

**NI 43-101 Technical Report**  
**Pine Point Project**  
**Northwest Territories, Canada**

Prepared for:  
**Tamerlane Ventures Inc.**

13 December 2007  
077421

Prepared by:  
**Chlumsky, Armbrust & Meyer, LLC**

Fred Barnard, Ph.D., Calif. Professional Geol. # 7432  
Steven Milne, P.E.  
Robert L. Sandefur, P.E.

## TABLE OF CONTENTS

	<u>Page No.</u>
<b><u>SECTION</u></b>	
1.0 SUMMARY .....	1
1.1 Introduction and Terms of Reference .....	1
1.2 Property.....	2
1.3 Geology.....	3
1.4 Mineralization.....	4
1.5 Exploration and Drilling .....	8
1.6 Sampling .....	9
1.7 Assaying and QA/QC .....	10
1.8 Density Measurements.....	11
1.9 Data Verification.....	11
1.10 Mineral Processing.....	12
1.11 Mineral Resources .....	12
1.12 Feasibility Study Results.....	14
1.13 Mineral Reserves. ....	15
1.14 Interpretation and Conclusions. ....	16
1.15 Recommendations.....	17
2.0 INTRODUCTION .....	18
2.1 Client.....	18
2.2 Purpose.....	18
3.0 RELIANCE ON OTHER EXPERTS .....	20
4.0 PROPERTY DESCRIPTION AND LOCATION .....	21
5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY .....	26
5.1 Physiography and Climate .....	26
5.2 Access and Infrastructure.....	27
6.0 HISTORY .....	28
6.1 Pre-production Period .....	28
6.2 Cominco production period .....	29
6.3 Post-production Period.....	32
7.0 GEOLOGICAL SETTING .....	33
7.1 Regional Geology .....	33
7.2 Middle Devonian Stratigraphy.....	34
8.0 DEPOSIT TYPES .....	39
9.0 MINERALIZATION .....	40
9.1 Distribution of Deposits .....	40
9.2 Controls on Mineralization .....	44
9.3 Mineral Paragenesis .....	46
9.4 Deposit Morphology and Size .....	49
9.5.1 R190 Deposit.....	52
9.5.2 N204 deposit.....	54
9.5.3 G03 Deposit.....	54
9.5.4 W85 Deposit.....	54
9.5.5 P499 Deposit .....	55
9.5.6 O556 Deposit.....	55

## TABLE OF CONTENTS

	<u>Page No.</u>
<b><u>SECTION</u></b>	
9.5.7 V46 Deposit.....	56
9.5.8 W19 Deposit.....	56
9.5.9 X25 Deposit.....	56
9.5.10 Z155 Deposit .....	56
10.0 EXPLORATION.....	58
11.0 DRILLING.....	59
11.1 Cominco Drilling .....	59
11.2 Westmin Drilling .....	60
12.0 SAMPLING METHOD AND APPROACH .....	65
12.1 Cominco Drilling .....	65
12.3 Tamerlane Program, 2005.....	68
12.4 Density Measurements.....	69
12.4.1 Cominco Practice.....	69
12.4.2 Westmin Practice.....	69
12.4.3 Tamerlane Practice .....	69
12.4.4 CAM Practice and Recommendations.....	70
13.0 SAMPLE PREPARATION, ANALYSES AND SECURITY .....	72
13.2 Westmin Samples.....	72
13.3 Tamerlane Samples, 2005 .....	72
14.0 DATA VERIFICATION.....	74
15.0 ADJACENT PROPERTIES .....	86
16.0 METALLURGICAL TESTING AND MINERAL PROCESSING.....	87
16.1 Metallurgical Testing .....	87
16.1.1 Dense Media Separation.....	87
16.1.2 Flotation and Gravity Separation.....	87
16.2 Mineral Processing.....	90
17.0 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES .....	93
17.1 R190 Deposit .....	93
17.1.1 Tamerlane Estimation.....	93
17.1.2 CAM Audit of Tamerlane Estimate.....	94
17.2 Other Deposits .....	98
17.3 Mining and Processing Method .....	101
17.4 Cutoff Grade Parameters.....	101
17.5 Mining Recovery and Mining Dilution.....	101
17.6 Mineral Reserve Categories .....	101
17.7 Mineral Reserve Estimate .....	101
18.0 OTHER RELEVANT DATA AND INFORMATION.....	103
19.0 ADDITIONAL REQUIREMENTS FOR TECHNICAL REPORTS	
ON DEVELOPMENT PROPERTIES AND PRODUCTION PROPERTIES .....	104
19.1 Environment and Socioeconomic Factors and Permits.....	105
19.2 Mining Operations .....	106
19.2.1 Mineable Reserves/Cutoff Grade .....	106
19.2.2 Mining Dilution and Ore Recovery .....	108
19.3 Mining Operations .....	109
19.4 Labor.....	112

## TABLE OF CONTENTS

	<u>Page No.</u>
<b><u>SECTION</u></b>	
19.5 Mining Equipment .....	114
19.6 Underground Mine Utilities .....	115
19.6.1 Electrical.....	115
19.6.2 Dewatering .....	115
19.6.3 Ventilation .....	115
19.6.4 Compressed Air .....	115
19.6.5 Underground Communications.....	116
19.7 Capital and Operating Costs .....	116
19.7.1 Capital Costs.....	116
19.7.2 Operating Costs .....	121
19.8 Economic Evaluation of the R190 Deposit.....	124
19.8.1 Input to Economic Evaluation .....	124
19.8.2 Results of Cash-Flow Analysis.....	129
19.8.3 Payback Calculation for Mine Plan .....	131
20.0 INTERPRETATION AND CONCLUSIONS .....	132
20.1 Nature of the Project .....	132
20.2 Geology.....	132
20.3 Drilling, Sampling, and Assaying.....	132
20.4 Mineral Resources .....	132
20.5 Mineral Reserves .....	132
20.6 Additional Potential .....	133
20.7 Analytical and Testing Data.....	133
20.8 Infrastructure.....	133
20.9 Viability of Project.....	133
21.0 RECOMMENDATIONS .....	134
21.1 R190 Deposit .....	134
21.2 Other Deposits .....	134
22.0 REFERENCES .....	135
23.0 DATE AND SIGNATURE PAGE .....	139
23.1 Fred Barnard, Ph.D. .....	139
23.2 Steve Milne, P.E. .....	141
23.3 Robert L. Sandefur, P.E. .....	143
Appendix A. Personal Inspections of the Property .....	145

## **Tables**

1-1 Tamerlane Measured and Indicated Resources for July 24, 2007 Feasibility Study Model for R190 Deposit (5% Zn Cutoff).....	14
1-2 43-101-compliant Resource in 5 of 9 Additional Subject Deposits.....	14
1-3 Total Reserves Encompassed by Stopes .....	16
4-1 Tamerlane Claims in the Pine Point District.....	23
6-1 Pine Point Deposits Mined by Cominco, 1964-1988. (from Hannigan, 2006).....	29

## TABLE OF CONTENTS

	<u>Page No.</u>
6-2 Historic Tonnages on Tamerlane Property .....	31
7-1 Mineralized Middle Devonian Units at Pine Point .....	36
9-1 NORTH TREND - Deposits Listed From Northeast to Southwest * indicates deposit not on Tamerlane property .....	40
9-2 MAIN TREND - Deposits Listed from Northeast to Southwest .....	41
9-3 SOUTH TREND - deposits listed from northeast to southwest.....	44
11-1 Drilling on the Ten Subject Deposits .....	59
11-2 Summary of the 2005 Tamerlane Assayed Drill Intercepts .....	61
12-1 Selected lithologic Unit Codes used by Cominco (Pine Point Mines Ltd.) .....	65
12-2 Lithologic units codes used by Westmin Modified from Turner, et al., 2002. ....	67
16-1 Head Assays.....	86
17-1 Tamerlane Resource Estimates for R190 deposit, November, 2006.....	93
17-2 Resources within 5% Zn Grade Shell Cutoff Utilized in Tamerlane Aug. 13, 2007 Feasibility Study for R190 Deposit.....	93
17-3 R190 Drilling Statistics from Assay Database.....	94
17-4 R-190 Backmarking Comparison for Lead and Zinc .....	97
17-5 R-190 Contained Metal Comparison Feasibility Model to CAM Nearest-Neighbor Model .....	97
17-6 Mineral Resources, 43-101 Compliant .....	100
17-7 Confirmation Drilling Needed in 4 Non-Compliant Deposits .....	100
17-8 Total Reserves Encompassed by Stopes .....	102
19-1 R190 Deposit Economic Parameters.....	107
19-2 Pine Point R190 Operations Staff .....	113
19-3 Underground Equipment List.....	114
19-4 Capital Cost Estimate.....	117
19-5 Preproduction Development Quantities.....	119
19-6 Underground Equipment List.....	119
19-7 Operating Labor Estimate .....	122
19-8 Breakdown of Estimated Freight and Smelting Charges .....	123
19-9 Estimated Unit Mine Operating Cost.....	123
19-10 Deposit R190 Estimated Cash Flow .....	126

### Figures

4-1 Location Map of Pine Point Project.....	21
4-2 Modified Satellite View of Pine Point Project Area .....	22
4-3 Map Showing Relation of Properties to Deposits and Cultural Features.....	24
7-1 Geological Provinces of Canada (from Hannigan, 2006) .....	34
7-2 Middle Devonian Sedimentary Facies in West-Central Canada (Modified from Rhodes, et al., 1984).....	35
7-3 Middle Devonian Sedimentary Facies (Modified and simplified from Hannigan, 2006).....	37
7-4 Subcrop Geologic Map of Pine Point District (Modified from Hannigan, 2006)....	38
7-5 Cross-Section through Southwest Part of Pine Point Property (Slightly modified from A Westmin Cross-Section dated 1982).....	38

## TABLE OF CONTENTS

Page No.

### Figures

9-1	Mineralized Trends in the Pine Point District (based on Rhodes, et al. 1984, Figure 18).....	45
9-2	Mineral Paragenesis, Pine Point Zinc-Lead District .....	47
9-3	Textures of Mineralized Rock, Pine Point District .....	49
9-5	Cross-Sections of Normal Prismatic Deposit (modified from Rhodes, et al. 1984, Figure 41A). Note vertical exaggeration.....	50
9-6	Cross-Section through R190 Deposit.....	53
9-7	Long Section through R190 Deposit.....	53
11-1	Photo of core from hole R190-TV03 .....	63
11-2	Tamerlane 2005 photo of core from hole R190-TV03, footage 510-530, after splitting .....	63
14-1	Lead Cumulative Frequency, 40 Deposits .....	75
14-2	Lead Cumulative Frequency, R190 Deposit .....	76
14-3	Lead cumulative frequency, N204 deposit .....	77
14-4	Zinc Cumulative Frequency, 40 Deposits.....	78
14-5	Lead cumulative frequency, R190 deposit.....	79
14-6	Lead Grade-Thickness Frequency, 40 Deposits.....	80
14-7	Lead Cumulative Frequency, R190 Deposit .....	81
14-8	Lead-Times-Thickness Cumulative Frequency, Z155 Deposit.....	82
14-9	Zinc Grade-Thickness Frequency, 40 Deposits .....	83
14-10	Zinc Grade-Thickness Frequency, R190 Deposits.....	84
14-11	Zinc Grade-Thickness Frequency, Z155 Deposit .....	85
16-1	Pb Grade-Recovery Curves.....	88
16-2	Zn Grade-Recovery Curves .....	88
16-3	Overall Separation of Pb .....	89
16-4	Overall Separation of Zn.....	89
16-5	Simplified Process Flow Sheet .....	92
17-1	Typical Graphical Model of Deposit Cross-Sections.....	96
19-1	Location R190 and Nearby Deposits .....	105
19-2	Operations Layout Map of R190 Site .....	105
19-3	Sensitivity Analysis for Costs at R190 .....	129
19-4	Sensitivity Analysis for Price at R190 .....	130
19-5	Sensitivity Analysis for Combined Grade and Recovery at R190 .....	130

## TABLE OF CONTENTS

<b>Reference in this Report</b>	<b><u>Page No.</u></b>
<b>43-101F1 Table of Contents</b>	
<b>Reference Item</b>	
Item 1. Title Page .....	Title Page
Item 2. Table of Contents.....	Table of Contents
Item 3. Summary.....	Sec 1.0
Item 4. Introduction And Terms Of Reference .....	Sec 2.0
Item 5. Reliance On Other Experts .....	Sec 3.0
Item 6. Property Description and Location .....	Sec 4.0
Item 7. Accessibility, Climate, Local Resources, Infrastructure and Physiography.....	Sec 5.0
Item 8. History .....	Sec 6.0
Item 9. Geological Setting .....	Sec 7.0
Item 10. Deposit Types .....	Sec 8.0
Item 11. Mineralization.....	Sec 9.0
Item 12. Exploration .....	Sec 10.0
Item 13. Drilling.....	Sec 11.0
Item 14. Sampling Method And Approach .....	Sec 12.0
Item 15. Sample Preparation, Analyses And Security .....	Sec 13.0
Item 16. Data Verification .....	Sec 14.0
Item 17. Adjacent Properties.....	Sec 15.0
Item 18. Mineral Processing and Metallurgical Testing .....	Sec 16.0
Item 19. Mineral Resource Estimate.....	Sec 17.0
Item 20. Other Data And Relevant Information .....	Sec 18.0
Item 25. Additional Requirements For Technical Reports on Development Properties And Production Properties .....	Sec 19.0
Item 21. Interpretation And Conclusions.....	Sec 20.0
Item 22. Recommendations .....	Sec 21.0
Item 23. References .....	Sec 22.0
Item 24. Date And Signature Page .....	Sec 23.0
Item 26. Illustrations .....	(See Figures)

Appendix A. Personal Inspections of the Property

## **1.0 SUMMARY**

### **1.1 Introduction and Terms of Reference**

This NI 43-101-compliant Technical Report was prepared by Chlumsky, Armbrust and Meyer, LLC (herein "CAM") of Lakewood, Colorado for Tamerlane Ventures Inc. (herein "Tamerlane"), a company listed on the Toronto Ventures Stock Exchange (TSXV). Tamerlane controls, among other mineral assets, mineral properties in the Northwest Territories (herein "NWT") of Canada which contain the lead-zinc deposits which are the subject of this report, as well as other mineralization.

This report describes ten lead-zinc deposits in the Pine Point district, defines mineral Resources as warranted for several of those ten, and defines mineral Reserves for one of those, the R190 deposit, which is the subject of a recent internal Feasibility Study by Tamerlane. The Feasibility Study was reviewed by CAM, and shows the economic feasibility of mining the R190 deposit. A summary of salient results of the Feasibility Study is included in Section 19 of this report.

The ten deposits which are the subject of this report are:

- R190 (formerly held by Westmin, and the subject of the current Feasibility Study)
- P499, O556, V46, W19, X25, and Z155 (deposits formerly held by Westmin).
- N204, G03 and W85 (deposits formerly held by Cominco).

In this report, these ten deposits are collectively referred to as the "subject deposits". Tamerlane's property contains more than 50 additional deposits that in aggregate contain a large tonnage of material which was historically classed as "reserves" or "resources", but are not currently 43-101-compliant.

More than 1,000 documents in digital, scanned, or hard-copy format, the majority of which pertain to the R190 deposit, were used in the preparation of this Technical Report and the referenced Feasibility Study.

Specific discussions of the mineralization and mineral Resources on the ten subject deposits addressed in this report are based on drilling on each of those Tamerlane properties, without extrapolation from ground not controlled by Tamerlane.

The Pine Point property was personally inspected by all three of the Qualified Person who signed this Report: Mr. Sandefur on 24 October, 2006; Mr. Milne of 14 November, 2007; and Dr. Barnard on 14-15 November, 2007. Details of the personal inspections are in Appendix A.

In addition, CAM geologist and Qualified Person Fred Barnard reviewed on 23 April 2007 the core drilled for Tamerlane in 2005 and stored in Ferndale, Washington. This core is critical because it serves

to validate results of the 1970's-1980's drilling and assaying, which had been carried out prior to the establishment of NI-43-101 protocols.

In the preparation of this report, CAM discussed the project with the persons below, but independently verified all material facts as reference throughout this Report:

- Mr. David Swisher, Vice President, Tamerlane Ventures Inc.
- Mr. Ross Burns, President and CEO, Tamerlane Ventures Inc.
- Mr. Wolfgang Schleiss, Senior Geologist, Tamerlane Ventures, Inc.
- Mr. Albert Siega, Mining Engineer, Tamerlane Ventures, Inc.
- Mr. Dan Brost, (formerly) Manager of Resource Geology, Tamerlane Ventures Inc.
- Mr. Terry Garrow, consulting geologist to Tamerlane Ventures.

Tamerlane's R190 Feasibility Study prepared by Tamerlane was critically reviewed by Mr. Steve Milne, P.E., and other CAM staff. CAM confirmed with the Mining Recorder, NWT Region in Yellowknife that Tamerlane's 40 claims are active and paid-up to various dates, the first due date being 6 September, 2008, and that Tamerlane Ventures Inc. is the 100% registered owner of all 40 claims.

Information relating to NWT mining law, obligations and encumbrances of Tamerlane, water rights, environmental permits, and operating permits was confirmed by CAM as explained in Section 19.

## **1.2      Property**

Tamerlane's Pine Point properties, including the ten lead-zinc subject deposits described in this report, and about 70 other known deposits, are located about 800 kilometers north of Edmonton, south of Great Slave Lake, in the Mackenzie Mining Division of the Northwest Territories of Canada. The properties lie north of the Territorial Highway 5 connecting Hay River and Pine Point townsite, and extend intermittently from 25 to 80 kilometers east of Hay River. Geographic coordinates are from latitude 114 degrees 0 minutes to 115 degrees 15 minutes west, and from 61 degrees 0 minutes to 61 degrees 45 minutes North latitude.

The Pine Point Project consists of 40 mining claims, owned 100 percent by Tamerlane Ventures Inc., covering 43,339.95 acres (17,539.04 hectares). The Mining Recorder's office in Yellowknife confirmed to CAM that the 40 claims are active and paid-up to various dates, the first date being 6 September, 2008, and that Tamerlane Ventures Inc. is the 100% registered owner of all 40 claims.

The claims cover the geological feature known as the Great Slave Reef (or the Pine Point Barrier Reef). The claims are largely contiguous, lying in five nearby blocks. The property is subject to a 3 percent NSR royalty, payable to Karst Investments LLC. Surface rights in this area are of Crown ownership, and

may be used in conjunction with valid mineral tenure. Nearly all the land within the project area is unoccupied.

Tamerlane's R190 deposit, which is the subject of a current Feasibility Study, lies on the R190 claim, which covers approximately 206.60 acres (83.61 hectares). The R190 project's footprint area will encompass approximately 6.2 acres (2.5 hectares). The R190 deposit is about 0.5 kilometers north of Territorial Highway 5, 40 kilometers east of Hay River.

The Pine Point project is located in a sub-arctic environment near 61 degrees north latitude. Swampy muskeg and shallow, marl-bottomed ponds characterize the project-area topography. A blanket of glacial debris produces a low-lying, hummocky terrain that slopes gently northward toward Great Slave Lake. The project area is of low relief, about 215 meters total. Dominant trees are scrub jack pine, black spruce and willows, which are interspersed between large areas of open swamp. Sparse moose, black bear and deer populations occur in the area, along with smaller mammals such as beaver, fox, and hares.

Winter conditions are sub-arctic, with mean average January temperatures at -17° C. Summers are hot and relatively dry with long daylight periods and a mean July temperature of +16° C. The mean annual precipitation is 34 cm, which includes 18 cm of rainfall, and the water content of 166 cm of snow. Discontinuous permafrost exists in a few localities, none near the ten subject deposits.

Comprehensive environmental surveys have been undertaken as input into the Feasibility Study, and monitoring is continuing.

Access to the project area is by 1100 kilometers of paved highway north from Edmonton, Alberta to Hay River and then 90 kilometers of paved highway to the old Pine Point town site. Hay River has all major services including an airport with scheduled jet service from Edmonton and Yellowknife, a rail terminal and a port from which barge traffic traverses the Mackenzie and Slave rivers.

### **1.3 Geology**

The Pine Point district area lies within the Western Canada Sedimentary Basin, which is underlain by gently west-dipping sedimentary strata between the Precambrian Shield to the east and the Cordilleran Orogen to the west. At Pine Point, 350 to 600 meters of Ordovician to Devonian miogeoclinal sedimentary rocks, consist of platformal carbonates, shales and evaporites, cover a basement made up of Archean crystalline rocks and Proterozoic sedimentary rocks. Rocks in the district are little-deformed except for a southwestward tilt of 2 to 4 meters per kilometer (less than one-half degree). Southwesterly fractures in the underlying Archean basement strike beneath the district, but do not have visible expression in the Devonian rocks.

The Middle Devonian rocks of interest in the Pine Point district are overlain by non-mineralized Middle and Upper Devonian rocks. These in turn are overlain by Pleistocene glacial deposits and post-glacial swamp deposits, which cover nearly all the surface of the district. Outcrops are rare, and all of the ten deposits which are the subject of this report are covered by non-mineralized Devonian strata, as well as by Pleistocene debris.

Certain formations within the Middle Devonian (Givetian) sedimentary sequence hosts the mineralization at Pine Point. These marine sedimentary rocks are part of a major complex of reefs, shelves, and evaporitic lagoons which covered what is now south-central Canada. A barrier reef complex nearly 1,000 kilometers long, more than 10 kilometers wide, and 200 m in thickness, separated a closed evaporitic basin on the south (the Elk Point Basin in Alberta, Saskatchewan, Manitoba, and North Dakota) from a shallow-water open-marine environment (the Mackenzie Basin) in the north. The Givetian barrier complex outcrops on the eastern half of the Pine Point project area and dips very shallowly to the west. The reef has been termed the Prequ'ile Barrier Reef, or alternatively the Pine Point Barrier Complex.

The units which host zinc-lead mineralization at Pine Point are described below. The facies relationships among the various named stratigraphic units are critical to understanding the environment of deposition and mineralization, as is the superimposed diagenetic dolomitization event referred to as "Prequ'ile dolomite".

Figure 7-3 shows the facies relationships, centering on the Prequ'ile Barrier Reef in the middle, with an open marine environment to the north, and the Elk Point lagoon or sea of restricted circulation to the south. A minor uplift after Pine Point time exposed the main reef, and ended the barrier-reef regime. The zinc-lead deposits shown in Figure 7-3 are epigenetic (i.e. subsequent to the depositional events).

The various lithofacies deposited during Pine Point time are remarkably consistent along the northeasterly strike of the reef complex, but show abrupt north-south variability, across the reef from fore-reef to back-reef environments.

#### **1.4 Mineralization**

Zinc-lead mineralization in the Pine Point district is clearly of Mississippi-Valley type, as that type has been defined in numerous published articles including some by the Geological Survey of Canada. The Mississippi-Valley affinity at Pine Point was recognized in print as early as 1929, and never has been seriously questioned.

The Pine Point mineralization is epigenetic, and occurs in the carbonate sediments as open-space cavity fillings and local replacements. Igneous rocks do not occur locally, and are not believed to have influenced the mineralization in any way.

The Pine Point district contains approximately 100 known zinc-lead deposits, distributed along three trends which extend in aggregate along 50 kilometers of strike and 7 kilometers of width. Cominco mined 48 of these deposits during 1964-1988. The Tamerlane property includes 72 of the 97 deposits enumerated on Table 9-1, including 42 of the 45 known deposits in the district which have not been mined. Mineralization occurs as sphalerite, galena, marcasite, and pyrite, replacing karst-filling sediments and breccias, open-space filling, and peripheral disseminations in vuggy porosity. The deposits occupy the most permeable portion of the highly porous Presqu'ile barrier complex. The highest-grade mineralization seems to be restricted to karstic structures hosting the greatest amount of infilling sediments. The most typical host lithology for ore-grade mineralization is the coarse-grained vuggy Presqu'ile dolomite, which has replaced permeable reef facies. The grade of mineralization varies widely, with the highest grade zones being in open-space-filling deposits where the mineralization formed without dilution by the host rock

Collapse breccia, formed by the upward stoping of the roofs of karst caverns, is seen as a diluent in many of the prismatic ore bodies and distinct horizons within the stratigraphy can often be traced as distinct zones of rubble within the ore. It is also not unusual to find ore zones having two or more collapse zones within the ore body. Ore is occasionally incorporated as fragments into later stages of collapse breccias. Since these multiple collapses represented very large caverns, usually of prismatic type, the largest ore zones were often of this type.

The grade of mineralization varies widely, with the highest grade zones being in open-space-filling deposits where the mineralization formed without dilution by the host carbonate rocks

All Pine Point deposits are hosted in Middle Devonian carbonate strata within or adjacent to the dolomitized barrier-reef complex. The mineralization occurs in interconnected paleo-karst cavity networks that are directly related to certain lithofacies and their behavior during episodes of uplift and karst formation. The deposits lie along three well-defined linear trends (North, Main, and South trends), which coincide with southwesterly fracture zones in the Precambrian basement rocks.

The deposits are strongly controlled by individual stratal horizons, although many deposits are discordant. The coarsely-crystalline dolomite alteration of the Presqu'ile dolomite event is also a key control for many deposits. The main mineralization stage at the Pine Point property witnesses a repetition diagenetic processes, such as karst formation (i.e. solution, fracturing, collapse), dolomitization, calcite deposition,

and introduction of sulphides and organic derivatives (bitumen and Sulphur). As indicated on Tables 7-1 and 9-1, important zinc-lead mineralization is limited to the specific listed stratigraphic units, with most deposits transgressing unit boundaries.

Apart from minor surficial oxidation products, zinc is present only as sphalerite, which is typically coliform: i.e. as crusts and radiating microcrysalline masses of light to dark brown sphalerite lining former vugs. However, sphalerite may also be present as coarse, subhedral crystals. Galena is the only important lead mineral, and tends to form crystalline masses nested inside sphalerite, toward the centers of former vugs or as massive replacement of individual beds. Large, euhedral galena crystals are rare. Marcasite and/or pyrite occur in lesser amounts, and occasional pyrrhotite, celestite, barite, gypsum anhydrite, and fluorite also occur. Where zinc-lead mineralization occurs as large open space fillings, it is often very pure and finely crystalline.

Four distinct deposit morphologies have long been recognized among the deposits in the district: tabular, normal prismatic, abnormal prismatic, and B-spongy. Each of these morphologies is inherited from different types of karst cavities. Tabular deposits formed in close conformity to karstic channels formed within a particular stratigraphic horizon, thus representing a paleo-aquifer. Normal prismatic deposits occur as fillings of collapse breccia pipes formed by intense karstification. These bodies are sub-circular in outline, and typically extend through 50 to 100 meters of stratigraphy, of which 30 to 50 meters may be mineralized. Among the ten subject properties, G03, O556, P499, R190, W85, X25, and Z155 are of normal-prismatic type. Abnormal prismatic deposits differ from the normal prismatic type in consisting of non-lithified mineralization which may have formed in a more recent (Holocene?) karstification event. B-spongy deposits are restricted to the B-spongy horizon at the base of the Upper Keg River Member of the Pine Point Group. The N204 deposit, one of the ten subject deposits of this report, is the only B-spongy deposit known to be of economic interest.

The ten subject deposits discussed in this report are all of Mississippi Valley type, but each has variations in geology and mineralization.

The R190 deposit is the subject of the feasibility study reviewed for this report. It is a normal prismatic type occurring in a karst collapse pipe, which bottoms in the Pine Point Group (Upper Keg River Member, Sulphur Point Fm.) and continues up through the Watt Mountain into the Slave Point Formation. The deposit measures 80 to 170 meters across, and as much as 45 meters in vertical extent. Metal grades vary from sub-economic on the fringes of the prismatic body to as high as 52.06% combined lead and zinc over 32.5 feet thickness in drill hole R190-TV5. Mineralization of over 2% combined lead and zinc in the 2005 drill program occurred over thicknesses ranging from a minimum of 60.5 feet in TV05 to a maximum of 109.2 feet in TV01.

The N204 deposit lies some 8 kilometers from any other known deposit. It is the only economically interesting B-spongy-type deposit in the district, being hosted in the B-spongy vuggy dolomite horizon at the base of the Upper Keg River Member. In plan view, the deposit extends 2,000 meters parallel to the northwesterly strike of the B-spongy unit, and about 1,000 meters down-dip. It ranges from 2 meters to 15 meters in thickness. Grades are low; on the order of 3 to 4 percent combined Zn plus Pb.

G03 is a normal prismatic deposit spanning the lower part of the Slave Point Fm., extending downward into the Watt Mtn. Fm. and into the Sulphur Point Fm.

W85 is a normal prismatic deposit, with mineralization extends for up to 20 meters vertically, encompassing parts of the Slave Point, Watt Mountain, Sulphur Point, Buffalo River, and Upper Keg River units. The deposit is 150 by 300 meters in plan view, and up to 20 meters thick. W85 consists of two deposits, a shallower, eastern, lead-dominant portion and a deeper, western, zinc-dominant portion.

The P499 deposit is of normal prismatic type. Mineralization extends from the Slave Point Fm. through the Watt Mtn. Fm. and Sulphur Point Fm., into the Upper Keg River Member, and occupies an oval about 60 by 90 meters, with up to 70 meters vertical extent. Most of the sulphides are in matrix fillings between breccia fragments, with larger breccia fragments being barren. The higher grades are in the dolomitized (Prequ'ile) Slave Point and Watt Mountain sections.

The O556 deposit is of normal prismatic type, within a karst breccia pipe extending from the Slave Point Fm. through the Watt Mtn. Fm. and Sulphur Point Fm., into the Upper Keg River Member. The deposit forms an east-west oval some 250 by 110 meters, and up to 50 meters thick.

The V46 deposit is of tabular type, hosted within the Slave Point Fm., through the Watt Mtn. Fm. and into the Sulphur Point Fm. The irregular body averages 150 meters east-west, 90 meters north-south, and is up to 30 meters thick.

W19 is also a tabular deposit in close proximity to V46 and X25, in the Sulphur Point Fm. and Upper Keg River Member. The deposit measures 275 meters long by 45 to 90 meters wide, and does not exceed 10 meters in thickness.

The X25 deposit is a normal prismatic deposit, occupying a karst collapse pipe in the Slave Point Fm. through the Watt Mtn. Fm. and into Sulphur Point Fm. The irregular surface projection of the mineralized pipe is 120 to 560 meters across, and mineralization extends for more than 60 meters vertically.

Z155 is a normal prismatic deposit in karst breccia, with mineralization extending up to 78 meters vertically, encompassing parts of the Slave Point, Watt Mountain, Sulphur Point, Buffalo River, and Upper Keg River units. The deposit is 170 to 185 meters in diameter.

Good exploration potential remains to find additional deposits on the Tamerlane property, but the focus of Tamerlane's efforts on the property is the near- to medium-term mining of the R190 and other nine subject deposits.

### **1.5 Exploration and Drilling**

Concerted exploration in the Pine point district began by Cominco in 1929, and in 1948, Cominco Ltd. began major exploration work, using the Mississippi-Valley-type model to guide exploration. Most of the program was based on fences of drillholes perpendicular to the reef trends, and drilling of IP anomalies. About 90 deposits were discovered by Cominco, including G03, N204, and W85 among the ten subject Tamerlane deposits. Drilling in the district by Westmin, Cominco, and Tamerlane has probably totaled over 3,000,000 feet in more than 10,000 core holes, of which approximately 300,000 feet were drilled on the ten subject deposits. There was some additional exploration drilling by junior companies in the 1970's, mainly on the eastern fringes of the district, and by Cominco west of the district in the Hay River area. The amount drilled on the Tamerlane property has not been separately totaled, but is probably on the order of 1.5 million feet, including drilling on deposits now mined out.

Western Mines, (later Westmin Resources, Ltd, or "Westmin") in 1975 acquired claims west of Cominco's property and commenced an extensive IP survey and drilling program referred to as the Great Slave Reef (GSR) Project. The GSR Project discovered nine blind (non-outcropping) zinc-lead deposits (O555, O556, P499, R190, T799, V46, W19, X25, and Z155), but did not place any of them in production. Seven of the deposits discovered by Westmin are among the ten subject Tamerlane deposits. Over 1,000 vertical core holes were drilled by Cominco and Westmin, although many of these were off the current Tamerlane property.

Large-scale mining by Cominco commenced in 1964 with reported reserves of 21.5 million tonnes averaging 4% lead 7.2% zinc (a historical, non-43-101-compliant figure). The "Pine Point mine" was actually an assemblage of 46 separate open pits and two underground deposits, lying along a 35-kilometers trend including the mill at the Pine Point camp. No mining took place on Westmin's Great Slave Reef area, located west of Cominco's Pine Point property. In aggregate, the Cominco deposits produced a total of 64,259,570 tonnes of ore grading 3.1% lead and 7.0% zinc. None of the production was from the ten subject deposits discussed herein. Cominco closed the Pine Point mines in 1988. After

the productive period from 1964 to 1988, activity in the district waned considerably. Eventually, both Cominco and Westmin allowed their claims to lapse after a long period of low prices for zinc and lead.

In 2001-2002, Ross Burns on behalf of Karst Investments LLC (originally Kent-Burns Group) staked parts of the district, including much of the Cominco productive area, and the main trends within the former Westmin property. In 2006, Tamerlane achieved 100% ownership, with a 3% NSR royalty payable to Karst Investments.

In 2005, Tamerlane conducted confirmatory and infill drilling on three deposits (W85, G03, and R190), to confirm historic grades and tonnages, and to provide samples for metallurgy studies to determine the applicability of a Dense Media Separation (DMS) process. Total footage drilled in the three areas was 9,198 feet, including 1,437 feet in G03, 2,725 feet in W85, and 5,036 feet in R190. Significant mineralization was assayed in 16 of the 18 completed holes. The visually estimated grades in the two unassayed holes, reserved for metallurgical tests, are believed to be comparable to grades in assayed holes. The Tamerlane drill campaign essentially confirmed the historic lead and zinc mineralization thickness and grade in for R190, and are not inconsistent with the historic drilling for G03 and W85. In addition to the core holes drilled on deposits G03, R190, and W85, Tamerlane undertook an airborne magnetic and electromagnetic survey for exploration purposes.

## **1.6 Sampling**

All Cominco core was logged by geologists, or by geology students who were supervised by experienced Pine Point Mines geologists. Logging followed rigorous standard procedures, utilizing pre-printed, standardized logging cards to systematically record run-by-run recoveries, geochemical and full assays, verbose geological logs, and digital codes for geology, alteration, karst and mineralization codes. Written logging protocols were provided to geologists. Cominco's stratigraphic logging scheme was based on carbonate and clastic lithofacies terminology, as originally developed by petroleum geologists, with over 30 facies recorded. Cominco geologists marked the core for sampling, which was then undertaken by trained technicians and sent to Cominco's laboratory for preparation and assay. Nearly all the sampled intervals contain over 2 percent Zn plus Pb. In the initial phases of the Cominco program, core was split and 50% was preserved. Later in the program, all the mineralized interval was sent for assay, and no core remains of mineralized intercepts. The remaining core, including non-mineralized intervals, was preserved in a large core library near the (former) Pine Point mill. Cominco's drilling data, but not all text reports, was subsequently acquired by Tamerlane Ventures Inc. CAM believe that there is sufficient documentation to conclude that the historic Cominco drilling on the ten subject deposits can be used to generate mineral Resource estimates which are compliant with NI 43-101.

Westmin, as the operator for a joint venture of Westmin (Boliden) and DuPont, are reported to have utilized a competent geological staff and industry-standard methods. However, few details of the specific procedures are known to Tamerlane or CAM. The available information, including CAM's brief review of Westmin core stored at Pine Point, suggests that core recovery was very high, exceeding 90%. Confirmation of high core recovery can be found in the Westmin drill logs. The Westmin geological logging scheme varied from that of Cominco, but was also focused on defining reefal and diagenetic facies. Westmin's geologic and drill data are presently housed in Yellowknife, and are available to the public. A complete set of the available data relating to the Westmin program was obtained by Tamerlane and was made available to CAM. CAM opine that Westmin's drilling and sampling were of a quality sufficient to use together with Tamerlane's more recent drill data, for estimation of mineral Resources.

Tamerlane's core logging and sampling procedures followed closely those of Cominco, except that Tamerlane used a somewhat simplified version of Cominco's complex lithologic coding system, due to the small number of Tamerlane holes and the restricted geographic/geologic range of Tamerlane's drilling program. Tamerlane followed modern procedures with respect to labeling and transport of samples, which were shipped to ALS Chemex in North Vancouver for analysis. Later, Tamerlane used the remaining half of mineralized core for metallurgical tests; thus the principal mineralized intervals are missing from core now stored in Ferndale, Washington, although a few high-grade lenses remain as well as much lower-grade mineralization. CAM believes that the Tamerlane drilling was professionally executed, and should accurately reflect the nature of the mineralization at the drilled sites, such that the samples are appropriate for mineral Resource estimation purposes.

## **1.7 Assaying and QA/QC**

Limited information is available about the preparation, analysis, and security features of the historic Cominco and especially the Westmin samples.

According to available information, Cominco's sample preparation and assaying were undertaken in Cominco's assay laboratory located in the Pine Point mill building. Cominco used an x-ray fluorescence (XRF) technique, in which samples outside a nominal range of contents for Zn, Pb, or Fe were assayed again using different machine calibrations. Results were reported as %Zn, %Pb, and %Fe.

CAM could not find any information relating to sample preparation or assaying of Westmin samples. The Westmin joint venture included major-company partners, and yielded comparable results to Cominco in terms of deposit tonnages and grades. Therefore, CAM assumes that Westmin's procedures were of industry standard at the time.

Sawn core samples from Tamerlane's drilling were shipped commercially to ALS Chemex in North Vancouver, B.C, where the samples were prepared and assayed using ALS' standard techniques. Analyses were performed for Zn, Pb, and Fe by a four-acid digestion and atomic-absorption analysis. Any Zn, Pb, or Fe values above 30% were re-determined by titration and reported to the nearest 0.01% Zn, Pb, or Fe. ALS Chemex assay results were transmitted to CAM as secured .pdf files. ALS Chemex have ISO certification and routinely undertake QA/QC measures that are of world-standard class.

CAM is of the opinion that the Tamerlane verification drilling was sufficient to validate the historic sampling, subject to any qualifications set forth in Section 14, below.

## **1.8 Density Measurements**

Most of the historical tonnage estimates in the Pine Point district have used calculated rather than measured bulk densities of mineralized rock. Cominco's bulk densities during the operational period were calculated from the density of dolomite, adjusted by the amount of sphalerite, galena, and marcasite/pyrite as determined by metal assays. A porosity of 5% was assumed. Reserve-to-mined reconciliations were sufficiently satisfactory that the method was not changed.

Westmin studies variously used bulk densities of 3.44 to 3.55, or calculated bulk densities for each drillhole composite, based on metals assays, and an assumed porosity of 5%. Apparently no bulk density determinations were made from actual drill core in any of the Westmin-sponsored estimates.

Tamerlane calculated bulk densities of composites, using a porosity of 5%. The calculated bulk densities lie mostly between 2.9 and 4.5 tonnes per cubic meter.

At a grade of 11.12 % Zn, 5.38 % Pb and 3.12% Fe, the average density is 3.06 tonnes per cubic meter.

CAM concludes that the assay-calculated bulk densities, using an assumed porosity of 5%, follow acceptable practice.

## **1.9 Data Verification**

Data for the ten subject deposits, and for many other deposits in the Pine Point district, were provided to CAM as a series of CSV and XLS files. The historic assay certificates were not available CAM was unable to verify the database against source documents. Statistical checks by CAM on the ten subject deposits indicate that the databases were internally consistent. Drilling data from most of them in terms of grade-times-thickness are consistent with the statistics of the Pine Point district deposits, especially the prismatic deposits showing sub-vertical structures sampled by sub vertical drilling.

Some other deposits in the district (e.g. Z155, which did not qualify for a 43-101-compliant mineral Resource) show statistically anomalous grade-thickness data for some drill holes. CAM recommends that the risk associated with these high grade-times-thickness holes be reviewed, and if necessary additional drilling be done to confirm the tonnage and grade for the various remaining deposits in the district.

## **1.10 Mineral Processing**

Reports on the initial process testwork are contained in Appendix D of Tamerlane's R190 Feasibility Study. The test work was performed by reputable laboratories; Mountain States R&D International, SGS Lakefield Research Limited, and Confidential Metallurgical Services, all knowledgeable in mineral processing.

The Feasibility Study adequately describes the testing and evaluations performed in development and adoption of the Dense Media Separation (DMS) pre-concentration system. Initial test work has indicated that this process will upgrade the product 58 percent with minimal (approximately 5 percent) metal losses. The DMS process should save capital, operating costs and energy consumption for the Project. The media that is used in this circuit is ferro-silica, which is inert by nature, posing no risk to the environment.

The upgraded ore is subsequently sent to a conventional flotation circuit. After further grinding, the material first passes through a circuit designed to liberate the lead from the zinc and waste, and then a second circuit to separate the zinc from the waste. The tailings from the flotation circuit are then mixed with cement and the coarse crush DMS float aggregate and sent back underground for backfill and shotcrete purposes. There will be no long term storage of tailings or other process waste on the surface for the Project.

The process is designed to eliminate the use of cyanide, a potentially hazardous chemical. The exclusion of cyanide from the process flow is accomplished through the use of the DMS, the additional grinding and safer chemicals such as lime.

## **1.11 Mineral Resources**

CAM has reviewed the R190 resource model preparation procedures and performed independent checks, and believes that the feasibility model is suitable for use in financial decisions and mine planning for cutoff grades down to about 3.0% Zn. Tamerlane used a cutoff of 5% Zn. Measured and Indicated tonnage and grades from Tamerlane's 24-Jul-2007 Feasibility Study Model are shown in Table 1-1 for a 5% Zn cutoff:

Table 1-1 Tamerlane Measured and Indicated Resources for July 24, 2007 Feasibility Study Model for R190 Deposit (5% Zn Cutoff)						
Resource Category	Cutoff Grade Zn $\geq$ 5%					
	Pb+Zn (%)	ZnEq (%)	Pb (%)	Zn (%)	Fe (%)	Tonnes
Measured	18.77	15.35	6.21	12.56	5.68	574,582
Indicated	14.18	11.69	4.53	9.63	4.32	501,555
Total (Measured + Indicated)	16.63	13.64	5.43	11.19	5.05	1,076,137

CAM believes that the methodology is acceptable but that if cutoffs below 3% Zn were to be used, the grade shell used to constrain the resource estimate would need to be revised.

The additional nine deposits other than R-190 (i.e. P-499, G-03, N-204, O-556, V-46, W-19, W-85, X-25, and Z-155) were drilled by Cominco or Westmin in the 1970's and 1980's. In the case of G03 and W85, Tamerlane also performed drilling in 2005. CAM has reviewed the historical and Tamerlane drilling, and agrees that Indicated Resource estimates for five of these nine deposits are 43-101-compliant. These five deposits (P-499, O556, X25, G03, and W85, contain in aggregate 10,903,000 tonnes grading 2.43% Pb and 4.69% Zn (see Table 1-2). No economic analysis has been undertaken by Tamerlane or CAM on these deposits.

Table 1-2 43-101-compliant Resource in 5 of 9 Additional Subject Deposits				
Deposit	tonnes	Pb %	Zn %	Category
P-499	876,000	2.88	6.45	Indicated Resource
O-556	861,000	4.32	4.22	Indicated Resource
X-25	3,289,000	2.30	6.54	Indicated Resource
G-03	3,444,000	3.00	4.10	Indicated Resource
W-85	2,597,000	1.05	2.82	Indicated Resource
<b>TOTAL</b>	<b>10,903,000</b>	<b>2.43</b>	<b>4.69</b>	<b>Indicated Resource</b>

## 1.12 Feasibility Study Results

CAM reviewed Tamerlane's internal Pine Point Feasibility Study for the development of the R190 deposit with the following observations:

- The Study is thorough and comprehensive.

- The Study was prepared in accordance with accepted industry practices and standards and appears to accurately state the conditions of the Project and the requirements for development.
- No fatal flaws were found in review of the Study, or the supporting documentation.

Results of the Feasibility Study showed that the R190 mining project has the following economics, using forecasted prices of US\$1.30/lb Zinc and US\$0.80/lb Lead, a production rate of 2,800 tonnes per day, and a life of 12 months of production.

Before Tax

IRR.....	54%
Net Cash Flow .....	US\$52.7 million
NPV @ 5% .....	US\$40.9 million

The project is naturally highly sensitive to capital and operating costs, lead and zinc prices, ore grade, and metallurgical recovery.

The Payback for the project is calculated at 1.8 years, with payback achieved near the time that the present (2007) Reserves will have been exhausted, without taking into account the future discovery or conversion of additional Reserves.

CAM is of the opinion that the present R190 deposit project is economically feasible.

### **1.13 Mineral Reserves.**

Following a review of Tamerlane's R190 Feasibility Study, CAM concludes that the measured and indicated Resources for R190 are convertible to Reserves.

The Vulcan underground mining reserving package was utilized to determine the total mining reserves encompassed by the stopes. The results are given in Table 1-3, showing that more than 90% of the Reserves are included in stopes, at a slightly lower grade due to dilution.

Table 1-3 Total Reserves Encompassed by Stopes			
Description	Zn%	Pb%	Tonnes
Proven	12.21	6.06	571,081
Probable	9.76	4.72	428,946
Total	11.16	5.49	1,000,027

## 1.14 Interpretation and Conclusions.

1. The economic potential on Tamerlane's Pine Point property lies in the numerous previously-drilled zinc-lead deposits, including R190, that were not mined by the previous owners, in addition to any additional undiscovered deposits on those portions of the Barrier Complex that were under-explored. The drilled deposits were left undeveloped at the time of district closure in 1988, due to a combination of low zinc and lead prices, long haul distances from the then-existing Pine Point mill, uneconomic depths for conventional open pit extraction and/or predicted high ground water inflow rates.
2. The geological model used at the Pine Point project is entirely appropriate to the well-documented type of Mississippi Valley zinc-lead mineralization on the property.
3. The drilling and assaying carried out by Cominco and Westmin to outline the ten subject deposits is largely of a historical nature (1970's and 1980's), but there has been sufficient diamond drilling by Tamerlane in 2005 to demonstrate that the earlier results are credible and conform to modern industry standards.
4. Drilling has been of sufficient density and consistency to adequately estimate mineral Resources at the R190 deposit and five of the other subject deposits. Tamerlane completed seven holes in the R190 deposit to confirm the historical data. Assay results for the sampled holes were within ranges that confirmed the deposit's historic grades. Thicknesses of the intervals with combined lead and zinc grades above 2.0% also confirmed the historic data. In addition, assayed and calculated head grades from various ore-grade samples (high, medium, low) from the R190 deposit used by MSDRI in their HMS sink-float program correlate well with the historical data.
5. Historic data appears to be adequate for the remaining four subject deposits, but CAM believes that additional drilling and surveying prior to an updated Resource estimate are required to bring these four deposits into 43-101 compliance.
6. CAM performed standard electronic check procedures on the exploration database. CAM believes that the exploration database has been prepared according to industry norms, and is suitable for the development of geological and grade models. Checks performed by CAM on

- the wireframe and block Resource models indicate that they were prepared according to accepted engineering practice and are suitable for use in calculating Resources.
7. CAM's review of the Tamerlane Feasibility Study indicates that the R190 deposit can be profitably mined and processed. The operational and cost scenarios used by Tamerlane are aggressive, but realistic.
  8. Given the large number (more than 40) of other unmined deposits on the Tamerlane property, excellent potential exists for elevation to Reserve status for several of these, and for their subsequent development. The R190 deposit has been extensively drilled, and substantial additions to the mineral inventory there are unlikely.
  9. Sufficient metallurgical/process testing has been performed to demonstrate the estimated percentage recoveries of lead and zinc.

## **1.15 Recommendations**

1. Development of the R190 deposit has been shown to be feasible, and development should proceed.
2. To bring the remaining historic resource tonnages in deposits N204, V46, W19, and Z155 into 43-101 Resource compliance, CAM believes that a minimum of the following work is required:
  - Search for additional documentation in the archives of Tamerlane, the Lord Centre in Yellowknife, the Geological Survey of Canada, or elsewhere.
  - Ensure that licensed surveys with modern methods (probably differential GPS) locate at least 10% of the holes in any deposit, to allow the geometry and location of the drilling to be verified.
  - Re-drill, re-sample and re-assay at least 5% of the holes (minimum of three per deposit) to confirm the thickness and grade of the mineralization.
  - Re-calculate the resources using the same methodology as was used on R190.
  - Development of the R190 deposit has been shown to be feasible, and development should proceed. This development is expected to have a capital outlay of US\$93.37 million.

## **2.0 INTRODUCTION**

### **2.1 Client**

This NI 43-101-compliant Technical Report was prepared by Chlumsky, Armbrust and Meyer LLC (herein "CAM") of Lakewood, Colorado for Tamerlane Ventures Inc. (herein "Tamerlane"), a company listed on the Toronto Ventures Stock Exchange (TSVX). Tamerlane controls, among other mineral assets, mineral properties in the Northwest Territories (herein "NWT") of Canada which contain the lead-zinc deposits which are the subject of this report, as well as other mineralization.

### **2.2 Purpose**

This report was written to describe ten lead-zinc deposits in the Pine Point district, to define mineral Resources as warranted for several of those ten, and to define mineral Reserves for one of those, the R190 deposit, which is the subject of a Feasibility Study dated 13 August 2007, prepared by Tamerlane. This report refers frequently to the Feasibility Study, which was critically reviewed by CAM in a document dated 14 August, 2007, and which shows the economic feasibility of mining the R190 deposit as part of Tamerlane's Pine Point Project (herein "PPP". A summary of salient results of the Feasibility Study, and of CAM's review of it, is included in Section 19 of this report.

The ten deposits which are the subject of this report are:

- R190 (formerly held by Westmin, and the subject of the current Feasibility Study)
- P499, O556, V46, W19, X25, and Z155 (deposits formerly held by Westmin).
- N204, G03 and W85 (deposits formerly held by Cominco).

In this report, these deposits are collectively referred to as the "subject deposits".

### **2.3 Sources of Information**

Numerous sources of information were used in the preparation of this Technical Report and the associated Feasibility Study. These include more than 1,000 documents in digital, scanned, or hard-copy format, the majority of which pertain to the R190 deposit. Most documents were obtained from Tamerlane, many of them having been originally prepared by Westmin Resources Ltd. (herein "Westmin"), and a few by Cominco. The most important of these documents are enumerated in Section 22 ("References"), and in the various chapters of the Feasibility Study (Tamerlane, 2007).

## **2.4 Visits to Property**

The R190 deposit is concealed beneath several decimeters of muskeg, which is underlain by 20 to 30 meters of glacial outwash sediments, which in turn is underlain by unmineralized Devonian sediments, and finally by mineralized Devonian carbonates. There are no outcrops of any Devonian rocks above or near the R190 deposit or others of the ten subject deposits.

All three Qualified Persons signatory to this Report visited the Property, as described in detail in Appendix A.

- The Pine Point property was visited on October 24, 2006 by Robert Sandefur of CAM, a qualified person.

- In November, 2007, Steve Milne and Fred Barnard of CAM, both Qualified Persons, visited the Pine Point Property.

- In addition, CAM geologist and qualified person Fred Barnard reviewed on 23 April 2007 the core drilled for Tamerlane in 2005 and stored in Ferndale, Washington, about 15 miles south of Blaine.

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

In the preparation of this report, CAM discussed the project with the persons below, but independently verified all material facts as reference throughout this Report:

- Mr. David Swisher, Vice President, Tamerlane Ventures, Inc.
- Mr. Ross Burns, President and CEO, Tamerlane Ventures, Inc.
- Mr. Wolfgang Schleiss, Senior Geologist, Tamerlane Ventures, Inc.
- Mr. Albert Siega, Mining Engineer, Tamerlane Ventures, Inc.
- Mr. Dan Brost, Manager of Resource Geology, Tamerlane Ventures, Inc.
- Mr. Terry Garrow, consulting geologist to Tamerlane Ventures, Inc.

As detailed below in Section 4.0, CAM received information directly from the NWT Region Mining Recorder in Yellowknife, confirming independently that the Tamerlane claims were in good standing as of November 5, 2007 and are registered in Tamerlane's name.

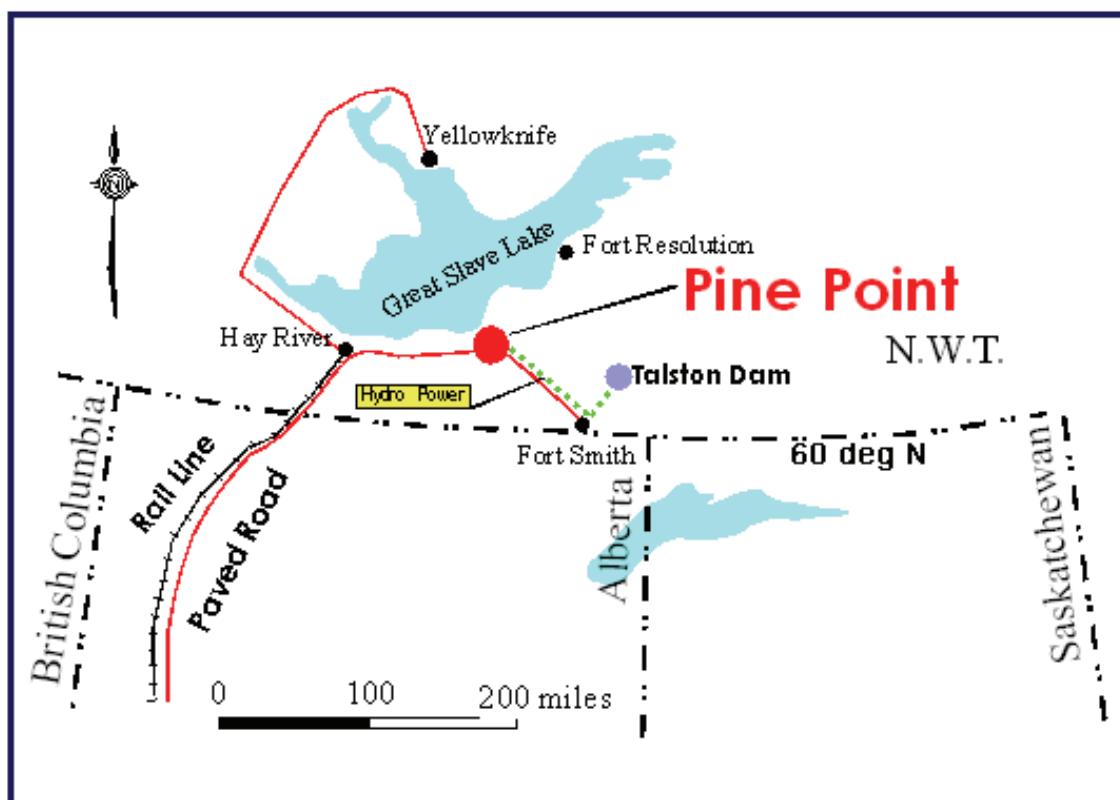
The numerical and geostatistical analysis of drill sampling for the deposits, and the mineral Resource estimation, were carried out by Mr. Robert Sandefur of CAM, as described in Sections 14 and 17 of this Report.

The Feasibility Study prepared by Tamerlane was critically reviewed by Mr. Steve Milne, P.E. and other CAM staff, as discussed in Section 19.

#### **4.0 PROPERTY DESCRIPTION AND LOCATION**

Tamerlane's Pine Point properties, including the ten lead-zinc subject deposits described in this report, are located about 800 kilometers north of Edmonton, south of Great Slave Lake, in the Mackenzie Mining Division of the Northwest Territories of Canada (Figure 4-1). The properties lie north of the Territorial Highway 5 connecting Hay River and Pine Point townsite, and extend intermittently from 25 to 80 kilometers east of Hay River (Figure 4-2). The Tamerlane claims also include over 70 other zinc-lead deposits, many of which have been less-extensively investigated.

The claim area is situated about 10 kilometers south of the lake and about 60 m above the lake level, which is 156 meters. Geographic coordinates are from latitude 114 degrees to 115 degrees 15 minutes West, and from 61° 0' to 61° 45' North latitude.



**Figure 4-1**  
**Location Map of Pine Point Project**



**Figure 4-2**  
**Modified Satellite View of Pine Point Project Area**

The Pine Point Project consists of 40 mining claims, owned 100% by Tamerlane Ventures Inc., covering 43,339.95 acres (17,539.04 hectares). The claims were originally staked in 2000-2002 by Mr. Ross Burns and were later transferred to Karst Investments LLC. According to a Tamerlane press release dated 15 June 2006, 100% ownership by Tamerlane was achieved in June 2006, and the property is subject to a 3% NSR royalty, payable to Karst Investments LLC.

On November 5, 2007, CAM received an e-mail directly from M. Rose Greening, Mining Recorder, NWT Region in Yellowknife (phone: 867-669-2634, fax: 867-669-2714, email: greeningr@inac.gc.ca) containing a spreadsheet (TamerlaneVentures.xls) showing that the 40 claims are active and paid-up to various dates, the first due date being 6 September, 2008, and that Tamerlane Ventures Inc. is the 100% registered owner of all 40 claims. Claim information is provided below in Table 4-1, and claim locations are shown on Figure 4-2.

The claims cover the geological feature known as the Great Slave Reef (or the Pine Point Barrier Reef) within NTS blocks 85 B-10, 11, 14, 15 and 16 (Figure and 4-3). The claims are largely contiguous, falling into five blocks, as shown on Figure 4-2. The M claims cover the strike length of the Main Trend mineralization and are contiguous except for a gap at the Pine Point mine tailings. A decision was taken not to stake the tailings areas as part of the current property, since Cominco had previously completed

condemnation drilling through the tailings pond area. The N claims are a separate contiguous group, covering the North Trend mineralization.

No legal survey for claims is required in the Northwest Territories prior to Mining Lease application, but Global Positioning Satellite (GPS) surveys of all claim boundaries were conducted during staking. As shown on Table 4-1, several claims have been legally surveyed for the purpose of tendering Mining Lease applications.

**Table 4-1  
Tamerlane Claims in the Pine Point District**

Claim Name	Registry No.	Area (acres)	Record Date	Work Commitment met until*	Lease Application Status	Geologic Trend	Deposit **
G3H2A	F69561	154.95	07/18/00	2010@	applied	Main	G03 #
G3H2B	F69562	154.95	07/18/00	2010@	applied	Main	G03 #
M2	F73157	309.90	09/06/01	2008	none	Main	#
M3	F73125	413.20	09/06/01	2008	none	Main	#
M4	F73126	774.75	09/06/01	2008	none	Main	#
M5	F73127	464.85	09/06/01	2008	none	Main	#
M6	F73128	826.40	09/06/01	2008	none	Main	#
M7	F73129	1,033.00	09/06/01	2008	none	Main	#
M8	F73130	1,446.20	09/06/01	2008	none	Main	#
M9	F73131	1,446.20	09/06/01	2008	none	Main	#
M10	F73132	1,033.00	09/06/01	2008	none	Main	#
M11	F73133	1,291.25	09/06/01	2008	none	Main	#
M12	F73134	1,291.25	09/06/01	2008	none	Main	--
M13	F73135	1,807.75	09/06/01	2008	none	Main	#
M14	F73136	2,324.25	09/06/01	2008	none	Main	#
M15	F73137	1,807.75	09/06/01	2008	none	Main	--
M16	F73138	1,807.75	09/06/01	2011@	none	Main	--
M18	F73140	2,479.20	09/06/01	2011@	applied	Main	#
M19	F73141	2,117.65	09/06/01	2011@	applied	Main	--
M20	F73142	2,014.35	09/06/01	2011@	applied	Main	Z155
M21	F73153	2,479.20	09/06/01	2011@	applied	Main	X25
M22	F73154	2,066.00	09/06/01	2011@	applied	Main	V46,W19, #
M23	F73155	1,859.40	09/06/01	2011@	applied	Main	--
M24	F73156	2,582.50	09/06/01	2011@	applied	Main	O556,P499
N1	F73143	619.80	09/06/01	2008	none	North	#
N2	F73144	619.80	09/06/01	2008	none	North	#
N3	F73145	619.80	09/06/01	2008	none	North	#
N4	F73146	585.80	09/06/01	2008	none	North	#
N5	F73147	619.80	09/06/01	2008	none	North	#
N6	F73148	1,033.00	09/06/01	2008	surveyed	North	#
N7	F73149	619.80	09/06/01	2011@	surveyed	North	--

**Table 4-1**  
**Tamerlane Claims in the Pine Point District**

Claim Name	Registry No.	Area (acres)	Record Date	Work Commitment met until*	Lease Application Status	Geologic Trend	Deposit **
N8	F73150	1,291.25	09/06/01	2011@	surveyed	North	--
N9	F73151	1,652.80	09/06/01	2011@	surveyed	North	--
N10	F73152	619.80	09/06/01	2011@	surveyed	North	#
N17	F75690	154.95	04/10/02	2009	none	South	N204
N18	F75732	103.3	04/10/02	2009	none	South	N204
R190	F73124	206.60	09/06/01	2011@	applied	Main	R190
S1	F73123	206.60	09/06/01	2008	none	South	N204
S17	F73139	206.60	09/06/01	2008	none	South	#
W85	F69560	194.55	07/18/00	2008	surveyed	North	W85
40 claims	Total	43,339..95					

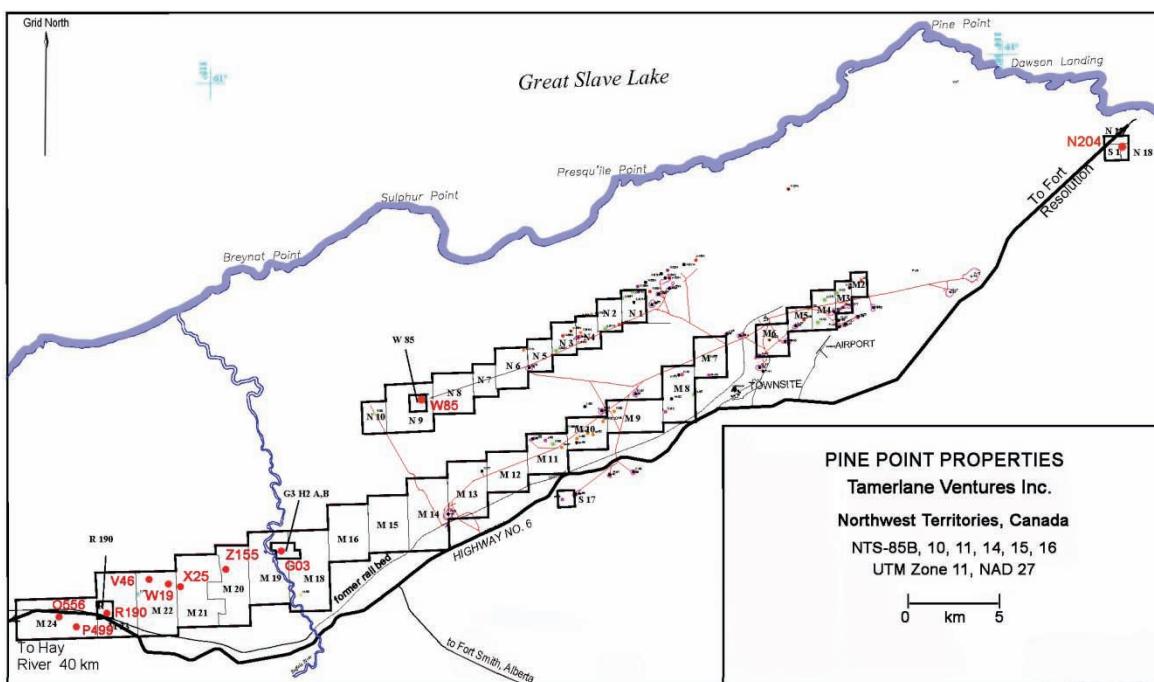
\* anniversary date in indicated year

@ indicates year of expiry as an exploration claim

\*\* Ten subject deposits listed

# indicates other deposits

--" indicates none known.



**Figure 4-3**  
**Map Showing Relation of Properties to Deposits and Cultural Features**

All the listed claims entitle the holder to explore the claim for up to ten years, with an annual work obligation of US\$Can 2.00 per acre, expenditures toward which may be carried forward. Within ten years, application may be made for a Mining Lease, at which time a legal survey of claim boundaries must be made. Mining can occur after the appropriate operating and environmental permits are obtained, as discussed in the R190 Feasibility Report (see CAM, 2007) and in Section 2. Surface rights in this area are of Crown ownership, and may be used in conjunction with valid mineral tenure.

Tamerlane's R190 deposit, which is the subject of a current Feasibility Study, lies on the R190 claim, which covers approximately 206.60 acres (83.61 hectares). The R190 project's footprint area will encompass approximately 6.2 acres (2.5 hectares). The R190 deposit is about 0.5 kilometers north of Territorial Highway 5, 40 kilometers east of Hay River.

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

### **5.1 Physiography and Climate**

The Pine Point project is located in a sub-arctic environment near 61 degrees north latitude. Swampy muskeg and shallow, marl-bottomed ponds characterize the project-area topography. A blanket of glacial till and outwash gravel, sand and clay produce a low-lying, hummocky terrain that slopes gently northward toward Great Slave Lake. The north-flowing Buffalo River is the principal through drainage. The Great Slave Lake, the tenth-largest lake on Earth, has a surface elevation of 156 meters.

The project area is of low relief, about 215 meters total (see photo in Appendix A). There are some surface expressions of modern karst features, including intermittent creeks, natural springs, and sinkholes. Many sinkholes have been filled by glacial debris.

Winter conditions are sub-arctic, with mean average January temperatures at -17° C. Summers are hot and relatively dry with long daylight periods and conditions with a mean July temperature of +16° C. The mean annual precipitation is 34 cm, which includes 18 cm of rainfall, and the water content of 166 cm of snow. Snowfall is relatively light, with maximum snow pack of 1 m or slightly more. The frost-free season averages 95 days. Discontinuous permafrost exists in a few localities, none near the ten subject deposits.

The dominant trees are scrub jack pine, black spruce and willows, which are interspersed between large areas of open swamp. Within the claim area, raised glacial-age beach ridges rising a few meters above the swampy surface afford drier areas.

Sparse moose, black bear and deer populations occur in the area, along with smaller mammals such as beaver, fox, and hares. The area is south of the normal caribou migration areas and northwest of the range of wood buffalo, although both species occasionally occur. The project area is designated as off-limits to wood buffalo, to avoid the spread of bovine disease; any wood buffalo found in the area are removed by government agents.

Comprehensive environmental surveys were undertaken as input into the Feasibility Study (CAM, 2007). Nearly all the land within the project area is unoccupied.

## **5.2 Access and Infrastructure**

Access is by 1100 kilometers of paved highway north from Edmonton, Alberta to Hay River and then 90 kilometers of paved highway to the old Pine Point town site (see photos in Appendix A). Access to many of the deposits within the project area is via gravel haul roads. The turnoff to the R190 deposit is at marker 41.6 on Highway 5.

Hay River has all major services including an airport with scheduled jet service from Edmonton and Yellowknife, a rail terminal and a port from which barge traffic traverses the Mackenzie and Slave rivers. An airstrip suitable for small aircraft is also present near the former Pine Point town site.

Many parts of the project claim area can be accessed using skidoos, Bombardier or Nodwell tracked vehicles, and other all-terrain vehicles via a series of all-season haul roads built to service the various open pit mines that were worked by Pine Point. Many of these roads remain serviceable, and summer light-truck access could be re-established with some repair of culverts and breaches.

## **6.0 HISTORY**

### **6.1 Pre-production Period**

This summary is taken largely from Hannigan (2006). Exploration of lead-zinc showings south of Great Slave Lake dates from 1898. The lack of significant precious-metal content in samples from this very remote area precluded any major evaluations in the ensuing decades.

Concerted exploration began by Cominco in 1929, with test-pitting, drilling and shaft sinking. In 1948, Cominco Ltd. began major exploration work, using the Mississippi-Valley-type model to guide exploration. About 90 deposits were discovered by Cominco, including G03, N204, and W85 among the ten subject Tamerlane deposits. Cominco drilled more than 10,000 core holes totaling over 2,000,000 feet.

By 1964, several deposits had been identified, and Cominco commenced production. Cominco also undertook exploration during 1978-1981 in the Hay West area, west of Westmin's Great Slave reef project, on both sides of the Hay River. Some 64,000 feet of drilling was undertaken there, but production was not achieved.

Several junior companies also explored in the district in the early years, and some were successful in discovering deposits. These were Pyramid Mining Company (X15 and W17 deposits), Buffalo River Exploration (A55), Coronet (R61 and S65), and Yellowknife base Metals (YBM). Cominco purchased these properties in 1966 or thereabouts.

Western Mines, (later Westmin Resources, Ltd, or "Westmin") in 1975 acquired claims west of Cominco's property (essentially west of the Buffalo River), and commenced an extensive IP survey and drilling program referred to as the Great Slave Reef (GSR) Project. This project was a joint venture of Westmin (then controlled by Boliden of Sweden), DuPont Exploration Canada, and Phillip Brothers. Westmin was the operator. Westmin's drill program was based on the premise that the 'Main Hinge Zone', a fracture zone resulting from differing rates of subsidence, was a controlling feature for mineralization.

The GSR Project discovered nine blind (non-outcropping) zinc-lead deposits (O555, O556, P499, R190, T799, V46, W19, X25, and Z155), but did not place any of them in production. Due to the regional dip to the southwest, the Westmin properties were more deeply buried than in the eastern (Cominco-controlled) part of the Pine Point district. Seven of the deposits discovered by Westmin are among the ten subject Tamerlane deposits.

## 6.2 Cominco Production Period

Large-scale mining by Cominco commenced in 1964 with reported reserves of 21.5 million tonnes averaging 4% lead 7.2% zinc (a historical, non-43-101-compliant figure reported by Giroux and McCartney, 2001). The "Pine Point mine" was actually an assemblage of 46 separate open pits and two underground deposits, lying along a 35-kilometers trend including the mill at the Pine Point camp. No mining took place on Westmin's Great Slave Reef area, located west of Cominco's Pine Point property, which extended to about 5 kilometers west of the Buffalo River. The deposits mined by Cominco are enumerated on Table 6-1.

Table 6-1 Pine Point Deposits Mined by Cominco, 1964-1988. (from Hannigan, 2006)						
Deposit	Ore Production (tonnes)	Grade			Metal Produced	
		% Pb	% Zn	% Zn + Pb	Pb (tonnes)	Zn (tonnes)
NORTH TREND - listed from northeast to southwest						
X-17	44,910	1.5	6.3	7.80	674	2,829
T-37	358,960	2.1	6.3	8.40	7,538	22,614
X-51	1,203,980	2.2	6.7	8.90	26,488	80,667
Y-53	967,710	1.5	5.6	7.10	14,516	54,192
X-52	1,104,080	1.6	6.3	7.90	17,665	69,557
X-53	1,231,940	2.7	9.2	11.90	33,262	113,338
Z-53	380,520	1.4	5.0	6.40	5,327	19,026
A-55	1,550,830	3.0	7.60	10.60	46,525	117,863
Y-54	263,840	1.3	4.0	5.30	3,430	10,554
X-54/X-55	216,130	2.1	6.7	8.80	4,539	14,481
X-56/X-57	1,319,580	1.6	6.3	7.90	21,113	83,134
Z-57	827,870	1.1	4.2	5.30	9,107	34,771
Y-65	149,770	7.0	12.9	19.90	10,484	19,320
Y-60	512,490	2.1	7.3	9.40	10,762	37,412
Y-61	549,040	3.5	9.3	12.80	19,216	51,061
Z-64	913,470	1.4	5.1	6.50	12,789	46,587
A-70	2,289,360	4.5	10.4	14.90	103,021	238,093
MAIN TREND - listed from northeast to southwest						
P-24	496,640	3.5	7.6	11.10	17,382	37,745
L-30	262,170	1.1	2.8	3.90	2,884	7,341
O-28	1,483,870	2.0	3.7	5.70	29,677	54,903
P-29	476,120	1.6	3.3	4.90	7,618	15,712
N-31	505,200	1.6	4.1	5.70	8,083	20,713
P-31	604,760	2.2	3.6	5.80	13,305	21,771
P-32	694,980	3.2	3.5	6.70	22,239	24,324
O-32	375,970	2.8	6.4	9.20	10,527	24,062

**Table 6-1**  
**Pine Point Deposits Mined by Cominco, 1964-1988.**  
**(from Hannigan, 2006)**

Deposit	Ore Production (tonnes)	Grade			Metal Produced	
		% Pb	% Zn	% Zn + Pb	Pb (tonnes)	Zn (tonnes)
N-32	1,862,070	3.4	8.4	11.80	63,310	156,414
L-37	3,417,550	1.0	3.4	4.40	34,176	116,197
N-38	1,182,110	4.9	7.4	12.30	57,923	87,476
N-42	2,959,680	5.3	9.5	14.80	156,863	281,170
O-42	2,742,720	8.8	11.6	20.40	241,359	318,156
P-41	196,140	2.1	8.3	10.40	4,119	16,280
M-40	350,870	2.2	5.5	7.70	7,719	19,298
J-44	1,282,230	5.9	9.8	15.70	75,652	125,659
I-46	389,870	5.1	4.2	9.30	19,883	16,375
M-52	455,260	3.5	7.6	11.10	15,934	34,600
K-53	468,900	3.7	9.3	13.00	17,349	43,608
K-57	1,564,540	6.5	5.2	11.70	101,695	81,356
K-62	1,001,590	3.6	4.8	8.40	36,057	48,076
I-65	194,510	3.8	11.1	14.90	7,391	21,591
M-64	178,460	4.9	8.0	12.90	8,745	14,277
R-61	1,034,540	1.6	5.2	6.80	16,553	53,796
J-69	854,770	1.2	5.2	6.40	10,257	44,448
K-77	511,120	6.4	6.4	12.80	32,712	32,712
N-81	2,699,950	7.0	14.1	21.10	188,997	380,693
<b>SOUTH TREND - listed from northeast to southwest</b>						
X-15	17,474,260	2.0	6.2	8.20	349,485	1,083,404
W-17	3,515,400	2.0	6.1	8.10	70,308	214,439
T-58	563,310	4.5	12.6	17.10	25,349	70,997
R-61	1,034,540	1.6	5.2	6.80	16,553	53,796
S-65	575,550	1.2	5.7	6.90	6,907	32,806
<b>TOTAL, DISTRICT</b>	<b>64,294,130</b>	<b>3.1%</b>	<b>7.0%</b>	<b>10.1 %</b>	<b>2,023,000</b>	<b>4,569,671</b>

In aggregate, these deposits produced over 64,000,000 tonnes of ore grading 3.1% lead and 7.0% zinc (Table 6-2). None of the production was from the ten subject deposits discussed herein. Low base metal prices, high power consumption related to pumping water, and acquisition of another deposit with better grades and mining characteristics prompted Cominco to close the Pine Point mines in 1988. Restoration of the mines was completed in 1991, including removal of the town site and railroad (Giroux & McCartney, 2001).

According to Hannigan (2006) and Kent Burns (2001) work by Westmin and Cominco in the 1970's and 1980's resulted in tonnage estimates as shown on Table 6-2 and includes only those deposits which were not subsequently validated as 43-101-compliant.. These are historical in nature.

**Table 6-2**  
**Historic Tonnages on Tamerlane Property**

CATEGORY	tonnes	% Pb	%Zn
Westmin total historic non-compliant tonnages. Includes V46, W19, Z155, excludes deposits now validated as 43-101-compliant	1,268,000	3.91	6.35
Cominco total historic non-compliant tonnages. Includes deposits shown in footnote, excludes deposits now validated as 43-101-compliant	49,669,000	1.17	3.77
- tonnages classed by Cominco as "inferred" (included in total above)	32,542,000	0.90	3.07
- tonnages classed by Cominco as "indicated" (included in total above)	17,126,000	1.69	5.11
Total, Historic Tonnage	50,936,000	1.24	3.84

Westmin deposits are as shown in Table 6-2. Cominco deposits are based on Kent Burns (2001) and include: A-70, HZ, J-44, J-68, J-69, K-32, K-35, K-51, K-53, K-57, K-60, K-66, K-68, K-77, L-27, L-30, L-35, L-36, L-37, L-65, M-40, M-48, M-52, M-62, M-63, M-64, M-67, N-31, N-32, N-33, N-38, N-42, N-50, N-81, N-99, N204, O-32, O-42, O-53, R-67, S-65, V-90, X-54/55, X-56/57, X-58, X-59, X-61, X-62, X-64, X-65, X-68, X-71, Y-60, Y-61, Y-62, Y-65, Y-72, YBM, Z-57, Z-60, Z-61, Z-64.

Hannigan (2006, his Table 1), shows pre-mining "reserves" and actual production for many Cominco deposits, but the source of Hannigan's data is not shown for each deposit.

Based on data provided by Tamerlane, there is a large tonnage of historical "reserves" and "resources" on Tamerlane's property, only some of which is 43-101-compliant. These are located in the following deposits situated on Tamerlane's property:

1. Former Cominco deposits G03, N204 and W85 among the ten subject deposits;
2. Former Cominco deposits A-70, HZ, J-44, J-68, J-69, K-35, K-51, K-53, K-57, K-60, K-66, K-68, K-77, L-27, L-30, L-35, L-36, L-37, L-65, M-48, M-52, M-62, M-63, M-64, M-67, N-31, N-32, N-33, N-38, N-42, N-50, N-81, N-99, O-32, O-42, O-53, R-67, S-65, V-90, X-54/55, X-56/57, X-58, X-59, X-61, X-62, X-64, X-65, X-68, X-71, Y-60, Y-61, Y-62, Y-65, Y-72, YBM, Z-57, Z-60, Z-61, Z-64, and
3. Former Westmin deposits R190, O556, P499, V46, W19, X25, and Z155 among the ten subject deposits.

### **6.3 Post-production Period**

After the productive period from 1964 to 1988, activity in the district waned considerably. Eventually, both Cominco and Westmin allowed their claims to lapse after a long period of low prices for zinc and lead.

### **6.4 Tamerlane Project**

In 2001-2002, Ross Burns on behalf of Karst Investments LLC (originally Kent-Burns Group) staked parts of the district, including much of the Cominco productive area, and the main trends within the former Westmin property. Shortly thereafter, the property was optioned to Terrastar Incorporated, which became Pine Point Mines Inc. The Property was taken back by Karst Investments LLC in 2003. In September 2004, Tamerlane Ventures acquired an option to earn 60% interest in the Pine Point property from Karst Investments LLC, and in 2006 Tamerlane achieved 100% ownership, with a 3% NSR royalty payable to Karst Investments.

Work on the property by Tamerlane during 2004 to date is discussed below in sections 10 to 12 of this report. This included core drilling of three of the previously-discovered deposits: W85 (eight holes), G03 (three holes), and R190 (seven holes).

## **7.0     GEOLOGICAL SETTING**

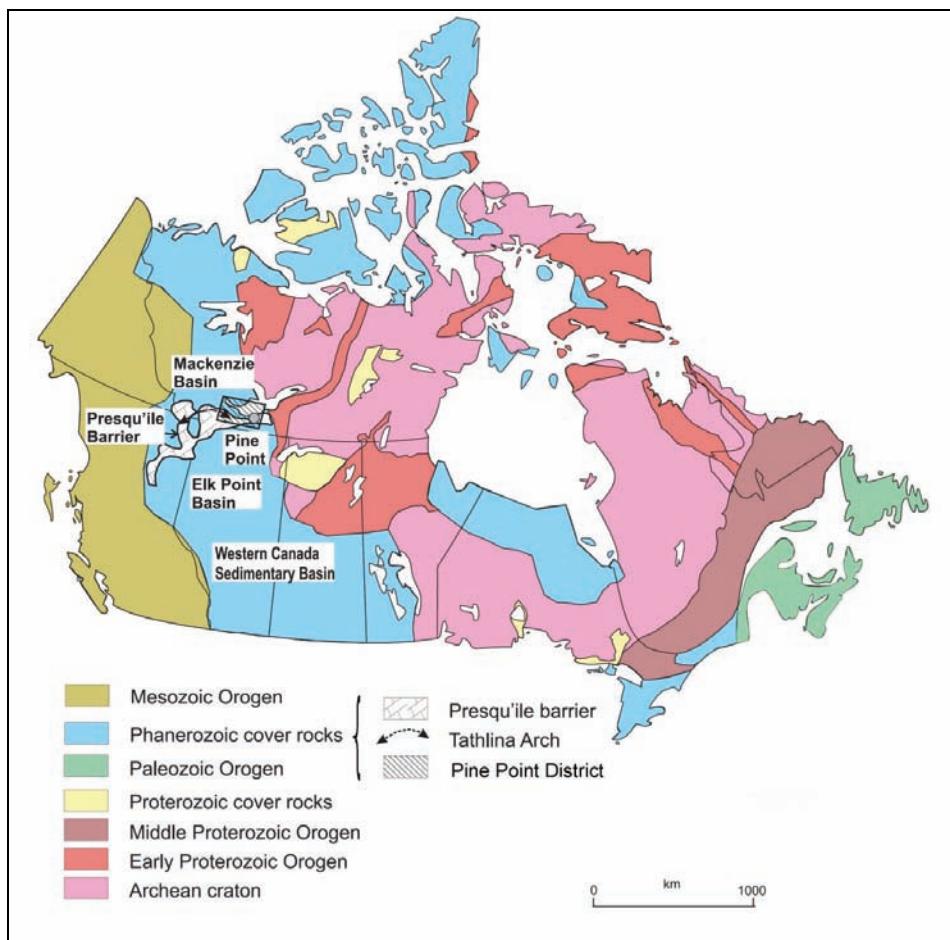
The discussion of geology below is largely summarized from Rhodes, et al. (1984) and Hannigan (2006), with some additions from other sources. Users of this report who are interested in the intricacies of the stratigraphy and facies lithologies are referred to the two cited reports.

### **7.1     Regional Geology**

The Pine Point district area lies within the Western Canada Sedimentary Basin, which is underlain by gently west-dipping sedimentary strata between the Precambrian Shield to the east and the Cordilleran Orogen to the west (Figure 7-1). At Pine Point, 350 to 600 m of Ordovician to Devonian miogeoclinal sedimentary rocks consist of platformal carbonates, shales and evaporites; cover a basement made up of Archean crystalline rocks and Proterozoic sedimentary rocks.

Rocks in the district are little-deformed except for a southwestward tilt of 2 to 4 meters per kilometer (less than one-half degree). Folding is minor and generally associated with differential compaction of the original sediments, or karst subsidence features. Southwesterly fractures in the underlying Archean basement strike beneath the district, but do not have visible expression in the Devonian rocks.

Slightly older Middle Devonian sedimentary rocks lie directly on the Precambrian crystalline basement, which is exposed about 50 kilometers east of Pine Point townsite.



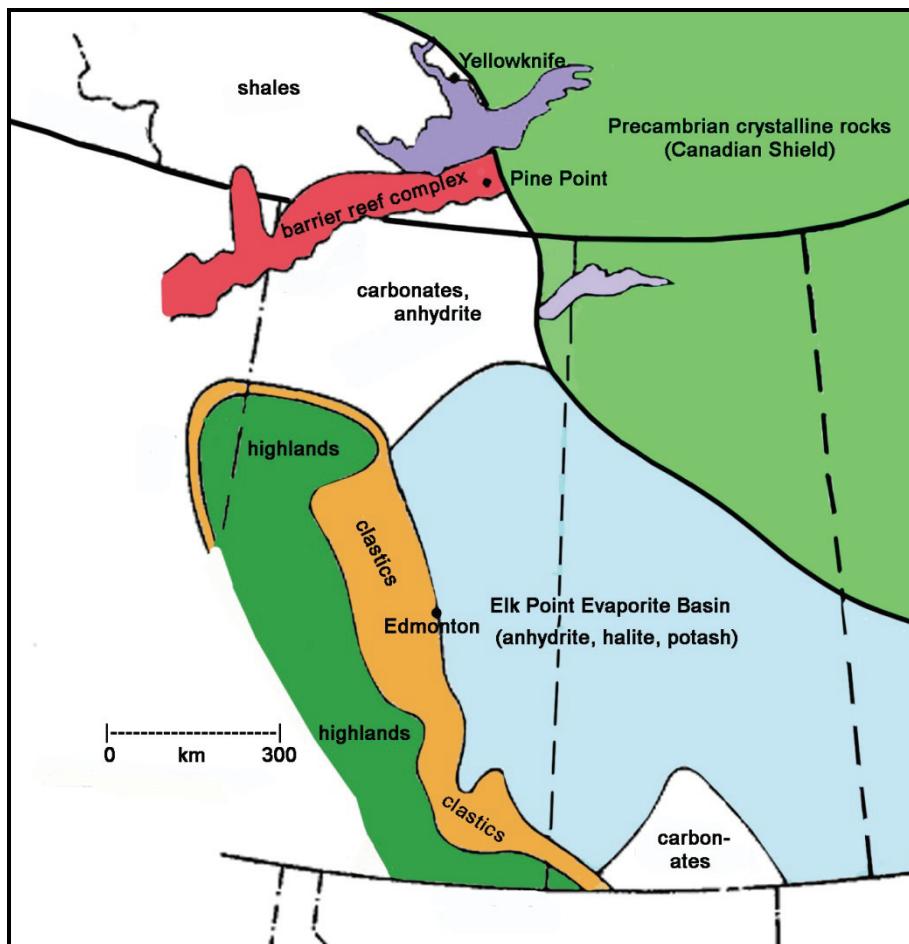
**Figure 7-1**  
**Geological Provinces of Canada (from Hannigan, 2006)**

The Middle Devonian rocks of interest in the Pine Point district are overlain by non-mineralized Middle and Upper Devonian rocks. These in turn are overlain by Pleistocene glacial deposits and post-glacial swamp deposits, which cover nearly all the surface of the district. Outcrops are rare, and all of the ten deposits which are the subject of this report are covered by non-mineralized Devonian strata, as well as by Pleistocene debris.

## 7.2 Middle Devonian Stratigraphy

Certain formations within the Middle Devonian (Givetian) sedimentary sequence host the mineralization at Pine Point. These marine sedimentary rocks are part of a major complex of reefs, shelves, and evaporitic lagoons which covered what is now south-central Canada. As shown in Figure 7-2, a barrier reef complex nearly 1,000 kilometers long, more than 10 kilometers wide, and 200 m in thickness, separated a closed evaporitic basin on the south (the Elk Point Basin in Alberta, Saskatchewan, Manitoba,

and North Dakota) from a shallow-water open-marine environment (the Mackenzie Basin) in the north. The Givetian barrier complex outcrops on the eastern half of the Pine Point project area and dips very shallowly to the west. The reef has been termed the Presqu'ile Barrier Reef, or alternatively the Pine Point Barrier Complex.



**Figure 7-2**  
**Middle Devonian Sedimentary Facies in West-Central Canada**  
**(Modified from Rhodes, et al., 1984)**

Understanding of the complex stratigraphy at Pine Point has evolved over many years of exploration and production, as summarized by Rhodes, et al. (1984) and by Hannigan (2006). There have been numerous variant interpretations of the facies stratigraphy, as summarized in the cited papers. Pioneering work in the application of petroleum-geology terminology and reef models to the zinc-lead deposits by Skall (1975) is largely summarized by Rhodes, et al. (1984).

The most controversial and confusing facies issue was the status of the "Presqu'ile Formation". This coarsely-crystalline dolomite unit was formerly assigned a great stratigraphic and facies range, but was

eventually recognized to be a diagenetic alteration facies of several different carbonate depositional facies. Thus, it has been discontinued as a stratigraphic unit, but is still referred to as a rock type (e.g. in drill logs). As discussed below, in section 9, *Mineralization*, the Presqu'ile diagenetic event is of great importance to mineralization.

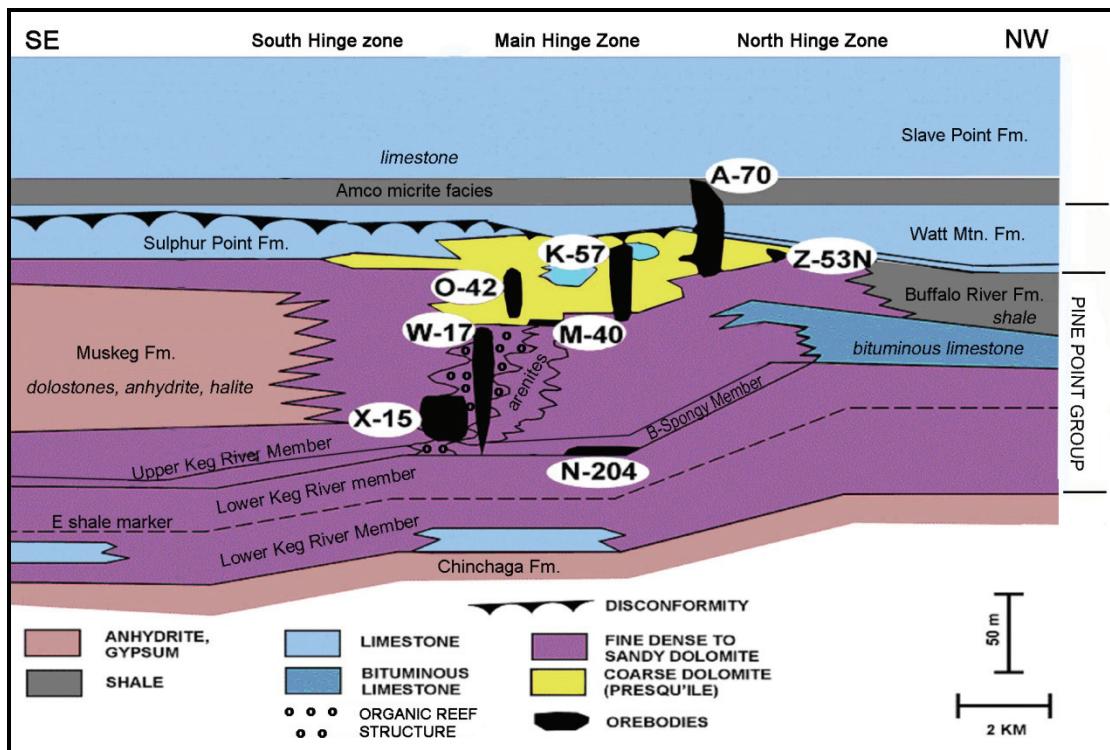
The units which host zinc-lead mineralization at Pine Point are described below, as treated in Hannigan (2006), which differs only slightly from the descriptions in Rhodes, et al. (1984). These are shown in summary form in Table 7-1. Due to the complexity of the facies relationships, reference to the stratigraphic diagram in Figure 7-3 is necessary.

Table 7-1 Mineralized Middle Devonian Units at Pine Point.				
Major Unit	Sub-Unit	Lithology	Environment	Thickness (Typical)
Slave Point Fm.	--	limestone, micritic shale	open-marine platform	50 m
subsidence				
Watt Mtn. Fm.	--	micritic limestone, minor gypsum	post-uplift tidal flat	20 m
minor uplift, karstification, and disconformity				
Pine Point Group	Buffalo R. Shale	calcareous shale	fore-reef basin	0 - 60 m in north only
	Sulphur Point Fm.	dolomitized limestone	back-reef debris, bioherms	0 - 20 m
	Muskeg Fm.	dolostones, anhydrite/gypsum, halite	back-reef evaporitic basin	0 - 50 m in south only
	Upper Keg River Member	dolomitized limestones	organic reef, isolate reefs, reef mounds	40 m
	B-Spongy Member	vuggy, clay-rich dolomitized limestone	shallow water	12 - 18 m

Figure 7-3 shows the facies relationships, centering on the Presqu'ile Barrier Reef in the middle, with an open marine environment to the north, and the Elk Point lagoon or sea of restricted circulation to the south. A minor uplift after Pine Point time exposed the main reef, and ended the barrier-reef regime. The zinc-lead deposits shown in Figure 7-3 are subsequent to the depositional events described here, and are described later in this report, in Section 9.

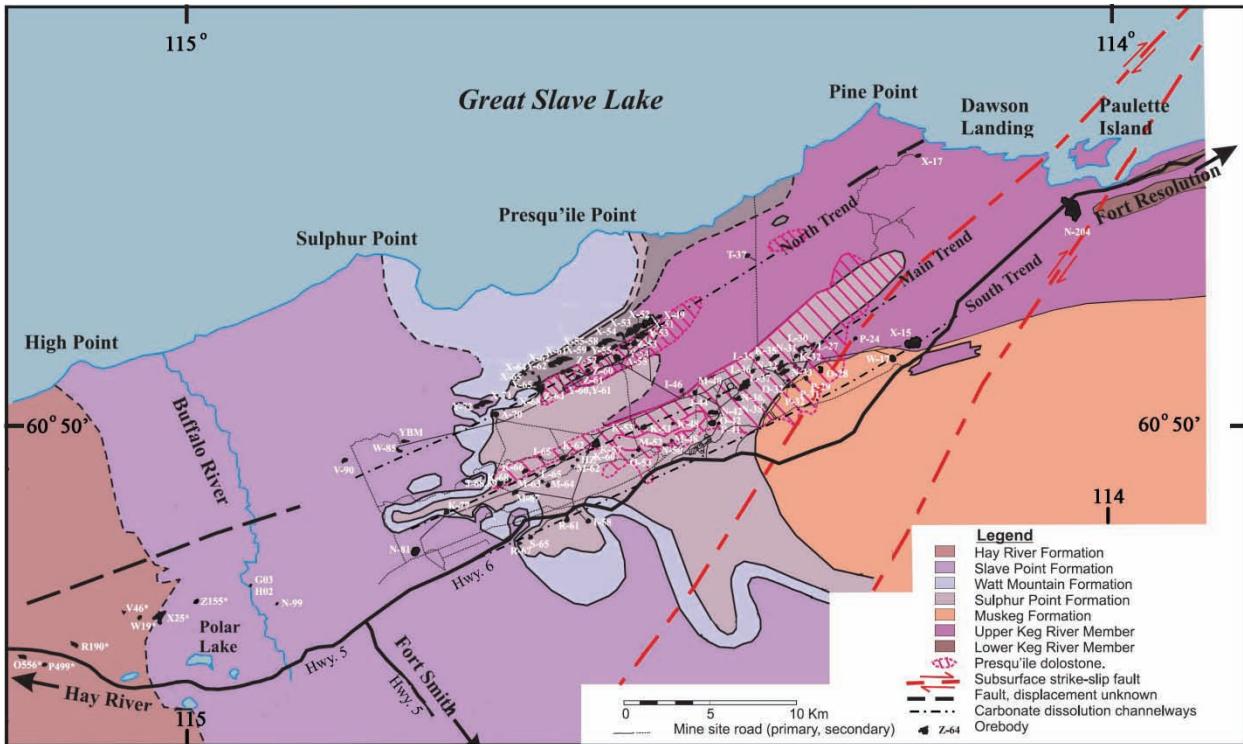
The various lithofacies deposited during Pine Point time are remarkably consistent along the northeasterly strike of the reef complex, but show abrupt north-south variability, across the reef from fore-reef to back-reef environments.

There is an abundant literature with details of the Pine Point sedimentary complex, as shown below in *References*, and additionally as referenced by Rhodes, et al. (1984) and Hannigan (2006).



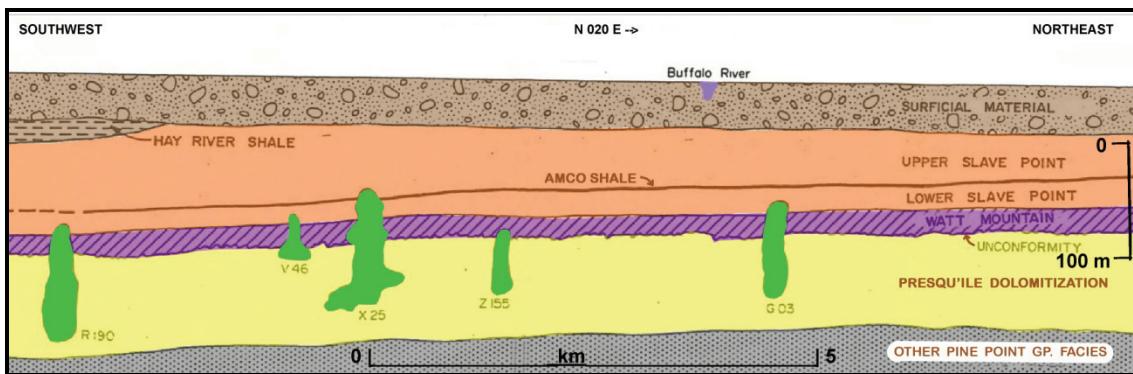
**Figure 7-3**  
**Middle Devonian Sedimentary Facies**  
**(Modified and simplified from Hannigan, 2006)**

A geologic map of the rocks encountered in drilling and in limited outcrop within the Pine Point district is shown in Figure 7-4. The known zinc-lead deposits are also shown.



**Figure 7-4**  
**Subcrop Geologic Map of Pine Point District**  
 (Modified from Hannigan, 2006)

Figure 7-5 shows a cross-section through the southwest part of the Tamerlane property, where five of the ten subject properties are located. Note the vertical exaggeration. The section shows the lateral persistence of units along the strike of the Main Trend of the barrier reef, in contrast to Figure 7-3 which shows variations across the reef trend.



**Figure 7-5**  
**Cross-Section through Southwest Part of Pine Point Property**  
 (Slightly modified from A Westmin Cross-Section dated 1982)

## **8.0 DEPOSIT TYPES**

According to Hannigan's (2006) Geological Survey of Canada publication, and Rhodes, et al. (1984), the zinc-lead mineralization in the Pine Point district is clearly of Mississippi-Valley type. According to Hannigan (2006, page 12), "*A single major deposit type has been recognized in the Pine Point district, the classic Mississippi Valley-type (MVT) zinc-lead sulphide deposit*", and (2006, page 6), "*Characteristic Mississippi Valley-type deposit features such as karst development, dolomitization, and the genetic association with evaporites and hydrocarbons are all present in the Pine Point district*". The Mississippi-Valley affinity was recognized in print as early as 1929, and never has been seriously questioned.

An accepted definition of Mississippi-Valley-type deposits (from Geological Survey of Canada, internet page [http://gsc.nrcan.gc.ca/mindep/synth\\_dep/mvt/index\\_e.php#def](http://gsc.nrcan.gc.ca/mindep/synth_dep/mvt/index_e.php#def) is as follows: *MVT deposits are stratabound, carbonate-hosted sulphide bodies, composed predominantly of zinc and lead, bound in sphalerite and galena. The deposits occur mainly in dolostone as open-space fillings, collapse breccias and/or as replacement of the carbonate host rock. Less commonly, sulphide and gangue minerals occupy primary carbonate porosity. The deposits are epigenetic, having been emplaced after lithification of the host rock.*

Mississippi-Valley-type zinc-lead deposits are widespread in the world, and of great economic importance. Currently- or formerly-producing major districts occur in Canada (including Polaris and Nanisivik) the United States, Brazil, Peru, Australia, China, and many other countries.

## 9.0 MINERALIZATION

Pine Point zinc-lead mineralization is epigenetic, and occurs in the carbonate sediments as open-space cavity fillings and local replacements. Igneous rocks do not occur locally and are not believed to have influenced the mineralization in any way.

Descriptions below of the mineralization are taken largely from Hannigan (2006), Rhodes et al. (1984), as well as from various Westmin and Tamerlane internal documents, and the observations of the undersigned.

### 9.1 Distribution of Deposits

The Pine Point district contains approximately 100 known zinc-lead deposits (or 97, depending on numbering conventions). These are distributed along three trends which extend in aggregate along 50 kilometers of strike and 7 kilometers of width. Cominco mined 48 of these deposits during 1964-1988. The distribution of deposits is shown on Figure 7-4 and Table 9-1. The Tamerlane property includes 72 of the 97 deposits enumerated on Table 9-1, including 42 of the 45 known deposits in the district which have not been mined.

Table 9-1 lists the zinc-lead deposits in the Pine Point district. This data was obtained from Hannigan, 2006, Table 1. Deposits with asterisk\* are not on the Tamerlane claims. Boldfaced deposits are those ten which are the subject of this report.

Table 9-1  
NORTH TREND - Deposits Listed From Northeast to Southwest  
\* indicates deposit not on Tamerlane property

Deposit	Host Formation(s)						Mineralization	Mined ?
	Up. Keg R	Muskeg (missing)	Sul. Pt.	Buff. R.	Watt Mtn.	Slave Pt		
X-17*	✗						normal prismatic	yes
T-37*	✗						tabular	yes
X-49*	✗						tabular	yes
X-51*	✗			✗			tabular	yes
Y-53*	✗		✗				tabular	yes
X-52*	✗			✗			tabular	yes
X-53*	✗		✗	✗			tabular	yes
Z-53*			✗		✗		tabular	yes
A-55*	✗		✗		✗	✗	abnormal prismatic	yes
Y-54*			✗				tabular	yes
Y-55*			✗				tabular	no

**Table 9-1**  
**NORTH TREND - Deposits Listed From Northeast to Southwest**  
 \* indicates deposit not on Tamerlane property

Deposit	Host Formation(s)						Mineralization	Mined ?
	Up. Keg R	Muskeg (missing)	Sul. Pt.	Buff. R.	Watt Mtn.	Slave Pt		
Y-62			X	X	X		tabular	no
X-54/X-55			X	X			tabular	yes
X-56/X-57	X		X	X	X		tabular	yes
Z-57			X				tabular	yes
X-58				X	X		tabular	no
Z-60			X				tabular	no
Z-61	X						tabular	no
X-59				X	X		tabular	no
X-61			X	X	X		tabular	no
X-62			X	X	X		tabular	no
X-64			X		X		tabular	no
X-65	X		X	X	X		tabular	partially
X-71	X		X	X	X		tabular	no
X-68	X		X	X	X		tabular	no
Y-65	X		X	X	X		tabular	yes
Y-60	X		X	X	X		tabular	yes
Y-61	X		X	X	X		tabular	yes
Z-64	X		X	X	X		tabular	yes
A-70	X		X		X	X	Normal prismatic	yes
Y-72	X		X	X	X		tabular	no
YBM	X			X			tabular	no
W-85	X		X	X	X	X	Normal prismatic	no
V-90	X						tabular	no

**Table 9-2**  
**MAIN TREND - Deposits Listed from Northeast to Southwest**

Deposit	Host Formation(s)						Mineralization	Produced ?
	Up. Keg R	Muskeg	Sul. Pt.	Buff. R. (missing)	Watt Mtn.	Slave Pt		
N-204	X B-spongy						B-spongy	no
P-24*			X				normal prismatic	yes
L-27		X	X				tabular	no
O-28*		X					normal prismatic	yes
L-30		X	X				tabular	yes
P-29*		X					normal prismatic	yes
K-32*			X				tabular	no

**Table 9-2**  
**MAIN TREND - Deposits Listed from Northeast to Southwest**

Deposit	Host Formation(s)						Mineralization	Produced ?
	Up. Keg R	Muskeg	Sul. Pt.	Buff. R. (missing)	Watt Mtn.	Slave Pt		
N-33			X				tabular	no
N-31			X				tabular	yes
P-31*		X					normal prismatic	yes
P-32*		X					normal prismatic	yes
O-32		X	X				normal prismatic	yes
N-32			X				tabular	yes
K-35			X				tabular	no
L-35		X	X				tabular	no
L-36		X	X				tabular	no
L-37		X	X				tabular	yes
N-36			X				?	no
N-38		X	X				normal prismatic	yes
N-42		X	X		X		normal prismatic	yes
O-42		X	X		X		normal prismatic	yes
P-41*			X				normal prismatic	yes
M-40*			X				tabular	yes
J-44			X				normal prismatic	yes
I-46*	X						normal prismatic	yes
K-48			X				?	no
M-48			X				?	no
N-50			X				?	no
K-51			X				normal prismatic	no
M-52		X	X				normal prismatic	yes
O-53		X	X				normal prismatic	no
K-53			X				normal prismatic	yes
K-57	X		X				normal prismatic	yes
K-60			X				tabular	no
HZ (Hinge Zone)			X				?	no
M-62			X				tabular	no
K-62*	X		X				normal prismatic	yes
I-65*	X		X				normal prismatic	yes
M-64	X		X				normal prismatic	yes

**Table 9-2**  
**MAIN TREND - Deposits Listed from Northeast to Southwest**

Deposit	Host Formation(s)						Mineralization	Produced ?
	Up. Keg R	Muskeg	Sul. Pt.	Buff. R. (missing)	Watt Mtn.	Slave Pt		
M-63			X				tabular	no
L-65			X				?	no
M-67			X				tabular	no
K-66			X				tabular	no
K-68			X				tabular	no
J-68			X				normal prismatic ?	no
J-69	X		X				normal prismatic	yes
K-77			X				normal prismatic	yes
N-81	X	X	X		X	X	normal prismatic	yes
N-99			X		X	X	normal prismatic	no
G-03/H-02			X		X	X	normal prismatic	no
Z-155	X		X		X	X	normal prismatic	no
X-25			X		X	X	normal prismatic	no
W-19	X		X				tabular	no
V-46			X		X	X	tabular	no
R-190	X		X		X	X	normal prismatic	no
P-499	X		X		X	X	normal prismatic	no
O-556	X		X		X	X	normal prismatic	no

**Table 9-3**  
**SOUTH TREND - deposits listed from northeast to southwest**

Deposit	Host Formation(s)						Mineralization	Produced ?
	Up. Keg R	Muske g	Sul. Pt.	Buff. R. (missing)	Watt Mtn.	Slave Pt		
X-15*	✗	✗					abnormal prismatic	yes
W-17*	✗	✗					abnormal prismatic	yes
T-58*		✗	✗				normal prismatic	yes
R-61*		✗	✗				normal prismatic	yes
S-65		✗	✗				normal prismatic	yes
R-67		✗	✗				normal prismatic	no

## 9.2 Controls on Mineralization

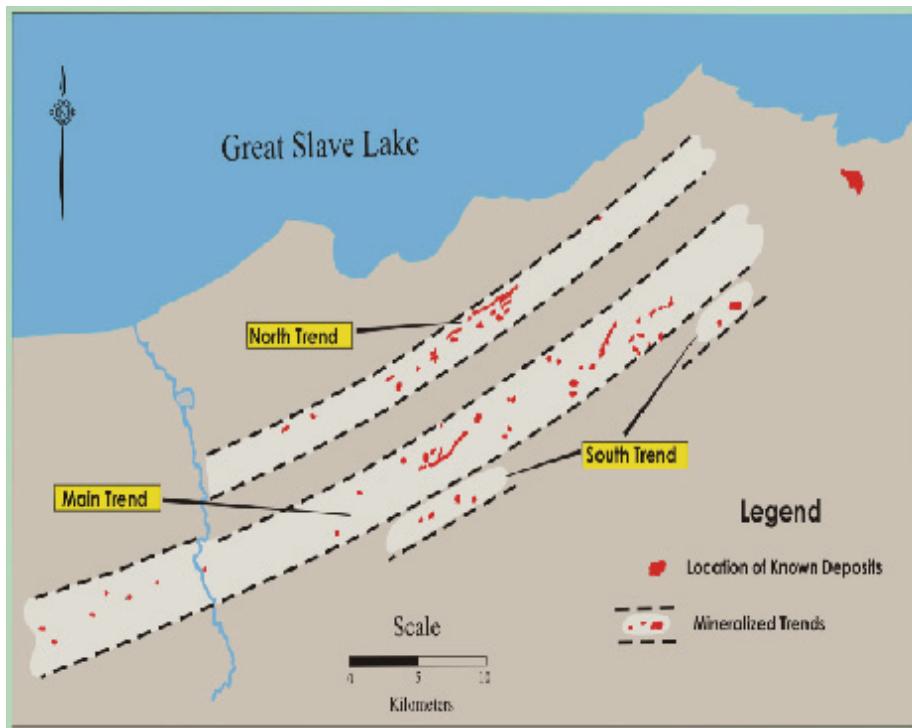
As summarized by Hannigan (2006) mineralization in the Pine Point district occurs as replacement of karst-filling sediments and breccias, open-space filling, and peripheral disseminations in vuggy porosity. The deposits occupy the most permeable portion of the highly porous Presqu'ile barrier complex (i.e. the Pine Point and Sulphur Point units). Mineralization (galena, sphalerite, marcasite, and pyrite) occurs within the karst networks as replacement of karst-filling internal sediments and breccias, open-space filling, and peripheral mineralization in vuggy, wall rock porosity. The highest-grade mineralization seems to be restricted to karstic structures hosting the greatest amount of infilling sediments. The most typical host lithology for ore-grade mineralization is the coarse-grained vuggy Presqu'ile dolomite, which has replaced permeable reef facies.

The grade of mineralization varies widely, with the highest grade zones being in open-space-filling deposits where the mineralization formed without dilution by the host rock.

Collapse breccia, formed by the upward stoping of the roofs of karst caverns, is seen as a diluent in many of the prismatic ore bodies and distinct horizons within the stratigraphy can often be traced as distinct zones of rubble within the ore. It is also not unusual to find ore zones having two or more collapse zones within the ore body. Ore is occasionally incorporated as fragments into later stages of collapse breccias. Since these multiple collapses represented very large caverns, usually of prismatic type, the largest ore zones were often of this type.

The grade of mineralization varies widely, with the highest grade zones being in open-space-filling deposits where the mineralization formed without dilution by the host rock

The deposits lie along three well-defined linear trends (North, Main, and South trends). These trends appear to coincide with southwesterly fracture zones in the Precambrian basement rocks, which are mappable in Precambrian exposures to the northeast.



**Figure 9-1**  
Mineralized Trends in the Pine Point District  
(based on Rhodes, et al. 1984, Figure 18)

Subtle tectonic adjustments along these three northeast-trending "hinge lines" contributed to the evolution of numerous paleoenvironmental facies within and adjacent to the barrier complex. The hinge lines are approximate projections of the underlying Precambrian McDonald- Great Slave Lake fault system.

Minor differential vertical movements on these fractures during Paleozoic times apparently created the "hinge zones" in the Devonian sediments, which controlled sedimentation (e.g. the position of the barrier reef on a slight high), as well as post-Devonian alteration (karst development and Presqu'ile dolomitization event) and mineralization (zinc-lead deposits). The fractures may well have controlled several aspects of the mineralization:

- creation of the reefal complex as a host,
- preparation of that host by increasing the porosity through dolomitization, and permeability increase through fracturing leading to karst development,

- circulation of metalliferous fluids, through a combination of emission of fluids of crustal origin and flushing of metalliferous formation waters from shales though the receptive carbonates during differential movements.

All Pine Point deposits are hosted in Middle Devonian carbonate strata within or adjacent to the dolomitized barrier-reef complex. The mineralization occurs in interconnected paleo-karst cavity networks that are directly related to certain lithofacies and their behavior during episodes of uplift and karst formation. The deposits are strongly controlled by individual stratal horizons, although many deposits are discordant. The coarsely-crystalline dolomite alteration of the Presqu'ile dolomite event is also a key control for many deposits.

Epigenetic sulphide mineralization occurs as open-space cavity fills and local replacement of carbonate strata. The main mineralization stage at the Pine Point property witnesses a repetition diagenetic processes, such as karst formation (i.e. solution, fracturing, collapse), dolomitization, calcite deposition, and introduction of sulphides and organic derivatives (bitumen and sulphur).

As indicated on Tables 7-1 and 9-1, important zinc-lead mineralization is limited to the specific listed stratigraphic units, with most deposits transgressing unit boundaries.

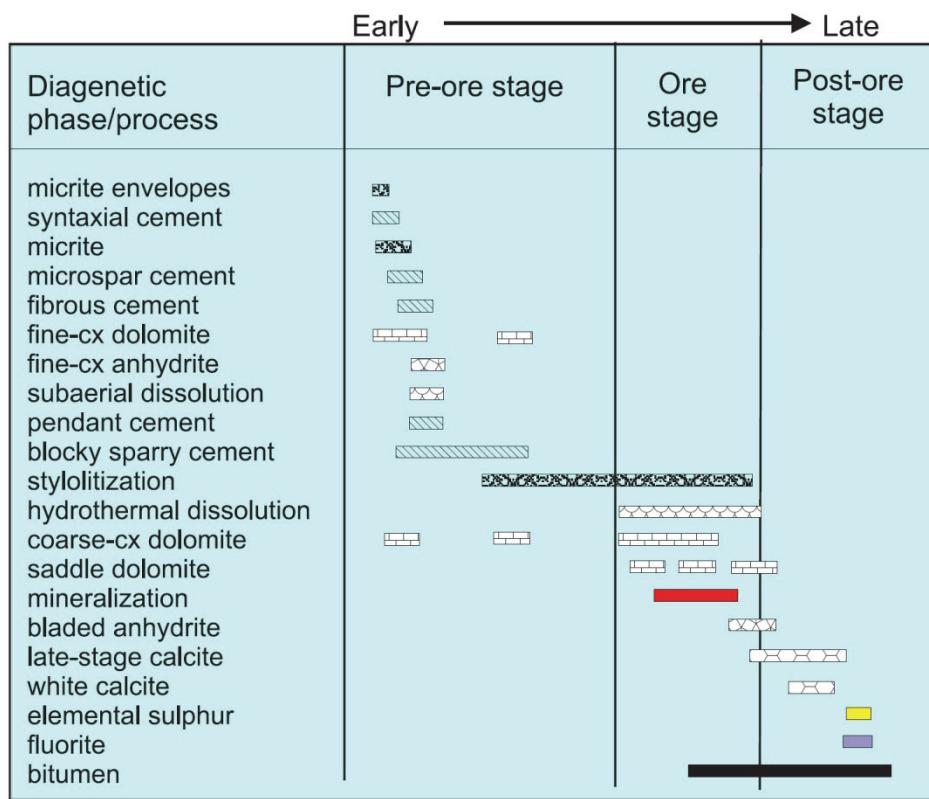
### **9.3 Mineral Paragenesis**

The sequence of events leading to the emplacement of mineralization at Pine Point began with karst development, and diagenetic alteration of the original rocks, which were mostly composed of calcium carbonate (calcite and aragonite).

Karst development apparently occurred at several periods, beginning with the slight uplift after Pine Point time and before deposition of that Watt Mountain Formation. Later karst events occurred after Watt Mountain time.

The diagenetic history began with several stages of calcite recrystallization and dolomitization, as shown in Figure 9-2. This part of the history is typical of marine limestones in general. The conversion of calcite to dolomite by circulating fluids commonly involves a volume loss of as much as 13%, resulting in increased porosity and permeability of the rock, thus further enhancing further fluid flow.

Several **pre-ore stages** of dolomite have been recognized, including the coarse-grained rhombic dolomite replacement which is referred to as Presqu'ile dolomite. The Presqu'ile type of dolomitization has affected 60 to 70 % of the barrier-reef rocks.



**Figure 9-2**  
**Mineral Paragenesis, Pine Point Zinc-Lead District**

From Hannigan, 2006, based on Qing (1991, unpublished; see Qing and Mountjoy, 1994). "Cx" denotes "crystalline". The "coarse-cx dolomite" phase is the "Presqu'ile dolomite" as described in drill logs.

The **ore-stage events** resulted in deposition of sphalerite, galena, and iron sulphides (pyrite and marcasite) in open spaces, and as a replacement of carbonates.

Apart from minor surficial oxidation products, zinc is present only as sphalerite, which is typically colliform: i.e. as crusts and radiating microcrysalline masses of light to dark brown sphalerite lining former vugs. However, sphalerite may also be present as coarse, subhedral crystals. Galena is the only important lead mineral, and tends to form crystalline masses nested inside sphalerite, toward the centers of former vugs (Figure 9-3) or as massive replacement of individual beds. Large, euhedral galena crystals are rare. Marcasite and/or pyrite occur in lesser amounts, and occasional pyrrhotite, celestite, barite, gypsum anhydrite, and fluorite also occur. Where zinc-lead mineralization occurs as large open space fillings, it is often very pure and finely crystalline.

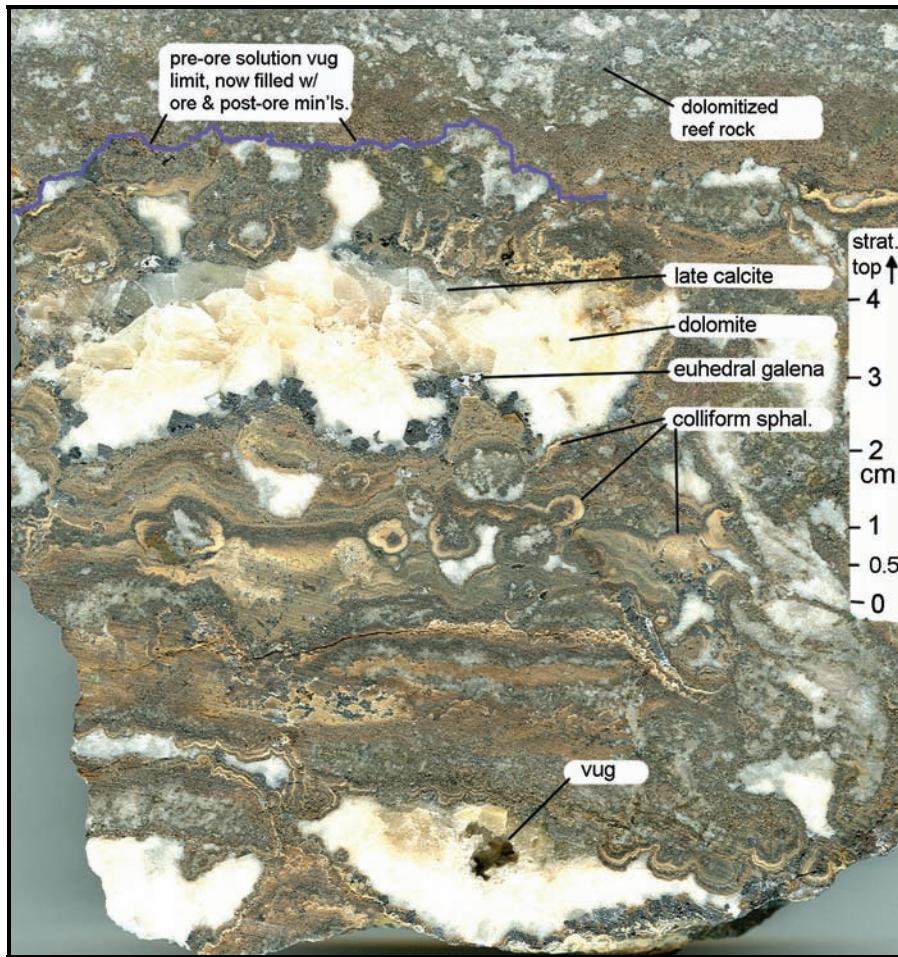
There is ample evidence that the karst openings were host to oil and gas deposits prior to the formation, or during the formation, of the zinc-lead mineralization. Tarry bitumen and brittle pyro-bitumen occur

within the upper portions of the deposits, especially in areas capped by impermeable shale, such as the North Trend tabular deposits. In other areas, bitumen can be found in vugs and sometimes filling fractures in the collapse breccias. All the mineralized cores at Pine Point contain some non-toxic volatile hydrocarbon compounds. Hydrogen sulphide gas was reported by Westmin in a few drillholes (e.g. Westmin, 1981, page 4).

Based on fluid-inclusion data, the ore-stage depositional temperatures were 90-100 degrees C, higher temperatures' than could be accounted for by burial alone. Thus a source of hydrothermal fluids is suggested, although no source of magmatic heat has been noted in or near the district.

**Post-ore events** include the deposition of minerals in remaining vugs. These minerals include early dolomite and later calcite, in addition to crystalline Sulphur, bitumen, and rare fluorite. In some intervals, sulphur and bitumen may each comprise on the order of 1% of the rock volume. Native sulphur apparently formed by bacterial reduction of sulphur compounds related to the hydrocarbons.

Because most of the ore-stage and post-ore minerals fill open spaces or massively replace host rock, much of the porosity which existed in the pre-ore stage due to natural deposition or early dolomitization has been eliminated in zinc-lead-mineralized rock. This is visible in Figure 9-3.



**Figure 9-3**  
**Textures of Mineralized Rock, Pine Point District**

This slabbed boulder is from one of the former Cominco open pits, not from one of the ten subject properties. The textures are typical of many deposits on the Tamerlane properties.

#### 9.4 Deposit Morphology and Size

According to Hannigan (2006), the 48 zinc-lead deposits mined by Cominco averaged 1.32 million tonnes of zinc-lead ore grading near 7.0 % zinc and 3.0% lead. The range of grades by deposit was 0.4% to 8.8 % Pb and 2.8% to 14.1 % Zn. The Fe content of individual deposits ranged from less than 0.5% to near 10.5 %, with an average near 3.5 % Fe. The total geological endowment of the district (ore mined plus estimated resources left) was estimated by Hannigan (2006) at 83.4 million tonnes.

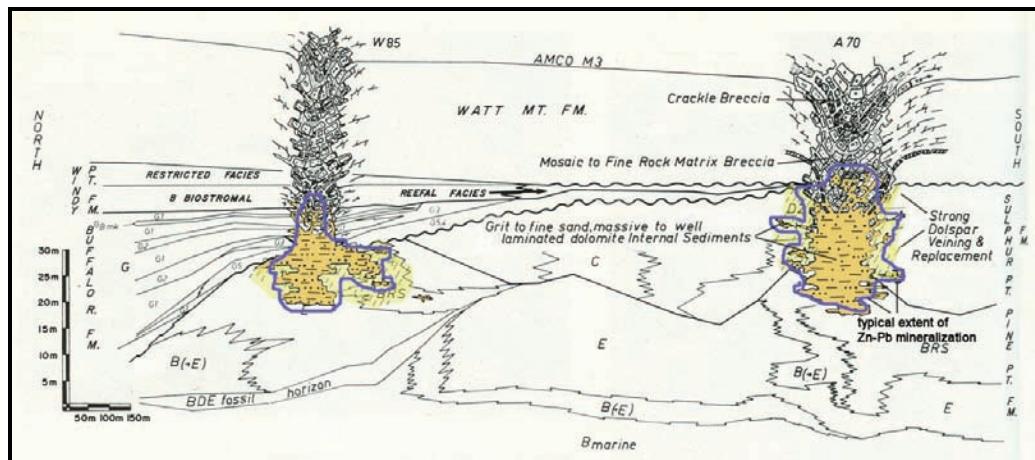
Four distinct deposit morphologies have long been recognized in the district: tabular, normal prismatic, abnormal prismatic, and B-spongy. Each of these morphologies is inherited from different types of karst

cavities. The types are discussed at great length by Rhodes, et al. (1984), and are summarized by Hannigan (2006).

**Tabular deposits** formed in close conformity to karstic channels formed within a particular stratigraphic horizon, thus representing a paleo-aquifer. Typically this was near the base of the Presqu'ile dolomite body, which tends to occur slightly below the base of the Sulphur Point Fm. Sphalerite, galena, and other ore-stage minerals replace karst-infill sediments and fill open spaces. Tabular deposits are represented schematically on Figure 7-3 by deposits M40 and Z53.

As may be noted on Table 9-1, tabular deposits are most widespread in the North Trend, where they occur in the Sulphur Point Fm. and in the adjacent Upper Keg River Member and Buffalo River Shale. Within the Main Trend, the few tabular deposits occur in the Sulphur Point Fm. and in the underlying Muskeg Fm. None occur on the South Trend. Among the ten subject properties, only W19 and V46 are of tabular type.

**Normal prismatic** deposits occur as fillings of collapse breccia pipes formed by intense karstification. These bodies are sub-circular in outline, and typically extend through 50 to 100 meters of stratigraphy, of which 30 to 50 meters may be mineralized. The collapse pipes tend to bottom at the level of tabular channels, i.e. at a paleo-aquifer. Sulphide minerals replace fine-grained post-karst infill sediments, and fill cavities. To a lesser degree, sulphides may replace large breccia fragments. Figure 9-5 depicts a typical normal-prismatic deposit in cross-section, while Figure 7-3 depicts this type of deposit schematically (deposits A70, K57, and O42.)



**Figure 9-5**  
**Cross-Sections of Normal Prismatic Deposits**  
 (modified from Rhodes, et al. 1984, Figure 41A). Note vertical exaggeration.

Normal prismatic deposits comprise most of those in the Main and South trends, and only a few of those on the North Trend. Among the ten subject properties, G03, O556, P499, R190, W85, X25, and Z155 are of normal-prismatic type.

**Abnormal prismatic** deposits differ from the normal prismatic type in consisting of non-lithified mineralization which may have formed in a more recent (Holocene?) karstification event. Also, they may bottom well below the higher Pine Point Group horizons typical of normal prismatic deposits. Two abnormal prismatic deposits are shown diagrammatically on Figure 7-3, deposits W-17 and X-15.

Only three of the 95 - 100 deposits in the Pine Point district are clearly of abnormal prismatic type, including X15, which is among the ten subject deposits of this report.

**B-spongy deposits** are restricted to the B-spongy horizon at the base of the Upper Keg River Member of the Pine Point Group. This horizon is characterized by abundant open molds of fossils, which were preferentially dissolved compared to the dolomitized matrix. Sulphide minerals have locally filled the open cavities, especially on the east end of the Pine Point district. The N204 deposit, one of the ten subject deposits of this report, is the only one known to be of economic interest.

There is some suggestion of zoning, both within individual deposits, and within the district, although no simple pattern has emerged. According to Hannigan (2006), Pb/(Pb+Zn) ratios of Pine Point district deposits range from 0.06 to 0.56 giving a district average of 0.26. Weighted averages of lead and zinc in various deposits from the upper and lower portions of the Presqu'ile barrier indicate weak vertical metal zoning. In the upper barrier, a weighted average Pb/(Pb + Zn) ratio of 0.20 indicates deposits are slightly richer in zinc than deposits occurring in the lower barrier (0.26). Kyle (1981) reported a district-wide pattern of metal zoning as determined from ore-reserve data at that time. He indicates the Pb/(Pb+Zn) ratio increases from about 0.2 in the southeast to about 0.5 in the northwest in zones parallel to the Main and North trends. However, a weighted average calculation of the Pb/(Pb+Zn) ratio on deposits along the entire length of the Main Trend reveals a consistent ratio (0.36), thus indicating the lack of a district-wide lateral zoning pattern.

Deposits of the normal prismatic variety are generally lead-rich averaging about 0.35. There is also a distinct lead high associated with Main trend normal prismatic deposits averaging near 0.37, while normal prismatic deposits in the North and South trends average near 0.25. Tabular and abnormal prismatic deposits present in all trends are relatively zinc-rich averaging near 0.25. Some of the prismatic bodies are zoned with a Pb-rich core, passing outward into a Zn-rich zone and enveloped by a Fe-rich aureole. The areal distribution of iron-sulphides is wider than galena and sphalerite and the Fe/(Fe + Zn + Pb) ratio increases outward from prismatic deposits. There are relatively small barren sulphide bodies in the district, consisting mostly of iron sulphides with minor lead and zinc.

## **9.5 Mineralization of the Ten Subject Tamerlane Deposits**

This section discusses each of the ten subject deposits in turn.

### **9.5.1 R190 Deposit**

This deposit is the subject of the feasibility study accompanying this report. R190 lies near the southwest end of the Main Trend. Overburden thicknesses encountered in the 2005 drill program ranged from 25 to 45 meters feet, and no bedrock outcrops occur. The deposit is a normal prismatic type occurring in a karst collapse pipe, which bottoms in the Pine Point Group (Upper Keg River Member, Sulphur Point Fm.) and continues up through the Watt Mountain into the Slave Point Formation. Two to 20 meters of Hay River Formation (Devonian) overlie the mineralized rocks. The deposit measures 80 to 170 meters across, and as much as 45 meters in vertical extent. It was discovered by Westmin, who drilled 48 vertical core holes. In 2005, Tamerlane drilled an additional 7 core holes.

Mineralization consists of galena and sphalerite, occurring both as massive mineralization with skeletal to massive galena and colliform sphalerite, and as crystals on the rims of vugs or within calcite  $\pm$  dolomite in thin veinlets on the margins of the deposit. Sulphur and bitumen commonly occur in vugs, veins, and pore spaces in and around the lead-zinc mineralization. Marcasite  $\pm$  pyrite occur as disseminations within the massive ore sequence to massive horizons near the base of the lead-zinc mineralization and continuing below the lead-zinc mineralization. Gypsum needles and their casts are common in association with the mineralized horizons.

Metal grades vary from sub-economic on the fringes of the prismatic body to as high as 52.06% combined lead and zinc over 32.5 feet thickness in drill hole R190-TV5. Mineralization of over 2% combined lead and zinc in the 2005 drill program occurred over thicknesses ranging from a minimum of 60.5 feet in TV05 to a maximum of 109.2 feet in TV01. Sinclair (1982) reports a non-43-101-compliant "reserve" of 1,013,000 tonnes averaging 12.7% Zn and 6.3% Pb, based on Westmin drilling.

CAM reviewed core from holes TV-02 and TV-10, drilled in 2005 by Tamerlane. Although the mineralized intervals had been completely consumed for assay, geotechnical, and metallurgical testing, core recovery for the remainder of the holes appeared to be near 100%, and the porosity near mineralized intervals appeared to be less than 5%.

Figures 9-6 and 9-7 depict the R190 deposit.

## R -190 CROSS SECTION

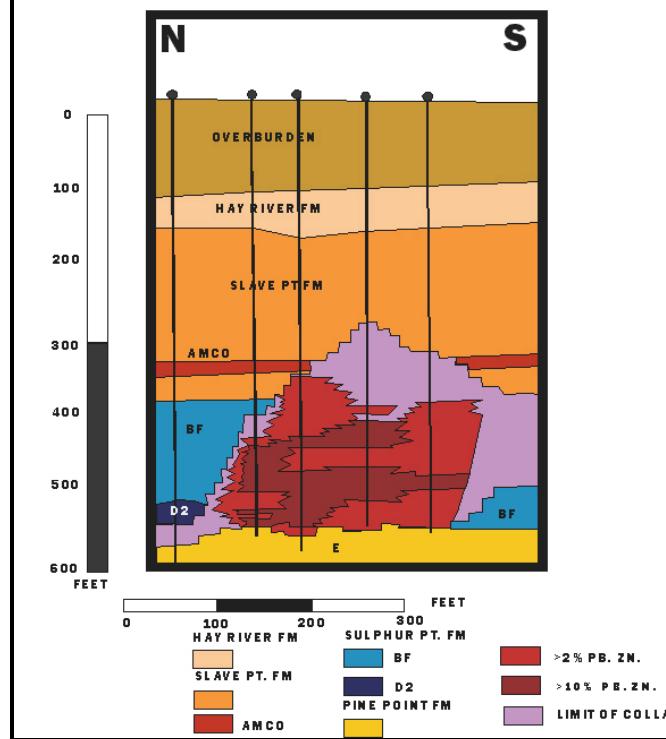


Figure 9-6  
Cross-Section through R190 Deposit

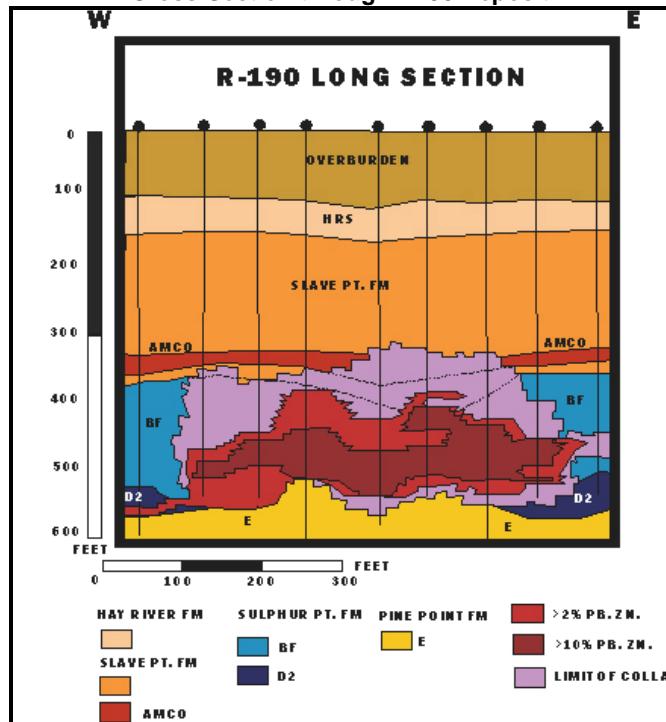


Figure 9-7  
Long Section through R190 Deposit

### **9.5.2 N204 deposit**

This isolated deposit is at the northeast extremity of the Pine Point district, lying some 8 kilometers from any other known deposit. It is on the strike of the North Trend, but not far from the extension of the South Trend. N204 is the only economically-interesting deposit of B-spongy type, being hosted in the B-spongy vuggy dolomite horizon at the base of the Upper Keg River Member. Drilling by Cominco shows about 30 meters of glacial overburden covering the subcrop of the B-spongy horizon.

In plan view, the deposit extends 2,000 meters parallel to the northwesterly strike of the B-spongy unit, and about 1,000 meters down-dip. It ranges from 2 meters to 15 meters in thickness. Grades are low; on the order of 3 to 4% combined Zn+Pb.

### **9.5.3 G03 Deposit**

G03 is a normal prismatic deposit lying toward the southwest end of the Main Trend, on the east bank of the Buffalo River. It spans the lower part of the Slave Point Fm., extending downward into the Watt Mtn. Fm. and into the Sulphur Point Fm. Overburden consisting of 25 meters of glacial debris and 35 meters of non-mineralized Slave Point Formation cover the mineralization.

Cominco drilled 73 vertical core holes on the G03 deposit. Hannigan (2006) quotes a 1978 calculation with a non-43-101-compliant tonnage of 907,000 tonnes, grading 6.0% Zn and 2.3% Pb. According to Mr. Ross Burns of Tamerlane, formerly a geologist at Pine Point Mines (Cominco), a tonnage of 3,444,000 tonnes of Indicated Resources (non-43-101-compliant) grading 4.1% Zn and 3.0% Pb was calculated by Cominco as remaining in place at the time of operational closure in 1988.

CAM reviewed core from Tamerlane hole TV01 at this deposit, one of 3 drilled by Tamerlane in 2005.

### **9.5.4 W85 Deposit**

W85 is a normal prismatic deposit near the southwest end of the North trend. There are no surface exposures of the Paleozoic host strata, the deposit being concealed by an average of 35 to 40 meters of glacial drift. Mineralization extends for up to 20 meters vertically, encompassing parts of the Slave Point, Watt Mountain, Sulphur Point, Buffalo River, and Upper Keg River units. The deposit is 150 by 300 meters in plan view, and up to 20 meters thick. W85 consists of two deposits, a shallower, eastern, lead-dominant portion and a deeper, western, zinc-dominant portion. A cross-section through this deposit is shown in Figure 9-5.

This deposit was discovered and first drilled by Cominco, who completed 194 vertical core holes. Mr. Ross Burns of Tamerlane, formerly a geologist at Pine Point Mines (Cominco), cites a Cominco-calculated (non-43-101-compliant) "Indicated Resources figure of 3,760,000 tonnes grading 4.0% Zn and 2.3% Pb, still in place at the time of closure of Cominco's (Pine Point Mines) operations in 1988.

In 2006, Tamerlane drilled an additional 8 core holes. Non-mineralized core intervals from Tamerlane hole W85-TV03 was reviewed by CAM, the mineralized intervals having been completely consumed for assaying and metallurgical testing.

#### **9.5.5 P499 Deposit**

This is a normal prismatic deposit, occupying a karstic pipe in the southwest extremity of the Main Trend. There are no surface exposures, and glacial overburden averages 35 meters thick. About 15 meters of barren Hay River Formation occur beneath the glacial debris. Mineralization extends from the Slave Point Fm. through the Watt Mtn. Fm. and Sulphur Point Fm., into the Upper Keg River Member. Westmin discovered and drilled the deposit (21 vertical core holes) in the 1980's

Mineralization occurs in an oval about 60 by 90 meters, with up to 70 meters vertical extent. Most of the sulphides are in matrix fillings between breccia fragments, with larger breccia fragments being barren. The higher grades are in the dolomitized (Prequ'ile) Slave Point and Watt Mountain sections. Giroux (1982b) calculated a non-43-101-compliant tonnage of 876,000 tonnes grading 6.5% Zn and 2.9% Pb, based on the 21 Westmin core holes.

#### **9.5.6 O556 Deposit**

The O556 deposit is the furthest southwest of all defined deposits in the district, lying on the Main Trend. It is of normal prismatic type, within a karst breccia pipe extending from the Slave Point Fm. through the Watt Mtn. Fm. and Sulphur Point Fm., into the Upper Keg River Member.

Glacial overburden covers the subcrops of Devonian strata to an average depth of 35 meters. In addition, 10 to 25 meters of Hay River Formation overlies the reef-complex strata. The deposit forms an east-west oval some 250 by 110 meters, and up to 50 meters thick.

Based on 26 Westmin core holes, Giroux (1982a) calculated a tonnage of 949,000 tonnes grading 4.2% Zn and 4.3% Pb.

### **9.5.7      V46 Deposit**

This is a tabular deposit hosted within the Slave Point Fm., through the Watt Mtn. Fm. and into the Sulphur Point Fm. It lies near the southwest end of the Main trend. About 30 of glacial debris obscure any bedrock exposures, and some 10 meters of Hay River Formation overlie the mineralized reef strata. The irregular tabular body averages 150 meters east-west, 90 meters north-south, and is up to 30 meters thick.

Westmin drilled 28 vertical core holes by 1976, and estimated 522,000 tonnes grading 5.5% Zn and 3.0% Pb. This estimate was not 43-101 compliant.

### **9.5.8      W19 Deposit**

This tabular deposit lies in close proximity to V46 and X25, near the southwest end of the Main trend. The deposit is covered by 40 meters of glacial debris on average, and a thin wedge of post-Slave Point sediments (Hay River Fm.). It lies within the Sulphur Point Fm. and Upper Keg River Member. The deposit measures 275 meters long by 45 to 90 meters wide, and does not exceed 10 meters in thickness.

A non-43-101-compliant tonnage of 141,000 tonnes grading 5.9% Zn and 0.4% Pb was calculated by Westmin from results of 23 vertical core holes drilled to 1976.

### **9.5.9      X25 Deposit**

This is a normal prismatic deposit, occupying a karst collapse pipe in the far southwest of the Main Trend. There are no surface exposures, and glacial overburden is 30 to 65 meters thick. Mineralization occurs within the Slave Point Fm. through the Watt Mtn. Fm. and into Sulphur Point Fm. The irregular surface projection of the mineralized pipe is 120 to 560 meters across, and mineralization extends for more than 60 meters vertically.

Giroux (1982c) calculated that 3,265,000 tonnes grading 7.1% Zn and 2.6% Pb were defined by 116 vertical Westmin core holes.

### **9.5.10     Z155 Deposit**

Z155 is a normal prismatic deposit in karst breccia in the southwest part of the Main Trend. There are no surface exposures of Devonian rocks, the deposit being concealed by 30 to 40 meters of glacial draft. Mineralization extends for up to 78 meters vertically, encompassing parts of the Slave Point, Watt

Mountain, Sulphur Point, Buffalo River, and Upper Keg River units. The deposit is 170 to 185 meters in diameter.

Westmin discovered and drilled the deposit (23 core holes, of which six had interesting Zn-Pb values), and in 1985 calculated 907,000 tonnes grading 7.5% Zn and 5.5% (Hannigan, 2006); these figures are not compliant with NI 43-101.

## **9.6 Exploration Potential**

The focus of Tamerlane's efforts on the property is the near- to medium-term mining of the R190 and other nine deposits. Over 30 additional non-mined deposits on the Tamerlane property, discovered by Cominco or Westmin, remain to be fully evaluated. Good potential remains for discovery of additional deposits on the Tamerlane property.

Drill centers were typically 100 feet on the prismatic deposit types. Tabular deposits required closer spacing (50 feet).

Deposits discovered and mined by Cominco in the past were found to be reasonably well-defined with these drill spacings; according to data reconciliations of actual tonnages and grades mined to reserves established by drilling were found to match reasonably. Prismatic deposits actually yielded more ore than the reserve estimate.

Deposits discovered and mined by Cominco in the past were found to be adequately defined with these drill spacings; reconciliations of actual tonnages and grades mined to reserves established by drilling were found to match reasonably. Prismatic deposits actually yielded more ore than the reserve estimate,

## **10.0 EXPLORATION**

During the 1960's to 1980's, major exploration programs were carried out in the Pine Point district, principally by Cominco (Pine Point Mines Ltd.) and Westmin. Due to the extensive (99%) glacial cover in thicknesses sometimes exceeding 50 meters, surface methods (geologic mapping, rock geochemistry) were of little use away from the few bedrock exposures.

Prior to 1963, exploration at Pine Point was accomplished by grid drilling, accompanied by shaft-sinking. By 1963, drilling had successfully delineated near eight million tonnes of ore averaging 2.6 percent lead and 5.9 percent zinc among several orebodies. Furthermore, stratigraphic and structural models had been developed for prioritizing drill targets.

Drilling in the district by Westmin, Cominco, and Tamerlane has probably totaled over 3,000,000 feet in an estimated 15,000 core holes, of which approximately 300,000 feet were drilled on the ten subject deposits. There was some additional exploration drilling by junior companies in the 1970's, mainly on the eastern fringes of the district, and by Cominco west of the district in the Hay River area. The amount drilled on the Tamerlane property has not been separately totaled, but is probably on the order of 1.5 million feet, including drilling on deposits now mined out.

Induced polarization (IP) geophysical methods were introduced to the Pine Point district in 1963 and proved successful in increasing the mineral inventory of the district. The mineralization contains sufficiently high concentrations of the conducting minerals galena, pyrite and marcasite to make the IP method feasible (sphalerite is non-conductive). However, in these deposits the electrical continuity among conducting minerals is poor, making standard electromagnetic (EM) methods unresponsive. The galena is often surrounded by nonconductive and non-polarizable sphalerite, and abundant limestone and dolomite gangue interrupts the conducting paths.

Attempts to locate MVT mineralization in the district by rock and soil geochemistry, gravity, and electromagnetic geophysics did not prove to be particularly effective. Seismic surveys were successful in identifying karstic collapse structures on certain horizons of interest. At least one seismically identified collapsed brecciated structure was confirmed by drilling.

In addition to the core holes drilled in 2005 on deposits G03, R190, and W85, Tamerlane undertook an airborne magnetic and electromagnetic (AeroTEM<sup>©</sup> II time-domain) survey, as reported by AeroQuest Limited (2005). The airborne survey results do not directly bear on the mineral Resource calculations on the ten subject deposits, and are not further discussed in this report.

## 11.0 DRILLING

The mineral Resources and Reserves defined in this report and in the accompanying Feasibility Study were based upon core drilling undertaken by Cominco (Pine Point Mines) and Westmin in the 1960's, 1970's and 1980's, plus the 18 core holes drilled on three deposits by Tamerlane during February-September 2005. A summary of drilling on the ten subject deposits is presented in Table 11-1.

Deposit	Table 11-1 Drilling on the Ten Subject Deposits							
	Original Drilling (Pre-1988)*				Confirmatory Drilling (2005)*			
	company	# holes	feet	meters	company	# holes <sup>+</sup>	feet	meters
R190	Westmin	48	28,073	8,559	Tamerlane	7	5,036	1,535
P499	Westmin	21	12,855	3,919	--	--	--	--
O556	Westmin	26	15,367	4,685	--	--	--	--
V46	Westmin	28	13,396	4,084	--	--	--	--
W19	Westmin	23	12,230	3,729	--	--	--	--
X25	Westmin	116	64,476	19,657	--	--	--	--
Z155	Westmin	23	12,249	3,734	--	--	--	--
N204	Cominco	464	89,511	27,290	--	--	--	--
G03	Cominco	73	32,797	9,999	Tamerlane	3	1,437	438
W85	Cominco	194	61628	18,789	Tamerlane	8	2,725	831

\* count includes all holes drilled in and around deposit.

+ count includes only those holes reaching target depth.

All holes were drilled vertically. Drill intercepts are assumed to represent true stratigraphic distances, since the strata dip less than one degree except within karstic collapse structures. In the database provided to CAM for Cominco, every downhole survey record had a dip of 90° indicating that the holes were assumed vertical and not surveyed. Shale within the Lower Keg River Member proved to be a useful marker horizon, as it is continuous across the district, unlike many of the reef-related horizons. The E shale underlies nearly all mineralization, and is thus a bottom for drilling in most cases.

Since nearly all the Cominco and Westmin data originated before 1985, little was originally available electronically. Tamerlane produced electronic versions of the assay data and geologic coding as their drilling progressed.

### 11.1 Cominco Drilling

CAM had access to drill logs and assay data for the 3 deposits formerly held by Cominco of the ten subject properties. However, very few text reports relating to the Cominco work were available for review by CAM. Much of the descriptions of Cominco procedures is based on data from Mr. Ross Burns, former Pine Point Mines geologist and current CEO of Tamerlane.

The Cominco drilling program was based on the premise that shallow deposits in the eastern part of the district were of more value than deeply-buried deposits further west (see Figure 7.5). Also, the mill was located in the eastern part, with consequently greater haul costs for western deposits. Therefore, the target size increased toward the west, consequently with greater drill spacing.

Drilling of IP anomalies resulted in discovered of most of the Cominco deposits at Pine Point. Drilling was done using vertical holes on fences oriented perpendicular to the mineralized trends, i.e. oriented N 030 W. The majority of the Cominco property east of the Buffalo River was drilled by vertical core drill holes on a 3000 x 3000 foot (915 x 915 meters), or locally 3000 X 6000 feet. Hole depths were typically 100 to 300 meters, usually stopping at the Keg River E Shale marker horizon. (The metric system replaced the Imperial system during Cominco's tenure at Pine Point).

The recognized ore trends on the eastern section of the property were drilled on 300 x 300 m grids and in some cases 150 x 150 m grids. When mineralization was encountered, a grid pattern of 100 feet was established, with 50-foot infill drilling as required, especially for tabular deposits which usually required 50 foot patterns for adequate definition.

Some early coring was done with AQ (27.0 mm diameter) core, but most of the program used BQ (36.5 mm) and NQ (47.6 mm) sizes. Most drilling was undertaken in winter when the ground was frozen. Recoveries were generally high, above 95%.

## 11.2 Westmin Drilling

The Westmin drilling was confined to west of the Buffalo River, in areas not controlled by Cominco. Westmin, like Cominco concentrated on the known "hinge zones" or "trends", especially the Main trend, and utilized diamond drilling as a follow-up to airborne and limited ground EM/IP surveys.

Limited text reports are available describing the Westmin core drilling during 1975-1984, including a report by Randall (1981). In 1981 alone, Westmin drilled over 51,000 feet in 92 holes. All told, Westmin defined nine blind (non-outcropping) zinc-lead deposits (O555, O556, P499, R190, T799, V46, W19, X25, and Z155), but did not place any of them in production. The total Westmin drilling on those seven of the ten subject Tamerlane deposits which Westmin discovered (O556, P499, R190, V46, W19, X25, and Z155) was 156,930 feet.

Much but not all of the Westmin core is stored in an open area near the former Pine Point Mill. The UTM location of the site is 637,481 E, 6,746,541 N, while the latitude-longitude is 60-49-49 N, 114-28-16 W).

### 11.3 Tamerlane Drilling, 2005

Tamerlane conducted confirmatory and infill drilling on three deposits (W85, G03, and R190), to fulfill two objectives:

- confirm historic grades and tonnages, and
- provide samples for metallurgy studies to determine the applicability of a Dense Media Separation (DMS) process.

A thirty-hole program was developed, to be completed during 2005. Ten holes were planned for each of the three areas to be tested. The holes were all targeted within areas of the deposits with grade (Zn+Pb) X thickness (feet) products greater than 500. Drilling was contracted to Discovery Diamond Drilling of Morinville, Alberta. The drill crews each consisted of a driller, helper, water truck driver, and a supervisor. The drill operated 24 hours per day, 7 days per week.

Eighteen of thirty proposed holes were completed in the three areas during the program, which lasted from early February to mid-August, 2005. (Drilling was suspended during the spring thaw). Total footage drilled in the three areas was 9,198 feet, including 1,437 feet in G03, 2,725 feet in W85, and 5,036 feet in R190. The direct drilling cost was US\$46.60 per foot.

Significant mineralization was assayed in 16 of the 18 completed holes, and visually estimated grades in the two unassayed holes (saved for engineering studies) are believed to be comparable to grades in assayed holes. A summary of the holes is shown in Table 11-2.

**Table 11-2  
Summary of the 2005 Tamerlane Assayed Drill Intercepts**

Drill Hole Number	Total Depth (feet)	Mineralized Interval (feet)		Thickness		Averages		
		From	To	Feet	Meters	% Pb	% Zn	% Pb +%Zn
W85-TV1	280	106	222	116	35.4	7.4	4.08	11.48
W85-TV2*	318	--	--	--	--	--	--	--
W85-TV3*	280	--	--	--	--	--	--	--
W85-TV4	280	87	203	116	35.4	7.24	5.97	13.21
W85-TV4	--	234	262	28	8.53	6.94	4.72	11.66
W85-TV5	280	201.5	285	83.5	25.5	4.12	8.14	12.24
W85-TV6	350	205	340	135	41.2	3.72	10.72	14.44
W85-TV7	237	165	235.7	70.7	21.6	0.6	3.42	4.02
W85-TV8	350	197	222	25	7.6	2.31	6.95	9.26
W85-TV8	--	262	350	88	26.8	5.66	9.48	15.14
W85-TV9	350	260	350	90	27.4	6.12	13.71	19.83
G03-TV1	400	180	342	162	49.4	4.5	12.33	16.83

**Table 11-2**  
**Summary of the 2005 Tamerlane Assayed Drill Intercepts**

Drill Hole Number	Total Depth (feet)	Mineralized Interval (feet)		Thickness		Averages		
		From	To	Feet	Meters	% Pb	% Zn	% Pb +%Zn
G03-TV2*	400	--	--	--	--	--	--	--
G03-TV3	400	165	377	212	64.6	5.22	9.94	15.16
G03-TV4 <sup>+</sup>	140	--	--	--	--	--	--	--
G03-TV6 <sup>+</sup>	97	--	--	--	--	--	--	--
R190-TV1	550	401	420	19	5.8	2.00	2.30	4.30
R190-TV1	--	449.8	535	85.2	30	6.35	17.27	23.62
R190-TV2	565	468	528	60	18.3	7.55	17.89	25.44
R190-TV3	565	400	435	35	10	13.71	4.35	18.06
R190-TV3	--	465	530	65	10.7	13.54	23.81	37.35
R190-TV4 <sup>+</sup>	307	--	--	--	--	--	--	--
R190-TV5	565	417	437	20	6.1	10.97	1.81	12.78
R190-TV5	--	500	532.5	32.5	9.9	14.84	37.22	52.06
R190-TV6 <sup>+</sup>	397	--	--	--	--	--	--	--
R190-TV7	565	396	440	44	13.4	4.42	5.48	9.90
R190-TV7	--	495	527	32	9.8	11.14	36.65	47.79
R190-TV8	405	--	--	--	--	--	--	--
R190-TV9	567	435	540	105	32	12.10	18.99	31.09
R190-TV10	550	457	517	60	18.3	4.65	17.72	22.37

\* these holes were not assayed, in order to provide additional mineralized material for metallurgical testing.

+ these holes were not drilled through the target horizons.

Upon completion of drilling, new drill holes were surveyed using GPS with a surveyed base station at an established survey point on Highway 5. Accuracy of survey points is expected to be in the tens of centimeters.

The Tamerlane drill campaign essentially confirmed the historic lead and zinc mineralization thickness and grade in for R190, and are not inconsistent with the historic drilling for G03 and W85.

All holes drilled to completion and assayed in the 2005 drill campaign intersected good grade mineralization over thicknesses similar to those reported in the historic data.

Figures 11-1 and 11-2 are photographs of mineralized R190 core supplied by Tamerlane, which were taken after core was split for assay, but before the remaining half of mineralized intervals were consumed for metallurgical testing.



Figure 11-1

Photo of core from hole R190-TV03, footage 430-440, after splitting. The interval 435-440 feet in this hole shows abundant galena with lesser sphalerite, and assayed 14.3% Pb and 5.4% Zn. As noted by the tags, some samples had been removed for geological examination. The remainder was later consumed in metallurgical tests. Photo by Tamerlane, 2005

The interval 435-440 feet in this hole assayed 14.3% Pb and 5.4% Zn. As noted by the tags, some samples had been removed for geological examination. The remainder was later consumed in metallurgical tests.



Figure 11-2  
Tamerlane 2005 photo of core from hole R190-TV03,  
footage 510-530, after splitting

The interval 510-530 feet in this hole assayed an average of 7.1% Pb and 16.9% Zn. This core was later consumed in metallurgical tests.

Even though the principal mineralized intervals from Tamerlane's 2005 drilling were subsequently consumed in metallurgical tests, CAM are satisfied that the nature of the mineralization and wall-rocks encountered were substantially as reported by Tamerlane. As mentioned in Section 2.4 and in Appendix A, CAM verified the presence of mineralized core in the field. This included a review of some of the 2005 holes in storage in Ferndale, Washington, and a review of Westmin core in storage at the former Pine Point Millsite in October 2006 and November 2007. In addition, CAM staff reviewed the assay reports for these holes, and spoke with geologists who had logged and handled the 2005 core.

Beginning in November 2007, Tamerlane undertook additional drilling in the district, results of which were not available when this Report was prepared.

## 12.0 SAMPLING METHOD AND APPROACH

### 12.1 Cominco Drilling

All Cominco core was logged by geologists, or by geology students who were supervised by experienced Pine Point Mines geologists. Logging followed rigorous standard procedures, utilizing pre-printed, standardized logging cards to systematically record run-by-run recoveries, geochemical and full assays, verbose geological logs, and digital codes for geology, alteration, karst and mineralization codes. Logging protocols were provided to geologists, the last-used protocol being issued by Pine Point Mines (1985).

Cominco's stratigraphic logging scheme was as shown on Table 12-1. From time to time, there were variations of this scheme, especially in the temporary addition of other facies designations.

**Table 12-1  
Selected lithologic Unit Codes used by Cominco (Pine Point Mines Ltd.)**

Upper Formations	Slave Point Fm.	SLPT	Slave Point general
		SLPT M1-3	Amco argillaceous limestone
		SLPT M2	sandy micrite above Amco
		SLPT M3	sandy micrite below Amco
		SLPT N	micrite N
		SLPT O	micrite O
		SLPT P	micrite P
Pine Point Group	Watt Mountain Fm.	L	Watt Mountain general
	Buffalo River Shale	G	Buffalo River general
		SP	Sulphur Point general
		BF	Bioclastic Floatstone
		BWK	Bioclastic Wackestone
		C	C facies / Grainstone, clean fine bioclastic unit, usually altered to Presqu'ile dolomite
		D2	Stromatoporoid Reef Facies, clean light colored, usually presqu'ile altered
		LAM	laminated carbonate intervals, stylolitic, algal
		CH	C-Horizon markers are J-like beds <20 feet thick
Pine Point reef facies	Pine Point reef facies	(J)	J like – transitional to Muskeg Fm., evaporite textures
		PP	Pine Point general
		E	E-facies: clean calcarenite, >20 % corals
		EFOS	E Fossiliferous: similar to above but fewer corals
		D1	D1 facies (bioclastic): main reef unit of Pine Point Fm.

**Table 12-1**  
**Selected lithologic Unit Codes used by Cominco (Pine Point Mines Ltd.)**

	E-B and B-E	transitional B to E	
	BMD	B marine dolomite: argillaceous / bituminous with brachiopods and crinoids	
	BML	B marine limestone: as above, limestone	
	BDE	BDE fossil horizon: clean, densely fossiliferous coquina (in North Trend)	
	BRS	B Reef substrate: pancake stromatolite-brachiopod fauna	
	EBL	E blotchy: bioturbated micrite with brachiopod fauna	
	BSP	B spongy: micrite with fossil moldic vuggy porosity	
	B-F	transition B to F Facies	
	F	F facies: brown-black lime mudstone with tentaculites	
	BR	Bioclastic Rudstone	
Muskeg Formation	J	evaporites, etc.	
Keg River Member	ESH	E Shale, 3 - 6 m below top of Upper Keg River Member	

The database for Pine Point drilling was compiled in "GEORES" format by the Cominco exploration staff (GEORES is Cominco's proprietary geological modeling software). Drill data exists for all holes drilled on the Pine Point Mines property. In the final years of operations the Pine Point Mines data was systematically updated and coded throughout the property according to the latest geological nomenclature developed from Cominco's geological research group at Pine Point. This data was subsequently acquired by Tamerlane Ventures Inc.

The geologists marked the core for sampling, which was then undertaken by trained technicians and sent to the laboratory for preparation and assay. Sample intervals were determined visually and measured to the nearest 0.1 foot. Nearly all the sampled intervals contain +2% Zn+Pb. In the initial phases of the Cominco program, core was split pneumatically and 50% of the core was preserved. Later in the program, all the mineralized interval was sent for assay, and no core remains of mineralized intercepts.

The remaining core, including non-mineralized intervals, was preserved in a large core library called the "Back 40" west of the site of the former (now-dismantled) Pine Point mill. It is stacked in forklift-moveable cradles containing approximately 2,000 feet of core per cradle. This core was left in an orderly and well-labeled condition, but in the 20+ years since drilling ceased, many of the labels have deteriorated or fallen off, and many of the wooden cradles no longer can be moved intact. This, plus the fact that the entire mineralized core was assayed in most holes, renders the historic core only marginally useful.

Cominco's work at Pine Point spanned 56 years (1929-1985), of which 20 years (1964-1984) involved intensive mining and exploration. CAM believe that there is sufficient documentation to conclude that the historic Cominco drilling on the ten subject deposits can be used to generate mineral Resource estimates which are compliant with NI 43-101.

## 12.2 Westmin Drilling

Westmin, as the operator for a joint venture of Westmin (Boliden) and DuPont, are reported to have utilized a competent geological staff and industry-standard methods. However, few details of the specific procedures are known to Tamerlane or CAM. The available information, including CAM's brief review of Westmin core stored at Pine Point, suggests that core recovery was very high, exceeding 90%. The Westmin geological logging scheme varied from that of Cominco (described above). The principal lithologic units recorded by Westmin were as shown in Table 12-2.

**Table 12-2**  
Lithologic units codes used by Westmin  
Modified from Turner, et al., 2002.

Abbreviation	Unit(s)
HR	Hay River Shale
SP	Slave Point (no Amco Shale)
SP UP	Slave Point (above Amco Shale)
SP AM	Slave Point Amco Shale
SP DN	Slave Point (below Amco Shale)
SP AM WT	Amco Shale – Watt Mountain transition
SP WT	Slave Point or Watt Mountain
SP WT DN	Slave Point (below Watt Mountain)
PP	Pine Point
PP WT	Pine Point – Watt Mountain transition
PP CF	Pine Point C-Facies
PP HI	Pine Point HI-Facies
PP DF	Pine Point D-Facies
PP CH	Pine Point C-Horizon
PP BR	Pine Point Basal Reef
PP EB	Pine Point E or B Facies
PP BU	Pine Point Buffalo River Shale
PP TE	Pine Point Tentaculites Facies
PP SF	Pine Point South Flank Facies
PR	Presqu'ile dolomitization, associated with any of the above units
BGSD	blue-grey saddle (Presqu'ile) dolomite. Intensity shown as 0 (none), 1 (<5%), 2 (5-25%), 3 (+25%)

Westmin's geologic and drill data are presently housed at the C.S. Lord Geological Institute in Yellowknife (Turner, et al., 2002), and are available to the public. A complete set of the available data relating to the Westmin program was obtained by Tamerlane and was made available to CAM.

CAM opine that Westmin's drilling and sampling were of a quality sufficient to use together with Tamerlane's more recent drill data, for estimation of mineral Resources.

### **12.3 Tamerlane Program, 2005**

Tamerlane's core logging and sampling procedures were supervised by geologist C. Watts. The procedural and logging protocols followed closely those of Cominco, as described in Pine Point Mines (1985), except that Tamerlane used a somewhat simplified version of Cominco's complex lithologic coding system, due to the small number of Tamerlane holes and the restricted geographic/geologic range of Tamerlane's drilling program.

The drill geologist determined sample intervals, which were recorded on the drill logs and marked on the core boxes. Sample intervals were determined visually and measured to the nearest 0.1 foot. Nearly all the sampled intervals contain +2% Zn+Pb. A technician split the core and placed half back in the core box, the other half being placed in a numbered bag with a sample tag. A duplicate numbered tag was stapled in the core box to mark the sample interval. Sample bags and a transmittal form were placed in a shipping box and labeled. The box was then taped shut and labeled with the lab address and Tamerlane's return address, plus a bar code for rapid tracking. The boxes were shipped to ALS Chemex in North Vancouver for analysis, via Northwest Transport.

Later, Tamerlane used the remaining half of mineralized core for metallurgical tests; thus no strong mineralization remains to be seen in the core, now stored in Ferndale, Washington.

Tamerlane also submitted 6 drill core samples to Terra Testing to be tested for unconfined compressive strength and stress/strain measurements. Two samples, W85TV2 (247.2-247.8 ft) and W85TV3 (195-195.4 ft) were taken from massive sulphide zones within the W85 ore deposit. The remaining four samples, TV10 (319-320.2 ft and 418-418.8 ft), TV5 (467-467.8 ft) and TV7 (370-371 ft) came from the R190 deposit and represent the mineralized zones found within that deposit. All samples represent true thickness since the holes they were taken from are vertical. The results of the tests are discussed in the Feasibility Study (CAM, 2007)

CAM believes that the Tamerlane drilling was professionally executed, and should accurately reflect the nature of the mineralization at the drilled sites, such that the samples can be used for mineral Resource estimation purposes.

## **12.4 Density Measurements**

The term "bulk density" is used here in preference to "density" or "specific gravity" since the measurement of importance is the overall density of a mass of more or less porous mixture of mineral grains, rather than the density of any particular solid mineral grain. Both "bulk density" and "specific gravity" are measured in relation to the weight of an equivalent volume of water; i.e. metric tonnes per cubic meter (same as grams per cubic centimeter). Because assays of mineralized material are determined in the laboratory on oven-dried samples, the result used in Resource calculations must also be in dry tonnes.

Most of the historical tonnage estimates in the Pine Point district have used calculated rather than measured bulk densities of mineralized rock.

### ***12.4.1 Cominco Practice***

According to Mr. Ross Burns, neither Cominco's historical tonnage estimations nor those of Giroux (1982) utilized original measured rock bulk densities. Cominco's bulk densities during the operational period were calculated from the density of dolomite, adjusted by the amount of sphalerite, galena, and marcasite/pyrite as determined by metal assays. A porosity of 5% was assumed. Reserve-to-mined reconciliations were sufficiently satisfactory that the method was not changed.

### ***12.4.2 Westmin Practice***

According to Westmin (1983b) a Kilborn Engineering study in 1979 (Kilborn, 1979) used a tonnage factor of 9.0 cubic feet per short ton ( $SG = 3.55$ ) for Westmin deposits, while Wright Engineers in 1979 calculated bulk densities for each drillhole composite, based on metals assays, and an assumed porosity of 5%.

Various reports by Giroux (1982a, 1982b, 1982c) used a bulk density of 3.48, including a porosity estimate of 5%. An internal Westmin study in 1982-83 assumed 9.3 cu ft per short ton ( $SG = 3.44$ ). Apparently no bulk density determinations were made from actual drill core in any of the Westmin-sponsored estimates.

### ***12.4.3 Tamerlane Practice***

Tamerlane calculated bulk densities, using data from the Polaris Mine, which is similar to the deposits at Pine Point. Porosity measurements were not been made, and a porosity of 5% was assumed in all calculations. Actual bulk densities lie mostly between 2.9 and 4.5 tonnes per cubic meter.

Giroux (2001) calculated theoretical densities, by relating zinc and lead grades to the proportions of sphalerite and galena in the rock based on assays, with corrections for iron and for native sulphur. The resultant calculated densities were assigned to each assay interval (usually 1.5 meters).

Advanced Terra Testing, Inc.(2006) determined densities of three rock samples, but these were very small-volume core samples and were not mineralized, and thus not relevant to bulk densities of ore-grade material.

#### **12.4.4 CAM Practice and Recommendations**

In the absence of direct bulk-density measurements on drill core, CAM followed Tamerlane's methodology (i.e. bulk densities for each composite calculated based on assays for Zn, Pb, and Fe). Tamerlane's (and Cominco's) method properly uses the *volume* percentage of each mineral, rather than the weight percentage.

The ore mineralogy at Pine Point is relatively simple, consisting of the principal sulphides pyrite, marcasite, sphalerite, galena, pyrite, and marcasite. Gangue consists predominantly of dolomite, with some calcite, bitumen, and native sulphur, plus trace amounts of other minerals (pyrrhotite, celestite, barite, gypsum, anhydrite, and fluorite). The mineral densities (SG's) used by Tamerlane were: dolomite 2.85, sphalerite 4.0, galena 7.5, and pyrite 5.02. The other minerals mentioned above, which are mostly less dense, comprise less than 2% of the mineralization, and are accounted for in the 5% porosity assumption.

At a grade of 11.12 % Zn , 5.38 % Pb and 3.12% Fe, the average density is 3.06 tonnes per cubic meter.

CAM concludes that the assay-calculated bulk densities, using an assumed porosity of 5%, are acceptable practice. A preferred practice would be to determine bulk densities of a number of core samples by cellophane wrapping and water immersion, a practice which is becoming more frequent on modern drilling projects.

An area of uncertainty which remains, whether bulk densities are directly measured or assay-calculated, is the effect of any large open karst cavities within a deposit. Previous descriptions, confirmed by CAM's review of drill core and examination of mineralized boulder specimens (see Figure 9-3), confirms to CAM's satisfaction that most of the original reefal porosity was eliminated by subsequent stages of dolomitization and sulphide deposition. However, large (up to automobile-sized) karst caverns were occasionally encountered by Cominco and Westmin in the district, although generally not within mineralized deposits. Drill logs do not indicate frequent open spaces within the limits of the ten subject

deposits, but the presence of some remaining karst caverns within the deposit limits cannot be ruled out. This is not believed to be a material issue for Resource estimation of the ten subject deposits.

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

Limited information is available about the preparation, analysis, and security features of the historic Cominco and especially the Westmin samples.

### **13.1 Cominco Samples**

Data about treatment of Cominco's samples came from Mr. Ross Burns, former Pine Point Mines geologist and current CEO of Tamerlane. According to him, Cominco's sample preparation and assaying were undertaken in Cominco's assay laboratory located in the Pine Point mill building.

Cominco used an x-ray fluorescence (XRF) technique in which capsules of pulverized sample were bombarded and the resultant fluorescent radiation was measured. This method was commonly used world-wide during the 1960 to 1980 period. Samples outside a nominal range of contents for Zn, Pb, or Fe were assayed again using different machine calibrations. Results were reported as %Zn, %Pb, and %Fe.

### **13.2 Westmin Samples**

CAM could not find any information relating to sample preparation or assaying of Westmin samples.

### **13.3 Tamerlane Samples, 2005**

Sawn core samples from Tamerlane's drilling were shipped commercially to ALS Chemex in North Vancouver, B.C. There the samples were prepared and assayed.

Most samples weighed between 2 kg and 5 kg as received. After oven-drying, samples were crushed to 70% < 2mm, then split and pulverized to 85% < 75 um. Analyses were performed for Zn, Pb, and Fe by Chemex method AA-62, which involves a four-acid digestion and atomic-absorption analysis. Any Zn, Pb, or Fe values above 30% were re-determined by titration (methods ZN-VOL50, PB-VOL50 and FE-VOL%), and reported to the nearest 0.01% Zn, Pb, or Fe.

ALS Chemex assay results were transmitted to CAM as secured .pdf files, Certificates of Analysis numbered VA05026858, VA05025500, and VA05022211. ALS Chemex are a major assay lab, with ISO 9001:2000 and ISO 17025 certification of North American facilities. They routinely undertake QA/QC measures that of world-standard class.

### **13.4 Statement Re sample Preparation, Analyses, and Security**

The Westmin data and to a lesser degree the Cominco data, are incompletely documented in terms of these phases. Documentation is complete for the Tamerlane samples. It is known that company employees logged and split core in all three drilling campaigns, and that Cominco prepped and assayed samples in-house.

Zinc and lead are the only payable minerals in these deposits, and their abundances can be readily estimated visually.

CAM is of the opinion that the Tamerlane verification drilling was sufficient to validate the historic sampling, subject to any qualifications set forth in Section 14, below.

## **14.0 DATA VERIFICATION**

Over the years, CAM has developed a procedure for mathematical and statistically validating exploration databases. This check procedure includes:

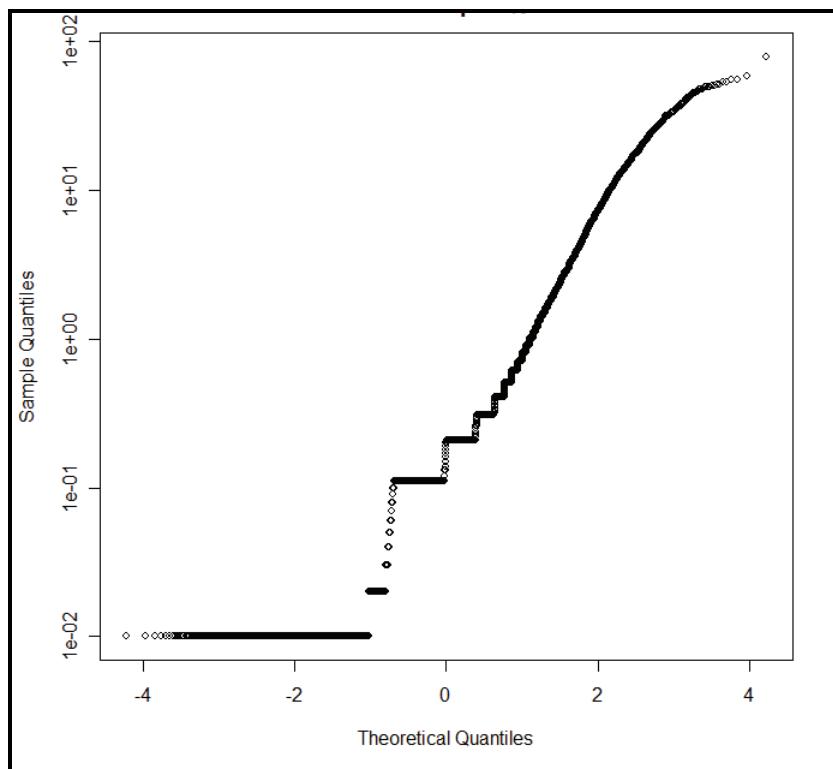
- Check for duplicate collars.
- Check of collar elevation versus surface topography elevation at the collar x, y location.
- Check for twin holes.
- Check for statistically anomalous downhole surveys.
- Check for overlapping assays
- Check for 0 length assays
- Review of assay statistics by grade class.
- Review of assay statistics by length class.
- Checks for holes bottomed in ore
- Check for assay values successively the same.
- Check for assay spikes.
- Check for downhole contamination by decay analysis.
- Check of total grade thickness by hole.

Data for the 10 deposits of interest and some 30 other deposits in the district were provided to CAM as a series of CSV files; the source documents were not available.

CAM's data verification consisted of internal consistency checks on data from the 10 deposits. These internal consistency checks indicated that the databases were internally consistent. Because historic assay certificates were not available, CAM was unable to verify the database against source documents.

Although CAM runs these checks on every project database, they not were as useful at Pine Point. For example, the topography at any given deposit at Pine Point is usually nearly flat, so the check of surface topography against collar elevation is not useful. Additionally, all holes in the database were assumed vertical so the downhole survey check showed nothing.

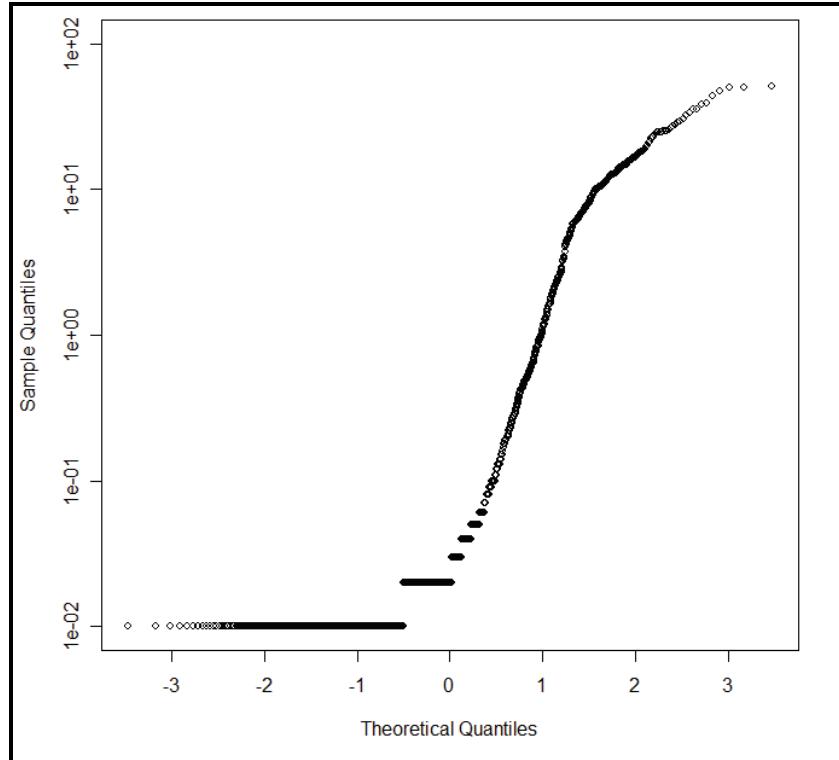
The most useful statistical checks were derived from cumulative frequency plots of assays and grade thickness for both lead and zinc. A cumulative frequency plot for all the lead assays for the 40 deposits is shown in figure 14-1.



**Figure 14-1  
Lead Cumulative Frequency, 40 Deposits.**

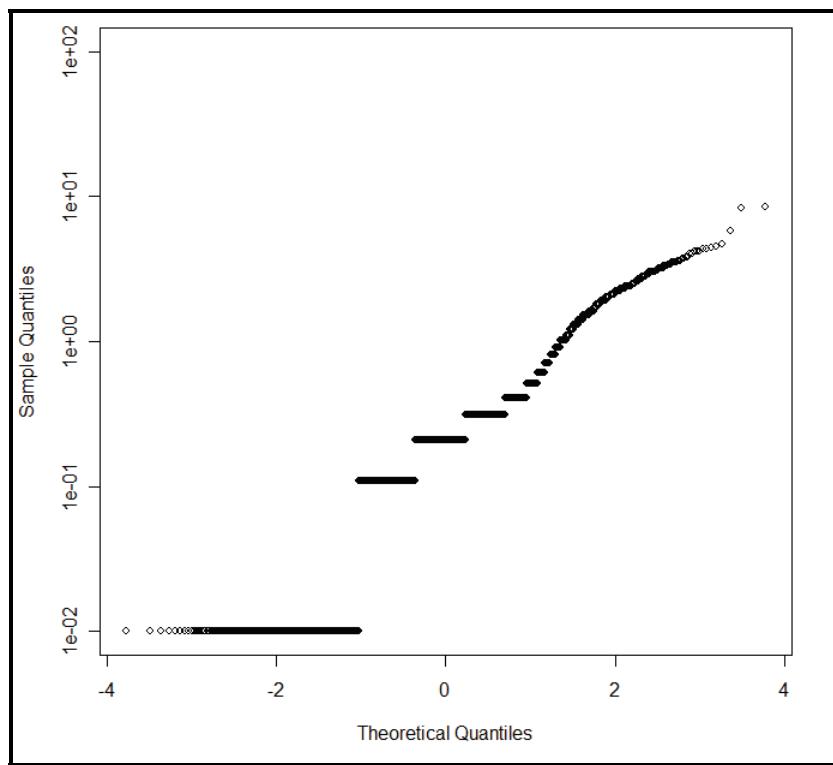
This plot shows a mixture of two or three lognormal distributions with the stair step effect corresponding to assay precision at the low end and one anomalously high point (this high point does not occur in the 10 deposits of interest).

An assay cumulative frequency plot for the R190 deposit is shown in figure 14 – 2



**Figure 14-2**  
**Lead Cumulative Frequency, R190 Deposit**

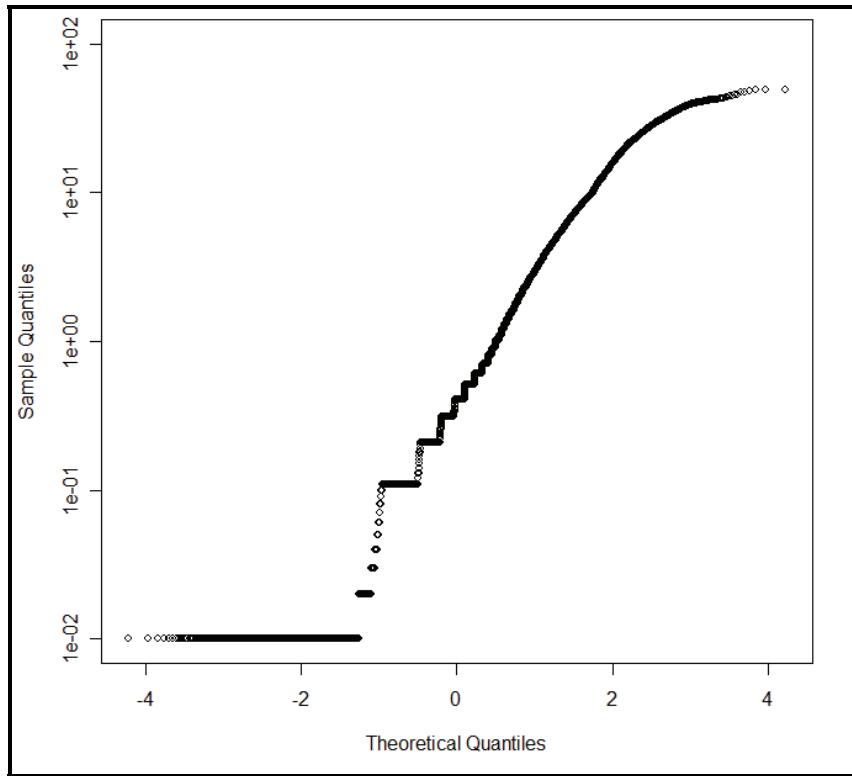
because of the smaller number of data points involved this plot is not as smooth as the plot of all the data. For some deposits there are a few statistically anomalous data points at the high end. An example of this is shown in the cumulative frequency plot for N204.



**Figure 14-3**  
**Lead cumulative frequency, N204 deposit.**

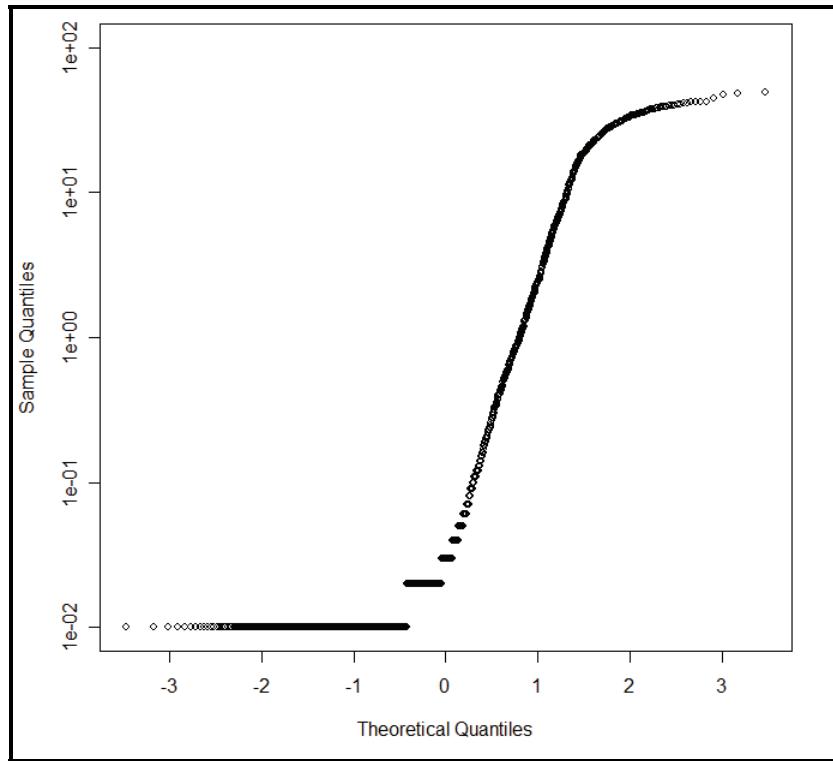
While these statistically anomalous points need to be checked, CAM does not believe they will significantly affect the overall resource estimate. Anomalous points have been summarized and will be reported Tamerlane for review prior to any Resource updates. (Initial work by CAM showed no anomalous values but it was found that a default setting in the x of the plotting software was incorrect).

CAM followed the same procedure for zinc assays. A cumulative frequency plot of all zinc assays for the 40 deposits is shown in figure 14-4.



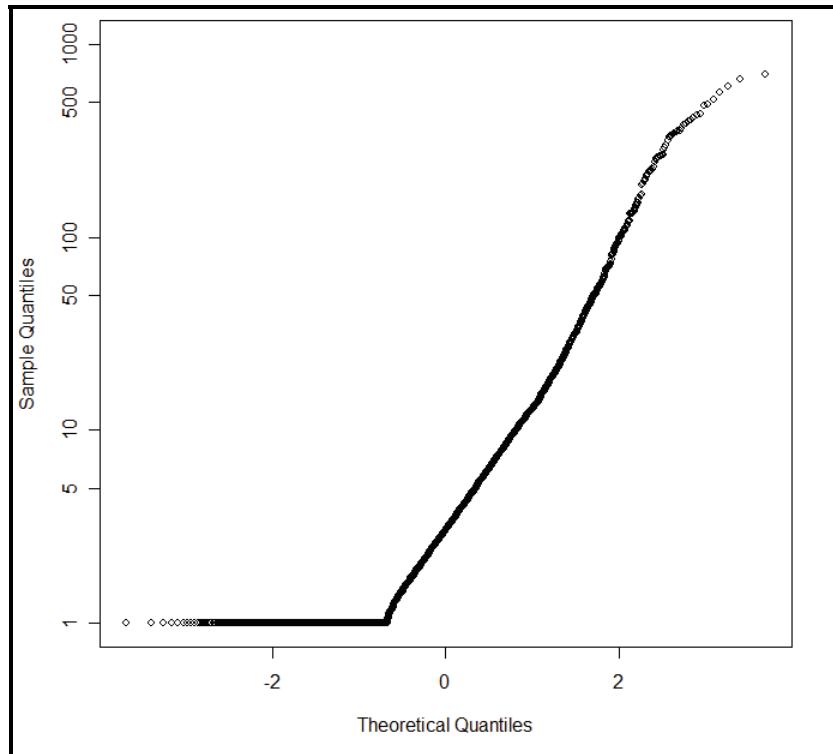
**Figure 14-4**  
**Zinc Cumulative Frequency, 40 Deposits**

This shows a similar structure to the lead cumulative frequency plot, with a stair-step effect at the low end, and a tailing-off at the high end which CAM believes is due to the maximum stoichiometric zinc limit for zinc sulfides. The cumulative frequency plot for zinc assays in R190 in Figure 14-5 shows a very good lognormal structure with a tailing off at the high end.



**Figure 14-5**  
**Lead cumulative frequency, R190 deposit**

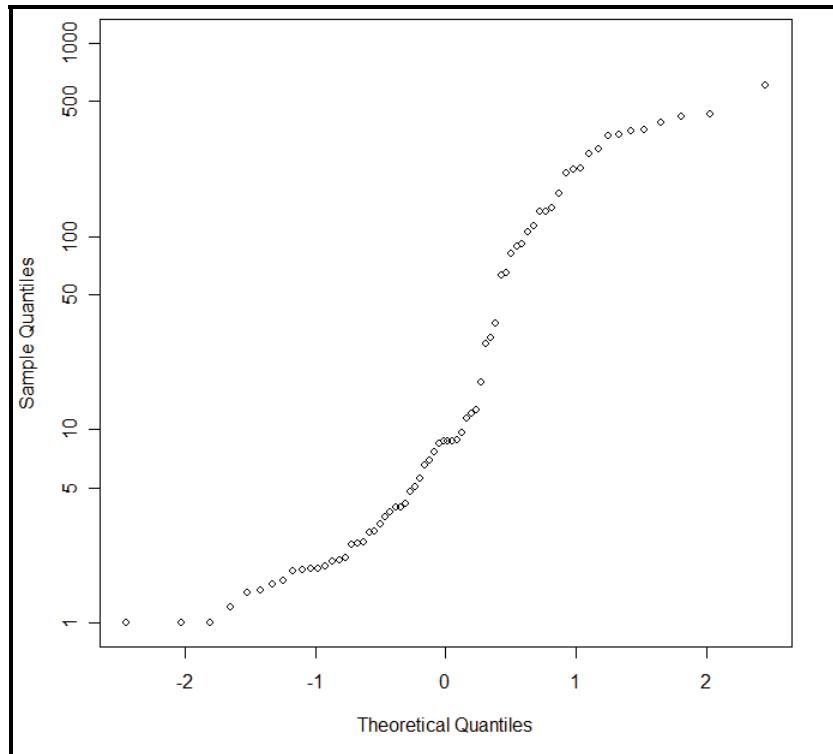
The cumulative frequency plots for zinc assays for the 10 deposits of interest were all similar to R-190. Cumulative frequency plots of assays are useful, but for deposits which are drilled by vertical holes, cumulative frequency plot of total grade-times-thickness also may provide useful information. Grade-thickness data is commonly used in roll-front uranium deposits, and the South African gold reefs. Multiplying grade times thickness by density and the appropriate conversion factor will give contained metal per square meter. A cumulative frequency plot of lead total grade-thickness for all holes in the 40 deposits is given in figure 14-6.



**Figure 14-6**  
**Lead Grade-Thickness Frequency, 40 Deposits**

The distribution in Figure 14-6 appears to consist of a mixture of three or four lognormal distributions with some very high values at the high end.

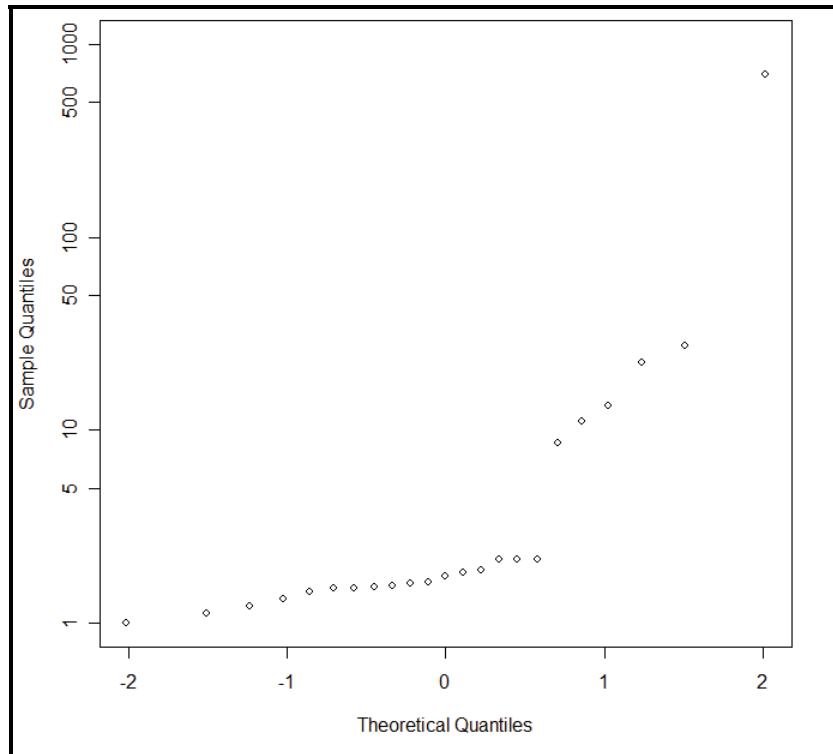
The cumulative frequency plot of lead grade thickness for R-190 is given in figure 14-7



**Figure 14-7**  
**Lead Cumulative Frequency, R190 Deposit**

Because of the smaller number of holes, this plot is not as smooth for as the entire data set.

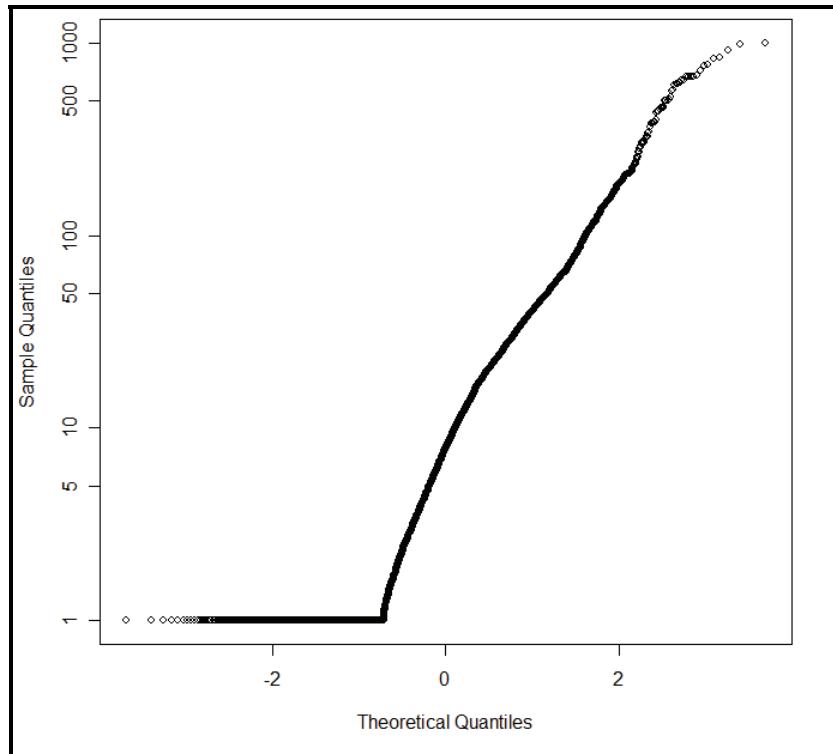
With the exception of Z155 (Figure 14-8) the lead grade thickness plots did not show anomalous values  
Note that Z155 is NOT included in the 43-101-compliant Resource.



**Figure 14-8**  
**Lead-Times-Thickness Cumulative Frequency, Z155 Deposit**

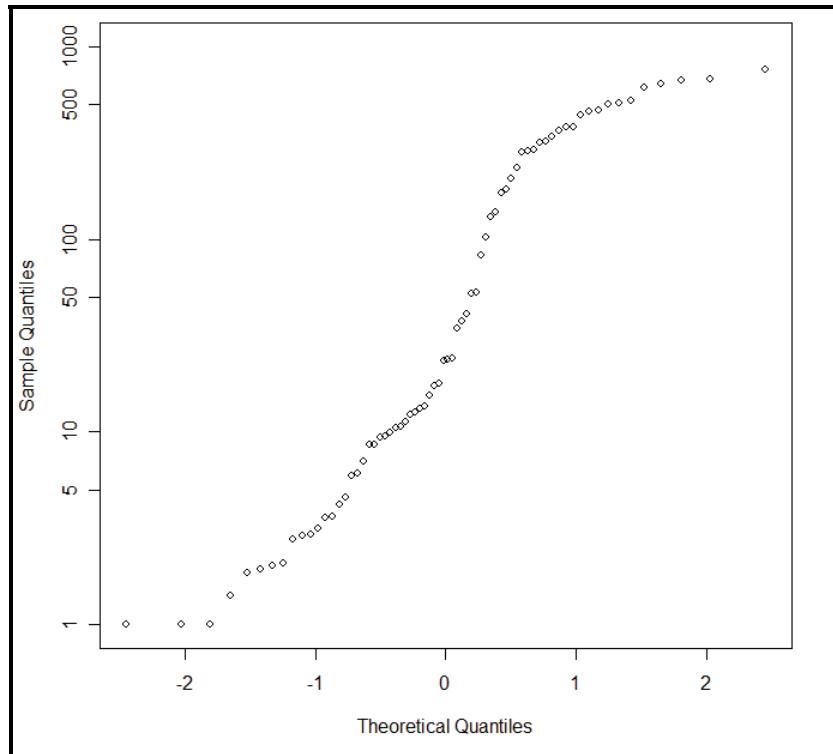
The highest point in deposit Z155 is not inconsistent with great thicknesses observed in the district but the fact that it is an order of magnitude higher than the next lowest value and there are relatively small number of drill holes indicates that there may greater risk associated with any eventual resource estimate for Z155 which includes this hole, unless this data point can be confirmed.

A cumulative frequency plot of zinc grade-thickness for all the holes in the 40 deposits is given in 14-9.



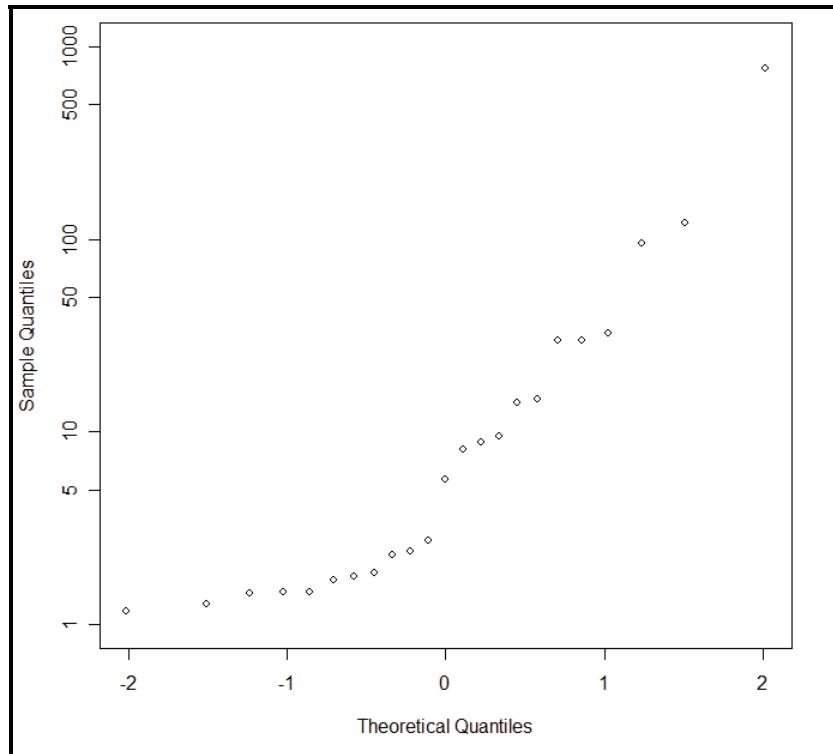
**Figure 14-9**  
**Zinc Grade-Thickness Frequency, 40 Deposits**

The result in Figure 14-9 is similar to the plot for lead grade thickness for the district (Figure 14-6) and shows a mixture of four or five lognormal distributions. The cumulative frequency plot for zinc grade-thickness for R190 is given in figure 14-10 and is similar to the cumulative frequency plot for lead grade-thickness for R190.



**Figure 14-10**  
**Zinc Grade-Thickness Frequency, R190 Deposits**

The cumulative frequency plot for zinc grade-thickness for deposit Z155 shows a trend in the higher grade, with the highest not being as isolated as in the cumulative frequency plot for lead grade-thickness.



**Figure 14-11**  
**Zinc Grade-Thickness Frequency, Z155 Deposit**

Statistical review of the database by CAM indicates that the deposits of potential interest are consistent with the results obtained historically in the district.

Because some of the single-deposit Resource estimates may be based on a relatively small number of holes, and may include some high grade-thickness values, a careful geological review and possibly additional specific confirmation drilling may be required before it is possible to convert historic resources on some other deposits in the district to Measured, Indicated and Inferred Resources.

## **15.0 ADJACENT PROPERTIES**

The geology and mineralization controls for Pine Point mineralization have been drawn in large part from previous exploration and mining on Cominco and Westmin properties. Only part of the surface area previously held by Cominco and Westmin are included within the current Tamerlane holdings, but Tamerlane's property contains about 60% of the known zinc-lead deposits. Data on the stratigraphy, deposit morphologies, mineralization geometry, and geostatistics are necessarily drawn from the district as a whole.

Specific discussions of the mineralization and mineral Resources on the ten subject deposits addressed in this report are based on drilling on each of those Tamerlane properties, without extrapolation from ground not controlled by Tamerlane.

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

### **16.1 Metallurgical Testing**

#### ***16.1.1 Dense Media Separation***

Confidential Metallurgical Services was contracted to perform the initial processing test work on the R190 ore. Complete reports of the tests are contained in the Appendices of the Tamerlane Feasibility Study dated , July 24, 2007.

Preliminary laboratory Dense Media Separation (DMS) testwork indicated that run-of- mine (ROM) ore could be significantly upgraded to the mid/upper-forty percent range. To improve the overall mineral recovery, laboratory testwork was done to determine how the pre-screened, minus 28 mesh screen fraction (range from 10 to 18 percent of the crushed ROM ore) could be processed so it could also be upgraded and then combined with the DMS “Sink” product for processing in the flotation circuit.

#### ***16.1.2 Flotation and Gravity Separation***

SGS Minerals Services subsequently performed flotation and gravity separation tests a representative sample of the R190 ore (Table 16-1)

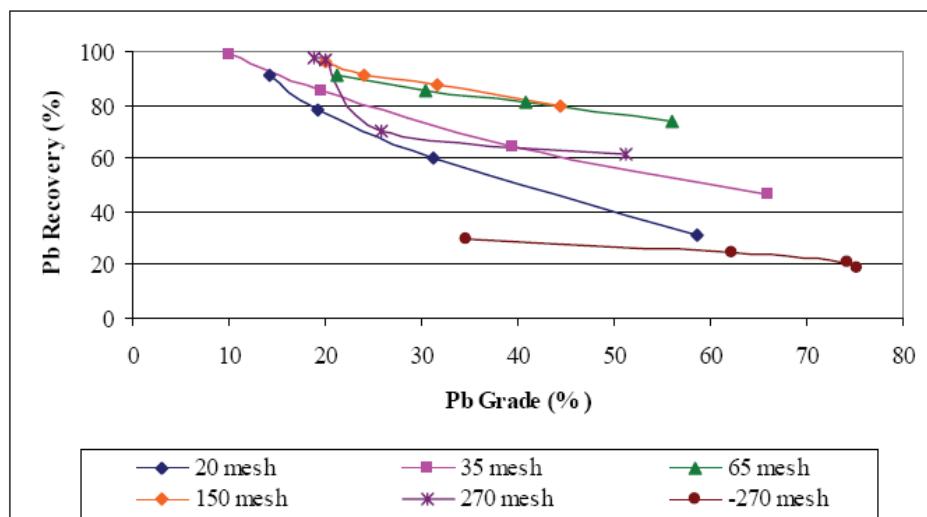
Table 16-1 Head Assays			
Element	Assay (%)		
	Pb	Zn	S
Test Sample	8.87	14.9	16.9

Size-by-size gravity separation was undertaken using a superpanner, to examine the potential for sulphide ore upgrading using a finer crush size.

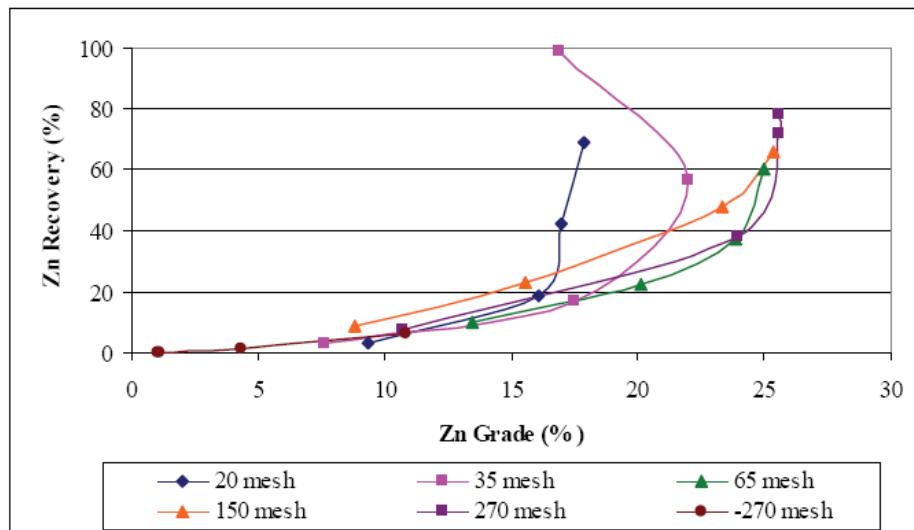
Gangue rejection was seen to improve at successively finer size fractions. Gravity separation was most efficient at a size of 150 mesh ( $100 \mu\text{m}$ ). Lead was separated efficiently, while zinc was not well separated using this method; 96.1% of the lead was recovered into 38.7% of the size fraction initial mass, but only 66.0% of the Zn reported to the concentrate. Overall, the combined six size fractions recovered 91.9% of the lead and 69.3% of the zinc, into 53.7% of the original mass.

The most effective separation was seen at a size of 150 mesh. The lead recovery to the concentrate was 96.1%, at only 38.7% mass pull. Zinc recovery was 66.0%. Higher recoveries of lead and zinc reported to the concentrates of 35 mesh (99.6% of the lead and 98.8% of the zinc) and 270 mesh (98.0% of the

lead and 78.3% of the zinc), but mass recoveries to those fractions were between 42.9 and 92.2%. Gangue recovery was thus reduced in the 150 mesh concentrates compared to the 35 and 270 mesh concentrates. The 65 mesh fraction also displayed high lead and zinc recoveries (91.4% Pb and 59.9% Zn), while recovering a lessened amount of gangue than the coarsest or finest fractions. Mass recovery of the 65 mesh concentrate was 38.6%, quite close to that of the 150 mesh concentrate. Figures 16-1 and 2 display the size-by- size performance of the R190 sample.

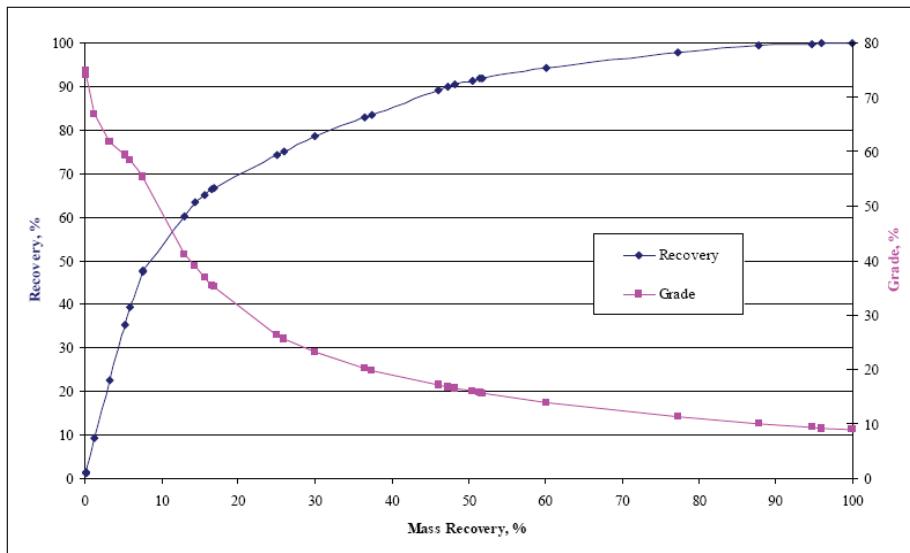


**Figure 16-1**  
**Pb Grade-Recovery Curves**

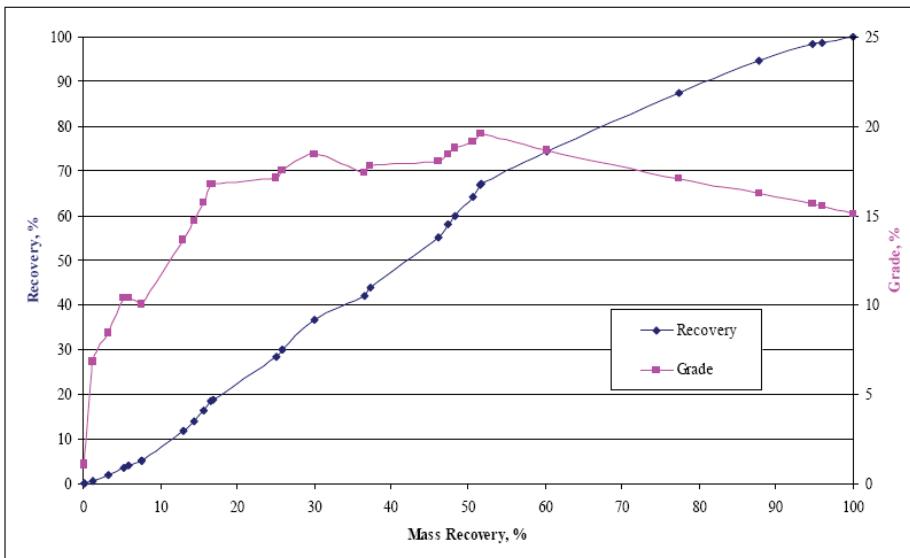


**Figure 16-2**  
**Zn Grade-Recovery Curves**

Overall, the cumulative mass-grade and mass-recovery relationships show that the zinc recovery fluctuates in the middle of the gravity separation; zinc is being pushed away by the lead at the higher end but is heavier than the gangue at the lower end. Gravity separation on the combined six size fractions recovered 91.9% of the lead and 69.3% of the zinc into 53.7% of the starting sample mass. Figures 16-3 and 16-4 show the overall results.



**Figure 16-3**  
**Overall Separation of Pb**



**Figure 16-4**  
**Overall Separation of Zn**

Lead was efficiently separated by gravity separation. The size fraction of peak response was 150 mesh (100 µm), recovering 96.1% of the lead and 66.0% of the zinc into 38.7% of the initial mass. 150 mesh is the recommended liberation size for future testwork. Coarser size fractions recovered more gangue, and gangue rejection was seen to improve with finer size fractions. Zinc did not separate efficiently using gravity separation. Overall lead and zinc recoveries to the combined superpanner concentrate were 91.9% and 69.3% respectively, at 53.7% mass recovery.

## 16.2 Mineral Processing

The DMS process which is proven/conventional technology includes the following operating stages:

- The ROM ore must be fine crushed (-1/4") so there is maximum release (liberation) of the host rock from virtually all of the mineralization.
- The crushed ore is pre-screened to remove the -28 mesh fines which could contaminate the dense media and thereby increase dense media losses as well as modify the DMS feed, slurry viscosity which will directly affect the specific gravity separation.
- The plus 28 mesh screen fraction is mixed with the dense media (ferrosilicon) to a cut-point specific gravity of 2.75 to 2.95 and then pumped to a DMS cyclone. In the cyclone the mineral particles (free and middling with the host rock) which are heavier than the cut-point specific gravity are recovered from the cyclone in the underflow as the "Sink" product and the host rock with minimal sulphides reports to the cyclone overflow as the "Float" reject product.

The dense media and water are recovered in the product (Sink and Float) dewatering screen underflows. The recovered ferrosilicon is recycled to the DMS separation circuit after its specific gravity has been corrected to the cut-point setting.

The minus 28 mesh screen fines will be dewatered for direct shipment as part of the DSO or post-treated by gravity separation or flotation to upgrade the minus 28 mesh fines for subsequent shipment as part of the DSO. The minus 28 mesh post-treatment fines will be thickened and mixed with cement and DMS "Float" reject for deposition as backfill in the underground mined-out areas.

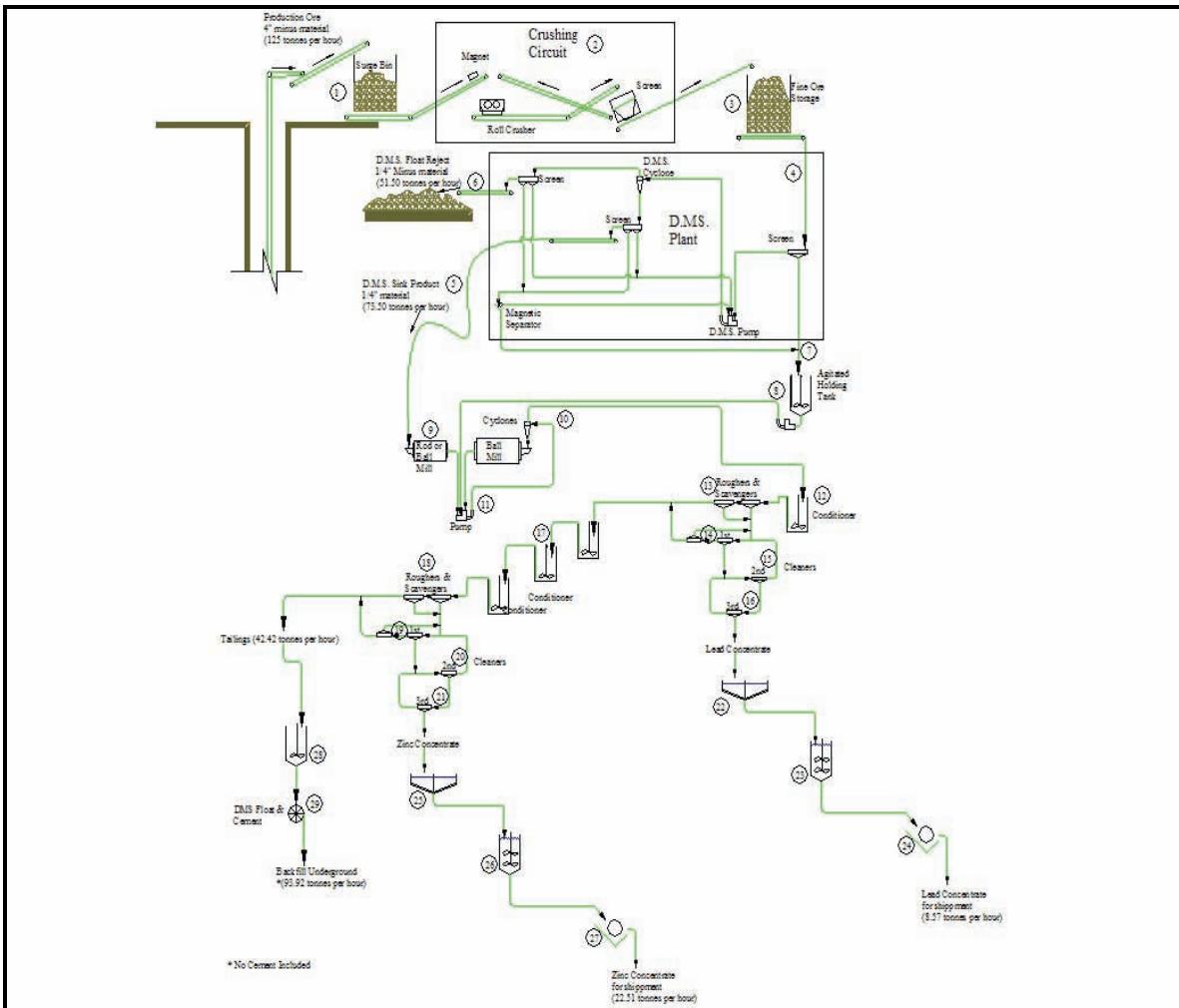
The DMS process plant will include facilities to beneficiate the ore. It will also house the processing equipment, maintenance facilities, plant warehouse, laboratory, and administration offices for facility supervisors and staff. The floor of the facility will be concrete-lined and sloped to a central drainage sump. All DMS circuit materials and chemicals will be stored in the DMS facility complex or in a separate building. Drainage will be included in the design to ensure that any spills are contained within the DMS circuit area can be effectively contained and cleaned up.

The plus 28 mesh DMS “sink” product (ore) will be sent to a 3.5 meter diameter by 5.6 meter long ball mill where it will be ground to 80% passing 105 microns. Specific reagents are added to the ball mill feed to prepare the ore for selective lead and later zinc flotation. The ground ore and the DMS pre-screen, minus 28 mesh fines will be pumped to a bank of cyclones. The coarser particles will report to the cyclone underflow and will return to the ball mill feed for more grinding. The cyclone overflow with the minus 105 micron particles will flow to a 2.4m diameter by 2.7m high agitated conditioner where reagents are added to selectively float the lead. The conditioned ground ore will report to the lead rougher and scavenger flotation circuits that consist of six, 300 cubic foot flotation cells. The lead concentrate floated will be further upgraded in three stages of cleaning. The cleaning will be respectively done in five, 100 cubic foot flotation cells, four, 50 cubic foot flotation cells and three, 50 cubic flotation cells. The final, lead cleaner concentrate will be thickened in a 16m diameter, conventional thickener before being stored in an agitated holding tank prior to dewatering in an 8'10" diameter-10 disc vacuum filter. The dewatered concentrate will be shipped by road and rail to designated, custom smelters.

The lead circuit flotation tailings will be pumped to a three stage conditioning circuit, to which reagents are added to depress iron, activate the zinc and prepare the zinc for selective flotation recovery. The conditioned ore will pass through the zinc rougher and scavenger flotation circuits that consist of six, 200 cubic foot flotation cells. The zinc concentrate floated will be further upgraded in three stages of cleaning. The cleaning will be respectively done in an eight, five and four bank of 100 cubic foot flotation cells. The final zinc concentrate will be thickened in a 26m diameter, conventional thickener before being stored in an agitated holding tank prior to dewatering in two, 8-foot 10-inch diameter-10 disc vacuum filter. The dewatered concentrate will be shipped by road and railway to designated, custom smelters.

The zinc circuit tailings will be sent to an agitated holding tank prior to mixing them with DMS “float” reject and cement for subsequent deposition as backfill and shotcrete underground.

A simplified process flowsheet is provided in Figure 6-1. It should be noted that this system is designed to eliminate the use of cyanide and zinc sulfate, both potentially hazardous chemicals. The exclusion of cyanide and zinc sulfate from the process flow is accomplished through the use of the DMS, additional grinding and safer chemicals such as lime and copper sulfate.



**Figure 16-5**  
**Simplified Process Flow Sheet**

## **17.0 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES**

This report has disclosed above those mineral-inventory tonnages and grades calculated during the 1970's and 1980's by Cominco and Westmin, which are historical estimates only, calculated prior to the issuance of NI-43-101 and therefore not 43-101 compliant.

This section summarizes the Resource review done by CAM. This section was prepared by Robert Sandefur, P.E., an experienced resource geostatistician, whose qualifications are listed in Section 23.3.

*Mineral Resources figures include Reserves, since Reserves are a sub-set of Resources.*

### **17.1 R190 Deposit**

This is the deposit to which the Feasibility Study pertains. Sufficient work has been done on R190 to readily qualify the historic tonnage as 43 -101-compliant, based on the criteria discussed in section 17.2 of this report.

#### **17.1.1 Tamerlane Estimation**

In November 2006, Tamerlane completed a new resource estimation for the R190 deposit at a cutoff grade of 5% Zn (Tamerlane, 2007a), as shown in Table 17-1.

Table 17-1 Tamerlane Resource Estimates for R190 deposit, November, 2006						
Resource Category	Cutoff Grade Zn $\geq$ 5%					
	Pb+Zn (%)	ZnEq (%)	Pb (%)	Zn (%)	Fe (%)	Tonnes
Measured	18.77	15.35	6.21	12.56	5.68	574,365
Indicated	14.18	11.69	4.54	9.65	4.32	499,496
Measured + Indicated	16.63	13.65	5.43	11.20	5.05	1,073,861

Measured and Indicated Tonnages at a 5% zinc cutoff for the model used in the Tamerlane Feasibility Study (Tamerlane, 2007b) are given in Table 17-2. The results are essentially identical to the earlier estimation given in Table 17-1.

Table 17-2						
Resources within 5% Zn Grade Shell						
Cutoff Utilized in Tamerlane Aug. 13 , 2007						
Feasibility Study for R190 Deposit						
Category	Pb+Zn%	ZnEq%	Pb%	Zn%	Fe%	Tonnes
Measured	18.77	15.35	6.21	12.56	5.68	574,582
Indicated	14.18	11.69	4.53	9.63	4.32	501,555
Total	16.62	13.64	5.43	11.20	5.04	1,076,137

When Tamerlane retabulated resources for indicated and measured only the total tonnage dropped by 1.6%. Tamerlane is investigating the source of this discrepancy which is believed to be due to inferred or unclassified blocks. When Tamerlane completes its investigation they will reissue the feasibility study with minor revisions to the resources. Tabulated results for material within the stopes did not change when the measured and indicated split was calculated. So the portion of the feasibility study as relates to mineable reserves is internally consistent.

CAM's review of the Tamerlane estimation is below.

### 17.1.2 CAM Audit of Tamerlane Estimate

#### Database

The exploration database and model were provided to CAM for review. Basic statistics on the database are given in table 17-3.

TABLE 17-3 R190 Drilling Statistics from Assay Database		
Item	Number	Length (m)
Holes	70	12255.5
Holes with non-collar downhole surveys	70	12255.5
Non-collar survey records	70	12255.5
Downhole surveys up	0	0.0
Downhole surveys down	140	12255.5
Assay intervals (Zn)	1931	12136.5
Assayed intervals (Zn)	1931	12136.5

CAM ran its standard statistical check procedures on the database and found few statistically anomalous results for a database for this type of deposit. This indicates that the database is internally consistent. Review of the cumulative frequency plots for zinc and lead indicated that there was no need for capping.

CAM reviewed the Resource estimation procedures described in the feasibility study and believes that they conform to accepted engineering practice. However, even though the described methodology appears to be correct and acceptable there is a chance that mistakes can be made in construction of the model. To check for possible mistakes and model construction CAM uses a number of procedures to check block models. Most of these are automated to assure consistency and minimize errors and costs. These procedures depend heavily on consistent and non-duplicated field labels and consistent number of fields per block. Over the years CAM personnel have developed a procedure for mathematical and statistically validating Block Models. This check procedure includes:

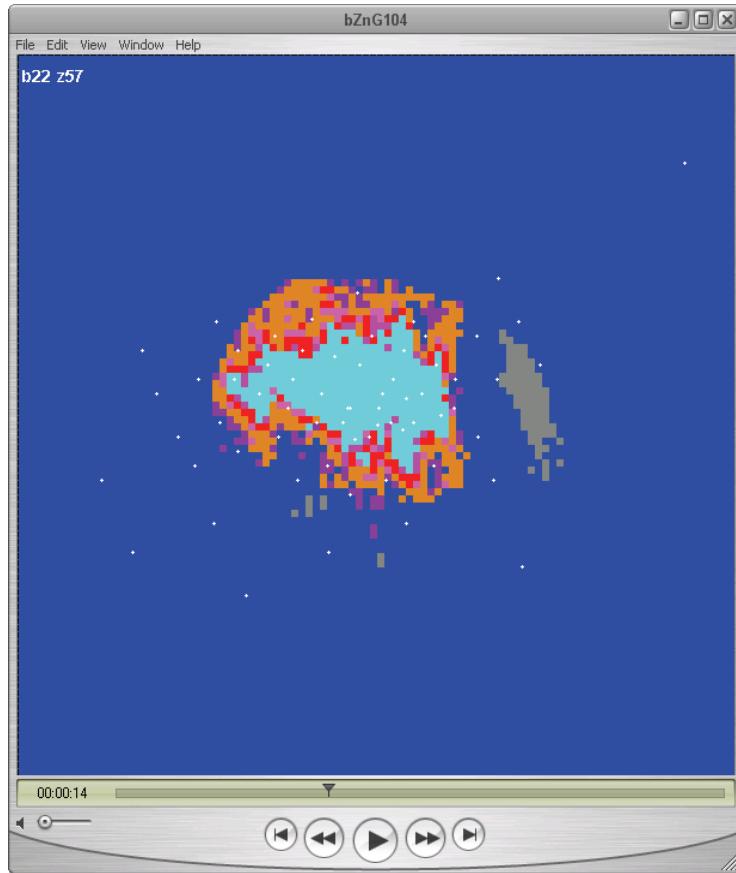
- Retabulation
- Graphical Modeling of Deposit Cross-Sections
- Cumulative Frequency Plots
- Backmarking
- Unconstrained Nearest Neighbor Estimate

#### Retabulation

Retabulation involves summing up irrelevant values in the provided model to make sure the provided model is consistent with the table provided in the report. CAM re-tabulated resources at the 5% zinc cutoff and obtained the same results as in the feasibility report to three decimals. This indicates that the correct model was provided and that the resource tabulation is correct.

#### Graphical Modeling of Deposit Cross-Sections

To check block models for visual of consistency CAM constructs graphical models with each frame corresponding to a row column or bench through the model. This procedure allows rapid visual checking of the entire model. A frame of one bench from the provided Zinc model is shown in Figure 17-1. The figure shows a contiguous area of plus 9% zinc (cyan corresponds to 9% and above). The models indicate that reasonable mineable continuity of ore can be expected.



**Figure 17-1**  
**Typical Graphical Model of Deposit Cross-Sections**

#### Cumulative Frequency Plots

As discussed above for the assay database, CAM also constructed cumulative frequency plots for zinc and lead. As with the assays, there were no statistically anomalous grade values for these two elements.

#### Backmarking

Backmarking involves the comparison of each sample or composite value to the block within which that compositor sample falls. Because of the relatively long intervals of zero grade in the database CAM elected to use 5-meter bench composites for backmarking. The consistency of block and backmarked values is a guide to how well the model compares with the data used to prepare it as shown in Table 17-4.

Table 17-4 R-190 Backmarking Comparison for Lead and Zinc								
Element	Cutoff 0.0			Actual / Backmarked	Cutoff 0.1			
	Count	Actual	Backmarked		Count	Actual	Backmarked	Actual / Backmarked
Pb	798	1.437	2.023	0.710	280	4.049	4.380	0.924
Zn	798	2.684	2.924	0.918	332	6.396	6.519	0.981

For blocks where both the backmarked value and the composite value are above the 0.1 cut off the comparison within the plus or minus 10% of that CAM regards is acceptable. At the zero cut off the comparison for lead is off some 29%. Most of these values are below the probable cutoff and given that the values at the .1 cut off her acceptable CAM believes the model is acceptable for use in feasibility study. While CAM believes that the global resource is within the range of accuracy usual for feasibility studies CAM recommends that missing lead assay values lead be reviewed as detailed mine design progresses.

#### Nearest Neighbor Estimate

The feasibility model was constructing using hard boundaries inside a grade shell. This grade shell is interpreted and resources inside the grade shell were calculated by kriging. To check for geometric consistency in interpretation of the grade shell and possible skewing of the great tonnage curve due to kriging within the grade shell, CAM constructed a nearest neighbor estimate using the 5 m bench composites and compared that to the feasibility model at various cutoffs for lead, zinc and equivalent zinc at various cutoffs

The CAM unconstrained nearest neighbor estimate gave about the same lead and zinc metal volumetric quantities at a zero cutoff which indicates that the model is globally satisfactory in terms of contained metals as shown in Table 17-5. However, at cutoffs slightly above zero but below the probable economic cutoffs CAM found that the feasibility model predicted more than 15% more metal than the corresponding CAM nearest neighbor model.

Table 17-5 R-190 Contained Metal Comparison Feasibility Model to CAM Nearest-Neighbor Model			
Lead		Zinc	
Pb Cutoff	metal ratio*	Zn Cutoff	metal ratio*
0.00	1.047	0.00	1.000
0.50	1.186	1.00	1.184
1.00	1.172	2.00	1.193

Table 17-5 R-190 Contained Metal Comparison Feasibility Model to CAM Nearest-Neighbor Model			
Lead		Zinc	
1.50	1.125	3.00	1.152
2.00	1.074	4.00	1.090
2.50	1.033	5.00	1.039
3.00	0.979	6.00	0.988
3.50	0.927	7.00	0.933

\* ratio of Krieged Model Volumetric Metal / Unconstrained Nearest Neighbor Volumetric Metal

Unless the cutoff grade is below 3.0% Zn, CAM believes the feasibility model is acceptable for use in financial and feasibility decisions. (3% percent is suggested as the cut off criteria because the contained metal predicted by a feasibility model is 15% higher than the CAM nearest neighbor model and 15% is the usual standard for accuracy and feasibility studies.) If the zinc cutoff grade falls below 3%, CAM believes that the grade shell model will need to be revised to confirm feasibility at the lower cutoff grades.

CAM believes that the total quantities contained in the Resource are acceptable for use in feasibility study subject to the cutoff grade criteria given above.

## 17.2 Other Deposits

In addition to R190, CAM was also provided with the historical tonnage estimates and drilling data for the P499, O556, V46, W19, X25, and Z155 deposits (drilled by Westmin), and the N204, G03 and W85 deposits (drilled by Cominco), as shown on Table 6-2. Tamerlane also drilled the W85 deposit (eight holes) and G03 deposit (three holes).

Since these tonnage estimates were calculated in the 1970's and 1980's, prior to establishment of NI 43-101 standards, CAM reviewed the data for these tonnages to determine their compliance with NI 43-101. The following factors were considered by CAM:

1. Whether the drilling, sampling, assaying and tonnage calculation were carried out by reputable mining companies with a successful history in this type of deposit and the district. Both Cominco and Westmin (the latter a joint venture of Boliden and DuPont) are considered to qualify.
2. The valuable minerals in question, which in this case are zinc and lead contained in sphalerite and galena. These minerals are readily visible and in concentrations measured in percent. Thus the numerous issues regarding sampling, assaying, and custody/salting applicable to precious metals are not as critical in this case.

3. The type of mineralization, which in all cases was of a known type (Mississippi Valley) which was successfully mined on a large scale previously in the district.
4. Whether a statistical review of the database for each deposit, in accord with the procedures described in section 14.0, indicated that the databases were internally consistent. All of the ten deposits, including R190, met these basic first-pass criteria. The following additional criteria were applied for determining whether the historic tonnages calculations could be regarded as 43-101 compliant.
5. The existence of an estimation report (historic or modern) done by well-known independent professionals, using accepted 43-101 engineering practice for deposits of this type, with internal checks in the report indicating that the calculation is internally consistent. CAM believes that the Giroux (1982a,b,c,d) reports can be regarded as consistent with 43 -101 procedures. These reports apply to R190, P499, X25 and O556, and the resources are thus regarded as 43-101 compliant. The methodology used in these calculations was the method of sections at a 2% Pb+Zn cutoff with an estimate check by conditional probability. The methodology described in these reports follows current acceptable practice. For R-190 the internal consistency of the Tamerlane ( 1,073,861 tonnes at 5.43 % Pb, 11.20 % Zn, 16.63% Pb+Zn) and Giroux Methods Sections: (1,014,00 tonnes at 6.29 % Pb, 12.07 %Zn, and 18.36 Zn+Pb) and 5x5x5m block method (1,011,000 tonnes at 16.78 % Pb +Zn (individual Pb and Zn by these methods not reported)) is good very good by current standards.
6. The existence of confirmation drilling by Tamerlane, combined with a Tamerlane resource estimation which agreed with the historic result. The methodology used in the Tamerlane Estimates was the same as for R-190 with CAM validated in some detail. Under this criterion, G03 and W85 were candidates because of the Tamerlane drilling and a resource estimate using R-190 methodology.. The contained metal in G03 agrees between Kent Burns (2001) and the Tamerlane calculation within 20%, and is thus accepted as being 43-101 compliant. The agreement for W85 is well outside this range, but CAM believes that acceptance of Tamerlane's lower tonnage at a comparable grade is acceptable for inclusion as 43-101-compliant Indicated resources. It should be noted that W85 is a normal prismatic deposit type, a frequently-mined type of deposit in the district, as are deposits R190, G03, O556, P499, and X25.
7. Even though CAM believes the reported tonnages and grade are accurate to 43-101, standards all tonnage is classified as indicated because additional verification is necessary to convert part of the indicated to measured.

The remaining deposits (N204, V46, W19, and Z155) did not satisfy criteria 5) or 6), and CAM regards them as non 43-101-compliant historic tonnages.

**Table 17-6**  
**Mineral Resources, 43-101 Compliant**

Deposit	Category	Tonnes	%Pb	%Zn
R190	Measured Resources	574,365	6.21	12.56
R190	Indicated Resources	499,496	4.54	9.65
P-499	Indicated Resources	877,000	2.88	6.45
O-556	Indicated Resources	861,000	4.32	4.22
X-25	Indicated Resources	3,124,000	2.30	6.54
G-03	Indicated Resources	3,444,000	3.0	4.1
W-85	Indicated Resources	2,597,000	1.05	2.82
Subtotal	Measured Resources	574,365	6.21	12.56
Subtotal	Indicated Resources	11,402,000	2.52	4.91
<b>Total</b>	Measure + Indicated	11,976,000	2.70	5.28

To bring the remaining historic resources into 43-101 compliance CAM recommends the following:

- Search for additional documentation in the archives of Tamerlane, the Lord Centre in Yellowknife, the Geological Survey of Canada, or elsewhere.
- Ensure that licensed surveys with modern methods (probably differential GPS) locate at least 10% of the holes in any deposit, to allow the geometry and location of the drilling to be verified.
- Re-drill, re-sample and re-assay at least 5% of the holes (minimum of three per deposit) to confirm the thickness and grade of the mineralization.
- Re-calculate the resources using the same methodology as was used on R190.

The amount of confirmation drilling needed on the four non-compliant deposits is detailed in Table 17-7.

**Table 17-7**  
**Confirmation Drilling Needed in 4 Non-Compliant Deposits**

ORIGINAL DRILLING (pre-1988)*					CONFIRMATION DRILLING+*			
Deposit	Company	# Holes	Feet	Ave Depth Feet	5%	Actual # Holes	Feet Needed	Cost @ US\$75/Foot
V46	Westmin	28	13,396	478	1	3	1,435	107,625
W19	Westmin	23	12,230	532	1	3	1,595	119,625
Z155	Westmin	23	12,249	533	1	3	1,598	119,850
N204	Cominco	464	89,511	193	23	23	4,437	332,775
<b>Total</b>	--	--	--	--	--	<b>32</b>	<b>9,065</b>	<b>679,875</b>

\* count includes all holes drilled in and around deposit.

+ count includes only those holes reaching target depth.

## **17.3 Mining and Processing Method**

Mining will be via underground stope method and is described in this report in Section 19 of this report. Processing of ore is by DMS and flotation/gravity separation methods and is also described in Section 16, Mineral Processing and Metallurgical Testing, of this report.

## **17.4 Cutoff Grade Parameters**

Several cutoff grade parameters for the R190 deposit were considered during development of the model. Grade shells for 2%, 5% and 7% Zn cutoffs were constructed and run through a cash flow model to determine the best Net Cash Flow using an average future zinc price of US\$1.18/lb and a future Pb price of US\$0.53/lb. The zinc and lead prices are based on the LME Futures for the next 15 months. The cash flow model developed by Tamerlane takes into account all operating costs, royalties, and future metals prices. DMS recovery for Zn is projected at 94% and lead at 95%. Based on the results of the cash flow model, it was determined that the 5% Zn cutoff gave the best NPV. Therefore, the current mine plan which is currently in development is based on a 5% zinc cutoff.

## **17.5 Mining Recovery and Mining Dilution**

Tamerlane's bulk stope mining methods are conducive to recovering all ore blocks with internal over-break of mineralized secondary stopes. External dilution will occur as over-break while mining the outlying stopes. Tamerlane plans on controlling dilution through a well planned and developed grade control program. Tamerlane has calculated that recoveries are based on the mineable reserves plus an external dilution of 5%. It should be noted that the dilution is not due to barren waste rock, rather radial zoning of surrounding lower grade material. For the purposes of this feasibility study, external dilution was considered barren waste rock.

## **17.6 Mineral Reserve Categories**

The definitions of Proven and Probable mineral reserves as used in this report are in conformance with Canadian National Instrument 43-101.

Based on the current cash flow model developed by Tamerlane Ventures Inc. and the initial mine plan, Tamerlane has classified reserves derived from both Measured and Indicated resources as Proven and Probable reserves utilizing a 5% Zn cutoff grade.

## 17.7 Mineral Reserve Estimate

Using the most recent block model the Vulcan underground mining reserving package was utilized to determine the total mining reserves encompassed by the stopes. The results are given in Table 17-8. This reserve yielded a positive NPV value for the 5% Zn mining reserve using the November 2006 Zn and Pb prices.

Table 17-8 Total Reserves Encompassed by Stopes			
Description	Zn%	Pb%	Tonnes
Proven	12.21	6.06	571,081
Probable	9.76	4.72	428,946
Total	11.16	5.49	1,000,027

## **18.0 OTHER RELEVANT DATA AND INFORMATION**

CAM is not aware of any other available data, which would significantly change the content or conclusions of this report.

## **19.0 ADDITIONAL REQUIREMENTS FOR TECHNICAL REPORTS ON DEVELOPMENT PROPERTIES AND PRODUCTION PROPERTIES**

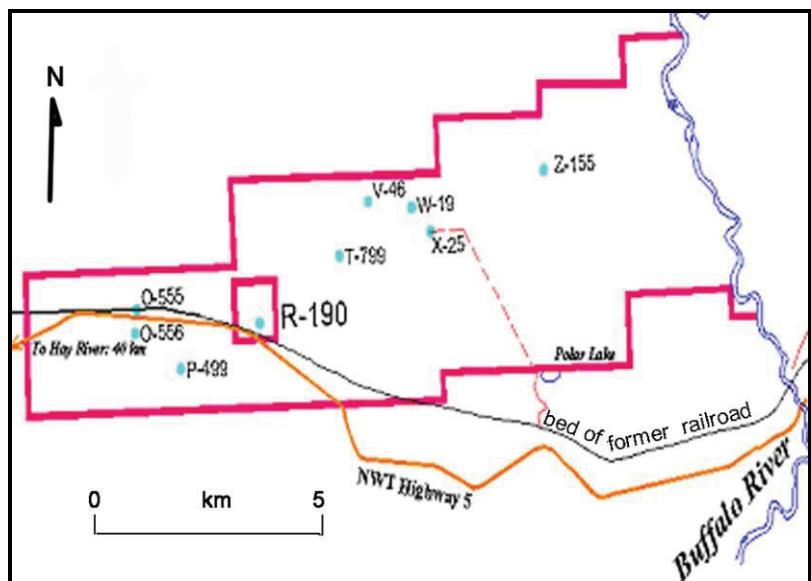
The R190 deposit is the subject of an internal feasibility study by Tamerlane (Tamerlane, 2007), which was reviewed by CAM (CAM, 2007). Only the R190 deposit is considered to be at development stage; all other deposits on Tamerlane's property are pre-development.

Tamerlane's internal Pine Point Feasibility Study, dated August 13, 2007, was the subject of a Tamerlane press release posted on SEDAR by Tamerlane on 24 August, 2007. This press release referenced CAM's Feasibility Review (CAM, 2007) dated August 14, 2007, which was subsequently posted on SEDAR by Tamerlane on 10 September, 2007 as a Technical Report.

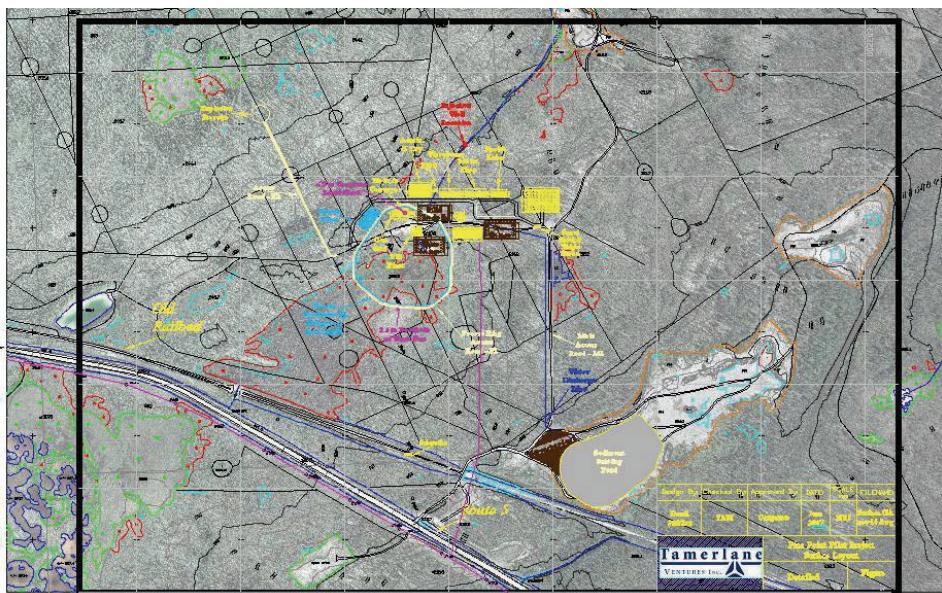
CAM (2007) referenced numerous support documents by independent contractors which were cited by Tamerlane (2007) in support of Tamerlane's internal Feasibility Study. Some of those numerous documents are referenced herein; e.g. environmental reports by EBA (2005, 2006); groundwater and freezing technology by EBA (2006a,b), archaeology (Points West, 2006), metallurgy (Confidential Metallurgical Services, 2006; geomechanics (Advanced Terra Testing, Inc., 2006). In addition, scores of reports, letters, supplier quotations, and other documents were cited by Tamerlane in support of the operating and capital costs used in the internal Feasibility Study.

The methods, equipment, and cost estimates for the mining of the R190 deposit are valid and all necessary information for a feasibility study has been included. All major capital costs are based on fixed quotes, operating and treatment costs based on accurate data from similar operations, and the mine plan and design has been approved by a suitably Qualified Person, Steve Milne, P.E. in Mining Engineering. The margin of error in all estimates is within 10-15%, which is acceptable for a bankable feasibility study.

Figure 19-1 shows the R190 deposit in relation to the highway and some other deposits, while Figure 19-2 shows the site in detail.



**Figure 19-1**  
**Location R190 and Nearby Deposits**



**Figure 19-2**  
**Operations Layout Map of R190 Site**

## 19.1 Environment and Socioeconomic Factors and Permits

Tamerlane have addressed environmental and socio-economic issues in the Feasibility Study, as documented by dozens of reports by independent specialists in their Appendices A, B, D, and E (respectively dealing with Traditional Knowledge, Environment, Community Affairs, and Archaeology).

Reference to a few of these is made in this Section 22 of this Report (EBA, Points West, etc). For example, environmental baseline studies were prepared by EBA in 2005 and 2006. Based on the cited reports, it appears that environmental concerns for this project are not of critical concern at this point.

Tamerlane's R190 Feasibility Study refers to several permits, some with bonding requirements, which will be required for development and production. CAM reviewed the status of many of Tamerlane's permits on the websites of the Mackenzie Valley Land and Water Board (<http://www.mvlwb.com>) and the Mackenzie Valley Environmental Review Board (<http://www.mveirb.nt.ca>). A number of permit applications have been lodged, and are in various stages of review or effect. These include permits for exploration, water use, and production (application MV2006C0014), and numerous environmental filings. All, including Tamerlane's Environmental Assessment (EA) appear to be moving through the process without undue delay. CAM believes that there is a reasonable expectation that the necessary permits will be granted within an acceptable time frame for the project.

## **19.2 Mining Operations**

### ***19.2.1 Mineable Reserves/Cutoff Grade***

In order to calculate the minable reserve portion of the measured and indicated resource, it is first necessary to identify that part of the resource that can be economically extracted.

The economic portion of the resource is typically determined by the application of a breakeven cutoff grade, or value, that considers the total operating cost (mine, plant and administration), metal price(s), process recovery(s), applicable royalties, and forward costs for concentrate freight, insurance, smelting and/or refining. The grade/value and cost parameters are equated to determine the minimum grade, grade equivalent, or value of metal(s) that will need to be mined in order to cover these total direct operating costs.

At the Pine Point deposit, lead-zinc ores are to be mined and processed on-site by Dense Media Separation and conventional floatation processing to produce lead and zinc concentrates that will be sent off-site to smelters.

Since there are two payable metals at Pine Point, the breakeven cutoff grade could be expressed as an equivalent of zinc, or based on the total net smelter values (NPV) for both zinc and lead, which could be compared to the on-site total operation costs (mine, processing, and G&A).

Since the breakeven cutoff grade represents the minimum grade, or value, that will be mined, the average grade, or value, delivered to the mill, will always be higher. This increment, between the breakeven cutoff grade and the head grade, provides the return of capital investment and profit.

Other cutoff grades (incremental) may be employed later in the mine planning process by the mine planners/management to handle situations where mineralized material, with a value below the economic cutoff grade, must be mined in order to reach ore, or to optimize the cash flow. However, these incremental cutoff grades are not normally used in determining the initial, breakeven cutoff grade used to establish minable reserves.

The following algorithm illustrates the typical relationship between the various parameters utilized to calculate the breakeven cutoff expressed as a zinc-equivalent grade:

$$Zn_{eq.} = \frac{\text{Total On-Site Operating Cost} + \text{Fwd. Costs}}{[(Zn price + credits) - (royalties)] \times Zn rec. \times 22.045\#/ \%}$$

If the breakeven cutoff is expressed as a value, it is the sum of the mine, mill, G&A, and forward operating costs. If a Net Smelter Return (NSR) is used, the total NSR value must exceed the on-site total operating costs.

At the Pine Point R190 deposit, the following economic parameters, based on a steady state production rate of 2,800 tonnes per day, have been used to estimate the zinc-equivalent breakeven cutoff grade.

<b>Table 19-1 R190 Deposit Economic Parameters</b>	
<b>Description</b>	<b>Value</b>
<b>Ore Production rate</b>	<b>2,800 tonne/day</b>
<b>Estimated Total Operating Costs</b>	
U.G. Mining	US\$32.83/tonne ore
Processing	
- Dense Media Separation	US\$7.33/tonne ore
- Milling	US\$5.88/tonne ore
- G&A (admin., power, propane, environmental)	US\$7.25/tonne ore
<b>Total Operating Cost</b>	<b>US\$53.29/tonne ore</b>
Overall Process Recoveries (DMS + Milling)	
Zinc	89
Lead (%)	91
Metals Prices	
Zinc	US\$1.30/lb
Lead	US\$0.80/lb

**Table 19-1**  
**R190 Deposit Economic Parameters**

Description	Value
Credits	
Lead as a credit	US\$0.35/lb Zn
Royalty (3%)	US\$0.03/lb Zn
<b>Forward Costs (from 7/05/2007 cash flow)</b>	
Freight (US\$152/tonne wet concentrate)	US\$42/tonne ore
Zinc Smelting (US\$253/tonne concentrate)	US\$46/tonne ore
Lead Smelting (US\$200/tonne concentrate)	US\$17/tonne ore
<b>Subtotal Forward Costs</b>	<b>US\$105/tonne ore</b>

Equating these parameters provides the following zinc-equivalent breakeven cutoff grade for a 2,800 tonne per day production rate:

$$Zn_{eq.} = \frac{US\$53/\text{tonne} + US\$105/\text{tonne}}{[(US\$1.30 + US\$0.35) - (US\$0.03)] \times .89 \times 22.045} = 4.97\%$$

Tamerlane has calculated a zinc equivalent (including lead credit) of 5% in their grade shell analyses, so their breakeven cutoff grade would be acceptable.

### **19.2.2 Mining Dilution and Ore Recovery**

**Dilution.** It is expected that stopes in the interior of the R190 orebody will be entirely in ore, with only minor waste pockets. The Resource estimation process takes into account the low-grade or barren pockets within the exterior grade shell. Dilution is expected to occur on the peripheries of the orebody, where above-cutoff material transitions into sub-cutoff material, as was the case in the numerous deposits mined by COMINCO in the district in prior years. Dilution during the mining process has thus been estimated by Tamerlane engineers at 5% of tonnes, with a diluent grade of around one-half the cutoff grade. For the purposes of this feasibility study, external dilution was considered barren waste rock.

**Ore Losses.** Tamerlane has assumed a mining recovery of 95%, to account for irregular external, deposit boundaries and ore lost in the mining process through stope wall failures in open stopes and during the backfilling process. Analysis of the R190 mineralization, as shown in Figure 17-1, indicates that the R190 deposit shows a concentric zoning or layering, with higher grades toward the center and lower grades toward the margin of the pipe-like body, which is of lower grade than the core. The lost material will therefore on average be of a lower grade than the Reserve average. The precise grade of the left-behind material in the outer perimeter cannot be predicted prior to actual mining.

Net Ore Recovery. Based on the R190 geological and Resource models, and COMINCO's past mining experience, it is likely that the tonnage losses will be offset by an equivalent amount of dilution tonnage mined at the deposit boundaries. The small drop in grade caused by this dilution should be offset by a slight upgrading of the mined material caused by losses of lower-grade tonnage on the peripheries. CAM believes that Tamerlane's calculation, using the Vulcan modeling package and using planned stope dimensions, yielding a recoverable tonnage of 1,000,027 tonnes at a grade of 5.49% Pb and 11.16% Zn, is reasonable and is within the limits of underground engineering precision.

### **19.3 Mining Operations**

R190 is situated in the Northwest Territories, and the potential for considerable underground water exists. Because of these conditions, Tamerlane has contracted with an outside contractor to construct a "freeze wall" around the deposit, and then pump any residual water from within the "freeze wall" prior to the mining process. This "freeze wall" will extend from the surface to approximately 185 meters below the surface. Layne Christensen, who has extensive experience in this area, will construct this phase of the mine's development, and has already completed the engineering design of the system. This technology has been in use for decades, the principles are well understood, and excellent results can be achieved.

In conjunction with the deposit "freeze wall", the shaft contractor will sink a 6.7 meter diameter, concrete-lined shaft to depth of 185 m. Freezing techniques will also be used to sink the shaft. Mine surface infrastructure will be constructed during the shaft sinking. Mining stations and levels will be established on the 140 m and 170 m levels. Once the shaft is complete, a connection to a proposed ventilation shaft will be driven on the 170 m level, and an access ramp to the shaft bottom will be driven for shaft bottom cleanout. In addition, a primary ramp will be driven between the two levels for movement of personnel, ore and equipment. Thyssen mining has performed the engineering design of the shaft and will also construct the shaft and initial underground development.

The project will utilize a vertical conveyor to move ore and waste from underground workings to the surface facilities. Mined material will enter a primary roll crusher located in a drift adjacent to the shaft on the 170-level. There the material will be sized to 4-inch minus before entering the vertical conveyance system. The vertical conveyor will lift the material from the mine at a rate of 156-tph from the bottom of the shaft to the collar. The vertical conveyor is energy efficient and has the ability to move large volumes of material at a constant rate of speed. A consistent material feed rate to the crusher will depend on sufficient ore surge capacity with a dedicated LHD to feed the crusher. The vertical conveyor will have a variable speed drive, with a maximum operating production rate of 225 tonnes per hour, allowing for flexibility to make up for temporary hoisting shortfalls. FKC-Lakeshore, in conjunction with Metso Minerals, are global leaders in vertical conveying solutions, and have completed the engineering design of the vertical conveyor. The belting itself will be purchased from Metso Minerals.

During preproduction development by the shaft contractor, Tamerlane crews can begin perimeter drifting, and top and bottom-cut drifting for stope development. Once the shaft contractor has equipped the shaft for muck hoisting, and the ventilation circuit has been established, Tamerlane crews would begin development of the drill and extraction levels. A mobile headframe structure is planned for the ventilation shaft and will be utilized for material hoisting while the vertical conveyor and service hoist are being installed in the main production shaft. Thyssen mining has operated similar set-ups at numerous sites, and the engineering and design of the mobile headframe has been completed.

When sufficient drill and extraction drifting has been completed, stoping between the levels can begin. The indicated preproduction development by the contractor is approximately 940 meters and 600 meters by Tamerlane. After production begins, the remaining 1,522 meters of development would be performed by Tamerlane crews.

The mining method selected is a variation of mechanized, blasthole stoping, where a drill drift (top cut) is driven (140 m level) over the ore and an extraction (bottom cut) drift (170 m level) is excavated directly below the drill drift. After developing these drifts to the deposit boundary, a slot raise will be developed between the levels, to provide a free-face for the initial stope blast.

Four rows, two meters apart, each containing eleven blastholes in a fan pattern, will be drilled from the drill drift to the stope boundaries and to the extraction drift below. These holes will be loaded with bulk emulsion and blasted.

The broken ore will be dropped to the bottom level, where it will be picked up by 6-cy LHD equipment. This will require the use of remote-controlled loaders while working in the open stope, for safety. Due to the relatively short haul, Tamerlane plans to move the mucked ore directly to the underground roll crusher, using the LHD's, rather than to haul it with trucks.

The broken ore will be carried directly to the crusher, or to a surge (drift), located adjacent to the crusher, directly by the LHD's. Keeping a sufficient surge, with a dedicated loader to feed the crusher, will be the key to maintaining the scheduled production rate.

Six cubic yard loaders, mucking and hauling an average one-way distance of 200 to 300 meters, will have a capacity of about 50 to 60 metric tonnes per hour. For an effective nine-hour work shift, the production would be limited to about 500 metric tonne per machine shift. For a production rate of 1,400 metric tonne per shift (approximately 1,000 metric tonne per shift from stoping and approximately 400 metric tonne per shift from drifting), this would indicate a requirement of two loaders in stoping and one loader in drifting, and one loader dedicated to keeping the crusher fed, for a total of four loaders.

Tamerlane has estimated an equipment availability of 85 percent, based on the use of new equipment. Typically, this could be considered high, even with the use of new equipment. However, with a good preventative maintenance program, it is realistic. Using this availability, the number of loaders needed in the fleet would be three in production, plus a spare to cover the availability down time. In addition, typically, one or more smaller LHD's (2 cubic yards) is typically needed for cleanup and utility tasks.

Tamerlane plans to haul all blasted muck to the crusher with LHD's, and the initial, upper level development muck will be carried down the ramp between levels until an ore pass is developed. Some spillage from the LHD buckets will result. Although a small grader would be more efficient, Tamerlane plans to clean roads with the LHD equipment included in their equipment list.

In order to obtain a high ore extraction percentage, Tamerlane plans to backfill the mined-out stopes with a cemented, paste backfill, with about six percent cement and fly ash. This will permit the mining of ore pillars left between previously mined-out stopes. This is an excellent backfill, and will reduce the amount of tailings disposal on the surface. At a backfill ratio of 0.75 tonnes of backfill per tonne of ore removed, the mine will need to place 2,100 tonnes of paste backfill per day, or approximately 117 tonnes per hour. AMC consultants have been contracted to provide the backfill system design.

The primary ventilation raise will be bored to a diameter of 2.44 meters and lined with concrete. Tamerlane engineers estimate a ventilation requirement of 300,000 cubic feet minute and have developed fan requirements to meet this quantity. Since the ventilation shaft is to serve as the second escape way from the mine, Tamerlane plans to install an Alimak raise climber system in the ventilation shaft. The gear rack would be installed on the shaft wall, and the climbing platform would be parked on the bottom level of the mine adjacent to the ventilation shaft, in order to mitigate pressure on the ventilation system. Thyssen mining has been contracted for the engineering design and will also construct the raise bore.

Underground maintenance repair shops, refuge chambers, underground explosives magazines, fuel and lube bays, and dewatering facilities are included in the feasibility study. For costing purposes, these items have been included as additional meters of development (79 meters). In the maintenance bays and sumps, where concrete floors, cranes, wash facilities, lighting, etc are necessary, the cost for these facilities is higher than regular drifting costs. Allowances have been made in the capital costs to cover these higher construction costs.

The total scheduled time estimated by Tamerlane for the freezing, infrastructure construction, the preproduction and production development and mining, is approximately 29 months.

Perimeter and shaft freezing is expected to take approximately eight months, infrastructure construction four months, shaft sinking/equipping ten months, level/ramp/raisebore development six months, and mine utilities ten months. These are overlapping activities that equal the 29 months.

Much of the preproduction level and ramp development will involve ore extraction from the drill and extraction drifts.

CAM has reviewed the proposed development schedule and finds it to be realistic with good quality control over the contractor and safe, productive management over their own personnel.

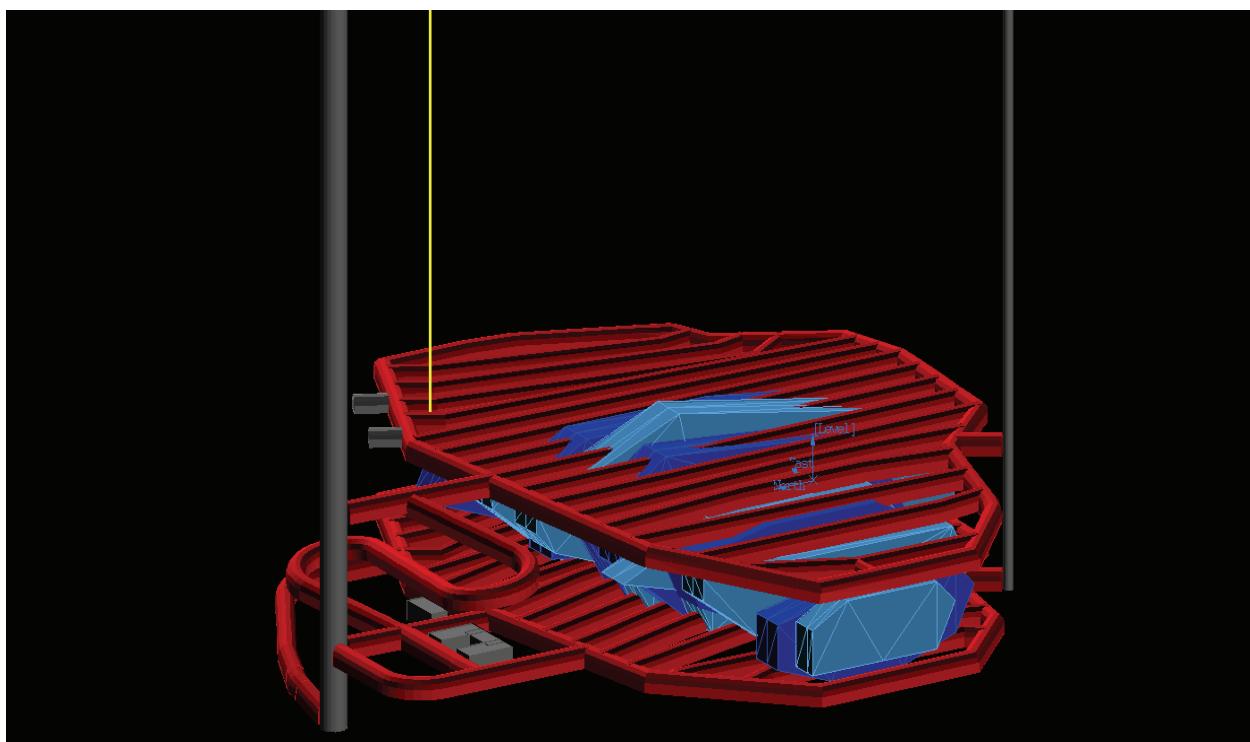


Figure 19-3  
3D Layout of R190 Deposit, Shaft and Proposed Lateral Development

#### 19.4 Labor

The scheduled production rate is 2,800 metric tonnes per day (mtpd), on two 12-hour shifts. The mine would work 357 days per year utilizing four crews. These crews would be staggered on and off to maintain a constant workforce 24/7. It will, however, require working men 12 hours per day (shift) for a period of 4 days (48 hours) on shift. Tamerlane has assumed an effective working time of 9 hours in a 12-hour shift.

The total underground mine labor personnel included in the Feasibility Study is 140. The number of individuals working per day would be 78 (62 hourly and 16 salaried indirect personnel). At any one time, 62 direct employees would be scheduled off.

This would translate to an overall mine productivity of 36 tonnes per manshift for a 12-hour shift. Although this figure is high, it is achievable in CAM's opinion with efficient, aggressive management. Although Tamerlane's work schedule limits working days to four in a row, with periods of seven days off each month, experience has shown that working personnel 12 hours per day for long periods in underground mines lowers their productivity rate, and raises absenteeism rates. Turnover may be higher, and miners are in short supply in today's market because so many new mines are opening up in North America, because of the current high metals prices. Tamerlane has considered this and has allowed for increased overtime, with an attractive incentive bonus structure to attract miners. Pine Point's location to nearby towns, and not having a fly-in, fly-out camp, should help in attracting and keeping labor. The following Table 19-2 details the forecast mine personnel.

Table 19-2 Pine Point R190 Operations Staff		
Cost Center	Hourly	Salaried
<b>MINE</b>		
Drilling/Blasting	24	0
Hauling	16	0
Backfilling	16	0
Maintenance	24	0
Electrical	4	0
Shotcrete	8	0
Support	<u>32</u>	<u>0</u>
<b>Subtotal U.G. Mine Direct</b>	<b>124</b>	<b>0</b>
Subtotal U.G. Indirect	0	16
<b>MILL</b>		
<b>Subtotal Mill</b>	<b>12</b>	<b>5</b>
<b>G&amp;A</b>		
<b>Subtotal G&amp;A</b>	<b>9</b>	<b>9</b>
<b>Total Mine</b>	<b>145</b>	<b>30</b>

## 19.5 Mining Equipment

CAM has reviewed the equipment proposed by Tamerlane and finds the type and size of mining equipment selected to be consistent with the mining method selected, the production rate, and the deposit geometry. All equipment is to be purchased new and delivered to the site.

The following Table 19-3 lists the underground equipment and the acquisition capital cost included in Tamerlane's feasibility. The following Table 19-3 lists the underground equipment:

Table 19-3 Underground Equipment List			
No. of Units	Description	Unit Cost (US\$)	Total Cost (US\$)
2	Jumbo A/C 282	682,000	\$1,364,000
2	Production Drill M2C	745,000	\$1,490,000
4	LHD's 6 cy	759,000	\$3,036,000
1	LHD's 2 cy (used)	100,000	100,000
2	Bolter MD	661,000	1,322,000
1	Shotcrete Unit	652,000	652,000
1	Scissor Lift Truck	150,000	150,000
2	Pickup trucks	30,000	60,000
3	Mechanics Truck	26,000	78,000
2	Boss Buggies	26,000	52,000
1	Utility Vehicles	45,000	45,000
1	Slurry Truck/Load Eq.	64,000	64,000
6	Load Centers	50,000	300,000
1	Borehole Fan	450,000	450,000
6	Axivane Fans U.G.	35,000	210,000
1	Mine Dry Eq./Furnish.	50,000	50,000
1	Cavity Monitoring Eq.	65,000	65,000
1	Compressor (used)	48,000	48,000
1	U.G. Communications	35,000	35,000
1	U.G. Pump/Sump Eq.	505,000	505,000
1	Eng./Surv. Equip.	250,000	250,000
1	U.G. Heating Equip.	93,000	93,000
1	Mine Rescue Equip.	150,000	150,000
1	Backfill Plant	3,000,000	3,000,000
1	U.G. Shop Equipment	100,000	100,000
1	Fuel/Lub Equipment	50,000	50,000
1	Misc. Support Equipment	1,544,000	1,544,000
	Subtotal U.G. Equipment		15,263,000
	U.G. Equip. Warehouse Spares @ 5%		\$763,000
	Freight & Commissioning @ 4%		610,000
	Total Equipment Estimate		16,636,000

## **19.6 Underground Mine Utilities**

### ***19.6.1 Electrical***

An 18 MW hydroelectric plant was built on the Talton River in 1965. The towns of Pine Point and Fort Smith, as well as, the Pine Point Mine were powered by the plant. A 274 kilometers long, single-circuit 115 kV transmission line connects the hydro plant to the mine site. The power line was extended to the town of Hay River, and presently runs along Highway 5, passing next to the R190 deposit. Electric power for the project will be provided from the Talton Dam via transition lines. In addition to power provided from the Talton dam, Pine Point will also incorporate diesel generator sets that will provide self-sufficient, uninterrupted power to the mine site for surge capacity and safety back-up. This on site diesel is being acquired from Finning Power. The power delivered to the mine will arrive via transmission lines held by Northland Utilities. Northland Utilities can deliver approximately 5-MW of power to the mine.

### ***19.6.2 Dewatering***

Ground Effects Industrial undertook a preliminary design and costing of the main underground pumping station. The requirements of the underground pumping system were determined using worst case scenario conditions, requiring a pumping rate of 10,000-gpm. The plan calls for installing four, centrifugal, 250 hp pumps (2,500 gpm/ea.)

### ***19.6.3 Ventilation***

M & I Mining Group designed the primary surface variable pitch ventilation fan. The primary ventilation fan will have a total output capacity of 300,000-cfm using a 300-hp motor. M & I Mining Group also provided a quotation for six - 965mm to 1067mm (38 to 42 in) diameter axial vane fans with a capacities of 14 to 24 cubic meters per second (30,000 to 50,000 cubic feet per minute). These fans (37 to 75 kW/50 to 100 hp)will be used to control ventilation in specific locations throughout the mine.

### ***19.6.4 Compressed Air***

Atlas Copco provided advice, engineering input and a quotation for the supply of compressed air to underground and the surface. The mine plans include four, 150 hp/ea.,1,200 cfm @ 150 psi compressors.

### **19.6.5 Underground Communications**

Mine Site Technologies has supplied a proposal for an underground leaky feeder communications system that will provide communications between the surface and the underground mine.

## **19.7 Capital and Operating Costs**

CAM have reviewed the numerous quotations which were received by Tamerlane for engineering, design, and construction, as contained in Appendices to the R190 Feasibility Study. Some of the major components with specific identified potential suppliers are:

- Environmental/ hydrogeological support and engineering- EBA Engineering
- Metallurgical testing- Confidential Metallurgical Services and SGS Lakefield
- Mineral processing engineering and design- Metso Minerals/ SALA
- Geomechanical engineering and design- Advanced Terra Testing
- Pre-production development- Thyssen Mining
- Freeze curtain engineering and design- Layne Christensen
- Freeze curtain construction- Layne Christensen
- Shaft engineering and design- Thyssen Mining
- Shaft construction- Thyssen Mining
- Hoist and vertical conveyor engineering, design, and supply- FKC Lakeshore
- Hoist and vertical conveyor installation- Thyssen Mining
- Underground mobile equipment- Fanning CAT
- Mineral processing equipment supply- Metso Minerals/ SALA
- Backfill system design and engineering- AMC/ AMEC
- On- site power generation- Fanning Power
- Electrical Power from Talston Dam- Northland Utilities
- Concentrate transportation- Canadian National Railway/CN Worldwide

### **19.7.1 Capital Costs**

The amount of preproduction development work that will be performed by the shaft sinking contractor has been finalized. The preliminary schedule indicates a preproduction period of approximately 18 months based on Thyssen's quoted schedule and cost structure

The primary basis for the capital and operating costs reviewed were the May 11, 2007 and June 27, 2007, feasibility documents supplied to CAM prior to, and during, the review. Subsequently, additional information has been made available.

The following major cost centers represent the capital costs that will typically occur during the preproduction phase of mine:

- Preproduction Development
- Mining and Development Equipment
- Mine Infrastructure
- Owner's Costs During the Preproduction Period
- Outside Engineering
- On-Going Capital Requirements
- Working Capital

The following Table 19-4 summarizes the mine capital estimated by Tamerlane for the project.

<b>Table 19-4 Capital Cost Estimate</b>	
<b>Cost Center</b>	<b>Estimated Cost (US\$ x 1000)</b>
<b>Preproduction/Production Development</b>	
Freeze Ring	22,000
Mobil./Demob./Setup	3,675
Shaft/Stations/Hoists	8,181
Service Shaft Hoist Systems	3,548
Vertical Conveyor	2,981
Ramp/Drift Development	7,666
Vent Shaft Boring/equipping	1,062
<b>Subtotal Preproduction/Production Development</b>	<b>49,113</b>
Mine Equipment	16,636
Mine Critical Spares	863
Surface Infrastructure	2,242
Misc. Utilities, Communications, Infrastructure	2,167
Crushing & Processing	12,552
Rail Head Loadout	1,308
<b>Subtotal Capital</b>	<b>84,881</b>
Contingency @ 10%	8,488
Total Capital	93,369
Working Capital	33,912
<b>Total Mine &amp; Working Capital</b>	<b>127,281</b>

CAM has reviewed the mine capital estimated by the Tamerlane engineers, and finds them to fairly reflect the costs that will occur during mine preproduction development and production phases of the project, providing good quality control and efficient operational management are maintained.

The following discusses each of the cost centers:

#### Preproduction Development

The mine Preproduction Development cost center includes the costs for: mobilization and demobilization, the freeze ring around the deposit, shaft sinking and equipping, shaft stations, crusher/feeder installation, vertical conveyor installation, ventilation borehole construction and /fan installation, service shaft facilities, primary level development, ramps, and secondary development for accessing and developing the stopes, maintenance areas, and supply areas, refuge stations, sumps and pump installations.

Tamerlane plans to utilize a contractor for the freeze ring around the deposit, the shaft sinking and equipping, ventilation shaft boring, and part of the preproduction development. The proposed contractor is an expert in these respective fields, and has given Tamerlane detailed estimates for their portions of the work. CAM has reviewed these estimates and found them to be consistent with industry standards.

Following shaft sinking to the 185-level, a connection to the proposed vent shaft on the 170-level will be made to provide a flow-through ventilation circuit for the balance of the underground development planned.

The preliminary development schedule by the contractor appears to include approximately 1,500 meters of primary perimeter haulage, ramp construction between levels and to the shaft sump, a connection to the vent shaft, and the reaming and lining of the ventilation shaft. The scheduled time in the feasibility study for development off of the shaft by the contractor is four months. This production rate has been confirmed by the mining contractor as feasible .Shaft sinking will commence independent of perimeter freezing, due to the localized freezing of the shaft , and main infrastructure construction, and is scheduled to take about eight months.

About 675 meters of perimeter drifting on the drill and extraction levels is scheduled during the preproduction period. This work will be performed in ore by Tamerlane's crews. The scheduled advance rates for the individual headings are about 4.5 meters a day.

The following Table 19-5 summarizes the preproduction development quantities.

Table 19-5 Preproduction Development Quantities		
Cost Center	Meters	Cost (US\$)
Access Ramp to Shaft bottom	100	
Primary Ramp between 170 and 140 levels	200	
Service Cage Access	110	
Maintenance Shop on 170 level	30	
Powder Magazines	36	
Surge Muck Bay ahead of Crusher	13	
Primary Conveyor Drift Access	40	
P-1 170 level	310	
P-1 140 level	126	
P-2 170 level	142	
P-2 140 level	142	
P-3 170 level	152	
P-3 140 level	152	
Perimeter Drifting on 170 & 140 levels	675	
Misc. openings*	100	
Total Preproduction Meters	2,328	
2,228 meters @ US\$3,250 per meter		7,566,000
Shop Construction		100,000
<b>Total Development Cost</b>		<b>7,666,000</b>

\*Sumps, pump room, supply areas, load center cutouts, extra excavation for turnouts, muck bays, etc.

## Mine Equipment

The type and size of equipment selected by Tamerlane is consistent with the mining method selected, the production rate, and the deposit geometry.

The following Table 19-6 lists the underground equipment and the acquisition capital cost included in Tamerlane's feasibility, and that considered necessary by CAM to develop and operate the mine.

Table 19-6 Underground Equipment List			
No. of Units	Description	Unit Cost (US\$)	Total Cost (US\$)
2	Jumbo A/C 282	682,000	\$1,364,000
2	Production Drill M2C	745,000	\$1,490,000
4	LHD's 6 cy	759,000	\$3,036,000
1	LHD's 2 cy (used)	100,000	100,000
2	Bolter MD	661,000	1,322,000

Table 19-6 Underground Equipment List			
No. of Units	Description	Unit Cost (US\$)	Total Cost (US\$)
1	Shotcrete Unit	652,000	652,000
1	Scissor Lift Truck	150,000	150,000
2	Pickup trucks	30,000	60,000
3	Mechanics Truck	26,000	78,000
2	Boss Buggies	26,000	52,000
1	Utility Vehicles	45,000	45,000
1	Slurry Truck/Load Eq.	64,000	64,000
6	Load Centers	50,000	300,000
1	Borehole Fan	450,000	450,000
6	Axivane Fans U.G.	35,000	210,000
1	Mine Dry Eq./Furnish.	50,000	50,000
1	Cavity Monitoring Eq.	65,000	65,000
1	Compressor (used)	48,000	48,000
1	U.G. Communications	35,000	35,000
1	U.G. Pump/Sump Eq.	505,000	505,000
1	Eng./Surv. Equip.	250,000	250,000
1	U.G. Heating Equip.	93,000	93,000
1	Mine Rescue Equip.	150,000	150,000
1	Backfill Plant	3,000,000	3,000,000
1	U.G. Shop Equipment	100,000	100,000
1	Fuel/Lub Equipment	50,000	50,000
1	Misc. Support Equipment	1,544,000	1,544,000
Subtotal U.G. Equipment			15,263,000
U.G. Equip. Warehouse Spares @ 5%			\$763,000
Freight & Commissioning @ 4%			610,000
Total Equipment Estimate			16,636,000

### Owners Costs

Tamerlane has included US\$2,000,000 for their overhead costs during the development of the project as part of their administration costs. This amount is adequate, considering the preproduction time of approximately 18 months.

### Outside Engineering

Outside engineering covers items typically contracted out such as the; freeze wall, shaft construction, stations, crusher design/installation, mine electrical distribution, maintenance facilities, pumping and ventilation design, etc. An amount of US\$800,000 has been included in the Contractor's bids to Tamerlane for engineering on these items.

## On-Going Capital Requirements

Since the life of the R190 deposit is only about one year, no on-going capital is considered necessary. Should Tamerlane continue operations beyond the R190 deposit, additional capital will need to be considered.

## Working Capital

Typically, the capital required to cover the operation's operating expenses, until payments are received from the smelters on concentrates shipments, are based on the first 60 to 120 days of the production's total unit operating cost. For the Pine Point operation 90 days at the full operating cost would equate to: 90 days x US\$134.57/tonne x 2,800 tonnes = US\$33,912,000

### **19.7.2    *Operating Costs***

The total underground mine unit-operating costs estimated and used by Tamerlane in the feasibility study cash flow is US\$33.58 per tonne (US\$13.4 per tonne labor & US\$19.36 tonne materials/supplies).

Their estimate is based on an annual cost per employee of US\$71,250, plus 35 percent burden, for a total cost of US\$96,200 per employee per year (US\$46.25 per hour for a 2,080-hour year). This operating cost estimate represents the mine operating cost at the full production rate of 2,800 tonnes per day.

The total underground mine labor indicated in the feasibility study is approximately 140 (124 direct plus 16 indirect), with 78 working on the two shifts per day and 62 scheduled off each day. The total annual mine labor cost would be 140 x US\$96,200, or US\$13,468,000. This total, divided by the annual production, would yield a labor cost of US\$13.47, or close to what Tamerlane has used in the study. This labor cost added to Tamerlane's estimated materials and supply cost of US\$19.36 equates to a total underground mining cost of US\$33.58 per tonne.

In all new operations, there is a "learning curve" for the first six months to a year, which can increase estimated full production unit costs substantially during this period. Tamerlane has accounted for this by keeping labor costs constant over the full year, even though the scheduled production during the first three months is 18% less, and the next three months 8% less.

Also, Tamerlane has elected not to use haul trucks for moving broken ore from the stopes to the shaft, because the orebody is small and would not justify the purchase of haul trucks. Using LHD's for hauling negates the loading part of the haul cycle, and the capital cost for purchasing the trucks, but results in a

lower efficiency in the hauling cycle. With the short haul distances at the R190 deposit, the choice of hauling with LHD's is justified.

Tamerlane has decided to access the deposit only with a shaft. A second escapeway will be available through a bored, concrete-lined vent shaft. The production shaft will be equipped with a vertical conveyor for hoisting the ore, utility piping, and a men/materials cage in the shaft for transporting men and materials in and out of the mine. Although having a second ramp access from the surface to the deposit may not be justifiable from a cost standpoint, not having this access will affect the efficiency of moving men, materials, and equipment in and out of the mine, and the operating costs. The exploitation of the ore is planned to be performed with diesel, trackless, and electric/hydraulic equipment. Without a ramp connecting the underground with the surface, all underground equipment requiring major repairs must be disassembled and moved through the shaft. In consideration of this, Tamerlane has contracted FKC-Lakeshore to design fully automated men and materials cage that is 10' by 12' by 25' high and equipped with an 11.3 tonne hoist for ease in handling long and/or heavy materials. The size is sufficient to lower the entire shift in one cycle, as well minimize equipment preparation time for lowering.

Although this will maximize component sizes handled in the shaft, it will still affect operating costs. To the extent possible, equipment maintenance component exchanges and repairs are planned be performed underground. A complete underground maintenance facility underground is planned.

The following Table 19-7 provides the details of CAM's labor cost estimation. The hourly rate is based on a production rate of 2,800 tonnes per day working two 12-hour shifts per day.

Table 19-7 Operating Labor Estimate	
Description	Estimated Cost US\$
Base Wage (average)	25.00/hr
Incentive Bonus @ 40% of base	10/hr
Sched/Unsched. Overtime @ 8%	2.5/hr
Fringe Benefits @ 35% of base	8.75/hr
Total cost per hour	46.25/hr
Employee cost for a 12 hr shift	555/day

A 3.0 percent royalty is due on production. The total dollar amount included for this royalty in the cash flow is US\$5,455,000. This figure divided by the pounds of zinc contained in the ore (185,774,000) equals a cost per pound of zinc of US\$0.03, including the royalty payable on lead.

Forward costs for concentrate freight, and treatment of the lead and zinc concentrates at smelters were estimated at US\$105 per tonne ore, detailed in the following Table 19-8.

Table 19-8 Breakdown of Estimated Freight and Smelting Charges	
Description	Estimated Cost (US\$ / tonne ore)
Freight (US\$41.719 M ÷ 1,000,027 tons ore)	41.72
Zinc Con [(180,249 tonne x US\$253/tonne)] ÷ 1,000,027 tonne ore	46.65
Lead Con [(70,323 tonne x US\$200/tonne)] ÷ 1,000,027 tonne ore	16.60
<b>Total Forward Costs</b>	<b>104.97</b>

Based on comparison with other recent zinc and lead smelting contracts, CAM believes that the costs in Figure 19-7 are realistic and within industry norms. The cost of freight was based on a firm quote from CN Worldwide. Zinc and lead smelting and treatment charge calculations were supplied by F.J. Bracken Consulting .

This would indicate a total unit mine operating cost of US\$158.26 per tonne ore, broken down in Table 19-9.

Table 19-9 Estimated Unit Mine Operating Cost	
Cost Center	Estimated Cost (US\$ / tonne ore)
Mine	32.84
Processing	
DMS	7.33
Milling	5.88
G&A	7.25
<b>Subtotal on-site operating costs</b>	<b>53.29</b>
Forward costs	104.97
<b>Total cost per tonne of ore mined</b>	<b>158.26</b>

The estimated operating costs by Tamerlane are realistic, assuming the mine is operated at a high level of efficiency.

## **19.8 Economic Evaluation of the R190 Deposit**

The anticipated cash flow and economic parameters for the R190 deposit are shown in Table 19-10. The cash flow analysis has been based on procurement, construction and production costs and metal prices from:

- Comparable mining operations,
- Engineering design and cost estimates from contractors, suppliers and fabricators,
- Materials quotations from contractors and equipment suppliers,
- Taxation rates for the Northwest Territories Government and the Canadian Federal Government (in part from <http://www.fin.gov.nt.ca/taxrates.shtml> and <http://www.fin.gov.nt.ca/taxrates.shtml>)
- Metals prices from the London Metal Exchange and Kitco Base Metals websites,
- Existing cost structures, e.g. smelting and refining contract costs, and
- From practical experience where no information or data is available.

### ***19.8.1 Input to Economic Evaluation***

#### **Metal Recoveries**

The forecast uses milling recoveries of 94% for zinc and 92% for lead..

The smelting returns are similar to those experienced during the past few years: 85% for zinc and 95% for lead.

#### **Capital and Operating Costs.**

The capital and operating costs utilized in the evaluation are those indicated in this section of the report.

#### **Taxes and Royalties**

The taxes and royalties are:

- Payroll Tax. A 2% Payroll Tax is paid by all employees through employer. This is included in the average wage per employee.
- GST/HST - Federal. The Federal GST rate is 6% on all goods and transactions. These taxes will likely be refunded as most expenses for the PPP will qualify for input tax credits.
- Territorial & Federal Corporate Income Tax. The territorial corporate taxation rate is 11.5%, and the federal corporate income tax rate, when allowing for resource deduction is 22.12%. The

combined income tax rate is 33.62%. The effective rate will be much lower for the PPP when the depreciation of capital is applied.

- Territorial Property Tax. The Northwest Territorial Property Tax rates are based on two-thirds of the assessed value. Items assessed are buildings, equipment, machinery, etc. Not included are earthworks and environmental works. The rates are \$16.35 per \$1,000 of assessed value. Exploration, pilot & feasibility projects are not taxed. Negotiations are with the Territorial authorities regarding the status of the PPP are ongoing.
- Territorial Fuel Tax. All fuels are taxed at rate of CD\$0.091 per liter regardless of the price of fuel. This is included in the operating costs estimates.
- Royalties – Federal. The royalty is levied on value of production less any operational costs and depreciation. There is also no tax levied until the mine has fully recouped all pre-production expenses.

### Metals Markets and Prices

Zinc and lead are both commodities which are widely traded world-wide at daily-quoted prices in US dollars, the prices varying from place to place only by small factors relating to transportation and form or quality of the metal. Demand for both metals is strong, as they are both used in essentially every sector of the world economy.

Concentrate marketing opportunities have been explored by Tamerlane within North America and overseas. They have opened discussions with several smelters regarding marketing of future Pine Point production. Typically, the smelter which processes the concentrate from a mine takes the metals to market itself, although other arrangements (toll-smelting) can be arranged. No smelting or marketing agreements had been signed by Tamerlane when this report was prepared.

The zinc and lead prices used in Tamerlane's R190 Feasibility Study were derived by taking the average price of each for the last two years plus the future 15 months, and last three years plus the future 15 months. The historic prices are from Kitco and the future prices are from the London Metal Exchange. The zinc price used in the cash flow models is \$1.30 per pound and the lead price \$0.80 per pound.

### Exploration Potential and Mine Life

The anticipated mine life for the R190 deposit is 12 months.

The R190 deposit has been drilled extensively (70 drillholes and 1931 assayed intervals for one million tonnes of reserves), and is believed to have a very limited additional potential. There are numerous other zinc-lead deposits on the Tamerlane property which could be sequentially mined after R190 is mined out.

**Table 19-10**  
**Deposit R190 Estimated Cash Flow**

## Deposit R190 Estimated Cash Flow

Deposit R190 Estimated Cash Flow											
Year	2007			2008			2009			2010	
	Unit	Total	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Sub-Total
Production											
Ore mined	Mt	1,000,027									
Ore mined	Mt										
Cumulative	Mt	28,338									
Waste mined	Mt										
Low grade	Mt										
Overburden	Mt										
Waste+LG+OB	Mt	28,338									
Strip ratio											
Grade - Zn	%	11.16%									
Grade - Pb	%	5.49%									
Mining Dilution	%	5%									
Mining Extraction including Dilution	%	100%									
Mine Product Moisture Content	%	8.0%									
Metal Recovered from Mining - Zn	Mt	111,603									
Metal Recovered from Mining - Pb	Mt	54,901									
DMS Feed Dry	Mt	1,000,027									
DMS Feed Grade - Zn	%	10.63%									
DMS Feed Grade - Pb	%	5.23%									
DMS Recovery - Zn	%	94.5%									
DMS Recovery - Pb	%	96.0%									
DMS Concentration	%	59%									
Metal Recovered from DMS - Zn	Mt	105,465									
Metal Recovered from DMS - Pb	Mt	52,705									
DMS Product Dry	Mt	587,716									
DMS Product Moisture Content	%	8.0%									
Milling Recovery - Zn	%	94%									
Milling Recovery - Pb	%	92%									
Milling Concentration - Zn	%	62%									
Milling Concentration - Pb	%	60%									
Metal Recovered from Mill - Zn	Mt	99,348									
Metal Recovered from Mill - Pb	Mt	48,647									
Shipped- Zn Concentrate Dry	Mt	160,497									
Shipped - Pb Concentrate Dry	Mt	80,448									
Mill Product Moisture Content	%	8.0%									
Smelter Payables - Zn	%	85%									
Smelter Payables - Pb	%	95%									
Zn Metal Produced	Mt	84,446									
Zn Metal Produced	Ib	186,168,998									
Pb Metal Produced	Mt	46,215									
Pb Metal Produced	Ib	101,885,038									
Value Zinc & Lead Metal Produced(US\$000's)	US\$	325,398	-								
		68,457	76,545	85,377	93,150	323,528					
		0	0	0	0	0					

**Table 19-10**  
**Deposit R190 Estimated Cash Flow**

Year	Unit	Total	2007				2008				2009				2010			
			1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Sub-Total	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Sub-Total	Total	
Zinc & Lead Revenue Received (US\$000's)																		
Fixed Costs (US\$000's)																		
Freight		41,226																
Smelting & Refining- Zn	US\$	46,646					0										39,642	
Smelting & Refining- Pb	US\$	15,919					0										41,535	
<b>Total Freight, Milling, Smelting &amp; Refining</b>	<b>US\$</b>	<b>103,791</b>					<b>0</b>										<b>18,211</b>	
Metal Revenues	US\$	221,607					0										99,388	
Operating Costs																		
Labor		96200					289											
Mining		19,363					0										19,363	
DMS Plant		5,001					0										5,001	
Milling		5,877					0										5,877	
Water Treatment Costs		39					0										39	
Propane		2,645					0										2,645	
Administration		3,280					0										3,260	
Technical services		50					0										50	
Environmental Expenses		50					0										50	
Cash operating costs	US\$	53,409	0	0	0	0	0	0	0	0	289	289	11,887	12,794	13,784	14,656	53,120	
Royalties etc.:																	0	
NSR - Karst Resources LLC		3%	0	0	0	0	0	0	0	0	0	0	0	3,585	2,473	2,717	8,774	
Canadian Royalties		2,542	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,542	
Reclamation Plan		300	0	0	0	0	0	0	0	0	0	0	63	71	79	86	300	
<b>Total cash costs</b>	<b>US\$</b>	<b>66,013</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>289</b>	<b>289</b>	<b>11,950</b>	<b>16,449</b>	<b>16,336</b>	<b>17,459</b>	<b>62,195</b>	
Cash flow from operations	US\$	155,594	0	0	0	0	0	0	0	0	(289)	(289)	(32,980)	79,523	39,869	44,484	130,895	
Investing (Capital):																		
Construction Working		93,370	0	0	0	0	0	18,674	18,674	18,674	74,696	74,696	18,674	0	0	18,674	0	
<b>Total investing</b>	<b>US\$</b>	<b>93,370</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18,674</b>	<b>18,674</b>	<b>18,674</b>	<b>74,696</b>	<b>74,696</b>	<b>18,674</b>	<b>0</b>	<b>0</b>	<b>18,674</b>	<b>0</b>	
Net cash flow	US\$	64,814	0	0	0	0	0	(18,674)	(18,674)	(18,674)	(18,674)	(18,674)	(51,654)	79,523	39,869	44,484	112,221	
Zinc price (US\$/per lb)		1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
Lead price (US\$/per lb)		0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	
Zinc price (US\$/per mt)		2,866	2,866	2,866	2,866	2,866	2,866	2,866	2,866	2,866	2,866	2,866	2,866	2,866	2,866	2,866	2,866	
Lead price (US\$/per mt)		1,764	1,764	1,764	1,764	1,764	1,764	1,764	1,764	1,764	1,764	1,764	1,764	1,764	1,764	1,764	1,764	
Cash operating cost per mt Zn & Pb (US\$) (+Royalties)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	405	
Total cash costs per mt Zn & Pb (US\$)	US\$	159,326	0	0	0	0	0	18,674	18,674	18,674	18,963	74,984	30,624	16,449	16,351	17,475	80,919	
Cash operating cost per tonne milled	US\$	-	-	-	-	-	-	-	-	-	-	96	92	89	87	91	91	
Cash operating cost per tonne (incl. Royalties)	US\$	-	-	-	-	-	-	-	-	-	-	96	118	105	103	112	112	
Mining cost per tonne mined	US\$	-	-	-	-	-	-	-	-	-	-	56	54	52	51	27	52	
<b>CASHFLOW FROM OPERATIONS</b>	<b>US\$</b>	<b>80,899</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>(18,674)</b>	<b>(18,674)</b>	<b>(18,674)</b>	<b>(18,963)</b>	<b>(74,984)</b>	<b>(32,980)</b>	<b>79,523</b>	<b>39,869</b>	<b>44,484</b>	<b>130,895</b>	<b>27,577</b>
																	<b>83,488</b>	

**Table 19-10**  
**Deposit R190 Estimated Cash Flow**

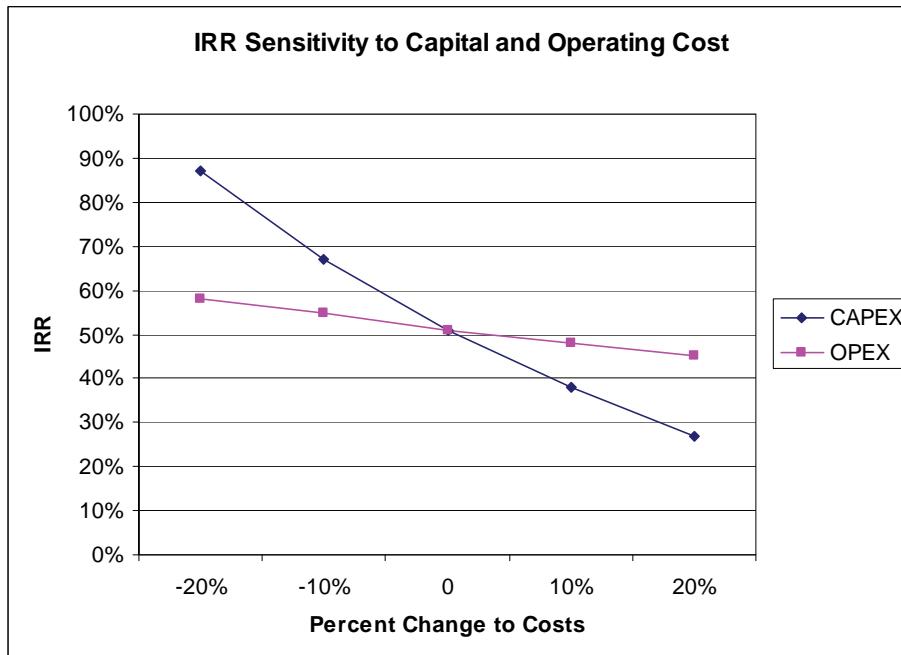
Year	Unit	Deposit R190 Estimated Cash Flow																	
		2007			2008			2009			2010								
	Total	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Sub-Total	Total				
Exploration		0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Head Office Expenses		2,000	0	0	0	0	0	0	0	250	250	250	250	250	2,000				
Permitting										125	125	125	500						
DEBT SERVICE																			
-Interest to	Construction capital	0	0	0	0	0	0	0	0	373	754	1,042	1,539	3,708	9,074				
-Interest to	Working capital	0	0	0	0	0	0	0	0	0	0	0	0	0	1,024				
-Fee to		0	0	0	0	0	0	0	0	0	0	0	0	0	0				
CORPORATE PRE-TAX CASHFLOW	US\$	71,390	0	0	0	0	0	(19,297)	(19,678)	(19,966)	(20,752)	(79,692)	(35,857)	76,968	38,636	43,759	123,505	27,577	71,390
DEPRECIATION	US\$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93,370
Sub-Total after Depreciation	US\$	101,525	0	0	0	0	0	(19,297)	(19,678)	(19,966)	(20,752)	(79,692)	(35,857)	76,968	38,636	43,759	30,136	27,577	101,525
TAXES																			
Federal GST	US\$	6.0%	0	0	0	0	0	(1,120)	(1,120)	(1,120)	(1,120)	(1,120)	(1,120)	(1,120)	(1,120)	(1,120)	(1,120)	(1,120)	(9,560)
Income Taxes Federal	US\$	33.7%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(19,426)
Territorial Property Tax (per US\$1,000 value)	US\$	16.35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL TAX (less existing tax losses)	US\$	(33,838)	0	0	0	0	0	0	0	(1,120)	(1,120)	(1,120)	(1,120)	(1,120)	(1,120)	(1,120)	(1,120)	(1,120)	(33,838)
NET INCOME	US\$	67,688	0	0	0	0	0	(20,417)	(20,798)	(21,086)	(21,389)	(21,684)	(21,981)	(21,981)	(21,981)	(21,981)	(21,981)	(21,981)	67,688

### **19.8.2 Results of Cash-Flow Analysis**

The R190 deposit has the following economics, using forecasted prices of US\$1.30/lb Zinc and US\$0.80/lb Lead:

#### Before Tax

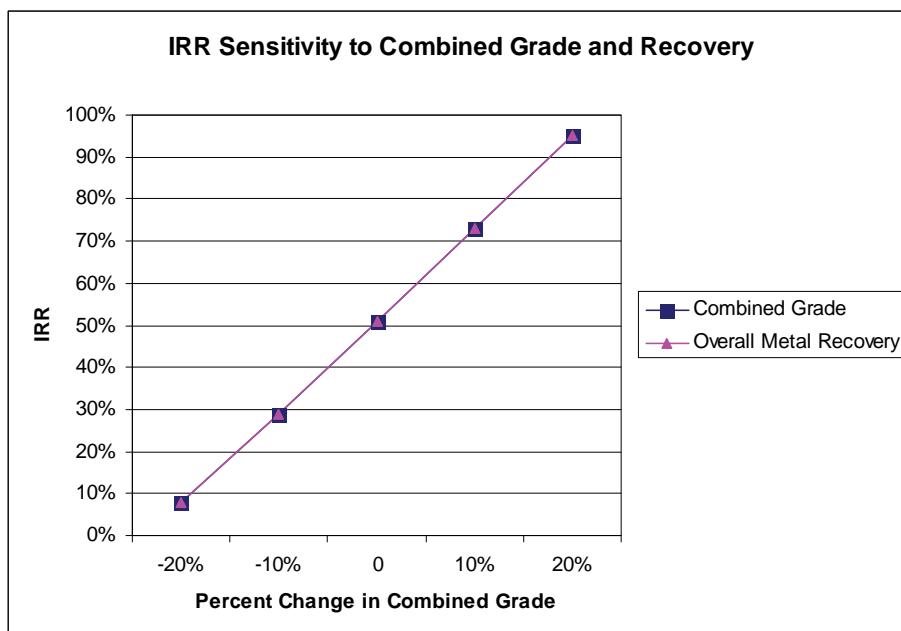
IRR.....	54%
Net Cash Flow .....	US\$52.7 million
NPV @ 5% .....	US\$40.9 million
Payback.....	1.8 years



**Figure 19-3**  
**Sensitivity Analysis for Costs at R190**



**Figure 19-4**  
Sensitivity Analysis for Price at R190



**Figure 19-5**  
Sensitivity Analysis for Combined Grade and Recovery at R190

### ***19.8.3 Payback Calculation for Mine Plan***

The Payback for the project presented above had been calculated at 1.8 years (i.e. payback will have been achieved by early 2009, near the time that the present (2007) Reserves will have been exhausted without taking into account discovery or conversion of additional Reserves.

CAM is of the opinion that the present R190 deposit project is economically feasible.

## **20.0 INTERPRETATION AND CONCLUSIONS**

### **20.1 Nature of the Project**

The economic potential on Tamerlane's Pine Point property lies in the numerous previously-drilled zinc-lead deposits that were not mined by the previous owners, in addition to any additional undiscovered deposits on those portions of the Barrier Complex that were under-explored. The drilled deposits were left undeveloped at the time of district closure in 1988, due to a combination of low zinc and lead prices, long haul distances from the then-existing Pine Point mill, uneconomic depths for conventional open pit extraction and/or predicted high ground water inflow rates.

### **20.2 Geology**

The geological model used at the Pine Point project is entirely appropriate to the well-documented type of Mississippi Valley zinc-lead mineralization on the property.

### **20.3 Drilling, Sampling, and Assaying**

The drilling and assaying used by Cominco and Westmin to outline the ten subject deposits is largely of a historical nature (1970's and 1980's), but there has been sufficient diamond drilling by Tamerlane in 2005 to demonstrate that the earlier results are credible and conform to modern industry standards.

### **20.4 Mineral Resources**

CAM has reviewed the R190 resource model preparation procedures and performed independent checks, and believes that the feasibility model is suitable for use in financial decisions and mine planning for cutoff grades down to about 3.0% Zn. Tamerlane used a cutoff of 5% Zn. CAM has reviewed the historical and Tamerlane drilling, and agrees that Indicated Resource estimates for five of the nine additional deposits are 43-101-compliant. These five deposits (P-499, O556, X25, G03, and W85) contain in aggregate 10,903,000 tonnes grading 2.43% Pb and 4.69% Zn (see Table 1-2). CAM did not review any economic analysis on these deposits.

### **20.5 Mineral Reserves**

CAM's review of the Tamerlane Feasibility Study indicates that the R190 deposit can be profitably mined and processed. The operational and cost scenarios used by Tamerlane are aggressive, but realistic.

## **20.6 Additional Potential**

Given the large number (more than 40) other unmined deposits on the Tamerlane property, excellent potential exists for elevation to Resource status for several of these, and for their subsequent development as Reserves.

## **20.7 Analytical and Testing Data**

Laboratory/process tests are considered adequate to confirm the lead and zinc recoveries anticipated in the cash flow analysis for the R190 Deposit.

## **20.8 Infrastructure**

Existing infrastructure in the area is more than adequate to support Project operations. Within the Tamerlane property, more than sufficient areas exist for mining operations, processing plants, waste and tailings storage, and facilities.

## **20.9 Viability of Project.**

It is CAM's opinion that Tamerlane's internal Feasibility Study, showing that the R190 deposit can be economically mined, is valid.

## **21.0 RECOMMENDATIONS**

### **21.1 R190 Deposit**

Development of the R190 deposit has been shown to be feasible, and development should proceed. This development is expected to have a capital outlay of US\$93.37 million.

### **21.2 Other Deposits**

Further confirmatory drilling should be carried out on additional deposits in the district, including the four 43-101 non-compliant deposits which could support mining in later years (N204, V46, W19, and Z155). This confirmation drilling is expected to cost about US\$680,000 for the four subject deposits, at an average cost of US\$75 per foot all-up cost including access roads, geology, and assays. As of this writing, such drilling is in progress.

## **22.0 REFERENCES**

AeroQuest Limited (2005), Report on a helicopter-borne AeroTEM II electromagnetic and magnetic survey: consulting report dated January 2005, prepared for Tamerlane Ventures Inc.

Advanced Terra Testing, Inc., 2006), Testing report, 16 pages in .pdf format. Includes lab tests for (bulk) density, (particle) specific gravity, moisture content, porosity, and compressive strength on core samples from drillholes W85-TV02, W85-TV03, R190-TV05, R190-TV07 and R190-TV10.

CAM, 2007, Pine Point Project Deposit R190 Feasibility Review Deposit R-190 - Feasibility Review: consulting report dated 14 August 2007, prepared for Tamerlane Ventures, Inc. Fred Barnard, PhD., CPG; Steve Milne, P.E.; Kenneth Meyer; and Robert Sandefur P.E.;of Chlumsky, Armbrust and Meyer LLC. 29 pages in pdf format. Posted on SEDAR as a Technical Report by Tamerlane on September 10, 2007.

CMS, 2006, Pine Point Project, Metallurgical Report: consulting report prepared by Confidential Metallurgical Services (Missisauga, ON) for Tamerlane, dated 2 September 2006.

9 pages in pdf format.

Cominco Ltd. 1984, Evaluation of Great Slave Reef project: internal report by R.C. Armstrong of Cominco subsidiary Pine Point Mines Ltd. dated 5 June 1984. Approx 120 pages. Hard copy only.

EBA, 2005a, Environmental Baseline Studies - Water Quality and Stream Assessment, Tamerlane Pine Point Project, NT: consulting report for Tamerlane Ventures by EBA Engineering Consultants, Ltd (Vancouver) dated September 2005. 86 pages in pdf format.

EBA, 2005b, Vegetation/Ecosystem Baseline Studies, Tamerlane Pine Point Project, NT: consulting report for Tamerlane Ventures by EBA Engineering Consultants, Ltd (Vancouver) dated November 2005. 41 pages in pdf format.

EBA, 2006a, Feasibility Assessment (Phase I) of Pine Point Mine Ground Freezing Project: consulting report for Century Mining Corporation by EBA Engineering Consultants, Ltd (Vancouver) dated May 2006. 26 pages in pdf format.

EBA, 2006b, Desktop Evaluation of Natural Groundwater Flow Velocities - Pine Point Mine Ground Freezing Project: consulting report for Tamerlane Ventures by EBA Engineering Consultants, Ltd (Vancouver) dated 18 September 2006. 11 pages in pdf format.

EBA, 2006c, Rare Plant Survey, Tamerlane Pine Point Project, NT: consulting report for Tamerlane Ventures by EBA Engineering Consultants, Ltd (Vancouver) dated October 2006.  
29 pages in pdf format.

EBA, 2006d, Wildlife Surveys, Tamerlane Pine Point Project, NT: consulting report for Tamerlane Ventures by EBA Engineering Consultants, Ltd (Vancouver) dated October 2006.  
43 pages in pdf format.

EBA, 2006e, Water Quality Sampling Program, Tamerlane Pine Point Project, NT: consulting report for Tamerlane Ventures by EBA Engineering Consultants, Ltd (Vancouver) dated November 2006. 82 pages in pdf format.

Giroux, 2001, Report on the Great Slave Reef lead-zinc deposits, Pine Point, N.W.T: consulting report prepared for Kent Burns Group LLC by G.H. Giroux and I. McCartney of Giroux Consultants Ltd., dated November 2001, 37 pages

Giroux, 1982a, Global Ore Reserve Estimates - O556 deposit: consulting report prepared October 1982 for Westmin Resources Ltd. by Sinclair, A.J., and Giroux, G.H. Approx. 50 pages. Hard-copy only.

Giroux, 1982b, Global Ore Reserve Estimates - P499 deposit: consulting report dated November 1982 for Westmin Resources Ltd. by Sinclair, A.J., and Giroux, G.H., approx. 60 pages. Hard-copy only.

Giroux, 1982c, Global Ore Reserve Estimates - X25 deposit: consulting report dated November 1982 for Westmin Resources Ltd. by Sinclair, A.J., and Giroux, G.H. Approx. 75 pages. Hard-copy only.

Giroux, 1982d, Global Ore Reserve Estimates - R190 deposit: consulting report dated November 1982 for Westmin Resources Ltd. by Sinclair, A.J., and Giroux, G.H. Approx. 112 pages in .pdf version.

Hannigan, P., 2006, Metallogeny of the Pine Point Mississippi-Valley-type zinc-lead district, southern Northwest Territories: Geological Survey of Canada electronic publication, accessed on 18 May, 2007 at: [http://gsc.nrcan.gc.ca/mindep/metallogeny/mvt/pine/index\\_e.php](http://gsc.nrcan.gc.ca/mindep/metallogeny/mvt/pine/index_e.php). 28 pages in .pdf version

Kent Burns Group, 2001, Claim location map showing past mining and remaining resources: map at approx. 1:75,000 scale, dated 15 November 2001. Hard copy only.

Kilborn Engineering (B.C.) Ltd., 1979, Western Mines Ltd. Great Slave Reef Project - Feasibility Study: consulting report dated 14 Dec 1979. Approx. 250 pages. Hard copy only.

Kyle, J.R., 1981, Geology of the Pine Point lead-zinc district, Chapter 11; in Wolf, K.H., ed., Handbook of Strata-bound and Stratiform Ore Deposits: Elsevier, p. 643-741.

Mountain States, 2006, Application of HMS Concept for Processing Pine Point Mine Ore - Progress Report: consulting report prepared by Mountain States R&D International Inc (Tucson, AZ) for Century Mining Company, dated 10 April 2006. 18 pages in pdf format.

Pine Point Mines, Ltd, 1984, Logging procedures: internal document signed by Jesse Winters, Exploration Geologist, 9 January, 1985, 12 pages.

Points West, 2006, Preliminary Archaeological Assessment of the Tamerlane Venture Inc.'s Pine Point Project: letter report addressed to Territorial Archaeologist Prince of Wales Northern Heritage Centre, Yellowknife, from Points West Heritage Consulting Ltd, dated 2 October 2006. 6 pages in pdf format.

Qing, H. and Mountjoy, E., 1994: Origin of dissolution vugs, caverns, and breccias in the Middle Devonian Presqu'ile barrier, host of Pine Point Mississippi Valley-type deposits; *Economic Geology*, v. 89, p. 858-876.

Rhodes, D., et al., 1984, Pine Point orebodies and their relationship to the stratigraphy, structure, dolomitization, and karstification of the Middle Devonian Barrier Complex: *Economic Geology*, volume 79, no. 5, pages 991-1055.

Sinclair, 1982, Global ore reserve estimates - R190 deposit: consulting reported dated 1982 for Westmin Resources Ltd. by Sinclair Consultants Ltd. and Montgomery Consultants Ltd.

Skall, H. (1975), The paleoenvironment of the Pine Point lead-zinc district. *Economic Geology*, volume 70, no. 1, pages, 22-47.

Tamerlane, 2007a, Pine Point Project, Hay River, NWT, Canada: report prepared by Tamerlane Resources Inc., dated March 2007. 132 pages.

Tamerlane, 2007b, Pine Point Feasibility Study: report prepared by Tamerlane Ventures, Inc, dated 24 July 2007. 115 pages plus numerous supporting appendices.

Turner W.A., Pierce K.L., and Cairns K.A., 2002. Great Slave Reef (GSR) Project Drillhole

Database. A compilation of the drillhole locations, drill logs, and associated geochemical data for the Great Slave Reef Joint Venture Project; Interior Platform, Northwest Territories, Canada (NTS 85B11 to 14). NWT Open Report 2002-001, C.S. Lord Northern Geoscience Centre, Yellowknife, Northwest Territories.

Westmin Resources Ltd., 1981, Great Slave Reef Project - Summary report of 1981 drilling program: internal report by A.W. Randall dated May 1981. Approx 20 pages plus map of O-555, 556. Hard copy only.

Westmin Resources Ltd., 1983a, Special Studies Group: internal geological report by J.L. Hardy dated April 1983. Approx. 100 pages Hard copy only.

Westmin Resources Ltd., 1983b, Great Slave Reef - R190, Review of mine planning: internal report by C.T. Penney dated Nov 83 (2 copies of this). 18 pages plus appendices. Hard copy only.

Westmin Resources Ltd., 1983c, Great Slave Reef Project, Review of Mine Planning - Phase I: internal report by C.T. Penney dated 8 Dec 1983. Approx. 25 pages. Hard copy only.

Westmin Resources Ltd., 1984, Great Slave Reef - Exploration meeting; internal report by A.W. Randall dated November 20-22, 1984. Approx 30 pages. Hard copy only.

Westmin Resources Ltd., (undated, 1980's) Great Slave Reef Project, West Reef, list of diamond drill holes: internal report, handwritten and typed. Approx 60 pages. Hard copy only.

## **23.0 DATE AND SIGNATURE PAGE**

### **23.1 Fred Barnard, Ph.D.**

Certificate of Author:

Fred Barnard  
1835 Alkire Street  
Golden, Colorado 80401 USA

I, Fred Barnard, do hereby certify that:

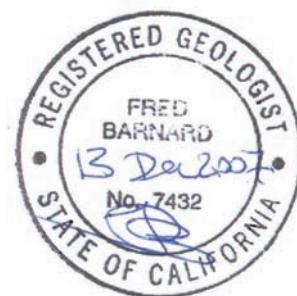
1. I am a consulting minerals geologist, affiliated with Chlumsky, Armbrust and Meyer LLC at 200 Union Boulevard, Suite 430, Lakewood, Colorado 80228, USA.
2. I am Professional Geologist #7432 in the state of California, in good standing.
3. I obtained a B. A. degree in Geology from the University of California at Berkeley in 1963 and a Ph.D. degree in Geology from the University of Colorado at Boulder in 1968.
4. Since 1968 I have practiced continuously as a geologist in the mining industry, as a corporate employee of INCO and later of Anaconda Minerals, and subsequently since 1985 as an independent consultant. I have been involved in the geology, exploration, and evaluation of numerous metallic and some non-metallic mineral deposits in about 40 countries.
5. I am a Fellow of the Society of Economic Geologists, and a Member of the Geological Society of America.
6. My professional work has included visits to mines and prospects of Mississippi-Valley-Type zinc-lead deposits in the USA (Buick Mine, Missouri) Austria (Bleiberg Mine), Uzbekistan (Uchkulach deposit), and operating lead/zinc mines of other geological types, including Sullivan, British Columbia; Langlois, Quebec; Galena, Idaho; Mt. Isa and Broken Hill in Australia; Charcas, San Martin, and Providencia in Mexico; Carguaicollo, Bolivia; Angela, Argentina; Madneuli, Georgian Rep.; and Hungtoushan, China.
7. I am a Qualified Person with regard to Mississippi-Valley-Type zinc-lead deposits, within the meaning of National Instrument 43-101, based on my education, professional registration, and experience with these deposits.
8. I reviewed drill core in Ferndale, Washington from Tamerlane's 2005 confirmation drilling of the R190, G03, and W85 deposits, on 23 April, 2007. I also visited the Pine Property on November 14-15, viewing drillhole collars at deposits R190, P499, O556, X25, G03 and W85, and examining historic core from deposits R190, O556, X25, and W85, as well as core from current drilling at deposit O556.

9. Sections 1 to 13, 15, 16, 18, 20, 21, and parts of Sections 22 and 23 were prepared by me or under my supervision, and I am not aware of any material fact or change with respect to the subjects of this report which is not reflected in this report, such that the exclusion of these facts would make this report misleading.
10. As defined in Section 1.5 of National Instrument 43-101, I am independent of the issuer, Tamerlane Ventures Inc.
11. I have read National Instrument 43-101 and Form 43-101F1, and have prepared this report in compliance with those documents.
12. I have read this Technical Report and do not have any reason to believe that there are any misrepresentations in the information in it.
13. I hereby notify the British Columbia Securities Commission of my consent to the filing of this Technical Report with stock exchanges and other regulatory authorities in Canada, and any publication by them, including electronic publication in the public company files on their website accessible by the public, of this Technical Report.

Dated this 13<sup>th</sup> day of December, 2007.



\_\_\_\_\_  
Fred Barnard, Ph.D., California Professional Geologist



## **23.2 Steve Milne, P.E.**

Certificate of Qualification (Steve L. Milne)

Steve L. Milne, P.E.  
1651 Calle El Cid  
Tucson, Arizona 85718  
Phone (520) 297-1291  
Fax (520) 297-1291  
Email: stmilne@comcast.net

I, Steve L. Milne, of Tucson, Arizona, certify that:

1. I am a Consulting Mining Engineer and an Associate of the mining consulting firm Chlumsky, Armbrust and Meyer LLC (CAM) located at 200 Union Blvd., Suite 430, Lakewood, Colorado 80228.
2. I am Professional Engineer in several U.S. states, including Colorado (#25589), and am in good standing in all of them.
3. I was awarded an E.M. degree in Mining Engineering from the Colorado School of Mines at Golden, Colorado in 1959.
4. Since 1959 I have practiced continuously for the past 48 years as a mining engineer, supervisor, mine manager, corporate officer, and consultant for mining firms and other mining consulting firms. This work has concentrated primarily on underground mines throughout the world, encompassing a wide variety of underground conditions, metals, reserve evaluations, production rates, mining planning, equipment selection, and cost analyses.
5. Two years were spent as a special projects engineer for Hecla Mining Company's north Idaho lead-zinc operations at the Star, Lucky Friday and Consolidated Silver underground mines. I served as a project engineer/project manager for Centennial Development Company performing mine-development work for underground lead-zinc mines in the Missouri lead belt, and in the Ducktown, Tennessee lead-zinc mines. I am the author/co-author of several publications on mine costing, shaft sinking, and equipment usage for the underground mining industry.
6. My experience has included work on lead-zinc deposits located in Missouri, Utah, Idaho, Mexico, Sweden, Finland, Peru, Bolivia, Greece, Morocco, and Spain. Since 1978, I have been involved in the preparation or review of about 20 feasibility studies for underground metal-mining projects worldwide. This has included the following lead-zinc mines: the Iscaycruz mine in Peru; the Sunshine mine in north Idaho; IMMSA's and Penoles' mines in Mexico; Boliden's mines in Sweden; and Centromin's mines in Peru. In many of these studies, I have evaluated the physical processes for treatment of lead-zinc ores of relatively simple galena-sphalerite mineralogy.

7. I am an active member of AIME/SME, and the Mining Foundation of the Southwest.
8. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with professional associations (as defined in NI 43-101), and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
9. On November 14<sup>th</sup>, I visited the R190 deposit site, and other mineralized sites in the area of the R190 deposit. The site visit also included examinations of past mining operations in the area (now closed), current exploration drilling efforts, drill core, and proposed infrastructure sites for developing and mining the R190 deposit.
10. I am responsible for the preparation of Sections 19 and part of 22 of the Report. I am not aware of any material fact, of change, with respect to the subject matter of the Technical Report that is not reflected in the Report. Nor am I aware of any material facts, or changes, with respect to the subjects of the Report, which are not reflected in this Report, such that the exclusion of these facts would make the Report misleading.
11. I am independent of Tamerlane Ventures, Inc., applying all of the tests in section 1.5 of National Instrument 43-101.
12. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that Instrument and Form.
13. I have read this Technical Report and do not have any reason to believe that there are any misrepresentations contained within it.
14. I hereby notify the British Columbia Securities Commission of my consent to the filing of this Technical Report with stock exchanges and other regulatory authorities in Canada, and any publication by them, including electronic publication in the public company files on their website accessible by the public, of the Technical Report.

Dated this 13<sup>th</sup> day of December, 2007



Steve L. Milne, P.E.



### **23.3 Robert L. Sandefur, P.E.**

I, Robert L. Sandefur, certify that:

1. I am a Consulting Geostatistician, affiliated with Chlumsky, Armbrust and Meyer LLC at 200 Union Boulevard, Suite 430, Lakewood, Colorado 80228, USA.
2. I am a Certified Professional Engineer (Number 11370) in the state of Colorado, USA, and a member of the Society for Mining, Metallurgy, and Exploration (SME).
3. I graduated from the Colorado School of Mines with a Professional (BS) degree in engineering physics (geophysics minor) in 1966 and subsequently obtained a Masters of Science degree in physics from the Colorado School of Mines in 1973.
4. I have practiced my profession as a geostatistical resource analyst continuously since 1969.
5. From 1969 to present, I have worked on mining projects in over 20 countries, have statistically analyzed more than 400 mineral deposits, and have personally visited more than 50 operating metal mines.
6. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
7. I am responsible for the preparation of sections 14 and 17 of the report entitled "NI 43-101 Technical Report, Pine Point Project, Northwest Territories, Canada dated 15 August , 2007.
8. The report is based on my personal review of published and unpublished information on the property and on a review of data and reports supplied by Tamerlane on work performed on the project.
9. I visited Tamerlane's Pine Point property on October 24, 2006.
10. I am not aware of any material fact or material change with respect to the subject matter of this report that is not reflected in the report, such that the exclusion of these facts would make this report misleading.
11. I am independent of Tamerlane or any of their subsidiary companies applying all of the tests in section 1.5 of National Instrument 43-101.
12. I have read National Instrument 43-101 and Form 43-101F1, and the report has been prepared in compliance with that Instrument and Form.
13. I have read this Technical Report and do not have any reason to believe that there are any misrepresentations contained within it.
14. I hereby notify the British Columbia Securities Commission of my consent to the filing of this Technical Report with stock exchanges and other regulatory authorities in Canada, and any

publication by them, including electronic publication in the public company files on their website accessible by the public, of the Technical Report.

Dated this 13<sup>th</sup> day of December 2007

*R L Sandefur*

\_\_\_\_\_  
Robert L. Sandefur, P.E.



## **APPENDIX A - Personal Inspections of the Property**

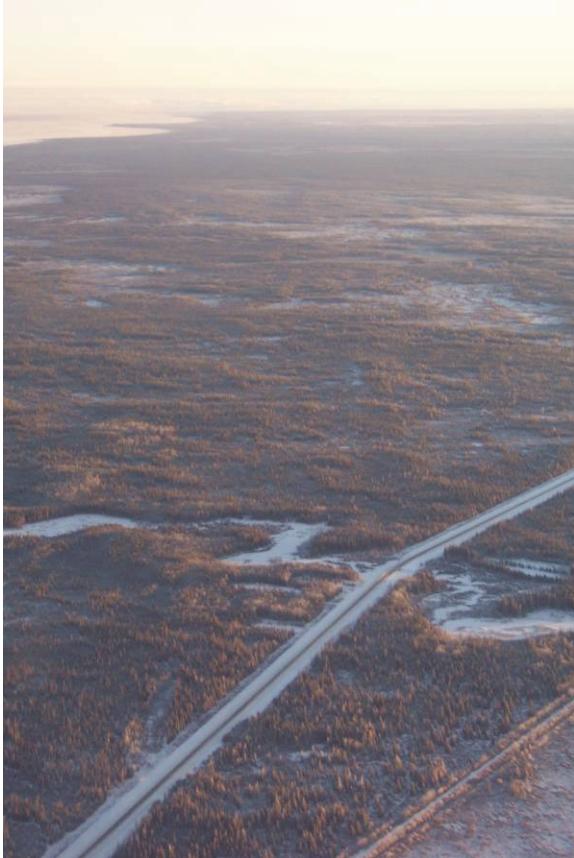


Figure A-1. Air view of Hwy 5 and rail bed, at Birch Creek east of Hay River, looking northeast, parallel to Pine Point trends, toward productive part of district.  
(Barnard photo, 14 November 2007)



Figure A-2. Paved Highway 5 near R190 deposit  
(Barnard photo, 15 November 2007)



Figure A-3. Old railroad spur with rails in place, south of Hay River.  
(Milne photo, 14 November 2007)



Figure A-4. Flooded open-pit mine of COMINCO, near Pine Point Mill site. (Barnard photo, 15 November 2007)

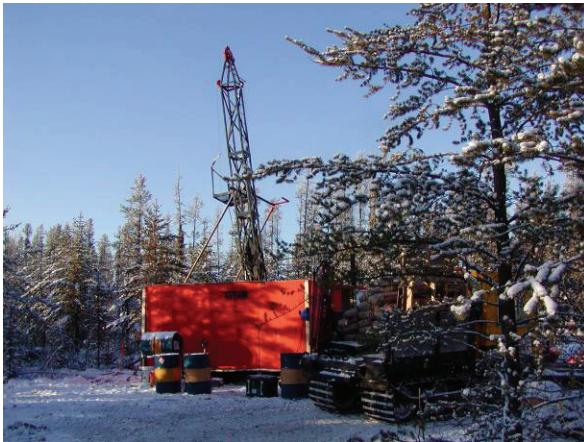


Figure A-5. Drill on hole O556-07-TV-2. (Milne photo, 14 Nov)



Figure A-6. Wall of old COMINCO open pit mine near Pine Point Mill site, showing porous reef stata overlying mined-out mineralization.  
(Sandefur photo, 24 October 2006)



Figure A-7. Drill collar at R190 deposit site. Metal sign is survey marker.  
(Sandefur photo, 24 October 2006)



Figure A-8. Collar of hole TV-03 at R190 deposit.  
(Barnard photo, 14 November 2007)



Figure A-9. O556 deposit, collar of Westmin hole 806.  
(Barnard photo, 14 November 2007)



Figure A-10. Collar of Tamerlane hole P499-TV03.  
(Barnard photo, 14 November 2007)



Figure A-11. Deposit G03, collar of hole G03-TV1 in foreground,  
collar of hole G03-TV02 in middle distance.

(Barnard photo, 14 November 2007)



Figure A-12. Deposit X25, collar of Westmin hole 840.  
(Barnard photo, 14 November 2007)



Figure A-13. W85 deposit, collar of Westmin hole 186.  
(Barnard photo, 15 November 2007)



Figure A-14. Westmin core storage site near Pine Point Mill site.  
(Sandefur photo, 24 October 2006)



Figure A-15. Split Westmin core at core storage site. R190, hole 871,  
589-613 feet. Galena visible in piece in sunlight and  
elsewhere in this core. (Barnard photo, 15 November)



Figure A-16. Core from hole R190-TV-10, 407 to 427 feet, at Ferndale, Washington storage site. The 427 marker is at lower left. Note sphalerite mineralization (honey and blackjack) in vugs. This interval is above the main mineralized zone and was not assayed. (Barnard photo, 23 April 2007)



Figure A-17. Core from hole G03-TV1, 297 to 302 feet, at Ferndale storage site, showing abundant brown colloform sphalerite. This high-grade interval is about 25 feet above the main mineralized interval in this hole, and this core was not split or assayed. (Barnard photo, 23 April 2007)



Figure A-18. Core from hole W85-TV3, 159 feet, at Ferndale storage site, showing 1-foot interval of massive galena with seams of brown colloform sphalerite. This high-grade interval is above the main mineralized interval in this hole, and this core was not split or assayed. (Barnard photo, 23 April 2007)