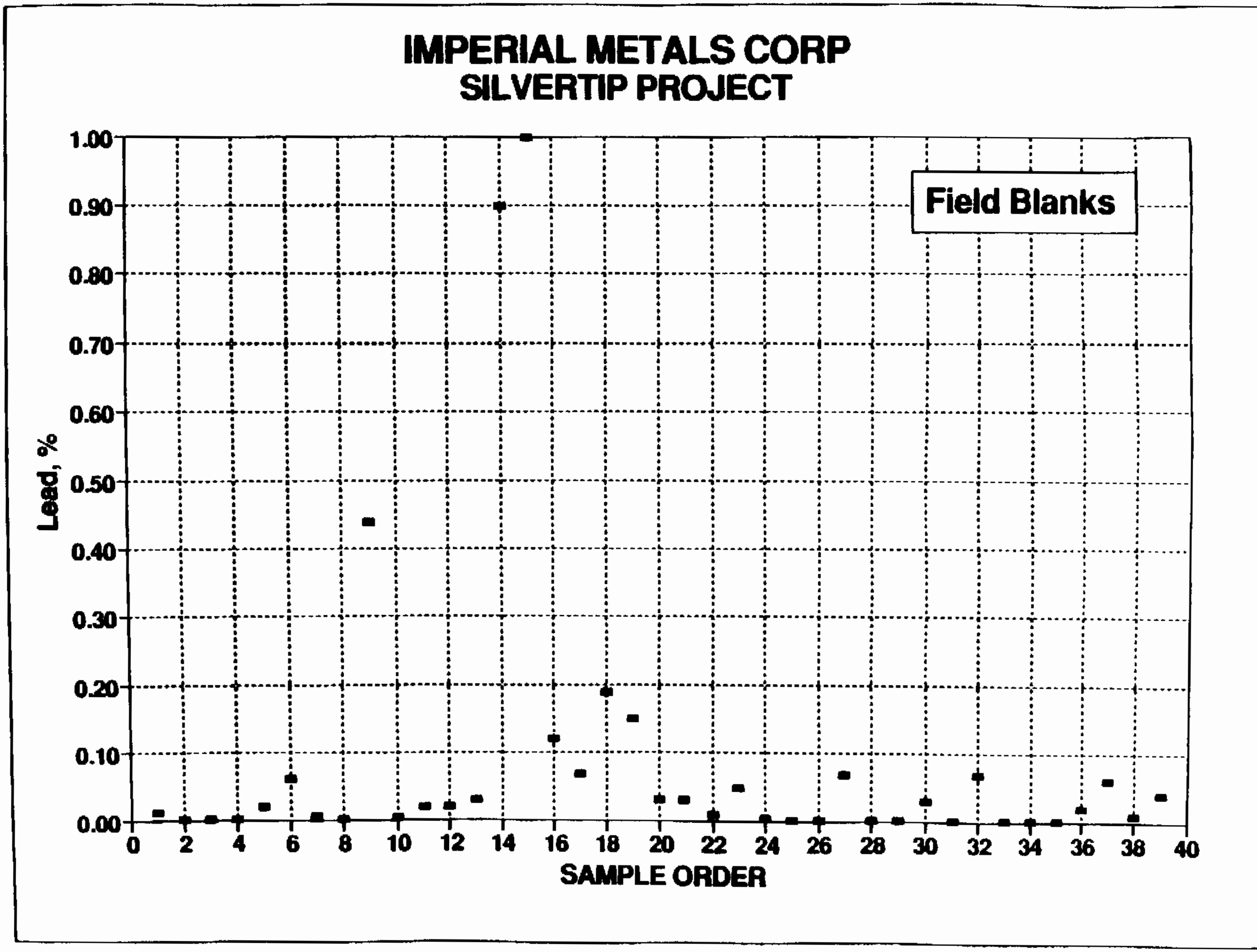
WO #	SAMPLE	AU MEAN	AU DIF	SN 1	SN 2	SN MEAN	SN DIF
9702717.0	140961						
9702717.0	140253						
9702717.0	140258						
9702717.0	140263						
9702717.0	140273						
9702717.0	140277						
9702717.0	140285						
9702717.0	140294						
9702717.0	140304			10	10	10	0
9702717.0	140306						
9702717.0	140360			10	10	10	0
9702717.0	140290						
9702717.0	140295						
9702717.0	140300						
9702717.0	140305						
9702717.0	140309						
9702717.0	140355						
9702717.0	140359						
9702717.0	140364						
9702717.0	140369						

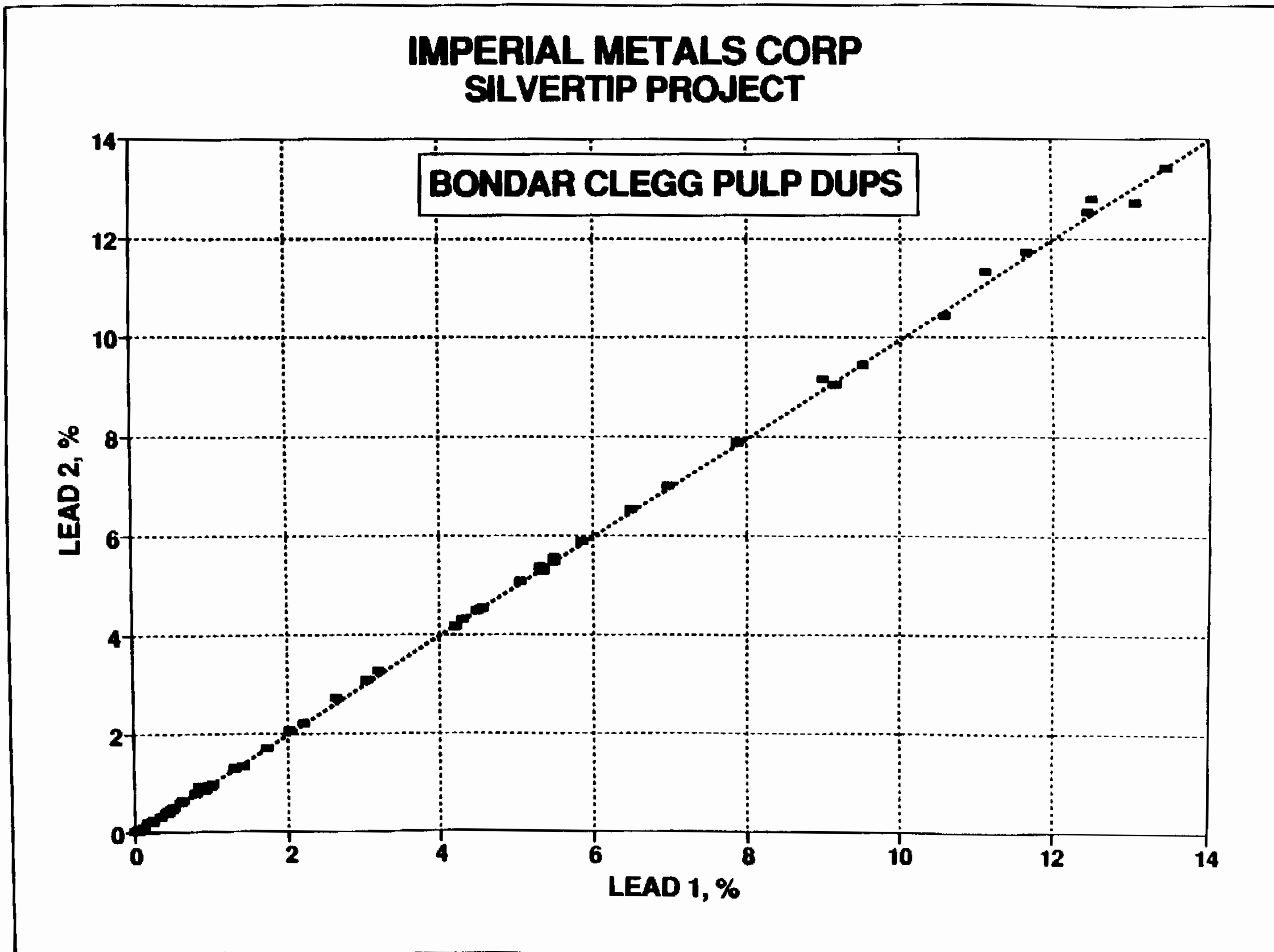
Imperial Metals Corp.
Silvertip Project
Bondar Clegg Quality Control Data

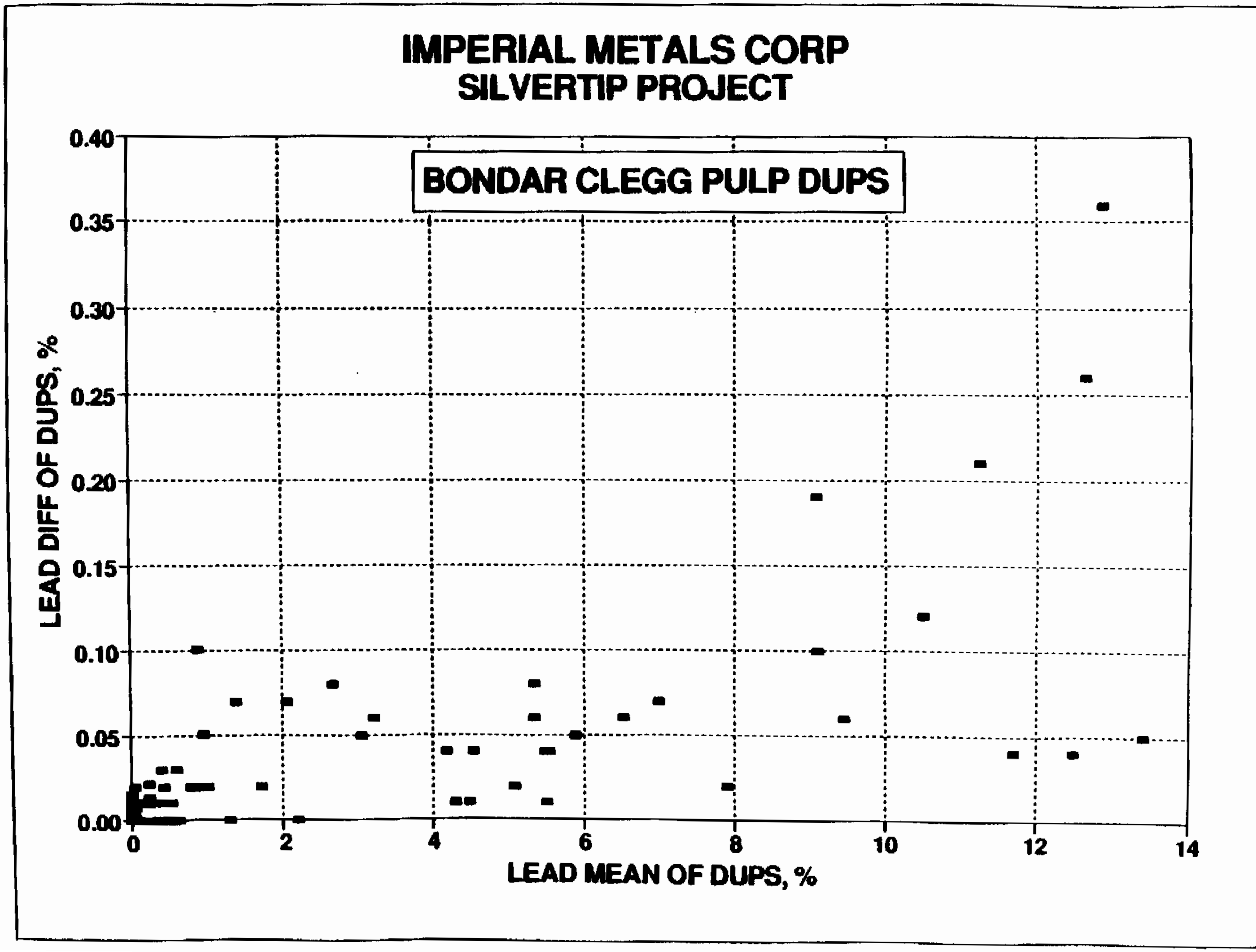
PREP DUPLICATES

WO #	SAMPLE	PB1	PB2	PB MEAN	PB DIF	ZN1	ZN2	ZN MEAN	ZN DIF	AG 1	AG2	AG MEAN	AG DIF	AU1	AU2
9701551.0	139533	1.72	1.83	1.775	0.11	2.2	2.16	2.18	0.04	54.3	62	58.15	7.7		
9701551.0	139543	0.06	0.05	0.055	0.01	0.06	0.04	0.05	0.02	2.8	2.7	2.75	0.1	2	7
9701661.0	139549	0.006	0.007	0.0065	0.001	0.05	0.07	0.06	0.02	1.1	0.9	1	0.2	27	2
9701663.0	139560	1.24	1.26	1.25	0.02	2.88	2.82	2.85	0.06	51.7	51.7	51.7	0	30	38
9701664.0	140954	7.57	7.39	7.48	0.18	1.43	1.42	1.425	0.01	367.7	390.8	379.25	23.1	1368	1489
9701975.0	139687	0.009	0.007	0.008	0.002	0.017	0.013	0.015	0.004	1	0.6	0.8	0.4	0.25	0.25
9701975.0	139678	0.01	0.02	0.015	0.01	0.01	0.02	0.015	0.01						
9702189.0	139776	0.84	0.97	0.905	0.13	6.52	6.03	6.275	0.49	35.1	35	35.05	0.1	28	24
9702212.0	139704	2.82	2.73	2.775	0.09	9.62	9.36	9.49	0.26	101.3	104.5	102.9	3.2	1931	1975
9702213.0	139751	0.035	0.038	0.0365	0.003	0.557	0.615	0.586	0.058	2.2	2.2	2.2	0	15	11
9702281.0	139749					12.24	12.85	12.545	0.61	192.6	179.9	186.25	12.7	2398	3434
9702282.0	139728	0.083	0.07	0.0765	0.013	0.394	0.33	0.362	0.064	4.2	4.7	4.45	0.5	30	38
9702377.0	139823	0.002	0.003	0.0025	0.001	0.014	0.015	0.0145	0.001	3.8	3.6	3.7	0.2		
9702378.0	139835	0.011	0.012	0.0115	0.001	0.047	0.047	0.047	0					15	2.5
9702378.0	139876	0.004	0.004	0.004	0	0.001	0.006	0.0035	0.005	0.1	0.1	0.1	0	2.5	2.5
9702433.0	140021													361	269
9702433.0	140023	0.106	0.094	0.1	0.012	0.417	0.423	0.42	0.006	10.6	8.1	9.35	2.5	15	38
9702501.0	139917									99.2	117.5	108.35	18.3	2170	2731
9702501.0	139948	0.031	0.037	0.034	0.006	0.078	0.08	0.079	0.002	1.5	1.8	1.65	0.3	2.5	7
9702535.0	139982	0.043	0.046	0.0445	0.003	0.445	0.476	0.4605	0.031	0.2	0.2	0.2	0		
9702535.0	140104	0.347	0.289	0.318	0.058	3.8	3.6	3.7	0.2	15.6	12.9	14.25	2.7	115	124
9702565.0	140046	9.17	7.22	8.195	1.95	14.23	16.85	15.54	2.62	338	267	302.5	71	1686	2119
9702717.0	140248	0.255	0.264	0.2595	0.009					12.3	10.9	11.6	1.4	13	12
9702717.0	140354									3.5	3.5	3.5	0	2.5	2.5
9702717.0	140367	0.003	0.003	0.003	0	0.116	0.124	0.12	0.008	0.3	0.3	0.3	0	2.5	2.5

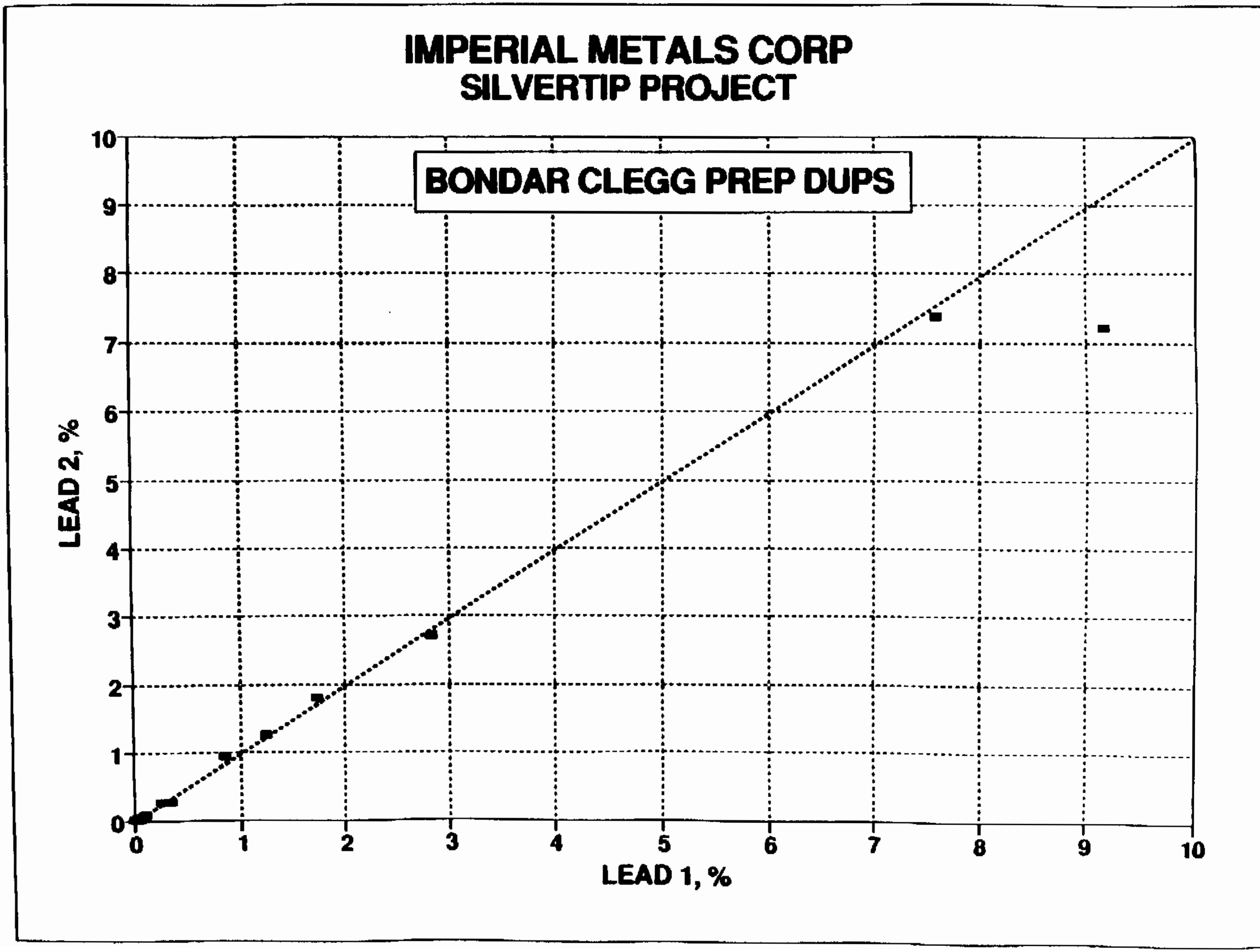
WO #	SAMPLE	AU MEAN	AU DIF	SN 1	SN 2	SN MEAN	SN DIF
9701551.0	139533			219	238	228.5	19
9701551.0	139543	4.5	5				
9701661.0	139549	14.5	25				
9701663.0	139560	34	8	250	225	237.5	25
9701664.0	140954	1428.5	121	154	187	170.5	33
9701975.0	139687	0.25	0				
9701975.0	139678						
9702189.0	139776	26	4	10	10	10	0
9702212.0	139704	1953	44	10	10	10	0
9702213.0	139751	13	4	10	10	10	0
9702281.0	139749	2916	1036				
9702282.0	139728	34	8	10	10	10	0
9702377.0	139823			10	10	10	0
9702378.0	139835	8.75	12.5	10	10	10	0
9702378.0	139876	2.5	0	10	10	10	0
9702433.0	140021	315	92				
9702433.0	140023	26.5	23	16	16	16	0
9702501.0	139917	2450.5	561	864	2259	1561.5	1395
9702501.0	139948	4.75	4.5	10	10	10	0
9702535.0	139982			10	10	10	0
9702535.0	140104	119.5	9				
9702565.0	140046	1902.5	433	295	333	314	38
9702717.0	140248	12.5	1				
9702717.0	140354	2.5	0				
9702717.0	140367	2.5	0	10	10	10	0

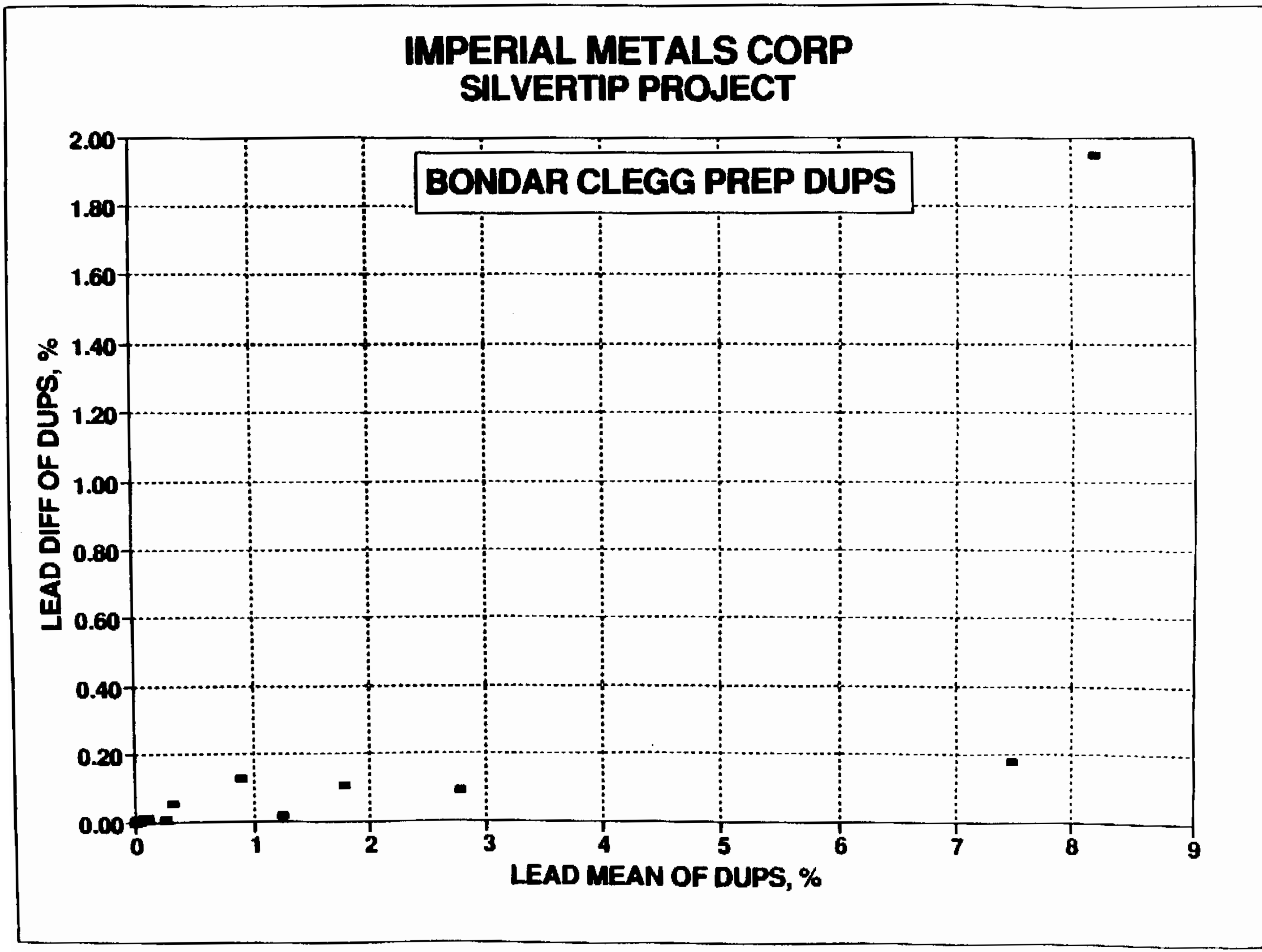

IMPERIAL METALS CORP
SILVERTIP PROJECT
Field Blanks
Lead, %
SAMPLE ORDER
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40

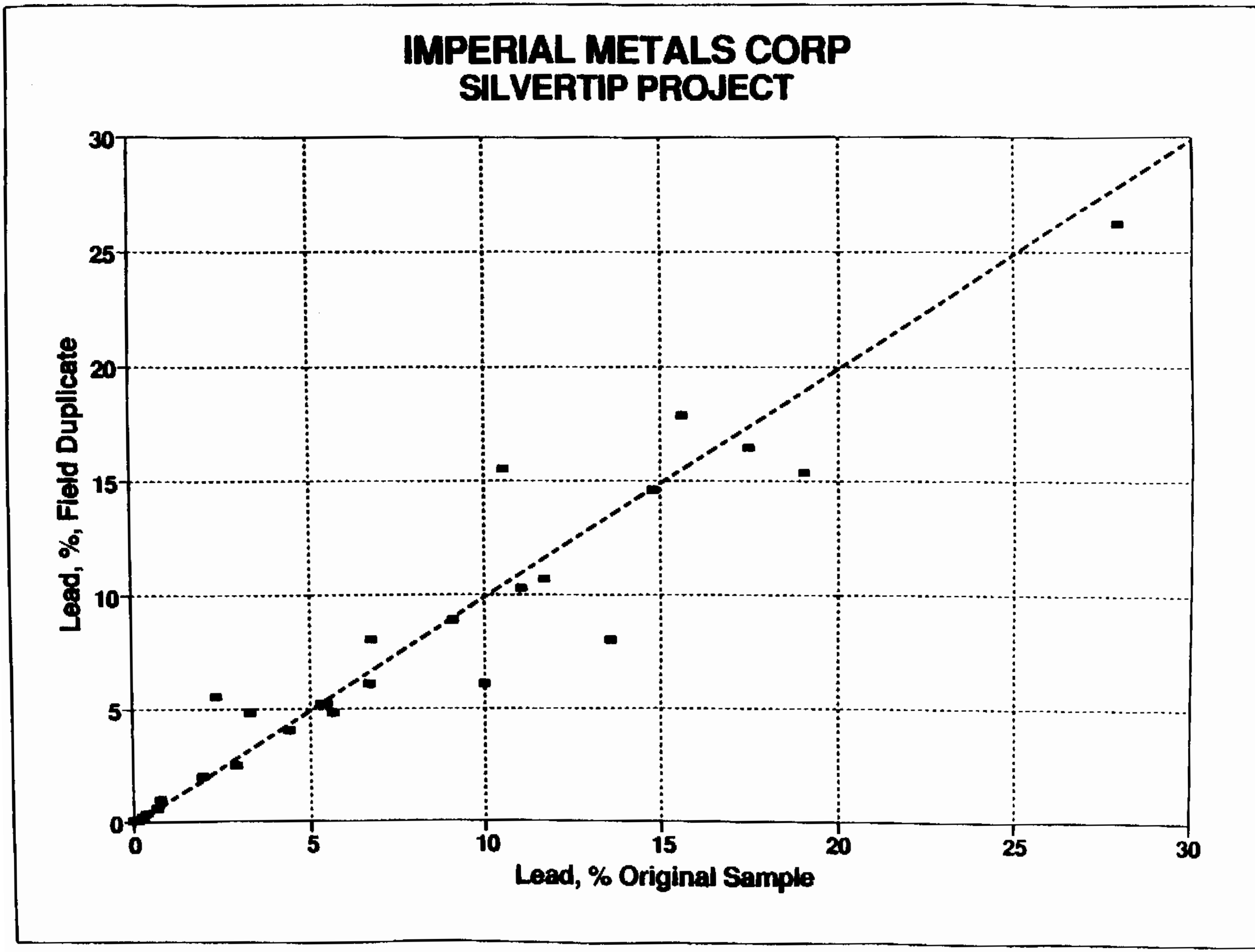

IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
LEAD 2, %
LEAD 1, %
0
2
4
6
8
10
12
14

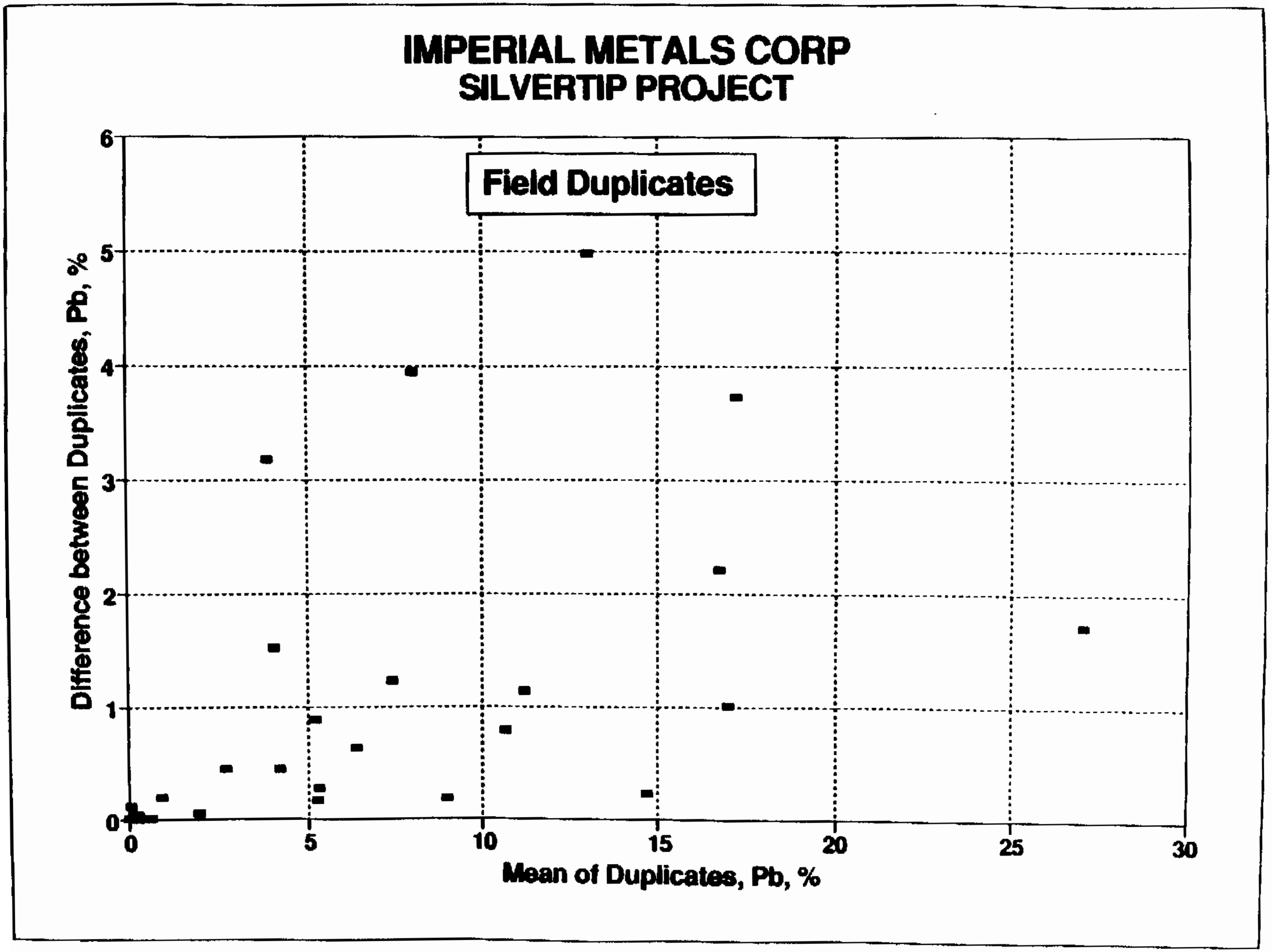


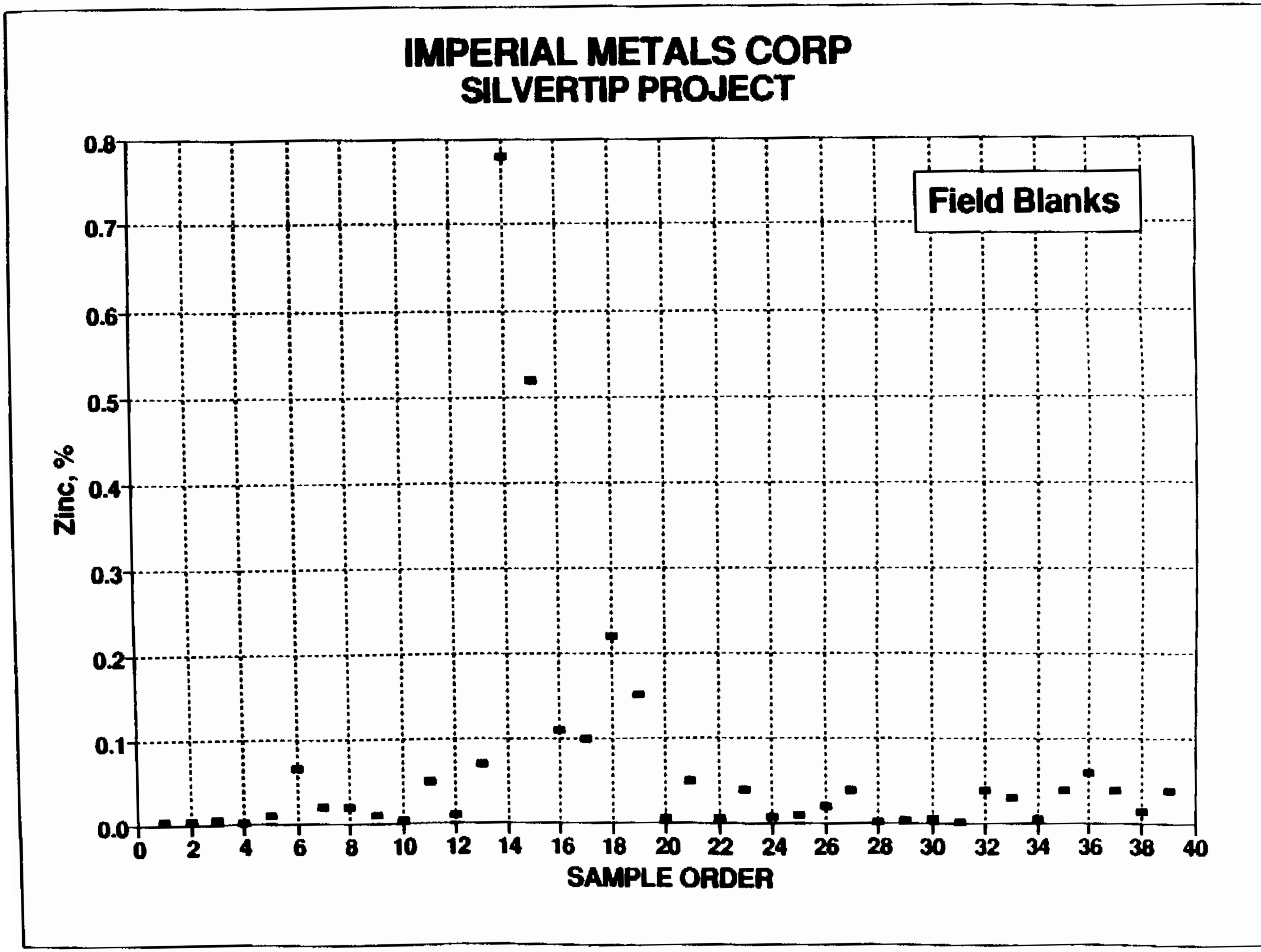
IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
LEAD DIFF OF DUPS, %
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
2
4
6
8
10
12
14
LEAD MEAN OF DUPS, %


IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
LEAD 2, %
LEAD 1, %
0
1
2
3
4
5
6
7
8
9
10

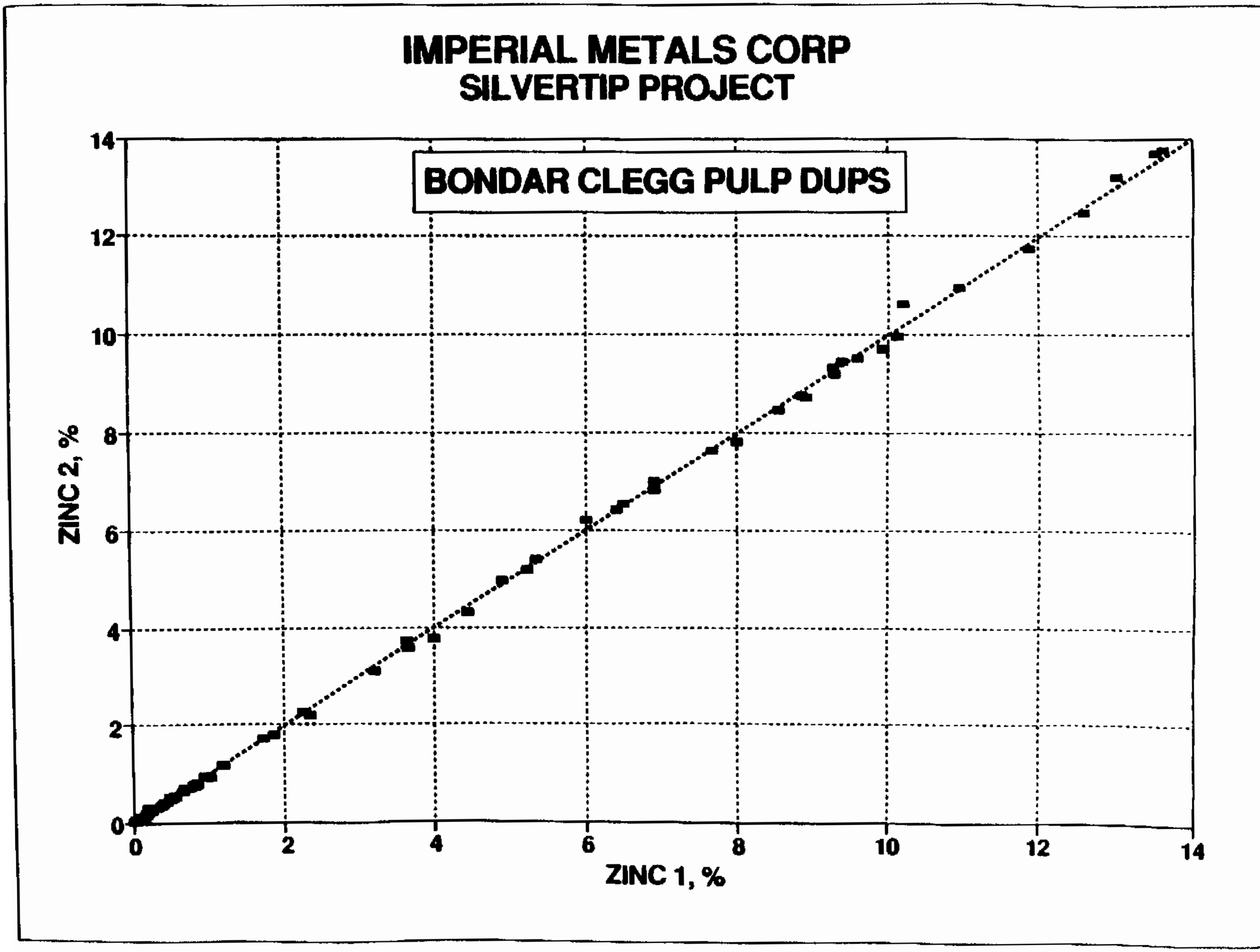

IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
LEAD DIFF OF DUPS, %
LEAD MEAN OF DUPS, %
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0
1
2
3
4
5
6
7
8
9


IMPERIAL METALS CORP
SILVERTIP PROJECT
Lead, %, Field Duplicate
Lead, % Original Sample
0
5
10
15
20
25
30

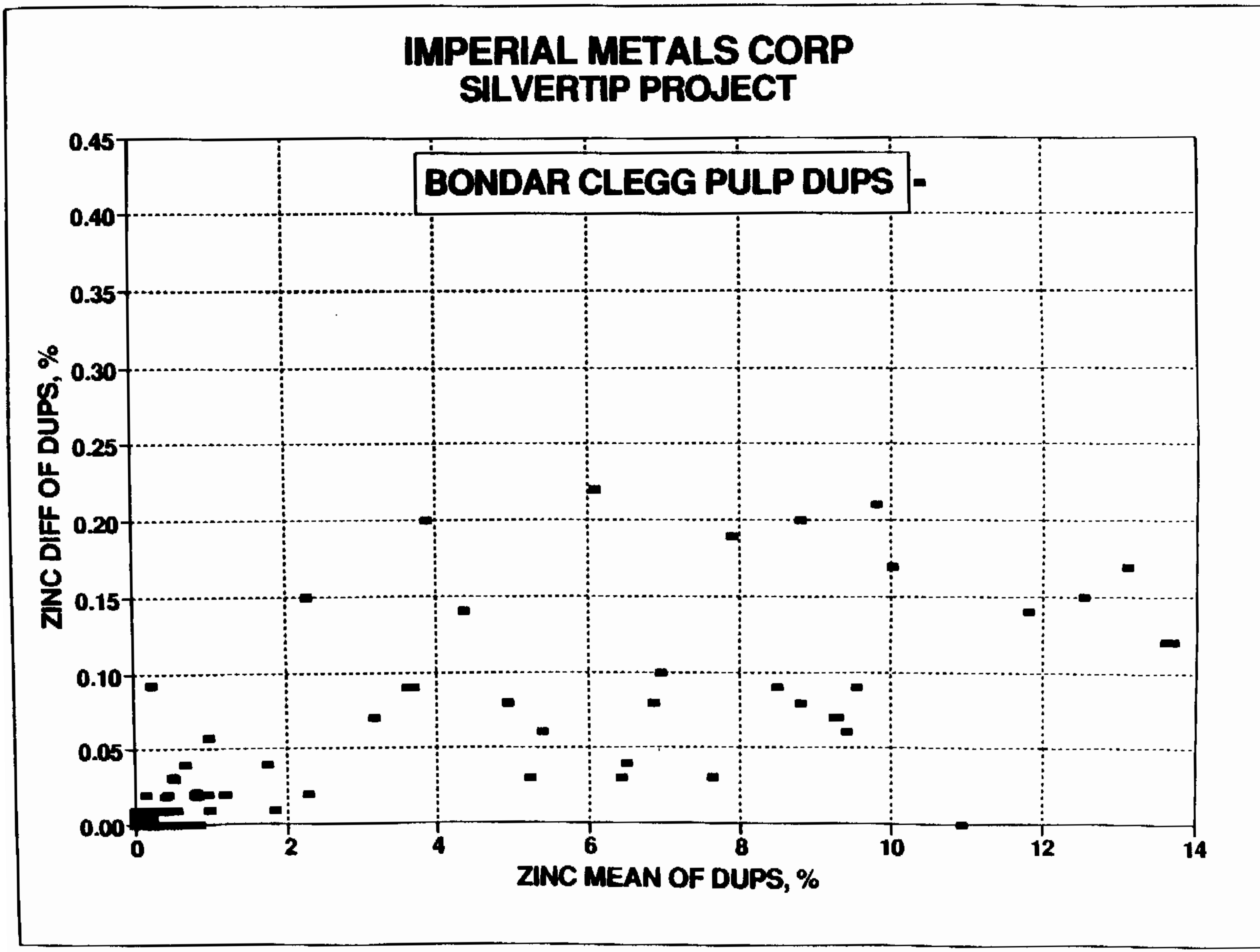

IMPERIAL METALS CORP
SILVERTIP PROJECT
Field Duplicates
Difference between Duplicates, Pb, %
Mean of Duplicates, Pb, %
0
1
2
3
4
5
6
0
5
10
15
20
25
30



IMPERIAL METALS CORP
SILVERTIP PROJECT
Field Blanks
Zinc, %
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
SAMPLE ORDER



IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
ZINC 2, %
ZINC 1, %
0
2
4
6
8
10
12
14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SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
ZINC DIFF OF DUPS, %
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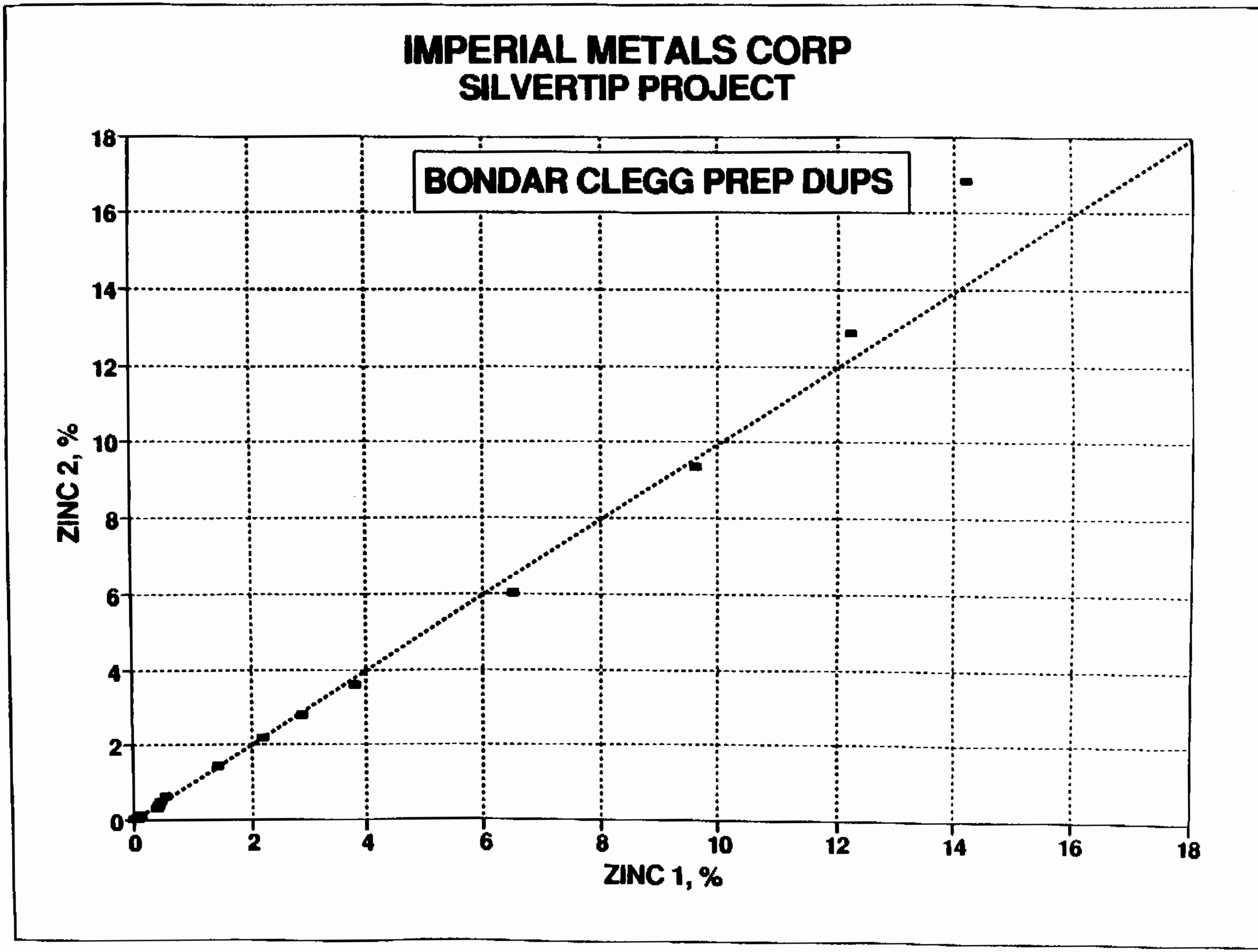
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
2
4
6
8
10
12
14
ZINC MEAN OF DUPS, %



IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
ZINC 2, %
ZINC 1, %
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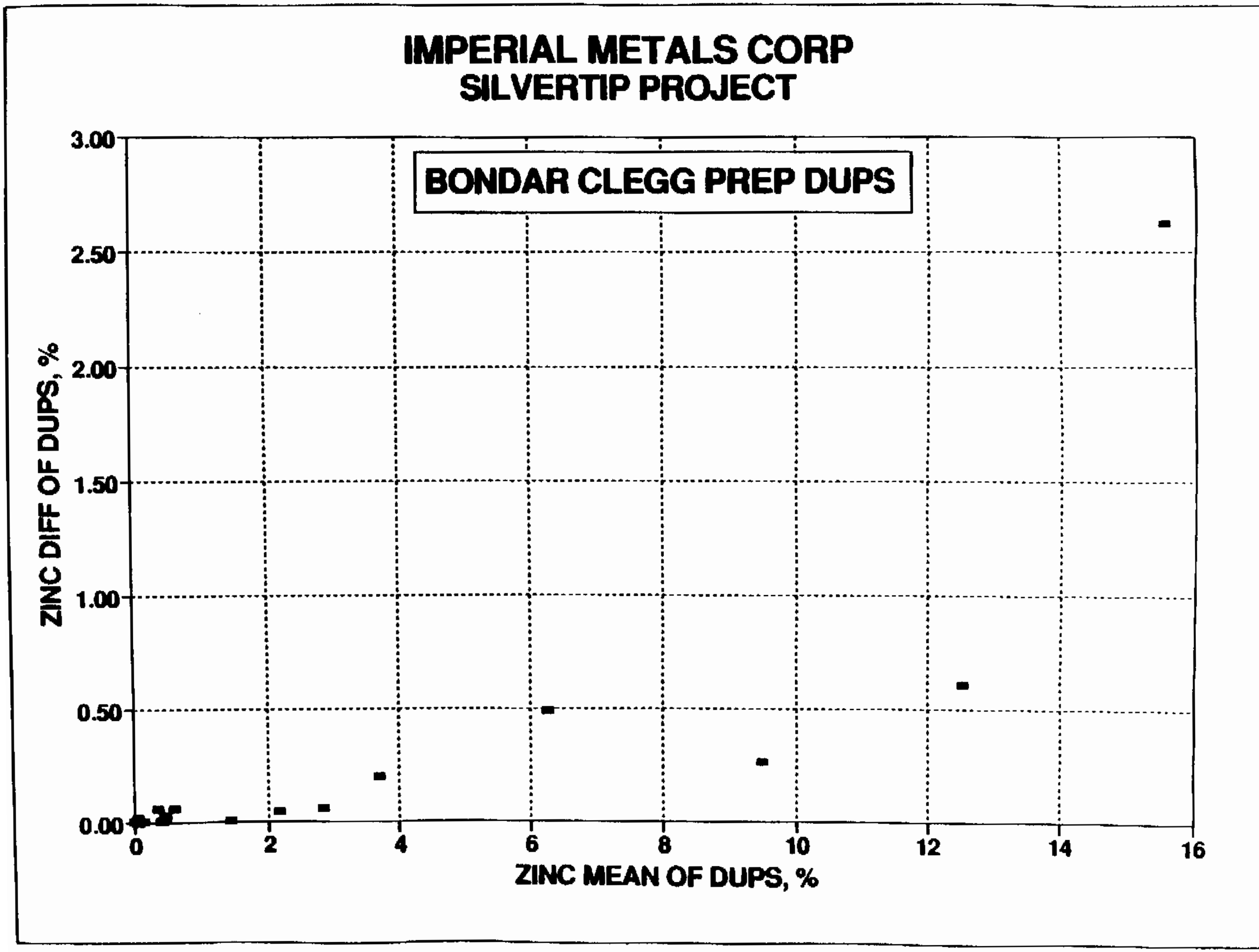
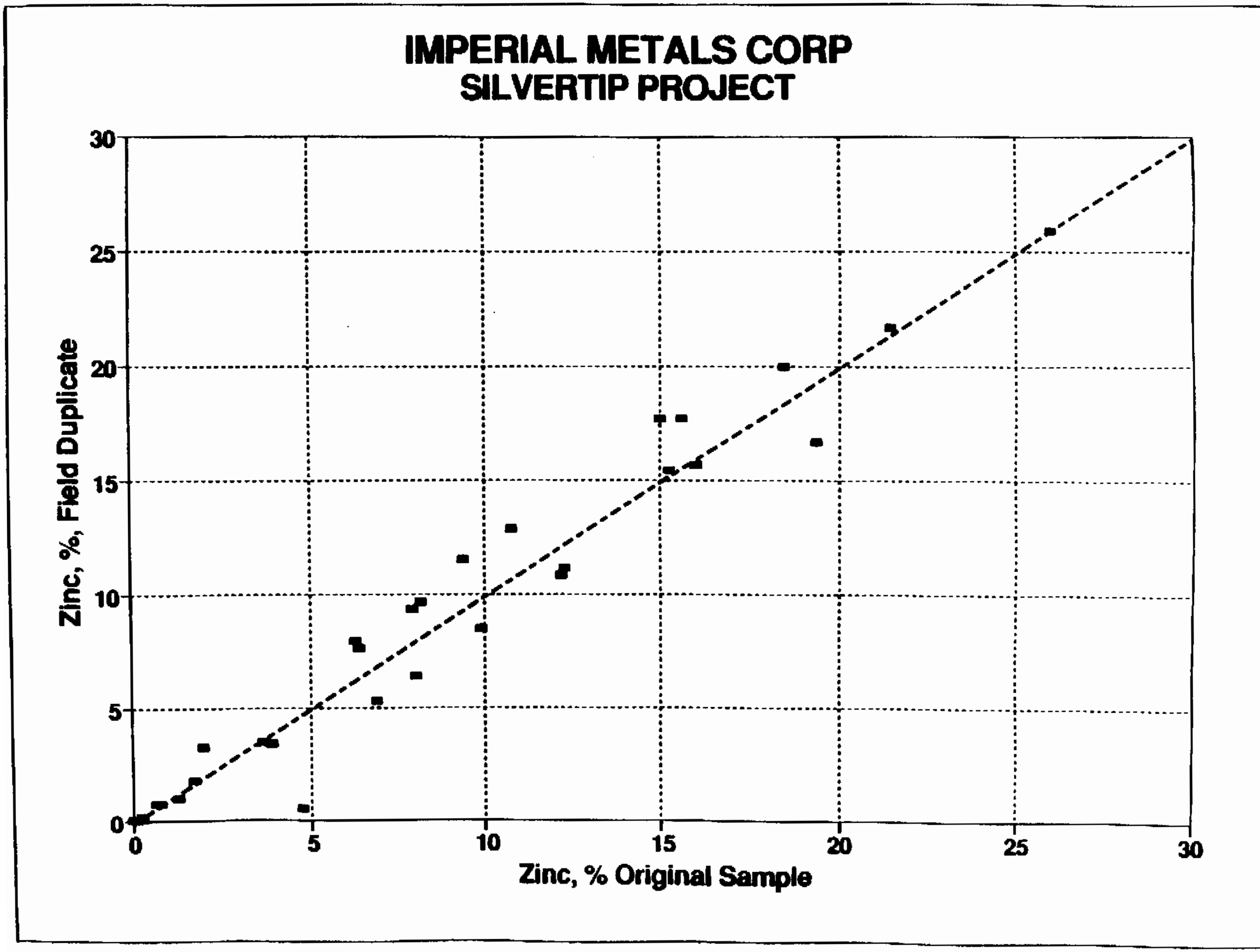
4
6
8
10
12
14
16
18



IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
ZINC DIFF OF DUPS, %
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0
2
4
6
8
10
12
14
16
ZINC MEAN OF DUPS, %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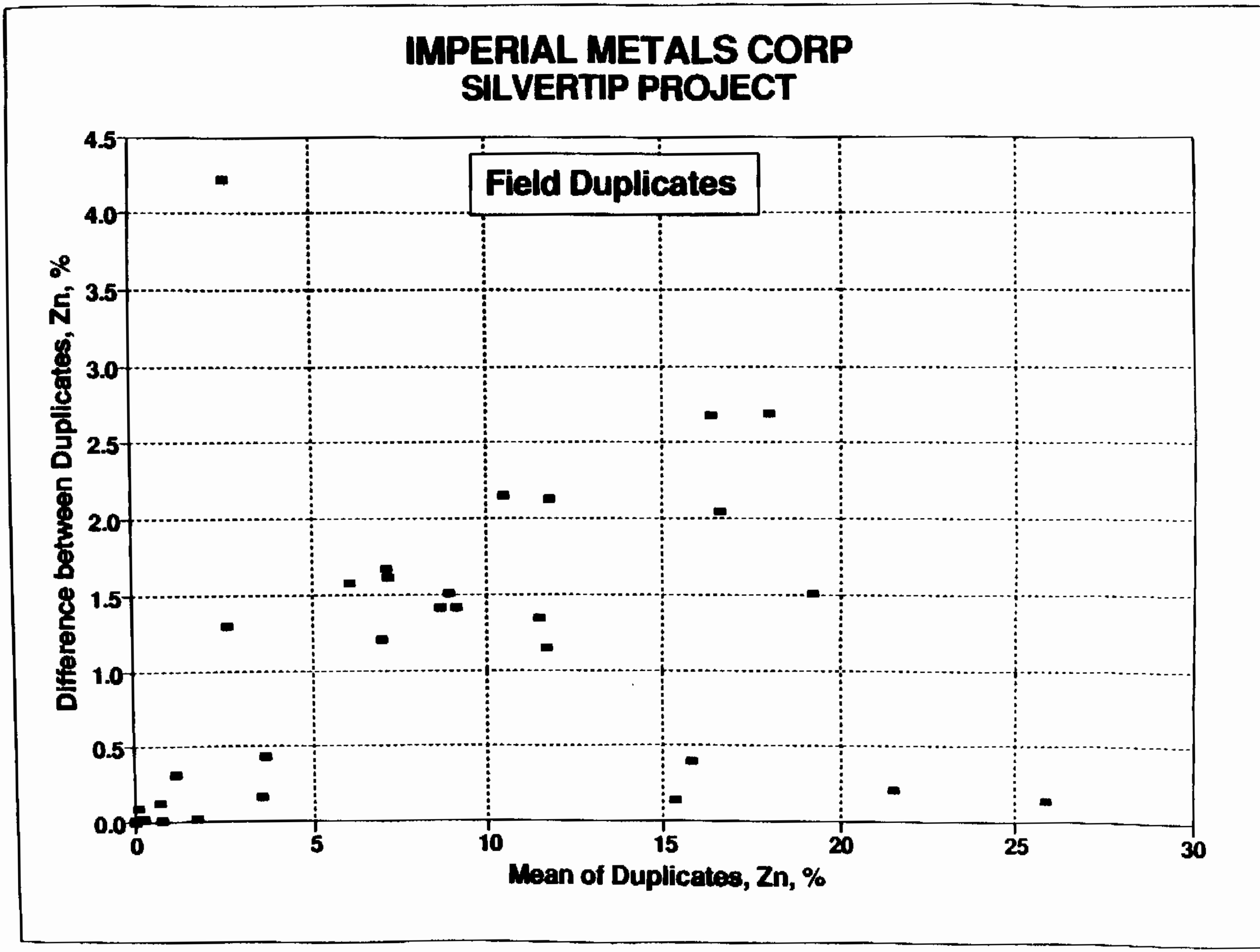
SILVERTIP PROJECT
Zinc, %, Field Duplicate
Zinc, % Original Sample
0
5
10
15
20
25
30


IMPERIAL METALS CORP
SILVERTIP PROJECT
Field Duplicates
Difference between Duplicates, Zn, %
Mean of Duplicates, Zn, %
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0.5
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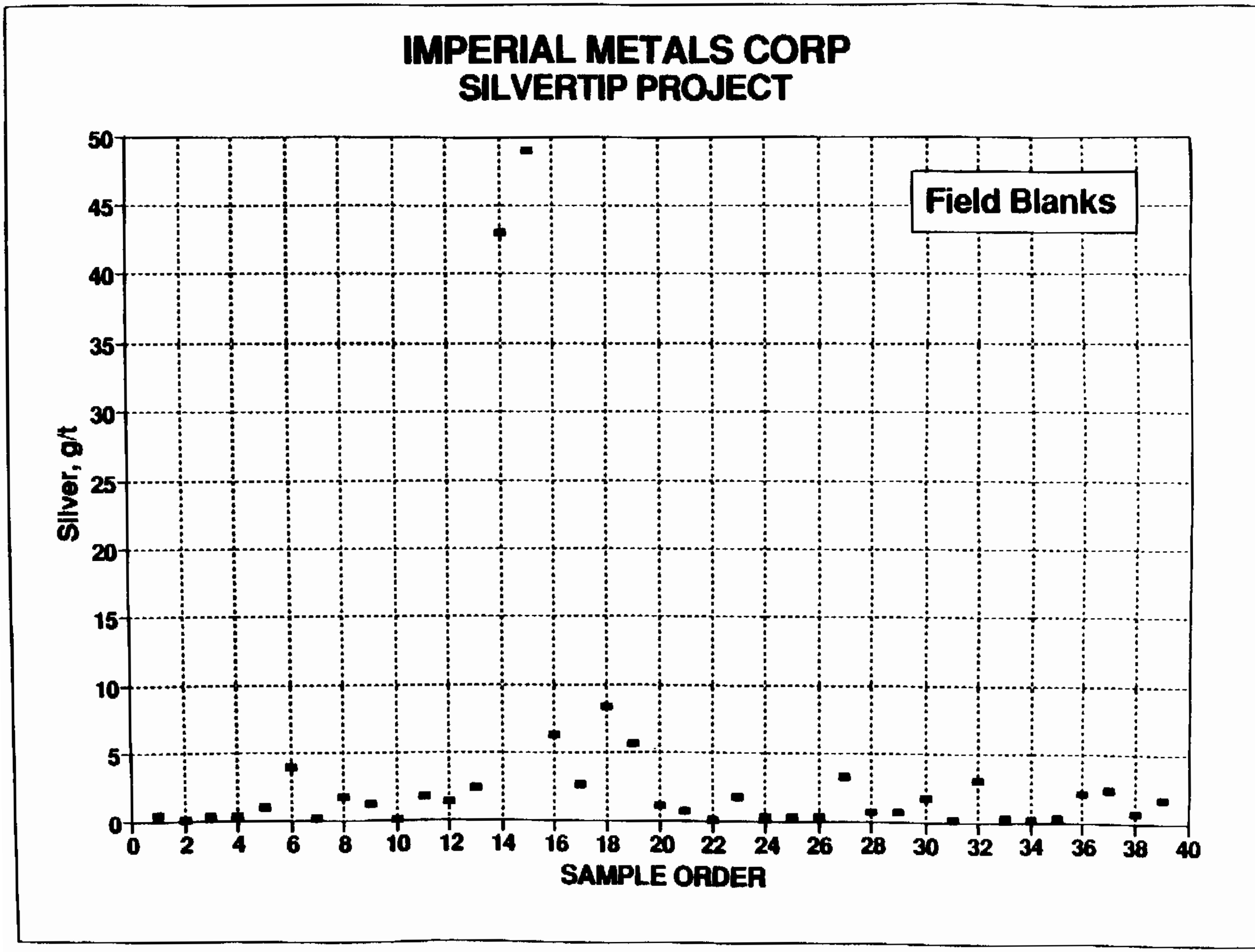
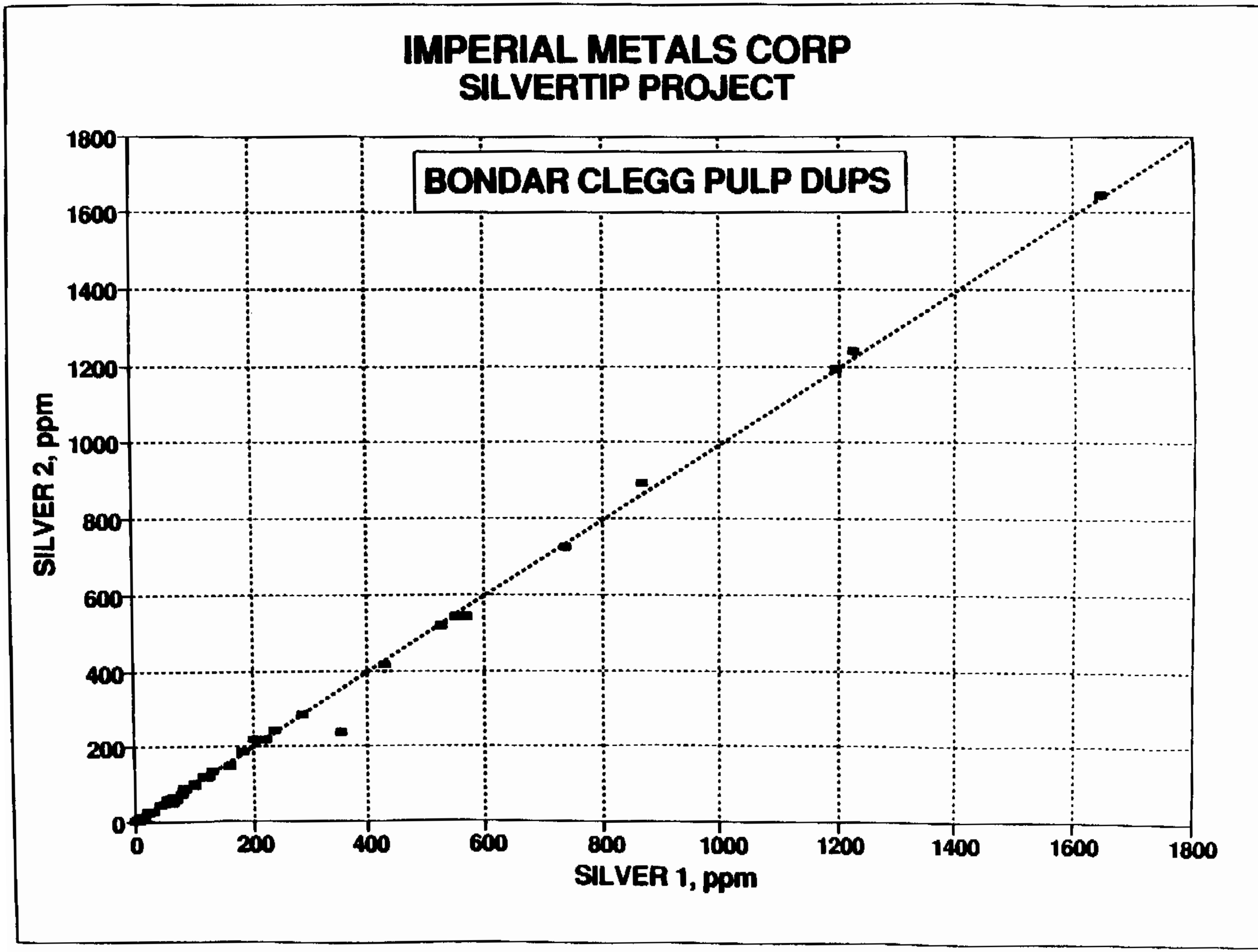
1.5
2.0
2.5
3.0
3.5
4.0
4.5
0
5
10
15
20
25
30



IMPERIAL METALS CORP
SILVERTIP PROJECT
Field Blanks
Silver, g/t
0
5
10
15
20
25
30
35
40
45
50
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
SAMPLE ORDER


IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
SILVER 2, ppm
SILVER 1, ppm
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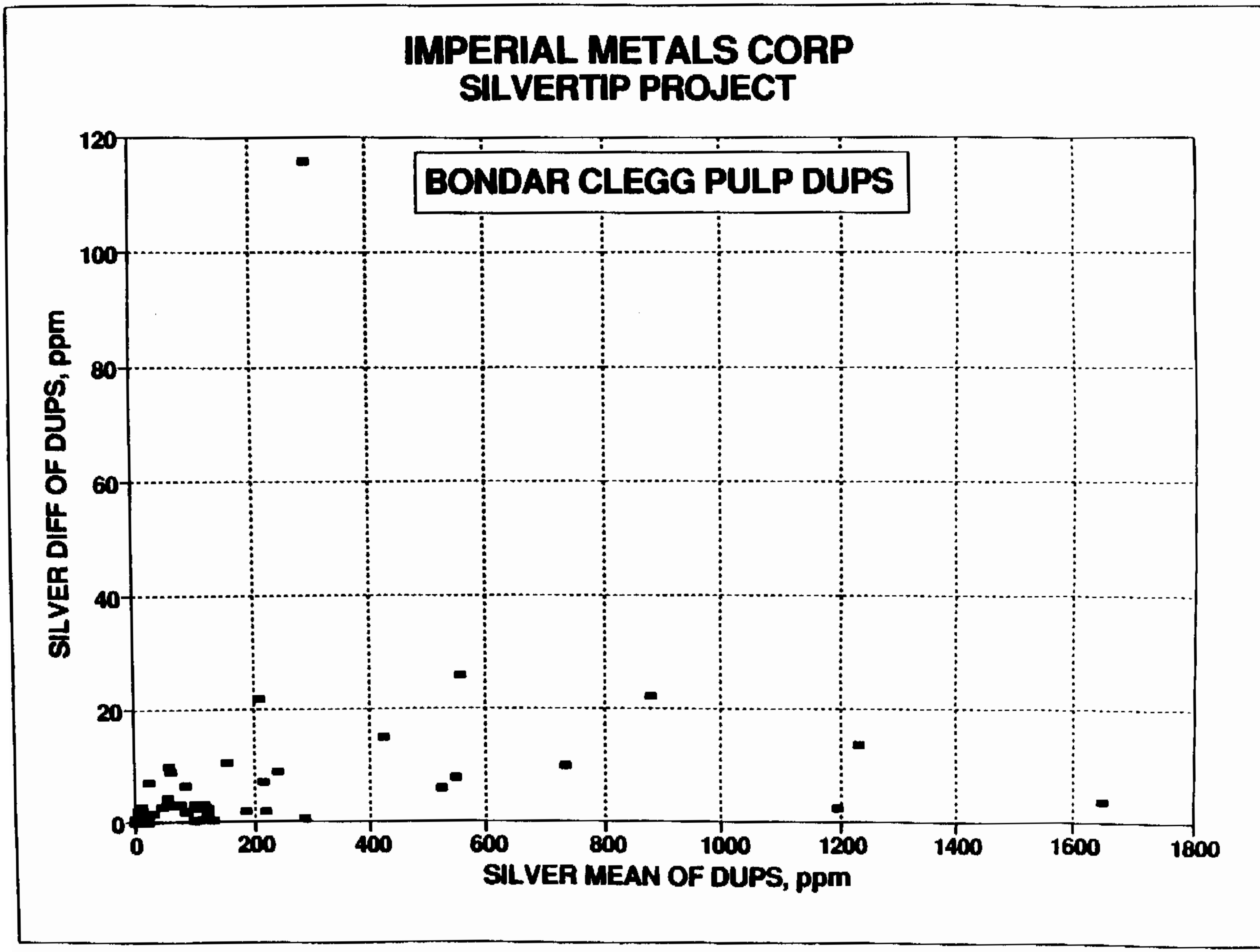
400
600
800
1000
1200
1400
1600
1800



IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
SILVER DIFF OF DUPS, ppm
SILVER MEAN OF DUPS, ppm
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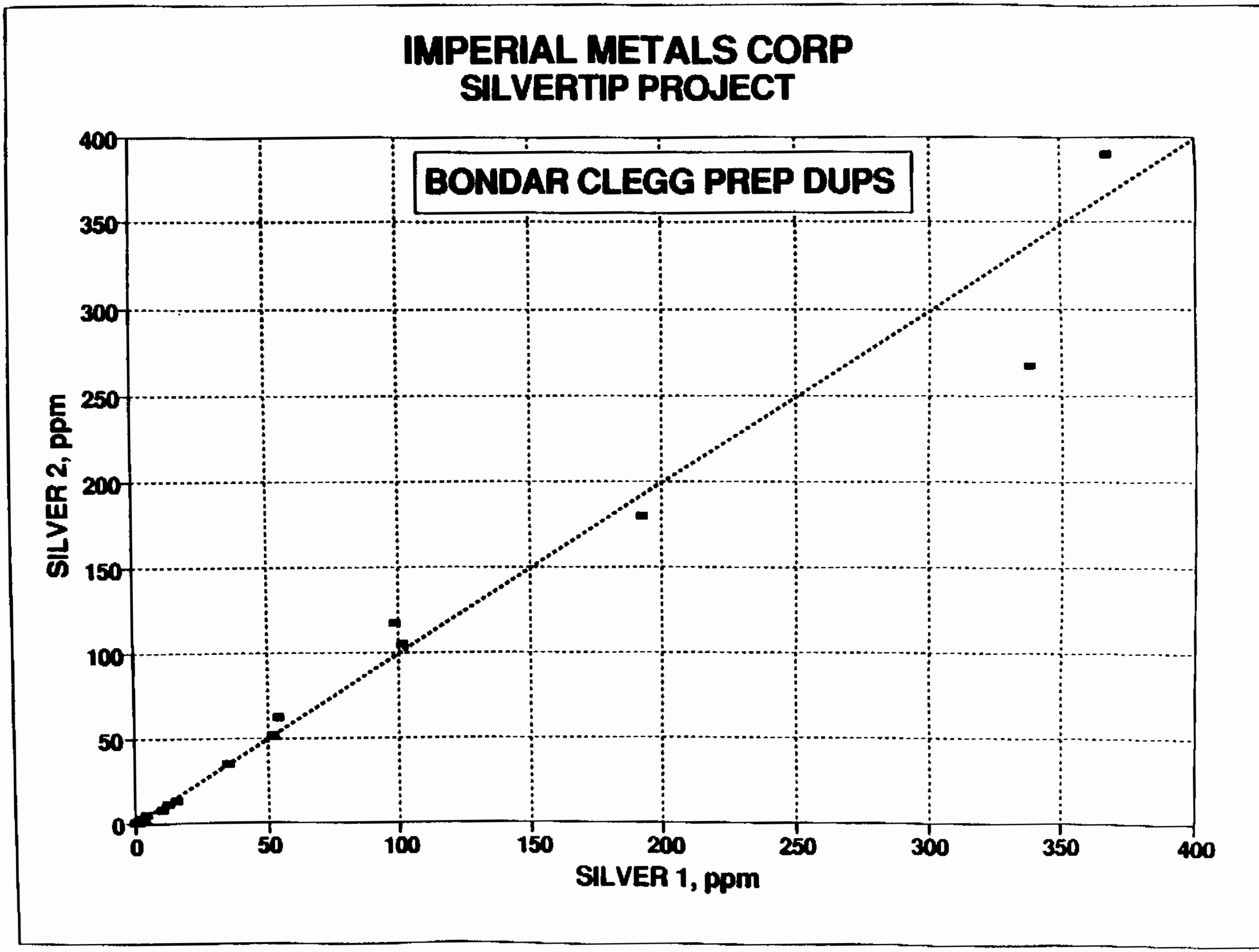
20
40
60
80
100
120
0
200
400
600
800
1000
1200
1400
1600
1800


IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
SILVER 2, ppm
SILVER 1, ppm
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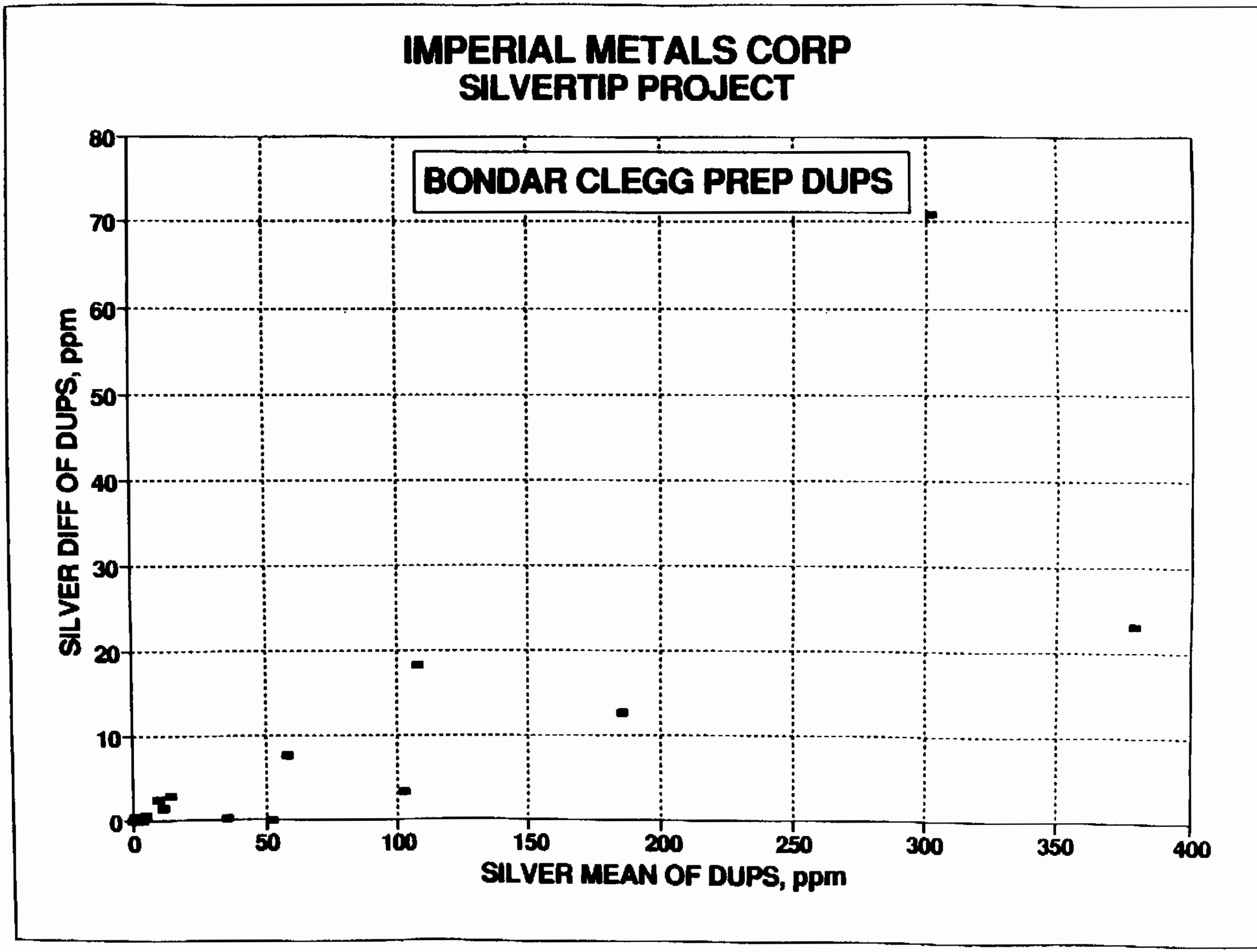
100
150
200
250
300
350
400


IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
SILVER DIFF OF DUPS, ppm
SILVER MEAN OF DUPS, ppm
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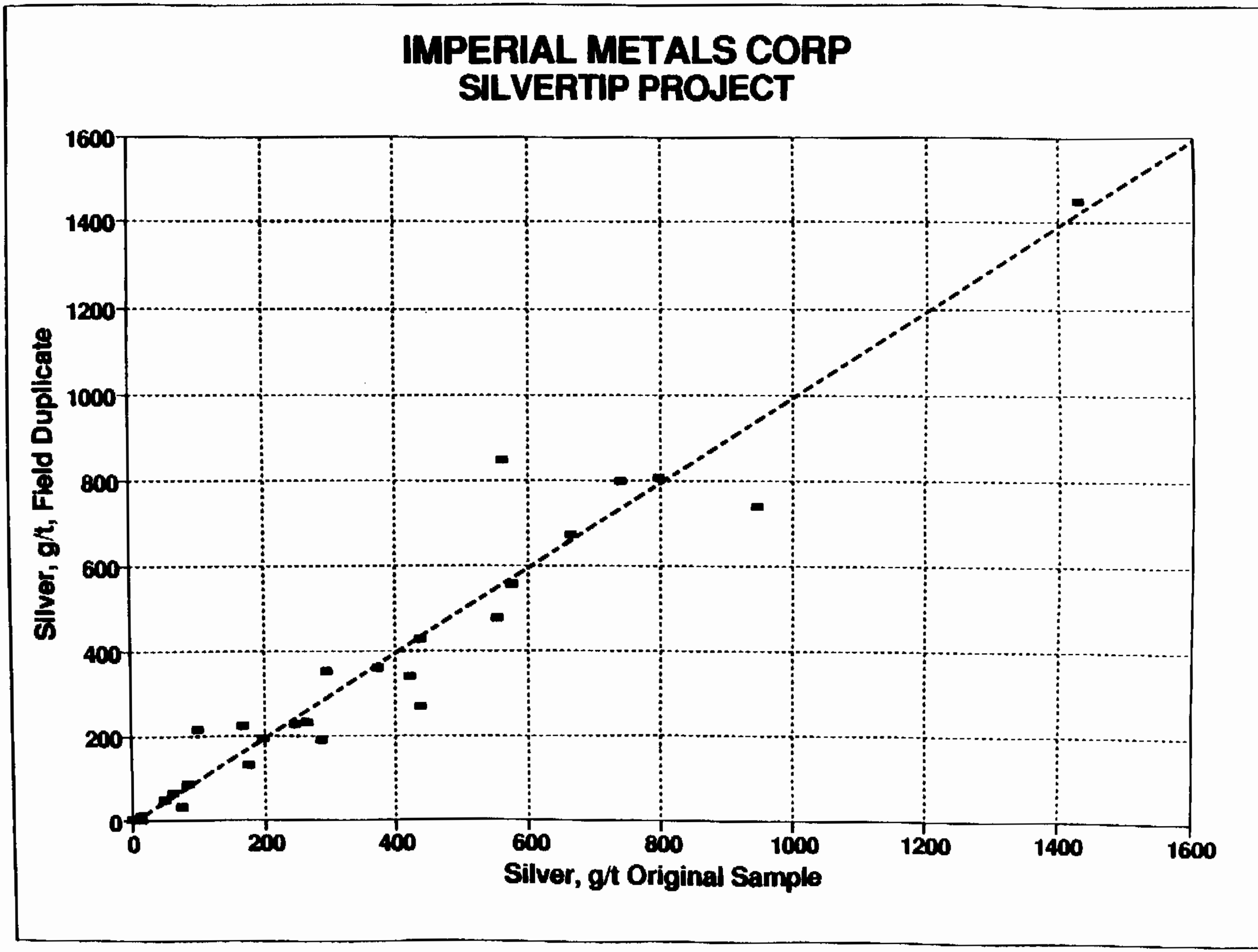
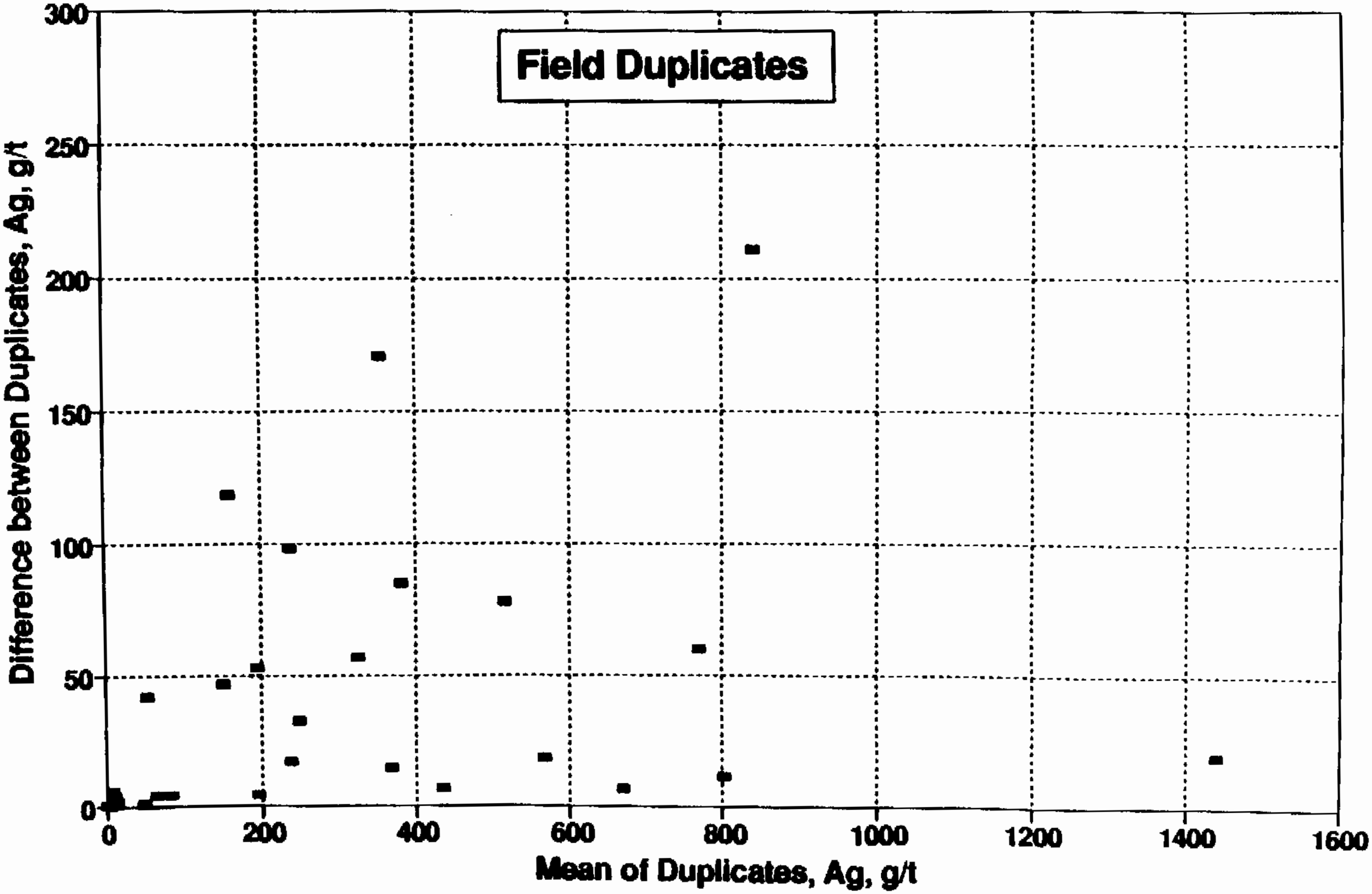
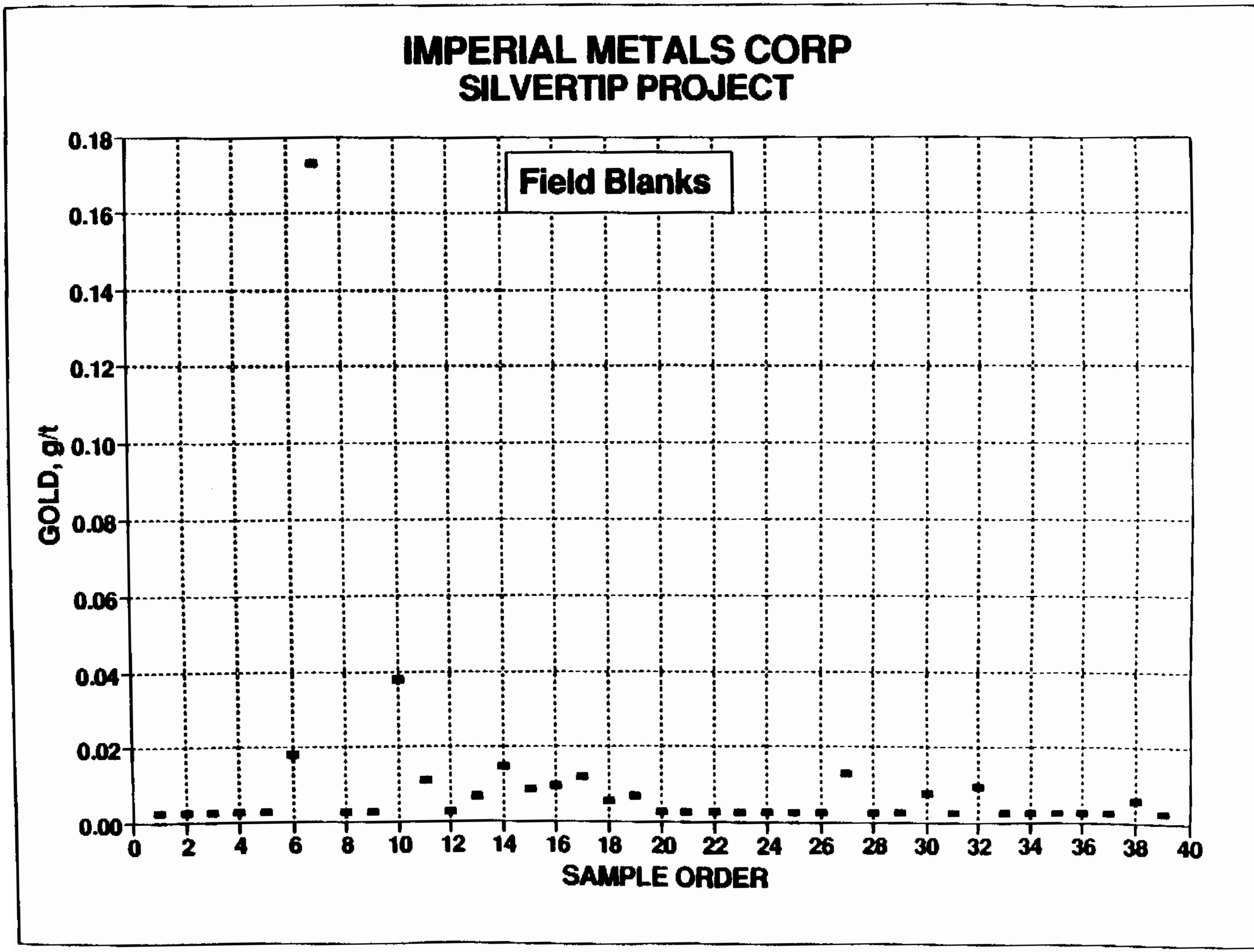
20
30
40
50
60
70
80
0
50
100
150
200
250
300
350
400



IMPERIAL METALS CORP
SILVERTIP PROJECT
Silver, g/t, Field Duplicate
Silver, g/t Original Sample
0
200
400
600
800
1000
1200
1400
1600

IMPERIAL METALS CORP
SILVERTIP PROJECT




IMPERIAL METALS CORP
SILVERTIP PROJECT
Field Blanks
GOLD, g/t
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0
2
4
6
8
10
12
14
16
18
20
22
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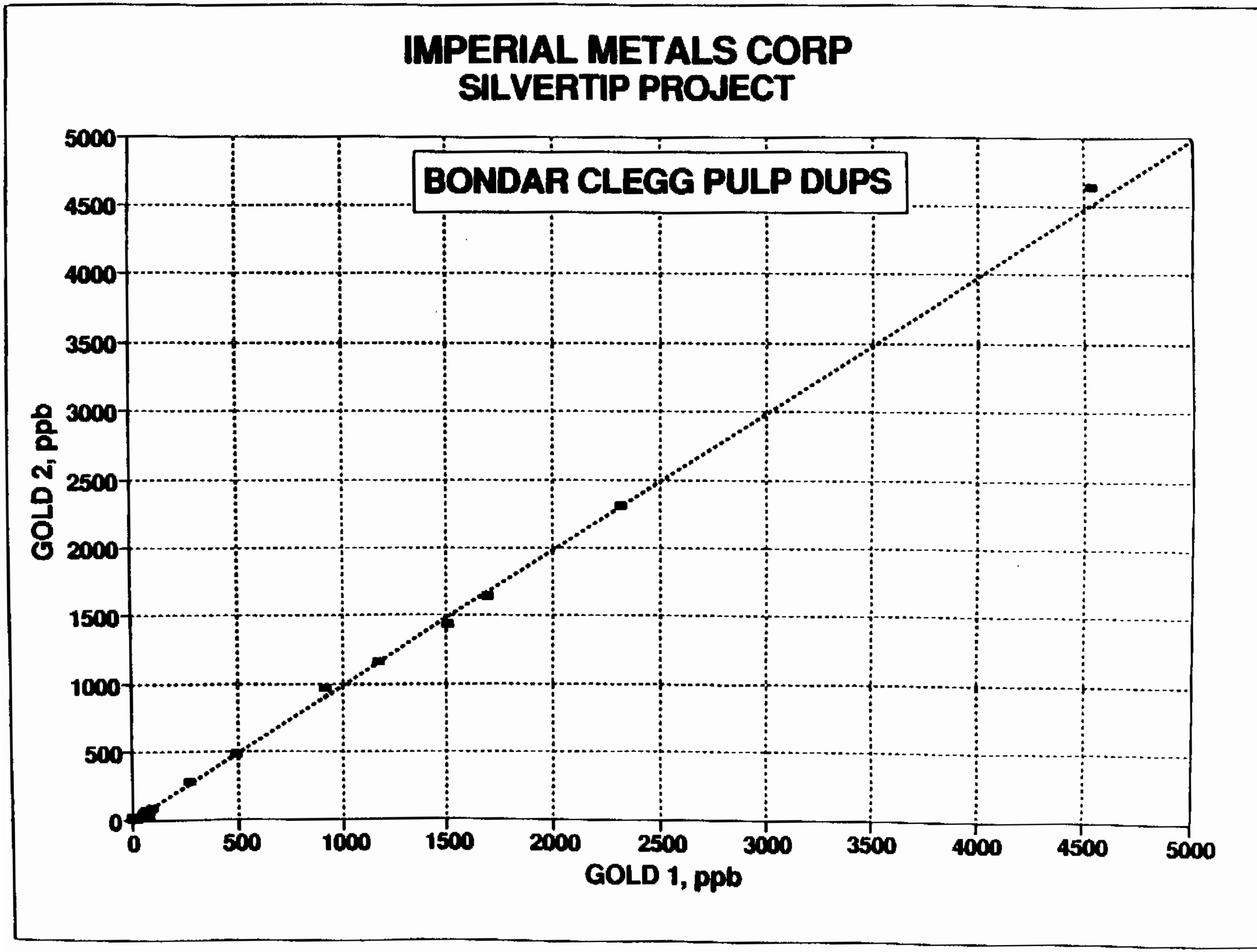
28
30
32
34
36
38
40
SAMPLE ORDER


IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
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GOLD 1, ppb
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500
1000
1500
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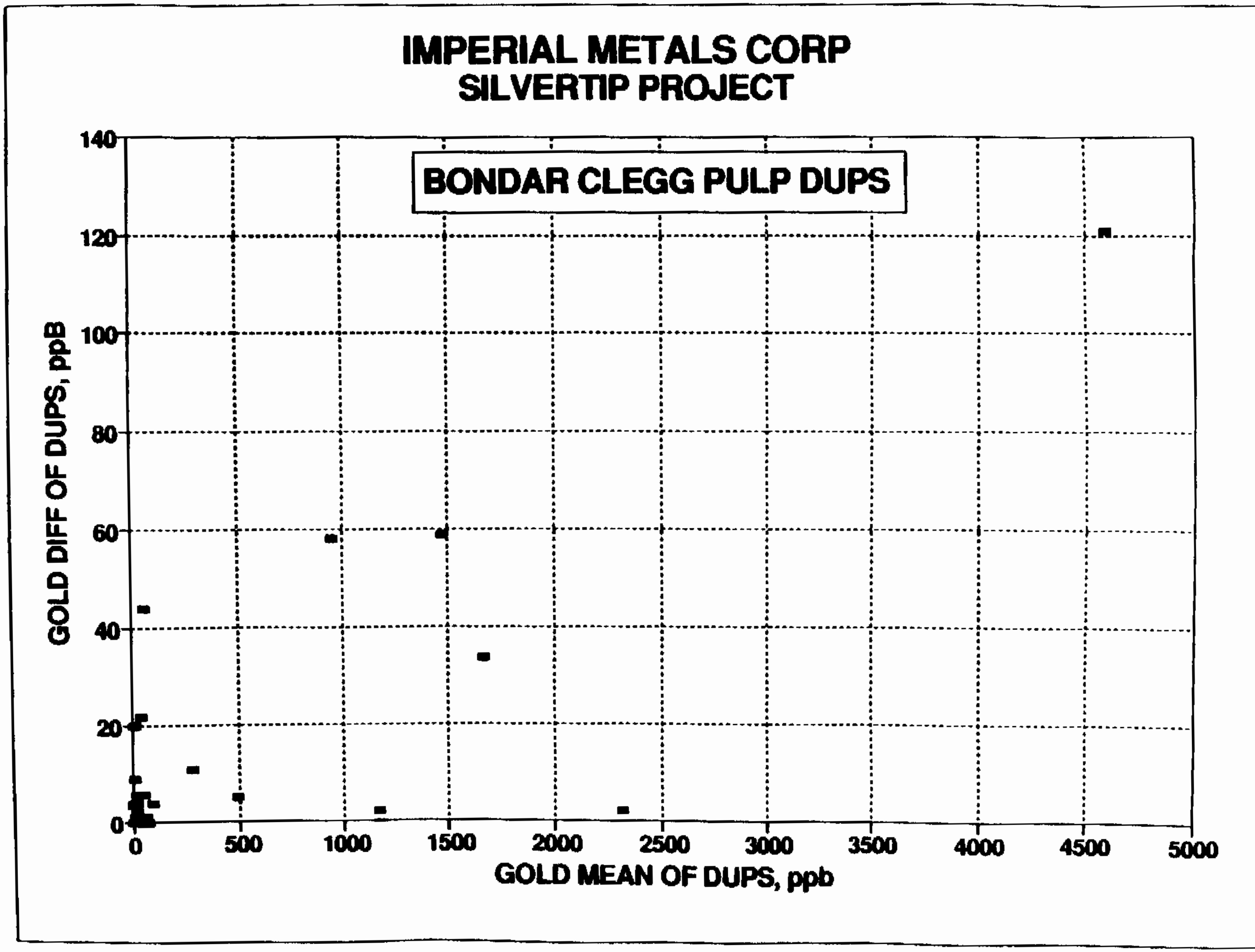
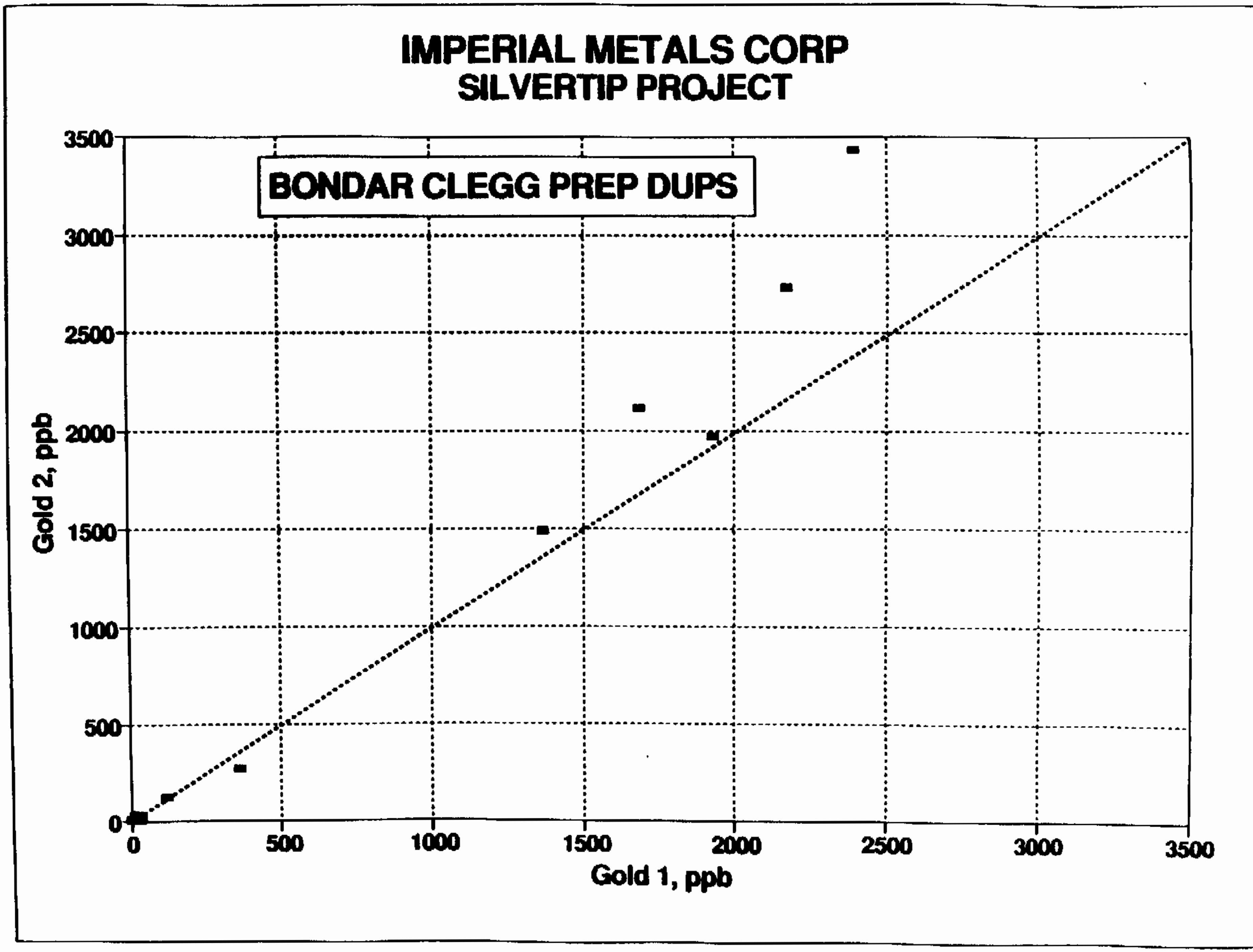
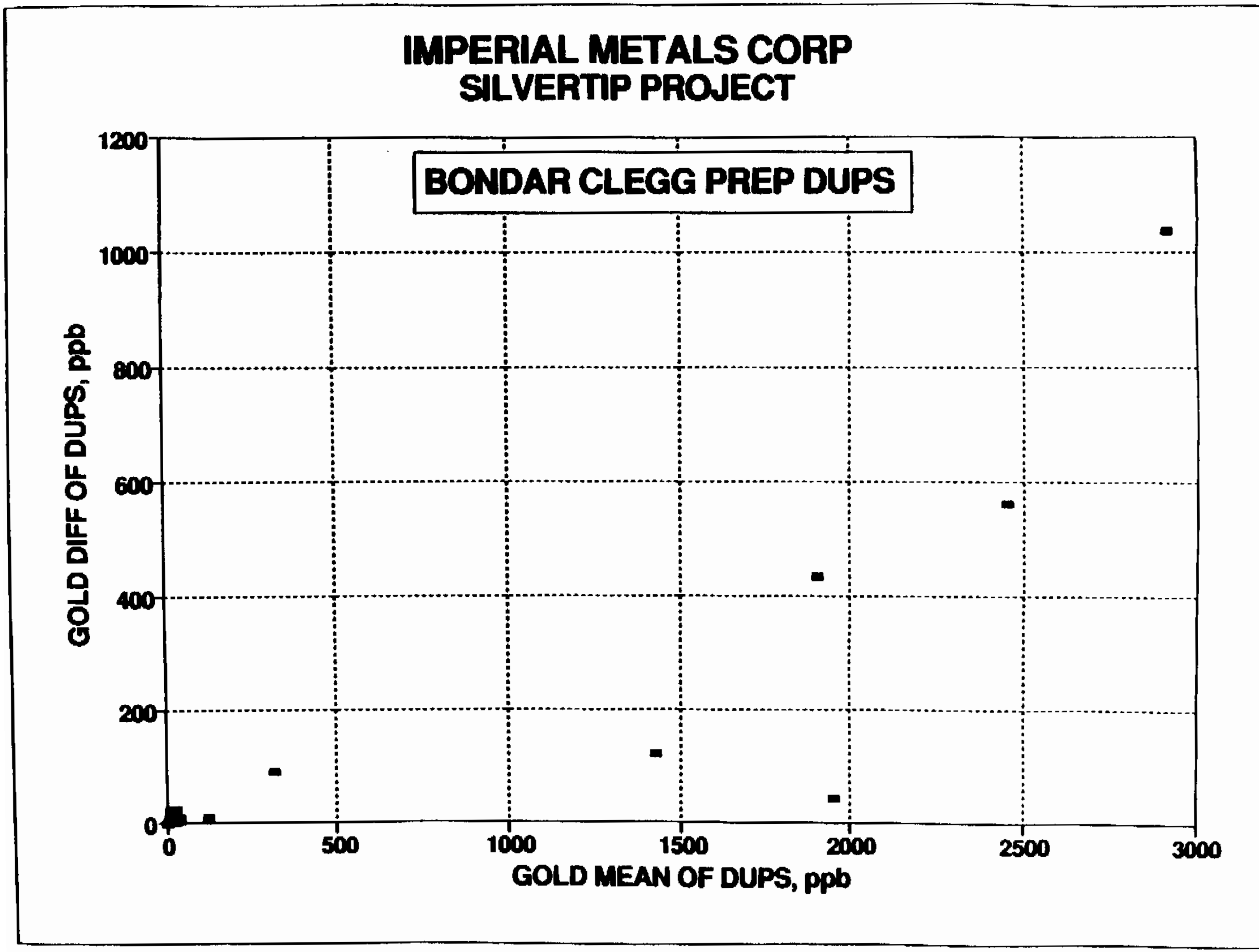
3000
3500
4000
4500
5000



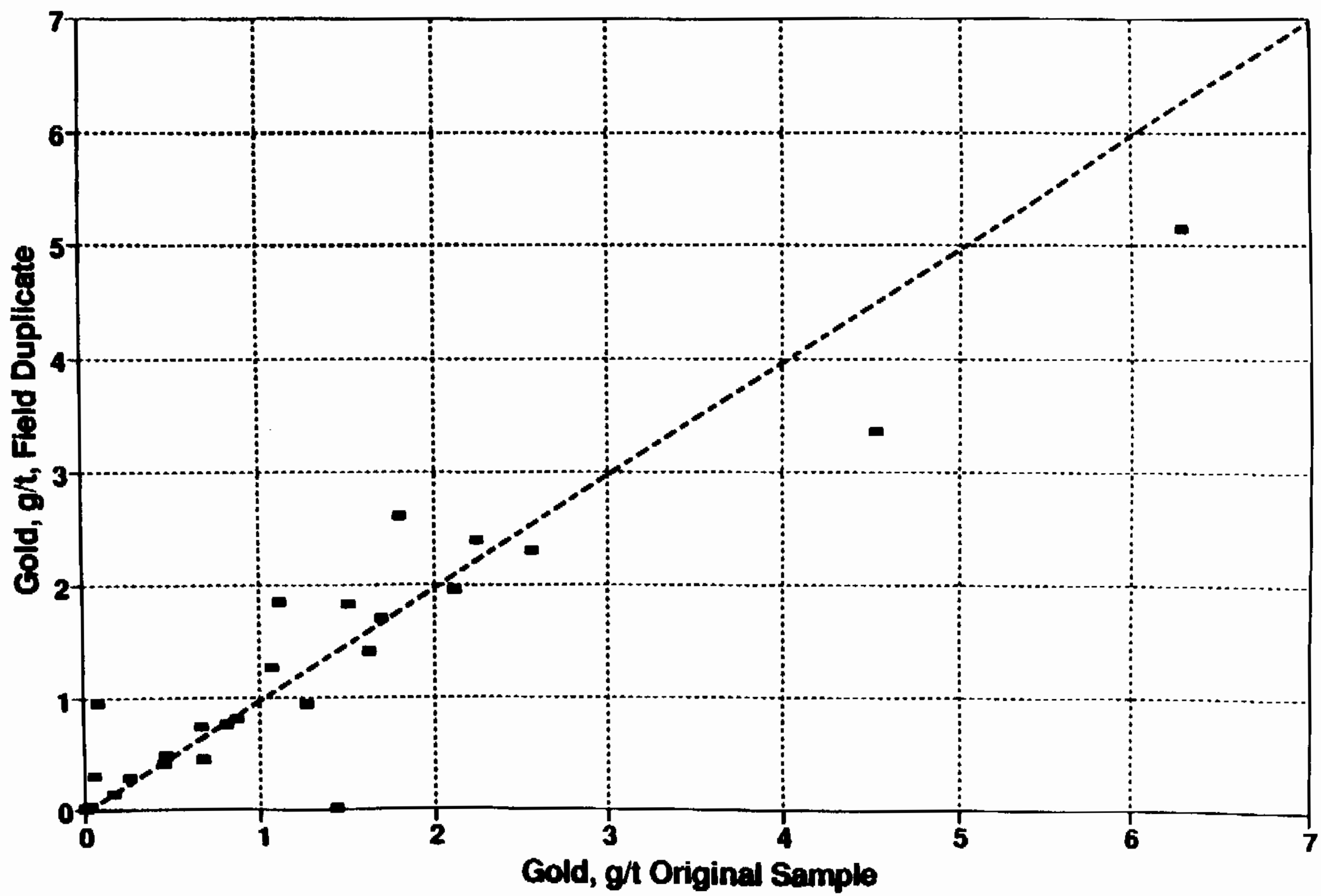
IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
GOLD DIFF OF DUPS, ppB
140
120
100
80
60
40
20
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
GOLD MEAN OF DUPS, ppb

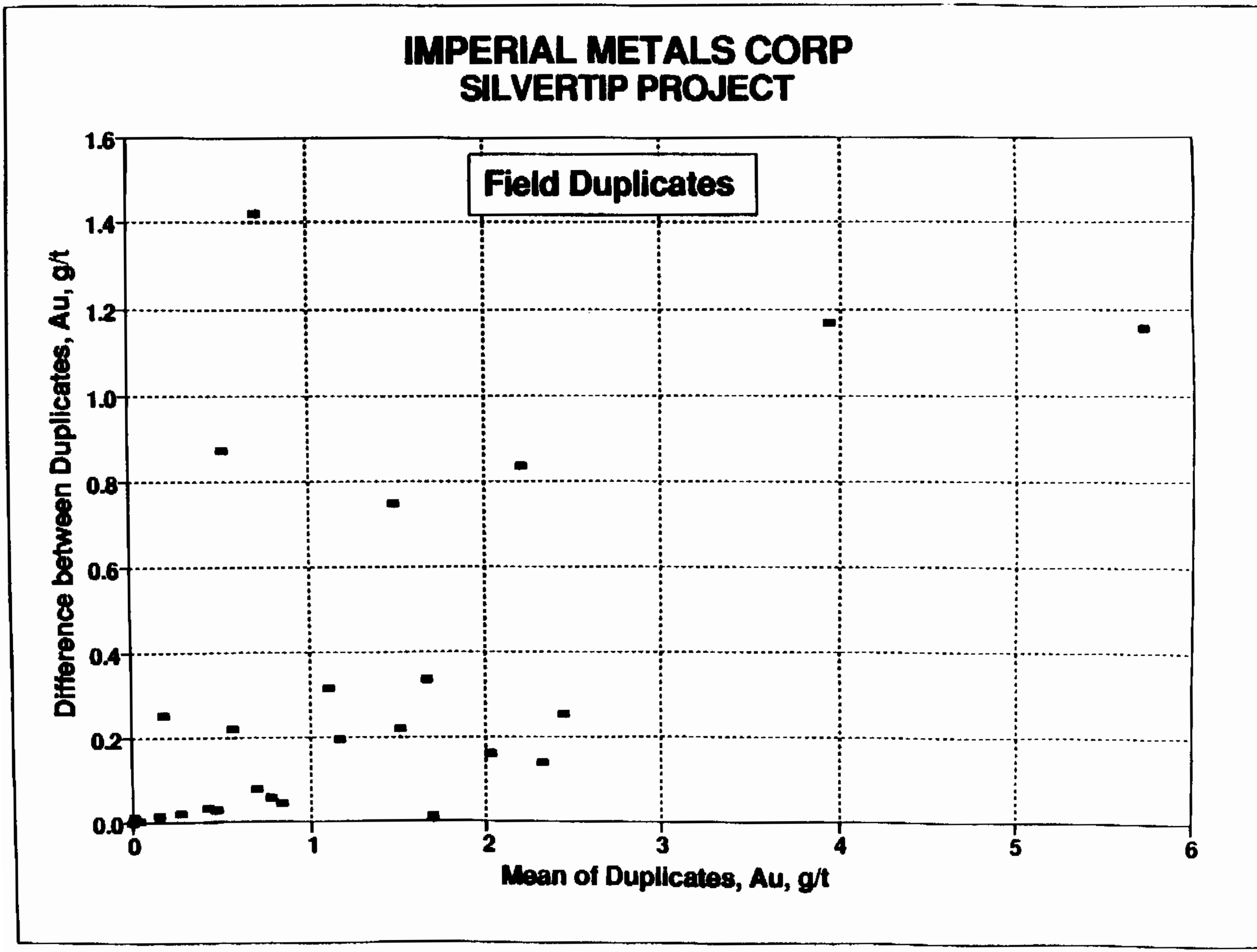


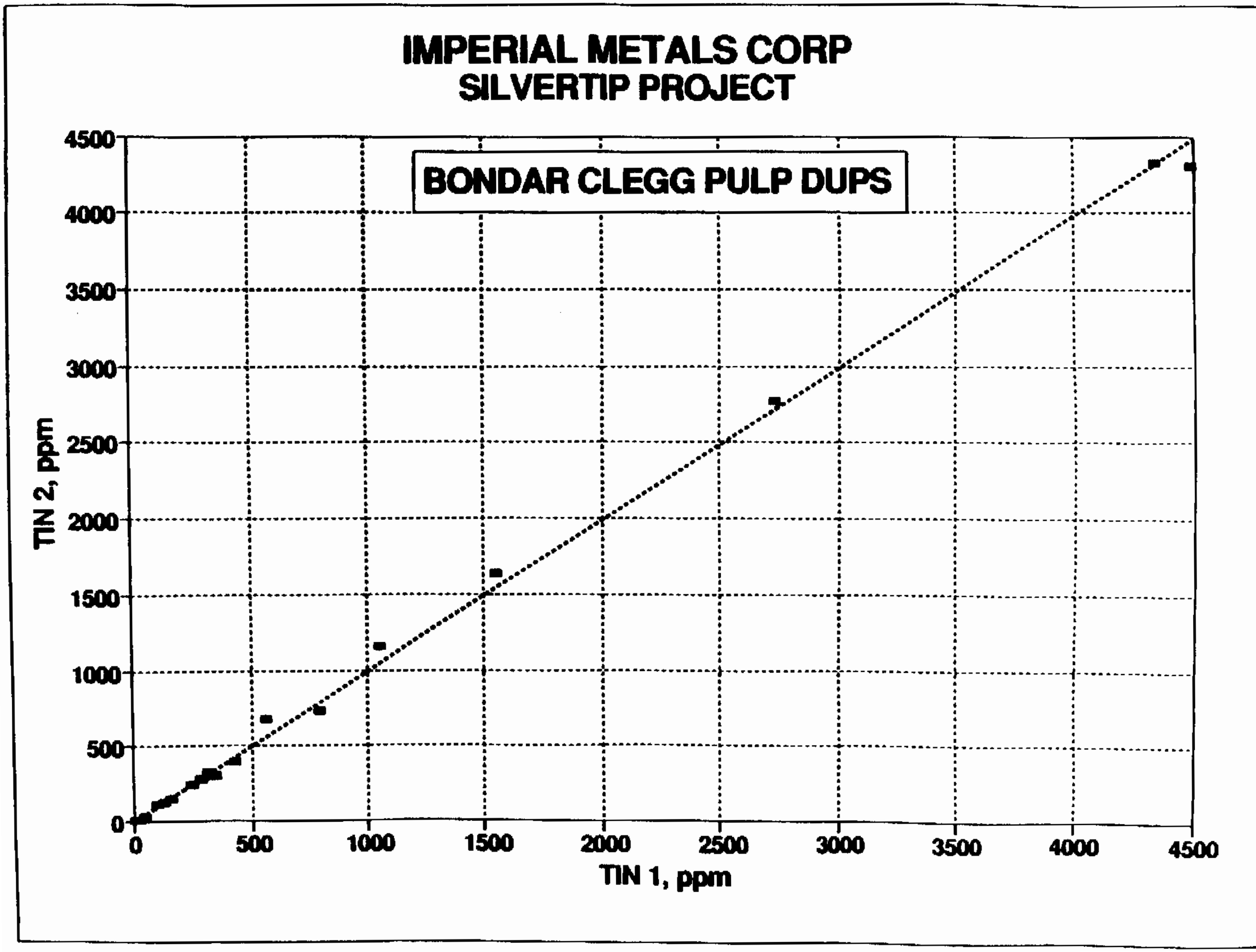
IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
Gold 2, ppb
Gold 1, ppb
0
500
1000
1500
2000
2500
3000
3500


IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PREP DUPS
GOLD DIFF OF DUPS, ppb
0
200
400
600
800
1000
1200
GOLD MEAN OF DUPS, ppb
0
500
1000
1500
2000
2500
3000

IMPERIAL METALS CORP
SILVERTIP PROJECT




IMPERIAL METALS CORP
SILVERTIP PROJECT
Field Duplicates
Difference between Duplicates, Au, g/t
Mean of Duplicates, Au, g/t
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
1
2
3
4
5
6


IMPERIAL METALS CORP
SILVERTIP PROJECT
BONDAR CLEGG PULP DUPS
TIN 2, ppm
TIN 1, ppm
0
500
1000
1500
2000
2500
3000
3500
4000
4500

Appendix I

Silvertip Project History of Previous Work

SILVERTIP PROJECT
HISTORY OF PREVIOUS WORK

by Janice M. Letwin
December 1997
for Silvertip Mining Corporation

1955-1968

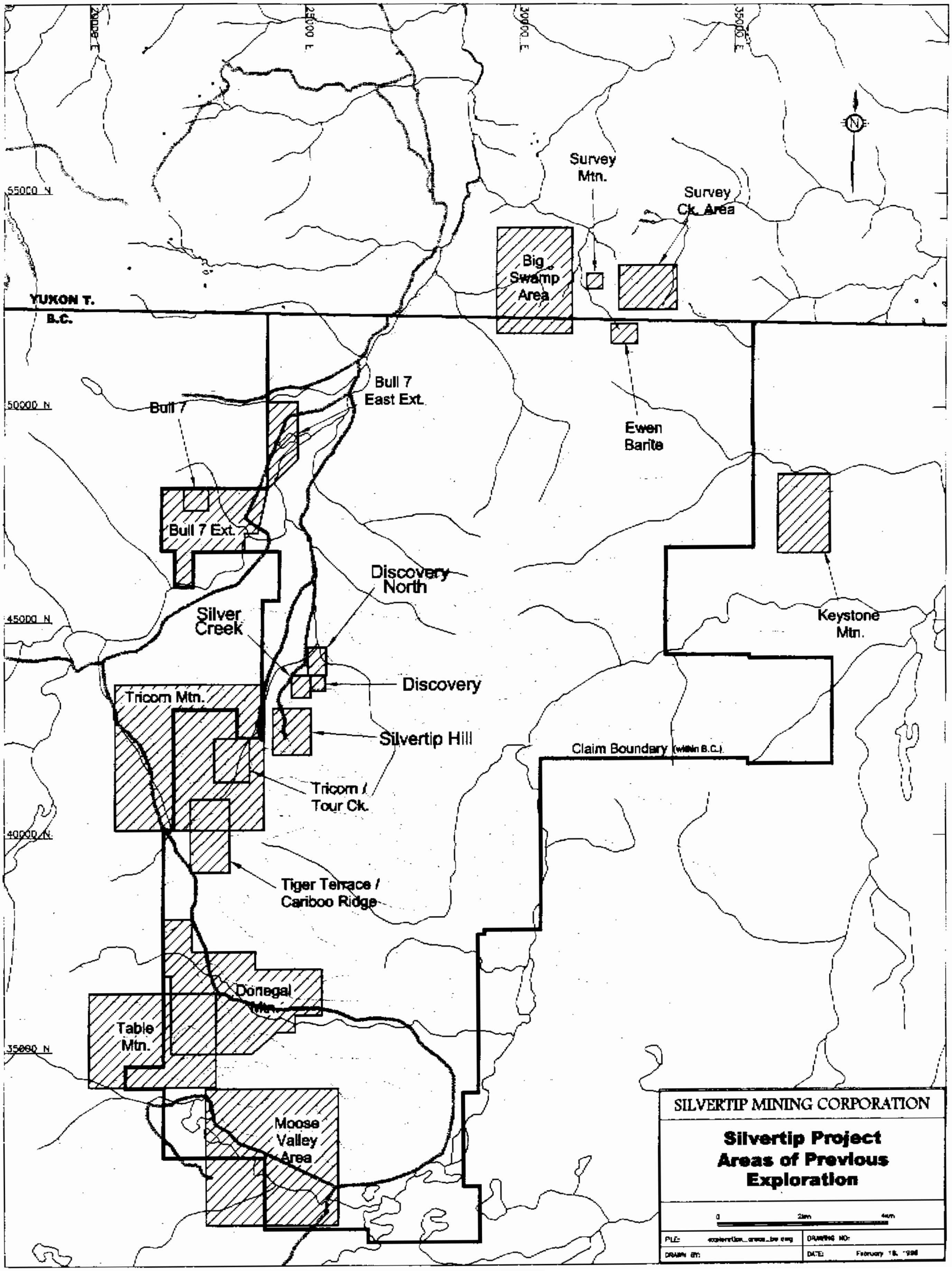
Initial discovery of mineralization on the property was made in 1955, by grubstakers (A. Zborovsky, V. Alfody, S. Meszaros, and S. Papp) on Silvertip Hill. Gossanous float, rich in silver-bearing galena, was thought to be the surface expression of mineralization filling steeply dipping, cross-cutting fractures in the limestone of the McDame Group.

Thirty-two claims were staked on the Silvertip Property in 1956, and held by A. Zborovsky in good standing until 1962. In late autumn of 1956, the claims were optioned to Conwest Exploration Company Limited of Toronto. Two geologic models were proposed - 1) vein-related deposit, 2) semi-conformable replacement deposit.

Focusing on the former geologic theory, Conwest engaged in both surface and underground activities during the summer of 1957 (refer to Table 2 and Map 1 of the 1997 Summary Report for summaries). Surface exploration included trenching six 'veins' with anomalous silver, lead and zinc values, diamond drilling (11 holes, 582 m), and plane table mapping. No unoxidised mineralization was encountered during drilling, and therefore surface drilling was dismissed as unreliable (due to drilling problems), and an underground program was initiated.

Underground exploration began on March 21, 1957, when the upper adit was cut 76 m below the crest of Silvertip Hill and extended southerly for 155 m. Hoping to intersect veins 1-4, the adit intersected minor galena mineralization. Three barren holes were drilled from the upper adit. Focusing on intersecting the No. 4 vein downdip, Conwest later drove an adit approximately 180 meters vertically below the upper adit. Collared on June 19, 1957, and 393 m long, this drift showed more promise. Three zones were outlined: one was cut by the drift, while the other two were intercepted by underground drilling. Galena was found associated with fractures, but corresponding silver grades were not economic. The six diamond drill holes totalled 204 m.

Development on the property included building six wood frame buildings and a 27.2 km sleigh road to the Alaska Highway. In the following year, Conwest relinquished their option on the claims.


20000 E
25000 E
30000 E
35000 E
55000 N
50000 N
45000 N
40000 N
35000 N
N
YUKON T.
B.C.
Survey Mtn.
Survey Ck. Area
Big Swamp Area
Ewen Barite
Bull 7
Bull 7 East Ext.
Bull 7 Ext.
Discovery North
Silver Creek
Discovery
Tricorn Mtn.
Silvertip Hill
Claim Boundary (within B.C.)
Tricorn / Tour Ck.
Keystone Mtn.
Tiger Terrace / Cariboo Ridge
Donegal Mtn.
Table Mtn.
Moose Valley Area
SILVERTIP MINING CORPORATION
Silvertip Project
Areas of Previous
Exploration
0
2km
4km
FILE:
DRAWING NO:
DRAWN BY:
DATE:

In 1958, a Joint Venture was signed between Noranda Mines Limited, Canex Aerial Exploration Limited, and Bralorne Mines Limited. The fractures were reinterpreted and the gossan was thought to be brecciated sulphides displaced along faults. Under this option, 3 holes (972 m) were drilled from the lower drift in an effort to find sulphides at depth or sulphides that had been displaced along fault zones. Drilling started August 27, and ended November 17, 1958 and no mineralization was encountered. It was then proposed that the mineralization was flat-lying and was formed by replacement, controlled by bedding and stratigraphic traps, and subsequently sliced by faulting.

The recommendation after this program was to drop the option. This was done in the summer of 1960, after the property lay dormant for the full year of 1959.

Peerless Oil and Gas obtained a lease agreement for the property in 1960, and enlisted Chapman, Wood, and Griswold Limited to run an AFMAG survey over the claims. No suitable drill targets were found. However, they did outline three conductive zones and suggested IP or EM surveys for clarification of the anomalies. Peerless withdrew from the lease in early 1961.

For the years 1961 to 1966, the property was optioned to Pegasus Exploration Limited with Chapman, Wood, and Griswold Limited managing the exploration programs.

In 1961, an IP survey covering 2.55 hectares was run in an attempt to locate at depth, the continuation of the high-grade silver-lead mineralization found on the surface of Silvertip Hill. Two anomalies were defined on Silvertip Hill near the Camp Creek fault. The strength and extent of the anomalies indicated the possibility of large, massive sulphide deposits.

Four diamond drill holes (Peg 1 to 4, 495 m) were completed in 1961 and in 1962, to test the IP anomalies. Graphite on fracture planes was thought to be responsible for low resistivities, and sulphides were present in sufficient abundance to explain the IP results otherwise, mineralization was limited.

A number of activities were performed on the property during June 14 to August 31, 1963:

- photogeologic study of Silvertip claims and adjoining areas
- geologic mapping
- geochemical soil sampling (1650 samples) and rock analysis
- trenching and stripping
- diamond drilling (Peg 5, 51 m)

The photogeologic study identified intense faulting that correlated with IP anomalies and sulphide zones. Trenching discovered that the gossan zones were in fact continuous for as long as 500 m. Sampling revealed uneconomic silver values within the gossan. Drilling intercepted only oxidised mineralization.

A new theory proposed the gossan at the siltstone/limestone contact was evidence of faulted mineralization, and by reconstructing the fault, one could focus exploration on the truncated mineralization.

In 1964 and 1965, the property lay inactive due to the high cost of exploration.

Silverknife Mines Limited owned the Silvertip claims from 1966, until the claims lapsed in the early 1970's. The property (96 BC claims) was optioned to Rodstrom Yellowknife Mines Limited. Four rotary holes (RDH 1 to 4, 684 m) were drilled to test IP anomalies outlined in the early 1960's. An early winter prematurely terminated the program that budgeted for over 1,200 metres of drilling. One hole intercepted limited pyrite and galena mineralization. The theory of silver-lead replacement of limestone at the contact with overlying shale had emerged during this program.

In 1967, regional exploration continued. An airborne EM survey corresponded well with the geochemical survey of 1963, and on this basis, two drill targets were proposed and executed (S1-67 and S2-67, 152 m). Neither hole was deep enough (due to drilling problems) to penetrate limestone.

The first ever reserve estimate predicted 1.8 million tonnes of 2778 grams per tonne silver, 50.3% lead, and 1.22% zinc. However, later in the year this estimate was dismissed due to large errors in calculation assumptions.

In 1968, the property was optioned by Northern Comstock Mining Limited who performed a seismic survey (GeoCal Ltd.), and two vertical diamond drill holes (C1-68 and C2-68, 388 m). The drill holes tested anomalous highs that were outlined in the survey. The second hole encountered weak mineralization in limestone before being shut down. The property was relinquished, and the area remained inactive until 1973.

1973-1990

Bralorne Mines Limited restaked the area in the spring of 1973, under the name Tam. Agilis Engineering was contracted to conduct an assessment of the property. The summary report recommended grassroots exploration. No action was taken, and the claims eventually lapsed.

In 1980, contractor Cordilleran Engineering, on behalf of Regional Resources Limited, staked the property upon the discovery of Earn hosted exhalites (both baritic and pyritic-siliceous). Stream sediment sampling indicated anomalous values for base metals, and subsequent prospecting and mapping unearthed the Discovery showing - a massive sulphide exhalite. The Discovery showing was then trenched extensively. At this time, the exploration target became shale-hosted sedex lead-zinc mineralization within the Earn Group.

Regional surveys and exploration were continued and expanded in 1981, by Cordilleran Engineering for Amax of Canada Limited (optioned property from Regional Resources Limited).

The exploration performed in 1981 was outlined in two phases:

1) airborne EM survey (841 claims, 778 line km)
   line cutting (435 km)
   soil sampling (8000 samples)
2) trenching (19)

3 areas were surveyed by PEM (8.5 line km) and gravity (8.9 line km)

6 diamond drill holes in the Discovery area (NQ size, 857m).

Seven target areas were proposed following execution of the aforementioned work and surveys; Discovery showing, Porcupine Ridge to Silvertip Hill, Tiger Terrace to Caribou Ridge, Moose Valley, Big Swamp, Survey Creek, and Tour Creek.

Of the six diamond drill holes in 1981, four intersected massive sulphides deeper in the stratigraphy than expected, at the top of the McDame limestone. These drill holes signalled a shift in the ideas of the nature and location of mineralization.

The relevant stratigraphy of the area is comprised of two groups; the McDame Group and the Earn Group. Contained within the McDame Group limestone is the Lower Zone - a massive sulphide replacement body that is closely related to the contact with the overlying shale and siltstone. The Earn Group (shale and siltstone) hosts four narrow, barite-rich, siliceous horizons interpreted as exhalite deposits and known as the Upper and Discovery Zones. Diamond drilling eventually proved that the main sulphide deposits were in the McDame Group, not the Earn Group as originally believed. This shift occurred after the 1982 exploration program. However, the implementation of a manto-style model as an exploration tool did not occur at this time.

Ownership and management in 1982 continued from 1981. The 1982 field season focused on:

1) assessing the mineral claims
2) refining the shape and size of previously located targets
3) increasing the known mineralization in the Discovery area as outlined in 1981

The airborne EM survey on the Way and Post claims, and continued exploration (prospecting, mapping, soil sampling, gravity surveys, trenching and packsack drilling) resulted in 166 BC units lapsing, and the staking of 153 BC units (Bull 7-14, Climax 12-14, Post 11-14). Down hole pulse EM tests were found to help distinguish between high grade Lower Zone massive sulphide and conductive graphitic zones or shale-hosted sulphides.

Diamond drilling consisted of 19 holes (5283 m) on a 150 m grid, focusing on the Discovery (14 holes), Silvertip Hill (1 hole), and Ewen Barite (4 holes) areas. The drill program expanded the geologic knowledge of the Discovery and Upper Zones, and increased the confidence in exploring for the Lower Zone sulphide bodies. Minor sulphide lenses below the Lower Zone were also recognised.

Reserve calculations for the Lower Zone after the 1982 exploration estimated 3.6 million tonnes of 452 grams per tonne silver, 6.7% lead, and 12.5% zinc.

In 1983, the focus of the program was to 1) delimit the extent and continuity of the massive sulphides in the Discovery area; 2) examine variability in massive sulphide thickness; 3) outline potential for massive sulphide occurrences between Discovery and Tour Ridge areas, and 4) find the ideal location to collar a portal.

Thirty-two diamond drill holes (11,734 m) were drilled on a 150 m grid with the following allocations: Discovery area (12 holes), Silvertip Hill (8 holes), Brinco Creek (1 hole), and Tour Ridge (1 hole). A number of other surveys and studies (petrographic, mineralogic, and metallurgic) were performed, all focusing on expanding resources and delimiting the Lower Zone. By this time, the focus of all exploration was the Lower Zone mineralization.

Conclusions following the 1983 field season were 1) the possibility exists for massive sulphide occurrence north and west of the Discovery area; 2) increased potential for massive sulphides on the south side of the Discovery area; 3) Lower Zone massive sulphides vary in thickness from 0-11 metres thick, with common lateral increases and decreases in thickness. These observations indicated that a manto-type model is best suited for the mineralization at Silvertip; 4) the optimum location for the portal was chosen.

Reserve calculations estimated 4.7 million tonnes of 350 g/tonne silver, 5.1% lead, and 12.3% zinc.

Surface exploration was pursued in the 1984 field season. The definition of the Silver Creek deposit was first priority. A total of 50 holes (10,981 m) were drilled from the surface, in four different locations: Silver Creek (43 holes, 8,995 m), Discovery (4 holes, 961 m), Silvertip Hill (1 hole, 437 m), and Tour Ridge (1 hole, 498 m). Of the 43 holes drilled in the Silver Creek area, 20 intersected Lower Zone massive sulphides. With this information, the Silver Creek North and South areas were defined. Also noteworthy is that the holes drilled on Silvertip Hill and Tour Ridge were barren.

Mapping and prospecting were performed at the Ewen Barite, Spider Swamp, Bull 7 claim, and Southern property areas. To better define the local controls on mineralization, extensive research studies were contracted. For instance, the McDame limestone was interpreted into biofacies (D.J.C. Mundy), breccias were classified, facies of the Earn clastics were determined, and petrographic and cathodoluminesence studies were performed.

To accommodate the heavy machinery needed for underground exploration, the access road to the highway was upgraded, and two bridges were installed. Infrastructure for a winter drill crew was installed including a 40 man trailer camp, dry, shop, powerhouse, water wells, and satellite telephone system. Underground mining began on October 11, 1984 when Canadian Mine Development collared a 4.27 x 4.57 m portal to gain access to Silver Creek North. Drift construction was completed May 15, 1985 with a total of 1453 meters of advance.

Underground drilling began on April 24, and finished on October 20, 1985, by Adtec Mining Consultants under the management of Cordilleran Engineering Limited. The underground workings exposed the Silver Creek North area and allowed for extensive chip sampling and metallurgical testing. The main object of the underground workings was to fan drill, at 20 m intervals, into the Silver Creek North (120 holes) and South (50 holes) areas in an effort to constrain the shape, size, and continuity of the sulphide mineralization, and asses the grade, and mineability of the sulphide zone.

From the 170 underground holes (12,383 m) drilled, reserves for the Silver Creek and Discovery areas were estimated to be 5.4 million ton of 390 grams per ton silver, 6.4% lead, and 12.3% zinc, with 0.54 g/ton gold. Following completion of underground exploration, the workings were allowed to flood. This is the first year that computers were implemented to manipulate drill log data and resource calculations.

In 1986, exploration efforts (all surface) were directed toward discovery of additional zones to augment the resource outlined in the Silver Creek area. Strathcona Mineral Services Limited (taking over from this point to 1990) managed the 1986 summer drill program for Regional Resources Limited. Soil geochemistry, line cutting, pulse EM, and magnetometer geophysical surveys were performed in 7 target areas: Bull 7, Donegal Mountain, Keystone Mountain, NW Discovery/Silver Creek North, Spider Swamp, Survey Creek, and Tricorn/Tour Creek. Fourteen diamond-drill holes (2660 m), and 9 reverse circulation holes (984 m) resulted in the reduction of targets from seven to two. All save the Spider Swamp, and NW Discovery/Silver Creek North areas were discounted.

Reserve calculations after the 1986 field season predicted 1.185 million tonnes of 410 grams per tonne silver, 7.0% lead, and 9.6% zinc (Exploration in British Columbia, 1986).

The property was on care-and-maintenance during 1987 and 1988, due to poor market conditions, low metal prices and the high cost of underground exploration.

The primary goals of the 1989-90 fall/winter/summer season were to test for additional mineralization, to evaluate the shape, extent, and continuity of the mineralization, and to determine mining conditions in the central Discovery area in a 200 m by 500 m area. All exploration was performed from underground.

General work on the property was done in 1989 in preparation for commencing underground work early in 1990. Preparations included the rehabilitation of underground workings and the installation of a new shop, generator, and mine water treatment plant.

To fulfil the goals of the 1990 season, Strathcona Mineral Services, managed the property (for Regional Resources Limited) and provided camp facilities and power generation while Canadian Mine Development (CMD) provided mining equipment, personnel, and underground service work. The decline was extended 765 meters to access deeper Discovery mineralization. The work was done between January 5 and June 11, 1990. A total of 68 holes (9620 m) were drilled. Additional mineralization below the Earn/McDame was not found.

A better understanding of the mineralization confirmed that the ore was distributed in a series of pods, tubes, and manto-like bodies which displayed great irregularity in shape and continuity. The recognition of two different modes of mineralization was made in an attempt to define controls and mining strategy: unconformity-related and limestone-hosted. Drill hole spacing was found to be too large to determine the fine details that are needed for accurate volume and resource calculations.

The potential for mining was decided to be low due to poor ground conditions encountered in the Discovery area. The best targets for underground mining were thought to be those which were the thickest, and the farthest below the Earn Group shale and siltstone.

The 1990 exploration year resulted in a resource estimate of 1.74 million tonnes at 352 grams per tonne silver, 6.4% lead, 10.0% zinc. The project lay dormant from 1991 until late 1996 when Imperial Metals Corporation acquired 100% of Regional Resources Limited. Regional's name was then changed to Silvertip Mining Corporation. Silvertip budgeted $2 million CDN for the 1997 exploration program, outlined in the summary report.