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SCOZINC MINE

# Preliminary Economic Assessment

Gays River, Nova Scotia

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**Prepared by:**

Allnorth Consultants Limited



**Prepared For:** Selwyn Resources

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## 1. SUMMARY

Allnorth Consultants Limited (Allnorth) was retained by Selwyn Resources Inc. (Selwyn) to perform a scoping level study and prepare a Preliminary Economic Assessment technical report on the ScoZinc mine, near Gays River. The ScoZinc mine is owned by ScoZinc Limited, a wholly-owned subsidiary of Selwyn. Nova Scotia. This Technical Report conforms to National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101).

### 1.1 ECONOMIC ANALYSIS

The potential economic viability of the Project was evaluated using a discounted cashflow analysis approach. In summary, the results of the preliminary economic analysis indicate that:

- Based on a mill through-put rate of 2,500 tonnes per day, the Project has a mine life of approximately 7.5 years and offers an approximate payback period of 1.2 years;
- Unit operating costs of \$51.77 per tonne milled for the first three years (\$49.16 per tonne milled for the life-of-mine);
- Mine and mill restart capital expenditures (CAPEX) of CAD \$30 Million, including 15% contingency (\$3.4 million) and two months of working capital (\$3.9 million);
- A project acquisition cost of \$10 million is assumed in the financial analysis;
- Assuming base case zinc and lead prices of US\$1.10 and US\$1.20/lb respectively and an exchange rate of 1 Canadian dollar to 1 US dollar, the Project has an estimated pre-tax internal rate of return (IRR) of 63.9% and an after-tax IRR of 60.2%.
- The Project has a pre-tax net present value (NPV) of \$54.1 million and an after-tax NPV of \$45.3 million, both using an 8% discount rate. At a 5% discount rate, the pre-tax NPV is \$63.9 million and the after-tax NPV is \$53.4 million.
- Direct cash cost of zinc production (after deducting credits for lead) for the first three years is CAD \$0.56/lb and to be further optimized through ongoing studies;
- Earnings before interest, taxes, depreciation and amortization (EBITDA) for the first three years of operations averages CAD \$26.2 million per annum.
- Total payable metal production over the life of the project is projected to be 298 million lbs (134,900 tonnes) of zinc and 196 million lbs (88,900 tonnes) of lead.
- Total life-of-mine gross revenue is about \$460 million, of which 54% is derived from zinc and 46% derived from lead.

The cashflow model is based on a scenario in which three open pits are to be mined sequentially; Main, Northeast, and Getty, each of which have been optimized using pit optimization software. The production scheduling is based on an average production rate of 875,000 tonnes per year (or 2,500 tonnes per day) into the mill over an average of 350 operating



days per year. The average strip ratio for the life-of-mine is 20.6 to 1 (excluding pre-stripping which is included in the capital costs). Approximately 58% of the waste is assumed to be readily removed without blasting, including soils that will be used for reclamation. Mine dilution and mining losses are assumed to be 10% and 5%, respectively.

The proposed open pits contain the potentially mineable resources, termed mill feed, listed in Table 1-1 with classifications having the meanings ascribed to them by the CIM Definition Standards on Mineral Resources and Mineral Reserves adopted by CIM Council. The proposed production schedule is based on milling a total tonnage of 6.47 million tonnes over the life of the project, of which only 19% is in the inferred category.

**Table 1-1: Potentially Mineable Resources (Mill Feed)**

<b>Classification<sup>1</sup></b>	<b>Tonnes</b>	<b>Zinc</b>	<b>Lead</b>	<b>Percent of Total</b>
Measured	1,732,000	3.10	1.69	26.8%
Indicated	3,513,000	2.99	1.71	54.3%
<b>Total M &amp; I</b>	<b>5,245,000</b>	<b>3.03</b>	<b>1.70</b>	<b>81.1%</b>
<b>Inferred</b>	<b>1,224,000</b>	<b>2.60</b>	<b>1.37</b>	<b>18.9%</b>

<sup>1</sup>. This preliminary economic assessment is preliminary in nature and includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

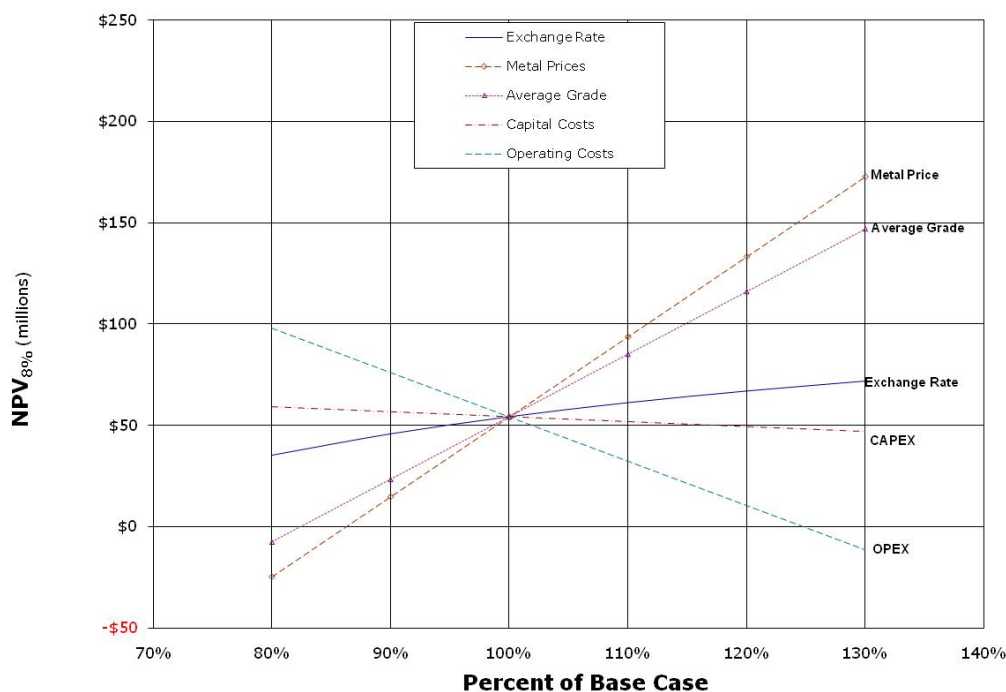
Selwyn's operating cost estimates are predicated upon historical September 2008 Year-To-Date operating costs. It is assumed that the manpower levels will remain unchanged, regardless of the plant throughput. Labour costs have been increased by 3 percent per annum for the period 2008 to 2011 and are classified as "fixed costs".

Other than the labour and assay laboratory costs, most other expenses were considered as "variable costs", thus increasing in direct proportion to the plant throughput. An escalator of 3 percent per annum was also applied to the variable costs to provide a basis for current costs. No further escalation is assumed for the purposes of the economic analysis.

Major capital costs include mine pre-stripping, the installation of a new primary and secondary crushers with a refurbished tertiary crusher, replacement of the vibrating screen and replacement of the two concentrate vacuum disc filters and dryers with two vertical plate pressure filters.

The economics of the project are most sensitive to metal prices, the grade of the potentially mineable mineralization, and operating costs. The results of the sensitivity analysis are shown in

Figure 1-2 (8% discount rate case) as related to the base case pre-tax net present value (NPV) of \$54.1 million.



**Figure 1-1: NPV<sub>8%</sub> Sensitivity**

## 1.2 TECHNICAL SUMMARY

### Property Description and Location

The Gays River and Getty Deposits ("the Property") are located approximately sixty kilometers northeast of Halifax in the community of Gays River, within the Halifax Regional Municipality. The property's general location is 45°02' North, 63°21' West. The Getty Deposit lies just northwest of the Gays River Deposit on the western side of Gays River. The Gays River Deposit was divided into two zones: the Main Zone, south of Highway 224 and the Northeast Zone, which lies northeast of the highway and partly under Gays River. The two deposits are separated by less than one kilometer. Access to the property is by paved roads and is approximately fifteen kilometers off of the Trans-Canada Highway along Route #224. The Halifax International Airport is located twenty kilometers southwest of the mine site.

### Land Tenure

A Mineral Lease covers the Gays River Deposit. It consists of 615 hectares of mineral rights, including land with exploration potential for zinc/lead mineralization, and 568.4 hectares of land

ownership (real property). There are also seven exploration licenses in the general vicinity of the mine. All lands were in good standing and were registered to ScoZinc Limited as of May 5, 2011.

Mineral Lease #10-1, which covers the entire mine site (Gays River Deposit), was originally granted by the Nova Scotia Government to Westminer Canada Limited on April 2, 1990. It was transferred to ScoZinc in 2002. The duration of the Mineral Lease is twenty years, at which time it may be renewed.

Regarding the Getty Deposit, Cullen et al. (2011) stated that "in September, 2006 the provincial government tendered exploration rights to the closed Getty property and Exploration Licenses 6959 and 6960 were subsequently issued to Acadian on October 20<sup>th</sup>, 2006 as successful bidder under the tendering process."

Selwyn currently holds the mineral rights to the Gays River and Getty deposits, the mining rights and surface rights (real property rights) for the Scotia Mine (Gays River Deposit). The existing surface rights are sufficient for mining operations.

## **History**

The Gays River Deposit was discovered in 1973 by the Imperial Oil Enterprises ("Esso")/Cuvier Mines joint venture. Esso initiated mine development in 1978 and commissioned the mill in 1979. From 1979 to 1981 the mine produced 554,000 tonnes of ore containing 2.1 % Zinc and 1.4 % Lead. The mine closed in 1982 due to groundwater inflow and operating losses caused by low metal prices.

Seabright Resources Inc. (Seabright) acquired the mine and mill in 1984. Despite a favourable feasibility study, they did not reactivate the mine due to depressed metal prices at the time. They converted the mill for gold processing and processed gold ore from several satellite properties.

With the takeover of Seabright by Western Mining Corporation (Westminer) in 1988, a review of the potential for mining the deposit was undertaken. Following completion of feasibility studies in 1989, the underground workings were dewatered and test mining was carried out. A total of 187,000 tonnes were mined over a fifteen month period with average grades of 7.47 % Zinc and 3.50% Lead. In 1991, production was suspended again due to groundwater inflow and economic considerations.

In 1997, Savage Resources Canada Limited acquired the Scotia Mine assets from Westminer. Savage concluded that an open pit operation was feasible and initiated environmental permitting, including provisions for a diversion of a portion of the Gays River. Savage was subsequently taken over by Pasminco Resources Canada Company (Pasminco Resources) and

their environmental assessment plan was approved by the Nova Scotia Minister of the Environment in August 2000.

Regal Mines Limited (Regal Mines) purchased Pasminco Resources which was later acquired by OntZinc in 2002. OntZinc later changed its name to HudBay Minerals Inc. (Hudbay). In 2006, Acadian Gold Corp ("Acadian Gold") purchased 100 % of ScoZinc and all of its assets (consisting mainly of Scotia Mine and its infrastructure) from OntZinc for \$7 million.

ScoZinc reactivated the mill and surface-mined the Gays River Deposit during 2007 and 2008. Depressed metal prices forced ScoZinc to place the mine on care-and-maintenance status at the end of 2008. In February 2011, Selwyn Resources Limited ("Selwyn") purchased ScoZinc and all of its assets, including the Scotia Mine and ScoZinc's exploration claims, for \$10 million less a deduction relating to increased reclamation bonding requirements that were being determined at the time of the acquisition.

## **Geology**

The Property is underlain by basement rocks of the Cambro-Ordovician Meguma Group which had significant local topographic relief due to rift faulting and erosion. Locally, a veneer of Horton Group, red-brown conglomerate and sandstone mark the base of the unconformably overlying Lower Carboniferous rocks which host the Gays River and Getty Deposits. In areas where the basement rocks formed islands in the Carboniferous Sea, coral reefs formed along the shores. These carbonate rocks are the Gays River Formation. The MacCumber Formation is time-equivalent to the Gays River Formation. The MacCumber and Gays River Formations are overlain by evaporites of the Carroll's Corner and Stewiacke Formations.

The Gays River Formation mineralisation has long been considered a Mississippi Valley-type lead-zinc deposit. This type of deposit is carbonate-hosted, classified as a typical open space filling type, and hosted in a dolomitized limestone. The limestone developed as a carbonate build-up on an irregular pre-Carboniferous basement topographic high where conditions allowed for growth of reef-building organisms.

The zinc/lead-bearing Gays River Formation trends in an east-northeast direction across the Property. Locally, the mineralisation dips up to 45 ° on average, and up to vertical in places, to the north-northwest which is the depositional slope of the front of the Gays River reef unit. But, the dip tends to be horizontal in the back reef area (south of the main trend). The mineralisation is present as sphalerite and galena and grades from massive Pb-Zn ore-grade material in the fore reef to finely disseminated, lower grade material in the back reef. In the mine area, the Gays River Formation is overlain either by the evaporites of the Carroll's Corner Formation and/or overburden.

## Mineral Resources

Only Mineral Resources were identified, there are no Mineral Reserves.

### ***Gays River Deposit Resource Estimate***

As detailed in Roy et al., (2011), MineTech International verified the sampling results and verified that the sample types and density are adequate for establishing Mineral Resources. The sampling results are representative of the mineralisation. The available information and sample density allow a reliable estimate to be made of the size, tonnage and grade of the mineralisation in accordance with the level of confidence established by the Mineral Resource categories in the CIM Standards.

Using a 0.75 % zinc-equivalent cut-off, the non-diluted mineral resources in the Gays River Deposit were estimated to be:

**Table 1-2: Gays River Mineral Resources**

<b>Zone and Resource Category</b>	<b>Tonnes</b>	<b>SG</b>	<b>Percent Zinc</b>	<b>Percent Lead</b>	<b>Percent Zinc-Equivalent</b>
Measured Category					
<i>Main Zone</i>	1,340,000	2.8	4.4	2	7.4
<i>Northeast Zone</i>	n/a	n/a	n/a	n/a	n/a
<b>Total Measured</b>	<b>1,340,000</b>	<b>2.8</b>	<b>4.4</b>	<b>2</b>	<b>7.4</b>
Indicated Category					
<i>Main Zone</i>	1,790,000	2.78	3.6	1.6	5.9
<i>Northeast Zone</i>	1,710,000	2.79	3.9	2.0	7.0
<b>Total Indicated</b>	<b>3,500,000</b>	<b>2.79</b>	<b>3.7</b>	<b>1.8</b>	<b>6.4</b>
Measured + Indicated					
<i>Main Zone</i>	3,130,000	2.79	3.9	1.8	6.6
<i>Northeast Zone</i>	1,710,000	2.79	3.9	2.0	7.0
<b>Total Measured + Indicated</b>	<b>4,840,000</b>	<b>2.79</b>	<b>3.9</b>	<b>1.8</b>	<b>6.7</b>
Inferred Category					
<i>Main Zone</i>	1,740,000	2.77	3.1	1.1	4.8
<i>Northeast Zone</i>	2,510,000	2.76	2.3	1.4	4.4
<b>Total Inferred</b>	<b>4,250,000</b>	<b>2.76</b>	<b>2.6</b>	<b>1.3</b>	<b>4.6</b>

*Refer to Table 14-2 and Table 14-6 for resource estimation notes.*

The majority of the outlined mineral resources could likely be mined using surface mining methods. Some of the identified mineral resources are located underneath Gays River. Sandy soil lies underneath Gays River, so mining close to the river would be susceptible to water

inundation. In other words, the mineral resources that lie close to, or underneath Gays River would be relatively more expensive to recover due to the added cost of either (a) diverting the river or (b) recovering the resources using underground mining methods.

### ***Getty Deposit Resource Estimate***

Cullen et al., (2011) summarized their Resource Estimate of the Getty Deposit as follows:

"The estimation of mineral resources of the Getty deposit is based on 138 drill holes completed by Acadian in 2007 and 2008 and 184 historic drill holes completed during the 1970's by prior operators. Getty Northeast Mines Limited drilled 181 of these historic drill holes and the remaining 3 drill holes were completed by Imperial Oil Limited. It should be noted that Mercator managed the 2007 and 2008 drilling programs for Acadian and that Quality Control and Quality Assurance protocols included the systematic insertion of independent analytical standards and blanks plus duplicate sample analyses and independent check sample analyses.

**Table 1-3: Getty Mineral Resources**

<b>Resource Category</b>	<b>Zn Eq. % Cut-off</b>	<b>Tonnes (Rounded)</b>	<b>Zinc %</b>	<b>Lead %</b>	<b>Zinc Eq %<sup>1</sup></b>
Measured	2.00	1,550,000	1.97	1.45	3.68
Indicated	2.00	2,810,000	1.82	1.44	3.51
<b>Indicated + Measured</b>	<b>2.00</b>	<b>4,360,000</b>	<b>1.87</b>	<b>1.44</b>	<b>3.57</b>
<b>Inferred</b>	<b>2.00</b>	<b>960,000</b>	<b>1.73</b>	<b>1.59</b>	<b>3.60</b>

Notes:

1. Zinc Equivalent % (Zn Eq.%) =  $\text{Zn \%} + (\text{Pb \%} \times 1.18)$  and is based on mill recoveries of 89.3% for zinc and 89.5% for lead, \$US1.10/lb Zn and \$US1.15/lb Pb metal pricing and smelter returns of 85% for Zn and 95% for Pb.

### ***Summary – Gays River and Getty Deposits***

A summary of the mineral resources for both deposits was prepared and is presented in the following table. The reader should note that the Gays River and Getty mineral resource estimates were prepared by different authors using different parameters.

**Table 1-4: Gays River and Getty Deposits Mineral Resources**

<b>Zone and Resource Category</b>	<b>Block Cut-off (% Zinc- Equivalent)</b>	<b>Tonnes</b>	<b>Average SG</b>	<b>Percent Zinc</b>	<b>Percent Lead</b>	<b>Percent Zinc- Equivalent</b>
<b>Measured Category</b>						
<i>Gays River Main Zone</i>	0.75%	1,340,000	2.8	4.4	2	7.4
<i>Gays River Northeast Zone</i>	0.75%	n/a	n/a	n/a	n/a	n/a
<i>Getty</i>	2%	1,550,000	2.86	2	1.5	4.1
<b>Total Measured</b>	<b>Varies</b>	<b>2,890,000</b>	<b>2.83</b>	<b>3.1</b>	<b>1.7</b>	<b>5.7</b>
<b>Indicated Category</b>						
<i>Gays River Main Zone</i>	0.75%	1,790,000	2.78	3.6	1.6	5.9
<i>Gays River Northeast Zone</i>	0.75%	1,710,000	2.79	3.9	2	6.9
<i>Getty</i>	2%	2,810,000	2.86	1.8	1.4	4
<b>Total Indicated</b>	<b>Varies</b>	<b>6,310,000</b>	<b>2.82</b>	<b>2.9</b>	<b>1.6</b>	<b>5.3</b>
<b>Measured + Indicated</b>						
<i>Gays River Main Zone</i>	0.75%	3,130,000	2.79	3.9	1.8	6.6
<i>Gays River Northeast Zone</i>	0.75%	1,710,000	2.79	3.9	2	6.9
<i>Getty</i>	2%	4,360,000	2.86	1.9	1.4	4
<b>Total Measured + Indicated</b>	<b>Varies</b>	<b>9,200,000</b>	<b>2.82</b>	<b>2.9</b>	<b>1.7</b>	<b>5.4</b>
<b>Inferred Category</b>						
<i>Gays River Main Zone</i>	0.75%	1,740,000	2.77	3.1	1.1	4.8
<i>Gays River Northeast Zone</i>	0.75%	2,510,000	2.76	2.3	1.4	4.4
<i>Getty</i>	2%	960,000	2.86	1.7	1.6	4.1
<b>Total Inferred</b>	<b>Varies</b>	<b>5,210,000</b>	<b>2.78</b>	<b>2.5</b>	<b>1.3</b>	<b>4.5</b>

Notes:

1. Cut-off grade for mineralized zone interpretation was different for each zone.
2. Block cut-off grade for defining Mineral Resources was 0.75% zinc-equivalent for the Gays River Deposit and 2% for the Getty Deposit
3. Non-diluted
4. Mineral resources that are not mineral reserves do not have demonstrated economic viability
5. Specific gravity was calculated based on zinc and lead content. There are no other sulphides or dense minerals that are present in significant quantities
6. No Mineral Reserves of any category were identified.
7. Zinc-equivalency for lead was calculated based on relative metal prices, demonstrated processing recoveries (86% & 84% for lead and zinc, respectively), estimated smelter returns 95% & 85% for lead and zinc) and demonstrated concentration factors (75% & 65% for lead and zinc). 1% Lead = 1.5% Zinc. Note that Cullen et al.. (2011) used a slightly different zinc equivalent grade value whereby 1% Lead = 1.18 % Zinc. Though this would affect the cut-off value, the "Percent Zinc Equivalent" column of this table uses a zinc-equivalent value of 1% Lead = 1.5% Zinc for both the Gays River and Getty Deposits.
8. The Gays River and Getty Deposit's mineral resources were estimated by the authors described in Roy and Cullen (2011).

The Gays River and Getty Deposits have merit enough to warrant additional work.

Further diamond drilling and specific gravity work is recommended on the Gays River Deposit. This work, plus a 20% contingency factor, was estimated to cost \$1.0 million.

## **Mining Methods**

The proposed open pit mining would be done using conventional truck and shovel open pit mining methods. No underground mining has been planned within this study. The open pits would be mined using 10 meter high benches. Drilling & blasting is assumed for the rock portion of the deposit while the overlying overburden is considered free digging and will not require blasting. The mine equipment fleet would include 90 tonne capacity haul trucks. Three principal pits and a small satellite pit would be mined, the total tonnage being 6.47 Mt at a grade of 1.64% lead and 2.95% zinc. This average grade equates to an average NSR value of C\$76.09 per tonne. The material movement rate in the 7.5 year production schedule peaks at approximately 67,000 tpd.

## **Mineral Processing and Metallurgical Testing**

Selwyn proposes to raise the mill throughput from a nominal 55,000 dmt per month to 73,000 dmt per month by effecting changes to the crushing, grinding and concentrate filtration circuits.

Metallurgical performance is expected to be similar to that achieved during the recent operations. However, the recovery of zinc will decrease as lower grade mineralization from the Getty Deposit is processed.

Once circuit stabilities have been achieved, it is recommended that comprehensive mineralogical and metallurgical surveys be conducted to facilitate a thorough understanding of the process dynamics. This information can then be applied to design circuit changes to enhance metallurgical performance.

Basic instrumentation and process control systems should be introduced, on a prioritized basis, as economic conditions permit.

## **Project Infrastructure**

The Scotia Mine mill, designed and built in 1978/1979, is a flotation process and has a rated capacity of 1,350 tonnes per day. However, it has operated for extended periods at a rate in excess of 2,000 tonnes per day. Most infrastructure required for mineral extraction and processing is available onsite.

New crushers will be purchased and a larger screen installed to enhance the performance of the crushing plant. Improvements to the fine ore bin discharge arrangements will improve the stability of the feed rates, and hence the performance of the rod mill. Concentrate pressure filters will replace the vacuum disc filters and dryers that were used in the earlier operations. As a result, the capacity of the concentrate dewatering circuits will be increased while reductions in operating costs will be realized through the elimination of fuel required to service the rotary



dryers. Offsetting these advantages there will be a modest increase in the cost of concentrate freight. Minor changes will be made to the flotation circuit to permit the advancement of final grade concentrates through the cleaner circuits to the respective thickeners, thereby providing some control on the loads in these circuits.

Highway access to the site is excellent. The road network and other civil infrastructure is in good condition with typical minor maintenance being required. A thorough inspection was completed of the main road access bridge and it was found that within 2-3 years, major maintenance must occur on the bridge. Before production may occur, integrated with the pre-stripping operation, roadwork will be completed onsite to service the expanded production area.

Storage and ship loading facilities for lead and zinc concentrates are available at the seaport of Sheet Harbour, a distance of eighty kilometres from the mine site over paved roads. ScoZinc leases land from the Province and owns the infrastructure (storage facility, conveyor). Rail transport facilities have also been used for concentrate shipping via the port in Halifax. A railway siding is located in Milford, eight kilometres from the site on paved roads.

Three-phase power is supplied through the regional grid at reasonable rates. Most of the mill's water requirements are satisfied by in-process recycling. Make-up water is drawn from the perennial Gays River. The existing tailings pond has sufficient capacity for the life of the project. There is also sufficient area for waste rock storage on the property.

## **Environmental**

The site has operated several times in the past as a fully permitted underground and, more recently, surface mine. The most recent operations by ScoZinc noted above were completed under the EA Approval granted in 1999 to Savage Resources and transferred to ScoZinc. The Industrial Approval (IA) and other minor operating approvals needed (Water Withdrawal and Septic System Operation for example) were in place during the previous operations and transfer have either happened or are in process. There is a requirement, as the Southwest Expansion Project is a new undertaking not covered under previous EA Approvals, to register the project as a Class I Undertaking pursuant to the Nova Scotia Environment Act and Environmental Assessment Regulations. Other relevant provincial regulations include the Activities Designation Regulations, which requires an amendment to the existing Industrial Approval from Nova Scotia Environment (NSE) for expansion of the zinc / lead mining operation, as well as approval to alter wetlands; and the General Blasting Regulations made pursuant to the Nova Scotia Occupational Health and Safety Act (1996). . No municipal approvals are required.

An Environmental Assessment Approval is in place for Scotia Mine (Gays River Deposit), approved in August 2000, which addresses the environmental concerns of a surface and

underground mining operation along with the diversion of a 500 meter section of the Gays River to accommodate the pit design. The river has not yet been diverted.

The Environmental Assessment Registration Document covered only part of the Gays River Deposit. This area was mined by ScoZinc Limited in 2007-2008. Resources in this area have not been exhausted. Additional environmental assessment work would be required before the mine can expand outside of the permitted footprint, either west along strike in the Main Zone, northeast across Gays River to the Northeast Zone or to the Getty Deposit.

Before mining can restart, the existing Industrial Approval must be amended to reflect operating status from its current "care and maintenance" status. This should be a relatively straightforward process.

There are no known requirements for an environmental assessment under the Canadian Environmental Assessment Act (CEAA) associated with the proposed Southwest Expansion Project. No federal land or funding is required for the Project. There are no requirements for federal permits or authorizations under the CEAA Law List Regulation currently projected.

The Project will be reviewed as outlined above and it is anticipated that the project will be granted Environmental Assessment with conditions and a new or amended Industrial Approval will be required. It is anticipated that all of the required permits and approvals for full operation will be in place by Q4 2011 or Q1 2012.

The schedule for reclaiming the site and additional detail has been created, it includes; removal of infrastructure and buildings, final rehabilitation of stockpiles, final surface contouring and sediment erosion control, assessment and remediation (if required), of any contaminated soils, rehabilitation of the former mining pit and tailings management area (including slope stabilization), pit flooding, water level control, revegetation, and, monitoring.

There have been initial consultations with both the local communities as well as the first nations and as mine plan has developed. This established communication will continue as the mine nears production and operation.

## **2. INTRODUCTION**

This preliminary economic assessment has been prepared for the ScoZinc Property, containing the Getty and Gays River deposits, located in central Nova Scotia, Canada, by Allnorth Consultants Limited (Allnorth) on behalf of Selwyn Resources Ltd. (Selwyn). The current and previous estimates were prepared and disclosed as required under the National Instrument 43-101 and are considered compliant with Canadian Institute of Mining, Metallurgy and Petroleum Standards for Mineral Resources and Reserves. The most recent report, which this Preliminary

Economic Assessment is primarily based on, is "Gay's River Zinc-Lead Deposit, Including the Getty Deposit, Nova Scotia, Canada," prepared for ScoZinc Limited by MineTech International Limited on July 2, 2011.

Terms of reference for this Preliminary Economic Assessment were initially established on April 27, 2011 between Selwyn and Allnorth.

## **2.1 EXTENT OF FIELD INVOLVEMENT OF THE QUALIFIED PERSON(S)**

Field involvement by Fisher and numerous Allnorth staff consisted of several site visits between early April, 2011 and the time of publishing this report. During those visits the mine property and mill facilities were viewed.

Field involvement for the geology component (Roy and Cullen) was described by Roy et al. (June, 2011).

Taggart visited the site during the period May 3 and May 4, 2011 during which time an inspection of the mill was carried out.

Taggart based the projections of plant throughput, metallurgical performance and operating costs primarily on information provided by ScoZinc. In particular, the data contained in Monthly Operating Reports and the Monthly Operating Cost Reports were relied upon for this purpose.

In general, technical information was lacking. No metallurgical testwork was available and the original design criteria could not be found. An audit of the metallurgical accounting protocols could not be performed due to the absence of relevant documentation.

## **3. RELIANCE ON OTHER EXPERTS**

This report was prepared by Allnorth for Selwyn; the material, conclusions and recommendations contained herein are based upon information available to Allnorth at the time of report preparation. Allnorth consulted several experts during the writing of this report; Mercator Geological Services Limited, MineTech International Limited, P&E Mining Consultants Inc., and Conestoga-Rovers & Associates. Allnorth has no reason to question the quality or validity of the data and opinions expressed by these experts. Allnorth supports the comments and conclusions of those qualified persons who have been included in this report.

This report includes opinions that concern exploration and development potential for the project as well as recommendations for further analysis. These are intended to serve as guidance and should not be taken as a guarantee of success.

Section 13 and components of Sections 17 and 21 were prepared exclusively for Selwyn Resources Ltd. by P. Taggart & Associates Ltd. The quality of the information, conclusions and

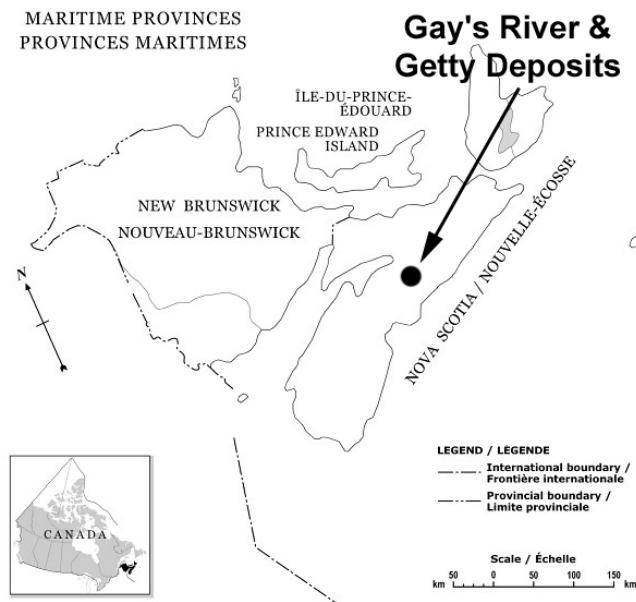
estimates contained herein are consistent with the level of effort in providing services based on information available at the time of writing this report, data provided by outside sources, and the assumptions, conditions and qualifications set forth in this report. Any use of, or reliance on, this report by any third party is at that party's sole risk.

#### 4. PROPERTY DESCRIPTION AND LOCATION

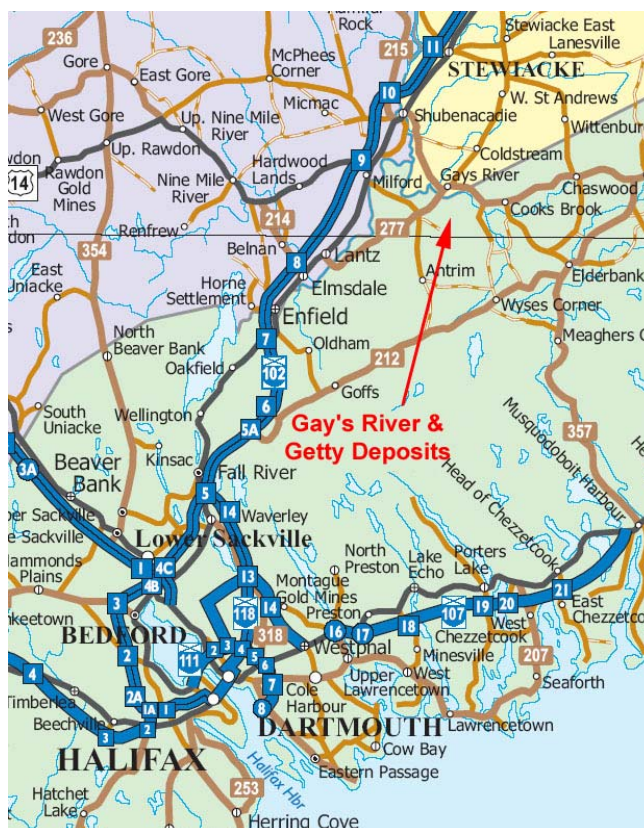
The Gays River (Main and Northeast) and Getty Deposits ("the Property") are located approximately 60 kilometers northeast of Halifax, Nova Scotia in the community of Gays River in the Halifax Regional Municipality. The property's general location is 45°02' North, 63°21' West.

The Gays River Deposit consists of 615 hectares of mineral rights, including land with exploration potential for zinc/lead mineralization, and 568.4 hectares of land ownership (real property) (Figure 4-1 and Figure 4-2).

The Getty property consists of 62 contiguous mineral claims, approximately 992 hectares.



**Figure 4-1: Location Map, Gays River, Nova Scotia**



**Figure 4-2: Location Relative to Halifax**

#### **4.1 EXPLORATION LICENCES**

ScoZinc currently controls eleven exploration licenses covering 260 claims in the immediate vicinity (within approximately 4 km) of the Gays River mineral lease. Each individual claim covers an area of forty acres (16 hectares). In total, the 260 claims cover approximately 4,200 hectares (10,000 acres). These licenses are located along strike from the Gays River Deposit and include favorable host rocks similar to that at the mine site. Exploration License no. 06959 covers the Getty Deposit.

Four of the exploration licenses (numbers 6517, 6518, 9069 and 9070) were recently transferred from Acadian to ScoZinc. This transfer was part of the Acadian-Selwyn agreement.

All licenses were in good standing and registered to ScoZinc Limited as of October 5th, 2011. Anniversary dates range from February 1st to December 21st. The ScoZinc exploration licenses are summarized in Table 4 1. Table 4 2 through Table 4 12 provide details on each ScoZinc exploration license.

**Table 4-1: Summary of ScoZinc Exploration Licenses (as of October 5<sup>th</sup>, 2011)**

License	No. of Claims	Sheet	Anniversary Date	In Good Standing?	Notes
05851	7	11E/03B	November 5 <sup>th</sup>	Y	
06268	28	11E/03B	May 2 <sup>nd</sup>	Y	
06303	5	11E/03B	October 25 <sup>th</sup>	Y	
06304	1	11E/03B	October 13 <sup>th</sup>	Y	
06517	4	11E/03B	February 1 <sup>st</sup>	Y	
06518	2	11E/03B	February 1 <sup>st</sup>	Y	
06959	62	11E/03B	October 20 <sup>th</sup>	Y	Getty Deposit
08905	7	11E/03B	October 20 <sup>th</sup>	Y	
08936	3	11E/03B	December 21 <sup>st</sup>	Y	
09069	62	11E/03B	August 14 <sup>th</sup>	Y	
09070	79	11E/03A, 11E/03B	April 26 <sup>th</sup>	Y	

**Table 4-2: Exploration License 05851 (7 Claims)**

Claim Reference Map	Tract	Claims
11E/03B	45	FGH L
11E/03B	46	BCD

**Table 4-3: Exploration License 06268 (28 Claims)**

Claim Reference Map	Tract	Claims
11E/03B	7	D E J L K M N O P Q
	18	A B C E F G H
	19	A B C D E F G H L M N

**Table 4-4: Exploration License 06303 (5 Claims)**

Claim Reference Map	Tract	Claims
11E/03B	29	L M N O P

**Table 4-5: Exploration License 06304 (1 Claim)**

Claim Reference Map	Tract	Claims
11E/03B	29	E

**Table 4-6: Exploration License 06517 (4 Claims)**

Claim Reference Map	Tract	Claims
11E/03B	6	NOPQ

**Table 4-7: Exploration License 06518 (2 Claims)**

Claim Reference Map	Tract	Claims
11E/03B	7	C F

A further five exploration licenses (numbers 6517, 6518, 8367, 9069 and 9070) are currently in the process of being transferred from Acadian to ScoZinc. This transfer is part of the Acadian-Selwyn agreement, and the exploration licenses will ultimately be held by Selwyn.

License 08367 is not contiguous to the Property – it is part of the Smithfield deposit.

**Table 4-8: Summary of ScoZinc Exploration Licenses**

License	No. of Claims	Sheet	Anniversary Date
06517	4	11E/03B	<i>February 1, 2012</i>
06518	2	11E/03B	<i>February 1, 2012</i>
09069	62	11E/03B	<i>August 14, 2012</i>
09070	79	11E/03A, 11E/03B	<i>April 26, 2012</i>
08367	5	11E/06A	<i>August 14, 2012</i>

## 4.2 GETTY DEPOSIT

Cullen et al., (2011) described the exploration rights that cover the Getty Deposit:

"The deposit occurs within Exploration License 06959 [refer to Table 4-1] which was issued to Acadian on October 20th, 2006 as a result of tendering by Nova Scotia Department of Natural Resources ("NSDNR") and is currently held by ScoZinc. The Getty property consists of 62

contiguous mineral claims, approximately 992 ha, held under Mineral Exploration License 06959 ...

"In 1990 lands covering the deposit were placed under closure by NSDNR (1990, c. 18, s. 22; 1999 (2nd Sess.), c. 12, s. 6.) and these were subsequently opened for staking on September 12th, 2006. Multiple applications for exploration licenses covering the deposit were received at that time by the Registrar of Mineral and Petroleum Titles, and all claims were therefore put up for tender under provisions of Section 34 of the Act (1990, c. 18, s. 34.). Acadian submitted the winning bid for this tender and was awarded the exploration licenses detailed in [Table 4-1]. Details of bids received and associated work requirements have been deemed confidential by the Minister of Natural Resources.

"At the effective date of this report [Cullen et al., 2011] exploration licenses described above were in good standing as represented in records of the Nova Scotia Department of Natural Resources. This assertion does not constitute a legal search of title by Mercator with respect to ownership or status of the licenses, but Mercator has no reason to question their status."

#### **4.3 ROYALTY AGREEMENT**

Cullen et al.. (2011) described a royalty agreement that covers the Getty Deposit:

"Acadian advised Mercator and Selwyn that License 06959 that covers the Getty Deposit, plus certain peripheral claims in the area, are subject to an agreement between Acadian and Globex Resources Ltd., dated October 10th 2006, that provides Globex with a 1% Net Smelter Return (NSR) royalty interest in the associated claims plus 25,000 common shares of Acadian. Agreement terms also allow Acadian to purchase 50% of the NSR for \$300,000 CDN. Mercator did not review or confirm terms of the Acadian-Globex agreement for purposes of this report and has relied upon Acadian and Selwyn for this information."

#### **4.4 MINERAL LEASE**

A Mineral Lease entirely covers (#10-1) the Scotia Mine site (Gays River Deposit). It was originally granted by the Nova Scotia Government to Westminer Canada Limited on April 2, 1990 as a "Mining Lease." However, changes to the Nova Scotia Mineral Resources Act that came into effect in November 2004 changed the terminology such that existing "Mining Leases" are now known as "Mineral Leases."

The anniversary date (review date) of Mineral Lease #10-1 is April 2<sup>nd</sup> of each year. Table 4-9 lists the claims comprising the Mineral Lease. Figure 4-5 shows its location. The lease conveys the rights to all minerals except coal, uranium, salt and potash. The lease was transferred to Savage Resources in 1996 and later to Pasminco Resources Canada Company in 1999. It was finally



transferred to ScoZinc in 2002. The duration of the lease is twenty years, at which time it may be renewed.

The Nova Scotia government currently holds a reclamation security (bond) for the lease in the amount of \$2.6 million. As well, Selwyn instructed its Nova Scotia counsel to pay the Nova Scotia government \$892,876.72 in provincial royalty payments for ScoZinc's past production.

**Table 4-9: Mineral Lease 10-1 (38 Claims)**

**Tract Map (NTS) 11E-3B**

<b>Tract</b>	<b>Claims</b>	<b>Number of Claims</b>
5	NOP	3
19	JKPQ	4
20	BCDE FGK LMNO PQ	13
28	DEKL MNOP	8
29	ABCD FGH JKQ	10
<b>Total</b>		<b>38</b>

## **4.5 SURFACE RIGHTS (REAL PROPERTY)**

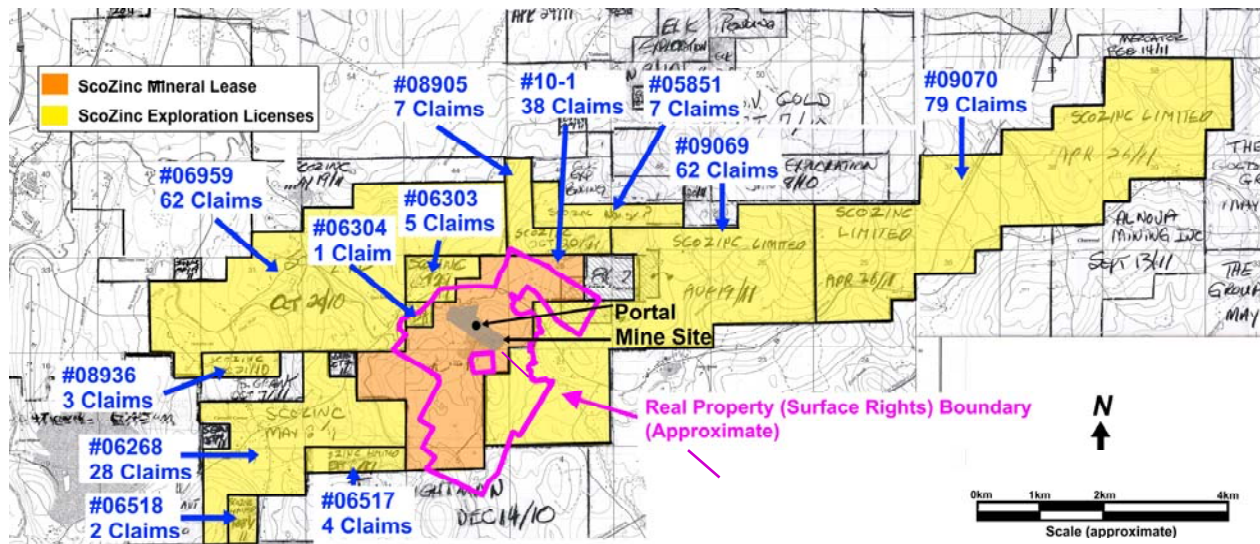
### **4.5.1 Gays River Deposit**

ScoZinc owns outright approximately 568 hectares (1,404.6 acres) of land (real property) containing the entire surface infrastructure; the tailings area and most of the outlined mineralization (refer to Table 4-10 and Figure 4-4). The boundaries were established through legal surveys.

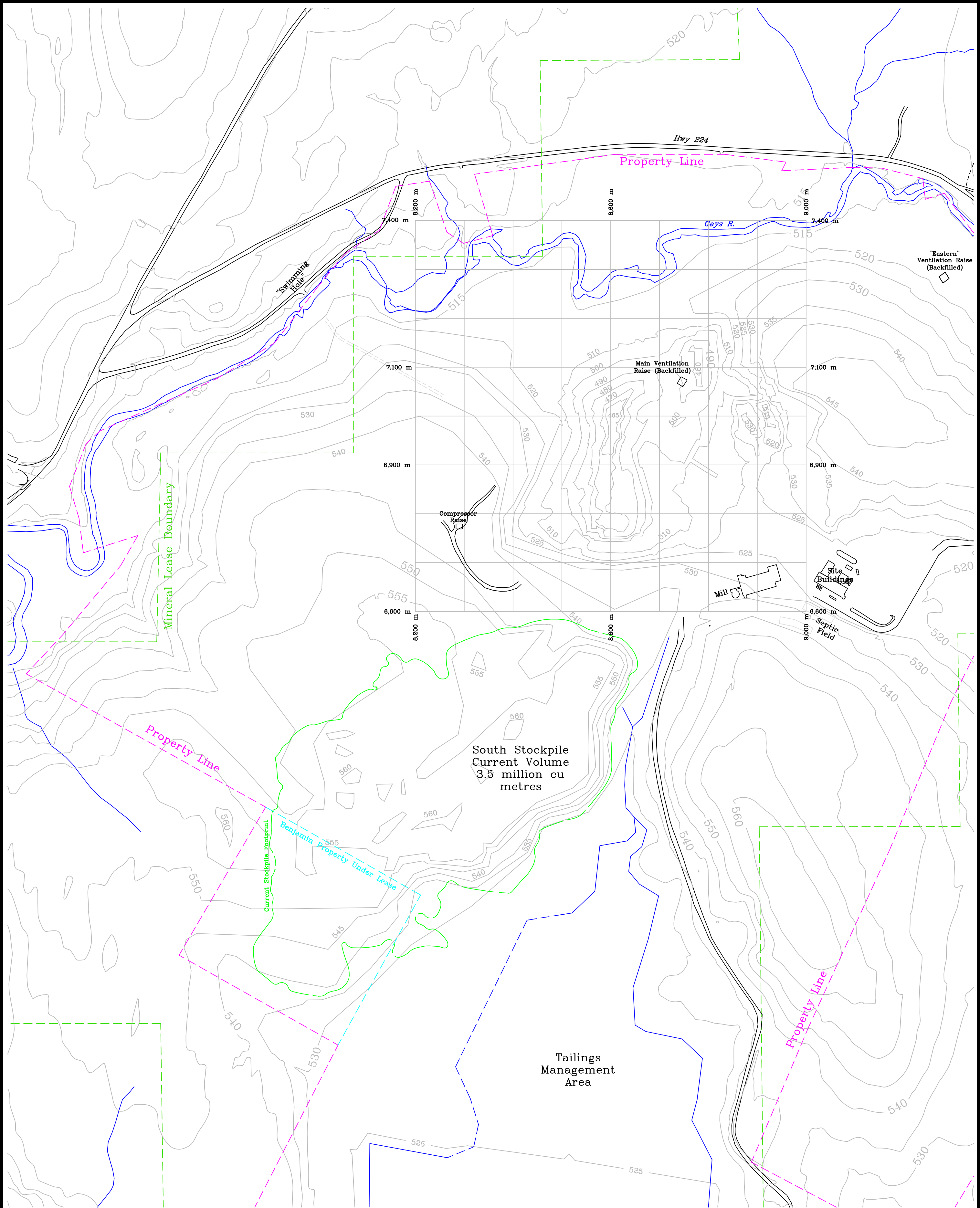
ScoZinc has an agreement with an adjacent landowner (Benjamin) to lease 13 hectares of land, adjacent to the tailings impoundment, for the purpose of stockpiling stripped overburden waste material (refer to Figure 4-4).

**Table 4-10: Property Ownership, ScoZinc Limited**

<b>Property ID #</b>	<b>Acres</b>	<b>Hectares</b>
00369363	50.0	20.2
00522623	90.0	36.4
20080495	49.0	19.8
20080529	10.0	4.0
20158176	8.7	3.5
20158184	4.4	1.8
20223400	6.0	2.4
20223413	3.0	1.2
20313250	4.5	1.8
20416384	1.6	0.6
40227936	3.0	1.2
40227951	7.5	3.0
40757577	115.4	46.7
40227963	181.3	73.4
40227985	5.6	2.3
40290256	0.72	0.3
40227963	171.8	69.5
40290264	110.0	44.5
40291452	544.6	220.4
40292553	4.5	1.8
40312092	33.0	13.4
<b>Total</b>	<b>1,404.59</b>	<b>568.4</b>

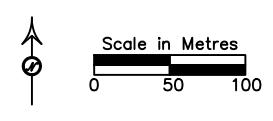


**Figure 4-3: Claim Reference Map 11E03B Showing Exploration Licenses, Mineral Lease and Real Property Boundary (Surface Rights) for the Gays River Deposit and Getty Deposit**



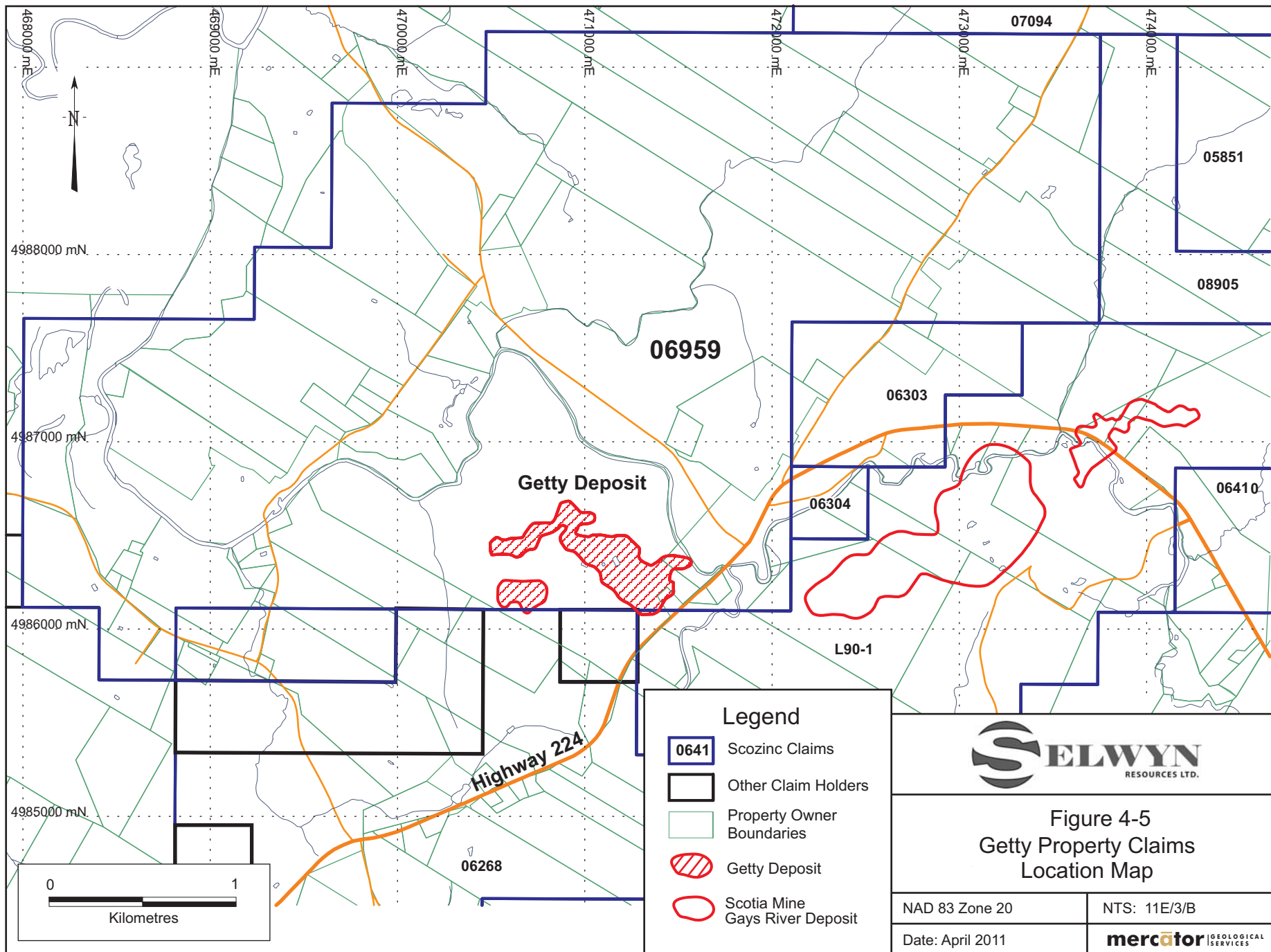
**Legend:**  
- Property Line  
- Contour Line  
- Mineral Lease Outline  
- Drainage Direction  
- Areas Requiring Contouring & Re-vegetation  
- Areas Requiring Only Re-vegetation  
- Water

Site Grid.  
Dimensions in metres.  
Site contour interval = 5 metres above RL 515 metres and variable below that level.



Date: March 25, 2011  
Scale: 1:5,000 (See Bar Scale)  
Drawn by: Douglas Roy, M.A.Sc., P.Eng.  
MINETECH INTERNATIONAL LIMITED  
CONSULTANT ENGINEERS & GEOLOGISTS  
HALIFAX, CANADA

ScoZinc Limited  
Scotia Mine  
Gays River, Nova Scotia  
Figure 4-4  
Site as of January 2011





#### **4.5.2 Getty Deposit**

Cullen et al.. (2011) described the surface or real property rights that cover the Getty Deposit:

"Acadian advised Mercator that surface rights to lands covering the Getty Deposit are owned under separate titles by Allan Benjamin, David Benjamin and Heather Killen. Mercator did not review the access agreements for purposes of this report but assumes that similar access permission to enter the lands for exploration purposes will be established by Selwyn. The mineral exploration claims and permits currently in place with respect to the Getty project are adequate for execution of technical programs recommended in this report. Permits necessary to do the proposed program will be applied for as required. There is adequate suitable land within the claim area for the recommend work program and future mining activities; however, Selwyn does not hold surface rights to this land. Selwyn will negotiate suitable purchase arrangements when the economic viability of the project has been demonstrated."

#### **4.6 AGGREGATE LEASE**

An aggregate lease covers the Scotia Mine property (Gays River Deposit). Gallant Aggregates signed a thirty-year lease agreement to mine and remove aggregate from the property for one dollar per tonne of material that is removed from the property. The lease was signed on May 15, 2003 and entitled Gallant, with certain limitations, to mine anywhere on ScoZinc's land. The agreement contains a renewal clause and gives Gallant the right of first refusal to purchase the surface rights (real property titles). A major condition of Gallant's lease is that metal mining takes precedence over aggregate mining. Therefore, Gallant's lease would not interfere with zinc and lead mining operations.

In January, 2008, Gallant exercised its option under the Gallant Agreement to purchase approximately 25 acres of the Scotia Mine property. Concurrent with the transfer of the 23 acres, ScoZinc and Gallant executed a License, Option and Royalty, which terminated the Original Agreement and granted Gallant the right to access the Scotia Mine property to access existing water infrastructure and to obtain electrical power. The License, Option and Royalty Agreement grants Gallant the right to remove, extract and process sand, gravel, fill and obtain materials from the overburden and waste material created by ScoZinc at the Scotia Mine site for the greater of \$25,000 per annum or \$1.00 per metric tonne. In addition, Gallant has a right of first refusal to purchase the Scotia Mine property if ScoZinc plans to sell the property after mining operations are completed or abandoned.

## **5. ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY**

### **5.1 ACCESSIBILITY**

The Gays River (Main and Northeast) and Getty Deposits ("the Property") are located approximately 55 kilometers northeast of Halifax, Nova Scotia along the border between Colchester and Halifax Counties (45°01'55" North Latitude and 63°21'30" West Longitude). It lies approximately one kilometre east of the community of Gays River. Access to the Property is by paved roads and is approximately fifteen kilometers off the Trans-Canada Highway, along Route #224. The Halifax International Airport is located 20 kilometers southwest of the mine site.

Portions of Highway #224 and Highway #277 are subject to spring weight restrictions. Truck weights are limited for a period that normally lasts six weeks.

### **5.2 PHYSIOGRAPHY**

The property is in a rural-residential area of central Nova Scotia that is typified by rolling topography and abundant surface water. The Gays River Deposit lies along the south side of the Gays River main branch, immediately east of the confluence with the Gays River south branch. The Getty Deposit lies immediately west of the Gays River Deposit, on the north side of Highway 224 (refer to Figure 4-5).

The Gays River watershed is characterized by gently rolling topography, having a maximum elevation of 170 meters, an extensive cover of deciduous forest, a small population and local agricultural land development. Lakes, ponds and rivers are sparsely distributed throughout the watershed. Typical vegetation consists of northern black spruce, balsam fir and juniper with birch in more wet areas. Areas of open bog occur on part of the claims. Currently, parts of the forest are being harvested or thinned.

### **5.3 CLIMATE**

The temperate climate permits year-round operations. Part of the main road (Highway 224) that leads to the mine site is subjected to road closure in the early spring when the frost thaws. The closure typically lasts a few weeks. The closure start and end dates vary year-to-year according to the weather. During that time, heavy truck traffic is not permitted on the road.

From the Getty Zinc-Lead Deposit 2011 Technical Report; "The property is situated in central Nova Scotia where northern temperate zone climatic conditions are present and are moderated by relative proximity to the Atlantic Ocean. Distinct seasonal variations occur, with winter conditions of freezing and potentially substantial snowfall expected from late November through late March. Spring and fall seasons are cool, with frequent periods of rain. Summer

conditions can be expected to prevail from late June through early September, with modest rainfall.

The following climate information reported for nearby Halifax International Airport during the 30 year period ending in 2000 characterizes seasonal precipitation and temperature trends in the area. The average July daily mean temperature for the reporting period was 18.6 degrees Celsius with a corresponding average maximum daily temperature of 23.6 degrees Celsius. Average daily winter temperature for January was minus 6 degrees Celsius with a corresponding average daily minimum being minus 10.6 degrees. Mean annual temperature is 6.3 °C, and mean annual precipitation is 1,452.2 mm. Yearly evapo-transpiration is estimated to be 560 mm. Climate conditions permit many exploration activities, such as core drilling and geophysics, to be efficiently carried out on a year-round basis. Other activities, such as geochemical surveys and geological mapping are typically limited by winter snow cover." (Cullen et al., 2011)

## **5.4 LOCAL RESOURCES AND SITE INFRASTRUCTURE**

The Scotia Mine mill, designed and built in 1978/1979 had a nominal ("nameplate") capacity of 1,350 tonnes per day (Figure 5-1). However, during 2007-2008, ScoZinc operated the mill for extended periods at rates over 2000 tonnes per day. It was initially built to treat the zinc/lead ore from the Gays River Mine. In 1986, it was modified to treat gold ores using gravity and flotation circuits. In 1989, it was again reworked to treat zinc/lead ore from the Scotia Mine which was then being operated by Westminer Canada Ltd. ("WMC"). The concentrator has been properly maintained and is ready for quick start-up at minimum cost.

The mill is equipped with two stage crushing, two stage grinding, flotation cells, thickening, disk filtration and rotary kiln concentrate drying. The concentrator building contains a complete analytical laboratory, metallurgical testing laboratory, control room, maintenance area and office facilities. Its total area is approximately 32,000 square feet.

The administration building has an area of approximately 26,000 square feet. It contains offices, a dry, warehouse, workshops, a large boardroom, and several heavy equipment bays. Other, smaller surface facilities include:

- a compressor building (1,600 square feet);
- a "tire shop" (2,000 square feet);
- a welding shop;
- a geology building; and,
- a core shed.



Storage and ship loading facilities for lead and zinc concentrates are available at the seaport of Sheet Harbour, a distance of eighty kilometers from the mine site over paved roads. ScoZinc owns loading equipment and a storage facility on lease land at the Sheet Harbour Marine Industrial Park. Sheet Harbour is a natural harbour on the Atlantic coast that remains ice free in the winter months and can handle vessels up to 40,000 tonnes in displacement. Rail transport facilities have also been used for concentrate shipping. A railway siding is located in Milford, eight road-kilometers from the site.

During the last period of operations, lead concentrate was shipped through the port of Halifax, approximately 70 kilometers from the mine over excellent roads. Zinc concentrate was shipped in bulk through port facilities at Sheet Harbour that ScoZinc leases. The lease expires in April 2018 and has a 10-year renewal option.

The existing surface rights are sufficient for mining operations. Power is supplied through the regional grid at reasonable, industrial rates. Scotia Mine owns and maintains step-down transformers adjacent to the mill. Most of the mill's water requirements are satisfied by in-process recycling. Make-up water is drawn from the perennial Gays River.

The Southwest Expansion project will use the existing TMF for the disposal of tailings and treatment of effluent. Bathymetric work in July 2011 indicated that the existing Tailings Pond has a volume of approximately 850,000 cubic metres available and the Polishing Pond a volume of approximately 500,000 cubic metres. Data for the original design was limited and not definitive on the original capacity but anecdotal information suggests that both the Tailings and Polishing ponds had over 50% of the original design volumes available. Mill discharge to the TMF has historically been to a "tailings beach" located in the northeastern part of the Tailings Pond in a valley that had an original elevation in the range of 10-15 m above sea level. Tailings have been discharged to the TMF from the mill via large piping and through a variety of diffusers to promote and enlarge a fan of tailings. The tailings beach has over time developed to cover an area roughly equal to the current Tailings Pond and to elevations between 26 metres in the north to 23 metres (slightly higher than the current water level in the Tailings Pond). ScoZinc intends to continue to use this method of tailings disposal as it allows all but the finest solids in the mill discharge to be deposited in the tailings beach and maintain a significant portion of the Tailings Pond as "open" for settling of the finer solids before effluent decants to the Polishing Pond. ScoZinc intends to explore other options for increasing the capacity of the tailings beach to higher elevations to maintain "open" capacity. The extra capacity between the 23 and 26 metre level in the area of the tailings beach is significant (up to 250,000 cubic metres).

There is sufficient area for waste rock and overburden storage on the property. The main area for waste rock storage lies adjacent to the tailings pond on its northwest shore.



**Figure 5-1: Site Infrastructure (Facing Southwest)**

## **6. HISTORY**

### **6.1 OVERVIEW**

The Gays River Formation has seen exploration since the 19th century. Modern exploration on the Gays River Formation began in the early 1970s. From Cullen et al. (2011):

“First reports of zinc-lead mineralization in the Gays River area date to the late 1800’s and from this time until the 1950’s exploration consisted of limited amounts of mapping, pitting, trenching and sampling with up to 3% lead values being reported. Most activities focused on the area immediately around the adjacent Scotia Mine site, particularly along the South Gays River, where outcropping Gays River Formation dolomite hosting low grade zinc and lead mineralization was trenced and drilled in the 1950’s in the “Gays River Lead Mines Area” (Campbell, 1952).” (Cullen et al., 2011, section 5.2)

#### **6.1.1 Gays River Deposit**

The history of the project begins with its discovery in the early 1970’s by Cuvier Mines. Cuvier and Imperial Oil Limited (ESSO) carried out exploration work and delineated the mineralized zone which was then identified as being four kilometers long, 220 meters wide with depths varying from 20 to 200 meters. Initial development consisted of an exploration decline driven in 1975/76 with mine development starting in 1978 and mill commissioning in October 1979.

From 1979 until 1981, ESSO operated the mine and targeted the lower grade ore using a lower cost, bulk room and pillar underground mining method approach. Though Esso carried out some test mining in the higher grade mineralization near the carbonate contact, it was not part of the underground mine plan at that time. During this period, 554,000 tonnes of lead/zinc ore was mined with an average grade of 2.12% zinc and 1.36% lead (Table 6-1). Due to low metal prices, problems caused by high rates of water influx and difficult ground conditions, mining was suspended in 1981 and the mine was allowed to flood.

**Table 6-1: Historical Milling Records**

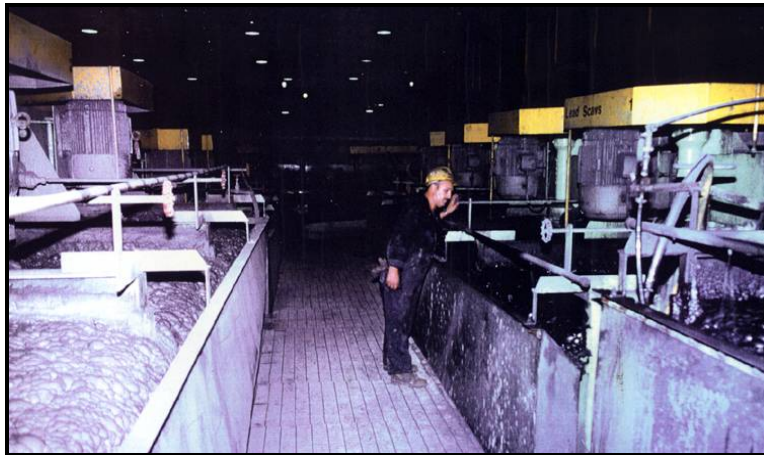
	Mill Feed			Concentrate Produced				Metal Recovery (%)	
	Tonnes	% Pb	% Zn	Pb Tonnes	Zn Tonnes	% Pb	%Zn	%Pb	%Zn
Esso (1979-1981)	550,000	1.4	2.1	10,000	17,000	74	62	96	91
WMC (1989-1991)	190,000	3.5	7.5	8,000	21,000	76	61	91	90
ScoZinc, 2007	337,000	0.85	2.14	3,359	8,694	64	55	76	67
ScoZinc, 2008	718,271	1.02	2.7	8,535	27,729	70	56	82	80
ScoZinc, 2009	101,097	0.60	0.91	790	3,785	61	57	82	82
Total	1,896,368	1.3	2.8	30,684	78,208	70	58	86	82

In 1985, Seabright Resources purchased the property and modified the mill circuits to treat gold ore from other Nova Scotia properties.

In 1988, Westminer Canada Limited (WMC) purchased Seabright Resources. WMC began dewatering the underground mine in 1989. Their extraction method was to use narrow vein, cut and fill mining to extract the higher grade ore zones. The mine was placed back into operation and reached commercial production in March 1990 (Figure 6-1 and Figure 6-2). During the period of operations by WMC (August 1989 to May 1991) the mine produced 190,000 tonnes of ore at an average grade of 7.5% zinc and 3.5% lead. Mining was curtailed due to low metal prices, mining method problems and high rates of water influx. Also, for corporate reasons, WMC decided to focus on larger scale mining ventures. Following suspension of mining at Gays River Mine, WMC commissioned several studies to characterize the local hydrology of the mine and to control the ground water in the mine. These results were never tested during mining, since a cyclic low in metal prices, among other factors, prompted WMC to place the property up for sale.



**Figure 6-1: Decline and Portal Access to the Underground Workings (circa 1990)**



**Figure 6-2: Flotation Circuit (circa 1990)**

In late 1996, Savage Zinc, Inc. purchased the Gays River Mine property from WMC and formed a wholly owned subsidiary named Savage Resources Canada Company (Savage). Savage started to rehabilitate the property, shops, equipment and office with the aim of starting production in 1997.

When Savage took over the operation of the former Gays River mining facility, the underground workings were flooded to the surface. After purchasing equipment and hiring employees, the mine dewatering phase started on June 7, 1997. With an installed pumping capacity of 9,000 USGPM, the average pumping rate to reach the 425 meter level was 5,200 USGPM. This level was reached during late August 1997. During this period of dewatering, men and equipment went underground to clean out the workings while management carefully examined the ground

conditions. They decided to prepare a mine plan that considered an open pit design. Later, after much review during a period of depressed metal prices, it was decided to abandon the proposed underground mining activities and keep the mine dewatered to the 425 level. The electrical equipment was removed and the pumps were shut off on April 1, 1998. At present the mine is flooded above the portal.

Savage concluded that an open pit operation was feasible and initiated environmental permitting, including provisions for a diversion of a portion of the Gays River. The environmental assessment plan was approved August 2000. The operating plan was never initiated, probably due to low metal prices at the time.

ScoZinc Limited ("ScoZinc"), purchased by Acadian Mining (ADA, TSX-V) in 2006 as its wholly-owned subsidiary, continued with Savage's plan and surface-mined the deposit during 2007 and 2008. ScoZinc mined 1.1 million tonnes of surface ore and stripped 9.4 million tonnes of overburden (refer to Table 6-1). Due to a drastic plunge of base metal prices nearly coinciding with the mine's re-opening; ScoZinc placed the mine on care-and-maintenance status in early 2009.

In 2008, ScoZinc also drilled 17 diamond drill holes through the Northeast Zone (refer to Sections 10 and 11).

In June 2011, Selwyn Resources Limited ("Selwyn") purchased ScoZinc with plans to reopen the mine amid high and rising metal prices.

### **6.1.2 Getty Deposit**

The following is adapted from Section 5 of Cullen et al. (2011):

"... with the exception of regional soil geochemical surveying by Penarroya Ltd. in 1964 (Rabinovitch, 1967) that did not identify the Getty Deposit, no substantial mineral exploration efforts appear to have been carried out on the current Getty property prior to its acquisition by Getty in 1972.

"Exploration in the current deposit area was initiated in 1972 by Getty and joint venture partner Skelly Mining Corporation under terms of an option - purchase agreement with Millmore-Rogers Syndicate.

"Discovery of the Getty zinc-lead deposit is attributed to drill hole GGR-12 which was completed in 1972 and intersected 4.63 meters of dolomite grading 15.48% combined zinc-lead, beginning at a down hole depth of 93.11 meters. Subsequent completion of over 200 holes by Getty and Imperial on and around the property served to delineate a nearly continuous mineralized zone

measuring approximately 1300 meters in length and up to 200 meters in width (Comeau, 1973, 1974; Comeau and Everett, 1975).

"Getty retained MPH Consulting Limited (MPH) to assess three development scenarios for the deposit and Riddell (1976) reported results of this work, which showed that production of 375,000 tonnes per year would be necessary to support a viable, stand-alone open pit operation.

"In 1980 economic aspects of developing the deposit based on an in-house tonnage and grade model were assessed by Esso (MacLeod, 1980). This study concluded that mining through open-pit methods as an ore supplement to the Gays River deposit would be economically viable, provided that important operating assumptions were met. The earlier MPH work was also reviewed at this time and some economic models updated. None of the work indicated that profitable stand-alone development of the deposit could be expected under market conditions of the time. George (1985) subsequently reviewed earlier evaluations and also reached a negative conclusion regarding development potential.

"In 1992 Westminer completed a resource estimate and preliminary economic assessment of the deposit based on Getty drilling results, with potential development in conjunction with the adjacent Gays River deposit being considered (Hudgins and Lamb, 1992). Results showed that milling of about 550 tonnes per day of Getty ore could be undertaken at a low cost if excess milling capacity at Gays River was being filled by such material. Westminer also indicated that zinc oxide production from the deposit would result in a substantially better financial return to the mine in comparison with a conventional smelter contract for sulphide concentrates.

"In December, 2007, Mercator completed an inferred resource estimate for the property, on behalf of Acadian, which was reported by Cullen et al.. (2007) and updated by Cullen et al.. (2008). Acadian completed a total of 138 new drill holes in support of these estimates." (Cullen et al., 2011, section 5.2)

## **6.2 OWNERSHIP HISTORY**

### **6.2.1 Gays River Deposit**

The Gays River Deposit was discovered in 1973 by the Imperial Oil Enterprises ("Esso") and Cuvier Mines Limited ("Cuvier") joint venture. Esso initiated mine development in 1978, commissioned the mill in 1979, developed the underground mine and began mining and milling.

Seabright Resources Inc. ("Seabright") acquired the Scotia Mine property and mill in 1984. Despite a favorable feasibility study, Seabright did not reactivate the Scotia Mine due to

depressed metal prices at the time. Seabright converted the mill for gold processing and processed gold ore from several satellite properties.

The Scotia Mine property was acquired by Westminer Canada Limited ("Westminer"), a Canadian subsidiary of Western Mining Corp of Australia, in 1988, at which time a review of the potential for mining the deposit was undertaken. Westminer dewatered the mine and continued mining and milling.

In 1997, Savage Resources Canada Limited acquired the Scotia Mine assets from Westminer. Savage concluded that an open pit operation was feasible and initiated environmental permitting, including provisions for a diversion of a portion of the Gays River. Savage was subsequently taken over by Pasminco Resources Canada Company ("Pasminco Resources") and the environmental assessment plan was approved by the Nova Scotia Minister of the Environment in August 2000. The operating plan was never initiated.

Regal Mines Limited ("Regal Mines") purchased Pasminco Resources in February 2002. Regal was owned 50% by OntZinc Corporation ("OntZinc") and 50% by Regal Consolidated Ventures Limited ("Regal Consolidated"). As part of the sale, Pasminco Canada Holdings Inc. ("Pasminco Holdings") retained a 2% net smelter return ("NSR") royalty on future production. OntZinc acquired Regal Consolidated's 50% interest in December 2002 to own 100% of Pasminco Resources. Savage Resources Limited was the successor of Pasminco Holdings and held the 2% royalty.

OntZinc later changed its name to HudBay Minerals Inc. (Hudbay) after purchasing, through reverse takeover, Hudson's Bay Mining and Smelting in December 2004. Hudbay owned Scotia Mine through its wholly-owned subsidiary, ScoZinc Limited ("ScoZinc").

In 2006, Acadian Gold Corp ("Acadian Gold") purchased 100% of ScoZinc and all of its assets (consisting mainly of Scotia Mine and its infrastructure) from OntZinc for \$7 million. Acadian Gold subsequently changed its name to Acadian Mining Limited ("Acadian Mining"). On May 29, 2007, ScoZinc exercised its option to buy-out the 2% NSR for \$1,450,000.

ScoZinc reactivated the mill and continued surface mining the deposit during 2007 and 2008. Depressed metal prices forced ScoZinc to place the mine on care-and-maintenance status.

In June 2011, Selwyn Resources Limited ("Selwyn") purchased ScoZinc and all of its assets, including the Scotia Mine and ScoZinc's exploration claims, for \$10 million less a deduction relating to increased reclamation bonding requirements that were being determined at the time of the acquisition. In a May 2, 2011 letter, the Nova Scotia government informed ScoZinc that the increased bond requirement amounted to \$1,887,790.

### **6.2.2 Getty Deposit**

The following is adapted from Cullen et al. (2011), Section 5.1:

"The Getty Property was acquired by Getty in 1972, at which time Getty and joint venture partner Skelly Mining Corporation began exploration under terms of an option - purchase agreement with Millmore-Rogers Syndicate.

"Claims covering the Getty Deposit were placed under closure in 1987 by the Nova Scotia government and a tender was subsequently let for acquisition of exploration rights to the property. In 1990 Westminer Canada Limited (Westminer) was deemed the successful bidder and awarded a Special Exploration License for further assessment of the deposit. Attempted renewals of the Getty Special Exploration License by Westminer for three consecutive years were not successful.

"Between 1992 and September 2006 Getty property claims were maintained under government closure and no work was carried out.

"Pasminco Resources Canada Company (Pasminco) acquired the adjacent Gays River Deposit and infrastructure in 1999 through purchase of Savage Resources Inc., and in 2000 Pasminco submitted an application to NSDNR for a Special Mining Lease covering the deposit. No lease was issued and the closed status of the property was maintained.

"In September, 2006 the provincial government tendered exploration rights to the closed Getty property and Exploration Licenses 6959 and 6960 were subsequently issued to Acadian on October 20th, 2006 as successful bidder under the tendering process. During the 2007-2008 period, Acadian carried out a substantial amount of diamond drilling in the deposit area and prepared two National Instrument 43-101 compliant mineral resource estimates.

"In February 2011, Selwyn Resources Limited ("Selwyn") purchased ScoZinc and related zinc-lead exploration properties, including the Getty deposit exploration licenses."

## **6.3 HISTORICAL MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES**

The following resource and reserve estimates are historical in nature, have not been extensively audited by the authors, were not prepared according to National Instrument 43-101 (except where noted) and should not be relied upon.

### **6.3.1 Gays River Deposit**

Numerous resource estimates have been carried out over the past 30 years since the discovery of the Scotia Mine mineralization. These resource estimates have been based on differing underlying parameters including varying minimum thickness of intercept, differing cut-off



grades, utilization of zinc equivalent or independent lead and zinc minimum grades, etc. Resource figures have ranged throughout the years from an initial 12,000,000 tonnes at 7% zinc-equivalent (drill-indicated) in 1974 (Patterson, 1993) to the 1985 figure of 980,000 tonnes at 5.35% lead and 9.42% zinc (mineable) at a 7% zinc-equivalent cut-off (Hale and Adams, 1985).

Westminer (Nesbitt Thompson, 1991; WMC, 1995) reported resources that were outlined by over 1,300 underground and surface holes in addition to the information derived from the underground workings. The calculations were based on a minimum true thickness of two meters with a cut-off of 7% zinc-equivalent. The total geologic reserves were quoted as 2,400,000 tonnes averaging 6.3% Pb and 8.7% Zn (Table 6-2). A mineable reserve was also quoted as 1,370,000 tonnes averaging 5.3% Pb and 9.8% Zn.

In 1992, Campbell, Thomas and Hudgins reported that there was potential for mining an additional 800,000 tonnes of lower grade mineralization via open pit methods. The authors went on to say "there is excellent potential to expand the underground reserves, particularly in the eastern section of the mine. Underground development in the western and central zones resulted in significant expansion of the reserves as ore zone continuity has generally been better than had been originally interpreted from the drill information."

In Claude Poulin's July 1, 1998 memo titled "Scotia Mine, Mineral Resource Status," he reported the deposit's resources. Higher grade [greater than 7% Zn-equivalent ( $\% \text{Zn} + 0.5 \times \% \text{Pb}$ )] and lower grade zones (greater than 2% but less than 7%) were outlined by Savage's geologists. The higher grade zone consists of massive sulphide and lies at the contact between the dolomite and the Trench or evaporite units. The lower grade zone consists of disseminated zinc and lead within the dolomite. These outlines were transferred to a block model by Tim Carew, manager of Gemcom Services in Reno, Nevada. Inverse-distance squared weighting was used to calculate block grades. Top-cut values of 15% Zn and 10% Pb were used. No dilution or mining recovery factors were applied to the calculations. Undiluted resources are reported in Table 6-2.

The reader should note that the Resources were unclassified. They were not separated into Measured, Indicated and Inferred categories "due to the lack of geostatistical information" [Poulin, 1998 (1)]. Those Resources were not entirely independent and did not follow NI 43-101 guidelines, as the report predated that Standard.

Reserves were estimated through a pit optimization process carried out on the Central portion of the deposit. These were reported in Claude Poulin's July 1, 1998 memo titled "Scotia Mine, Mining Reserve Status." Zinc and lead prices were \$US 0.55 and \$US 0.36 per pound, respectively. The optimized pit, which considered diverting Gays River by moving it toward the highway, was sent to Mine Design Associates (MDA) for practical pit design. Savage supplied the

economic and geotechnical parameters to MDA. Dilution and recovery factors of 20% and 90%, respectively, were used.

Reserves included Resources that lie northeast of the highway. These would be accessed using underground methods. For this material, dilution and recovery factors of 25% and 90%, respectively, were used. The estimated Reserves are reported in Table 6-2. Those Reserves were not entirely independent and did not follow NI 43-101 guidelines, as the report predated the Standard.

It was discovered during the current Resource estimation process that an error was made when calculating resource and reserve grades during the 1998 estimate. When estimating block grades in the High Grade Zone, lower grade (less than 7% Zn-Eq) assays were filtered-out because they were thought to belong to a separate domain. Likewise in the lower grade Disseminated Zone, higher grade (greater than 7% Zn-Eq) was filtered-out. This incorrectly increased the grade of the high grade zone, which increased the overall resource and reserve grade by approximately 1% Zn-Eq. The error had less of an effect on the lower grade zone. The error was corrected during the current Resource estimate.

**Table 6-2: Historical Resource and Reserve Estimates**

<b>Estimator</b>	<b>Category</b>	<b>Tonnes</b>	<b>Zinc Grade</b>	<b>Lead Grade</b>
Westminer (1991)	"Geologic Reserve" (Undifferentiated)	2,400,000	8.7%	6.3%
	Reserve (Underground)	1,370,000	9.8%	5.3%
Savage (1998)	Resource (Undifferentiated):			
	Higher Grade	1,700,000	11.1% <sup>1</sup>	4.7% <sup>1</sup>
	Lower Grade	3,400,000	2.6% <sup>1</sup>	1.3% <sup>1</sup>
	Total	5,100,000	5.5% <sup>1</sup>	2.4% <sup>1</sup>
	Reserve (Undifferentiated):			
	Northeast (Underground)	360,000	8.6%	4.3%
	Central (Open Pit)	1,900,000 <sup>1</sup>	4.1% <sup>1</sup>	1.6% <sup>1</sup>
	Total	2,260,000	4.8%	2.0%

It should be noted that the above referenced historical Resources and Reserves estimates were not carried out in accordance with the Canadian Institute of Mining and Metallurgy and

Petroleum CIM standards on Mineral resources and Reserve Definitions ("CIM Standards") and therefore do not conform to Sections 1.3 and 1.4 of NI 43-101.

In 2006, MineTech International Limited ("MineTech") carried out a National Instrument 43-101-compliant resource and reserve estimate. MineTech's results are reported in Table 6-3.

**Table 6-3: Previous Mineral Resource and Reserve Estimate (Roy et al, 2006)**

<b>Mineral Resources</b>					
<b>Category</b>	<b>Volume (m<sup>3</sup>)</b>	<b>SG</b>	<b>Tonnes</b>	<b>Zinc Grade</b>	<b>Lead Grade</b>
Measured (surface)	680,000	2.78	1,880,000	3.80%	1.60%
Indicated					
<i>Surface</i>	810,000	2.77	2,250,000	3.20%	1.40%
<i>Underground</i>	381,000	2.9	1,110,000	6.60%	3.70%
<i>Subtotal</i>	1,190,000	2.82	3,360,000	4.30%	2.20%
Measured and Indicated (Surface and Underground)	1,870,000	2.8	5,240,000	4.10%	2.00%
Inferred	652,000	2.76	1,800,000	3.10%	1.10%

<b>Mineral Reserves</b>					
<b>Category</b>	<b>Volume (m<sup>3</sup>)</b>	<b>SG</b>	<b>Tonnes</b>	<b>Zinc Grade</b>	<b>Lead Grade</b>
Proven Reserves (Surface)	630,000	2.78	1,750,000	3.20%	1.30%
Probable Reserves					
<i>Surface</i>	610,000	2.76	1,690,000	2.50%	1.00%
<i>Underground</i>	395,000	2.9	1,150,000	5.70%	3.20%
<i>Subtotal</i>	1,005,000	2.83	2,840,000	3.80%	1.90%
Total Proven and Probable Reserves (Surface and Underground)	1,635,000	2.81	4,590,000	3.60%	1.70%

### 6.3.2 Getty Deposit

The following summary is taken in large part from Cullen et al. (2011):

"Five previous estimates of tonnage and grade for in-situ mineralization comprising the Getty Deposit are available in the public record. The earliest of these was prepared for Getty by MPH Consulting Limited (Riddell, 1976) and was revised in 1980 as part of a Mine Valuation Study carried out for Esso (MacLeod, 1980). Subsequently, Westminer developed an in-house estimate and preliminary economic assessment of the deposit based on historic drilling (Hudgins and Lamb, 1992). The fourth estimate is compliant with NI 43-101 and was completed in December,

2007 by Mercator for Acadian (Cullen et al. 2007). The fifth was also prepared by Mercator for Acadian, it is also NI 43-101 compliant, and was reported by Cullen et al.. (2008) after completion of a large 2007-2008 core drilling campaign.

"Results of the first three historic estimates are presented below in Table 6-4 and all pertain to areas currently covered by Acadian exploration licenses. These pre-date National Instrument 43-101 (NI 43-101) and have not been classified under Canadian Institute of Mining, Metallurgy and Petroleum Standards for Reporting of Mineral Resources and Reserves: Definitions and Guidelines (the CIM standards). On this basis they should not be relied upon. Table 6-5 presents the Cullen et al.. (2007) NI43-101 compliant resource estimate and Table 6-6 presents the Cullen et al.. (2008) NI 43-101 compliant resource.

**Table 6-4: Historic Resource Estimates for Getty Deposit Not NI 43-101 Compliant (from Cullen et al., 2011)**

Reference	Tonnes	Zn + Pb %	Zn %	Pb %
Riddell(1976)	4,470,400	3.71	1.87	1.84
MacLeod(1980)	3,149,600	2.97	1.60	1.37
Hudgins and Lamb(1992)	4,490,000	3.20	1.87	1.33

**Notes:** With regard to the historic mineral resource estimates stated above 1) a qualified person has not done sufficient work to classify the historical estimate as current mineral resources or mineral reserves; 2) the issuer is not treating the historical estimate as current mineral resources or mineral reserves as defined in sections 1.2 and 1.3 of NI43-101; and 3) the historical estimate should not be relied upon.

**Table 6-5: Mercator NI 43-101 Compliant Resource Estimate for Getty Deposit (2007) (from Cullen et al., 2011)**

Resource Category	Zn % + Pb % Threshold	Tonnes (Rounded)	Pb %	Zn %	Zn % + Pb %
Inferred	2.00	4,160,000	1.40	1.81	3.21

**Table 6-6: Mercator NI 43-101 Compliant Resource Estimate for Getty Deposit (2008) (from Cullen et al., 2011)**

Resource Category	Zn % + Pb % Threshold	Tonnes (Rounded)	Pb%	Zn %	Zn % + Pb %
Measured	2.00	1,470,000	1.48	2.02	3.50
Indicated	2.00	2,540,000	1.48	1.91	3.39
<i>Indicated Plus Measured</i>	<i>2.00</i>	<i>4,010,000</i>	<i>1.48</i>	<i>1.95</i>	<i>3.43</i>
Inferred	2.00	860,000	1.65	1.82	3.48
Measured	2.50	1,070,000	1.74	2.22	3.97
Indicated	2.50	1,680,000	1.78	2.21	3.99
<i>Indicated Plus Measured</i>	<i>2.50</i>	<i>2,750,000</i>	<i>1.76</i>	<i>2.21</i>	<i>3.98</i>
Inferred	2.50	580,000	1.98	2.09	4.07

## 7. GEOLOGICAL SETTING AND MINERALIZATION

### 7.1 REGIONAL AND LOCAL GEOLOGY

An excellent summary of the regional and deposit geological settings of the Gays River area is supplied by Patterson (1993). There is also a recent "special issue devoted to zinc-lead mineralization and basinal brine movement, lower Windsor Group (Viséan), Nova Scotia Canada" released as Volume 93 by Economic Geology in 1998. The bulk of the descriptions below are taken from those publications.

The Gays River and Getty Deposits occur along the southern margin of the large (more than 250,000 km<sup>2</sup>) and deep (more than 12 kilometers) late Palaeozoic Fundy (Magdalen) Basin, bordered on the northwest by the New Brunswick platform, and on the south by the Meguma platform (Figure 7-1). During the late Palaeozoic, the Fundy Basin was divided or segregated through a complex series of grabens into deep linear successor basins or sub-basins, which are now interpreted (Fralic and Schenk, 1981) as small pull-apart basins. Subsequent basement subsidence, fragmentation and block faulting produced the irregular pre-Carboniferous topography that was partly filled-in by early Carboniferous clastics, and later flooded by middle Carboniferous seas. Carboniferous sediments consisting of terrestrial conglomerates, and sandstones, siltstones and marine limestones and evaporites, were deposited in this Fundy Basin which probably remained active during and after the Carboniferous, and may have had a major impact in the ore-forming process. These sub-basins contained thick accumulations of terrestrial

and shallow marine sediments, and therefore could provide substantial volumes of basinal fluids (Ravenhurst, 1987).

In their 2011 report, Cullen et al.. give further detail about the Carboniferous strata:

"The Getty Deposit is hosted by lower Mississippian age dolostone of the Windsor Group's Gays River Formation. Well defined carbonate banks characterize this formation and in most instances are associated with well-defined paleo-basement high features. On depositional basin scale, Gays River Formation bank carbonates and laminated limestone of the laterally equivalent Macumber Formation mark the onset of marine depositional conditions after a prolonged period of predominantly terrigenous clastic sedimentation represented by Horton Group siliciclastic rocks.

"Carboniferous strata in Central Nova Scotia occur within the Shubenacadie and Musquodoboit sub-basins of the larger Maritimes basin and were described by Giles and Boehner (1982). Geometry of both sub-basins was significantly influenced by strong northeast trending structural grain in basement sequences of the Cambro-Ordovician Meguma Group. Deformation was heterogeneously distributed across the sub-basins and at present is now represented by northeast trending normal and thrust faults which are locally associated with open to moderately folded structural domains. Deformation features are essentially absent near the southern margins of the basins but become more prevalent and pervasive toward the northern limits, where effects of the regionally significant Cobequid-Chedabucto fault system are represented. Minor faults or fracture zones may be present at Getty but no structural complexity is evident in either the surface morphology or drill logs." (Cullen et al., 2011, Section 6)

The Gays River area is underlain by the Cambro-Ordovician metasediments of the Meguma Group which form the pre-Carboniferous basement upon which the Gays River carbonate host rock was deposited. The Meguma rocks were tightly folded during the Acadian Orogeny into long northeast-southwest anticlines and synclines which have been faulted and jointed. Erosion of this basement into irregular knobs and ridges was controlled by these structures prior to the deposition of overlying sediments (the Gays River carbonate). Unconformably overlying the Meguma Group are clastic sedimentary rocks of the Horton Group and marine sedimentary rocks of the Windsor Group which overstep the Horton near the basin margins and rest directly on Meguma basement. It is these Windsor Group carbonates which have been the host for the carbonate-hosted base metal sulphide and associated sulphate deposits in Nova Scotia.

Over 100 base metal occurrences, including a few deposits, are hosted by Lower Windsor Group marine carbonate rocks in Nova Scotia. About half of these occur within the Kennetcook, Shubenacadie, Musquodoboit and River Denys sub-basins. In addition to the Gays River and Getty Deposits, the most significant examples include the Walton deposit and the Jubilee

deposit. Walton has two types of mineralization: concordant sheets of barite contain lenses of lead-rich and copper-rich mineralization. Between 1941 and 1978, 4.5 million tonnes containing over 90% BaSO<sub>4</sub>, and 0.4 million tonnes containing 0.52% Cu, 4.28% Pb, 1.29% Zn and 350 g/t Ag were produced (Sangster, Savard and Kontak, 1998). At the Jubilee deposit on Cape Breton sulphides cement fault-related breccias and replace adjacent limestone; there are reported, unclassified resources (e.g. Fallara and Savard, 1998) of 0.9 million tonnes containing 5.3% Zn and 1.4% Pb.

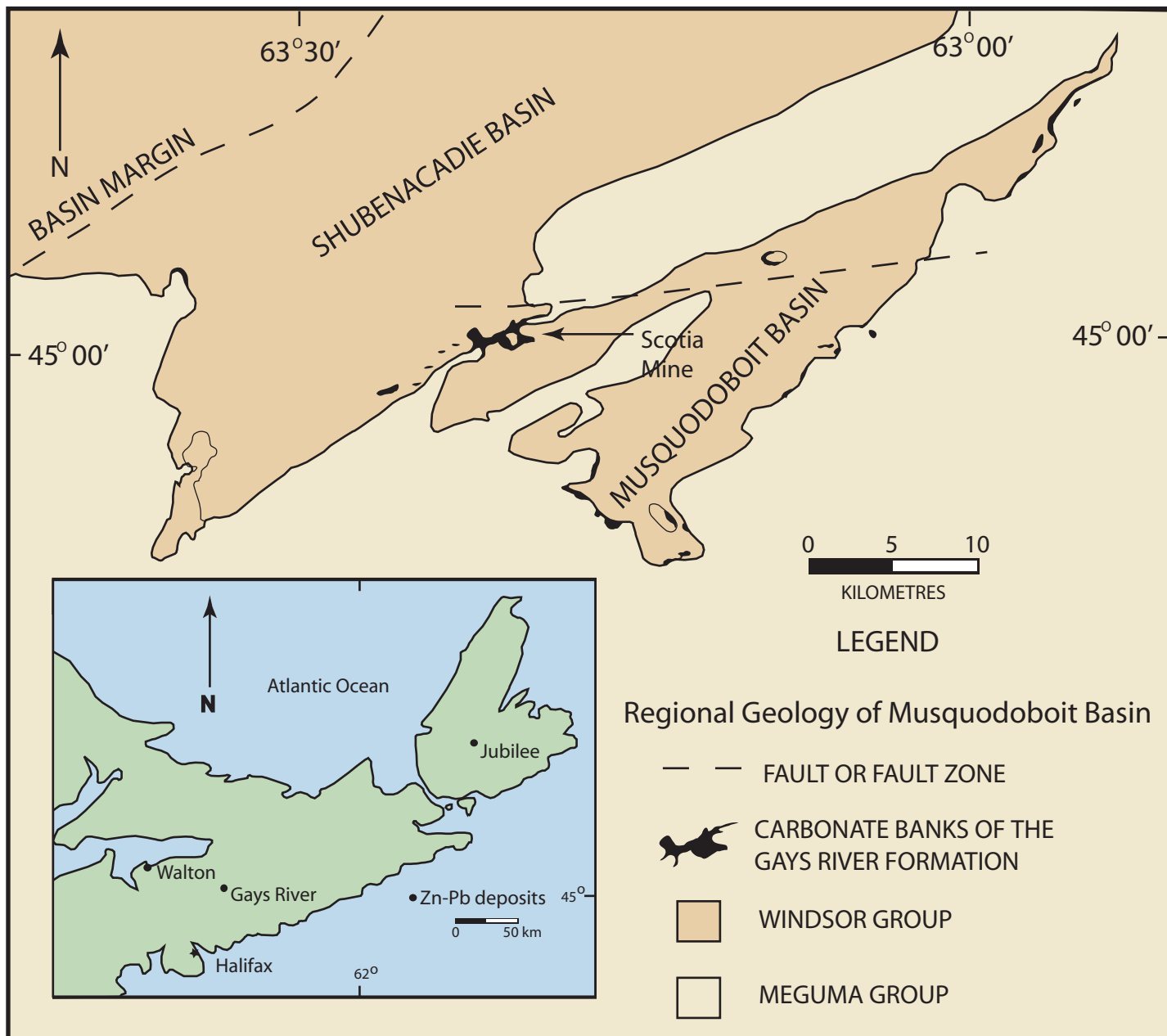


Figure 7-1: Regional geology.



## 7.2 PROPERTY GEOLOGY

The Gays River Formation and its lateral equivalent, the Macumber Formation, form the basal carbonate units of the Windsor Group. There is an angular unconformity between the marine sediments (Gays River Formation and Macumber Formation) and the underlying basement rocks. The underlying 380-400 million-year-old basement rocks consist of greenschist facies meta-turbidites of the Meguma Group that form a northeast-trending, paleotopographic high which separates the Shubenacadie and Musquodoboit basins, and over which the Gays River carbonate bank developed (Kontak, 1998; Savard & Chi, 1998). The property's stratigraphy is shown in Figure 7-2.

The basement is overlain by a laterally extensive, but discontinuous, talus breccia composed of centimeter-to meter-size, rounded to sub-rounded fragments of Meguma Group lithologies cemented by dolostone. Overlying the basal breccia or directly in contact with the basement rocks is a carbonate build-up composed of various bank and interbank facies: algal, coral and bryozoan bafflestones, skeletal packstones and wackestones. Contours for the top of Goldenville / bottom of carbonate contact are shown in Figure 7-3. The carbonate bank can be traced basinward into a laterally extensive, thinly laminated, 3 to 18 meter thick argillaceous, bituminous dolostone or limestone unit referred to as the Macumber Formation.

Overlying the carbonate rocks are evaporites (gypsum, anhydrite, halite and minor potash) with minor interbeds of dolostone and mudstone, all of which constitute the Carroll's Corner Formation. Nearby, (5 kilometers to the southwest), the gypsum is being mined at the National Gypsum Quarry.

In the deposit area, the contact between the evaporites of the Carroll's Corner Formation and the carbonates of the Gays River Formation was deeply incised by a palaeochannel during a period of uplift and erosion during the Cretaceous period. It was filled-in by sedimentary debris (boulders, sands, silts, clay and gypsum fragments) to which a Cretaceous age has been assigned. This dense, over-compacted debris has been termed "Trench" material; it occurs adjacent to the massive sulphide mineralization. Near the contacts, highly permeable, open channel-type structures have caused locally high rates of water flow that have been an impediment to underground mining.

Both the bedrock and "trench" sediments are overlain by 20-40 m of glacial till, which is locally cut by glacial-fluvial sands and gravels. Three geological cross sections are included as Figure 7-4, Figure 7-5, and Figure 7-6. Figure 7-6 represents the prototypical cross-sectional geology for the deposit.

Cullen et al. (2011) describe the Getty Deposit in Section 7.1 & 7.2 ('Stratigraphy' and 'Deposit Type', respectively) of their report:

"Geology in the Getty Deposit area has been interpreted from compiled results of Giles and Boehner (1982) plus results of various mapping and diamond drilling campaigns carried out in the area. The actual deposit does not outcrop, but was delineated by Getty through drilling (e.g., Bryant, 1975, Comeau, 1973, 1974; Palmer and Weir, 1988a, b).

"As represented in [Figure 7-7], the Getty Deposit is hosted by a northwest trending Gays River Formation carbonate bank complex that occurs as a direct extension to the larger, northeast trending carbonate bank that hosts Scotia Mine's zinc lead resources and reserves. Both banks developed along paleo-basement highs comprised of Cambro-Ordovician age Goldenville Formation quartzite and greywacke. At Getty host dolostone ranges in true thickness from less than a meter to a maximum of about 45 meters.

"The carbonate host sequence occurs above a thin sedimentary breccia or conglomerate unit comprised predominantly of Goldenville Formation debris with a small carbonate matrix component resting unconformably on Goldenville Formation basement. Carrolls Corner Formation evaporites lie stratigraphically above the Gays River Formation and are comprised locally of gypsum and anhydrite with minor amounts of interbedded dolomitic limestone and siltstone. With possible exception of local clay and sand accumulations of Cretaceous age, Carrolls Corner Formation rocks are the youngest sequences of the local bedrock section. Figure 7-8 presents a stratigraphic column for the deposit area.

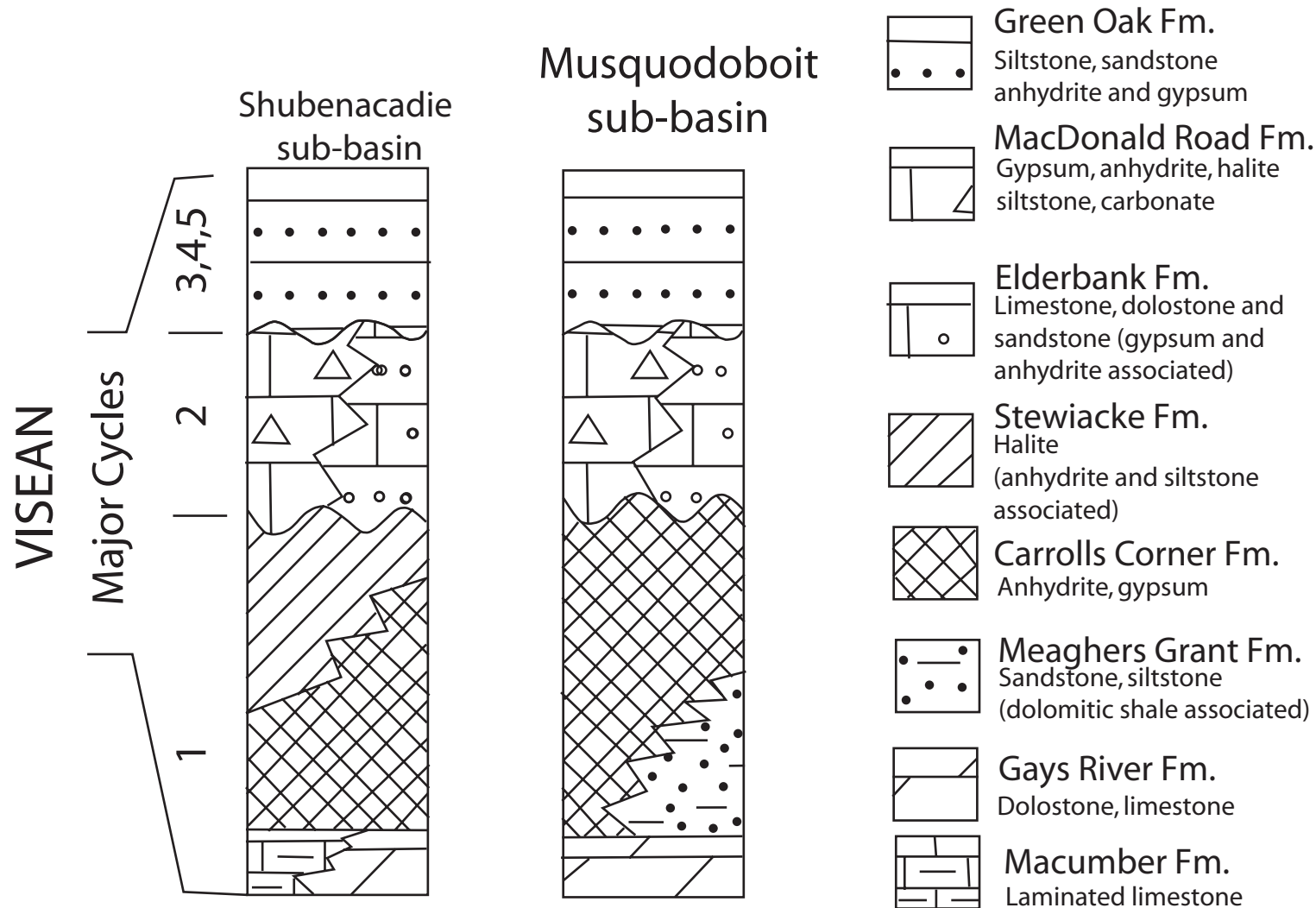
"Historical and recent drilling on the Getty property has shown that evaporite cover at the Gays River Formation contact was in many instances preferentially removed by erosion and karst-related solution processes during Cretaceous time, leaving a trough or trench parallel with the carbonate contact in many areas. Stratified Cretaceous fill sedimentary material followed by Quaternary material of glacio-fluvial origin infilled this trough, and is termed "Trench" material on the adjacent Scotia Mine property. Similar material exists in some areas adjacent to the Getty Deposit but in many instances is difficult to distinguish from less consolidated overburden material that is of glacial origin.

"The Getty Deposit carbonate bank forms a northwest extension to the adjacent Gays River bank that hosts Scotia Mine zinc-lead resources and reserves. While broadly similar, carbonate bank slopes at Getty are generally gentler than those seen at Gays River. Figure 7-9 depicts a typical bank cross section illustrating occurrence of thickest carbonate on the bank top, with progressive thinning down dip on the paleo-topographic high. Variations existed locally in basement paleo-slope angles and appear to have directly influenced corresponding carbonate bank morphology. Areas with steep basement slopes tend to show rapid thinning of carbonate

away from the thicker bank tops, with correspondingly steep contact surfaces with overlying evaporites. Gentle slope areas show greater lateral and down-dip continuation of thicker carbonate and corresponding lower average contact dips with the overlying evaporite. Based on the drilling carried out to date at Getty, the maximum carbonate thickness encountered along the basement high trend is 45.48 meters in drill hole GGR-221.

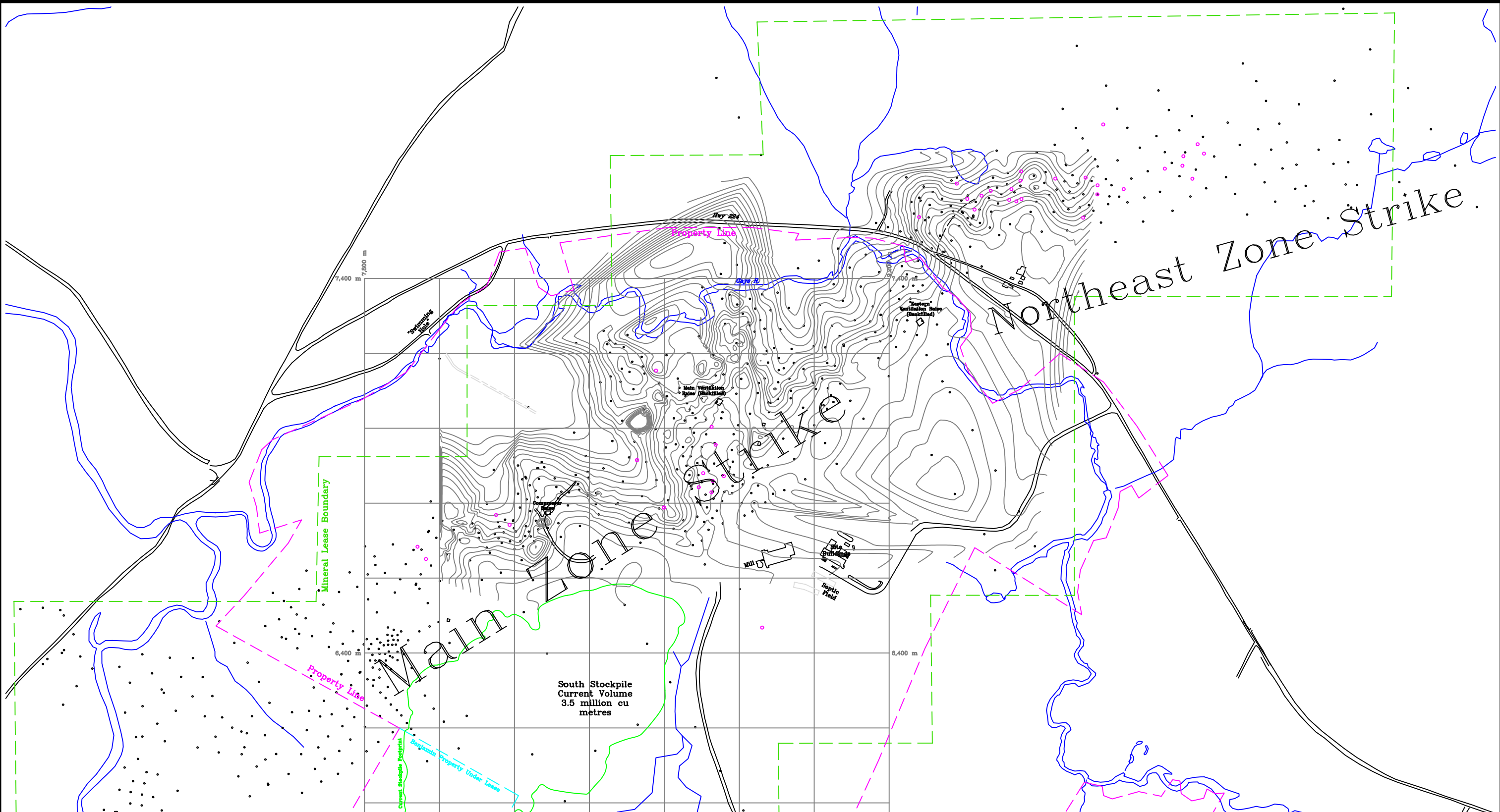
"Gays River Formation carbonate banks include intricately intercalated algal, peloidal and coralline lithofacies, with abundance of bindstone, bafflestone, packstone and micrite. These facies show transition downdip to thin (typically <5 meters), variably laminated algal/silty carbonates that are lateral equivalents to laminated carbonates of the Macumber Formation. The latter occurs basinward of the underlying Horton Group's stratigraphic pinchout and is not present in the deposit area."

# STRATIGRAPHY - WINDSOR GROUP

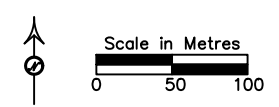



From Chagnon and others, 1998



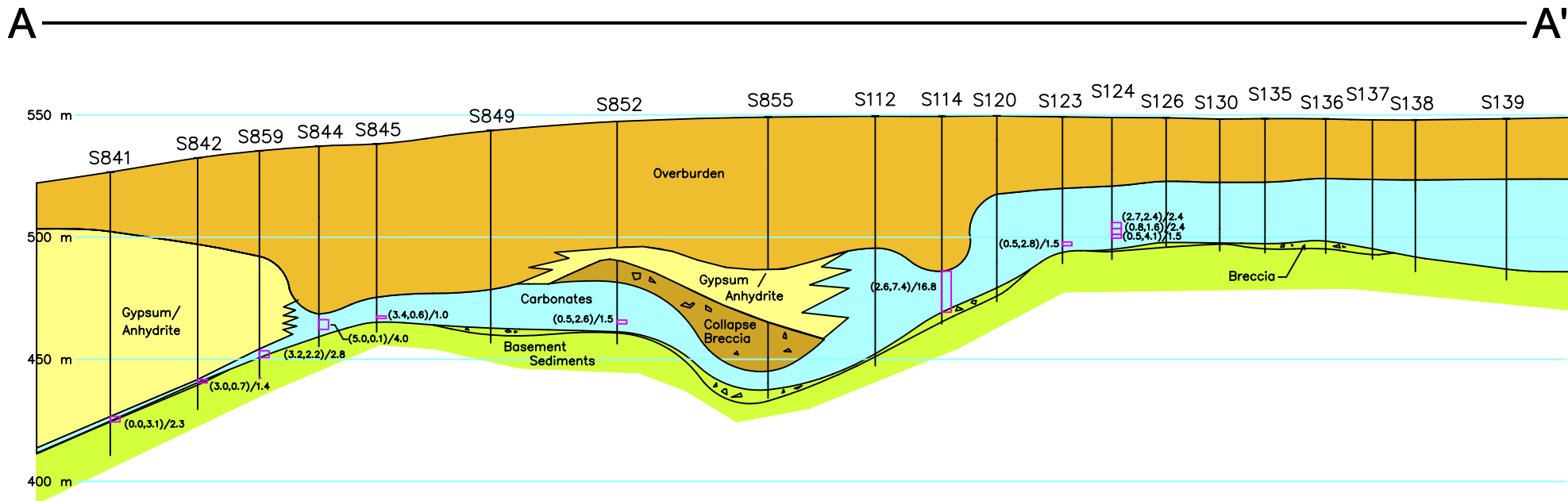


- Legend:**
- Property Line
  - Contour Line
  - Mineral Lease Outline
  - Underground Workings
  - Historical Drill Collar
  - "New" Drill Collar for Current Estimate



Date: May 6, 2011	ScoZinc Limited Scotia Mine Gays River, Nova Scotia
Scale: 1:10,000 (See Bar Scale)	
Drawn by: Douglas Roy, M.A.Sc., P.Eng.	<b>Figure 7-3</b> Drill Collars and Top-of-Carbonate Contours
<div>MINETECH INTERNATIONAL LIMITED</div> <div>CONSULTANT ENGINEERS &amp; GEOLOGISTS</div> <div>HALIFAX, CANADA</div> <div></div>	

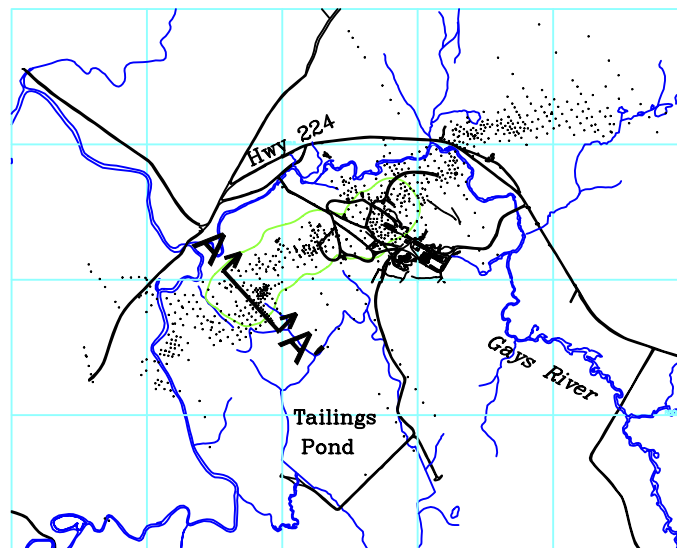




**Legend:**

(0.0,3.1)/2.3 Sample Composite (Avg Percent Zinc, Avg Percent Lead)/Composite Length

- 7. Overburden – Till, Sand, Silt
- 6. 'Trench': Collapse Breccia, Ancient Till
- 5. Carroll's Corner Formation:  
Evaporites – Anhydrite, Gypsum, Siltstone, Dolomite, Limestone
- 4. Gays River Formation (MacCumber):  
Carbonates – Dolomite, Limestone
- 3. Horton Formation:  
Sediments – Shale, Siltstone, Sandstone, Conglomerate
- 2. Breccia: Goldenville Clast in Dolomite Matrix
- 1. Goldenville Formation  
Metasediments – Greywacke, Slates



Date: June 22, 2004

Scale: Bar Scale

Drawn by: Douglas Roy, M.A.Sc., P.Eng.

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HALIFAX, CANADA

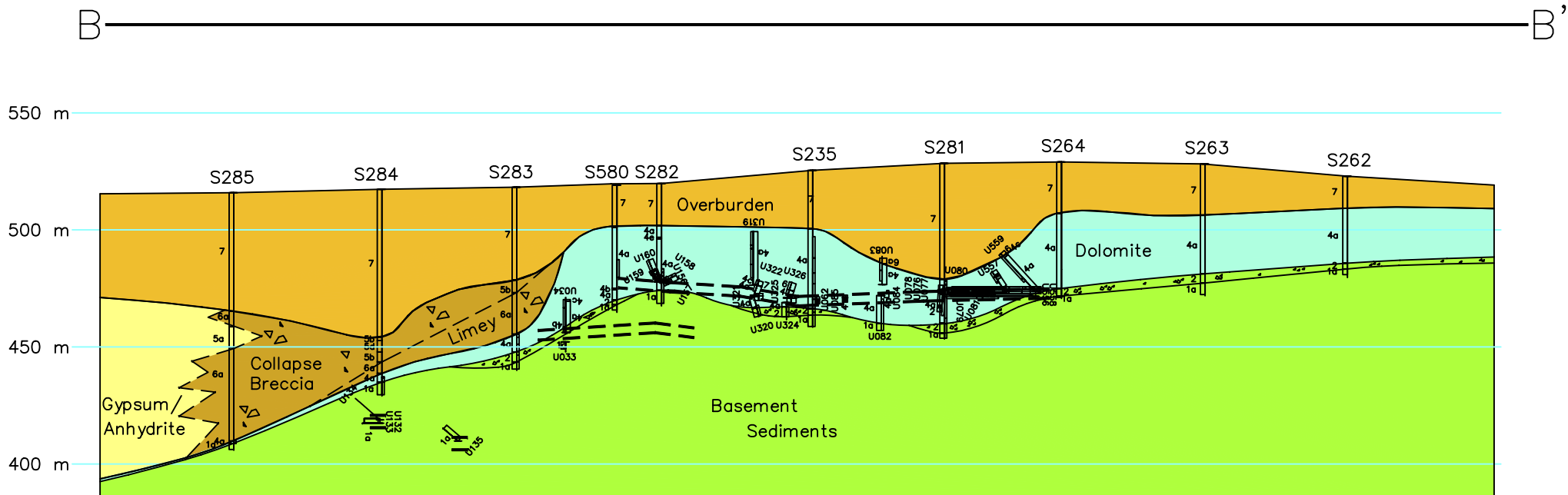


**Scotia Mine**  
**Gays River, Nova Scotia**  
**Cross-Section A---A'**

**Figure 7-4**

Dimensions in metres.  
Looking Northeast.

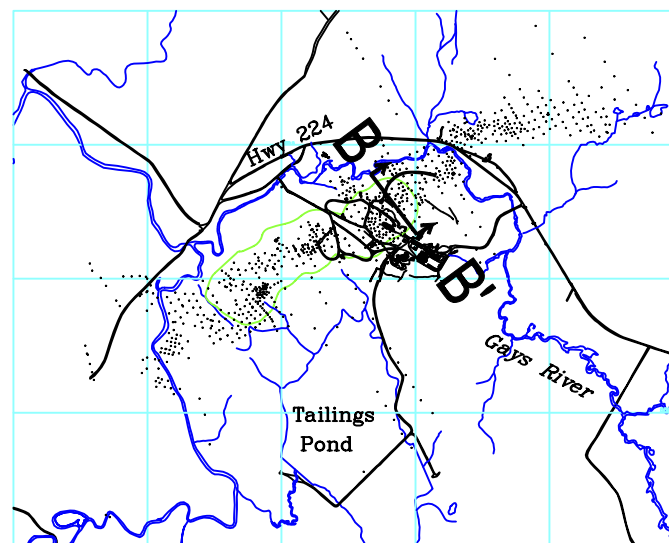
See sample sheets for complete sampling data.



**Legend:**

(0.0,3.1)/2.3 Sample Composite (Avg Percent Zinc, Avg Percent Lead)/Composite Length

- 7. Overburden – Till, Sand, Silt
- 6. 'Trench': Collapse Breccia, Ancient Till
- 5. Carroll's Corner Formation:  
Evaporites – Anhydrite, Gypsum, Siltstone, Dolomite, Limestone
- 4. Gays River Formation (MacCumber):  
Carbonates – Dolomite, Limestone
- 3. Horton Formation:  
Sediments – Shale, Siltstone, Sandstone, Conglomerate
- 2. Breccia: Goldenville Clast in Dolomite Matrix
- 1. Goldenville Formation  
Metasediments – Greywacke, Slates
- Intersected Underground Workings



Scale in Metres  
0 25 50

Date: June 22, 2004

Scale: Bar Scale

Drawn by: Douglas Roy, M.A.Sc., P.Eng.

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HALIFAX, CANADA



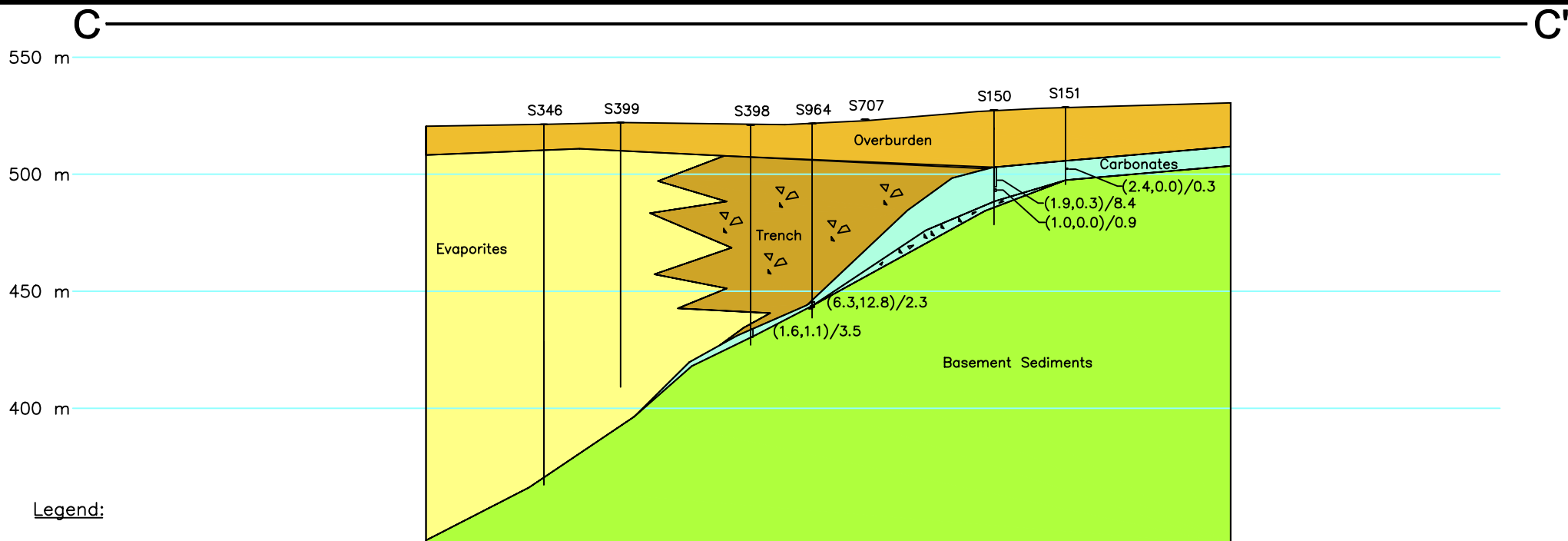
**Scotia Mine**  
Gays River, Nova Scotia  
**Cross-Section B---B'**

**Figure 7-5**

Dimensions in metres.  
Looking Northeast.

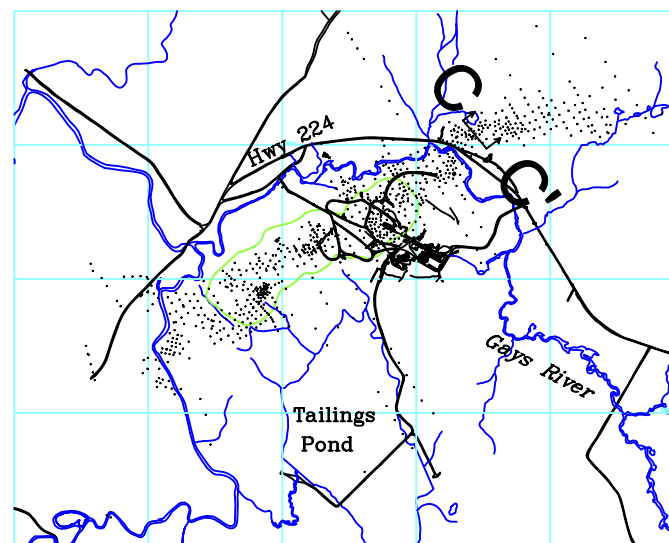
Refer to data table for sampling data.





(0.0,3.1)/2.3 Sample Composite (Avg Percent Zinc, Avg Percent Lead)/Composite Length

-  7. Overburden – Till, Sand, Silt
-  6. 'Trench': Collapse Breccia, Ancient Till
-  5. Carroll's Corner Formation:  
Evaporites – Anhydrite, Gypsum, Siltstone, Dolomite, Limestone
-  4. Gays River Formation (MacCumber):  
Carbonates – Dolomite, Limestone
-  3. Horton Formation:  
Sediments – Shale, Siltstone, Sandstone, Conglomerate
-  2. Breccia: Goldenville Clast in Dolomite Matrix
-  1. Goldenville Formation  
Metasediments – Greywacke, Slates
-  Intersected Underground Workings



Scale in Metres  
0 25 50

Date: September 21, 2004

Scale: Bar Scale

Drawn by: Douglas Roy, M.A.Sc., P.Eng.

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HALIFAX, CANADA

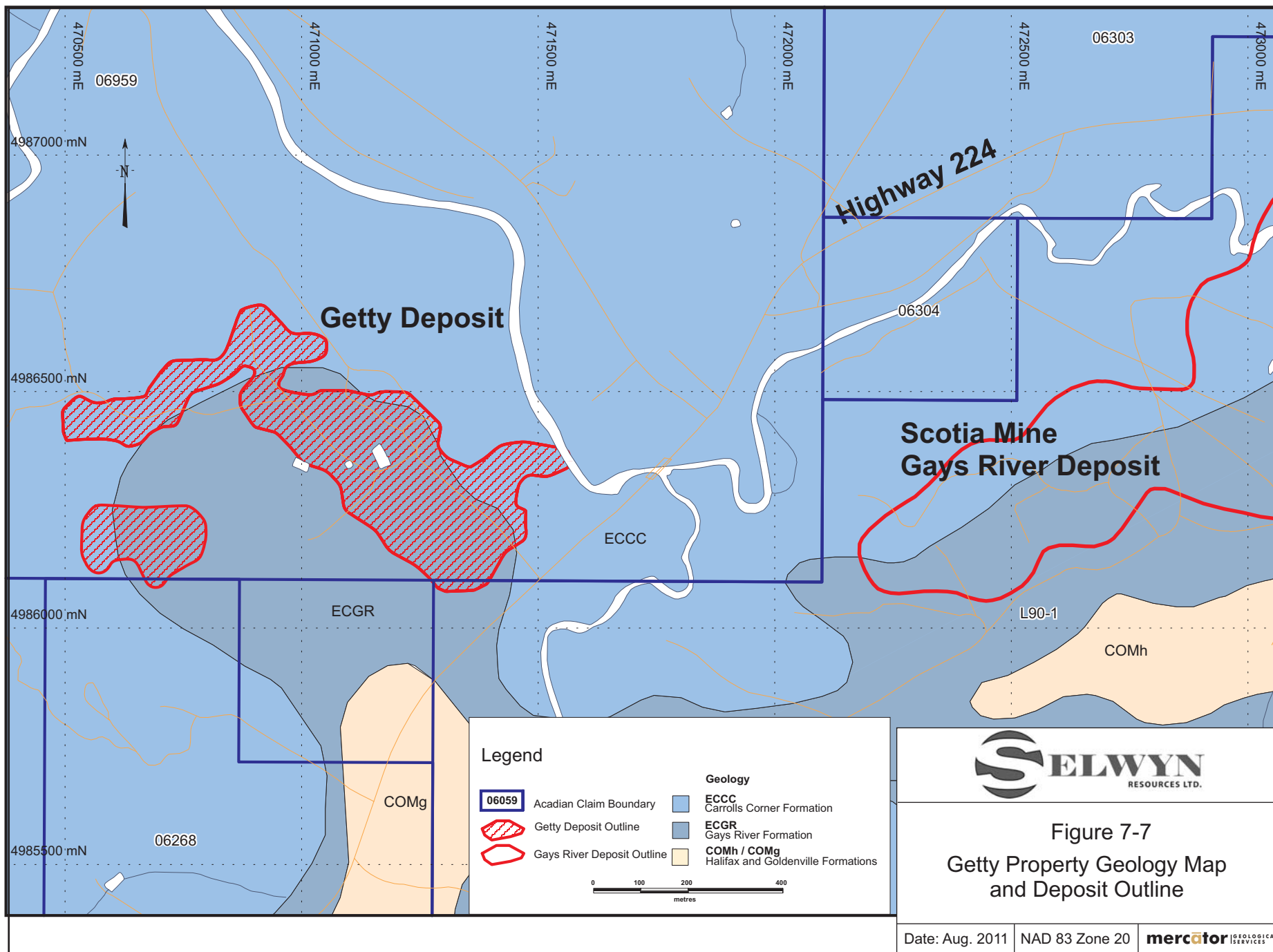


**Scotia Mine**  
Gays River, Nova Scotia  
**Cross-Section C---C'**

**Figure 7-6**

Dimensions in metres.  
Looking Northeast.  
Refer to data table for sampling data.





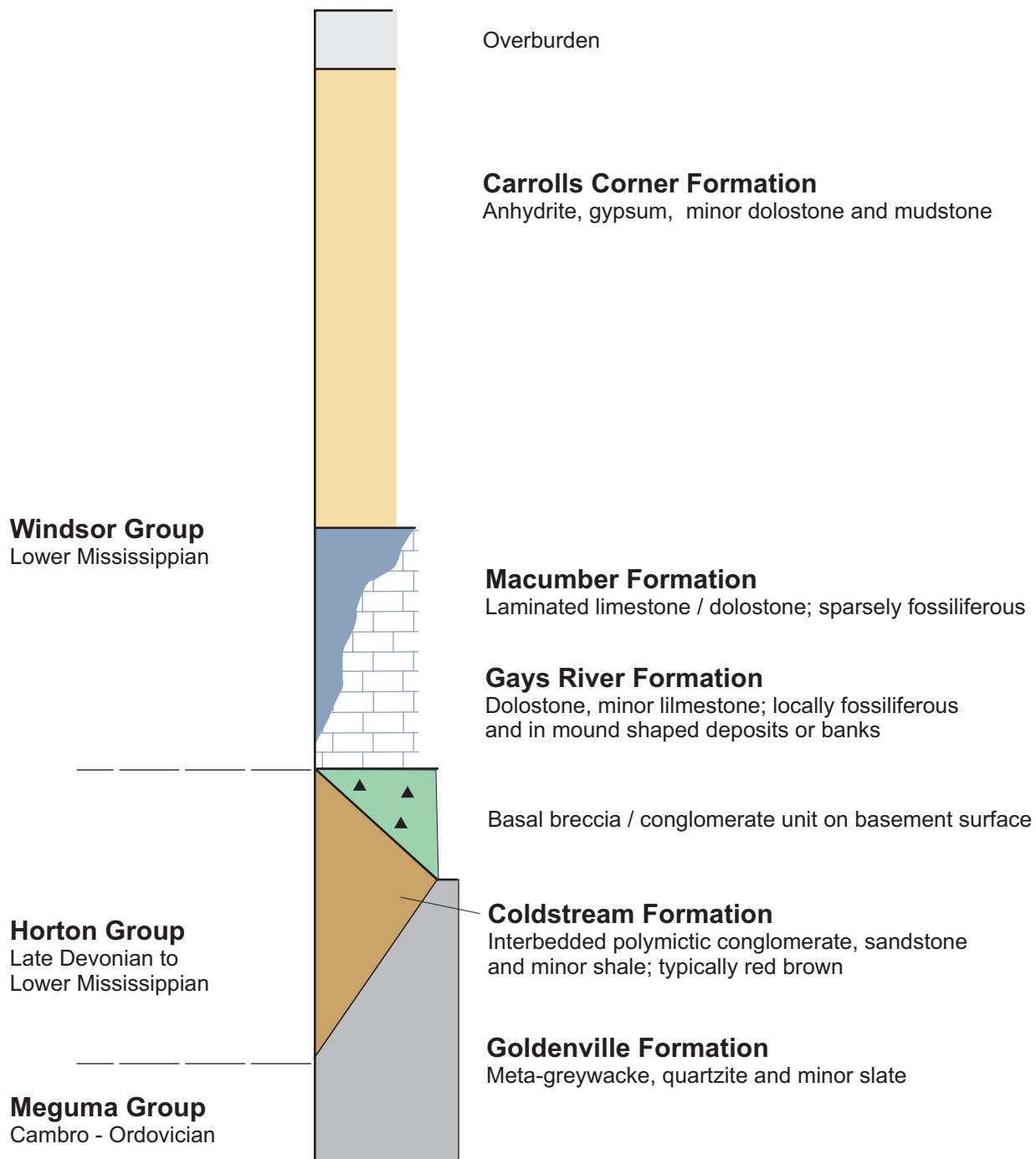
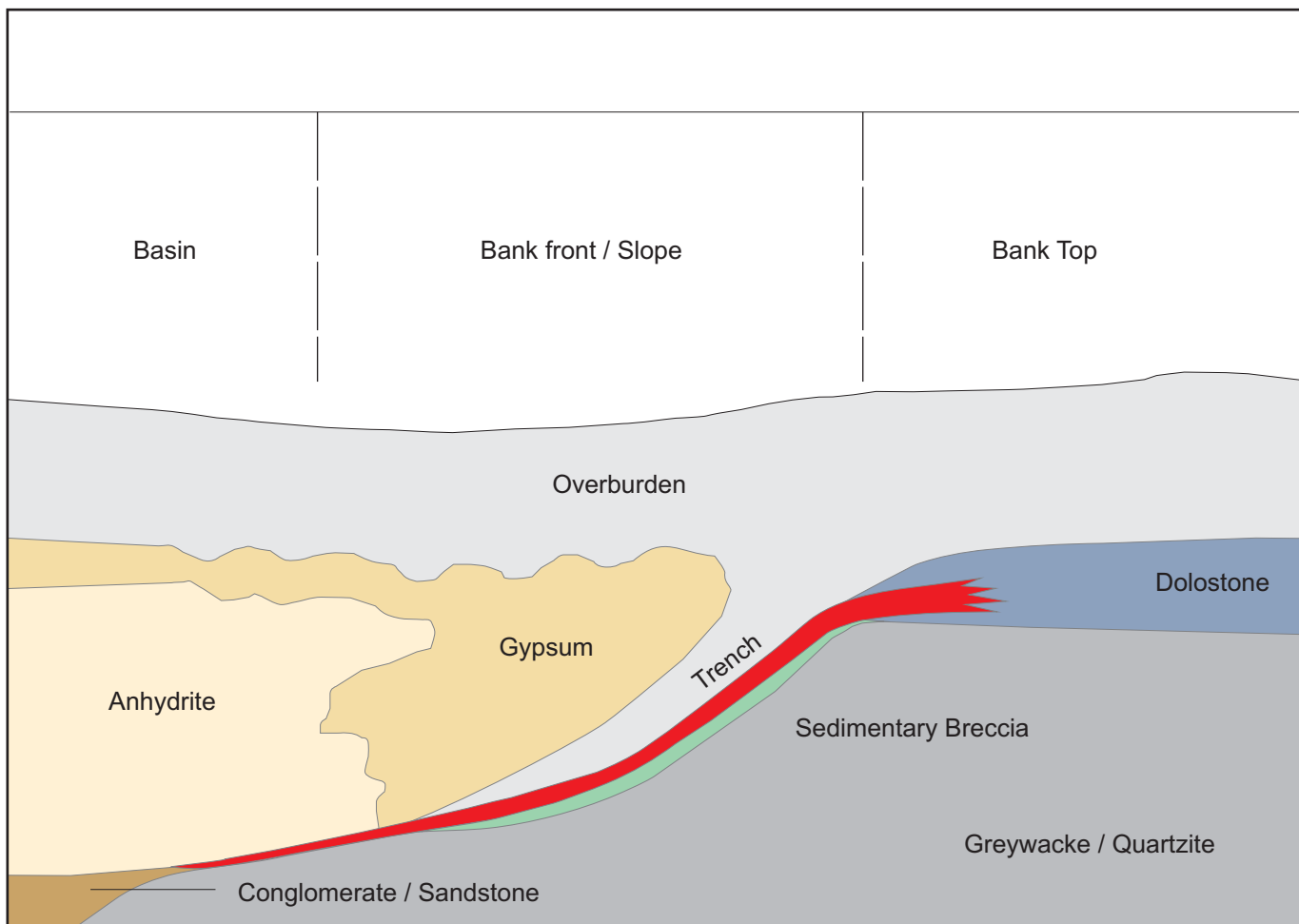


Figure 7-8  
Stratigraphic Column for  
Getty Deposit Area

Date: August 2011

mercator GEOLOGICAL SERVICES



■ Lead / Zinc mineralization in dolostone



Figure 7-9  
Carbonate Bank Cross Section  
*Not to scale*

Date: August 2011

**mercator** GEOLOGICAL SERVICES

## **7.3 MINERALISATION**

### **7.3.1 Gays River**

Nesbitt Thomson Inc. (1991) describe the high-grade mineralisation as consisting of a massive sulphide zone in contact with the evaporite or Trench, ranging in thickness from 0.1 to 5.0 metres and locally containing up to 78 % Pb and 57 % Zn. On the footwall of the massive sulphide, there is a zone of disseminated material ( $>7\%$  Zn equivalent<sup>1</sup>) which, in places, is up to 12 metres in thickness. Locally disseminated mineralisation ( $>2\%$  Zn equivalent) extends up to twenty metres into the footwall.

The Gays River Deposit is essentially controlled by a sinuous paleo coastline. The main part of the deposit is shallow (generally  $<150$  m deep), has a dip length of approximately 100 m and a strike length following the paleo-coastline over a straight line distance of 2 km (Nesbitt Thomson Inc., 1991).

The mineralisation at the Gays River Deposit consists of massive and/or disseminated ore hosted predominantly by the carbonate rocks, with extensions down into the basal breccia unit. The massive mineralisation consists of fine-grained ( $<10$ -20 mm), Fe-poor, beige-coloured sphalerite and medium to coarse-grained, Ag-poor galena ( $<10$ -20 ppm Ag in galena concentrates) (Kontak, 1998; Savard and Kontak, 1998), is restricted to the carbonate-evaporite contact and is 1 to 3 metres in true thickness. Disseminated mineralisation, consisting of yellow to orange, millimetre-size euhedral sphalerite and millimetre-to-centimetre-size euhedral galena, fills in primary porosity in the dolomitized carbonates and walls of primary cavities (Kontak, 1998).

Sphalerite and galena constitute about 99.5% of metallic minerals. Other sulphide minerals are marcasite, pyrite and chalcopyrite, while gangue minerals include calcite, dolomite, fluorite, barite and selenite (Patterson, 1993).

### **7.3.2 Getty Deposit**

Zinc and lead sulphide mineralization are found throughout the Getty carbonate bank, along with trace amounts of iron sulphide in isolated areas. Base metal sulphides are also present to a lesser extent in carbonate matrix of the underlying conglomerate/breccia unit and within calcite or micrite filled fractures and joints present in underlying Goldenville Formation greywackes. While not extensively reported to date, galena has also been documented locally at the Scotia Mine deposit in thin ( $<20$ cm thick) discordant, steeply dipping veins that generally trend north-south (B. Mitchell, personal communication, 2007).

Drilling to date on the Getty deposit has shown that massive to submassive high grade mineralization like that commonly present along steep bank front zones at Scotia Mine is not present to a significant degree at Getty (Bryant, 1975). However, a clear association of higher zinc and lead grades with dolostone intervals on the northeast and north slopes of the Getty bank is recognized and lower grades over thicker intervals occur within the carbonate sections at the top of the bank. Mineralization is more poorly developed along the southwest side of the bank.

Sphalerite is the predominant base metal sulphide phase present and is typically honey yellow to buff or beige in color and finely crystalline. Based on drill core observations, Bryant (1975) specified the following four modes of sphalerite occurrence within the deposit, with the first being the most common: (a) disseminated mineralization showing concentrations from trace to 10% or more, (b) semi-massive and massive mineralization as seams and replacements along bedding surfaces or laminae, (c) massive, porosity filling or surface coating mineralization in fossiliferous and vuggy carbonate, (d) mineralization associated with secondary calcite in small stringers and veinlets.

Silver is a trace constituent of the Getty sulphide assemblage but is not present at levels of economic significance. This parallels the situation at adjacent Scotia Mine where Roy et al (2006) reported historic silver values in mill concentrates that were typically less than 40 parts per million.

## **8. DEPOSIT TYPES**

The Gays River Deposit mineralization has long been considered a Mississippi Valley-type ("MVT") lead-zinc deposit. Characteristics of sedimentary formations that host MVT lead-zinc mineralization include shallow-water, shelf-type carbonate rocks with reefs around the peripheries of intracratonic basins, karst structures, limestone-dolomite interfaces and proximity to a major hydrocarbon-bearing basin. The archetypical MVTs occur in the United States in several famous districts surrounding the Michigan-Illinois Basin which also has significant hydrocarbon production. Each of the districts is enormous, with resource potential of 75 million to 750 million tonnes and individual deposits in the order of 1 to 100 million tonnes.

Other MVTs have been mined in the past in Canada (e.g. Pine Point in the Northwest Territories, Nanisivik mine in Nunavut, and Newfoundland Zinc) and in Ireland.

MVTs are thought to have formed when hot, basin-derived, oil field-type brines formed at depths of more than 2 km, migrated towards lower pressure areas around the basin periphery. Mineralization precipitated from the brines when they encountered porous areas like reefs, karst breccias or sedimentary traps.

Sangster and others (1998) draw on their own and others' evidence to conclude that all Windsor Group lead-zinc deposits are epigenetic relative to their enclosing strata, exhibiting both open-space filling and host-rock replacement. At the Gays River Deposit, textures (including fossils) have been preserved; representing volume-for-volume replacement of original limestones by dolomite, and the sulphides are, in turn, replacements and porosity fillings within the previously altered host rocks. Kontak (2002) feels that petroleum in fluid inclusions in the Gays River Deposit mineralization suggest a role of hydrocarbons in the mineralizing process, like many MVTs, but Sangster and others (1998) point to basement rocks underlying the Palaeozoic sedimentary rocks as the source of the mineralizing fluids.

The temperatures of formation of the Gays River Deposit (and others in Nova Scotia) are higher than most North American MVTs, and compare more favorably with the clearly epigenetic MVTs of the Central Ireland Basin (Sangster and others, 1998). The Irish deposits also occur in Upper Paleozoic (Carboniferous) carbonate rocks, predominantly in shallow-water carbonates and a mudbank limestone (reef). The Irish deposits are also preferentially associated with east-northeast-trending faults which are thought to have acted as conduits for mineralizing hydrothermal fluids; basement lineaments may also have controlled deposition. As with the Gays River Deposit, sphalerite and galena are the main sulphides; barite is also usually present (Exploration and Mining Division Ireland, 2004). Seven economic deposits have been mined or are currently in production in Ireland. The largest of these, the world-class Navan deposit, had total production and proven + probable reserves of 82.1 million tonnes containing about 10.6% Zn+Pb; its annual production is 2.5 million tonnes of ore. Other producers and former producers had resources between about 8 and 18 million tonnes and grades of 9-25% Zn+Pb (Exploration and Mining Division Ireland, 2004).

It is noteworthy that two major carbonate-hosted zinc-lead deposits discovered in Ireland since 1986 occur down-dip from areas where considerable exploration, including diamond drilling, had been carried out over the prior 20 years (Patterson, 1993). Similarly, the MVT deposits of the Viburnum trend in the U.S.A. were discovered at depths of 300 meters by understanding of the regional geology of the hosts rocks of the Old Lead Belt about 80 km away.

Cullen et al. (2011) describe the Getty Deposit in Section 7.2 of their report, quoted below in part:

"The adjacent Scotia Mine deposit (Gays River Deposit) has been the subject of extensive academic and government research and reporting since its discovery in 1971. Much of this work was summarized by Roy et al. (2006) and the deposit is a considered an example of the Mississippi Valley Type (MVT) class of carbonate hosted, stratabound, base metal deposits. Prominent examples of the paleo-basement high deposit setting occur along the Viburnum Trend of Southeast Missouri, but are characterized in that area by dominance of lead

mineralization over that of zinc (Sangster et. al., 1998; Akande and Zentilli, 1983; MacEachern and Hannon, 1974).

"Localization of base metals within the Getty bank complex is believed to have resulted from interaction between metal-bearing basinal fluids, potentially sourced in the Horton Group stratigraphic section or in basement sequences, and chemical reductants, possibly including hydrocarbon, that were present at sites of deposition within the bank. Kontak (1998, 2000) reported on fluid inclusion and other studies of ore from the adjacent Scotia Mine property and concluded that saline brines in the 100° C to ≤ 250° C temperature range were involved in the main mineralizing process and that these temperatures are higher than those typically seen in MVT districts. Héroux et al (1994) studied organic maturation and clay mineral crystallinity characteristics of Gays River Formation rocks of the Musquodoboit and Shubenacadie basins and identified a corridor of higher interpreted heat flow that occurs in part over the Gays River and Getty Deposit areas and is consistent with the higher fluid temperatures previously noted. It is clear that zinc and lead mineralization were superimposed on lithified and dolomitized host rocks (Akande and Zentilli, 1985; Kontak, 1998)." (Cullen et al., 2011)

## **9. EXPLORATION**

### **9.1 GAYS RIVER DEPOSIT**

At the effective date of this report, the issuer (Selwyn) had not completed any exploration on the Gays River Property.

There is no written record regarding the sampling method employed during the early exploration years (i.e. pre-1970's) in the Scotia Mine area.

The exploration approach and sample collection procedures employed by the more recent exploration efforts reflects thorough sampling methodology and documentation procedures. Exploration activity was carried out in a professional manner by a team of local, experienced geologists and technicians supervised by Esso's, Seabright's, Westminer's, Savage's and ScoZinc's professional staff. The work has been well organized throughout their exploration efforts and more recently computer facilities were available to generate reports and prepare maps, etc. from the vast database.

The assay data and other parameters for all core drilling programs and underground work were entered into a computerized database using Microsoft Excel and resource-generating software programs. The quality control and validation of the coded data included steps to ensure that the assay intervals and the sample locations were correct. To ensure accuracy of the database, all assays were coded and the data entry system automatically checked for interval overlaps. The coded assays were also printed and a visual inspection was completed for comparison with the

original (logged) data sheets. The sample locations were validated with appropriate plotting and visual checks against the original sections and plans.

Core drilling was carried out using North American service providers with the collection of BQ and NQ core. The portions of core to be analyzed were either split or sawed into two sections with one half submitted for analysis, the other half remaining in the core tray. All sampling procedures were carried out on site.

Sampled core lengths were determined visually. All drill holes were logged, noting lithology, structure, alteration and mineralization. Core recovery was generally greater than 90%. Early in the exploration program, the samples were been sent via air cargo to several analytical laboratories; however, after the construction of the mill facility, the internal laboratory was used.

## **9.2 GETTY DEPOSIT**

At the effective date of this report, the issuer (Selwyn) had not completed any exploration on the Getty Property.

The historic sampling method and approach for the Getty Deposit was described in Cullen et al. (2011) and is presented in section 9.2.1 and 9.2.2 below...

### **9.2.1 Getty and Esso Programs: 1972 to 1975**

"Government assessment reports were reviewed to identify core logging and sampling procedures applicable to the Getty and Esso drilling programs carried out between 1972 and 1975. These showed that drill core was typically logged by staff geologists who produced hard copy lithologic logs for each drill hole. Detailed information related to lithology and mineralization was systematically recorded in the logs along with complete records of core sampling and major analytical results. There is no specific description of sample marking, cutting, handling, tagging or shipping protocols, but industry standard marking and tagging of sample intervals is evident in the archived drill holes viewed and sampled by Mercator staff in 2007 at the Nova Scotia Department of Natural Resources core library in Stellarton, Nova Scotia (core library). Half-core samples were typically submitted for analysis and sample intervals reflected visually determined mineralized zone limits. A sample interval of 5 feet was commonly used but no standard appears to have been established by either company. Non-mineralized carbonate was rarely sampled. Core was logged in imperial measure and drill logs were transformed to metric equivalents subsequently during the digital data entry process.

Core from the original Getty drilling program was placed in marked core boxes and retained in covered storage in the local area until 1984. At that time NSDNR took possession of the core and it was archived at the core library in Stellarton. Esso core was stored at the Gays River mine site, with mineralized intervals typically retained in covered storage and the remaining non-



mineralized intervals stored out of doors where rapid deterioration of boxes and core took place. Core storage facilities established by Esso deteriorated over the years and in some cases have been demolished. No accurate records exist of archived core or of core salvaged from the deteriorated buildings. As a result, it is unclear whether core from the Esso holes completed at Getty is included in the non-inventoried remnants of archived core that currently exists at the Scotia Mine facility. With no evidence to the contrary, it is assumed that this core has been lost or destroyed and is not available for review at present.

### **9.2.2 Acadian Program: 2007 to 2008**

"All drill core was transported on a daily basis from the site to the nearby Scotia Mine owned by Acadian/ScoZinc. Core was photographed, logged and sampled in a secure logging facility and then continuously sampled through the carbonate and basal breccia intervals using a nominal 1.0 meter sample length. A mechanical core splitter was used to create half core samples, with one half retained for archival purposes and the other placed in a pre-numbered plastic sample bag along with a corresponding paper sample tag and submitted for laboratory analysis. Sample numbers were recorded in both the core log and in sample record logs for the drill hole. In accordance with the quality assurance and quality control protocol set up by Mercator for this drill program, the archive portion of every 40th sample in the core sample sequence was quarter split and one quarter was sent to ALS Chemex, an ISO certified third part commercial laboratory, for analysis of metal levels.

After insertion of quality control samples, including blanks and standards, all bagged samples were checked for sequence, placed in sealed plastic buckets and shipped to Eastern Analytical in Newfoundland for multi element ICP analysis. Systematic check sample pulps were prepared and forwarded to Mercator by Eastern Analytical, where standards and blanks were inserted prior to submission to ALS Chemex in Sudbury for analysis.

#### **9.2.2.1 Acadian Re-sampling of Getty Drill Holes**

Ten drill holes completed by Getty in 1972, representing a wide grade and location range within the deposit, were selected by Mercator for re-sampling as part of the project quality control and assurance program. This work was carried out by Mercator geologists during 2007 and 2008 on core from the ten Getty drill holes noted in Table 9-1 that are archived at the Stellarton core library maintained by Nova Scotia Department of Natural Resources. Quarter core samples of the historically half-core sampled carbonate intervals were collected from the selected holes, ensuring a quarter of the core remained for archival purposes.

**Table 9-1: Historical Drill Holes Re-sampled in 2007**

Drill Hole	Drill Hole	Drill Hole	Drill Hole	Drill Hole
GGR-39A	GGR-96	GGR-125	GGR-130	GGR-167
GGR-178	GGR-193	GGR-208	GGR-211	GGR-217

## **10. DRILLING**

### **10.1 GAYS RIVER DEPOSIT**

To date, 1,380 diamond core drill holes have been drilled on the Gays River Deposit (Table 10-1). The majority were drilled to determine the characteristics of the zinc- and lead-mineralized dolomite.

ScoZinc drilled 17 holes totaling 1,613 meters through the Northeast Zone in 2008. These collars, as well as the collars from ScoZinc's 2004 program, are shown in magenta in Figure 7-3.

Most of the 914 surface holes were drilled vertically. The azimuth and dip of the 467 holes drilled from the underground workings was variable.

Generally, holes were drilled so as to fully penetrate the dolomite reef and continue on until no more mineralization was found. This resulted in most drill holes being drilled a few meters beyond the dolomite reef.

A compilation of core logs and sample assays and historical logs are provided in the previous technical reports for the property.

The sample intervals do not necessarily represent true widths. The orientation of the mineralization is well known and is described in Section 7.

**Table 10-1: Historical Surface and Underground Diamond Drilling Activity<sup>a</sup>**

From	To	Holes with Info <sup>b</sup>	Meters	Time Frame	Company
<b>Surface Holes</b>					
1	72	70	2,951.7	1951-1952	Gays River Lead Mines
73	740	646	59,123.6	1972-1982	Imperial Oil/Canada Wide Mines
741	900	89	7,596.8	1985-1995	Seabright, then Westminer (undifferentiated)
901	966	66	3,664.0	1997	Savage/Pasminco
967	991	25	1,864.3	2004	ScoZinc
1130-08	1146-08	<u>17</u>	<u>1,613.5</u>	2008	ScoZinc
<b>Subtotal</b>		<b>913</b>	<b>76,813.9</b>		
<b>Underground Holes</b>					
1	341	318	7,460.7	1979-1982	Imperial Oil/Canada Wide Mines
342	651	<u>149</u>	<u>4,434.9</u>	1985-1995	Seabright, then Westminer (undifferentiated)
<b>Subtotal</b>		<b>467</b>	<b>11,895.6</b>		
<b>Total</b>		<b>1,380</b>	<b>88,709.5</b>		

<sup>a</sup> Data supplied by ScoZinc.

<sup>b</sup> The electronic database does not contain information for underground holes 342-499.

## 10.2 SAMPLE STATISTICS

Sample statistics were calculated for sampling within the carbonate. All samples for which at least one metal (zinc or lead) was assayed were considered. Most samples were assayed for both zinc and lead. Depending on the amount of visible mineral, some samples were assayed for only one metal. The total sample count was 8,022.

The mean sample interval length was 1.44 meters with a standard deviation of 0.82 meters (Table 10-2). Skewness is a measure of symmetry, or more precisely, the lack of symmetry. The positive value for skewness indicates that the data is skewed right, meaning that the right tail is heavier than the left tail. This is also shown in the histogram in Table 10-3. The aggregate sample length was 11,522 meters.

The mean zinc grade was 3.55%. From the histogram, we can see that zinc assays are approximately lognormal. The range in zinc content was zero to 62.10%. Theoretically, the maximum possible zinc assay is 67.10%, the zinc content of pure sphalerite.

The mean lead grade was 1.91%. From the histogram, we can see that lead assays are also approximately lognormal. The range in lead content was zero to 79.50%. Theoretically, the maximum possible lead assay is 86.6% - the lead content of pure galena.

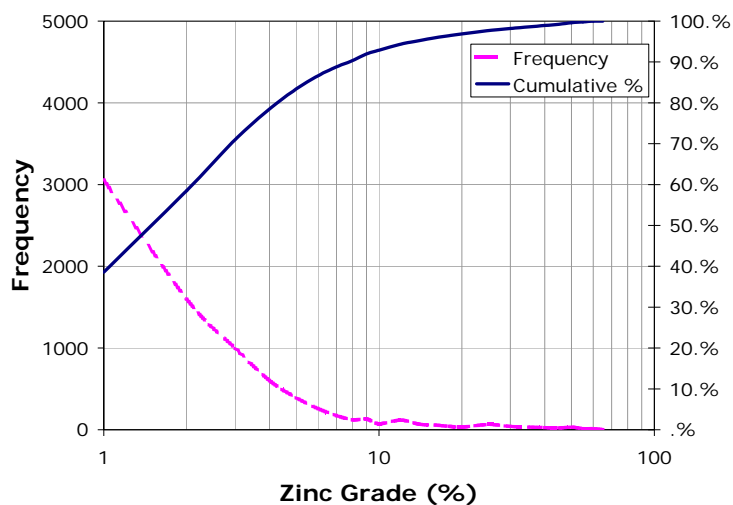
**Table 10-2: Descriptive Statistics**

<b>Descriptive Statistic</b>	<b>Zinc Grade (%)</b>	<b>Lead Grade (%)</b>
Mean	3.55	1.91
Standard Error	0.08	0.07
Median	1.52	0.12
Mode	0.02	0.01
Standard Deviation	6.79	6.24
Sample Variance	46.17	38.99
Kurtosis	25.17	52.86
Skewness	4.6	6.56
Range	62.1	79.5
Minimum	0	0
Maximum	62.1	79.5
Sum	n/a	n/a
Count	8,022	8,022

**Table 10-3: Sample Histograms**

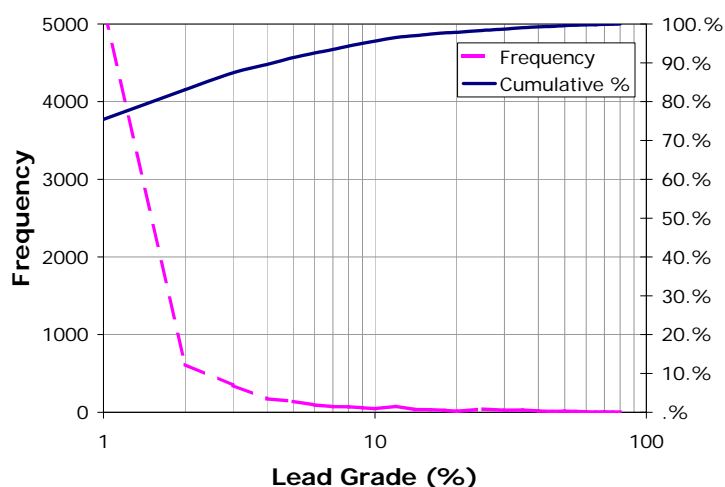
a) Zinc Histogram

Range	Frequency	Cumulative %
0	39	.49%
0-1	3056	38.58%
1-2	1599	58.51%
2-3	999	70.97%
3-4	603	78.48%
4-5	393	83.38%
5-6	259	86.61%
6-7	174	88.78%
7-8	123	90.31%
8-9	132	91.96%
9-10	74	92.88%
10-12	118	94.35%
12-14	68	95.20%
14-16	58	95.92%
16-18	42	96.45%
18-20	33	96.86%
20-25	65	97.67%
25-30	41	98.18%
30-35	33	98.59%
35-40	27	98.93%
40-45	23	99.21%
45-50	32	99.61%
50-55	15	99.80%
55-60	14	99.98%
60-65	2	100.00%
65+	0	100.00%



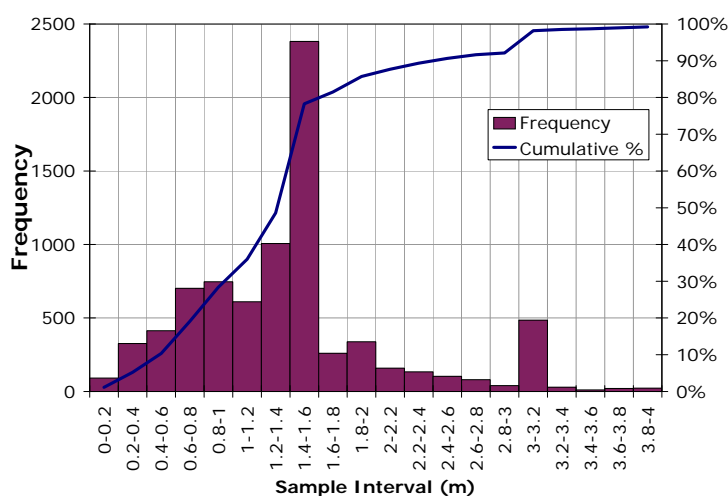
b) Lead Histogram

Range	Frequency	Cumulative %
0	851	10.61%
0-1	5200	75.43%
1-2	616	83.11%
2-3	347	87.43%
3-4	173	89.59%
4-5	141	91.35%
5-6	94	92.52%
6-7	73	93.43%
7-8	70	94.30%
8-9	59	95.04%
9-10	45	95.60%
10-12	77	96.56%
12-14	34	96.98%
14-16	33	97.39%
16-18	25	97.71%
18-20	12	97.86%
20-25	41	98.37%
25-30	26	98.69%
30-35	29	99.05%
35-40	17	99.26%
40-45	10	99.39%
45-50	15	99.58%
50-55	10	99.70%
55-60	7	99.79%
60-65	3	99.83%
65-70	7	99.91%
70-75	3	99.95%
75-80	4	100.00%
80+	0	100.00%



c) Sample Interval Histogram

Range	Frequency	Cumulative %
0	0	.00%
0-0.2	91	1.13%
0.2-0.4	326	5.20%
0.4-0.6	413	10.35%
0.6-0.8	702	19.10%
0.8-1	746	28.40%
1-1.2	611	36.01%
1.2-1.4	1007	48.57%
1.4-1.6	2381	78.25%
1.6-1.8	260	81.49%
1.8-2	338	85.70%
2-2.2	159	87.68%
2.2-2.4	134	89.35%
2.4-2.6	103	90.64%
2.6-2.8	80	91.64%
2.8-3	40	92.13%
3-3.2	485	98.18%
3.2-3.4	29	98.54%
3.4-3.6	11	98.68%
3.6-3.8	21	98.94%
3.8-4	23	99.23%
4+	62	100.00%



### **10.3 GETTY DEPOSIT**

Drilling on the Getty Deposit was described in Cullen et al. (2011).

Historic diamond drilling information pertaining to the Getty deposit was compiled by Westminer in a digital database containing information for approximately 181 vertical holes totaling 16,875 meters of drilling. The Westminer database was originally prepared to support the resource estimate reported by Hudgins and Lamb (1992) and to this end, collar coordinates, lithologic codes, geologic legend and individual drill core assay interval results were compiled from original drill logs, checked for errors, and entered into the original digital database. All historic holes were initially coordinated to local Getty reference grid but Mercator subsequently transformed all drill hole coordinates into the Scotia Mine grid using historic tie points for which Acadian surveyors provided up to date mine grid coordination. Universal Transverse Mercator (UTM) coordinates (Zone 20, NAD 83 Datum) were also calculated by Mercator for all holes in the project database and a listing of drill hole coordinates and orientation data for the deposit in the block model grid system appears in Cullen et al. (2011). Mercator staff physically checked all drill hole entries in the database against the original hard copy logs.

Between July 2007 and April 2008, Acadian completed 10,620 meters of drilling in 138 diamond drill holes on the Getty property under the direct supervision of Mercator staff. The drilling program focused on 1) validation of past drilling results, 2) infilling in areas where insufficient information existed to define mineral resources or in areas where upgrading of existing Inferred mineral resources to Indicated or Measured categories was possible, 3) re-drilling of historic holes where information on sampling and assays were missing and 4) extension of mineralized zone limits beyond those previously defined. Table 10-4 below present's collar information for all drill holes completed by Acadian during the 2007-2008 program and a drill collar location plan is included in Cullen et al. (2011).

**Table 10-4: Collar Information by Acadian during 2007-2008<sup>a</sup>**

Hole Number	Collar Coordinates Easting (m)	Collar Coordinates Northing (m)	Collar Elevation (m)	Angle (Deg.)	Depth (m)
S992-07	6893.91	6584.66	556.35	-90	74
S993-07	6929.3	6618.11	549.27	-90	94
S994-07	6856.41	6554.85	557.89	-90	80
S995-07	6821.7	6521.68	555.54	-90	80
S996-07	6848.41	6595.56	556.96	-90	71
S997-07	6930.65	6508.78	556.57	-90	77
S998-07	6781.44	6593.48	557.26	-90	56
S999-07	6814.47	6624.98	555.77	-90	59
S1000-07	6885.79	6686.53	545.67	-90	86
S1001-07	6845.17	6658.82	549.86	-90	68
S1002-07	6786.06	6490.32	553.46	-90	61
S1003-07	6768.48	6552.21	555.35	-90	55
S1004-07	6752.62	6685.67	552.13	-90	70
S1005-07	6721.44	6644.97	554.69	-90	62
S1006-07	6686.72	6625.8	557.38	-90	47
S1007-07	6677.94	6663.15	555.31	-90	59
S1008-07	6683.03	6555.39	561.89	-90	41
S1009-07	6660.73	6593.76	562.19	-90	44
S1010-07	6614.98	6667.11	558.38	-90	50
S1011-07	6659.09	6707.74	551.81	-90	62
S1012-07	6682.36	6743.91	548.51	-90	73
S1013-07	6565.82	6741.08	553.64	-90	41
S1014-07	6578.49	6782.15	548.88	-90	44
S1015-07	6548.12	6785.4	548.88	-90	35
S1016-07	6535.89	6832.24	545.65	-90	35
S1017-07	6617.88	6791.98	549.48	-90	47
S1018-07	6609.9	6750.15	551.23	-90	44
S1019-07	6716.98	6769.9	548.11	-90	41
S1020-07	6685.49	6840.5	545.4	-90	92
S1021-07	6731.32	6614.94	555.01	-90	88
S1022-07	6720.95	6531.89	558.79	-90	38
S1023-07	6681.89	6793.99	548.38	-90	89
S1024-07	6726.11	6814.06	547.27	-90	116
S1025-07	6651.11	6897.88	541.49	-90	62
S1026-07	6622.5	6932.19	539.15	-90	71
S1027-07	6597.45	6897.27	541.61	-90	56



**Table 10-4: Collar Information by Acadian during 2007-2008<sup>a</sup>**

Hole Number	Collar Coordinates Easting (m)	Collar Coordinates Northing (m)	Collar Elevation (m)	Angle (Deg.)	Depth (m)
S1028-07	6627.4	6863.73	543.79	-90	62
S1029-07	6695.96	6898.51	542.29	-90	82
S1030-07	6565.23	6857.1	544.22	-90	53
S1031-07	6749.13	6795.28	547.15	-90	110
S1032-07	6546.38	6900.8	540.64	-90	46
S1033-07	6654.41	6851.35	544.55	-90	66
S1034-07	6774.93	6837.9	544.93	-90	121
S1035-07	6721.65	6897.27	542.28	-90	109
S1036-07	6805.61	6879.92	543.86	-90	146
S1037-07	6751.97	6930.99	539.29	-90	107
S1038-07	6772.03	6951.67	537.47	-90	104
S1039-07	6603.08	7032.43	533.53	-90	78
S1040-07	6794.17	6918.98	541.32	-90	137
S1041-07	6670.44	6962.86	537.76	-90	61
S1042-07	6673.35	7031.89	529.53	-90	62
S1043-07	6744.07	6997.2	531.85	-90	80
S1044-07	6964.92	6534.27	554.71	-90	68
S1045-07	6993.7	6571.8	549.4	-90	80
S1046-07	6728.98	7029.9	527.17	-90	89
S1047-07	7033.36	6544.93	548.43	-90	62
S1048-07	7070.89	6511.28	547.12	-90	89
S1049-07	6698.73	6997.98	531.93	-90	60
S1050-07	7036	6590.68	545.38	-90	95
S1051-07	6731.34	6719.44	550.07	-90	76
S1052-07	6864.45	6441.26	552.43	-90	92
S1053-07	6857.46	6523.76	557.03	-90	89
S1054-07	6913.68	6433.7	553.87	-90	116
S1055-07	6999.86	6326.58	546.89	-90	151
S1056-07	6952.4	6314.51	544.55	-90	83
S1057-07	6975.89	6618.16	546.16	-90	101
S1058-08	6925.51	6667.45	545.26	-90	101
S1059-08	6997.46	6512.28	553.1	-90	71
S1060-07	7032.31	6419.19	548.38	-90	96
S1061-08	7005.67	6381.08	550.01	-90	121
S1062-08	7103.53	6470.53	544.62	-90	92
S1063-08	6795.97	6801.93	546.91	-90	107
S1064-08	6898.19	6224.86	535.36	-90	43

**Table 10-4: Collar Information by Acadian during 2007-2008<sup>a</sup>**

Hole Number	Collar Coordinates Easting (m)	Collar Coordinates Northing (m)	Collar Elevation (m)	Angle (Deg.)	Depth (m)
S1065-08	6853.43	6228.9	537.35	-90	64
S1066-08	6883.95	6318.98	540.69	-90	60
S1067-08	6883.85	6114.43	538.11	-90	48
S1068-08	6917.47	6721.67	544.39	-90	113
S1069-08	6906.4	6055.05	532.45	-90	71
S1070-08	6908.98	6368.17	548.36	-90	92
S1071-08	6826.52	6747.33	549.09	-90	88
S1072-08	6851.27	6786.47	546.98	-90	95
S1073-08	6742.15	6144.4	530.59	-90	27
S1074-08	6607.02	6107.87	524.85	-90	78
S1075-08	6947.63	6763.13	542.18	-90	113
S1076-08	6672.95	6163.98	528.14	-90	43
S1077-08	6811.59	6037.49	526.52	-90	60
S1078-08	6533.73	6301.72	543.98	-90	83
S1079-08	6549.57	7039.43	528.97	-90	80
S1080-08	6584.42	6310.65	543.13	-90	68
S1081-08	6637.48	6293.16	538.46	-90	32
S1082-08	6561.66	7000.93	531.65	-90	77
S1083-08	6616.27	6221.05	529.77	-90	44
S1084-08	6500.18	6997.6	530.26	-90	101
S1085-08	6526.73	6184.7	528.75	-90	117
S1086-08	6482.64	6911.99	538.37	-90	76
S1087-08	6468.44	6959.88	533.3	-90	95
S1088-08	6538.84	6228.15	532.35	-90	51
S1089-08	6535.1	6226.14	532.34	-90	95
S1090-08	6537.21	6351.61	552.64	-90	86
S1091-08	6728.05	7111.32	513.44	-90	83
S1092-08	6604.71	6354.78	550.65	-90	80
S1093-08	6763.48	7081.3	514.8	-90	59
S1094-08	6521.74	6394.32	560.35	-90	86
S1095-08	6803.17	7074.47	512.95	-90	72
S1096-08	6478.63	6368.11	556.93	-90	104
S1097-08	6434.31	6928.53	533.35	-90	95
S1098-08	6538.88	6442.45	564.27	-90	68
S1099-08	6468.35	6412.56	561.4	-90	112
S1100-08	6472.48	6865	539.96	-90	57
S1101-08	6512.89	7035.97	529.15	-90	104

**Table 10-4: Collar Information by Acadian during 2007-2008<sup>a</sup>**

Hole Number	Collar Coordinates Easting (m)	Collar Coordinates Northing (m)	Collar Elevation (m)	Angle (Deg.)	Depth (m)
S1102-08	6551.6	6494.31	564.66	-90	71
S1103-08	6594.06	6495.9	565.4	-90	62
S1104-08	6440.43	6964.51	531.46	-90	50
S1105-08	6557.47	6553.06	564.25	-90	122
S1106-08	6610.53	6545.52	566.28	-90	62
S1107-08	6518.11	6592.52	562.51	-90	101
S1108-08	6422.59	6869.34	539.52	-90	58
S1109-08	6467.99	6317.44	549.34	-90	59
S1110-08	6369.43	6864.19	537.5	-90	41
S1111-08	6389.85	6915.57	533.73	-90	73
S1112-08	6668.56	6196.65	528.77	-90	30
S1113-08	6656.95	6116.13	526.39	-90	78
S1114-08	6281.48	6867.3	535.48	-90	23
S1115-08	6662.51	6243.31	531.36	-90	26
S1116-08	6570.75	6406.75	561.01	-90	68
S1117-08	6257.15	6957.27	528.04	-90	62
S1118-08	6490.24	6252.22	539.16	-90	104
S1119-08	6551.7	6113.51	523.32	-90	77
S1120-08	6314.82	6982.61	527.53	-90	36
S1121-08	6236.26	6900.8	529.95	-90	38
S1122-08	6571.44	6219.21	530.35	-90	75
S1123-08	6960.44	6664.49	544.9	-90	116
S1124-08	6896.65	6538.24	557.69	-90	80
S1125-08	6987.14	6469.86	553.76	-90	89
S1126-08	6817.12	6150.5	534.95	-90	38
S1127-08	6489.42	6146.45	529.21	-90	137
S1128-08	6851.05	5283.15	543.74	-90	218
S1129-08	6256.73	6257.29	555.39	-90	177

<sup>a</sup> Data supplied by ScoZinc.

The complete Getty project drilling database includes results of the 138 diamond drill holes recently drilled by Acadian and the 184 historic drill holes completed during the 1970's, 181 of which were drilled by Getty and total 16,875 meters of drilling. The three remaining holes were completed by Esso during the same time period and totaled 157 meters of drilling. The resource outline pertinent to this report includes all of the 138 Acadian holes and 68 of the historic drill holes.

All holes were drilled vertically and mineralized intercepts from holes drilled on the bank top, where mineralization is generally horizontal, represent true width. Mineralization intercepts from holes drilled on the bank front, where mineralization slopes, have a true width that is 60-70% of the intercept width. Drill hole core recovery for Acadian drilling was in excess of 90% and recovery was not a factor in the resource estimation. A review of logs for historic drill holes and re-logging of select historic holes by Mercator did not identify core loss as an issue.

### **10.3.1 Logistics of Acadian Drill Program**

Logan drilling of Stewiacke, Nova Scotia was contracted to complete 2007-2008 drilling utilizing skid-mounted Longyear 38 drilling equipment equipped to recover NQ sized drill core (4.76 cm diameter). One drill was typically employed, but a second drill was periodically on site. Both machines typically operated on a 24 hour per day basis. Mercator was contracted to manage day to day drilling operations and provided onsite supervision, transportation of core to the secure logging facility at Acadian's Scotia Mine, plus logging of drill core and supervision of core sampling services. A registered land surveyor surveyed drill hole collars, and all drill holes were coordinated to the local Scotia Mine grid system.

## **11. SAMPLE PREPARATION, ANALYSES, AND SECURITY**

As stated in Roy and Carew (2011), the quality of the sample preparation, security measures and analytical procedures that were used on the Gays River and Getty Deposits are adequate for the purpose of estimating NI 43-101-compliant mineral resources and reserves.

### **11.1 GAYS RIVER DEPOSIT**

#### **11.1.1 1997 and 2004**

Core samples from Savage's 1997 drilling program and ScoZinc's 2004 drilling program were submitted to the Minerals Engineering Centre of Dalhousie University (formerly Technical University of Nova Scotia) in Halifax. The laboratory was not International Standard Organization (ISO) accredited.

According to the Minerals Engineering Centre; the core sample preparation procedure was as follows. The samples were dried, and then crushed in one or more jaw crushers, depending on the original size, to under one-quarter inch. The sample was then split in a Jones riffle to a mass of 150-200 grams. The sample was then pulverized using a ring and puck pulverizer to 80% minus 200 mesh (75 microns). The material was then put into either a bag or a vial. Rejects were kept for six months.

The sample analysis procedure consisted of the following: one gram sample lots were digested with hydrochloric-nitric-hydrofluoric-perchloric acids. Elements were determined by Flame

Atomic Absorption with detection limit of 1 ppm. Arsenic was determined by atomic absorption/hydride generation method.

Reference standards from CANMET were routinely used as internal checks on the accuracy of the analysis.

## **11.2 GETTY DEPOSIT**

### **11.2.1 Getty and Esso Programs: 1972 to 1975 (from Cullen et al., 2011)**

Government assessment reports were reviewed to identify core logging and sampling procedures applicable to the Getty and Esso drilling programs carried out between 1972 and 1975. These showed that drill core was typically logged by staff geologists who produced hard copy lithologic logs for each drill hole. Detailed information related to lithology and mineralization was systematically recorded in the logs along with complete records of core sampling and major analytical results. There is no specific description of sample marking, cutting, handling, tagging or shipping protocols, but industry standard marking and tagging of sample intervals is evident in the archived drill holes viewed and sampled by Mercator staff in 2007 at the Nova Scotia Department of Natural Resources core library in Stellarton, Nova Scotia (core library). Half-core samples were typically submitted for analysis and sample intervals reflected visually determined mineralized zone limits. A sample interval of 5 feet was commonly used but no standard appears to have been established by either company. Non-mineralized carbonate was rarely sampled. Core was logged in imperial measure and drill logs were transformed to metric equivalents subsequently during the digital data entry process.

Core from the original Getty drilling program was placed in marked core boxes and retained in covered storage in the local area until 1984. At that time NSDNR took possession of the core and it was archived at the core library in Stellarton. Esso core was stored at the Gays River mine site, with mineralized intervals typically retained in covered storage and the remaining non-mineralized intervals stored out of doors where rapid deterioration of boxes and core took place. Core storage facilities established by Esso deteriorated over the years and in some cases have been demolished. No accurate records exist of archived core or of core salvaged from the deteriorated buildings. As a result, it is unclear whether core from the Esso holes completed at Getty is included in the non-inventoried remnants of archived core that currently exists at the Scotia Mine facility. With no evidence to the contrary, it is assumed that this core has been lost or destroyed and is not available for review at present.

### **11.2.2 2008 Acadian Program**

Cullen et al. (2011) provided the following description for the sampling methods that were used for the 2007-2008 drilling program carried out by Acadian on the Getty deposit.

#### 11.2.2.1 Sample Security and Chain of Custody

In accordance with the sample protocol established by Mercator, all drill core was delivered from the drill site to the secure and private core logging facility at Acadian's Scotia Mine by either Logan Drilling Limited staff or Mercator field staff. Drill core logging was carried out by a Mercator geologist who also marked core for sampling and supervised core splitting by a technician using a rock saw. Sample tag numbers from a three tag sample book system were used for the program, with one tag showing corresponding down hole sample interval information placed in the sampled core boxes at appropriate locations, one tag lacking down hole interval information placed in the core sample bag for shipment to the laboratory, and the third tag with sample interval information retained in the master sample book for future reference and database entry purposes. After sampling, core boxes were closed and placed in storage at the Scotia Mine site. Sealed sample bags were placed in an ordered sequence prior to insertion of quality control samples, preparation of sample shipment documentation, checking, and placement in plastic buckets for shipment by commercial courier to Eastern Analytical Limited ("Eastern"), a recognized commercial laboratory located in Springdale Newfoundland. A check pulp sample split was prepared at Eastern for every 25th submitted sample and these were labeled, placed in a sealed envelope and returned to Mercator. After insertion of certified standard and blank samples, all check samples were sent to ALS Chemex in Sudbury, ON for independent analysis of zinc and lead levels. All other prepared pulps and coarse reject material was stored at Eastern until the end of the program, at which time they were shipped back to Scotia Mine for secure archival storage.

#### 11.2.2.2 Core Sample Preparation

Core samples received by Eastern were organized and labeled and then placed in drying ovens until completely dry. Dried samples were crushed in a Rhino Jaw Crusher to consist of approximately 75% minus 10 Mesh material. The crushed sample was riffle split until 250 to 300 grams of material was separated and the remainder of the sample was bagged and stored as coarse reject. The 250 – 300 gram split was pulverized using a ring mill to consist of approximately 98% minus 150 Mesh material. All samples underwent ICP analysis, for which a 0.50g portion of the pulverized material was required. Those samples containing greater than 2200 ppm of zinc or lead were then processed using ore grade analysis for which 0.20g of pulverized material was required. Laboratory sample preparation equipment was thoroughly cleaned between samples in accordance with standard laboratory practice.

Check sample splits of pulverized core were submitted to the ALS Chemex laboratory facility in Sudbury, Ontario as part of the project quality control and assurance protocol. This material was prepared in approximately 100 gram bagged splits by Eastern and returned to Mercator for subsequent submission to ALS Chemex. Since the received split material had already been

pulverized, further preparation was limited to homogenization and splitting of a 0.4g portion for subsequent analysis.

#### 11.2.2.3 Core Sample Analysis

Eastern Analytical procedures outlined below pertain to all core samples from the 2008 drill program.

ICP Analysis: A 0.50 gram sample is digested with 2ml HNO<sub>3</sub> in a 95°C water bath for ½ hour, after which 1ml HCL is added and the sample is returned to the water bath for an additional ½ hour. After cooling, samples are diluted to 10ml with deionized water, stirred and let stand for 1 hour to allow precipitate to settle.

For ore grade analysis base metals (lead, zinc, copper), a 0.20g sample is digested in a beaker with 10ml of nitric acid and 5ml of hydrochloric acid for 45 minutes. Samples are then transferred to 100ml volumetric flasks and analyzed on the Atomic Absorption Spectrophotometer (AA). The lower detection limit is 0.01% and the upper detection limit is >2200 ppm lead or zinc.

For silver, a 1000mg sample is digested in a 500ml beaker with 10ml of hydrochloric acid and 10ml of nitric acid with the cover left on for 1 hour. Covers are then removed and the liquid is allowed to evaporate leaving a moist paste. 25ml of hydrochloric acid and 25ml of deionised water are then added and the solution is gently heated and swirled to dissolve the solids. The cooled material is transferred to 100ml volumetric flask and is analyzed using AA. The lower detection limit is 0.01oz/t of silver with no upper detection limit.

A prepared sample is digested in 75% aqua regia for 120 minutes. After cooling, the resulting solution is diluted to volume (100 ml) with de-ionized water, mixed and then analyzed by inductively coupled plasma - atomic emission spectrometry or by atomic absorption spectrometry.

#### 11.2.2.4 Acadian Re-Sampling Of Getty Drill Holes

Ten drill holes completed by Getty in 1972, representing a wide grade and location range within the deposit, were selected by Mercator for re-sampling as part of the project quality control and assurance program. This work was carried out by Mercator geologists during 2007 and 2008 on core from ten Getty drill holes (Table 6) archived at the Stellarton core library maintained by Nova Scotia Department of Natural Resources. Quarter core samples of the historically half-core sampled carbonate intervals were collected from the selected holes, ensuring a quarter of the core remained for archival purposes. Assay comparison tables for this sampling program appear in report Section 13.2.2, along with descriptions of sample handling, lab information and

analytical procedures. Eastern Analytical (Eastern) was the primary lab used for the 2007/2008 Getty program and ALS Chemex (ALS) was used for check samples.

**Table 11-1: Historic Drill Holes Re-sampled in 2007**

<b>Drill Hole</b>	<b>Drill Hole</b>	<b>Drill Hole</b>	<b>Drill Hole</b>	<b>Drill Hole</b>
GGR-39A	GGR-96	GGR-125	GGR-130	GGR-167
GGR-178	GGR-193	GGR-208	GGR-211	GGR-217

## **11.3 HISTORIC DRILLING PROGRAMS**

### **11.3.1 Gays River Deposit**

There is no written record regarding the sampling method employed during the early exploration years (i.e.: pre-1970's) in the Scotia Mine area.

The exploration approach and sample collection procedures employed by the more recent exploration efforts reflects thorough sampling methodology and documentation procedures. Exploration activity was carried out in a professional manner by a team of local, experienced geologists and technicians supervised by Esso's, Seabright's, Westminer's, Savage's and ScoZinc's professional staff. The work has been well organized throughout their exploration efforts and more recently computer facilities were available to generate reports and prepare maps, etc. from the vast database.

The assay data and other parameters for all core drilling programs and underground work were entered into a computerized database using Microsoft Excel and resource-generating software programs. The quality control and validation of the coded data included steps to ensure that the assay intervals and the sample locations were correct. To ensure accuracy of the database, all assays were coded and the data entry system automatically checked for interval overlaps. The coded assays were also printed and a visual inspection was completed for comparison with the original (logged) data sheets. The sample locations were validated with appropriate plotting and visual checks against the original sections and plans.

Core drilling was carried out using North American service providers with the collection of BQ and NQ core. The portions of core to be analyzed were either split or sawed into two sections with one half submitted for analysis, the other half remaining in the core tray. All sampling procedures were carried out on site.

Sampled core lengths were determined visually. All drill holes were logged, noting lithology, structure, alteration and mineralization. Core recovery was generally greater than 90%. Early in



the exploration program, the samples were been sent via air cargo to several analytical laboratories; however, after the construction of the mill facility, the internal laboratory was used.

### **11.3.2 Getty and Esso**

Cullen et al. (2011) provided the following summary assessment with respect to adequacy of sampling, analyses and security programs related to historic drilling programs carried out on the Getty Deposit.

"Reports documenting the Getty and Esso drilling programs in the Getty deposit area do not provide detailed descriptions of sample preparation methodologies, analytical procedures or security considerations. However, both Getty and Esso were major, reputable exploration companies carrying out exploration programs in various settings at that time. More specifically, Esso was also in the process of defining reserves at the adjacent Gays River mine at the time and appears to have employed the same operating protocols for Getty drilling as were applied at the adjacent development property. Mercator is of the opinion that, while not specifically detailed in historic reporting, procedures employed by both Getty and Esso for sample preparation, record keeping, chemical analysis, and security, would have met industry standards of the day. This assertion is supported by review of original drill logs and supporting data, physical review of archived core and through recognition that both companies completed resource estimate and preliminary development assessments based on the same historic drilling results." (Cullen et al., 2011, Section 11.1)

### **11.3.3 Adequacy of Getty, Esso, and Acadian Programs**

Based upon review of reporting as described above, Cullen et al.. (2011) determined that validated data associated with Acadian and historic drilling programs on the Getty deposit is of acceptable quality for resource estimation purposes.

## **12. DATA VERIFICATION**

### **12.1 GAYS RIVER DEPOSIT**

As stated in Roy and Carew (2011), reviewed the sampling results and verified that the sample types and density are adequate for establishing Resources and Reserves. The sampling results are representative of the mineralization. The available information and sample density allow a reliable estimate to be made of the size, tonnage and grade of the mineralization in accordance with the level of confidence established by the Mineral Resource categories in the CIM Standards.

## 12.1.1 Database Validation

A sample of 59 drill holes (4.3%) was selected for database validation. The collar locations, downhole survey data, geological logs and assay data in the database was compared against the original, written logs.

### 12.1.1.1 Methodology

ScoZinc provided scanned original drill logs in Adobe \*.pdf format. An up-to-date copy of the electronic database of all drill hole information was also provided. An additional data file of drill hole co-ordinates was supplied, as many of the original drill logs did not have co-ordinates.

A total of 59 holes were selected (Table 12-1). Most of the holes were located within areas with the highest economic potential, but the selection process also strived to provide good coverage for the whole deposit. This amounted to 4.3% of the more than 1400 holes drilled on the property.

Print-outs were made of the relevant sections of each of the holes and also of the assay data of the corresponding assay intervals. The assays were printed on the reverse of the drill logs. Co-ordinates on the log and database were manually compared.

### 12.1.1.2 Results

The data in the Excel database and original drill logs were manually compared. They were found to be, for the most part, comparable. Many of the original drill logs, both underground and surface, did not have collar co-ordinates or downhole survey data. Another database was located that contained the required information. It is more than likely that the holes were surveyed and the information filed in a separate location from the original logs.

**Table 12-1: Holes That Were Verified During the Database Validation**

S61	S352	S613	S882	U047	U206
S69	S390	S634	S938	U057	U217
S71	S404	S648	S939	U061	U218
S85	S423	S663	S943	U073	U246
S94	S431	S690	S956	U087	U259
S110	S466	S703	S975	U093	U290
S183	S473	S705	S976	U106	U297
S220	S555	S726	S980	U129	U321
S251	S568	S843	U003	U148	U337
S268	S574	S857	U008	U174	

The following holes were found to have discrepancies between the original data from the drill logs and the final database:

- S 69      Database 73.76-75.59 lead 0.01% Original Log 73.76-75.59 lead 0.32%
- S110      Assay data for database match that on original log. However, a hand-written correction on the log shows reduced lead and zinc values.
- S 663      Minor sample depth errors - not significant.
- S703      Assays on original log for interval 89.0-99.83 meters not shown. These were likely assayed at a later date.
- S 726      Assay section on original log 77.72- 83.82 m (6.1m) used on database. Original log interval was corrected by hand at a later date to 2 ft. (0.61m)
- U 129      Sample from 115'-125' (10') misread as 115' -128' (13'). Written entry on original log looks like 128'.
- U218      Azimuth on database shows 235 degrees, which is consistent with other angle holes with the same co-ordinates. However, a listing in another database shows an azimuth of 180 degrees. It is more than likely that the database listing is correct.

#### 12.1.1.3 Conclusion

With the exception of Hole S 110 and S 726, where significant assay intervals and values were involved, the remainder of the holes do not represent any factor that would change the status of the deposit. In general, the data transfer from the original logs was of high quality and the database was considered a valid representation of the mineral deposit.

#### 12.1.2 Verification Sampling

The Scotia Mine property was visited by Mr. Reg Comeau of ACA Howe on June 17 and June 21 and on September 22 and September 26, 2004 in order to become familiar with the area and to conduct verification sampling on the property. Split, random, core samples were inspected and sampled from the site on the second visit during the 2004 drilling campaign. These core samples were in the area of the proposed low grade open pit, in the central portion of the deposit, as well as the Northeast zones' higher grade area. A second set of core samples from the 1997 drilling campaign was later collected by Mr. Doug Roy.

Samples from 1997 and 2004 drilling campaigns were collected, packaged and independently shipped by Reg Comeau. All samples were taken from the remaining half core samples in the core boxes and were sawed in half, reflecting a quarter core sample. The remaining quarter core was left in the core tray. The samples were packaged and shipped to ACA Howe's office in Toronto, then subsequently shipped to and analyzed by SGS Toronto. The comparison of assay results is shown in Table 12-2.

The comparison of analytical results between the original 1997 SGS samples and the samples from the 2004 drilling program (analyzed at Minerals Engineering Centre of Dalhousie University) was excellent.

The author is satisfied that the assay data base for the property is sound and sufficient for the purpose of estimating resources and reserves.

**Table 12-2: Results of Verification Sampling**

				Original Assay		Howe Sampling	
Hole #	From (m)	To (m)	Interval (m)	% Zn	% Pb	% Zn	% Pb
<b>2004 Drilling Program by ScoZinc - Pit Area</b>							
S968	2.70	4.70	2.00	3.38	0.29	3.62	0.14
S969	8.00	10.00	2.00	2.15	0.00	2.22	0.00
S971	2.90	4.90	2.00	4.63	0.00	3.91	0.00
S972	14.30	16.30	2.00	1.86	0.18	2.06	0.17
S973	74.00	75.00	1.00	11.90	14.98	14.18	17.25
S974	66.80	68.00	2.00	2.46	2.22	2.59	1.95
S976	98.10	98.45	0.35	7.66	0.23	7.19	0.17
<b>2004 Drilling Program by ScoZinc - Northeast Zone</b>							
S977	96.00	96.40	0.40	6.77	0.01	9.47	0.01
S982	133.30	133.60	0.30	0.84	0.32	0.84	0.18

				Original Assay		Howe Sampling	
Hole #	From (m)	To (m)	Interval (m)	% Zn	% Pb	% Zn	% Pb
<b>1997 Drilling Program by Westminer - Pit Area</b>							
S926	18.40	19.90	1.50	2.82	0.01	3.16	<0.01
	19.90	21.40	1.50	3.27	0.01	2.86	<0.01
S933	12.10	13.60	1.50	1.40	0.01	1.47	0.01
	13.60	14.90	1.30	2.78	0.01	2.45	<0.01
S936	8.50	9.80	1.30	3.73	0.01	4.20	<0.01
	11.00	12.20	1.20	1.02	0.01	0.98	<0.01
<b>1997 Drilling Program by Westminer - Northeast Zone</b>							
S943	60.75	62.00	1.25	7.56	2.63	6.95	2.76
	62.00	63.00	1.00	3.16	5.70	2.78	3.30
S950	36.00	37.15	1.15	5.20	3.02	3.99	2.19
	37.15	38.25	1.10	17.37	1.07	15.54	0.67
S953	91.80	92.65	0.85	4.41	7.34	3.97	7.47

## **12.2 GETTY DEPOSIT**

### **12.2.1 Review and Validation of Project Data Sets**

Data verification measures for the Getty Deposit were described in Cullen et al. (2011):

"Review by Mercator of all government assessment reports and internal Acadian files available from the Scotia Mine site established that typed lithologic logs with complete assay records from the Getty drilling era were available. However, original sample record books, laboratory reports and other associated information were not found. The digital drill hole database used for the Westminer's 1992 resource estimate was also obtained from Acadian and validated against the original hard copy drill log and assay record entries. Checking of digital records included manual inspection of individual database lithocode entries against source hard copy drill logs as well as use of automated validation routines that detect specific data entry logical errors associated with sample records, drill hole lithocode intervals, collar tables and down-hole survey tables. Drill hole intervals were also checked for sample interval and assay value validity against the original drill logs. Database entries were found to be of consistently acceptable quality but minor lithocode and assay entry corrections were made by Mercator. These were incorporated to create the validated and functional drilling database used in the resource estimate. As noted earlier, original assays certificates were not found for any of the historic drilling programs and no records of the laboratories to which samples were submitted for analysis, or methods of analysis, were documented in any of the historic drilling reports reviewed for the resource estimate.

"As part of the validation process, Mercator staff visited the NSDNR Core Library in Stellarton, Nova Scotia to review and sample core from the archived Getty drill holes. Nineteen holes were examined but only one hole GGR-212 was re-logged in detail and ten holes ... were re-sampled and analyzed for purposes of quality control and quality assurance. These provided additional verification of historical assays and logging results. Results of this and related programs are presented below under separate headings." (Cullen et al., 2011, section 13.1)

"Combined results of the Getty drill hole re-sampling and twin hole programs by Acadian generally support the earlier conclusion of Cullen et al.. (2008), based on a smaller data set, that validated historic drilling information represented in Acadian's Getty deposit database is of acceptable quality for resource estimation purposes." (Cullen et al..)

## **12.3 QUALITY CONTROL AND QUALITY ASSURANCE (QA/QC)**

### **12.3.1 Historic Drilling Programs**

Assessment reports documenting Getty and Esso drilling programs do not specifically address QA/QC issues. No evidence was noted of independent certified standards being submitted with

core samples from either company nor is there any evidence of systematic submission of blank samples or systematic provision for duplicate sample splits to be prepared and analyzed. Similarly, detailed descriptions of sample preparation methodologies, analytical procedures or security considerations are not present in any of the historic documentation reviewed for this report. This situation was not uncommon in exploration program reporting during the 1970's era and later, when reliance was placed to a substantial degree on standards, duplicate samples and other quality assurance and control procedures implemented by the commercial laboratories providing analytical work.

As noted earlier, both Getty and Esso were major, reputable companies at the time of their drilling programs on the Getty deposit. Esso was completing reserve delineation and mine planning work for the adjacent Gays River (Scotia Mine) project that entered commercial production in 1979. Both companies are considered credible and Mercator's review of drill logs and associated sample data did not reveal any points of obvious concern with respect to use of historic results for the project.

Notwithstanding the above, the lack of laboratory assay certificates and information on sampling and laboratory procedures necessitated a review of and re-sampling of archived Getty core as well as the twinning of a number of Getty-era drill holes within the resource area. These safeguards were implemented and results are discussed below.

### **12.3.2 Acadian Programs**

Mercator, on behalf of Acadian, established and administered a quality control and quality assurance program for the Getty 2007-2008 drilling project. All drill core samples, including samples associated with the twinned and re-sampled historic drill holes, were subject to project quality control and assurance (QA/QC) protocols. The program included insertion of blind certified standards and in-house blanks, analysis of quarter core duplicate samples, duplicate analysis of prepared pulps and submission of check sample pulps to an alternate commercial laboratory for analysis. Details of each program component are discussed in Cullen et al.. (2011).

### **12.3.3 Comment on Quality Control and Quality Assurance Programs**

Combined results of the Getty drill hole re-sampling and twin hole programs by Acadian were interpreted by Cullen et al.. (2011) as providing acceptable confirmation of historic drilling results. Collective results of the extensive Quality Control and Quality Assurance programs carried out during the Acadian 2007-2008 drilling program are interpreted by the same authors as confirming the integrity of those results. The validated project database developed through combination of the historic and Acadian drill hole results were determined to be acceptable for use in resource estimation programs that are compliant with NI 43-101 and the CIM Standards.

## **13. MINERAL PROCESSING AND METALLURGICAL TESTING**

### **13.1 SUMMARY**

As discussed in Section 8, the low grade lead/zinc deposit is of the Mississippi Valley Type (MVT). The projected Life of Mine (LOM) mill feed grades were calculated to be 1.64% Pb and 2.95% Zn.

The projected metallurgical performance provides for a lead concentrate grading of 70% Pb at an 88% recovery, and a zinc concentrate grading 57% Zn at an 86% recovery.

Allowance is made in the production schedule to reflect the adverse effects of plant tune-up and crew training during the first six months of operation. The projected metallurgical performance is predicated on having in place competent operating and maintenance crews, a fully-functional assay laboratory, a dependable on-stream analysis system and an effective preventive maintenance program.

Metallurgical performance will improve or deteriorate with fluctuations in feed grade.

No deleterious minor elements are contained in the concentrates. The products should be readily marketable, given the clean high-grade nature of the materials.

### **13.2 METALLURGICAL TESTWORK**

No metallurgical test reports have been reviewed. In the absence of these data, metallurgical projections are predicated upon the plant performance in 2008.

### **13.3 METALLURGICAL PROJECTIONS**

Scotia Mine's past production history is reported in Table 6-1. The reported high concentrate grades and metal recoveries reflect the relatively simple mineralogical characteristics of this type of mineralization. Estimates of plant metallurgical performance have been prepared by Thornton (2006), Flint (2011) and Taggart (2011).

Thornton's estimate of metallurgical performance, indicated in Table 13-1, was based on empirical plant data produced prior to 2006.



**Table 13-1: Expected Metallurgical Balance (Thornton, 2006)**

Product	Weight Percent	Grade		Distribution %	
		% Pb	% Zn	Pb	Zn
Feed	100.00%	1.40	4.00	100.00	100.00
Lead Concentrate	1.80%	75.00	4.00	95.00	1.80
Zinc Concentrate	6.10	0.40	60.00	1.70	91.00
Tailings	92.20	0.05	0.31	3.30	7.20

Ian Flint, Ph.D., P.Eng., a Metallurgical Engineer with MineTech International Limited, carried out an analysis of the mill's performance during the 2007-2008 period of operations (Flint, 2011). Dr. Flint concluded that metallurgical performance was adversely affected by a number of factors, including, but not necessarily limited to:

- Highly variable mill feed grades and feed rates,
- Frequent circuit disruptions caused by unscheduled maintenance,
- The use of inappropriate grinding and flotation circuits,
- A lack of managerial expertise and operator experience,
- Substandard metallurgical accounting procedures,
- The ineffective use of the on-stream analyzing and sampling equipment, and,
- Inadequate assay and metallurgical laboratory support and a lack of metallurgical test data.

Dr. Flint reported the projected metallurgical balance to be as shown in Table 13-2, based on the effective mitigation of the problems noted above.

**Table 13-2: Expected Metallurgical Balance (Flint, 2011)**

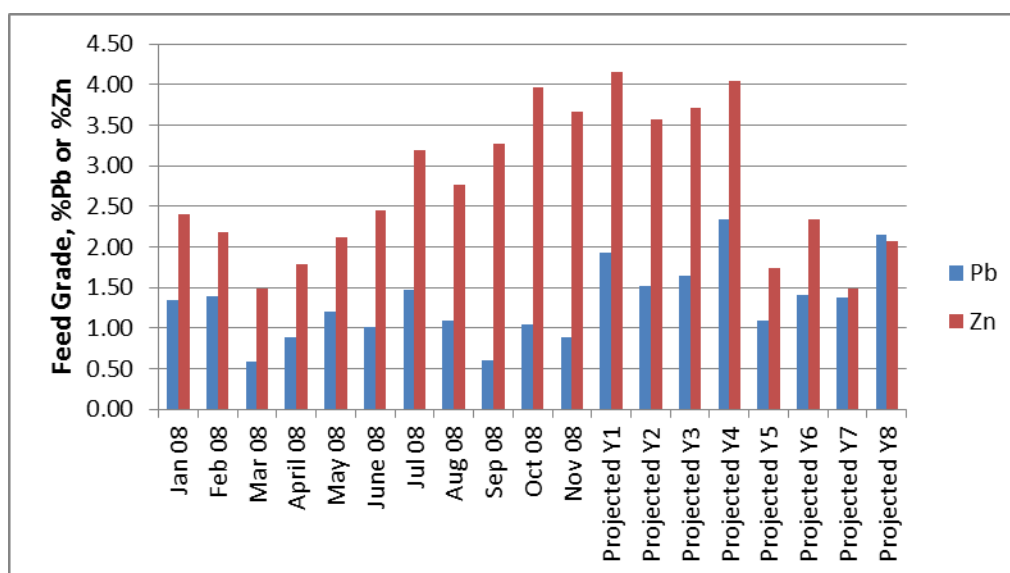
Product	Weight Percent	Grade		Distribution %	
		% Pb	% Zn	Pb	Zn
Feed	100.00%	1.40	4.00	100.00	100.00
Lead Concentrate		80 +		95 +	
Zinc Concentrate			67.0		71 - 81

Dr. Flint attributed some of the zinc flotation challenges to degrees of mineral liberation. At the prevailing product grinds, it was reported that recoveries between 71 and 81 percent zinc recovery could be achieved with a concentrate grade approximating 67.0% Zn, close to the maximum theoretically possible. Alternatively, with zinc concentrate grades within the range of 52-56% Zn, an "almost total recovery" could be achieved.

An independent review of the metallurgical data was conducted by Taggart in 2011, based primarily on the plant results achieved in 2008.

Figure 13-1 indicates the monthly feed grades that were reported during the period January to November, inclusive, in 2008. The lead feed grades were erratic during the period, while the zinc feed grade increased each month, following the end of the first quarter.

The average projected feed grades for years 1 through 8 are shown, based on the August 11, 2011 mine plan values. The projected average lead grades are higher than those achieved in 2008 while the projected zinc grades are similar to those experienced during the final two months of operations in 2008.



**Figure 13-1: Monthly Feed Grades**

The high feed grades will generally enhance metallurgical performance. It may be necessary, however, to adjust the mining schedule and/or implement ore stockpile management practices to minimize potential short term fluctuations in plant feed grade.

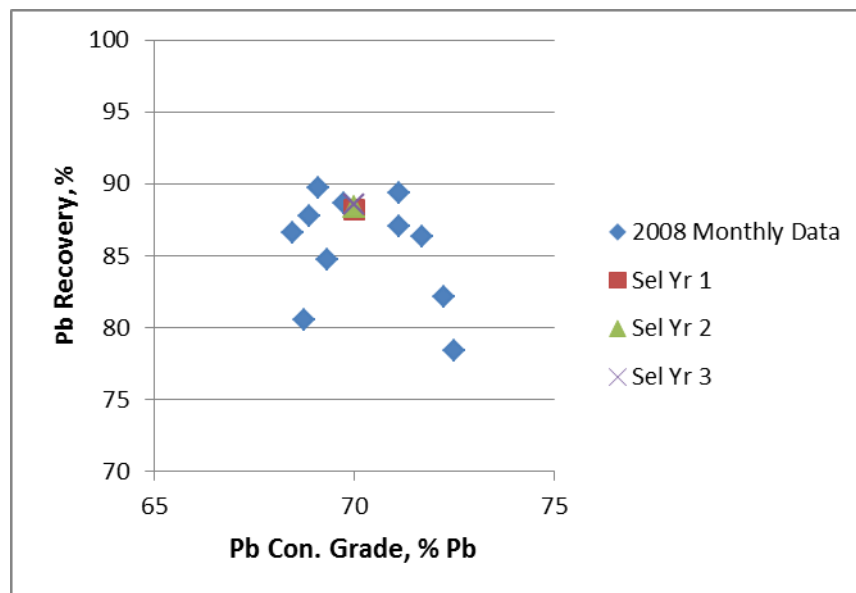
The drop in the zinc feed grade in Year 5 is attributed to the introduction of mineralization from the Getty Deposit. Not only will the plant feed grade decrease, but the lead-zinc ratio will be less

conductive to efficient selective flotation. Given the lack of any flotation test work, however, it is assumed that the metallurgical response of the mill feed will remain unchanged for this purpose, regardless of mill feed source.

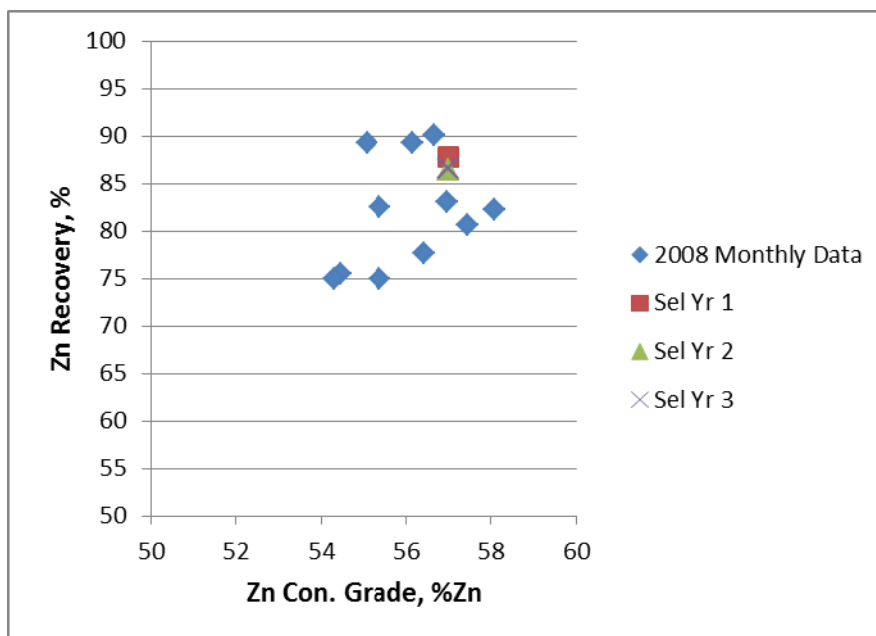
The plant metallurgical results were influenced by fluctuations in feed grade: metallurgical results improved with increasing feed grades, and conversely deteriorated as feed grades decreased. This was particularly evident in the case of zinc metallurgical response. Metallurgical projections have been adjusted to reflect fluctuations in feed grade. However, no provision has been included to allow for major short-term variations which will affect metallurgical performance and possibly mill throughput rates.

As reported by Dr. Flint, and confirmed by Taggart, the ScoZinc operations were disrupted to varying degrees by mechanical problems and materials handling difficulties. Selwyn intends to correct known deficiencies prior to the resumption of operations.

The monthly lead and zinc grade/recovery data for the period January to November 2008 are shown in Figure 13-2 and Figure 13-3, respectively, as provided in the Monthly Reports. In addition, the projected concentrate grades and metal recoveries for the first three years are shown for comparison.



**Figure 13-2: 2008 Lead Grade Recovery Data**



**Figure 13-3: 2008 Zinc Grade Recovery Data**

No data has been reviewed with respect to the sensitivity of metallurgical performance to changes in flotation feed grind size, rougher concentrate regrind size or flotation circuit retention times. These parameters will change as a result of the proposed increased mill feed rates, and the higher feed grades. Upon achievement of stable operations, Selwyn proposes to conduct comprehensive circuit sampling surveys which, in conjunction with mineralogical analyses, could identify means by which further improvements in metallurgical performance might be attained.

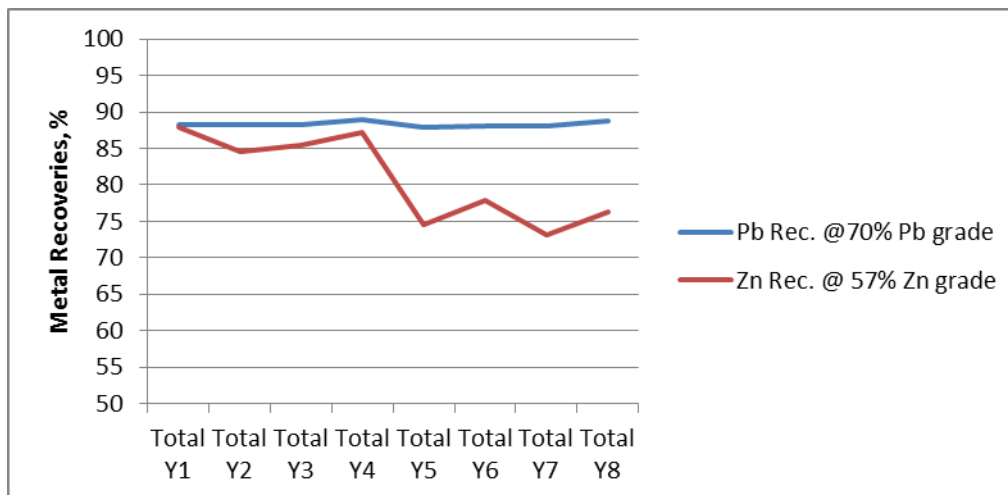
The metallurgical balances prepared by Taggart and used in this Preliminary Economic Assessment are shown in Table 13-3 for Years 1 through 8. Estimates of metal recoveries are discounted by 3 percent, 2 percent and 1 percent during months 1 and 2, months 3 and 4 and months 5 and 6 respectively in Year 1, to reflect plant tune-up and crew training.

**Table 13-3: Projected Annual Metallurgical Performance (Taggart 2011)**

Year	Product	Tonnes dmt	Grade		Distribution, %	
			% Pb	% Zn	Pb	Zn
1	Feed	839,167	1.92	4.16	100.0	100.0
	Lead concentrate	20,350	70.0	4.6	88.3	2.7
	Zinc concentrate	53,463	1.8	57.0	6.0	87.9
2	Feed	875,000	1.52	3.56	100.0	100.0
	Lead concentrate	16,760	70.0	5.0	88.2	2.7
	Zinc concentrate	46,288	1.7	57.0	6.0	84.6
3	Feed	875,000	1.64	3.71	100.0	100.0
	Lead concentrate	18,118	70.0	4.8	88.3	2.7
	Zinc concentrate	48,706	1.8	57.0	6.0	85.4
4	Feed	875,000	2.34	4.04	100.0	100.0
	Lead concentrate	25,984	70.0	3.7	88.9	2.7
	Zinc concentrate	54,133	2.3	57.0	6.0	87.2
5	Feed	875,000	1.09	1.74	100.0	100.0
	Lead concentrate	12,023	70.0	4.4	87.9	3.5
	Zinc concentrate	19,875	2.9	57.0	6.0	74.6
6	Feed	875,000	1.42	2.34	100.0	100.0
	Lead concentrate	15,596	70.0	3.5	88.1	2.7
	Zinc concentrate	27,964	2.7	57.0	6.0	77.9
7	Feed	875,000	1.38	1.48	100.0	100.0
	Lead concentrate	15,205	70.0	3.0	88.1	3.5
	Zinc concentrate	16,618	4.4	57.0	6.0	73.1
8	Feed	343,897	2.06	2.07	100.0	100.0
	Lead concentrate	9,407	70.0	2.6	88.7	3.5
	Zinc concentrate	9,529	4.7	57.0	6.0	76.4

Constant concentrate grades are assumed throughout, for the primary metals. However, metal recoveries are adjusted to reflect fluctuations in feed grade, based on empirical data produced in 2008.

Figure 13-4 indicates the projected decrease in zinc recoveries that will probably occur once the lower grade Getty mineralization is delivered to the plant. Zinc recoveries to the lead concentrate have also been increased marginally, in anticipation of potential challenges caused by the adverse Getty mineralization lead-zinc ratios.



**Figure 13-4: Projected Metallurgical Performance**

In the absence of any relevant metallurgical testwork, Taggart assumed that the metallurgical response of the Getty mineralization will be the same as that from the Gays River Deposit. Cullen et al. (2011) reported that no mineral processing work is known to have been completed for the Getty Deposit. However, since the Getty Deposit's geology and mineralogy are nearly identical to the Gays River Deposit's, Doug Roy, P.Eng (Cullen et al. (2011) expects similar mineral processing behavior for both deposits. The author recommends flotation test work to confirm that belief.

### 13.4 METALLURGICAL ACCOUNTING

Given the absence of any metallurgical test data, Taggart's metallurgical projections are based on data provided in the ScoZinc monthly reports. Flint expressed concerns with respect to the reliability of the sampling and metallurgical accounting protocols, noting that the "lead and zinc circuit recoveries were consistently overstated".

Taggart shares these concerns and noted that a lack of relevant procedural documentation and reports precluded audits and validation of important metallurgical accounting information. Answers to the following questions are outstanding.

- Did ScoZinc conduct metallurgical accounting in accordance with some formal, documented protocol?

- How did the cumulative daily metallurgical balance compare with the balance based on concentrate shipments and month end concentrate inventories?
- How did the monthly calculated and measured mill feed grades compare with each other, and with the grades estimated by mine ore control geologists?
- How did the monthly mill throughput tonnage compare with the values measured and estimated by the Mine Department?

## **14. MINERAL RESOURCES ESTIMATES**

The mineral resource estimates that are presented in this section are current, but not new. They were originally presented in the NI 43-101 technical report, "Updated mineral resource report for the Gays River zinc-lead deposit, including the Getty Deposit" (Roy and Carew, 2011). The report was prepared by MineTech International Limited for Selwyn Resources Ltd and had an effective date of July 6, 2011.

The Gays River Deposit's mineral resource estimate was prepared by Doug Roy, P.Eng. and Tim Carew, P.Geo. of MineTech International Limited. Getty's mineral resource estimate was prepared by Cullen et al. (2011) of Mercator Geological Services Limited. The estimates were separately prepared using slightly different parameters, the most significant of which were different zinc-equivalent grade formulae and different block cut-off grades for resource reporting. These differences preclude reporting a total for both Deposits. In other words, mineral resources for the Gays River and Getty Deposits are reported separately.

### **14.1 GAYS RIVER DEPOSIT**

Main Zone mineral resources, located south and west of Gays River, were estimated by Tim Carew, M.Sc., P.Geo., who was a Co-author of Roy and Carew, 2011 and is a Qualified Person under Section 1.1 of National Instrument 43-101. Estimation of Main Zone mineral resources is discussed in Section 14.1.3.

Northeast Zone mineral resources, located underneath and northeast of Gays River, were calculated by Douglas Roy, M.A.Sc., P.Eng., who was this Principal Author of Roy and Carew, 2011 and is a Qualified Person under Section 1.1 of National Instrument 43-101. Estimation of Northeast Zone mineral resources is discussed in Section 14.1.4.

The Main Zone mineral resources (discussed in Section 14.1.3) were originally modeled by Tim Carew for Savage Resources during 1998. Mr. Carew updated the model using linear unfolding for a NI 43-101-compliant resource estimated in 2006 (Roy et al, 2006). As there was no new drilling in this zone since 2006, the significant changes from 2006 were (1) a re-tabulation of Main Zone mineral resources using the revised zinc-equivalent grade (for lead – refer to Section 14.1.1) and (2) subtraction of the material that was mined during 2007 and 2008.

Mr. Roy estimated the Northeast Zone's mineral resources in 2006 using a cross-sectional end-area method (Roy et al, 2006). For the current estimate, Mr. Roy re-estimated those resources using block modeling and carried out grade estimation using inverse distance weighting (refer to Section 14.1.4).

Though mineral resources for the Main and Northeast Zones were estimated separately, they abut one another and represent a single, geologically continuous, mineralized body.

### 14.1.1 Zinc-Equivalent Grade

For cut-off grade purposes, lead's zinc-equivalent grade was calculated and added to the zinc grade. The zinc-equivalency calculation considered differential metal prices, recovery values, smelter returns and concentration factors (for consideration of treatment charges). The prices were current as of late-March, 2011.

The zinc-equivalency of 1% lead was determined to be 1.5% zinc. In other words, lead was determined to be worth 50% more than zinc at the time of report writing.

$$\begin{aligned}
 \text{1\% Lead} &= \frac{\text{Lead Price}}{\text{Zinc Price}} \times \frac{\text{Lead Recovery}}{\text{Zinc Recovery}} \times \frac{\text{Lead Smelter Return}}{\text{Zinc Smelter Return}} \times \frac{\text{Lead Concentration Factor}}{\text{Zinc Concentration Factor}} \\
 &= \frac{\$1.15}{\$1.10} \times \frac{86\%}{84\%} \times \frac{95\%}{85\%} \times \frac{75}{60} \\
 &= \$1.50\% \text{ Zinc}
 \end{aligned}$$

1. Recovery values are actual values from 2008.
2. Smelter returns were estimated.
3. Concentration factors are in consideration of treatment charges (assuming that the per tonne charge for lead and zinc would be equal).
4. Metal prices are estimated from two-year LME hedge prices.

### 14.1.2 Specific Gravity/Density

There was no record of any systematic whole-rock SG measurements being taken. Therefore, a formula for specific gravity based on zinc and lead grades was used for the mineralized zones. This formula, which was also used by Savage Resources for their 1998 resource estimate, was:

$$\text{SG} = \frac{1}{\left( \frac{\text{Pb\%}}{(86.6 \times 7.6)} + \frac{\text{Zn\%}}{(67.0 \times 4.0)} + \left( 1 - \frac{\text{Pb\%}}{86.6} - \frac{\text{Zn\%}}{67} \right) \right) \times 2.7}$$



ScoZinc carried out a limited amount of SG measurement work during the 2007-2008 period. The results are presented in Table 14-1. Though the sample size was very small, the measurements show that the formula-estimated SG values consistently underestimate the actual SG by approximately 6-7% for samples with typical (of this deposit's) grade values. Laboratory testing was carried out by the Minerals Engineering Center at Dalhousie University in Halifax, Nova Scotia.

The ramification of this underestimation is that the tonnage of the current resource estimate may be underestimated by an amount in the range of 6-7%. More SG test work, on a sample set that numbers in the hundreds, would be required to define an adequate empirical SG versus grade relationship. For that reason, the tonnage of the current resource estimate was not adjusted from the formula-estimated values.

**Table 14-1: Comparison of SG Values**

Sample	Type	Zn % (lab)	Pb% (lab)	Lab S.G.	Formula S.G.	Under- estimation (%)	Description
39472	Dolostone	3.17	0.0007	2.94	2.74	7%	Dark grey brown, slightly fossiliferous, 10% sph
39473	Dolostone	0.65	0.021	2.9	2.71	7%	Brown grey, slightly fossiliferous, <1% sph, 3% vugs
39474	Dolostone	0.91	0.021	2.89	2.71	6%	Grey brown, slightly fossiliferous, 2 - 3% sph, 1% vugs
39494	Ore	28.64	36.04	4.72	4.55	3%	Massive sphalerite/galena
39495	Ore	49.8	0.6	3.74	3.58	4%	Semi massive sphalerite, minor galena
39496	Ore	7.8	52.79	6.69	4.74	29%	Massive coarse grained galena/sphalerite
39498	Dolostone	5.72	0.039	2.97	2.78	6%	Brown grey, 5 - 10% sph/trace ga, 2- 3% vugs
34499	Dolostone	3.76	0.022	2.93	2.75	6%	Grey brown, 3% sph, 1% vugs

### **14.1.3 Main Zone Resources**

#### **14.1.3.1 General**

The deposit is characterized by complex geometry and is difficult to model in terms of standard techniques. Lying along a 'paleo-shoreline', it features repetitive changes in strike of 90° or more around a general trend of 060° Azimuth, with varying dip. This geometry makes it difficult to incorporate the true spatial relationship of the samples for estimation purposes without the use of 'unfolding' techniques. Unfolding transforms the sample data into another coordinate space that honors the spatial relationships. Variography and estimation are conducted in the transformed space, and the results are then back-transformed into the original space. The deposit has been mined by underground methods in the past and is therefore intersected by numerous openings along the hanging wall contact.

#### **14.1.3.2 Geological Modeling Approach**

The drill-hole data entered in the database was displayed in 3D graphics mode, and a number of triangulated surfaces (TINs or Triangulated Irregular Networks) were created to represent the base of the overburden, and the lower and upper contacts of the carbonate (ore) horizon. The surfaces were developed by selecting the relevant down-the-hole intersects (with interactive inspection and adjustment), and calculating a best-fit plane through the data points derived. The selection process for the underground holes was complicated by the fact that some holes were drilled from footwall to hanging-wall, and some in the opposite direction. To assist in differentiating the contacts, a new field (T/B) was added to the Geology table of the database to contain a numeric code designating the contact as either a top or bottom contact. Codes were also defined to designate carbonate intervals that were either the first or the last interval in a hole, indicating that the hole had been either collared or ended in carbonate. The codes were calculated by a formula in the original Excel spreadsheets and then merged into the 'T/B' field in the Geology table. The drill-holes were grouped by orientation (vertical up, vertical down and inclined) to further facilitate this process. A smooth 3D surface through the active data was then created by Laplace interpolation, relative to the best-fit plane.

Topographic contour data derived from the AutoCAD drawing files provided was utilized to create a TIN of the original topography over the project area.

A 3D solid of the carbonate formation was initially created from the top and bottom surfaces developed above. In the initial absence of detailed geologic plans and sections, the surfaces used were based solely on drill hole intersections. The drill holes utilized were the surface holes, up-holes from underground, and horizontal underground holes that had clearly defined 'top' and 'bottom' contacts, as designated by the 'TJB' numeric code described above. A set of 3D solid models of the existing underground development and stope areas developed by Mr. Bruce

Hudgins of Hudgtec Consultants was imported from the AutoCAD DXF files provided. It should be noted that these solids could not be validated in G4W, indicating that they were probably not completely closed. This problem again reflects the complexity of the models, but does not significantly affect the results of volume determinations or block model 'stamping' in G4W.

Subsequent Inspection of the 3D solid in section and plan indicated that although the overall geometry of the deposit was being honored, there were significant variances from existing manual interpretations and underground mapping in a number of areas. After a number of re-interpolations utilizing both drill-hole and digitized data, it was concluded that inconsistencies in lithological coding in the drill holes would negate the contact modeling approach.

It was further decided that manual interpretation was required, and that the ore zone be differentiated into a high-grade massive sulphide zone and a low-grade disseminated zone. Drill-hole data and underground openings were then plotted on hard-copy plans at ten meter intervals and interpretations of the high-grade zone, the low-grade and the hanging-wall 'Trench' were produced. The cut-off grades that were used for the high-grade and low-grade zones were 7% Zn-Eq and 2% Zn-Eq respectively. These values were selected to correspond with cut-offs utilized in earlier resource evaluations. The plan-view interpretations were digitized as closed polygons, then tied together in the solids modeling system to create separate 3D solid models of the high-grade, low-grade and trench zones of the deposit. This work was completed by Mr. Peter Irwin, of Resource Data Management Inc., under contract to Savage Resources Canada Co. The geometric complexity of the deposit is reflected in the large number of tie lines required to adequately control the triangulation process utilized to create 3D solid models. The modeling was, therefore, time consuming but produced valid solids for the ore and trench zones. These models were adopted for use during the previous resource estimate in 1998 (Carew, 1998) and again for the current resource estimate.

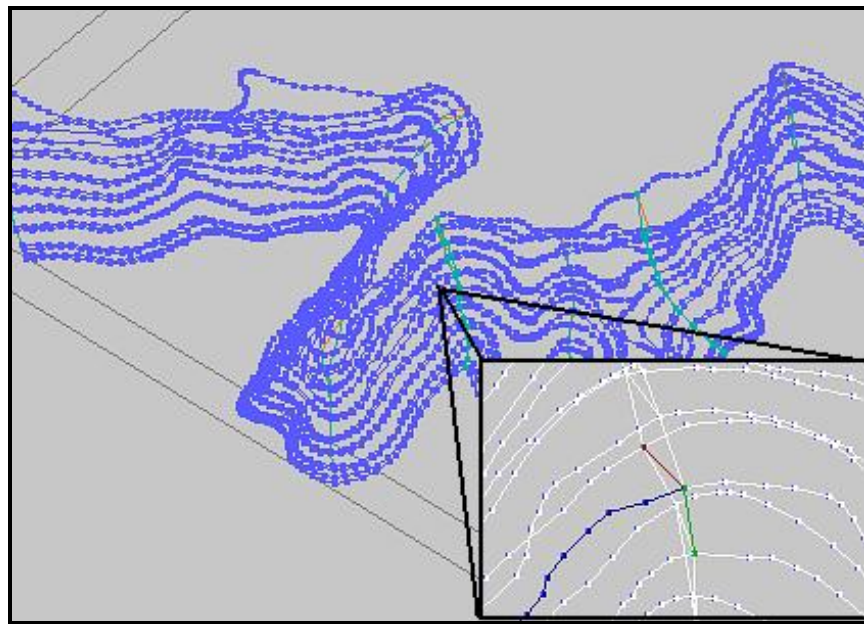
#### 14.1.3.3 "Unfolding" Process

As stated in Section 14.1.3.1, the deposit is characterized by complex geometry and is difficult to model in terms of standard techniques. An 'unfolding' technique was used that transformed the sample data into another co-ordinate space while honoring the spatial relationships.

The Gemcom unfold application was used for the transformation in this case. This approach is based on the concept of slabs – a slab being a region of space that is topologically equivalent to a cube. The edges are 3D polylines and are not necessarily straight from end to end. Each face is defined by four polylines on its perimeter and the nominally vertical edges of the slab may also have more than two points. The geological feature of interest, e.g. a folded and/or faulted vein or seam is broken down into a collection of adjacent slabs, the only proviso being that any two adjacent slabs must share an entire common face. The algorithm highlights three of the edge

polylines of a representative slab that are nominally orthogonal and allows them to be associated with X, Y and Z axes of the unfolded space. All of the polylines are then categorized into three sets of lines corresponding to these unfolded axes. The unfolded slabs are displayed below the original polylines, and the unfolded lines will be aligned approximately to the X, Y, and Z axes. The average length of each of the sets is calculated and a nominal graticule size, or spacing, is entered. The unfolding transformation includes two graticules – one for the folded region and one for the unfolded region. The points in the two graticules have an exact 1:1 correspondence, which provides for a check that the transformation will be reasonable. If any graticule cells are highly skewed, for example, the folded region can be subdivided into smaller slabs. In addition, the interior vertices can be allowed to slide on the various sets of lines in order to minimize distortion.

The graticule points are simply samples of the transformation, and are connected by straight lines to make the visualization easier. Various combinations of the sliding axes can be experimented with, particularly in cases where the polyline lengths along the feature are different, in order to minimize the distortion in these cases. The 3D polylines were generated by contouring the 3D solid of the mineralized carbonate developed for the deposit in earlier studies at 10m plan intervals, as the original polylines are no longer available. These polylines were subdivided into a series of smaller adjacent slabs corresponding to the alternating strike direction of the deposit. A section showing the slabs and the allocation of the association with the unfolded axes is illustrated in Figure 14-1. The unfolded space is illustrated later in Figure 14-6.



**Figure 14-1: 3D Polyline Slabs and Axes**

The basic procedure is as follows:

- Creation of the unfolding transformation;
- Forward transformation (unfold) of the sample data points;
- Variography and block modelling in the transformed space;
- Back-transformation of the estimated block data (Zn and Pb) into normal (folded) space; and,
- Allocation of the values to a block model in normal (folded) space by nearest neighbour interpolation.

#### 14.1.3.4 Drillhole Data

A subset of the overall drillhole database was utilized for estimation purposes, comprising those drill holes that intersected the 3D solid model of the carbonate mineralization. This subset comprises 623 holes and includes both surface and underground drilling.

#### 14.1.3.5 Mineralized Envelope

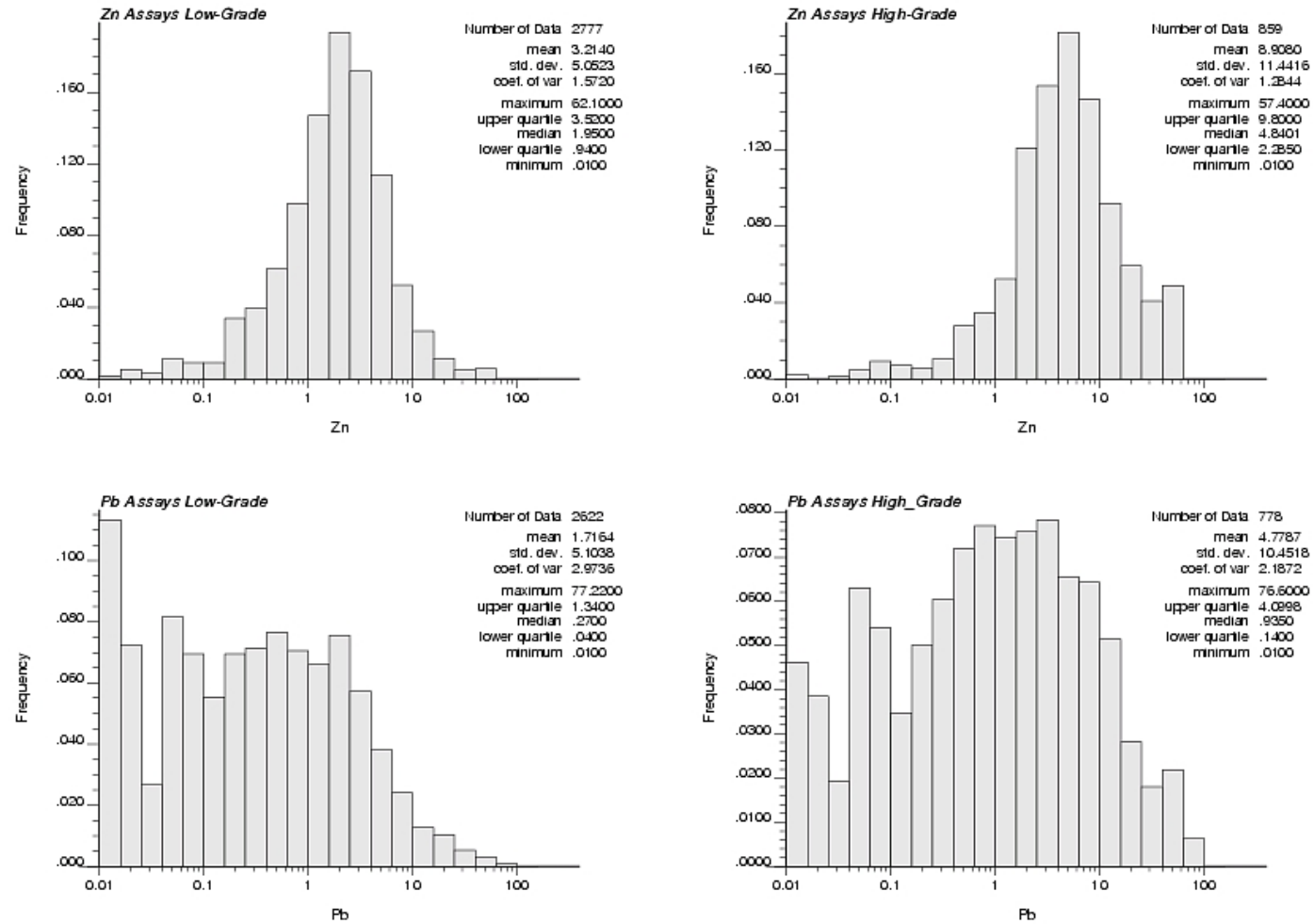
The mineralized envelope for estimation purposes was restricted to the carbonate material within the 3D solid models created from plan view interpretations. These interpretations and 3D model are regarded as the most representative constraints on the mineralization available. Separate 3D models were developed for the low grade, disseminated portion of the deposit, and for the less continuous high grade zone that lies along the footwall contact, and which was exploited by previous underground mining.

#### 14.1.3.6 Statistical Analysis and Capping

The sample sets for zinc and lead mineralization comprised those assay intervals falling within the 3D solids and were compiled separately for the low-grade (LG) and high-grade (HG) zones. The sample statistics, histograms and probability plots are shown in Figure 14-2 and Figure 14-3.

While both Zn and Pb assay grades exhibit fairly typical positively skewed distributions, the Pb values exhibit evidence of a multi-modal distribution, with a set of values falling in the 0.01 to 0.1% range - this may be related to the use of arbitrary and variable values for detection limits in the Pb data. In general, Zn and Pb values are not particularly well correlated, with a correlation coefficient of 0.32. There is also some evidence of possible misclassification of some values between low grade and high grade zones in both cases, either in terms of original typing, or in geometric boundary effects relative to the 3D solids. The Zn values are generally well behaved, with relatively low Coefficients of Variation (COV), whereas the Pb values exhibit a relatively high COV.

Whereas initial studies on the deposit by Savage Resources Canada Co. considered a capping value of 13% on both Zn and Pb, examination of the probability plots indicates that although the number of high values steadily decreases, the upper tail for the all distributions are fairly continuous and unbroken up to values considerably higher than this, suggesting that higher capping values could be utilized. In later studies, discussions with Savage personnel led to an alternative approach in which the high-grade outliers in the distributions were retained in the data set prior to any compositing, but severely restricted in terms of interpolation. Block centroids were required to be within 5 meters of the sample before it could be used in the estimation of the block in question. Given the indication that higher capping values could be considered, and to maintain consistency, this approach was retained for this study. No grade capping was applied prior to compositing, but the range restriction was subsequently applied in estimation for Zn and Pb composites above 26%.



**Figure 14-2: Zn and Pb Assay Lognormal Histograms**

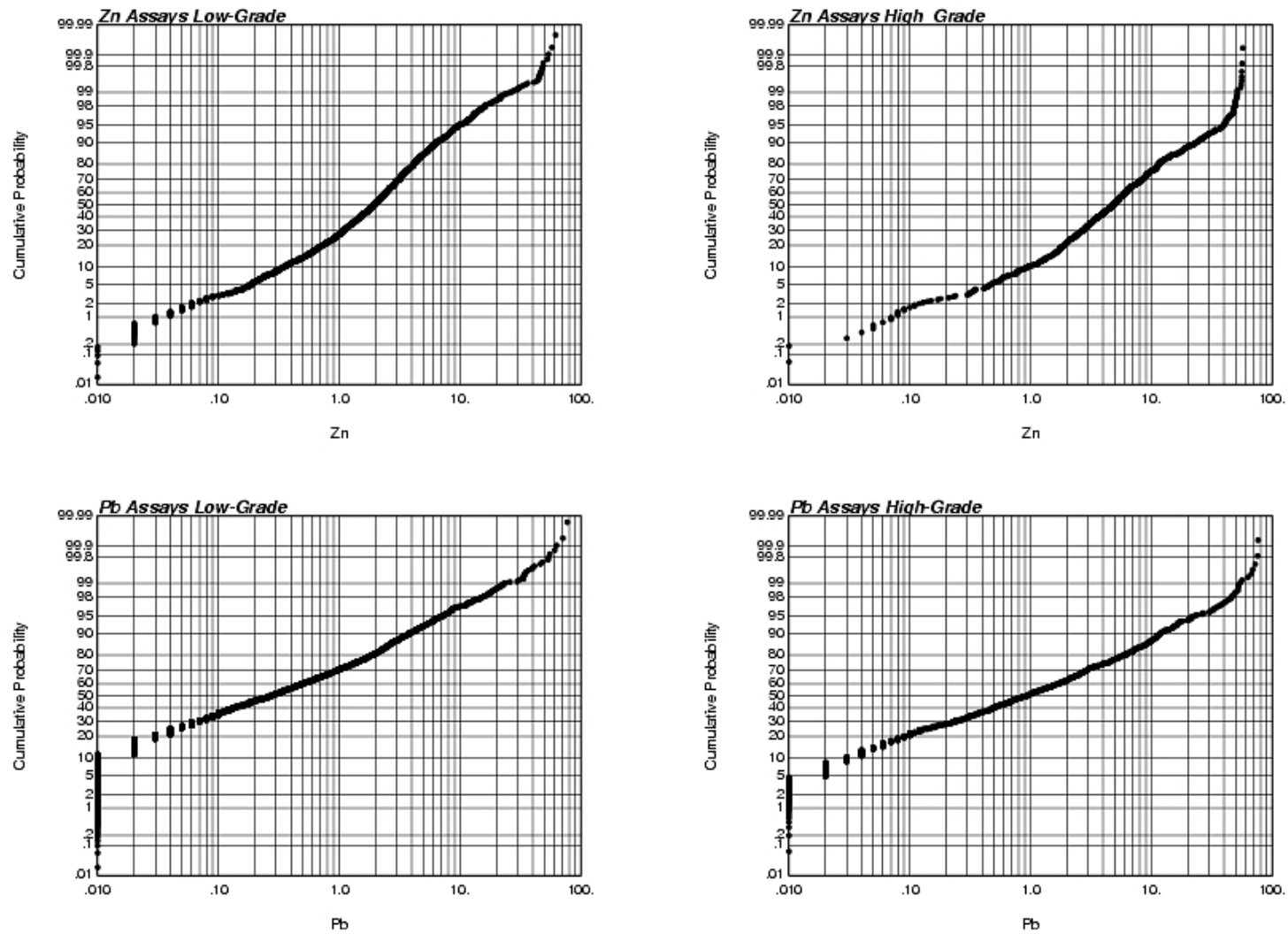


Figure 14-3: Zn and Pb Assay Probability Plots



#### 14.1.3.7 Compositing

Equal length composites were prepared from uncut assay values in a two-step process. Initial composite intervals were defined from the intercepts of the drill holes with the high-grade and low-grade 3D solids of the mineralized zone. Equal length composites of 1.5 meters were then generated within these intervals – 1.5 meters is approximately the average length of the assay intervals. Residual intervals of less than 1.5 meters at the top and bottom contacts were retained if the length was at least 0.6 m (40% of composite length). Intervals less than 0.6 m in length were discarded. The low-grade composites set was further subdivided into those falling below 490 m elevation (below which the deposit dips at varying angles) and those above 490 m where the deposit is essentially flat-lying. The composite statistics and histograms for the overall high grade and low grade Zn and Pb are shown in Figure 14-4.

#### 14.1.3.8 Variography

Three dimensional experimental correlograms were generated using the transformed (un-folded) Zn and Pb composite data, for both low-grade and high-grade mineralized zones below an elevation of 490 m. Separate 3D experimental correlograms were generated using un-transformed composite data for the low-grade mineralized zone above 490 m elevation, where the deposit is essentially horizontal in attitude. Nested correlogram models comprising nugget effect and two spherical components were fitted to all experimental variograms as tabulated in Table 14-2 and shown in Figure 14-5.

**Table 14-2: Correlogram Models**

Zone	Nugget Effect	Spherical components						
		Sill	Ranges					
			Maximum		Intermediate		Minimum	
			m	Az/Dip	m	Az/Dip	m	Az/Dip
LG – Zn <490	0.337	0.103	48	181/-4	11	232/84	8	92/5
		0.560	32	258/-50	23	275/39	3	178/8
HG - Zn	0.250	0.305	231	98/20	15	133/-66	9	13/-13
		0.445	412	87/63	118	351/3	10	80/-27
LG – Pb <490	0.517	0.402	75	121/-72	7	84/15	4	177/10
		0.081	267	96/16	69	268/74	22	5/2
HG – Pb	0.579	0.270	39	78/-19	21	134/59	11	357/24
		0.151	186	126/51	170	169/-31	17	65/-22
LG>490-Zn	0.306	0.443	46	174/-2	21	262/44	4	85/46
		0.251	442	239/22	30	144/0	17	59/68
LG>490- Pb	0.395	0.474	58	77/-4	20	168/-6	7	131/83
		0.131	113	222/83	61	243/-7	42	153/-3

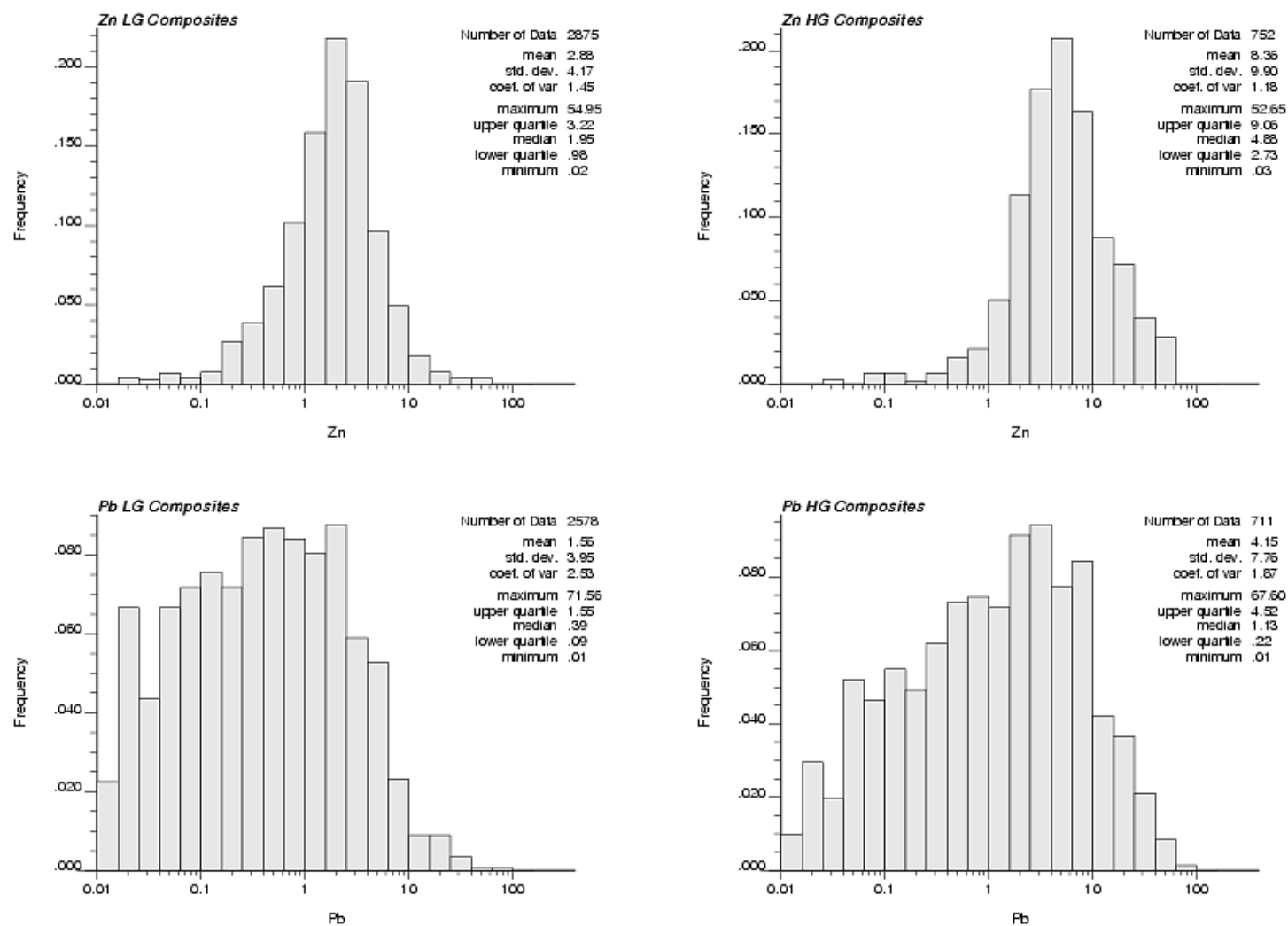
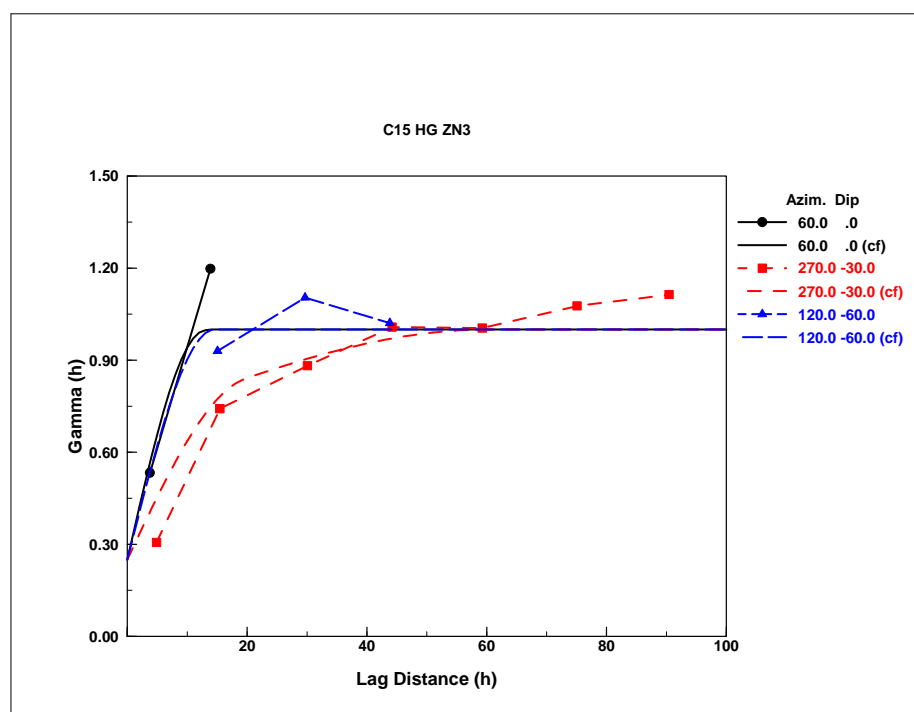
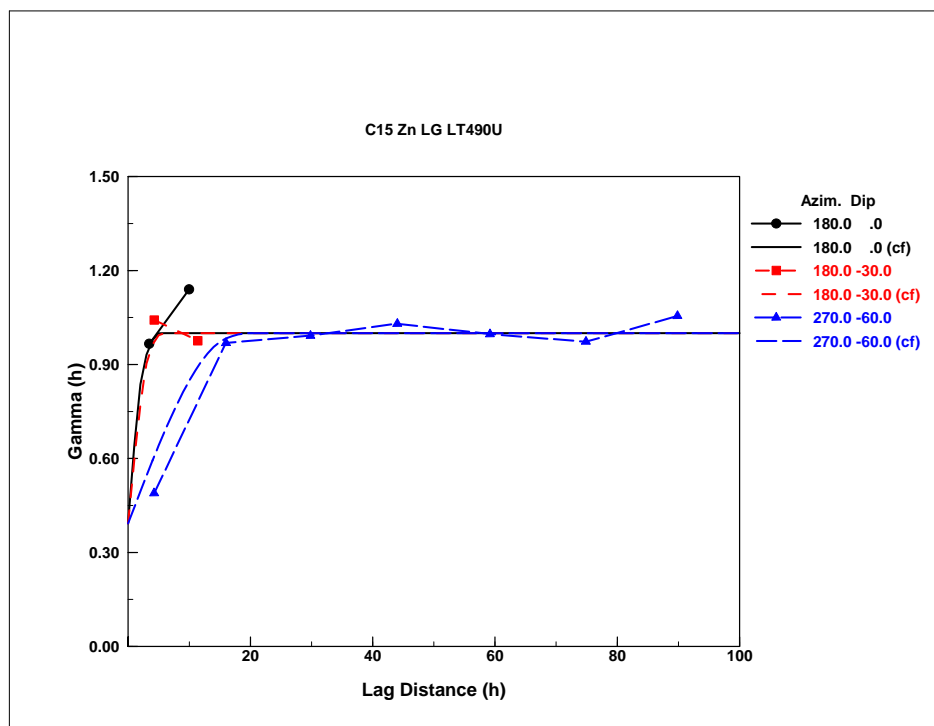
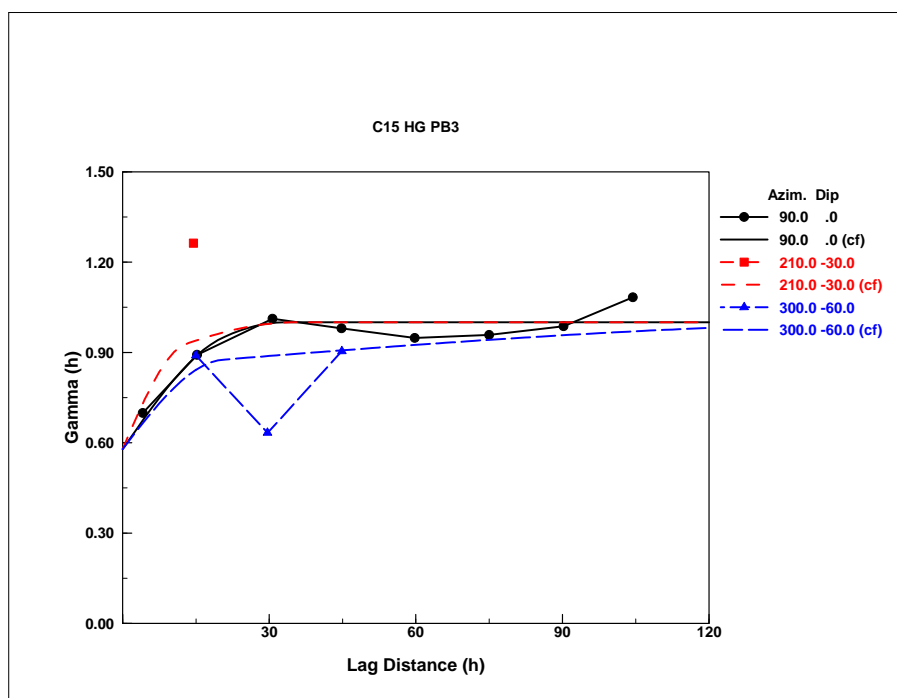
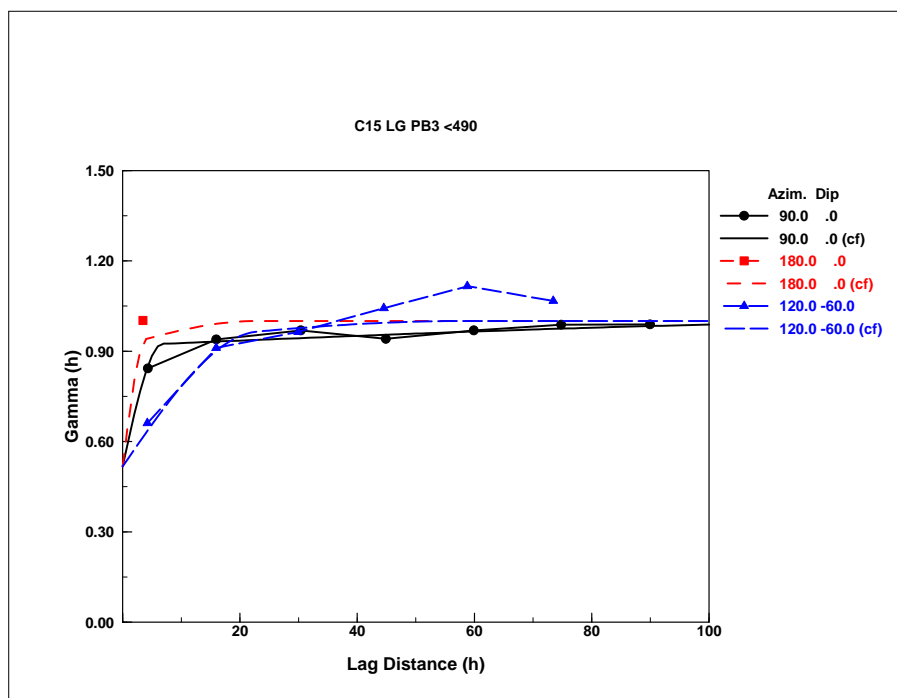


Figure 14-4: Composite Statistics and Histograms

a) b) c) d) Transformed Space - <490m Elevation





e) f) Untransformed Space – 490m Elevation Plus

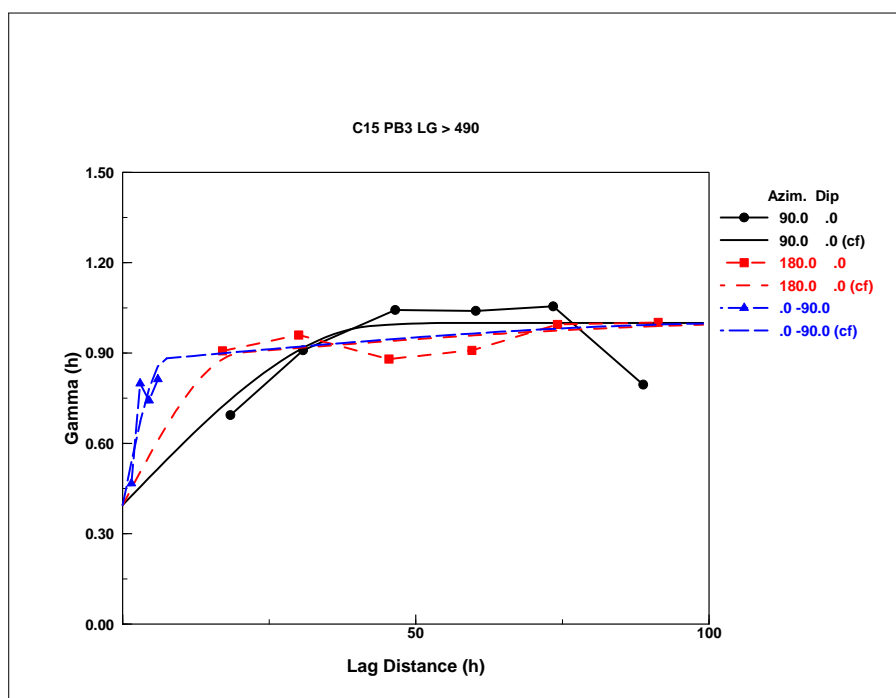
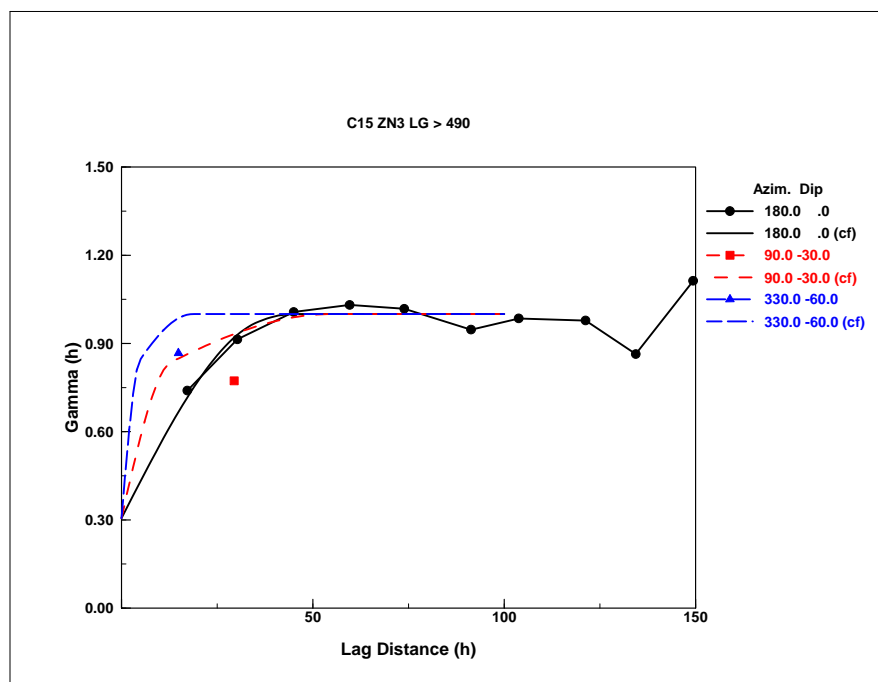


Figure 14-5: a,b,c,d,e,f: Experimental and Model Correlograms

#### 14.1.3.9 Block Model and Grade Interpolation

Two block models were constructed for interpolation purposes, a primary model in normal (un-transformed) space, and a secondary, smaller model in transformed space for interpolation of the un-folded data. The primary block model was defined to cover the volume of interest, and has the following Gemcom® parameters:

Origin:	7200.00E / 6592.82N / 375.00 AMSL (Lower Left)
Block Size:	5m x 5m x5m
Columns:	160
Rows:	400
Levels:	45
Rotation:	-60° (To align with overall strike of deposit – Azimuth 060)

The primary block model is configured as a 'partial' block model, which allows the percentage of various rock types within the block to be stored and utilized for manipulation and reporting purposes. The rock type model was initialized with the default rock code for air and all blocks below the topographic surface were set to the Evaporites (gypsum) rock code. The model was then overprinted with rock codes for the overburden, Trench and Goldenville (quartzite) using 3D solids created from surfaces and sectional interpretations. This rock type model is referred to as the 'Standard' rock type model. The final step was overprinting with rock codes for the existing U/G mining excavations, the high-grade (HG) carbonate and the low-grade (LG) carbonate. The percentage of these three material types in blocks intersecting the solids was calculated and stored separately, with the excavations having the highest priority, and the high-grade zone the next highest priority, in blocks where the solids overlapped. This procedure ensures that the mined-out material in the model is correctly accounted for. The rock code for any other material in these blocks was taken from the standard rock type model, i.e. a block on the hanging wall contact might comprise 50% U/G excavation, 20% HG carbonate and 30% Trench material.

The 3D solid of the existing U/G excavations was generated by Mr. Bruce Hudgins of Hudgtec Consulting and was supplied by ScoZinc. The 3D solids of the HG and LG zones were generated by Mr. Peter Irwin of Resource Data Management, Inc. from plan interpretations. Zinc equivalent cut-offs of 2% and 7% were utilized for the LG and HG zones, respectively in developing the interpretations.

The standard ordinary kriging (OK) procedure was used to interpolate Zn and Pb block values in the flat lying portions of the deposit above 490 m elevation. This estimation was restricted to the LG zone, as the HG zone does not extend above this elevation. The kriging was done in three passes with parameters as follows:

### Pass 1

Minimum # of samples: 3  
 Maximum # samples: 8  
 Max. # samples/hole: 2 (ensures that samples come from at least 2 holes)  
 Search Radius/Direction: Based on first component ranges and anisotropy

Zone	Ranges					
	Maximum		Intermediate		Minimum	
	m	Az/Dip	m	Az/Dip	m	Az/Dip
LG>490-Zn	46	174/-2	21	262/44	4	85/46
LG>490- Pb	58	77/-4	20	168/-6	7	131/83

### Pass 2

Minimum # of samples: 3  
 Maximum # samples: 8  
 Max. # samples/hole: 2 (ensures that samples come from at least 2 holes)  
 Search Radius/Direction: Pass 1 x 2

### Pass 3

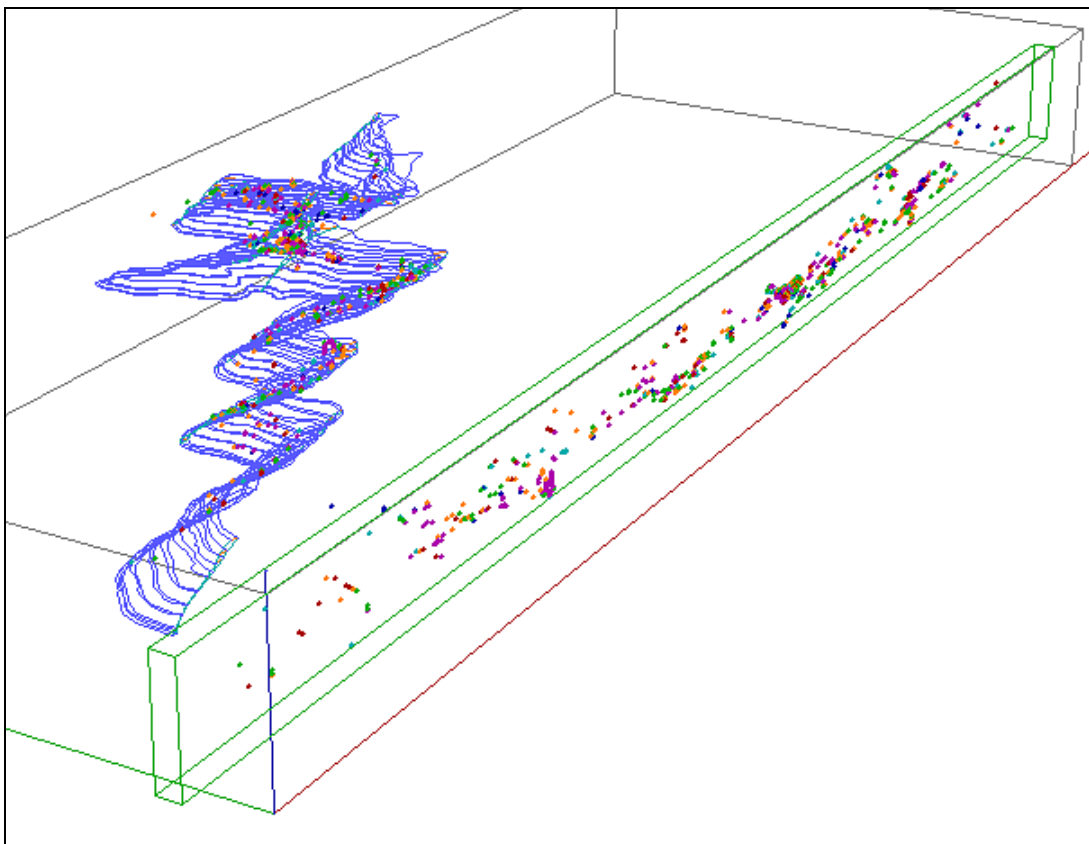
Minimum # of samples: 2  
 Maximum # samples: 8  
 Max. # samples/hole: 0 (no restriction)  
 Search Radius/Direction: Pass 1 x 3

Mineralized blocks in the dipping portion of the deposit below 490 m elevation were populated separately following interpolation in transformed space and back-transformation of the generated values (at block centroids) into normal space, as described below. The back-transformed data was then used to interpolate the Zn, Pb and Classification values in normal space by the nearest-neighbor technique, separately for the LG and HG zones.

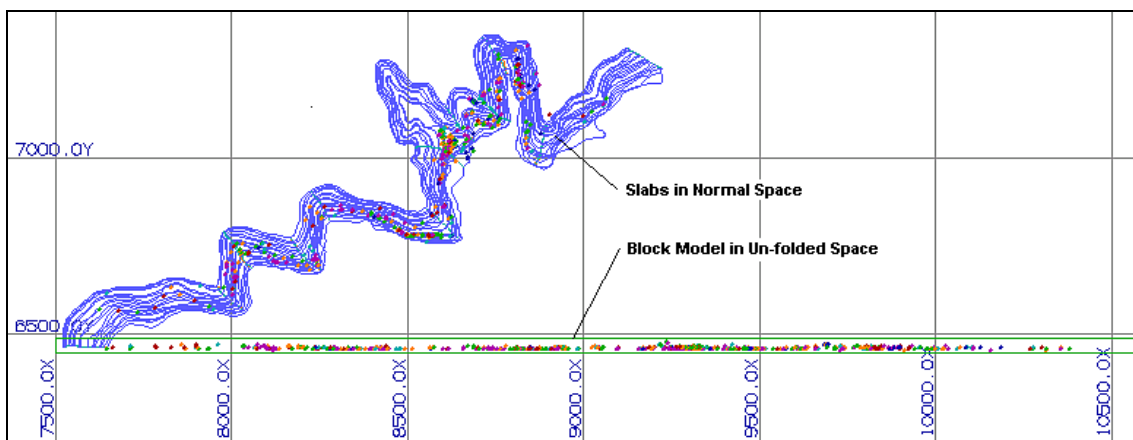
The secondary block model is a standard block model (every block has only one rock code), defined in 3D space to cover the volume of interest. As described earlier, the transformation process associates three of the edge polylines of a representative slab that are nominally orthogonal with the X, Y and Z axes of the unfolded space – this space is orthogonal with



respect to the original co-ordinate axes, and offset by a specified amount. The transformation selected in this case results in a space in which the X axis corresponds to the unfolded strike component of the deposit (approximately 3050 m), the Y axes with cross-strike component (12 m), and the Z axis with the down-dip component (143 m), as shown in Figure 14-6 and Figure 14-7, which also show transformed and un-transformed composite data.



**Figure 14-6: 3D View - Transformation and Block Model Definition**



**Figure 14-7: Transformation - Plan View**

The secondary block model definition is as follows:

Origin: 7500.00E / 6450.00N / 200.00 AMSL (Lower Left)  
 Block Size: 7.5m x 5m x5m  
 Columns: 410 (7.5m)  
 Rows: 8 (5m)  
 Levels: 40 (5m)  
 Rotation: No rotation

Separate interpolations of Zn and Pb block values for the LG and HG zones were kriged in three passes using ordinary kriging (OK), the transformed composites and the correlograms generated from those composites. The parameters were as follows:

**Pass 1**

Minimum # of samples: 3  
 Maximum # samples: 8  
 Max. # samples/hole: 2 (ensures that samples come from at least 2 holes)  
 Search Radius/Direction: Based on first component ranges and anisotropy

Zone	Ranges					
	Maximum		Intermediate		Minimum	
	m	Az/Dip	m	Az/Dip	m	Az/Dip
LG – Zn <490	48	181/-4	11	232/84	8	92/5
HG - Zn	231	98/20	15	133/-66	9	13/-13
LG – Pb <490	75	121/-72	7	84/15	4	177/10
HG – Pb	39	78/-19	21	134/59	11	357/24

**Pass 2**

Minimum # of samples: 3  
 Maximum # samples: 8  
 Max. # samples/hole: 2 (ensures that samples come from at least 2 holes)  
 Search Radius/Direction: Pass 1 x 2

**Pass 3**

Minimum # of samples: 2  
 Maximum # samples: 8  
 Max. # samples/hole: 0 (no restriction)  
 Search Radius/Direction: Pass 1 x 3

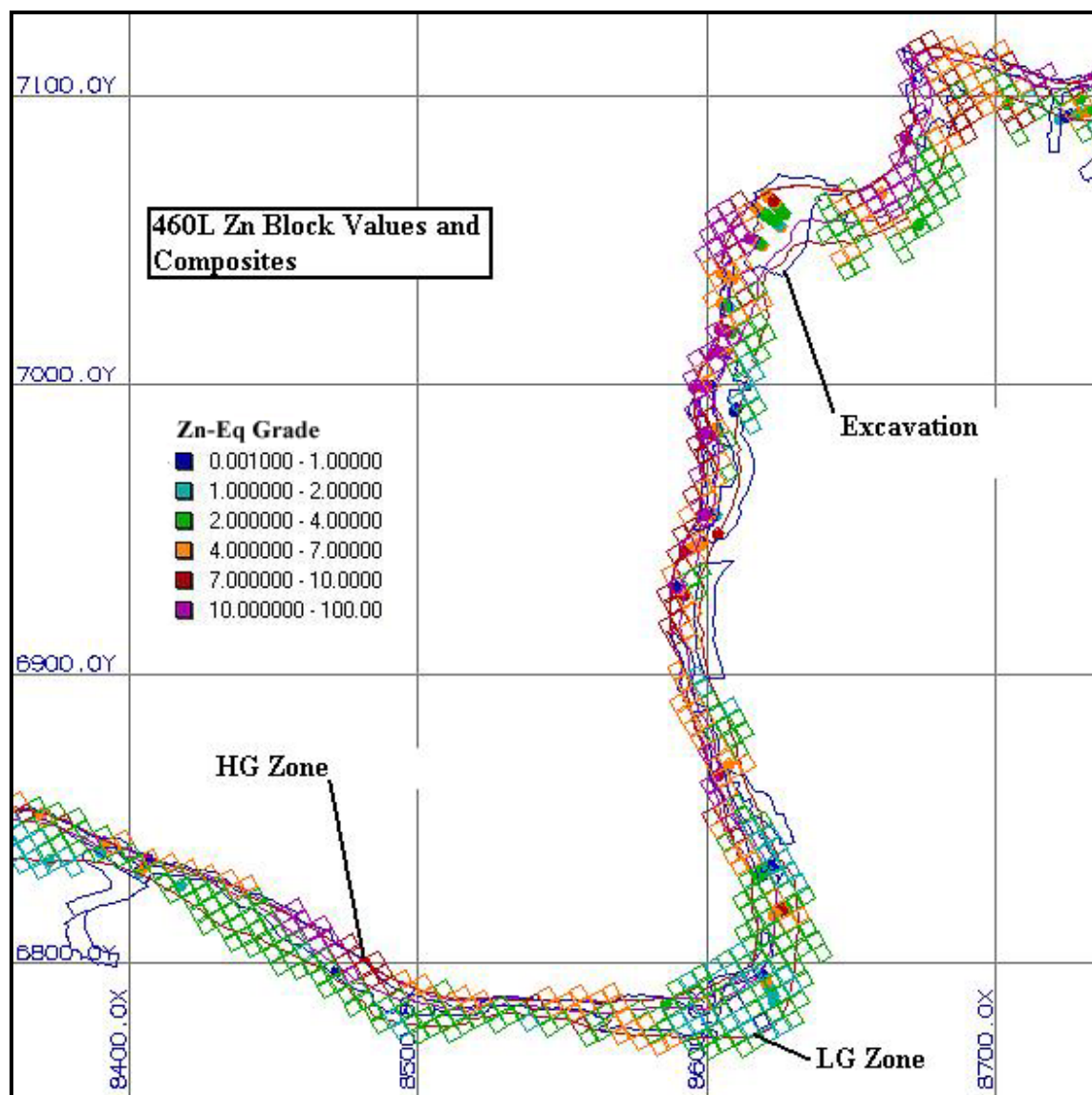
An additional block model variable (Class) was updated according to the pass in which the block was interpolated; with a default value of 3. The Zn, Pb and Class block values were then back-transformed into normal space, using the block centroid as the 3D co-ordinate. These points do not correspond to block centroids in the original rotated block model and are used as input data in the nearest-neighbor interpolation to assign values to corresponding models in the primary model. The HG and LG models are interpolated into separate grade models associated with the percentage models that store the percentage of HG and LG material in a particular block.

The primary density model for the mineralized zone was then generated, utilizing the Zn and Pb block values and the SG, estimated using the formula from Section 4.1.2.

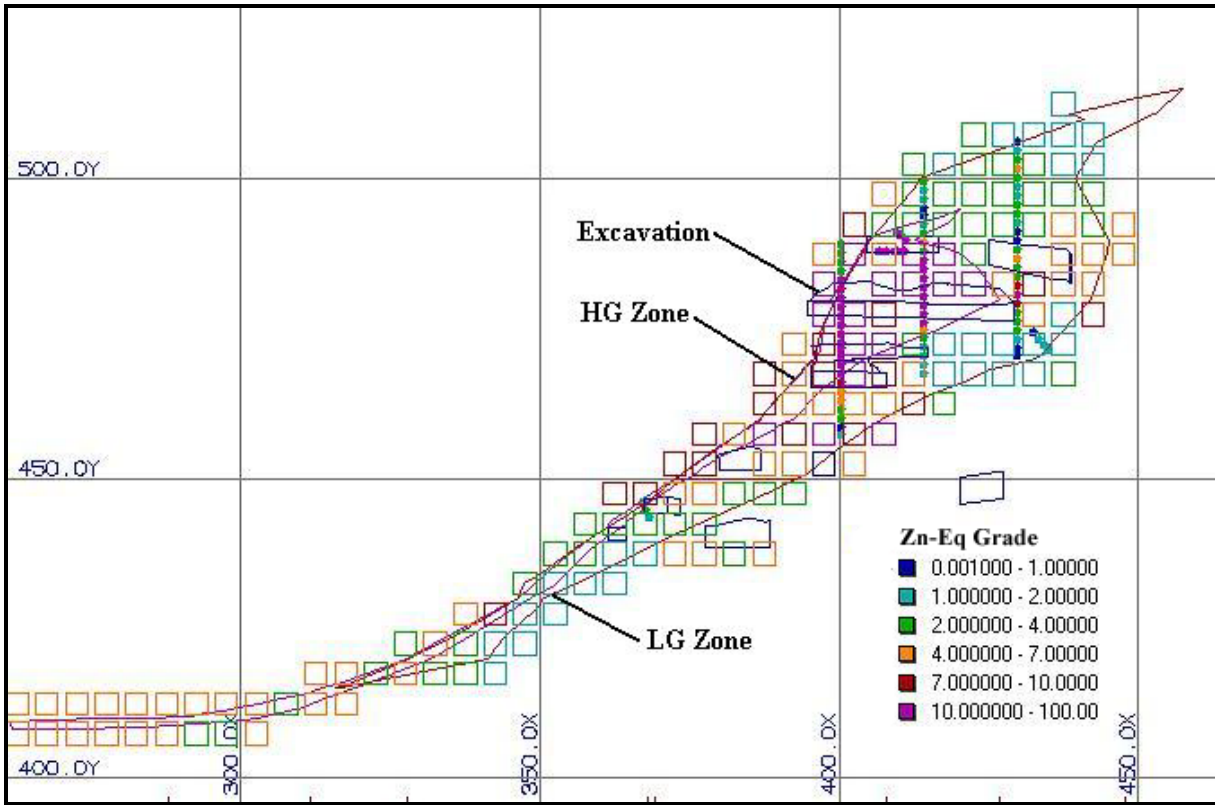
Typical cross- and plan sections through the block model are illustrated in Figure 14-8 and Figure 14-9.

#### 14.1.3.10 Mineral Resource Classification

The mineral Resources were classified according to the pass in which a block was interpolated, as recorded in the Class variable. Blocks interpolated in Pass 1 were considered to be in the Measured category. The Pass 1 ranges are based on the ranges of the first spherical component of the corresponding correlogram, and vary from 10% to 80% of the maximum ranges of the correlograms. Blocks interpolated in the second and third passes are considered to be in the Indicated and Inferred categories, respectively.



**Figure 14-8: Plan Section Through the Block Model on the 460-Meter Level**



**Figure 14-9: Typical Cross-Section of the Block Model, Facing Northeast**

#### 14.1.3.11 Results

As described in previous paragraphs, Surface Resources for the High-grade and Low-grade zones were calculated separately (Table 14-3). Resources are reported using a cut-off grade of 0.75% zinc-equivalent. For both zones, undiluted Measured Resources total 1.9 million tonnes containing 3.8% zinc and 1.6% lead. Indicated Resources total 2.2 million tonnes containing 3.5% zinc and 1.5% lead. The combined Measured + Indicated Resources total 4.1 million tonnes containing 3.5% zinc and 1.5% lead.

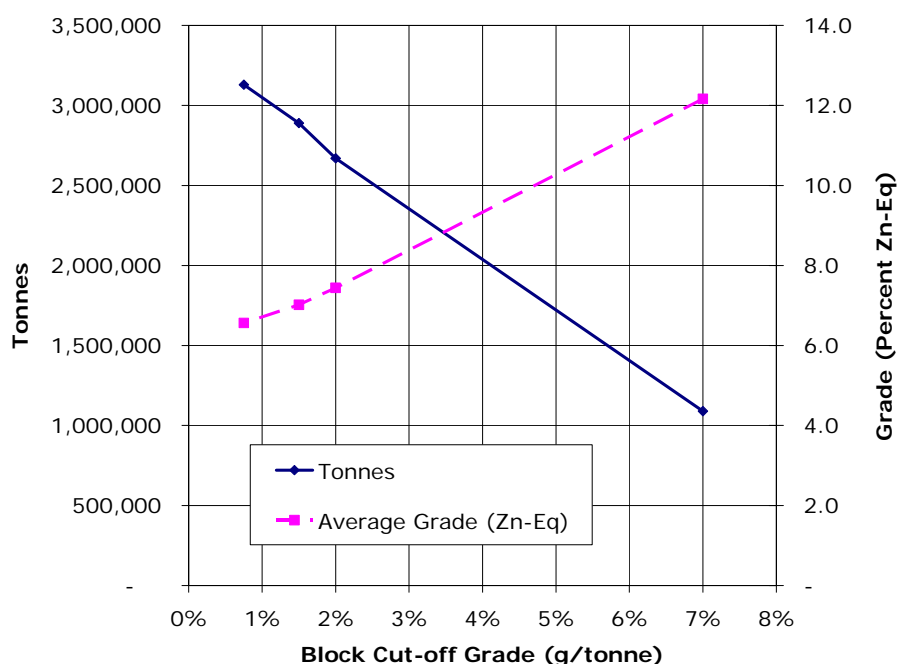
Undiluted Inferred Surface Resources total 1.8 million tonnes containing 3.1% zinc and 1.1% lead.

**Table 14-3: Non-Diluted Main Zone Resources**

<b>Cut-off Grade (Percent Zinc- Equivalent)</b>	<b>Tonnes</b>	<b>SG</b>	<b>Percent Zinc</b>	<b>Percent Lead</b>	<b>Percent Zinc- Equivalent</b>
<b><u>Measured Resources, "High Grade" Domain</u></b>					
7%	410,000	2.90	8.2	3.9	14.0
2%	500,000	2.87	7.4	3.4	12.4
1.5%	500,000	2.87	7.4	3.4	12.4
0.75%	500,000	2.87	7.4	3.4	12.4
<b><u>Indicated Resources, "High Grade" Domain</u></b>					
7%	320,000	2.88	6.9	3.9	12.8
2%	360,000	2.87	6.6	3.6	12.1
1.5%	360,000	2.87	6.6	3.6	12.1
0.75%	360,000	2.87	6.6	3.6	12.1
<b><u>Inferred Resources, "High Grade" Domain</u></b>					
7%	90,000	2.88	6.3	4.3	12.8
2%	110,000	2.86	5.7	3.6	11.2
1.5%	110,000	2.86	5.7	3.6	11.2
0.75%	110,000	2.86	5.7	3.6	11.2
<b><u>Measured Resources, "Low Grade" Domain</u></b>					
7%	130,000	2.83	5.0	3.1	9.6
2%	670,000	2.77	3.1	1.4	5.2
1.5%	750,000	2.77	2.9	1.3	4.8
0.75%	840,000	2.76	2.7	1.2	4.5
<b><u>Indicated Resources, "Low Grade" Domain</u></b>					
7%	230,000	2.83	5.0	3.0	9.5
2%	1,140,000	2.77	3.2	1.3	5.1
1.5%	1,280,000	2.76	3.0	1.2	4.8
0.75%	1,430,000	2.76	2.8	1.1	4.4
<b><u>Inferred Resources, "Low Grade" Domain</u></b>					
7%	250,000	2.84	5.3	3.0	9.8
2%	1,320,000	2.77	3.3	1.2	5.1
1.5%	1,460,000	2.76	3.1	1.1	4.8
0.75%	1,630,000	2.76	2.9	1.0	4.4
<b><u>Total Measured Resources, Both Domains</u></b>					
7%	540,000	2.88	7.4	3.7	12.9
2%	1,170,000	2.81	4.9	2.3	8.3
1.5%	1,250,000	2.81	4.7	2.1	7.9
<b>0.75%</b>	<b>1,340,000</b>	<b>2.80</b>	<b>4.4</b>	<b>2.0</b>	<b>7.4</b>
<b><u>Total Indicated Resources, Both Domains</u></b>					
7%	550,000	2.86	6.1	3.5	11.4
2%	1,500,000	2.79	4.0	1.9	6.8
1.5%	1,640,000	2.78	3.8	1.7	6.4
<b>0.75%</b>	<b>1,790,000</b>	<b>2.78</b>	<b>3.6</b>	<b>1.6</b>	<b>5.9</b>
<b><u>Total Measured + Indicated Resources, Both Domains</u></b>					
7%	1,090,000	2.87	6.8	3.6	12.2
2%	2,670,000	2.80	4.4	2.0	7.4
1.5%	2,890,000	2.80	4.2	1.9	7.0
<b>0.75%</b>	<b>3,130,000</b>	<b>2.79</b>	<b>3.9</b>	<b>1.8</b>	<b>6.6</b>
<b><u>Total Inferred Resources, Both Domains</u></b>					
7%	340,000	2.85	5.6	3.3	10.6
2%	1,430,000	2.78	3.5	1.4	5.6
1.5%	1,570,000	2.77	3.3	1.3	5.2
<b>0.75%</b>	<b>1,740,000</b>	<b>2.77</b>	<b>3.1</b>	<b>1.1</b>	<b>4.8</b>

Notes for Main Zone Estimate:

1. Cut-off grade for mineralised zone interpretation was 2% zinc-equivalent for the "low-grade" domain and 7% for the "high-grade" domain.
2. Block cut-off grade for defining Mineral Resources was 0.75% zinc-equivalent.
3. No top-cut grade was used. In the author's opinion, the use of a top cut would not have significantly affected the results.
4. Zinc price was \$US 1.10 per lb, lead price was \$US 1.15 per lb.
5. Zones extended up to 50 metres down-dip from last intercept.  
Along strike, zones extended halfway to the next cross-section.
6. Minimum width was 2 metres.
7. Non-diluted.
8. Mineral resources that are not mineral reserves do not have demonstrated economic viability.
9. Main Zone resource estimate prepared by Tim Carew, M.Sc., P.Geo.
10. Specific gravity was calculated based on zinc and lead content. There are no other sulphides or dense minerals that are present in significant quantities.
11. Block kriging using "unfolding" was used for estimating block grades.
12. No Mineral Reserves of any category were identified.
13. Zinc-equivalency for lead was calculated based on relative metal prices, demonstrated processing recoveries (86% & 84 % for lead and zinc, respectively), estimated smelter returns 95% & 85 % for lead and zinc) and demonstrated concentration factors (75% & 65% for lead and zinc).



**Figure 14-10: Grade-tonnage Curve for Measured and Indicated Surface Resources (Non-diluted)**

#### **14.1.4 Northeast Zone Resources**

The Northeast Zone abuts the Main Zone. Though they were modeled separately, the Main and Northeast zones represent a geologically continuous body of mineralization.

##### **14.1.4.1 Grid Rotation**

For ease in modeling, data was rotated 30° clockwise about the site grid origin (0,0).

##### **14.1.4.2 Mineralized Zone Interpretation**

Mineralized zones were outlined to enforce geological control during block modeling.

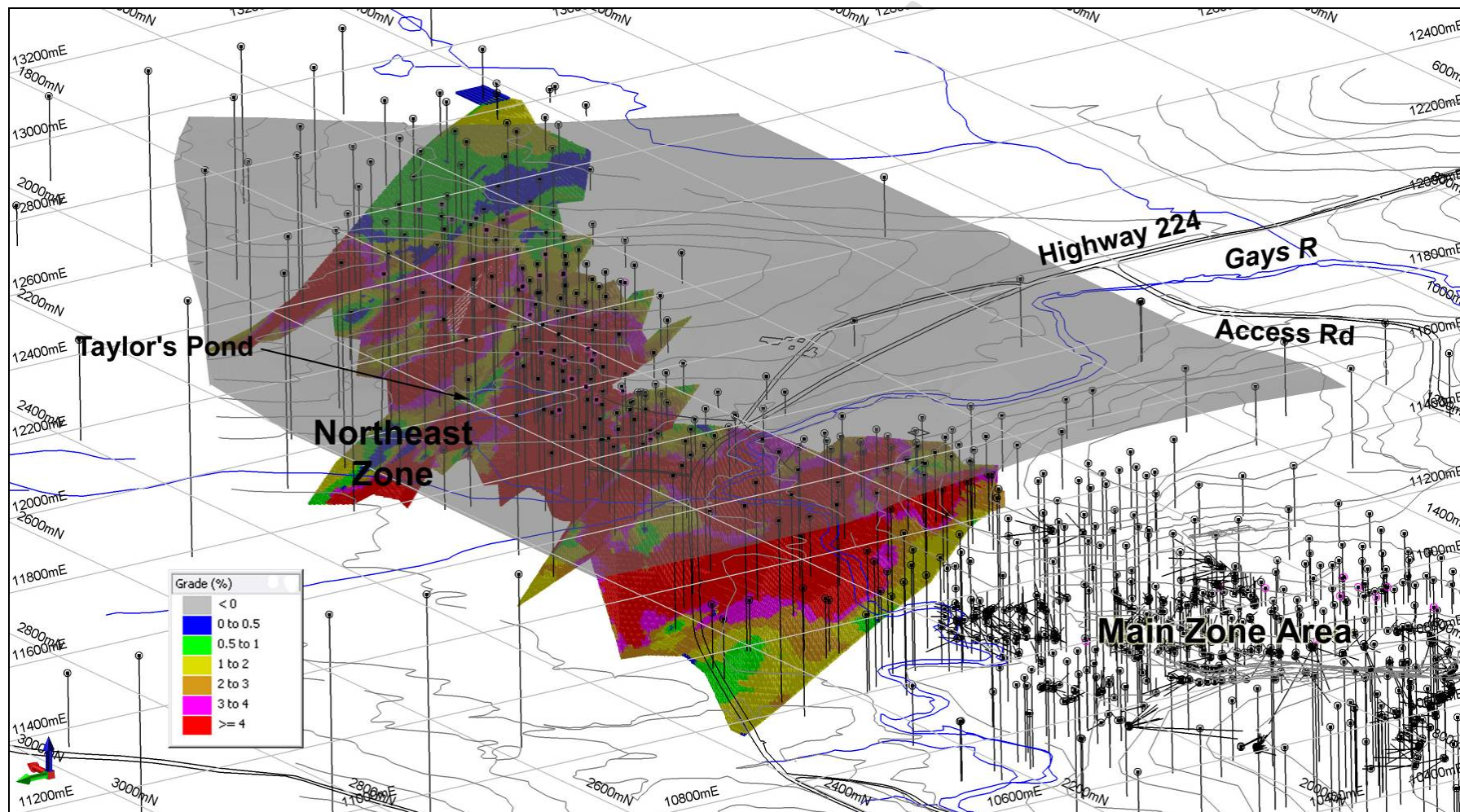
It was assumed that near-surface blocks could be exploited using surface mining methods, while deeper blocks could be exploited using underground mining methods. The division between the two was considered to be an elevation of 420 meters – approximately 100 meters depth.

The following guidelines were used during the interpretation process:

- A cut-off grade of 0.5% zinc-equivalent was generally used for outlining near-surface mineralization that could be exploited using surface mining methods. Deeper mineralization was outlined using a 2% cut-off. Cut-off grades are further discussed in Section 14.1.4.5.
- A minimum true width of 2 meters was used.
- Along strike, zones were extended halfway to the next, under-mineralized cross-section.
- Zones were extended down-dip by a maximum of 100 meters past the last intercept.
- Zones were allowed to extend through “below cut-off” intercepts so long as there was a “geological reason” to do so.
- Interpretations were accomplished by plotting and interpreting hard-copy cross-sections (refer to Figure 14-13 for cross-sections. Those interpretations were digitized and zone intercepts were tagged.
- The mineralized outline was refined using plan views. On some sections, the interpreted outline was adjusted to form a smoother, more realistic plan view outline.
- Digital terrain models (“DTM”s) for the hanging wall (upper) surface and the footwall (lower) surface were created using the contact coordinates of the interpreted intercepts. These surfaces were later used to constrain the block modeling and grade estimation process (refer to Section 14.1.4.7).
- Figure 14-11 and Figure 14-12 show plan and three-dimensional views of the interpreted zones.







**Figure 14-12: 3D View of the Northeast Zone, Facing East. Block grades are expressed as percent Zn-Eq.**

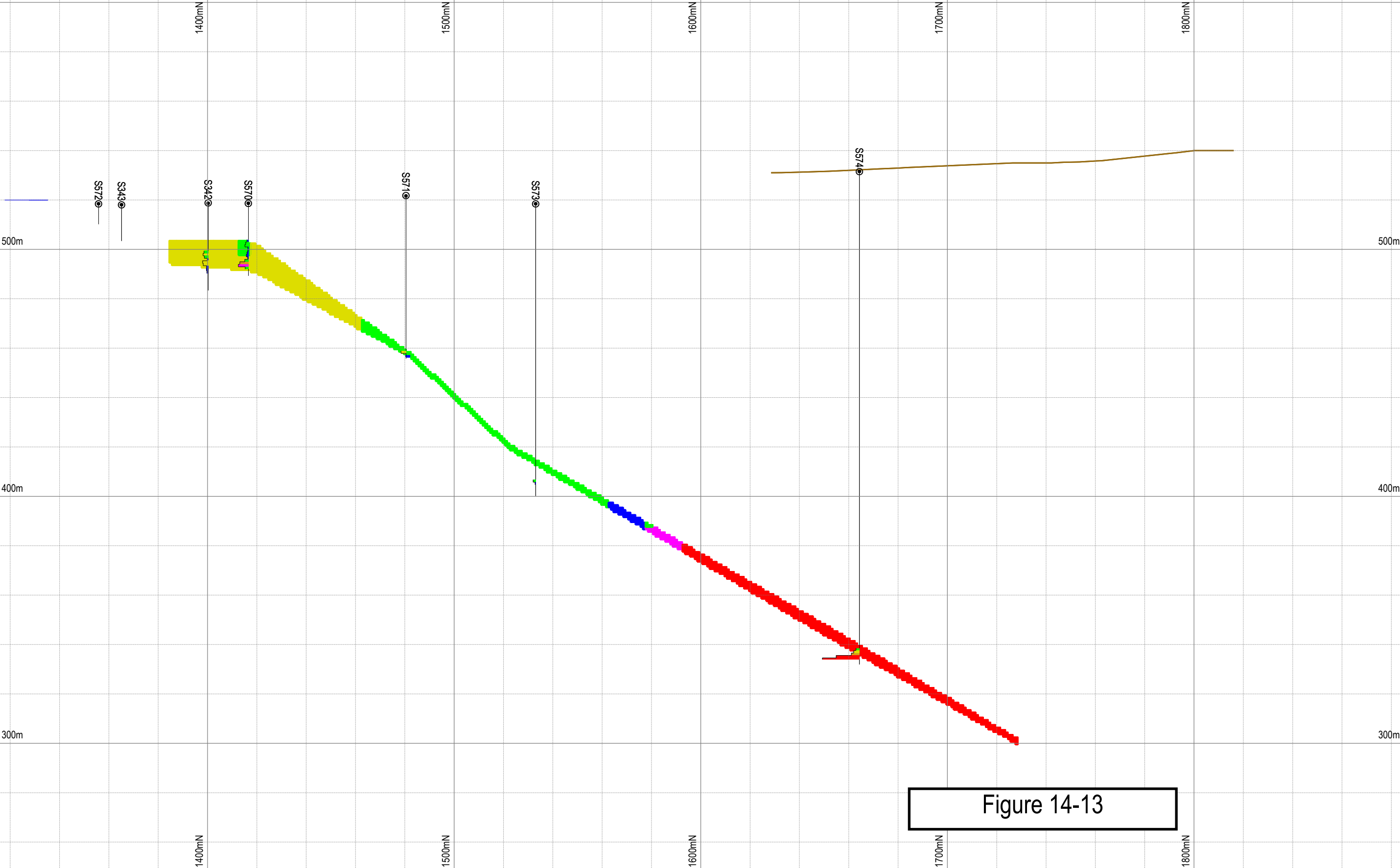
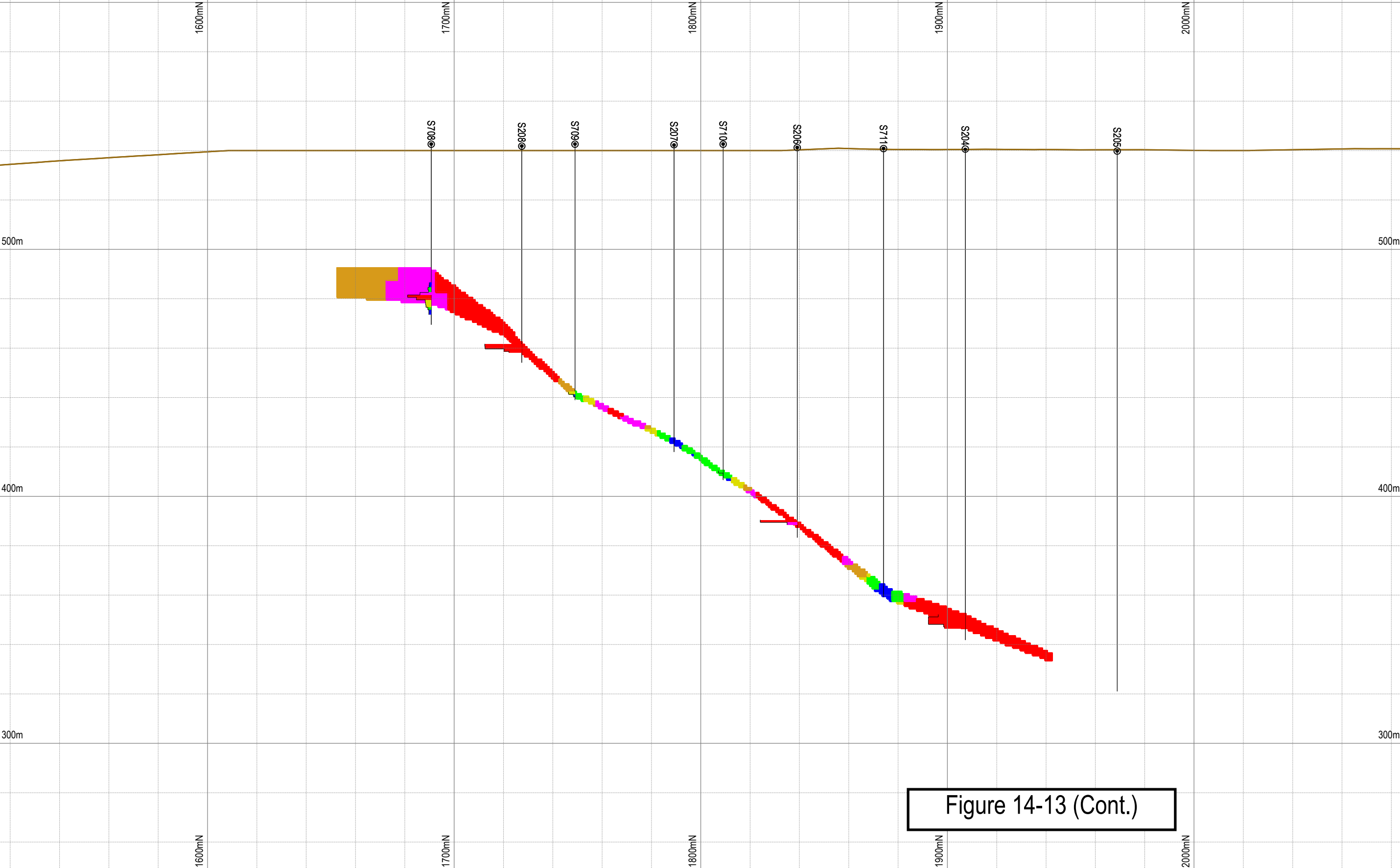


Figure 14-13





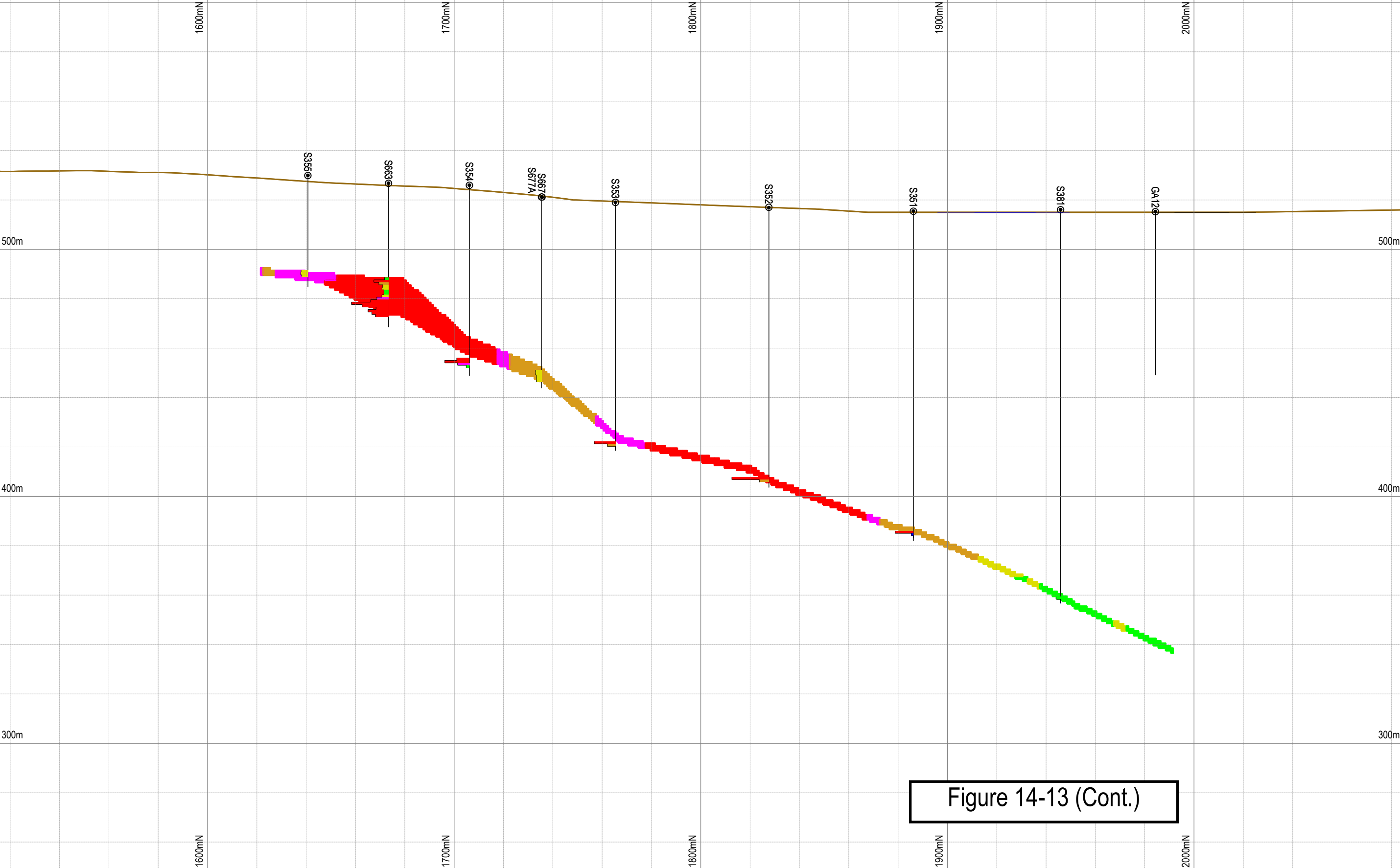
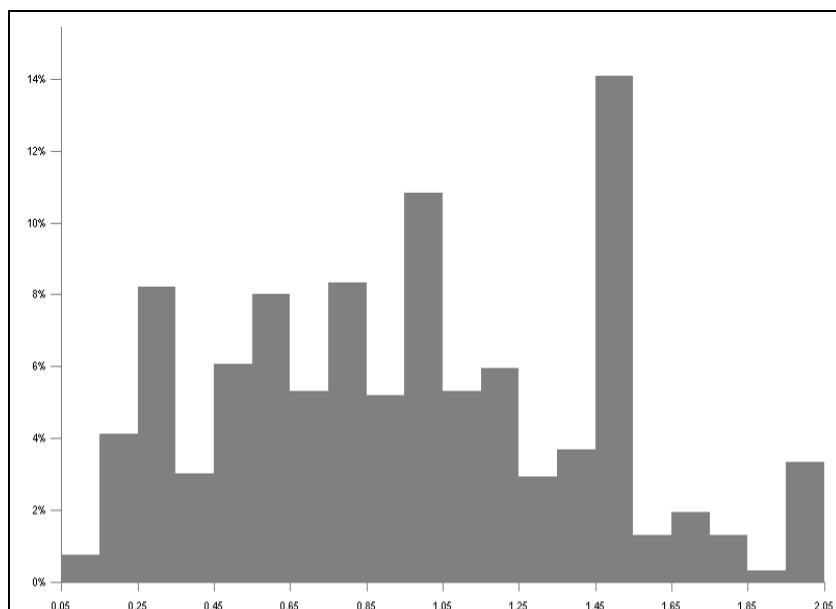


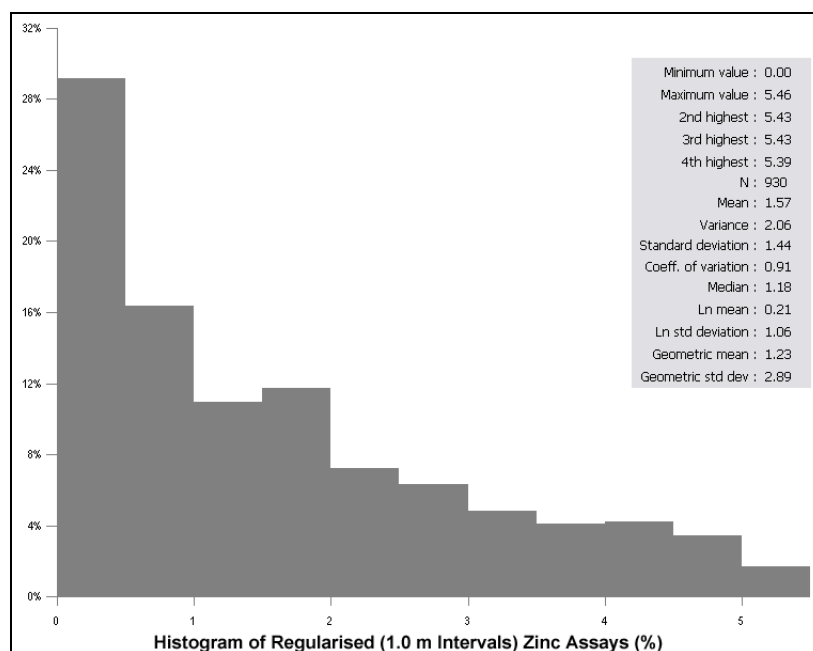
Figure 14-13 (Cont.)

### 14.1.4.3 Sample Statistics

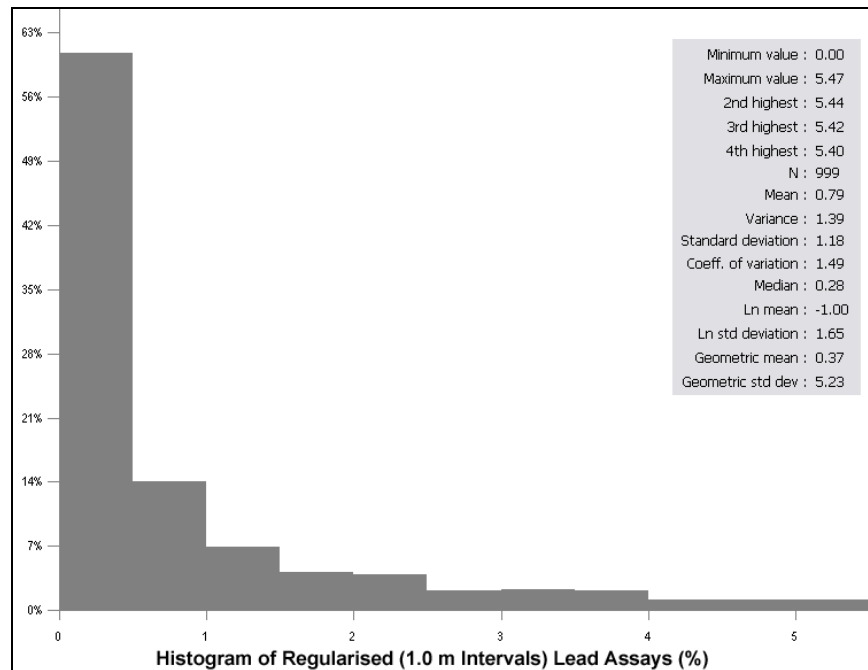
Samples were regularized over 1 m intervals – a common sample length (refer to Figure 14-14) - to provide a common support (sample size) for calculating statistics.



**Figure 14-14: Sample Lengths, Northeast Zone**



**Figure 14-15: Zinc Assay Histogram, Northeast Zone**

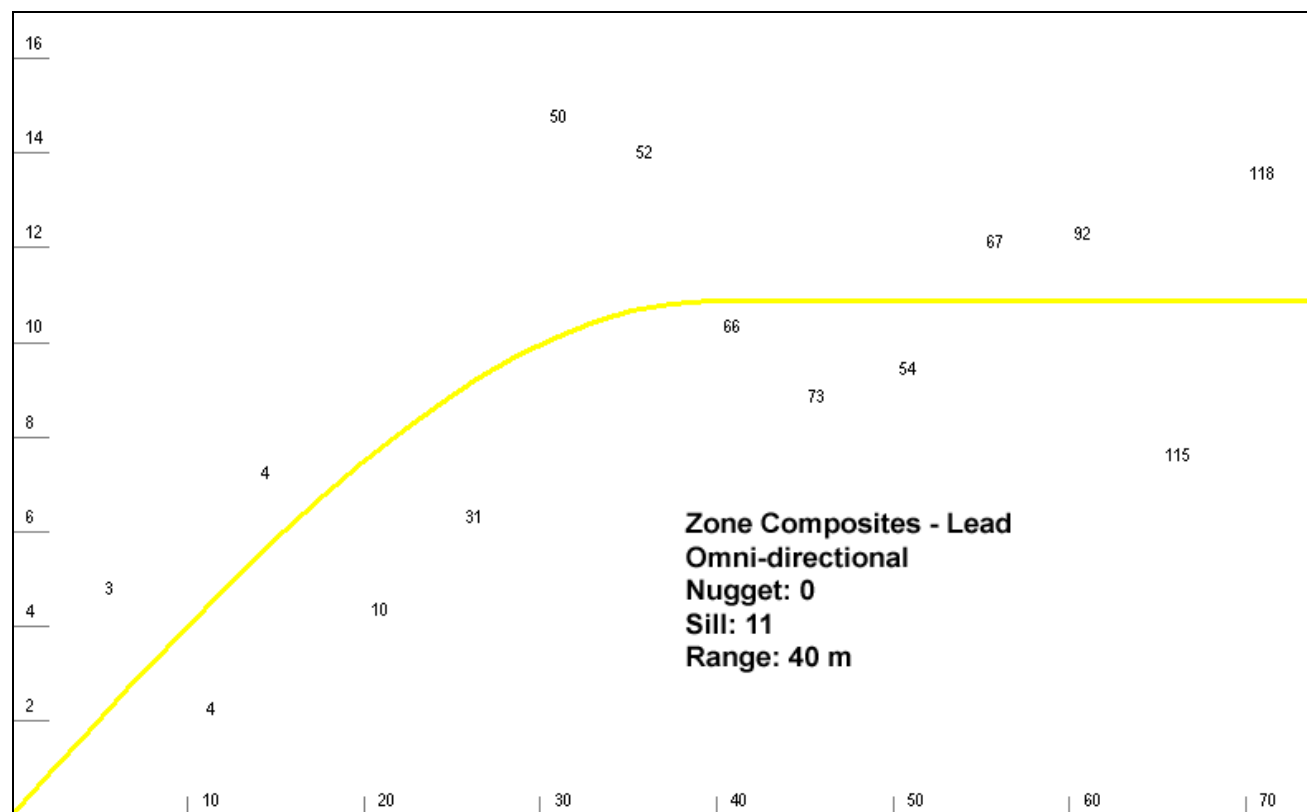


**Figure 14-16: Lead Assay Histogram, Northeast Zone**

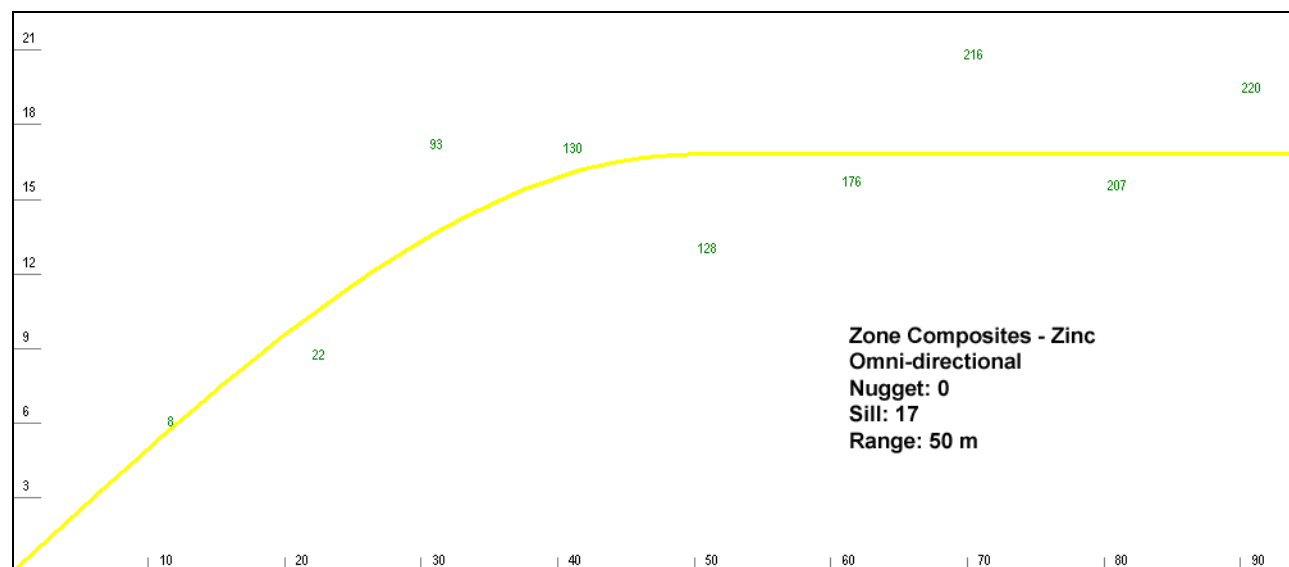
#### 14.1.4.4 Variography

For the zone composites, using a 5 meter lag interval, a spherical model was fit to the raw semivariogram data for lead samples. An acceptable model was also fit to the raw semivariogram data for composited zinc samples (10 meter lag).

Directional semivariogram data was calculated for the strike and dip directions. There was no significant difference between the two directions or between the directional and omni-directional results. Therefore, it was decided to use the omni-directional models for grade estimating purposes.



**Figure 14-17: Lead Semi-variogram, Northeast Zone**



**Figure 14-18: Zinc Semi-Variogram, Northeast Zone**



#### 14.1.4.5 Cut-off Grades

##### *Zone Interpretation*

The chosen cut-off grade for near-surface mineralized zone interpretation was 0.5% zinc-equivalent. This value was chosen through iteration as the cut-off that, in the author's opinion, when used for outlining the lower grade mineralization, provided the closest approximation of the continuity of that mineralization. Using the prices and other factors from Section 14.1.1, rock containing 0.5% zinc would have revenue of approximately \$7. Typical mining and processing costs for this deposit would likely be \$3-4 and \$9-10 per tonne respectively, for a total operating cost of \$12-14 per tonne (not including stripping, capital, or G&A costs). In other words, the cut-off grade for mineralized zone interpretation was slightly more than half of an approximate operating cut-off grade for this deposit.

For deeper mineralization that could be mined using underground mining methods, a 2% zinc-equivalent cut-off grade was used for mineralized zone interpretation. Using the prices and other factors from Section 14.1.1, rock containing 2% zinc would have revenue of approximately \$28. Typical underground mining and processing costs for this deposit would likely be \$30-40 and \$9-10 per tonne respectively, for a total operating cost of approximately \$50 per tonne (not including stripping, capital, or G&A costs). As with the near-surface cut-off, the cut-off grade for deeper mineralized zone interpretation was slightly more than half of an approximate underground operating cut-off grade for this deposit.

##### *Mineral Resources*

The chosen "block cut-off"<sup>2</sup> grades for defining near-surface (less than 100 meters deep) and deeper mineral resources 0.75% and 2%, respectively.

#### 14.1.4.6 Top-Cut Grade

A top-cut value is normally chosen to prevent the overestimation of block grades by a small number of very high assays or outliers.

Through examination of the sample statistics, the author determined that no top-cut value was required. No top-cut was applied because, in the author's opinion, a top-cut would not affect the global estimate.

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<sup>2</sup> The grade at which it is possible to mine and process an exposed block (i.e.: stripping not included).

#### 14.1.4.7 Block Modeling

A blank block model with the file name "Blocks – NE Zone - Blank.dat" was created with the parameters that were reported in Table 14-4. The blocks were constrained by the mineralized zone wireframe.

The "parent" block size was 10x10x10 meters (Easting x Northing x Elevation).

There were ten sub-blocks in each direction for a geological resolution of 1x1x1 meters (Easting x Northing x Elevation).

**Table 14-4: Block Model Parameters**

<b>Direction</b>	<b>Model Origin (Grid, m)</b>	<b>Model Limit (Grid, m)</b>	<b>Model Extent (m)</b>	<b>Block Size (m)</b>	<b>Number of Blocks</b>	<b>Number of Sub-blocks</b>
East	11,200	13,200	2,000	10	201	10
North	1,200	2,200	1,000	10	101	10
Elevation (RL)	200	550	350	10	36	10

#### 14.1.4.8 Grade Estimation

Regularized samples were used for estimating block grades (refer to Section 14.1.4.3).

The fit of the raw semi-variogram data to the spherical model was considered to be good enough for determining resource classification parameters (refer to Section 14.1.4.9) but, in the author's opinion, not quite good enough for kriging. Instead, inverse distance weighting ("ID") using a power of two was considered to be an appropriate method for estimating block grades.

Blocks were discretised twice in each dimension. The grade estimation process was carried out using the parameters that are reported in Table 14-5. A description of the block model file fields is reported in Table 14-6.

Grade estimation was carried out in three "runs." The first run had a maximum search radius of 50 meters and required samples from at least three holes. In subsequent runs, the parameters were relaxed.

The resulting three block model files were compiled into a single block model titled "Blocks - NE Zone - Inferred - IDS Compiled.DAT". Run 2's block grades overprinted Run 3's grades and Run 1's grades overprinted Runs 2's and 3's grades.

**Table 14-5: Grade Estimation Parameters**

<b>Parameter</b>	<b>Run 1</b>	<b>Run 2</b>	<b>Run 3</b>
Search Sphere Radius (m)	50 m	50 m	100 m
Min. Number of Holes	3	2	1
Min. Number of Samples Per Hole	7	5	3
Max. Number of Samples Per Hole	24	24	24
Resulting File	Blocks - NE Zone - Inferred - IDS Run 1.DAT	Blocks - NE Zone - Inferred - IDS Run 2.DAT	Blocks - NE Zone - Inferred - IDS Run 3.DAT

**Table 14-6: Block Model Fields**

<b>Field</b>	<b>Description</b>
East	Easting (Grid)
_East	Block Dimension, East Direction
North	Northing (Grid)
_North	Block Dimension, North Direction
RL	Reduced Level (Grid)
_RL	Block Dimension, Reduced Level
Zone	Outlined Zone
Index	Unique index value for each block
%Zn	Estimated zinc grade (percent)
%Pb	Estimated lead grade (percent)
Points	Number of Samples Used for Estimate
STD_DEV	Standard deviation of samples used
Number of Holes	Number of Holes Used for Estimate
Run	Run number that was used to estimate the block grades
Zn-Eq	Zinc-equivalent grade
Resource Category	Resource category

#### 14.1.4.9 Resource Classification Parameters

Resource classification parameters were chosen based on a combination of variography results and the author's judgment. The degree of confidence in the reported resources was classified based on the validity and robustness of input data and the proximity of resource blocks to sample locations. Resources were reported, as required by NI 43-101, according to the CIM Standards on Minerals Resources and Reserves.

Rather than classifying resources using the search ellipse parameters, Inferred resources were outlined graphically, on cross-sections using the process that was described in Section 14.1.4.2. All of the material that was contained within the mineralised outlines was classified as Inferred resources.

Indicated Resources were outlined graphically in plan view within areas where the intercept spacing was approximately 40-50 meters – approximately the variogram ranges for zinc and lead (refer to Figure 14-17 and Figure 14-18).

No Measured Resources were identified in the Northeast Zone. In the author's opinion, the current intercept spacing was not sufficient to demonstrate grade continuity to the level that is demanded by Measured category.

#### 14.1.4.10 Results

Using a block cut-off grade of 0.75% zinc-equivalent for near-surface resources and 2% for deeper resources, non-diluted Northeast Zone Indicated mineral resources totaled 1.7 million tonnes with average grades of 3.9% zinc and 2.0% lead (refer to Table 14-7).

Non-diluted Northeast Zone Inferred mineral resources totaled 2.5 million tonnes with average grades of 2.3% zinc and 1.4% lead.

No Measured mineral resources were identified.

**Table 14-7: Non-Diluted Northeast Zone Resources**

Zone and Resource Category	Tonnes	SG	Percent Zinc	Percent Lead	Percent Zinc-Equivalent
<b>Surface Resources (Less than 100m Deep)</b>					
Indicated Category:					
7%	500,000	2.90	7.3	4.3	13.8
2%	1,430,000	2.80	4.3	2.2	7.6
1.50%	1,490,000	2.80	4.2	2.1	7.4
0.75%	1,560,000	2.80	4.0	2.0	7.0
Inferred Category:					
7%	150,000	2.89	7.5	4.0	13.5
3%	850,000	2.77	3.3	1.2	5.1
1.50%	1,040,000	2.76	3.0	1.0	4.5
0.75%	1,480,000	2.75	2.4	0.7	3.5
<b>Underground Resources (More than 100m Deep)</b>					
Indicated Category:					
7%	50,000	2.87	4.9	4.9	12.3
2%	150,000	2.79	3.3	2.4	6.9
Inferred Category:					
7%	280,000	2.84	3.5	4.3	10
2%	1,030,000	2.78	2.2	2.4	5.8
<b>Total Indicated Mineral Resources (Cut-off varies):</b>					
	1,710,000	2.79	3.9	2	7
<b>Total Inferred Mineral Resources (Cut-off varies):</b>					
	2,510,000	2.76	2.3	1.4	4.4

**Notes for Northeast Zone Estimate:**

1. Cut-off grade for mineralized zone interpretation was 0.5% zinc-equivalent for surface resources (less than 100m deep) and 2% at depth
2. Block cut-off grade for defining Mineral Resources was 0.75% zinc-equivalent for surface resources (less than 100m deep) and 2% at depth
3. No top-cut grade was used. In the author's opinion, the use of a top cut would not have significantly affected the results
4. Zinc price was \$US 1.10 per lb, lead price was \$US 1.15 per lb
5. Zones extended up to 50m down-dip from last intercept. Along strike, zones extended halfway to the next cross-section
6. Minimum width was 2m
7. Non-diluted
8. Mineral resources that are not mineral reserves do not have demonstrated economic viability
9. Resource estimate prepared by Doug Roy, M.A.Sc., P.Eng
10. Specific gravity was calculated based on zinc and lead content. There are no other sulphides or dense minerals that are present in significant quantities
11. Inverse distance weighting, power of "2" ("ED2") was used for estimating block grades
12. Indicated resources identified where sample intercept spacing was 40m or less (based on variography)
13. No measured mineral resources or mineral reserves of any category were identified
14. Zinc-equivalency for lead was calculated based on relative metal prices, demonstrated processing recoveries (86% & 84% for lead and zinc, respectively), estimated smelter returns 95% & 85% for lead and zinc) and demonstrated concentration factors (75% and 65% for lead and zinc)

### 14.1.5 Summary of Mineral Resources

In both the Main and Northeast Zones, Measured plus Indicated mineral resources totaled 4.8 million tonnes with average grades of 3.9% zinc and 1.8% lead (refer to Table 14-8).

Inferred mineral resources totaled 4.2 million tonnes with average grades of 2.6% zinc and 1.3% lead.

**Table 14-8: Summary of Non-Diluted Mineral Resources – Both Zones**

<b>Zone and Resource Category</b>	<b>Tonnes</b>	<b>SG</b>	<b>Percent Zinc</b>	<b>Percent Lead</b>	<b>Percent Zinc-Equivalent</b>
Measured Category					
<i>Main Zone</i>	1,340,000	2.8	4.4	2	7.4
<i>Northeast Zone</i>	n/a	n/a	n/a	n/a	n/a
<b>Total Measured</b>	<b>1,340,000</b>	<b>2.8</b>	<b>4.4</b>	<b>2</b>	<b>7.4</b>
Indicated Category					
<i>Main Zone</i>	1,790,000	2.78	3.6	1.6	5.9
<i>Northeast Zone</i>	1,710,000	2.79	3.9	2.0	7.0
<b>Total Indicated</b>	<b>3,500,000</b>	<b>2.79</b>	<b>3.7</b>	<b>1.8</b>	<b>6.4</b>
Measured + Indicated					
<i>Main Zone</i>	3,130,000	2.79	3.9	1.8	6.6
<i>Northeast Zone</i>	1,710,000	2.79	3.9	2.0	7.0
<b>Total Measured + Indicated</b>	<b>4,840,000</b>	<b>2.79</b>	<b>3.9</b>	<b>1.8</b>	<b>6.7</b>
Inferred Category					
<i>Main Zone</i>	1,740,000	2.77	3.1	1.1	4.8
<i>Northeast Zone</i>	2,510,000	2.76	2.3	1.4	4.4
<b>Total Inferred</b>	<b>4,250,000</b>	<b>2.76</b>	<b>2.6</b>	<b>1.3</b>	<b>4.6</b>

Refer to Table 14-2 and Table 14-6 for resource estimation notes.

### 14.1.6 Comparison of Estimated Block Grades with Blasthole Sampling from Production

During surface mining that ScoZinc carried out in 2007-2008, blastholes were sampled and assayed for zinc content. The mineral resource block model for the Main Zone, which was estimated using diamond drilling samples, was compared with the results from closely-spaced blast hole samples that were collected during the recent surface mining operation. Jason Baker, a mining engineer formerly with ScoZinc Limited, carried out this comparison work (Baker, 2011).

There are numerous blast holes which are shown graphically in Figure 14-19. The solid bench models that were constructed for comparison purposes are shown in Figure 14-20.

During operations at Scotia Mine, blast hole data was recorded along with the assay data for each blast hole (refer to Figure 14-19). A single assay was calculated for each blast hole (i.e., if a blast hole had a depth of 10 meters, then a single assay value covered the entire 10 meter length). Spacing between blast holes was 3m (10 ft.) The blast hole data was imported into Gemcom software and a block model was created.

Blocks in the block model were interpolated for Zn grade using the blast hole assay intervals within the solid. The blast hole block model was constructed with the following orientation:

**Origin** = 8500 X, 6700 Y, 520 Z

**Rotation** = 0 degrees

**Block Size** = 5m x 5m x 5m

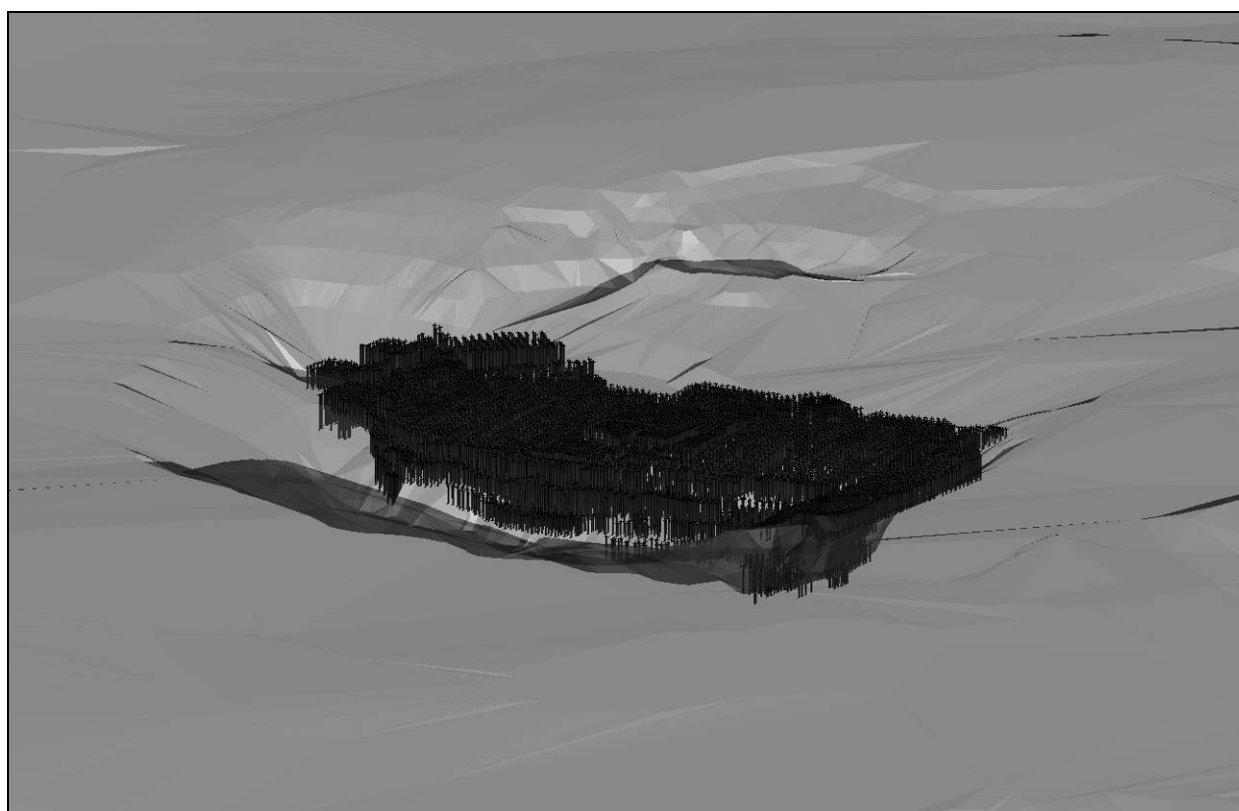
Blocks were interpolated for grade by the Inverse Distance Cubed method. A search ellipse with dimensions of X=10m, Y=10m, Z=10m was used in the interpolation. Once the block model was created volumetrics were performed on the blast hole solids using the resource block model as well as the new blast hole block model, and results were compared.

Results of the comparison were reported in Table 14-9 and shown graphically in Figure 14-21. The results compared well. For all benches, zinc grades from the resource block model were slightly, but not significantly greater than the blast hole data. The blast hole model volume was slightly greater.

The resulting metal content in the resource block model was actually 7-8% less than that predicted by blast hole samples. Meaning, the estimated block grades of the mineral resource block model may be slightly underestimated. In other words, it is possible that there is slightly more metal in the ground than estimated by the block model.

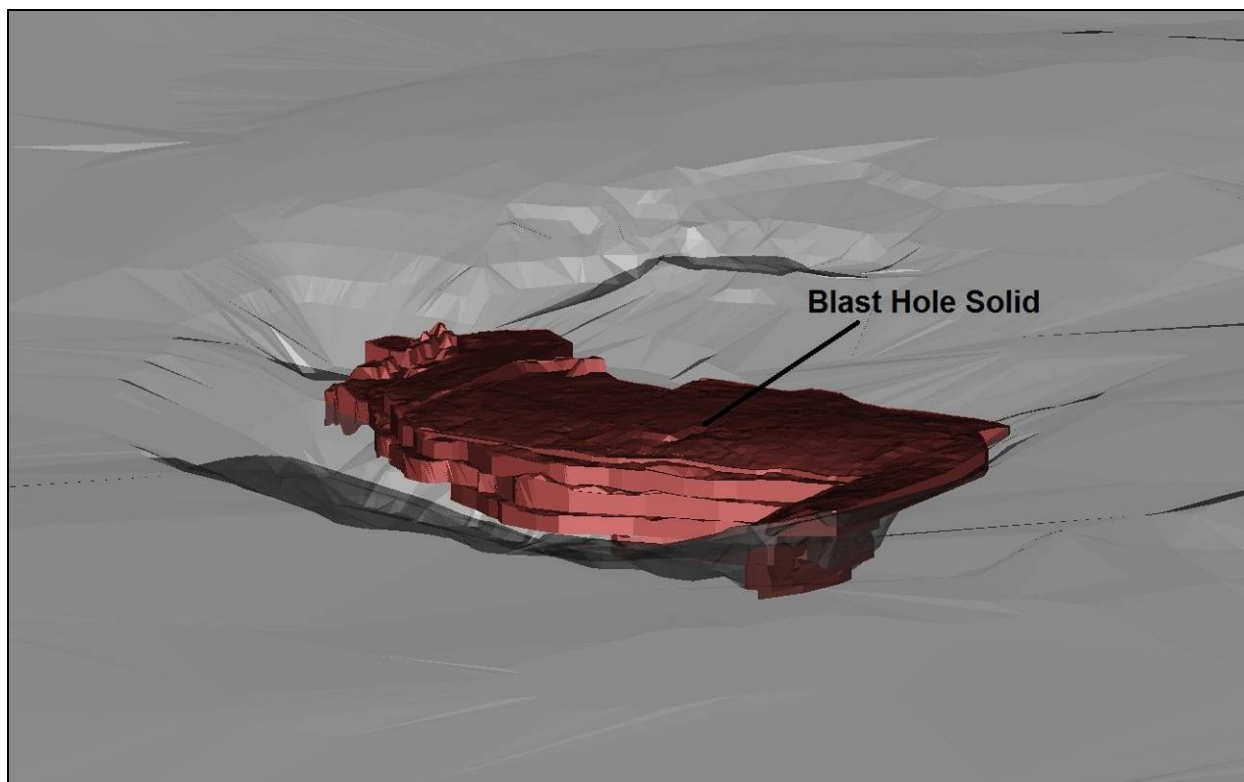
**Table 14-9: Results of Comparison between Blast Hole and Resource Model**

<b>Model</b>	<b>Bench</b>	<b>Volume (m<sup>3</sup>)</b>	<b>Zn Grade (%)</b>
ScoZinc	505	189,500	1.48
Blast Hole	505	217,400	1.67
ScoZinc	495	196,300	1.26
Blast Hole	495	231,500	1.09
ScoZinc	485	158,800	1.43
Blast Hole	485	166,000	1.27
ScoZinc	475	49,500	1.86
Blast Hole	475	55,650	1.62
ScoZinc	465	16,600	2.89
Blast Hole	465	20,500	2.40
<b>Total ScoZinc</b>	<b>All Benches</b>	<b>610,700</b>	<b>1.47</b>
<b>Total Blast Hole</b>	<b>All Benches</b>	<b>691,050</b>	<b>1.40</b>



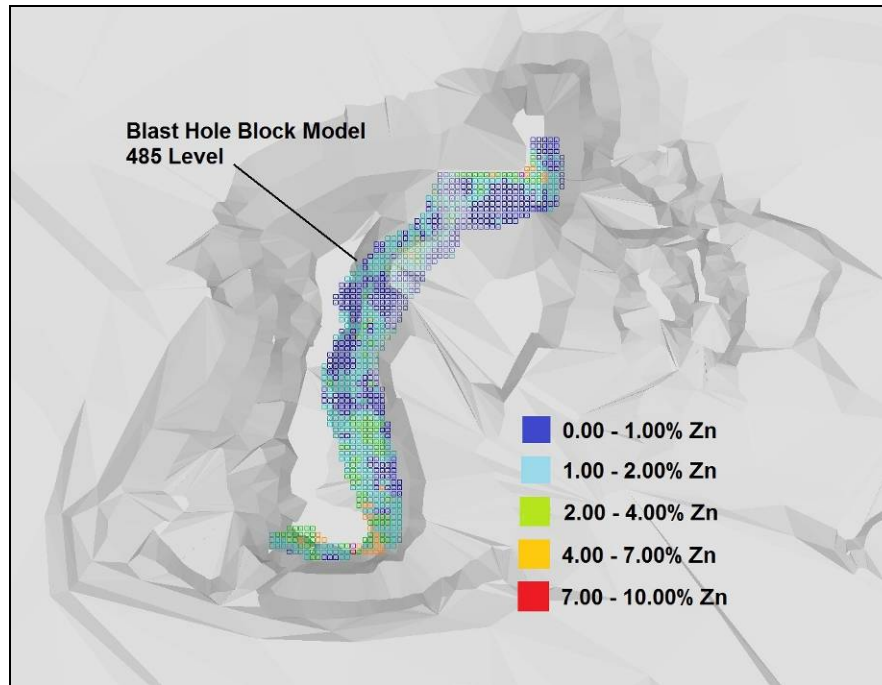
**Figure 14-19: 3D View of the Pit Showing Blast Holes (Roy and Carew, 2011)**



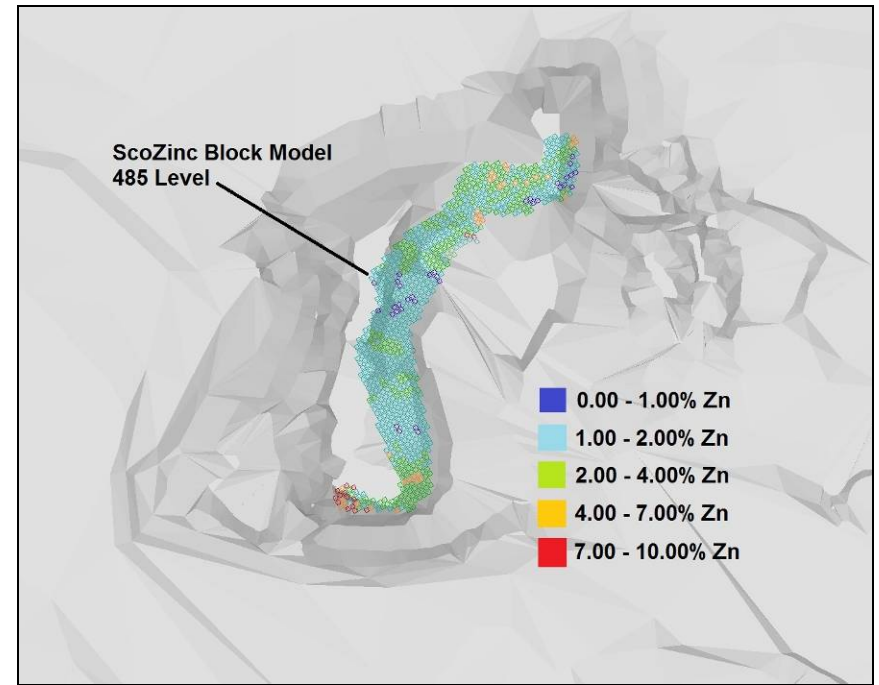


**Figure 14-20: 3D View of the Pit Showing the Bench Models That Were Constructed  
(Roy and Carew, 2011)**

### **Blast Hole Block Model**



### **Mineral Resource Block Model**



**Figure 14-21: Blast Hole and Mineral Resource Block Model Results, 485-Meter Level (Roy and Carew, 2011)**

### 14.1.7 Comparison of Current Estimate with Previous (2006) Estimate

The results of the current estimate were compared with the previous estimate (Roy et al, 2006).

In 2007-2008, ScoZinc mined material mostly in the Measured and Indicated categories, with some coming from the Inferred category. Measured and Indicated resources in the main zone both decreased after 2006. However, an increase in Northeast Zone Indicated resources caused a small, net increase in Indicated resources. Overall, there has been a decrease in Measured+Indicated resources since 2006, which is intuitive seeing as ScoZinc mined approximately one million tonnes of carbonate after 2006.

Though Main Zone Inferred resources decreased after 2006, there was an overall increase owing to a significant addition of Inferred Northeast Zone resources.

**Table 14-10: Comparison of Current Estimate with Previous (2006) Estimate**

Category	Changes in Tonnes	Change in Percent Zinc	Change in Percent Lead
Measured	-540,000	0.6	0.4
Indicated	140,000	-0.6	-0.4
Measured + Indicated	-400,000	-0.2	-0.1
Inferred	2,450,000	-0.5	0.2

### 14.1.8 Items that May Affect the Mineral Resources

There are a certain amount of mineral resources, mostly in the Northeast Zone, that have been identified below the river and highway (refer to Figure 14-11).

Gays River has caused water problems for past underground mining operations. The river's flood plain is sandy and permeable. The current environmental registration document permits shifting the river toward the highway (refer to Figure 4-4), which would allow the pit to expand northward.

The proposed open pit mining program does not include diverting the river.

## 14.2 GETTY DEPOSIT

Cullen et al. (2011) estimated the Getty Deposit's mineral resources. The following (i.e.: the entirety of Section 14.2) is an excerpt from that report.

### 14.2.1 General

"The definition of mineral resource and associated mineral resource categories used in this report are those recognized under National Instrument 43-101 and set out in the Canadian

Institute of Mining, Metallurgy and Petroleum Standards on Mineral Resources and Reserves Definitions and Guidelines (the CIM Definition Standards).

### **14.2.2 Geological Interpretation Used In Resource Estimation**

"All areas of zinc-lead mineralization included in the current resource are restricted to the Getty Deposit carbonate bank and occur within dolomitized Gays River Formation lithologies. For resource model purposes the Getty Deposit is considered an extension of the adjacent Gays River Deposit and both are classified as carbonate-hosted, stratabound zinc-lead deposits of the Mississippi Valley Type (MVT). Mineralization is localized in carbonate bank lithofacies that developed above and around paleo-topographic basement highs comprised of Cambro-Ordovician Goldenville Formation greywacke and slate. By definition, Gays River Formation lithologies are laterally equivalent to laminated and thin bedded limestones of the Macumber Formation.

"Zinc and lead mineralization of economic proportions is exclusively developed within dolomitized carbonate bank lithologies at Getty and is considered directly comparable to that seen on the adjacent Scotia Mine property. Sphalerite and galena are the dominant sulphide minerals present but trace amounts of marcasite/pyrite occur locally, typically as cavity-lining phases that post-date the zinc-lead mineralizing stage. Silver does not occur in economic proportions in this district but does report to Scotia Mine concentrates at levels of about one ounce per tonne. A similar presence at Getty may exist. Barite is absent from the deposit, as is celestite, but traces of fluorite have been reported (Kontak, 1998, 2000; Sangster et. al., 1998).

"As noted earlier, several types of lead and zinc mineralization are represented in the related Scotia Mine and Getty Deposits, the most important of which are (1) submassive to massive replacements of carbonate bank lithofacies by sphalerite and galena, typically along steeply dipping carbonate bank front intervals that face the open paleo-basin, (2) disseminated, replacement and porosity filling phases within various carbonate bank lithologies adjacent to and within bank-front intervals, and (3) in rare vein and irregular vug settings or as matrix mineralization between greywacke clasts or boulders in a basal breccia unit that typically separates carbonate bank lithologies from basement greywacke. The dominant type of mineralization in the Getty Deposit is disseminated in nature.

### **14.2.3 Methodology of Resource Estimation**

#### **14.2.3.1 Overview of 2011 Estimation Procedure**

"The Getty mineral resource estimate is based on a three dimensional block model developed using Surpac Version 6.0.3 modeling software and the validated project drill hole database. The database includes results from 181 historic diamond drill holes completed by Getty as well as 4

holes completed by Esso and 138 diamond drill holes completed by Acadian in 2007-2008. The current resource outline includes 84 historic holes and 94 Acadian holes, although additional holes from both sources occur adjacent to the outline and were used for geological and block model peripheral constraint definition purposes.

"The first step in development of the resource model was creation of a set of interpreted geological cross sections presenting lithocoded rock types interpreted from drill logs as well as lead and zinc core sample assay interval data. These served to establish an understanding of carbonate bank geometry and grade distribution trends present in the deposit and were later augmented by contour plans depicting overburden depth, dolomite thickness and basement surface configurations. Sections were created using the local project grid at a nominal spacing of 50 meters, with adjustment of this spacing made as necessary to provide complete coverage of the deposit. Geological and grade distribution models developed from the sections were used to guide and assess subsequently developed versions of the three-dimensional block model.

"Assay results from the validated project database were initially assessed through calculation of distribution statistics for both zinc and lead populations after compositing to a common 1.0 meter support base. In total, 1672 composites were created from analytical results for 1794 original core samples. Frequency distribution and probability plots for the composite data set were also prepared and results were interpreted as showing that the few high grade samples present were reflections of valid mineralization styles for which block-scale correlations could be reasonably expected. This assertion reflects observations made during underground mining of high grade portions of the adjacent Gays River Deposit. Composites showing high zinc and lead grades occur in several areas along the north-facing bank front of the Getty Deposit, as is the case at Scotia Mine, but these are typically lower in grade, thinner and spatially less extensive than similar high grade areas at Scotia Mine. On the basis of combined factors, no requirement for high grade capping of assay results in the Getty data set was established.

"The Getty Deposit model was developed within a three-dimensional, peripheral constraint (or solid) created in Gemcom Surpac Version 6.0.3 initially based on a combination of two contributing parameters, these being (1) a minimum grade % (zinc plus lead) value of 1.00% with a minimum down-hole intercept length of 3.0 meters, and (2) lateral limits to the deposit solid defined on the basis of midpoints between mineralized and non-mineralized drill holes or a maximum 25 meter projection from a mineralized hole where no other constraining hole was present. The grade cut-off was assigned as a reflection of the deposit's near-surface location and associated potential for open pit development.

"While not as complex as that at Scotia Mine, the carbonate bank front configuration at Getty is irregular and the solid developed for deposit modeling purposes is characterized by numerous promontories and re-entrants. This is particularly true along north-facing bank front intervals

that show spatial association with areas of best zinc and lead mineralization. This configuration approximates a series of variably-oriented panels of dipping mineralization that, although correlative, show strike and dip changes along the length of the deposit. The current peripheral deposit constraint solid for the block model reflects this variation and is based on that developed for the earlier Acadian resource estimate (Cullen et al., 2007). However, it differs from the earlier constraint by accommodating the new drill holes by Acadian and being comprised of 26 sub-domains reflecting areas of common mineralized zone orientation. As detailed later in this report, block grade interpolation was separately carried out in each sub-domain using unique search ellipse orientations.

"Spatial variability of mineralized zone trends at Getty prevented development of experimental variograms for the lead and zinc data set that reflected continuity of the mineralized zone to the degree seen in the original geological cross section model. This issue was addressed by Roy et al. (2006) at the Gays River Deposit through three-dimensional transformation of their deposit model that "unfolded" the various mineralized segments to a common surface. Transformed data supported acceptable variogram models and these were subsequently used to establish parameters for grade interpolation into their block model.

"In contrast to the method used at Scotia Mine, mineralized trend variability along the Getty Deposit was addressed in the current model through development of the 26 orientation domain solids within which grade interpolation was constrained. Composite populations within individual domains typically did not provide an adequate number of sample pairs to create well developed experimental variograms. However, useful variogram models for the largest northwest trending sub-domain were initially developed and these were augmented by variogram models calculated for the entire composite population occurring within the peripheral deposit constraint. In the latter case it was recognized that geometric aspects of the deposit could factor negatively in the evaluative process. Based on combined results of the two approaches, the strike and dip directions of the mineralized zones were determined to show the highest degrees of grade correlation at longest range values. This directly supported earlier qualitative geological assessment of the grade trends. Geometric aspects of the mineralized zones were used in conjunction with variogram results to select interpolation ellipsoid axial ranges, with common ranges used in all sub-domains in conjunction with unique assigned orientation parameters. Block grades were assigned to the 26 deposit sub-domains using inverse distance squared (ID2) interpolation methodology.

"Results of the grade interpolation process were initially checked against geological cross sections to assess conformity and to provide primary validation of the final deposit block model. A further check on the resource model was completed using Nearest Neighbour grade interpolation methodology on the deposit solid. Resource figures reflecting ID2 interpolation

and a range of minimum grade cutoff values, beginning at 2.0% (zinc + lead), constitute the final resource estimate documented in this report.

#### 14.2.3.2 Capping of High Grade Assay Values

"Zinc and lead grades for all drill core samples were reviewed and descriptive statistics calculated for both the raw data set and that reflecting 1 meter composite support. The latter are presented below in Table 14-11 and include only those holes that intercept the deposit solid.

**Table 14-11: Descriptive Statistics - 1-Meter Drill Core Composites in Resource Solid**

Parameter	Zinc	Lead
Mean	1.46%	1.00%
Variance	1.94	2.53
Standard Deviation	1.39	1.59
Coefficient of Variation	0.948	1.580
Maximum	11.30	18.54
Minimum	0.00	0.00
Number	1961	1961

"Maximum zinc and lead grades at 1 meter composite support are 11.30% and 18.54% respectively and reflect zones of higher grade mineralization that are considered spatially coherent and correlative at block scale within the deposit. These form a meaningful part of the grade distribution spectrum of the deposit and are associated with valid geological domains. On this basis, high grade lead and zinc values were not capped for use in the current resource estimate.

#### 14.2.3.3 Compositing of Drill Hole Data

"One meter down-hole composites of raw core sample assay values were created for each drill hole, with this length representing the dominant sample interval used by Acadian in the 2007-2008 drilling program. Historic drilling program sample length statistics for all holes are presented in Table 14-12. A review of associated rank and percentile figures shows that 99 percent of the historic samples measure less than 2.0 meters in length, 75 percent measure 1.52 meters or less in length and 39 percent measure less than 1.0 meter in length. Average length of historic samples is 1.15 meters.

**Table 14-12: Core Sample Length Descriptive Statistics**

<b>Parameter</b>	<b>Historic Core Sample Length (m)</b>	<b>Acadian Core Sample Length (m)</b>
Mean	1.15	1.00
Variance	0.222	0.063
Standard Deviation	0.47	0.25
Coefficient of Variation	0.411	0.250
Maximum	4.26	6
Minimum	0.02	0.38
Number	855	939

"With respect to Acadian sampling, associated rank and percentile figures show that 95 percent of samples measure 1.0 meter or less in length and 99% of samples measure 2.0 meters or less in length. Average length of Acadian core samples is 1.00 meters. Sampling of high grade intervals in historic drill holes was typically carried out based on geological contacts with no minimum sample length parameters applied. This may in part be reflected in samples from historic programs with lengths of less than 0.5 meters.

"In total, 1672 assay composites at 1.0 meter support were calculated within the resource estimation solids from the combined historic drill hole and Acadian drill hole data set.

#### 14.2.3.4 Calculation of Equivalent Zinc

"The previous Mercator resource estimate for the Getty Deposit reported by Cullen et al.. (2008) presented a zinc equivalent parameter of zinc equivalent = (zinc% + lead %). Riddell (1976) also used a zinc% + lead% factor to define resource cutoff values and included the parameter in the associated resource estimate. Use of zinc% + lead% to define cutoff values was not retained for the current estimate.

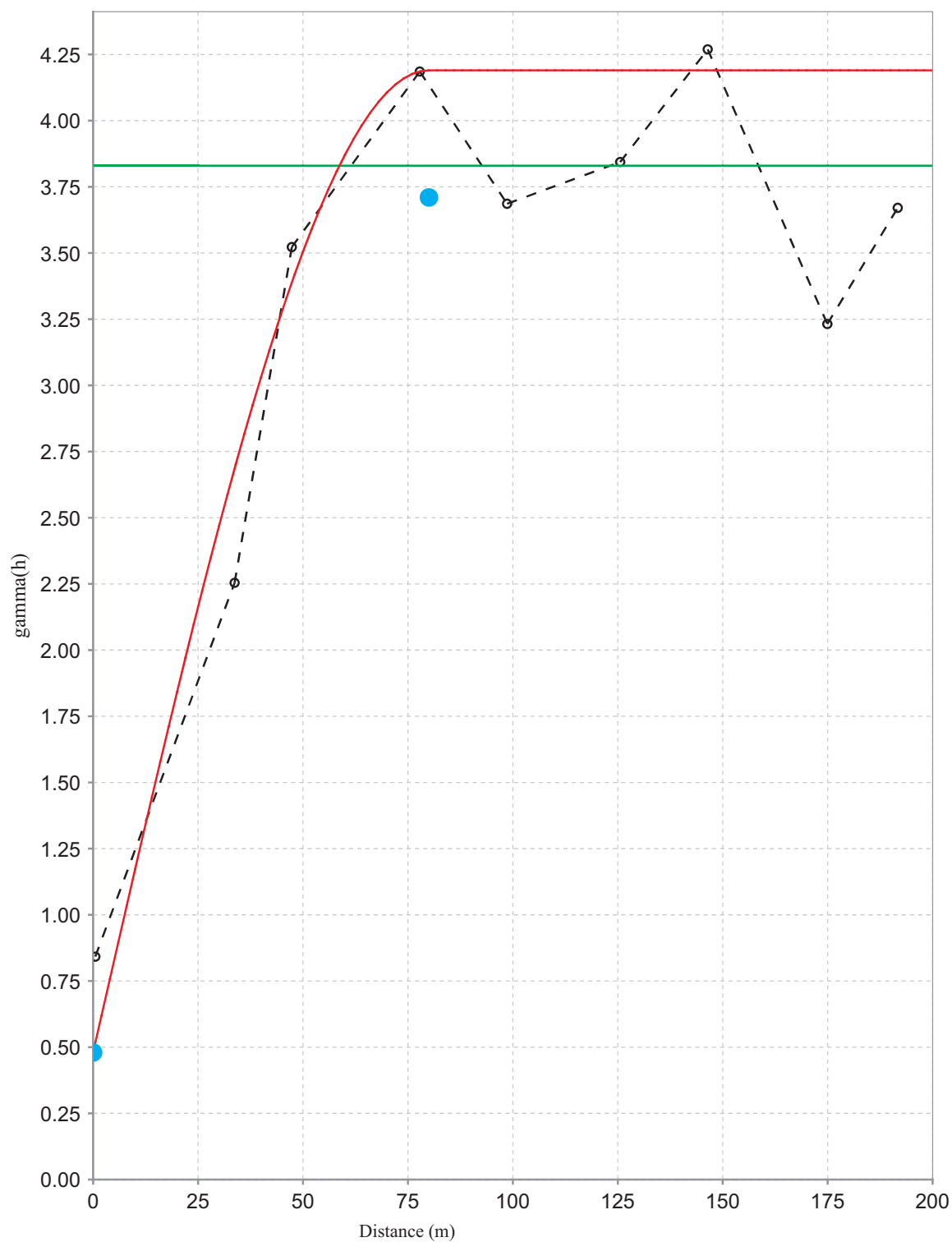
"Market conditions at the effective date of this report have changed since the 2008 resource estimate. Based on (1) review of London Metal Exchange 27 month forward contract pricing for lead and zinc, (2) consideration of current and future market pricing projections prepared for Selwyn (Brook Hunt, 2010), (3) availability of 2007-2008 milling recovery data from Scotia Mine, and (4) provision of relevant smelter return factors, the authors have chosen to redefine zinc equivalent for current purposes. Zinc Equivalent % (Zn Eq %) for this report is defined as  $Zn \% + (Pb \% \times 1.18)$ , based on mill recoveries of 89.3% for zinc and 89.5% for lead, \$US1.10/lb Zn and \$US1.15/lb Pb metal pricing and smelter returns of 85% for Zn and 95% for Pb. A 2.00% Zn Eq. resource statement cutoff value was used and reflects open pit development potential.



#### 14.2.3.5 Variography

"As reported by Cullen et al.. (2008), an initial assessment of variography for the deposit area was carried out for historic drill hole data by creation of experimental variograms for combined zinc plus lead (zinc + lead) values for the largest northwest trending sub-domain of the deposit that corresponds with mineralization developed along the contact between overlying evaporite and extending southwest into the dolomitized bank proper. Further details pertaining to deposit sub-domains are presented in the following sections. In plan projection the selected sub-domain measures approximately 700 meters in length by 200 meters in average width and forms a broad corridor of northwest striking, flat-lying to northeast-dipping mineralized carbonate that shows restriction of most mineralization to a relatively narrow, 150 meter elevation interval. Local irregularities of the mineralized carbonate's trend are present in this corridor and take the form of promontories and re-entrants that have associated variations in strike and dip components.

"Experimental variograms for the selected sub-domain were calculated at various lags and bearings within a horizontal reference plane and resulted in selection of spherical variogram models for major and semi-major axes of continuity in orientations that correspond to the dominant geological strike and dip directions within the sub-domain. Representative variogram models for these two axial components are presented in Figure 14-22 and Figure 14-23 and show ranges of 75 meters and 100 meters respectively. Experimental variograms were also calculated in the same horizontal reference plane for the entire composite data set occurring within the deposit peripheral constraint and these provided definition of spherical variogram models showing similar major and semi-major axis orientations as those calculated for the northwest sub-domain, but with higher degrees of complexity resulting from combination of data from the various orientation sub-domains present within the deposit.



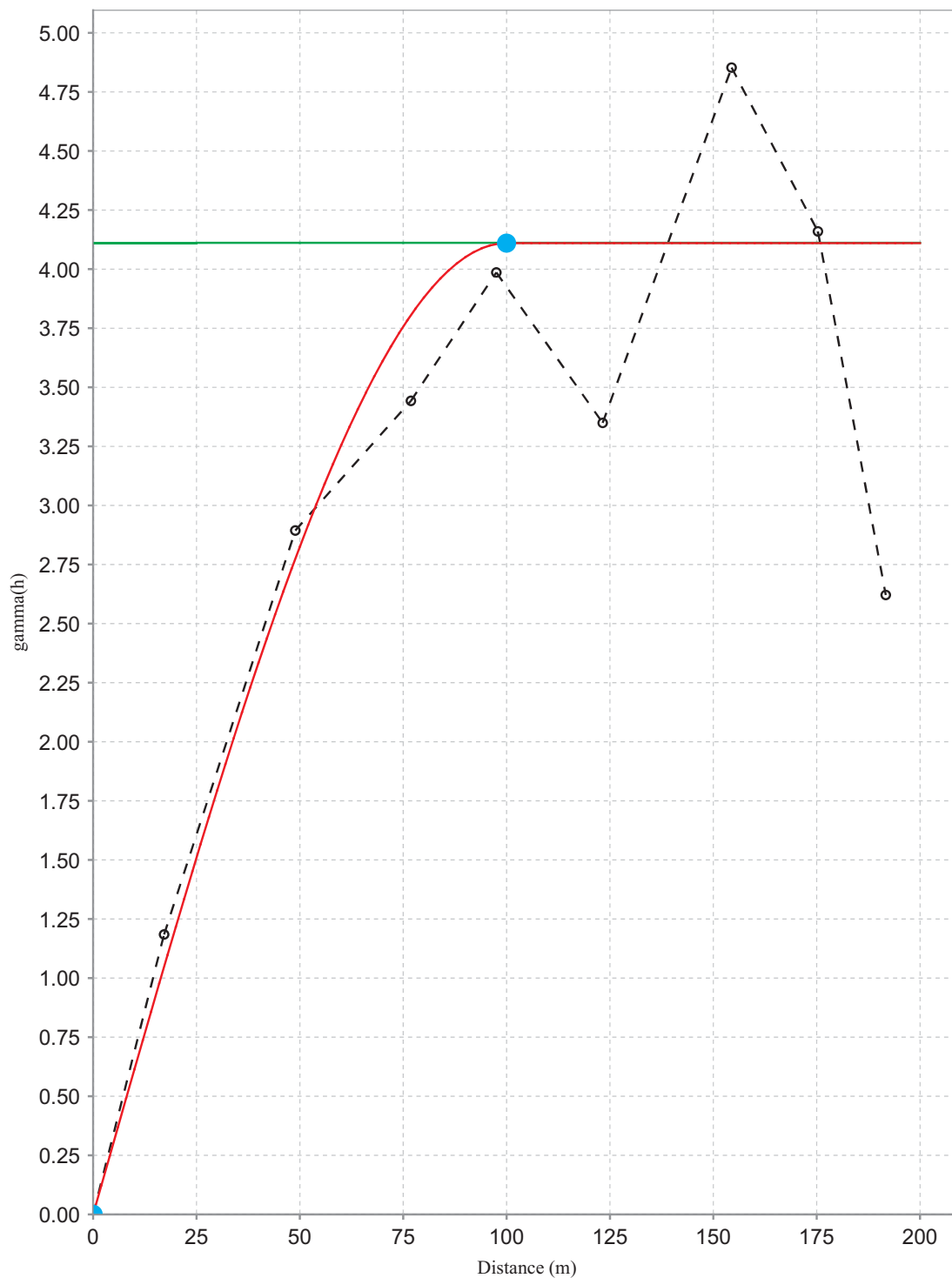
- Normal
- Variance
- Variogram Model
- Variogram Structures



Figure 14-22  
Experimental Variogram in Sub-Domain 1  
Azimuth 150 Degrees Grid  
Getty Deposit

Date: April 2011

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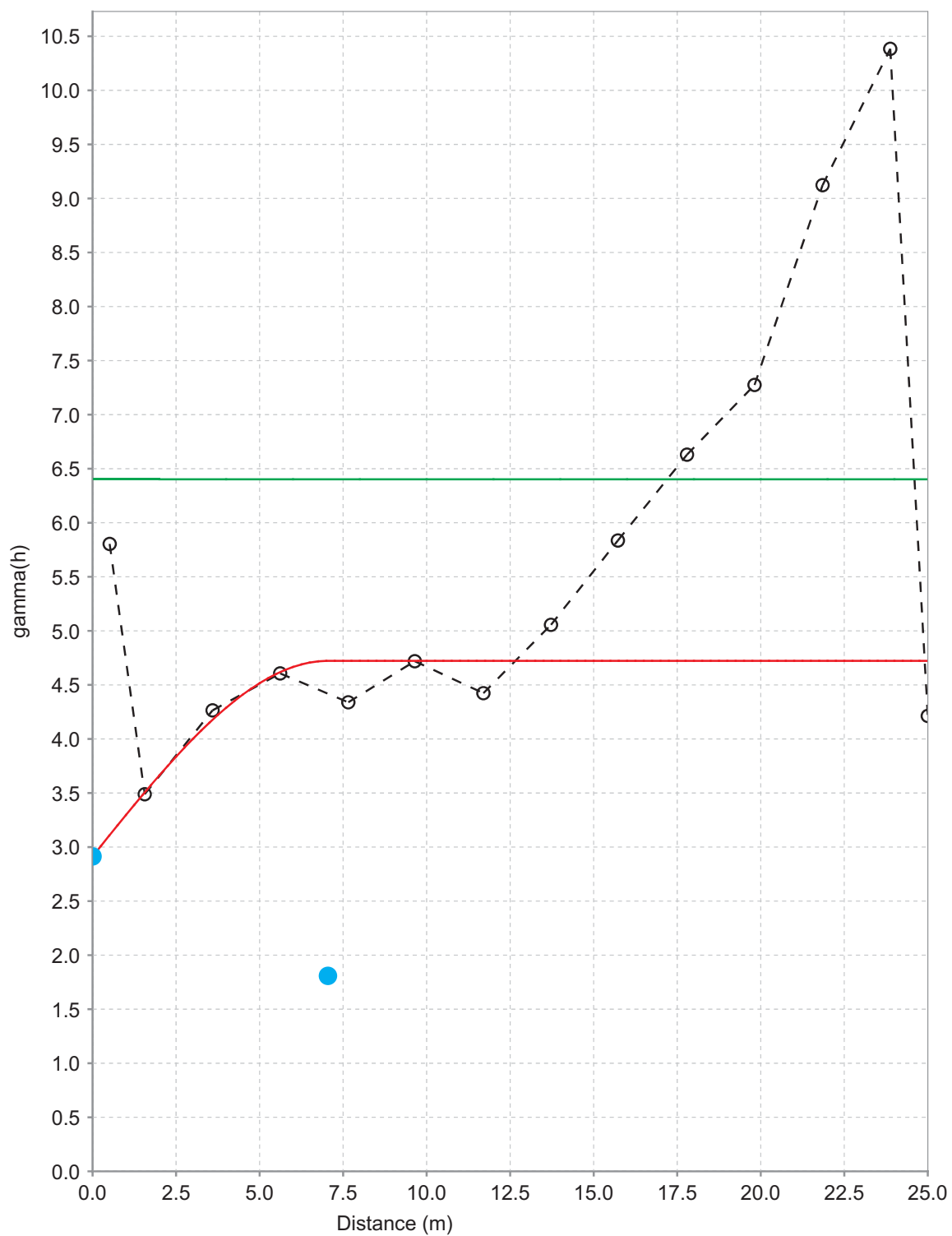
- Normal
- Variance
- Variogram Model
- Variogram Structures



Figure 14-23  
Experimental Variogram in Sub-Domain 1  
Azimuth 75 Degrees Grid  
Getty Deposit

Date: April 2011

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- Normal
- Variance
- Variogram Model
- Variogram Structures



Figure 14-24  
Experimental Variogram  
Downhole  
Getty Deposit

Date: April 2011

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"Down hole experimental variograms and spherical model variograms were also prepared to assess grade continuity and correlation trends vertically within the dolostone unit that hosts the deposit. Figure 14-24 presents the best resulting down-hole variogram model and supports a range of 12 meters at a lag of 2 meters. This range is interpreted as reflecting the average mineralized thickness of the host carbonate within the deposit peripheral constraint and was considered during selection of a minor axis range value for the grade interpolation search ellipse.

"Ranges for variograms defined for the main northwest trending sub-domain were assumed to be applicable in the other deposit sub-domains, based on (1) correlation of the modeled continuity trends with local geological strike and dip directions and (2) independent confirmation of grade continuity based on systematic review and interpretation of multiple geological and assay cross sections through the deposit. In combination, these assumptions largely reflect the recognized stratabound character of the zinc and lead mineralization within the Gays River Formation host sequence in the Getty Deposit area.

#### 14.2.3.6 Setup of 2011 Three-Dimensional Block Model

"Block model total extents were defined in local grid coordinates as being from 6000 meters East to 7145 meters East and from 6300 meters North to 7150 meters North. The model extends in elevation from 150 meters to 700 meters relative to the Scotia Mine local grid that has a datum of mean sea level plus 500.11 meters. The nominal topographic surface in the Getty Deposit area occurs between the 550 meter and 520 meter local grid elevations and all resource solids respect the bedrock/overburden surface defined by the resource drill hole data set. As noted earlier, all drill holes in the Getty resource database are coordinated to both the Scotia Mine local grid and to UTM Zone 20 (NAD83) and collar coordinates for the local grid are reported in Appendix 2. The local grid closely reflects the 3° Modified Transverse Mercator (MTM) projection for Nova Scotia (ATS 77 datum).

"A standard block size for the model was established at 2.50 meters x 2.50 meters x 2.50 meters, with no sub-blocking. Descrretization within blocks was 1 x 1x 1 and no block rotation was applied. The chosen block size reasonably reflects the character of mineralization within the deposit and also provides approximation of a mining unit size that could be applicable in development of this style of base metal deposit.

"All historic drill holes were lithocoded using the lithocode system originally established by Westminer for the Gays River Deposit. This system was also being used in the Getty Deposit drilling program by Acadian.

"Resource estimation was completely constrained within a peripheral deposit solid developed from wireframing of mineralized envelope limits on geological cross sections cut through the

deposit. A minimum 1.0% (zinc + lead) value over a minimum 3.0 meter down hole sample length was used initially to define wire-framed mineralized envelope limits for a peripheral deposit constraint, with slight modifications made locally as required after inspection of the resultant solid. Lateral or down-dip deposit limits were typically created at midpoints between holes that mark the mineralized zone to non-mineralized zone transition or at a distance of 25 meters from a mineralized drill hole, the lesser distance being utilized.

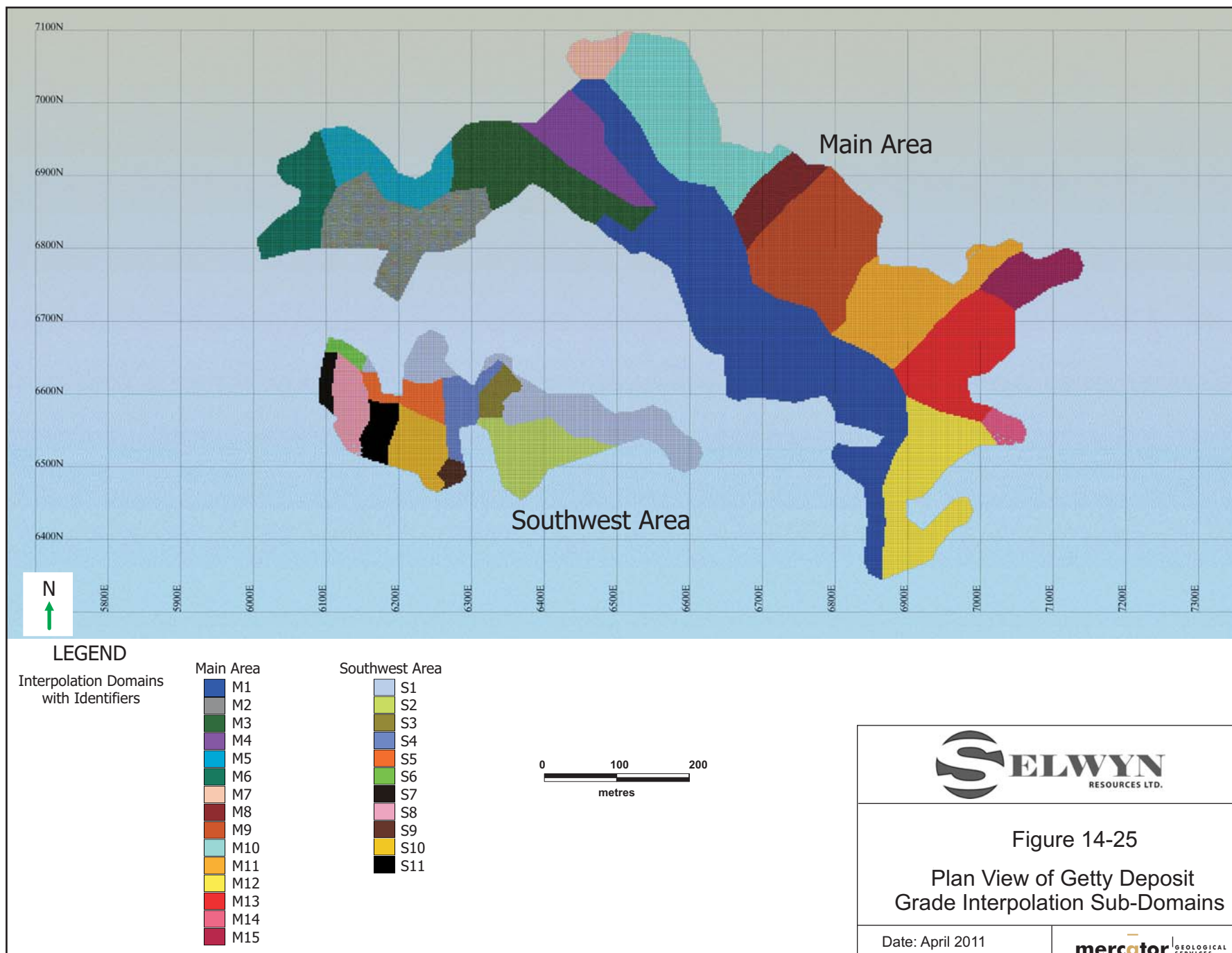
"To properly accommodate deposit geometry during modeling, twenty-six grade interpolation sub-domains were established within the block model peripheral constraint and these are illustrated in (Figure 14-26). Sub-domains reflect areas of common geometric orientation of the mineralized carbonate and were established as discrete three dimensional constraints within which block grade interpolation could be carried out. Contributing composites for block grade interpolation were not constrained within the sub-domains, to ensure that modeling allowed grade continuity to exist across sub-domains boundaries. Fifteen sub-domains occur contiguously within the main northwest trending deposit outline and the remaining 11 occur contiguously within the southwest zone of the deposit that, at the minimum cut-off used in this report, has been modeled as a separate mineralized area immediately adjacent to the main deposit ([refer to] Figure 14-25).

#### 14.2.3.7 Assignment of Resource Estimate Cutoff Values

"A minimum cutoff value of 2.0% zinc equivalent was used for reporting the current mineral resource estimate. This value was selected to reflect recognized potential for open pit development of the deposit and processing of ore at the adjacent Scotia Mine milling complex.

#### 14.2.3.8 Material Densities

"No historic collection of Specific Gravity (SG) data for either the Scotia Mine or Getty Deposits was identified in historic records. However, during the course of the 2007-2008 drilling program, Mercator selected 120 dolostone and basal breccia pulp samples representing the grade range within the deposit and submitted these to ALS Chemex in Sudbury, ON for the purpose of Specific Gravity (SG) determination. Pycnometer and methanol laboratory methodology was utilized as set out in the ALS Chemex OA-GRA-08b laboratory protocol. Analytical results for zinc and lead had previously been received for all of the samples submitted for SG determination. No porosity factor was used in the specific gravity calculations.



"Specific gravity (SG) values for the block model were assigned by calculation based on a base dolostone SG value of 2.82 g/cm<sup>3</sup> and application of the formula set out below that assigns SG values based on zinc and lead block grades plus the base dolostone value. Zinc is assumed to be present as sphalerite and lead to be present as galena. This approach is consistent with methodology used for the previous Getty Deposit resource estimate by Mercator (Cullen et al., 2008) and follows the earlier example of MineTech International Limited (Roy et al., 2006) for calculation of mineral resources and reserves supporting the recent feasibility study for Acadian's adjacent Scotia Mine project.

"The 120 SG determinations from the Acadian drilling program were used to assess the assignment equation and results correlated sufficiently well to maintain its use. However, the equation was modified through increase of the original base dolostone SG value of 2.7 g/cm<sup>3</sup> to 2.82g/cm<sup>3</sup>. SG values calculated for each block were multiplied by corresponding block volumes and results summed according to applied cutoff parameters to obtain tonnage values for the deposit model. For purpose of review, descriptive statistics for calculated block density values used in the current deposit model are presented in Table 14-13.

**Table 14-13: Descriptive Statistics: Block Model Density Values**

Parameter	Value
Mean	2.86
Variance	0.001
Standard Deviation	0.028
Coefficient of Variation	0.010
Maximum	3.27
Minimum	2.82
Number	209757

#### 14.2.3.9 Interpolation Ellipsoid and Resource Estimation

"Inverse Distance Squared (ID2) grade interpolation was used to assign block model metal grades, with blocks being fully constrained by limits of the 26 separate resource domain solids. Variogram models were used in conjunction with geological model attributes to guide assignment of major, semi-major and minor axis range values for interpolation ellipses used in the current model. Unique search ellipse orientation parameters were developed that reflect local geological strike and dip components for mineralized carbonate in each of the 26 interpolation domains and axial orientations were assigned to conform to this geometry.



"Major and semi-major axial range values for the ellipsoids were set at 75.00 meters for each domain and in no case exceeded the maximum major and semi-major range values indicated by the selected assay composite variogram models. The 75.00 meter range in both major and semi-major orientations was considered sufficient to insure block grade interpolation from 3 contributing drill holes in a 25 meter spaced drill pattern. Minor axis ranges of 37.5 meters were assigned to ensure full exposure to the thickness of stratabound mineralization within all sub-domains. This value exceeds the down-hole variogram range mentioned above and is fifty percent of the selected major and semi-major axis range values. Minor axis range selection was weighted on the basis of the deposit geological model to ensure inclusion of the full host sequence stratigraphic thickness in all sub-domains. Orientation parameters pertaining to the 26 grade interpolation sub-domains appear in Table 14-14 and Figure 14-26 presents a graphic representation of the various search ellipses superimposed on the block model.

**Table 14-14: Search Ellipse Parameters for Interpolation Domains**

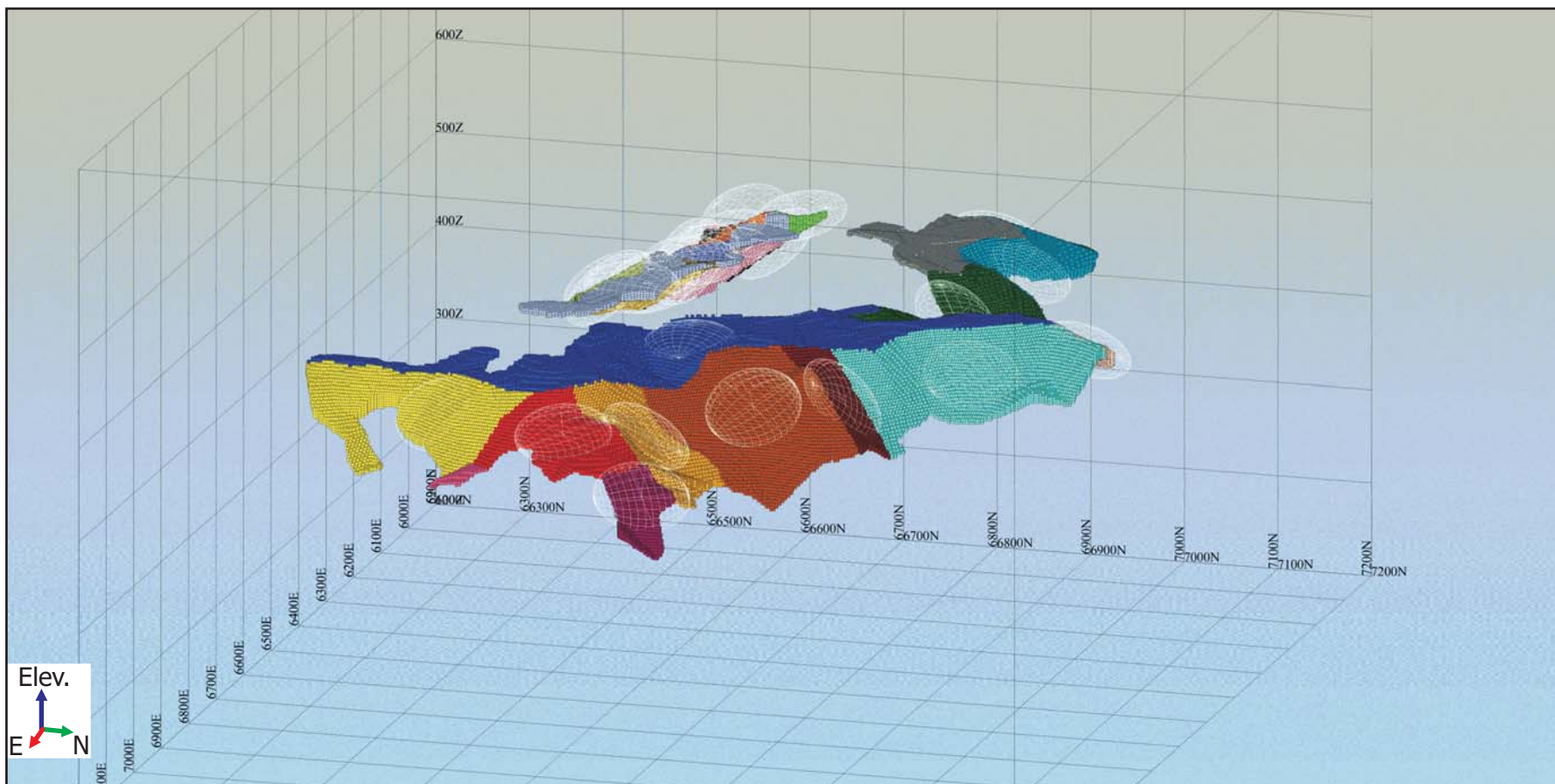
<b>Interpolation Domain Name</b>	<b>Azimuth (Degrees)</b>	<b>Plunge (Degrees)</b>	<b>Dip (Degrees)</b>
Main 1	0	0	0
Main 2	0	0	0
Main 3	306	-22.5	-33.5
Main 4	306	-20.5	37
Main 5	0	-24	0
Main 6	250	-25	-18
Main 7	295	-33	0
Main 8	47	-31	35
Main 9	36	-20	-27
Main 10	33	-23	-10
Main 11	43	-15	30
Main 12	132	-24	15
Main 13	43	-8.5	-10
Main 14	0	0	0
Main 15	58	23	0
South 1	103	0	0
South 2	90	-5	-31.5
South 3	190	10	-20
South 4	176	26	16
South 5	108	0	-30
South 6	307	0	22
South 7	184	41	4
South 8	180	41	-45
South 9	193	44	7
South 10	194	38	-24
South 11	197	41	42

"A maximum of 12 included sample composites was established for estimation of individual block grades, with no more than 4 composites allowed from a single drill hole.

"These parameters ensured both multiple drill hole inclusion in block grade estimations and lateral grade projection between drill holes in dip and strike orientations. Single passes of ID<sup>2</sup> grade interpolation were separately completed for the zinc and lead data sets within each of the

26 interpolation sub-domains and results were initially reported at grade cut-offs of 1.50%, 2.00%, 2.50% and 3.00% (zinc equivalent).

"Grade distribution within the block model was assessed against vertical geological and grade cross sections cut through the deposit at nominal spacings of 50 to 70 meters and also against horizontal sections cut through the model at 10 meter elevation intervals. Metal distribution trends observed in the sections were considered acceptable against the geological model. Figure 14-27 through Figure 14-30 present perspective views of block model grade distribution trends at specified cut-off values.



## LEGEND

Interpolation Domains  
with Identifiers

### Main Area

- M1
- M2
- M3
- M4
- M5
- M6
- M7
- M8
- M9
- M10
- M11
- M12
- M13
- M14
- M15

### Southwest Area

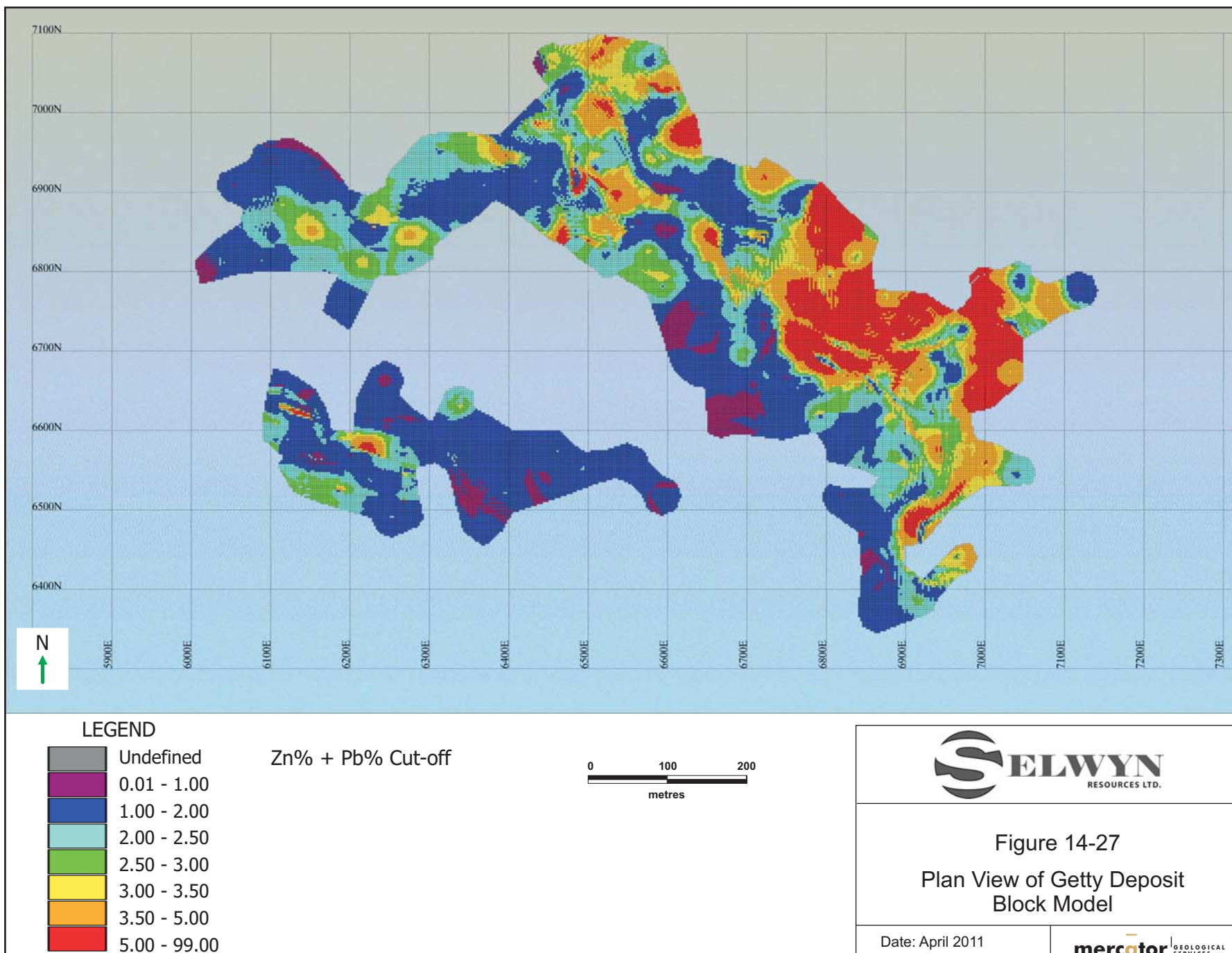
- S1
- S2
- S3
- S4
- S5
- S6
- S7
- S8
- S9
- S10
- S11



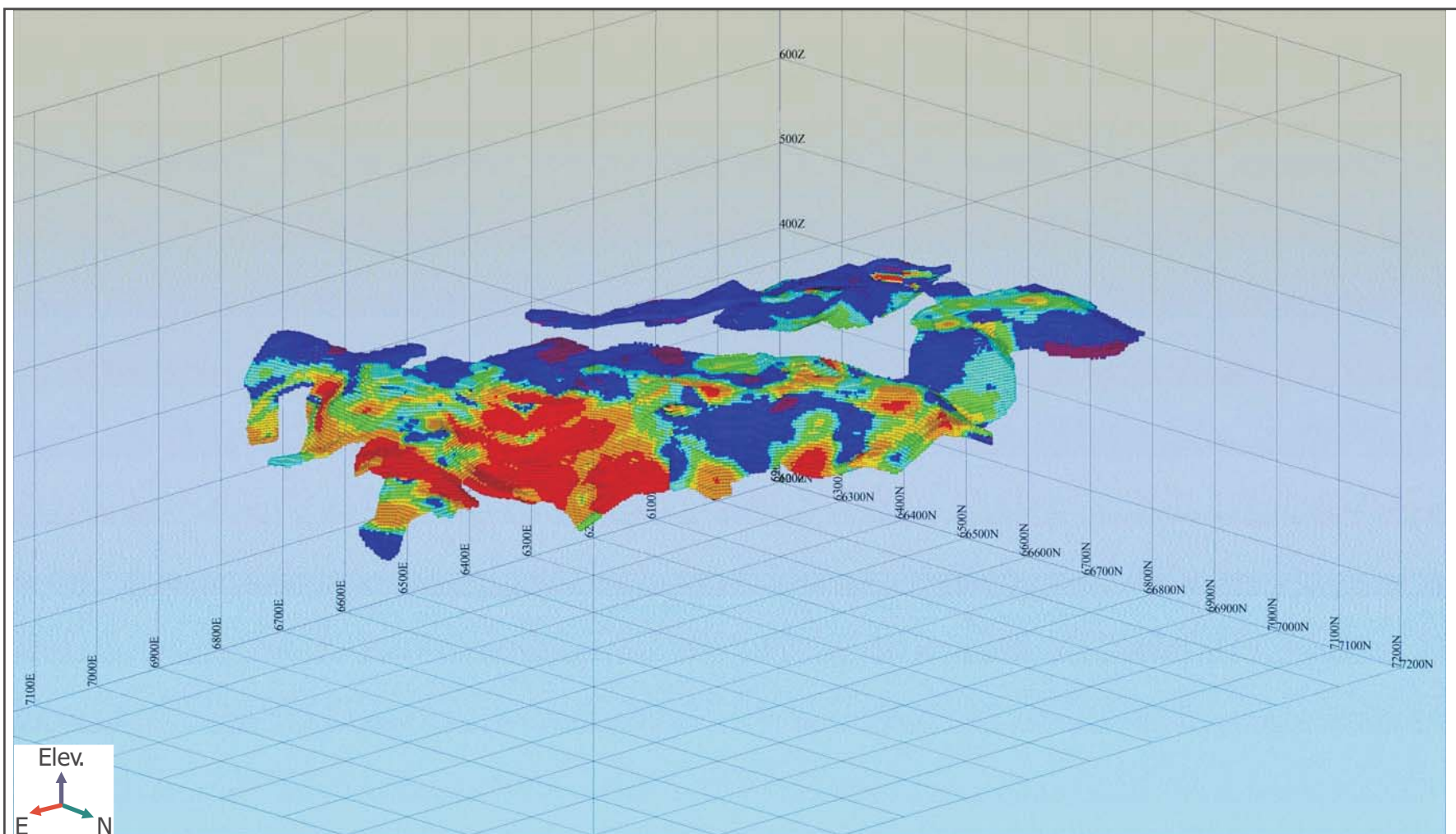
Figure 14-26  
View of Grade Interpolation  
for Getty Block Model  
Looking Southwest

Date: April 2011

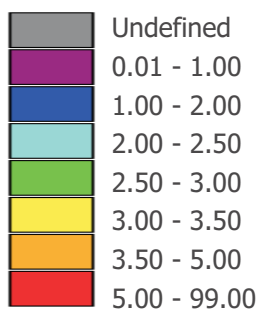
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#### LEGEND



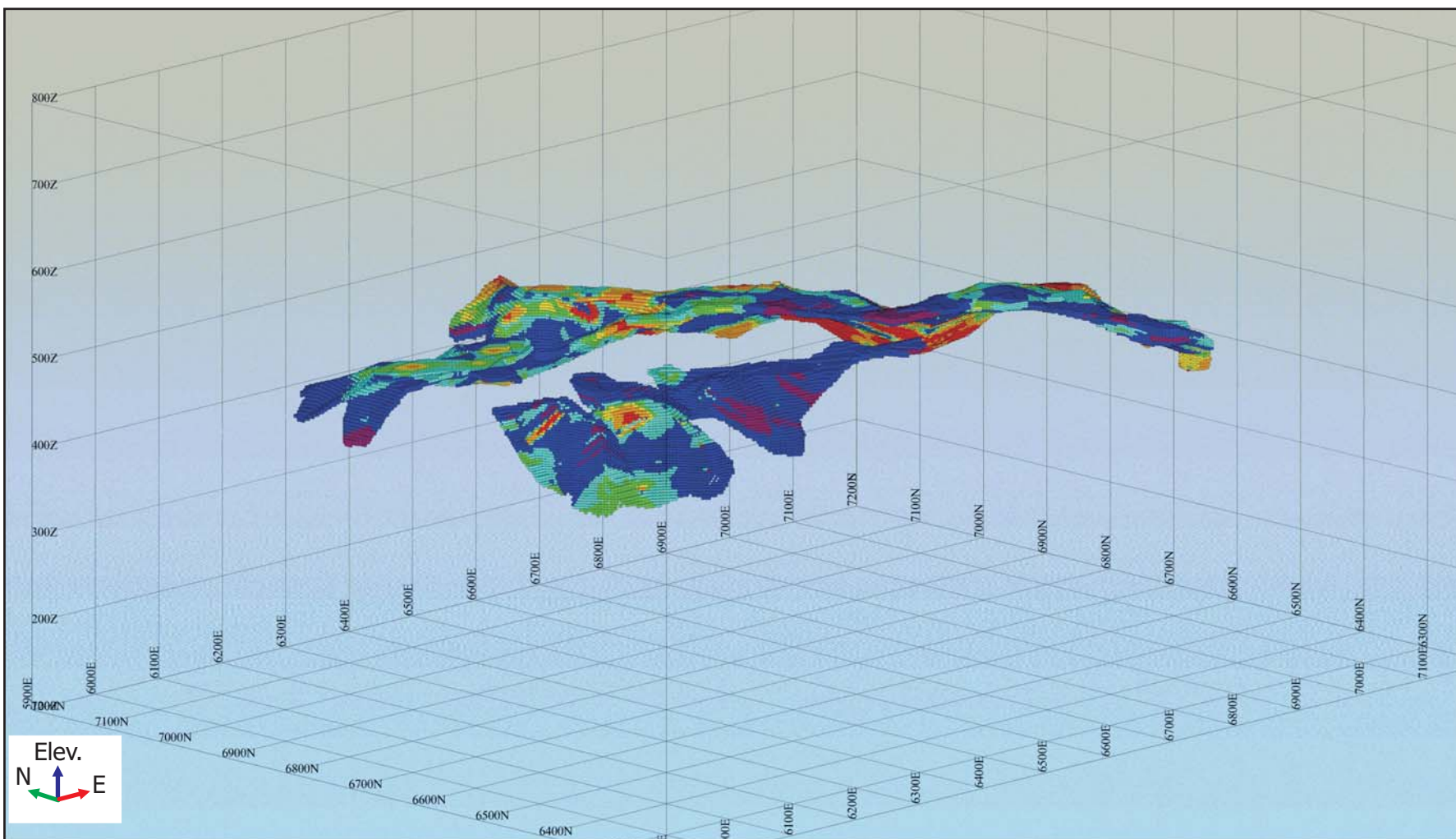
Zn% + Pb% Cut-off



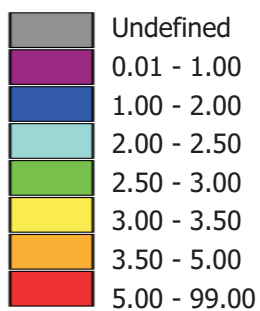
Figure 14-28  
Perspective View of Getty Deposit  
Grade Distribution  
Looking Southwest

Date: April 2011

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#### LEGEND



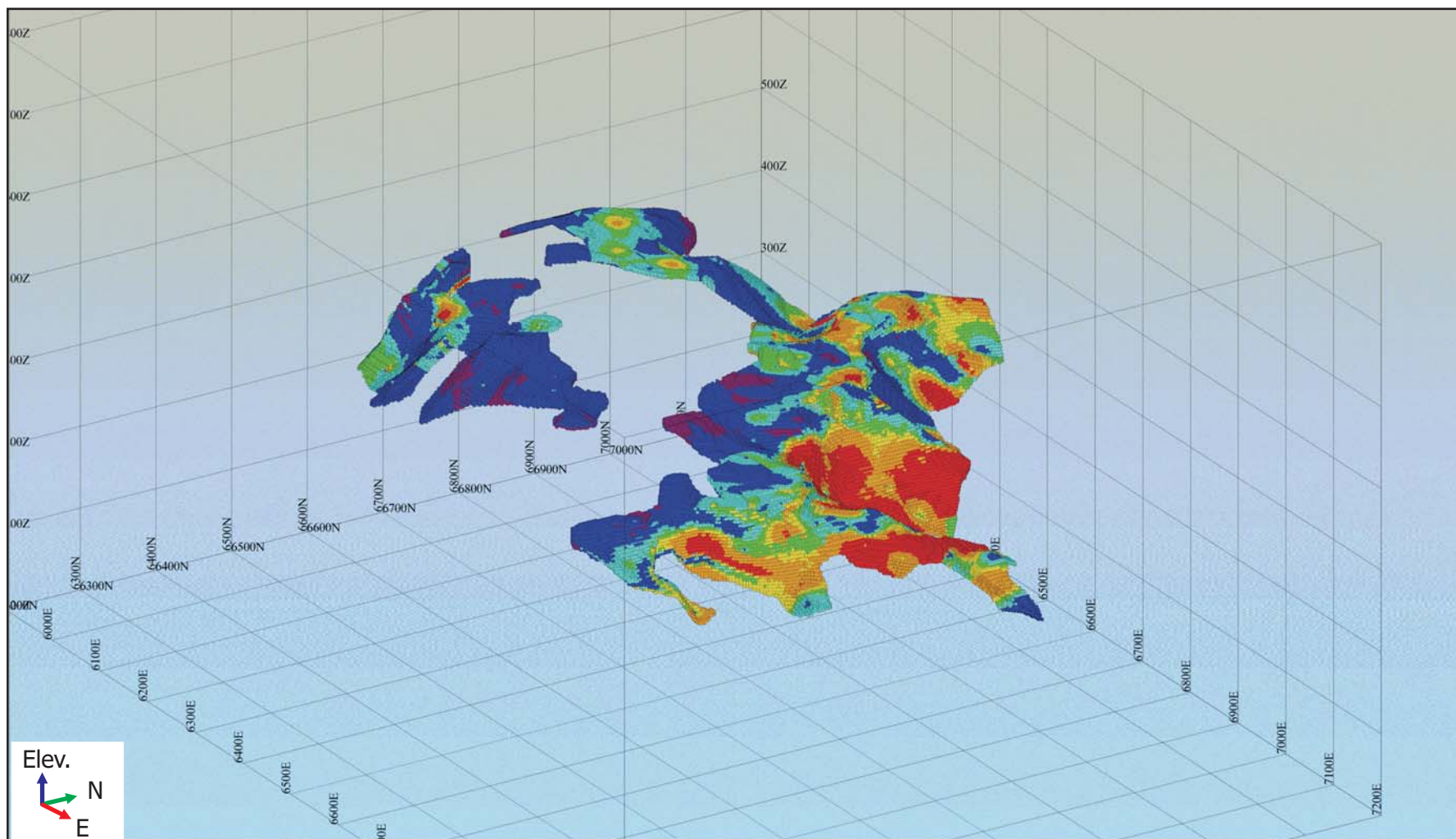
Zn% + Pb% Cut-off



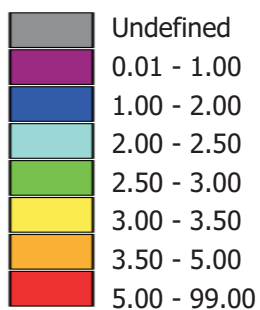
Figure 14-29  
Perspective View of Getty Deposit  
Grade Distribution  
Looking Northeast

Date: April 2011

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#### LEGEND



Zn% + Pb% Cut-off



Figure 14-30  
Perspective View of Getty Deposit  
Grade Distribution  
Looking Northwest

Date: April 2011

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#### 14.2.3.10 Resource Classification

"Mineral resources presented in the current estimate have been assigned Inferred, Indicated and Measured resource categories that reflect increasing levels of confidence with respect to spatial configuration or resources and corresponding grade assignment within the deposit. Several factors were considered in defining resource category assignments, including drill hole spacing, geological interpretations and integrity of supporting data sets. Results of the 2007-2008 core drilling program by Acadian provided the most important upgrading factor to the deposit data set in comparison to the 2007 resource estimate which previously reported Inferred mineral resource. The new Acadian drill holes provided a nominal drill hole spacing of approximately 50 meters by 50 meters over much of the deposit area and constituted a major degree of infilling with respect to more broadly spaced historic drill holes that supported the previous estimate. The increased drill hole density factor was augmented by additional QA/QC program results associated with twinning of 10 historic drill holes during the 2007-2008 Acadian drill program and also by re-logging and sampling of 10 historic drill holes for which archived core was available. Positive results from all noted programs served to upgrade overall confidence in the project data set and justified definition of higher category resources.

"Definition parameters for each resource category specified in the current Getty estimate are set out below and Figure 14-31 illustrates distribution of categories in plan view.

"Measured Resources: All blocks with grades based on three drill holes and a minimum of 9 included samples, with not more than 4 composites from a single drill hole, for which the averaged distance to included samples was 28 meters or less with no sample greater than 50% of the major axis range (37.5m) from the block were categorized as Measured mineral resources.

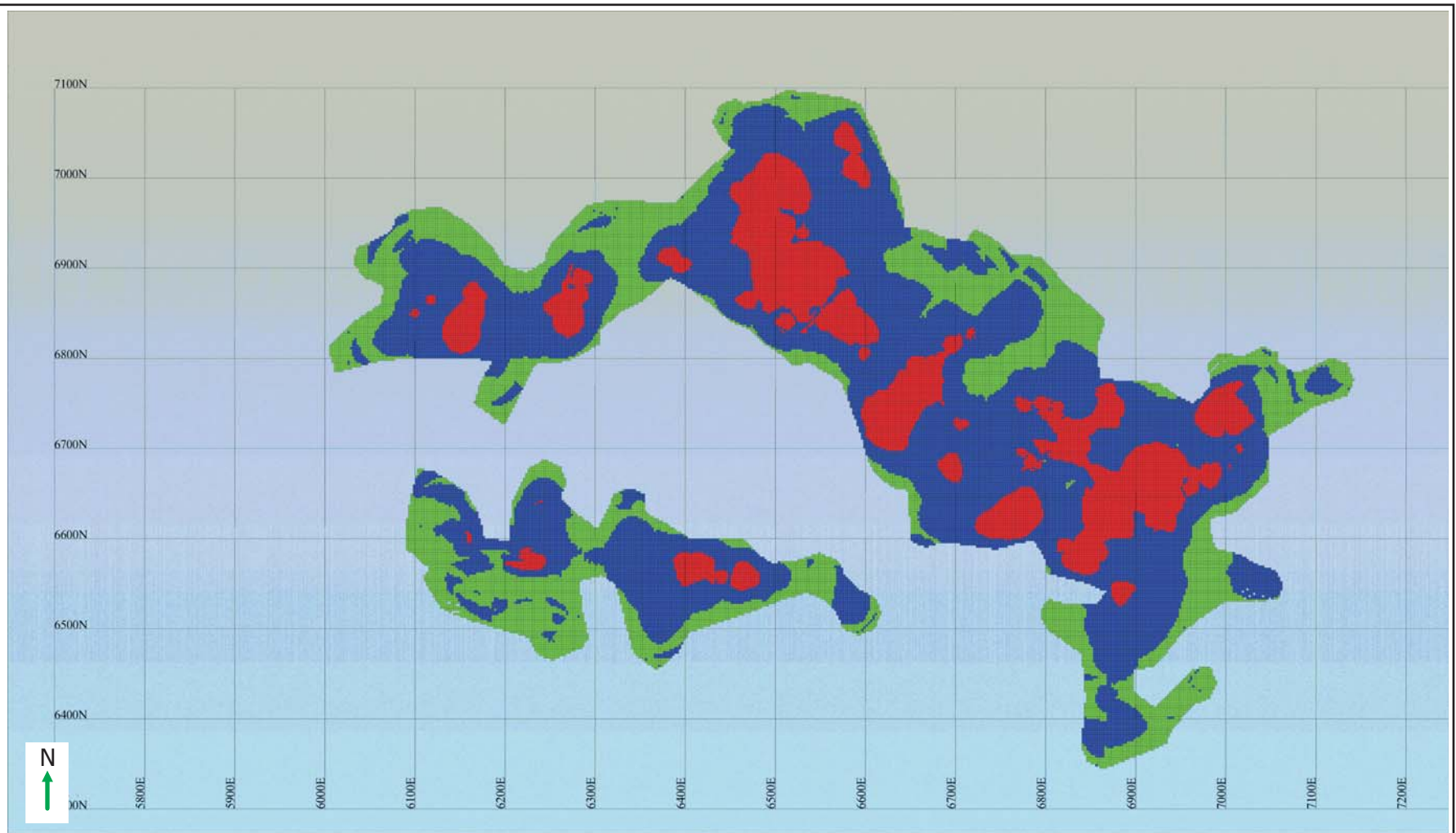
"Indicated Resources: All blocks with grades based on two or more drill holes and a minimum of 5 included samples, with not more than 4 composites from a single drill hole, for which the averaged distance to included samples was 40 meters or less with no sample greater than 75% of the major axis range (56.5m) from the block were categorized as Indicated mineral resources.

"Inferred Resources: All blocks present within the deposit solid that did not meet other resource category requirements and for which interpolated grades were present were categorized as Inferred mineral resources.

#### 14.2.3.11 Statement of Mineral Resource Estimate at Effective Date

"Table 14-15 presents a statement of the updated mineral resource estimate for the Getty zinc-lead deposit supported by content of this technical report. The estimate is considered to be compliant with both the CIM Standards and disclosure requirements of NI-43-101. The effective date of the estimate is deemed to be March 30, 2011. All parameters utilized in the 2008

resource estimate were applied to this revised estimate with the exception of the Zinc Equivalent % calculation factor. For the current resource estimate Zinc Equivalent % (Zn Eq %) has been defined as  $\text{Zn \%} + (\text{Pb \%} \times 1.18)$  and is based on mill recoveries of 89.3% for zinc and 89.5% for lead, \$US1.10/lb Zn and \$US1.15/lb Pb metal pricing and smelter returns of 85% for Zn and 95% for Pb.



#### Legend

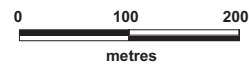
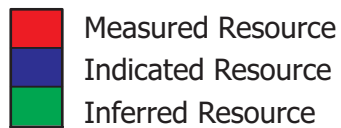


Figure 14-31  
Plan View of Getty Deposit  
Resource Categories

Date: April 2011

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**Table 14-15: Mineral Resource Estimate for Getty Deposit - March 30, 2011**

<b>Getty Deposit - Resource Statement - Zn Eq. % * Cut-off</b>					
<b>Resource Category</b>	<b>Zn Eq. % Cut-off</b>	<b>Tonnes (Rounded)</b>	<b>Zinc %</b>	<b>Lead %</b>	<b>Zinc Eq %*</b>
Measured	1.50	1,930,000	1.81	1.26	3.30
Indicated	1.50	3,790,000	1.62	1.21	3.05
<b>Indicated + Measured</b>	<b>1.50</b>	<b>5,720,000</b>	<b>1.68</b>	<b>1.23</b>	<b>3.13</b>
<b>Inferred</b>	<b>1.50</b>	<b>1,350,000</b>	<b>1.52</b>	<b>1.31</b>	<b>3.06</b>
<b>Measured</b>	<b>*2.00</b>	<b>1,550,000</b>	<b>1.97</b>	<b>1.45</b>	<b>3.68</b>
<b>Indicated</b>	<b>*2.00</b>	<b>2,810,000</b>	<b>1.82</b>	<b>1.44</b>	<b>3.51</b>
<b>Indicated + Measured</b>	<b>*2.00</b>	<b>4,360,000</b>	<b>1.87</b>	<b>1.44</b>	<b>3.57</b>
<b>Inferred</b>	<b>*2.00</b>	<b>960,000</b>	<b>1.73</b>	<b>1.59</b>	<b>3.60</b>
Measured	2.50	1,180,000	2.14	1.68	4.12
Indicated	2.50	1,950,000	2.06	1.70	4.07
<b>Indicated + Measured</b>	<b>2.50</b>	<b>3,130,000</b>	<b>2.09</b>	<b>1.69</b>	<b>4.09</b>
<b>Inferred</b>	<b>2.50</b>	<b>680,000</b>	<b>1.95</b>	<b>1.88</b>	<b>4.16</b>
Measured	3.00	860,000	2.34	1.95	4.64
Indicated	3.00	1,300,000	2.35	2.03	4.74
<b>Indicated + Measured</b>	<b>2.50</b>	<b>2,160,000</b>	<b>2.35</b>	<b>2.00</b>	<b>4.70</b>
<b>Inferred</b>	<b>3.00</b>	<b>460,000</b>	<b>2.21</b>	<b>2.23</b>	<b>4.85</b>

Notes:

1. Zinc Equivalent % (Zn Eq.%) = Zn % + (Pb % x 1.18) and is based on mill recoveries of 89.3% for zinc and 89.5% for lead, \$US1.10/lb Zn and \$US1.15/lb Pb metal pricing and smelter returns of 85% for Zn and 95% for Pb,
2. \* denotes the 2.00% Zn Eq. resource statement cutoff value that reflects open pit development potential

### 14.2.3.12 Validation of Model

#### *Comparison to Geological Sections*

"Results of block modeling were compared on a section by section basis with corresponding interpreted geological and grade distribution sections prepared prior to block model development. This showed that block model grade patterns show good correlation with those interpreted from the geological sections and that the stratabound character of the mineralization was being properly represented. Results of visual inspection are interpreted as showing an acceptable degree of consistency between the block model and the independently

derived sectional interpretation, thusly providing a measure of validation against the geological model developed for the deposit.

#### *Comparison of Composite Database and Block Model Grades*

"Descriptive statistics were calculated for those portions of the drill hole composite population falling within the total deposit peripheral constraint and these figures were compared to corresponding values calculated for the resource estimate block model. Results of the comparison are tabulated in Table 14-16. Mean drill hole assay composite grades for zinc and lead compare closely with corresponding zinc and lead grades calculated for the entire block model and provide a check on bias within the model with respect to the underlying total assay composite population.

**Table 14-16: Comparison of Drill Hole Assay Composite and Block Model Grades**

<b>Parameter</b>	<b>Total Model Grade (Zn %)*</b>	<b>Total Model Grade (Pb %)*</b>	<b>Composites Grade (Zn %)</b>	<b>Composites Grade (Pb %)</b>
Mean	1.43	1.01	1.46	1.00
Variance	0.86	0.99	1.94	2.53
Standard Deviation	0.93	1.00	1.39	1.59
Coef. of Variation	0.648	0.990	0.948	1.580
Maximum	10.27	14.52	11.30	18.54
Minimum	0.00	0.00	0.00	0.00
Number	209,757	209,757	1961	1961

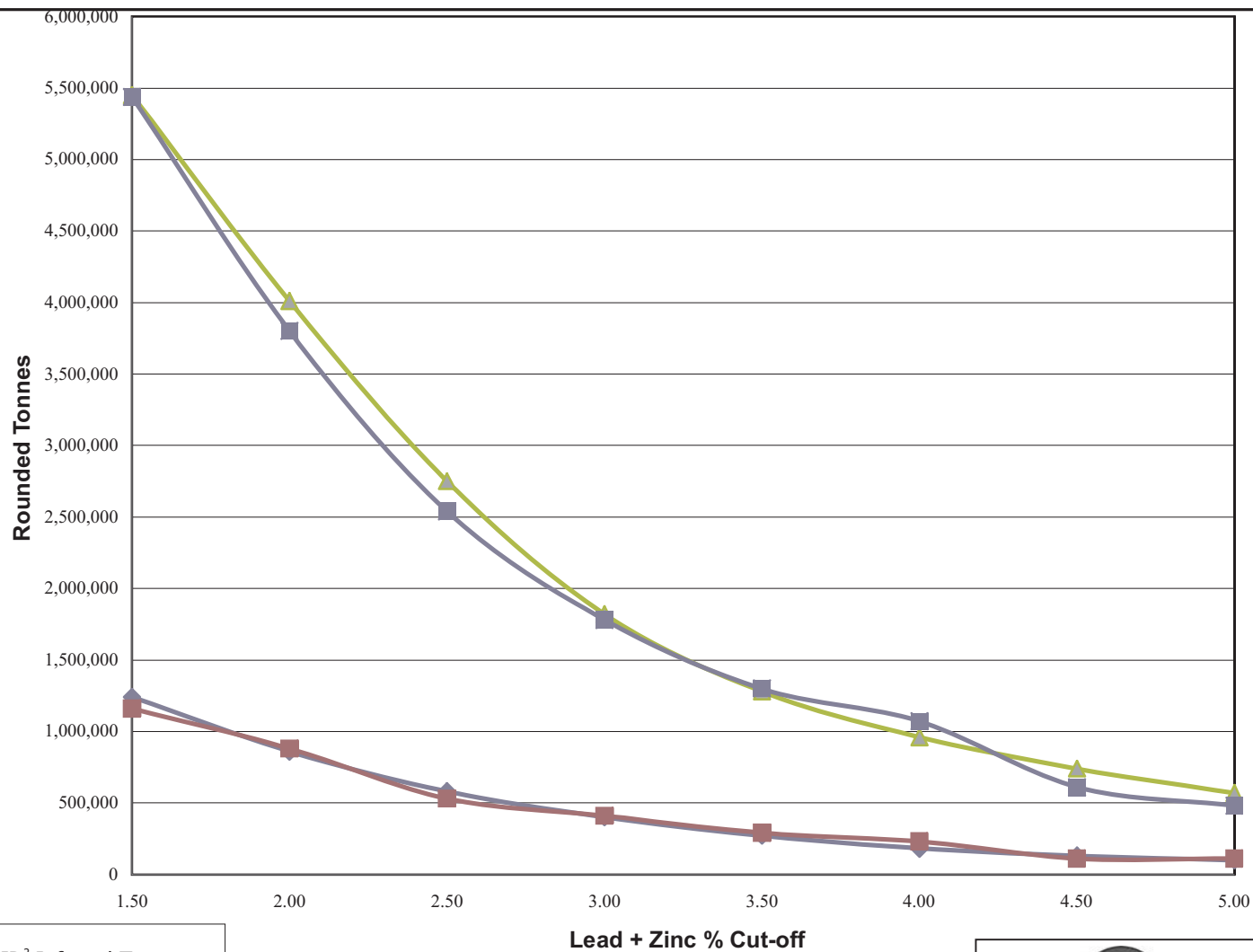
\* Defined as all blocks having interpolated grades within the deposit peripheral constraint.

#### *Comparison With Nearest Neighbour Grade Interpolation Model*

"The ID2 block model was checked using Nearest Neighbour (NN) grade interpolation methodology within the same resource solids used for the ID2 method and associated weighted average drill hole intercepts appear in Cullen et al. (2011). Assigned block resource categories were constant between models as were metal cut-off values. Results of the NN estimation appear in Table 14-17 and Figure 14-32 provides a comparison to ID2 model results.

**Table 14-17: Results of Nearest Neighbour Block Model Estimate**

<b>Cutoff: Pb%+Zn%</b>	<b>Resource Category</b>	<b>Tonnes (Rounded)</b>	<b>Pb %</b>	<b>Zn%</b>	<b>Pb%+Zn%</b>
2.00	Measured	1,480,000	1.44	1.90	3.34
2.00	Indicated	2,320,000	1.51	1.96	3.47
2.00	<i>Indicated Plus Measured</i>	<i>3,800,000</i>	<i>1.48</i>	<i>1.94</i>	<i>3.42</i>
2.00	Inferred	880,000	1.58	1.81	3.39
2.50	Measured	1,050,000	1.75	2.07	3.82
2.50	Indicated	1,490,000	1.90	2.27	4.17
2.50	<i>Indicated Plus Measured</i>	<i>2,540,000</i>	<i>1.84</i>	<i>2.19</i>	<i>4.03</i>
2.50	Inferred	530,000	2.05	2.15	4.20
3.00	Measured	700,000	2.07	2.31	4.38
3.00	Indicated	1,080,000	2.19	2.56	4.75
3.00	<i>Indicated Plus Measured</i>	<i>1,780,000</i>	<i>2.14</i>	<i>2.46</i>	<i>4.60</i>
3.00	Inferred	410,000	2.24	2.41	4.64



- ◆ ID<sup>2</sup> Inferred Tonnes
- NN Inferred Tonnes
- ▲ ID<sup>2</sup> Measured and Indicated Tonnes
- NN Measured and Indicated Tonnes

NN equals Nearest Neighbour Interpolation Method  
ID<sup>2</sup> equals Inverse Distance Squared Interpolation Method



Figure 14-32  
Comparison of Block Model  
Interpolation Methods

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"Grade and tonnage figures for the two block models correlate well at all cutoff values and are interpreted as providing an acceptable check of the ID2 model.

#### 14.2.4 Comments on Previous Resource or Reserve Estimates

"Three historic mineral resource estimates were reviewed for purposes of this report and these were referenced previously in section 5.2. The first was prepared in 1976 for Getty by MPH Consulting Limited (Riddell, 1976) and apparently followed earlier in-house estimates by Getty. Subsequently, an in-house assessment was prepared by Esso (MacLeod, 1980) and in 1992 Westminer also completed an estimate (Hudgins and Lamb, 1992). Results of these programs are presented in Table 14-18 and, as noted earlier, all are historic in nature, pre-date NI 43-101 and are not compliant with current CIMM Standards. As such, they should not be relied upon.

**Table 14-18: Historic Tonnage and Grade Estimates for Getty Deposit**

(Estimates Are Not Compliant With NI 43-101 or CIMM Standards)

Reference	Cutoff	Tonnes	Pb %	Zn %	Zn + Pb %
Riddell (1976)	2% Zn + Pb	4,005,000	1.84	1.87	3.02
MacLeod (1980)*	1.5% Zn + Pb	3,078,000	1.37	1.60	2.97
Hudgins and Lamb (1992)**	1.5% Zn Eq.**	4,500,000	1.33	1.87	3.20

\* Diluted and Minalbe;

\*\* Zn Eq. = Zn% + 0.60 x Pb%

**Notes:** With regard to the historic mineral resource estimates stated above 1) a qualified person has not done sufficient work to classify the historical estimate as current mineral resources or mineral reserves; 2) the issuer is not treating the historical estimate as current mineral resources or mineral reserves as defined in sections 1.2 and 1.3 of NI43-101; and 3) the historical estimate should not be relied upon.

"Support documents provided for the historic estimates showed that those of Getty and Esso were based on drill-hole-centered polygonal methods with tonnage weighting to establish final deposit grade. A single density factor of 11.5 cubic feet per ton (~2.78g/cm<sup>3</sup>) was used in the Riddell (1976) estimate and this appears to have been used by MacLeod (1980) before application of a 10% tonnage reduction factor to drill hole intercepts. Westminer employed a cross-sectional method using Surpac® mining software to determine resource area limits and volume and used a single density factor of 2.75 g/cm<sup>3</sup> to estimate tonnage. Deposit grade was calculated as the length-weighted average of all drill hole intercepts, but spatial distribution of grade within the deposit was not specifically addressed.

"A summary review of supporting file information for the historic estimates was completed for current purposes and it is apparent that the noticeably lower tonnage figure quoted by Esso reflects exclusion of certain drill holes based on the report's development potential assumptions.



The higher lead grade in the MPH estimate is also notable but main contributing factors were not clearly identified.

"Riddell (1976) completed a preliminary economic assessment for open pit development of a 3.6 million ton (3.3 million tonne) portion of the deposit at a diluted grade of 1.28% Pb and 1.74% Zn. Modeling parameters included options of a stand-alone mill, custom milling of ore at Esso's adjacent Gays River site and development of a jointly-owned mill complex in association with Esso. Analysis showed that a 20 year model producing at 182,000 tons per year with a dedicated mill was uneconomic. However, 10 year projects producing at 375,000 tons per year were financially attractive in both the custom milling and jointly owned mill models.

"In 1980 Esso reported on economic aspects of developing the deposit based on an in situ tonnage and grade model of 3.1 million diluted tons (2.8 million tonnes) grading 1.37% Pb and 1.60% Zn (MacLeod, 1980). This study concluded that mining the deposit through open-pit methods as an ore supplement to the Gays River deposit was economically viable, provided that important operating assumptions were met. Positive Net Present Value figures at 15% discounting were returned for 1000 and 1250 ton per day production rates, with the Gays River operation absorbing certain operating and capital cost components. George (1985) again reviewed deposit economics for Getty and used economic analysis applied to tonnage and grade curves to show that a deposit size of approximately 8 million tons was necessary to justify stand-alone profitable development at realizable metal grades. The earlier MPH work was also reviewed and some of the economic models updated. None of the work indicated that profitable stand-alone development of the deposit could be expected under existing market conditions of the time.

"Hudgins and Lamb (1992) reported on preliminary economic analysis of a 3.9 million tonne portion of the total resource at their assigned grade and concluded that a positive economic case could be made for development of the property as a "top-up" source of feed for the Gays River concentrator. Assumptions included sharing of various operating costs with the Gays River operation and that the full 1500 tonne per day capacity of the Gays River concentrator would not be required for underground production.

"In review, each of the historic estimates reflects specific assumptions considered appropriate at the time of preparation. This includes exclusion of certain historic drill holes, establishment of different maximum depth criteria and use of differing minimum grade and width cut off values. The current estimate does not directly reflect any of the parameter sets used in the early programs and results are therefore different. However, all historic programs model the Getty Deposit as a relatively low grade accumulation of lead and zinc having potential for open pit development. From the grade and tonnage perspective the earlier estimates are generally

consistent with results of the current estimate and provide relevant views of the deposit under historic market conditions.

"The first NI 43-101 compliant Getty resource estimate completed by Mercator for Acadian (Cullen et al., 2007) was based solely on historical drilling and the entire resource was assigned to the Inferred resource category. Inferred designation reflected drill hole spacing and historical nature of the supporting database. The associated block model provided a well-developed view of geological and grade trends within the deposit area and also highlighted the need to carry out a substantial amount of infill drilling before higher category resources could be defined for the deposit. Table 14-19 presents results of the Cullen et al., (2007) resource estimate, which, on a total tonnage basis, is approximately 19% smaller than total tonnage at the same cutoff value for the 2008 resource at comparable average grades.

**Table 14-19: Getty Deposit Mineral Resource Estimate - December 2007\***

<b>Resource Category</b>	<b>Zn Equivalent % Threshold**</b>	<b>Tonnes (Rounded)</b>	<b>Lead %</b>	<b>Zinc %</b>	<b>Zinc % + Lead %</b>
Inferred	2.00	4,160,000	1.40%	1.81%	3.21%
Inferred	2.50	2,860,000	1.60%	2.06%	3.66%
Inferred	3.00	1,970,000	1.82%	2.26%	4.08%
Inferred	3.50	1,300,000	2.09%	2.42%	4.51%

Notes: \* Estimate is compliant with NI 43-101 and CIM Standards;

\*\* Zn Equivalent calculated as  $Zn\ Equivalent = (Zn\% + Pb\%)$

"Completion of infill drilling was recommended and ultimately carried out during the 2007-2008 Acadian drilling campaign that totaled 138 holes in the deposit area. Addition of results for the 138 drill holes is the principal difference between the 2008 resource data set and that used in the 2007 estimate, with the designation of higher category resources in reflecting increased confidence in deposit geology and grade distribution models (Cullen et al., 2008). The NI 43-101 compliant 2008 estimate is summarized in Table 14-20.

**Table 14-20: Getty Deposit Mineral Resource Estimate – November 2008\***

<b>Resource Category</b>	<b>Zinc % + Lead % Threshold **</b>	<b>Tonnes (Rounded)</b>	<b>Lead %</b>	<b>Zinc %</b>	<b>Zinc % + Lead %</b>
Measured	2.00	1,470,000	1.48	2.02	3.50
Indicated	2.00	2,540,000	1.48	1.91	3.39
<b><i>Indicated + Measured</i></b>	<b><i>2.00</i></b>	<b><i>4,010,000</i></b>	<b><i>1.48</i></b>	<b><i>1.95</i></b>	<b><i>3.43</i></b>
Inferred	2.00	860,000	1.65	1.82	3.48
Measured	2.50	1,070,000	1.74	2.22	3.97
Indicated	2.50	1,680,000	1.78	2.21	3.99
<b><i>Indicated + Measured</i></b>	<b><i>2.50</i></b>	<b><i>2,750,000</i></b>	<b><i>1.76</i></b>	<b><i>2.21</i></b>	<b><i>3.98</i></b>
Inferred	2.50	580,000	1.98	2.09	4.07
Measured	3.00	740,000	2.04	2.47	4.52
Indicated	3.00	1,080,000	2.13	2.54	4.67
<b><i>Indicated + Measured</i></b>	<b><i>3.00</i></b>	<b><i>1,820,000</i></b>	<b><i>2.09</i></b>	<b><i>2.51</i></b>	<b><i>4.61</i></b>
Inferred	3.00	400,000	2.34	2.37	4.71

\* Estimate is compliant with NI 43-101 and CIM Standards

\*\* Zn Equivalent calculated as  $Zn\text{ Equivalent} = (Zn\% + Pb\%)$

"A portion of this tonnage increase is directly attributable to change in base SG value for the block model, from 2.7 g/cm<sup>3</sup> in 2007 to 2.82 g/cm<sup>3</sup> in 2008. The remaining change is attributed to incremental extension of local deposit limits on the basis of 2007-2008 drilling program results."

### **14.3 SUMMARY OF MINERAL RESOURCES – GAYS RIVER AND GETTY DEPOSITS**

The Gays River Deposit's mineral resource estimate was prepared by Doug Roy, M.A.Sc., P.Eng. and Tim Carew, P.Geo. of MineTech International Limited. The Getty Deposit's mineral resource estimate was prepared by Cullen et al. (2011) of Mercator Geological Services Limited. The estimates were separately prepared using slightly different parameters, the most significant of which were different zinc-equivalent grade formulae and different block cut-off grades for resource reporting.

### 14.3.1 Gays River Deposit

For the Main and Northeast Zones, Measured plus Indicated mineral resources totalled 4.8 million tonnes with average grades of 3.9% zinc and 1.8% lead (refer to Table 14-21).

Inferred mineral resources totalled 4.3 million tonnes with average grades of 2.6% zinc and 1.3% lead.

**Table 14-21: Summary of Non-Diluted Mineral Resources – Both Zones**

<b>Zone and Resource Category</b>	<b>Tonnes</b>	<b>SG</b>	<b>Percent Zinc</b>	<b>Percent Lead</b>	<b>Percent Zinc-Equivalent</b>
Measured Category					
<i>Main Zone</i>	1,340,000	2.8	4.4	2.0	7.4
<i>Northeast Zone</i>	n/a	n/a	n/a	n/a	n/a
<b>Total Measured</b>	<b>1,340,000</b>	<b>2.8</b>	<b>4.4</b>	<b>2.0</b>	<b>7.4</b>
Indicated Category					
<i>Main Zone</i>	1,790,000	2.78	3.6	1.6	5.9
<i>Northeast Zone</i>	1,710,000	2.79	3.9	2	7
<b>Total Indicated</b>	<b>3,500,000</b>	<b>2.79</b>	<b>3.7</b>	<b>1.8</b>	<b>6.4</b>
Measured + Indicated					
<i>Main Zone</i>	3,130,000	2.78	3.9	1.8	6.6
<i>Northeast Zone</i>	1,710,000	2.79	3.9	2	7
<b>Total Measured + Indicated</b>	<b>4,840,000</b>	<b>2.79</b>	<b>3.9</b>	<b>1.8</b>	<b>6.7</b>
Inferred Category					
<i>Main Zone</i>	1,740,000	2.77	3.1	1.1	4.8
<i>Northeast Zone</i>	2,510,000	2.76	2.3	1.4	4.4
<b>Total Inferred</b>	<b>4,250,000</b>	<b>2.76</b>	<b>2.6</b>	<b>1.3</b>	<b>4.6</b>

Refer to Table 14-2 and Table 14-6 for resource estimation notes.

### 14.3.2 Getty Deposit

Using a zinc-equivalency ratio of 1% lead = 1.18% zinc and a block cut-off grade of 2% zinc-equivalent, Cullen et al. (2011) determined that Measured plus Indicated mineral resources totaled 4.4 million tonnes with average grades of 1.9% zinc and 1.4% lead (refer to Table 14-22). Inferred mineral resources totaled 1.0 million tonnes with average grades of 1.7% zinc and 1.6% lead.

**Table 14-22: Getty Deposit Mineral Resources (from Cullen et al., 2011)**

<b>Resource Category</b>	<b>Zn Eq. % Cut-off</b>	<b>Tonnes (Rounded)</b>	<b>Zinc %</b>	<b>Lead %</b>	<b>Zinc Eq %*</b>
Measured	2.00	1,550,000	1.97	1.45	3.68
Indicated	2.00	2,810,000	1.82	1.44	3.51
<b>Indicated + Measured</b>	<b>2.00</b>	<b>4,360,000</b>	<b>1.87</b>	<b>1.44</b>	<b>3.57</b>
<b>Inferred</b>	<b>2.00</b>	<b>960,000</b>	<b>1.73</b>	<b>1.59</b>	<b>3.60</b>

Notes:

Zinc Equivalent % (Zn Eq.%) = Zn % + (Pb % x 1.18) and is based on mill recoveries of 89.3% for zinc and 89.5% for lead, \$US1.10/lb Zn and \$US1.15/lb Pb metal pricing and smelter returns of 85% for Zn and 95% for Pb.

### 14.3.3 Gays River and Getty Deposits Combined

A summary of the mineral resources for both deposits was prepared. The reader is advised that the Gays River and Getty mineral resource estimates were prepared by different authors using different parameters.

**Table 14-23: Summary of Mineral Resources for Getty Deposit and Gays River Deposit**

<b>Zone and Resource Category</b>	<b>Block Cut-off (% Zinc- Equivalent)</b>	<b>Tonnes</b>	<b>Average SG</b>	<b>Percent Zinc</b>	<b>Percent Lead</b>	<b>Percent Zinc- Equivalent</b>
<b>Measured Category</b>						
<i>Gays River Main Zone</i>	0.75%	1,340,000	2.8	4.4	2	7.4
<i>Gays River Northeast Zone</i>	0.75%	n/a	n/a	n/a	n/a	n/a
<i>Getty</i>	2%	1,550,000	2.86	2	1.5	4.1
<b>Total Measured</b>	<b>Varies</b>	<b>2,890,000</b>	<b>2.83</b>	<b>3.1</b>	<b>1.7</b>	<b>5.7</b>
<b>Indicated Category</b>						
<i>Gays River Main Zone</i>	0.75%	1,790,000	2.78	3.6	1.6	5.9
<i>Gays River Northeast Zone</i>	0.75%	1,710,000	2.79	3.9	2	6.9
<i>Getty</i>	2%	2,810,000	2.86	1.8	1.4	4
<b>Total Indicated</b>	<b>Varies</b>	<b>6,310,000</b>	<b>2.82</b>	<b>2.9</b>	<b>1.6</b>	<b>5.3</b>
<b>Measured + Indicated</b>						
<i>Gays River Main Zone</i>	0.75%	3,130,000	2.79	3.9	1.8	6.6
<i>Gays River Northeast Zone</i>	0.75%	1,710,000	2.79	3.9	2	6.9
<i>Getty</i>	2%	4,360,000	2.86	1.9	1.4	4
<b>Total Measured + Indicated</b>	<b>Varies</b>	<b>9,200,000</b>	<b>2.82</b>	<b>2.9</b>	<b>1.7</b>	<b>5.4</b>
<b>Inferred Category</b>						
<i>Gays River Main Zone</i>	0.75%	1,740,000	2.77	3.1	1.1	4.8
<i>Gays River Northeast Zone</i>	0.75%	2,510,000	2.76	2.3	1.4	4.4
<i>Getty</i>	2%	960,000	2.86	1.7	1.6	4.1
<b>Total Inferred</b>	<b>Varies</b>	<b>5,210,000</b>	<b>2.78</b>	<b>2.5</b>	<b>1.3</b>	<b>4.5</b>

Notes:

1. Cut-off grade for mineralized zone interpretation was different for each zone.
2. Block cut-off grade for defining Mineral Resources was 0.75% zinc-equivalent for the Gays River Deposit and 2% for the Getty Deposit
3. Non-diluted
4. Mineral resources that are not mineral reserves do not have demonstrated economic viability
5. Specific gravity was calculated based on zinc and lead content. There are no other sulphides or dense minerals that are present in significant quantities
6. No Mineral Reserves of any category were identified.
7. Zinc-equivalency for lead was calculated based on relative metal prices, demonstrated processing recoveries (86% & 84% for lead and zinc, respectively), estimated smelter returns 95% & 85% for lead and zinc) and demonstrated concentration factors (75% & 65% for lead and zinc). 1% Lead = 1.5% Zinc. Note that Cullen et al. (2011) used a slightly different zinc equivalent grade value whereby 1% Lead = 1.18% Zinc. Though this would affect the cut-off value, the "Percent Zinc Equivalent" column of this table uses a zinc-equivalent value of 1% Lead = 1.5% Zinc for both the Gays River and Getty Deposits.
8. The Gays River and Getty Deposit's mineral resources were estimated as described by Roy et al. (2011) using different estimation parameters.

## 15. MINERAL RESERVE ESTIMATES

No mineral reserves have been established for this Project since the economics of the project have not yet been demonstrated by a pre-feasibility or feasibility study.

For the purposes of production scheduling for economic modeling in this Preliminary Economic Assessment, a total open pit mineralized material designated as mill feed and waste tonnage has been defined and is described in Section 16.3.

## 16. MINING METHODS

Mining will be done using conventional truck & shovel open pit mining methods. No underground mining is planned in this study. The open pit mining will be mined on 10 meter high benches using 90 t capacity haul trucks. Drilling & blasting is assumed for the rock portion of the deposit while the overlying overburden is considered free digging and will not require blasting.

### 16.1 PIT OPTIMIZATION

Prior to designing the operating open pits, a series of Whittle pit optimizations were run to define the optimal pit size and their configurations. The optimized pits were based on selecting the maximized operating NPV calculated by Whittle (no capital costs included).

The inputs to the Whittle Analysis were based on preliminary estimates and are as follows:

- Metal Prices: Lead = US\$ 1.20/lb    Zinc = US\$ 1.10/lb
- Waste rock mining cost: \$1.50 / tonne
- Overburden mining cost: 1.10 / tonne
- Processing cost: \$15 / tonne
- G&A cost: \$7.50 / tonne
- Rock pit slopes: 50 degrees
- Overburden pit slopes: 22 degrees
- Mining dilution: 10%
- Diluting grade: zero% Pb and Zn
- Mining losses: 5%

#### 16.1.1 Net Smelter Return (“NSR”) Algorithm

For each mineralized block in the model, a NSR value was calculated. Table 16-1 summarizes the parameters used in the calculation of the NSR values.

The distinction between economic mineralization ("mill feed") and waste is made using a NSR cut-off value of \$CAD 22.50/tonne.

**Table 16-1: NSR Parameters**

		<b>Lead</b>	<b>Zinc</b>
Metal Price	\$US/lb	\$1.20	\$1.10
Recovery	%	85.0%	88.0%
Smelter Payable	%	93.0%	85.0%
Refining Charge	\$US/lb	\$0.00	\$0.00
Concentration Ratio		64.9	22.2
Concentrate Handling and Freight	\$US/DMT	\$100	\$100
Smelter Treatment Charge	\$US/DMT	\$100	\$229
Humidity Factor	%	8.0%	8.0%
Currency Exchange Rate	\$C/\$US	\$1.00	\$1.00

## 16.2 PIT DESIGN CRITERIA

Using the optimized pit shells as a design guide, operating pits shapes were designed to incorporate truck access ramps into the pit. Different slopes angles were used in the weaker overburden and the harder rock. Table 16-2 summarizes the pit design criteria. Note that no pit wall geotechnical investigations have been completed nor any pit slope geotechnical studies, but these slopes angles are reasonable for the Preliminary Economic Assessment study stage.

**Table 16-2: Pit Design Criteria**

<b>Overburden</b>	
Bench Height	10 metres
Berm Width	4.53 metres
Batter Face Angle	35°
Inter ramp angle	28°
<b>Rock &amp; Gypsum</b>	
Bench Height (double benching)	20 metres
Berm Width	9.50 metres
Batter Angle	70°
Inter ramp angle	50°
Haul Road Width	20 metres
Haul Road Gradient	10%



## 16.3 PIT TONNAGES

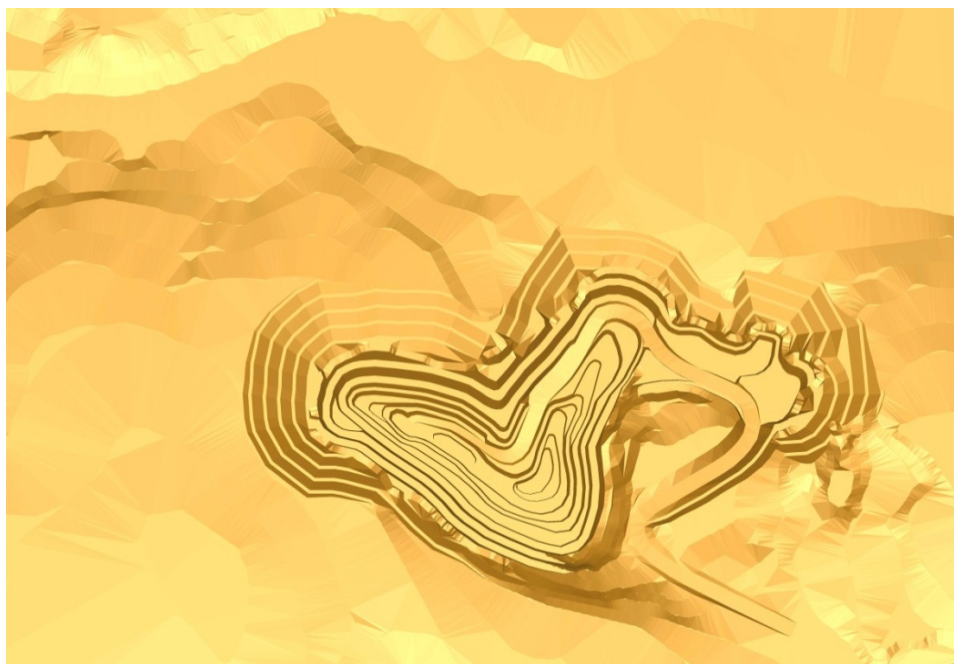
A series of four different pits have been designed and some of these have been sub-divided into different pit phases to smoothly distribute the waste stripping volumes over time. The total mill feed tonnage provided by the four pits is 6.47 Mt at a grade of 1.64% lead and 2.95% zinc. This average grade equates to an average NSR value of C\$76.09 per tonne.

Table 16-3 presents a summary of the mill feed tonnage and waste tonnage provided by each pit and pit phase. Waste has been sub-divided into overburden, gypsum, and waste rock. The various pits and pit phases are shown in Figures 16-1 to 16-7.

**Table 16-3: Pit Tonnage Summary**

	Mill Feed	NSR	Pb	Zn	Overburden	Gypsum	Waste Rock	Total Waste	Total Material	Strip
Bench	Tonnes	\$/t	%	%	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	Ratio
Main Pit Phase-1	843,103	\$103.93	1.920	4.156	8,918,545	4,439,896	1,717,118	15,075,559	15,918,662	17.9
Main Pit Phase-2A	717,962	\$74.82	1.318	3.246	15,119,517	1,535,680	1,028,439	17,683,636	18,401,598	24.6
Main Pit Phase-2B	471,395	\$128.78	2.463	4.901	4,500,649	6,385,136	1,046,981	11,932,766	12,404,161	25.3
Main Pit Phase-3	491,943	\$72.45	1.230	3.214	6,676,423	2,419,739	986,516	10,082,678	10,574,621	20.5
NE Pit	878,800	\$110.52	2.287	4.096	9,360,441		14,475,835	23,836,276	24,715,076	27.1
Getty Pit Phase-1	1,241,824	\$55.15	1.304	2.177	14,763,454		12,726,195	27,489,649	28,731,473	22.1
Getty Pit Phase-2	1,414,140	\$49.96	1.501	1.663	12,694,330		8,973,112	21,667,442	23,081,581	15.3
Getty Satellite Pit	409,731	\$44.52	1.257	1.645	4,589,186		877,956	5,467,142	5,876,873	13.3
	<b>6,468,897</b>	<b>\$76.09</b>	<b>1.64</b>	<b>2.95</b>	<b>76,622,545</b>	<b>14,780,451</b>	<b>41,832,152</b>	<b>133,235,148</b>	<b>139,704,045</b>	<b>20.6</b>

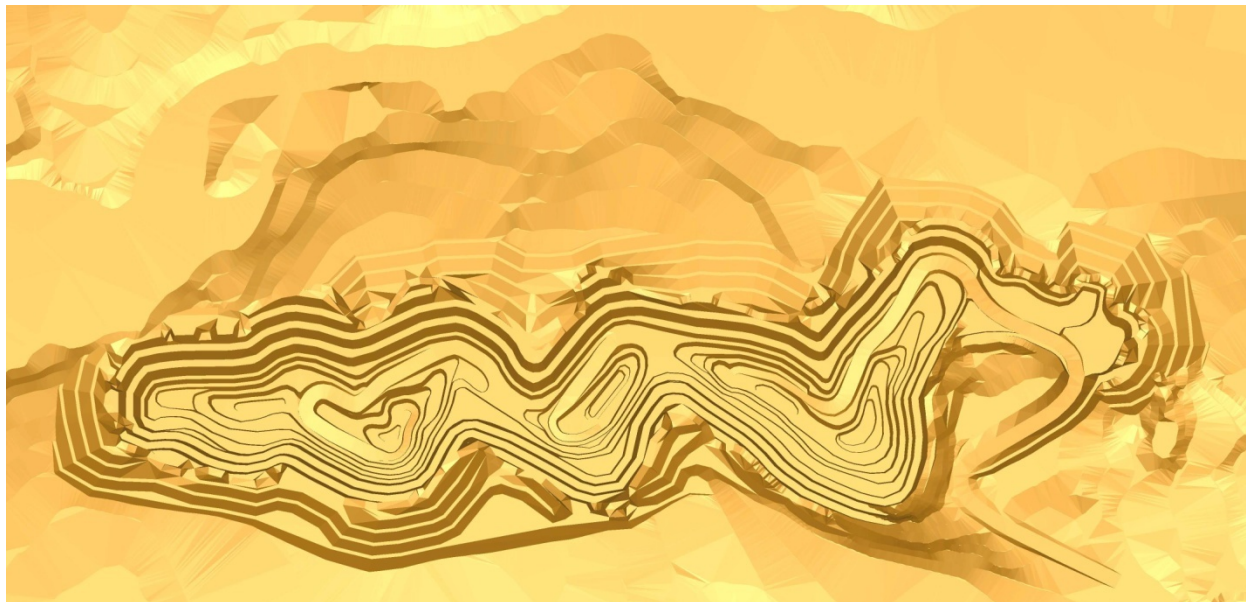
<sup>1</sup>. This preliminary economic assessment is preliminary in nature and includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability.



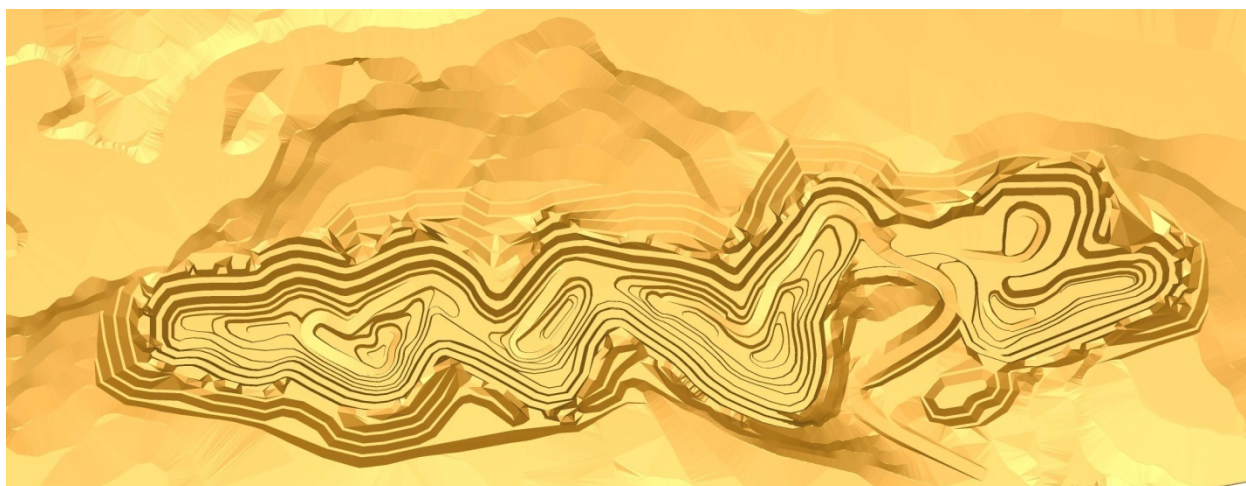
**Figure 16-1: Main Pit – Phase 1**



**Figure 16-2: Main Pit – Phase 2A**



**Figure 16-3: Main Pit – Phase 2B**

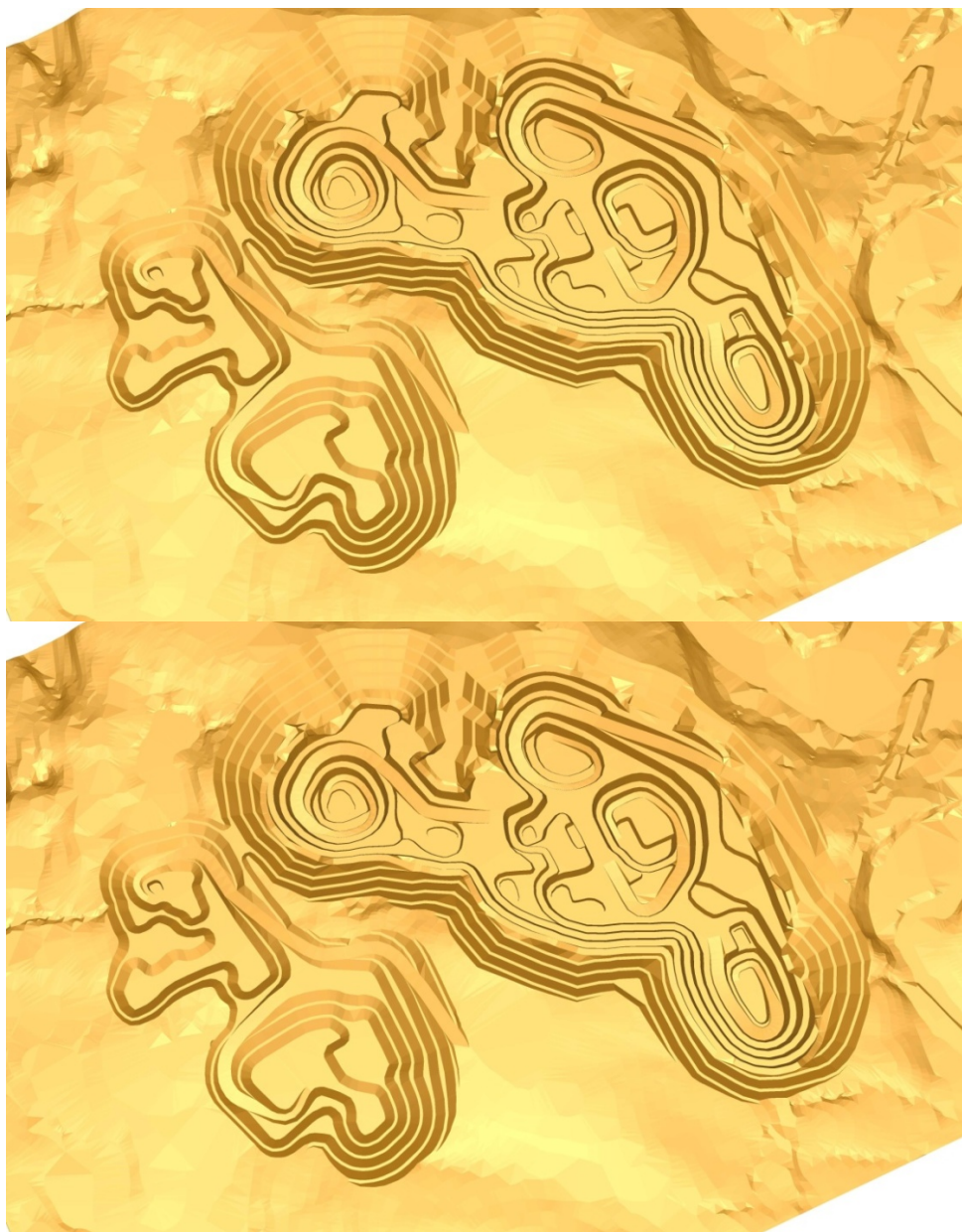


**Figure 16-4: Main Pit – Phase 3**

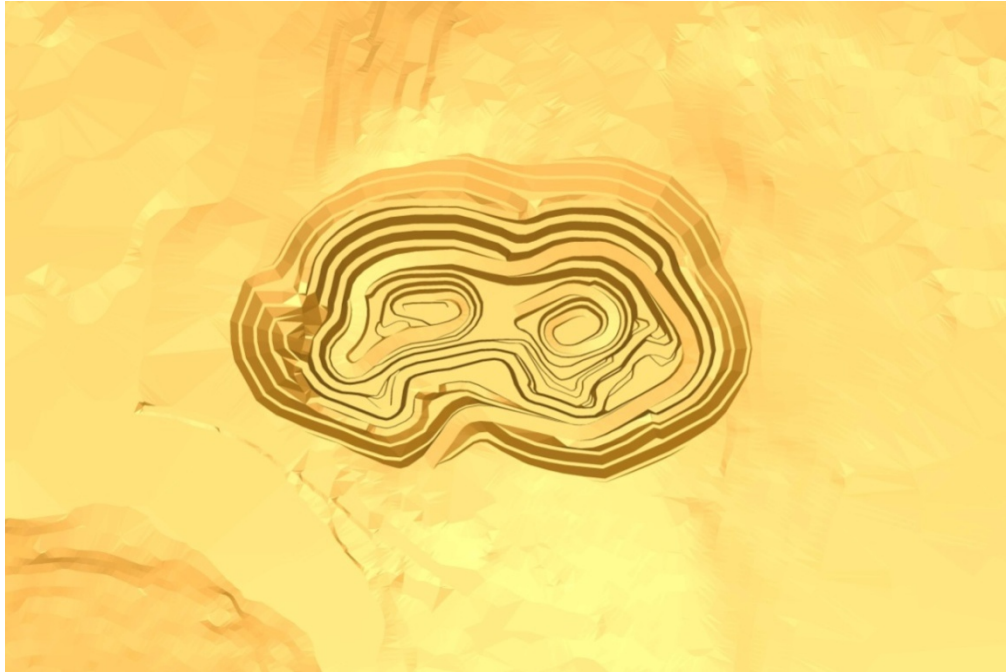




**Figure 16-5: Getty Pit – Phase 1**



**Figure 16-6: Getty Pit – Phase 2 & Satellite Pit**



**Figure 16-7: NE Pit**

#### **16.4 WASTE DUMP CRITERIA**

Waste stripped from the open pits will consist of three materials; overburden, gypsum and waste rock. The plan is to segregate overburden, gypsum, and waste rock placement within the waste storage area although the detailed layout for this has not been developed at this stage.

The design criteria for the waste piles, including footprint, side slopes, height, setbacks and drainage were established based on waste volume requirements, reclamation plan, current and proposed environmental assessment and approvals, land ownership constraints, and stakeholder input. Basic configurations include:

- 30 meter pile toe setback distance from Gays River
- 2.25:1 (H:V) side slopes on the waste pile
- 55m and 88m crest elevation levels for the north and south waste piles respectively
- irregular footprint to improve natural aesthetics of final piles

The two waste piles are shown in Figure 16-8.





**Figure 16-8: Wastepile Locations**

## 16.5 PRODUCTION SCHEDULE

The production schedule is based on targeting a maximum daily material movement quantity of approximately 67,000 tpd.

Figure 16-9 provides an illustration for how the mining operations will sequence through the various pits and pit phases. Table 16-4 presents the annual tonnages of potentially economic mineralization and waste material.

	Year 1				Year 2				Year 3				Year 4				Year 5				Year 6				Year 7				Year 8					
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
Main Pit Phase-1																																		
Main Pit Phase-2A																																		
Main Pit Phase-2B																																		
Main Pit Phase-3																																		
NE Pit																																		
Getty Pit Phase-1																																		
Getty Pit Phase-2																																		
Getty Satellite Pit																																		

**Figure 16-9: Proposed Mining Sequence**

**Table 16-4: Mine Production Schedule**

YEARS	-1	1	2	3	4	5	6	7	8	Total
Total Mill Feed (Mt)		0.839	0.875	0.875	0.875	0.875	0.875	0.875	0.380	6.469
% Zn		4.16%	3.56%	3.71%	4.04%	1.74%	2.34%	1.48%	2.18%	2.95%
% Pb		1.92%	1.52%	1.64%	2.34%	1.09%	1.42%	1.38%	2.02%	1.64%
Tonnes overburden (Mt)	4.20	12.71	11.32	13.23	9.03	15.70	9.01	1.41	0.02	76.62
Tonnes gypsum (Mt)		4.47	6.51	3.80	-	-	-	-	-	14.78
Tonnes waste rock (Mt)		1.75	1.10	3.24	13.49	6.83	8.57	4.91	1.94	41.83
Total Waste (Mt)	4.20	18.93	18.93	20.28	22.53	22.53	17.58	6.33	1.96	133.24
Strip Ratio		22.6	21.6	23.2	25.7	25.7	20.1	7.2	5.2	20.6
Total Material (Mt)	4.20	19.76	19.80	21.15	23.40	23.40	18.45	7.20	2.34	139.70

<sup>1</sup>. This preliminary economic assessment is preliminary in nature and includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

## 16.6 EQUIPMENT FLEET

The open pits will be mined using an owner operated mining fleet. It is expected that the major mining fleet will consist of the equipment listed in Table 16-5. Support equipment such as graders, dozers, pickup trucks, service vehicles, light plants, drainage pumps, etc. will also be acquired to support the mining operations.

**Table 16-5: Major Mining Equipment Fleet**

Haul trucks (90 t)	Up to 19 trucks
Front end loader (14 m <sup>3</sup> )	1 loader
Hydraulic excavators (16.5 m <sup>3</sup> )	2 excavator
Drilling & Blasting equipment	Contractor provided

## 17. RECOVERY METHODS

### 17.1 THE FLOWSHEET

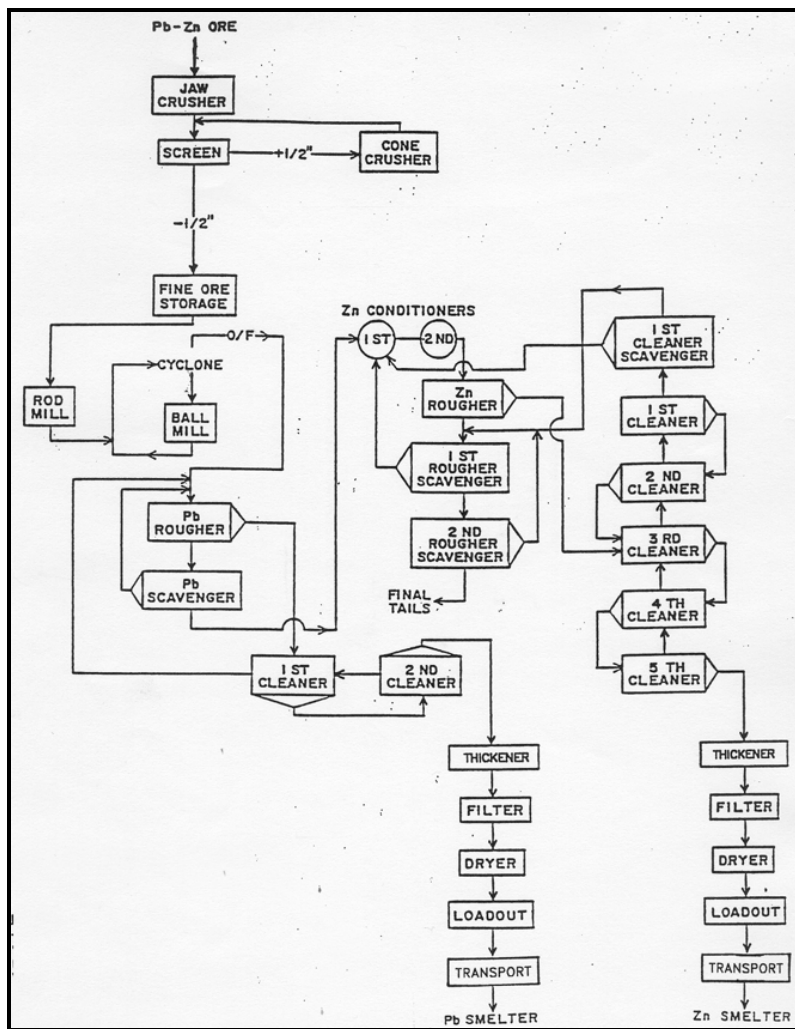
The 2008 ScoZinc flowsheet was conventional and incorporated:

- A primary jaw crusher;
- A secondary cone crusher in closed circuit with a vibrating screen;
- A rod mill, and a ball mill, the latter in closed circuit with cyclones;



- Differential lead/zinc flotation circuits, complete with a zinc regrind;
- Concentrate thickeners followed by vacuum disc filters and concentrate dryers.

The schematic flowsheet is shown in Figure 17-1.



**Figure 17-1: Process Flowsheet**

Note that this schematic flowsheet does not show the regrind mill that is used to grind the zinc rougher concentrate, an important unit process.

Zinc concentrate was trucked in bulk to Sheet Harbour, Nova Scotia where it was loaded onto a bulk ocean carrier. Lead concentrate was loaded into lined ocean shipping containers, and trucked to the Port of Halifax.

## 17.2 THE PLANT

The Scotia Mine processing plant was constructed during the late 1970's by Canada Wide Mines (Esso). Esso operated for less than two years during the period 1979-1981. Seabright converted the mill to process gold during the mid-to-late 1980's. Westminer later re-converted and updated the mill to process zinc and lead, then operated it for a short time during the period 1989-1991. In all, 740,000 tonnes of zinc and lead ore have been processed in the mill (Table 6-1).

External and internal views of the plant are shown in Fig. 17-2.



**Figure 17-2: Views of the Outside and Inside (Right) of the Mill**

The mill building housed the primary jaw crusher, the fine crushing, grinding, flotation, reagent storage and mixing facilities and concentrate dewatering equipment. In addition, the mill offices, an analytical laboratory and metallurgical laboratory are located in the building.

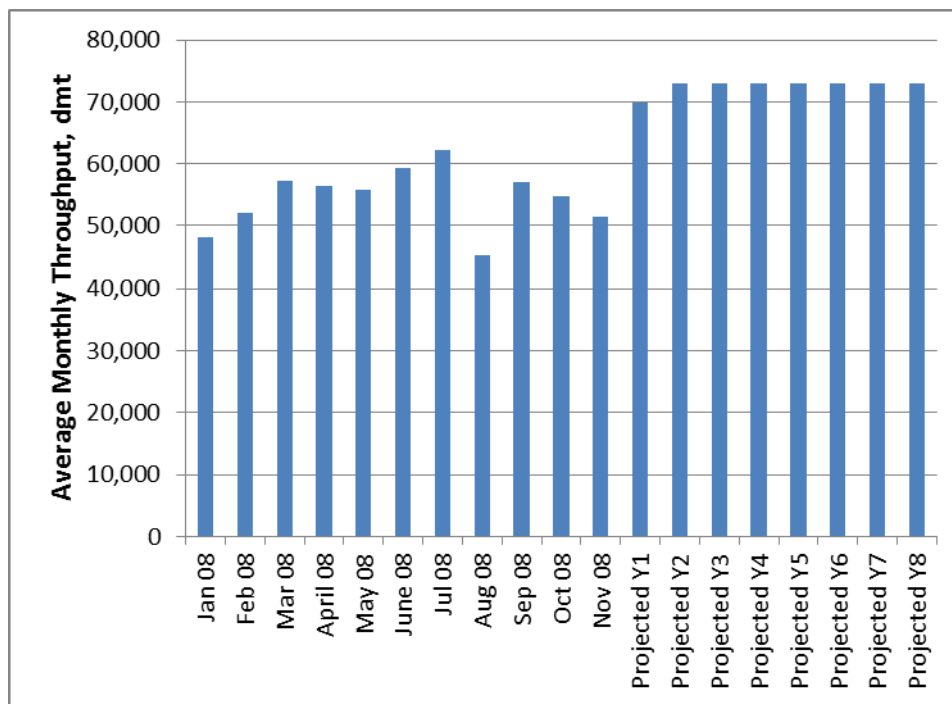
## 17.3 2007-2008 MILL OPERATIONS

The plant throughput rates approximated 55,000 dmt per month in 2008. Selwyn proposes to make modifications which, together with improved plant availability, will permit average mill feed rates of about 73,000 dmt per month, or 875,000 dmt per annum.

A plant inspection was carried out by Taggart during the period May 3 – May 5, 2011. In general, appropriate measures had been taken to de-commission the plant, which was found to be relatively clean and, with some notable exceptions, in reasonable condition.

Copies of the original Kilborn Engineering drawings are available, although plant design criteria could not be found. The nominal mill capacity was shown to be 1,500 short dry tons per day, or

1,360 dmt per day. Selwyn proposes to commence operations at an average rate of 2,500 dmt per day. The 2008 and proposed mill throughput rates are shown below.



**Figure 17-3: 2008 Monthly Mill Feed Rates**

Selwyn intends to achieve the increased mill feed rates by making plant modifications to mitigate most of the problems that challenged the previous operators. In addition, an effective preventive maintenance program will be implemented to increase the plant availability from 85 percent to 92 percent plant; deemed a more reasonable value for a plant of this type. Selwyn's management intends to initiate a rigorous operating crew training program to improve safety and operating efficiencies.

Disruptions in mill throughput rates were principally attributed to a lack of capacity in the crushing plant, and difficulties caused by significant amounts of "sticky fines" in the mill feed.

A "temporary" portable crusher was installed in May 2008 to provide short-term relief in this area. Mill throughput rates as high as 2,500 sdtpd were achieved, once the supplemental crushing equipment was brought on line. Selwyn proposes to install new primary and secondary crushers with a refurbished tertiary crusher and to increase the screening capacity to mitigate most of the materials handling problems. The fine ore bin slot feeders will be redesigned and replaced to improve material flow in this area, where chronic problems disrupted the prerequisite consistent flow of ore to the grinding circuit.

The grinding circuit comprises an 8' x 12', 400 HP rod mill and an 11'x 15', 900 HP ball mill. Rod and ball mill work indices were reported by SGS Lakefield (November 26, 2007) to be 11.7 kWh/t and 10.9 kWh/t, respectively. Grinding at rates considerably in excess of design values will result in coarser flotation feed sizes and could compromise effective mineral liberation. Promptly upon achieving grinding circuit stability, regular surveys of grinding and flotation circuit products will be performed. Based on the results of this work, decisions will be made with respect to modifications that might be required to provide optimum metallurgical performance at the higher mill throughput rates.

The metallurgical performance of the flotation circuit was reasonable in 2008, notwithstanding the probable coarse grind and fixed flotation circuit capacity, which was not expanded by the previous operators. Inadequate flotation capacity generally results in high flotation pulp densities, inadequate retention times, excessive froth and lip loadings; symptoms that are not readily evident, but individually and collectively adversely affect flotation performance. It is recommended that provision be made to advance concentrates through the circuit from the first few cells of selected flotation stages to alleviate cleaner circuit loads, and possibly the regrind feed rate. With this exception, and given that "acceptable" results were achieved in 2008, it is suggested that no changes be made to the circuit prior to plant commissioning. Once the circuits have stabilized, comprehensive circuit surveys will be conducted to establish meaningful mass balances. Concurrently, samples of all key circuit products will be subjected to mineralogical analyses to ascertain mineral distribution and degrees of liberation around the circuit. This information will be used to establish design criteria for further plant modifications, should these be justified.

The plant is virtually devoid of basic instrumentation and process control systems. Improvements in operations will be realized by the staged introduction of prioritized instrumentation and process control systems. At the very least, it would be highly advantageous to install variable frequency drives on the fine ore bin slot feeders which, together with the existing belt scale, will permit automatic rod mill feed rate control to maximize feed rates.

The concentrate thickeners are of adequate size to accommodate the proposed increased plant throughput. The vacuum filters have been inspected and found to be in very poor condition. Selwyn will replace the vacuum filters and dryers with two vertical plate pressure filters which will provide increased flexibility in the concentrate dewatering circuit. Offsetting the capital cost will be savings in the oil used to fuel the two concentrate dryers.

Based on an assumed 10 percent concentrate filter cake moisture, there will be a modest increase in product shipping costs.

## **18. PROJECT INFRASTRUCTURE**

### **18.1 TRANSPORTATION AND OFF-SITE INFRASTRUCTURE**

Infrastructure requirements for the ScoZinc open pit mine are discussed within this section. Halifax is the provincial capital of Nova Scotia and in combination with surrounding communities forms a major center of population, government, business, education, industry, and transportation services. The mine site is 55 kilometers northeast of Halifax and is directly accessible from the paved provincial Highway 277 or 224.

Robert Stanfield International Airport is located approximately 20 kilometers southwest of the property and provides both daily domestic and international airline services.

The property area is rural and has been extensively developed for agricultural purposes in the past. Access to mainline rail facilities is possible at the nearby town of Milford (8 km by paved road) and direct access to deep-water shipping facilities with post-Panamax capacity is present through the ice-free, deep water port of Halifax.



**Figure 18-1: Port of Halifax**

Year round, deep water access, storage and ship loading facilities for lead and zinc concentrates are also available at the seaport of Sheet Harbour, a distance of 80 kilometers from the mine site over paved roads. Sheet Harbour is a natural harbour on the Atlantic coast that remains ice free in the winter months, the Harbour can handle vessels up to 40,000 tonnes in displacement.



**Figure 18-2: Sheet Harbour**

Rail transport facilities have also been used for concentrate shipping. A railway siding is located in Milford, eight road-kilometers from the site.

## **18.2 ONSITE INFRASTRUCTURE**

Due to the mine's operational history, existing onsite infrastructure will continue to be maintained and used as the ScoZinc mine goes into production.

The required infrastructure for the Main zone and Southwest expansion is currently in place. Some minor road development will be required during the pre-strip to access the north wastepile and the expansion of the south wastepile. In addition, the Northeast and Getty zones will require service and haul roads and other minor infrastructure such as out-buildings, staging areas and working areas. As this is a Preliminary Economic Assessment, the detailed design of these improvements has not been performed but conservative conceptual cost estimates have been included in the cashflow to account for the anticipated work that will be required. The cash analysis can be seen in Table 18-1.

Due to site expansion, new access roads will be required onsite. A new at-grade intersection may be required at the existing mine main entrance to provide a safe highway crossing for trucks into the Northeast zone.

During the quarter prior to pre-stripping in each of the Northeast and Getty zones, haul and service roads or conveyors may be constructed. It can be estimated that construction costs would be in the range of \$200,000 per zone.

The existing roads are in adequate condition and will require minor realignments, extensions, intersections and signage to accommodate the increased traffic and additional operational areas. Ongoing maintenance of the onsite road surfaces including grading and drainage allowances will cost \$50,000 per quarter.

The main ScoZinc Access Bridge was inspected by Allnorth on July 27, 2011. The assessment indicated that additional to regular inspection and maintenance, there are signs of distress and deterioration that require replacement and/or repair within 2-3 years. Deterioration was found within; pier 1, pier 2, the north abutment, the slope protection material and a guide rail post. It can be assumed that \$5,000 each year will be required for regular inspections and monitoring as well as a major maintenance expense of \$50,000 in Q4/Q1 of 2012/2013.

**Table 18-1: Infrastructure Costs**

<b>Infrastructure Component</b>	<b>Cost (\$)</b>	<b>Timing</b>
Additional haul and service roads	200,000	Quarter prior to pre-stripping Northeast and Getty pits
Ongoing road maintenance	50,000	Each quarter
Regular bridge inspections	5,000	Annual
Major bridge maintenance	50,000	Q4/Q1 of 2012/2013

Power is supplied through the regional grid at industrial rates. Scotia Mine owns and maintains step-down transformers adjacent to the mill. Most of the mill's water requirements are satisfied by in-process recycling and, if required, make-up water will be drawn from the perennial Gays River.

The existing tailings pond is large enough for the life of the proposed operation. It is located just south of the mill on the footwall side of the deposit. The pond's design capacity was ten million tonnes. Approximately two million tonnes of tailings have been stored there, indicating a current capacity of about eight million tonnes.

There is sufficient area for waste rock and overburden storage on the property. The main area for waste rock storage lies adjacent to the tailings pond on its northwest shore, on the footwall side of the deposit.

## **19. MARKET STUDIES AND CONTRACTS**

### **19.1 MARKETS**

ScoZinc has several potential markets for concentrate sales. Historically (2007-2009) the ScoZinc concentrate was sold to smelters in Europe, South Africa and Asia through contracts with major trading companies. The ScoZinc mine concentrates are deemed highly desirable by smelters due to their high concentrate quality, grading 57% zinc and 70% lead, and low levels of deleterious metals. These characteristics enable marketing of the ScoZinc concentrate at favorable terms as its purity is suitable for blending by smelters worldwide.

### **19.2 CONCENTRATE SALES**

Historically, ScoZinc established multi-year concentrate purchase contacts with MRI Trading AG ("MRI") and Trafigura AG ("Trafigura") under terms consistent with the market terms at that time. The purchase contracts accounted for 100% of zinc production and 100% of lead production in which Trafigura and MRI each had the obligation to purchase 50% of the produced zinc concentrate. Trafigura also had the obligation to purchase 100% of the lead concentrate



produced; in both cases ScoZinc had obligation to sell its zinc and lead concentrate production under the established quantities and terms.

In the coming months, ScoZinc expects to once again establish concentrate purchase contracts with one or more metal trading companies under terms consistent with the current market terms. This PEA assumes that long-term treatment charges will be \$200/dmt of concentrate for zinc; and \$100/dmt of concentrate for lead, based on the acceleration of a general supply shortage of zinc concentrate and resulting in industry terms benefiting producers as reported by numerous research agencies.

## **20. ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT**

### **20.1 BACKGROUND AND EXISTING SOCIO-ECONOMIC CONDITIONS**

The Gays River site is located in Cooks Brook, a small unincorporated community in the Halifax Regional Municipality (HRM) that borders the community of Gays River, Colchester County. This community lies between the larger communities of Middle Musquodoboit, Lantz and Shubenacadie. The population of the surrounding area is described by Nova Scotia Finance, Community Counts to fall within three "communities" namely Middle Musquodoboit, Lantz, and Wittenburg. The total population of these three areas is 6816 (2006 Census). About 28% of the population is under 20 years of age and 13% is 65 years of age or older. Population growth between 1996 and 2006 was about 3%. English is spoken by over 99% of the population. The average family income for the area ranges from \$56,500 to \$67,000 per annum (the more affluent area being Lantz).

In the local area there is a range of land uses focused on resource based industries such as agriculture, forestry and mining. The mine site is located in an agricultural area that extends from the Musquodoboit Valley north into Colchester County. Agricultural land use accounts for approximately 5% of the Gays River area.

The area is primarily forested with mixed use (mainly residential and small business) located along the secondary roads. Sawmills and a wood pellet manufacturing plant are located near Middle Musquodoboit. Forested lands are primarily privately owned. Private woodlot owners are a significant source of supply to these facilities. ScoZinc Limited (ScoZinc) owns about 50% of the property in the Gays River area.

Future deposit developments will use existing public roads that require no upgrading or infrastructure changes such as bridges. The primary route for the transport of concentrates from the mill facility will be Highway 224 to Upper Musquodoboit and Highway 277 to Sheet Harbor. All previous operations at the mine site used the same route for shipping concentrate. The



expected average daily number of trucks (B-train styled with closed boxes) is 4 which is a small percentage (less than 2%) of the daily truck traffic based on recent data from public sources. Other routes for shipments of concentrate may be examined should the Sheet Harbour facility cease to be able to accommodate ScoZinc's needs or during spring weight restriction periods. All provincial 100-series highways do not have the spring weight restrictions and therefore may need to be used depending on concentrate storage capacities and customer requests. This option would not require another storage facility or a spring weight restriction exemption.

Savage Resources ("Savage") dewatered the underground workings during 1997 and started to rehabilitate the mine before a decision was made to extract the ore in the Main Zone using open pit methods. An open pit design was prepared using appropriate technical criteria for ore mining and waste stripping.

Between 1997 and 2000, baseline and technical engineering studies were completed and an environmental registration document was prepared for the Main Zone. It addressed the environmental concerns of a surface and underground mining operation along with the diversion of a 500 meter section of the Gays River to accommodate the pit design. On August 4, 2000, the Open Pit Lead/Zinc Mine and River Diversion Project proposed by Pasminco Resources (who had acquired Savage) received Environmental Assessment (EA) Approval.

MGI Limited carried-out a Phase I Environmental Site Assessment (ESA) in 1996. An updated Phase I ESA, carried-out in conjunction with the technical report, was completed in March 2006 by Conestoga-Rovers & Associates (CRA) for Acadian Mining (Acadian) after they purchased ScoZinc Limited. The updated Phase I ESA included several site inspections during which several minor liabilities were identified and addressed as part of the mine's re-start process during 2006/2007.

During the brief mining history the mine site employed approximately 120 people in various aspects of mine operations and administration. The mine produced, over a two year period in 2007 and 2008, 656,500 tonnes of ore and 341,000 tonnes of low grade ore which yielded 28,000 tonnes of zinc and 11,100 tonnes of lead concentrates.

The mining and environmental permits at Scotia Mine are still in force (mining lease has been recently renewed) and are currently held by ScoZinc along with all the Scotia Mine assets. Acadian acquired 100% of the outstanding shares of ScoZinc on July 6, 2006 from HudBay Minerals, thereby acquiring the Scotia Mine property and the other assets of ScoZinc. The Scotia Mine property is subject to Mineral Lease 10-1, which consists of 615 hectares of mineral rights, including land with exploration potential for zinc/lead mineralization and 728 hectares of land ownership. The Scotia Mine property also includes five exploration licenses in the general vicinity of the Scotia Mine. In total, the 91 claims cover 1,473 hectares. These licenses are located

along strike from the Scotia Mine deposit and include favourable host rocks similar to that at the mine site.

The site has therefore operated several times in the past as a fully permitted underground and, more recently, surface mine. The most recent operations by ScoZinc noted above were completed under the EA Approval granted in 1999 to Savage Resources and transferred to ScoZinc. The Industrial Approval (IA) and other minor operating approvals needed (Water Withdrawal and Septic System Operation for example) were in place during the previous operations and transfer have either happened or are in process. As per standard procedure, there is a requirement, as the Southwest Expansion Project is a new undertaking not covered under previous EA Approvals, to register the project as a Class I Undertaking pursuant to the Nova Scotia Environment Act and Environmental Assessment Regulations. Other relevant provincial regulations include the Activities Designation Regulations, which requires an amendment to the existing Industrial Approval from Nova Scotia Environment (NSE) for expansion of the zinc / lead mining operation, as well as approval to alter wetlands; and the General Blasting Regulations made pursuant to the Nova Scotia Occupational Health and Safety Act (1996). No municipal approvals are required.

There are no known requirements for an environmental assessment under the Canadian Environmental Assessment Act (CEAA) associated with the proposed Southwest Expansion Project. No federal land or funding is required for the Project. There are no requirements for federal permits or authorizations under the CEAA Law List Regulation currently projected.

The Project will be reviewed as outlined above and it is anticipated that the project will be granted Environmental Assessment with conditions and a new or amended Industrial Approval will be required. It is anticipated that all of the required permits and approvals for full operation will be in place by Q4 2011 or Q1 2012.

Applications will be made to expand the Mining Permit boundaries to include all of the mineral resources noted in this report as being scheduled for extraction. This process is done through Nova Scotia Department of Natural Resources (NSDNR) and typical schedule will not affect the overall planned schedule for this project.

### **20.1.1 Operations Phase**

Settling ponds will be located at the base of the stockpiles to ensure that the overall drainage and flow patterns leading into the existing catchment areas are maintained. The ponds will be designed to ensure that the limits of any IA that may be granted by NSE for the project are not exceeded.

Mill effluent, site drainage and water from dewatering operations all go to the Tailings Management Facility (TMF) where treatment occurs via settling. The site is subject to the Metal Mining Effluent Regulations (MMER) approach and guidelines as well as some additional requirements from the Province via the Industrial Approval. Historically the effluent has met all requirements except minor copper exceedances that were properly reported and corrective actions were successful.

Solid waste generated at the Project site will consist of unusable rock, organics and other naturally occurring materials from the pit. Waste rock from the pit will be used, as appropriate, for infrastructure development with the excess being stored in the waste rock stockpile. Garbage produced on the mine site will be brought back to the existing facilities and trucked away for appropriate reuse or disposal to a provincially approved waste disposal facility.

All of the administration, processing and support facilities will remain at the existing site location and are serviced by an on-site sewage treatment system. Mill discharges go to the TMF where passive treatment occurs and effluent is monitored.

Materials needed for mine site operations are stored in accordance with applicable legislation. Explosives will be not be stored on site.

ScoZinc is very familiar with the requirements for petroleum management. The Project will require the use, storage and handling of petroleum products such as gasoline, fuel oil, and lubricants (POL). Mobile equipment will be fueled within the pit or at a central facility using tanks and infrastructure that is approved for use in Nova Scotia. Storage of any POL will be in compliance with applicable legislation. Any location where fuelling is taking place will be equipped with a spill kit and the operators will be trained in their use. Storage of POL will be mainly at existing facilities where the majority of the routine maintenance would take place. Limited storage may take place at the Southwest Expansion area in compliance with applicable legislation for quantities and container types.

ScoZinc will comply with the current regulations and recently had a Phase 1 Environmental Site Assessment completed to qualify existing conditions and ensure current compliance. Site monitoring is ongoing under the care and maintenance status requirements of the Industrial Approval and includes liquid effluent, groundwater and surface water monitoring. No issues have been identified in the data and the regulatory authorities have no outstanding issues or orders for ScoZinc.

### **20.1.2 Post-Mine Closure Phase**

The schedule for reclaiming the site and additional detail is discussed below.

Reclamation will include:

- removal of infrastructure and buildings,
- final rehabilitation of stockpiles,
- final surface contouring and sediment erosion control,
- assessment and remediation (if required), of any contaminated soils,
- rehabilitation of the former mining pit and tailings management area (including slope stabilization),
- pit flooding,
- water level control,
- revegetation, and,
- monitoring.

#### 20.1.2.1 Post-Reclamation Monitoring

ScoZinc commits to implementation and completion of its Reclamation Plan as described, including all monitoring aspects. During the course of reclamation and monitoring activities certain deficiencies or issues may be noted by staff and regulators involved; ScoZinc commits to addressing all identified deficiencies. ScoZinc views monitoring as an important function and method of obtaining information in order to make sound decisions relative to site activities.

This section outlines monitoring specific to reclamation activities that occur after sub-grade milling, approximately Month 20 after mine closure. The EA and IA for Site Operations prescribe required monitoring for the duration of site operations that includes a number of aspects (surface water, groundwater, rare plants, etc.). Post-reclamation monitoring, including groundwater levels, surface water quality, vegetation and aquatic habitat will be carried out for a period of three years subsequent to final site reclamation.

Key elements of the Reclamation Plan include:

- |                     |  |
|---------------------|--|
| Vegetative<br>Cover | <ul style="list-style-type: none"><li>• Periodic inspections of the effectiveness of revegetation efforts will be needed. Areas identified as requiring additional effort will be noted, and a program to address the deficiencies in the re-vegetation will be developed and submitted to NSDNR and NSE for review.</li></ul> |
|---------------------|--|

- |                                 |   |
|---------------------------------|---|
| Slope and Shoreline Inspections | <ul style="list-style-type: none"><li>• Slopes on stockpiles and shorelines of the lakes created by reclamation activities will be inspected for issues of erosion on a routine basis during reclamation operations. Inspections on a monthly basis are proposed at the Pit for a period of three years after mine closure or less as agreed to by NSDNR, NSE and the CLC. ScoZinc recognizes that additional monitoring may be required after the reclamation program is complete, if so directed by NSDNR and/or NSE.</li></ul>   |
| Pit Water Quality               | <ul style="list-style-type: none"><li>• Before decommissioning, the water being pumped from the Pit to the Tailing Management Area will be monitored for general chemistry and metals according to stipulations set forth in the IA. Upon cessation of dewatering operations in the Pit, this monitoring will be replaced by seasonal water quality measurements from two depths (0-1 m and 1 m from bottom) in a central location of the pit lake for general chemistry and metals. An in-situ water quality meter may be used to provide a suite of parameters such as temperature, conductivity, and pH. It is proposed that monitoring continue for two years after the water level in the pit has reached pre-mining site elevation of 514.5 m and then be re-assessed by ScoZinc and NSE to determine if refinements to the program are required or cessation of the program is approved.</li></ul> |
| Groundwater Levels and Quality  | <ul style="list-style-type: none"><li>• The site is well equipped with monitoring wells that are used to address the IA requirements for both water level and water quality monitoring. All available wells in this network will be monitored on a monthly basis for water level and for general chemistry and metals after mine closure. Each year, ScoZinc will review the data and consult with NSE on any required refinements to the program.</li></ul>  |

#### 20.1.2.2 Project Permitting

Acadian Mining Corporation acquired the mining assets of ScoZinc from Savage Resources in July 2006. The Minister transferred the August 2000 Environmental Approval. An IA (2006-055136) to "Construct, Operate, and Reclaim the Gays River Mine at Cooks Brook, Nova Scotia" was granted to ScoZinc on February 23, 2007 and is in effect for a 10 year period ending February 23, 2017. Production commenced at the mine in May 2007.

The Bulk Solids Handling Facility located at Sheet Harbour Industrial Park, North Atlantic Marine Terminal, Sheet Harbour, Nova Scotia was developed for the temporary storage of zinc and lead concentrate with the capacity at the terminal to load the concentrates on to a ship. IA (2007-057986) to operate the Bulk Solids Handling Facility was granted to ScoZinc Limited on October 31, 2007. The approval is in effect for a 10-year period and includes provision for a 10-year renewal.

The mine operations for Acadian at the Gays River mine proceeded according to the 1999 EA as an open pit operation, with on-site milling, and with concentrates shipped via Sheet Harbour port facility. A river diversion was part of the 1999 EA, however this aspect was not completed and this was an allowable deviation. Meetings were held with NSDNR, NSE, Environment Canada (EC), and Fisheries and Oceans Canada (DFO) in 2006 and 2007 that confirmed that the need for the river diversion did not exist. The value of the ore resources at that time did not warrant extending the existing pit to the north, requiring a river diversion when considering the regulatory requirements and public concern. As prices for zinc-lead increase the river diversion may be re-visited but are not part of the current undertaking described in this document as proposed by ScoZinc.

The Mine was placed on care and maintenance in late 2008 due to falling metal prices. The pit was allowed to fill with water over a period of nine months. The assets of ScoZinc were sold to Selwyn Resources Ltd. on June 1, 2011.

## **20.2 REGULATORY ENVIRONMENT**

Federal and provincial environmental acts and regulations apply to ScoZinc in regards to the design, site preparation, operation, and rehabilitation of the proposed mine. In addition to the environmental legislation, other acts and regulations relating to labor standards, mining practices, and other phases are applicable to the Project.

ScoZinc has made themselves aware of the applicable acts and regulations that pertain to the proposed undertaking at Cooks Brook, Halifax Regional Municipality, Nova Scotia. ScoZinc personnel and their consultant team have demonstrated the ability to prepare the necessary information and design plans required to obtain permits and approvals, as well as the ability to operate within the requirements of such acts and regulations.

The following list provides some pertinent acts that may be applicable for the undertaking.

### *Federal Legislation*

- Canada Wildlife Act and Regulations
- Canadian Environmental Assessment Act and Regulations
- Canadian Environmental Protection Act and Regulations
- Fisheries Act and Regulations
- Migratory Birds Convention Act and Regulations
- Transportation of Dangerous Goods Act and Regulations
- Species at Risk Act

### *Provincial Legislation*

- Environment Act and Regulations
- Dangerous Goods Transportation Act and Regulations
- Endangered Species Act and Regulations
- Labor Standards Code

ScoZinc currently has a performance bond for the protection of domestic water supplies (\$75,000) and a reclamation bond (\$2.6 Million, consisting of \$650,000 from previous bonds plus the \$1,950,000 discussed below that has recently been posted) held with the Province of Nova Scotia. The domestic water supply related bond has been in place for over 5 years and has never needed to be drawn from due to an unresolved water supply related issue. The reclamation bond amount was calculated based on the Reclamation Plan submitted to and accepted by the Province in 2011. The Province sees the bond value noted above as a reasonable amount to reclaim the site to an acceptable state should ScoZinc not complete the work outlined in the Reclamation Plan on their own.

## **20.3 REGULATORY AGENCY CONSULTATION**

Prior to and post-purchase of ScoZinc, Selwyn engaged in a series of meetings with NSE and NSDNR officials to understand local issues and legislation. These meetings involved several Selwyn representatives and assisted in the project design that is presented. An official One Window Committee meeting was held on June 21, 2010. This valuable process involves presentation of key project information to regulators from a variety of agencies including NSE, NSDNR, Environment Canada (EC), Canadian Environmental Assessment Agency (CEAA), Fisheries and Oceans Canada (DFO), and NS Labour. This meeting served to assist with screening the project for issues of concern and identifying possible federal triggers of which none were noted. ScoZinc will continue to be in contact with all agencies and understand that CEAA will coordinate a review of the EARD by federal agencies as part of the provincial EA process.

Public consultation is a key element in the environmental assessment process in that it allows the proponent to gather and use information from communities surrounding the project site and use this information in final project design. ScoZinc understands the value of public engagement and appreciates the community input thus far on the project and envisions a long and mutually beneficial public engagement program for the Southwest Expansion Project.

Following the June 2011 announcement that ScoZinc had acquired the assets of ScoZinc, the Company began a pro-active consultation and community outreach program. The intent of this program was to (a) provide information (as available at the time) about the intended project; (b) elicit possible questions and/or concerns from the local community and other stakeholders, and;

(c) attempt to address these questions and/or concerns either through the provision of information or accommodating changes to the Project design.

The consultation program was undertaken simultaneously with the environmental baseline study program for the project. This approach has the potential to have some limitations in that some questions raised by the public may not be immediately addressed because the environmental studies that provide those answers often take months or years to complete. However, the long history of environmental baseline studies and data from the various periods of site operation allow for many issues to be known, thereby allowing ScoZinc and the public to have a clear idea of past issues and how best to deal with these when operations recommence.

The following summary provides the various activities that have been undertaken by ScoZinc with respect to public consultation and communications relative to the southwest Zone and general community information sharing:

- Meeting with Community Liaison Committee (CLC) - May 5, 2011.
- One Window Committee Meeting - June 21, 2011
- ScoZinc Mine Site Open House Meeting - June 22, 2011.
- Public Information Session for EA – Cooks Brook Fire Hall - June 29, 2011

## **20.4 LOCAL RESIDENTS**

An initial meeting with the CLC was held on May 5, 2011. ScoZinc provided an overview of plans and introduced key staff to the CLC. Discussions centered on past issues, communications protocols and the commitment of the current CLC members to remain on the CLC. ScoZinc sees this as a great asset to the project.

An informal meeting of local residents was held on June 22, 2011 at the ScoZinc Operations. The main purpose of the meeting was introducing Selwyn to the community and to discuss plans for the mine. The local communities were informed of the meeting through direct handbill delivery as Canada Post was on strike. A total of 200 invitations were placed in local mailboxes with over 80 attendees noted from local communities. An overview presentation was given and a series of panels with information on ScoZinc as a company, Selwyn's Howard's Pass Project, the ScoZinc plans, ScoZinc corporate philosophy, and commitment to completing projects that consider key factors in success i.e. community, environment, health and safety and economics. Information on the upcoming Public Information Session was provided at the Open house as well.

ScoZinc also informed all attendees of the then upcoming Public Information Session for the EA to be held on June 29, 2011 at this Open House meeting.



## 20.5 LOCAL COMMUNITIES

The local residents were informed of the Public Information Session for the EA through direct handbill delivery as Canada Post was in the early stages following a strike/lock out. A total of 200 invitations were placed in local mailboxes. The meeting was also advertised in a regional newspaper according to EA regulatory requirements. The Project area does not have a local paper with the coverage to inform local communities, nor does it have a community radio station, so ScoZinc relied on direct handbill delivery.

A series of panels was available for viewing from 12:00 to 9:00 PM on Wednesday, June 29, 2011 which explained the following:

Poster Name	Poster Description
Who is Selwyn Resources?	<ul style="list-style-type: none"><li>• Introduction to the company, its resources and its directors and management.</li></ul>
The Southwest Expansion Project	<ul style="list-style-type: none"><li>• Specific details on the project being proposed and key components.</li></ul>
Project Timeline	<ul style="list-style-type: none"><li>• A time-line of past and future activities leading to eventual zinc/lead production.</li></ul>
Geology	<ul style="list-style-type: none"><li>• Explanation of the geological setting and rock types involved in the Gays River area deposits.</li></ul>
Mining	<ul style="list-style-type: none"><li>• Explanation of how mining within the pit would be conducted and how mining was conducted in the past.</li></ul>
Milling/Ore Processing	<ul style="list-style-type: none"><li>• Description of the ore processing methodology, with flowsheet, from crushing and grinding through the chemical process to the production of concentrate and shipping details.</li></ul>
Environmental Baseline Studies	<ul style="list-style-type: none"><li>• An overview of the various studies completed and key results.</li></ul>
Reclamation	<ul style="list-style-type: none"><li>• Outline of the process to return the site, during and after mining, to a state at least equal to that prior to disturbance.</li></ul>

The panels were supplemented with additional information on aspects of the Project by consultants to the Project. These individuals provided information on topics such as environmental baseline studies and permitting history, archaeology and cultural resource management.

Participants were asked to sign in to the Session and then were provided with a quick overview of the panels and structure of the Session. A summary of the number of participants and their home community is provided below. Participants then viewed the various panels and

information and were assisted by company representatives and the aforementioned consultants with any questions that they had. Comments from the participants were recorded on flipcharts for other participants to view. This format allows all participants to get a sense of the primary issues/concerns and for ScoZinc to use this information to refine aspects of the Project. A summary of the comments is provided below.

A total of 32 participants attended the session with a breakdown of their home communities shown in Table 20-1.

**Table 20-1: Home Communities of Public Information Session Participants**

<b>Location</b>	<b>Number of Participants</b>
Gays River	11
Cooks Brook	5
Carrolls Corner	3
Middle Musquodoboit	1
Lake Echo	1
Toronto	1
New Glasgow	1
Wyses Corner	1
Central North River	1
Ellershouse	1
Indian Brook	2
Milford	1
Enfield	1
Dartmouth	1
Urbania	1
<b>Total</b>	<b>32</b>

## 20.6 FIRST NATIONS

First Nation involvement with past operators of the mine and mill were favourable and meaningful. First Nations were involved in Mi'kmaq ecological knowledge gathering in the late 1990's and again in 2005. In 2006, an archaeological site of significance (the Sinkhole Site) was mitigated using First Nations involvement and staff in an area of Gays River. The site had been planned for disturbance by a previous mine plan. Contact has been made with representatives from the closest First Nations community of Indian Brook and preliminary discussions held

about mutually beneficial programs. ScoZinc will pro-actively engage in further discussions and are cognizant of the "Mi'kmaq - Nova Scotia - Canada consultation Terms of Reference". A copy of the Environmental Assessment Registration Document was sent to Indian Brook First Nation as part of the EA process.

## **20.7 ENVIRONMENTAL PERMITTING**

Between 1997 and 2000 work proceeded on an Environmental Registration Document. This document, which was submitted with the regulatory authorities in September 1999, addressed the environmental concerns of a surface and underground mining operation along with the diversion of a 500 meter section of the Gays River to accommodate the pit design. On August 4, 2000 the Open Pit Lead/Zinc Mine and River Diversion Project proposed by Pasminco Resources Canada Company received environmental assessment approval.

Before mining can re-start, the existing Industrial Approval for the site must be returned to operating status from its current "care and maintenance" status. This should be a relatively straightforward process.

The Environmental Registration Document covered only part of the deposit. This area was mined by ScoZinc Limited in 2007-2008. Resources in this area have not been exhausted. However, additional environmental assessment work is required before the mine can expand very far outside of its current footprint, either west along strike in the Main Zone or northeast, across Gays River to the Northeast Zone.

Prior to expansion outside the currently permitted area, updated plans would have to be approved by the Nova Scotia government and an updated Industrial Approval (essentially an environmental operating permit) would be required.

An overview of the various deposits/zones and the permitting requirements is provided in Table 20-2 below.

**Table 20-2: Deposit Permitting Overview**

<b>Deposit</b>	<b>Permitting Status</b>	<b>Notes</b>
Northeast Zone	Included in 1999 EA if completed as an underground operation. Requires additional approval related to mine plans, mine safety, ventilation and effects monitoring.	Will require EA if completed as a surface mine and often typical surface mine approvals likely through provincial EA process only.  Some EBS work has been completed to assist with future permitting.
Main Zone	All approvals in place for current footprint except for amended IA.	Minimal efforts required for resumption of mining after pit is dewatered.
Southeast Expansion Zone	Provincial EA currently being reviewed with decision date of October 7, 2011. Additional approval such as IA needed.	No identified issues to be dealt with. Mining could proceed in 2012.
Getty	Will require EA which is likely provincial with federal review aspects. No other approvals in place that will assist or discourage permitting success.	Some EBS work has been completed to assist with future permitting.  Depending on the ore transport scenarios the federal EA process may be triggered.

## 20.8 ENVIRONMENTAL LIABILITIES

Existing environmental liabilities are typical of a surface mining operation that has temporarily suspended operations. These include:

- disturbed, as-yet non-reclaimed ground from the previous surface mining operations;
- exposed tailings in the tailings impoundment; and,
- site infrastructure such as buildings, the mill and site roads.

A revised reclamation plan was recently approved by the Nova Scotia government who currently holds a reclamation security (bond) for the lease in the amount of \$2.6 million.

## 20.9 FINAL RECLAMATION PLAN

The needs and wishes of a community, as well as the mining process, may change as the project proceeds resulting in the requirement for a "Final Reclamation Plan" to be submitted six months prior to the end of the extraction phase of the mine life. This Plan is prepared by the proponent

in consultation with the CLC, NSE, NSDNR and possibly other parties such as a community group or technical organizations. This "final reclamation plan" is then approved and the proponent begins the work. The plan often includes monitoring components for aspects such as surface water quality, groundwater quality, water levels, vegetation growth and wetlands health. When the proponent completes all of the requirements of the EA, IA and any other reclamation related conditions, the proponent is able to get back the reclamation bond value in full. Nova Scotia does also allow for portions of the bond to be released if progressive reclamation is part of the project. For example, if 20 percent of the area has been reclaimed to the goal in the "preliminary reclamation plan", a portion of that bond may be released if NSE and NSDNR are satisfied with the work completed.

The socio-economic impacts of the mine to the local economy will be seen in the creation of available employment, expenditures in the local area for suppliers of fuel, equipment, repair and maintenance services, and trucking. Impacts due to industrial activities that require mitigation are reduced residential and land values. Given the length of the proposed project this would only be a short term outcome, however, a stable employment base in the area may also move to increase land values.

Recreational use of the Mine site has been limited in the past by mining activity and the need, due to safety factors, to limit site access to the site. Local residents and others continue to use the areas south of Highway 224 and adjacent to the Gays River for walking, fishing and swimming. The future final land use of the mine site will be determined with input from the local community. After closure of the mine, final reclamation is intended to return the site to a condition that reflects the surrounding landscape. Disturbed areas will be regraded and revegetated, and all buildings will be removed or put to other use. Flooding of the open pit should provide new opportunities for recreation, previously unavailable in this area.

Mining operations often involved changing the land use of an area. In some cases a new mine will require lands that may have been publicly used for recreation, agriculture or other purposes. These lands would be needed for stockpile locations, within the ore body or other mine infrastructure. In the case of the lands needed for the Southwest Expansion Project the existing land use is confined to two types: forestry (by past operators of the mine and by private landowners) and mine related operations from past operators (stockpiles, roads, borrow pits). The majority of the lands are already owned by the proponent and discussions are ongoing with third parties to secure all the required lands through purchase or lease. During the various operations and idle periods at the mine site, public access was restricted for safety reasons so that public use of the lands has not occurred, with permission of the owner, since before the facility was originally developed in the 1970s. Therefore the proposed Southwest Expansion Project will have little effect on local land use.

ScoZinc considers the goal and responsibilities of reclaiming mined sites to be a key element of the project plan, and will return the land to a state of equal or better status than prior to disturbance. Reclamation is understood as not only operational activities of overburden removal, stock piling, backfilling overburden, contouring, placing of topsoil, and revegetation, but also as an integral part of project planning that keeps future land use foremost in mind.

The previous operator developed a detailed reclamation plan (April 2011) in consultation with NSDNR and NSE, and with input from other stakeholders that included the community. ScoZinc sought public input on the conceptual reclamation plan for the Southwest Expansion and this input will be integrated with the mine plan and will address the key areas of land use, water resources, restructuring, recontouring, revegetation, restoration of services, aesthetics, safety, and future land use.

A cost estimate to accompany the program has been prepared and noted above. It was assumed that the work would be carried out by ScoZinc personnel whenever possible, with some work being contracted out under ScoZinc's supervision. The estimated costs are based on a mixture of ScoZinc rates (owner/operator rates) and contractor rates, with productivity estimated partly from experience and partly from published sources. ScoZinc understands the reclamation bonding legislation in Nova Scotia and will submit plans to NSE and NSDNR to have the appropriate bonding in place prior to additional site disturbance in the Southwest Expansion Area. This will take place after Environmental Assessment approval is granted.

ScoZinc plans to use their own resources for reclamation activities, although some contract tree-planting and hydroseeding contractors may be required. Dozers and excavators will be used to regrade and contour the side slopes of piles to ensure that they are stable. Rock lined ditches are constructed as necessary, to control run-off and prevent erosion of the exposed soils. The slopes are typically seeded with a naturalization mix of native grasses, fescue, trefoil and clover. Nova Scotia has many examples of reclaimed mine sites that are used for a variety of purposes including recreation, wood lots and wetlands.

## 21. CAPITAL AND OPERATING COSTS

### 21.1 CAPITAL COSTS

#### 21.1.1 Capital Cost Summary

**Table 21-1: Capital Cost Summary**

Item	Projected Capital Cost (thousands)
Permitting and engineering	\$550
Mill refurbishment	\$6,751 <sup>A</sup>
Mine capital expenditures	\$8,100
Mine/mill re-staffing	\$6,995
Refurbishment construction contingency	\$3,420
Exploration	\$1,000
<b>Subtotal</b>	<b>\$26,216</b>
Plus: Project acquisition cost	\$10,000
<b>Total</b>	<b>\$36,216</b>

<sup>A</sup> Includes \$6,501k for mill/storage/crusher refurbishment and \$250k for a programmable logic control (PLC) system.

#### 21.1.2 Mine Capital Cost

The projected mine capital cost is shown in Table 21-2.

**Table 21-2: Mine Capital Cost Summary**

Item	Projected Capital Cost
Capitalized waste prestripping cost	\$5,046k
Capitalized pre-stripping equipment lease costs	\$1,954k <sup>A</sup>
Capitalized pit dewatering cost	\$500k
<b>Total</b>	<b>\$7,500k</b>

<sup>A</sup> Includes a \$490k allowance for equipment transportation and assembly costs.

The initial waste stripping would be carried out by Selwyn using its labour force and leased equipment. The proposed mine equipment fleet includes Caterpillar 777 (90.9 tonne capacity) haul trucks, a Caterpillar 6030 (16.5 m<sup>3</sup> capacity bucket) diesel-powered hydraulic face shovel, a Caterpillar 993K (12.2 to 23.7 m<sup>3</sup> range bucket capacity) wheel loader, and ancillary equipment. It is expected that Selwyn would evaluate and assess mining equipment available from several equipment suppliers.

The initial mining equipment fleet which consists of five Caterpillar 777 haul trucks, one Caterpillar 6030 hydraulic shovel, one Caterpillar 993K wheel loader and ancillary equipment would be leased. Five trucks would be leased during the pre-production stripping stage and an additional five trucks would be added to the lease fleet in production year 1. A second

Caterpillar 6030 hydraulic excavator would be added to the lease fleet in production year 2, Q3. The ancillary equipment consisting of a grader, a water/sander truck, a fuel and lubrication truck, and two bulldozers would also be leased. It is assumed that new equipment would be leased from an equipment dealer under a lease-to-own type contract.

Other Caterpillar 777 haul trucks (up to 9 trucks) would be rented to meet additional short term haul truck requirements commencing in production year 2, Q3. The rented Caterpillar 777 haul trucks are assumed to have been previously used, each having less than 30,000 engine hours on them when mobilized to site. It is assumed that three trucks would be rented on a 4-year rent-to-own basis and purchased by Selwyn at a residual cost of \$1/truck in production year 6 Q3. The other rented haul trucks would be returned to the equipment supplier. The production drilling and blasting equipment would be supplied by the drilling and blasting contractor.

No salvage value has been included and no reclamation and closure cost is included. It is assumed that salvage values will offset closure costs.

### **21.1.3 Mill Capital Costs**

The principal capital cost programs in the mill relate to the crushing, grinding and filtration sections.

The crushing circuit has been one of the major impediments to stable and efficient operations, particularly during cold weather. It is proposed to install a three staged crushing circuit, complete with a larger vibrating screen.

Ore has been withdrawn from the fine ore bin by two parallel slot feeders. These feeders had poor performance and are currently beyond repair. Selwyn proposes to mitigate historical problems through the use of a new and redesigned system.

The two existing concentrate vacuum filters have been examined and found to be in very poor condition and beyond their economic life. It is proposed to replace these units with two vertical plate pressure filters. By so doing, the concentrate dryers will be eliminated, together with the high associated fuel costs.

Most of the remaining plant capital costs relate to a thorough and comprehensive program of rehabilitation for all items of process equipment.

## **21.2 OPERATING COSTS**

### **21.2.1 Mine Operating Cost**

The open pits would be developed and operated using conventional open pit mining practices and equipment and in conformance with regulatory requirements.



It is assumed that drilling and blasting would be conducted by a qualified and licensed contractor as previously done. Loading and haulage operations would be conducted by Selwyn's equipment operators using a combination of leased and rented mine equipment. The leased and rented equipment would be maintained by the equipment supplier under a maintenance and repair type contract. Refuelling, tire inspection and miscellaneous maintenance work not covered by the maintenance and repair contract would be carried out by Selwyn's maintenance personnel.

The mine operating cost components include:

- Mine operating labour costs.
- Subcontracted drilling and blasting costs.
- Equipment leasing and rental costs.
- Mine equipment operating costs such as fuel, lubricants, parts, ground engagement tools, and maintenance supply costs.
- Mine indirect operating costs.

The total mining cost is summarized in Table 21-3. The estimated annual mine operating costs vary in the cashflow model as material quantities and unit operating costs vary from year to year.

**Table 21-3: Mine Operating Cost Summary**

Item	Life of mine (\$M)	\$/tonne of material moved	\$/tonne of potential mineable mineralization
Mine direct labour cost	27.60 <sup>A</sup>	0.20	4.27
Drilling and blasting cost	51.30 <sup>B</sup>	0.37	7.93
Mine equipment operating costs	98.62 <sup>C</sup>	0.71	15.25
Mine indirect costs	9.70 <sup>D</sup>	0.07	1.50
Subtotal	187.22 <sup>E</sup>	1.35	28.95
Mine equipment leasing costs	40.98 <sup>F</sup>	0.29	6.34
Mine equipment rental costs	11.86 <sup>G</sup>	0.09	1.83
Subtotal	52.84	0.38	8.17
Total	240.06	1.73	37.12

<sup>A</sup> Labour cost for Selwyn equipment operators.

<sup>B</sup> Drill and blasting are assumed to be a contracted operation, at a cost of \$0.80/tonne. Approximately 45% of the total material mined would require blasting and the remaining 55% is estimated to be free digging overburden.

<sup>C</sup> Includes equipment fuel, lubricants, ground engagement tool, tire, undercarriage and repair reserve costs, and maintenance labour costs for the leased and rented mine equipment. The PEA is based on an assumed diesel fuel cost of \$0.80/L.

<sup>D</sup> The mine indirect costs include annual allowances for grade control consumables, mine training and safety, and field shop operating costs; and the cost of mine supervision during the mine pre-stripping phase.

<sup>E</sup> Subtotal excludes mine-related costs included in the General and Administration (G&A) costs.

<sup>F</sup> The estimated cost includes mine equipment lease costs incurred during the pre-stripping phase and projected equipment mobilization/setup costs during the pre-stripping phase and in year 1.

<sup>G</sup> The cost includes projected mine equipment rental costs and equipment mobilization / setup / teardown / demobilization costs in production years 2 to 6. It is assumed that Selwyn would rent three Caterpillar 777 trucks on a rent-to-own basis and purchase the three trucks for residual payments of \$1 per truck in production year 6 Q3.

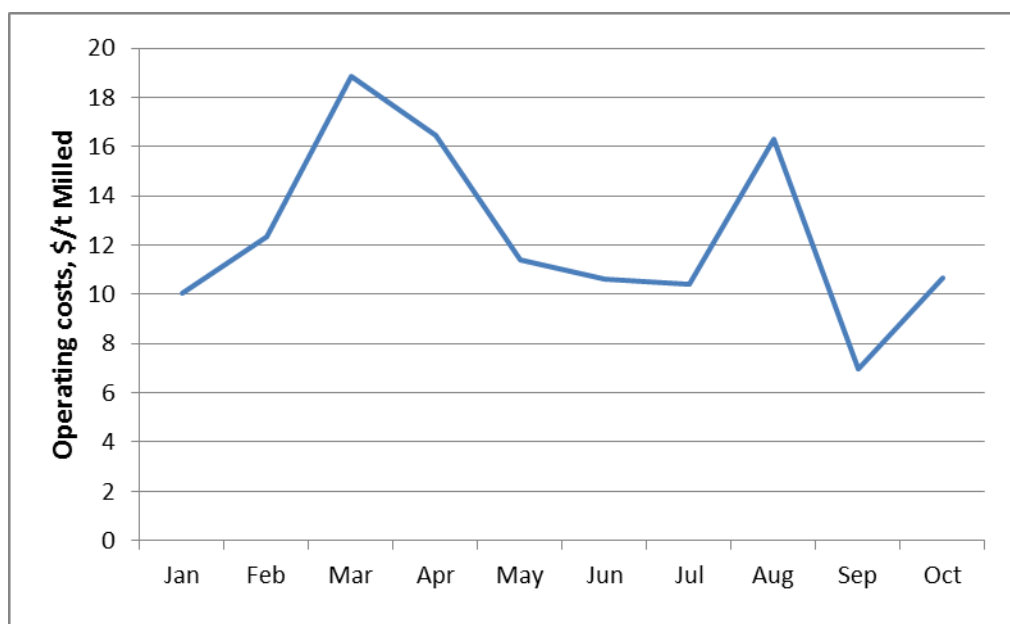
It is expected that detailed mine plans will be developed by others following the completion of the present PEA as part of the detailed engineering and further assessment of the Project. The detailed mine plans will need to take the historic mine workings and associated geotechnical stability aspects into account in relevant open pit, haulage route and mine material stockpile locations – see also Recommendations.

#### 21.2.1.1 Mine Labour Rates

The mine would be operated on a two twelve hour shifts per day, 350 days per year basis with rotating crews. It is envisaged that mine equipment operators would be hired locally.

#### 21.2.2 Mill Operations and Processing Cost

The 2008, January to October mill operating costs are shown in Figure 21-1. While the unit costs varied considerably from month to month, the trend was generally favorable.



**Figure 21-1: 2008 Mill Operating Costs (\$/sdt)**

A summary of the projected annual mill operating costs for Year 1 and subsequent years is shown in Table 21-4.

**Table 21-4: Annual Mill Operating Cost Projections**

		2008		
Cost Centre		Ytd Sept	Year 1	Year 2 +
Mill Throughput	dmt	493,452	839,167	875,000
Mill - General Expense	\$/dmt milled	2.87	3.14	3.10
Crushing	\$/dmt milled	2.98	1.29	1.28
Grinding	\$/dmt milled	1.24	1.13	1.12
Mill Assay/Met Lab	\$/dmt milled	0.81	0.52	0.50
Flotation	\$/dmt milled	0.99	1.01	1.00
Con Dewatering	\$/dmt milled	0.81	0.24	0.23
Con Loadout	\$/dmt milled	1.14	1.10	1.09
Mill Maintenance	\$/dmt milled	1.32	1.47	0.84
<b>Total</b>		<b>12.16</b>	<b>9.89</b>	<b>9.16</b>

Selwyn's operating cost estimates are predicated upon the reported September 2008 Year-To-Date costs. At the time of this report preparation, insufficient information was available to prepare a zero-based budget.

It is assumed that the manpower schedule will remain unchanged, regardless of the plant throughput. Classified as "*fixed costs*", labour costs have been increased by 3 percent per annum for the period 2008 to 2011.

Other than the labour and assay laboratory costs, most other expenses were considered as "*variable costs*", thus increasing in direct proportion to the plant throughput. An escalator of 3 percent per annum was also applied to the variable costs to provide a basis for current costs. Thereafter, no provision is included for further escalation. The cost of mill power, a variable cost, comprises over 80 percent of the Mill General account. The electrical load factors in 2008 are unknown. If the grinding mills and flotation equipment were drawing close to full load, as could well have been the case, then the projected costs for the proposed operations will be conservative. The cost of mill power in 2008 was approximately \$1.2 million.

Selwyn will install new primary and secondary crushers with a refurbished tertiary crusher and replace the vibrating screen. A loader will be dedicated to feeding ore from a crushed ore stockpile into the mill feed hopper. The net effect of these significant changes will be to reduce the unit cost of crushing.

The replacement of the two concentrate vacuum disc filters and dryers with two vertical plate pressure filters will appreciably reduce unit costs of this operation, primarily through the elimination of the fuel required to dry the concentrates. Offsetting this, the concentrate filter cake moisture content will probably approximate 10 percent, a value which should be included when determining concentrate shipment costs in Net Smelter Return calculations.

A provision of \$500,000 is included in the Plant Maintenance cost center in 2012 to cover the costs of a "mod squad". This will comprise a small group of mechanics assigned specifically to perform plant tune-up activities in the first year. By so doing, the normal maintenance crew will be able to focus attention on the scheduled preventive maintenance programs, undistracted by commissioning issues.

The costs associated with shipping concentrates to Halifax have been extracted from the operating costs, since such expenses are normally included in the Net Smelter Return Calculations, an integral part of the cashflow calculations.

### **21.2.3 General and Administration Costs**

The General and Administration (G&A) Costs are summarized in Table 21-5, where:

- Administration costs include projected administrative / supervisory / technical labour costs as well as insurance, taxes, security, indirect equipment operating, office operating and consulting costs. Labour costs account for 56% of the Administration cost in

production year 1. The mine indirect cost includes the mine staff labour cost during the pre-stripping phase.

- Safety and environmental costs include the coordinator labour cost, training and hygiene costs, environmental monitoring and contracted environmental services costs, and a 5% cost contingency. The estimated environmental monitoring and contract services costs total \$480k/year.
- Human resources costs include employee training, staff recognition, employee development and recruiting costs, and a 7.5% cost contingency.

**Table 21-5: General and Administration Costs**

Area	G&A cost (\$/year) (thousands)							
	Production Year							
	1	2	3	4	5	6	7	8
Administration	2,297	2,297	2,297	2,297	2,297	2,297	2,297	1,305
Safety & environmental	806	772	772	772	772	772	772	423
Human resources	85	85	85	85	85	85	85	26
Total	3,188	3,188	3,154	3,154	3,154	3,154	3,154	1,754
G&A cost per tonne of potentially economic mineralization	3.80	3.64	3.61	3.61	3.61	3.61	3.61	4.62

## 22. ECONOMIC ANALYSIS

The potential economic viability of the Project was evaluated using a discounted cashflow analysis approach. In summary, the results of the preliminary economic analysis indicate that:

- The Project has a mine life of approximately 7.5 years and offers an approximate 1.2 year payback.
- The Project has an estimated pre-tax internal rate of return (IRR) of 63.9% and an after-tax IRR of 60.2%.
- The Project has a pre-tax net present value (NPV) of \$54.1 million and an after-tax NPV of \$45.3 million, both using an 8% discount rate. At a 5% discount rate, the pre-tax NPV is \$63.9 million and the after-tax NPV is \$53.4 million.

This preliminary economic assessment is preliminary in nature and includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no

certainty that the preliminary economic assessment will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

## 22.1 INPUT PARAMETERS

The input parameters to the cashflow model are listed below. All amounts are expressed in Canadian dollars, except where noted.

- Zinc price: \$US 1.10/lb (for life of mine)
- Lead price: \$US 1.20/lb (for life of mine)
- US:CDN exchange rate: \$US 1.00 = \$CDN 1.00
- Zn mill recovery 73.1% to 87.9%
- Zn Concentrate Grade: 57%
- Zn Concentrate Moisture 10%
- Zn Payable from Smelter 85%
- Zn Treatment Charge: \$200 per tonne of concentrate
- Land Freight: \$11.61/tonne
- Ocean Freight: \$US 60/tonne
- Pb mill recovery 87.9% to 88.9%
- Pb Concentrate Grade: 70%
- Pb Concentrate Moisture 10%
- Pb Payable from Smelter 95%
- Pb Treatment Charge: \$100 per tonne of concentrate
- Land Freight: \$11.61/tonne
- Liners: \$95 per container
- Ocean Freight: \$US 60/tonne
- Project Acquisition Cost: \$10 million
- Capital Cost: \$26.2 million
- Working Capital: \$3.9 million
- No annual inflation or escalation was included.

## 22.2 RESULTS

The results of the economic analysis are as follows:

- The project has a mine life of approximately 7.5 years with a project payback of approximately 1.2 years.
- Total payable metal production over the life of the project is projected to be 298 million lbs (134,900 tonnes) of zinc and 196 million lbs (88,900 tonnes) of lead.

- Total life-of-mine gross revenue is about \$460 million, of which 54% is derived from zinc and 46% derived from lead.

The economic results are summarized in Table 22-1 and the cashflow model is shown in Table 22-2.

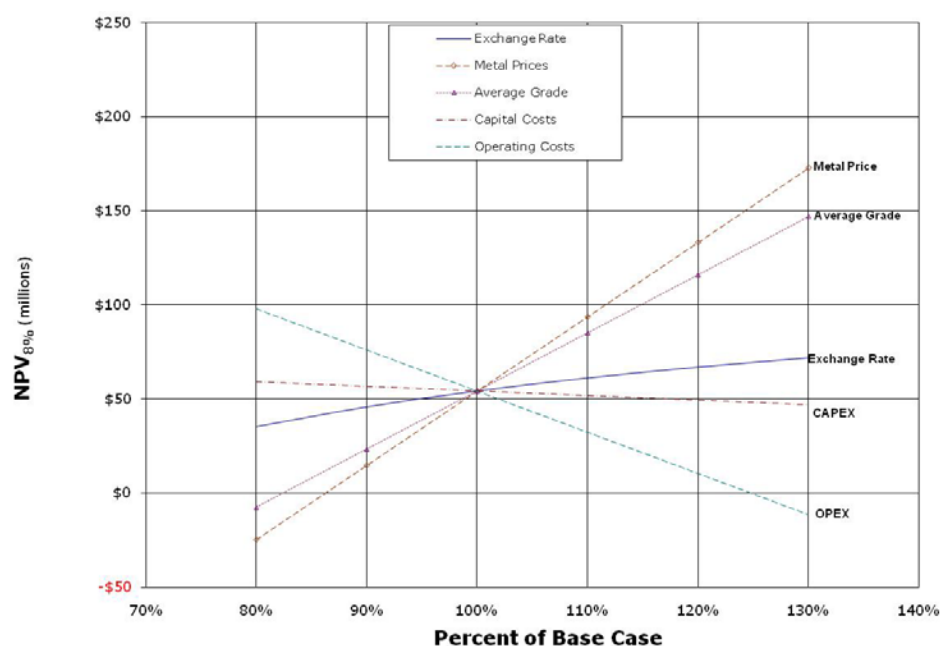
**Table 22-1: NPV and IRR Summary**

	<b>Pre-tax</b>	<b>After-tax</b>
NPV (8%)	\$54.14M	\$45.29M
NPV (5%)	\$63.90M	\$53.36M
IRR	63.9%	60.2%

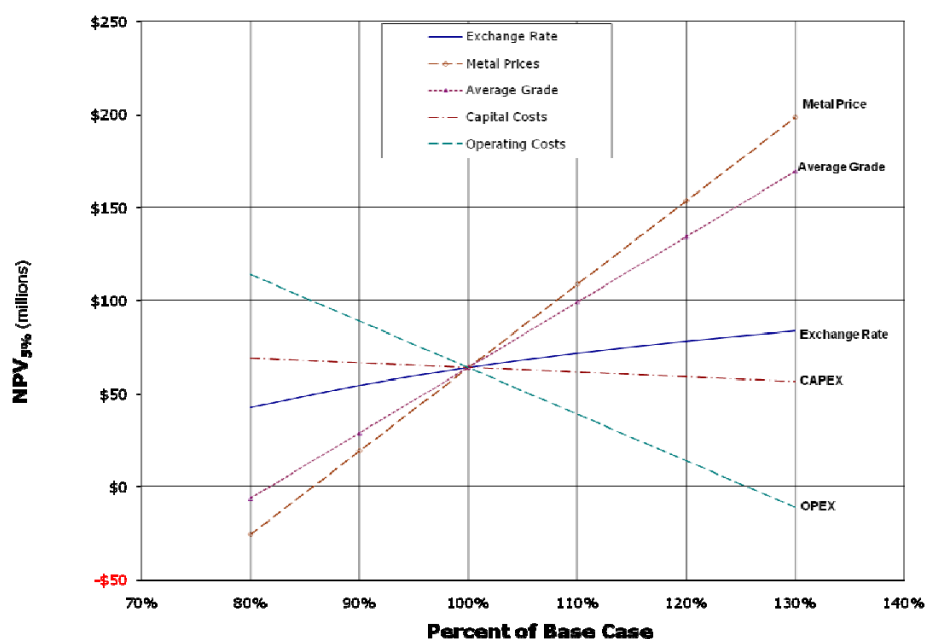
This preliminary economic assessment is preliminary in nature and includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

## 22.3 SENSITIVITIES

The economics of the project are most sensitive to metal prices, the grade of the potentially mineable mineralization, and operating costs. The results of the sensitivity analysis are shown in Figure 22-1 (8% discount rate case) and Figure 22-2 (5% discount rate case).



**Figure 22-1: NPV<sub>8%</sub> Sensitivity**



**Figure 22-2: NPV<sub>5%</sub> Sensitivity**



Table 22-2: Cashflow Model Detail

Cashflow Summary											
	(Cdn \$'s)	Pre-Production	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	
<b>Mill Feed (tonnes)</b>			<b>839,167</b>	<b>875,000</b>	<b>875,000</b>	<b>875,000</b>	<b>875,000</b>	<b>875,000</b>	<b>875,000</b>	<b>875,000</b>	<b>379,731</b>
Tonnes per day			2,398	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Zinc Head Grade	%		4.16%	3.56%	3.71%	4.04%	1.74%	2.34%	1.48%	2.18%	
Lead Head Grade	%		1.92%	1.52%	1.64%	2.34%	1.09%	1.42%	1.38%	2.02%	
Concentrate Moisture	%		10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	
Zinc Concentrate	dmt		34,909	31,184	32,500	35,372	15,197	20,470	12,951	8,278	
Lead Concentrate	dmt		16,112	13,303	14,360	20,467	9,577	12,386	12,083	7,671	
Zinc Recovery	%		87.9%	84.6%	85.4%	87.2%	74.6%	77.9%	73.1%	77.0%	
Lead Recovery	%		88.3%	88.2%	88.3%	88.9%	87.9%	88.1%	88.1%	88.6%	
Recovered Zinc	lbs		67,648,848	58,160,890	61,188,000	67,999,786	24,993,087	35,155,351	20,871,825	14,052,483	
Recovered Lead	lbs		31,364,627	25,867,432	27,954,797	40,113,159	18,558,253	24,056,176	23,467,918	14,982,730	
Metal Payable from Smelter - Zinc	%		85%	85%	85%	85%	85%	85%	85%	85%	
Metal Payable from Smelter - Lead	%		95%	95%	95%	95%	95%	95%	95%	95%	
Payable Zinc	lbs		57,501,521	49,436,756	52,009,800	57,799,818	21,244,124	29,882,049	17,741,051	11,944,611	
Payable Lead	lbs		29,796,396	24,574,060	26,557,057	38,107,501	17,630,340	22,853,367	22,294,522	14,233,593	
Zinc Price	\$ / lb		\$1.10	\$1.10	\$1.10	\$1.10	\$1.10	\$1.10	\$1.10	\$1.10	
Lead Price	\$ / lb		\$1.20	\$1.20	\$1.20	\$1.20	\$1.20	\$1.20	\$1.20	\$1.20	
Zinc Revenue			\$ 63,251,673	\$ 54,380,432	\$ 57,210,780	\$ 63,579,800	\$ 23,368,537	\$ 32,870,253	\$ 19,515,156	\$ 13,139,072	
Lead Revenue			\$ 35,755,675	\$ 29,488,872	\$ 31,868,468	\$ 45,729,001	\$ 21,156,408	\$ 27,424,040	\$ 26,753,427	\$ 17,080,312	
<b>Revenues from Operations</b>			<b>\$ 99,007,348</b>	<b>\$ 83,869,304</b>	<b>\$ 89,079,248</b>	<b>\$ 109,308,801</b>	<b>\$ 44,524,945</b>	<b>\$ 60,294,294</b>	<b>\$ 46,268,583</b>	<b>\$ 30,219,384</b>	
TC/RC's & Freight - Zinc			\$ 15,050,161	\$ 12,939,329	\$ 13,612,785	\$ 15,128,236	\$ 5,560,331	\$ 7,821,178	\$ 4,643,454	\$ 3,126,323	
TC/RC's & Freight - Lead			\$ 3,680,419	\$ 3,035,361	\$ 3,280,299	\$ 4,706,997	\$ 2,177,681	\$ 2,822,823	\$ 2,753,795	\$ 1,758,118	
<b>Gross Revenue</b>			<b>\$ 80,276,769</b>	<b>\$ 67,894,613</b>	<b>\$ 72,186,164</b>	<b>\$ 89,473,569</b>	<b>\$ 36,786,934</b>	<b>\$ 49,650,292</b>	<b>\$ 38,871,334</b>	<b>\$ 25,334,943</b>	
Annual Provincial Royalty			-\$ 2,809,687	-\$ 2,376,311	-\$ 2,526,516	-\$ 3,131,575	-\$ 735,739	-\$ 993,006	-\$ 1,360,497	-\$ 886,723	
<b>Net Revenue</b>			<b>\$ 77,467,082</b>	<b>\$ 65,518,302</b>	<b>\$ 69,659,648</b>	<b>\$ 86,341,994</b>	<b>\$ 36,051,195</b>	<b>\$ 48,657,287</b>	<b>\$ 37,510,837</b>	<b>\$ 24,448,220</b>	
Operating Expenses - Mine			-\$ 28,466,466	-\$ 33,855,846	-\$ 37,861,505	-\$ 46,827,964	-\$ 36,224,311	-\$ 30,979,734	-\$ 14,788,345	-\$ 5,248,573	
Operating Expenses - Mill			-\$ 8,297,753	-\$ 8,013,513	-\$ 8,013,513	-\$ 8,013,513	-\$ 8,013,513	-\$ 8,013,513	-\$ 8,013,513	-\$ 3,477,691	
<b>Gross Profit</b>			<b>\$ 40,702,863</b>	<b>\$ 23,648,943</b>	<b>\$ 23,784,630</b>	<b>\$ 31,500,516</b>	<b>\$ 8,186,629</b>	<b>\$ 9,664,040</b>	<b>\$ 14,708,979</b>	<b>\$ 15,721,956</b>	
ScoZinc SG&A			-\$ 3,188,704	-\$ 3,188,713	-\$ 3,154,719	-\$ 3,154,719	-\$ 3,154,719	-\$ 3,154,719	-\$ 3,154,719	-\$ 1,754,124	
<b>EBITDA</b>			<b>\$ 37,514,159</b>	<b>\$ 20,460,230</b>	<b>\$ 20,629,911</b>	<b>\$ 28,345,798</b>	<b>\$ 11,341,348</b>	<b>\$ 6,509,321</b>	<b>\$ 11,554,260</b>	<b>\$ 13,967,832</b>	
Deferred Income Taxes			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Net Changes in Working Capital			-\$ 3,891,771	\$ 1,457,274	-\$ 20,991	-\$ 693,412	\$ 3,506,915	-\$ 1,508,995	-\$ 451,036	\$ 71,783	
Acquisition Price		-\$ 10,000,000									
Restart CAPEX		-\$ 26,216,572									
Ongoing CAPEX				-\$ 1,437,500	-\$ 1,897,500	-\$ 1,437,500	\$ -	\$ -	\$ -	\$ -	
<b>EBIT</b>			<b>-\$ 36,216,572</b>	<b>\$ 33,622,387</b>	<b>\$ 20,480,004</b>	<b>\$ 18,711,420</b>	<b>-\$ 26,214,885</b>	<b>-\$ 7,834,433</b>	<b>\$ 5,000,326</b>	<b>\$ 11,103,224</b>	<b>\$ 14,039,614</b>
Income Taxes			\$ -	\$ 0	-\$ 1,700,953	-\$ 6,193,715	\$ -	-\$ 862,662	-\$ 2,497,487	-\$ 3,078,534	
<b>Net Income / Cash Flow for Debt Servicing</b>			<b>-\$ 36,216,572</b>	<b>\$ 33,622,387</b>	<b>\$ 20,480,004</b>	<b>\$ 17,010,467</b>	<b>-\$ 20,021,171</b>	<b>-\$ 7,834,433</b>	<b>\$ 4,137,664</b>	<b>\$ 8,605,738</b>	<b>\$ 10,961,081</b>

## **23. ADJACENT PROPERTIES**

Selwyn's Scotia Mine complex adjoins the Getty property to the east and drilling results clearly show that the Getty deposit to be a contiguous extension of the carbonate bank complex that hosts zinc-lead mineralization at Scotia Mine. At the effective date of this report no mining was taking place at the Scotia Mine. However, Roy et al (2006) reported on mine reserves as part of a NI 43-101 compliant feasibility study prepared for Acadian and the deposit was mined by Acadian using open pit methods from 2007 until closure in late 2008. Roy et al. (2011) subsequently provided an updated NI 43-101 compliant mineral resource estimate for the Scotia Mine Main Zone and Northeast Zone deposits, results of which are detailed elsewhere in this report. Comparison of Scotia Mine reserve and resource figures with Getty deposit resource figures shows that higher metal grades and larger tonnages are present at Scotia Mine.

Approximately 1.5 kilometers to the southwest of the Getty deposit, on adjacent exploration claims now held by Selwyn, the Carrolls Farm zinc-lead prospect was discovered by Acadian in 2007 in dolomitized carbonate. The historic Carrolls Corner zinc-lead prospect occurs in a comparable geological setting 700 meters further to the west. In combination, these appear to reflect a continuously mineralized trend extending from Scotia Mine westerly to the Carrolls Corner area. Further extensions to the west have not been evaluated to date. The prospect areas mentioned do not have associated mineral resources at present but both show good potential for future resource delineation.

## **24. OTHER RELEVANT DATA AND INFORMATION**

There is no other relevant data or information that we are aware of that has not been presented in the other sections of this report.

## **25. INTERPRETATION AND CONCLUSIONS**

Using a cut-off grade of 0.75% zinc-equivalent for the Gays River Deposit, a zinc-lead-mineralized zone was outlined with a straight-line strike length of almost four kilometers. The Getty Deposit measures over one kilometre along strike.

Outcrops are rare, but both deposits sub-crop under the unconsolidated glacial till overburden. The dolostone host rock drapes over a paleo-shoreline of metasediments at dip that varies between 30-40 ° and vertical, averaging 40-60 °. Thickness varies from less than one meter to over ten meters in true thickness.

The zinc is contained in a very low-iron sphalerite that is highly marketable.

A limited amount of specific gravity work has been carried out. The results indicated that the tonnage of the current mineral resource estimate may have been underestimated by an amount

in the 6-7% range. Because the sample set that was available was quite small, no adjustment was made for the resource estimate.

Mineral resources were identified in Measured, Indicated and Inferred categories.

For the Gays River Deposit, in both the Main and Northeast Zones, Measured plus Indicated mineral resources totaled 4.8 million tonnes with average grades of 3.9% zinc and 1.8% lead (refer to Table 14-8). Inferred mineral resources totaled 4.2 million tonnes with average grades of 2.6% zinc and 1.3% lead. The block cut-off grade was 0.75% zinc-equivalent.

For the Getty Deposit, Cullen et al. (2011) determined, using a block cut-off grade of 2% zinc-equivalent, that Measured plus Indicated mineral resources totaled 4.36 million tonnes with average grades of 1.87% zinc and 1.44% lead (refer to Table 14-16). Inferred mineral resources totaled 0.96 million tonnes with average grades of 1.73% zinc and 1.59% lead.

The majority of the outlined mineral resources could likely be mined using surface mining methods.

For the Gays River Deposit, some of the identified mineral resources are located underneath Gays River. Sandy soil lies underneath Gays River, so mining close to the river would be susceptible to water inundation. In other words, additional mineral resources that lie close to, or underneath Gays River would be relatively more expensive to recover due to the added cost of either (a) diverting the river or (b) recovering the resources using underground mining methods.

## **26. RECOMMENDATIONS**

Additional work is recommended for both deposits.

### **26.1 GAYS RIVER DEPOSIT**

Additional diamond drilling should be carried out. These holes should be drilled at an angle that would pierce the dolostone at as near a perpendicular angle as is practicable. Approximately 8,000-10,000 meters of additional drilling is recommended.

Further specific gravity ("SG") test work is warranted. In conjunction with the recommended drilling, the SG of the core samples should be determined prior to "preparing" the sample (crushing and pulverizing). The results should be compared against the SG formula, based on mineralogy, that has been traditionally used for the property.

The cost of the recommended work was estimated to be \$1.0 million.

**Table 26-1: Estimated Costs for Recommended Work**

<b>Item</b>	<b>Estimated Cost</b>
Fill-in Drilling (8,000 meters)	\$830,000
Contingency (20%)	\$170,000
<b>Total</b>	<b>\$1,000,000</b>

## 26.2 GETTY DEPOSIT

Cullen et al. (2011) recommended the following work for the Getty Deposit:

"Based on results of the resource estimation program described in this report, the following recommendations are provided with respect to future work on the Getty Deposit. Estimated budget figures for recommended work are not included because detailed planning and execution of such programs should only be undertaken after full coordination with advancement of the adjacent Scotia Mine project is possible.

1. "Additional infill drilling should be carried out in areas of Inferred resources, particularly those present in the southeast half of the deposit, where generally higher metal grades are present. Infill drill hole spacing of at least 50 meters by 50 meters should be completed to allow upgrading of resources. The anticipated result of such drilling would be to increase Indicated mineral resources within the deposit limit.
2. "A preliminary metallurgical testing program should be carried out on selected core sample reject materials or on new representative drill core samples from the deposit. Results of this work should identify basic processing attributes and provide input data for more advanced assessments of development potential.

**Table 26-2: Estimated Phase 2 Budget (Cullen et al., 2011)**

<b>Task</b>	<b>Estimated Cost</b>
Infill drilling 2,500 m	\$500,000
Metallurgical Testing	\$100,000
Contingency 10%	\$60,000
<b>Total</b>	<b>\$660,000</b>

### **26.3 DETAILED MINE PLANNING RECOMMENDATION**

It is recommended that the detailed mine planning be carried out by qualified engineers taking into consideration the historic underground workings, geotechnical stability, worker and visitor safety, regulatory requirements, existing underground survey records, pit bench layout and stability monitoring aspects. As part of the detailed mine planning work, a screening level risk assessment should be used to assess the possible need for additional engineered controls to eliminate or mitigate associated potential risks in the open pits, along the haul routes, and at the mine material stockpile locations. Engineered controls are measures or procedures proactively designed to eliminate or mitigate risks.

### **26.4 METALLURGICAL RECOMMENDATIONS**

It is recommended that ScoZinc be prepared to conduct meaningful plant process surveys as soon as reasonable circuit stability has been achieved in addition to the following recommendations:

- Implement effective crew training programs, prior to plant commissioning.
- Ensure the assay laboratory, metallurgical laboratory and on-stream sampling/analysis systems are commissioned, to the maximum extent possible, prior to the resumption of operations.
- Arrange to send samples of intermediate and exit flotation circuit products to a qualified laboratory for mineralogical analyses, once reasonable circuit stability has been achieved.
- Conduct bench-scale flotation tests at the mine site laboratory on composite samples of mill feed. By so doing, the effects of grind, regrind, retention times and other key variables can be rapidly determined. Plant results can be compared with the best results achieved in the laboratory to provide an indication of potential improvements in plant performance.

### **26.5 GYPSUM SALES ASSESSMENT RECOMMENDATION**

It is recommended that Selwyn review existing information on the quantity and grade of gypsum rock and assess potential revenues from gypsum sales. The present preliminary economic assessment assumes that gypsum rock produced by the pit waste stripping operations would be disposed of in the mine waste stockpile.

### **26.6 ONGOING PROJECT ECONOMIC ASSESSMENT RECOMMENDATION**

It is recommended that Selwyn re-run its cashflow model and analyze and assess the Project on an ongoing basis as new and additional information becomes available such as: revised mine designs; geotechnical and hydrogeological mine design criteria; revised mine schedules and metal prices projections, and smelter terms; potential gypsum sales revenue and costs (see

above recommendation); mine equipment, services, and lease, rental and buy-out costs offered by established mine equipment dealers; competitive quotes from suppliers and contractors; and changes in the assumptions and criteria used in the present preliminary economic assessment.

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## 28. DATE AND SIGNATURE PAGE

Dated at Bedford, NS  
October 7, 2011

***[Original signed and sealed by]***

***[Colin Fisher]***

Colin S. Fisher, P.Eng  
Principal Author

Dated at Halifax, NS  
October 7, 2011

***[Original signed and sealed by]***

***[Doug Roy]***

Doug Roy, M.A.Sc., P.Eng.  
Geologist (Main and N)

Dated at Dartmouth, NS  
October 7, 2011

***[Original signed and sealed by]***

***[Michael Cullen]***

Michael Cullen, M. Sc., P. Geo  
Geologist (Getty)

Dated at Brampton, Ont  
October 7, 2011

***[Original signed and sealed by]***  
***[Eugene Puritch]***

Eugene Puritch, P.Eng.  
Principal Mining Consultant

Dated at Vancouver, BC  
October 7, 2011

***[Original signed and sealed by]***  
***[Peter Taggart]***

Peter Taggart, P.Eng.  
Principal Metallurgist

Dated at Dartmouth, NS  
October 7, 2011

***[Original signed and sealed by]***  
***[Peter Oram]***

Peter Oram, P.Geo.  
Principal Environmental Consultant

## **29. AUTHOR CERTIFICATES**

## **29.1 CERTIFICATE OF AUTHOR – C.S. FISHER**

I, Colin S. Fisher, *P. Eng.* do hereby certify that:

1. I currently reside in Belnan, Nova Scotia and I am currently employed as Halifax Division Manager with Allnorth Consultants Limited located at 229 – 1595 Bedford Highway, Bedford, Nova Scotia, Canada.
2. I graduated with a Bachelor's Degree in Civil Engineering from Dalhousie University in 2001. In addition, I have completed Masters and Bachelor level courses in Groundwater Chemistry and Hydrogeology.
3. I am a Professional Engineer (Civil), registered with the Association of Professional Engineers of Nova Scotia (Registered Professional Engineer, No. 8989), Professional Engineers and Geologists of Newfoundland and Labrador (No. 05184), Association of Professional Engineers and Geoscientists of New Brunswick (No. L4365), Professional Engineers & Geoscientists of Saskatchewan (No. 15622) and the Association of Professional Engineers, Geologists and Geophysicists of Alberta (No. M78543).
4. I have worked continuously as a civil engineer in various parts of Canada for over 10 years since my graduation from university. I have been involved in numerous civil and structural aspects of design and project management of road, bridge and other heavy civil works related to mining, forestry, oil and gas and public transportation systems.
5. 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.
6. I authored Sections 1, 2, 3, 18, 19, 25 and 26 of the Technical Report.
7. I have visited the ScoZinc property several times since May 2011.
8. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public.
9. To the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make those sections of the technical report not misleading.

10. I am independent of ScoZinc Limited applying all of the tests in Section 1.5 of National Instrument 43-101.

Effective Date: August 30, 2011

Signing Date: October 7, 2011

***{SIGNED AND SEALED}***

***[Colin S. Fisher]***

---

Colin S. Fisher, P. Eng.

Halifax Division Manager, Allnorth Consultants Ltd.

## **29.2 CERTIFICATE OF CO-AUTHOR – W.D. ROY**

I, William Douglas Roy, M.A.Sc., P.Eng., do hereby certify that:

1. I am a Mining Engineer employed by MineTech International Limited, with an office at 1161 Hollis St, Halifax, Nova Scotia, Canada.
2. I graduated with a Bachelor of Engineering degree in Mining Engineering from the Technical University of Nova Scotia (now Dalhousie University) in 1997 and with a Master of Applied Science degree in Mining Engineering from Dalhousie University in 2000.
3. I am a Professional Engineer (Mining), registered with the Association of Professional Engineers of Nova Scotia (Registered Professional Engineer, No. 7472). I am a member of the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") and of the Prospectors and Developers Association of Canada ("PDAC").
4. I have worked as a mining engineer for 14 years since graduating from university. This work has included the estimation of resources and reserves for precious metals, base metals and industrial minerals, as well as participation in pre-feasibility and feasibility studies.
5. 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 fulfil the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I was a co-author of the report titled "ScoZinc Mine, Preliminary Economic Assessment," dated October 7, 2011. I authored Sections 4.1, 4.3, 4.4, 4.5.1, 4.6, 5, 6.1.1, 6.2.1, 6.3.1, 7 excluding 7.3.2, 8, 9.1, 10.1, 10.2, 11.1, 11.3.1, 11.3.3, 12.1, 12.3, 14.1 (Mineral Resource Estimate, Gays River Deposit) except for two parts: Section 14.1.3 (Main Zone Resources) and Section 14.1.6 (comparison of block model with blast hole samples), 23 and 26.1
7. I have read NI 43-101 and Form 43-101F1. This Technical Report has been prepared in accordance with that Instrument and Form.
8. I visited the Scotia Mine property many times since 2004. As an independent consultant, I supervised exploration work on the property including diamond drilling and trenching. I carried out several assignments for ScoZinc as an independent consultant during the period 2006-2011, including authoring a reclamation plan. I last visited the property in 2010.



9. I have had prior involvement with ScoZinc Limited and the property that is the subject of the Technical Report (refer to Item 8 for details).
10. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.
11. I am independent of the issuer, Selwyn Resources Limited, applying all of the tests in Section 1.4 of NI 43-101 and Section 3.5 of NI 43-101 CP. Accordingly, I am also independent of ScoZinc Limited and Acadian Mining Limited.
12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public.
13. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the report not misleading.

Effective Date: August 30, 2011

Signing Date: October 7, 2011

***[Original signed and sealed by]***

***[Doug Roy]***

---

William Douglas Roy, M.A.Sc., P. Eng.

Consultant Mining Engineer, MineTech International Limited

### **29.3 CERTIFICATE OF CO-AUTHOR – M.P. CULLEN**

I, Michael P. Cullen, P. Geo. do hereby certify that:

1. I am currently employed as a Senior Geologist by Mercator Geological Services Limited located at 5 Queen St, Dartmouth, Nova Scotia, Canada.
2. I graduated with a Master of Science Degree (Geology) from Dalhousie University in 1984. In addition, I obtained a Bachelor of Science degree (Honours, Geology) in 1980 from Mount Allison University.
3. I am a registered member in good standing of the following professional associations: (1) Association of Professional Geoscientists of Nova Scotia, registration number 064, Professional Engineers and Geologists of Newfoundland and Labrador, registration number 05058 and Association of Professional Engineers and Geoscientists of New Brunswick, registration number L4333.
4. I have worked as a geologist in Canada and internationally since graduation from university.
5. 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
6. I am the qualified person responsible for preparation of a mineral resource estimate for the Getty Zn-Pb deposit as described in sections 4.5.2, 6.1.2, 6.2.2, 6.3.2, 7.3.2, 9.2, 10.3, 11.2, 11.3.2, 11.3.3, 12.2, 12.3, 14.2 and 26.2 of the technical report entitled: "ScoZinc Mine Preliminary Economic Assessment, Gays River, Nova Scotia" (the "Technical Report") with an effective date of August 30, 2011.
7. I have visited the Getty Property on numerous occasions since September, 2006 and most recently visited the property on August 4th, 2011. I have inspected diamond drill core at the core logging facility at the Scotia Mine site and participated in planning and management of deposit delineation core drilling and resource estimation programs carried out by Mercator on behalf of Acadian Mining during the 2007 through 2009 period.
8. I previously reviewed and reported on historic Getty deposit drilling results on behalf of Savage Zinc Inc., this work being carried out by Mercator on a fee for service basis in 2001. I am also a co-author of two previously disclosed National Instrument 43-101 compliant mineral resource estimates for the Getty deposit that were prepared by Mercator for Acadian Mining.

9. I have extensive experience in the Carboniferous stratigraphy and zinc lead mineralization within Nova Scotia having worked and managed drilling programs within the Gays River area and other areas of Nova Scotia over my 30 year career.
10. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.
11. I am independent of the issuer 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 believe that this Technical Report has been prepared in compliance with that instrument and form.
13. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Effective Date: August 30, 2011

Signing Date: October 7, 2011

***[Original signed and sealed by]***

***[Michael P. Cullen]***

---

Michael P. Cullen, M. Sc., P. Geo.

Senior Geologist, Mercator Geological Services Limited

## 29.4 CERTIFICATE OF CO-AUTHOR – E.J. PURITCH

I, Eugene J. Puritch, P. Eng., residing at 44 Turtlecreek Blvd., Brampton, Ontario, L6W 3X7, do hereby certify that:

1. I am President of P & E Mining Consultants Inc. and am contracted independently by Allnorth Consultants Limited.
2. This certificate applies to the Technical Report titled, "ScoZinc Mine Preliminary Economic Assessment, Gays River, Nova Scotia" (the "Technical Report") with an effective date of October 7, 2011.
3. I am a graduate of The Haileybury School of Mines, with a Technologist Diploma in Mining, as well as obtaining an additional year of undergraduate education in Mine Engineering at Queen's University. In addition I have also met the Professional Engineers of Ontario Academic Requirement Committee's Examination requirement for Bachelor's Degree in Engineering Equivalency. I have practiced my profession continuously since 1978. My summarized career experience is as follows:

- Mining Technologist - H.B.M.&S. and Inco Ltd.	1978-1980
- Open Pit Mine Engineer – Cassiar Asbestos/Brinco Ltd	1981-1983
- Pit Engineer/Drill & Blast Supervisor – Detour Lake Mine	1984-1986
- Self-Employed Mining Consultant – Timmins Area	1987-1988
- Mine Designer/Resource Estimator – Dynatec/CMD/Bharti	1989-1995
- Self-Employed Mining Consultant/Resource-Reserve Estimator	1995-2004
- President – P & E Mining Consultants Inc.	2004-Present
4. I am a mining consultant currently licenced by the Professional Engineers of Ontario (Licence No. 100014010) and registered with the Ontario Association of Certified Engineering Technicians and Technologists as a Senior Engineering Technologist. I am also a member of the National CIM.
5. I am responsible for Sections 15 and 16 and contributed to portions of sections 21, 22, 25 and 26.
6. I visited the ScoZinc Property on May 3, 2011.
7. I have had no prior involvement with the Property that is the subject of this Technical Report.
8. As of the date of this certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

9. I am independent of the issuer applying the test in Section 1.4 of NI 43-101.

10. I have read NI 43-101 and Form 43-101F1 and the Report has been prepared in compliance therewith.

Effective Date: August 30, 2011

Signing Date: October 7, 2011

**{SIGNED AND SEALED}**

**[Eugene J. Puritch]**

---

Eugene Puritch, P.Eng.

## **29.5 CERTIFICATE OF CO-AUTHOR – P. TAGGART**

I, Peter Taggart, P.Eng, residing at Bowen Island, B.C., Canada do hereby certify that:

1. I am the Principal of P. Taggart & Associates Ltd., with a business office at 1660 Whitesails Drive, Bowen Island, British Columbia, V0N 1G0.
2. I am a graduate of the University of Nottingham, United Kingdom (B.Sc. Joint Honours Mining and Metallurgy, 1966).
3. I am a member in good standing with the Association of Professional Engineers and Geoscientists of British Columbia (License# 14,298).
4. I have practiced my profession continuously since graduation. I have fulfilled senior management positions in operating companies and engineering firms. I have been the Principal of P. Taggart & Associates Ltd. since 1992.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association, as defined by NI 43-101, and past relevant work experience, I fulfill the requirements to be a "qualified person". I have considerable experience pertaining to the metallurgical testing, development and subsequent operations of base metal projects.
6. I am responsible for Sections 13, 17 and parts of Section 21 in the technical report entitled, "ScoZinc Mine Preliminary Economic Assessment, Gays River, Nova Scotia", October 7, 2011". I have provided consulting engineering services to Selwyn Resources Ltd. on the ScoZinc Project since December 2010.
7. I visited the ScoZinc property in May 2011.
8. I am independent of the issuer, Selwyn Resources Ltd., applying all the tests in Section 1.4 of NI 43-101.
9. I have read National Instrument 43-101 and Form 43-101F1, and the subject technical report has been prepared in compliance with that instrument and form of reporting.
10. As of the date of this certificate, and to the best of my knowledge, information and belief, the subject technical report contains all information that is required. There is nothing in the report that would make the information misleading.
11. I consent to the filing of the subject Technical Report with any stock exchange and any other regulatory authority and any publication by them, including electronic

publication in the public company files on their websites accessible by the public, of the subject Technical Report.

Effective Date: August 30, 2011

Signing Date: October 7, 2011

***{SIGNED AND SEALED}***

***[Peter Taggart]***

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Peter Taggart, P.Eng.

## 29.6 CERTIFICATE OF CO-AUTHOR – P.G. ORAM

I, Peter G. Oram, P. Geo. do hereby certify that:

1. I currently reside in Halifax, Nova Scotia, Canada and I am currently employed as Vice President and Principal with:  
Conestoga-Rovers & Associates Limited  
45 Akerley Boulevard  
Dartmouth, Nova Scotia, Canada  
B3B 1J7
2. I graduated with a Bachelors Degree in Geology/Geography from Mount Allison University in 1987. In addition, I have completed Masters and Bachelor level courses in Groundwater Chemistry and Hydrogeology.
3. I am a registered member in good standing of the Association of Professional Geoscientists of Nova Scotia, registration number 027.
4. I have worked as a geologist in various parts of Canada for over 25 years since my graduation from university. I have been involved in all aspects of mineral resource projects from exploration to development to reclamation planning and closure with a focus on mine permitting and hydrogeology.
5. 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.
6. I am responsible for Sections 4.3 and 20 of the Technical Report.
7. To the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make those sections of the technical report not misleading.
8. I am independent of ScoZinc Limited applying all of the tests in Section 1.5 of National Instrument 43-101.

Effective Date: August 30, 2011

Signing Date: October 7, 2011

**{SIGNED AND SEALED}**

**[Peter G. Oram]**

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Peter G. Oram, P. Geo.

Vice President, Conestoga-Rovers & Associates Limited