A.C.A. HOWE INTERNATIONAL LIMITED
Mining and Geological Consultants

TECHNICAL REPORT AND
PRELIMINARY ECONOMIC ASSESSMENT

of the

SONG TOH – BOH YAI PROPERTIES,
KEMCO PROJECT
THONG PHAPHUM DISTRICT
KANCHANABURI PROVINCE, THAILAND

for

SOUTHEAST ASIA MINING CORP.

Report No. 968

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Effective Date: March 31, 2013
Signing Date: April 19, 2013

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1. EXECUTIVE SUMMARY

1.1. INTRODUCTION

A.C.A Howe International Limited ("ACA Howe") was retained by Southeast Asia Mining Corporation ("SEA") to provide a Technical Report and Preliminary Economic Assessment ("the Report") of the Song Toh and Boh Yai historical silver-lead-zinc mining operations in Kanchanaburi Province, Western Thailand (the "Property"). **It should be noted that the economic analysis contained in this report is based, in part, on Inferred Resources, and is preliminary in nature. Inferred Resources are considered too geologically speculative to have mining and economic considerations applied to them and to be categorized as Mineral Reserves and there is no certainty that economic forecasts upon which this PEA is based will be realized.**

SEA and its wholly controlled subsidiaries Southeast Asia Exploration and Mining Co. Ltd. ("SEAM") and Southeast Asia Mining Co. Ltd. ("SEAMC") entered into an Amended Joint Venture Agreement ("JVA") dated October 15, 2012 with Mr. Pornnaret Klipbua ("Pornnaret"), Kanchanaburi Exploration and Mining Company Limited ("KEMCO") and Boh Yai Mining Company Limited ("BYMC") for the Song Toh and Boh Yai mines. The JVA provides SEA with the option to earn an 80% interest in the mining lease applications comprising the mines and an 80% interest in the flotation plant, buildings and equipment. **This PEA is prepared for 100% of the project revenues and expenditures and does not take into consideration the cost for SEA to earn an 80% interest in the mining lease applications comprising the mines, an 80% interest in the floatation plant, buildings and equipment, or its partner's 20% interest pursuant to the JVA.**

1.2. PROPERTY DESCRIPTION AND LOCATION

The properties comprise two distinct license groups around the Song Toh and Boh Yai mines and are situated in the Meklong Highlands, a tropical forest region in Kanchanaburi Province lying between the valleys of the Khwae Yai (River Kwai) and Khwae Noi Rivers, approximately 300 km northwest of Bangkok and 186 km from the Kanchanaburi town.

1.3. CLIMATE, LOCAL RESOURCES, & PHYSIOGRAPHY

The Thai climate is of the monsoon type with an average rainfall per annum of 1,700mm. The project site is located in the central part of Thailand.

This area has a tropical climate with the influence of seasonal monsoons. During the rainy season (May to October) significant rainfall, high humidity and dense cloud will be experienced. During the cold season (November to February) light rainfall, lower humidity and clear sky will be experienced. The rest of the year from March to April consists of hot and dry conditions.

Transportation to and from the mine sites is well served by both hard top highways/roads. These routes were used historically for transportation of concentrate from the Song Toh processing plant to smelters. The main provincial highways are suitable for trucks carrying approximately 35 tonnes.

Roads directly to both sites of Song Toh and Boh Yai from Highway 323 are limited for 12 tonne trucks for a distance of 26 and 24 kilometers, respectively.

Supplies and labour are available at Thong Phaphum town and villages closer to the site. Kanchanaburi town is a much larger source. Material unavailable locally can be sourced in Bangkok. Some specialized mining supplies must be imported.

The topography of Kanchanaburi province is a combination of mountain ranges, valleys, and river plains. The northern and western regions are mostly mountainous, and include the Thanon Thong Chai and Tanawsi mountain ranges. These mountainous areas are largely covered in evergreen and deciduous forests. The northeast region of Kanchanaburi consists of undulating land, and the far east and the south are mostly river plains.

The general topography of the Song Toh and Boh Yai project area is characterized by low hills, alternating with valleys and level areas between 600 and 650 meters altitude. The Song Toh project area lies between steep limestone hills to the east and the west. There are two mountains near the project area, Khao Tue Kalo and Khao Song Toh, which are located southwest of the project area, rising to elevations of 900 msl and 800 msl, respectively. The Boh Yai project area is located on the Tanawsi limestone ridge, which comprises karst topography and includes many sinkholes, springs, and caves.

1.4. GEOLOGY

The Song Toh and Boh Yai deposits are hosted by Lower to Middle Ordovician carbonates that form a NNW-trending belt extending from the Gulf of Thailand to China. They comprise two distinct facies; a pale fossiliferous limestone and a dark fine-grained argillaceous limestone. The carbonate succession is folded along NNW axes that dip steeply east which has resulted in a series of asymmetrical anticlines with steep or overturned western limbs (70-90 dip) and shallow eastern limbs (dipping 20-45 degrees east).

The mineralization is confined to the pale limestone facies in which it forms conformable stratabound bands that are generally highly deformed. Mineralization comprises intergrown galena, sphalerite and pyrite, with varying content of silver and mercury. The mineralization appears to be of Mississippi Valley Type with affinities to Alpine.

1.5. HISTORICAL MINING

Mining operations were carried out by Metallgesellschaft AG ("MG") between 1978 and 1991, after which operations were continued by KEMCO until 2002 when the mine closed due to low metal prices. During this period, 4.46 Mt tonnes of ore was mined from the Song Toh operation and 0.79Mt from the Boh Yai operation. Underground mining was by room and pillar in shallow dipping parts of the orebody and by overhead open stoping in steeply dipping parts. Close grade control was required in order to avoid undue dilution due to the irregular shape of the numerous oreshoots. The Property has had a successful operating history and only closed due to poor metal prices. There is no apparent reason operations could not be resumed with the current higher metal prices and new operating staff.

A wealth of mining, drilling and geological information remains available at the Song Toh mine offices in hardcopy format. Drilling information has been reviewed, analysed and captured in digital format in order to allow estimation of drilled resources. Additional information needs to be captured to allow an assessment of old mine workings and potential of the greater area. The Property clearly warrants further exploration.

1.6. CIM Compliant Resource

The resource estimation procedure is fully described in the November 2012 Technical Report. The current resource estimate is shown on the following table.

Boh Yai and Song Toh Resources by Deposit (Cut-Off Grade 3% Pbeq)

Deposit	Class	Tonnes	Pb, %	Zn, %	Ag, g/t
Boh Yai	Indicated	2,138,000	3.12	3.49	73.84
Song Toh SW	Indicated	318,000	2.84	0.25	87.27
Song Toh Camp	Indicated	439,000	6.29	1.42	56.13
Total	Indicated	2,896,000	3.57	2.82	72.63
Boh Yai	Inferred	1,643,000	2.36	3.37	44.10
Song Toh SW	Inferred	179,000	4.70	0.05	78.35
Song Toh Camp	Inferred	133,000	7.80	3.53	68.40
Total	Inferred	1,955,000	2.95	3.08	48.89

Notes for Resource Estimate:

1. Cut-off grade for mineralized zone interpretation was 3.0% Pb Equivalent.
2. **Mineral resources, which are not mineral reserves, do not have demonstrated economic viability. The estimate of mineral resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.**
3. The database used by ACA Howe for the resource estimate contains 3,914 Pb, Zn and Ag assay results from 551 surface and underground diamond drill holes (total of 58,078 metres). Samples were assayed historically by the mine laboratory at Song Toh with check samples by SGS. A representative number of core and pulp samples that were analysed in 2012 by ALS provided verification of the historical assays.
4. Lead Equivalent - Pbeq - was calculated using prices of US$0.93/lb lead, US$0.90/lb zinc, and US$ 23.03/oz silver, (with no provision for metallurgical recoveries). The formula used was Pbeq% = Pb% + 0.962Zn (%) + 0.0360Ag (g/t). Small discrepancies may exist due to rounding errors.
5. Mineralized domains were modelled with the aid of drill results and detailed interpretations of geology recorded on historical plans. A total of 42 individual domains was identified, including 28 at the Boh Yai deposit 9 at the Song Toh SW deposit and 5 at the Song Toh Camp deposit.

6. Micromine block models with block cell dimensions of 4.0 metres and sub blocks of 2.0 metres were coded to reflect surface topography and geology. Metal values from 1.0 metre drill composites were interpolated to block models using Inverse Distance Squared weighting (IDW2) according to parameters and search ellipsoids established from analysis of the variography within each domain. A three-pass approach was used to interpolate metal into the blocks. A density factor of 2.9 t/m3 was assigned to all mineralized domains based on historical measurements of specific gravity. For resource classification, 2 drill holes with 3 composites and a search distance less than the range were required for Indicated category, remaining blocks were assigned to Inferred category.
7. Resource estimate prepared by Richard Parker, C.Eng.
8. Tonnages are rounded to nearest 1,000.

1.7. MINING

Mining will be carried out with the same underground methods that were in use in 2002. Rock will be moved with rubber-tired, diesel-powered loaders and trucks. Most of the ore will be mined at Boh Yai and trucked 14km to the Song Toh concentrator. At Song Toh Mine, the Camp Zone will be developed near Mine North (MN) and there are remnants to be mined South West (MSW). Stopes vary in width from 2m to 10m and greater. The stopes vary from flat lying (less than 10° dip) to shallow dipping (less than 30°) to steeply dipping (more than 60°).

Stopes will be mined using the room-and-pillar mining method and the overhand open stoping method. Room-and-pillar will be used where the ore zone dips at a shallow angle. Pillars will be left as required, with the lowest grade material being left in pillars as much as possible. The stopes will be accessed from sub-levels that will be 12m apart vertically. Overhand open stoping will be used in steeply dipping ore zones. In this case, the stopes will be accessed from sub-levels that will be 15m apart vertically. The rock will be removed from the stope after the miners have reached the sub-level above. The stopes will then be backfilled and the miners will continue to the next sub-level.

The mineralized zones are accessed with tunnels, ramps, and drifts driven in waste rock. Their excavation will usually employ mobile drilling units (“drill jumbos”) equipped with heavy rock drills. Blasted rock will be removed by an LHD. The main haulages, with a maximum gradient of 1:9 (11%), accommodated trucks carrying a 16t payload. Other ramps have a maximum gradient of 1:7 (14%); the 10t trucks operated here. Rock from waste development will be used for backfilling stopes or crushed and used for maintenance of roadways.

Stoping areas at Boh Yai and MSW will be developed from existing underground workings. The Camp Zone will be accessed from a new ramp driven from surface.

In preliminary mine planning, ACA Howe used dilution and mining loss factors developed during the previous mining operations.

A preliminary geotechnical review concluded that past practice for mining layouts should continue to be effective at depths considered in the present plan.

In addition to jackleg drills, the main mining equipment will consist of load-haul-dump machines, haul trucks, jumbo drill rigs, and a grader. Some of the equipment is on site and will be refurbished; other equipment will be purchased new. Used equipment, rebuilt to factory specifications, will also be considered.

Mining will be carried out by two crews working on day and night shift five days per week. The mining department is forecast to employ 328 persons, in addition to contractors hauling plant feed from Boh Yai to the plant at Song Toh.

For the purpose of the PEA, both Indicated and Inferred Resources are considered in the mining schedule. A 14-year schedule has been prepared incorporating dilution and mining losses. Since most of the rock is hard, production will be limited by the crushing and grinding section of the concentrator to 300,000 tonnes per year. SEA anticipates rehiring some experienced miners and supervisors, but much of the crew will be inexperienced at underground mining; it will take two years for mine production to ramp up to the full rate.

Mine ventilation will be re-established during the pre-production period.

In order to access the mineralized rock, much of the underground development will be excavated in waste rock. Some waste rock will also` be produced by hand sorting of screened, washed rock from a conveyor following the primary crusher in the mill. As in the past, waste rock will be used in several ways. Clean waste rock will be crushed and used for road maintenance and general construction. Some will be used for enlarging the tailings storage facility. It is not anticipated that there will be surplus rock to be permanently stockpiled.

All mineralized rock and development waste occurs in hard rock and explosives will be used to break the rock. The Company will produce an inventory of the quantity of explosives to the relevant government authority on a consistent basis and must strictly comply with the terms and conditions governing the use and storage of explosives pursuant to the Ministerial Regulations No. 9 (1970) in every respect. Explosives and detonators will be stored in separate magazines that will comply with current regulations.

1.8. Mineral Processing and Tailings Management

An intact processing facility in serviceable buildings exists at Song Toh. The concentrator had processed 5.2 million tonnes of lead-zinc ore of various types until 2002 when mining ceased. The facility is a conventional crushing, rod and ball mill grinding, flotation plant that had been configured in the past to produce a lead concentrate, a bulk lead-zinc concentrate and a zinc concentrate, either concurrently or separately according to type of ore received. The concentrator had been built in 1978 by Metallgesellschaft and was expanded/modified over the years. In the late 1940's Cominco operated a gravity concentration process (jig) at Boh Yai followed by a flotation plant in the early 1950s. However, no processing facilities remain at Boh Yai; all processing has taken place at Song Toh since 1978.

The facilities were inspected in 2012 by SEA experts and the processing components were found to be in generally good condition with significant service life judged to be remaining in all components. The 2012 inspection revealed a number of repairs and replacements that are needed in advance of plant restart.

The concentrator process flowsheet had historically been configured to process ores according to type. Mineralized rock produced by underground mining will be processed at the rehabilitated Song Toh concentrator facility in which lead and zinc concentrates and combined lead-zinc concentrates can be produced. Plant feed-specific flowsheets will be selected and optimized by SEA following plant restart to maximize recovery and maintain operations reliability. Current plans are for the production of four different-quality lead concentrates, as well as one zinc concentrate. Based on historical information, the main metallurgical performance parameters anticipated in a typical year during full production (year 3 and beyond) are summarized below. For this PEA, selected metallurgical performance criteria are also shown.

METALLURGICAL YIELD PARAMETERS

Ore Type	Total Tonnes (% of total)	Item	Pb	Zn	Ag
PbS Song Toh Pb:Zn > 5	246,500 (6.3)	Recovery	83%	40%	80%
		Pb Concentrate Grade	70.0%		
Mix Song Toh Pb:Zn < 5	457,600 (11.7)	Recovery	81%	20%	78%
		Pb Concentrate Grade	68.0%		
PbS Boh Yai	397,600 (10.2)	Recovery	90%	60%	90%
		Pb Concentrate Grade	75%		
Mix Boh Yai	2,792,800 (71.8)	Recovery	83%	6%	75%
		Pb Concentrate Grade	72.0%		
		Recovery	6%	78%	12%
		Zn Concentrate Grade		54%	
Total	3,894,500 (100)				

The lead concentrate will contain some zinc; zinc is not recovered in the lead smelting process and no revenue will be received by SEA for this zinc. Similarly, no payment will be received for the lead content of the zinc concentrate.

Of the projected annual mine production of 300,000t, it is planned that, in an average year, 20,000t of concentrate will be sold, 9,000t (3% of mill feed) of clean waste rock will be removed by hand sorting, and 271,000t will be placed in the tailings storage area.

The key components of the concentrator include three-stage crushing, rod and ball mill grinding, spiral and cyclone classifiers, and a complement of 56 flotation cells, which can be arranged according to process requirements. The historically successful strategies used at Song Toh of sequentially recovering lead mineralization from predominately lead feed or very low zinc feed will be applied. Lead-zinc feed will be subject to lead flotation, followed by zinc flotation. Normally, rougher flotation concentrate will be reground in ball mills and final concentrates produced in cleaner cells.

In general, the flotation circuit and reagents additions will be arranged in configurations according to the type of feed: Boh Yai lead ore, Boh Yai mix ore, Song Toh lead ore, Song Toh mix ore. Boh Yai lead feed produces a lead concentrate with typical metal content of 75% Pb and up to 2,000g/t Ag, depending on the silver grade in the feed.

Boh Yai mix feed will produce a lead concentrate (typically 72% Pb with up to 1,500g/t Ag) and a zinc concentrate, with a typical metal content of 54% zinc. Zinc smelters cannot recover any lead found in the zinc concentrate. At zinc smelters, silver recovery is poor; some payment may be received when the silver content is high.

Song Toh lead feed produces a lead concentrate with typical metal content of 70% Pb and up to 1,500g/t Ag, depending on the silver grade in the feed. Lead smelters cannot recover zinc and do not pay for any contained zinc.

There are three possible processing configurations for Song Toh mix feed – produce a lead concentrate only; produce a lead concentrate, zinc concentrate, and bulk (mix) concentrate; or subject to successful test results, produce a marketable zinc concentrate. The sale of a bulk concentrate depends on the availability and economics of smelter technologies such as Imperial Smelting type facilities in China.

After thickening and filtration, the lead and zinc flotation concentrates will be stored under cover and air-dried for reducing moisture content to levels acceptable for shipment (<8% moisture). Following establishment of steady state mining and concentrator operations, the installation of a moisture-reducing pressure filter will be considered in order to reduce concentrate inventory times.

Other concentrator upgrades to be considered in early stages of operation include conversion of metal-lined slurry pumps to conventional rubber lined pumps, installation of automatic slurry samplers and electronically controlled reagent feeders.

During the 1978 to 2002 production years, the concentrates were shipped from Song Toh in dump trucks covered with tarpaulins. SEA plans to ship concentrates in 1-tonne bulk bags loaded into shipping containers for export to lead and zinc smelters. Each bag will be sampled at the concentrator using pipe samplers to produce a composite sample, which will be analyzed for metal and free moisture content. Zinc concentrates could possibly be sold to Thailand's zinc smelter, but, at this early stage, no discussions have been held with the owner, Padaeng Industry. For the purpose of the PEA, concentrates will be shipped by ocean to lead and zinc smelters in Japan, Korea, China, or elsewhere in the world. The bulk bags will be transported in 12t loads to a depot located on Highway 323, then in 30t loads to the port. Smelters on tidewater in Japan and Korea have an ocean shipping distance of approximately 5,000km; south China ports are considerably closer.

The Song Toh laboratory building remains intact and serviceable with operational fume hoods and dust collectors. However the chemical analyses and laboratory sample preparation equipment have been removed and these need to be acquired for performing geology and concentrator assays. Equipment acquisition will include sample preparation equipment as well as chemical analyses equipment such as electronic balances, crucibles and glassware, hot plates and burners, a water purifier and an AA (atomic absorption) analyser.

The concentrator water supply will be sourced from Song Toh mine dewatering, tailings recycling and local fresh water sources (wells). Water recycled from tailings will require treatment to be suitable for reintroduction into the flotation circuit. This treatment would involve the removal of suspended solids and trace amounts of soluble heavy metals using a pH-adjusted lime treatment followed by activated carbon absorption of organic collectors and oils. Subject to confirmatory testing, the estimated cost for this water treatment is approximately US$0.55/m3, or US$1.00 per tonne of concentrator mineralized rock feed.

SEA plans to investigate water quality that reports to the local environment to ensure that water quality meets IFC (International Finance Corporation) guidelines.

Tailings management will be achieved by upgrading and expanding the existing tailings facility, which is a valley containment design containing about 5 Mt of tailings. About 3.5 Mt of tailings will be produced. The footprint of the existing tailings will be moderately increased up gradient in the valley.

Tailings will be spigotted at mill discharge density (about 30% solids) from both internal dykes and from upstream beaches to result in a 1% tailings slope. The Song Toh tailings are not acid generating and subject to test confirmation, metal leaching is expected to be minimal. The design and operation of the upgraded tailings facility will facilitate permitting and new tailings facility will be designed for closure. Capital costs for facility upgrading and preparation for operation are estimated to be US$1,527,000 million and costs for closure are estimated to be US$732,000 including a 20% provision for design and supervision.

1.9. General and Administration

The administration building is located at Song Toh, close to the warehouse and the maintenance garage.

Operation and maintenance of the housing (camp) at Song Toh and Boh Yai is part of the Administration function. The Administration Department keeps available a pool of vehicles and drivers.

The department maintains roads and power lines and administers the security group.

1.10. INFRASTRUCTURE

The Boh Yai site is connected to the national power grid and a line runs from Boh Yai to Song Toh. The Song Toh housing area and school (camp) are also connected to the villages to the northwest and a power line running along Highway 323 from Thong Phaphum.

The site uses a communications tower located on a hill near Song Toh. Telephone and high speed Internet are provided.

Plant tailings will be pumped as slurry to the tailings management area using a pipeline similar to the previous one. Water recovered from the decant tower will be pumped back to the water treatment plant to be located adjacent to the processing plant.

Domestic water is pumped from naturally fed reservoirs separately feeding both mine sites.

1.11. ENVIRONMENTAL CONSIDERATIONS

The concentrator and tailings water balance indicates zero discharge during operations; all water will be recycled to the process.

Some water will remain in the pore space between particles in the tailings management area, some will leave the site in the concentrate, and some will evaporate. On the other hand, rain will fall onto the tailings management area and increase the quantity of recycle water. The net deficit of process water is estimated to be 10m3 to 20m3 per hour.

Make-up water for the process plant will be pumped from a sump located beside the dewatering drift in Song Toh Mine North. Water flowing into the mines will greatly exceed the facility needs. The drift drains from Mine South to Mine North and continues another 1,700m to the Huai Chanee discharge portal. In the past, the discharged water met all quality objectives except for the quantity of suspended solids. Metallgesellschaft built a settling pond to allow settling of suspended solids before final discharge. Similarly, mine water at Boh Yai is collected in a dewatering- haulage drift and discharges at the base of Hill 7.

The Golder tailings report recommends additional fill placement in order to decrease slope angles for the present containment dam. This means that SEA's work will increase the long-term safety of the existing structure.

SEA will remove historical low-grade stockpiles from the Boh Yai area and process the rock during the re-commissioning of the plant. This will eliminate run-off from the stockpiles.

A detailed closure plan has not been completed for the project; however IEM has developed a preliminary rehabilitation plan. At this conceptual level, it has been assumed that the final tailings surface would be graded and a 0.5m thick layer of overburden would be placed over the tailings to minimize the ingress of water, reduce tailings erosion, and support vegetative growth. A dry cover would also prevent ponding of water on the surface to reduce long-term risks and improve dam stability.

Because of high carbonate content, acid generation of the tailings is not a concern.

The extent of post-closure effluent treatment will be established as the project advances.

At closure, all mine entrances will be capped with reinforced concrete and made safe. All buildings and structures will be removed, except any requested by the community. Inventory of chemicals and other supplies will be removed for sale or proper disposal. The sites will be graded and planted with indigenous species to ensure a sustainable ground cover.

1.12. Operating Cost

The cost estimates were prepared in Thai Baht and converted to US$ using an exchange rate of 31.0 Baht to the US dollar. The estimates were based on 22 years of operating history at the former mines and actual costs and budgets from 2002, which was the last year of operations.

Detailed operating budgets and production schedules were prepared for Year 1 and Year 2.

Averaged over the entire mine life, the operating cost estimate for Mining is US$21.89/t, for Processing US$9.90/t, and for General & Administration US$1.92/t. The total is US$33.71 per tonne.

The workforce is estimated to number 413 persons, not including contractors.

1.13. Capital Cost

Capital cost estimates have been prepared in Thai Baht and converted to US$ using an exchange rate of 31.0 Baht to the US dollar. The life-of-mine total capital cost before working capital, parts inventory, and initial fills is approximately US$37.2 million, of which US$12.6 million relates to pre-production capital expenditures and US$24.6 million relates to post-production capital expenditures.

Costs include new mining equipment, underground development, refurbishing the processing plant, infrastructure, expanding the tailings management area, sustaining capital, and site restoration at closure.

1.14. Financial Analysis

The economic analysis contained in this report is based, in part, on Inferred Resources, and is preliminary in nature. **Inferred Resources are considered too geologically speculative to have mining and economic considerations applied to them and to be categorized as Mineral Reserves and there is no certainty that economic forecasts on which this Preliminary Economic Assessment is based will be realized.**

ACA Howe has constructed an Excel spreadsheet model to determine the economic feasibility of re-opening the Song Toh and Boh Yai Mines subject to the JVA. The basic underlying assumptions and sources of data used in the model are:

- Only 100% of the project revenues and expenditures is considered and does not take into account the cost for SEA to earn an 80% interest in the mining lease applications comprising the mines, an 80% interest in the floatation plant, buildings and equipment, or its partner's 20% interest pursuant to the JVA.

- Costs are as of March 1, 2013.

- All units are metric units unless otherwise indicated.

- The basic monetary unit is the US Dollar. The Thai Baht is also used with an exchange rate of 31.0 Baht to the US dollar (based on the 3 year average exchange at February 28, 2013).

- Metal prices are based on the 3-year trailing average London Metal Spot price for lead and zinc and the 3-year trailing average for the London fixing for silver. These metal prices used are:

  - Lead, US$1.00 per lb. or US$2,204.62 per metric tonne
  - Zinc, US$0.95 per lb. or US$2,094.39 per metric tonne
  - Silver, US$30 per oz.

The mine schedule, production rates, and metal recoveries have been prepared by ACA Howe and SEA personnel. The following table shows the tonnages, grades and recoveries from each deposit.

CONCENTRATE RECOVERY

	Ore Mined (tonnes)	Metal Grades			Recoveries to Lead Concentrate		
		Lead (%)	Zinc (%)	Silver (g/t)	Lead (%)	Zinc (%)	Silver (%)
Boh Yai Pb	246,500	5.46%	0.01%	156	90.0%	60.0%	90%
Boh Yai Mixed	2,792,800	2.08%	3.18%	44	83.0%	6.0%	75.0%
Song Toh Pb	397,600	3.18%	0.17%	76	83.0%	40.0%	80.0%
Song Toh Mixed	457,600	6.08%	1.71%	51	81.0%	20.0%	78.0%
Total	3,894,500	2.88%	2.50%	55	83.2%	14.5%	76.8%
					Zinc	**Lead**	**Silver**
Boh Yai Mixed	Recoveries to Zinc Concentrate				78.0%	6.0%	12.0%

All operating and capital cost estimates were prepared by ACA Howe and SEA personnel. These are summarized in the table on the following page.

Typical smelter terms have been used in the analysis.

The government of Thailand imposes royalties on metal concentrates via the Mineral Royalty Rates Act. Royalties are based on the metal content of the concentrate and not the payable amounts (if any). The act uses a sliding scale of royalties based on the metal prices at the time.

The Government of Thailand imposes taxes on all for-profit corporations in Thailand. While the tax rate had been 30%, the government lowered the rate to 20% for 2013 and 2014. ACA Howe has been advised by SEA's accounting consultant, John Casella, of PKF Tax and Consulting Services (Thailand) Ltd. that he believes that the Government of Thailand will follow past precedent and maintain the corporate tax rate at 20%. ACA Howe has used 20% in its Base Case and constructed an alternative calculation using 30%.

The Preliminary Economic Assessment demonstrates robust economics. The Base Case Net Present Value, discounted at 7.5%, is US$88.8 million with an IRR of 148% pre-tax and US$69.6 million with an IRR of 112% after tax. From the start of construction, the payback period is 1.5 years (1.3 years without tax). The sensitivity analysis indicates that the project can pay back the capital invested with a significant drop in metal prices, achieving a zero rate of return with the metal prices lowered 39%.

At this stage of analysis, the project is modeled to contribute US$30 million in corporate taxes and US$59 million in royalties to the Government of Thailand.

SUMMARY TABLE
$US

Mine Life	13 Years		
Metal Prices	**Imperial**	**Metric**	
Lead	$1.00 /lb	$2,205 /t	
Zinc	$0.95 /lb	$2,094 /t	
Silver	$30.00 /oz	$0.965 /g	
Exchange Rate	31	Baht per US dollar	
Ore Mined	3,894,500	tonnes	
Concentrate Produced	**Tonnes**	**$/t**	**Total Value**
Lead Concentrate	131,315	$2,231	$293,000,000
Zinc Concentrate	128,318	$664	$85,200,000
Total Revenue	259,633	$1,456.67	$378,200,000
Less: Government Royalties		$227.24	$59,000,000
Net Revenue		$1,229.43	$319,200,000
Metal Revenues	**Total NSR Value**	**Less Royalties**	**Net Smelter Return**
Lead	$152,600,000	$25,800,000	$126,800,000

Silver	$131,300,000	$13,600,000	$117,700,000
Zinc	$94,300,000	$19,600,000	$74,700,000
Total	$378,200,000	$59,000,000	$319,200,000
Operating Costs	**$/tonne Ore**	**US$**	**Thai Baht (฿)**
Mining	$21.89	$85,264,000	฿2,643,200,000
Processing	$9.90	$38,540,000	฿1,194,700,000
General & Administration	$1.92	$7,462,000	฿231,300,000
Total Operating Cost	$33.71	$131,266,000	฿4,069,200,000
EBITDA	$48.24	$187,887,000	฿5,824,500,000
Capital Costs	**$/tonne Ore**	**US$**	**Thai Baht (฿)**
Initial Capital Costs	$4.14	$16,118,000	฿499,700,000
Total Capital Costs	$9.55	$37,192,000	฿1,153,000,000
Maximum Working Capital	$1.84	$7,170,000	฿222,300,000
Depreciation (UoP)	$9.46	$36,853,000	฿1,142,400,000
Corporate Taxes	**Corporate Tax Rate**		
(US dollars)	0%	20%	30%
Taxes Paid	-	$30,462,000	$45,693,300
Internal Rate of Return	148%	112%	95%
Payback Period from Start of Development	1.32 Years	1.53 Years	1.69 Years
Net Cash Flow to Project	$150,695,000	$120,233,000	$105,001,000
Net Present Value discounted at:			
5.0%	$104,730,000	$82,631,000	$71,582,000
7.5%	$88,768,000	$69,614,000	$60,037,000
10.0%	$75,963,000	$59,192,000	$50,807,000
12.5%	$65,567,000	$50,749,000	$43,340,000
15.0%	$57,031,000	$43,832,000	$37,232,000

ACA Howe has tested the sensitivity of the project to changes in metal prices, metal grades, operating costs and capital costs. In each case these have been varied up and down by 30%. As would be expected, the project is most sensitive to metal prices followed by metal grades. It is less sensitive to operating costs and least sensitive to changes in capital costs. It should be noted that the project still returns an after tax net cash flow of US$30 million when the metal prices are reduced by 30%.

In order of most sensitive to least sensitive the parameters are:

1. All metal prices

2. Metal grades
3. Lead price alone
4. Silver price alone
5. Operating costs
6. Zinc price alone
7. Capital costs

The breakeven prices (i.e. the metal prices at which the project repays the capital but no profit is generated) are jointly US$0.607/lb. for lead, US$0.577/lb. for zinc and US$18.22/oz for silver. In this case each price has been reduced by approximately 39%. If silver and zinc prices are kept constant (i.e. at the base case prices) the lead price must be reduced to US$0.05/lb. to achieve breakeven.

1.15. CONCLUSIONS

The Preliminary Economic Assessment demonstrates robust economics. The Base Case Net Present Value, discounted at 7.5%, is US$88.8 million with an IRR of 148% pre-tax and US$69.6 million with an IRR of 112% after tax. From the start of construction, the payback period is 1.5 years (1.3 years without tax). The sensitivity analysis indicates that the project can pay back the capital invested with a significant drop in metal prices, achieving a zero rate of return with the metal prices lowered 39%.

At this stage of analysis, the project is modeled to contribute US$30 million in corporate taxes and US$59 million in royalties to the Government of Thailand.

The present resource base appears able to support production at the existing processing plant for 14 years. Extending the life would require further exploration to extend the known zones and exploration at other targets on the licence area.

The Indicated Resources would feed the plant for 9 years; the remaining life depends on resources classified as Inferred.

Song Toh and Boh Yai Mines are in good condition and can be placed into production quickly. The Camp Zone near Song Toh Mine North will be a new development, separate from the other Song Toh workings.

The existing processing plant can easily be refurbished and should be able to treat 300,000 tonnes of feed per year. Minor modifications can be expected to result in improved metallurgical performance over historical performance.

The existing tailings facility can be upgraded with minimal increase in footprint to accommodate the expected tonnage of tailings over 14 years.

The preliminary estimate of jobs to be created is 413, not including truck haulage from Boh Yai Mine to the processing plant and not including haulage and handling of concentrates.

1.16. RECOMMENDATIONS

Engineering Studies

SEA should proceed with permitting. The following engineering and environmental studies should be completed in order to support the applications.

- A detailed analysis of topography and hydrogeology should be conducted in order to determine the water flow in, and surrounding the former mines;
- A Health and Environmental and Impact Assessment ("HEIA") should be completed as further detailed in section 26.4.
- Testwork is required to prepare design and costing for water management and the proposed water treatment plant.

The cost to complete the engineering studies outlined above is estimated to be $600,000.

Exploration Data

Data compilation within the immediate mine areas has largely been completed, but the Company should continue the compilation and indexing of all available historical data.

The estimated cost to complete the data compilation is $100,000.

Exploration

Following the compilation and review of available data an exploration programme should be designed to test the wider potential of the Limestone Belt. Consideration should be given to exploring the whole of the belt on a reconnaissance scale. Exploration to date has identified a number of Pb and Cu soil anomalies and IP anomalies peripheral to the Song Toh and Boh Yai mines, which may be indicative of more extensive Pb-Zn mineralisation in these areas. Further work, including geological mapping and more detailed geochemical and geophysical surveys is warranted in order to further define drill targets. A provision of 1,000 m of drilling would be appropriate for testing of targets emerging from this work.

The estimated cost to complete the exploration program is $300,000.

2. INTRODUCTION

2.1. GENERAL

This Technical Report and Preliminary Economic Assessment (“the Report”) has been prepared by A.C.A. Howe International Limited (“ACA Howe”) at the request of Mr. Brian Jennings, President & CEO of Southeast Asia Mining Corp. (“SEA” or “the Company”). This report is specific to the standards dictated by National Instrument 43-101 in respect of the KEMCO Project consisting of the former producing Song Toh & Boh Yai silver-lead-zinc properties, located in Thong Phaphum District, Kanchanaburi Province, Thailand (the “Property”).

It should be noted that this report is based, in part, on Inferred Resources, and is preliminary in nature. Inferred Resources are considered too geologically speculative to have mining and economic considerations applied to them and to be categorized as Mineral Reserves and there is no certainty that economic forecasts upon which this Preliminary Economic Assessment is based will be realized.

SEA and its wholly controlled subsidiaries Southeast Asia Exploration and Mining Co. Ltd. and Southeast Asia Mining Co. Ltd. entered into an Amended Joint Venture Agreement (“JVA”) dated October 15, 2012 with Mr. Pornnaret Klipbua (“Pornnaret”), Kanchanaburi Exploration and Mining Company Limited (“KEMCO”) and Boh Yai Mining Company Limited (“BYMC”) for the Song Toh and Boh Yai mines. The JVA provides SEA with the option to earn an 80% interest in the mining lease applications comprising the mines and an 80% interest in the floatation plant, buildings and equipment.

This PEA is prepared for 100% of the project revenues and expenditures and does not take into consideration the cost for SEA to earn an 80% interest in the mining lease applications comprising the mines, an 80% interest in the floatation plant, buildings and equipment, or its partner’s 20% interest pursuant to the JVA.

2.2. TERMS OF REFERENCE

SEA requested ACA Howe to complete a NI 43-101 compliant Preliminary Economic Assessment (“PEA”) for the proposed underground mining and on-site milling of the Song Toh & Boh Yai silver-lead-zinc deposits located in Thong Phaphum District, Kanchanaburi Province, Thailand (the “Project”).

Southeast Asia Mining Corp. is a Canadian based mineral resource company, with its corporate offices at: 130 Adelaide Street West Suite 1010, Toronto, Ontario, Canada.

ACA Howe is an international mining and geological consulting firm that has been serving the international mining community for over 30 years. ACA Howe is well recognized by the major Canadian Stock Exchanges and provincial regulatory bodies and its personnel have worked on projects involving a wide variety of commodities and deposit types throughout the world. The firm’s services are provided through offices in Toronto and Halifax, Canada; and London, England.

Neither ACA Howe nor any of the Authors of the opinions expressed in this Report (nor family members nor associates) have business relationships with the Company or any associated company, nor with any other company mentioned in this Report, which is likely to materially influence their impartiality or create the perception that the credibility of this Report could be compromised or biased in any way. The views expressed herein are genuinely held and deemed independent of the Companies.

Moreover, neither the Authors of this Report nor ACA Howe (nor their family members nor associates) have any financial interest in the outcome of any transaction involving the Property considered in this Report, other than the payment of normal professional fees for the work undertaken in its preparation (which are based upon hourly charge-out rates and reimbursement of expenses). The payment of such fees is not dependent upon the content or conclusions of either this Report, nor any consequences of any proposed transaction.

The PEA assesses the potential economic viability and practicality of the proposed underground mining and on-site milling operation. The PEA is based on the NI 43-101 compliant Mineral Resource Estimate completed by ACA Howe, entitled "Mineral Resource Estimate of the Song Toh – Boh Yai Properties, KEMCO Project, Kanchanaburi Province, Thailand" and with effective date October 30, 2012 (Parker, 2012).

This Report presents the results of the Project's NI 43-101 compliant PEA with recommendations to allow SEA and current or potential partners to reach informed decisions. ACA Howe understands that this report will be used for both internal decision making purposes and in support of public equity financings.

This Report:

1. Re-states the NI 43-101 compliant Mineral Resource Estimate presented in the 2012 ACA Howe report, which was prepared in accordance with the CIM Definition Standards for Mineral Resources and Mineral Reserves prepared by the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") Standing Committee on Reserve Definitions and adopted by CIM Council on December 11, 2005. Only mineral Resources were estimated – no Reserves were defined.

2. Presents a NI 43-101 compliant Preliminary Economic Assessment ("PEA") of the Project conducted by ACA Howe, where ACA Howe's mandate is to assess the practicality and potential economic viability of an underground mining operation at the Song Toh & Boh Yai lead-zinc deposits.

The effective date of this Report is March 31, 2013; the mineral resource estimate is restated from the 2012 ACA Howe report with an effective date of October 30, 2012 and which remains current.

This Report was prepared and co-authored by Mr. Richard Parker, C.Eng., Senior Associate Geologist; Messrs. Bruce Brady, P. Eng.; and Gordon Watts, P. Eng., Senior Associate Engineers, all with ACA

Howe and Qualified Persons (QP) under the regulations of NI 43-101, and Mr. Grant Feasby, M.Sc., with EHA Engineering Ltd. and Associate Metallurgist with ACA Howe. Richard Parker conducted a site visit to the Property between December 3rd and 7th, 2011. Bruce Brady conducted site visits between January 4th and 7th, 2012 and between April 16th and 24th, 2012.

In addition to the site visit, ACA Howe carried out a review of literature pertaining to the properties and held discussions with consultants and personnel from KEMCO who had previously worked in the mining operations. The reader is referred to the data sources, which are outlined in the "Sources of Information" & "References" sections of the report, for further background information relating to the region.

SEA has accepted that the qualifications, expertise, experience, competence and professional reputation of ACA Howe's Principals and Associate Geologists and Engineers are appropriate and relevant for the preparation of this Report. The Company has also accepted that ACA Howe's Principals and Associates are members of professional bodies that are appropriate and relevant for the preparation of this Report.

SEA has warranted that full disclosure of all material information in its possession or control at the time of writing has been made to ACA Howe, and that it is complete, accurate, true and not misleading. The Company has also provided ACA Howe with an indemnity in relation to the information provided by it, since ACA Howe has relied on SEA's information while preparing this Report. The Company has agreed that neither it nor its associates or affiliates will make any claim against ACA Howe to recover any loss or damage suffered as a result of ACA Howe's reliance upon that information in the preparation of this Report. SEA has also indemnified ACA Howe against any claim arising out of the assignment to prepare this Report, except where the claim arises out of any proven willful misconduct or negligence on the part of ACA Howe. This indemnity is also applied to any consequential extension of work through queries, questions, public hearings or additional work required arising out of the engagement.

This report is considered current as of March 31, 2013.

The present Technical Report is prepared in accordance with the requirements of NI 43-101 and form NI 43-101F1 of the OSC and the CSA.

2.3. Sources of Information

This report is based both on information provided in internal company documents, plans, sections and drill logs, as well as public information as listed in the "References" section of this report.

Wherever reports, articles or papers by other individuals have been quoted they are clearly referenced.

The information gathered for this report was obtained through a number of technical meetings, follow-up research of published technical papers, referenced in section 27 and publicly available material available from the internet, principally from Thailand's Department of Mineral Resources ("DMR") and Department of Primary Industries and Mines ("DPIM").

During the course of the historical operation of Song Toh and Boh Yai mines, detailed information was held primarily in the form of paper files and historical drawings located at the KEMCO and BYMC office in Song Toh. SEA has selected the most relevant and most recent of these for digital scanning. Other information includes assay sheets, drill survey sheets and drill logs which are held on file in the mine office which were transcribed to digital format to create a database suitable for resource estimation.

2.4. UNITS & CURRENCY

Units of measurement used in this report conform to the SI (metric) system. Base metal assay values is given in percent ("%") or in parts per million ("ppm"). Precious metal values are reported in grams per tonne ("g /t"). Currencies used in this report are Thai Baht and US$. The exchange rate on March 15, 2013 was B29.54/US$.

2.5. GLOSSARY AND ABBREVIATION OF TERMS

In this document, in addition to the definitions contained heretofore and hereinafter, unless the context otherwise requires, the following terms have the meanings set forth below:

"ACA Howe" means A.C.A. Howe International Limited.
"Austhai" means Austhai Geological Consultants Limited.
"BC" means Bided Concession.
"Bhol and Sons" means a related company of KEMCO and BYMC.
"Boh Yai MLAs" means 6 mining lease applications at the Boh Yai mine.
"BYMC" means Boh Yai Mining Company Limited.
"C-Forest" means Conservative Forest.
"CIDA" means Canadian International Development Agency.
"CSA" means Canadian Securities Administrators.
"EPL" means Exclusive Prospecting Licence.
"DMR" means Thailand Department of Mineral Resources.
"DPIM" means Thailand Department of Primary Industry and Mines.
"E-Forest" means Economic Forest.
"ESRT" means Environmental Standards and Regulations of Thailand.
"Golder" means Golder Associates Ltd.
"GPL" means General Prospecting Licence.
"GMT" means GMT Corporation Limited.
"HEIA" means Health and Environmental Impact Assessment.
"IEM" means International Environmental Management Co. Ltd.
"JVA" means Joint Venture Agreement.
"KEMCO" means Kanchanaburi Exploration and Mining Company.
"KESIL" means Kenting Earth Sciences International Limited.
"LUP" means Land Use Permit.

"LUPA" means Land Use Permit Application.
"MAS" means Mineral Assay and Services.
"MG" means Metallgesellschaft.
"MI" means Ministry of Industry.
"Minerals Act" means the principal law governing exploration and mining in Thailand.
"ML" means Mining Lease.
"MLA" means Mining Lease Application.
"MNRE" means Ministry of Natural Resources and Environment.
"MSTE" means Ministry of Science, Technology and Environment.
"Mt" means millions of tonnes.
"MVT" means Mississippi Valley Type.
"New Boh Yai MLA" means revised and consolidated mining lease application at Boh Yai.
"New MLAs" means revised and consolidated mining lease applications at Boh Yai and Song Toh.
"New Song Toh MLA" means revised and consolidated mining lease application at Song Toh.
"NI 43-101" means National Instrument 43-101.
"NI 43-101F1" means form National Instrument 43-101F1.
"ONEP" means Office of Natural Resources and Environmental Planning.
"OSC" means Ontario Securities Commission.
"Pb-Zn" means lead-zinc.
"Pornnaret" means Mr. Pornnaret Klipbua controlling shareholder of KEMCO and BYMC.
"SEA" means Southeast Asia Mining Corp.
"SEAM" means Southeast Asia Exploration and Mining Co. Ltd.
"SEAMC" means Southeast Asia Mining Co. Ltd.
"SEA Shares" means common shares in the capital of SEA.
"SEAM SPLAs" means SEAM special prospecting licence applications.
"SIA" means Social Impact Assessment.
"Song Toh MLAs" means 4 mining lease applications at the Song Toh mine.
"SPL" means Special Prospecting Licence.
"SPLA" means Special Prospecting Licence Application.
"TMA" Tailings Management Area.

3. RELIANCE ON OTHER EXPERTS

The authors have relied upon, and believe that they have a reasonable basis to rely upon:

Golder Associates Ltd. for conceptual design and cost estimation for expansion of the existing tailings management area (Couto and Merry, 2013).

Golder Associates Ltd. for a preliminary assessment of underground geotechnical considerations (Roworth and Steed, 2012).

ACA Howe has assumed, and relied on the assumption, that all the information and existing technical documents listed in the sources of information section of this report are accurate and complete in all material aspects. While we carefully reviewed all the available information presented to us, we cannot guarantee its accuracy and completeness. We reserve the right, but will not be obligated to, revise our report and conclusions if additional information becomes known to us subsequent to the date of this report.

Although a copy of a legal contract between KEMCO, BYMC, Pornnaret, SEA, SEAM and SEAMC was reviewed, an independent legal opinion of this agreement has not been sought as part of this report nor has any verification of land title and tenure been performed. ACA Howe has not verified the legality of any underlying agreements that may exist concerning the properties or any other agreements between third parties but has relied on the clients solicitors, to have conducted the proper legal due diligence.

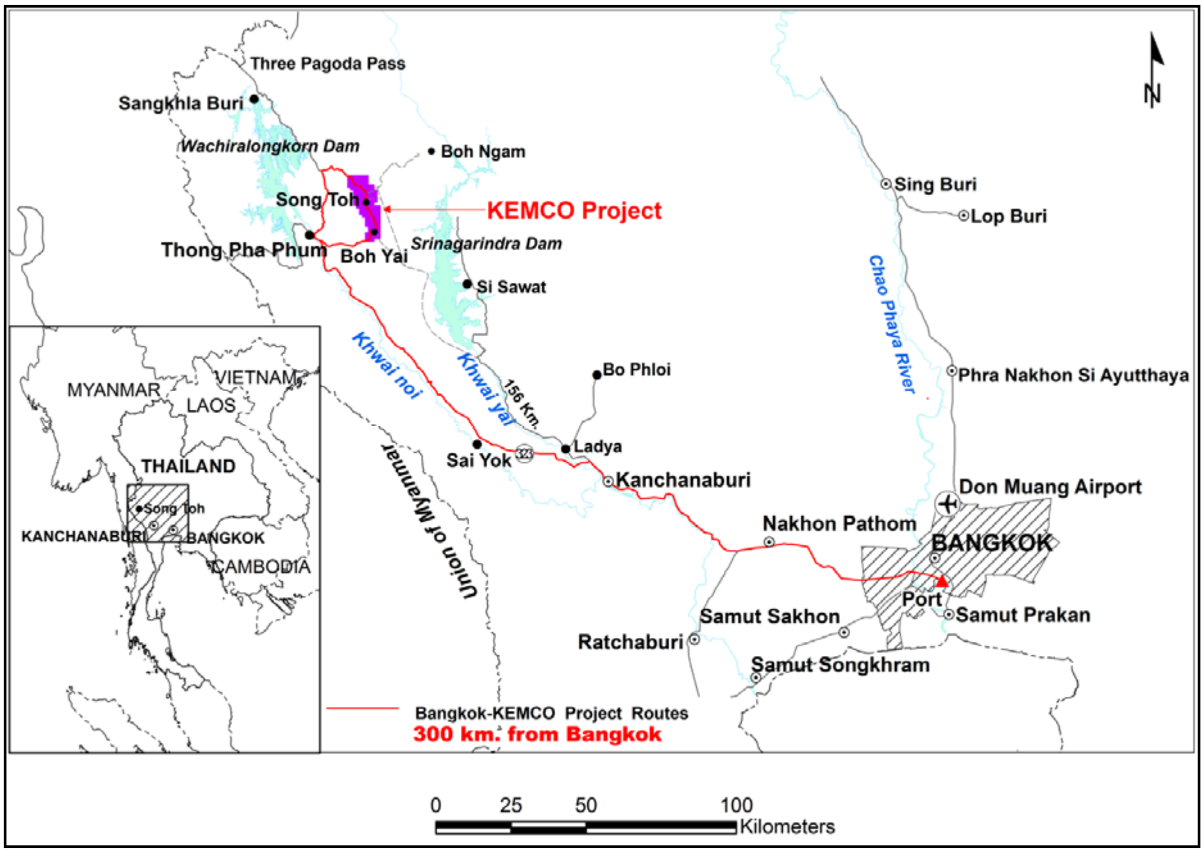
A draft copy of this report has been reviewed for factual errors by the client and ACA Howe has relied on SEA's knowledge of the Properties in this regard. All statements and opinions expressed in this document are given in good faith and in the belief that such statements and opinions are not false and misleading at the date of this report.

4. PROPERTY DESCRIPTION AND LOCATION

4.1. LOCATION

The properties comprise two distinct historical lease groups around the Song Toh and Boh Yai mines and are situated in the Meklong Highlands, a tropical forest region in Kanchanaburi Province lying between the valleys of the Khwae Yai (River Kwai) and Khwae Noi Rivers, approximately 300 km northwest of Bangkok (Diehl & Kern 1981) and 186 km from the Kanchanaburi town (Figure 4-1 below). The Song Toh Mine (office) is centered at 14° 51′ 00N″, 98° 47′ 50E″. The Boh Yai Mine (camp) is located 14 kilometers SSE of Song Toh at 14° 45′ 40N″, 98° 49′ 39E″.

FIGURE 4-1. KEMCO PROJECT LOCATION MAP



4.2. GENERAL INFORMATION ON THE MINING INDUSTRY IN THAILAND

4.2.1. THAILAND MINING REGULATION

The principal law governing exploration and mining in Thailand is the Minerals Act B.E. 2510 (1967) ("Minerals Act"), as amended. The Minerals Act governs onshore and offshore exploration, mineral production, mineral trading, ore-dressing, transport, and export of minerals other than petroleum. The Mineral Royalty Rates Act B.E. 2509 (1966) prescribes the rates of royalties to be assessed for different kinds of minerals. Royalties for lead and zinc ore are based on a progressive rate whereby the rates range from 2% to 15%. Royalty rates for copper, molybdenite and silver are fixed at 10% while royalty rates on gold range from 2.5% to 20%.

The Ministry of Industry ("MI") is the principal Thai government agency to govern the mining sector and has signing authority over all exploration and mining leases and permits. The DPIM of the MI is empowered to administer the Minerals Act and to issue ministerial regulations. The DMR of the Ministry of Natural Resources and Environment ("MNRE") provides technical assistance in exploration, mining, mineral processing and metallurgical activities. The DPIM is empowered to draft national mineral and geologic polices after consulting with DMR. The DMR provides technical assistance in geologic prospecting and mineral exploration.

4.2.2. OWNERSHIP OF MINERALS

Minerals belong to the state. No one can explore for minerals or undertake mining unless a prospecting licence or mining lease ("ML") is first obtained.

4.2.3. EXPLORATION RIGHTS

Before exploration can be undertaken, a prospecting licence must be obtained. There are four kinds of exploration licences that mining investors may apply for:

1. General Prospecting Licence ("GPL");
2. Exclusive Prospecting Licence ("EPL");
3. Special Prospecting Licence ("SPL"); and
4. Bidded Concession ("BC").

A GPL is a document of rights granted for mineral prospecting and exploration within a designated area of an administrative district, or a province. It is issued by Local Ministry of Industry Office, is not exclusive and valid for one year.

An EPL is a document of rights granted to an applicant for exclusive mineral prospecting and exploration rights within a designated area. An EPL is issued by the Minister of Industry and is valid for one year.

A SPL is a document of rights granted to an applicant for exclusive mineral prospecting and exploration rights within a designated area. A SPL is issued by the Minister of Industry and is valid for 5 years. An application for an SPL must include a work plan and an estimate of expenses for each year of the project. It allows all types of surface work including drilling but excludes underground work and the taking of bulk samples. The exploration area granted under an SPL may not exceed 16 square kilometres (10,000 rai). The licence holder must commence exploration within 90 days of the issuance of the SPL. A progress report to the DPIM must be submitted every 120 days. An SPL is suitable for all exploration projects where there is the possibility for progression to mineral production. Expenditures exceeding the annual commitment may be carried forward into subsequent years. Where the budgeted expenditures in any one-year are not met, the licence holder must pay the deficiency in cash. The licence holder may relinquish areas the licence holder no longer wishes to explore and may terminate the licence at the end of any year during the 5-year term thereby not being required to make any further financial commitments.

The BC pertains to areas that the MNRE defines to have the potential to host large deposits of major economic benefit to the country.

4.2.4. Rights to Surface Land and Forestry Classifications

Mineral rights under the Minerals Act do not entitle the licensee to any rights to the surface land. Before applying for a prospecting licence or ML the applicant must acquire the right to use the surface land from the public or private owner, as the case may be. Negotiation with a private landowner is concluded by purchase or lease. When the government owns the land, a permit issued by the applicable government agency must be submitted along with the application for a mining lease before a lease application will be considered.

With respect to a public owner, there are numerous laws and policies governing the management of natural resources in Thailand, especially concerning forest management issues. This legislation is under the responsibility of several government agencies that are empowered to oversee the utilization, management, development, and conservation of natural resources. For over a century, enforcing these laws has largely been a function of the forestry department, which is authorized to act as the sole manager of forest land throughout the country. There are various categories of reserved forestry (Table 4-1) areas in Thailand which are summarized as follows:

(i) prohibited entirely from conducting mining activity: wildlife sanctuary areas, national park areas, certain 1A watershed areas, and conservation forest areas reserved for mangroves or other environmental purposes;

(ii) subject to the government's approval to conduct mining operations: in certain areas, conservation forest and 1A watershed are subject to the review and approval of Cabinet in order to conduct exploration and mining activities. Beginning in 1995 and as recent as 2005, the Thai Government has relaxed its rules with respect to 1A watershed and conservation forest in order to encourage investment in the mining industry. Cabinet resolutions have now been passed which set out under what circumstances the Cabinet will consider the granting of mining rights in these areas; and

(iii) few restrictions on mining activities: economic forestry including natural resources development areas, community forest areas, mineral deposit area and forestation area.

In 2009, the Thai Government reviewed the forestry classifications in Western Thailand resulting in the reclassification of forestry in the 35-kilometre prospective limestone belt that hosts the Song Toh and Boh Yai mines. The forestry classifications in the area and the effect of the classification on mining are as follows:

TABLE 4-1. FORESTRY CLASSIFICATION

Forestry Classification	Description	Effect on Mining
Economic Forest ("E-Forest")	Forestry area is planned for commercial plantations and reserved areas for landless farmers.	Few mining restrictions
Conservation Forest ("C-Forest")	National reserved forests excluded from utilization to conserve: environment, soil, water, fauna and flora and to protect natural catastrophes such as flooding and landslides.	Cabinet approval
1A Watershed	Designated to have permanent forest cover because of the steep slopes, high susceptibility to soil erosion, and importance as head-watershed.	Cabinet approval
National Park and Wildlife Sanctuary	Land with beautiful landscape, important history, and rare plant or animal species; preserved in its natural state for the benefit of public education and enjoyment; and declared as such under the National Park Act.	No mining activity

The forestry designations within SEAM's areas are well mapped and the MLAs, SPLs, and SPLAs have been developed based on these designations. The Song Toh MLAs, and hence the New Song Toh MLA is located on Economic Forest and accordingly the granting of a land use permit and ML will require the approval of the Minister of Natural Resources and the Minister of Industry (Figure 14-2, Figure 14-3 and Table 4-2).

The Boh Yai MLAs, and hence the New Boh Yai MLA is located on both Economic Forest and 1A Watershed and accordingly the granting of a land use permit and ML for the portion of the New Boh Yai MLA located on 1A Watershed will require the approval of Cabinet as well as the approval of the Minister of Industry (Figure 14-2, Figure 4-4 and Table 4-2).

As discussed above, the Thai government developed guidelines for the consideration of land use permission in C-Forest and 1A Watershed areas with respect to mining activities. Under the guidelines, the areas with historical evidence of mining and exploration activities will be eligible for MLAs which will be considered by Cabinet for approval. SEAM has been advised by the legal office of the DPIM that the Boh Yai area is eligible for a ML as a result of historical mining and exploration permits granted in the area and that the New Boh Yai MLA will be subject to consideration by Cabinet.

4.2.5. MINING RIGHTS

Upon discovery of a commercial mineral deposit, the holder of an exploration licence must apply for a mining lease in order to mine. Although there is no guarantee of being granted a mining lease, the holders of exclusive prospecting licences or special prospecting licences have first priority. A mining lease may cover an area of not more than 300 rai (0.48 square kilometres) for surface mining and 10,000 rai (16 square kilometres) for underground mining. There is no limit on the number of mining leases for which one entity may apply. A mining lease has a duration of not more than 25 years or the number of years a study indicates the mine will produce. A mining lease may be transferred or subleased with the approval of the Minister of Industry. The mining lease can be extended under similar terms with the holder of the expired mining lease having the first right to renew. Pending the approval of the mining lease, the miner may apply for a non-transferable temporary mining lease that is valid for one year.

An applicant for a mining lease must provide the following: a map of the area to be mined, evidence of financial capital, a work plan, evidence of the acquisition of surface land rights, evidence of technological ability (e.g., tools, equipment and machinery); and a Health and Environmental Impact Assessment ("HEIA"). A HEIA is required to be prepared by a consultant firm registered with the Office of Natural Resources and Environmental Planning ("ONEP"), approved by ONEP and submitted in conjunction with the mining lease application.

The DPIM has published guidelines for determining the minimum amount of capital required. A letter of confirmation issued by a bank may be accepted as evidence of financial capital. An applicant who declares that he has his own machinery and equipment may produce evidence of ownership and value thereof.

4.2.6. OTHER APPROVALS

Other approvals which may be required in specific cases in respect of operational leases include: a Joint Mining Plan, Construction of Buildings outside a Mining Lease, Containment or Discharge of Tailings outside a Mining Lease, Removal of Tailings from a Mining Lease, Mining near or blockage of a waterway or public highway, Mining Inspections, and Mine Reclamation and Rehabilitation.

Other required approvals regarding mineral leases include: Mineral Purchase, Mineral Purchase outside a Designated Place, Setting up a Mineral Store, Mineral Sale, and Mineral Processing and Metallurgical Processing.

Other licences include: Possession of Minerals, Transportation of Minerals, Mineral Import Licence, Mineral Export Licence and Mineral Depository Licence.

4.3. DESCRIPTION AND OWNERSHIP

SEA entered into an amended JVA on October 15, 2012, for the Song Toh and Boh Yai mines. The JVA provides SEA with the option to earn an 80% interest in the mining lease applications comprising the mines and an option to earn an 80% interest in the flotation plant, buildings and equipment. The details of the agreement are outlined below.

Under the terms of the JVA, SEA can earn its 80% interest in the MLAs by exercising the first and second option. The MLAs subject to the JVA are as follows:

TABLE 4-2.MLAS SUBJECT TO THE JVA

Company	Company Relationship to SEA	Mining Lease Number	License Priority
KEMCO	Joint Venture Partner	14/2520, 63/2523, and 37/2526	First Priority
BYMC	Joint Venture Partner	41/2528, 42/2528, 8/2529, 18/2540, 19/2540, 10/2550, and 3/2555	First Priority
SEAMC	80% controlled subsidiary of SEA and 20% controlled by Joint Venture Partner	7/2555 and 8/2555	Second Priority

First Option

SEA may exercise the first option by making a payment of USD $500,000 and issuing 3 million common shares to its joint venture partner prior to December 13, 2012 for the exclusive right to exercise the second option detailed below. On December 13, 2012 SEA exercised the first option.

Second Option

SEA may exercise the second option by making a USD$2,500,000 payment to its joint venture partner on July 11, 2013. Upon making the payment, SEA will have earned an 80% interest in the mining lease applications and will assume operatorship of the project. The mining lease applications will be effectively transferred to SEAMC which is controlled 80% by SEA and 20% by its joint venture partner.

As discussed above in section 4.2.5 the holder of an expired mining lease application has the first right to renew the mining lease. The Minerals Act allows for first priority mining lease applications and subordinate mining lease applications to be filed for overlapping areas.

KEMCO, a party to the Joint Venture Agreement, currently holds first priority mining lease applications Nos. 14/2520, 63/2523 and 37/2526 located on an area of land referred to as the Song Toh mine.

BYMC, a party to the JVA, currently holds first priority mining lease applications Nos. 41/2528, 42/2528, 8/2529, 18/2540, 19/2540, 10/2550 and 3/2555 located on an area of land referred to as the Boh Yai mine.

SEAMC has submitted second priority mining lease applications nos. 7/2555 and 8/2555 which overlap the first priority mining lease applications currently held by KEMCO and BYMC as listed above and other areas covered by SEAM special prospecting license Nos. 2/2552, 3/2552, 4/2552.

The Company's rights to the mining applications come from i) SEAMC's secondary mining lease applications Nos. 7/2555 and 8/2555 already submitted and ii) KEMCO's and BYMC's obligations to withdraw their respective priority mining lease applications (for KEMCO: priority mining applications nos. 14/2520, 63/2523 and 37/2526 and for BYMC: priority mining applications nos. 41/2528, 42/2528, 8/2529, 18/2540, 19/2540, 10/2550 and 3/2555) for areas overlapping SEAMC's secondary mining lease applications as set forth in of the JVA.

Pursuant to the JVA, upon closing of the second option KEMCO and BYMC shall withdraw their respective first priority mining lease applications and SEAMC's second priority mining lease applications will be advanced to first priority moving forward according to applicable law subsequent to the closing of the second option.

Upon closing of the second option and the advancement of SEAMC's second priority mining lease application to first priority the Company will commence the formal mining lease application process.

Production Payments

In order to maintain its 80% ownership interest in SEAMC, SEA is required to make the following production payments:

- Upon completion of the first complete calendar year following the commencement of commercial production at the Boh Yai mine, SEA must pay USD$600,000 and 20% of any net profits in excess of USD$2,000,000;

- Upon completion of the second and third complete calendar years following the commencement of commercial production at the Boh Yai mine, SEA must pay the greater of USD$2,000,000 or 20% of the net profits; and

- Upon completion of the fourth complete calendar year following the commencement of commercial production at the Boh Yai mine, SEA must pay USD$400,000 and 20% of any net profits in excess of USD$2,000,000.

- Upon completion of the fifth complete year following the commencement of commercial production at the Boh Yai mine, SEA must pay 20% of any net profits in excess of US$2,000,000 and thereafter 20% of net profits.

Equipment Option

In addition to the option to earn an 80% interest in the mining lease applications, SEA has been granted the option to earn an 80% interest in a flotation plant, buildings and equipment by making installment payments to its joint venture partner totaling USD$1,400,000. The installment payments are presented in Table 4-3 on the following page.

TABLE 4-3.EQUIPMENT EARN IN INSTALMENT PAYMENTS

Period	Amount
October 15, 2013 to June 15, 2015	US$5,823 per month
July 15, 2015	US$377,709
August 15, 2015 to December 15, 2015	US$6,470 per month
January 15, 2016	US$467,648
February 15, 2016 to June 15, 2016	US$6,470 per month
July 15, 2016	US$367,650

On the date that is six months following the receipt of a mining permit at the Boh Yai mine, the remaining installment payments are due. Upon making the total payment of USD$1,400,000 the equipment will be transferred to SEAMC.

In the event that SEA fails to make an equipment option payment the option to acquire the equipment shall terminate.

4.4. SPECIAL PROSPECTING LICENCES AND APPLICATIONS

The Company has a 100% interest the following special prospecting licenses and special prospecting license applications (Figure 4-2 and Table 4-4 and Table 4-5) on areas which are adjacent to the Song Toh and Boh Yai mines.

TABLE 4-4.SPECIAL PROSPECTING LICENCES AND APPLICATIONS

Company	Company Relationship to SEA	Special Prospecting License Number
SEAM	Wholly controlled subsidiary of SEA	2/2552, 3/2552, and 4/2552
		Special Prospecting License Application Number
SEAM	Wholly controlled subsidiary of SEA	1/2555, 2/2555, 3/2555, 4/2555, 5/2555, 6/2555, and 7/2555

FIGURE 4-2. LAND USE AND PERMIT STATUS

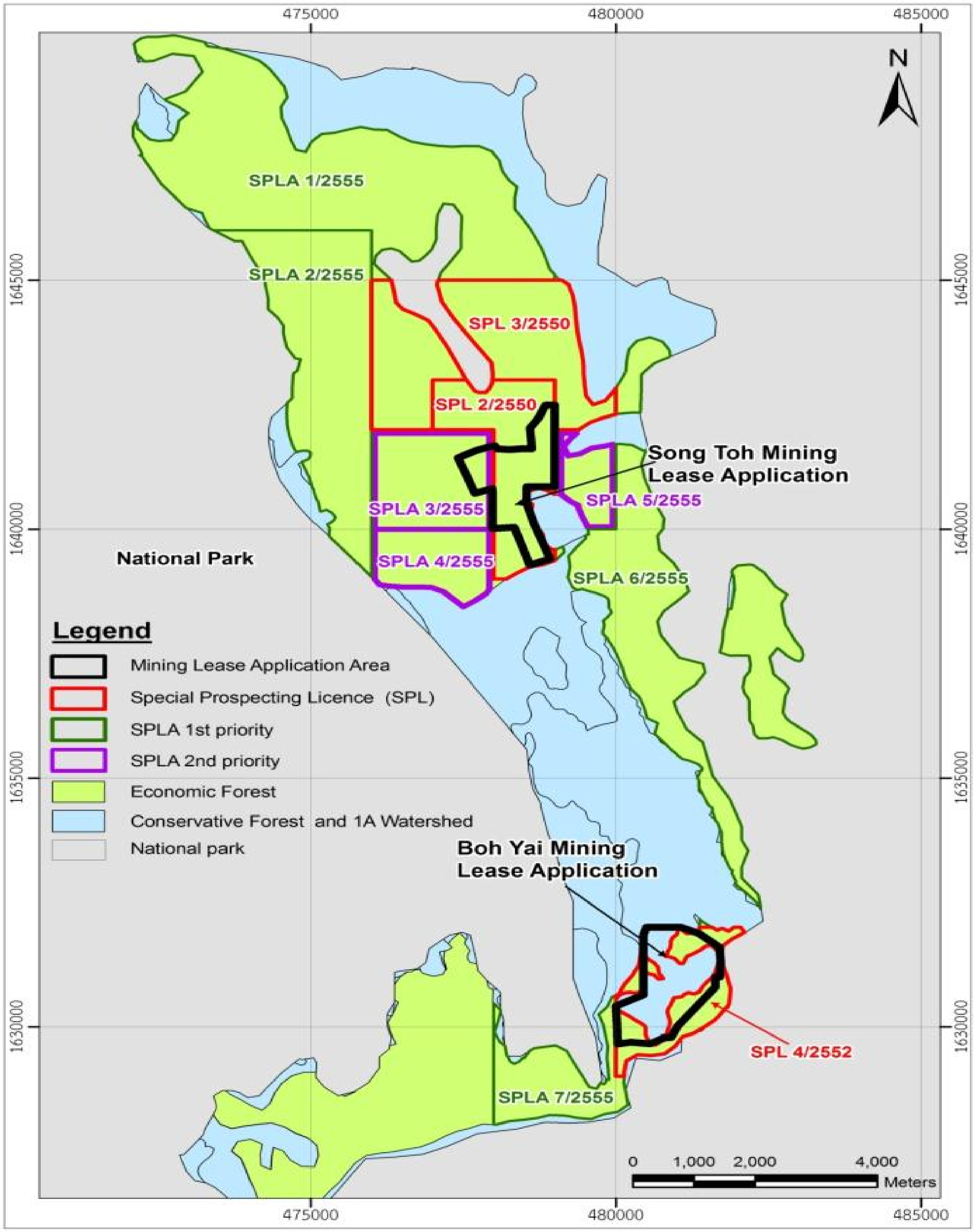


FIGURE 4-3. SONG TOH HISTORICAL AND CURRENT PROPERTY MAP

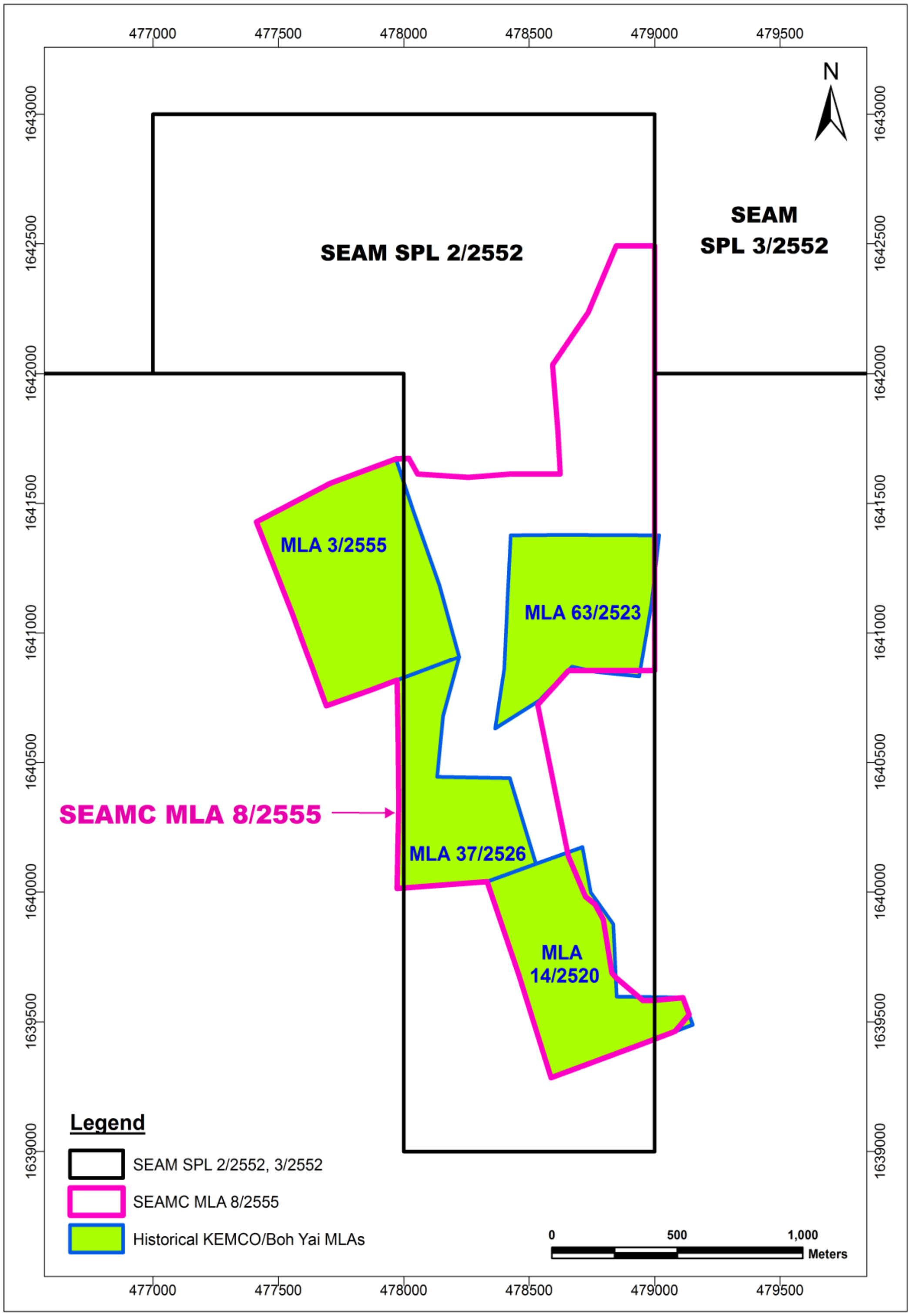


FIGURE 4-4. BOH YAI HISTORICAL AND CURRENT PROPERTY MAP

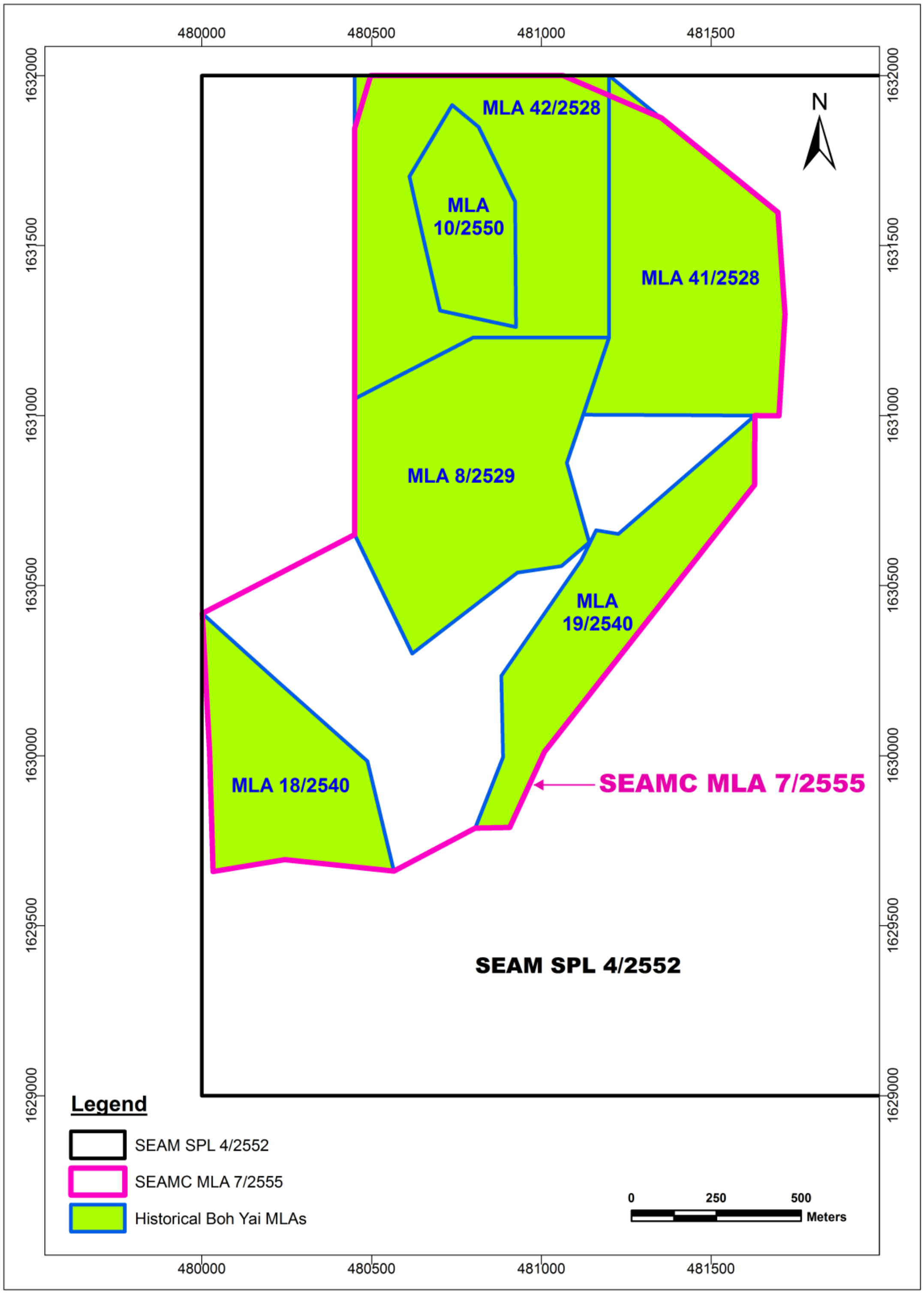


TABLE 4-5.STATUS OF EXPLORATION LICENCES AND APPLICATIONS, 01-07-2012

Area	License	Licence Type	Licence Number	Area (Ha)	Application Date	Date Granted	Expiry Date
Song Toh - Boh Yai	SEAM	SPL	2/2552	287.68	-	21/10/2009	20/10/2014
Song Toh - Boh Yai	SEAM	SPL	3/2552	828.64	-	21/10/2009	20/10/2014
Song Toh - Boh Yai	SEAM	SPL	4/2552	192.00	-	21/10/2009	20/10/2014
Song Toh - Boh Yai	SEAM	SPLA	1/2555	1,464.00	21/3/2012	-	-
Song Toh - Boh Yai	SEAM	SPLA	2/2555	824.00	21/3/2012	-	-
Song Toh - Boh Yai	SEAM	SPLA	3/2555	360.16	21/3/2012	-	-
Song Toh - Boh Yai	SEAM	SPLA	4/2555	247.68	21/3/2012	-	-
Song Toh - Boh Yai	SEAM	SPLA	5/2555	142.88	21/3/2012	-	-
Song Toh - Boh Yai	SEAM	SPLA	6/2555	1,088.00	21/3/2012	-	-
Song Toh - Boh Yai	SEAM	SPLA	7/2555	268.00	21/3/2012	-	-

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

5.1. ACCESSIBILITY

The properties are located in the Meklong Highlands region of tropical forest in Kanchanaburi Province between the valleys of the Kwae Yai (River Kwai) and Kwae Noi Rivers, approximately 300km northwest of Bangkok (Diehl & Kern 1981) and 186 km from the town Kanchanaburi. A well maintained road extends to within 19 km of the area. Thereafter, access to the mines is via dirt and gravel road accessing Boh Yai from the southwest (18km) or Song Toh from the northwest via Pokhana village (26km). A gravel road 14 kilometres long links Song Toh directly with Boh Yai Figure 5-1).

5.2. CLIMATE

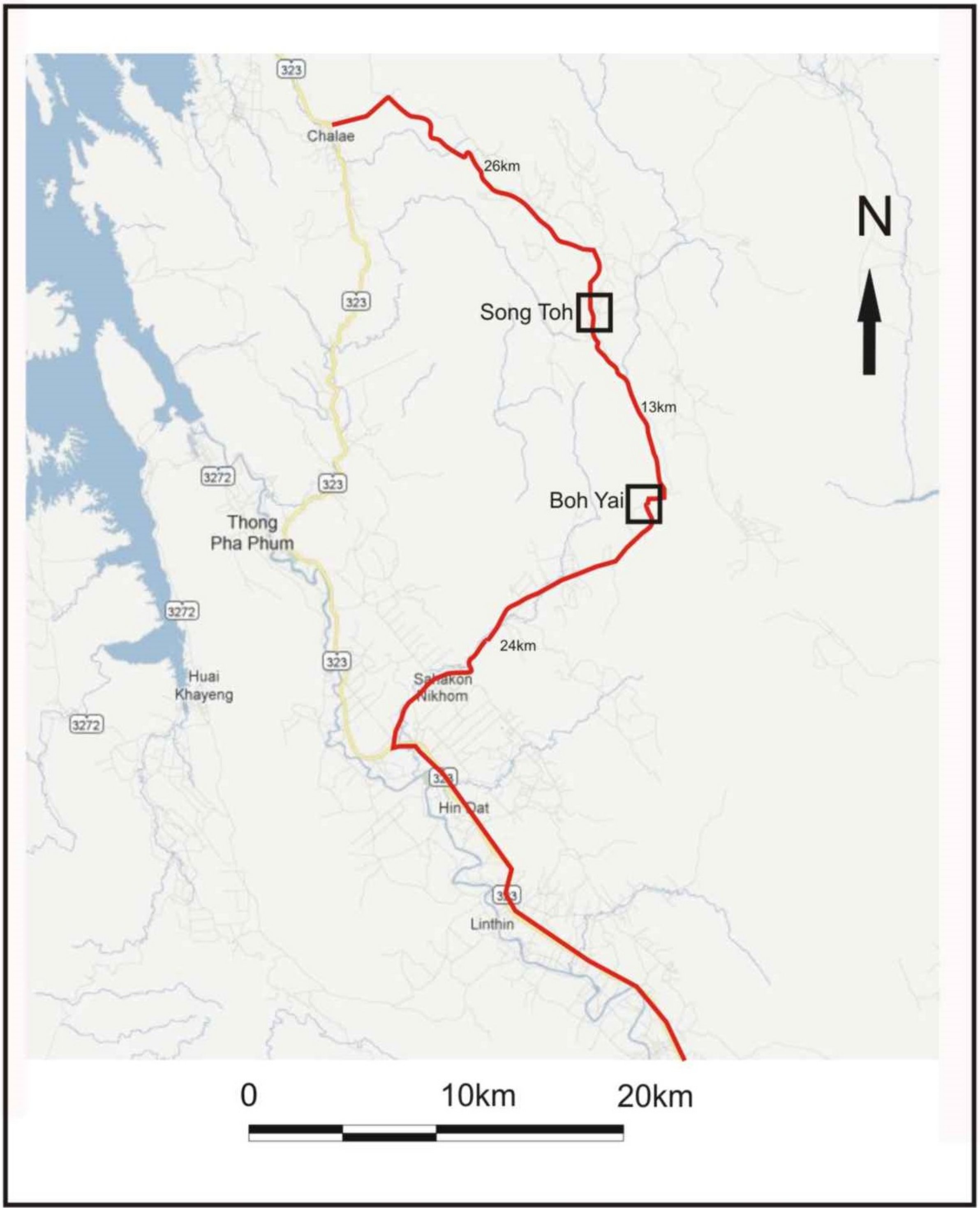
Thailand is located in the northern hemisphere on the southeast of Eurasia continent between latitude 53° 37′ to 20° 27′ N and longitude 93° 22′ to 105° 37′E. The climate is of the monsoon type with an average rainfall per annum of 1700mm (Table 5-1). The project site is located in the central part of Thailand.

This area has a tropical climate with the influence of seasonal monsoons. During the rainy season (May to October) significant rainfall, high humidity and dense cloud will be experienced. During the cold season (November to February) light rainfall, lower humidity and clear sky will be experienced. The rest of the year from March to April consists of hot and dry conditions. Based upon the nearest climatologic station at Thong Phaphum District (1971-2000), the important climate features at site can be summarized as shown in Table 5-1 below:

TABLE 5-1.CLIMATIC DATA

Description	SW Monsoon (May-Oct)	NE Monsoon (Nov-Feb)	Summer (Mar-Apr)	Per Annum
Avg. Temperature (^oC)	26.9	24.9	29.2	26.6
Pan Evaporation (mm.)	621.0	467.3	351.8	1,440.1
Avg. Relative Humidity (%)	87	77	71	81
Avg. Cloudiness (0-10)	8.1	2.3	2.8	5.3
Rainfall (mm.)	1,572.8	48.8	141.9	1,763.5

FIGURE 5-1. SONG TOH AND BOH YAI LOCATION AND ACCESS



5.3. LOCAL RESOURCES AND INFRASTRUCTURE

Transportation to and from the mine sites is well served by both hard top highways/roads. These routes were used historically for transportation of concentrate from the Song Toh processing plant to smelters. The main provincial highways are suitable for trucks carrying approximately 35 metric tonnes. Roads directly to both sites of Song Toh and Boh Yai from Highway 323 are limited for 12 tonne trucks for a distance of 26 and 24km, respectively.

Electrical facilities for mine operations, processing and camp areas are fed from two separate directions and both sites are on the Provincial Electrical Authorities power distribution grid.

Historically water was pumped from naturally fed reservoirs separately feeding both mine sites. Song Toh is fed from the Thane Reservoir, which is approximately 4 kilometers southeast of the site. Boh Yai gets its water from the Khao Deang Reservoir which is located approximately 2 kilometers northeast of the site.

Neither site has incoming landline cables for communication. Telephone and data communications are facilitated by IP Star (satellite communications). The Song Toh office had phone, fax and internet set up in January 2012.

Supplies and labour are available at Thong Phaphum town and villages closer to the site. Kanchanaburi town is a much larger source. Material unavailable locally can be sourced in Bangkok. Some specialized mining supplies must be imported.

5.4. PHYSIOGRAPHY

The topography of Kanchanaburi province is a combination of mountain ranges, valleys, and river plains. The northern and western regions are mostly mountainous, and include the Thanon Thong Chai and Tanawsi mountain ranges. These mountainous areas are largely covered in evergreen and deciduous forests. The northeast region of Kanchanaburi consists of undulating land, and the far-east and the south are mostly river plains.

The general topography of the Song Toh and Boh Yai project area is characterized by low hills, alternating with valleys and level areas between 600 and 650 meters altitude. The Song Toh project area lies between steep limestone hills to the east and the west (Figure 5-2). There are two peaksnear the project area, Khao Tue Kalo and Khao Song Toh, which are located southwest of the project area, rising to elevations of 900 msl and 800 msl, respectively. The Boh Yai project area (Figure 5-3) is located on the Tanawsi limestone ridge, which comprises karst topography and includes many sinkholes, springs, and caves.

FIGURE 5-2. SONG TOH TOPOGRAPHY

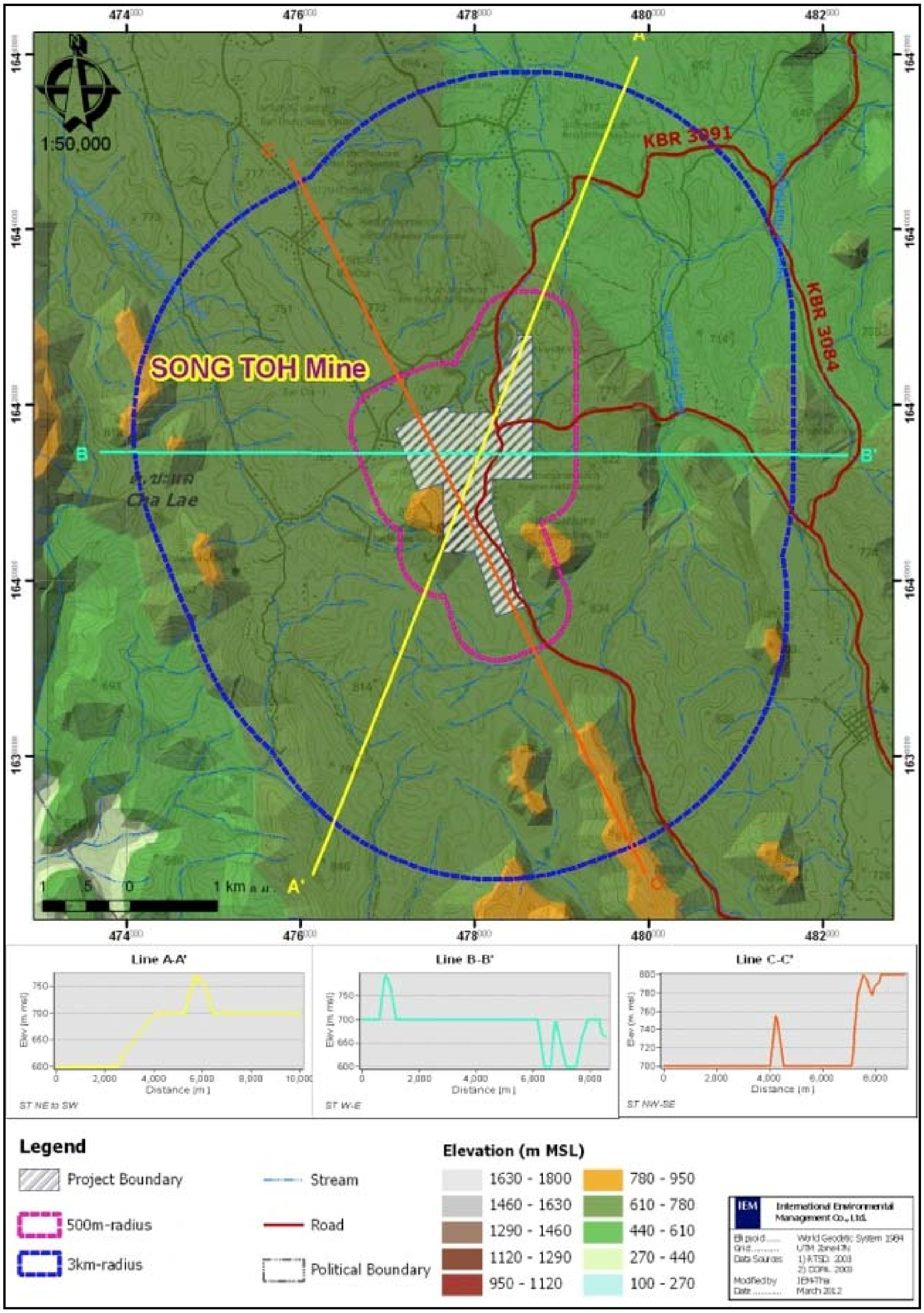
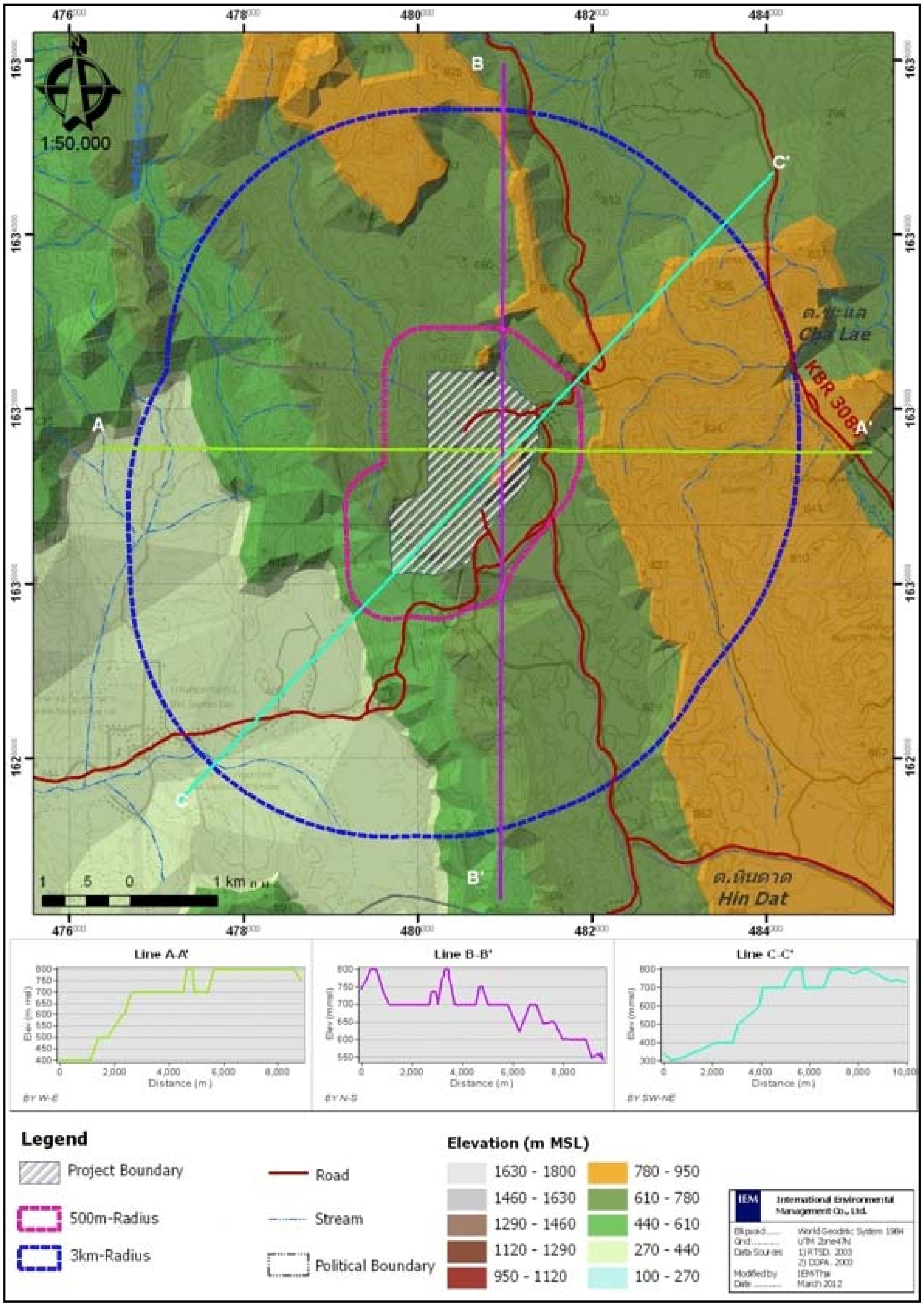


FIGURE 5-3. BOH YAI TOPOGRAPHY



6. HISTORY

6.1. EXPLORATION AND HISTORICAL MINING

Exploration for Pb-Zn mineralization has taken place in several phases in the Kanchanaburi region but historical records for the region are poor and published information is generally inadequate.

Mining records extend back over several centuries (Hagen & Kemper 1976). Most of the known Pb-Zn deposits are surrounded by historical slag dumps where Carbon-14 determinations of charcoals indicate that the slags are of medieval age (1300-1600 A.D.) (Diehl & Kern 1981). The early miners are thought to have been attracted by the silver content of the ores. In 1912 a German-Austrian prospecting group re-discovered the Boh Yai deposit and some development was carried out including a cable railway to transport the ore but ore production never commenced.

A Thai-American group assessed the area in 1951 and production finally commenced in the early 1950's with Cominco extracting an estimated 100,000 tonnes of lead rich ore at Boh Yai (Diehl & Kern 1981). The Bhol family, who assisted Cominco in the mining at Boh Yai, independently exploited some oxide ore from Boh Noi. Cominco is reported to have abandoned the mining rights due to poor access, lack of infrastructure and complexity of the Mining Laws in Thailand at the time.

In 1953 Dr. Bhol Kilpbua took over Cominco's mining rights and Bhol and Sons was founded. In 1955 Bhol and Sons took possession of the deposit and extended the area of the workings as well as locating further mineralization at Boh Noi (6 km South of Boh Yai) and Song Toh South (14km North of Boh Yai). Bhol and Sons mined on a small and selective scale, selling 1-2,000 tonnes of ore annually to Metallgesellschaft through a broker in Bangkok.

In 1970 a new company, KEMCO, was founded by the Bhol family in partnership with MG and commenced an exploration programme to explore and examine the mineralized showings in the area and to assess their depth extent. A diamonddrilling programme of 3,000m indicated potential for 1.5Mt of mineralization. Low metal prices and the inaccessibility of the area at the time meant that little exploration was carried out between 1971 and 1974.

Independently, the German Mission to Thailand carried out a geological mapping programme in the area and much of the existing geological knowledge of the region dates back to that time. Exploration continued during the mid-1970s resulting in the discovery of a number of promising Pb-Zn targets including those at Song Toh and Boh Yai.

Diamond drilling carried out by KEMCO at Song Toh (6,400m) resulted in the definition of two ore bodies (Song Toh North and South) with historical drill indicated and drill inferred resources of 1.2 million tons of ore grading 11.5 % of combined Pb-Zn in Mine North and 0.2 million tons of ore grading 6.5 % of Pb and <1 % of Zn in Mine South. (Kuchelka 1981, Greise, 2010).

In 1978, MG committed to a mining project involving a 30 million Deutsch Mark ($15 million) investment at Song Toh, and commenced construction of a flotation plant and underground development.

In 1991 Bhol and Sons purchased MG's interest in KEMCO and continued to operate the Song Toh and Boh Yai mines until 2002 when mining ceased due to low metal prices.

6.2. Song Toh Mine Production (KEMCO)

Before underground extraction commenced in the area approximately 3Mt of lead oxide/carbonate ore is reported to have been mined in shallow pits.

Song Toh District

Production took place between 1978 and 2002 and was divided between three areas termed Song Toh North, Song Toh South and Song Toh Southwest (Table 6-1).

Song Toh North

At Song Toh North a reported 1.3Mt of ore has been extracted to date. The mineralization is zinc dominant (unusual for the area) with grades indicated to be 6-7% Zn and 3-4% Pb. Ground problems associated with caving and karstified zones filled with laterite were commented on.

Song Toh South and Southwest

An estimated 3.2 Mt of ore has been extracted. Access problems were encountered regarding further drilling of resources due to topographic extremes. From the plans and sections inspected during the site visit there appeared to be greater continuity in the mineralization at Song Toh South compared to that at Song Toh North.

Mining at Song Toh commenced in 1978 and continued until 2002, with production of approximately 4.5 million tonnes of ore at a mean grade of 7% Pb and 3% Zn, as listed in Table 6-1 below on the following page.

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TABLE 6-1.HISTORICAL PRODUCTION SONG TOH AND BOH YAI

Mine	Production source	Units	1978-1997	1998	1999	2000	2001	2002	Total
Song Toh North	Development in ore	metres	8,226	24.0	36.0	-	-	-	8,296
	Development in waste	metres	6,313	25.0	-	-	-	-	6,338
	Total development	metres	14,539	59.0	36.0	-	-	-	14,634
	Crude ore from development	Tonnes	279	0.8	0.7	-	-	-	280
	Crude ore from stoping	thousand tonnes	851	62.6	38.0	8.0	34.6	0.0	994
	Total crude ore	thousand tonnes	1,129	63.4	38.7	8.0	34.6	0.0	1,274
	Waste	thousand tonnes	213	0.8	-	-	-	-	214
	Total material	thousand tonnes	1,343	64.3	38.7	8.0	34.6	0.0	1,488
Song Toh, South	Development in ore	metres	10,603	400.0	924.0	57.0	524.0	-	12,508
	Development in waste	metres	8,267	692.0	496.0	209.0	377.0	67.0	10,108
	Total development	metres	18,870	1092.0	1420.0	266.0	901.0	67.0	22,616
	Crude ore from development	thousand tonnes	329	14.1	36.1	2.5	21.6	0.0	403
	Crude ore from stoping	thousand tonnes	1,698	18.1	54.3	71.3	46.6	11.3	1,900
	Total crude ore	thousand tonnes	2,027	32.2	90.4	13.8	68.2	11.3	2,303
	Waste	thousand tonnes	236	16.9	9.2	6.5	13.1	3.6	285
	Total material	thousand tonnes	2,263	49.2	99.6	80.3	81.3	14.9	2,588
Song Toh, Southwest	Development in ore	metres	7,155	-	-	166.0	246.0	380.0	7,947
	Development in waste	metres	10,224	5.0	-	273.0	209.0	103.0	10,814
	Total development	metres	17,379	5.0	-	439.0	455.0	483.0	18,761
	Crude ore from development	thousand tonnes	224	-	-	3.6	11.6	19.5	255
	Crude ore from stoping	thousand tonnes	495	47.2	23.1	31.9	8.8	22.1	628
	Total crude ore	thousand tonnes	719	47.2	23.1	35.4	20.4	38.6	884
	Waste	thousand tonnes	348	-	0.2	5.9	8.7	2.5	366
	Total material	thousand tonnes	1,067	47.2	23.3	41.3	29.1	41.1	1,249

Mine	Production source	Units	1978-1997	1998	1999	2000	2001	2002	Total
Boh Yai	Development in ore	metres	5,053	42.0	76.0	808.0	1311.0	40.0	7,330
	Development in waste	metres	9,634	321.0	890.0	2479.0	2158.0	614.0	16,096
	Total development	metres	14,687	363.0	966.0	3287.0	3469.0	654.0	23,426
	Crude ore from development	thousand tonnes	170	1.2	2.4	26.8	21.1	1.8	223
	Crude ore from stoping	thousand tonnes	418	22.5	23.6	55.2	33.6	11.8	564
	Total crude ore	thousand tonnes	587	23.7	26.0	81.9	54.7	13.7	787
	Waste	thousand tonnes	289	27.0	38.6	100.5	69.3	26.5	551
	Total material	thousand tonnes	877	50.7	64.5	182.5	124.0	40.2	1,339
Boh Noi	Development in ore	metres	599	7.0	-	-	-	-	606
	Development in waste	metres	710	98.0	-	-	-	-	808
	Total development	metres	1,309	105.0	-	-	-	-	1,414
	Crude ore from development	thousand tonnes	16	0.1	-	-	-	-	16
	Crude ore from stoping	thousand tonnes	21	16.4	-	-	-	-	38
	Total crude ore	thousand tonnes	37	16.5	-	-	-	-	54
	Waste	thousand tonnes	34	3.4	-	-	-	-	38
	Total material	thousand tonnes	71	20.0	-	-	-	-	91
Total All Mines	Development in ore	metres	31,636	483.0	1036.0	1031.0	2081.0	420.0	36,687
	Development in waste	metres	35,148	1141.0	1386.0	2961.0	2744.0	784.0	44,164
	Total development	metres	66784	1624	2422	3992	4825	1204	80851
	Crude ore from development	thousand tonnes	1,017	16.3	39.3	32.8	54.3	18.3	1,178
	Crude ore from stoping	thousand tonnes	3,428	166.9	139.0	166.3	123.6	45.3	4,123
	Total crude ore	thousand tonnes	4,499	183.2	178.2	199.2	177.9	63.6	5,301
	Waste	thousand tonnes	1,121	48.2	48.0	112.9	91.1	32.6	1,454
	Total material	thousand tonnes	5,621	231.3	226.2	312.1	269.0	96.1	6,755

The following is based largely on a Historical Summary by Walter Griese, Mine Manager from 1978 to 2002:

Underground development at Song Toh North began in 1978, with an access and haulage ramp of $18m^2$ cross section and 1:9 slope being developed in the footwall of the mineralized zone. Main haulage drifts of $16m^2$ cross-section were driven at 50 m vertical intervals following the zone for up to 500 m. Sublevels were driven into the orebody at 10-12 m intervals off an 8 m^2 cross-section sub-ramp. Sub-ramps were driven at 1:6 slope every 220 m along strike between main haulage levels. The mine was developed for trackless mining with 4 tonne capacity LHD units used for development and stoping. Ore haulage up the ramp to surface and to the mill was carried out by 10 wheel, 15 tonne capacity trucks. Main ramps and haulage drifts were advanced with a 2 boom pneumatic jumbo. Sublevel development and stope mining was carried out with hand-held (Jackleg) drilling equipment.

The dip of mineralization at Song Toh ranges from 15° to 90° and widths range from 3m to 20m. Stoping techniques had to be varied accordingly. Steeply dipping parts of the orebody (mostly Mine North and Mine Southwest) were exploited by overhead open stoping. Backfill was by normal waste which was subject to a mining loss of 5-12%. In high grade areas, concrete backfill was used in order to allow extraction of pillars and cut mining loss to less than 5%. Shallow dipping parts of the orebody, (mostly Mine South), were exploited by room and pillar, which is subject to mining losses of up to 20%. In high grade areas concrete pillars or timber were used in order to allow extraction of pillars and reduce mining loss.

Scrapers were used to move broken ore in narrower areas, while the LHD unit could enter the stope in wider areas. Production scheduling of any one stope was 4,000-6,000 tonnes per month.

Dilution was a significant problem at Song Toh due to the irregularity of the mineralization over short distances (particularly in Mine South) which precluded the use of long hole drilling beyond 3-4 metres. Close and intensive grade control and careful mining were required in order to keep dilution to acceptable levels.

Water ingress was a problem and cost to underground operations due to the presence of the karstic limestone and associated sinkholes and caves full of mud and water. Water inflows were significant, especially in the rainy season, sometimes exceeding 40 m^3/min. When pumping costs at Song Toh North became excessive a drainage tunnel 1700m long was developed at 545m elevation, with outflow at Huai Chanee Creek. The drainage tunnel was subsequently extended for 1650m in order to drain Song Toh South at an elevation of 555m.

6.3. Boh Yai Mine Production (BYMC)

The Boh Yai district lies approximately 14 km south of Song Toh.

As mentioned above, the mining activities in Kanchanaburi Province began at Boh Yai area. The area was surveyed by a German team during the years 1912 to 1914 and outcrops were exploited during World War II by the Royal Thai Army and to the end of World War II by the Cominco. Under a Joint

Venture between Bhol and Sons and MG a core drilling programme was carried out between 1981 to 1988 directed by the German and Thai geologists Dr. Pedall, Khun Amomsak and Khun Paisan. This drilling outlined resources of 1.2 million tons of Pb-Zn sulphide in a number of separate deposits designated 'Hill1' to 'Hill 11'.

Mineralization of galena (PbS) and sphalerite (Zns) is exclusively bound to pale limestone of Ordovician age. There is no strict conformity but the mineralization is strata bound. Thickness of the ore horizon is 2.5m on average, but at some places increases up to 10m and more. General strike of the ore horizons is south – north with pyrite and barite as associated minerals at the northern part. Three types of mineralization were distinguished: massive high grade ore, breccias ore and replacement ore as described in section 7.3 of this report. The host limestones are folded along NNW axes with steeply dipping (70°-90°) westerly limbs and gently dipping easterly limbs (30°-50°). The separate parts of the deposits follow this pattern with Hill 7 occupying a steep dipping limb and Hill 1 a shallow dipping limb.

Mining to date has extracted 0.8Mt set out in Table 6-1. Average grades are reported as 3-5% Pb, 4-6% Zn. From the information presented there may be some metal zoning associated with the Boh Yai deposit and mine staff commented on the necessity to blend ore from various parts of the mine in an effort to eliminate penalties due to the mercury levels in the concentrate. The presence of potentially high mercury levels requires more detailed investigation.

6.3.1. BOH YAI MINING METHOD

In July 1988, an underground mining operation commenced and continued up to the end of 2002, with 0.8Mt of crude ore produced. The main production was Pb-dominant ore. Additional core drilling was done concurrently with mining from 1993 to 1998 by Thai geologists with the result that the overall remaining drill-indicated ore was then Zn-dominant.

At Song Toh, the mineralization is very irregular and the host rock is very competent and does not require artificial support. The mine was therefore amenable to trackless mining and load-haul-dump (LHD) equipment was used.

A Main Haulage Drift (MHD, dimension 18 m^2) was completed for 2,200m from Hill7 at 555m level to east of Hill 1 at 565 level. This MHD serves as a dewatering drift and is required to drain a high flow rate, caused by karst features, which may exceed of 25m3 per minute during the rainy season.

Other main haulage drifts were developed at approximately 50m vertical intervals, connected by spiral ramps with a gradient of 1:7 driven in waste. Horizontal sublevels were driven at 10-15m intervals.

The main exploitation was carried out by "room and pillar method" which was subject to a mining loss of 15- 20%. Other methods were precluded by the difficulty of obtaining economical backfill above the MHD and low metal prices (Zn <1,000 US$, Pb <500 US$) which rendered replacement of ore pillars by concrete uneconomic.

6.4. HISTORICAL MINERAL PROCESSING

Between 1978 and the cessation of operations in 2002, a total of 5,237,800 tonnes of ore was produced and milled at the floatation plant located near Song Toh to produce 648,760 tonnes of lead and zinc concentrates. In 2008, a total of 60,000 tonnes of ore was produced and milled from a stockpile. This plant is a standard Pb-Zn flotation circuit and can be operated at between 25 and 50 tonnes per hour depending on the type of feed. Both sulfide feed from underground mining and oxide feed from surface mining have been treated at the plant. The milling plant and equipment are in fair to good condition with much service life remaining. Some repairs and upgrades are required and additional equipment for spares and/or expansion of the plant is available locally.

PLATE 6-1. PART OF SONG TOH MILL

6.5. TAILING MANAGEMENT AREA

The tailings from the plant are stored locally in a Tailing Management Area ("TMA") consisting of three discrete cells. One cell had been used in the past to store thickened tailings produced by a clasifier associated with the mill, which are still in-storage for possible reprocessing. The other two cells, formed by a separator dyke, represent the main TMA. The dam forming the TMA is constructed of spigotted tailing and constructed in 3 lifts using the up-stream method of construction. The structure is approximately 10 - 25 m high with a 5 m top width on the upper bench. No slumping or excessive lateral or longitudinal cracking was observed during the walk through inspection. Slope angles were considered to be at the upper range for dams of this height.

Reportedly the TMA had been upgraded just prior to cessation of operations and with further upgrading required to create capacity for the remaining resource. ACA Howe has been informed that SEAM has retained Golder Associates Ltd. ("Golder") to assist with a study for the expansion and upgrade of the existing TMA.

6.6. HISTORICAL MINERAL RESOURCE ESTIMATES

This section of the report deals with information that is historical in nature and as such much of the terminology used may not be in keeping with modern or current usage. In particular mineral resource/reserve classification or categories and related terms may not be considered appropriate or acceptable under the current rules and regulations.

However, the context of the source material has been kept intact to ensure historical accuracy and the reader is cautioned not to rely on historical information as necessarily relevant or appropriate under current circumstances.

The reader is cautioned that this section of the report regarding Mineral Resource Estimates contains various resource estimates that are considered historical in nature and as such are based on prior data and reports prepared by previous operators. The historical estimates should not be relied upon and there can be no assurance that any of the resources in whole or in part will become economically viable.

Historical documents refer consistently to 'reserves' rather than 'resources' and for the sake of consistency the term 'reserve' will be retained in this section of the report. However it is unclear whether any formal economic cut-off, dilution or recovery factors were applied.

'Reserve' estimates through the life of the operation were maintained by the Mine Manager, Mr. Walter Greise, a Mining Engineer. 'Reserve' estimates were reported in the form of detailed 'Reserve Balance' files that were updated annually to reflect production and exploration results. Figure 6-1 provides an example of one such statement from Song Toh Southwest. The 'Reserve Balance' statements listed resources according to Class and Location. 'Reserve' classes were based on the following criteria:

- Class A: 'reserves' defined by channel sampling in drifts above and below;
- Class B: 'reserves' defined by less channel sampling in drifts above or below;
- Class C: 'reserves' indicated or inferred from diamond drilling results.

Historical documents make no reference to what economic cut-off was applied to define the historical reserves. However based on available sections, it appears that a figure of around 6%PbEq was used. It is unclear what other economic factors were applied or whether factors for mining dilution or recovery were used in estimating the historical reserves.

An extract from a typical section of the 2000 'Reserve Balance' statement is presented below:

FIGURE 6-1. EXTRACT OF A SECTION OF THE 2000 'RESERVE BALANCE'

RESERVE BALANCE SONG TOH SOUTH WEST 2000

Mine	Level	Block	Class	Location	Pb	Zn	Fe	Ag	Hg	Pb/Zn	Ag/Pb	Hg/Zn	T.thick	Tons	Mine til	Mine adjust	Left	Found Till	This Month	Remark
					%	%	%	g/t	g/t				(m.)	01/01/00	Dec 2000	__/__/__	01/01/01	Dec 2000	Dec 2000	
STSW	580	80K	A	J+36-K+05	4.90	0.10	2.00	96	7	49.00	19.59	70.00	4.20	1,000			1,000			
STSW	580	77 O	A	14.32-15.17	5.40	0.10	8.70	117	6	54.00	21.67	60.00	4.50	2,400			2,400			
STSW	580	No Block																		
STSW	580	No Block																		
STSW	580	No Block																		
Total	580	Start__/__/__			5.25	0.10	6.73	111	6	52.53	21.10	62.94	4.35	3,400			3,400			
		Mine__/__/__			######	######	######	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!								
		Left__/__/__			5.25	0.10	6.73	111	6	52.53	21.10	62.94	4.35				3,400			
STSW	567	67EF1	A	E+11-E+26	8.00	2.70	1.00	118	62	2.96	14.75	22.96	4.20	1,000			1,000			
STSW	567	No Block																		
STSW	567	No Block																		
STSW	567	No Block																		
Total	567	Start__/__/__			8.00	2.70	1.00	118	62	2.96	14.75	22.96	4.20	1,000			1,000			
		Mine__/__/__			######	######	######	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!								
		Left__/__/__			8.00	2.70	1.00	118	62	2.96	14.75	22.96	4.20				1,000			
STSW	555	55F3	A	E+35-F+17	7.40	2.10	1.60	138	85	3.52	18.65	40.48	7.80	8,160			8,160			
STSW	555	55JH3	A	H+30-J+00	5.60	0.30	1.80	69	16	18.67	12.32	53.33	3.20	1,100			1,100			
STSW	555	55FG4	A	F+07-F+45	6.60	0.70	0.60	129	38	9.43	19.55	54.29	1.70	1,300			1,300			
STSW	555	55GH4	A	G+20-G+37	3.90	0.10	0.90	60	4	39.00	15.38	40.00	2.30	900			900			
STSW	555	55HJ4	A	H+14-H+30	8.90	0.30	1.70	128	23	29.67	14.38	76.67	2.30	500			500			
STSW	555	55JK4	A	J+33-K+08	6.80	0.60	2.90	141	33	11.33	20.74	55.00	2.50	1,800			1,800			
STSW	555	55LM4	A	L+00-L+34	5.80	0.70	3.80	118	15	8.29	20.34	21.43	6.00	2,710			2,710			
STSW	555	55MN	B	L+41-M+32	7.50	0.90	3.70	143	14	8.33	19.07	15.56	4.80	4,200			4,200			
STSW	555	No Block																		
STSW	555	No Block																		
STSW	555	No Block																		
Total	555	Start__/__/__			6.90	1.23	2.35	129	45	5.62	18.67	36.83	3.83	20,670			20,670			
		Mine__/__/__			######	######	######	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!								

The location of the reserves is listed in the 'Reserve Balance' statements by mining block according to level and location. In most cases reserves of Class A and B have been listed down to the lowest level of mine development. Reserves of Class C occur mostly below the lowest level of mining or in undeveloped areas and are based solely on diamond drill intersections.

The latest complete Reserve Balance statements are for the end of year 2000. Production continued until 2002, which would have resulted in depletion of the Boh Yai reserve by approximately 64,400 tonnes and the Song Toh SW reserve by approximately 68,000 tonnes. These amounts have been deducted from the 2000 reserve balance (at a similar grade) to arrive at a summary 2002, 'Reserve Balance' for Boh Yai and Song Toh SW in Table 6-2 on the following page.

TABLE 6-2.BOH YAI AND SONG TOH SW HISTORICAL RESERVES, 2002

Deposit		No of Blocks	Tonnes	Pb, %	Zn, %	Ag, g/t
Boh Yai	Developed	79	182,750	4.76	3.21	98.71
Boh Yai	Undeveloped	57	543,851	3.95	4.77	74.29
Boh Yai	Total	136	726,601	4.15	4.38	80.43
Song Toh SW	Developed	44	53,731	6.52	0.98	131.07
Song Toh SW	Undeveloped	24	174,964	4.72	0.64	132.40
Song Toh SW	Total	68	228,695	5.14	0.72	132.09
BY and ST SW	Developed	123	236,481	5.16	2.70	106.06
BY and ST SW	Undeveloped	81	718,815	4.14	3.77	88.43
BY and ST SW	Total	204	955,296	4.39	3.50	92.80

The developed ‘reserves’ or Class A and B ‘reserves’ of 236,000 tonnes (5.4% Pb, 2.4%Zn and 110 g/t Ag), as summarized in Table 6-2 (182,750 tonnes at Boh Yai and 53,731 located at Song Toh SW) exist as unmined blocks and pillars largely depicted on the relevant longitudinal section. ACA Howe has not attempted to classify these resources as CIM compliant due to the lack of data to conclusively determine the quantity and grade of remaining ore. The 236,000 tonnes of developed ‘reserves’ are based primarily on historical diamond drilling and channel and chip sampling. Verification of these developed ‘reserves’ and conversion to CIM compliant resources could best be achieved by the following:

- detailed compilation of chip and channel sample results;
- check assays of chip and channel sample pulp duplicates if available;
- underground check chip and channel sampling if accessible;
- conversion of underground development and stoping plans to digital format; and
- digital modeling of resources by mining block.

The undeveloped “reserves” or Class C reserves of 718,815 tonnes as summarized in Table 6-2 are based on diamond drill intersections. Former mine management also estimate 1.5 million tonnes of potential reserves at Boh Yai. These figures contrasts with CIM compliant indicated resources of 2.9 million tonnes and inferred resources of 1.9 million tonnes. This difference is due to a number of factors, including the following:

- CIM compliant resources include Song Toh Camp (439,000t indicated, 133,000t inferred) which is not included in the former mine managers historical estimates;

- Lower cut off used in CIM compliant resources of 3% PbEq vs 6% PbEq used by former mine management for historical estimates;

- Inclusion of internal waste in CIM compliant resources results in a much wider area of influence;

- The fact that former management estimated its reserves based on short-term production planning rather than a global estimate of resources.

It was possible, in the previous operation, to calculate reserves to a confidence level that allowed mine production to continue for in excess of 20 years.

It should be noted that the Boh Yai and Song Toh mines have each produced roughly twice the tonnage initially estimated for them at the time of development. This is consistent with a conservative approach used in the estimation of historical reserves.

These factors are discussed in more detail in section 14.8.3, 'Comparison with Previous Estimates'.

6.7. DRILLING

6.7.1. DRILLING HISTORICAL DATA AND INFORMATION

Investigation of the various mineral occurrences was carried out in a number of phases of diamond core drilling between 1977 and 2002. A total of 58,077 metres of drilling were completed at Song Toh and Boh Yai, as detailed in Table 6-3. The vast majority of core was 27 mm in diameter (AQ size) and was completed by LY-24 wireline machine.

Surface drilling has been largely constrained by the local topography where the steep limestone hills have controlled the location of drill sites. Underground drilling has been utilized to build up a more coherent database. In most areas drilling was carried out on an approximate 50m grid through a combination of angled and vertical holes from surface and mostly sub-horizontal holes from underground. However, in many areas the drilling density is considerably less dense.

Figure 6-2 and Figure 6-3 on the following page show the collar locations and drill traces at Boh Yai and Song Toh.

TABLE 6-3.SUMMARY OF DIAMOND DRILLING; BOH YAI AND SON TOH

Area and Hole Numbers	Number of Holes	Total Metres
Boh Yai		
B03/18 to B11/59	53	1,881
DDH003 to DDH 153	31	3,507
MKL1/01 to MKL11/31	157	18,163
NSN002 to NSN159	75	7,293
Total, Boh Yai	316	30,844
Song Toh		
BS001 to BS266	167	21,399

Area and Hole Numbers	Number of Holes	Total Metres
DDH062 to DDH156	39	5,080
N017	1	27
S005 to S084	28	728
Total, Song Toh	235	27,234
Total, Song Toh and Boh Yai	551	58,078

FIGURE 6-2. BOH YAI DRILL COLLAR LOCATIONS AND TRACES

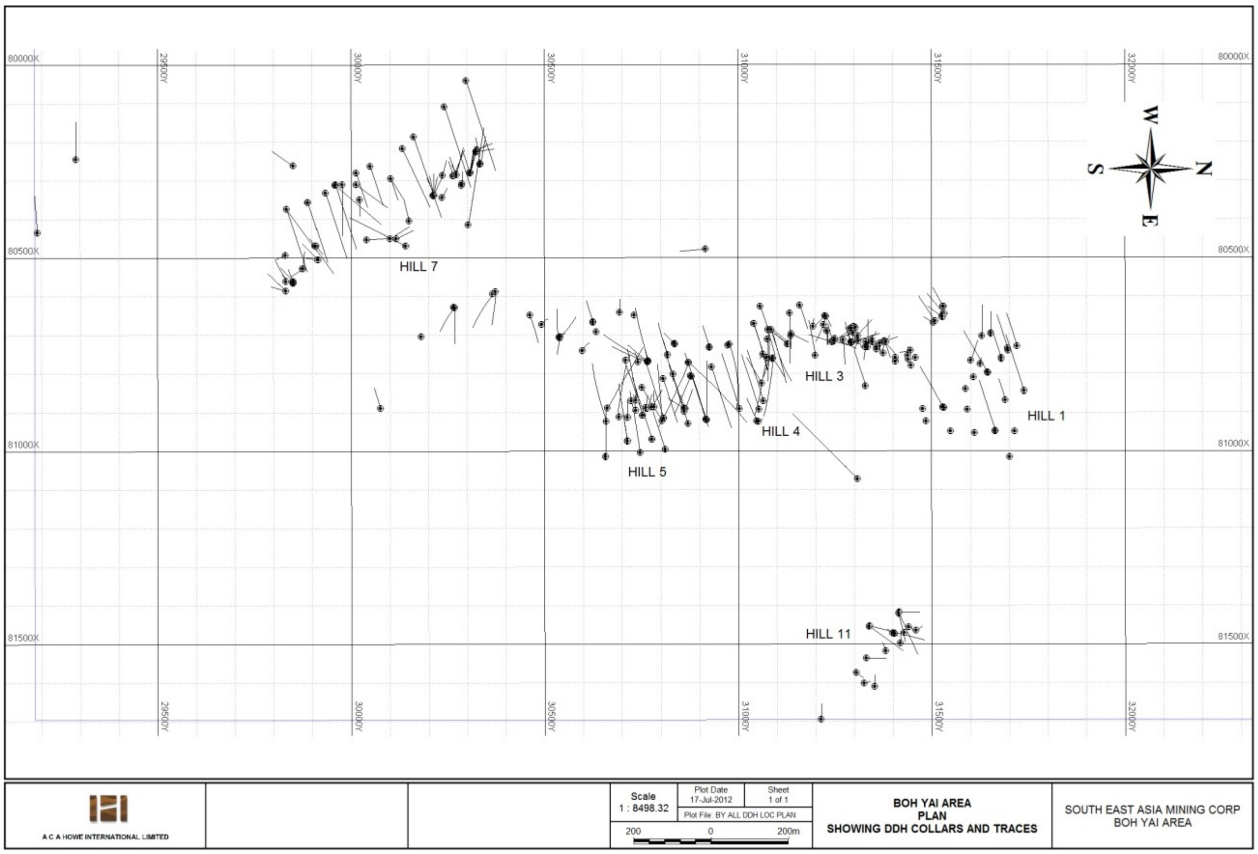
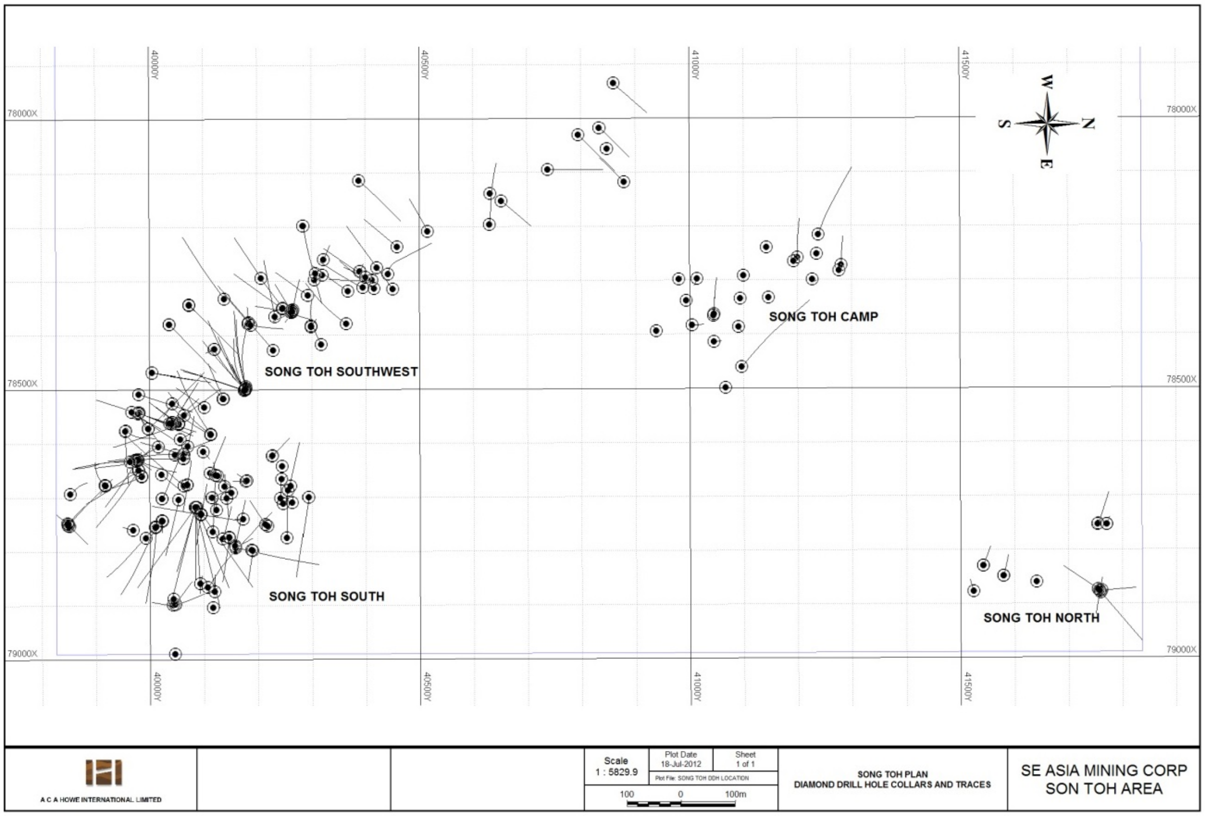


FIGURE 6-3. SONG TOH DRILL COLLAR LOCATIONS AND TRACES



Drill core is stored in a core magazine at Song Toh (Plate 6-2) and the majority appears to be in good condition and properly marked with hole numbers, run depths and sample numbers.

The results of drilling are recorded in graphical and narrative logs filed in the Kemco offices in Song Toh. Comparison of selected sections of drill core against the relevant drill logs confirmed that lithological, structural and mineralization features were accurately and properly recorded to a good professional standard.

SEAM has extracted all available data relating to collars, assays, collar locations and down hole surveys that is recorded in the logs and in journals and entered this in a database as described in section 14.1.4 of this report.

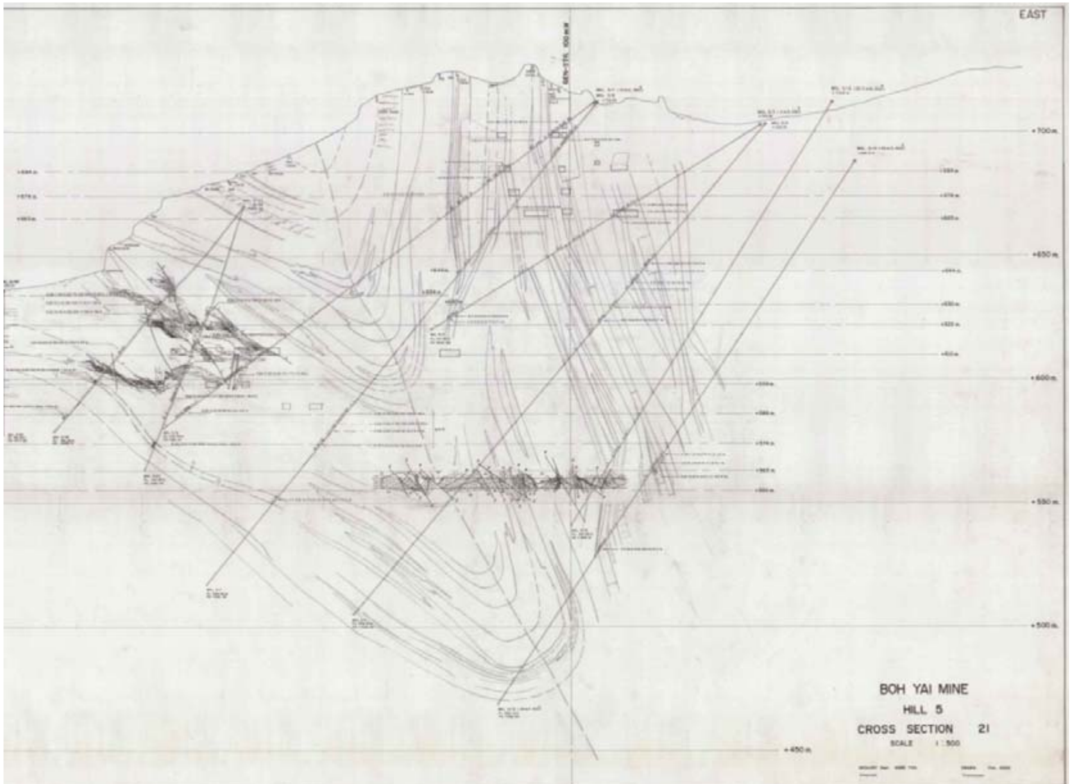
There appears to be limited geotechnical data although some drill holes do record RQD, (a measurement of rock quality based on the number of fractures). Basic descriptions of the mineralization and assays for selected sections of the drill holes are also available.

PLATE 6-2. CORE MAGAZINE AT SONG TOH

6.7.2. DRILL SECTIONS

The historically available drilling information was compiled onto a series of 1:500 scale cross-sections and plans (e.g. Figure 6-4), which were filed methodically at the Song Toh Mine office. The most relevant of these (totaling 547) have been scanned by SEAM and made available to ACA Howe as described in section 14.1.3. Examination of the plans and sections shows that they are of high quality and represent a diligent interpretation of the geology and mineralization. The interpretation of continuity of lithological and mineralized features between adjacent 25m sections is generally well conceived allowing accurate translation to domains in Micromine.

FIGURE 6-4. EXAMPLE OF HISTORICAL CROSS-SECTION (BOH YAI HILL 5)



6.8. CORE RECOVERY

Core recovery as recorded in drill logs and as evidenced from an inspection of drill core was generally close to 100%, as would be expected in competent carbonate lithologies.

6.9. DRILL HOLE SURVEYS

Drill hole collars all appear to have been surveyed accurately and collar elevation, azimuths and inclination data are all recorded in logs and in journals. The majority of holes exceeding 100m were surveyed by single shot instrument at intervals of between 20 and 40 metres.

SEAM has extracted the records of these surveys and compiled them in a database. Comparison of Micromine digital plots of hole collars and trajectories with those recorded on historical plans and cross sections confirms a close spatial correlation in almost all cases.

6.10. ASSAYS

MG/KEMCO performed a total of approximately 6,500 assays for Pb-Zn and Ag on drill core samples from Song Toh and Boh Yai at its laboratory facilities at Song Toh with check sampling at MG head office in Meggen, Germany and at SGS Bangkok. The procedures used are described in section 11.1 of this report.

7. GEOLOGICAL SETTING AND MINERALIZATION

7.1. REGIONAL GEOLOGY

The regional geology of western Thailand was mapped on a scale of 1:250,000 by the German Geological Mission in co-operation with the DMR between 1968 and 1971 (Koch 1973, Hagen & Kemper 1976) and the majority of available geological maps and texts appear to originate from this phase of work. The level of geological knowledge regarding the area is reasonably well documented.

The following is a summary of the geological setting of the area of interest in Western Thailand based on a review of the available literature.

A sedimentary sequence comprising at least 3,000m of mostly marine carbonates were deposited between the Cambrian and Jurassic (Koch 1973, Diehl & Kern 1981). The sediments are believed to have been deposited in a large sedimentary basin, described as the Yunnan-Malaya Geosyncline. These units are locally covered by fluviatile sediments of Cenozoic age. The most comprehensive geological account of the area is given by Hagen & Kemper (1976) and the following is based largely on their work.

The oldest known strata are clastic sediments of reported Cambrian age, based on faunal evidence and correlation with sequences in Myanmar. The beds are comprised of quartzite, slates and biotite schists with occasional intercalations of calcsilicates. These beds are apparently conformably and overlain by a thick sequence of Ordovician aged carbonates. However, the contact is not observed and Hagen & Kemper (1976) suggest it is structural in nature. The Ordovician carbonate package is reported to be in the order of 500m thick (Kuchelka 1981) consisting of a monotonous dark grey, flaser-structured, limestone with some clay content. Hagen & Kemper (1976) estimate the sequence to be in the order of 1000m-1500m thick. The dark limestone reportedly contains intercalations of 5 to 50m thick layers of light grey limestone, interpreted by Kuchelka to indicate a shallow marine mud. All the known Pb-Zn mineralization in the KEMCO properties occurs within the Ordovician carbonates.

The Ordovician-Silurian contact is poorly exposed and the flaser bedded limestone grade upwards into a more argillaceous and sandy sequence. During Silurian and Devonian times several hundred metres of fine clastic rocks accumulated, overlying the carbonates. Hagen & Kemper suggest, based on faunal evidence, that flaser-bedded carbonates are also present in both the Silurian and Devonian. During the Carboniferous, marine greywackes and conglomerate were deposited indicating occasional instability within the sedimentary basin (Diehl & Kern 1981). Hagen & Kemper also describe further carbonates of Carboniferous age, up to 100m thick, overlain by several hundred meters of shales. Further carbonates were deposited during the Permian and are distinguishable from the underlying Ordovician carbonates by their bituminous and dolomitic nature (Diehl & Kern 1981). Deformation of the older strata took place during the Triassic (Koch 1973) with tectonism extending at least into the Jurassic where Jurassic aged carbonates display similar deformation to the older rocks (Diehl & Kern 1981). A generalized stratigraphic column for the region is shown in Figure 7-1 and Figure 7-2.

The region is intruded by granitic rocks of Triassic or younger age, as they reportedly intrude and affect sediments of Palaeozoic age (Diehl & Kern 1981) although no radiometric age determination have been carried out.

FIGURE 7-1. REGIONAL GEOLOGY LEGEND

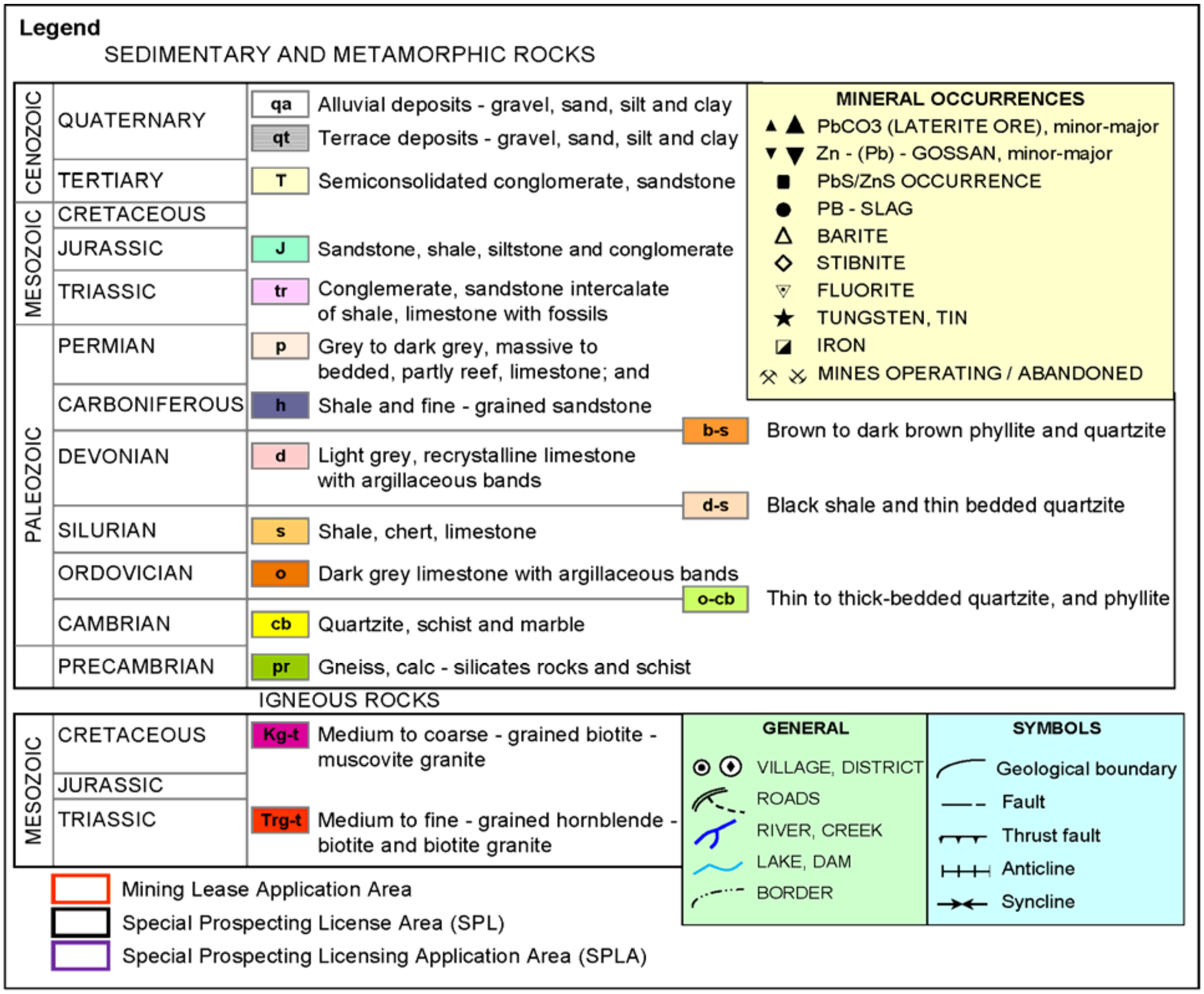
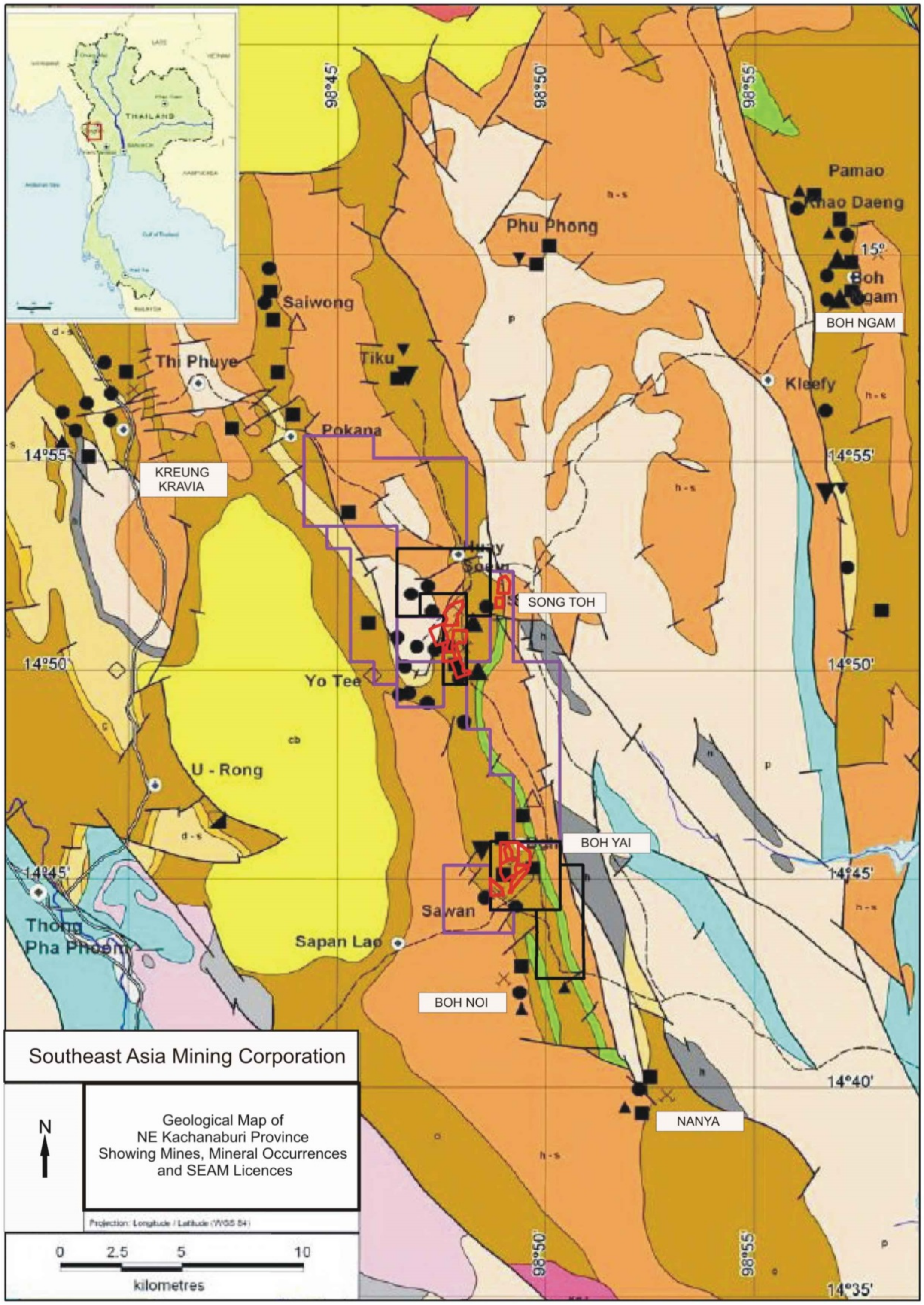


FIGURE 7-2. REGIONAL GEOLOGY



7.2. Property Geology

The ore bearing carbonates have been dated as Lower to Middle Ordovician (German Geological Mission Report 1971) using conodonts and assemblages of calcareous algae. The carbonates are part of a belt of similar aged carbonates that extend from the Gulf of Thailand to China and host a number of Pb-Zn deposits including those of the Kanchanaburi area under consideration here.

The carbonates are simply divided into two main facies: a pale coloured fossiliferous limestone and an underlying dark argillaceous limestone. The pale limestone exclusively hosts the mineralization and has been further sub-divided by Diehl & Kern (1981) into three groups:

- White or light grey bedded limestone;
- White or light grey massive limestone ; and
- Reddish or yellowish thin-bedded limestone-slate.

The dark grey argillaceous limestone is fine grained, micrite or mudstone with sparse bioclastic debris and common pyrite nodules and carbonaceous matter.

The carbonate succession is folded along NNW axes that dip steeply east which has resulted in a series of asymmetrical anticlines with steep or overturned western limbs (70-90 dip) and shallow eastern limbs (dipping 20-45 degrees east).

The carbonate succession and the mineral deposits are cut by numerous faults that are depicted on Boh Yai (Figure 7-3) and Song Toh (Figure 7-4) properties and published geological maps as trending in two principal directions, northwest (315°) and northeast (135°) or roughly parallel and at right angles to the regional strike and the fold axes. The NW-trending faults tend to exploit the steep-dipping fold limbs and disrupt mineralization in comparison to that in the shallow-dipping limbs.

FIGURE 7-3. BOH YAI GEOLOGY

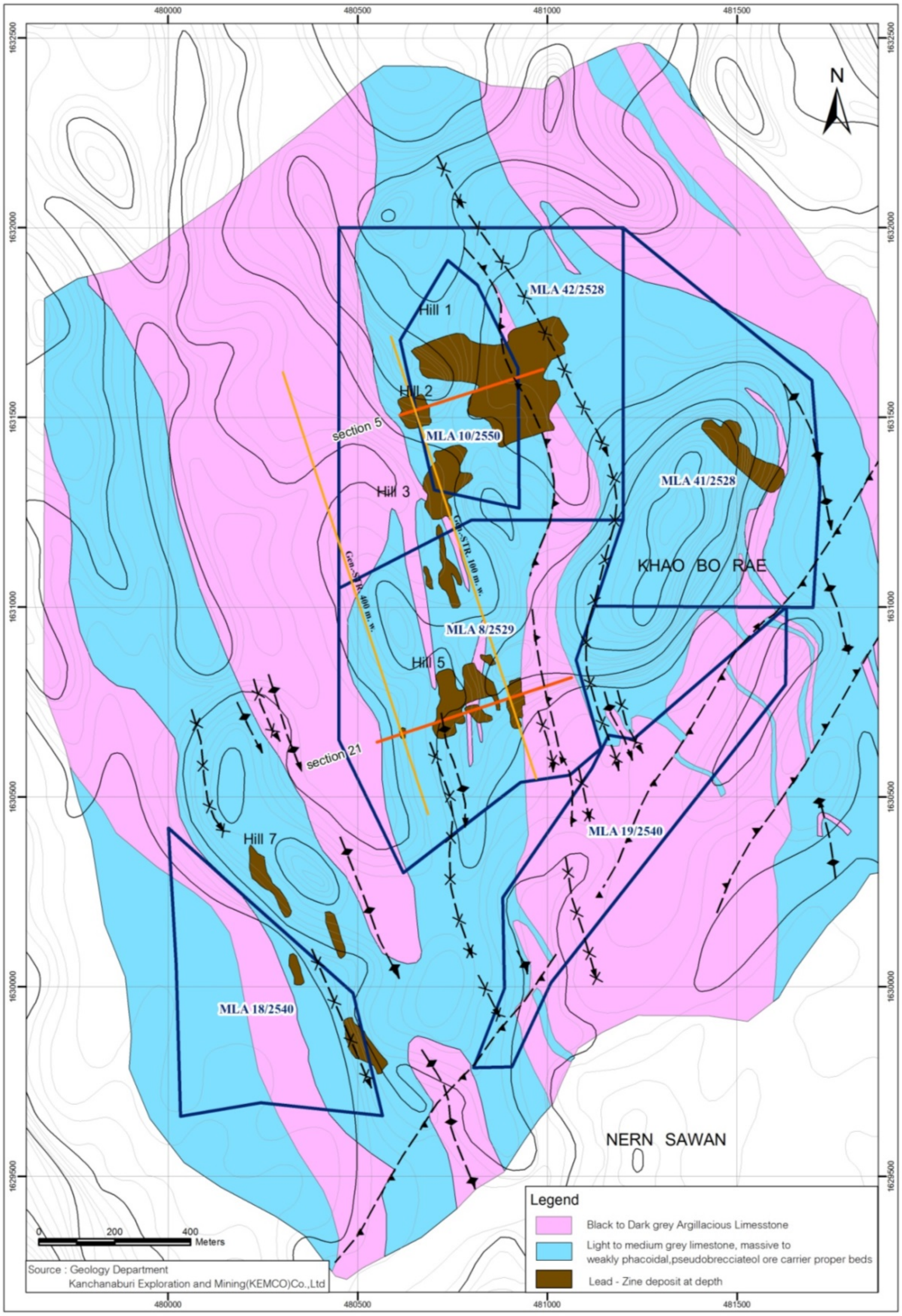
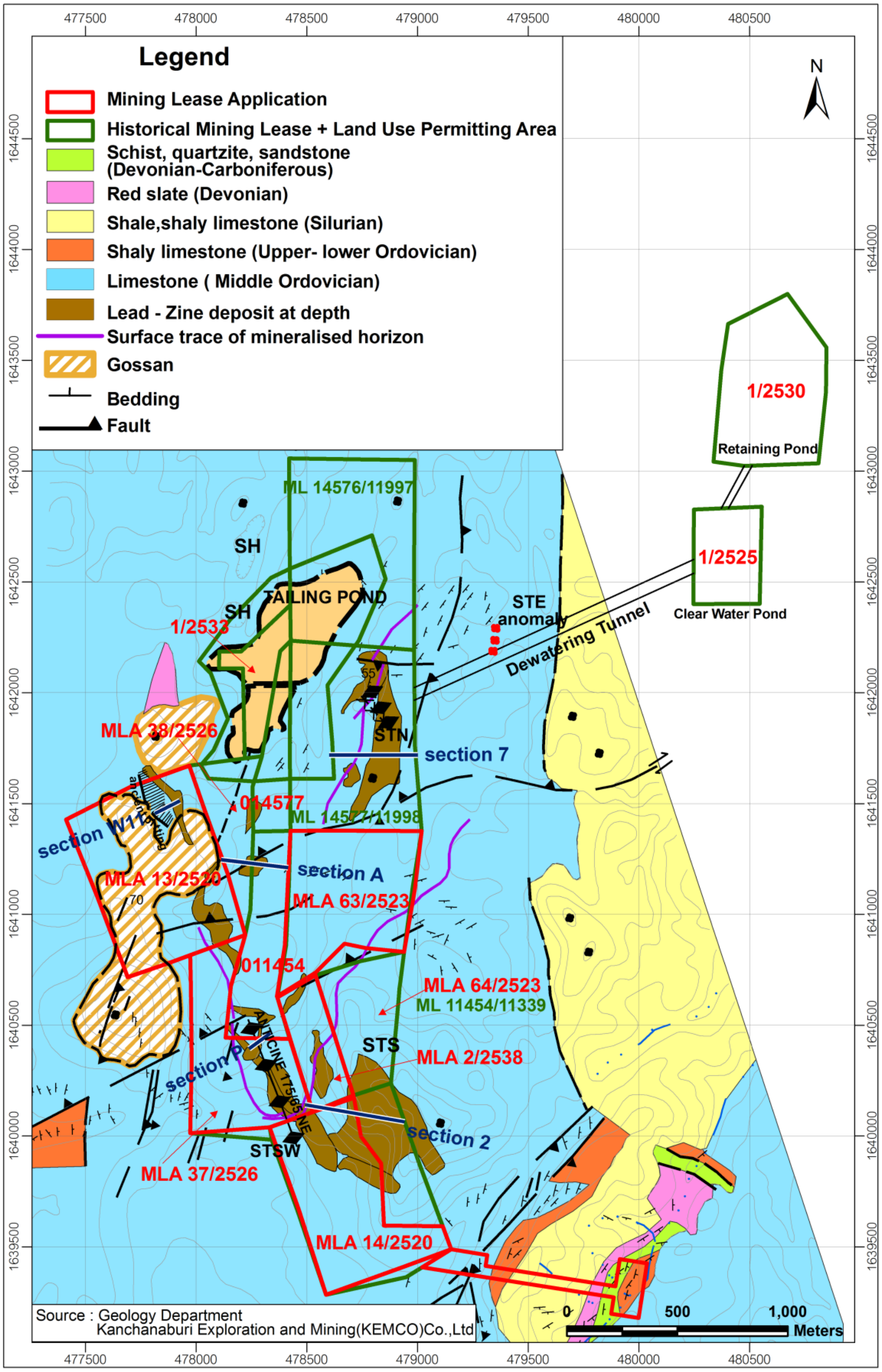


FIGURE 7-4. SONG TOH GEOLOGY



7.3. MINERALIZATION: SONG TOH AND BOH YAI

Mineralization occurs within the Ordovician carbonates over a belt extending for more than 35km from Nanya in the south-east, to Kreung Kravia in the North-west. The mineralization at Song Toh is exclusively hosted within the pale micritic limestone units although there is no strict concordance to bedding, with the mineralization being stratabound rather than stratiform. The thickness of the ore at Song Toh is reported to be on average 2.5m (Kuchelka 1981) with local thickening to 10m. The nature of the thickening is unclear and may be related to primary controls or later structural thickening.

Three different styles of mineralization are reported:

- Banded Ore – with ore bands of several to 10 cm thickness and roughly concordant with the host rock. The ore type exhibits rapid variation in grade and thickness over short distances;
- High grade lenses – locally with metal contents of 50% and with single lenses extending over 20m with thickness of up to 5m;
- Disseminated ore – of relatively low grade <5% and which appear to form as lateral extension of the banded ore and between ore bands;

The mineralization mainly consists of quite finely intergrown sphalerite, galena and pyrite with a Pb:Zn ratio of approximately 2.5:1 (Kuchelka 1981). The metal ratio is not uniform throughout the deposits and can locally be 1:2 where higher zinc grades occur locally. In underground exposure the sulphide mineralization appears to be highly deformed, exhibiting rapid pinch-swell structure, sheared, horse-tailed and injected, see Plate 7-1 below. Textures range from banded & folded sulphide mylonite to intensely recystallized to mineralized carbonate megabreccias. Associated gangue alteration includes siderite, barite, dolomite, silica “red-chert” or hematite-silica, minor chalcopyrite, talc & serpentine. According to Diehl & Kern 1981 replacement of the host rock by the sulphide is minor or absent. The age of the main deformation is Permo-Triassic, and this is followed by late Cretaceous-early Tertiary thrusting.

The mineralization is highly deformed, possibly as a result of both tectonic events and therefore might be presumed to be pre-Permian in age. The dip of the mineralized zones depends on whether they occur on the steep fold limbs (70-90 degrees) as at Boh Yai Hill 7 and Song Toh Southwest, or on the shallow limbs (20-45 degrees) as at Boh Yai Hill 1, Song Toh South and Song Toh Camp. The steep-dipping fold limbs appear to be more strongly faulted and deformed with consequent decrease in continuity of mineralization compared to the shallow-dipping limbs.

The mineralization includes varying content of silver and mercury, up to 3500 ppm and 918 ppm respectively but no mineralogical studies are available indicating which mineral species these metals occur in. In general the higher silver content occurs in steeply dipping parts of the deposits (eg. Song Toh SW, Boh Yai Hill 7) whereas the shallow dipping more tectonised parts of the deposits (Song Toh Camp, Boh Yai Hill1) are characterized by lower silver content.

PLATE 7-1. BOH YAI, TYPICAL MINERALIZATION, PB-ZN-FE SULPHIDES IN SHEARED LIMESTONE

8. DEPOSIT TYPES

The deposits are described by Diehl & Kern (1981) as of Mississippi Valley Type ("MVT") with close similarities to some of the Alpine deposits. Extensive mining has taken place since the published work by Diehl and Kern and the remaining staff at the mine now has much better appreciation of the metal distribution and ratios throughout the deposits. Currently this information is only available in a large number of hardcopy maps. Until there is a much better geological understanding of the area the classification of the deposit will remain uncertain and the presence of major early Triassic granites in the area might suggest alternative affinities and origins for the deposits.

9. EXPLORATION

Reconnaissance exploration was carried out by SEAM and its subcontractor GMT on the three SPLs surrounding Song Toh and Boh Yai mines in 2011 and 2012. The aim of this work was to generate targets for similar mineralization peripherally to the known deposits.

The work has included the following:

- Lineament interpretation using Landsat imagery;
- Airborne Magnetic and Radiometric Survey data interpretation;
- Petrographic and ore microscopic examination;
- Geochemical sampling (soil and rock chip);
- IP and Resistivity survey.

9.1. LANDSAT IMAGERY

The Company interpreted LANDSAT satellite TM images using Band 453-RGB and Band 321-RGB. The image Band 453-RGB is more suitable for a geological study in the area.

Delineation of areas of possible different rock types (Figure 9-1 and Figure 9-2) is based on the pattern of drainage in the area. They are interpreted as granite, bedded limestone, and massive limestone.

Interpretation of geological structures, i.e., lineaments of faults and joints of country rocks is as follows:

- Faults - Major faults trend NNW-SSE following the direction of the Three Pagodas Fault that extends from Myanmar and is apparently associated with lead-zinc mineralization. Minor faults trend NW-SE and NE-SW. Faults in N-S and E-W direction are rare.
- Joints - Significant joints are in NE-SW and NW-SE directions.

FIGURE 9-1. LANDSAT 5 TM IMAGE OF KEMCO PROJECT AREA AND VICINITY

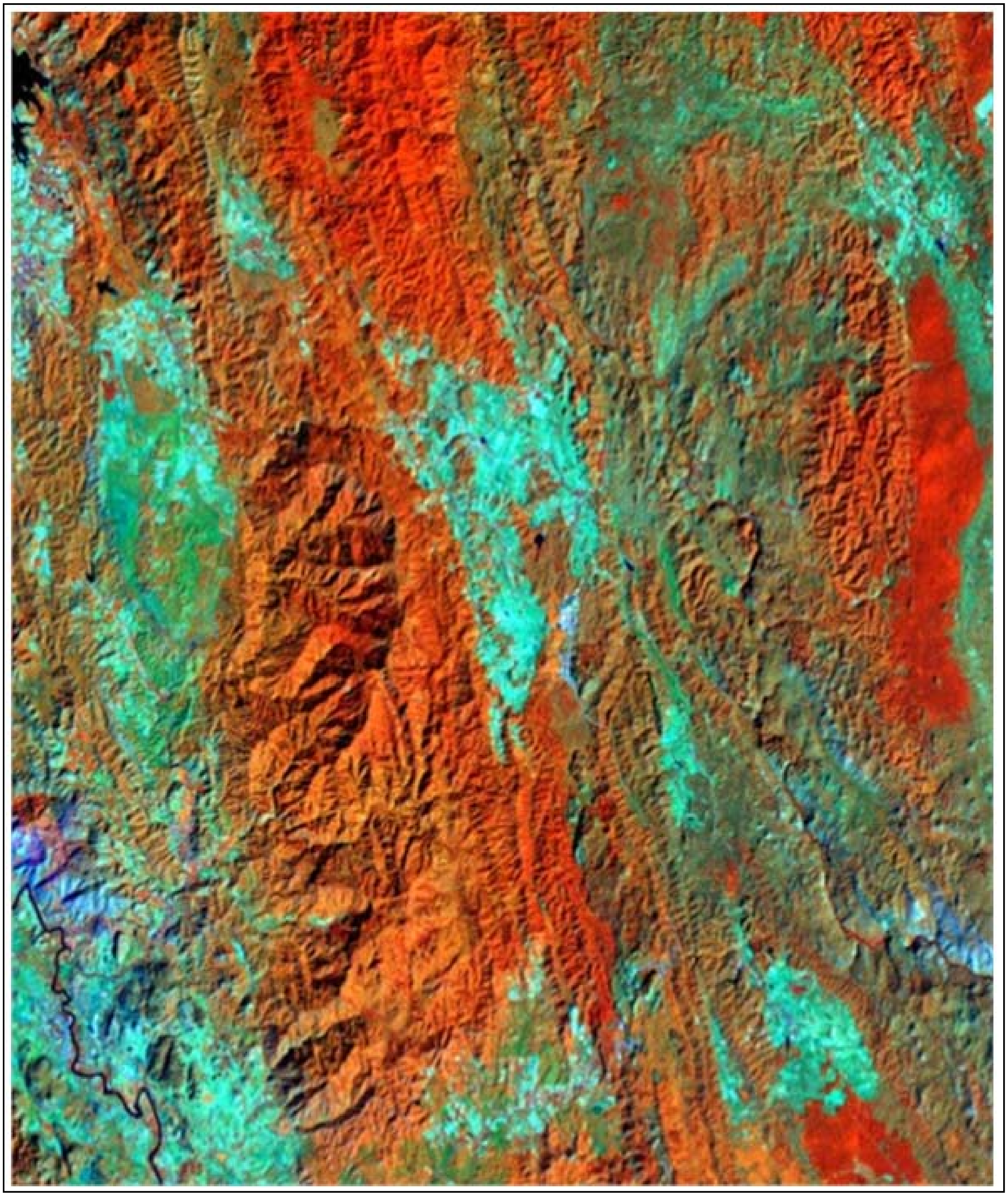
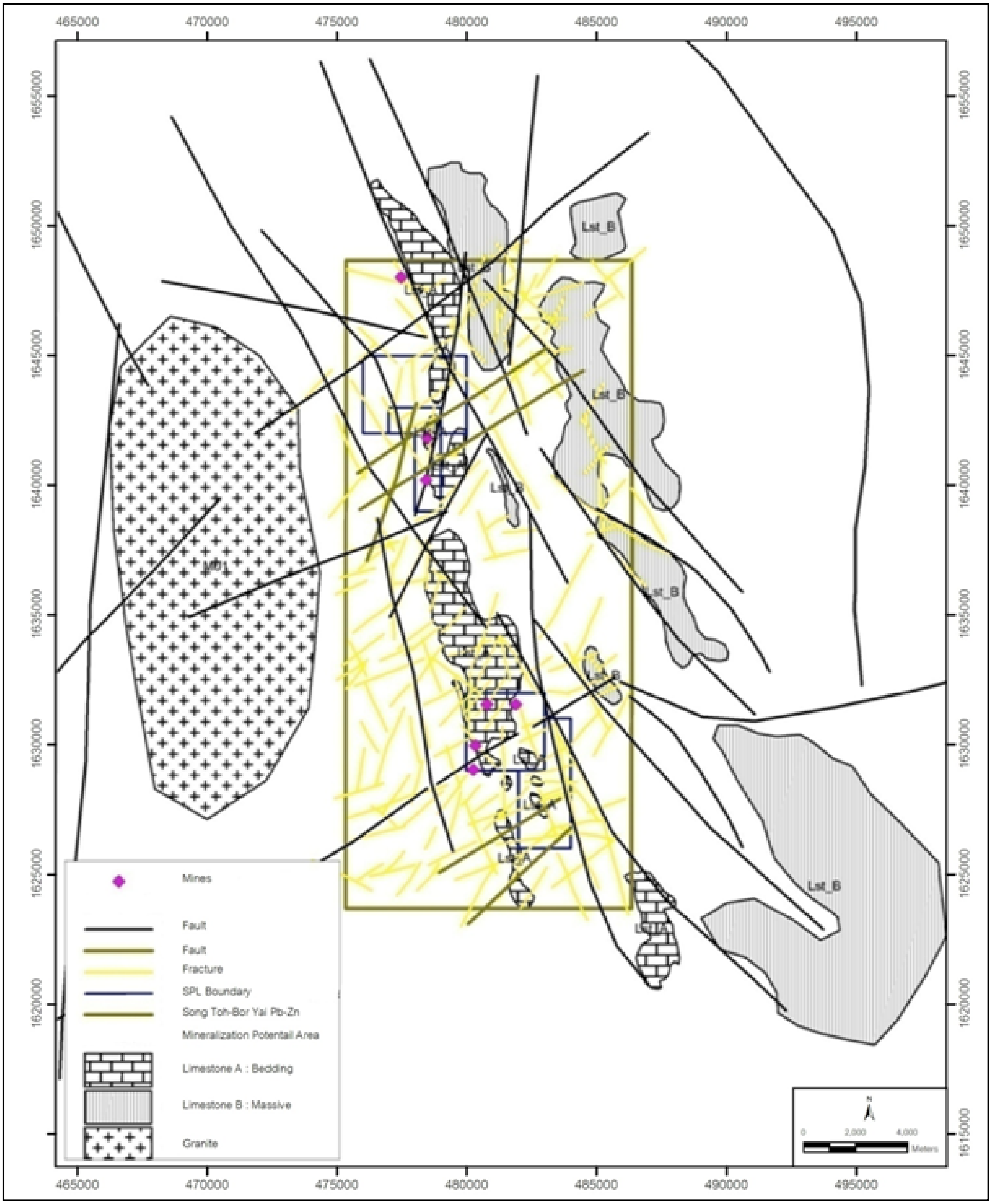


FIGURE 9-2. LANDSAT INTERPRETATION - LINEAMENTS AND ROCK UNITS



9.2. AIRBORNE MAGNETIC SURVEY INTERPRETATION

The DMR with the assistance of the Canadian International Development Agency ("CIDA") carried out airborne magnetic and gamma-ray radiometric surveys covering most of the country during 1984 and 1989. The surveys were flown by Kenting Earth Sciences International Limited ("KESIL"), a Canadian contractor. In the Kanchanaburi area, both the magnetic and radiometric airborne surveys were flown with survey flight-line spacing of 1 kilometre. The flight-line directions are N-S and E-W for magnetic and radiometric surveys, respectively. Aeromagnetic and radiometric grids used in the interpretation were extracted from the nationwide grids with a 500 metre grid cell size.

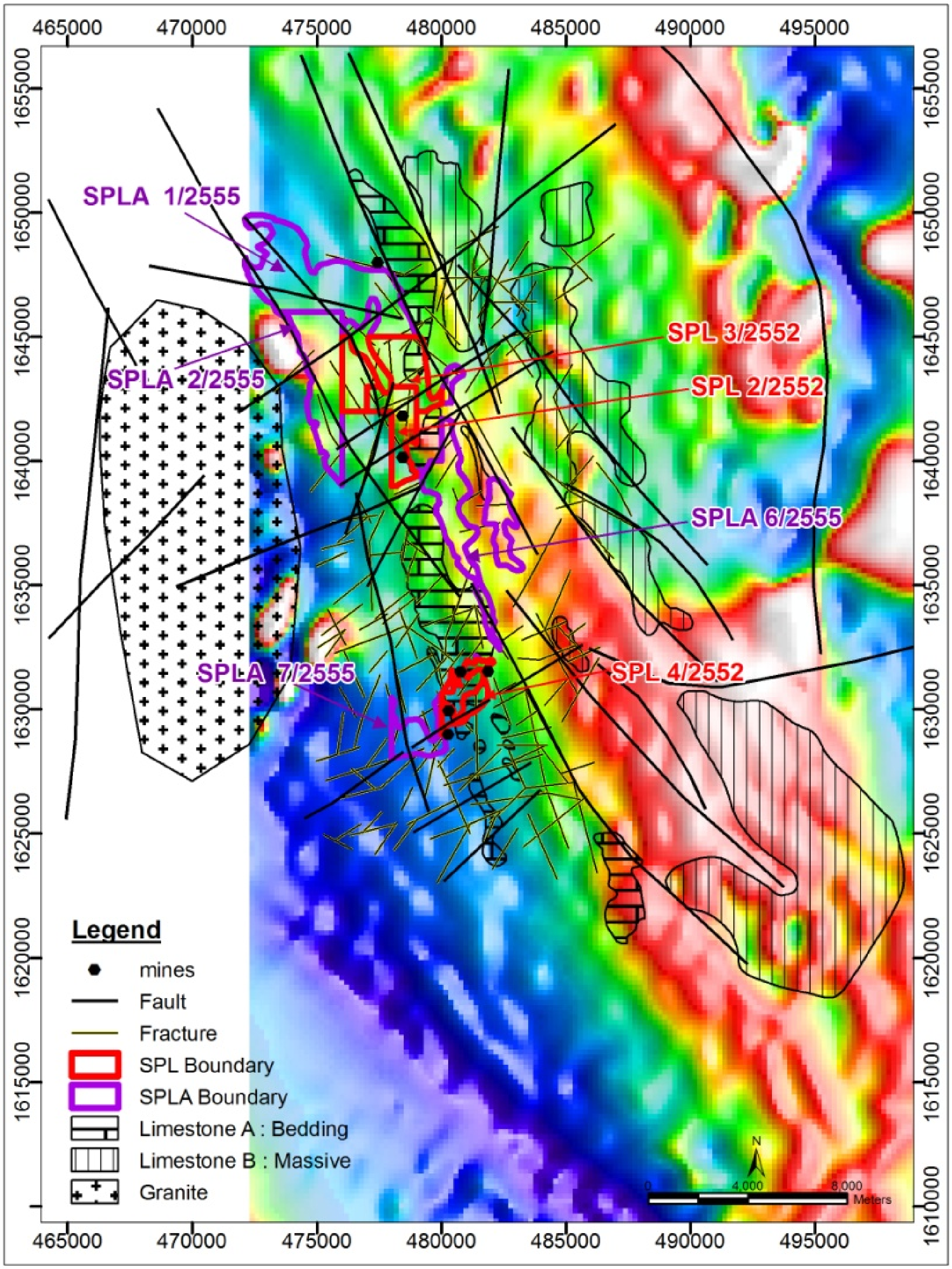
The data from this survey was processed and interpreted by Austhai Geophysical Consultants Limited ("Austhai") who recognized the following principal features:

- Enhanced Reduction to the Pole image definition to the Northwest-Southeast structural texture as well as cross-cutting Northeast-Southwest trending structures running through the SPL's and SPLA's.
- Both the Song Toh and Boh Yai mines are located along the margins of major Northwest-Southeast trending structural trends;
- The Song Toh mine is associated with an apparent intersection of the main Northwest-Southeast structure with a cross cutting Northeast-Southwest structure;
- The NW-SE and NE-SW linear structural features noted above coincide with linear features that had been interpreted from Landsat imagery. This feature is particularly prominent on the Y gradient of the Vertical Integral image, (Figure 9-3);
- The Song Toh mine is associated with a mild high in the Reduction to the Pole trending Northwest-Southeast indicating that a magnetic signature is associated with the mineralization;
- A large magnetic high to the west of Boh Yai and Song Toh is coincident with a granite intrusion mapped in this area.

Based on this interpretation, Austhai recommended the following geophysical exploration programme:

- Phase I as outlined in section 26.1 - Ground magnetic survey over the SPL's to verify the association of magnetic high in the Reduction to the Pole and analytical signal with mineralization.
- Phase II as outlined in section 26.2- Tighter line survey of 50m or 100m spaced Airborne or Heli-magnetic survey over the SPL's and SPLA's. Either as a standalone survey or in conjunction with a Heli Electromagnetic survey of the area.

FIGURE 9-3. VERTICAL GRADIENT AEROMATICS AND LANDSAT INTERPRETATION

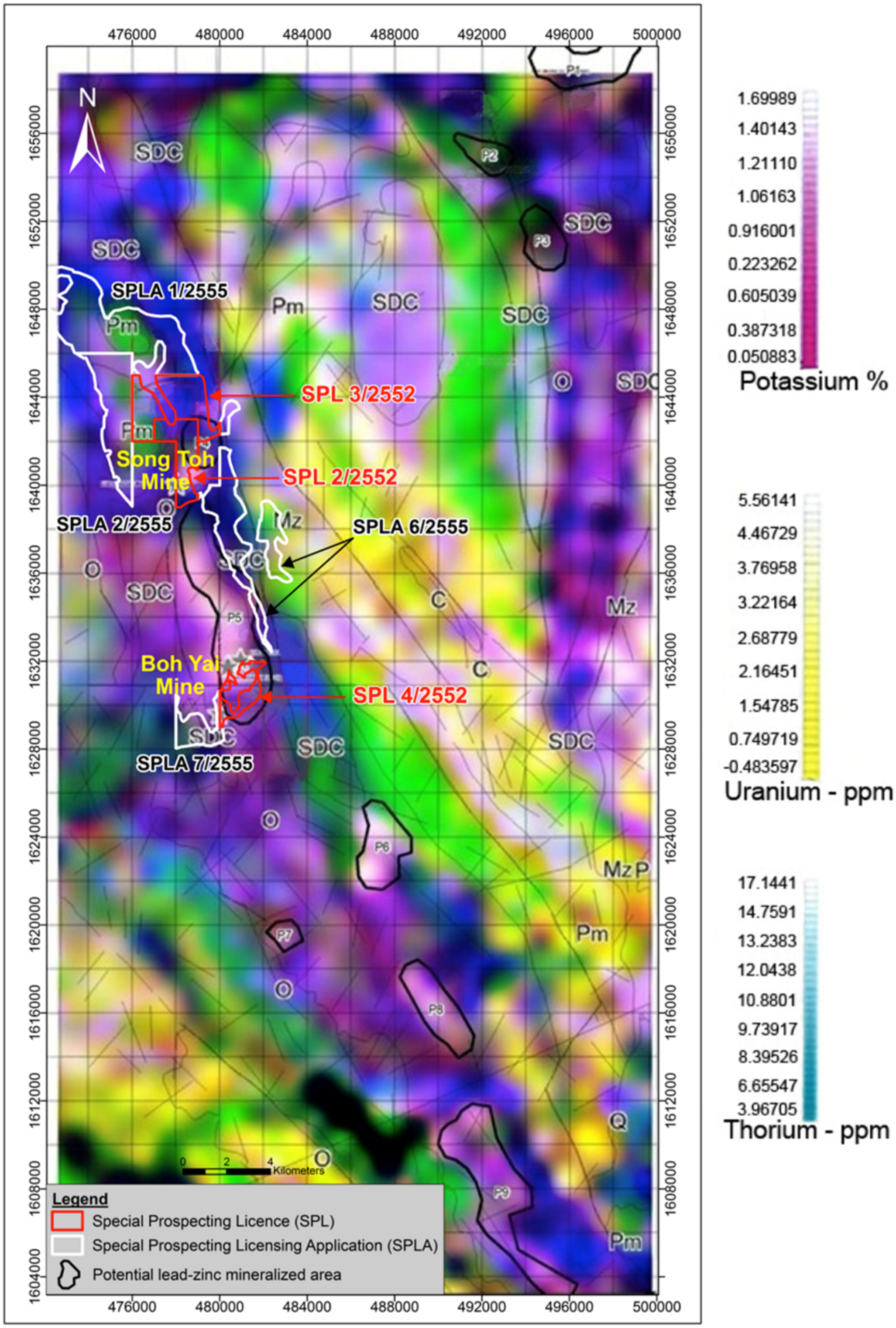


9.3. AIRBORNE RADIOMETRIC SURVEY INTERPRETATION

The airborne radiometric data from the above mentioned survey program in the Song Toh and Boh Yai area was processed and interpreted by GMT Corporation Limited.

The interpretation was based on the observation that lead-zinc mineralization is closely associated with Lower to Middle Ordovician argillaceous limestone which is characterized by a low uranium, thorium and potassium signature compared to other rock units in the area. A number of potential lead-zinc mineralized target areas were identified on the basis of radiometric low anomalies (Figure 9-4).

FIGURE 9-4. RADIOMETRIC TERNARY MAP OF SONG TOH - BOH YAI AREA SHOWING POTENTIAL PB-ZN MINERALIZATION AREAS



9.4. PETROGRAPHIC AND ORE MICROSCOPIC EXAMINATION

In June 2011, rock samples were collected from SPL 2-3/2552 and SPL 4/2552 for petrographic study and ore microscopy by GMT.

9.4.1. PETROGRAPHIC STUDY

Twelve rock samples were collected from SPL 2-3/2552 and fourteen samples were collected from SPL 4/2552 for petrographic classification. The samples were described as follows:

- Limestone (HS-003 RK, HS-012 RK, HS-031 RK, HS-032 RK, HS-034 RK),
- Argillaceous limestone (HS-001 RK, HS-006 RK, HS-020 RK),
- Oolitic limestone (HS-013 RK and HS-019 RK),
- Marble (HS-015 RK, BR 001 RK, BR 002 RK, BR 010 RK, BR 020 RK, BR 023 RK, BR 024 RK, BR 029 RK),
- Dolomite breccias (BR 022 RK),
- Dolomite (BR 028 RK, BR 030 RK, BR 044 RK, BR 046 RK, BR O47 RK, BR 081 RK), and
- Feldspathic arenite sandstone (HS-10 RK)

9.4.2. ORE MICROSCOPY

Eight samples were collected from SPL 2-3/2552 and six samples were collected from SPL 4/2552 and analyzed for identification under an ore microscope.

In SPL 2-3/2552, six of the samples (HS-003 RK, HS-006 RK, HS-007 RK, HS-013 RK, HS-020 RK, HS-031 RK) were determined to be brecciated limestone with disseminated sphalerite, galena, and pyrite. The remaining two samples (HS-015 RK and HS-034 RK) were determined to be quartz vein material disseminated with the same sulphide minerals as the other samples.

In SPL 4/2552, all six samples (BR-005 RK, BR-008 RK, BR-009 RK, BR-020 RK, BR-021 RK and BR-052 RK were determined to be brecciated limestone with disseminated sphalerite, galena, and pyrite. Intergrowth between galena, sphalerite and pyrite in sample No. BR-021 RK implies that the minerals were deposited from hydrothermal fluids synchronously in similar geologic conditions.

9.5. ROCK CHIP GEOCHEMICAL SAMPLING

In March 2011, SEAM conducted a geochemical sampling program consisting of rock chip sampling on SPL 2-3/2552 and SPLs 4/2552. All samples were sent to Mineral Assay and Services (MAS) Laboratory in Bangkok, and analyzed using Induced Couple Plasma Emission Spectroscopy (ICP-ES) for 23 elements.

Song Toh Area – SPL 2-3/2552

58 rock chip samples were collected from SPL 2-3/2552 in the vicinity of the Song Toh mine. The following is a summary of the more significant results:

- 17 samples > 100 ppm Pb;
- 6 samples > 1000 ppm Pb;
- 4 samples > 10000 ppm Pb
- 14 samples > 100 ppm Zn;
- 5 samples > 1000 ppm Zn;
- 3 samples > 1,000 ppm Ba.

All of these elements show a strong correlation.

In SPL 2-3/2552, moderate to high lead and zinc values from the rock chipsampling program occur in the central part of SPL 2/2552 area which is associated with the NE-SW main structure. Many of the anomalous values correspond with known areas of sub-outcropping lead-zinc mineralization or old underground working areas. Many of the weakly anomalous lead and zinc values are present in the northeastern part of SPL 3/2552 area which was mapped as argillaceous limestone of Permian age. Follow up work is required to clarify that the lead-zinc mineralization is indeed associated with Permian limestone.

Boh Yai – SPL 4/2552

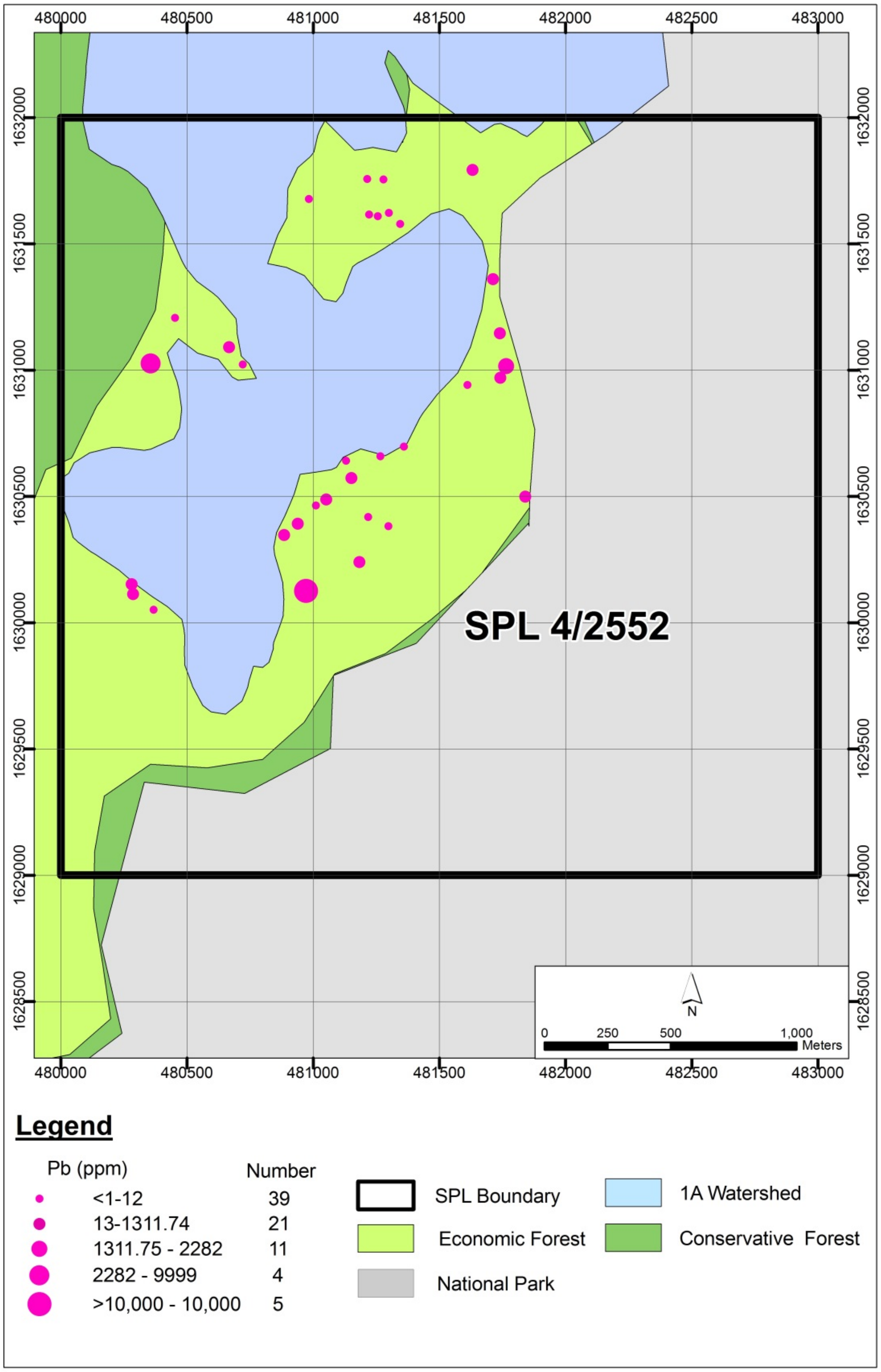
Forty-six rock chip samples were collected from SPL 4/2552 in the vicinity of the Boh Yai mine. The following is a summary of the more significant results:

- 7 samples > 100 ppm Pb;
- 5 samples > 1000 ppm Pb;
- 1 sample > 10000 ppm Pb
- 2 samples > 1000 ppm Zn;
- 1 sample > 100 ppm Cd
- 2 samples have > 1,000 ppm Ba.

All of these elements show a strong correlation.

Low to moderate lead anomalous values from the rock chip sampling are widely distributed in the SPL area (Figure 9-5).

FIGURE 9-5. BOH YAI LEAD ANOMALIES IN ROCK CHIP SAMPLES



9.6. Soil Geochemical Sampling Song Toh

A soil geochemical survey was conducted in October and November 2011 on SPL 2/2552 and 3/2552 by GMT. A total of 175 soil samples were collected from a 16 line-survey totaling 15 line-km. The line spacing was 100 – 200 m and 100 m sample spacing. The samples were collected from the B or C soil horizon by hand auger and analyzed for 23 elements by aqua regia leach / ICP-ES at MAS Laboratory in Bangkok.

Results of the survey are summarized below and Pb anomalies outlined in Figure 9-6.

SPL 2/2552

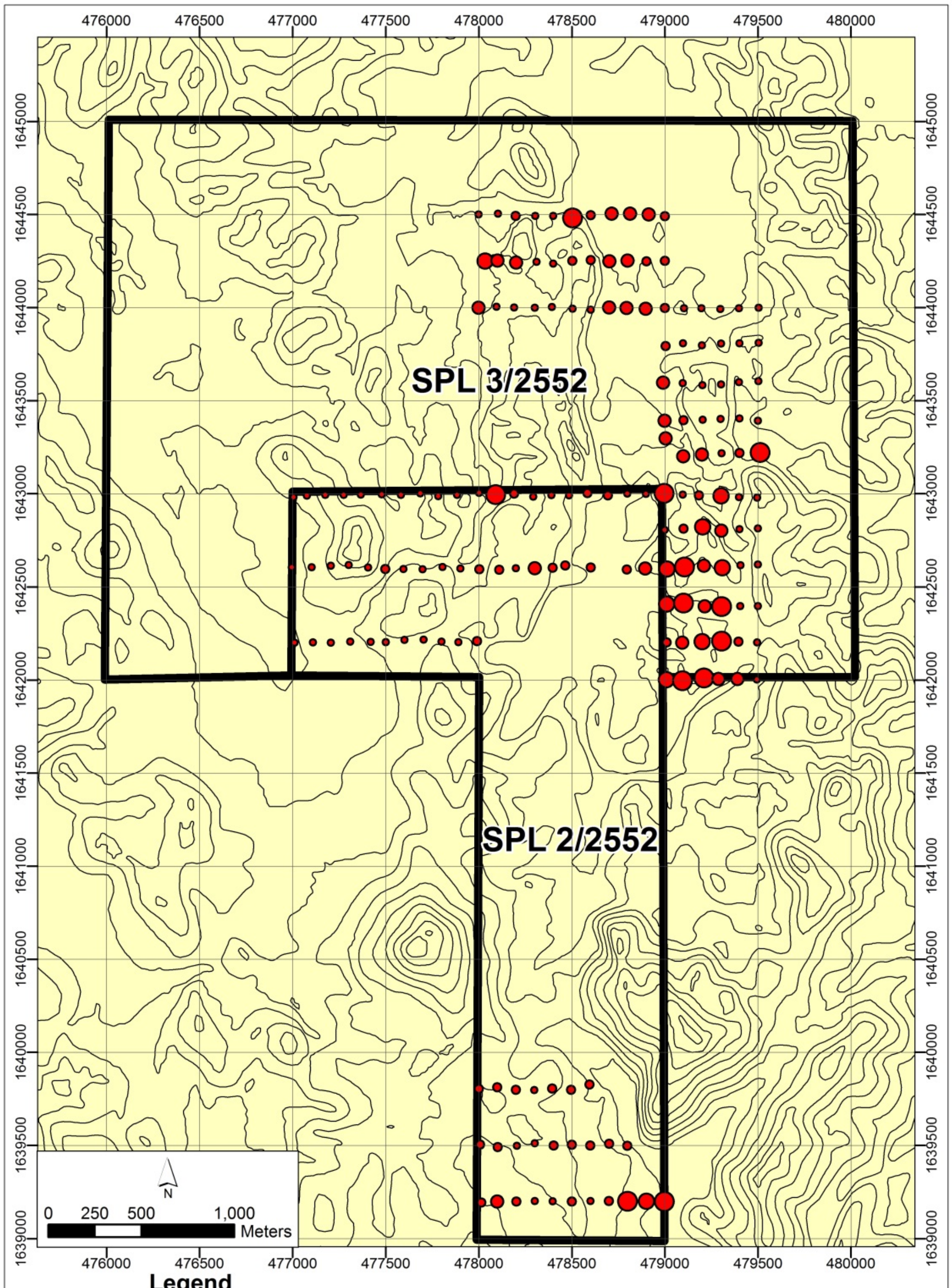
Results from the survey showed high lead anomalies ranging from 4,800 to 4,900 ppm, which are found in the southern part of the SPL. Based on field observation in the surrounding area, the Pb anomalies were likely derived from calcite veinlets containing minor galena and pyrite located over the southern part of Song Toh south ore body.

Copper anomalies are weak (50 to 245 ppm) and are mainly found in the north western area of the SPL and others are found in the southern part of the SPL associated with lead anomalies.

SPL 3/2552

The survey results showed high lead anomalies > 1,000 ppm that are mainly found in the eastern part of the SPL. In general, the high lead values are found along hill slope and karst topography associated with slightly reddish brown to dark brown soil, a weathering product of light grey to grey, fine grained limestone. Zinc anomalies also show the same distribution pattern as lead on the eastern part of the SPL but with lower values. These results suggest the presence of unidentified mineralization in this area.

FIGURE 9-6. SONG TOH LEAD ANOMALIES IN SOIL SAMPLES



Legend

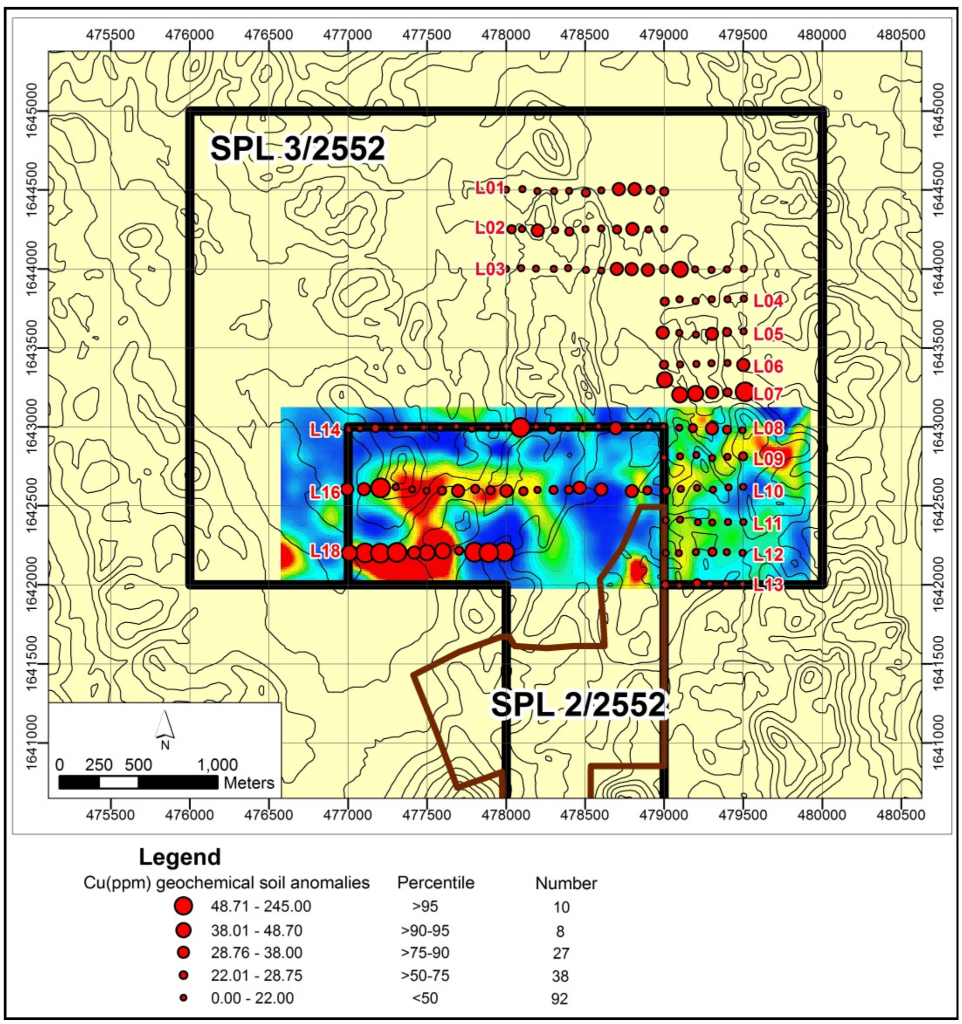
Pb(ppm)	Percentile	Number
2275.76->10000	>95	12
989.41-2275.75	>90-95	9
531.76-989.40	>75-90	25
191.01-531.75	>50-75	43
15.00-191.00	<50	86

9.7. GROUND IP AND RESISTIVITY SURVEY

A ground IP and resistivity survey (Time Domain Induced Polarization method) was conducted on SPL 2/2552 and SPL 3/2552 area by Austhai in October and November, 2011. The complete survey totaled 20 line-km concentrating on areas to the north and west of the Song Toh mine with 100 - 200 m line-spacing. A series of 6 electrode pole-dipole arrays with dipoles of 100 m and poles spaced every 100 m along line was used to collect the inline 2D IP data. To optimize the information from the pole-dipole data collected over the Song Toh grid, two separate 3D block inversions were completed.

IP and resistivity anomalies correspond mostly with known areas of sub-outcropping lead-zinc mineralization or old underground working areas, but several anomalous zones are located distally from the known mineralization and are partly coincident with lead, zinc and copper soil anomalies as shown in Figure 9-7.

FIGURE 9-7. SONG TOH - IP CHARGEABILITY AND SOIL ANOMALIES



9.8. EXPLORATION POTENTIAL

The potential for increasing the resources at Boh Yai and Song Toh both at depth and peripherally is discussed in section 14.

The mineralization at Song Toh and Boh Yai occurs in prominent limestone hills in which outcrops are common and mineral showings would have been easy to identify by simple prospecting methods. However the topography over much of the 35 kilometer limestone belt is relatively subdued and covered by forest which hampers prospecting. Much of this belt is mapped as underlain by the same formations that host the Song Toh and Boh Yai deposits and holds potential for similar mineralization which warrants exploration by similar geochemical and geophysical methods to those already used.

9.9. EXPLORATION CONCLUSIONS AND RECOMMENDATIONS

Exploration to date has identified a number of Pb and Cu soil anomalies and IP anomalies peripheral to the Song Toh and Boh Yai mines, which may be indicative of more extensive Pb-Zn mineralization in these areas. Further work, including geological mapping and more detailed geochemical and geophysical surveys is warranted in order to further define drill targets.

The interpretation of exploration results is hampered by the lack of a detailed geological map and by lack of proper understanding of the geological controls of the Song Toh and Boh Yai deposits.

ACA Howe recommends that SEAM should continue indexing historical plans and the most recent and reliable of these should be imported as georeferenced images into a suitable GIS package such as Mapinfo. Other available data should also be imported into the GIS package, including radiometrics, all available satellite imagery, published and unpublished geological and topographic maps and SRTM.

Exploration data recently generated by SEAM should be compiled within a database and imported into the GIS package.

The integration of this historical and modern data will allow:

- compilation of a geological map of the 35 km limestone belt,
- better characterization of the mineralization controls at Song Toh and Boh Yai,
- better interpretation of exploration results and prioritization of targets,
- recognition of additional targets warranting exploration.
- drilling program

The following geophysical exploration program, as recommended by Austhai should be considered:

Phase I as outlined in section 26.1:

- ground magnetic survey over the SPL's to verify the association of magnetic high in the Reduction to the Pole and analytical signal with mineralization;

- infill IP and Resistivity lines in the northwest area which will allow a direct comparison of model results for the southern portion of the area with the eastern area;

- Additional IP to identify areas of copper mineralization in the form of disseminated sulphide alteration in conjunction with areas silicification;

- orientation IP surveys should be carried out over the Song Toh and Boh Yai deposits in order to characterize the response and allow optimization of survey parameters;

Phase II as outlined in section 26.2:

- Further specific gravity measurements of a wider range of samples with the view of conducting gravity survey in conjunction with the heliEM/IP to locate potential massive galena occurrences along the main NNE-SSW trending lead deposits in the east.

- tighter line survey of 50m or 100m spaced Airborne or Heli-magnetic survey over the SPL's and SPLA's. Either as a standalone survey or in conjunction with a Heli Electromagnetic survey of the area;

10. DRILLING

No drilling has been carried out on the Kemco properties by SEAM. All the drilling on the properties is historical in nature and is discussed in section 6.7 “Drilling, (Historical)”, of this report.

11. SAMPLE PREPARATION ANALYSIS AND SECURITY

11.1. HISTORICAL DRILL CORE SAMPLES

Drill core was aligned in the core box and marked with crayon along the top surface. Each section of drill core was removed from the core box and cut using a diamond saw. One half of the core was returned to the core box and aligned with the previous piece, the other half was placed in a numbered plastic and dispatched for sample preparation and assay.

Mineralized core zones were sampled continuously with sample intervals depending on mineralization and lithology and ranging from 0.3 metres to 3.0 metres, and averaging 1.27 metres.

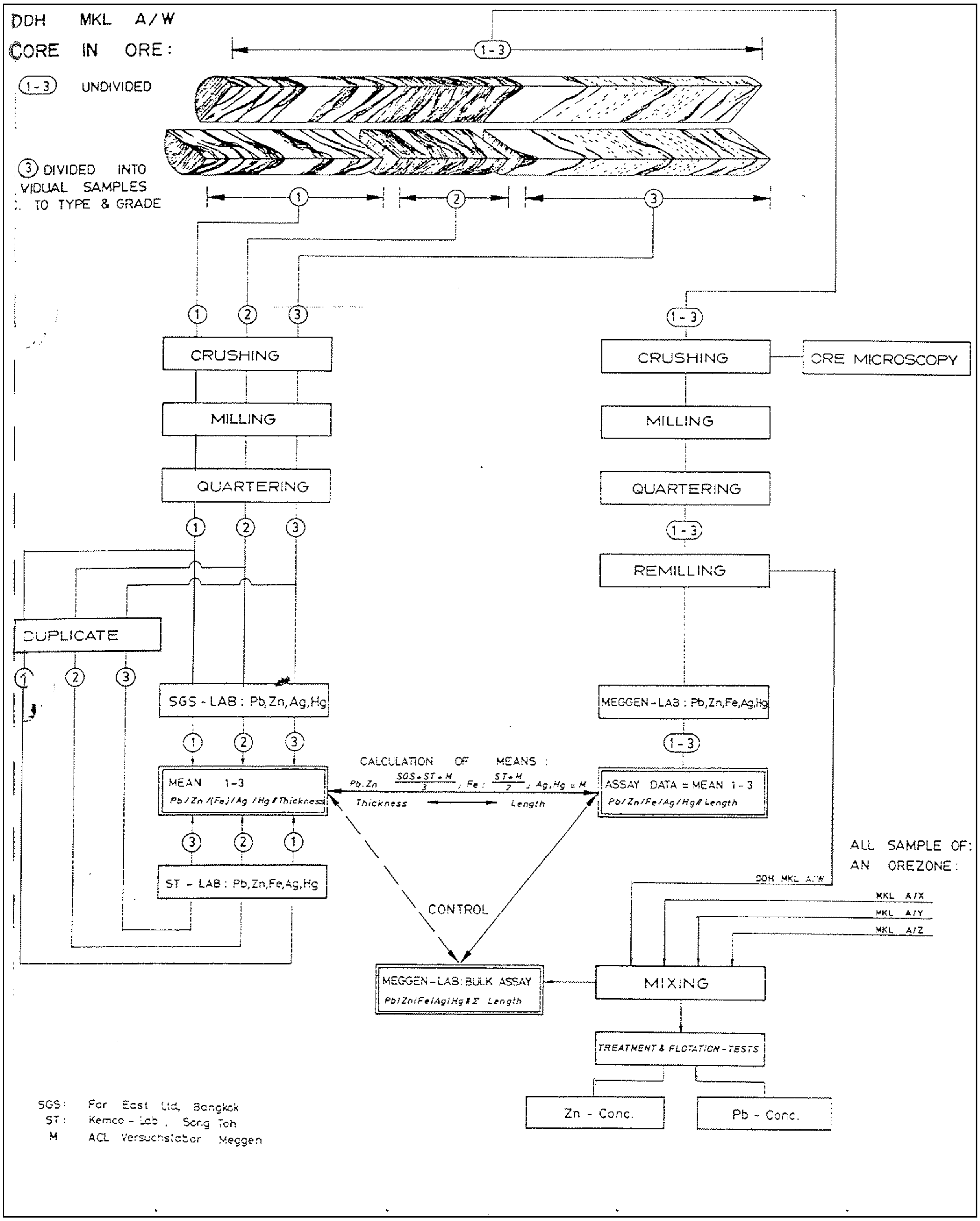
Half core samples were submitted to the MG/Kemco laboratory at Song Toh where they were crushed in a jaw crusher and pulverized in a mill. Each pulp sample was split twice by riffle to produce four sub-samples, one of which was retained. The remaining three pulp sub-samples were split further to produce duplicates, one which was submitted for analysis at the Song Toh laboratory and the other was submitted for analysis at SGS Far East Laboratory, Bangkok.

A composite sample was submitted to MG's Meggen laboratory.

Analysis for Pb, Zn, Fe and Ag was performed at both laboratories by atomic absorption spectrophotometry (AA). The Song Toh Laboratory used a Phillips PNA100 instrument. Both laboratories employed a quality control system involving duplicates, standards and blanks but the details of these procedures and their results cannot be verified.

Figure 11-1 shows details of the core sampling procedure used during the historical diamond drilling programmes.

FIGURE 11-1. HISTORICAL SAMPLE PREPARATION AND ASSAY FLOWSHEET



11.2. ACA HOWE VERIFICATION SAMPLES

ACA Howe supervised a programme of verification sampling involving duplicate pulp samples and quarter core samples, recovered from storage at Song Toh.

Half core samples were split by identifying the original samples according to tags and depth marks in the core boxes. Each piece of half core was then split by diamond saw. One half was returned to the core box and the other half was placed in a numbered plastic bag and submitted for analysis.

Duplicate pulp samples were split in a riffle. Each sub-sample was re-bagged and numbered. One sample was returned to the storage facility. The other was submitted for analysis.

Duplicate core and pulp samples were shipped by air to ALS Laboratory, Brisbane, Queensland, Australia, which is accredited to ISO 17025. The laboratory maintained quality control through the use of standards, blanks and duplicates.

Core samples were pulverized in their entirety in a puck-type pulverizer to 85% passing 75 microns or better.

Core samples received by ALS were prepared by crushing to 70% <2 mm and pulverising of 1,000 g to 85% passing 75 µm according to ALS procedure PUL-21.

Analysis of both pulp and core samples for Zn, Pb and Ag were conducted by aqua regia digest with inductively coupled plasma atomic emission spectroscopy finish ("**ICP-AES**") according to ALS method code ME-OG46h and results were reported in % Pb and Zn and ppm Ag.

11.3. EXPLORATION SAMPLES

Soil samples and rock samples collected from Song Toh and Boh Yai areas during the course of exploration between 2011 and 2012 were submitted to MAS Laboratory in Bangkok. Due to the reconnaissance exploration character of these samples no special measures were adopted to ensure their security.

Rock samples were dried and crushed to nominal 10 mesh (1.7mm) then split into 250 g sub- sample which was pulverized to 90% passing 150 mesh (100 microns).

Soil samples were dried and the entire sample sieved to -80 mesh (170 microns).

Sub samples of 0.5g of soil and rock pulp were digested in aqua regia and analyzed by Inductively Coupled Plasma Emission Spectroscopy (ICP-ES) according to MAS procedure GEO23AR/ICP. Analytical results were reported for 23 elements: Ag, As, Ba, Bi, Cd, Co,Cr,Cu, Hg,Mn,Mo, Ni, Pb, Sb,V, Zn,Al, Ca, Fe, K, Mg, Na, and Ti.

12. DATA VERIFICATION

ACA Howe visited the Song Toh and Boh Yai mining sites between 2nd and 7th December 2012, during which time the mine surface and underground facilities were inspected. Drill core was inspected and compared with historical drill logs and it was confirmed that lithological, structural and mineralization features were accurately and properly recorded to a good professional standard and that best practice logging procedures had been implemented.

ACA Howe supervised a programme of verification sampling involving 79 samples; 59 duplicate pulp samples recovered from storage at Song Toh, and 20 duplicate quarter core samples. The duplicate samples were selected in order to be representative of the Song Toh and Boh Yai drilled resources and were therefore taken from drillholes that were widely spaced both in location and over time and reflected the full range of assay values used in resource estimation.

Half core samples were split by identifying the original sample intervals according to tags and depth marks in the core boxes. Each piece of half core was then split by diamond saw to produce two quarter cores. One quarter was returned to the core box and the other quarter was placed in a numbered plastic bag and submitted for analysis.

Duplicate pulp samples were split in a riffle. Each sub-sample was re-bagged and numbered. One pulp sample was returned to the storage facility. The other was submitted for analysis.

Duplicate core and pulp samples were shipped by air to ALS Laboratory, Brisbane, Queensland, Australia, which is accredited to ISO 17025. The laboratory maintained quality control through the use of standards, blanks and duplicates.

Core and pulp samples were prepared and analyzed according to the procedures described in section 011 of this report and results were reported in % Pb and Zn and ppm Ag.

12.1. PULP DUPLICATE RESULTS

The results of the duplicate pulp analyses, summarised in Table 12-1 below and detailed in Table 12-3 show that the historical assay results for lead and silver are consistently lower than those of the duplicate samples, averaging 4.68% lower for Pb, and 17.41% lower for silver. The historical assay results for zinc are consistently higher than those of the duplicate samples, averaging 9.6% higher.

The reason for this discrepancy is not known but it is believed that Metallgesellschaft/Kemco maintained a deliberately conservative approach to resource estimation and that this was reflected in analytical reporting.

ACA Howe considers that the correlation between the two sets of results provides verification of the reliability of the historical assay results and the sampling and assay procedures.

TABLE 12-1. SUMMARY OF HISTORICAL VS. 2012 DUPLICATE PULP SAMPLE RESULTS

Area	Number of duplicate samples	Pb(%) average		Difference %	Zn(%) average		Difference %	Ag(ppm) average		Difference %
		KEMCO	ALS		KEMCO	ALS		KEMCO	ALS	
Son Toh	30	7.73	8.11	4.66	2.55	2.66	4.46	114.50	147.80	22.53
Boh Yai	29	4.86	5.09	4.55	4.17	3.39	-22.93	92.32	103.54	10.84
Song Toh and Boh Yai	59	6.32	6.63	4.68	3.31	3.02	-9.60	103.79	125.67	17.41

TABLE 12-2. SONG TOH DUPLICATE PULP SAMPLES

No.	Name	Pb (%)		Zn(%)		Ag (ppm)	
		KEMCO	ALS	KEMCO	ALS	KEMCO	ALS
1	STSW +484(3/4)	10.11	11.05	2.18	1.725	48.00	96.00
2	STSW +484(5/3)	1.75	1.835	0.69	0.653	24.00	32.00
3	STSW +484(16/2)	4.01	4.12	1.18	1.195	68.00	79.00
4	STSW +484(18/1)	6.01	5.47	5.91	4.33	186.00	126.00
5	STSW +484(30)	14.98	16.65	5.66	5.77	282.00	340.00
6	STSW +484(23/1)	6.66	6.41	0.60	0.985	92.00	100.00
7	STSW +484(21)	1.58	1.875	2.78	2.25	32.00	41.00
8	STSW +484(16/1)	4.97	5.09	2.70	2.77	66.00	84.00
9	STSW +484(15/2)	13.08	13.9	1.65	1.57	194.00	240.00
10	STSW +484(6/2)	1.58	1.57	1.06	0.883	30.00	38.00
11	STSW +484(3/3)	3.06	3.54	0.26	0.168	26.00	40.00
12	STS +421(1/4)	2.89	5.01	0.14	0.077	26.00	37.00
13	STS +421(1/5)	3.11	2.89	0.10	0.052	27.00	55.00
14	STS +421(6/2)	6.38	3.01	0.03	0.228	96.00	53.00
15	STS +421(7/1)	15.87	16.6	1.52	1.485	216.00	288.00
16	STS +421(7/2)	3.96	4.06	2.69	2.01	74.00	90.00
17	STS +421(8/2)	9.62	9.6	6.08	5.73	236.00	238.00
18	STS +421(9/1)	4.44	5.15	0.85	0.964	32.00	50.00
19	STS +421(11/1)	1.60	1.655	0.24	0.327	34.00	22.00
20	STS +434(8/1)	3.42	3.55	0.28	0.177	64.00	89.00
21	STS +434(15/1)	12.03	11	7.74	7.15	182.00	194.00
22	STS +434(30/1)	8.10	18.05	1.61	3.02	155.00	325.00
23	STS +434(31/2)	20.40	5.98	2.26	0.104	118.00	140.00
24	STS +447(3/1)	10.03	16.9	0.01	2.82	165.00	380.00
25	STS +447(6/2)	14.47	18	0.10	3.78	234.00	365.00
26	STS +447(6/6)	18.32	14.95	4.33	0.083	318.00	276.00
27	STS +447(A7/3)	10.20	8.88	10.24	9.12	110.00	122.00
28	STS +447(A7/4)	2.85	2.39	0.05	0.052	22.00	15.00

No.	Name	Pb (%)		Zn(%)		Ag (ppm)	
		KEMCO	ALS	KEMCO	ALS	KEMCO	ALS
29	STS +447(10/1)	1.96	9.92	0.06	8.59	32.00	192.00
30	STS +447(16)	14.47	14.15	13.35	11.85	246.00	287.00
	mean	7.73	8.11	2.55	2.66	114.50	147.80
	% difference		4.89		4.67		29.08

TABLE 12-3. BOH YAI DUPLICATE PULP SAMPLES

List	Sample No.		Pb(%)		Zn(%)		Ag(ppm)	
			KEMCO	ALS	KEMCO	ALS	KEMCO	ALS
1.00	MKL 1/28	35.80 - 37.09	2.35	2.31	4.30	4.47	39.00	45.00
2.00	MKL 4/39	36.82 - 37.80	6.95	7.86	6.46	5.58		
3.00	MKL 4/42	30.00 - 30.50	5.77	6.88	5.73	4.85	68.00	68.00
4.00	MKL 4/38	28.62 - 31.25	2.10	2.49	5.70	5.22	80.00	87.00
5.00	MKL 4/42	31.37 - 31.73	5.24	5.90	4.46	4.77	68.00	64.00
6.00	MKL 4/42	71.06 - 75.52	2.19	2.46	1.07	1.25	10.00	9.00
7.00	MKL 5/73	29.18 - 29.80	1.98	2.04	5.97	4.48	88.00	82.00
8.00	MKL 5/73	37.30 - 38.55	4.47	5.00	0.44	0.41	128.00	139.00
9.00	MKL 4/40	38.40 - 39.13	1.76	1.80	1.96	1.64	12.00	15.00
10.00	MKL 5/64	16.51 - 17.32	2.26	2.39	3.80	3.34	12.00	16.00
11.00	MKL 5/65	2.50 - 4.12	2.12	2.50	0.75	0.85	6.00	10.00
12.00	MKL 5/66	36.20 - 36.93	2.71	2.99	2.08	1.99	60.00	65.00
13.00	MKL 4/39	27.30 - 30.00	2.69	2.45	3.54	3.64	42.00	45.00
14.00	H4 +672	12/2	3.60	3.05	17.74	14.50	164.00	150.00
15.00	H4 +672	15/2	0.35	0.41	0.12	0.19	6.00	9.00
16.00	H4 +672	17/1	0.06	0.05	4.88	3.98	18.00	24.00
17.00	H5 +655	8/1	1.48	2.18	1.74	0.29	10.00	7.00
18.00	H7 +451	21	2.14	2.22		0.02	34.00	33.00
19.00	H7 +451	18	3.24	3.22	0.01	0.00	26.00	51.00
20.00	H7 +451	17/2	1.70	1.79		0.00	4.00	24.00
21.00	H7 +451	6/2	14.90	13.90	0.03	0.02	304.00	318.00
22.00	H7 +451	3/1	5.75	5.93	0.01	0.01	78.00	102.00
23.00	H7 +451	4/1	2.37	2.41	0.01	0.00	32.00	37.00
24.00	H5 +655	5/2	17.32	18.05	7.08	6.80	96.00	106.00
25.00	H5 +655	9/1	2.86	2.26	3.65	0.31	14.00	13.00
26.00	H5 +655	4/2	9.08	11.50	13.48	14.85	34.00	43.00
27.00	H4 +672	13/2	2.23	2.73	7.79	7.26	58.00	88.00
28.00	H4 +595	16/6	5.33	1.32	4.50	1.97	4.00	9.00
29.00	H5 +610	26	25.95	29.60	5.17	5.60	1090.00	1240.00
		mean	4.86	5.09	4.17	3.39	92.32	103.54

		% difference		4.77		-18.65		12.15

FIGURE 12-1. SCATTER PLOT OF HISTORICAL PULP ASSAYS VS. 2012 DUPLICATE PULP ASSAYS (PB)

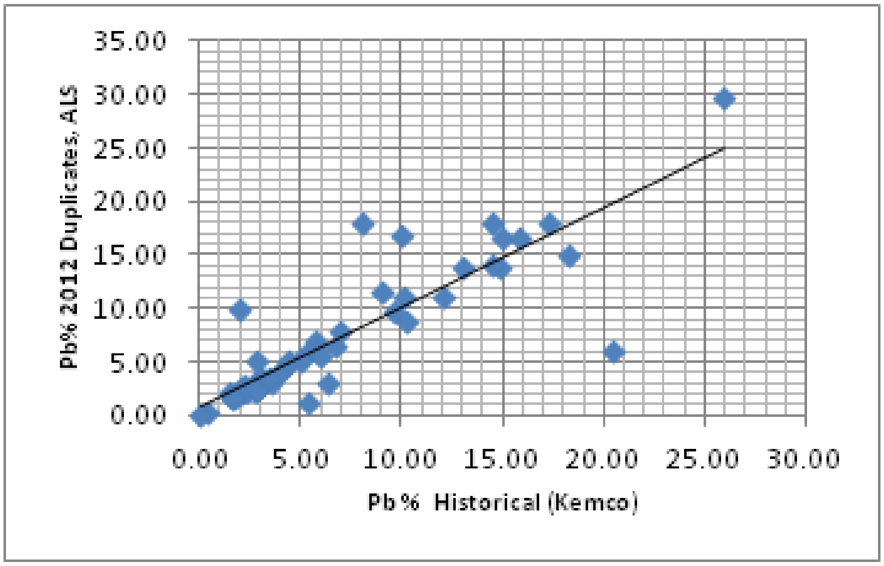


FIGURE 12-2. SCATTER PLOT OF HISTORICAL PULP ASSAYS VS. 2012 DUPLICATE PULP ASSAYS (ZN)

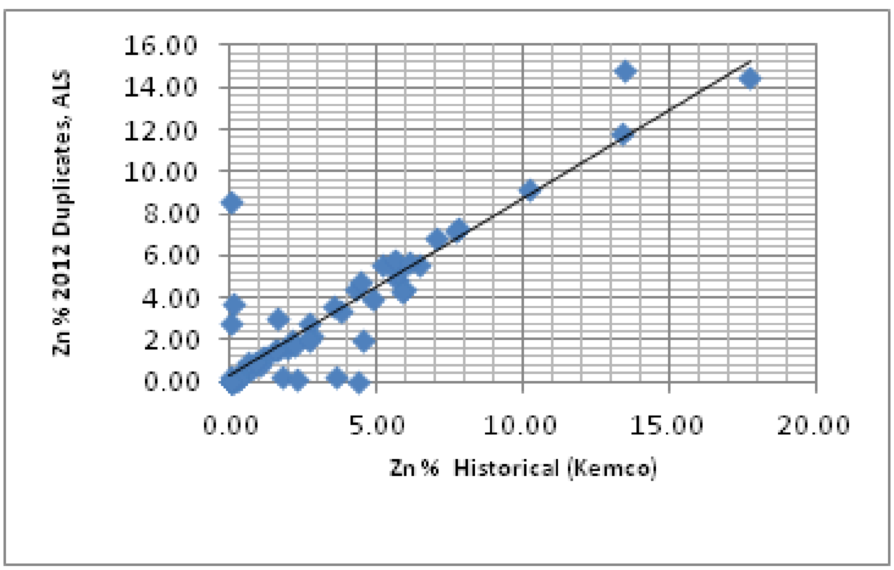
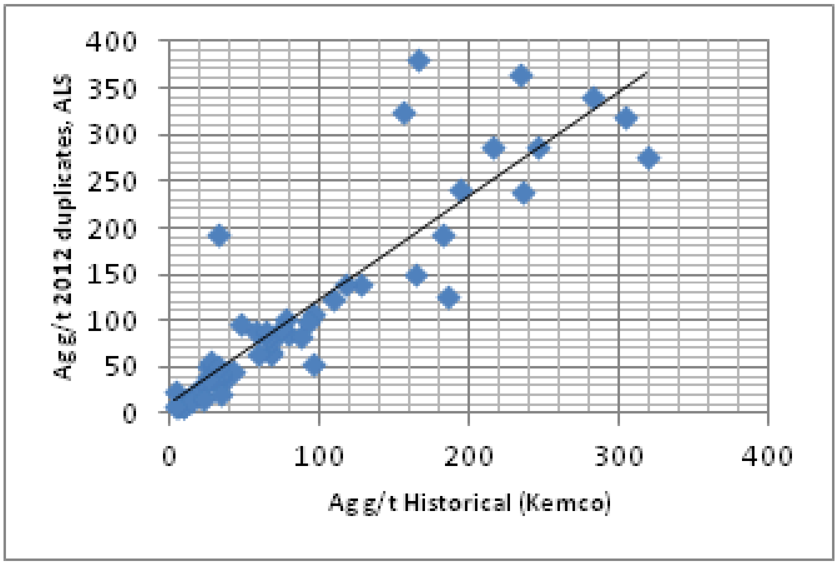


FIGURE 12-3. SCATTER PLOT OF HISTORICAL PULP ASSAYS VS. 2012 DUPLICATE PULP ASSAYS (AG)



12.2. CORE DUPLICATE RESULTS

A total of 20 half-core samples were selected for re-sampling by quartering. Analytical results are summarized in Table 12-5, and displayed in graphical form in Figure 12-4 to Figure 12-6.

TABLE 12-4. SUMMARY OF HISTORICAL HALF CORE VS. 2012 QUARTER CORE ASSAY RESULTS

Area	Number of duplicate samples	Pb(%)		Zn(%)		Ag(ppm)	
		KEMCO	ALS	KEMCO	ALS	KEMCO	ALS
Son Toh and Boh Yai	20	6.49	6.12	0.62	0.76	84.84	79.12

The 2012 quarter core assays provide a reasonable comparison with the original Kemco half core results (Table 12-5).. A number of factors may contribute to differences including:

- Differences in distribution of mineralization between half core and corresponding quarter core;
- Differences in individual core intervals;
- Different analytical procedures.

In view of these multiple factors, ACA Howe considers that the correlation between the two sets of results provides verification of the reliability of historical sampling and assay procedures.

TABLE 12-5. COMPARISON OF ORIGINAL ASSAYS ON HALF CORE VS. CHECK ASSAYS ON QUARTER CORE

KEMCO Sample Interval. (half core)	SEAM Sample Interval (quarter core)	Pb (%)		Zn (%)		Ag(g/t)	
		KEMCO	ALS	KEMCO	ALS	KEMCO	ALS
BS 151 152.35 - 153.74	BS 151 152.36 - 153.36	2.55	2.32	0.02	0.01	72.00	70.00
BS 151 153.74 - 154.75	BS 151 153.36 - 154.36	2.98	0.89	0.01	0.01	12.00	27.00
BS 149 97.95 - 98.95	BS 149 98.09 - 99.09	11.20	11.45	0.07	0.03	205.00	186.00
BS 149 98.95 - 99.58	BS 149 99.09 - 99.58	1.86	1.31	0.06	0.01	31.00	17.00
BS 137 177.45 - 178.39	BS 137 177.45 - 178.45	4.18	3.50	0.01	0.00	72.00	63.00
BS 137 178.39 - 179.22	BS 137 178.4 - 179.45	8.76	7.08	2.85	2.60	165.00	154.00
BS 137 179.22 - 180.35	BS 137 179.45 - 180.45	3.29	3.40	0.18	0.01	57.00	62.00
BS 137 180.35 - 182.86	BS 137 180.45 - 181.45	2.41	2.75	0.01	0.01	68.00	58.00
DDH 114 115.24 - 116.80	DDH 114 115.24 - 116.24	9.72	9.10	5.12	5.26	107.00	117.00
DDH 114 116.80 - 118.16	DDH 114 116.24 - 117.24	3.20	2.54	0.41	0.91	26.00	21.00
DDH 114 118.16 - 121.15	DDH 114 117.24 - 118.24	0.39	2.86	0.11	0.18	11.00	19.00
DDH 115 91.15 - 92.40	DDH 115 91.03 - 92.03	4.67	5.94	1.39	2.10	27.00	32.00
DDH 115 92.40 - 93.86	DDH 115 92.03 - 93.03	1.64	1.67	0.54	0.83	16.00	11.00
DDH 115 93.86 - 96.52	DDH 115 93.03 - 94.03	0.76	0.69	0.16	0.11	11.00	3.00
DDH 115 98.20 - 98.37	DDH 115 98.03 - 98.37	38.30	25.50	0.05	0.02	423.00	301.00
DDH 116 90.76 - 91.90	DDH 116 90.57 - 91.57	0.76	5.89	0.21	1.01	14.00	21.00
DDH 114 128.57 - 130.00	DDH 114 129.90 - 130.90	0.75	3.21	0.50	1.41	11.00	21.00
DDH 114 130.45 - 132.72	DDH 114 131.90 - 132.90	0.18	7.17	0.06	0.02	11.00	97.00
DDH 114 132.72 - 133.28	DDH 114 132.90 - 133.28	25.77	19.10	0.01	0.00	273.00	224.00
	mean	6.49	6.12	0.62	0.76	84.84	79.16
	% difference		-5.68		23.39		-6.70

FIGURE 12-4. SCATTER PLOT OF HISTORICAL HALF CORE ASSAYS VS. 2012 QUARTER CORE ASSAYS (PB)

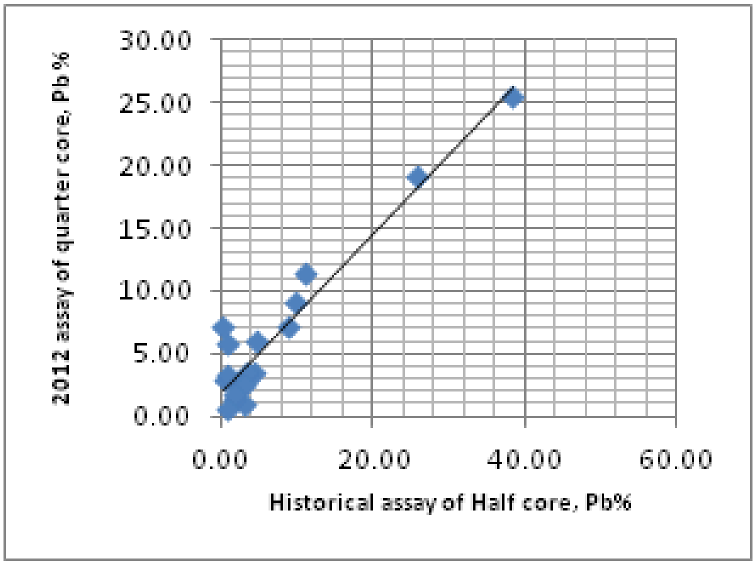


FIGURE 12-5. SCATTER PLOT OF HISTORICAL HALF CORE ASSAYS VS. 2012 QUARTER CORE ASSAYS (ZN)

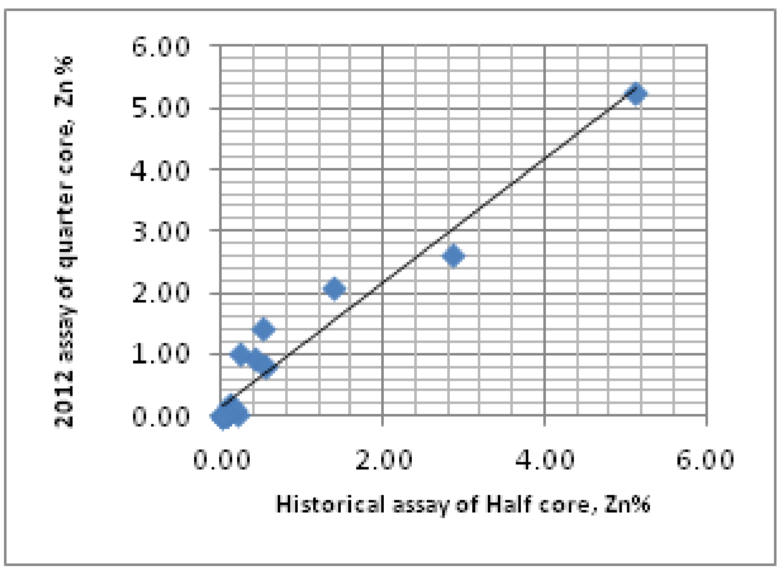
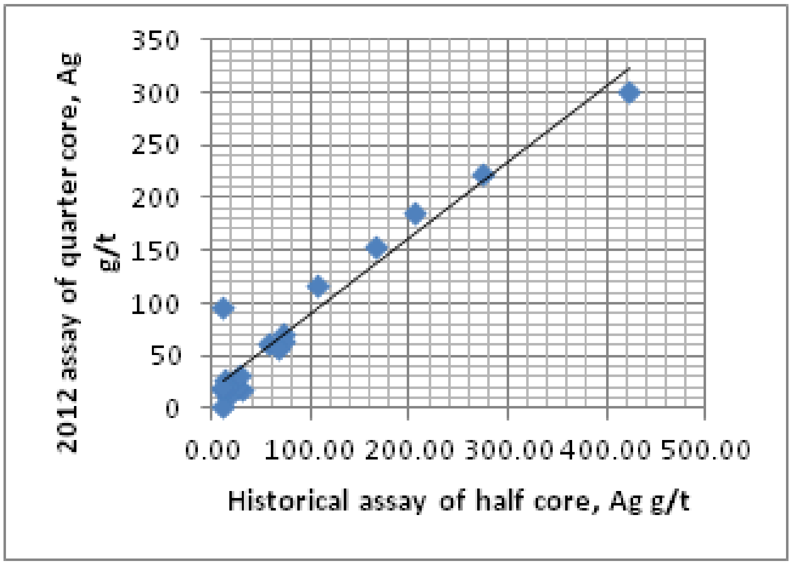


FIGURE 12-6. SCATTER PLOT OF HISTORICAL HALF CORE ASSAYS VS. 2012 QUARTER CORE ASSAYS (AG)



12.3. ASSAY VERIFICATION CONCLUSIONS

Check assays carried out on a total of 79 core and pulp samples indicated an overall bias of +2.23% for Pb assays, -3.94% for Zn assays and +15% for Ag assays as listed in Table 12-6.

This indicates that the overall biases in historical Pb and Zn assays are within 5% of the check values, and are therefore considered reliable and acceptable for use in CIM compliant resource estimation.

The silver values indicate a bias of +15.8% when 2012 assays are compared with historical values. This suggests that the use of historical silver values for resource estimation may result in an underestimation of silver grades and in an overall conservative bias in the silver resource.

Since silver represents less than 30% of the Song Toh or Boh Yai resource, ACA Howe is of the opinion that any underestimate of resource silver values is insufficiently serious as to render the historical silver values unacceptable for use in CIM compliant resource estimation.

TABLE 12-6. SUMMARY OF CHECK ASSAYS OF 78 CORE AND PULP SAMPLES

	Pb(%)		Zn(%)		Ag (g/t)	
	KEMCO	ALS	KEMCO	ALS	KEMCO	ALS
mean	6.36	6.50	2.64	2.54	99.12	114.77
% difference		+2.23		-3.94		+15.79

13. MINERAL PROCESSING AND METALLURGICAL TESTING

13.1. CURRENT METALLURGICAL STUDIES

No mineral processing or metallurgical studies have been carried out by SEAM with respect to the Property. Historical mineral processing at the Song Toh Mill is discussed in section 6.4 of this report.

13.2. PREVIOUS METALLURGICAL STUDIES

Although no recent metallurgical studies have been performed, the metallurgical characteristics of the mineralization can be inferred from the milling records. Certainly any metallurgical problems should be evident in the mill recoveries. The mineralized material was processed at the 1,200 tonne per day milling operation at Song Toh. Lead and Zinc concentrates were recovered from the mineralization by the flotation process. The mill appears to be in reasonable condition and the former operations staff feel that it could be operational in a short time and at low cost.

14. MINERAL RESOURCE ESTIMATES

14.1. Resource Estimation Overview

14.1.1. Software

Resources for the Song Toh and Boh Yai areas were estimated using MICROMINE Version 11.0 software.

14.1.2. Data Sources and Data Compilation

During the course of the operation of Song Toh and Boh Yai mines, information was held primarily in the form of paper files and historical drawings.

14.1.3. Historical Drawings

The principal plans used for resource estimation are long sections, cross sections and plans which range in scale from 1:100 to 1:5000. The plans are all hand drawn to a professional standard mostly on plastic film ('mylar') and summarized in TABLE 15. The principal features depicted on these plans are:

- Topographic sections and contours;
- Underground development and stoping;
- Drill traces;
- Mineralized intersections and assay summaries; and
- Geological interpretations including lithological features and structures.

Many hundreds of plans and sections are filed at the mine office at Song Toh. SEAM has selected the most relevant and most recent of these for digital scanning which amount to a total of 547 plans and sections, digital copies of which were provided to ACA Howe. Table 14-1 below summarizes the main features of these plans:

TABLE 14-1. Summary of Plans and Sections

Plan Type	Subject	Scale	Number of plans
Boh Yai			
Plans	Drilling	500	10
Plans	Surface Geology	500-2000	10
Plans	Topography	500	29
Long Sections	Drilling, Underground Development, Resource Blocks	500	25
Cross Sections	Geological Interpretation, Drilling	500	147

Plan Type	Subject	Scale	Number of plans
Song Toh			
Plans	Early Exploration From 1975	1000-5000	61
Plans	Surface Geology	2000	15
Plans	Hydrology and Hydrogeology	1000-5000	11
Plans	Underground Development Level Plans	500	20
Plans	Surface Topography	500	8
Long Sections	Drilling, Underground Development, Resource Blocks	500	4
Cross Sections	Geological Interpretation, Drilling	500	207
		TOTAL	547

14.1.4. Database Creation

The principal paper files used as a source of information for resource estimation were as follows:

- Assay sheets;
- Drill survey sheets; and
- Drill logs.

SEAM has transcribed information as summarized in TABLE 16 from these sources to corresponding digital spreadsheets representing assay, collar and survey information. ACA Howe has carried out random checks on the spreadsheets to verify that there are no transcription errors. The small number or errors found during this process have been corrected.

A number of other errors became apparent during visual checks of the spreadsheets and during Micromine validation. These errors have also been corrected in the original spreadsheets.

ACA Howe added data for lead equivalent (Pbeq) to the assay spreadsheet, according to the following formula: Pbeq =Pb + (0.962 *Zn) + (0.0360 * Ag), where zinc and lead are reported in percent and silver in parts per million. The prices used for this formula are based on a three year average price for December 2008 to December 2011: Pb=$2059/t, Zn=$1981/t and Ag= $23/oz. ACA Howe believes that it would be premature to make any presumptions concerning relative metallurgical recoveries in this formula, since these have not yet been determined.

Azimuth and dip angles in Kemco records are expressed in terms of a 400 degree circle (‘400 gons’). ACA Howe has converted all such units to conventional degrees by multiplying them by 0.9.

ACA Howe carried out random checks on the spreadsheets to verify that there are no transcription errors. The small number or errors found during this process have been corrected. A number of additional errors became apparent during visual checks of the spreadsheets. These errors were also corrected in the original spreadsheets.

ACA Howe carried out an adjustment of the SEAM spreadsheets in order to create separate master databases for Song Toh and Boh Yai areas containing collar, survey and assay data suitable for import into MICROMINE.

The table below summarizes the data contained within the Song Toh and Boh Yai Databases which formed the basis of resource estimations.

TABLE 14-2. DATABASE DETAILS

Data	Number of Records	
	Boh Yai	**Song Toh**
Drill Holes	316	236
Drill Hole Surveys	548	1052
Drill Hole Assays, Pb, Zn, Ag	2180	1734
Drill Hole Assays, Fe	1879	1518
Drill Hole Assays, Cd	577	86
Drill Hole Assays, Hg	1666	1492

Geology was not incorporated into the database as the numerous plans and sections represent a diligent interpretation of the geology and mineralization that could best be utilized by importing the relevant scanned images into MICROMINE.

14.1.5. DATABASE VALIDATION

Once the drill hole database had been created, separate files for "assays", "collars" and "surveys" were imported into MICROMINE. A series of validation functions were then run, designed to reveal the following errors:

- Duplicate drill holes or channels;
- One or more collar coordinates missing in the collar file;
- FROM or TO missing in the assay file;
- FROM > TO in the assay file;
- Sample intervals non contiguous;
- Overlapping sample intervals;
- First sample ≠ 0m in the assay file;
- First survey ≠ 0m in the survey file;
- Multiple surveys for the same depth;
- Azimuth not between 0 and 360 degrees in collar or survey file;
- Angle not between 0 and 90 degrees in collar or survey file;

- Azimuth or angle missing in survey file;
- Depth of hole less than depth of final sample; and
- Down hole survey depth greater than drill hole depth.

After the validation functions had been run, any errors identified were corrected in the master databases, so that the resulting databases contain all available drilling and sampling data and are robust and suitable for resource estimation.

14.2. Interpretation and Modeling

When the databases had been validated all drill hole data was viewed interactively in MICROMINE software 2D and 3D environments.

Historical plan, long section and cross section images were then imported into MICROMINE using the georeference facility. This allowed validation of digital drill hole traces against the corresponding traces on the historical plans, and identified a small number of errors in collar locations, azimuths and dips which were corrected in the relevant databases. Elsewhere the plotted location of drill traces on historical plans corresponded closely to the locations plotted from historical surface and downhole survey data using Micromine.

14.2.1. Selection of Mineralized Zones for Resource Estimation

Following examination and review of plans, sections and digitally rendered drillholes it was apparent that many of the drilled areas had been mined historically as represented on long section by depiction of underground development and stoping. Detailed confirmation of the extent of these developed areas was carried out by reference to Kemco production and reserve records which could be correlated with the corresponding drawings. The review concluded that undeveloped resources existed in three principal areas as summarized in Table 14-3.

TABLE 14-3. Summary of Unmined Resource Areas

Deposit	Section	General minimum level of mine development, metres
Boh Yai	Hills 1 To 5	600
Boh Yai	Hill 7	450
Song Toh	Song Toh Southwest	450
Song Toh	Song Toh Camp	None; no historical mining

The former mine manager, Mr Walter Griese, in subsequent and prior discussions, agreed that these areas were the principal ones containing resources that were unaffected by mining.

Following discussions with SEA and with ACA Howe mining engineer Bruce Brady, a nominal cutoff of 3.0% Pbeq was adopted in order to define the limits of mineralized domains. Detailed examination of cross sections allowed the definition of twentyeight separate mineral domains at Boh Yai, nine at Song Toh Southwest and five at Song Toh Camp, as listed in Table 14-4.

The following techniques were employed whilst interpreting mineralized domains:

- Cross sections were displayed interactively at intervals of 25 metres, generally corresponding to the historical cross section images with a clipping window (distance constraint to the north or south of the plane of the cross section) of 10m;

- Strings were drawn in the plane of the cross section to enclose the mineral domains as interpreted from the historical sections and from the drill intersections;

- Drill intersections within mined zones were included within domain boundaries if they were less than 25m from the limit of mining in order that they could be used to inform blocks beyond the mined areas;

- All interpreted strings were snapped (constrained) to corresponding drill hole sample intervals, and so constrained in the 3rd dimension;

- A minimum mining width of 2m was selected as being appropriate to the dimensions of equipment and type of mining envisaged

- Internal dilution of up to 2m was accepted if the overall grade of the diluted section and immediately adjacent samples exceeded 3% Pbeq;

- Where any interpreted domain did not extend from one cross section to the next, because of truncation or diminution of grade, it was projected half way to the next section and terminated, and

- The interpretation was extended beyond the first and last cross sections by a distance of half the section spacing or 50m. At depth, the interpretation was extended by a distance of half the drill hole spacing or 50m. The use of one or the other of these extent parameters is informed by the observed level of geological/grade continuity.

14.2.2. 3D WIREFRAMING

After interpreted strings had been created to define mineralized zones, the strings were used to generate three-dimensional solid wireframe domain models of each mineralized zone.

The continuity, orientation and geometry of any given mineralized zone may vary and zone continuity along strike varies between 50m and 265m, influenced by either structural disruption or offset. Therefore each continuous/semi-continuous mineralized zone, interpreted in three dimensions and defined by grade criteria, was considered as an individual domain for estimation.

Each wireframe solid was visualized in 3D space and validated using Micromine solid object validation functions to ensure wireframe surface continuity and generation of solid model volume. Once validated, each wireframe was given a domain name so that the assay database could be coded, and each assay flagged by the domain it informs. The locations of the interpreted domains are shown in Figure 14-1 to Figure 14-4 and details of each domain are listed in Table 14-4 below:

TABLE 14-4. BOH YAI AND SONG TOH DOMAIN DETAILS

Domain	Location	Affected By Stoping/ Lowest Level	Strike Extent, Metres	Max Elev., Metres	Min Elev, Metres	Depth Extent, Metres	Dip, Degrees	Strike, Degrees
1 105L	Boh Yai - Hill 1	no	190	709	517	192	38E	0
1 105U	Boh Yai - Hill 1	no	105	622	516	106	38E	0
1 SH1	Boh Yai - Hill 1	no	265	601	404	197	38E	0
1SH1L	Boh Yai - Hill 1	no	155	545	400	145	38E	0
1SH1U	Boh Yai - Hill 1	no	50	577	424	153	38E	0
3 MKL302L9	Boh Yai - Hill 3	no	43	605	545	60	50E	315
4 MKL301	Boh Yai - Hill 4	610	50	624	564	60	50E	315
4 MKL408L4	Boh Yai - Hill 4	620	110	645	575	70	80E	340
4 MKL424A	Boh Yai - Hill 4	no	65	592	528	64	88E	344
4 MKL424C	Boh Yai - Hill 4	no	105	605	545	60	86E	343
5 L1	Boh Yai - Hill 5	no	146	651	583	68	40E	352
5 L1B	Boh Yai - Hill 5	no	139	616	475	141	50E	340
5 L1C	Boh Yai - Hill 5	no	55	618	582	36	50E	340
5 L1D	Boh Yai - Hill 5	no	95	546	482	64	42E	346
5 L1E	Boh Yai - Hill 5	no	50	562	503	59	48E	343
5 MKL 527	Boh Yai - Hill 5	no	50	617	556	61	50E	340
5 MKL511	Boh Yai - Hill 5	no	47	600	534	66	75E	343
5 MKL563	Boh Yai - Hill 5	no	30	586	532	54	85E	343
5 U1	Boh Yai - Hill 5	670	50	695	619	76	70E	343
5 U3	Boh Yai - Hill 5	no	125	643	509	134	75E	345
5 U4	Boh Yai - Hill 5	no	78	600	504	96	80W	343
7 NSN091	Boh Yai - Hill 7	500	183	589	419	170	80E	335
7 nsn129	Boh Yai - Hill 7	no	60	500	453	47	90E	343
7NSN031	Boh Yai - Hill 7	no	90	600	490	110	75E	342
7NSN058	Boh Yai - Hill 7	454	75	541	422	119	75E	343
7NSN089	Boh Yai - Hill 7	454	105	558	488	70	77W	349
7NSN159	Boh Yai - Hill 7	no	105	618	550	68	65E	345
7NSN343	Boh Yai - Hill 7	454	145	544	405	139	72E	340
BS123	Song Toh SW	no	53	447	404	43	88W	295
BS235	Song Toh SW	no	105	428	290	138	67E	310
BS245	Song Toh SW	450	50	465	415	50	80E	310
CN	Song Toh SW	450	93	474	389	85	72E	311
CS	Song Toh SW	no	65	473	389	84	85E	305
NE1	Song Toh SW	450	46	492	370	122	85E	335
NE2	Song Toh SW	no	60	472	347	125	75E	320
NE3	Song Toh SW	no	86	469	406	63	76E	310

Domain	Location	Affected By Stoping/ Lowest Level	Strike Extent, Metres	Max Elev., Metres	Min Elev, Metres	Depth Extent, Metres	Dip, Degree s	Strike, Degrees
SC	Song Toh SW	no	53	462	390	72	86E	306
Camp 142 Upper	Song Toh Camp	no	50	538	518	20	28E	0
Camp Lower	Song Toh Camp	no	50	515	485	30	38E	0
Camp SE Lower	Song Toh Camp	no	211	539	445	94	30E	0
Camp SE Upper	Song Toh Camp	no	155	613	523	90	40E	0
Camp Upper	Song Toh Camp	no	94	597	497	100	38E	0

FIGURE 14-1. BOH YAI WIREFRAMES PLAN

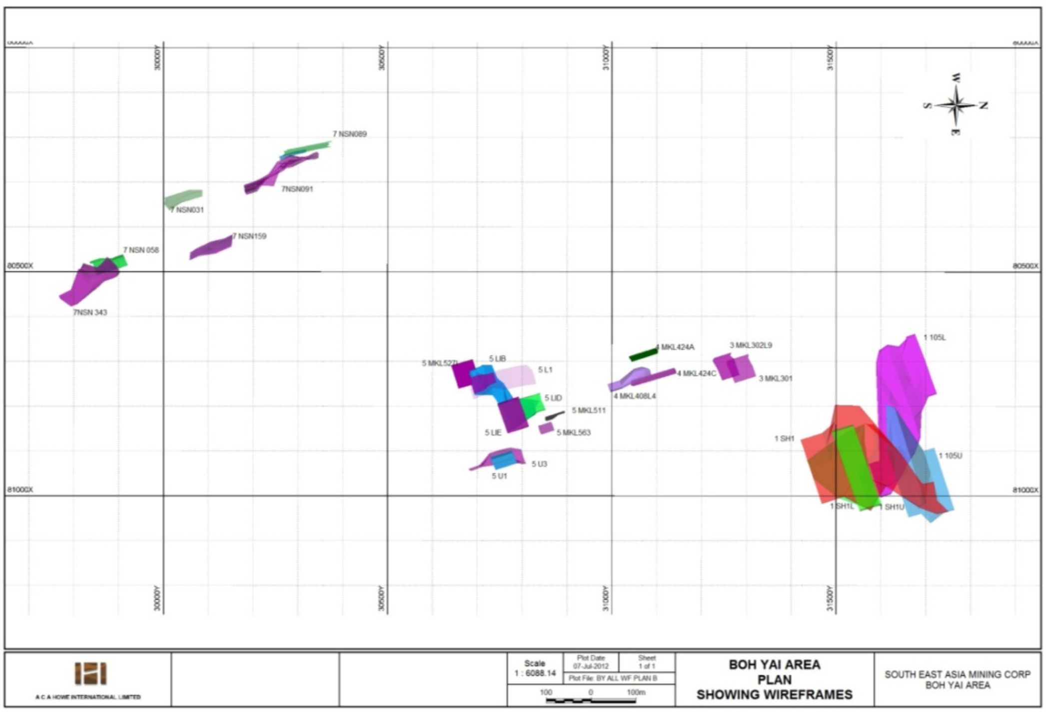


FIGURE 14-2. BOH YAI WIREFRAMES - VERTICAL LONGITUDINAL SECTION

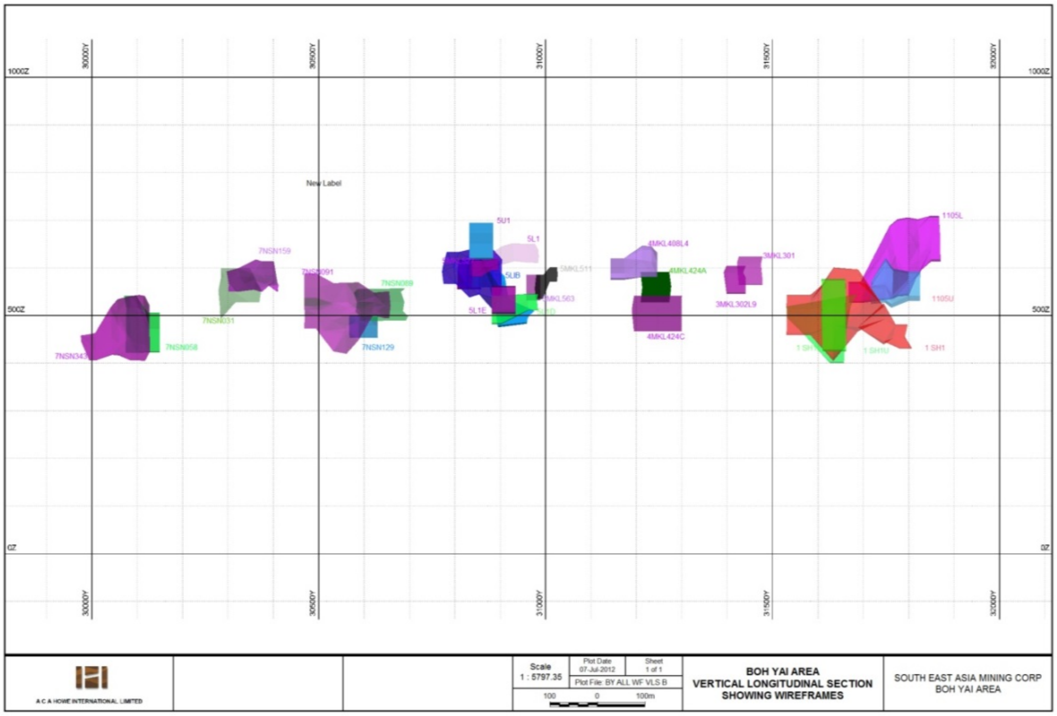


FIGURE 14-3. SONG TOH CAMP WIREFRAMES PLAN

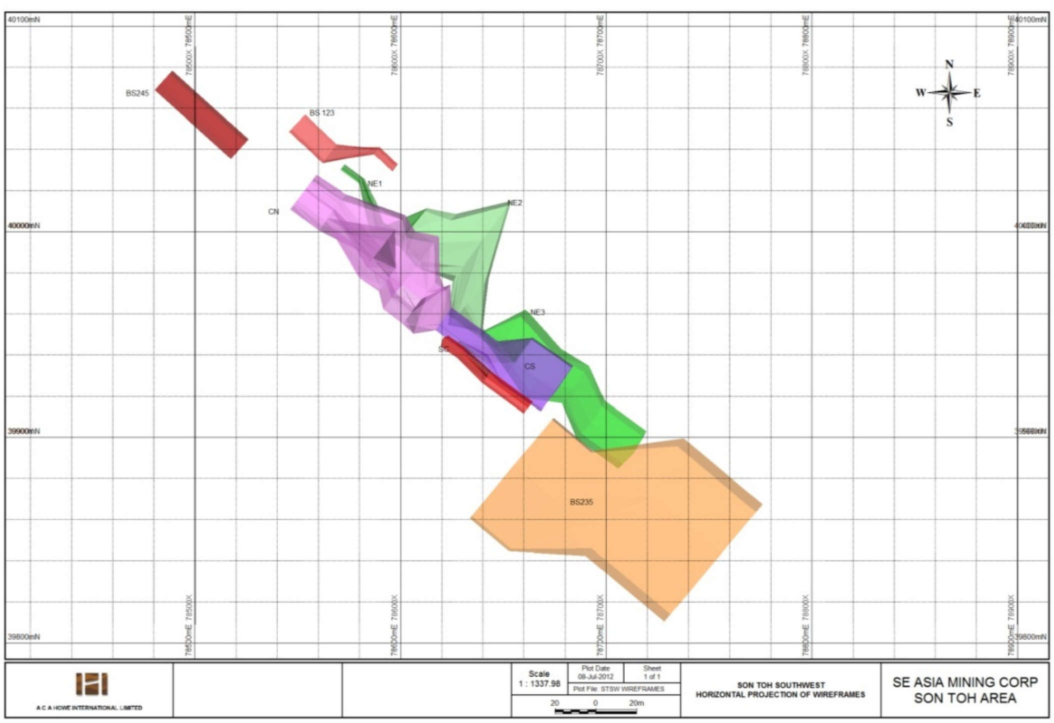
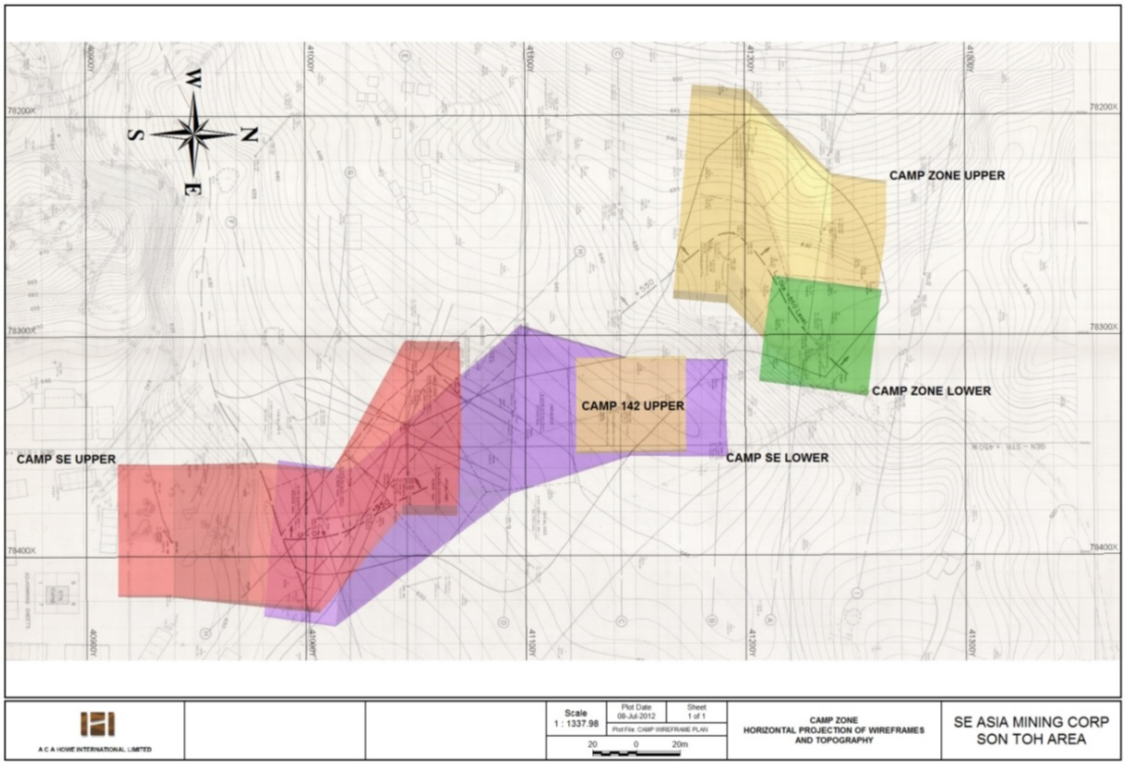


FIGURE 14-4. SONG TOH SOUTHWEST WIREFRAMES PLAN



14.3. SAMPLE DATA SELECTION

Prior to selecting samples for use in resource estimation of the Boh Yai and Song Toh deposits exploratory data analysis was undertaken on the raw sample database to assess the statistical characteristics of each sample support. Statistical data is contained Table 15-5 below.

Histograms of these data indicate a skewed distribution of silver values with the possibility of anomalous outlying values which may not be representative. These anomalous values contribute to corresponding anomalous Pbeq values of up to 260% Pbeq.

The raw assay databases were flagged so that each assay value was assigned to the domain it informed and classical statistical analysis was undertaken on assays within each domain to investigate the statistical characteristics of each domain and to provide useful information when considering top-cutting data prior to estimation. The raw mean grades for samples that fall within each of the domains are contained in Table 14-5.

TABLE 14-5. BOH YAI AND SONG TOH ASSAY RAW STATISTICS

	Pbeq	Ag
Boh Yai Assay Raw Statistics		
Minimum	0	1
Maximum	260	3170
No. of points	2177	2057
Sum	20537	163459
Mean	9	79
Variance	250	47457
Std Dev	16	218
Rel Std Dev	1.676	2.744
Song Toh Assay Raw Statistics		
Minimum	0.01	1
Maximum	56.2	1398
No. of points	1740	1662
Sum	9407	179136
Mean	5.41	108
Variance	57.68	23204
Std Dev	7.59	152
Rel Std Dev	1.405	1.413

14.3.2. TOP-CUTTING

Prior to compositing, top-cut analysis was performed on assay values sample data. Top-cutting is an important step in resource estimation, and particularly so for the estimation of resources at Boh Yai, since extreme silver grades (>3000 g/t Ag) are known to occur.

Whilst extreme grades are real, they may not be representative grades of any given domain, and may represent outliers that have the potential to overestimate domain grade if left un-capped since, were a hole to be drilled into any given domain, the probability of returning an extreme grade assay is low, and it is more likely that a grade closer to the mean grade of the domain will be returned.

A histogram of Ag values for Boh Yai indicates that values above 1000 g/t Ag form anomalous outliers that are probably not representative. Accordingly 24 such assays were cut to a maximum of 1000 g/t (this includes 5 assays above 2000 g/t Ag). Examination of the location of the high value silver assays in the range 500-1000g/t Ag shows that they are confined to a single domain in Hill 7 (7 NSN 091) where they occur in adjacent samples rather than isolated outliers; cutting of high silver values below 500 g/t Ag was therefore considered not to be justified. Appendix V contains a list of assays that were affected by top cutting.

For Song Toh the distribution of Ag indicates a maximum of 1398 g/t with no significant outliers, accordingly no top-cutting was applied to the Song Toh assays.

14.3.3. COMPOSITING

Data compositing was undertaken on raw sample data prior to geostatistical analysis and interpolation in order to standardize the sample database by generating sample points of equal support to be used in estimation. Historical and recent drill hole sampling was undertaken over drilled intervals of between 0.20m and 10.0m, averaging 1.6m. A composite length of 1.0 m was chosen as representative.

Raw drill hole samples within each mineralized zone were flagged by domain in the sample database and composited to 1.0m intervals, starting at the drill hole collar and progressing down hole.

Compositing was stopped and restarted at domain boundaries and at the end of every hole.

Though isolated and rare, un-sampled intervals within the domain model were inserted in to the sample database and assigned a grade value of 0 prior to compositing. The minimum permitted composite length was 0.3m, defined in order to capture the final grade interval down hole, commonly at the edges of mineralized domains and often less than 0.5m. In these instances, a final composite was created if the interval was greater than 0.30m. If the final interval was less than 0.30m, a weighted average was calculated from the final two composites.

14.4. GEOSTATISTICS

Semivariograms were calculated and modelled separately for the main domains at Boh Yai and Song Toh.

The experimental semivariogram models for the directions of maximum grade continuity were attempted, and although the models for the first direction (main direction) appeared reliable and were based on a significant number of sample points, the sample points captured in models for the second (dip) and third (across dip) directions were few, and well defined semivariograms, for use in Kriging, could not be modelled.

Directional semivariograms oriented parallel to the strike indicated ranges of between 50 and 80 metres, as listed in Table 14-6

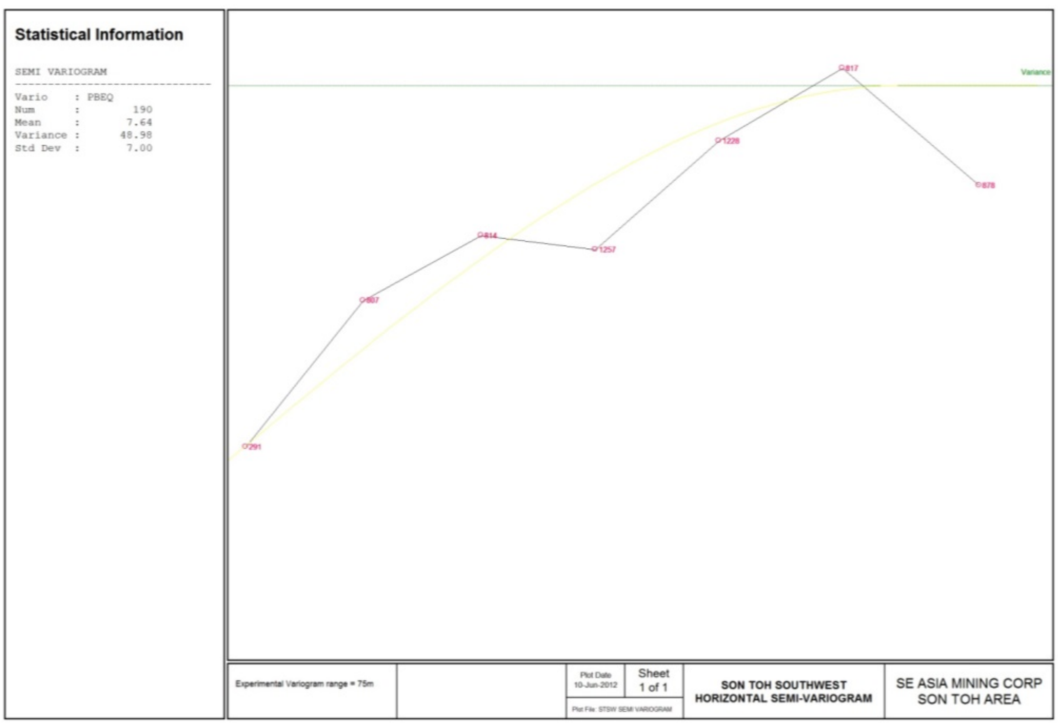
Although the generated semivariogram parameters are not sufficiently defined to be used as inputs to Kriging, the orientations and dimensions approximate the geometry of interpreted mineralized zones and so are considered valid inputs to define the search ellipse used in the interpolation process. In the absence of third direction parameters, the third direction in each domain was defaulted as being perpendicular to the other main directions, and approximates the across -dip direction of each mineralized domain. The range in the third direction was input as being 1/3 the range of the other directions, to honour the narrow thickness of the mineral zones in the across-dip direction.

TABLE 14-6. BOH YAI AND SONG TOH SEMIVARIOGRAM SUMMARY

Area	Data	Main Azimuth	Dip	Range, m
Boh Yai	All Composites	356	0	60
Boh Yai	Hill 1 Composites	345	0	80
Boh Yai	Hill 7 Composites	335	0	50
Song Toh SW and Song Toh Camp	All Composites	345	0	75

Generated semi-variograms from this study are contained in Appendix IV. Figure 14-5 below represents one of the better-defined semivariograms:

FIGURE 14-5. SONG TOH SOUTHWEST SEMIVARIOGRAM



14.5. BLOCK MODELING

Block modelling was undertaken in several stages. Firstly, an empty block model was generated for the Boh Yai and Song Toh deposits covering the extents of all domain wireframes within each deposit The block models were then constrained to the wireframe domains and each three dimensional wireframe solid populated with blocks to create an empty resource block model for each deposit. Assigned blocks were then coded with the code of the domain into which they were assigned.

Parent block dimensions of 4m in X, Y and Z direction were used, with sub-blocking down to 2m in each direction in order to maintain the resolution of the mineralized envelopes so as to accurately honor wireframe volume.

TABLE 14-7. BLOCK MODEL PARAMETERS

Area	Sector	Item	Eastings	Northings	Elevation	Blocks & Sub-Blocks
Boh Yai North	By Hills 1 & 2	From, m	80,608	31,424	400	34,372
		To, m	81,060	31,766	711	
		Extent, m	452	342	311	
Boh Yai Central	By Hills 3,4, & 5	From, m	80,698	30,648	467	17,528
		To, m	80,943	31,324	710	
		Extent, m	245	676	243	
Boh Yai South	By Hill 7	From, m	80,209	29,766	407	11,741
		To, m	80,575	30,376	618	
		Extent, m	366	610	211	
Song Toh SW	All	From, m	78,480	39,812	290	9,353
		To, m	78,776	40,078	508	
		Extent, m	296	266	218	
Song Toh Camp	All	From, m	78,187	40,915	446	7,593
		To, m	78,431	41,264	602	
		Extent, m	244	349	156	

14.5.2. GRADE INTERPOLATION

Grades for Pbeq, Pb, Zn and Ag were interpolated into the empty block model separately for each domain using the Inverse Distance Weighting interpolation, raised to the second power (IDW^2). Each block model was populated on a domain-by-domain basis using composited assay data (top-cut for Boh Yai). A closed interpolation approach was adopted, whereby only composite assay data situated within each domain was used to interpolate the grade of blocks within that domain. Variographic analysis was not considered to be robust enough to define the input parameters required for a reliable kriged estimate. However the observed nugget effect, derived from variograms, is considered reliable and is found to be low for each of the domains investigated through variography (<10%). One of the main advantages that kriging has over IDW interpolation is that the nugget effect, or grade variability over very short distances, is factored in to the kriging algorithm whereas it is assumed to be 0 when using IDW. The presence of a very low nugget effect therefore validates the use of IDW as a reliable interpolation method.

Interpolation of each deposit block model was undertaken on a domain-by-domain basis and for each domain, grade interpolation was run twice, or sometimes three times at successively larger search radii until all blocks received an interpolated grade. Concentric search ellipses were used in order to avoid grade smearing and to preserve local grade variation.

The radii of the search ellipses listed were determined by the results of variographic analysis listed in Table Table 14-8, from consideration of appropriate ranges of continuity applicable to this type of deposit, and from a consideration of the drill grid spacing. The directions of the ellipsoids were adjusted according to the orientations of each domain, as listed in Table 14-4.

TABLE 14-8. SEARCH STRATEGY USED AT SONG TOH AND BOH YAI

Interpolation Method	IDW2	
Interpolation Run Number	1	2
Search Radii	Equal to the range in all directions	Twice the range in all directions
Search Radii, Metres	1	2
Factor, Axis1 and 2	60	120
Factor, Axis 3	20	40
Minimum Number of Samples	4	2
Maximum Number of Samples	16	16
Minimum Number Holes	2	1
Resource Category	Indicated	Inferred

For all domain interpolations, the first search radius was selected to be equal to the range, and the radius was increased in all directions until all domain blocks received an interpolated grade.

To increase the reliability of the estimates, when model blocks were interpolated in the first run, a restriction of at least four samples, from at least two drill holes was applied. When blocks were interpolated using search radii exceeding the range, the criteria was reduced to at least two samples from at least one drill hole. Table 14-8 details the search strategy used.

An unbalance between the numbers of samples in adjacent drillholes (clustering) may lead to a bias in local estimation. This effect was mitigated by the use of the MICROMINE sector method whereby the search ellipse, regardless of the radii employed, is divided into four sectors and a constraint used during interpolation, whereby a maximum of eight points per sector were allowed. Therefore, the maximum combined number of sample allowable for the interpolation was 32.

Once grade interpolation was complete, all block models were checked against longitudinal sections depicting topography and underground workings. Blocks which were above the lowest level of stoping were excluded by from the estimate by applying an appropriate vertical (Z) filter. Figure 14-6 to Figure 14-9 show typical plans and cross sections of block models generated for Song Toh and Boh Yai.

FIGURE 14-6. BOH YAI HILLS 3, 4 AND 5 RESOURCE BLOCK MODELS-VERTICAL LONGITUDINAL SECTION

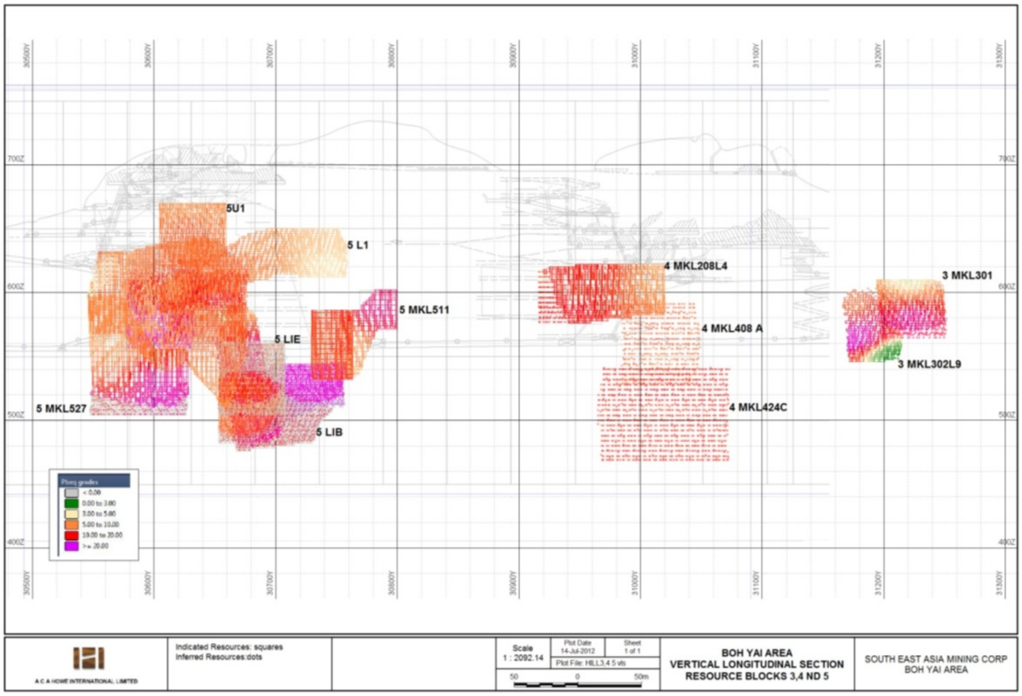


FIGURE 14-7. BOH YAI HILL RESOURCE BLOCK MODELS, HILL 1, CROSS SECTION

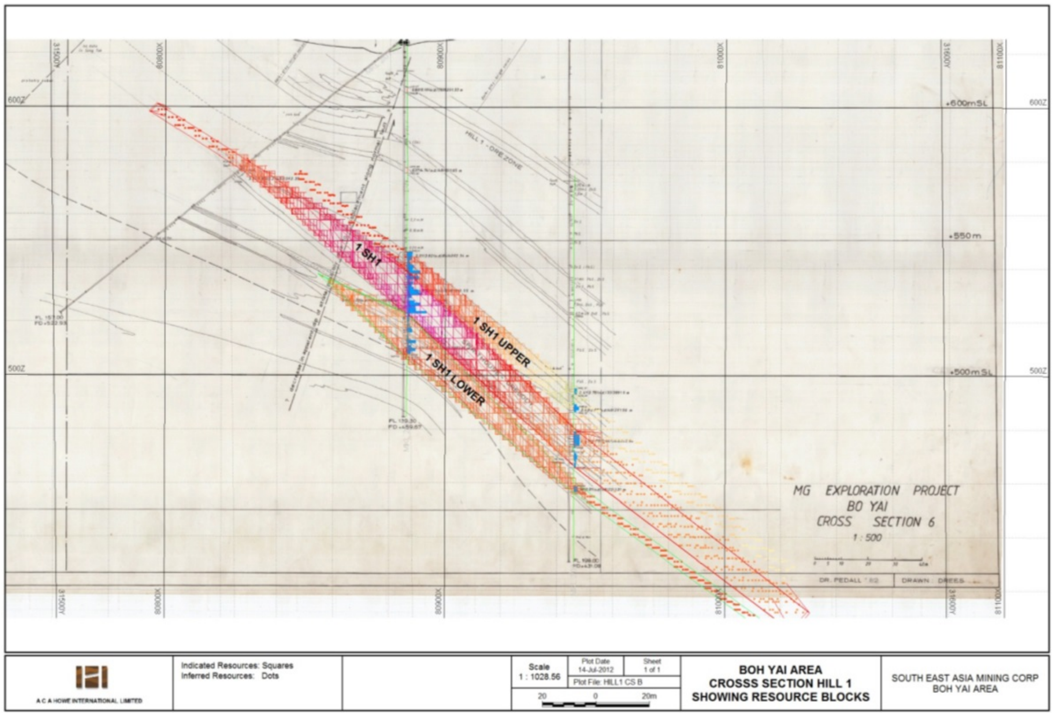


FIGURE 14-8. SONG TOH CAMP DEPOSIT: RESOURCE BLOCK MODEL PLAN

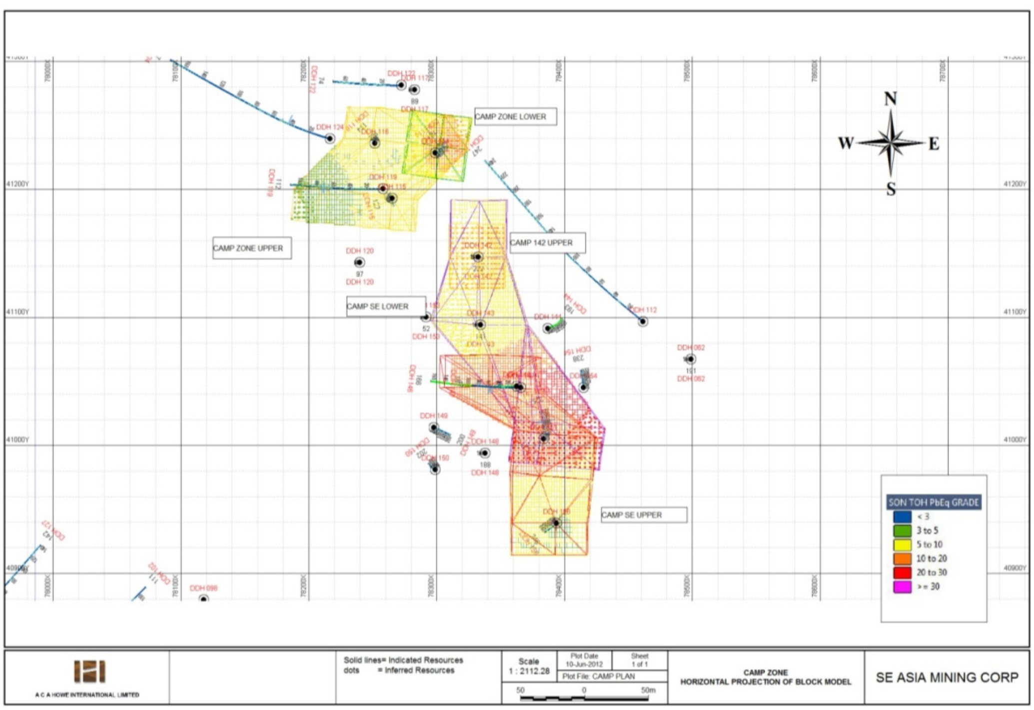
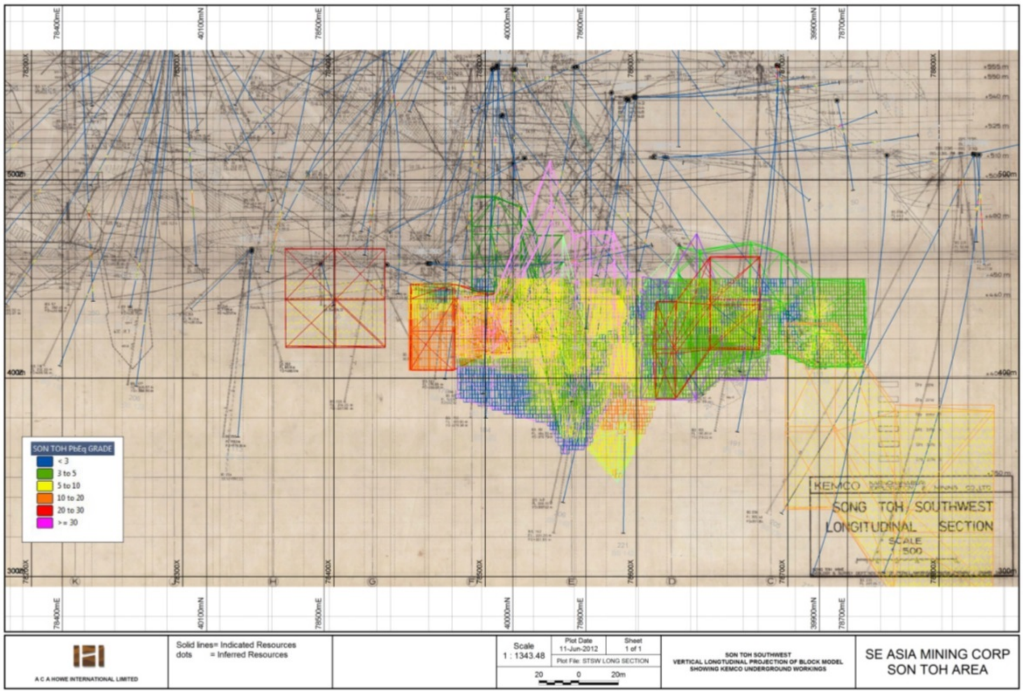


FIGURE 14-9. SONG TOH SOUTHWEST: RESOURCE BLOCK MODEL, VERTICAL LONGITUDINAL SECTION



14.6. RESOURCE CLASSIFICATION

The CIM Definition Standards on Mineral Resources and Mineral Reserves, prepared by the CIM Standing Committee on Resource Definitions and adopted by the CIM council on December 11, 2005, provide standards for the classification of Mineral Resources and Mineral Reserve estimates into various categories. The category to which a resource or reserve estimate is assigned depends on the level of confidence in the geological information available on the mineral deposit, the quality and quantity of data available, the level of detail of the technical and economic information which has been generated about the deposit and the interpretation of that data and information. Under CIM Definition Standards:

> *An "Inferred Mineral Resource" is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological or grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.*

> An "Indicated Mineral Resource" is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics can be estimated with a level of confidence sufficient to allow appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate

is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.

Classification, or assigning a level of confidence to Mineral Resources has been undertaken in strict adherence to the CIM Definition Standards on Mineral Resources and Mineral Reserves referred to above, and follows the Micromine Consulting Resource Modelling Standard Procedures (2001).

Classification of interpolated blocks is undertaken using the following criteria:

- Interpolation criteria and estimate reliability based on sample density, search and interpolation parameters;
- Assessment of the reliability of geological, sample, survey and bulk density data;
- Assessment of geological/grade continuity over the various domains at each deposit; and
- Drilling exploration grid dimensions.

The interpolation strategy largely dictates the classification of blocks since the parameters of each interpolation run result in a greater level of confidence in assigned block grade during the first interpolation run, whereas interpolation runs at search radii larger than the defined range, capturing fewer points from fewer holes results in a lower level of confidence in block grade, even though the block estimates are reliably calculated from available sample points.

No measured resources have been classified at Boh Yai or Song Toh, as the density of the drilling grid is insufficient to support this class of resource. Measured resources at both Song Toh and Boh Yai would require further underground development and sampling.

Blocks were classified as "indicated" if the following criteria were fulfilled:

- Blocks in any domain at either deposit that have been captured in the first interpolation run at distances up to the range in all directions, and are informed by more than one drill hole.

- Blocks in domains where good geological continuity can be established from historical plans and sections

Blocks were classified as "inferred" if the following criteria were fulfilled:

- Blocks in any domain at either deposit that have been captured in the second interpolation run at distances equal to or exceeding the range in all directions, and are informed by one drill hole, or

- Blocks in any domain at either deposit that have been captured in the first interpolation run at distances up to the range in all directions, but where good geological continuity cannot be established from historical plans and sections.

14.7. DENSITY

A density of 2.9 tonnes per cubic metre (t/m^3) was used historically throughout the mine's history for historical resource and reserve estimation and for production records. It is unlikely that any significant error in this figure would have remained un-noticed over the 22 year period of the mines' operation.

This density figure of 2.9 t/m^3 is in close accord with the theoretically calculated density of limestone containing 3.5% Pb as galena.

In view of these considerations a density of 2.9 t/m^3 is considered reliable and has been used in the present resource estimate.

14.8. RESOURCE TABLE

The resource estimates for the Boh Yai and Song Toh deposits is summarized in the following table, with resources classified in strict accordance with CIM Definition Standards on Mineral Resources and Mineral Reserves, prepared by the CIM Standing Committee on Resource Definitions and adopted by the CIM council on December 11, 2005.

TABLE 14-9. BOH YAI AND SONG TOH RESOURCES BY DEPOSIT (CUT-OFF GRADE 3% PBEQ)

Deposit	Class	Tonnes	Pb, %	Zn, %	Ag, g/t
Boh Yai	Indicated	2,138,000	3.12	3.49	73.84
Song Toh SW	Indicated	318,000	2.84	0.25	87.27
Song Toh Camp	Indicated	439,000	6.29	1.42	56.13
Total	Indicated	2,896,000	3.57	2.82	72.63
Boh Yai	Inferred	1,643,000	2.36	3.37	44.10
Song Toh SW	Inferred	179,000	4.70	0.05	78.35
Song Toh Camp	Inferred	133,000	7.80	3.53	68.40
Total	Inferred	1,955,000	2.95	3.08	48.89

(note: tonnages are rounded to nearest 1,000)

Notes for Resource Estimate:

1. Cut-off grade for mineralized zone interpretation was 3.0% Pb Equivalent.

2. **Mineral resources, which are not mineral reserves, do not have demonstrated economic viability. The estimate of mineral resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.**
3. The database used by ACA Howe for the resource estimate contains 3,914 Pb, Zn and Ag assay results from 551 surface and underground diamond drill holes (total of 58,078 metres). Samples were assayed historically by the mine laboratory at Song Toh with check samples by SGS. A representative number of core and pulp samples that were analysed in 2012 by ALS provided verification of the historical assays.
4. Lead Equivalent - Pbeq - was calculated using prices of US$0.93/lb lead, US$0.90/lb zinc, and US$ 23.03/oz silver, (with no provision for metallurgical recoveries). The formula used was Pbeq% = Pb% + 0.962Zn (%) + 0.0360Ag (g/t). Small discrepancies may exist due to rounding errors.
5. Mineralized domains were modelled with the aid of drill results and detailed interpretations of geology recorded on historical plans. A total of 42 individual domains was identified, including 28 at the Boh Yai deposit 9 at the Song Toh SW deposit and 5 at the Song Toh Camp deposit.
6. Micromine block models with block cell dimensions of 4.0 metres and sub blocks of 2.0 metres were coded to reflect surface topography and geology. Metal values from 1.0 metre drill composites were interpolated to block models using Inverse Distance Squared weighting (IDW2) according to parameters and search ellipsoids established from analysis of the variography within each domain. A three-pass approach was used to interpolate metal into the blocks. A density factor of 2.9 t/m3 was assigned to all mineralized domains based on historical measurements of specific gravity. For resource classification, 2 drill holes with 3 composites and a search distance less than the range were required for Indicated category, remaining blocks were assigned to Inferred category.
7. Resource estimate prepared by Richard Parker, C.Eng.
8. Tonnages are rounded to nearest 1,000.

Resources listed by domain are listed in Appendix II.

To the best knowledge of ACA Howe, the stated mineral resources are not materially affected by any known environmental, permitting, legal, title, taxation, socio-economic, marketing, political or other relevant issues, unless stated in this report.

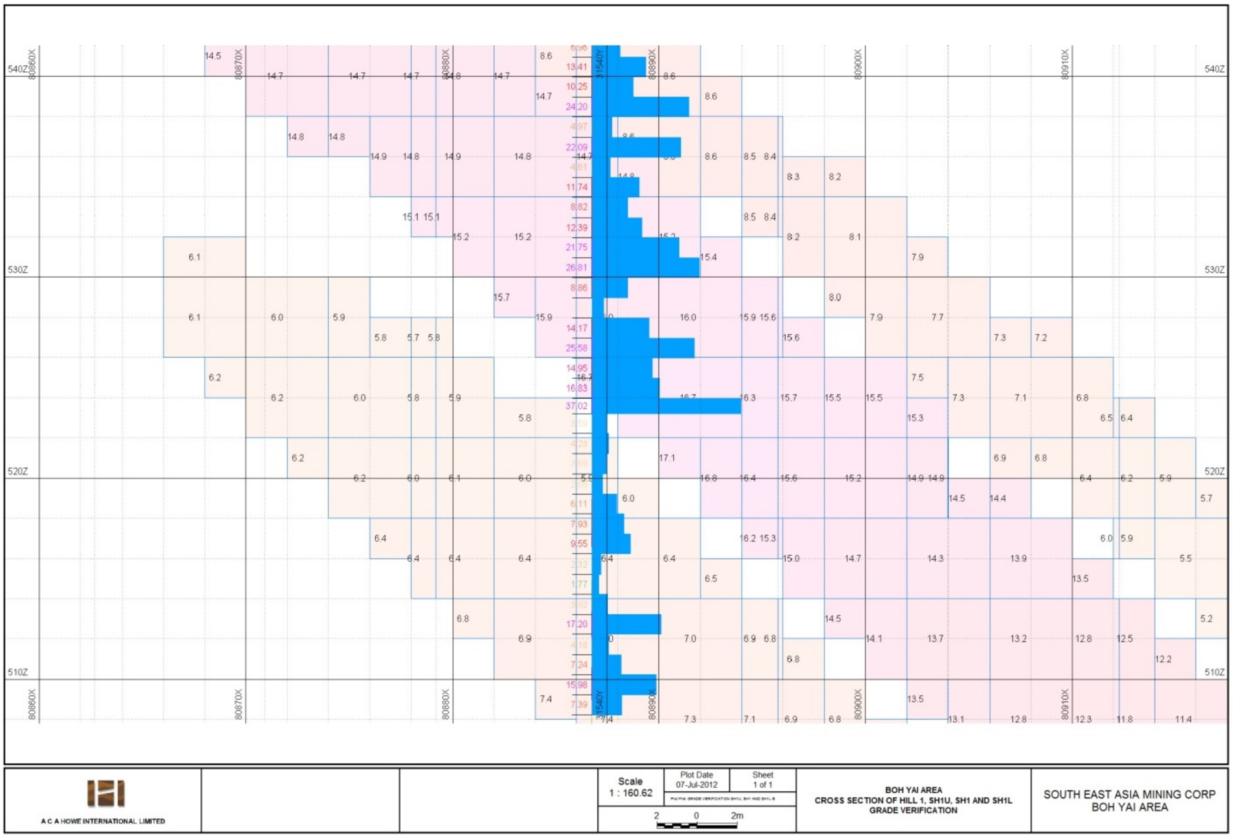
The mineral estimate, prepared by Richard Parker, ACA Howe Senior Associate Geologist – Resources, is compliant with current standards and definitions required under NI 43-101 and is reportable as a mineral resource by Southeast Asia Mining Corporation. However, the reader should understand that mineral resources are not mineral reserves and do not have demonstrated economic viability.

14.8.2. Model Validations

Upon completion of resource estimations for Boh Yai and Song Toh deposits, model validations were run and a series of checks performed to validate each block model. Screenshots of each block model, coloured by Pbeq grade are contained in Appendix VI.

Detailed visual inspection of the block models was undertaken following completion of each domain interpolation to ensure that all blocks received an interpolated grade. In addition, the proper assignment of domain codes to blocks was verified. Once modeling was complete, a series of sectional slices through each block model was undertaken, with drill hole traces, composite grade data and block grade data displayed and compared to assess whether block grades honour the general sense of composite grades, that is to say that high grade blocks are located around high grade composite sample grades, and vice versa. A degree of grade smoothing is evident in all block models, which is expected but the blocks grades do honour composite grades in all models, as shown in the example in Figure 14-10 below.

FIGURE 14-10. BLOCK GRADE VERIFICATION - HILL 1



A useful measure of the reliability of resource estimates is the comparison of mean block grade and mean composite grade on a domain by domain basis. A good correlation between average block grade and average composite grade suggests that block grade data honours the composite data used in the interpolation process and therefore the estimated grades reliably reflect the input grades.

Mean composite grades and mean block grades for each domain are contained in Table 14-10.

On the whole, mean block grades correlate well with input composite grades, within acceptable limits. A degree of grade smoothing is evident, which occurs in all estimations where grades are interpolated into blocks at unsampled locations, often at significant distances away from sampled points, regardless of estimation methodology. In most cases where there is a significant discrepancy between composite grades and resource grades the difference can be attributed to the fact that resource blocks have been restricted only to the lower part of the wireframe due to stoping and are may not therefore be representative of composites contained within the upper part.

TABLE 14-10. BOH YAI AND SONG TOH COMPOSITE GRADES VS. RESOURCE GRADES

Domain	Affected By Stoping/ Lowest Level	Location	Composite Count	Composite Mean Grade, Pbeq%	Indicated Resource Grade, Pbeq	Inferred Resource Grade, Pbeq
1 105L	no	Boh Yai - Hill 1	104	6.74	9.72	6.83
1 105U	no	Boh Yai - Hill 1	37	5.16	4.88	5.57
1 SH1	no	Boh Yai - Hill 1	78	9.48	10.78	6.33
1SH1L	no	Boh Yai - Hill 1	37	6.33	6.43	6.52
1SH1U	no	Boh Yai - Hill 1	16	5.52	5.64	4.67
3 MKL302L9	no	Boh Yai - Hill 3	16	6.41	11.83	9.95
4 MKL301	610	Boh Yai - Hill 4	11	7.67	9.26	13.12
4 MKL408L4	620	Boh Yai - Hill 4	35	8.49	7.88	9.48
4 MKL424A	no	Boh Yai - Hill 4	8	6.59	6.60	6.59
4 MKL424C	no	Boh Yai - Hill 4	9	9.40	9.34	9.34
5 L1	no	Boh Yai - Hill 5	63	6.93	6.35	-
5 L1B	no	Boh Yai - Hill 5	34	10.44	10.04	11.79
5 L1C	no	Boh Yai - Hill 5	11	4.35	4.36	-
5 L1D	no	Boh Yai - Hill 5	7	16.39	-	14.94
5 L1E	no	Boh Yai - Hill 5	10	6.06	-	6.12
5 MKL 527	no	Boh Yai - Hill 5	6	17.78	17.94	18.48
5 MKL511	no	Boh Yai - Hill 5	7	10.53	10.05	8.79
5 MKL563	no	Boh Yai - Hill 5	24	7.53	-	7.39
5 U1	670	Boh Yai - Hill 5	17	5.59	5.99	6.21
5 U3	no	Boh Yai - Hill 5	31	6.06	6.31	6.07
5 U4	no	Boh Yai - Hill 5	30	6.94	8.69	8.02
7 NSN091	500	Boh Yai - Hill 7	115	19.00	17.82	15.10
7 nsn129	no	Boh Yai - Hill 7	10	16.12	15.80	-
7NSN031	no	Boh Yai - Hill 7	8	16.38	16.49	10.38
7NSN058	454	Boh Yai - Hill 7	11	7.85	-	7.07
7NSN159	no	Boh Yai - Hill 7	46	5.35	8.59	6.30
7NSN343	454	Boh Yai - Hill 7	91	8.41	10.84	11.80
BS123	no	Song Toh SW	26	11.91	10.72	14.40
BS235	no	Song Toh SW	15	9.17	7.32	7.54
BS245	450	Song Toh SW	3	6.15	-	7.35
CN	450	Song Toh SW	91	4.93	6.50	7.63
CS	no	Song Toh SW	17	4.13	3.71	-
NE1	450	Song Toh SW	75	4.90	5.29	-
NE2	no	Song Toh SW	29	8.36	6.50	-
NE3	no	Song Toh SW	31	4.47	4.15	2.63
SC	no	Song Toh SW	9	6.25	4.97	-
Camp 142 Upper	no	Song Toh Camp	3	12.86	-	12.86

Domain	Affected By Stoping/ Lowest Level	Location	Composite Count	Composite Mean Grade, Pbeq%	Indicated Resource Grade, Pbeq	Inferred Resource Grade, Pbeq
Camp Lower	no	Song Toh Camp	6	9.57	-	9.45
Camp SE Lower	no	Song Toh Camp	12	15.1	16.1	16.9
Camp SE Upper	no	Song Toh Camp	16	10.2	10.0	-
Camp Upper	no	Song Toh Camp	26	6.13	6.01	5.66

14.8.3. COMPARISON WITH PREVIOUS ESTIMATES

Historical documents refer only to 'reserves' and make no mention of 'resources'; any comparison of figures should be conscious of this distinction.

As discussed in section 6.4 of this report, the 2002 historical Reserve Balance for Boh Yai and Song Toh SW totaled 955,000 of which ACA Howe has categorized 236,000 tonnes as 'developed' and 719,000 as 'undeveloped'. Former mine management also estimated approximately 1.5 Mt of 'potential ore'.

The developed historical reserves were defined principally by channel sampling whereas the undeveloped historical reserves were defined by diamond drilling in areas outside the limits of mining. The CIM-compliant resources are based on the same drill data as the undeveloped historical reserves and therefore deserve comparison.

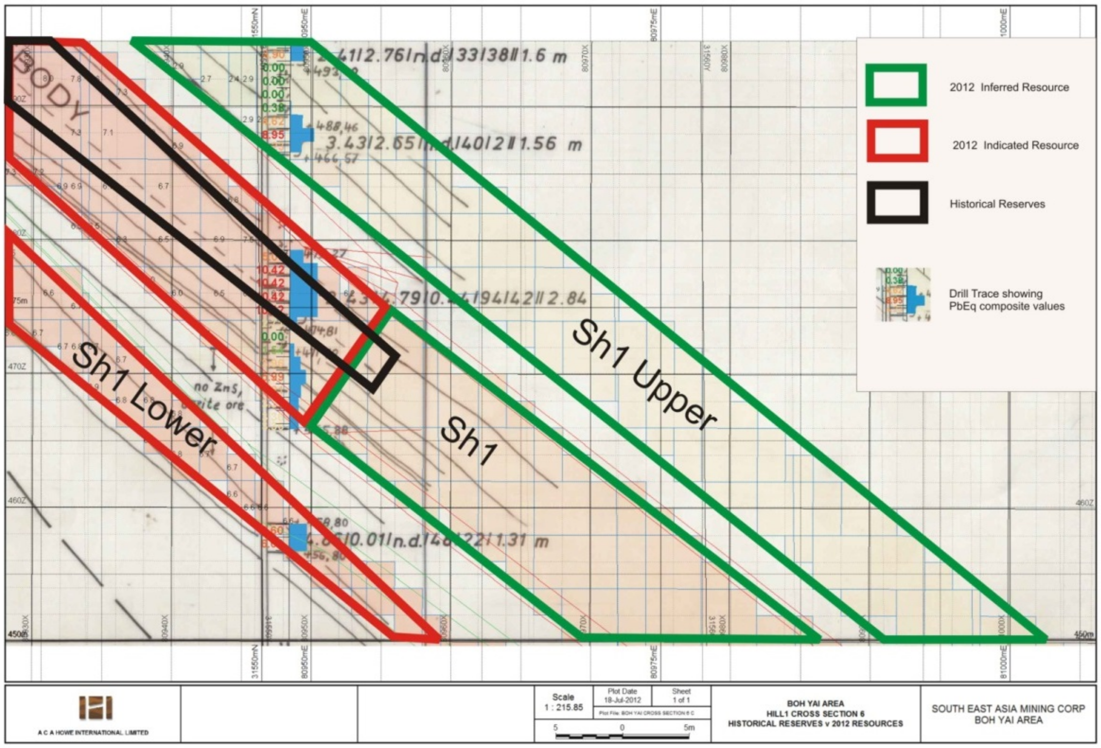
The Table 14-9undeveloped reserve of 719,000 and 1.5Mt of potential ore contrasts with CIM compliant indicated resources of 2.9 million tonnes and inferred resources of 1.9 million tonnes. This difference is due to a number of factors, including the following:

- CIM compliant resources include Song Toh Camp (439,000t indicated, 133,000t inferred) which is not included in the former mine manager's estimates;
- Lower cutoff used in CIM compliant resources of 3% PbEq vs 6% PbEq used by former mine management;
- Inclusion of internal waste in CIM compliant resources results is a Much wider area of influence;
- The fact that former management estimated its reserves based on short term production planning rather than a global estimate of resources.

Certain of These factors can be illustrated by reference to Figure 14-11 on the following page.

The lower cut-off used for the 2012 resources has resulted in the inclusion of numerous composites of between 3% and 6% PbEq which were not included in the historical reserve. This has resulted in much thicker domain envelopes for SH1, and the addition of two more domains, SH1 Upper and SH1 Lower, that were not included in the historical reserve balance.

FIGURE 14-11. HILL 1 CROSS SECTION SHOWING HISTORICAL RESERVES AND 2012 RESOURCES



The historical reserve envelope extends for approximately 10 metres down-dip. ACA Howe considers that this is unduly conservative, in view of the demonstrated continuity of zones between drillholes and the 80m range of the relevant semivariogram. A down-dip extension of 100m was therefore considered reasonable and used for the construction of the relevant domain wireframes. Resource blocks in these areas were subsequently designated as inferred category as the search ellipsoid included composites from only one drill hole.

These factors apply generally to the comparison between the historical reserve balance and the CIM compliant resource estimate in other areas in Boh Yai and Song Toh and account for the majority of the difference between these estimates.

15. MINERAL RESERVE ESTIMATES

No mineral reserve estimates have been prepared on the Property by SEA. The existing reserve estimates on the Property are considered to be strictly historical in nature as outlined above in section 6.6.

The derivation of reserves from the CIM-compliant resources will require the application of economic factors including dilution and recovery and an examination and possible revision of the cut -off grade.

16. MINING METHODS

Historical mining methods are discussed in section 6 of this report ('History').

16.1. MINING METHODS

Mining will be carried out with the same underground methods that were in use in 2002. Rock will be moved with rubber-tired, diesel-powered loaders and trucks. Miners and supplies will be transported to the workplaces in utility vehicles. Most of the ore will be mined at Boh Yai and trucked 14km to the Song Toh concentrator. At Song Toh Mine, the Camp Zone will be developed near Mine North (MN) and there are remnants to be mined South West (MSW). The MSW ore is below the elevation of the dewatering drift; this mining will be done in the dry season only. Stopes vary in width from 2m to 10m and greater. The stopes vary from flat lying (less than 10° dip) to shallow dipping (less than 30°) to steeply dipping (more than 60°).

16.1.1. STOPING

Stopes will be mined using the room-and-pillar mining method and the overhand open stoping method. In order to minimize dilution, blast holes will be drilled with small equipment – hand held pneumatic rock drills, with 2.4m (sometimes 1.6m, 1.8m, or 3.2m) long drill rods drilling 32mm diameter holes. Each hole will be loaded with one electric detonator, one cartridge of gelatin dynamite, and ANFO (Ammonium Nitrate Fuel Oil blasting agent).

16.1.2. ROOM-AND-PILLAR MINING

This method will be used where the ore zone dips at a shallow angle. After blasting, rock will be removed with a load-haul-dump machine ("LHD" or "scooptram"). The LHD will transport the rock to an "ore pass" where the rock will drop down to a loading chute above the haulage level. The truck drivers will park under the chute and operate the hydraulically controlled gate to fill their truck. The trucks will then travel along the haulage drift and up a ramp to surface. In thick zones, miners will excavate one lift and then stand on the broken rock to drill blast holes above. Pillars will be left as required, with the lowest grade material being left in pillars as much as possible.

If the dip is slightly greater, scrapers (electric winch dragging a hoe up and down the slope) will be used to pull the rock down the slope.

The stopes will be accessed from sub-levels that will be 12m apart vertically. The sub-levels will be connected by a spiral ramp.

16.1.3. OVERHAND OPEN STOPE MINING

This method will be used in steeply dipping ore zones. Miners will stand on broken rock to drill blast holes above. In this case, the stopes will be accessed from sub-levels that will be 15m apart vertically. The sub-levels will be connected by a spiral ramp. The rock will be removed from the stope after the miners have reached the sub-level above. The stopes will then be backfilled and the miners will continue to the next sub-level. In the past, backfill has come from development waste rock and hydraulic fill (tailings from the concentrator; the fill drains though filters and the fill becomes solid). To create a harder floor for the next lift, cement can be added to the final fill pour.

16.2. Development

The mineralized zones are accessed with tunnels, ramps, and drifts driven in waste rock. Their excavation will usually employ mobile drilling units ("drill jumbos") equipped with heavy rock drills. Development is advanced by drilling blast holes 3.6m long and 64mm in diameter. Blasted rock will be removed by an LHD. Every 150m, a truck-loading area will be excavated; it will be high enough for the loader to fill a truck and large enough to turn a truck around and to store rock after blasting and between truck arrivals. The main haulages, with a cross section of $18m^2$ (4.25m wide by 4.25m high) and maximum gradient of 1:9 (11%), accommodated trucks carrying a 16t payload. Other ramps, at 16m2 (4.0m by 4.0m), have a maximum gradient of 1:7 (14%); the 10t trucks operated here. At the present time, there are underground mining trucks on the market with up to 20t capacity that can operate in a 4m wide haulage.

Rock from waste development will be used for backfilling stopes or crushed and used for maintenance of roadways.

Stoping areas at Boh Yai and MSW will be developed from existing underground workings. The Camp Zone will be accessed from a new ramp driven from surface.

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PLATE 16-1. PORTAL AT BOH YAI

16.3. DILUTION

ACA Howe used dilution factors developed during the previous mining operations. For deposits other than Song Toh Mine South and Song Toh Mine North, the grade reduction from dilution is 15% in drifting and 10% in stoping; average 11%.

16.4. MINING LOSSES

ACA Howe used tonnage reduction factors developed during the previous mining operations. The tonnage reduction, compared the Resource tonnage, is 15% for Boh Yai lead (Hill 7) and 20% for the other zones.

16.5. GEOTECHNICAL CONSIDERATIONS

16.5.1. GEOTECHNICAL DOMAIN

The Song Toh and Boh Yai mines can be characterized as shallow underground mines. Several faults exist; in some cases these control the mineralization. Faulting does not have a significant impact on ground control in the mines, although it can be a factor at Boh Yai.

16.5.2. GROUND CONDITIONS

Ground conditions generally range from very good to excellent. However, the host limestone is in karst terrain and poor ground conditions can be encountered, rarely, in the vicinity of caverns that have been created by water dissolving the limestone.

16.5.3. Rock Stress

At Song Toh, the depth of mining operations ranges from zero to 200m below the level of the surrounding area, although hills arise up to 100m and even 150m above the surrounding area. As such, there is little stress in the rock hosting the ore deposits. No deeper mining is planned at Song Toh.

At Boh Yai, the depth of mining operations ranges from zero to 75m below the level of the surrounding area, although hills arise up to 100m and even 150m above the surrounding area. Again, there is little stress in the rock hosting the ore deposits. Mining is planned to extend another 100m deeper, so little change in rock stress will occur.

16.5.4. Rock Strength

The host limestone is medium strength rock; this has the advantage of providing competent ground that is not brittle. The result is good ground conditions for mining. Uniaxial compression testing of hangingwall and footwall limestone indicates average strength in the order of 75MPa, with 60Mpa for the mineralized zone.

16.5.5. Geotechnical Report

A preliminary review by Golder Associates (Roworth and Steed, 2013) concluded that past practice for mining layouts should continue to be effective at depths less than 250m. If future exploration extends the resources below that depth, then pillar size and spacing will need to be modified. The report is presented in Appendix VII.

16.6. Mining Equipment

The main mining equipment to be used is listed in Table 16-1 below. Some of the equipment is on site and will be refurbished; other equipment will be purchased new. Used equipment, rebuilt to factory specifications, will also be considered.

TABLE 16-1. Main Mining Equipment (Full Fleet)

Description	Refurbished	Purchase New	Total Quantity
LHD, 5t	3	2	5
LHD, 7t		2	2
Haul Truck, 16t		4	4
Haul Truck, 12t		2	2
Jumbo Drill	1	1	2
Grader		0.5	0.5
Utility Truck	2	1	3

The grader will be shared with surface road maintenance.

Mining will be carried out by two crews working on day and night shift, five days per week. The personnel list for the mining department is shown in Table 16-2 below.

TABLE 16-2. MINING PERSONNEL LIST

Description	Quantity
Mine Superintendent	1
Mine Captain	1
Mining Engineer	3
Supervisor	9 + 9 foreman helper
Vehicle / Jumbo Operator	6
Miner	128 daily
Services	6
Surveyor	1 + 2 helper
Chief Geologist	1
Geologist	2 + 2 helper
Sampler	2
Diamond Driller	3 + 3 helper
Draughtsman	1

16.7. LOW GRADE STOCKPILES

In the past, low-grade material was stockpiled near the Boh Yai mine entrances. This material had to be removed in order to expose the ore, but it was not economic to process. With current technology and metal prices, this material may be economic, but after years of oxidation the recovery will be low. SEA will haul this material to the concentrator for the initial start-up. It is not included in the financial analysis.

16.8. MINING SCHEDULE

For the purpose of this PEA, both Indicated and Inferred Resources are considered. A 14-year mining schedule has been prepared incorporating dilution and mining losses. Walter Griese and Chaiyo Yimrawd, the former mine manager and mine engineer respectively, prepared the detailed development and stope-by-stope planning for Years 1 and 2. Since most of the rock is hard, production will be limited by the capacity of the crushing and grinding sections of the concentrator to 300,000 tonnes per year. SEA anticipates rehiring experienced miners and supervisors, but much of the crew will be inexperienced at underground mining; it will take two years for mine production to ramp up to the full rate. Table 16-3 on the following page shows the mining schedule

TABLE 16-3. MINING SCHEDULE, TONNES

Zone	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	9 - 13	Yr. 14	Total
Song Toh											
MSW	6,000	66,500	100,000	110,000	115,100						397,600
Camp	37,400	5,500	75,000	75,000	75,000	75,000	75,000	39,700			457,600
Boh Yai											
Hills 1-5	106,600	141,300	75,000	65,000	59,900	168,900	225,000	260,300	1,500,000	190,800	2,792,800
Hill 7		40,400	50,000	50,000	50,000	56,100					246,500
Total	150,000	253,700	300,000	300,000	300,000	300,000	300,000	300,000	1,500,000	190,800	3,894,500

16.9. VENTILATION

Large quantities of fresh air are required to ventilate the mine workings. The air stream sweeps dust away from the miners, dilutes and removes exhaust from diesel engines, and clears away blasting fumes. Large primary fans draw air out of the mine ventilation shafts; this induces air to flow into the roadways at their surface entrances. The airflow is controlled with doors and regulators. Workplaces that are out of the main airflow are ventilated by placing a secondary fan in the flow of fresh air and blowing air through ductwork to the workplace. The ventilation ducts range from 600mm to 900mm in diameter.

16.10. WASTE ROCK

In order to access the mineralized rock, much of the underground development will be excavated in waste rock. Some waste rock will also be produced by hand sorting of screened, washed rock from a conveyor following the primary crusher in the mill. As in the past, waste rock will be used in several ways. Clean waste rock will be crushed and used for road maintenance and general construction. Some will be used for enlarging the tailings storage facility. It is not anticipated that there will be surplus rock to be permanently stockpiled.

16.11. EXPLOSIVES

All mineralized rock and development waste occurs in hard rock and explosives will be used to break the rock. The explosives are charged into holes drilled into the rock. Blasting design is based on a number of inter-related variables; type and hardness of rock, diameter of blast hole, depth of blast hole, space between holes, space between rows of holes, type of explosive, and quantity of explosive. Blast design will be undertaken by the company's mining engineers, with technical assistance provided by the explosives vendor.

The mine will use gelatin dynamite and ANFO (Ammonium Nitrate Fuel Oil) along with electric detonators. The detonators have built-in delays so that rows of holes can be detonated sequentially.

The Company will produce an inventory of the quantity of explosives to the relevant government authority on a consistent basis and must strictly comply with the terms and conditions governing the use and storage of explosives pursuant to the Ministerial Regulations No. 9 (1970) in every respect. Explosives and detonators will be stored in separate magazines that will comply with current regulations.

Transport of explosives from the supplier (vendor) to the mine project area must be carried by the Company with proper permission from the relevant government authority. The transport of each type of explosives must be made separately and will be under control and supervision of the Company's expert in explosives at all times.

Blasting will take place daily on a schedule established by the Manager.

17. RECOVERY METHODS

17.1. CURRENT MILL CONDITIONS

The Song Toh concentrator had processed 5.2 million tonnes of lead-zinc ore of various types until 2002 when mining ceased. In 2008, 60,000 tonnes of low-grade stockpile were processed. The plant is a conventional crushing, rod and ball mill grinding, flotation plant that has been configured in the past to produce a lead concentrate, a bulk lead-zinc concentrate and a zinc concentrate, either concurrently or separately according to type of ore received.

PLATE 17-1. SONG TOH CONCENTRATOR

The facilities have been maintained intact and were inspected in 2012[1]. The concentrator and processing components were found to be in generally good condition with significant service life judged to be remaining in all components. While it is uncertain whether the plant was carefully "mothballed" – e.g. all bearings, gears, switches and moving parts preserved with grease and oils, the 2012 inspection revealed a number of repairs and replacements needed in advance of plant restart. The most significant items are listed in Table 17-1 on the following page.

[1] Report – April 2012, Mr. Akaraawin Hassadee, for KEMCO.

TABLE 17-1. MAJOR CONCENTRATOR REPAIRS AND MODIFICATIONS NEEDED FOR RE-START

Area	Specifics	Comments and repairs needed (major noted)
General	Overall plant repairs	Walkways, stairs, roof requiring repairs and painting.
Crushing	Pan feeder	Feeder drive repairs.
Crushing	Jaw crusher	Hoist structure replacement.
Crushing	Screen	Significant repairs to screen deck.
Crushing	First spiral classifier	Inoperable – replace drive shaft. (major)
Crushing	Symons cone crushers	Need to be disassembled, cleaned, repair lubricating systems, acquire spare parts. (major)
Crushing	Belt conveyors	General repairs to shuts and freeing up rollers. Repair/replace deteriorated belts. (major)
Crushing	Ore bin	Repair/patch bottom of bin. (major)
Grinding	Second spiral classifier	Minor repairs – bearings.
Grinding	Rod and primary ball mill	Minor repairs.
Grinding	Secondary ball mill	Replace shell and end liners. (major)
Grinding	#4 ball mill (regrind)	Replace shell and end lines. Noise in drive indicates misalignment or gear damage. (major)
Grinding/Flotation	Pumps	HPK metal lined pumps; all need checking and repairs. Conversion to more conventional rubber lined pumps in future recommended. (major)
Flotation	Cells	Remove agitators for cleaning and repair. Repair/replace pipes, valves and launders.(major)
Concentrate	Filters	Repair #2 and #3 filters
Concentrate	Cone thickener	Repairs (major)
General	Tailings line	Condition unknown, but repairs could be anticipated.
General	Safety upgrade	Equipment drive mechanism safety covers.

Specific plant flowsheets are shown in Figure 17-1 and Figure 17-2. While major process modifications are not anticipated, these flowsheets will be optimized by SEA following plant restart to maximize recovery and maintain operations reliability. For example, one improvement could be changing slurry pumps from unconventional metal-lined units to more conventional rubber-lined pump casings. In general, the existing components in the Song Toh concentrator are expected to satisfy processing needs for the expected SEA mine life.

From an operating perspective, the small (200t) bin with an estimated “live capacity” of 150t, requires that the availability of the crushing plant be high – as much as 20 hours per day.

FIGURE 17-1. SONG TOH CONCENTRATOR FLOWSHEET – LEAD CIRCUIT

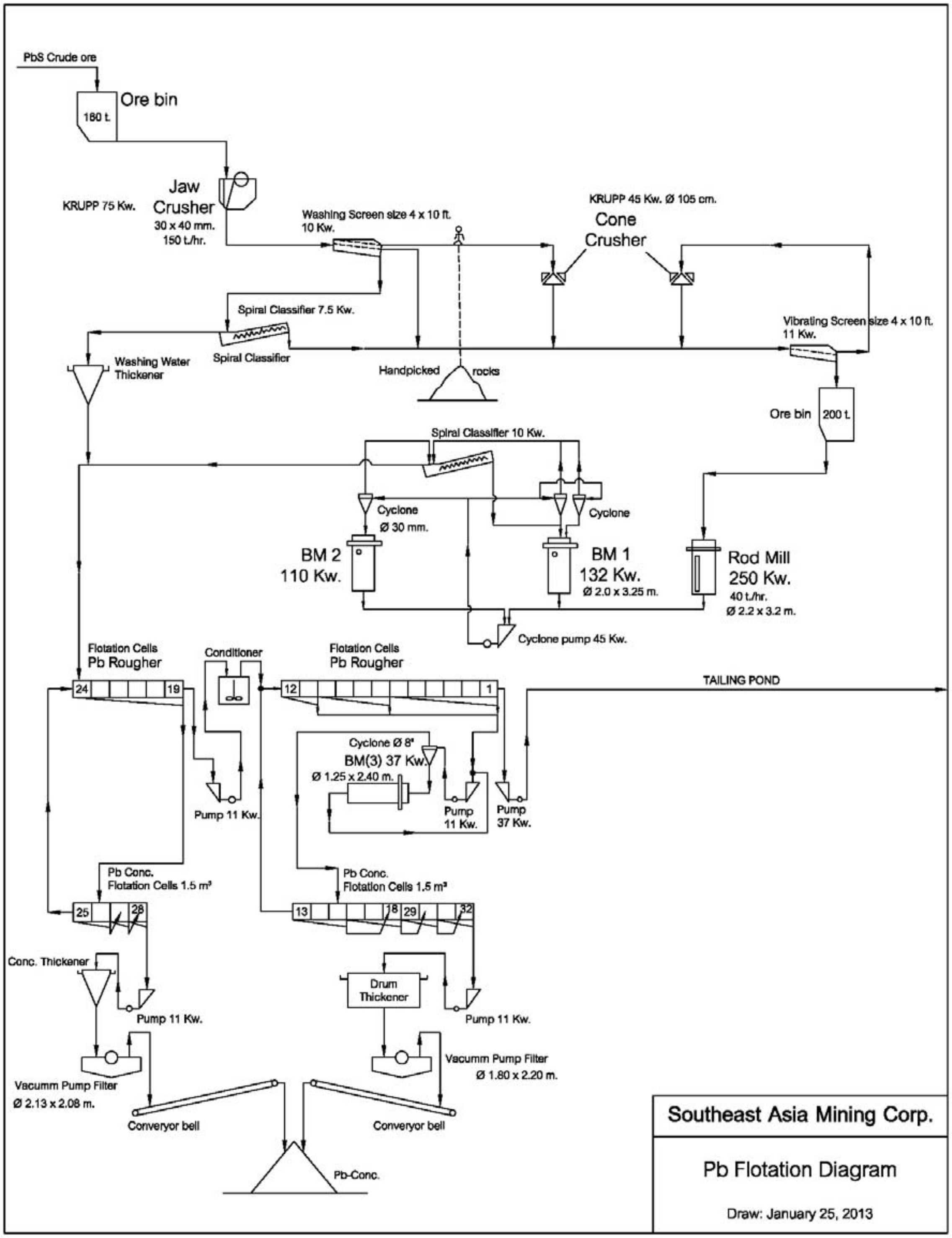
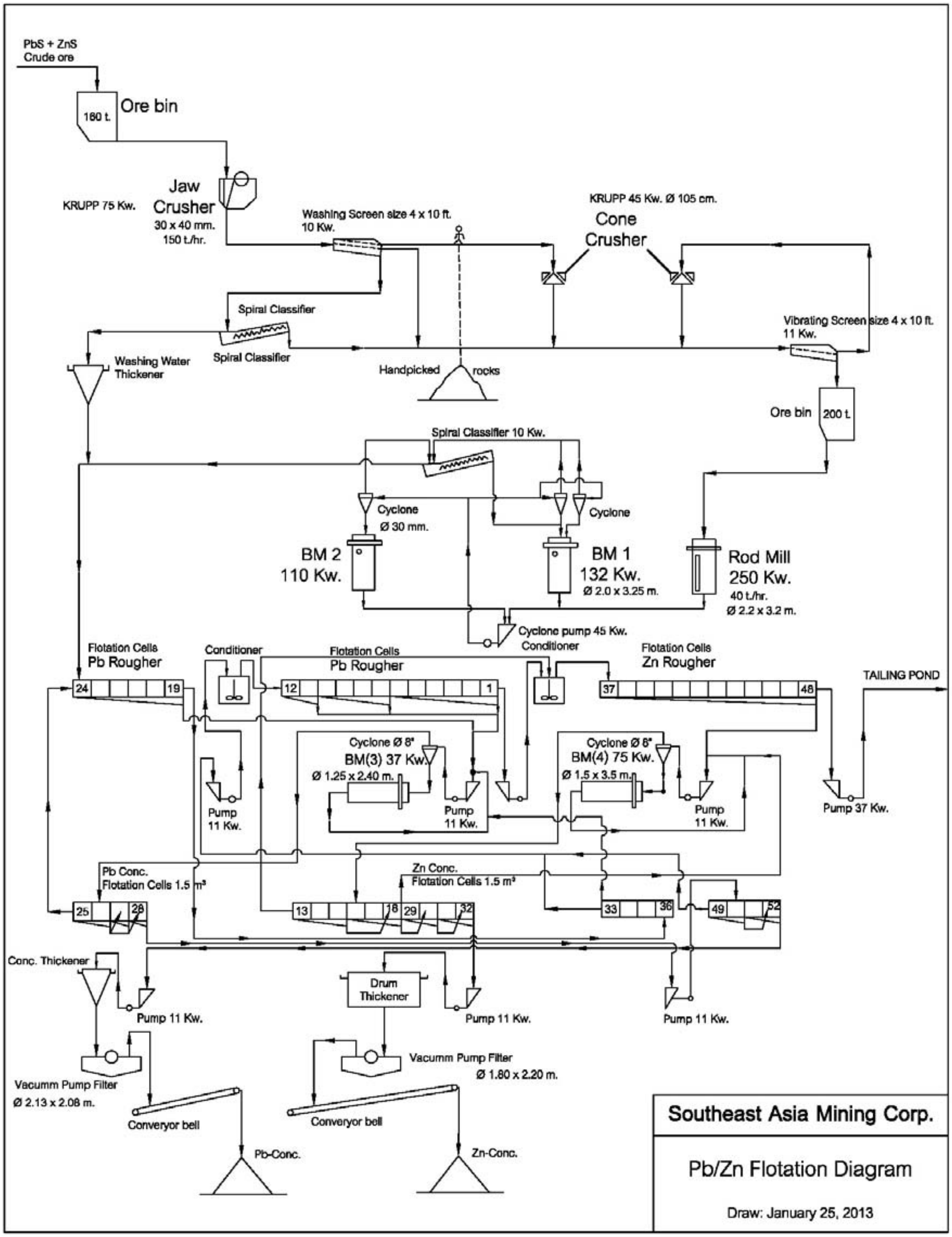


FIGURE 17-2. SONG TOH CONCENTRATOR FLOWSHEET – COMBINED LEAD AND ZINC CIRCUITS



17.2. PROCESSING

Mineralized rock produced by underground mining will be processed at the rehabilitated Song Toh concentrator facility in which lead and zinc concentrates and combined lead-zinc concentrates could be produced. Depending on the rock type, four different-quality lead concentrates will be produced, as well as one zinc concentrate. The concentrator was built in 1978 by Metallgesellschaft and expanded/modified over the years.

In the late 1940s Cominco operated a gravity concentration process (jig) at Boh Yai followed by a flotation plant in the early 1950s. However, no processing facilities remain at Boh Yai; all processing has taken place at Song Toh since 1978.

Based on historical information, the main metallurgical performance parameters anticipated in a typical year during full production (year 3 and beyond) are summarized in Table 17-2 below. For this PEA, selected metallurgical performance criteria are also shown.

TABLE 17-2. METALLURGICAL YIELD PARAMETERS

Ore Type	Total Tonnes (% of total)	Item	Pb	Zn	Ag
PbS Song Toh Pb:Zn > 5	246,500 (6.3)	Recovery	83%	40%	80%
		Pb Concentrate Grade	70.0%		
Mix Song Toh Pb:Zn < 5	457,600 (11.7)	Recovery	81%	20%	78%
		Pb Concentrate Grade	68.0%		
PbS Boh Yai	397,600 (10.2)	Recovery	90%	60%	90%
		Pb Concentrate Grade	75%		
Mix Boh Yai	2,792,800 (71.8)	Recovery	83%	6%	75%
		Pb Concentrate Grade	72.0%		
		Recovery	6%	78%	12%
		Zn Concentrate Grade		54%	
Total	3,894,500 (100)				

The lead concentrate will contain some zinc; zinc is not recovered in the lead smelting process and no revenue will be received by SEA for this zinc. Similarly, no payment will be received for the lead content of the zinc concentrate.

Of the projected annual production of 300,000t, it is planned that, in an average year, 20,000t of concentrate will be sold, 9,000t (3% of mill feed) of clean waste rock will be removed by hand sorting, and 271,000t will be placed in the tailings storage area.

17.2.2. CRUSHING

The plant is equipped with three stage crushing. Feed can be dumped from haulage trucks directly into a hopper equipped with a grizzly. Usually, however, the mine trucks will dump onto stockpiles and a front-end-loader will be used to feed a blend to the hopper. The stockpiles are used to segregate material by grade and type and to permit further blending of the mill feed. Oversize rocks are retained on the grizzly and removed for breakage with a rock breaker.

The primary crusher, fed by a pan feeder, is a 75kW jaw crusher, which reduces the rock to -100mm. A washing screen directs -16mm ore on to a conveyor belt to secondary crushing; the +16mm -100mm rock passes along a hand-sorting belt for removal of clean waste rock by trained workers. Clean waste is physically discernible from zinc and lead containing material.

The secondary crusher is a 3-foot Symons standard cone crusher with a 45kW drive. After secondary crushing, the product is screened, with +14mm material conveyed to the tertiary cone crusher (3-foot Symons short head), which is also equipped with a 45kW drive and the -14mm material is conveyed to the 200t fine ore bin.

17.2.3. GRINDING

Further size reduction is achieved by feeding the fine material with water to a 2.2m by 3.2m rod mill with a 250 kW drive. Rod mill discharge is split to 2.0m by 3.25m and 1.6m by 3.0m ball mills, operating in parallel with 132kW and 90kW drives respectively. Size classification is achieved by using a combination of spiral and cyclone classifiers. The combined spiral and cyclone overflow is sent to flotation.

17.2.4. FLOTATION

Valuable minerals, predominantly galena (lead sulphide) and sphalerite (zinc sulphide) are separated from gangue by froth flotation; various types of lead feed and lead- zinc mix feed will be fed to the plant in separate campaigns.

The well-established method and historically successful strategy at Song Toh of sequentially recovering the valuable minerals from a slurry using froth flotation will be employed. Lead mineralization will be freely floated from lead only or very low zinc feed. Lead-zinc feed will be subject to lead flotation, followed by zinc flotation.

Specific reagents are added to vigorously stirred tanks (conditioners) in advance of both lead and zinc flotation. In the total compliment of 56 flotation cells, air is introduced into the stirred slurry. The valuable mineral particles, preferentially coated with reagents have been rendered hydrophobic and adhere to the bubbles; the froth formed on the surface is skimmed off, and the tailings are pumped as slurry to the tailings storage facility. The flotation cells are divided into banks of roughers, cleaners, and scavengers. The first (rougher) concentrate is sized with a cyclone, with oversize going to one of the two regrind mills (37kW and 75kW) to completely free the valuable minerals from waste minerals. A final concentrate is produced in the cleaner cells, with the cleaner concentrate dewatered by filtration and transferred to the concentrate storage area. The rougher and cleaner rejects are pumped to the scavenger cells, with the scavenger floats going to regrind and the scavenger rejects to tailings.

The circuit and reagents are modified into configurations according to the type of feed: Boh Yai lead ore, Boh Yai mix ore, Song Toh lead ore, Song Toh mix ore.

Boh Yai lead feed produces a lead concentrate with typical metal content of 75% Pb and up to 2,000g/t Ag, depending on the silver grade in the feed. Lead smelters cannot recover zinc and do not pay for any contained zinc.

Boh Yai mix feed produces a lead concentrate (typically 72% Pb with up to 1,500g/t Ag) and a zinc concentrate, with a typical metal content of 54% zinc. Zinc smelters cannot recover any lead found in the zinc concentrate. At zinc smelters, silver recovery is poor; some payment may be received when the silver content is high.

Song Toh lead feed produces a lead concentrate with typical metal content of 70% Pb and up to 1,500g/t Ag, depending on the silver grade in the feed. Lead smelters cannot recover zinc and do not pay for any contained zinc.

There are three possible processing configurations for Song Toh mix feed.

1. Produce a lead concentrate only. This produces a lead concentrate, typically 68% Pb with less than 1,000g/t silver. No payable zinc is recovered.
2. Produce a lead concentrate, zinc concentrate, and bulk (mix) concentrate. The lead concentrate has an expected content of 72% Pb and less than 1,000g/t Ag. The zinc concentrate is typically 52% Zn. A bulk concentrate grade would be 49% Pb, 20% Zn, and less than 600g/t Ag. This may be advantageous if reasonable value can be received for the bulk concentrate. Smelters using the outdated Imperial Smelting process can recover lead, zinc, and silver from this type of concentrate. Imperial smelters have high energy costs, emissions issues, and most have been closed. There are however some remaining in China in locations with access to low cost coal.
3. Subject to successful test results, a marketable zinc concentrate may be produced from the Song Toh mix feed. This material represents about 72% of total resources and 80% of the zinc values would otherwise report to tailings.

At present, plans do not include the production of a bulk Pb-Zn concentrate, but SEA will pursue avenues for marketing this material and then evaluate the economics.

17.2.5. Concentrate Storage

After thickening and filtration, concentrate falls through a chute onto a concrete floor in the covered concentrate storage area. At this point, the concentrate is still unacceptably high in moisture, in the order of 13%. It air dries further until ready for transportation, with an 8% moisture content. Lead and zinc concentrates are stored in separate areas.

Air-drying may not be a desirable option, especially in the rainy season. High moisture content must be avoided in transport. Time to dry can be excessive, resulting in costly product inventory due to the delay in shipping and receiving payment. The most reasonable alternative would the installation of pressure filters at the cost of ~US$250,000 each. Since Pb concentrate is the primary product, the acquisition of a pressure filter for lead concentrate could be a priority in the early years of operation.

17.2.6. Concentrate Shipping

During the 1978 to 2002 production years, the concentrates were shipped from Song Toh in dump trucks covered with tarpaulins. SEA plans to ship concentrates in 1-tonne bulk bags loaded into shipping containers for export to lead and zinc smelters. Each bag will be sampled at the concentrator using pipe samplers to produce a composite sample, which will be analyzed for metal and free moisture content. Zinc concentrates could possibly be sold to Thailand's zinc smelter, but at this early stage no discussions have been held with the owner, Padaeng Industry. For the purpose of the PEA, concentrates will be shipped by ocean to lead and zinc smelters in Japan, Korea, China, or elsewhere in the world. The bulk bags will be transported in 12t loads to a depot located on Highway 323, then in 30t loads to the port. Smelters on tidewater in Japan and Korea have an ocean shipping distance of approximately 5,000km; south China ports are considerably closer.

17.2.7. Concentrator Grinding Media and Chemical Use

Steel rods and balls are used in grinding the rock. Based on historical use, steel consumption will be moderately low at:

Rods: 0.071 kg/t
Balls: 0. 215 kg/t

The reagents used in the flotation circuit are those commonly used in Pb-Zn flotation. They are widely available and exhibit low toxicity in the environment. In the past other more active chemicals (such as sodium sulphide) have been used to assist in the processing of oxide ores, but these are not expected to be encountered in the new SEA mining activities. Specific reagents, their purpose, addition rates and costs are given in Table 17-3 on the following page.

TABLE 17-3. REAGENT AND STEEL CONSUMPTION

Reagent		Purpose	Form	Price US$/kg	Song Toh Lead		Song Toh Mine S/SW		Boh Yai Hill 7 lead		Boh Yai Mix	
% of feed over mine life					6.3		11.771.8		10.2		71.8	
					g/t	US$/t	g/t	US$/t	g/t	US$/t	g/t	US$/t
KAX (PAX)	Xanthate	Pellets	Pellets	4.06	94	0.38	-		-		-	
NiPX (SIPX)	Xanthate	Pellets	Pellets	4.06		0.00	98	0.39	84	0.34	109	0.44
ZnSO47H20	Zinc sulphate	Crystals	Crystals	1.58	554	0.88	947	1.50	295	0.47	765	1.21
CuSO45H20	Copper sulphate	Crystals	Crystals	4.06			-		-		147	0.60
Pine oil		Liquid	Liquid	8.35	121	1.01	32	0.27	14	0.12	78	0.65
Lime (Ca(OH)2		pH, pyrite depressant	Powder	0.13	588	0.76	227	0.03	112	0.01	-	
Steel Grinding media												
Rods	80 mm g/ton feed			1.00	71	0.07	71	0.07	71	0.07	71	0.07
Balls	40 mm g/ton feed			1.71	150	0.26	150	0.26	150	0.26	150	0.26
Balls	30 mm g/ton feed			1.71	65	0.11	65	0.11	65	0.11	65	0.11
		Total Cost US$/t			2.78		2.62		1.37		3.33	
		Weighted Average Cost US$/t			2.59							

17.2.8. Mill Instrumentation

The primary belt weightometer is assumed to be in place, in reasonable condition, with calibration tools available. In general the concentrator will require minimal instrumentation such as density gauges (4), pH metre (1 plus 1 spare) and various sampling devices. In the past process sampling was performed by manually collecting samples. It is recommended that SEA purchase and install automatic samplers on heads (flotation feed) and on tailings after start up. Also after start-up, it is recommended that plant built reagent flow meters be upgraded to electronically controlled pumps. The total estimated cost for this is US$ 120,000.

17.3. Laboratory

The Song Toh laboratory building remains intact and serviceable with operational fume hoods and dust collectors. However the chemical analyses and laboratory sample preparation equipment have been removed. All of these devices are essential for geology assays and concentrator performance monitoring. The basic sample preparation equipment includes laboratory scale crushers and grinders, drying oven and sample splitters. The basic chemical analyses equipment includes electronic balances, precious metal crucibles and glassware, hot plates and burners, water purifier and an AA (atomic absorption) analyser. The laboratory will also require two computers and two printers.

17.4. Water Management and Treatment

The concentrator requires a constant supply of water to operate and needs a nearby reservoir for this purpose, for fire emergencies and possibly for standby diesel generator cooling water. In addition, surge capacity may be needed for unexpectedly extended dry seasons. The sources of this water are the Song Toh mine dewatering, tailings recycling and local fresh water sources (wells). SEA has prepared an approximate water balance for the Song Toh Concentrator as shown in Table 17-4 on the following page.

Water recycled from tailings will require treatment to be suitable for reintroduction into the flotation circuit. This treatment would involve the removal of suspended solids and trace amounts of soluble heavy metals using a pH-adjusted lime treatment followed by activated carbon absorption of organic collectors and oils. Subject to confirmatory testing, the estimated cost for this water treatment is approximately US$0.55/m3, or US$1.00 per tonne of concentrator-mineralized rock feed (Table 17-4). A conservative capital cost estimate for the complete water handling and treatment facility is US$2.903M. This includes up to 5 days surge capacity on surface for treatment plant feed and discharge. Lime will be added as hydrated lime slurry and pH will be adjusted to neutral with carbon dioxide.

SEA plans to directly recycle treated tailings reclaim water to the concentrator and to investigate water quality that reports to the local environment to ensure that water quality meets IFC (International Finance Corporation) guidelines.

TABLE 17-4. SONG TOH WATER BALANCE

Item	Annual	Solids t/h	Water m3/h	Notes
Feed (dry 300,000 t/a)	300,000t	37.20	1.15	3% moisture
Hand sorted Waste 3%	9,000t dry	1.12	0.03	
Mill Feed		36.09	1.12	
Concentrate	20,000t dry	2.48	0.37	
Tailings		33.61	78.41	30% solids
Mill Water Requirements			77.67	
Tailings Area 10 hectares				Assumed area
Annual precipitation - m	1.76		20.09	
Annual evaporation - m	1.44		16.44	
Net precipitation -m	0.32		3.65	
Retained water in tailings			14.40	70% solids
Water available from tailings area			67.66	
m3/t of feed			1.88	
Fresh Water Requirements			10.00	

17.5. TAILINGS MANAGEMENT

Tailings management will be relatively straightforward. The existing tailings facility, which is a valley containment design, contains about 5 Mt of tailings. Tailings had been covered with laterite soils and naturally revegetated. Important aspects of this old facility will be upgraded and it will be expanded to contain an additional 3.51 Mt of tailings. Details are provided in Appendix VIII, "Conceptual Design for Expansion of Tailings Disposal Facility", Golder Associates, April 2013.

The footprint of the existing tailings will be moderately increased up gradient in the valley. Existing downstream dams constructed with 1:1 slopes will have the downstream embankment slope rebuilt to a 2H:1V slope with additional stabilization of the slope base with a berm. A new decant structure will be constructed and the existing spillway will be upgraded. Also rip-rap filled surface water diversion ditches will be constructed.

Tailings will be spigotted at mill discharge density (about 30% solids) from both internal dykes and from upstream beaches to result in a 1% tailings slope. The Song Toh tailings are not acid generating and metal leaching is expected to be minimal (to be confirmed in future tests).

The design and operation of the upgraded tailings facility will facilitate permitting and new tailings facility will be designed for closure. Capital costs for facility upgrading and preparation for operation are estimated to be US$1,527,000 million and costs for closure are estimated to be US$732,000 including a 20% provision for design and supervision.

17.6. GENERAL AND ADMINISTRATION

The administration building is located at Song Toh, close to the warehouse and the maintenance garage. The Geology, Mine Engineering, and Surveying departments also occupy space in the building. Minor refurbishing is required.

PLATE 17-2. ADMINISTRATION BUILDING

Operation and maintenance of the housing (camp) at Song Toh and Boh Yai is part of the Administration function. The camps will include single-family houses, multi-family buildings, a guesthouse, and recreation facilities.

The Administration Department keeps available a pool of vehicles and drivers.

The department maintains roads and power lines and administers the security group. Having been built by KEMCO, the haul road from Boh Yai to Song Toh is private and gated.

The General and Administration workforce is summarized in Table 17-5 on the following page..

TABLE 17-5. GENERAL AND ADMINISTRATION PERSONNEL

Description	Monthly	Daily	Total
Administration	7		7
Camp, Song Toh	7	3	10
Camp, Boh Yai	4		4
Hospital Song Toh & Clinic Boh Yai	5		5
Car Pool	3		3
Road / Power Line Maintenance	1	8	9
Total	27	11	38

18. PROJECT INFRASTRUCTURE

18.1. POWER

The Boh Yai site is connected to the national power grid and a line runs from Boh Yai to Song Toh. The Electricity Generating Authority of Thailand operates a 300MW hydroelectric generating station at the nearby Vajiralongkorn Dam on the River Kwai. Diesel generators will provide a minimum amount of standby power for surface and underground lights, fire pumps and thickener rakes as well as communication equipment.

The Song Toh housing area and school (camp) are also connected to the villages to the northwest and a power line running along Highway 323 from Thong Phaphum.

18.2. COMMUNICATIONS

The site uses a communications tower located on a hill near Song Toh. Telephone and high speed Internet are provided using IP Star satellite communications.

18.3. TAILINGS PIPELINE

Plant tailings will be pumped as slurry to the tailings management area using a pipeline similar to the previous one. The maximum pumping distance will be about 600 to 800m. Water recovered from the decant tower will be pumped back to the water treatment plant to be located adjacent to the processing plant.

18.4. RESERVOIRS

Domestic water is pumped from naturally fed reservoirs separately feeding both mine sites. Song Toh is fed from the Thane Reservoir, which is approximately 4 kilometers southeast of the site. Boh Yai gets its water from the Khao Deang Reservoir, which is located approximately 2 kilometers northeast of the site.

19. MARKET STUDIES AND CONTRACTS

SEA have not conducted studies on the market for production, commodity price projections, product valuations, market entry strategies, or product specification requirements.

No contracts material to the issuer have been identified that are required for property development, including: mining, concentrating, smelting, refining, transportation, handling, sales and hedging, and forward sales contracts or arrangements.

20. ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

An Environmental Due Diligence Review (Bowman 2007) determined that the Environmental liabilities associated with the Kemco Pb-Zn properties were judged to be “low” largely due to the mine’s historical design and operation by MG.

There are over 70 pieces of legislation that deal with environmental matters, and Thailand is party to several international agreements on the environment. Amendments have been made to domestic laws to comply with these international obligations. According to the Thailand Ministry of Science, Technology and Environment’s (“MSTE”) announcement concerning the Enhancement and Conservation of the National Environmental Quality Act B.E. 2535, all mining activities are required to be assessed by a HEIA. The HEIA report must be submitted to ONEP for review and approval prior to further proceedings of the mining project. The HEIA for mining projects under Thai law must also include a SIA (“Social Impact Assessment”).

DPIM has effluent and off-property monitoring data available from which to judge environmental, as well as potential human health impacts associated with the mines’ historical operations which will be considered in the impact assessments.

20.1. ENVIRONMENTAL CONSIDERATIONS

20.1.1. ENVIRONMENTAL ASPECTS

ACA Howe has allocated one year to obtain the necessary environmental and mining permits.

The concentrator and tailings water balance indicates zero discharge during operations; all water will be recycled to the process.

Some water will remain in the pore space between particles in the tailings management area, some will leave the site in the concentrate, and some will evaporate. On the other hand, rain will fall onto the tailings management area and increase the quantity of recycle water. The net deficit of process water is estimated to be 10m3 to 20m3 per hour.

Make-up water for the process plant will be pumped from a sump located beside the dewatering drift in Song Toh Mine North. Water flowing into the mines will greatly exceed the facility needs. The drift drains from Mine South to Mine North and continues another 1,700m to the Huai Chanee discharge portal. In the past, the discharged water met all quality objectives except for the quantity of suspended solids. Metallgesellschaft built a settling pond to allow settling of suspended solids before final discharge. Similarly, mine water at Boh Yai is collected in a dewatering- haulage drift and discharges at the base of Hill 7.

The Golder tailings report (Couto and Merry, 2013), recommends additional fill placement in order to decrease slope angles for the present containment dam. This means that SEA’s work will increase the long-term safety of the existing structure.

SEA will remove historical low-grade stockpiles from the Boh Yai area and process the rock during the re-commissioning of the plant. This will eliminate run-off from the stockpiles.

Cominco created jig tailings in the Boh Yai area in 1948 and 1949. KEMCO recovered and processed 20,000t of this material in 2008, yielding a profit from the residual lead, zinc, and silver. If desired by the authorities, SEA could remove and process the remaining 60,000t.

20.2. CLOSURE

20.2.1. TAILINGS MANAGEMENT AREA

The following is taken from Couto and Merry, April 2013: A detailed closure plan has not been completed for the project; however IEM has developed a preliminary rehabilitation plan. At this conceptual level, it has been assumed that the final tailings surface would be graded and a 0.5m thick layer of overburden would be placed over the tailings to minimize the ingress of water, reduce tailings erosion, and support vegetative growth. A dry cover would also prevent ponding of water on the surface to reduce long-term risks and improve dam stability.

Because buffering by the high carbonate content of the material, acid generation of the tailings is not a concern; in the unlikely event that acid generation does emerge as a concern, an oxygen or water barrier cover consisting of several layers may need to be considered. A common design is to provide a fine-grained layer between two layers of coarse material. The bottom coarse fill is to prevent the capillary rise of water from the tailings. The fine-grained middle layer serves as a low permeability barrier for water and air and is designed to remain at a high degree of saturation (typically greater than 85% moisture content). The surficial layer helps to maintain the low permeability zone saturated and acts as a protective layer.

The extent of post-closure effluent treatment will be established as the project advances.

20.2.2. SITE CLOSURE

All mine entrances will be capped with reinforced concrete and made safe. All buildings and structures will be removed, except any requested by the community. Inventory of chemicals and other supplies will be removed for sale or proper disposal. The sites will be graded and planted with indigenous species to ensure a sustainable ground cover.

21. CAPITAL AND OPERATING COSTS

21.1. Operating Cost

The more significant assumptions used in estimating the operating costs set out in Table 21-1 on the following page are as follows:

General Assumptions:

- The cost estimates were prepared in Thai Baht and converted to US$ using an exchange rate of 31.0 Baht to the US dollar (based on the 3 year average exchange at February 28, 2013).
- Overhead costs of operating the Bangkok and Toronto offices are not included.
- All operating costs were estimated by Walter Griese and Chaiyo Yimrawd, the former mine manager and mine engineer. The estimates were based on 22 years of operating history at the former mines and actual costs and budgets from 2002, which was the last year of operations.
- Detailed operating budgets and production schedules were prepared for Year 1 and Year 2 by Walter Griese and Chaiyo Yimrawd and extrapolated over the total mine life.
- Cost estimates used in the operating budgets were prepared using quotes obtained for supplies in 2012 and kept constant for 2013.
- For items not quoted, as they were not considered significant, the historical operating costs from 2002 were used and inflated by 80%.
- The electrical power cost is the current rate of 4.5 Baht per kilowatt-hour (US$0.145/kWh).
- The monthly salaries (staff) and daily wages (workers) were estimated by increasing the 2002 pay scale inflated by 80% and increased a further 19% for the minimum wage increase in Thailand in 2013.
- Mine costs includes all mining operating costs and the haulage of ore to the Song Toh concentrator from the Boh Yai mine.
- Mining auxiliary includes maintenance, geology, surveying, laboratory, and the warehouse.
- Processing costs include the operation of the flotation plant and tailings management.
- The proposed water treatment plant is conceptual and will be based on further tailings water studies. An allowance of US$1.00 per tonne was used to prepare the cash flow analysis discussed in section 15 and is included in processing costs in Table 21-1.

The per-tonne costs in Table 21-1 are averaged over the full mine life, including the 2-year period of production ramp-up; Mining costs include the haulage from Boh Yai to the plant at Song Toh.

The estimated cost per tonne when the project is in full production, starting in Year 3, are US$18.81 for mining (all zones), US$9.90 for processing, and US$1.87 for General & Administration. In addition, the cost to haul ore from Boh Yai is US$3.71/t for Hills 1 to 5 and $4.10/t for Hill 7.

TABLE 21-1. OPERATING COST ESTIMATE

US$ 000's	Person-nel	Haulage From Boh Yai	Fuel	Re-agents	Explo-sives	Drill Steel	Drill Equip.	Grind-ing	Energy	Mobile Equip.	General Supplies	Water Treatment	Total
Mining													
Mine Operations	15,069	11,553	552		6,765	1,775	2,862		18,517	16,471	2,771		76,335
Auxiliary	6,323								202	482	1,914		8,920
Total Mining	21,392	11,553	552	0	6,765	1,775	2,862	0	18,719	16,953	4,685	0	85,255
Mining Cost $/t	5.49	2.97	0.14	0.00	1.74	0.46	0.73	0.00	4.81	4.35	1.20	0.00	21.89
Processing													
Plant	2,794		226	12,363				1,803	11,052	3,230	2,451	3,895	37,814
Maintenance	654		71										726
Total Processing	3,448	0	298	12,363	0	0	0	1,803	11,052	3,230	2,451	3,895	38,540
Processing Cost $/t	0.89	0.00	0.08	3.17	0.00	0.00	0.00	0.46	2.84	0.83	0.63	1.00	9.90
General and Administration													
Administration	848		20						18		85		971
Camp Song Toh	875		16						1,184		64		2,139
Camp Boh Yai	532		16						1,445		64		2,057
Clinics	423										204		628
Car Pool	243		381								213		838
Road/Power Maintenance.	447									384	28		860
Total G&A	3,369	0	433	0	0	0	0	0	2,647	384	658	0	7,492
G&A Cost $/t	0.86	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.68	0.10	0.17	0.00	1.92
Total	**28,209**	**11,553**	**1,283**	**12,363**	**6,765**	**1,775**	**2,862**	**1,803**	**32,418**	**20,567**	**7,794**	**3,895**	**131,287**
Total Cost $/t	**7.24**	**2.97**	**0.33**	**3.17**	**1.74**	**0.46**	**0.73**	**0.46**	**8.32**	**5.28**	**2.00**	**1.00**	**33.71**

Table 21-2 summarizes the workforce during full production. Any contractor's employees, such as those hauling rock from Boh Yai to the processing plant, are additional.

TABLE 21-2. PERSONNEL ESTIMATE

Description	Monthly	Daily	Total
Mine Operations	35	226	261
Mine Auxiliary	38	29	67
Processing	7	33	40
Process Maintenance	2	5	7
General & Admin.	27	11	38
Total	109	304	413

21.2. CAPITAL COST

21.2.1. INTRODUCTION

Capital cost estimates have been prepared in Thai Baht and converted to US$ using an exchange rate of 31.0 Baht to the US dollars (based on the 3 year average exchange at February 28, 2013). The detailed schedule of capital cost expenses by year is presented in 28.Appendix IXCapital Cost Schedule The life-of-mine total capital cost before working capital, parts inventory, and initial fills is approximately US$37.2 million, of which US$12.6 million relates to pre-production capital expenditures and US$24.6 million relates to post-production capital expenditures. Pre-production capital and post-production capital is summarized below:

TABLE 21-3. CAPITAL SUMMARY (SURFACE & UNDERGROUND)

US $ 000's	Total Pre-Production	Total Post-Production	Total
Permitting Studies	600	-	600
Infrastructure			
Camp	791	140	931
Road upgrades	32	32	64
Office refurbishment	48	-	48
Lab	148	-	148
Truck scale refurbishment	16	-	16
Workshop refurbishment	48	-	48
Boh Yai Workshop	129	-	129
Communications upgrades	32	-	32
	1,244	172	1,416
Tailings Containment and Water Treatment			
Settling pond	1,168	360	1,528

US $ 000's	Total Pre-Production	Total Post-Production	Total
Tailings storage	2,803	-	2,803
Water treatment, allowance	4,004	360	4,364
	1,168	360	1,528
Underground Mining and Surface Support Equipment			
Service trucks	97	-	97
Light vehicles	318	334	652
Explosives magazines	32	-	32
Compressors	39	-	39
Mining equipment	4,885	10,967	15,852
Front-end-loader	210	-	210
	5,581	11,301	16,882
Processing Plant Refurbishment	105	65	170
Underground Development			
Development ST MSW	-	484	484
Development ST Camp Zone	291	1,600	1,891
Development BY	80	4,073	4,153
Dewatering ST MSW	711	-	711
	1,082	6,157	7,238
Sustaining	**-**	4,984	4,984
Closure			
Tailings	-	732	732
Other	-	1,000	1,000
Salvage	-	(194)	(194)
	-	1,538	1,538
Total	**12,616**	**24,577**	**37,192**

21.2.2. INFRASTRUCTURE

Infrastructure includes the estimated costs to refurbish and construct new where required; the site camp, machine shops, laboratory, office, communications, roads etc. Approximately US$1.245 million in capital expenditures will be required pre-production and US$172,000 post-production.

21.2.3. TAILINGS CONTAINMENT AND WATER TREATMENT

Golder Associates ("Golder") were engaged to complete a conceptual design for the expansion of the tailing facility. Golder estimated the cost of expansion to be approximately US$1.273 million plus a design and supervision allowance of US$254,000, or a total of US$1.527 million. The cost estimate is contained in the Golder report, Appendix VIII, and summarized in Table 21-4 on the following page.

As outlined in the Golder report, the present tailings management area will be expanded in several stages during the first 12 years of production. Approximately US$1.167 million in capital expenditures is required pre-production and US$360,000 required post-production.

Water decanted from the tailings management area will be reclaimed and treated so that it is suitable for re-use in the processing plant. An allowance of approximately US$2.803 million has been made for the cost of the water treatment plant. The cost of the water treatment plant was estimated by EHA Engineering Ltd. and is based on conservative assumptions – lime treatment, with subsequent pH adjustment, carbon absorption of organics and surge capacities for raw and treated waters.

TABLE 21-4. TAILINGS MANAGEMENT COST ESTIMATE

US$ 000's	Year										Total
	1		2	3	4	5	6	7	8	9	
	Pre Prod	Post Prod									
Area A	837	-	-	-	-	-	-	-	-	27	864
Area B	-	-	-	-	-	-	36	43	14	-	93
Area C	136	41	35	36	33	34	-	-	-	-	330
Sub-Total	978	36	35	36	33	34	36	43	14	27	1,273
Design and Supervision	196	7	7	7	7	7	7	9	3	5	255
	1,168	49	42	43	40	41	43	52	17	32	1,527

21.2.4. UNDERGROUND MINING AND SURFACE SUPPORT EQUIPMENT

During the pre-production period, some of the existing mining equipment will be refurbished and new equipment will be purchased. Additional new equipment will be purchased after production starts and replacement equipment is budgeted to be purchased during the life of the mine. Pre-production capital is budgeted to be US$5.581 million and post-production capital is estimated to be US$11.301 million. Of the US$11.301 million of post-production capital, approximately US$2.809 million relates to start-up equipment expenditures in Year 1, and US$1,074,000 relates to start-up equipment expenditures in Year 2 and are outlined below in Table 21-5.

TABLE 21-5. NEW UNDERGROUND MINING EQUIPMENT AT START-UP

	Units				US$ 000's			
	Pre Prod	Year 1	Year2	Unit Cost	Pre Prod	Year 1	Year 2	Total
Compressors	3	2	-	39	117	78	-	195
Jackleg Drills	15	14	5	9	131	122	44	296
Drill Jumbo	1	-	-	710	710	-	-	710
LHD, 3t	3	2	1	445	1,335	890	445	2,671

LHD, 5t	1	1	-	468	468	468	-	935
LHD, 7t	1	1	-	645	645	645	-	1,290
Underground Truck, 12t	2	-	-	387	774	-	-	774
Dump trucks, 16t	2	2	-	161	323	323	-	645
Front-end-loader	1	-	-	210	210	-	-	210
Service trucks	1	-	-	97	97	-	-	97
Light vehicles	10	-	-	31.8	318	-	-	318
Miscellaneous	-	-	-	-	454	283	585	1,322
				-	5,581	2,809	1,074	9,464

21.2.5. Processing Plant Refurbishment

The cost to refurbish the processing plant has been estimated at US$170,000. Major needs will be addressed during the pre-production period; the remaining amount will be spent in Year 1, but after production starts. The cost of refurbishment has been estimated by Walter Griese and is based on the major concentrator repairs set out in Table 17-1.

21.2.6. Underground Development

Walter Griese prepared detailed cost estimates for mine development for Years 1 and 2. An allowance of US$484,000 per year was used for the remaining mine life using Year 1 and 2 cost estimates as well as the two historical operating budgets available for review for 1999 and 2002.

21.2.7. Sustaining Capital

Sustaining capital includes replacement of various equipment during the life of the mine and various other capital projects. An allowance of US$484,000 per year has been estimated.

21.2.8. Closure

Golder and Associates were engaged to complete a conceptual design for the expansion of the tailing facility. Based on the conceptual tailings plan and review of a rehabilitation plan prepared by IEM, Golder has estimated the total cost of closure to be approximately US$610,000 plus a design and supervision allowance of US$122,000, or US$732,000 in total.

Considering the present resource estimate, closure costs will be divided between Year 14 and Year 15. The cost to remove buildings, block entrances to the mines, and restore the sites to a natural state is estimated to be US$1 million. It is estimated that there will be salvage value of 6 million Baht, mainly from selling the crushers and grinding mills.

22. ECONOMIC ANALYSIS

22.1. INTRODUCTION

The economic analysis contained in this report is based, in part, on Inferred Resources, and is preliminary in nature. Inferred Resources are considered too geologically speculative to have mining and economic considerations applied to them and to be categorized as Mineral Reserves and there is no certainty that economic forecasts upon which this Preliminary Economic Assessment is based will be realized.

ACA Howe has constructed an Excel spreadsheet model to determine the economic feasibility of re-opening the Song Toh and Boh Yai Mines belonging to Southeast Asia Mining Corp. The basic underlying assumptions and sources of data used in the model are:

- Only 100% of the project revenues and expenditures are considered and does not take into account the cost for SEA to earn an 80% interest in the mining lease applications comprising the mines, an 80% interest in the flotation plant, buildings and equipment, or its partner's 20% interest pursuant to the JVA.
- Costs are as of March 1, 2013.
- All units are metric units unless otherwise indicated.
- The basic monetary unit is the US Dollar. The Thai Baht is also used with an exchange rate of 31.0 Baht to the US dollar (based on the 3 year average exchange at February 28, 2013).
- Metal prices are based on the 3-year trailing average London Metal Spot price for lead and zinc and the 3-year trailing average for the London fixing for silver. These metal prices used are:
    - Lead, US$1.00 per lb. or US$2,204.62 per metric tonne
    - Zinc, US$0.95 per lb. or US$2,094.39 per metric tonne
    - Silver, US$30 per oz.

The mine schedule, production rates, and metal recoveries were prepared by ACA Howe and SEA personnel. Table 22-1 on the following page shows the tonnages, grades and recoveries from each deposit.All operating and capital cost estimates were prepared by ACA Howe and SEA personnel. The Summary Table 22-3 on page 150 summarizes the operating and capital costs.

TABLE 22-1. CONCENTRATE RECOVERY

	Ore Mined (tonnes)	Metal Grades			Recoveries to Lead Concentrate		
		Lead (%)	Zinc (%)	Silver (g/t)	Lead (%)	Zinc (%)	Silver (%)
Boh Yai Pb	246,500	5.46%	0.01%	156	90.0%	60.0%	90%
Boh Yai Mixed	2,792,800	2.08%	3.18%	44	83.0%	6.0%	75.0%
Song Toh Pb	397,600	3.18%	0.17%	76	83.0%	40.0%	80.0%
Song Toh Mixed	457,600	6.08%	1.71%	51	81.0%	20.0%	78.0%
Total	3,894,500	2.88%	2.50%	55	83.2%	14.5%	76.8%
					Zinc	**Lead**	**Silver**
Boh Yai Mixed	Recoveries to Zinc Concentrate				78.0%	6.0%	12.0%

22.2. ROYALTIES

The government of Thailand imposes royalties on metal concentrates via the Mineral Royalty Rates Act. Royalties are based on the metal content of the concentrate and not the payable amounts (if any). The act uses a sliding scale of royalties based on the metal prices at the time. While the prices are published in Thai Baht, they are based on the London Metal Exchange prices for base metals (i.e. lead and zinc) and the London Fixing for silver. The following table illustrates the royalty rates in Thai Baht. For the metal concentrates, the act allows a deduction for freight charges from Thailand to London England. Metal prices are in Baht per tonne of metal. The royalty on silver is a flat 10%.

TABLE 22-2. THAI ROYALTY RATES

	Metal Prices (Baht)		Royalty Rate (%)
	From	To	
Lead	-	8,000	2%
	8,000	12,000	5%
	12,000	20,000	10%
	>20,000	∞	15%
Zinc	-	10,000	2%
	10,000	20,000	5%
	20,000	30,000	10%
	>30,000	∞	15%
Silver	10%		

22.3. Corporate taxes.

The Government of Thailand imposes taxes on all for profit corporations in Thailand. While the tax rate had been 30%, the government lowered the rate to 20% for 2013 and 2014. ACA Howe has been advised by SEA's accounting consultant, John Casella, of PKF Tax and Consulting Services (Thailand) Ltd. that he believes that the Government of Thailand will follow past precedent and maintain the corporate tax rate at 20%. ACA Howe has used 20% in its Base Case and constructed an alternative calculation using 30%.

- Taxable depreciation has been calculated using the "Straight Line" method with a rate of 20%.
- The model assumes no tax pools.
- Accounting depreciation has been calculated using the "Units of Production" method.
- Any tax losses are carried forward up to five years.

22.4. Smelter Terms

Smelter treatment charges are based on a Teck Resources Ltd. 'Modeling Workshop' dated March 13, 2012. Metal prices are the 3-year average LME base metal prices.

For zinc concentrates the terms are:

- Pay for 85% of the contained zinc with a minimum deduction of 8 units.
- Pay for 70% of the contained silver after deducting 100 g.
- The basic smelter charge is US$225 per dry metric tonne ("dmt") of concentrate.
- A treatment charge escalator of US$0.06 for every US$1.00 the price of zinc is above the base price ($2500).
- A treatment charge de-escalator of US$0.04 for every US$1.00 that the price of zinc is below the base price.
- Silver refining charge - US$1.00 per oz of payable silver.
- No penalties have been included at this time.
- A premium charge of US$85.00 per tonne of metal to cover the costs of marketing, storage and shipping to the final buyer.
- Truck transport to port - US$24 per tonne of concentrate
- Shipping cost - US$30 per tonne of concentrate.
- A moisture content of 8% is assumed.

For lead concentrates the treatment terms are:

- Pay for 95% of the contained lead with a minimum deduction of 3 units
- Pay for 95% of the contained silver with a minimum deduction of 50 g.
- The basic smelter charge is US$220 per dmt of lead concentrate
- A treatment charge escalator of US$0.07 for every US$1.00 the price of lead is above the base price (US$2,500)

- A treatment charge de-escalator of US$0.04 for every US$1.00 that the price of lead is below the base price.
- Silver refining charge - US$1.00 per oz of payable silver.
- No penalties have been included at this time.
- A premium charge of US$175.00 per tonne of metal to cover the costs of marketing, storage and shipping to the final buyer.
- Truck transport to port - US$24 per tonne of concentrate
- Shipping cost - US$30 per tonne of concentrate.
- A moisture content of 8% is assumed.

22.5. Cash Flow Details

Working capital has been calculated as follows:

- Concentrate inventory – six weeks of revenue.
- Accounts receivable – six weeks of revenue.
- Accounts payable – four weeks of material costs.
- Spare parts and supplies – US$130,000 plus six weeks of material costs
- VAT – 10% of capital and material costs for six weeks.
- Reclamation. ACA Howe has included US$1.73 million in reclamation costs spread over the life of the mine. ACA Howe has also assumed that the company will realize US$194,000 in revenue from the sale of mine and mill equipment at the end of the mine life.

All working capital is recovered at the end of the mine life.

All net cash flows have been discounted to the present at 5% through 15%. Midyear discounting is used.

The Preliminary Economic Assessment demonstrates robust economics. The Base Case Net Present Value, discounted at 7.5%, is US$88.7 million with an IRR of 147% pre-tax and US$69.5 million with an IRR of 111% after tax. From the start of construction, the payback period is 1.5 years (1.3 years without tax). The sensitivity analysis indicates that the project can pay back the capital invested with a significant drop in metal prices, achieving a zero rate of return with the metal prices lowered 39%.

At this stage of analysis, the project is modeled to contribute US$30 million in corporate taxes and US$59 million in royalties to the Government of Thailand.

TABLE 22-3. SUMMARY TABLE, US$

Mine Life	13 Years			
Metal Prices	**Imperial**		**Metric**	
Lead	$1.00 /lb		$2,205 /t	
Zinc	$0.95 /lb		$2,094 /t	
Silver	$30.00 /oz		$0.965 /g	
Exchange Rate	31		Baht per US dollar	
Ore Mined	3,894,500		tonnes	
Concentrate Produced	**Tonnes**	**$/t**		**Total Value**
Lead Concentrate	131,315	$2,231		$293,000,000
Zinc Concentrate	128,318	$664		$85,200,000
Total Revenue	259,633	$1,456.67		$378,200,000
Less: Government Royalties		$227.24		$59,000,000
Net Revenue		$1,229.43		$319,200,000
Metal Revenues	**Total NSR Value**	**Less Royalties**	**Net Smelter Return**	**Percent of Total**
Lead	$152,600,000	$25,800,000	$126,800,000	39.7%
Silver	$131,300,000	$13,600,000	$117,700,000	36.9%
Zinc	$94,300,000	$19,600,000	$74,700,000	23.4%
Total	$378,200,000	$59,000,000	$319,200,000	100.0%
Operating Costs	**$/tonne Ore**	**US$**		**Thai Baht (฿)**
Mining	$21.89	$85,264,000		฿2,643,200,000
Processing	$9.90	$38,540,000		฿1,194,700,000
General & Administration	$1.92	$7,462,000		฿231,300,000
Total Operating Cost	$33.71	$131,266,000		฿4,069,200,000
EBITDA	$48.24	$187,887,000		฿5,824,500,000
Capital Costs	**$/tonne Ore**	**US$**		**Thai Baht (฿)**
Initial Capital Costs	$4.14	$16,118,000		฿499,700,000
Total Capital Costs	$9.55	$37,192,000		฿1,153,000,000
Maximum Working Capital	$1.84	$7,170,000		฿222,300,000
Depreciation (UoP)	$9.46	$36,853,000		฿1,142,400,000
Corporate Taxes	**Corporate Tax Rate**			
Corporate Tax Rate	0%	20%		30%

(US dollars)			
Taxes Paid	-	$30,462,000	$45,693,300
Internal Rate of Return	148%	112%	95%
Payback Period from Start of Development	1.32 Years	1.53 Years	1.69 Years
Net Cash Flow to Project	$150,695,000	$120,233,000	$105,001,000
Net Present Value discounted at:			
5.0%	$104,730,000	$82,631,000	$71,582,000
7.5%	$88,768,000	$69,614,000	$60,037,000
10.0%	$75,963,000	$59,192,000	$50,807,000
12.5%	$65,567,000	$50,749,000	$43,340,000
15.0%	$57,031,000	$43,832,000	$37,232,000
(Thai Baht)			
Taxes Paid	-	฿944,300,000	฿1,416,500,000
Internal Rate of Return	148%	112%	95%
Net Cash Flow to Project	฿4,671,500,000	฿3,727,200,000	฿3,255,000,000
Net Present Value discounted at:			
5.0%	฿3,246,600,000	฿2,561,600,000	฿2,219,000,000
7.5%	฿2,751,800,000	฿2,158,000,000	฿1,861,100,000
10.0%	฿2,354,900,000	฿1,835,000,000	฿1,575,000,000
12.5%	฿2,032,600,000	฿1,573,200,000	฿1,343,500,000
15.0%	฿1,768,000,000	฿1,358,800,000	฿1,154,200,000

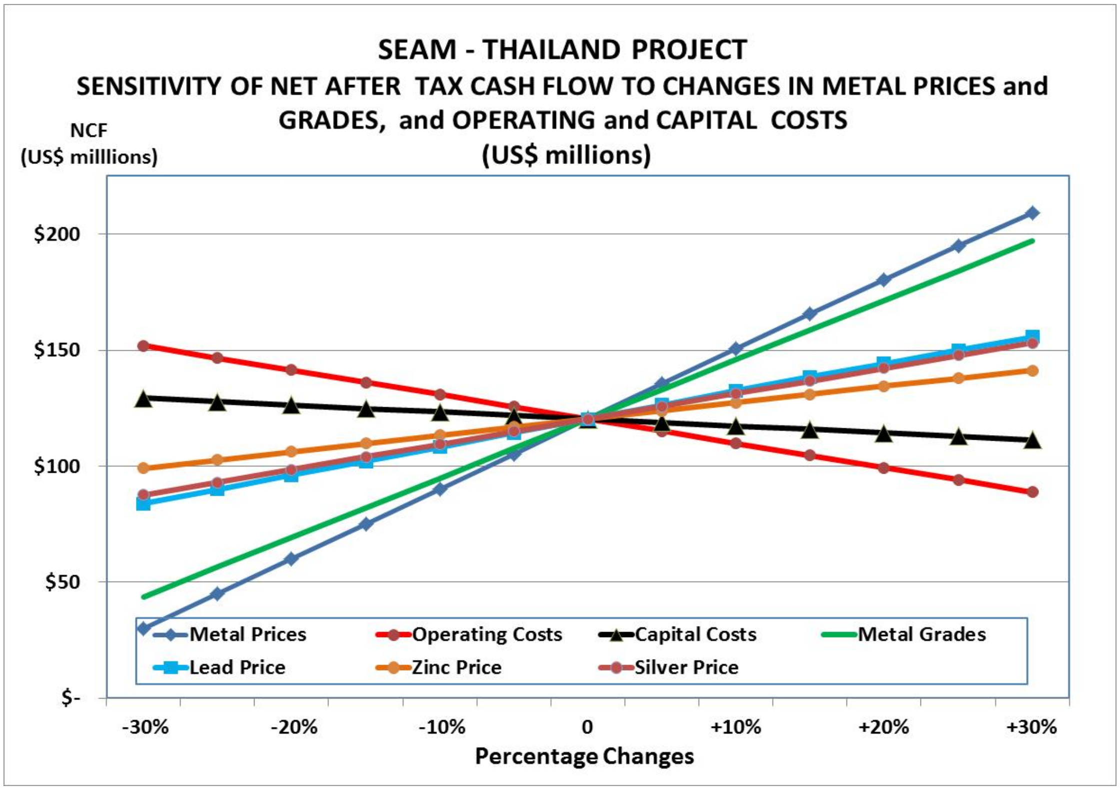
22.6. Sensitivity Analysis

ACA Howe has tested the sensitivity of the project to changes in metal prices, metal grades, operating costs and capital costs. In each case these have been varied up and down by 30%. The results of the sensitivity analysis are contained in Appendix XI and are plotted in Figure 22-1 on the following page. As would be expected the project is most sensitive to metal prices followed by metal grades. It is less sensitive to operating costs and least sensitive to changes in capital costs. It should be noted that the project still returns an after tax net cash flow of US$30 million when the metal prices are reduced by 30%. In order of most sensitive to least sensitive the parameters are:

1. All metal prices
2. Metal grades
3. Lead price alone
4. Silver price alone
5. Operating costs
6. Zinc price alone
7. Capital costs

The breakeven prices (i.e. the metal prices at which the project repays the capital but no profit is generated) are jointly US$0.607/lb. for lead, US$0.578/lb. for zinc and US$18.21/oz for silver. In this case each price has been reduced by approximately 39%. If silver and zinc prices are kept constant (i.e. at the base case prices) the lead price must be reduced to US$0.05/lb. to achieve breakeven.

FIGURE 22-1. SENSITIVITY TO METAL PRICE, GRADES, OPEX AND CAPEX



Change	Metal Prices	Operating Costs	Capital Costs	Metal Grades	Lead Price	Zinc Price	Silver Price
-30%	29.7	151.7	129.3	43.6	83.8	99.0	87.5
-25%	44.8	146.5	127.8	56.4	89.8	102.5	92.9
-20%	59.9	141.2	126.2	69.2	95.9	106.1	98.4
-15%	75.0	136.0	124.7	81.9	102.0	109.6	103.8
-10%	90.1	130.7	123.2	94.7	108.1	113.1	109.3
-5%	105.1	125.5	121.7	107.5	114.2	116.7	114.8
0	120.2	120.2	120.2	120.2	120.2	120.2	120.2
-5%	135.3	115.0	118.7	133.0	126.3	123.8	125.7
+10%	150.4	109.7	117.2	145.8	132.4	127.3	131.2
-15%	165.4	104.5	115.7	158.5	138.4	130.9	136.6
+20%	180.1	99.2	114.2	171.3	144.1	134.4	142.1
-25%	194.6	94.0	112.7	184.1	149.8	137.7	147.5
+30%	209.1	88.7	111.2	196.8	155.6	141.0	153.0

23. ADJACENT PROPERTIES

The mineralized belt of Ordovician carbonates extends from Song Toh for approximately 22 km southwards to Nanya (see figure 7-2). Parallel mineralized belts also occur in the region hosted by limestone apparently of a similar age, such as at Boh Ngam and Kreung Kravia.

The Boh Noi area lies 6 km south of Boh Yai within the Sri Nakharin and Erawan National Parks, and is reported to be a small deposit with no (or low) silver. The ore zone was mined for years by numerous open pits and small adits (Diehl & Kern 1981) by the Bohl family in the 1950s and subsequently by Kemco. Mine staff have reported verbally that approximately 100,000 tonnes of mineralization grading 5-7% Pb and 0.5-1.5% Zn is believed to exist with reported potential for a further 0.3 Mt. ACA Howe has not attempted to substantiate this data. SEAM has no intention at this time to further investigate this property as it is located in a National Park.

The Nanya area lies some 8km south east of Boh Noi and is reported to be a small deposit which has not been fully investigated as it currently lies within the boundaries of a Wildlife Park. SEAM has no intention at this time to further investigate this property as it is located on a Wildlife Park.

The Kreung Kravia district lies approximately 15 km north-west of Song Toh, where a further series of lead-zinc occurrences are known in a second parallel belt of Ordovician aged limestone. A drill indicated resource of 0.9 Mt of oxide ore, with a grade of 7% Pb has been reported verbally by mine staff. ACA Howe has not attempted to verify this data. SEAM has no intention at this time to further investigate this property as it is located on a National Park.

At Boh Ngam 20 kilometres north-east of Song Toh lead-zinc mineralization occurs in a third parallel belt of Ordovician aged limestone. A historical resource 0.2 Mt of has been reported verbally by mines staff. ACA Howe has not attempted to verify this data. SEAM has no intention at this time to further investigate this property as it is located on a National Park.

Numerous other mineral occurrences of lead-zinc mineralization are known in the area as shown on Figure 7-2 but no data on their extent is known to ACA Howe.

24. OTHER RELEVANT DATA AND INFORMATION

24.1. Mining & Exploration Records

The Survey and Geology offices at the Song Toh mine office contain numerous technical files and plans. Much of this data relating to the specific historical mining operations has been captured by digital scanning, but there is also reference to a number of exploration programmes, such as soil geochemistry and geophysics which has not been scanned. It is recommended that all these data are properly archived and indexed, with a view towards future digital capture, if a wider exploration programme is to be proposed for the region.

25. INTERPRETATION AND CONCLUSIONS

The Preliminary Economic Assessment demonstrates robust economics. The Base Case Net Present Value, discounted at 7.5%, is US$88.8 million with an IRR of 148% pre-tax and US$69.6 million with an IRR of 112% after tax. From the start of construction, the payback period is 1.5 years (1.3 years without tax). The sensitivity analysis indicates that the project can pay back the capital invested with a significant drop in metal prices, achieving a zero rate of return with the metal prices lowered 39%.

At this stage of analysis, the project is modeled to contribute US$30 million in corporate taxes and US$59 million in royalties to the Government of Thailand.

The present resource base appears able to support production at the existing processing plant for 14 years. Extending the life would require further exploration to extend the known zones and exploration at other targets on the licence area.

The Indicated Resources would feed the plant for 9 years; the remaining life depends on resources classified as Inferred.

Song Toh and Boh Yai Mines are in good condition and can be placed into production quickly. The Camp Zone near Song Toh Mine North will be a new development, separate from the other Song Toh workings.

The existing processing plant can be easily refurbished and should be able to treat 300,000 tonnes of feed per year. Minor modifications can be expected to result in improved metallurgical performance over historical performance.

The existing tailings facility can be upgraded with minimal increase in footprint to accommodate the expected tonnage of tailings over 14 years.

The preliminary estimate of jobs to be created is 413, not including truck haulage from Boh Yai Mine to the processing plant and not including haulage and handling of concentrates.

26. RECOMENDATIONS

26.1. RECCOMENDATIONS - PHASE I

A program of engineering studies and evaluation is necessary to support the mine permitting process. A continued exploration program is warranted on the SPLs. The following defines the proposed programme felt necessary at this stage.

26.1.1. ENGINEERING STUDIES

SEA should proceed with permitting. The following engineering and environmental studies should be completed in order to support the applications.

- A detailed analysis of topography and hydrogeology should be conducted in order to determine the water flow in, and surrounding the former mines;
- A Health and Environmental and Impact Assessment ("HEIA") should be completed as further detailed in section 26.4.
- Testwork is required to prepare design and costing for water management and the proposed water treatment plant.
- Design and costing is required for the tailings management plan.

The cost to complete the engineering studies outlined above is estimated to be $600, 000..

26.1.2. EXPLORATION DATA

Data compilation within the immediate mine areas has largely been completed, but the Company should continue the compilation and indexing of all available historical data.

ACA Howe recommends that all plans should be properly indexed and the most recent and reliable of these should be imported as georeferenced images into a suitable GIS package such as Mapinfo. Other available data should also be imported into the GIS package, including radiometrics, all available satellite imagery, published and unpublished geological and topographic maps and SRTM data.

The integration and interpretation of this historical and modern data will allow:

- compilation of a geological map of the 35 km limestone belt;
- better characterization and understanding of the mineralisation controls at Song Toh and Boh Yai;
- better interpretation of exploration results and prioritization of targets;
- recognition of additional targets warranting exploration; and
- planning of new resource and district-scale exploration programmes.

The estimated cost to complete the data compilation is $100,000.

26.1.3. Exploration

Following the compilation and review of available data an exploration programme should be designed to test the wider potential of the Limestone Belt. Consideration should be given to exploring the whole of the belt on a reconnaissance scale. Exploration to date has identified a number of Pb and Cu soil anomalies and IP anomalies peripheral to the Song Toh and Boh Yai mines, which may be indicative of more extensive Pb-Zn mineralisation in these areas. Further work, including geological mapping and more detailed geochemical and geophysical surveys is warranted in order to further define drill targets. A provision of 1,000 m of drilling would be appropriate for testing of targets emerging from this work.

The estimated cost to complete the exploration program is $300,000.

26.1.4. Environmental

The following summary has been provided by International Environmental Management Co. Ltd. (“IEM”):

An HEIA is to be conducted by IEM, which is licensed by ONEP as an approved environmental consultant firm in Thailand. The HEIA scope of work involves the preparation of an HEIA to seek approval for the planned project and to demonstrate compliance with the Environmental Standards and Regulations of Thailand (“ESRT”) and international practices.

The impact assessment performed shall address and assess the potential environmental, social and health impacts of all activities of the planned project. The following will be included in the HEIA study:

- Define all relevant environmental legislation that the project must comply with;
- A full description of the project to be implemented;
- Full description of the project environment and neighbouring areas, which could be influenced by the implementation of the project or that could influence the project;
- All existing baseline environmental data will be obtained from the client and other available sources, assessed for its quality and relevance and analyzed;
- Liaison with Local Authorities to collect any further information;
- Screening & scoping studies to identify and define key environmental issues;
- Assessment of the potential positive or negative, cumulative or non-cumulative, direct or indirect, short or long term impacts on the environment, health, and socio-economic conditions that may be affected throughout the various project phases;
- Identification of mitigation measures for predicted environmental impacts for all stages of the

project;

- Assessment of the requirement for environmental monitoring based on the study findings and a proposed environmental monitoring program to be implemented in different stages of the project;

- Design an environmental management plan consistent with the Equator Principles.

26.2. Recommendation – Phase II

Following the successful permitting of the Song Toh and Boh Yai mines SEA could consider a Phase II program:

- A more detailed economic analysis, should be completed prior to the commencement of commercial production if deemed necessary, perhaps including market and contract studies;

- A drilling program on a 50m grid or smaller should be undertaken in order to increase the indicated reserve base by conversion of inferred resources;

- It is recommended that SEA purchase and install automatic samplers on heads (flotation feed) and on tailings after start up.

- After start-up, it is recommended that plant-built reagent flow meters be upgraded to electronically controlled pumps. Also, consideration should be given to substitution of metal lined slurry pumps with conventional rubber lined pumps. It is recommended that a pressure filter to dry the lead concentrate be considered, eliminating the time required for air-drying and speeding up shipping and payment.

- After steady-state production is achieved, a program of metallurgical testwork and review is recommended. It is possible that there are worthwhile investments to be made in de-bottlenecking or in technology that has advanced since the plant was built in 1978.

- SEA should investigate the possibility of selling zinc concentrate in Thailand in order to increase the economic benefit to Thailand and reduce various expenditures.

To date little to no exploration has been done to test the depth extent of the known zones of mineralization. Clearly there is considerable potential to be tested and part of the drilling program needs to be focused on deeper drilling beneath the known mineralization and along strike at Song Toh and Boh Yai. A detailed review of possible mine planning, targets and accessible collar locations are required before formulating a drilling programme. A provisional drill programme based on infill and step-out drilling totaling 10,000m metres is laid out in Table 26-1 on the following page.

Subsequent to the granting of SPLs on the 44 square kilometer area currently held under SPLAs, the Company should consider a district scale exploration program to test the wider potential of the Limestone Belt. Consideration should be given to exploring the whole of the belt on a reconnaissance scale using drainage and soil geochemistry, airborne EM and magnetics, prospecting and geological mapping.

TABLE 26-1. BOH YAI AND SONG TOH PROVISIONAL DRILL PROGRAMME				
Proposed Drilling	**Number of Holes**	**Average Depth**	**total metres**	collar location
Boy Yai Hill 1: 10 vertical holes, mean 200m to infill and test down-dip extension of SHI zone	10	200	2,000	surface
Boy Yai Hill 1: 10 vertical holes, mean 100m to infill and test down-dip extension of 1 105U and 1 105 L zone	10	100	1,000	surface
Boy Yai Hill 5: 4 angle holes, average 150m to infill and test down-dip extension of L1B, L1D and L1E zones	5	150	600	underground
Boy Yai Hill 5: 4 angle holes, average 100 m to infill and test up and down-dip extension of 5 MKL 563	4	100	400	underground
Boy Yai Hill 7: 7 x 100m angle holes to infill and test down-dip extension of 7 NSN 343 zone	7	100	700	underground
Boy Yai Hill 7: 5 x 120m angle holes to infill and test down-dip extension of 7 NSN091L zone	5	120	600	underground
Song Toh SW: 6x 250m angle holes to test BS235 zone	6	250	1,500	underground
Song Toh SW: 10x 200m angle holes to test extensions of BS123 and NE2 zones	10	200	2,000	underground
Song Toh Camp: 8 x150m vertical holes to test Upper and Lower zones	8	150	1,200	surface
Total	65	154	10,000	

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28. CERTIFICATES

CERTIFICATE OF CO-AUTHOR: RICHARD PARKER, B.SC., C.ENG.

I, Richard Parker, C.Eng., do hereby certify that:

1) I am an Associate Senior Geologist with ACA Howe International Limited, whose office is located at 365 Bay Street, Suite 501, Toronto, Ontario, Canada.
2) I graduated with a Bachelor of Science ("B.Sc.") degree in Geology from the University of Newcastle upon Tyne, England, in 1968.
3) I am a Chartered Engineer registered with Engineering Council (UK), a Professional Member of the Institute of Materials, Minerals, and Mining and a Fellow of the Geological Society of London.
4) I have practiced as a geologist for forty two years and as a Chartered Engineer for thirty two years.
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 co-author of the technical report titled: "Technical Report and Preliminary Economic Assessment on The Song Toh – Boh Yai Properties, Kemco Project, Thong Phaphum District, Kanchanaburi Province, Thailand " for Southeast Asia Mining Corp. with effective date March 31, 2013 (the "Technical Report"). I am responsible for Sections 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 19, 20, 23, 24, and responsible for the geological and mineral resource portions of Sections 1, Executive Summary, 2, Introduction, 25, Interpretation and Conclusions, and 26, Recommendations.
7) I have read NI 43-101 and Form 43-101 F1. This Technical Report has been prepared in compliance with that Instrument and Form.
8) I visited the Mineral Property that is the subject of this technical report from December 3 to 7, 2011.
9) My prior involvement with Southeast Asia Mining Corp. was as author of the report titled: "NI 43-101 Technical Report, Mineral Resource Estimate, of the Song Toh – Boh Yai Properties, Kemco Project, Kanchanaburi Province, Thailand "; I have had no prior involvement with Southeast Asia Mining Corp., its Principals or its shareholders.
10) I am not aware of any material fact or material change with respect to the subject matter of this Report that is not reflected in the Report, the omission to disclose which makes the Report misleading.
11) I am independent of Southeast Asia Mining Corp., applying all of the tests in Section 1.4 of NI 43-101 and Section 3.5 of NI 43-101 CP.
12) 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.
13) I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes.

Dated this 19th Day of April 2013.

Richard Parker, C. Eng.
Senior Associate Geologist
ACA Howe International Limited

CERTIFICATE OF CO-AUTHOR: BRUCE BRADY, B.ENG., P.ENG.

I, Bruce Brady, P.Eng., do hereby certify that:

1) I am an Associate Mining Engineer with ACA Howe International Limited, whose office is located at 365 Bay Street, Suite 501, Toronto, Ontario, Canada.
2) I graduated with a Bachelor of Engineering ("B.Eng.") degree in Mining Engineering from McGill University in 1972.
3) I am a Professional Engineer registered with Professional Engineers Ontario (PEO) and the Quebec Order of Engineers (OIQ).
4) I have worked as a mining engineer for forty years since graduating from university and my experience includes mine operation, mine engineering, project evaluation, 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 fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6) I am co-author of the technical report titled: "Technical Report and Preliminary Economic Assessment on The Song Toh – Boh Yai Properties, Kemco Project, Thong Phaphum District, Kanchanaburi Province, Thailand " for Southeast Asia Mining Corp. with effective date March 31, 2013 (the "Technical Report"). I am responsible for Sections 16, Mining, and 18, Project Infrastructure, and responsible for the mining portions of Sections 1, Executive Summary, 2, Introduction, 21, Capital and Operating Costs, 25, Interpretation and Conclusions, and 26, Recommendations.
7) I have read NI 43-101 and Form 43-101 F1. This Technical Report has been prepared in compliance with that Instrument and Form.
8) I visited the Mineral Property that is the subject of this technical report from January 4 to 7, 2012 and April 16 to 18 and 21 to 25, 2012.
9) My prior involvement with Southeast Asia Mining Corp. was as co-author of the report titled: "Preliminary Economic Assessment of The Song Toh – Boh Yai Properties, Kemco Project, Thong Phaphum District, Kanchanaburi Province, Thailand "; I have had no prior involvement with Southeast Asia Mining Corp., its Principals or its shareholders.
10) I am not aware of any material fact or material change with respect to the subject matter of this Report that is not reflected in the Report, the omission to disclose which makes the Report misleading.
11) I am independent of Southeast Asia Mining Corp., applying all of the tests in Section 1.4 of NI 43-101 and Section 3.5 of NI 43-101 CP.
12) 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.
13) I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes.

Dated this 19th Day of April 2013

LICENSED PROFESSIONAL ENGINEER
B. S. BRADY
PROVINCE OF ONTARIO

Bruce Brady, P. Eng.
Senior Associate Mining Engineer
ACA Howe International Limited

LICENSED PROFESSIONAL ENGINEER
B. S. BRADY

CERTIFICATE OF CO-AUTHOR: ALFRED HAYDEN, P.ENG.

I, Alfred S. Hayden, B.A.Sc., P.Eng. (PEO), do hereby certify that:

1) I am President of EHA Engineering Ltd , PO Box 2711, Postal Station "B", Richmond Hill Ontario.
2) I graduated from the University of British Columbia, Vancouver, B.C. in 1967 with a Bachelor of Applied Science in Metallurgical Engineering.
3) I am a member of the Canadian Institute of Mining, Metallurgy and Petroleum and a Professional Engineer and Designated Consulting Engineer registered with Professional Engineers Ontario.
4) I have worked as a metallurgical engineer for a total of 45 years since my 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 co-author of the technical report titled: "Technical Report and Preliminary Economic Assessment on The Song Toh – Boh Yai Properties, Kemco Project, Thong Phaphum District, Kanchanaburi Province, Thailand " for Southeast Asia Mining Corp. with effective date March 31, 2013 (the "Technical Report"). I am responsible for Sections 17, Recovery Methods, and the processing portions of Sections 1, Executive Summary, 2, Introduction, 21, Capital and Operating Costs, 25, Interpretation and Conclusions, and 26, Recommendations. I have not visited the Project.
7) I have had no prior involvement with Southeast Asia Mining Corp., its Principals or its shareholders.
8) 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.
9) I am independent of Southeast Asia Mining Corp., applying all of the tests in Section 1.4 of NI 43-101 and Section 3.5 of NI 43-101 CP.
10) I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
11) I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated this 19th Day of April 2013.

REGISTERED PROFESSIONAL ENGINEER
A. S. HAYDEN
PROVINCE OF ONTARIO

Al Hayden, P. Eng
Associate Metallurgical Engineer

CERTIFICATE OF CO-AUTHOR: GORDON WATTS, P.ENG.

I, Gordon Watts, B.A.Sc., P.Eng. (PEO) do hereby certify that:

1. I reside at 347 Berkeley Street, Toronto, Ontario.

2. I am a Senior Associate Mineral Economist with ACA Howe International Limited, whose office is located at 365 Bay Street, Suite 501, Toronto, Ontario, Canada.

3. I graduated with a Bachelor of Applied Science (B.A.Sc.) degree in Mining Engineering from the University of Toronto in 1966.

4. I am a Professional Engineer registered with Professional Engineers Ontario (PEO, number 49149016).

5. I have worked as a mining engineer for forty two years since graduating from university. My relevant experience includes:

- The preparation of over 250 financial models during the past 28 years;
- Skilled in tax modeling, risk analysis and Monte Carlo simulations;
- Constructed numerous mining cash flow models for mining consulting companies e.g. ACA Howe; Watts, Griffis, McOuat; Roscoe Postle Assoc.; MPH; Derry Michener Booth and Wahl.
- Prepared reports on mineral properties throughout Canada, the United States of America, and Internationally.

6. I have read the definition of a "qualified person‖" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

7. I am co-author of the technical report titled: "Technical Report and Preliminary Economic Assessment of the Song Toh – Boh Yai Properties, Kemco Project, Thong Phaphum District, Kanchanaburi Province, Thailand, for Southeast Asia Mining Corp." dated April 19, 2013, (the Technical Report‖). I am responsible for Section 15 and portions of Sections 1, and 16 of the report. I have not visited the aforementioned Project.

8. I have had no prior involvement with Southeast Asia Mining Corp., their Principals, or their shareholders.

9. 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.

10. I am independent of the issuer, Southeast Asia Mining Corp applying all of the tests in Section 1.5 of NI 43-101 and Section 1.5 of NI 43-101 CP.

11. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared incompliance with that instrument and form.

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, of the Technical Report.

Effective Date: March 31st, 2013
DATED this 19th Day of April 2013.

{SIGNED and SEALED }
[*Gordon Watts]*

REGISTERED PROFESSIONAL ENGINEER
G. D. WATTS
PROVINCE OF ONTARIO

Gordon Watts, P. Eng.
Senior Associate Mineral Economist

APPENDIX I. CERTIFICATES FOR ANALYTICAL QUALITY CONTROL

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Page: 1
Finalized Date: 2-FEB-2012
This copy reported on 3-FEB-2012
Account: SOUASI

QC CERTIFICATE BR12003796

Project:
P.O. No.:
This report is for 59 Crushed Rock samples submitted to our lab in Brisbane, QLD, Australia on 19-JAN-2012.
The following have access to data associated with this certificate:
SURAPOL UDOMPORNWIRAT

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LEV-01	Waste Disposal Levy
LOG-22	Sample login - Rcd w/o BarCode
PUL-21	Pulverize entire sample

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-OG46h	Extended Ore Grade-Aqua Regia	ICP-AES
ME-OG46	Ore Grade Elements - AquaRegia	ICP-AES
Pb-OG46h	High Grade Pb - Aqua Regia	VARIABLE

To: SOUTHEAST ASIA EXPLORATION & MINING CO LTD
ATTN: SURAPOL UDOMPORNWIRAT
3RD FL, PERMPOOM BLDG, 32 SOI SUKHUMVITH 87
SUKHUMVITH ROAD, BANGCHACK, PHRACKANONG
BANGKOK 10260
THAILAND

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

Signature:
Shaun Kenny, Brisbane Laboratory Manager

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Page: 2 - A
Total # Pages: 3 (A)
Finalized Date: 2-FEB-2012
Account: SOUASI

QC CERTIFICATE OF ANALYSIS BR12003796

Sample Description — Method / Analyte / Units / LOR	ME-OG46 / Ag / ppm / 1	ME-OG46 / Pb / % / 0.001	ME-OG46 / Zn / % / 0.001	Pb-OG46h / Pb / % / 0.1
STANDARDS				
GBM 303-1				23.0
Target Range - Lower Bound				22.7
Upper Bound				24.8
GBM 305-11				11.2
Target Range - Lower Bound				11.9
Upper Bound				12.9
GBM 306-12	6	2.64	2.02	
Target Range - Lower Bound	3	2.59	1.975	
Upper Bound	7	2.78	2.12	
GBM 308-14	41	0.632	1.845	
GBM 308-14	42	0.659	1.885	
Target Range - Lower Bound	38	0.628	1.835	
Upper Bound	43	0.675	1.970	
GBM 398-1	4	2.62	2.04	
GBM 398-1	6	2.64	2.05	
Target Range - Lower Bound	3	2.58	1.965	
Upper Bound	7	2.77	2.11	
GBM 908-14	300	3.17	4.23	
GBM 908-14	310	3.27	4.38	
Target Range - Lower Bound	292	3.18	4.12	
Upper Bound	315	3.41	4.42	
OGGeo08	20	0.717	0.718	
Target Range - Lower Bound	18	0.672	0.684	
Upper Bound	22	0.723	0.736	
BLANKS				
BLANK	<1	0.002	0.001	
BLANK	<1	<0.001	<0.001	
BLANK	<1	<0.001	<0.001	
Target Range - Lower Bound	<1	<0.001	<0.001	
Upper Bound	2	0.002	0.002	
BLANK				<0.1
Target Range - Lower Bound				<0.1
Upper Bound				0.2

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Total # Pages: 3 (A)
Finalized Date: 2-FEB-2012
Account: SOUASI

QC CERTIFICATE OF ANALYSIS BR12003796

Sample Description / Method / Analyte / Units / LOR	ME-OG46 Ag ppm 1	ME-OG46 Pb % 0.001	ME-OG46 Zn % 0.001	Pb-OG46h Pb % 0.1
DUPLICATES				
H7 +451 (17/2)	24	1.785	0.002	
DUP	23	1.775	0.003	
Target Range - Lower Bound	22	1.735	<0.001	
Upper Bound	25	1.825	0.004	
H5 +610				29.6
DUP				28.5
Target Range - Lower Bound				28.2
Upper Bound				29.9
STSW +484 (30)	340	16.65	5.77	
DUP	340	16.40	5.76	
Target Range - Lower Bound	331	16.10	5.62	
Upper Bound	350	16.95	5.91	
STS +447 (6/2)	365	18.00	3.78	
DUP	355	17.90	3.76	
Target Range - Lower Bound	350	17.50	3.67	
Upper Bound	370	18.40	3.87	
STS +447 (16)	287	14.15	11.85	
DUP	298	14.25	11.75	
Target Range - Lower Bound	284	13.85	11.50	
Upper Bound	301	14.55	12.10	
ORIGINAL	22	0.096	0.217	
DUP	24	0.097	0.214	
Target Range - Lower Bound	21	0.093	0.209	
Upper Bound	25	0.100	0.222	

APPENDIX II. BOH YAI AND SONG TOH RESOURCES BY DOMAIN.

BOH YAI RESOURCES BY DOMAIN							
DOMAIN	**HILL**	**CLASS**	**TONNES**	**Pbeq**	**Pb**	**Zn**	**Ag**
1 105L_IND	HILL1	INDICATED	145,000	9.72	3.95	3.26	72.77
1 105U_IND	HILL1	INDICATED	207,640	4.88	0.97	3.20	23.19
1 SH1_IND	HILL1	INDICATED	643,452	10.78	3.10	4.57	90.95
1 SH1L_IND	HILL1	INDICATED	255,548	6.43	1.58	3.28	46.52
1 SH1U_IND	HILL1	INDICATED	69,693	5.64	1.52	2.44	49.01
3MKL309L9_IND	HILL3	INDICATED	16,031	11.83	4.66	5.80	44.21
3MKL301_IND	HILL3	INDICATED	26,634	9.26	1.77	6.84	25.30
4MKL408L4_IND	HILL4	INDICATED	130,477	7.88	3.16	4.29	16.40
5L1_IND	HILL5	INDICATED	76,328	6.35	2.97	1.14	63.17
5L1B_IND	HILL5	INDICATED	89,227	10.04	4.53	2.20	93.93
5L1C_IND	HILL5	INDICATED	17,006	4.36	2.56	0.35	40.43
5MKL527_IND	HILL5	INDICATED	23,618	17.93	9.82	0.01	224.65
5MKL511_IND	HILL5	INDICATED	11,414	10.05	2.98	6.44	24.21
5U1_IND	HILL5	INDICATED	53,453	5.99	2.36	2.85	24.48
5U3_IND	HILL5	INDICATED	95,213	6.33	1.61	4.46	11.73
5U4_IND	HILL5	INDICATED	35,658	8.69	3.05	5.30	14.53
7NSN091_IND_BB	HILL7	INDICATED	77,279	12.79	5.38	0.00	205.94
7NSN129_IND	HILL7	INDICATED	27,631	15.80	8.08	0.05	212.53
7NSN031_IND	HILL7	INDICATED	34,661	16.49	9.45	0.01	195.02
7NSN159_IND	HILL7	INDICATED	11,670	8.59	4.33	0.01	117.88
7NSNSN343_IND	HILL7	INDICATED		10.84	5.62	0.00	141.76
TOTAL		INDICATED	2,138,112	8.96	3.12	3.30	73.84
DOMAIN	HILL	CLASS	TONNES	Pbeq	Pb	Zn	Ag
1 105L_INF	HILL1	INFERRED	92,545	6.83	1.55	3.19	61.02
1 105U_INF	HILL1	INFERRED	303,665	5.57	1.09	3.36	34.70
1 SH1_INF	HILL1	INFERRED	330,925	6.33	2.02	2.50	52.86
1 SH1L_INF	HILL1	INFERRED	94,656	6.52	2.12	3.07	39.70
1 SH1U_INF	HILL1	INFERRED	135,650	4.67	1.48	1.94	36.51
3MKL309L9_INF	HILL3	INFERRED	1,276	9.95	3.73	5.11	36.20
3MKL301_INF	HILL3	INFERRED	9,744	13.12	2.44	9.92	31.58
4MKL408L4_INF	HILL4	INFERRED	25,079	9.48	3.86	4.99	22.46
4MKL424A_INF	HILL4	INFERRED	59,856	6.60	2.56	3.46	19.29
4MKL424C_INF	HILL4	INFERRED	147,900	9.34	2.66	6.47	12.48
5L1B_INF	HILL5	INFERRED	49,207	11.79	4.97	3.60	93.09
5L1D_INF	HILL5	INFERRED	57,234	14.94	6.04	6.99	60.07
5L1E_INF	HILL5	INFERRED	87,626	6.12	3.10	1.02	56.36

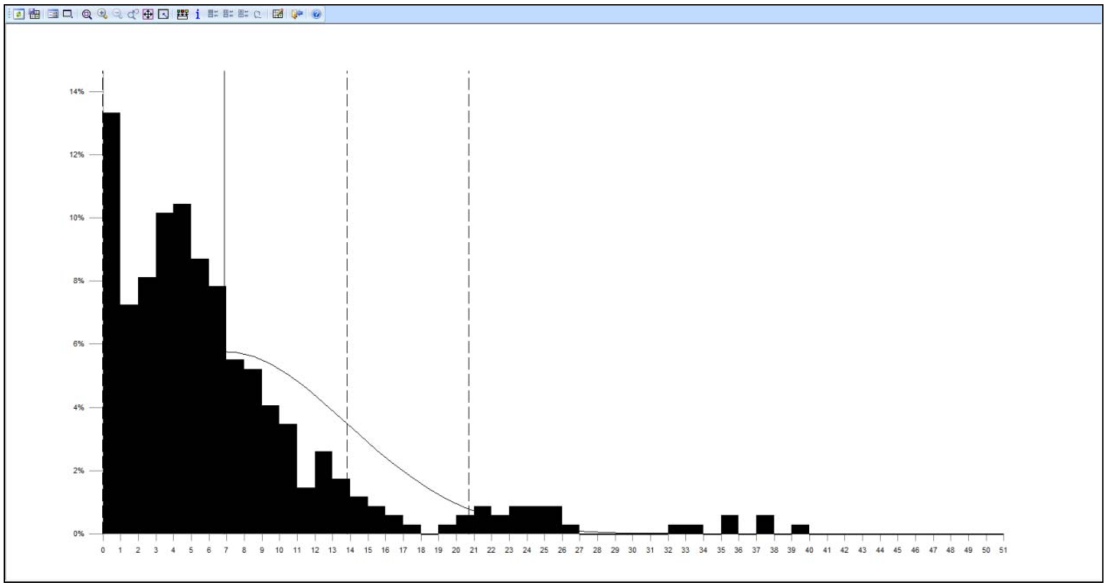
BOH YAI RESOURCES BY DOMAIN							
DOMAIN	**HILL**	**CLASS**	**TONNES**	**Pbeq**	**Pb**	**Zn**	**Ag**
5MKL527_INF	HILL5	INFERRED	5,707	18.49	10.00	0.01	235.06
5MKL511_INF	HILL5	INFERRED	1,485	8.79	2.31	6.00	19.53
5MKL563_INF	HILL5	INFERRED	80,875	7.39	3.19	3.13	32.76
5U1_INF	HILL5	INFERRED	6,009	6.21	2.57	2.91	23.14
5U3_INF	HILL5	INFERRED	58,209	6.07	1.87	3.98	10.08
5U4_INF	HILL5	INFERRED	47,722	8.02	2.32	5.43	12.91
7NSN091_INF	HILL7	INFERRED	7,842	12.89	5.49	0.00	205.54
7NSN031_INF	HILL7	INFERRED	6,751	19.20	10.38	0.01	244.37
7NSN159_INF	HILL7	INFERRED	17,864	6.93	2.77	0.01	114.94
7NSNSN343_INF	HILL7	INFERRED	15,266	11.80	5.76	0.00	165.58
TOTAL		INFERRED	1,643,093	7.19	2.36	3.36	44.10

SONG TOH SOUTHWEST RESOURCES BY DOMAIN						
DOMAIN	**CLASS**	**TONNES**	**Pbeq, %**	**Pb, %**	**Zn, %**	**Ag, %**
CN	INDICATED	131,544	6.51	3.04	0.42	84.76
CS	INDICATED	30,137	3.71	2.05	0.02	45.31
NE2	INDICATED	47,490	6.50	0.73	0.04	158.99
NE3	INDICATED	44,034	4.16	2.89	0.20	29.65
SC	INDICATED	20,555	4.98	2.66	0.28	56.34
NE1	INDICATED	10,185	5.29	2.79	0.36	59.20
BS123	INDICATED	34,290	10.72	5.75	0.10	135.29
TOTAL	INDICATED	318,234	6.23	2.84	0.25	87.27
BS123	INFERRED	6,009	14.40	7.35	0.08	193.30
BS235	INFERRED	160,219	7.36	4.67	0.04	73.39
CN	INFERRED	603	7.63	4.49	0.46	74.34
NE3	INFERRED	742	3.58	2.63	0.21	20.88
BS245	INFERRED	10,927	7.35	3.88	0.14	91.98
TOTAL	INFERRED	178,501	7.58	4.70	0.05	78.35

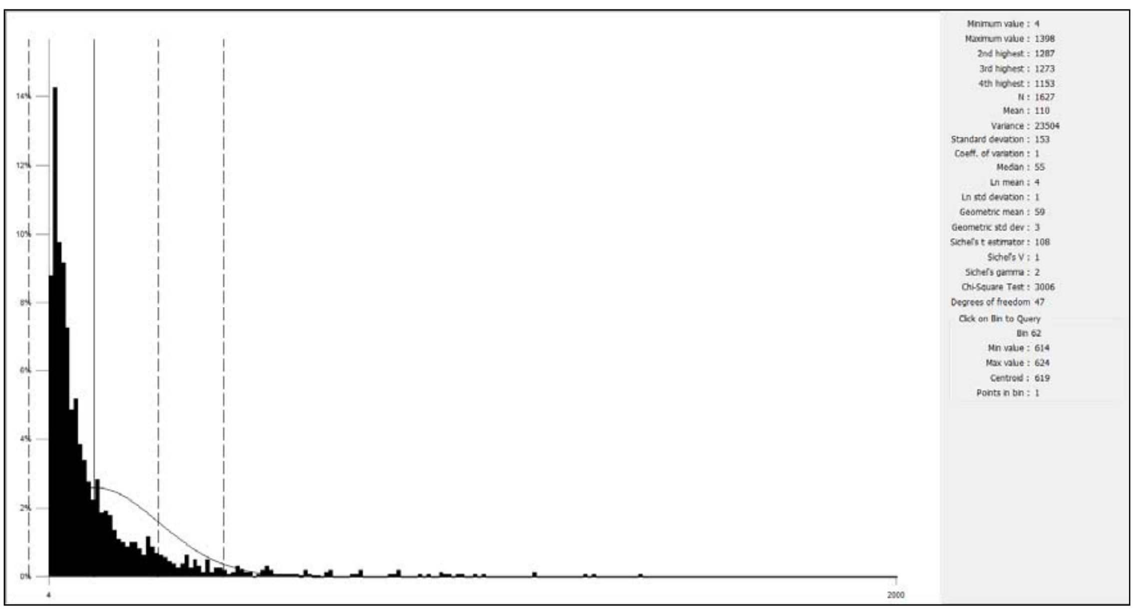
SONG TOH CAMP RESOURCES BY DOMAIN						
DOMAIN	CLASS	TONNES	Pbeq, %	Pb, %	Zn, %	Ag, %
CAMP_SE_LOWER	INDICATED	91,918	16.08	8.93	4.46	79.48
CAMP_SE_UPPER	INDICATED	172,979	10.00	7.40	0.23	65.78
CAMP_UPPER	INDICATED	174,325	6.01	3.80	1.00	34.24
TOTAL	INDICATED	439,222	9.69	6.29	1.42	56.13
CAMP_142_UPPER	INFERRED	14,987	12.86	7.16	4.35	42.00
CAMP_LOWER	INFERRED	32,944	9.45	6.16	0.97	65.32
CAMP_SE_LOWER	INFERRED	74,542	16.87	9.30	4.85	80.61
CAMP_UPPER	INFERRED	10,997	5.66	3.45	1.14	30.82
TOTAL	INFERRED	133,470	13.67	7.80	3.53	68.40

APPENDIX III. BOH YAI AND SONG TOH ANALYTICAL HISTOGRAMS

BOH YAI HILL 1 PBEQ ALL ASSAYS HISTOGRAM,

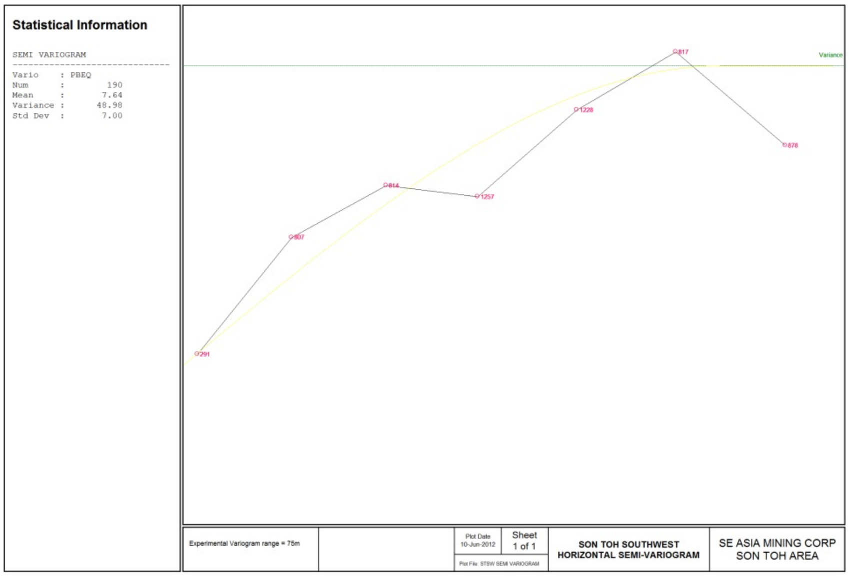


SONG TOH AG ALL ASSAYS HISTOGRAM

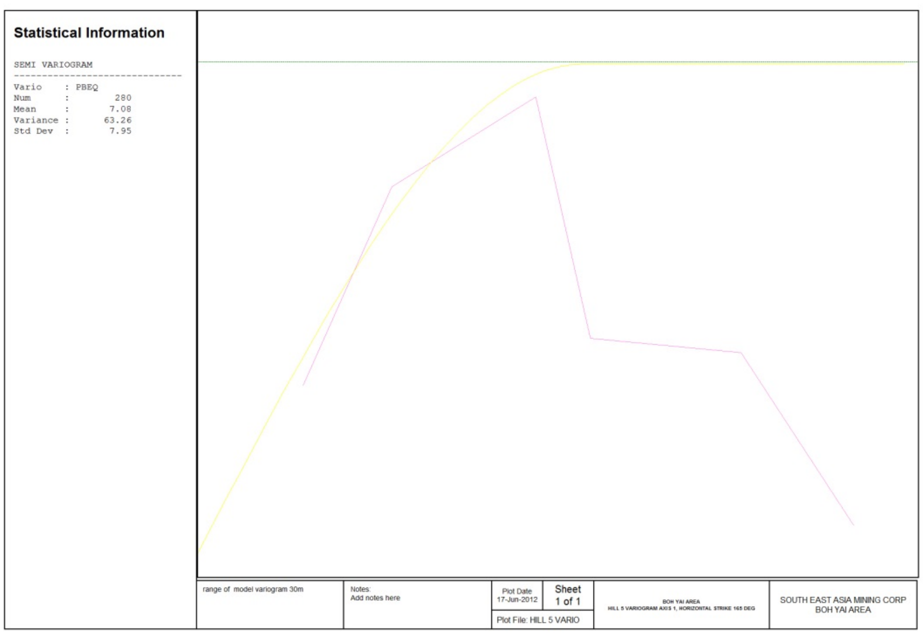


APPENDIX IV. BOH YAI AND SONG TOH SEMI-VARIOGRAMS

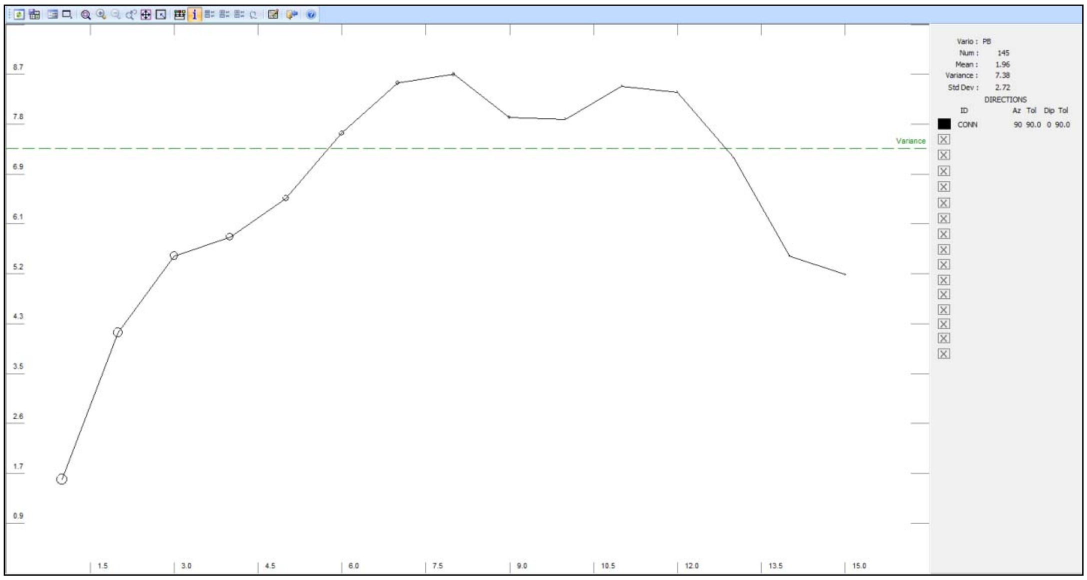
SONG TOH SOUTHWEST PBEQ HORIZONTAL SEMI-VARIOGRAM PBEQ



BOH YAI PBEQ HORIZONTAL SEMI-VARIOGRAM HILL 5



BOH YAI PBEQ DOWN HOLE SEMI-VARIOGRAM HILL 5

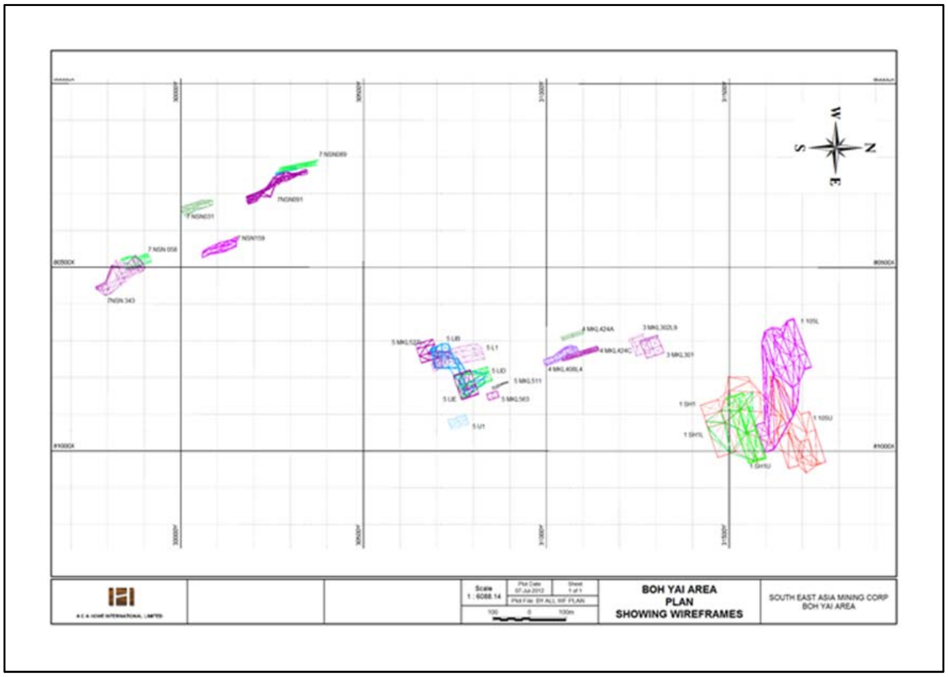


APPENDIX V. BOH YAI; LIST OF CUT SILVER ASSAYS

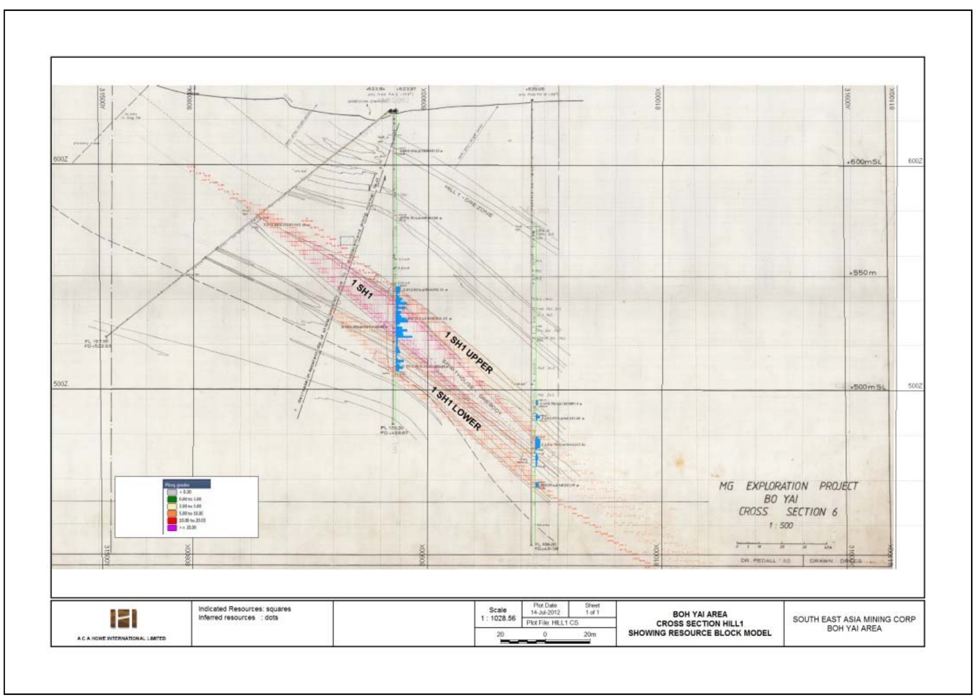
BOH YAI, DETAILS OF CUT SILVER VALUES				
Drillhole Number	**depth, from, metres**	**depth, to metres**	**Assay Value Ag g/t**	**Cut Value Ag g/t**
NSN 128	22.83	23.07	3170	1000
NSN 094	0.11	0.54	2960	1000
NSN 090	39.92	40.45	2660	1000
NSN 075	46.63	46.95	2390	1000
NSN 098	24.28	25.19	2330	1000
NSN 002	206.07	206.18	1969	1000
NSN 091	48.34	49.36	1753	1000
NSN 096	26.30	26.43	1670	1000
NSN 010	138.70	139.12	1624	1000
NSN 097	20.93	21.27	1505	1000
DDH 072	161.64	161.89	1398	1000
NSN 023	182.35	182.87	1359	1000
NSN 085	17.63	19.52	1248	1000
NSN 130	72.42	72.65	1195	1000
NSN 128	14.93	16.62	1170	1000
NSN 129	46.28	48.29	1170	1000
NSN 105	58.03	58.27	1150	1000
NSN 032	17.16	17.79	1147	1000
NSN 090	37.66	38.86	1144	1000
NSN 075	45.13	45.64	1140	1000
NSN 090	32.22	33.50	1115	1000
NSN 005	34.33	35.34	1055	1000
NSN 064	6.09	6.41	1050	1000
MKL 5/47	65.67	66.01	1042	1000

APPENDIX VI. SCREENSHOTS OF BLOCK MODELS

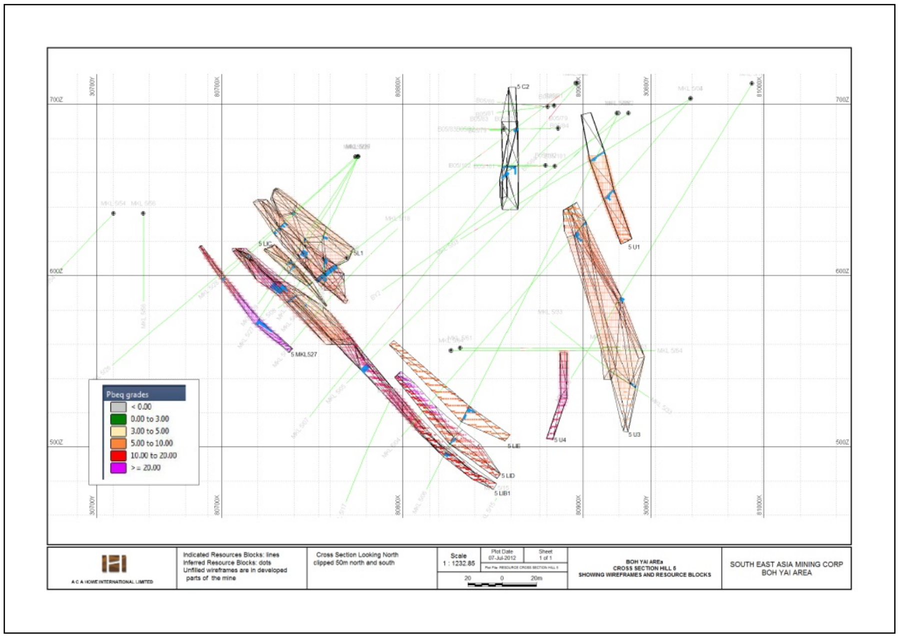
BOH YAI PLAN SHOWING WIREFRAME LOCATIONS



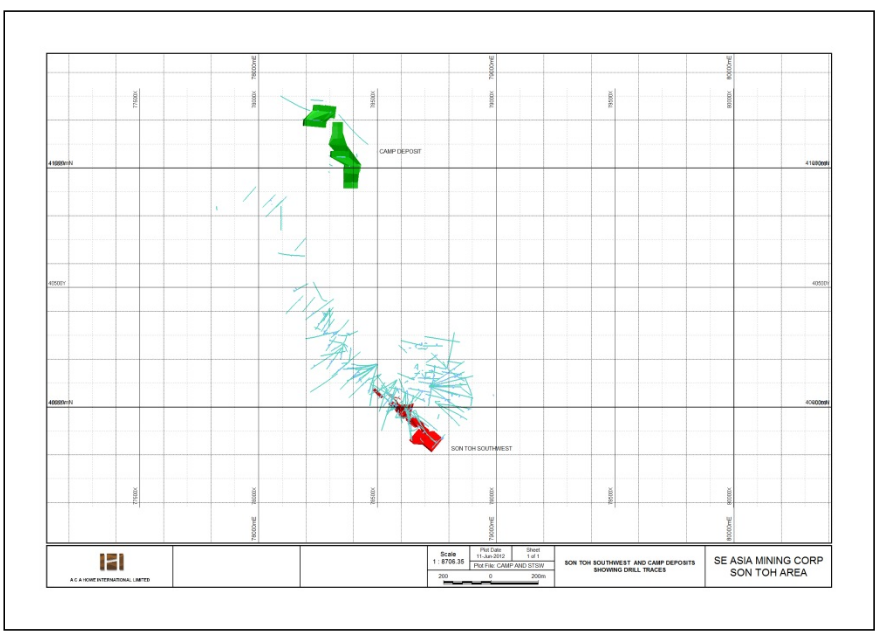
BOH YAI HILL 1 CROSS SECTION SHOWING RESOURCE BLOCKS, INDICATED BLOCKS SHOWN AS SQUARES, INFERRED BLOCKS SHOWN AS DOTS. SUPERIMPOSED ON HISTORICAL GEOLOGICAL SECTION



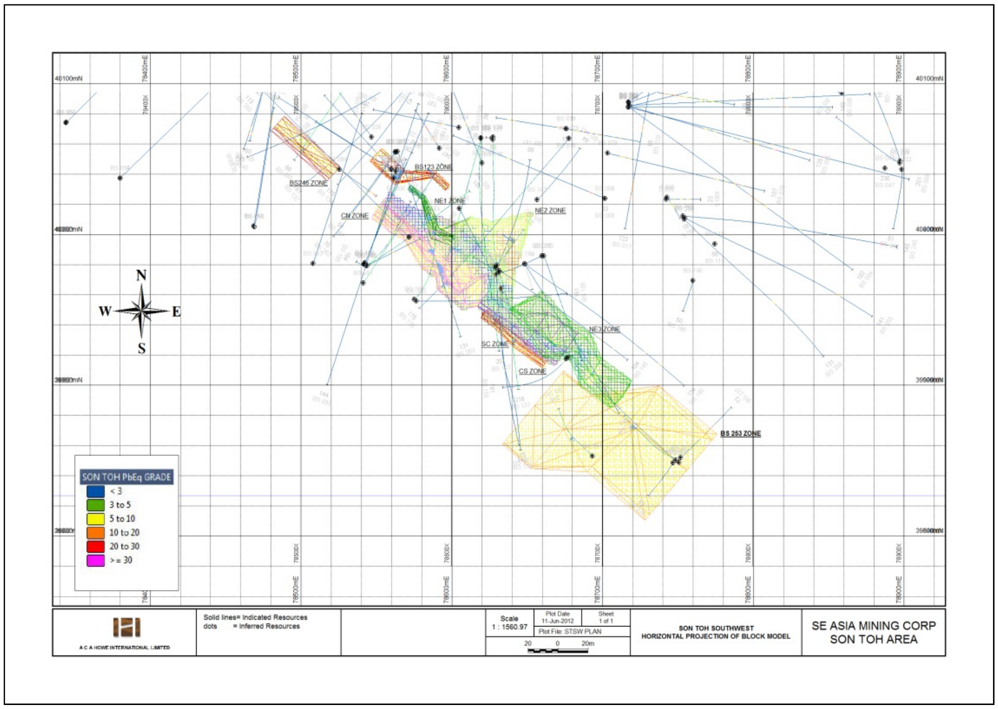
BOH YAI HILL 5 CROSS SECTION SHOWING RESOURCE BLOCKS, INDICATED BLOCKS SHOWN AS SQUARES, INFERRED BLOCKS SHOWN AS DOTS



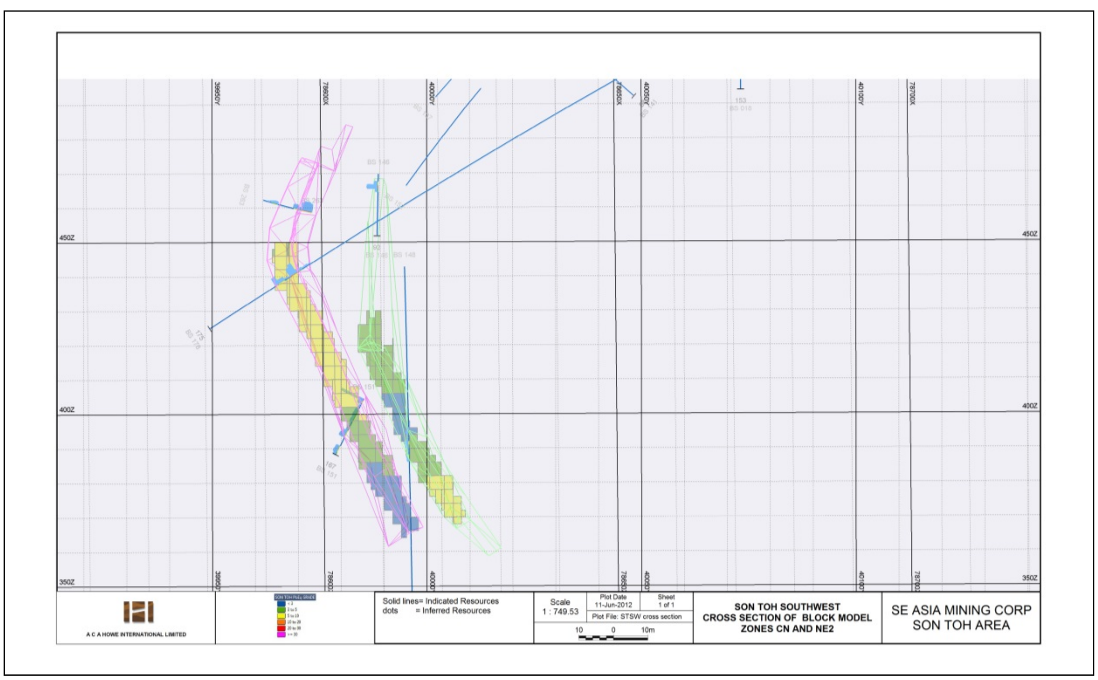
SONG TOH CAMP DEPOSIT AND SONG TOH SOUTHWEST DEPOSITS; LOCATIONS SHOWING DRILL TRACES



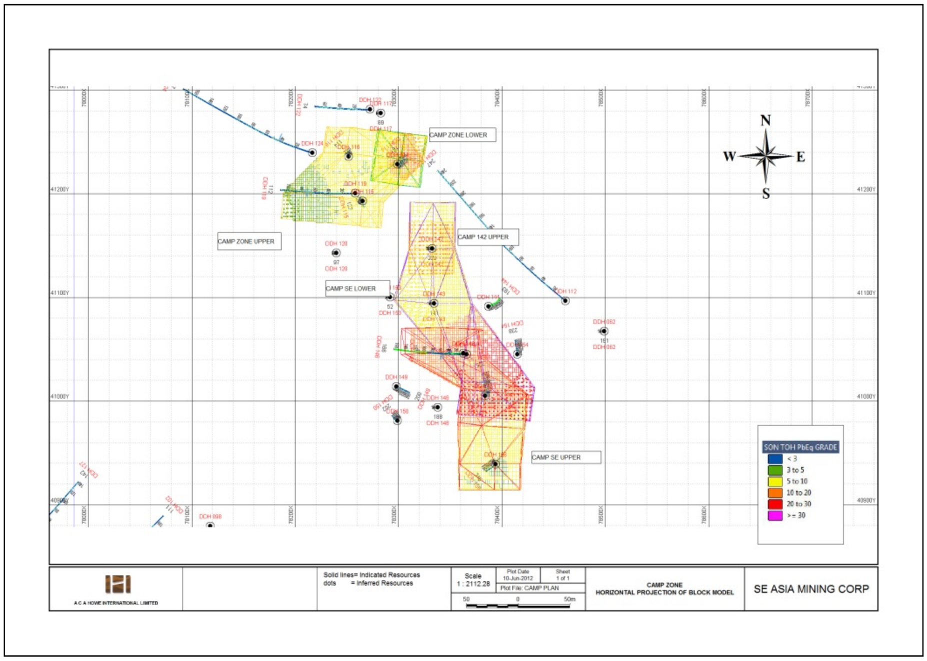
SONG TOH SOUTHWEST DEPOSIT: PLAN SHOWING DRILL TRACES AND RESOURCE BLOCKS



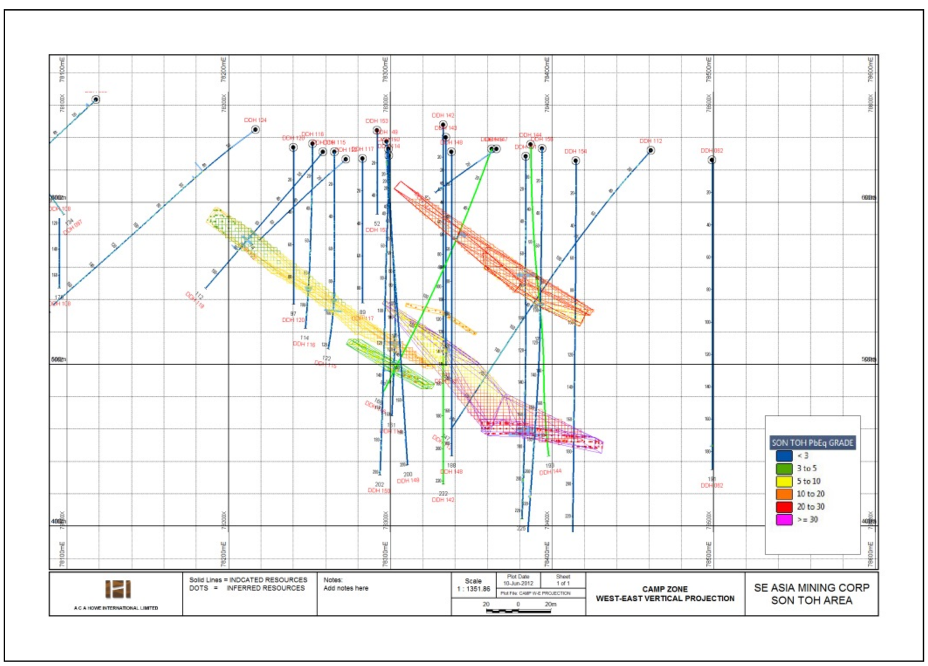
SONG TOH SOUTHWEST DEPOSIT: TYPICAL CROSS SECTION SHOWING DRILL TRACES AND RESOURCE BLOCKS



SONG TOH CAMP DEPOSIT; PLAN SHOWING RESOURCE BLOCKS, INDICATED BLOCKS SHOWN AS SQUARES, INFERRED BLOCKS SHOWN AS DOTS



SONG TOH CAMP DEPOSIT; CROSS SECTION SHOWING RESOURCE BLOCKS, INDICATED BLOCKS SHOWN AS SQUARES, INFERRED BLOCKS SHOWN AS DOTS



APPENDIX VII. GEOTECHNICAL REPORT

March 2013

PRELIMINARY UNDERGROUND GEOTECHNICAL ASSESSMENT

Song Toh - Boh Yai Mine

Submitted to:
Southeast Asia Mining Corp.
1010, 130 Adelaide Street West
TORONTO, ON, CANADA M5H 3P5

REPORT

Report Number: 12-1118-0011 (3000)

Distribution:

1 Copy - Southeast Asia Mining Corp.

2 Copy - Golder Associates Ltd.

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FIGURES

APPENDICES

1.0 INTRODUCTION

At the request of South East Asia Mining Corp. (SEA), Golder Associates Ltd. (Golder) has been retained to review the historical and currently available geotechnical information regarding the Song Toh and Boh Yai mines, in order to assist SEA with application for potential resumption of mining of these zones. Information provided to date by SEA has included historical mine plans and sections of the mines and a summary of recent rock strength testing.

It is understood that an applicant for underground mining must state *"the details of geological structure of minerals, mechanic strength of geological structure of minerals, and calculation in accordance with engineering theory which has been applied and proved of success so that to affirm any damage caused to a person and property"*.

2.0 INFORMATION AVAILABLE

The information available and reviewed was supplied by SEA and includes:

- Geological and level plans of Boh Yai Hill 3 mining zone including elevations: +595, +610, +626, Main Haulage and Dewatering Drift
- Geological and level plans of Boh Yai Hill 4 mining zone including elevations: +595, +610, +622, +635, +647, +659, +672
- Geological and level plans of Boh Yai Hill 5 mining zone including elevations: +563, +574, +586, +598, +610, +620, +644, +655, +665, +674, +684, +698
- Geological and level plans of Boh Yai Hill 7 mining zone including elevations: +494, +498, +500, +505, +511, +520, +524, +532, +538, +554, +573
- Geological and level plans of Hill 11 mining zone including elevations: +593, +610, +620
- Rock strength tests of core from selected from boreholes: BS137, BS 185, DDH 116, MKL 5-27, MKL 5-28, MKL 5-29, MKL 5-62, NSN 73, NSN 109, NSM 127, NSN 128, and their borehole logs
- Plans indicating locations of Geotechnical samples from Boh Yai Hill 5, Boh Yai Hill 7, Song Toh Camp and Song Toh SW
- Boh Yai Cross Section 18, Boh Yai Hill 5 Cross Section 20+25, Boh Yai Hill 7 Cross Sections 26+25, 27+25 and 37
- Song Toh North (Camp) Section 1, Song Toh Southwest Cross Section D+25, Song To Southwest Cross Section F-F

3.0 GEOLOGICAL STRUCTURES

Western Thailand, Laos, China and Eastern Myanmar and areas are underlain by limestones of varying age, most of which host lead / zinc / silver mineralization, intermingled with three major granitic intrusive belts. In the Kemco / Boh Yai areas, the limestones are Ordovician aged and further to the north at the Padaeng silicate zinc deposit, they are Permian aged. Large, regional faulting is found in the area, but there is no obvious spatial relationship with the known deposits. At a deposit scale, the mineralization deposition is influenced by local faulting.

There are two major deposits evaluated in this assessment: 1) Song Toh, mined from 1978 to 2002 (Figure 2); and 2) Boh Yai, with underground infrastructure prepared to mine in 2009 (Figure 3). The Song Toh mineralization is stratabound, lying on the western limb of a major anticline that plunges approximately 15%. The Boh Yai mineralization is a series of pods of different size, in places influenced by local faulting.

The following is a summary of the geological setting of the area of interest in Western Thailand based on a review of the available literature. A sedimentary sequence comprising at least 3,000m of mostly marine carbonates were deposited between the Cambrian and Jurassic. The sediments are believed to have been deposited in a large sedimentary basin, described as the Yunnan-Malaya Geosyncline. These units are locally covered by fluviatile sediments of Cenozoic age. The carbonates are part of a belt of similar aged carbonates that extend from the Gulf of Thailand to China and host a number of Pb-Zn deposits. The carbonates are simply divided into two main facies; a pale coloured fossiliferous limestone and a dark argillaceous limestone. The pale limestone exclusively hosts the mineralization and has been further sub-divided by Diehl & Kern (1981) into three groups;

- White or light grey bedded limestone;
- White or light grey massive limestone; and
- Reddish or yellowish thin-bedded limestone-slate.

The dark grey argillaceous limestone is fine grained, micrite or mudstone with sparse bioclastic debris and common pyrite nodules and carbonaceous matter. Mineralization occurs within the Ordovician carbonates over an area extending greater than 35km from Nanya in the south-east, to Kreung Kravia in the North-west. The mineralization at Song Toh is exclusively hosted within the pale micritic limestone units and although there is no strict concordance to bedding, with the mineralization being stratabound rather than stratiform. The thickness of the ore at Song Toh is reported to be on average 2.5m with local thickening to 10m. The age of the main deformation is Permo-Triassic, and this is followed by late Cretaceous-early Tertiary thrusting. The mineralization is highly deformed, possibly as a result of both tectonic events and therefore might be presumed to be pre-Permian in age.

4.0 HISTORICAL MINING GEOMETRIES AND GROUND SUPPORT

The underground Boh Yai and Song Toh mines were developed by drill and blast techniques from orebodies that vary from shallow (<30^0) to steep (>60^0) dipping. The mined ore zones varied between 2 and 10m in width, with stope strike lengths in excess of 400m. Mining depths are highly variable due to the hilly topography in this region and range from as shallow as 25m depth to approximately 200m.

Mining geometries were observed underground directly by Mr. Bruce Brady (2012) and mining techniques were reported by SEA personnel. Mr. Brady's observations are included below.

The Main Haulage and Drainage Drift at Boh Yai Mine is 4.5m wide by 4.0m high. It discharges at 550masl at the Hill 7 zone and rises at a grade of 0.5% to 565m at the Hill 1 zone; then ramps up to the 608m portal at a slope of 1:9. The entire 3km, all in limestone, is unsupported except for a section of approximately 200m where rock bolts are inserted on an as needed basis. All rock bolts observed as used at this project were 6-foot Split Sets. There are a number of intersections for muck bays / truck turnarounds, some with ore pass chutes. The *corner to corner span across these intersections is typically 20m, the centre of the intersection domes up to a height of 5.5m to 7m, typically 6m. These intersections were also observed to be unsupported.*

Steeply dipping stopes, for example at Boh Yai Hill 7, were mined with sub-level open stoping, using 12m sub-level intervals connected with ramps. Ore thickness generally ranges from 2m to 10m. Miners climbed up the muck pile and stood on the muck to drill. Rock bolts were used in the walls somewhat rarely. Occasionally, pillars were left, especially where the dip became shallower. A sill pillar was left as the floor of the intermediate haulage levels, every 50m vertically. When stoping reached the sill pillar, the roof was bolted. After completion, the stope was mucked with 5t or 7t LHDs. There was no hydraulic backfill at Boh Yai, and a little waste rock backfill. All stoping is in limestone.

Shallower dipping stopes, often 40° to 50°, such as Song Toh Mine North, have sub-levels 15m apart vertically, connected with spiral ramps. Ore thickness is also usually between 2m and 10m. A raise was driven from one sub-level to the next, using a slusher. Then the raise was enlarged. Miners stood on the ore to drill and completed the sub-level interval before the stope was mucked out (slusher and LHD) and backfilled with hydraulic fill or development waste. Pillars were left. These are usually round, 2m to 4m in diameter, typically 3m. Some are elongated, as long as 7m. Spacing and size were not predetermined but designed to suit ground conditions, but pillars are often spaced at centres of 7m to 15m. The hangingwall was bolted as required to hold visible weak blocks. All hangingwalls and footwalls are in limestone. Ramp intersections have spans similar to those in the Haulage described above.

The limestone has a bulk density of 2.5t/m^3. Waste that is mineralized, but below cut-off, has an average density of 2.6t/m^3. Ore density varies by Pb-Zn grade from 2.7t/m^3 to 3.0t/m^3 with 2.8t/m^3 as the average.

Ground problems associated with karstified zones were noted but no specific details provided.

5.0 GEOTECHNICAL CONCEPTS

Geotechnical classification systems are typically used for assessment of rock mass strength for use as input into excavation design. Two of the most popular classification systems include the Norwegian Geotechnical Institute (NGI) Tunnelling Index (*Q*) (Barton et al. 1974) and the Bieniawski's Rock Mass Rating (RMR) system (1976). Typically the parameters required in these systems are measured or estimated directly in the field. Input to these classification systems can include the following:

- RQD (Rock Quality Designation), a measure of the quality of rock based on measurements of the degree of brokenness of recovered diamond drill core;
- Number of predominant joint sets;
- Spacing of joint sets;
- Joint condition;
- Rock strength;
- Influence of water; and
- Influence of stress.

The results of rock mass classification are typically used as input to analytical, empirical or numerical stability assessment techniques or programs to determine excavation stability such as maximum safe excavated span, pillar sizing and loading and ground support requirements.

There was no documentation found of a formal geotechnical assessment of rock mass classification had been carried out prior to or during the mining operations at Boh Yai or Song Toh mines. Review of the available geotechnical information available does not provide sufficient information to directly determine rock mass classification, however back analysis of existing stable excavated geometries can be used to indirectly determine minimum rock mass classifications that can be used for future design of excavations. A summary of geotechnical findings based on review of available information is outlined below.

5.1 Historical Drilling

No digital database of all the drilling exists, rather hardcopy logs of some Song Toh and Boh Yai logs were provided to Golder. Within the NI-43101 report (Arum Exploration and NAR Environmental Servecs, 2008), noted that the basic drilling information appears to have been recorded though the geological descriptions and geotechnical parameters are lacking detail beyond the rock type and color.

5.2 Rock Quality Designation (RQD)

RQD is defined as the percentage of solid core in excess of 100mm in length retrieved from a length of core. This parameter is typically measured as soon as the core is retrieved from the core barrel, as handling and storage can result in breakage and an underestimation of RQD measurement. If RQD is not measured directly from fresh core, it can often be measured from photographs of core within core boxes, as long as the drillers indicate which fractures they created by mechanical means (for example breaking the core to fit it into the box). From review of the core logs provided no record of RQD was noted.

Zones of high core loss are associated with karstic areas and faulting and have been noted in the select borehole logs. The expected width of these zones can not be determined from the data provided.

5.3 Predominant Joint Sets

Geological and level plans supplied for the Song Toh and Boh Yai mine included some mapping along the access ramps and stoping areas. Bedding, foliation, strike slip faults, normal faults and thrust faulting were noted as traces on the planes for Boh Yai Hills 3 and 7. These traces were measured off the supplied plans and have been plotted within stereonets included within Appendix A. The summary plots indicate three major sets including bedding and two steeply dipping orthogonal sets.

Joint set spacing was not recorded on the provided borehole logs or in any previous site reports. Based on a review of the underground photos at the Boh Yai mine from Golder's 2012 site visit by Peter Merry, the rock mass appears massive to blocky with joints typically spaced 0.5 m, ranging form 0.2 to 1.0 m.

5.4 Joint Condition

The shape and roughness of each discontinuity surface is typically described along with the infilling, alteration, or other notable characteristics. Neither the joint condition or discontinuity shape/roughness was routinely recorded in the drillhole logs provided to Golder.

Pyrite, calcium carbonate and quartz veins were noted on various drillhole logs within the limestone and ore. Laterite filled karstitifed zones were commented on causing ground instability issues in Song Toh mine. Near surface iron staining on the joint surfaces is attributed with water flowing along the joints. A few fault planes were noted with graphite infilling though no thickness was indicated.

5.5 Intact Rock Strength

The hardness or strength of the intact rock can be estimated in the field with a hammer or knife and related to the Unconfined Compressive Strength (UCS). Measuring the field strength at regular intervals provides a good determination of the UCS over the drill core as samples for UCS testing are limited. Field strength of the drill core is not typically noted on the drill hole logs except in very weak zones due to faulting or karstic ground.

Unconfined compressive strength (UCS) testing was conducted on drill core samples collected by SEA at the site. Samples tested from the Song Toh and Boh Yai mines of limestone and ore rock samples are listed in Table 5.1 below, as included in Appendix B.

Table 5.1: Summary of Unconfined Compressive Strength Testing

Mine	Rock Type	No. Samples	UCS (MPa)
Song Toh	Limestone	4	Average: 86 Range: 72 – 98
	Ore	4	Average: 54 Range:35 – 74
Boh Yai	Limestone	10	Average: 67 Range: 42 – 100
	Ore	6	Average: 66 Range: 20 – 94

Figures 4 to 6 present the UCS testing of the provided UCS data. Based on the select UCS testing no trend in rock strength is noticeable between Song Toh and Boh Yai mine. The ore zone is generally slightly weaker than the limestone and rock strength increases with distance away from the ore zone. No difference in strength was noted between the hanging wall and footwall. Rock samples for UCS testing were collected from near surface up to 200 m depth and the rock strengths were found to be highly variable within this range. No trend between rock strength and depth can be established from this data set.

For the purpose of design the limestone and ore are assumed to be medium strong with a UCS of 75 MPa and 50 MPa, respectively.

6.0 GEOLOGICAL STRUCTURE

The geological cross sections through the Boh Yai deposit clearly indicate the geological complexity of the area and suggest some discontinuity of the mineralization. However, it should be noted that the interpretations of the cross-sections has been simplistic with the joining of mineralized intersections between adjacent holes regardless of any geological or structural knowledge. Adjacent intersections vary markedly in thickness and grade throughout the area. Some simplistic geological structures are depicted based on the geological logging in some drill holes.

Appendix A presents stereographic projections of the structural discontinuity data measured from the geological cross sections. The projections indicate the major (or dominant) and minor discontinuity sets, which represent the structural fabric for the main rock masses that will daylight on the stope walls. Based on the review of the limited discontinuity data it would appear that a major discontinuity set parallels the ore zone dip, and up to two sub-vertical joint sets bisect the rock mass. Minor joint sets are also indicated.

6.1 Rock Mass Classification

A preliminary assessment of the overall quality of the rock masses that will comprise the underground excavations has been prepared using the NGI-Q (Barton et al. 1974) and Rock Mass Rating – RMR (Bieniawski, 1976) rock mass classification systems, based on the following data and the procedure outlined below.

Both the Q-System (Barton et al., 1974) and Rock Mass Rating (RMR) (Bieniawski, 1976) were estimated to compare the two classification systems.

The Q-system for classification is calculated as follows:

$$Q = \frac{RQD}{J_n} \cdot \frac{J_r}{J_a} \cdot \frac{J_w}{SRF}$$

Where:

Where:	RQD	is the Rock Quality Designation;
	J_r	is the Joint Roughness number;
	J_w	is the Joint Water reduction factor;
	J_n	is the Joint Set number;
	J_a	is the Joint Alteration number; and,
	SRF	is the Stress Reduction Factor.

The Q' value is defined according to the following formula, without any correction for external influences such as stress or water conditions (i.e. Jw = 1 for dry conditions and SRF = 1, medium stress).

$$Q' = \frac{RQD}{J_n} \cdot \frac{J_r}{J_a}$$

The RMR_{76} (Bieniawski, 1976) classification system is calculated as follows:

$$RMR_{76} = P1 + P2 + P3 + P4 + P5$$

Where:	P1	is the strength of intact rock material (rating = 0 to 15);
	P2	is the drill core quality, Rock Quality Designation, RQD (rating = 3 to 20);
	P3	is the spacing of joints (rating = 5 to 30);
	P4	is the condition of joints (rating = 0 to 25); and,
	P5	is the groundwater (rating = 0 to 10).

6.1.1 Rock Mass Classification Estimates

In general, the rockmass can be described as good rock (10 < Q' < 40) (60 < RMR < 80) based on the assumptions below. Note that there is not sufficient information for separate rock mass classifications for the limestone and ore.

For RMR calculations, a groundwater rating for dry conditions has been assumed for the purpose of assessing the geomechanical characteristics of the rock mass in the absence of external factors. For certain design applications, it may be necessary to adjust the rock mass quality to account for the expected water conditions.

For the purpose of assessing the rock mass quality without any correction external influences, the Q' values were estimated assuming dry conditions (Jw =1) and medium in-situ stresses (SRF = 1). Table 6.1 below and Figures 7 and 8 present the average rock mass classification estimates for RMR76 and Q based on the drillhole logs, 2012 site visit by Golder (Peter Merry), and personal communication with Mr. Brady (2012).

Table 6.1: Rock Mass Classification Estimates

Parameter	Description or Range of Values	Rating	
		NGI-Q'	**RMR_{76}**
Drill Core Quality (RQD%)	Good to Very Good Quality; Assume 85% (+/- 10 %) (based on observation of underground photographs)	85	14
Number of Joint Sets (Jn)	Assume three sets (bedding plus two joint sets) (based on stereographic projections)	9	
Spacing of Joints, Fracture Index	Blocky to massive (based on observation of underground photographs)		20
Condition of Joints Roughness (Jr) Alteration (Ja)	Generally smooth to rough (Jr = 2) Generally slightly altered joint walls (Ja = 2) (Assumed average conditions)	1	20
Intact Strength from UCS (MPa)	Strong Limestone = 75 MPa Ore = 50 MPa (Based on limited strength testing results)		7 - 10
Groundwater Inflow Conditions	Moist to some water	1	10
Structure Orientation Rating	Not used for general conditions		0
Stress Reduction Factor	Not used for general conditions	1	
		9.4	**71 - 74**

6.1.2 Back Analysis of Rock Mass Classification Based on Maximum Observed Span Openings

From a review of the provided Song Toh North mine plans, the maximum spans of the excavations were measured to provide a lower bound estimates of the rock mass quality (Q') based on the fact that the excavations are still stable since the mine has been closed. Three techniques were used including:

- Mathews/Potvin stability graph (Mathews et.al 1989);
- Maximum unsupported span incorporating the Q method; and
- Stand up time incorporating the RMR.

Mathews Method

The Mathews method developed by Mathews et al. (1981) and updated by Potvin (1988) compares a modified stability number (N') (based on rock mass characterization, stress, structure orientation) to opening dimension (calculated as hydraulic radius) to predict the stability of an open stope wall. A summary of the technique is included in Figures 9 to 11.

The modified stability numbers (N') are estimated by:

$$N' = Q' \times A \times B \times C$$

where:

Q' = modified NGI-Q rock mass quality

A = Rock Stress Factor

B = Joint Orientation Adjustment Factor

C = Gravity Adjustment Factor

By comparing the existing mined geometries at the Song Toh and Boh Yai mines to the Mathews stability chart, the minimum modified stability number can be determined and the minimum Q for a measured opening size can be estimated. The following assumptions were used in the assessment:

- A = 1, hanging wall is relaxed;
- B = 0.3, predominant joint set is within 20 to 30 degrees of the plane of the hanging wall;
- C = 4.2, for typical dip of orebody of 50 degrees; and
- C = 2.0, for typical flat back room.

Spans were measured from Song Toh north and Boh Yai Hills 3, 4, 5, 7, and 11 mine plans for the largest circular opening and for the largest width in the back of select inclined stopes. From approximately 100 openings measured, the minimum Q' value for stability was estimated at a value of 10 (good rockmass). This equates to a RMR_{76} value of 65 (good rock mass) (given RMR76 = 9lnQ'+44).

Maximum Unsupported Span – Q System

The maximum unsupported span based on the Q system is given by the following equation:

$$Span\ (unsupported) = 2(ESR)Q^{0.4}$$

Where: ESR (Excavation Support Category) is estimated to range between 3 and 5 to represent a temporary mine opening.

For the maximum unsupported span of 20 m determined from measurement of existing mine plans, a Q value of 10 to 20 is calculated (good rock mass). This equates to a RMR_{76} value of between 65 and 71 (good rock mass).

Maximum Stand Up Time – RMR System

The relationship between stand-up time for an unsupported underground excavation span and the RMR system as proposed by Bieniawski (1989) is shown in Figure 12.

For the unsupported spans of between 10 and 20 m determined from measurement of existing mine plans, which has been in place for approximately 10+ years, an RMR_{76} value in excess of 80 is calculated (very good rock mass). This equates to a Q value of approximately 55 (very good rock mass).

6.2 Geotechnical Domain

6.2.1 Ground Conditions

Estimates of rock mass conditions by observation and back analysis of the condition of existing mine openings indicate the conditions that have been mined in to date have encountered good to very good ground conditions. There was some mention in the technical report on the Kemco and Boh Yai Lead-Zinc Properties (Aurum Exploration Services, 2008) of zones of ground problems associated with caving of karstified zones, filled with laterite, however no details were given and such zones were not observed during the mine inspection by Aurum.

6.2.2 Rock Stress

There are no known reports of in-situ rock stress measurements carried out in the vicinity of the mine site, nor in Thailand in general. The World Stress Map (Heidbach et.al 2009), included as Figure 13, does indicate the principal horizontal stresses in the vicinity of the Gulf of Thailand to be generally in a North-South direction, however the magnitudes are not measured.

The mining to date has predominantly been done in steep hills at the mine site, above the eroded valley floor. As such, the principal in-situ stress (σ_{max}) can be expected to be in the vertical direction (σ_v=σ_{max}) above the valley floors, with a horizontal minor principal stress less than the vertical (σ_{hmin}<σ_{max}) value due to the un-confinement of the hills above the valley floor. A thesis carried out on “The Determination and Application of In Situ Stresses in Petroleum Exploration and Production” (Meyer, 2002), suggests the in-situ stress tensor within the Pattani Basin, Gulf of Thailand may have a stress regime such that $\sigma_{hmin}<\sigma_v=\sigma_{Hmax}$ which would suggest that the maximum principal horizontal and vertical stresses are approximately equal at depth.

6.2.3 Rock Strength

The rock mass strength as determined by the back analysis carried out in Section 6.1 would indicate the previous mine stoping was carried out in good rock mass conditions (RMR = 65-80, Q = 10-55). It is recommended that for preliminary excavation design a Hoek-Brown (2002) failure criterion for estimation of rock mass strength be used.

The Generalised Hoek-Brown failure criterion for jointed rock masses is defined by:

$$\sigma_1' = \sigma_3' + \sigma_{ci}\left(m_b \frac{\sigma_3'}{\sigma_{ci}} + s\right)^a$$

Where:

- σ_1' and σ_3' are the maximum and minimum effective principal stresses at failure;
- m_b is the value of the Hoek-Brown constant m for the rock mass;
- s and a are constants which depend upon the rock mass characteristics; and
- σ_{ci} is the uniaxial compressive strength of the intact rock.

In order to use this criterion for estimating the strength and stiffness parameters for jointed rock masses, three different 'properties' of the rock mass have to be estimated. These are:

- value of the Hoek-Brown material constant m_i for the intact rock pieces;
- UCS of the intact rock; and
- GSI (RMR_{76}) for the rock mass.

The relationships between the rock mass Hoek-Brown parameters and the intact rock parameters as a function of GSI are as follows:

$$a = \frac{1}{2} + \frac{1}{6}\left(e^{-\frac{GSI}{15}} - e^{-\frac{20}{3}}\right)$$

$$s = e^{\frac{GSI-100}{9-3D}}$$

$$m_b = m_i \times e^{\frac{GSI-100}{28-14D}}$$

where D is the disturbance factor $(0 < D < 1)$.

Based on the following assumptions:

- GSI (RMR_{76}) = 70
- m_i = 7 (carbonate rock)
- σ_{ci} = 50 Mpa
- D = 0 (careful blasting)

The following Hoek-Brown criteria is determined:

- a = 0.501
- m_b = 2.405
- s = 0.036

7.0 GROUND SUPPORT AND REINFORCEMENT

Observations reported by Brady (2012) and Aurum (2008), indicated rock support was generally not used, with support consisting of 6 ft. long split set bolts on an as needed basis. Based on the estimated rock mass conditions of Q ranging from 10 to 55, and unsupported spans of up to 20m within the stoping areas reinforcement requirements can be estimated based on the support requirements chart of Grimstad and Barton (1993). As an example demonstrated within Figure 13, for the 20m span measured within the stoping area, with an ESR of 3 to 5 for temporary excavation, the support requirement would suggest no bolting required to spot bolting in the stoping area.

This chart can be used to plan support requirements for the proposed stoping and development areas, based on the encountered rock mass conditions.

8.0 GEOTECHNICAL CONSIDERATIONS

8.1 Local Scale Ground Control

8.1.1 Geological Structure

The rock mass classification estimates presented have been based on back analysis of reported conditions encountered to date. As the mine is prepared and developed for re-opening, the existing accessible stopes and new development areas must be geotechnically assessed to confirm the assumptions presented. Mapping of the geotechnical structure should be undertaken on a regular basis to build on the geotechnical database in order to optimize design of excavation geometries and support requirements.

8.1.2 Opening Size and Geometry

Based on precedent experience at the mine sites a predominantly unsupported development drift span of 4m has proved to be stable, with the requirement for spot bolting as required. As spot bolting has been required in the past, a regular geotechnical assessment of openings must be undertaken to determine when additional support may be required. Those zones where reported ground control problems may have been encountered as a result of karst conditions should be re-visited to assess the conditions in order to identify similar conditions that may be encountered during the mine re-development.

In the case of stoping, spans in the order of 10 to 15m were commonly excavated with no reported cases on major instability. It is recommended that for planning purposes a maximum stope span of 15m be used until access and redevelopment, along with regular geotechnical assessment of ground conditions confirms the rock mass conditions.

Previous mining in steeper zones of the mines used 12m sublevels, with sill pillars left between levels at approximately 50m intervals. It is recommended that this design be used for planning purposes until access and redevelopment, along with regular geotechnical assessment of ground conditions confirms the rock mass conditions. An assessment of sill pillar stability and sizes depending on ore body width has been carried out in Section 8.2.

8.2 Large-Scale ground Control

8.2.1 Geotechnical Data

The following section provides the stope mining design for the preliminary underground geomechanical design based on the rock mass information presented in Section 6. This assessment should be re-assessed following access and redevelopment, along with regular geotechnical assessment of ground conditions to confirm the rock mass conditions and allow optimization of design.

8.2.2 Stope and Pillar Dimensions

An assessment of pillar sizing for room and pillar operations in flatter zones of the orebody, as well as sill pillar sizing in steeper portions of the orebody has been carried out based on findings of UCS testing presented in Section 5.5.

8.2.2.1 Room and Pillar

Mining to date has incorporated random pillars established when mining flatter sections of the orebody to essentially act as “span breakers” to limit the maximum open span of back within a stope typically to 12 to 15m. The load that these pillars will carry will depend on the geometry of the orebody and the span of the openings. With an orebody dip ranging between 50 and 90 degrees and ore widths typically not exceeding 10m, the width of a single cut would typically not exceed 20m in transverse distance in the shallowest dipping area. Due to this rather small span, the stress loading on these pillars is far less than superincumbent load due to the load transfer to the abutments of the hanging and foot walls.

In previous mining of flatter zones of the ore bodies, pillars of 3-4m width were left at approximately 10 m centre to centre distance along the mid span of the stope. This resulted in extraction ratios of approximately 90%. A numerical analysis has been carried out to approximate the stress concentrations on these pillars based on the historical mining geometries. It has been assumed that the ore is mined in 4 m high slices with pillars left along the central span of the orebody. The model induced pillar stress calculated in Rocscience boundary element program Examine2D is an approximation of the average load that will be on the pillar. The induced pillar stress is compared to the Pillar Stability graph (Figure 15) for 4 m high cuts that are stable for extraction ratios from 75% to 95% at depths of 100m, 200, and 300 m.

As potential stress increases with depth of the orebody, the pillar stability decreases. The options to decrease induced pillar stress include enlarging the widths of the pillars or decreasing the spacing between pillars. As pillar stability increases at a greater rate with increase width than increased spacing, with increasing depth there is a trade off between increasing the pillar sizes or reducing the opening width between the pillars.

From results of modeling the induced stress within the pillars and comparing it to pillar stability, for the conditions outlined above, the following observations are made:

- Pillars 3m x 3m with a 10 m centre to centre span are satisfactory for depths up to 150m;
- Pillars 4m x 4m with 10m centre to centre span are satisfactory to depth of up to 190 m;
- Pillars 5m x 5m with 10m centre to centre span are satisfactory to depths of up to 230 m; and

- Pillars 6m x 6m with 10m centre to centre span are satisfactory to depths of up to 270 m.

A summary of proposed pillar sizes and resulting extraction ratios are outlined in Table 8.1 below.

Table 8.1: Summary of Recommended Pillar Geometries for Room and Pillar with a 10 m Centre to Centre Span

Pillar Size (m)	Recommended Depth for Pillar Geometry(m)	Span (m)	Extraction Ratio (%)
3 m x 3 m	150 m	17 m	96%
4 m x 4 m	190 m	16 m	92%
5 m x 5 m	230 m	15 m	88 %
6 m x 6 m	270 m	14 m	82%

Mining flatly dipping ore with room and pillar below depths of 250 m will require increasing the span between pillars greater than 10 m and or increasing the pillar geometries.

8.2.2.2 Sill Pillars

Based on the provided mine plans and cross-sections, for steeply dipping ore (greater than 60 degrees), the ore has typically been accessed at 10 to 12m sublevels, with sill pillars left at 50 m levels, typically of 10-12m thickness (height).

Numerical modelling has been carried out to determine stress loadings and stability of the sill pillars between levels. Various mining geometries were considered for ore widths at 5 m and 10 m and sill pillar heights ranging from 5m to 15m (corresponding to extraction ratios of 75% to 92%). The pillar stress (σi) was determined in the center of each pillar up to a 300 m depth for the steeply dipping ore, using Rocscience 2D boundary element software Examine 2D. From the pillar stability graph (Figure 15), the ratio of the induced stress (σi) to the unconfined compressive strength (UCS) is compared to the pillar ratio (Wp:Hp) to determine if the pillar will be stable at that depth and extraction ratio.

The analyses and recommendations are based on models assuming the following:

- A 2-D analysis where infinite strike length is assumed. This can be considered to be a worst case as rib pillars left between adjacent panels will reduce sill pillar loadings.
- K_o (ratio of Horizontal to Vertical Stress) = 1
- Pillar / Excavation geometries remain constant from surface to 350 m depth
- Strength Factor calculated using Hoek Brown failure criterion as discussed in Section 6.2.3

For vertical ore zones averaging 5 m wide, pillar ratios (Wp(vertical):Hp(horizontal)) (of 1:1 are recommended for planning purposes up to 150 m depth. Below 150 m depth, the pillar ratio (Wp:Hp) should be increased to 2:1 up to 350 m depth. Refer to Figure 16.

For vertical ore zones averaging 10 m width, pillar ratios (Wp:Hp) of 1:1 are appropriate up to 325 m depth. Below 325 m, the pillar ratio (Wp:Hp) should be increased to 2:1. Refer to Figure 17.

Table 8.2: Summary of Recommended Pillar Geometries for Sill Pillars

Ore Width (m)	Depth (m)	Pillar Geometry (Wp:Hp)	Extraction Ratio (%)
5	0 to 150 m	1	92%
	150 m to 350 m	2	80%
10	0 to 325 m	1	80%
	325 m to 350 m	2	75%

9.0 RECOMMENDATIONS FOR GEOTECHNICAL BEST PRACTICE

In order to optimize the mining practice, stope sizing and support requirements once the mine re-opens geotechnical data should be collected on a regular basis to assist with design. This will include:

- Field Mapping – geotechnical mapping of the discontinuity orientation, distribution and condition should be carried out as the mine is developed.
- Rock Mass Characterization – a data base of mine wide rock mass characterization should be established and updated as development and mining progresses. This would include:
  - Measurement of RQD based on investigation drilling, or field estimation of RQD parameters;
  - Collection of additional samples of HW, Ore Zone and FW for rock strength testing, or carrying out field estimation of rock strength; and
  - Measurement and monitoring of water inflow to determine trends and quantities.
- Establishing a geotechnical reporting form that mine workers and supervisors can report observations or changes in ground condition on a daily basis so that support methods can be quickly implemented and mining geometries optimized as ground conditions change.

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Report Signature Page

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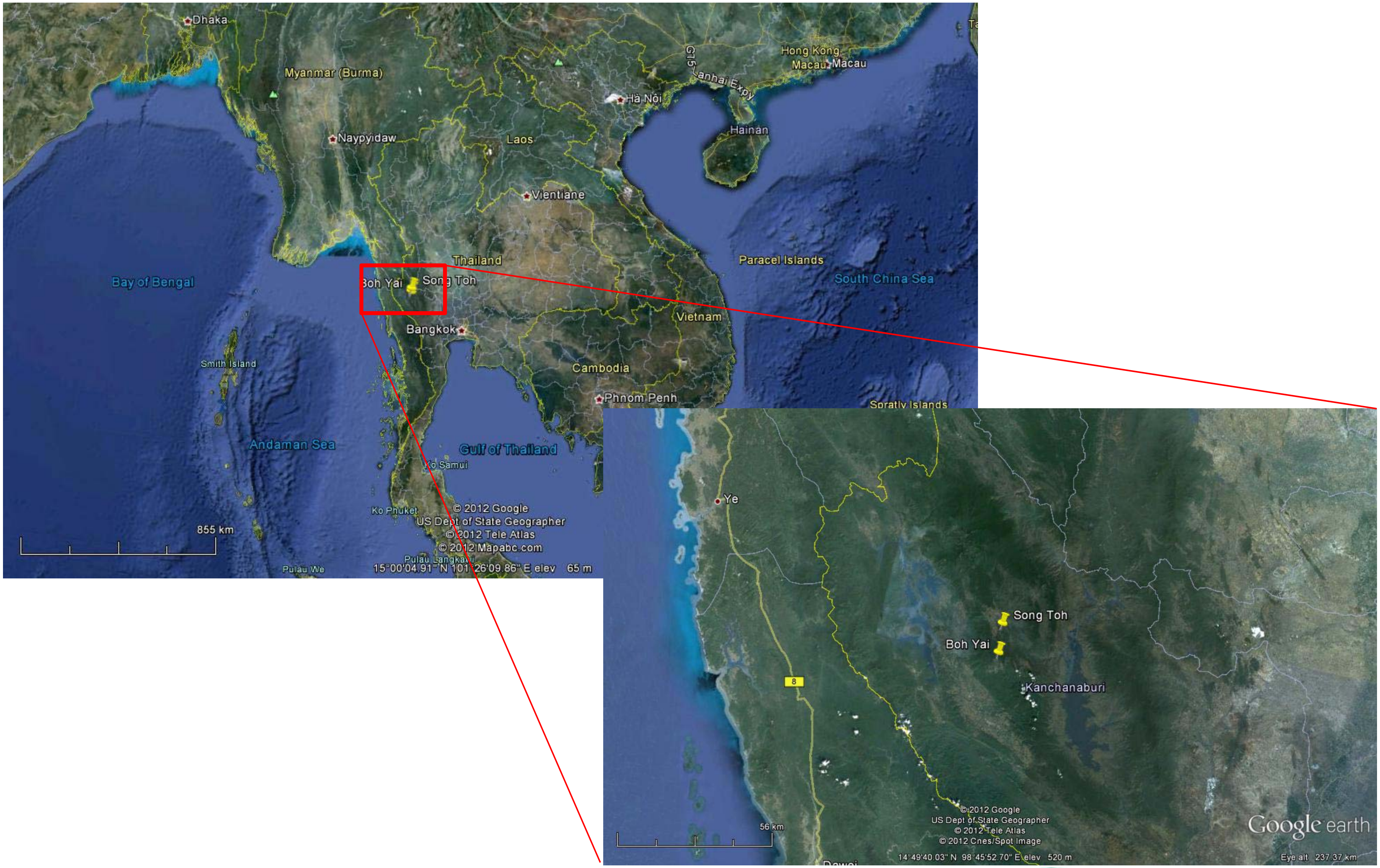
FIGURES

Location of Song Toh Boh Yai Mine

FIGURE 1



Date: August 2012

Project: 12-1118-0011-3000 - Song Toh Mine

Golder Associates

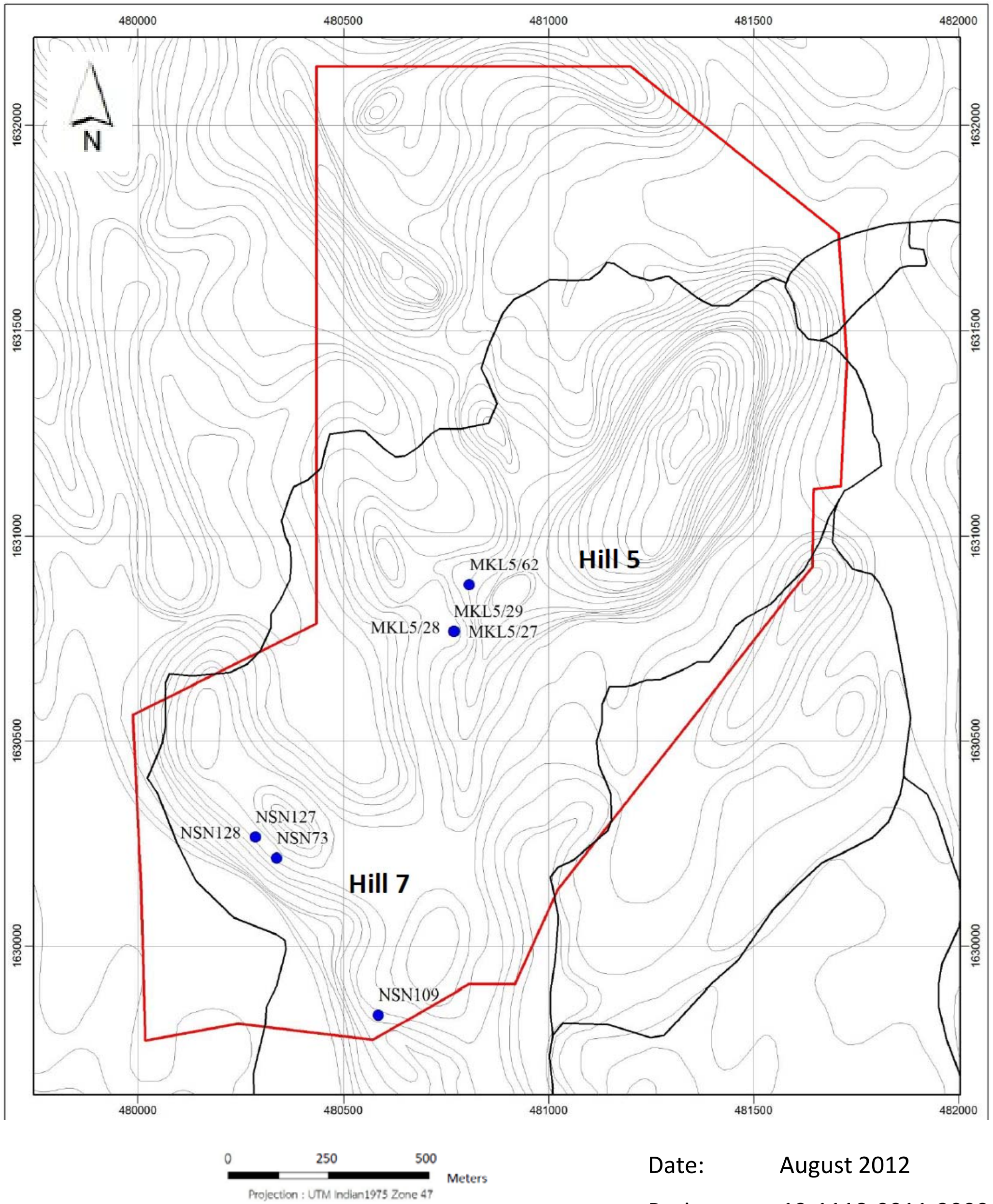
Drawn: JH / MRR

Chkd : CMS

Map provided by SEAMC, 2012

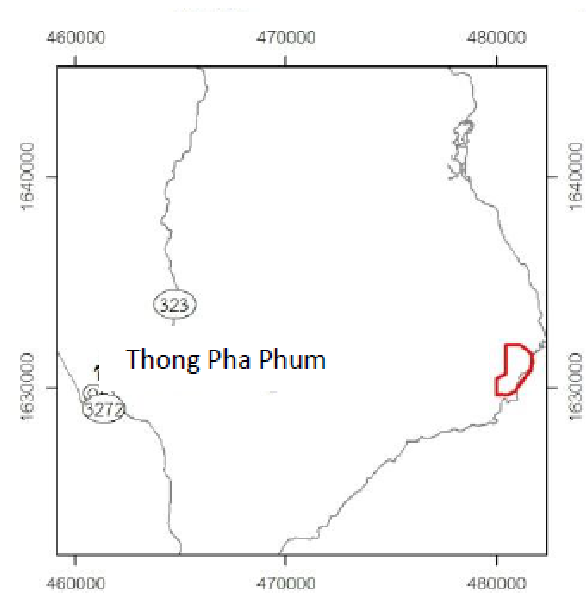
Boh Yai Site Surface Plan

FIGURE 2



Legend

- Claim Boundary
- Drill Holes
- Roads
- Elevation Contours



Date: August 2012

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Golder Associates

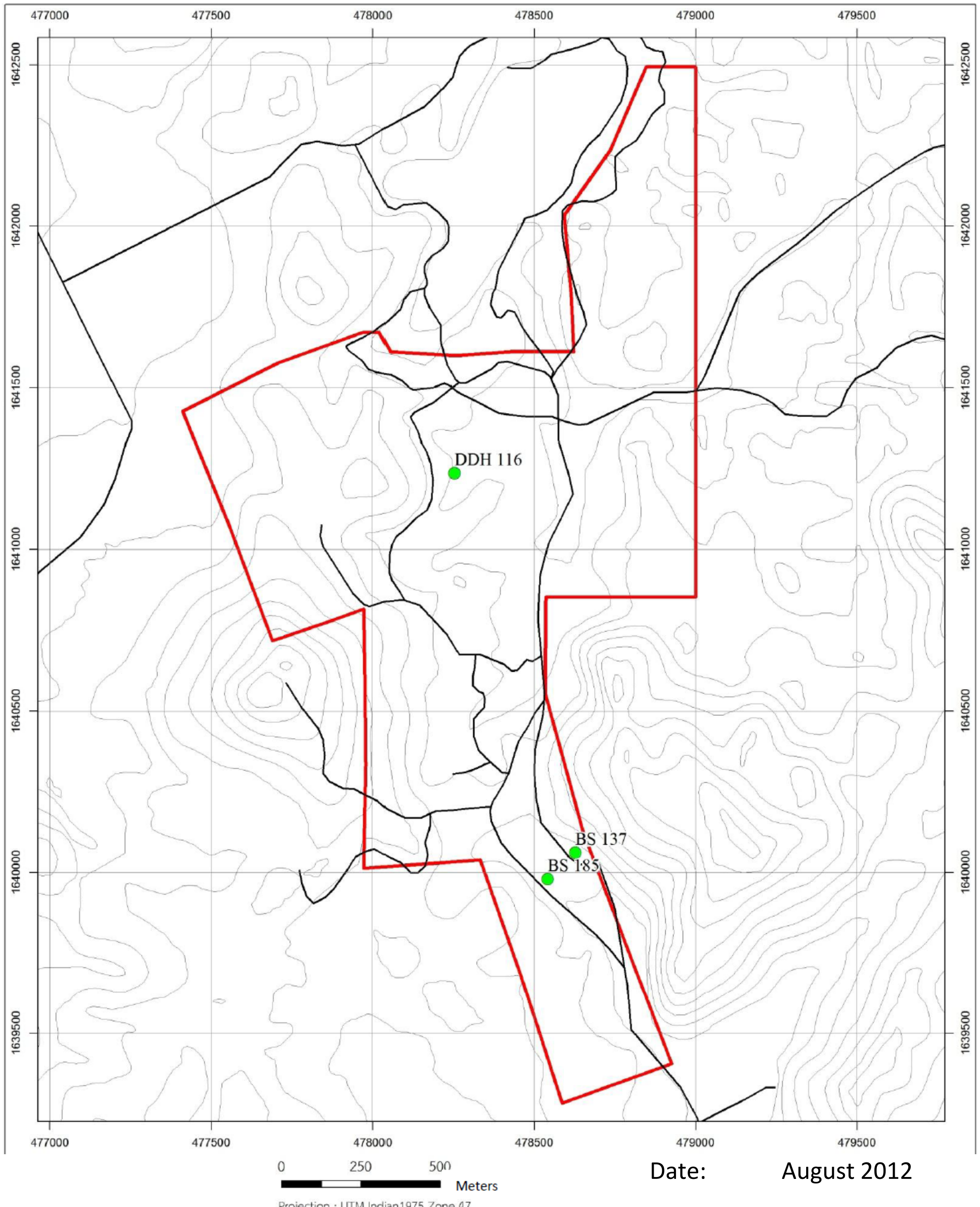
Drawn: JH / MRR

Chkd : CMS

Map provided by SEAMC, 2012

Song Toh Site Surface Plan

FIGURE 3



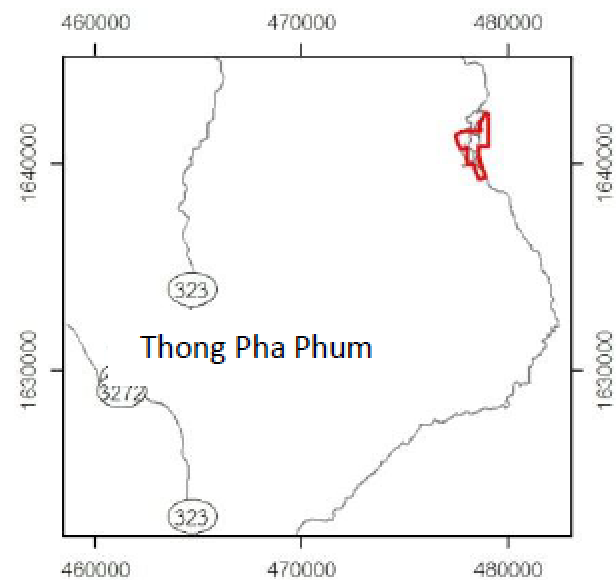
Legend

Claim Boundary

Drill Holes

Roads

Elevation Contours



Date: August 2012

Project: 12-1118-0011-3000 - Song Toh Mine

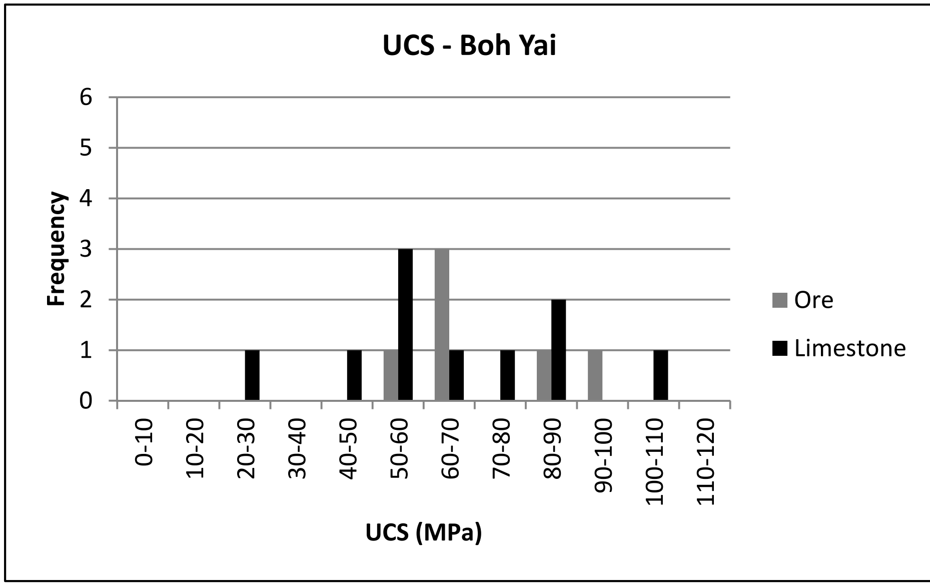
Golder Associates

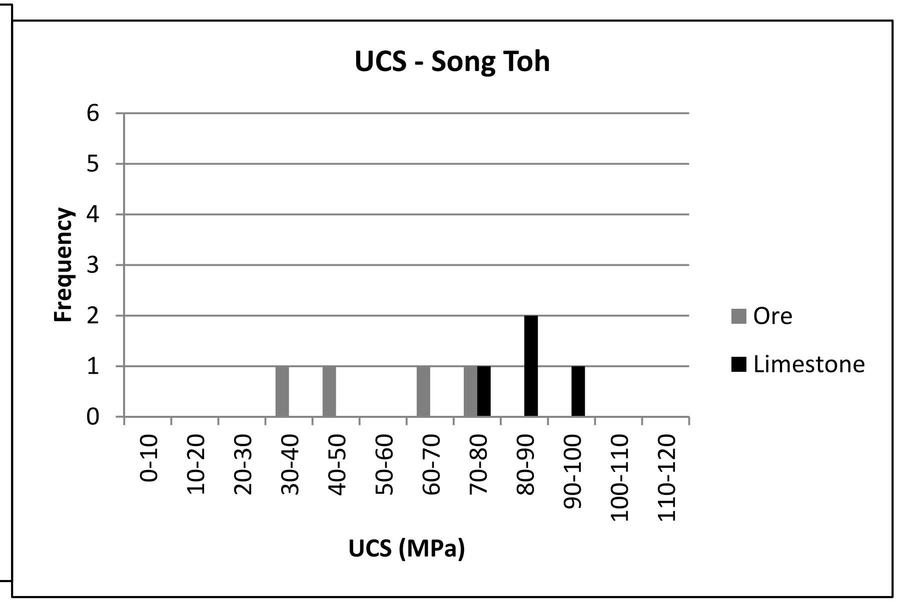
Drawn: JH / MRR

Chkd : CMS

Summary of UCS Testing Provided to Golder

FIGURE 4





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Song Toh	Limestone	4	Average: 86 Range: 72 – 98
	Ore	4	Average: 54 Range:35 – 74
Boh Yai	Limestone	10	Average: 67 Range: 42 – 100
	Ore	6	Average: 66 Range: 20 – 94

Date: August 2012

Project: 12-1118-0011-3000 - Song Toh Mine

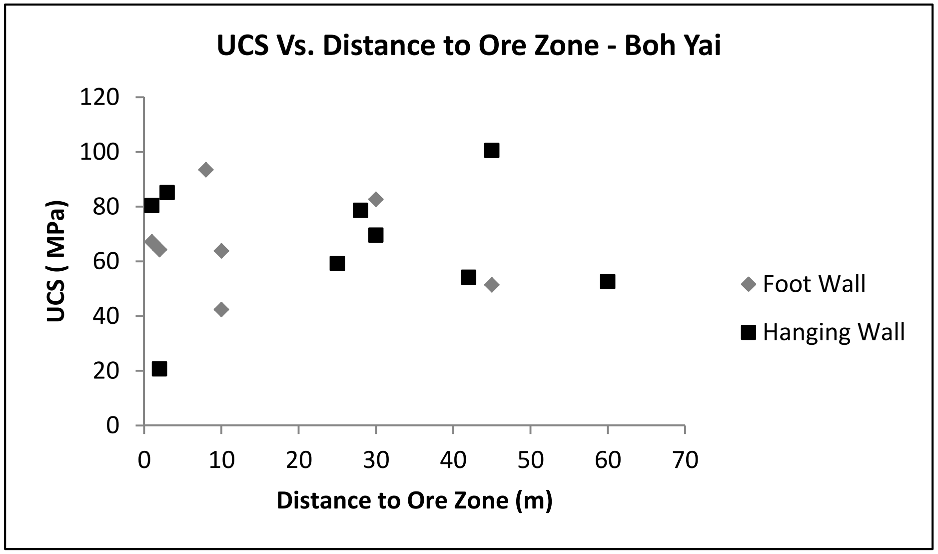
Golder Associates

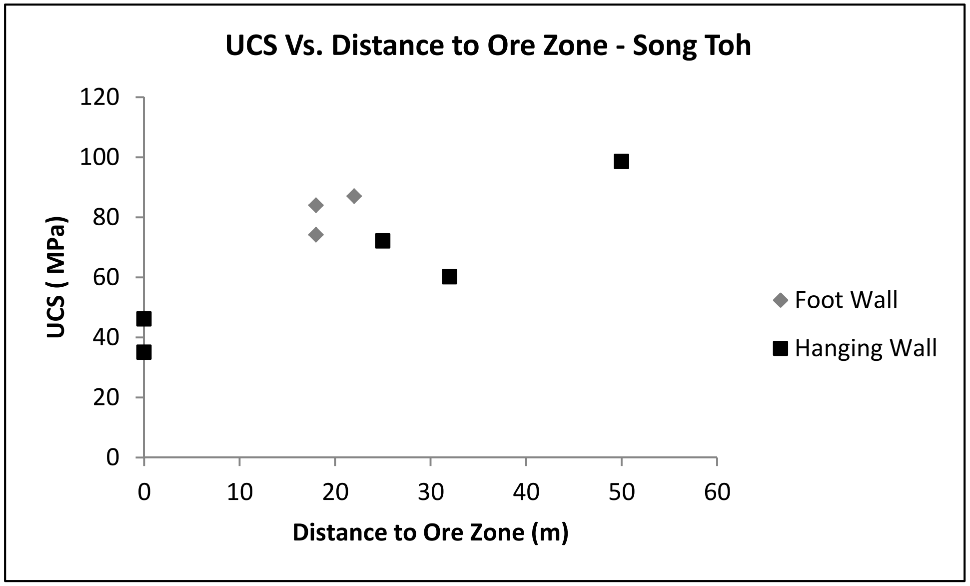
Drawn: JH / MRR

Chkd : CMS

UCS vs. Distance to Ore Zone

FIGURE 5





Distance to ore zone based on provided cross sections and the UCS depths along the drill hole

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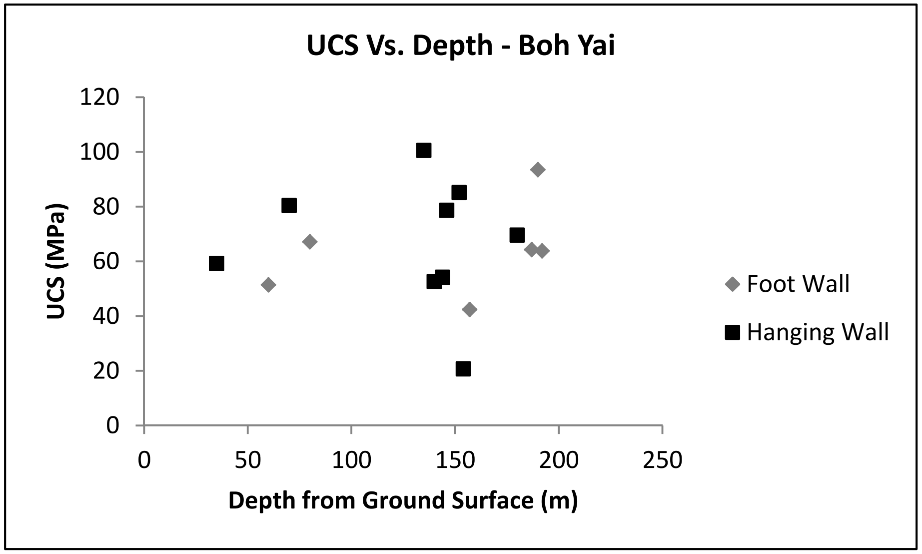
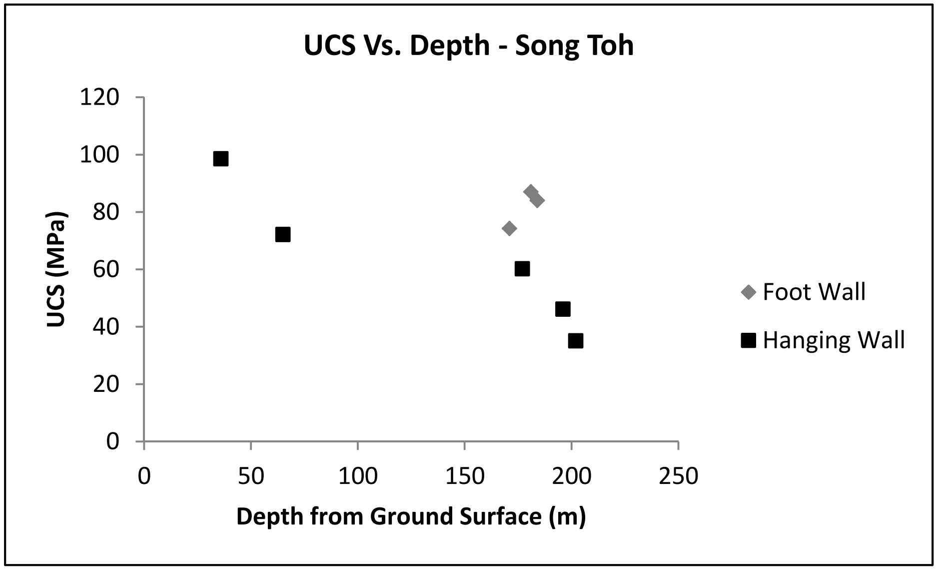
Chkd : CMS

UCS vs. Depth from Surface

FIGURE 6





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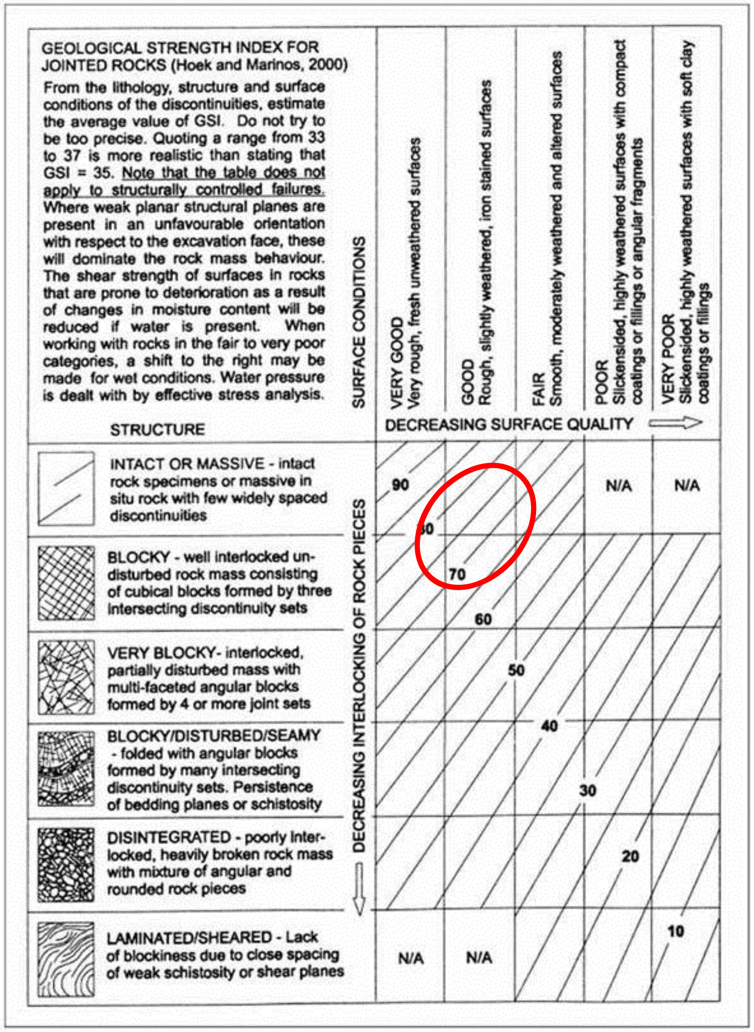
GSI Estimation Based on Photographs from Site Visit

FIGURE 7



GSI = 65 – 80 (equivalent to RMR76)

Given GSI = 9 lnQ’ + 44

Q’ (equivalent) = 10 - 55

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Rock Mass Classification Summary

FIGURE 8

ROCK MASS CLASSIFICATION BASED ON REPRESENTATIVE PARAMETERS

Parameter	Description or Range of Values	Rating	
		NGI-Q'	**RMR76**
Drill Core Quality (RQD%)	Good to Very Good Quality; Assume 85% (+/- 10 %)	85	14
Number of Joint Sets (Jn)	Assume three sets (bedding plus two joint sets)	9	
Spacing of Joints, Fracture Index	Blocky to massive		20
Condition of Joints Roughness (Jr) Alteration (Ja)	Generally smooth to rough (Jr = 2) Generally slightly altered joint walls (Ja = 2)	1	20
Intact Strength from UCS (MPa)	Strong Limestone = 75 MPa Ore = 50 MPa		7 - 10
Groundwater Inflow Conditions	Moist to some water	1	7
Strucutre Orientation Rating	Not used for general conditions		0
Stress Reduction Factor	Not used for general conditions	1	
		9.4	**68 - 71**

The Modified Tunnel Quality Index, Q' (Barton et al. 1974) is calculated as follows:

$$Q' = \frac{RQD}{J_n} \cdot \frac{J_r}{J_a}$$

Where:

RQD is the Rock Quality Designation;
J_r is the Joint Roughness number;
J_n is the Joint Set number; and
J_a is the Joint Alteration number.

The RMR_{76} (Bieniawski, 1976) classification system is calculated as follows:

RMR_{76} = P1 + P2 + P3 + P4 + P5

Where:

P1 is the strength of intact rock material (rating = 0 to 15);
P2 is the drill core quality, Rock Quality Designation, RQD (rating = 3 to 20);
P3 is the spacing of joints (rating = 5 to 30);
P4 is the condition of joints (rating = 0 to 25); and,
P5 is the groundwater (rating = 0 to 10).

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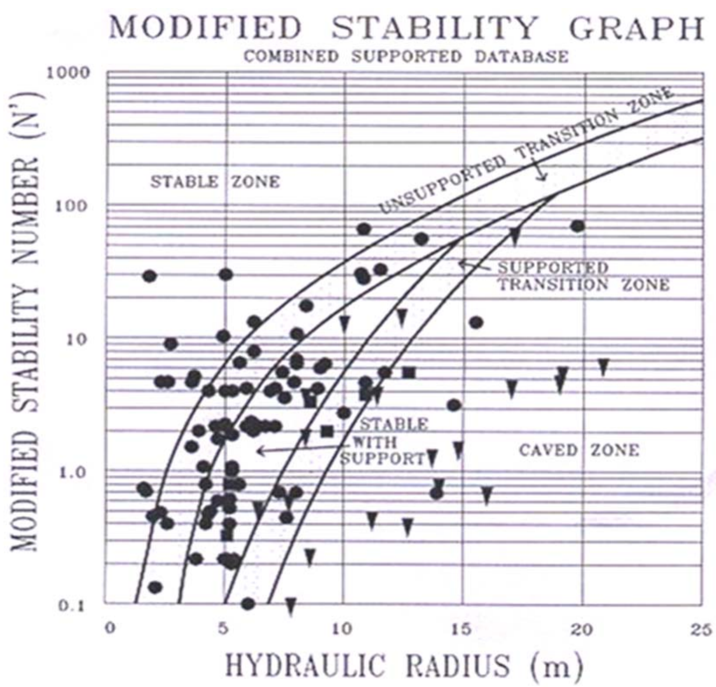
Mathews Potvin Stability Graph Method

FIGURE 9

Q' Calculation Using the Stability Graph Method (Potvin et al. 1992)

- Q' can be calculated using the N' equation below;
- N' is approximated from the Modified Stability Graph, below; and
- A, B and C are approximated using the tables and graphs on the next slide.



The stability number, N' (Potvin et al. 1992), is defined as:

N' = Q' x A x B x C

Where:

Q'	is the modified Q Tunnelling Quality Index;
A	is the rock stress factor;
B	is the joint orientation adjustment factor; and
C	is the gravity adjustment factor.

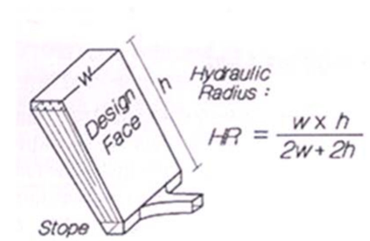
Generally hydraulic radius is calculated using the equation:

$$HR = \frac{A}{P}$$

Where:

HR	is the hydraulic radius;
A	is the area of the surface analyzed; and
P	is the perimeter of the surface analyzed.

So for a stope:



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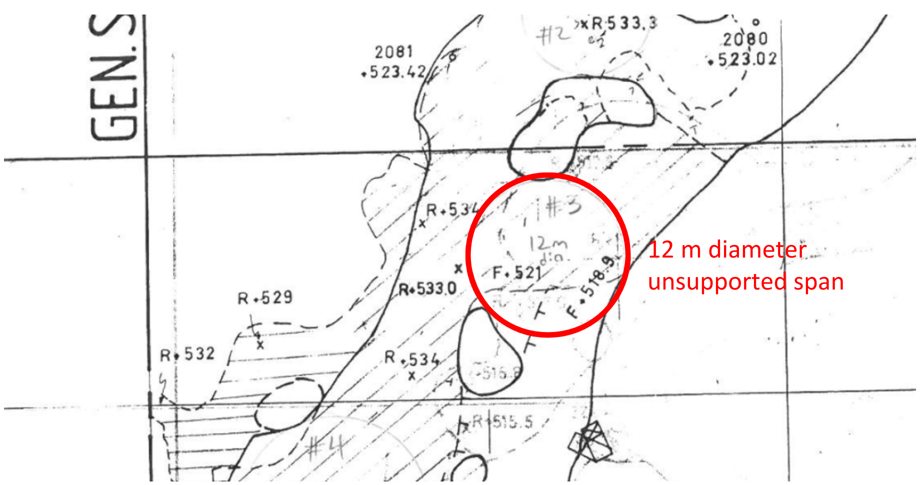
Stability Graph Method Example

FIGURE 10

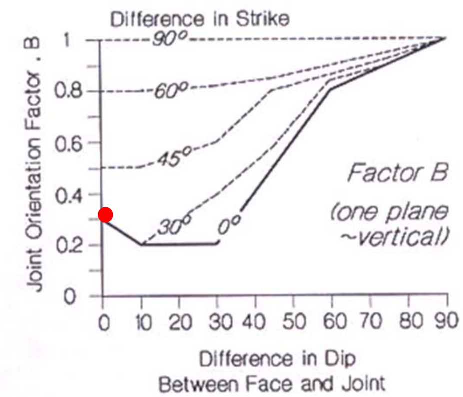
Stability Graph Method Example



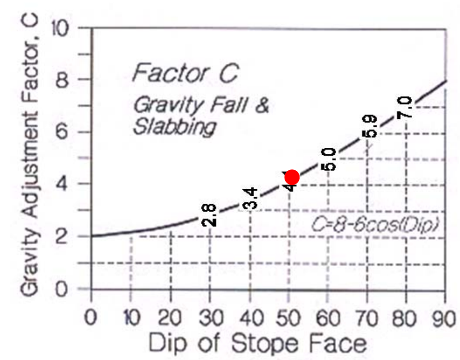
1. The unsupported span is measured on plan drawings above.

2. A value of 1 is assumed for the parameter A as the rock is assumed to be in a relaxed state.

3. Considering that the difference in both strike and dip of the major joint set and excavation surface have been approximated at 0, the factor B is estimated to be 0.3 using the graph below.



4. The factor C is estimated to be 4.1 using the chart below as the dip of the stope face is approximately 50°.



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Stability Graph Method Example

5. They hydraulic radius, HR, is calculated as follows using the area and perimeter of the circular unsupported span.

$$A = \pi R^2 \qquad P = \pi D \qquad HR = \frac{A}{P}$$

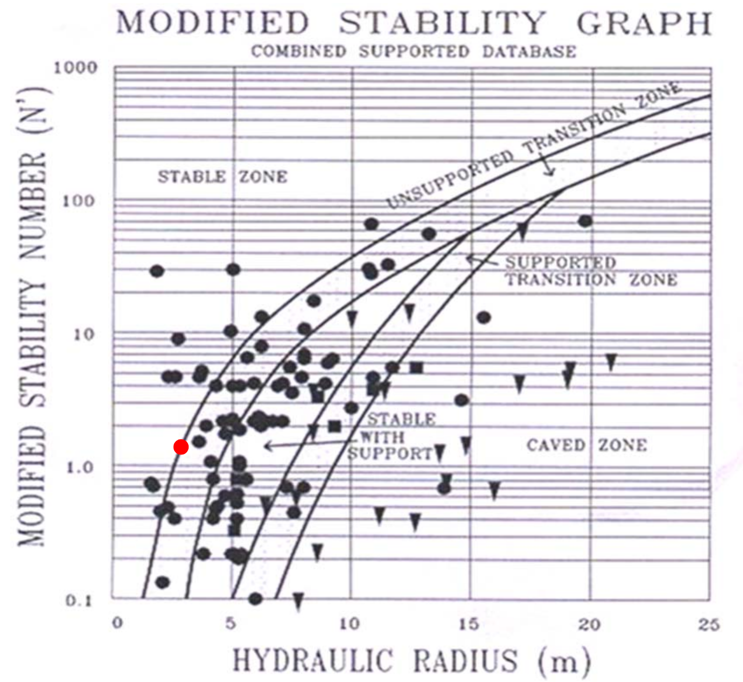
$$A = \pi 6^2 \qquad P = \pi 12 \qquad HR = \frac{113.1}{37.7}$$

$$A = 113.1 m^2 \qquad P = 37.7 m \qquad HR = 3$$

Where:

R	is the radius of the circular span;
D	is the diameter of the circular span;
A	is the area of the circular span;
P	is the perimeter of the circular span; and
HR	is the hydraulic radius.

6. The minimum N' is approximated as 1.2 using the calculated HR value and the chart below.



7. The equation for N' is rearranged as follows and the minimum Q' is calculated to be 0.98 using A, B, C and N' determined in the previous steps.

$$N' = Q' \times A \times B \times C$$

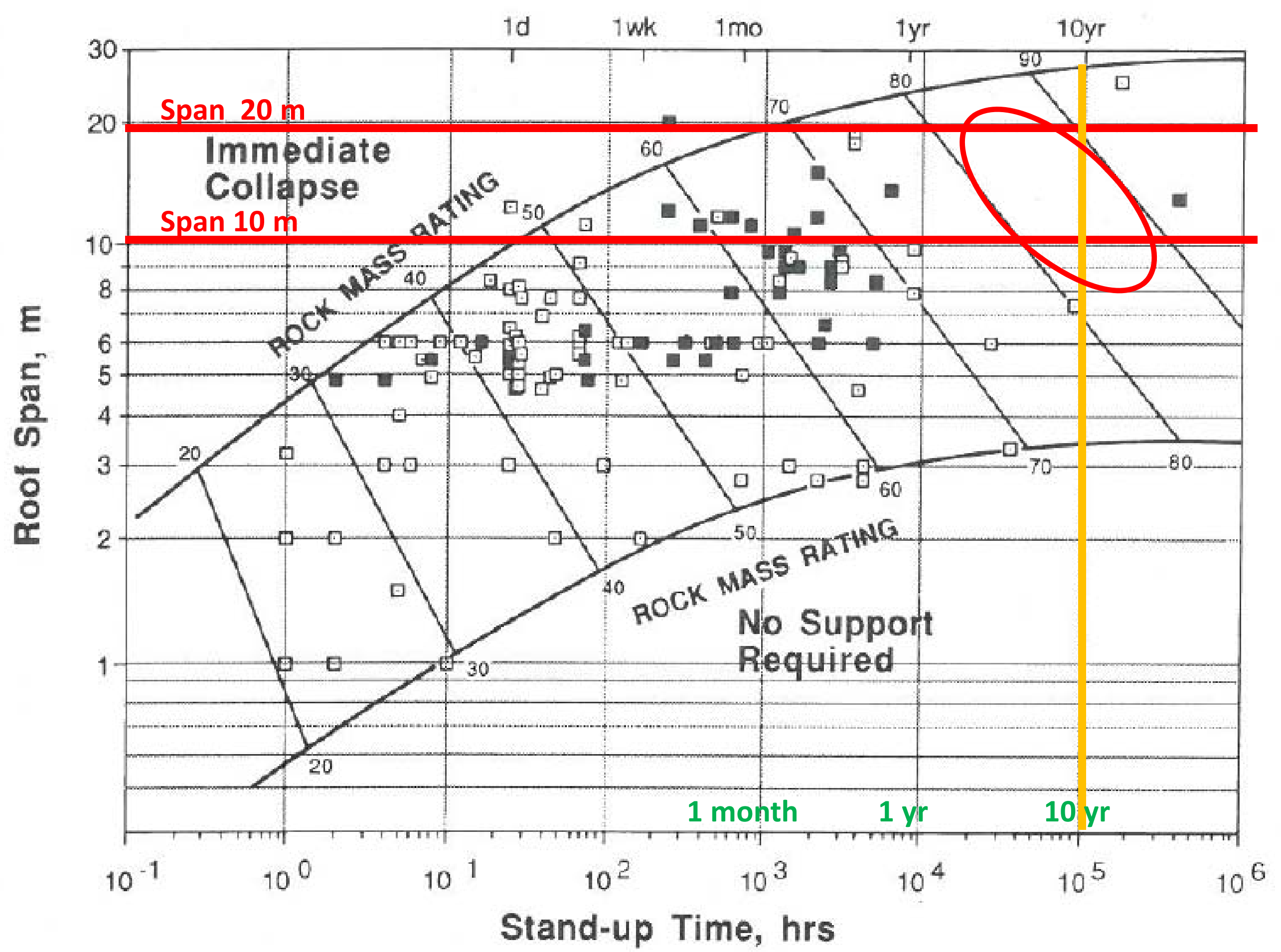
$$Q' = \frac{N'}{A \times B \times C}$$

$$Q' = \frac{1.2}{1 \times 0.3 \times 4.1}$$

$$Q' = 0.98$$

Unsupported Standup Time for Underground Openings
(after Bieniawski, 1989)

FIGURE 12



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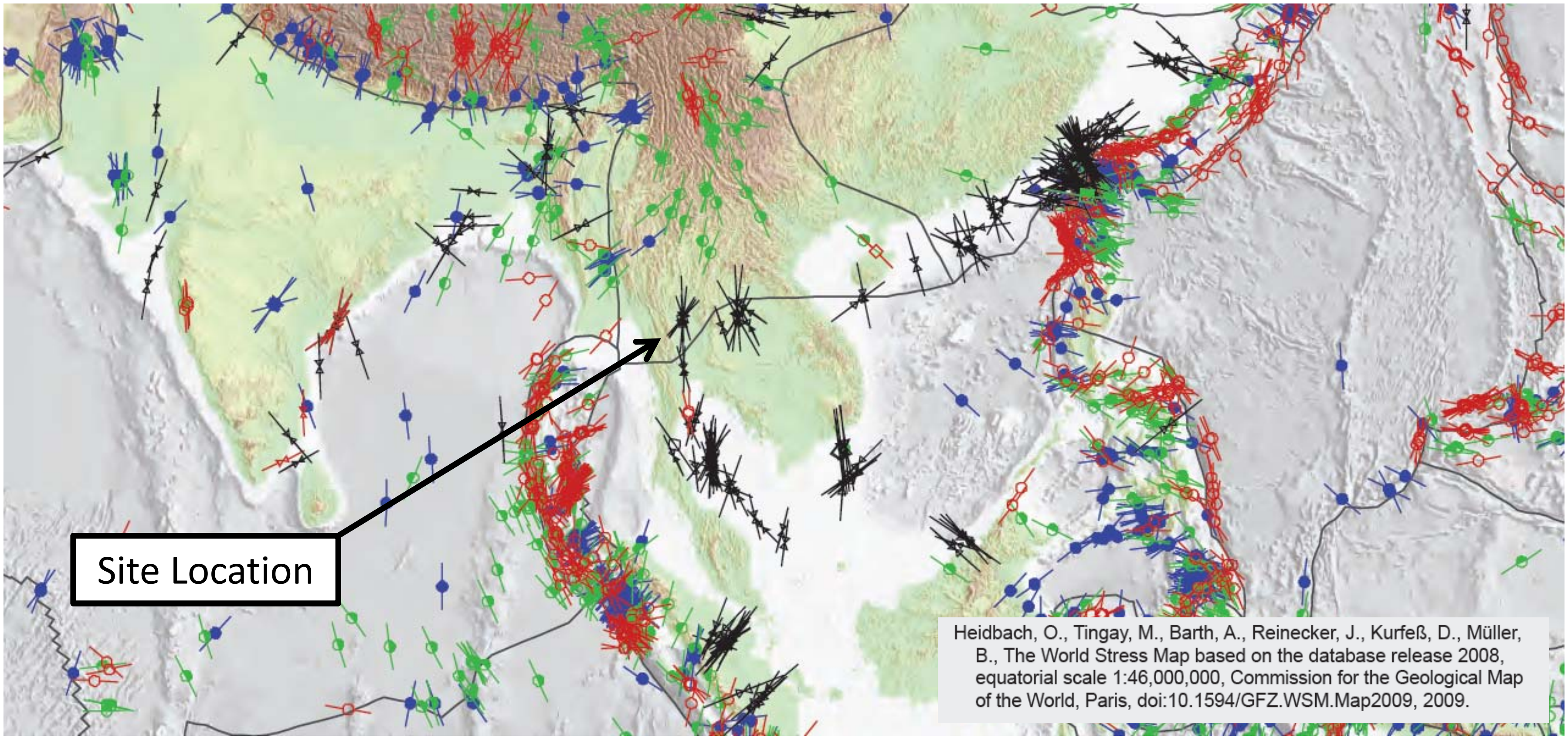
Chkd : CMS

Horizontal Stress for Song Toh - Boh Yai Mine

FIGURE 13

Southeast Asia Primary Horizontal Stress Directions from World Stress Map (2008 Release)



Primary horizontal stress direction is roughly North-South at the locations of Song Toh and Boh Yai.
The ratio of horizontal stress to vertical stress, Ko, is assumed to be 1 as determined in the thesis, "The Determination and Application of In Situ Stresses in Petroleum Exploration and Production" (Meyer, 2002)

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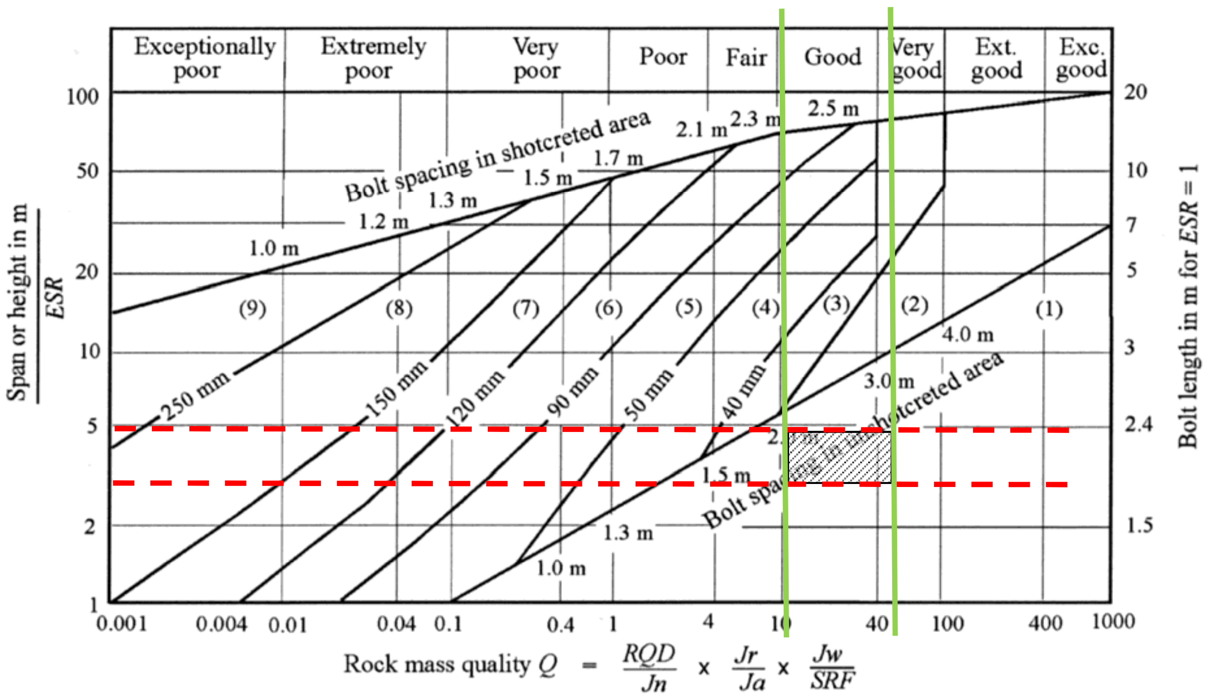
Support Requirements Graph
after Grimstad and Barton, 1993

FIGURE 14



REINFORCEMENT CATEGORIES
1) Unsupported
2) Spot bolting
3) Systematic bolting
4) Systematic bolting with 40-100 mm unreinforced shotcrete
5) Fibre reinforced shotcrete, 50 - 90 mm, and bolting
6) Fibre reinforced shotcrete, 90 - 120 mm, and bolting
7) Fibre reinforced shotcrete, 120 - 150 mm, and bolting
8) Fibre reinforced shotcrete, > 150 mm, with reinforced ribs of shotcrete and bolting
9) Cast concrete lining

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Project: 12-1118-0011-3000 - Song Toh Mine

Golder Associates

Drawn: JH / MRR

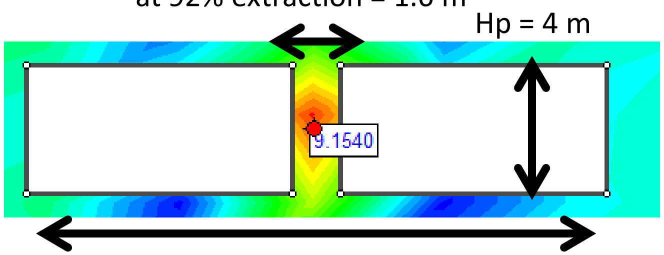
Chkd : CMS

Pillar Stresses Shallow to Moderately Dipping Ore

FIGURE 15

•In flat lying ore bodies for 10 m wide ore, the ore is assumed to be mined in 4 m high slices with pillars left in the ore body.
•The model pillar stress is based an approximation of the average load that will be on the pillar
•The induced pillar stress is compared to the Pillar Stability graph for 4 m high cuts that are stable for extraction ratios from 87% to 95%

For stress determination, equivalent rib pillar width at 92% extraction = 1.6 m



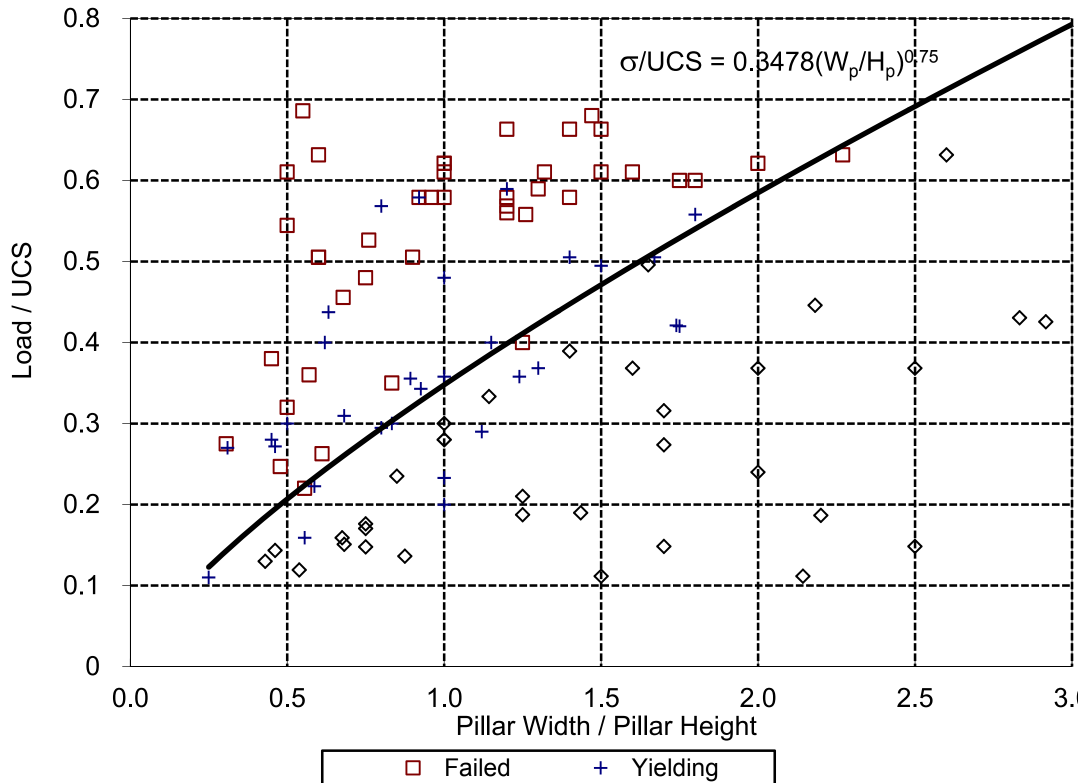
20 m Span (Pillars on 10 m centers)

Example: for 4m x 4m pillar (Wp) x 4m (Hp)

At 100 m Depth, Extraction Ratio = 92%
σi = 9.1 MPa
σi / UCS = 9.1 / 50 MPa = 0.182
Wp = 1.7 m from $\sigma/UCS = 0.3478(W_p/H_p)^{0.75}$
Wp / Hp = 0.4 (therefore 4m wide pillar = stable)

At 190 m Depth, Extraction Ratio = 92%
σi = 18.2 MPa
σi / UCS = 18.2 / 50 MPa = 0.35
Wp = 4.0 m from $\sigma/UCS = 0.3478(W_p/H_p)^{0.75}$
Wp / Hp = 1.0 (therefore max depth for 4m wide pillar)

Pillar Stability Graph-Summary of Experience



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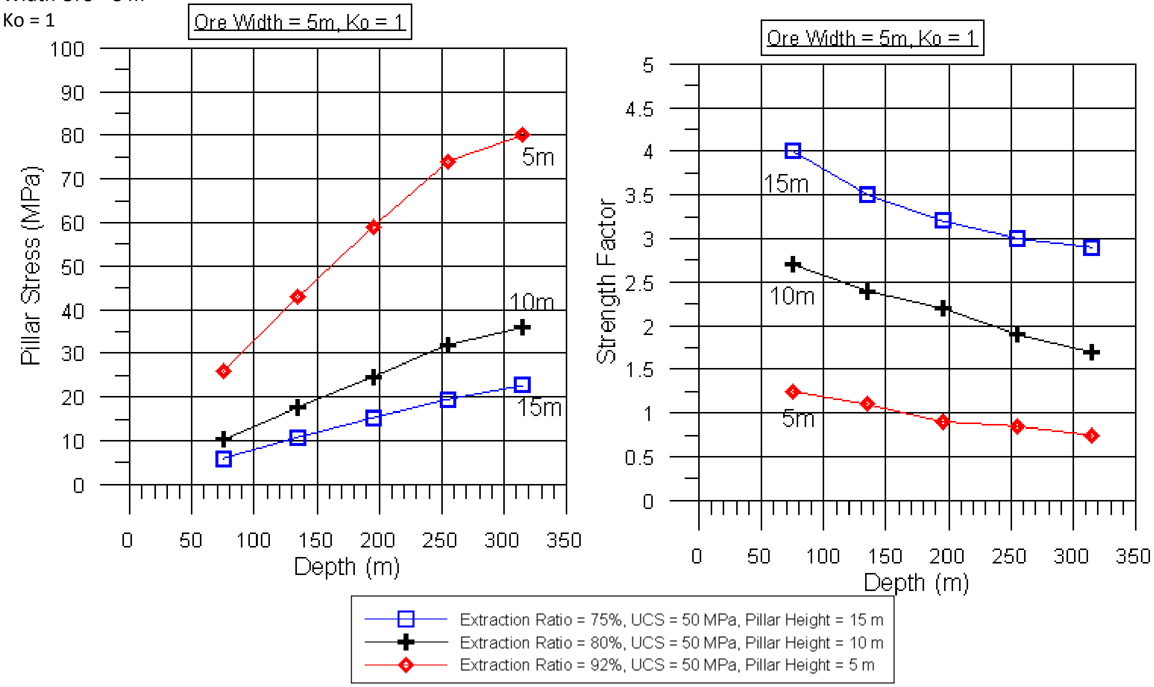
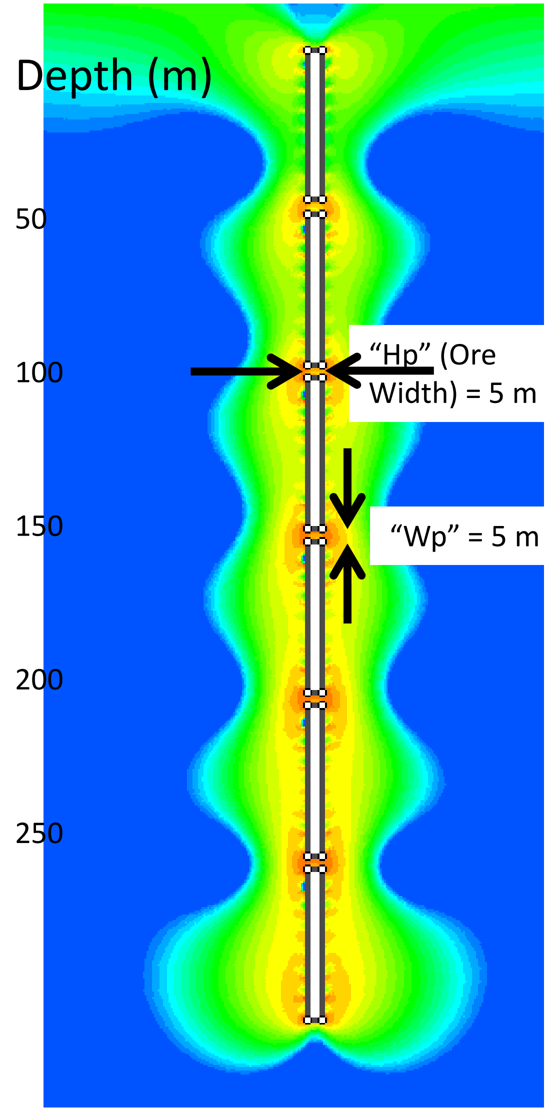
Drawn: JH / MRR
Chkd : CMS

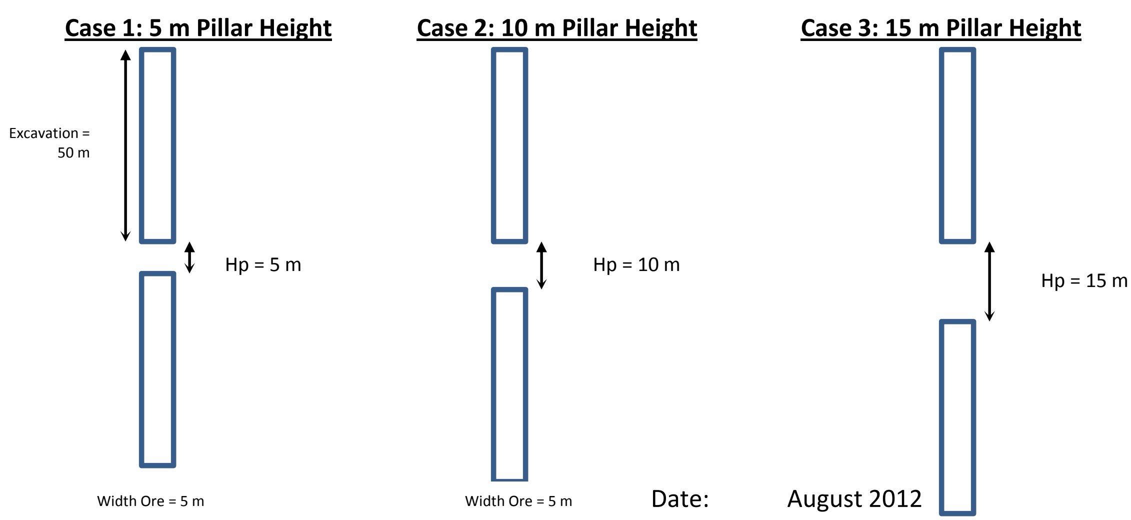
Input
Cover over first pillar = 25 m
Unit Weight (Limestone) = 2.5 t/m3
Unit Weight Ore = 2.7 t/m3
Excavated Ore = 50 m High
Width Ore = 5 m
Ko = 1

Pillar Stresses in Vertical Ore For 5 m Wide Ore

FIGURE 16







Date: August 2012

Project: 12-1118-0011-3000 - Song Toh Mine

Golder Associates

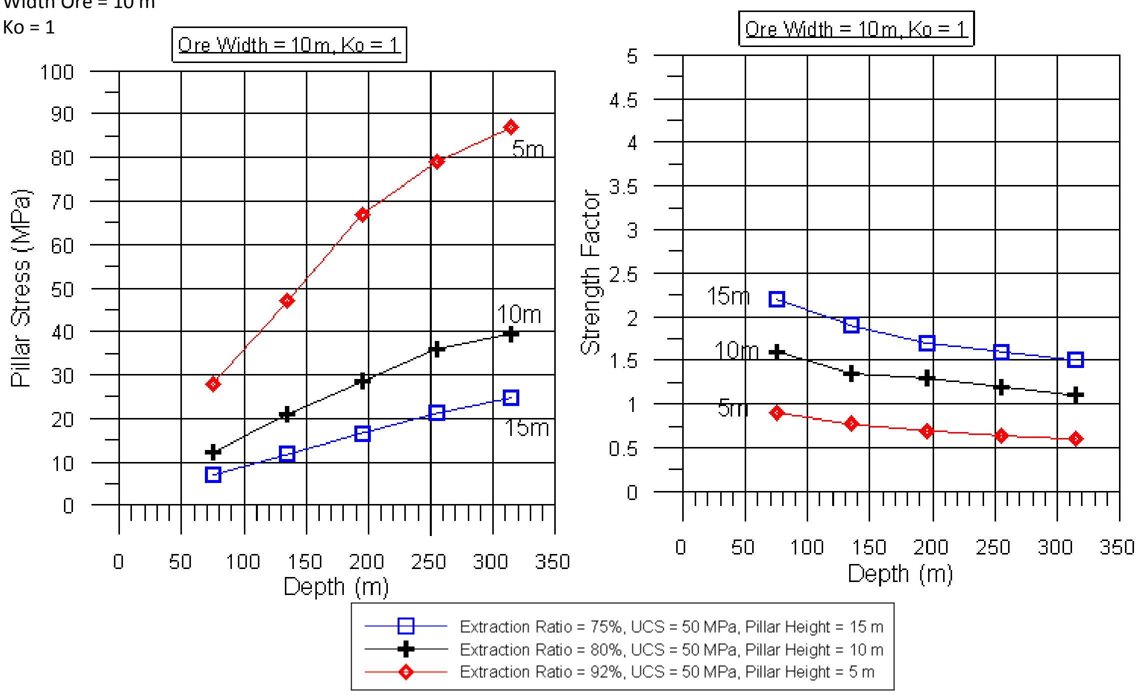
Drawn: JH / MRR

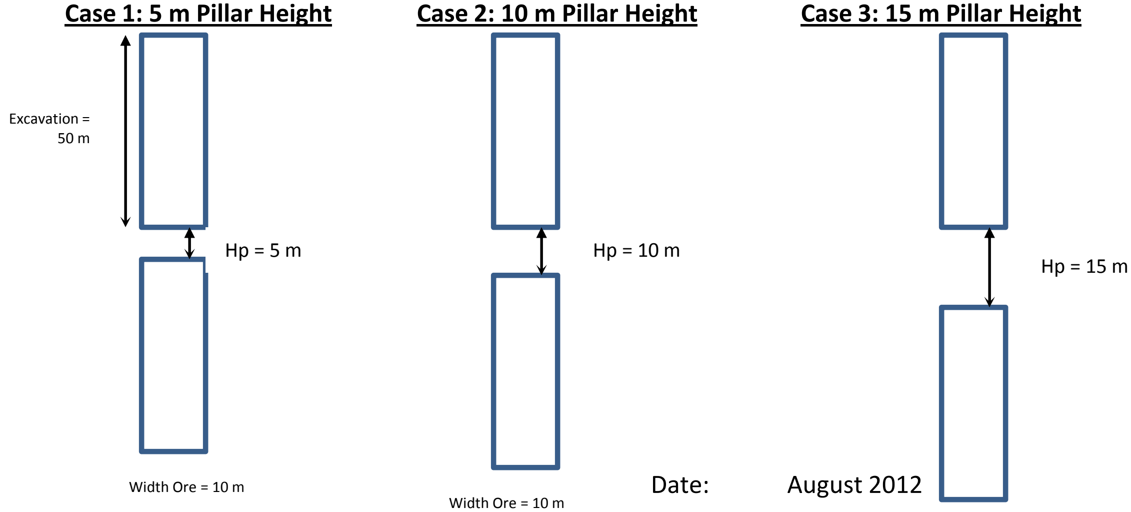
Chkd : CMS

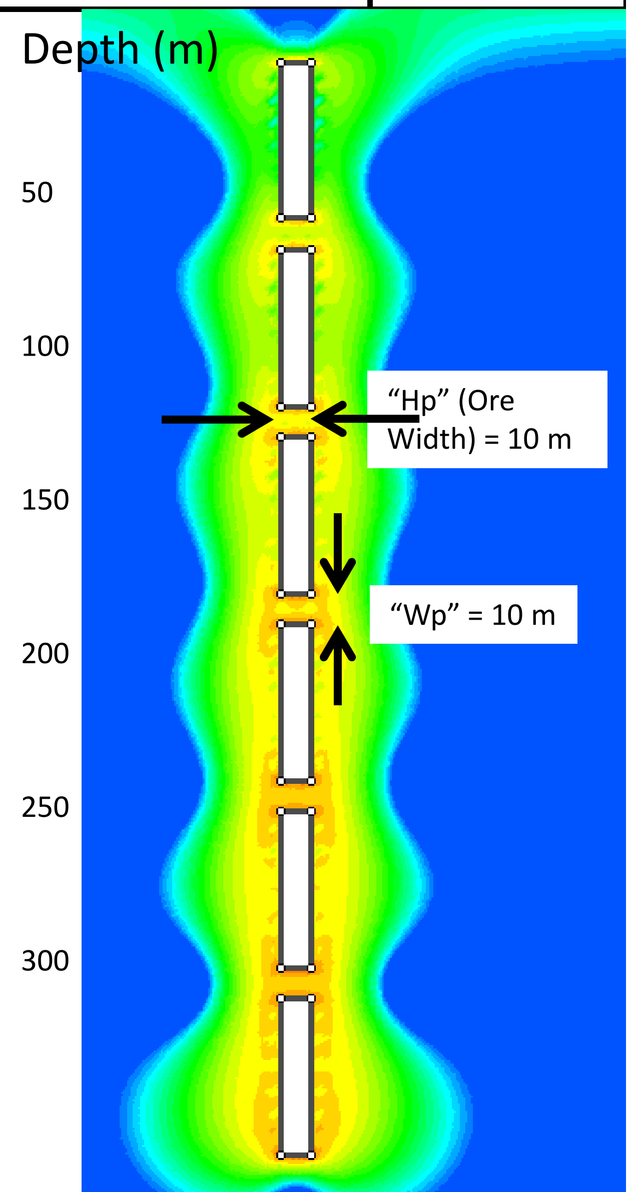
Input
Cover over first pillar = 25 m
Unit Weight (Limestone) = 2.5 t/m3
Unit Weight Ore = 2.7 t/m3
Excavated Ore = 50 m High
Width Ore = 10 m
Ko = 1

Pillar Stresses in Vertical Ore For 10 m Wide Ore

FIGURE 17







Date: August 2012

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Golder Associates

Drawn: JH / MRR

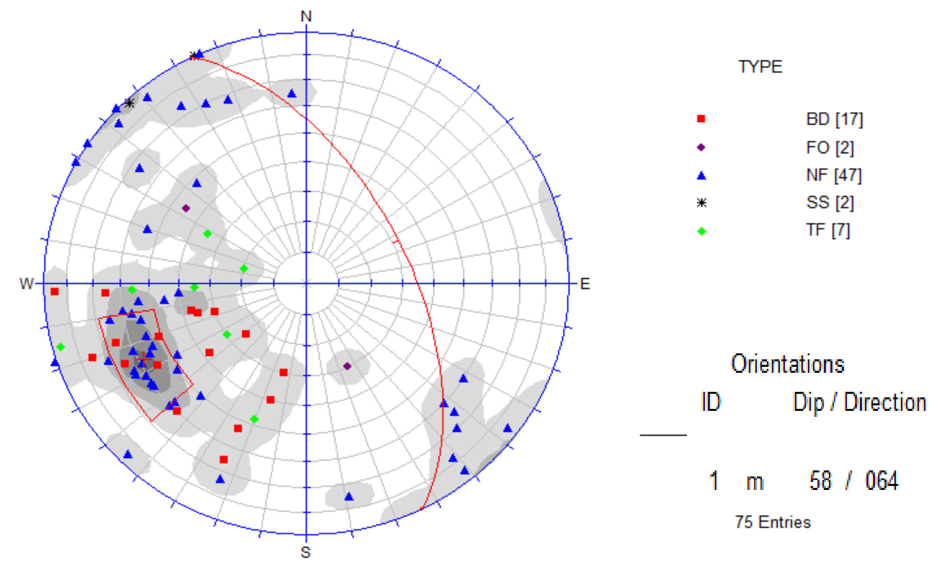
Chkd : CMS

APPENDIX A

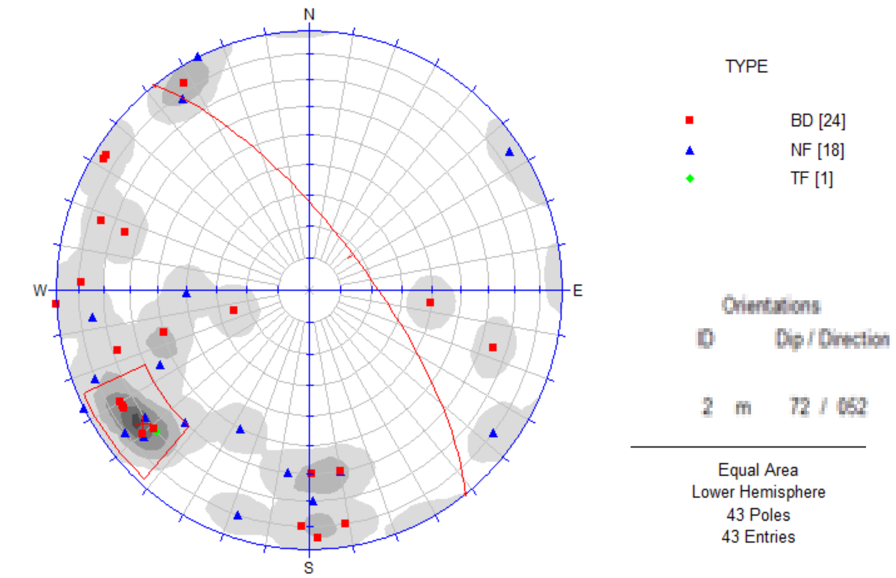
Stereoplots

Appendix A – Boh Yai Stereoplots from Cross-Sections and Plan Map Structure Measurements

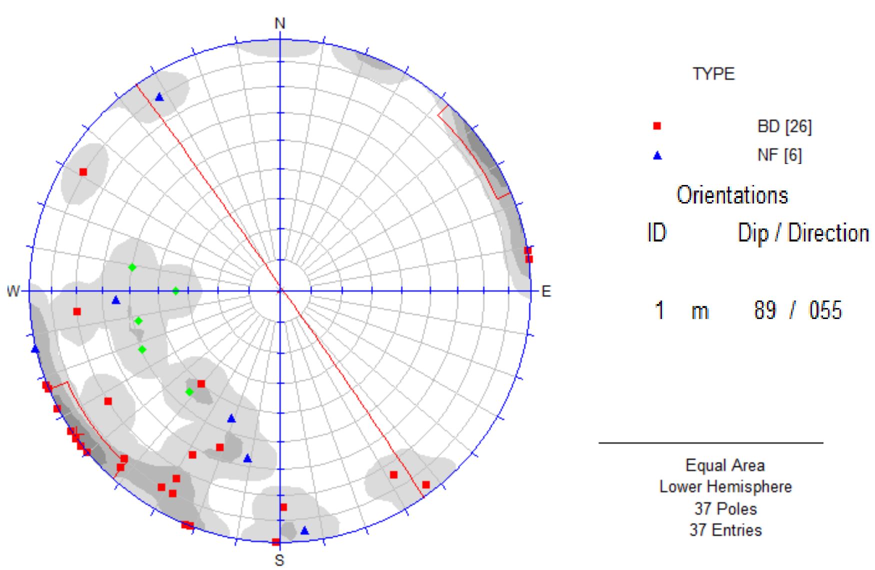
Feature	Abbreviation
Bedding	BD
Foliation	FO
Strike Slip Fault	SS
Normal Fault	NF
Thrust Fault	TF



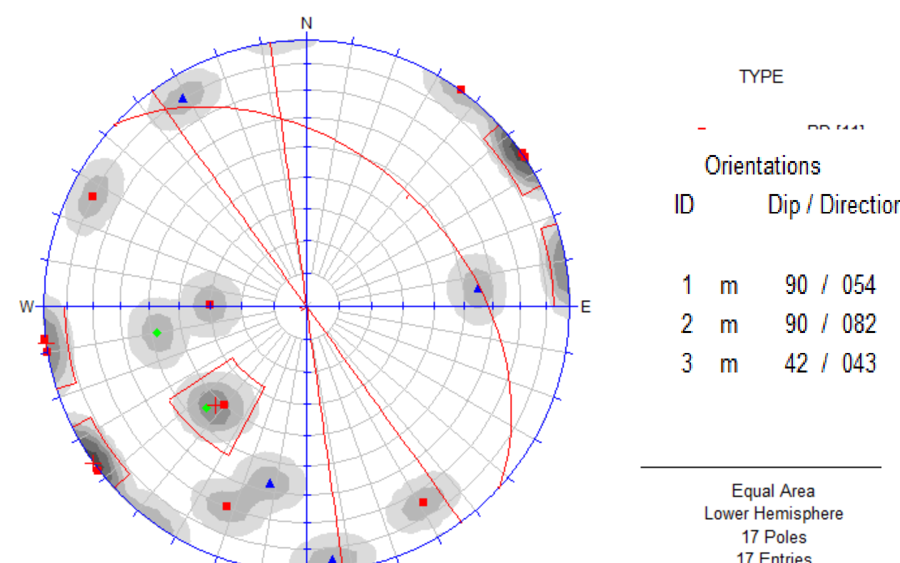
Hill 3 + 610m



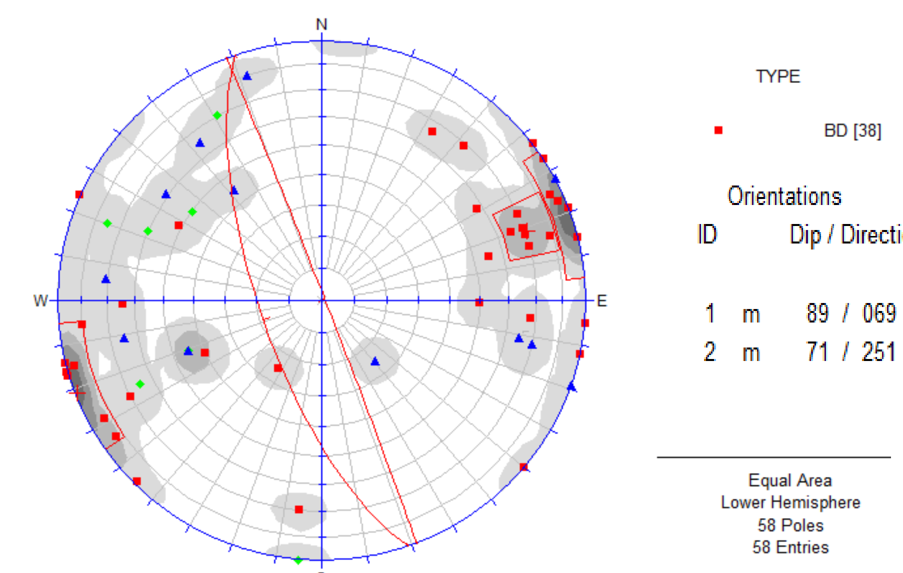
Hill 3 +626m



Hill 7 – Geological map 1



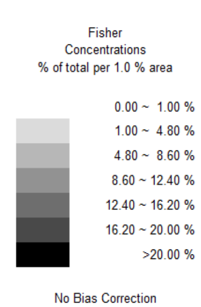
Hill 7 + 505m



Hill 7 + 511m

August 29, 2012

Drawn: AJ



Scale used for plots with <100 poles:

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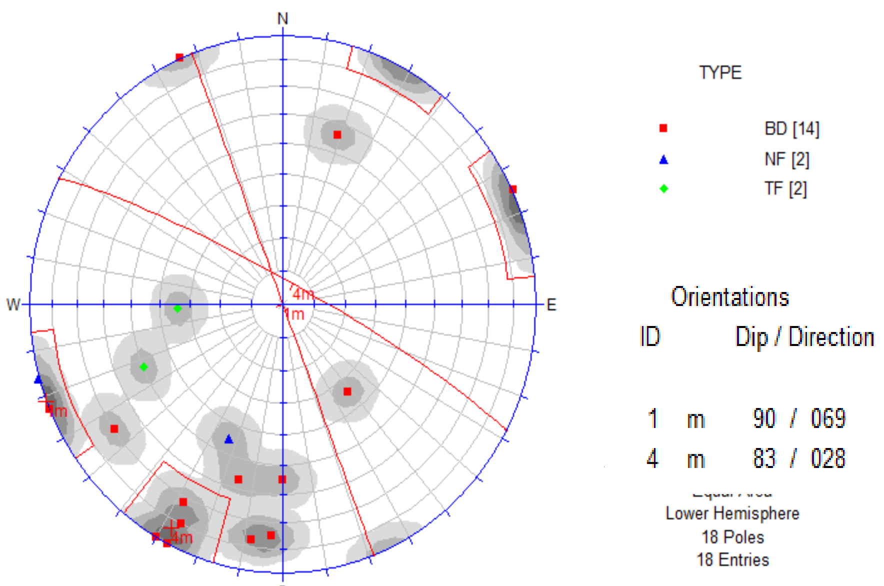
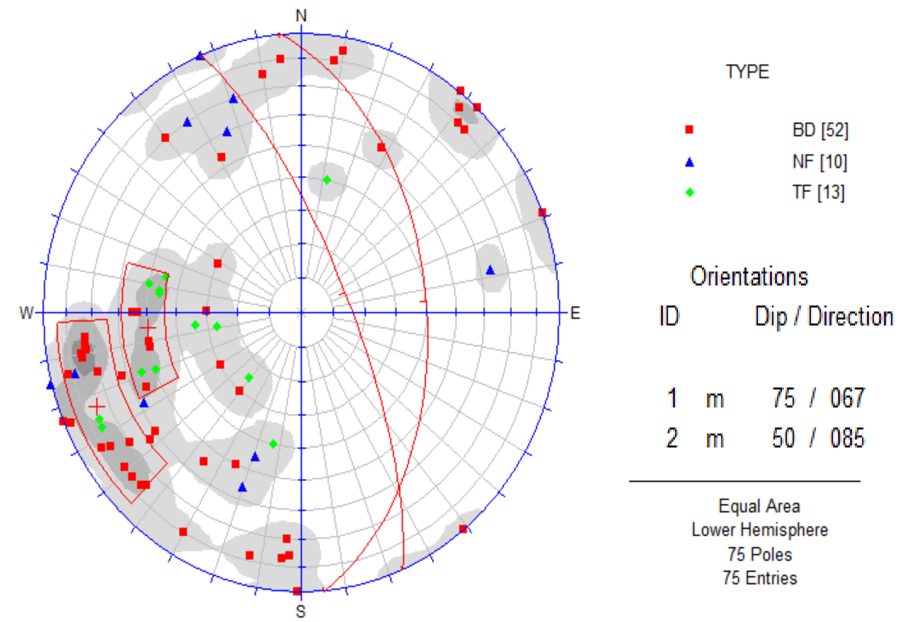
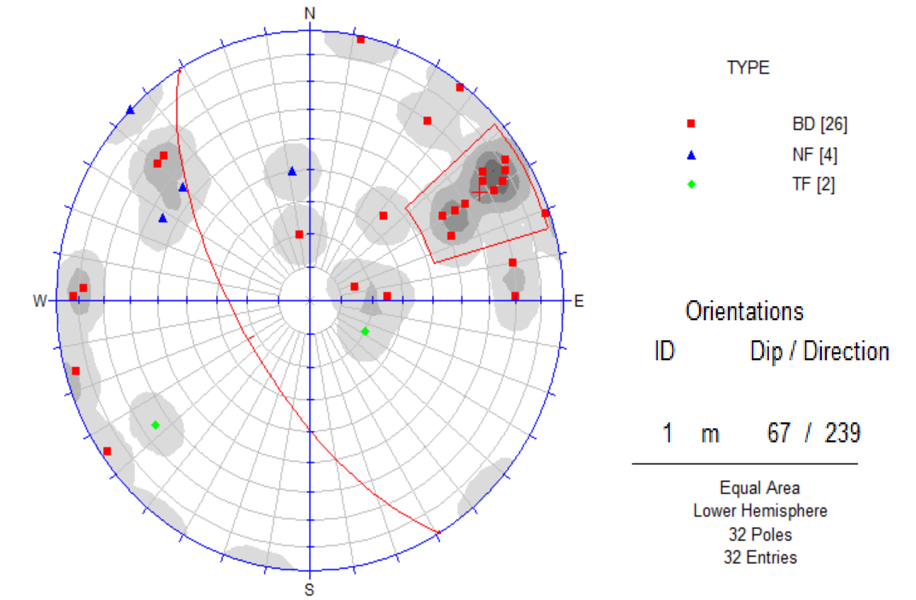
Appendix A – Boh Yai Stereoplots from Cross-Sections and Plan Map Structure Measurements



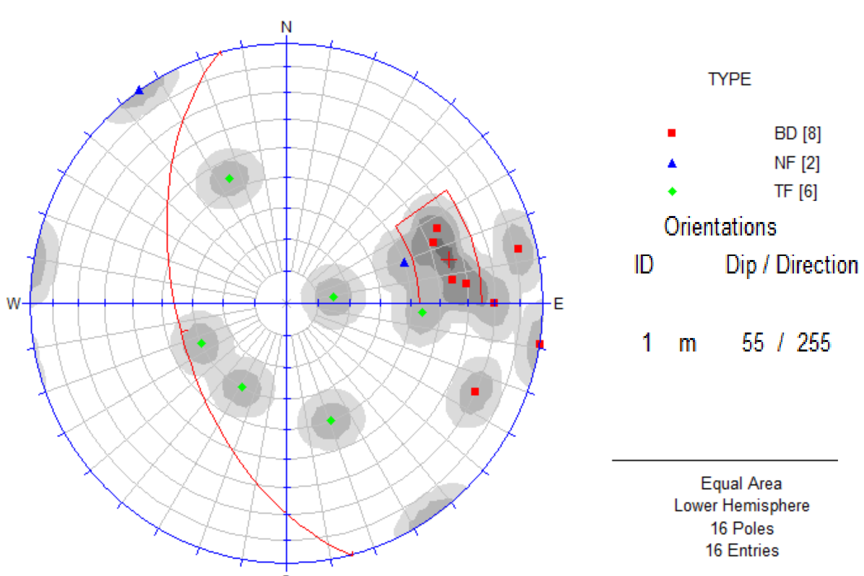
Hill 7 + 520m



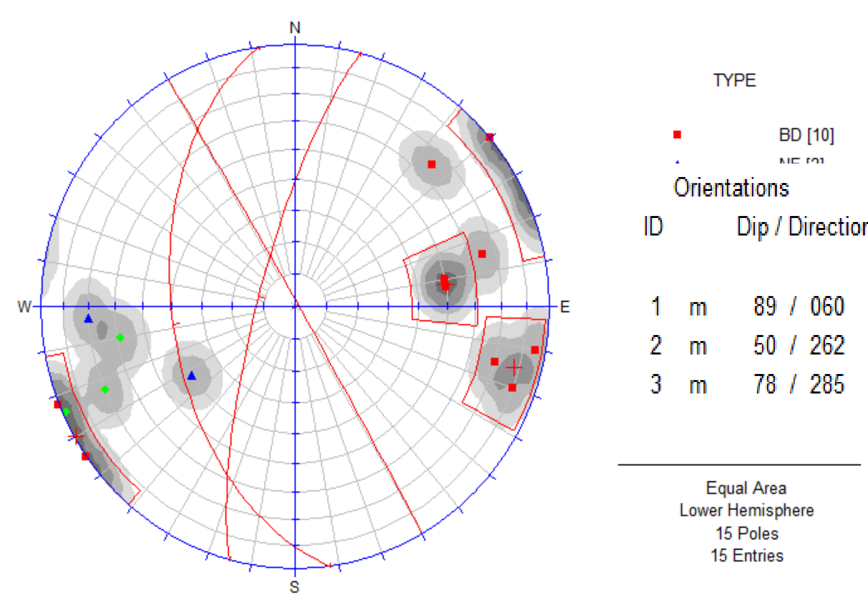
Hill 7 + 520m 2



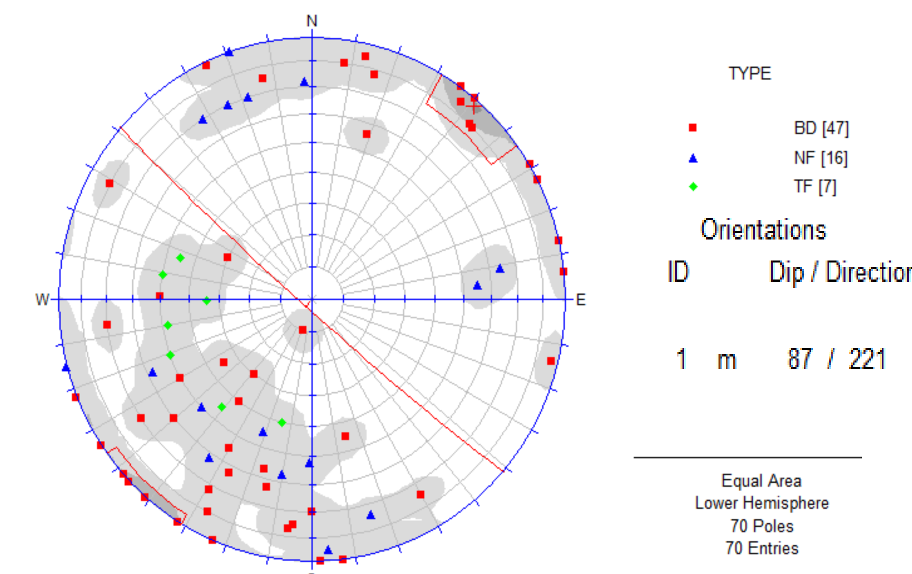
Hill 7 + 524m



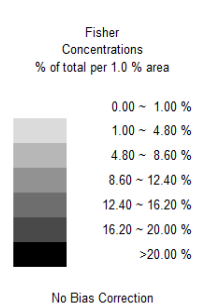
Hill 7 + 538m



Hill 7 + 554m

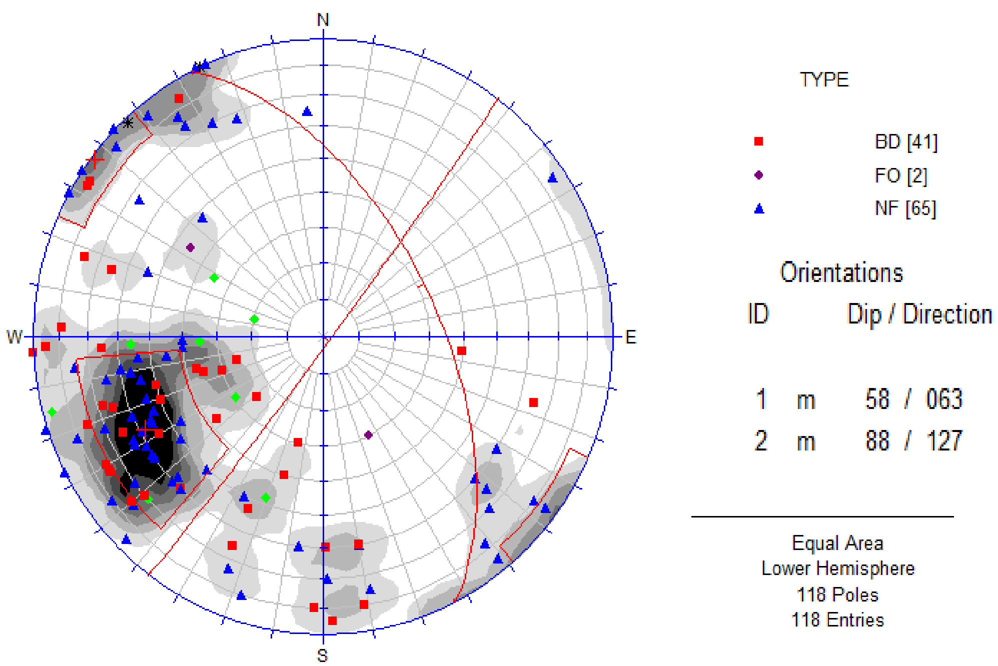


Hill 7 + Geological map 2

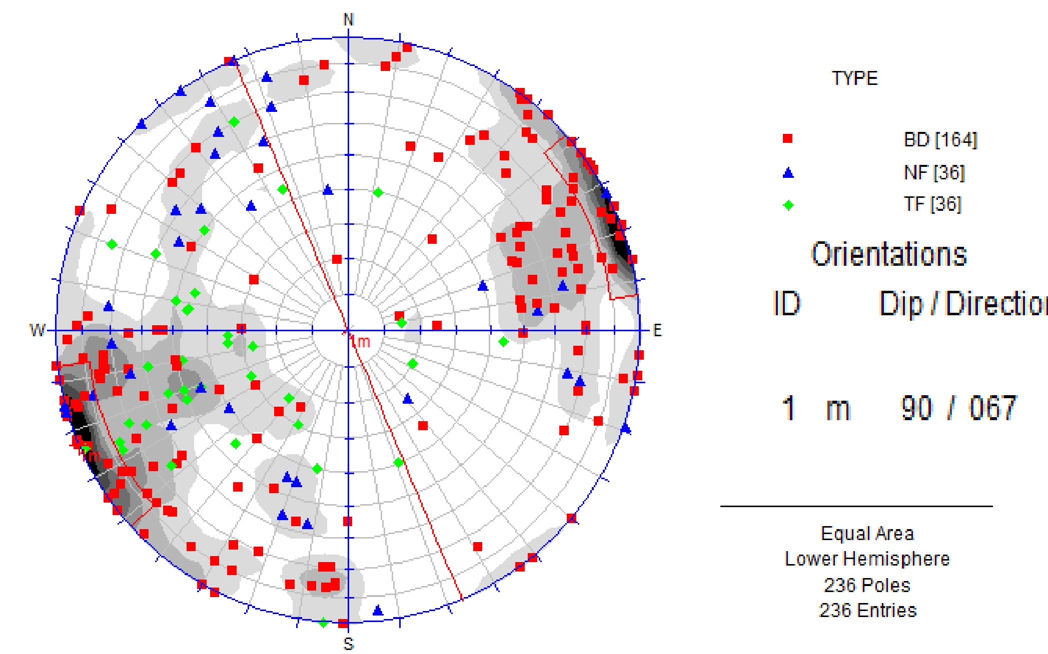


Scale used for plots with <100 poles:

Appendix A – Boh Yai Stereoplots from Cross-Sections and Plan Map Structure Measurements

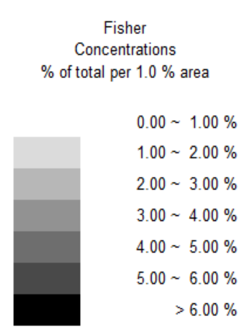


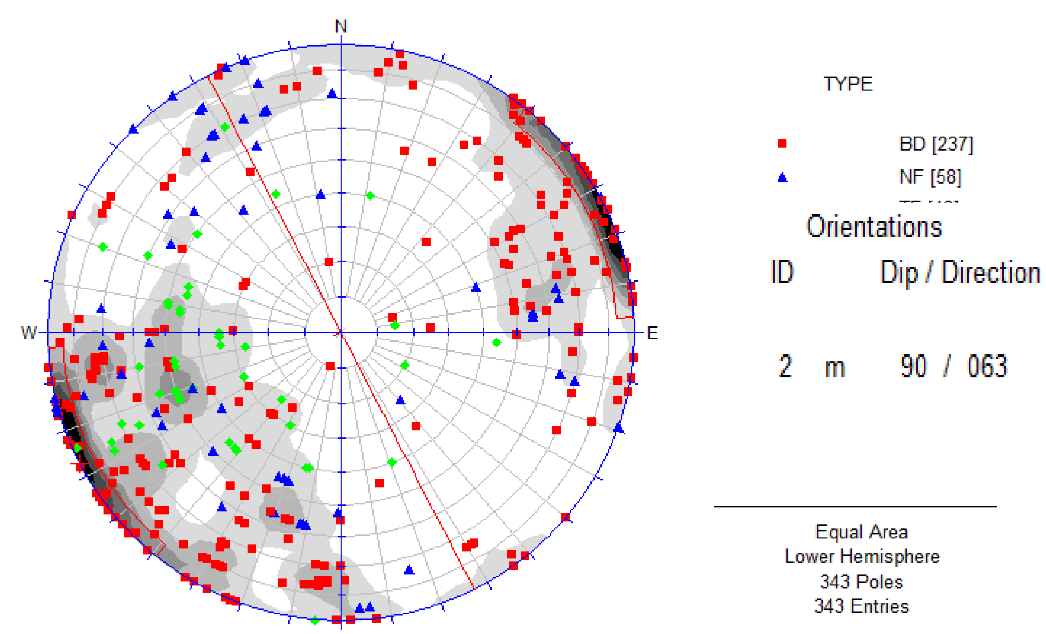
HILL 3 – combined cross sections



HILL 7 – combined cross sections

Contour scale for all combined plots :





HILL 7 – combined with geological maps

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APPENDIX B

Unconfined Compressive Strength Data Provided to Golder

GMT CORPORATION LTD.

Project: Geotechnical Core Inspection and Sampling Selection for Song Toh and Boh Yai

SUMMARY OF TEST RESULTS

Drill Hole	Area	Ore Zone	Depth	HW or FW	Distance to Ore Zone	Hold ID	Depth, m		Type	Bulk Density	Uniaxial Compression Test with Strain Gauge			
							Depth From	Depth to		kN/m^3	q_u Mpa	E_t Gpa	E_{s50} Gpa	Poission's ratio, ν
MKL	Boh Yai	Hill 5	90	F	30	5/27	119.62	119.80	Ore	27.41	82.71	6.250	3.084	0.29
MKL	Boh Yai	Hill 5	60	F	45	5/28	136.18	136.58	Limestone, light grey-argillaceous	27.01	51.46	4.231	1.913	0.18
MKL	Boh Yai	Hill 5	35	H1	25	5/29	29.35	29.61	Limestone-dark grey	27.15	59.23	10.000	1.680	0.30
MKL	Boh Yai	Hill 5	70	H3	1	5/29	81.50	81.70	Limestone-light grey	27.04	80.44	6.000	2.517	0.22
MKL	Boh Yai	Hill 5	80	F3	1	5/29	90.85	91.14	Limestone-white-light grey	26.92	67.19	17.500	3.929	0.25
MKL	Boh Yai	Hill 5	180	H	30	5/62	45.23	45.52	Ore	25.51	69.58	9.091	2.913	0.24
DDH	Song Toh	Camp	36	H	50	116	36.38	36.60	Limestone-dark greyish black	27.44	98.58	10.000	4.585	0.26
DDH	Song Toh	Camp	65	H	25	116	65.30	65.50	Limestone-light grey	27.95	72.15	11.429	2.841	0.33
NSN	Boh Yai	Hill 7	135	H	45	73	2.25	2.50	Limestone-ore	26.58	100.55	3.750	2.258	0.20
NSN	Boh Yai	Hill 7	140	H	60	109	3.55	3.79	Limestone-dark grey-fault	27.44	52.58	6.500	2.948	0.31
NSN	Boh Yai	Hill 7	144	H	42	109	25.20	25.38	Limestone-pink	26.62	54.16	6.579	2.056	0.27
NSN	Boh Yai	Hill 7	146	H	28	109	36.15	36.53	Limestone-violet-sheared	27.31	78.67	13.889	3.450	0.21
NSN	Boh Yai	Hill 7	157	F	10	109	79.67	79.90	Limestone-white/grey	26.84	42.43	5.000	1.807	0.39
NSN	Boh Yai	Hill 7	187	F	2	127	45.28	45.41	Ore	27.96	64.30	19.000	1.099	0.20
NSN	Boh Yai	Hill 7	190	F	8	127	49.92	50.14	Wall rock-ore	26.92	93.52	8.621	2.420	0.25
NSN	Boh Yai	Hill 7	192	F	10	127	51.70	51.84	Ore	26.04	63.82	2.667	2.440	0.25
NSN	Boh Yai	Hill 7	152	H	3	128	11.54	11.69	Limestone-white to light grey	26.94	85.15	4.000	1.972	0.28
NSN	Boh Yai	Hill 7	154	H	2	128	15.65	15.75	Ore-cuttted for assaying	28.37	20.72	1.455	1.274	0.36
BS	Song Toh	SW	177	H	32	137	125.90	126.08	Ore	26.06	60.19	3.000	2.072	0.36
BS	Song Toh	SW	196	H	0	137	163.10	163.36	Ore	27.85	46.15	4.857	1.532	0.18
BS	Song Toh	SW	202	H	0	137	168.05	168.22	Ore	25.97	35.08	1.370	1.413	0.25
BS	Song Toh	SW	171	F	18	185	82.69	82.80	Ore/weak sulphitetissem	27.47	74.24	12.333	4.549	0.30
BS	Song Toh	SW	181	F	22	185	92.66	92.85	Limestone, dark brown	26.86	87.06	5.303	2.988	0.50
BS	Song Toh	SW	184	F	18	185	95.10	95.30	Limestone, grey to dark grey	27.65	84.05	14.000	3.104	0.30

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Golder Associates

APPENDIX VIII. TAILINGS MANAGEMENT

April 2013

SONG TOH MINE, KANCHANABURI, THAILAND

Conceptual Design for Expansion of Tailings Disposal Facility

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Report Number: 12-1118-0011 (2000)

Distribution:

2 Copies - Southeast Asia Mining Corporation

2 Copies - Golder Associates Ltd.

REPORT

Golder Associates

Executive Summary

Golder Associates Ltd. (Golder) has been retained by Southeast Asia Mining Corporation (SEA) to assist with a conceptual study for the expansion and upgrade of an existing tailings storage facility at the Song Toh Mine in the province of Kanchanaburi, Thailand (Figure 1). SEA is considering restarting mining operations at the Song Toh Mine. The project includes the nearby Boh Yai Mine, which will be an additional source of ore feed for the Song Toh flotation plant. The tailings facility will need to be expanded to store an additional 3.51 Mt (2.19 M-m^3) of tailings, based on a production rate of 300,000 tonnes of ore / year (ramping up from 150,000 tonnes / year in Year 1 and 253,700 tonnes / year in Year 2) over a 13.6 year mine life.

The purpose of this study is to complete a conceptual design for expansion of the existing tailings disposal facility at the Song Toh Mine. The study includes an evaluation of the expansion with respect to operation, capital cost, construction, environmental performance, and closure considerations.

This conceptual design report is provided to SEA with the intention that the report will be used by SEA to support their preliminary economic assessment report, mine permitting and financing processes. This report also includes recommendations for additional investigations and analyses required to carry the project forward to the feasibility level of design.

The existing tailings facility contains approximately 5 Mt of tailings. The tailings facility is a valley impoundment with an earthfill dam up to 15 metres in height along its north-eastern perimeter, and is underlain by karstic limestone bedrock. Sinkholes have been observed around the site and encountered in the underground mine workings. Areas of known karstic features around the tailings area are shown on Figure 2.

A decant tower (monch) and a discharge pipeline through the maximum section of the dam allow passive discharge from the facility. Stop logs in the decant tower have been removed to prevent ponding within the tailings area. Discharge from the decant tower flows downstream and ultimately reports to a Retaining Pond. During operations, a pipeline conveyed the excess water from the tailings area back towards the flotation plant and discharged into a sinkhole that reported to the underground workings. From there water was pumped back to surface for use in the flotation plant. A spillway has been incorporated into the dam near its west abutment to prevent overtopping its crest.

At the time of reporting, no geochemistry test data on the tailings were available. For the purpose of the conceptual design, the tailings are assumed to be non-acid generating (NAG). No indications of acid drainage were observed by Golder during the site visit, and no information with respect to any historical acid drainage issues have been provided by SEA. Geotechnical testing on the tailings indicate that the beach material near the dam is a poorly graded sand [SP], while material farther into the tailings area is considerably finer and have been classified as a silty clay to clayey silt [CL-ML]. The average specific gravity for all three samples was determined to be 2.65. Three in-situ field wet (i.e. bulk) density tests were also performed on the tailings, indicating an average in-place wet density for the tailings of 1.84 t/m^3 +/- 5%. Until further testing is conducted to better define the tailings characteristics, Golder has adopted a 1.6 t/m^3 deposited dry density for the conceptual level design, which results in a total required storage capacity of 2.19 M-m^3.

Figure 4 provides a plan view of the preferred layout for the expansion of the Song Toh Tailings Facility taking into account the above mentioned constraints. Schematic tailings cross-sections are provided in Figure 5. The increase in storage capacity is achieved by raising the perimeter and internal dykes in small lifts in the upstream direction. The raises are offset to provide a sufficiently flat overall downstream slope to ensure long term stability.

Tailings deposition would commence in Area C. Dyke construction in Area C would consist of a series of small laterite dykes (about 2.0 m to 3.75 m in height) built-up in various stages using the upstream method to produce a "stacked" configuration for tailings deposition. A total of six staged dyke raises are proposed in Area C. The dykes would have a crest width of 5 m and 2H:1V side slopes. Natural containment following the 650 m contour would be provided around the west, south, and southeast ends of Area C. Assuming a 1% average tailings deposition slope, the maximum tailings discharge elevation from the south end would be 649 m. A dam, with a sloping crest, would also be required on the northeast side of Area C to contain the tailings. The total length of the dyke construction around Area C would be about 2,900 m (includes the lengths associated with the various raises), requiring a total fill volume of about 75,000 m^3.

Deposition of tailings within Area C would mainly occur from south to north, with spigotting off of the southern, western and eastern hillsides, to form a 1% tailings slope to promote drainage to the north against the internal dam between Areas C and B. A small overflow spillway will be required in each internal dam to allow gravity discharge into Area B (with the water eventually leading into the Area A pond).

A diversion channel excavated into the western hillside could divert surface runoff from Temple Mountain and the flooded open pit towards the sinkhole northwest of Area B, similar to the ditch constructed during previous mining operations. Based on the above configuration and assuming a 1 m freeboard, 1.41 M-m^3 (2.26 Mt) of tailings can be stored in Area C, leaving about 0.78 M-m^3 (1.25 Mt) to be stored in Areas A and B.

In Area B, the internal dyke between Areas A and B can be raised in three separate stages to an ultimate elevation that ranges from 632.5 m to 636.5 m to allow additional tailings deposition in Area B. A dyke along the northern end of Area B would be constructed to block off any tailings migration to the sinkholes that are known to exist north of Area B. Total length of dam construction in Area B would be about 1,770 m, with a total fill volume requirement of about 36,800 m^3 over the life of the mine.

Deposition in Area B would promote drainage to the north and excess water would be conveyed into Area A through a small overflow spillway constructed through the internal dyke.

In Area A, the large dam around the north eastern perimeter of the facility would be raised by 1 m, and its downstream shell stabilized along its entire length (about 910 m). The fill volume required for the 1 m dam raise would be about 13,650 m^3. Tailings would be deposited off the crest of the Area A dam and the internal dyke between Areas A and B to produce a tailings pond near the north end of Area A as shown in Figure 4. A new decant would have to be constructed along the north end of the dam as well as upgrading of the existing spillway. Based on the above expansion scenarios, Area B would be able to store an additional 0.66 M-m^3 (1.06 Mt) of tailings, while Area A would store the remaining 0.12 m^3 (192,000 tonnes).

The total capital cost for the tailings facility expansion was estimated at about $ 1,272,550 CAN, while the cost for closure was estimated at about $610,000 CAN. About 76% of the capital cost is associated with fill placement for dam construction. A detailed cost breakdown is provided in Table 3 in the main document.

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) has been retained by Southeast Asia Mining Corporation (SEA) to assist with a conceptual study for the expansion and upgrade of an existing tailings storage facility at the Song Toh Mine in the province of Kanchanaburi, Thailand (Figure 1). SEA is considering restarting mining operations at the Song Toh Mine. The project includes the nearby Boh Yai Mine, which will be an additional source of ore feed for the Song Toh flotation plant.

The purpose of this study is to complete a conceptual design for expansion of the existing tailings disposal facility at the Song Toh Mine. The study includes an evaluation of the expansion with respect to operation, capital cost, construction, environmental performance, and closure considerations.

Peter Merry of Golder's Mississauga office visited the site between February 10 and 12, 2012. The purpose of the site visit was to become familiar with the site conditions, previous mining operations, and to assess factors that could affect tailings and water management for the next phase of project development. During the site visit, discussions were held with Walter Greise (previous Mine Manager), Geoff McIntyre (SEA Managing Director), Dylan Jenkins (IEM consultant), and Chaiyo Yimrawd (SEA Mining Engineer). The site meeting was focused around historical mining practices and options to dispose of tailings as part of the reactivation project.

On January 14, 2013, SEA provided Golder with revised operational data for the containment of 3.51 Mt of tailings, which forms the basis of this conceptual design report.

This conceptual design report on the expansion of the Song Toh tailings facility is provided to SEA with the intention that the report will be used by SEA to support their preliminary economic assessment report, mine permitting and financing processes. This report also includes recommendations for additional investigations and analyses required to carry the project forward to the feasibility level of design.

2.0 BACKGROUND AND CURRENT SITE CONDITIONS

Figure 2 provides a general site plan of Song Toh Mine. Song Toh Mine is a lead-zinc underground mine that ceased operations in 2002. The flotation plant on site was last operated between 2008 and 2009 to process oxide ore that had been stockpiled on site. The existing tailings facility, located immediately north of the flotation plant, contains approximately 5 Mt of tailings. The tailings facility is a valley impoundment with an earthfill dam up to 15 metres in height along its north-eastern perimeter, and is underlain by karstic limestone bedrock. Sinkholes have been observed around the site and encountered in the underground mine workings. Areas of known karstic features around the tailings area are shown on Figure 2. The tailings area surface runoff was allowed to discharge into one of these sinkholes during previous mining operations and it is believed that these sinkholes are connected to the underground workings. A dewatering drift in the underground workings is able to discharge water from the underground mine workings by gravity. Dewatering the lower part of the mine workings is accomplished by pumping up to the dewatering drift.

Limited background data is available for the project with respect to hydrology, water quality, hydrogeology, the extent and flows associated with the karst features, and construction records. No background studies are available on the design of the tailings dams and water conveyance structures, and mapping in the area is limited to hard copies of historical surveys.

Records between 1970 and 2011 from Thong Pha Phum, a town located approximately 25 km west of site, indicate the area is characterized by a wet and dry season each year. The driest month occurs around January and the wettest around August. There is approximately 1,800 mm of precipitation each year. Evaporation is generally constant over the year, with an average annual lake evaporation reported at 1,400 mm.

Available surface water quality results were reviewed for the period between April 1998 and December 2001, for 9 sampling locations around the site. Results for pH, manganese and lead were provided. It is not clear if the metal concentrations are total or dissolved. Golder compared the results to the International Finance Corporation (IFC) Effluent Guidelines, which are normally applied to the total concentrations. In addition, data was compared to Industrial Effluent Standards (IES) defined by the Thailand Pollution Control Department of the Ministry of Natural Resources and Environment. Values for pH and manganese always met the IES and IFC guidelines. Some measured lead concentrations were greater than the IES and IFC effluent guideline limits at various locations on site but prior to the final discharge point. In all cases, values for pH, lead and manganese met the IES and IFC guidelines at the final discharge point (Retaining Pond Overflow).

Groundwater results include pH values, total dissolved solids (TDS) and lead concentrations, for 2008 and 2009. Values for all three parameters met the IES and IFC guidelines.

A flooded open pit exists immediately southwest of the tailings area and access road. The open pit is approximately 20 m x 100 m in area and is flooded to surface. Between the open pit and access road is a small, approximately 3 m high dam, that was constructed to divert excess water around the west side of the tailings area, in combination with a diversion ditch. The objective was to drain the catchment into a sinkhole on the west side of the tailings area. The flotation plant only uses a small amount of fresh water for gland seal and reagent mixing. The exact quantity was not known, but considered insignificant to affect the overall water balance. Most water used in the flotation plant is pumped from the underground workings. Historical mining operations have shown that sufficient water is available from the underground mine to run the floatation plant during the dry season. It was estimated that approximately 92,000 m^3/yr. of potable water is used by the camp (840 people x

300 l/d). Freshwater to the camp and flotation plant was obtained from a small pond (Freshwater Pond) approximately 2 km south of the flotation plant. The pond is approximately 100 m x 200 m in area and is retained by an earthfill dam likely constructed of local overburden (laterite). The dam is approximately 100 m long, 7 m high, and 7 m wide at the crest with steep overgrown side slopes. An emergency overflow spillway, approximately 0.5 m below the crest is incorporated into the crest near the east abutment. A decant tower (monch) through the dams allow excess water to drain by gravity from the pond. The decant tower is a stop log structure and is in poor condition. The emergency spillway is covered with a plastic sheet and the outlet channel has nearly completely eroded away, resulting in near vertical channel on the downstream shell.

Immediately downstream (north) of the Freshwater Pond, is an outlet of a drift that was cut through the hill side to dewater a swampy area over Song Toh South Mine. The drift, also known as the Khao Daeng Spillway, is a 6 m x 6 m channel constructed in 1988 with an invert Elevation of 680 m.

It is understood that excess water from the Freshwater Pond and Khao Daeng Spillway ultimately flows into the Retaining Pond, approximately 4 km downstream.

The dewatering drift, also known as the Huai Chanee, was constructed in 1982 to drain the mine workings. The dewatering drift is a 6 m x 6 m channel and collects excess water in Song Toh South Mine at Elevation 555.0 m then drains to Song Toh North Mine at Elevation 545.0 m before exiting approximately 1.7 km west of the mine at Elevation 538.0 m, in a topographic low area. At the time of the site visit, the discharge from the dewatering drift was estimated at 2 m^3/min. The water was turbid and brown at the time of the site visit. The reported maximum discharge during operations was estimated at 60 m^3/min.

The dewatering drift drains into the Retaining Pond, approximately 500 m downstream of its outlet. The pond is used to settle solids prior to final discharge to the environment. The Retaining Pond is approximately 400 m x 150 m in area. The depth of the pond is unknown but appears to be quite shallow based on the reeds that are growing around the shores of the pond. Silting is most pronounced at the south limb where the mine water enters the pond

The Retaining Pond is retained on the west side by an earthfill embankment constructed of locally available laterite, and is overgrown with vegetation. The dam is used by locals as an access road. A decant pipe through the dam (monch) allows for gravity discharge from the pond. An emergency spillway exists nears the south abutment of the dam that appears to be approximately 1 m below the crest elevation and approximately 15 m wide.

3.0 EXISTING TAILINGS FACILITY

Figure 3 provides a plan view of the existing tailings storage facility (TSF). The TSF is divided by small internal dykes into three distinct areas, named Areas A, B, and C. The small internal dykes appear to have been constructed with the locally excavated residual soil (i.e. laterite).

It is understood that approximately 5 Mt of tailings are contained within the TSF. Most of the tailings were covered with laterite and re-vegetated in 2002 upon ceasing the operations. The tailings that were deposited between 2008 and 2009 have not been covered. However, some re-vegetation trials have been conducted on some areas of the exposed tailings. The vegetation is thick in the lower reaches of the tailings beach, where moisture supports its growth. Surface drainage over the tailings area is characterized by tailings deposition that took place from the east side of the facility near the flotation plant. A partial cone has formed around the deposition point and promotes drainage towards the north and south. A small pond exists at the south side of the tailings area (in Area C) and is isolated from drainage to the north until a certain pond elevation is reached. A decant tower (monch) allows for passive overflow of excess water from the tailings area on the north side.

The tailings area is contained by natural topography around its southwestern perimeter and an earthfill dam on the northeastern side to complete the containment (north and east side of Area A). The dam is up to 15 m in height at its maximum section and is overgrown with vegetation. It is understood that the dam is a homogenous earthfill embankment constructed in stages with laterite. The dam is approximately 800 m long and has a crest width of approximately 7 m. There are no construction records available. It is unclear whether the dam was constructed with the upstream or downstream method, or a combination of both. There is approximately 2 m of freeboard above the tailings surface on the upstream slope. The downstream slope is steep and was constructed at approximately 1H:1V. The toe of the downstream slope appeared to have been under-cut around the outlet of the decant pipe. A spillway has been incorporated into the dam near its west abutment to prevent overtopping its crest.

A decant tower (monch) and a discharge pipeline through the maximum section of the dam allow passive discharge from the facility. At the time of the site visit, the stop logs in the decant tower were removed to prevent ponding within the tailings area. Discharge from the decant tower flows downstream and ultimately reports to the Retaining Pond. During operations, a pipeline conveyed the excess water from the tailings area back towards the flotation plant and discharged into a sinkhole that reported to the underground workings. From there water was pumped back to surface for use in the flotation plant.

Groundwater monitoring wells were installed downstream of the containment dam in 2008. The water level in the wells was approximately 11-12 m below ground surface at the time of installation.

4.0 TAILINGS CHARACTERISTICS

4.1 Geochemistry

At the time of reporting, no geochemistry test data on the tailings were available. For the purpose of the conceptual design, the tailings are assumed to be non-acid generating (NAG). No indications of acid drainage were observed by Golder during the site visit, and no information with respect to any historical acid drainage issues have been provided by SEA.

If future testing confirms that the tailings are indeed NAG, then the requirements for closure of the tailings facility may be simplified and any need for effluent treatment reduced.

4.2 Physical Properties

As part of the conceptual design study, three tailings samples were obtained by SEA from the existing tailings facility for geotechnical testing. The approximate sample locations are shown on Figure 3. The samples were obtained by excavating approximately 1.2 m below the existing ground surface to obtain the samples below the overburden cover. The samples were transported to GMT Corporation Ltd., a local geotechnical laboratory, for specific gravity and particle size distribution testing.

The results of the geotechnical testing are provided in Appendix A and are briefly summarized below.

The particle size distribution tests, as shown on Figure A-1, indicate that significant segregation of the tailings has occurred during deposition based on the coarser fraction of the tailings remaining near the historical discharge point and finer fraction being conveyed towards the decant.

The particle size distribution results for Sample 1 indicate that the material is a poorly graded sand [SP], with 11% silt and clay size particles (i.e. 11% passing the No. 200 sieve). Samples 2 and 3 are considerably finer than Sample 1 and have been classified as a silty clay to clayey silt [CL-ML]. Particle size distribution tests indicate that Sample 2 consists of 65% silt sized particles, 20% sand size particles, and 15% clay sized particles. Sample 3 consists of 70% silt size particles, 28% clay size particles, and 2% sand size particles.

The average specific gravity for all three samples was determined to be 2.65.

Three in-situ field wet (i.e. bulk) density tests were also performed on the tailings. The locations of the tests are shown on Figure 3. The test was performed by hammering a 0.25 m square steel form into the tailings and retrieving the tailings sample from within the form. The sample was then weighed in order to determine the in-situ wet density. The results of the field density tests are provided in Appendix A.2. The testing indicated an average in-place wet density for the tailings of 1.84 t/m^3 +/- 5%.

5.0 DESIGN CRITERIA

Based on our experience on similar projects the following design criteria are proposed for the conceptual design to expand the existing tailings facility. Not all of these criteria are addressed in the conceptual design stage.

5.1 Design Capacity

Preliminary estimates provided by SEA indicate a resource yielding 3.9 million tonnes of ore, resulting in about 3.51 million dry tonnes of tailings. Based on the nominal flotation plant production rate of approximately 150,000 tonnes / year (411 tonnes per day) in Year 1 ramping up to 300,000 tonnes / year (822 tonnes / day) by Year 3), the expected mine life is about 13.6 years. 190,800 tonnes of ore will be processed during the final year of production. The existing tailings facility shall be expanded to accommodate all the tailings generated during the mine life.

SEA has previously used a deposited dry density of 1.8 t/m^3 for the tailings. Based on the average specific gravity of 2.65 for the tailings samples obtained from testing in February 2012 (see Section 5.2), this translates into a deposited void ratio of 0.47. Golder believes that the deposited dry density used to date is high. For this conceptual study, Golder has adopted a dry density of 1.6 t/m^3, which Golder believes to be reasonable given the results of the in-situ density testing (Section 4.2) that indicated an average wet density of tailings of 1.8 t/m^3. For a dry density of 1.6 t/m^3, the required storage capacity has been estimated at 2.19 M-m^3. Further testing is recommended during later stages of design to better define the tailings characteristics.

5.2 Environmental

The following environmental criteria are proposed for the mine re-activation:

- Divert clean water runoff away from the tailings facility where possible;
- Contain tailings solids and porewater during operations and following closure;
- Minimize groundwater impacts;
- Minimize the footprint area of the tailings facility and keep it close to the process plant;
- Mitigate dam failure risk;
- Meet IFC and applicable Thai water quality guidelines for tailings effluent (overflow from the decant);
- Manage surface run-off during normal operations and excess water resulting during storm events; and
- Design for closure with the ability to initiate progressive decommissioning.

5.3 Dam Design

The existing dams around the TSF and associated water ponds are in a poor state of maintenance and relatively steep. The condition of the dams and their foundation should be determined from a geotechnical investigation and appropriate stabilization measures implemented to improve their long term stability under current and proposed configurations. As stated previously, an area of karst features along the north-east end of the Area A dam should be investigated to adequately characterize the sinkholes and determine the remedial measures required to stabilize them. Dam improvement will be based on the following considerations:

- Dam design and upgrade to meet the Canadian Dam Association's Dam Safety Guidelines (2007);
- Provide complete storage of the tailings through a combination of natural containment and dam construction / raises;
- Where possible, raise the dams in stages to minimize dam construction (i.e. fill) requirements;
- Contain contact water from the Environmental Design Storm (to be determined) during the operating period; and
- Use of natural construction material for longevity considerations.

6.0 TAILINGS FACILITY EXPANSION

6.1 Expansion Constraints

The following sections describe the screening methodology for the expansion of the Song Toh tailings facility, followed by describing the conceptual design in further detail. For the purpose of discussion, the existing TSF is partitioned into three Areas as shown in Figure 4.

To determine the preferred expansion layout, particular attention was given to capital cost of construction, operability, and environmental performance in order to minimize the impact on surface and groundwater and to ensure long-term physical stability.

To aid in the evaluation, a survey of the tailings area and dams was performed in February, 2012 by AAM (Thailand) Co. Upon review of the survey data, it was noted that the majority of the data encompassed Area C, with minimal coverage in Areas A and B. Therefore, Golder was only able to generate digital contours of the Area C tailings surface, to better estimate the additional volume capacities for the options described below. The survey around Areas A and B were used to obtain general elevations and dam characteristics.

Table 1 below summarizes the main constraints associated with the tailings expansion.

Table 1: Constraints for Tailings Facility Expansion, Song Toh Mine

Item	Constraints	Comments
Physical		
Required Storage Capacity	2.19 M-m^3 (3.51 Mt) of tailings to be deposited	Geotechnical study required of current dam structure and local karst features.
Stability	Area A Dam is up to 15 m in height and its internal characteristics are unknown.	Need to stabilize the existing dam and minimize raising as part of the expansion. Current ponding of water against the dam requires attention and should be avoided during expansion.
Watershed	Encompasses tailings area and land within the surrounding public road / mine road system	There is minimal collecting watershed that drains through the tailings area. Further watershed studies required.
Receptor	Downstream Retaining Pond and final discharge to the environment	Investigation of settling pond capacity required.
Footprint	Minimize tailings area footprint	There is potential to create a division ditch around west side of the tailings area. Increase in footprint during expansion
Environmental		
Tailings Containment	No migration of tailings off site during operations and following closure	Provide engineered containment

Item	Constraints	Comments
Hydrogeology	Karst foundation and sinkholes around tailings facility.	Difficult to understand all drainage paths, although SEA believes all water from site reports to the Retaining Pond. Additional studies will be required to characterize the sinkholes and karst foundations.
Effluent Quality	Final discharge to meet IFC Effluent Guidelines and applicable Thai water quality standards	Collect all site runoff to allow for monitoring and potential treatment. Enhance solids removal capacity and provide effluent treatment for parameters of concern, if necessary. Further studies required to assess the requirement for a water treatment plant.
Closure – Water quality	Limit potential treatment of water	Minimize infiltration into tailings with cover system
Closure Stability	Minimize post closure care and maintenance	Dams, spillways, and cover designed for long-term stability

6.2 Conceptual Design for Expansion of Song Toh Tailings Facility

6.2.1 General Layout and Development

Figure 4 provides a plan view of the preferred layout for the expansion of the Song Toh Tailings Facility taking into account the above mentioned constraints. Schematic tailings cross-sections are provided in Figure 5. The increase in storage capacity is achieved by raising the perimeter and internal dykes in small lifts in the upstream direction. The raises are offset to provide a sufficiently flat overall downstream slope to ensure long term stability.

The preferred option provides a design capacity to store the full 3.51 Mt of tailings.

The preferred option includes the expansion of Areas A, B, and C.

Tailings deposition would commence in Area C. Dyke construction in Area C would consist of a series of small laterite dykes (about 2.0 m to 3.75 m in height) built up in various stages using the upstream method to produce a “stacked” configuration for tailings deposition. A total of six staged dyke raises are proposed in Area C. Stages 1 through 3 would consist of two 3 m high and one 2.5 m high upstream dyke raise along the existing road between Areas B and C, up to an elevation of 637.5 m. Dyke construction for Stages 4 through 6 would be stepped in approximately 75 m from the Stage 3 dyke and would consist of three dam raises to an elevation of 646 m The dykes would have a crest width of 5 m and 2H:1V side slopes. Natural containment following the 650 m contour would be provided around the west, south, and southeast ends of Area C. Assuming a 1% average tailings deposition slope, the maximum tailings discharge elevation from the south end would be 649 m. A dam, with a sloping crest, would also be required on the northeast side of Area C to contain the tailings. The total length of the dyke construction around Area C would be about 2,900 m (includes the lengths associated with the various raises), requiring a total fill volume of about 75,000 m^3.

Deposition of tailings within Area C would mainly occur from south to north, with spigotting off of the southern, western and eastern hillsides, to form a 1% tailings slope to promote drainage to the north against the internal dam between Areas C and B. During the final stage, tailings would be spigotted off of the south end of Area C at an elevation of 649 m. A small overflow spillway will be required in each internal dam to allow gravity discharge into Area B (with the water eventually leading into the Area A pond).

A diversion channel excavated into the western hillside could divert surface runoff from Temple Mountain and the flooded open pit towards the sinkhole northwest of Area B, similar to the ditch constructed during previous mining operations. The dam that contains the flooded open pit may need to be upgraded, or the necessity for the diversion investigated further. The surface runoff from the Temple Mountain watershed and the flooded open pit could be collected and managed within the TSF, eliminating the diversion channel and upgrades to the dam at the outlet of the flooded open pit.

Based on the above configuration and assuming a 1 m freeboard, 1.41 M-m^3 (2.26 Mt) of tailings can be stored in Area C, leaving about 0.78 M-m^3 (1.25 Mt) to be stored in Areas A and B.

In Area B, the internal dyke between Areas A and B can be raised in three separate stages to an ultimate elevation that ranges from 632.5 m to 636.5 m to allow additional tailings deposition in Area B. A dyke along the northern end of Area B would be constructed to block off any tailings migration to the sinkholes that are known to exist north of Area B. Total length of dam construction in Area B would be about 1,770 m, with a total fill volume requirement of about 36,800 m^3 over the life of the mine.

Deposition in Area B would promote drainage to the north and excess water would be conveyed into Area A through a small overflow spillway constructed through the internal dyke.

In Area A, the large dam around the north eastern perimeter of the facility would be raised by 1 m, and its downstream shell stabilized along its entire length (about 910 m) (see Section 6.2.3). The fill volume required for the 1 m dam raise would be about 13,650 m^3. Tailings would be deposited off the crest of the Area A dam and the internal dyke between Areas A and B to produce a tailings pond near the north end of Area A as shown in Figure 4. A new decant would have to be constructed along the north end of the dam as well as upgrading of the existing spillway. Based on the above expansion scenarios, Area B would be able to store an additional 0.66 M-m^3 (1.06 Mt) of tailings, while Area A would store the remaining 0.12 m^3 (192,000 tonnes). Table 2 provides a summary of the additional tailings storage capacity for each area.

Table 2: Summary Additional Tailings Capacity – Song Toh Tailings Area

Area	Containment Dam Elevation (m)	Footprint Area (m^2)	Additional Capacity	
			Volume (M-m^3)	Tonnage (Mt)
A	627 to 624	115,000	0.12	0.19
B	636.5 to 632.5	60,000	0.66	1.06
C	637.5 to 648.5	130,000	1.41	2.26
		TOTAL	**2.19**	**3.51**

6.2.3 Design Assumptions

The following assumptions have been made for the conceptual design tailings expansion:

- Slurry tailings beach profile of 1% based on survey completed in February 2012; and
- Deposited dry density of 1.6 t/m^3.

6.2.4 Area A Dam Stability Considerations

Based on visual observations and the preliminary survey, the containment dam in Area A is an earthfill embankment (most likely constructed of laterite) up to 15 m high, with a steep downstream slope of approximately 1H:1V. The toe of the downstream slope also appeared to be undercut around the outlet of the decant pipe. Based on a survey line obtained across the northern end of Area A, Golder confirmed that the upstream slope of the dam is also approximately 1H:1V. Based on the results of a hydrogeological investigation conducted in 2008, along the northeast end of Area A, the dam is underlain by 12 to 13 m of residual soil before encountering limestone bedrock. It is understood that an zone of karst topographic features exists downstream of the northeast section of the dam, including various sinkholes of unknown depth and dimensions.

The Area A Dam, in its current condition, appears not to meet stability requirements for the long term and will require a detailed geotechnical investigation to adequately characterize its configuration and foundation conditions. Following the geotechnical investigation, a stability analysis will need to be completed to accurately determine stabilization measures required. For the purposes of the conceptual design, a minimum overall slope of 2H:1V has been proposed with a toe berm to provide drainage and additional stability (Figure 6). Any sinkholes that would encroach on the dam footprint could be filled and stabilized with rockfill prior to the dam upgrade. Upgrading the dam prior to re-commissioning the operation is recommended.

6.2.5 Water Management and Treatment

Water collected from the TSF, plant site, stockpiles, and underground workings all reports to the Retaining Pond as surface run-off or through the karst foundations and dewatering drift. The Retaining Pond provides the best opportunity to collect, monitor, and treat the water (if required) prior to discharge to the environment. Solids settling will also take place in the Retention Pond. The final discharge water quality will need to meet IFC effluent guidelines and applicable Thai water quality standards. The level of treatment, if required, will be determined as the project develops. It is understood that studies are currently underway to investigate the process and water quality to determine if the water that accumulates in the TSF is suitable as reclaim water to the mill, or whether it needs to be treated prior to discharge to the environment.

6.2.6 Closure Considerations

A detailed closure plan has not been completed for the project; however, IEM has developed a preliminary rehabilitation plan. At this conceptual level, it has been assumed that the final tailings surface would be graded and a 0.5 m thick layer of overburden would be placed over the tailings to minimize the ingress of water, reduce tailings erosion, and support vegetative growth. A dry cover would also prevent ponding of water on the surface to reduce long term risks and improve dam stability.

If acid generation of the tailings becomes a concern, then an oxygen or water barrier cover, consisting of several layers may need to be considered. A common design is to provide a fine grained layer between two layers of coarse material. The bottom coarse fill is to prevent the capillary rise of water from the tailings. The fine-grained middle layer serves as a low permeability barrier for water and air and is designed to remain at a high degree of saturation (typically greater than 85% moisture content). The surficial layer helps to maintain the low permeability zone saturated and acts as a protective layer.

The extent of post-closure effluent treatment will be established as the project advances.

7.0 CAPITAL COST

A capital and closure cost estimate for the preferred tailings expansion option is provided in Table 3. Included in the cost estimate are site/foundation preparation, earthwork for dam and internal dyke raises, construction of water diversions, outlet channels and reclamation costs for closure.

Engineering and construction assistance costs, which may be about 20% of the total capital cost has not been included in the cost estimate. Also excluded are the operating costs (effluent treatment, care, maintenance, and surveillance, tailings deposition, and water reclaim).

It has been assumed that site rehabilitation will involve draining the tailings pond(s) and placing an engineered soil cover over the tailings to restore natural site drainage as much as possible.

To the extent possible capital cost estimates were prepared using local Thailand unit rates, as provided by SEA, or estimates based on Golder experience on similar projects. The following assumptions were made in the cost estimate:

- Construction quantities are total, with the allowance for stage construction of the tailings dams;
- The costs are in current 2013 Canadian dollars (discount rate not included for future work);
- It has been assumed that construction materials are available near the project site and that the locally available laterite will be used for the majority of the dam construction, along with processed waste rock, which will be available for development of the underground workings or a local quarry developed on site; and
- Natural re-vegetation was assumed.

The total capital cost for the tailings facility expansion was estimated at about $ 1,272,550 CAN, while the cost for closure was estimated at about $610,000 CAN. About 76% of the capital cost is associated with fill placement for dam construction.

8.0 EVALUATION

8.1 Summary of Tailings Facility Expansion

The following provides a summary of the proposed tailings expansion:

- The staged dam raise configuration provides significant savings with respect to fill material requirements. The volume of dam fill includes both locally available laterite and processed waste rock (total of about 255,500 m^3 of laterite and potentially up to about 100,000 m^3 of waste rock). There may be insufficient waste rock available during development of the underground workings and a local limestone quarry may be required to supplement the required quantities.
- The capital cost for the tailings expansion is roughly $1,272,550 CAN The tailings expansion will require the realignment of the public road and hydro line that runs along the west side of the facility, as well as the construction of a rip rap lined channel to divert water from the Temple Mountain catchment towards the sinkhole.
- The tailings expansion option includes raising the containment Dam in Area A by 1.0 m in the upstream method to allow for deposition from the crest and pushing the pond away from the dam. Raising the dam is subject to further investigations and stabilization requirements. Some type of stabilization toe berm or regrading of the downstream slope to a shallower angle is likely required.
- Tailings will be deposited to promote drainage towards a newly constructed decant at the northern end of Area A.
- The layout of the internal dykes within Areas A, B and C is approximately only. A detailed stability analysis should be completed at the next stage of designed to determine the overall allowable slope and required set-back for each dyke raise.
- The tailings expansion option includes the collection of all surface water with the ability to manage water quality prior to final discharge to the environment. The Retaining Pond provides excellent opportunities to monitor and manage flows and water quality from not only the tailings facility, but from the underground dewatering drift and the plant site runoff.

8.2 Further Studies

The conceptual tailings expansion option presented has been prepared based on a number of assumptions that should be verified in advance for the feasibility level design of the TSF upgrades. Studies that should be carried include the following:

- Detailed hydrological assessment with predictions of storm events, wet/dry year precipitation, and runoff off coefficients is required to properly size ponds, containment dams, and conveyance structures;
- A detailed topographic survey of the entire site should be carried out to gain a better understanding of the existing conditions and requirements for dam raising and collecting watersheds;
- The geochemical characteristics of the tailings are not well defined. Additional testing should be undertaken to help design the appropriate waste and water management facilities;

- Surface and ground water quality around the site is not well understood. Future monitoring should include a more complete set of analysis including a full suite of metals, cations (calcium, magnesium, potassium, sodium), anions (chloride, sulphate, nitrate, fluoride) as well as total dissolved and suspended solids;
- Effluent treatment will be provided to ensure site discharge meets IFC effluent guidelines and Thai environmental standards. The need for effluent treatment will be determined from a comprehensive water quality and flow monitoring program;
- A detailed site wide water balance to define the water management requirements is needed and a water quality model to confirm effluent treatment requirements;
- The hydrogeological conditions are difficult to define given the karst foundations. Sinkholes should be investigated to confirm all drainage on site is conveyed to the dewatering drift;
- Foundation stabilization against karstic voids to ensure stability of existing and proposed dams
- The design and construction of the existing containment dam around the tailings area are unknown. Water should not be allowed to pond against the dam. A geotechnical investigation should be carried out to determine the upgrades required to stabilize the dam. Further raising of the dam to contain additional tailings should be avoided until the stability of the structure is better defined;
- The water quality in the flooded open pit should be investigated to determine whether the catchment should be included within the tailings area, or whether it's considered clean and could be diverted around the tailings area. As the open pit effluent reports to the sinkhole on the northwest side of Area B, which is connected to the dewatering drift the necessity for the diversion channel should be reviewed;
- The Retaining Pond was constructed to settle solids prior to its final release from site. The pond was not sized and the characteristics of the dam are not known. A geotechnical investigation should be carried out to determine the requirements to stabilize the dam;
- The suspended solids loading to the environment can be reduced by enhancing the settling ability of the Retaining Pond through a dredging program; and

9.0 CONCLUSIONS

The expansion of the Song Toh tailings facility, involving the deposition of conventional slurry tailings, can be carried out in an environmentally acceptable manner with the proper management and operational oversight.

Upon evaluating various options for the expansion of the tailings facility, the option presented in this report was most favourable with respect to construction requirements, capital cost, dam stability, reduced risk, flexibility, and environmental performance.

Report Signature Page

GOLDER ASSOCIATES LTD.

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Geotechnical Engineer

Peter Merry, P.Eng.
Associate

Shiu Kam, P.Eng.
Principal

RMC/WPM/SNK/jm

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AAM (Thailand) Co, Ltd. (2012). "Report of Survey at Song Toh and Bo Yai Mining Areas, Thong Pha Phum, Thailand". Report submitted to Southeast, Asia Mining Corporation, February / March, 2012.

Golder Associates Ltd. (2012). "Site Visit Report – February 10-12, 2012, Song Toh and Boh Yai Mines, Kanchanaburi, Thailand". Memorandum submitted to Southeast Asia Mining Corporation, March 6, 2012.

Southeast Asia Mining Corp. (2012). "Waste (Tailing) Management". Technical document provided to Golder Associates Limited, February, 2012.

n:\active\2012\1118\12-1118-0011 song toh mine\2000 tailings expansion\report\final report\1211180011 (2000) conceptual tailings expansion final april 1-2013.docx

Table 3
Preliminary Capital Cost Estimate for Song Toh Tailings Expansion
Conceptual Tailings Expansion with Dry Cover for Closure
Song Toh Mine, Kanchanaburi, Thailand

Dam	Area A Dam	A/B Internal Dyke (stage raised)	Area B North Dyke	Area B	Area C (staged raise)	
Crest Elevation (m)	627 to 624 m	636.5 to 632.5 m	633.5 to 632.5 m		637.5 to 648.5 m (staged raising)	
Crest Width (m)	5	5	5		5	
Sideslopes (H:V)	2	2	2		2	
Length (m)	910	390	300		varies	
Maximum Raise Height (m)	1	7.5 (three stages)	4.5 (two stages)			

Description	Unit	Unit Rate ($CDN)	Start-up		Year 12		Closure (Year 14)		Year 7 (Stage 1)		Year 9 Stage 2)		Year 11 (Stage 3)		Year 9		Year 11		Closure (Year 14)		Start-up (Stage 1)		Year 1 (Stage 2)		Year 2 (Stage 3)		Year 3 (Stage 4)		Year 4 (Stage 5)		Year 5 (Stage 6)		Closure (Year 14)		TOTAL
			Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost			Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	
Clearing and Grubbing (Dam footprint)	ha	$5,000	2.73	$13,650																															$13,650
Laterite Fill	m^3	$2.0	130,000	$260,000	13,650	$27,300			13,000	$26,000	13,000	$26,000	3,600	$7,200	3,600	$7,200	3,600	$7,200			10,500	$21,000	15,500	$31,000	12,500	$25,000	13,000	$26,000	11,500	$23,000	12,000	$24,000			$510,900
Waste Rock Fill (underground source)	m^3	$2.0	35,000	$70,000																															$70,000
Waste Rock fill (Quarry source)	m^3	$6.0	65,500	$393,000																															$393,000
Spillway Upgrade / Raise	lump sum	$50,000	1	$50,000																															$50,000
Decant Upgrade	lump sum	$50,000	1	$50,000																															$50,000
Outlet Channel	lump sum	$10,000							1	$10,000	1	$10,000									1	$10,000	1	$10,000	1	$10,000	1	$10,000	1	$10,000	1	$10,000			$80,000
Rip Rap Diversion Channel	m	$50																			1,000	$50,000													$50,000
Access Road Realignment	km	$60,000																			0.5	$30,000													$30,000
Hydro-Pole Realignment	km	$50,000																			0.5	$25,000													$25,000
TOTAL				**$836,650**		**$27,300**		**$0**		**$36,000**		**$36,000**		**$7,200**		**$7,200**		**$7,200**		**$0**		**$136,000**		**$41,000**		**$35,000**		**$36,000**		**$33,000**		**$34,000**		**$0**	**$1,272,550**
Closure																																			
Overburden Cover (0.5 m thick assumed	m^3	$2.0					115,000	$230,000											60,000	$120,000													130,000	$260,000	$610,000
TOTAL CLOSURE				**$0**		**$0**		**$230,000**		**$0**		**$0**		**$0**		**$0**		**$0**		**$120,000**		**$0**		**$0**		**$0**		**$0**		**$0**		**$0**		**$260,000**	**$610,000**

Notes:
1) Unit rates for Laterite fill ($1/t), waste rock fill from underground ($1/t), and Waste rock fill from quarry ($3/t) provided by SEAM. Unit rate per cubic metre based on in-place density of 2.0 t/m^3.

FIGURES

LEGEND

- ★ Song Toh Project Area
- National Capital
- International Airport
- Other Airport
- Roads
- State-Province Boundary
- Waterbody

REFERENCE

Base Data - ESRI Data 2008
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2012
Projection: Transverse Mercator Datum: D_Indonesian_1974 Coordinate System: UTM Zone 47N

30 15 0 30 60 90

SCALE 1:2,000,000 Kilometers

PROJECT

SONG TOH MINE - THAILAND

TITLE

PROJECT LOCATION

Golder Associates
Mississauga, Ontario

PROJECT NO. 12-1118-0011			SCALE AS SHOWN	REV. 0.0
DESIGN	JMC	14 Nov. 2008	FIGURE: 1	
GIS	JMC	26 Mar. 2013		
CHECK	RC	26 Mar. 2013		
REVIEW	PWM	26 Mar. 2013		

G:\Projects\2012\12-1118-0011_SAMC_Thailand\GIS\MXDs\Working\Project_Location.mxd

PLOT DATE: March 26, 2013
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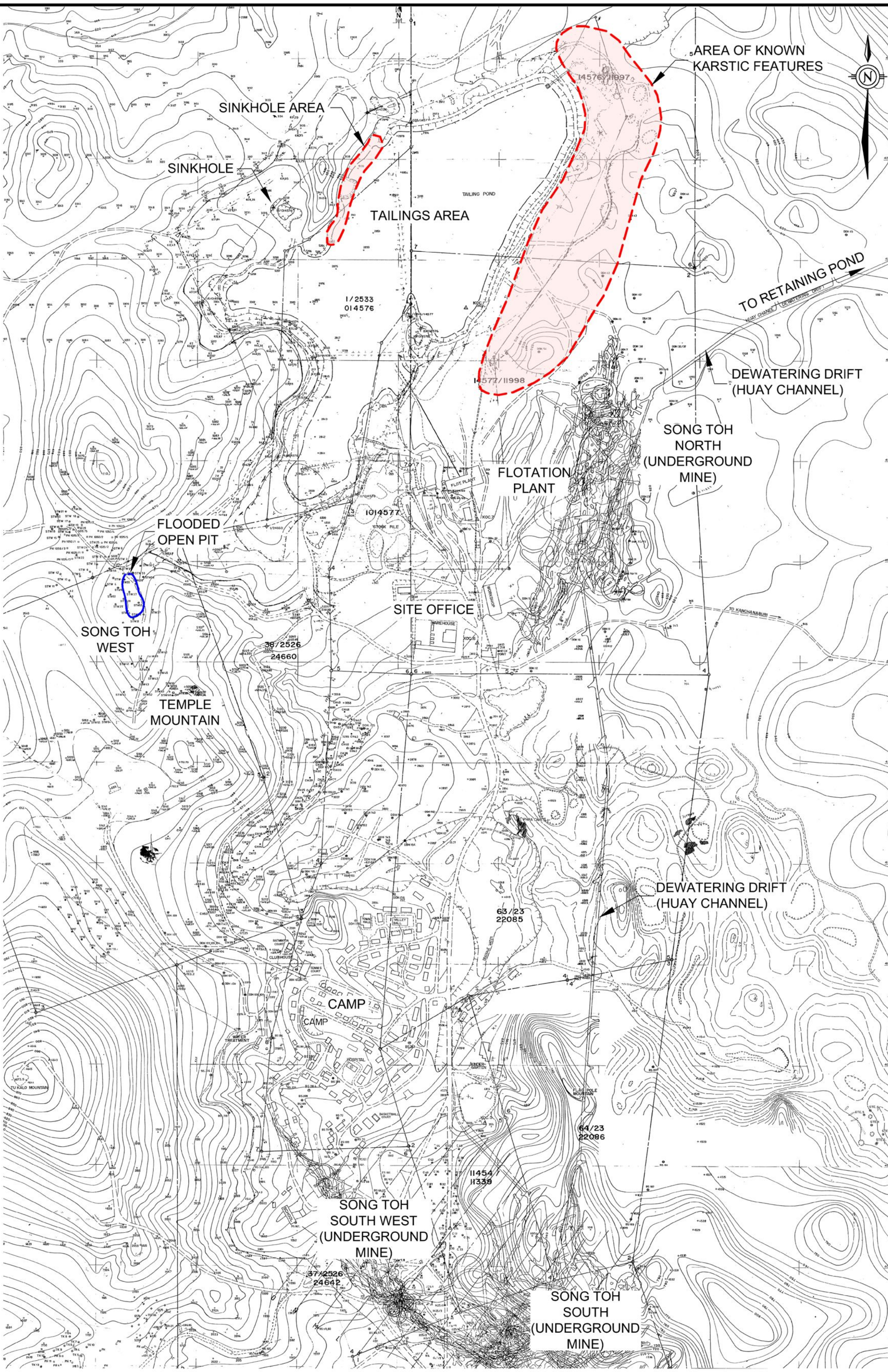

150 0 150
SCALE 1:7500 METRES

REFERENCES:

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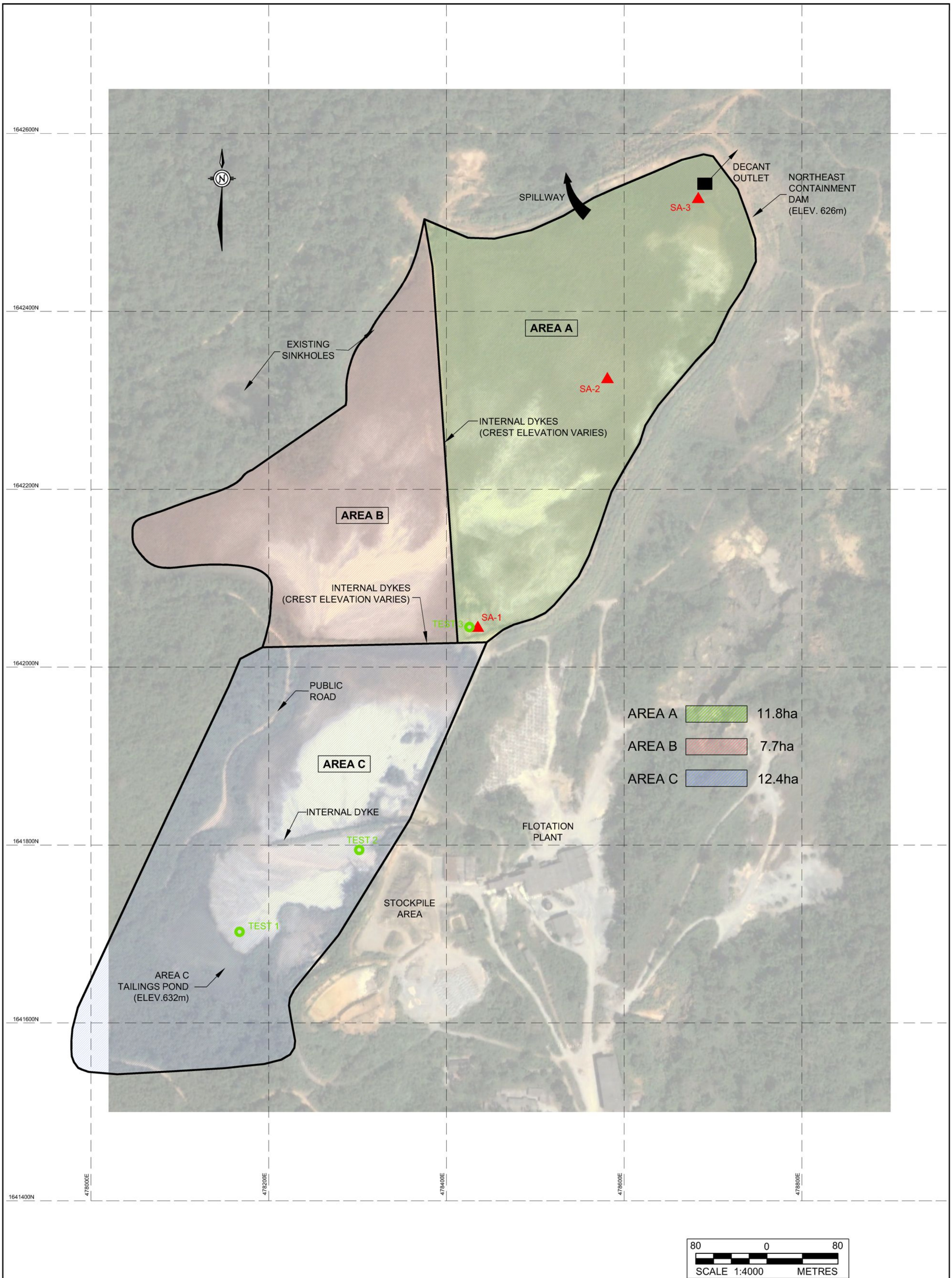
Golder Associates
Mississauga, Ontario, Canada

SCALE	AS SHOWN	TITLE	
DATE	Jul. 3, 12	GENERAL SITE PLAN	
DESIGN	RMC		
CAD	TDR		
FILE No. 1211180011AB002.dwg	CHECK RMC	SONG TOH MINE - THAILAND	FIGURE 2
PROJECT No. 12-1118-0011 REV. A	REVIEW WPM / SNK		



LEGEND

SA-1 2012 TAILINGS SAMPLE LOCATION

TEST 1 2012 FIELD DENSITY TEST LOCATIONS (APPROX.)

REFERENCE:

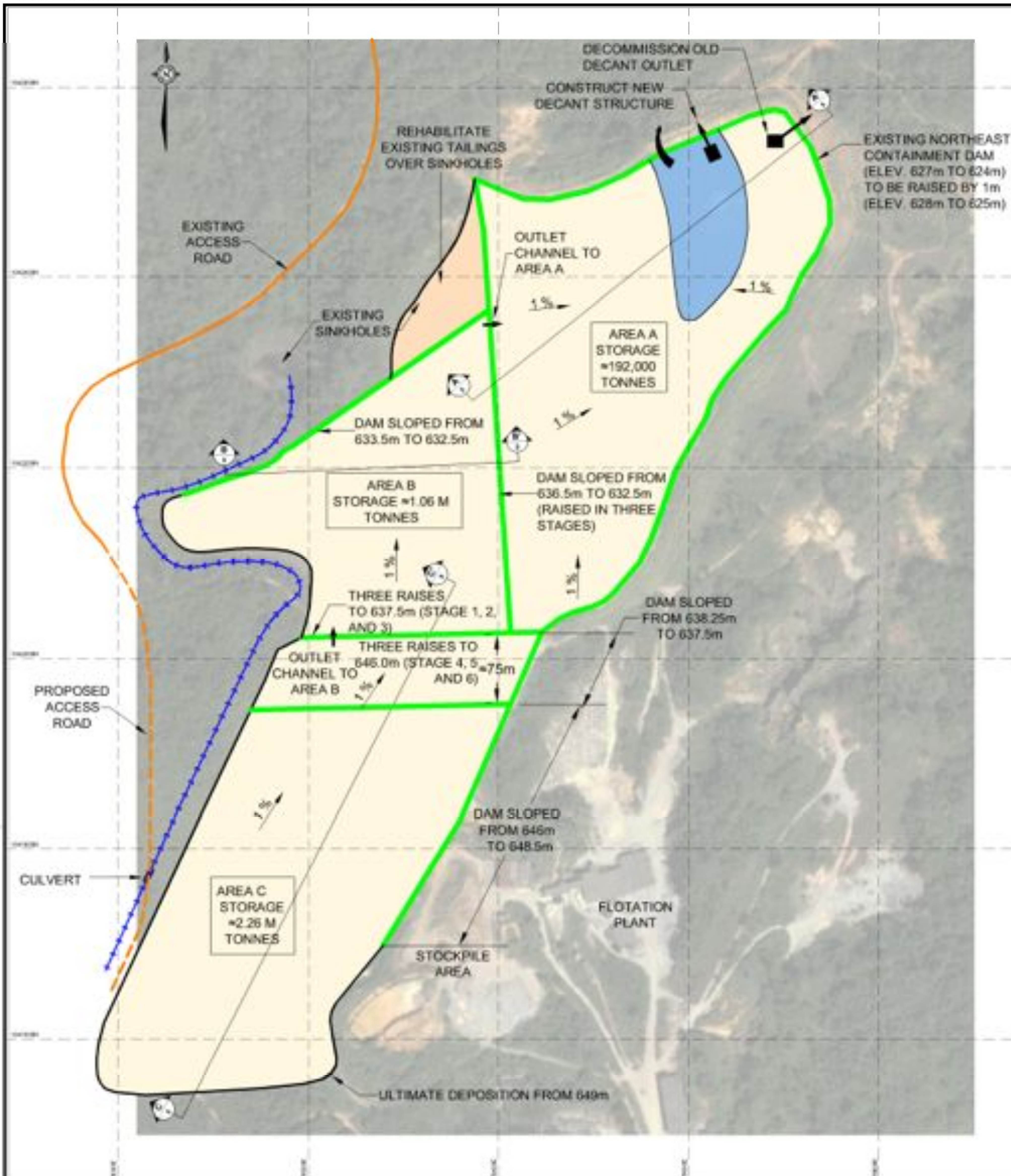
1. GRID IS INDIAN THAILAND - 1975 (UTM)

REFERENCE:

1. MAPPING BASED ON Tailing Pond_DEM Survey.dwg PROVIDED BY CLIENT

Golder Associates Mississauga, Ontario, Canada	SCALE: AS SHOWN	TITLE	
	DATE: Jun. 28, 2012	**EXISTING TAILINGS FACILITY**	
	DESIGN: RMC		
	CAD: TDR		
FILE No. 1211180011AB003.dwg	CHECK: RMC	SONG TOH MINE - THAILAND	FIGURE 3
PROJECT No. 12-1118-0011 REV. A	REVIEW: WPM / SNK		

PLOT DATE: April 4, 2013
FILENAME: T:\Projects\2012\12-1118-0011 (SAMC, Thailand)\-BB-\1211180011BB004.dwg



LEGEND:

- DAM
- TAILINGS MANAGEMENT AREA
- 1% APPROXIMATE TAILINGS BEACH SLOPE
- EXISTING TAILINGS REHABILITATED OVER SINKHOLES
- PROPOSED RIP RAP LINED CHANNEL
- PROPOSED ACCESS ROAD
- EXISTING ACCESS ROAD
- TAILINGS POND
- DECANT STRUCTURE
- EMERGENCY SPILLWAY
- OUTLET CHANNEL

80 0 80
SCALE 1:4000 METRES

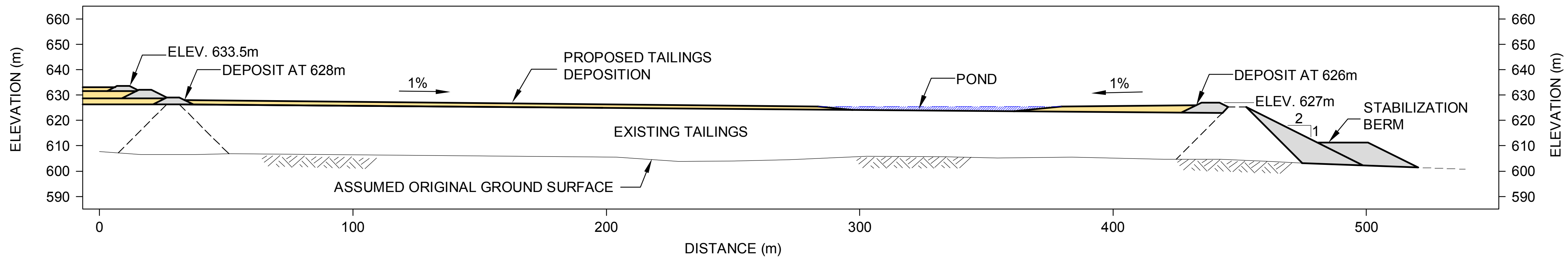
REFERENCE:

1. MAPPING BASED ON Tailing Pond_DEM Survey.dwg PROVIDED BY CLIENT
2. GRID IS INDIAN THAILAND - 1975 (UTM)

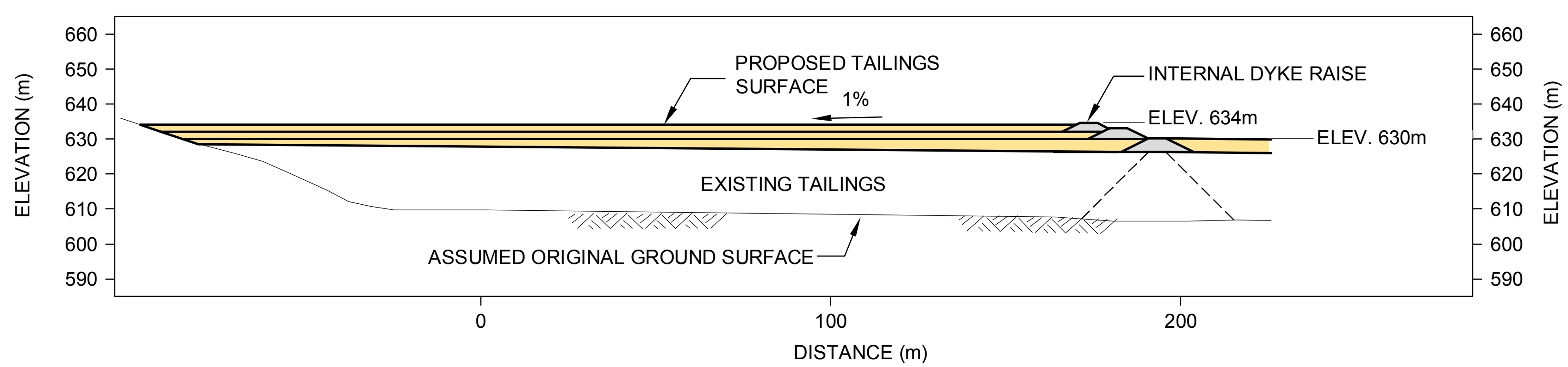
Golder Associates
Mississauga, Ontario, Canada

SCALE	AS SHOWN	TITLE	TAILINGS FACILITY EXPANSION LAYOUT
DATE	APR. 2013		
DESIGN	RMC		
CAD	TDR/MY		
CHECK	RMC		SONG TOH MINE - THAILAND
REVIEW	WPM / SNK	FIGURE	4

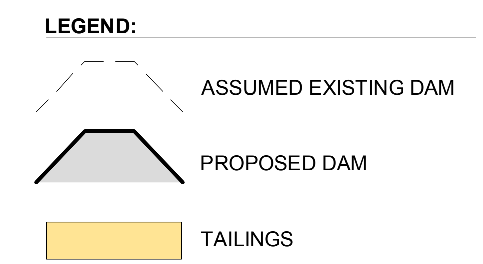
FILE No. 1211180011BB004.dwg
PROJECT No. 12-1118-0011 REV. B

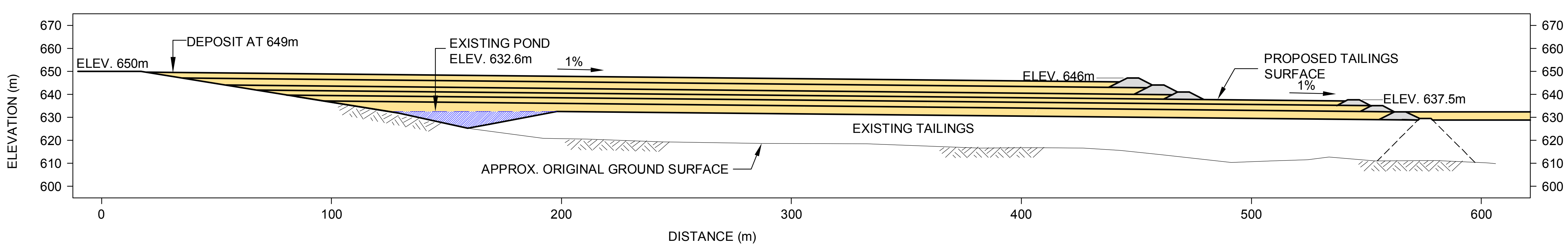


A / 4 — CROSS-SECTION A - A'



B / 4 — CROSS-SECTION B - B'

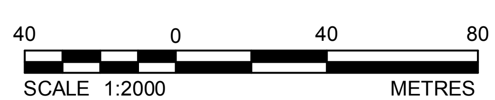




C / 4 — CROSS-SECTION C - C'

NOTES:

1. LIMITED GROUND SURFACE SURVEY DATA IS AVAILABLE FOR THE TAILINGS AREA, GROUND SURFACE AND PROPOSED DAM ELEVATIONS ARE APPROXIMATE ONLY.



Golder Associates
Mississauga, Ontario, Canada

SCALE	AS SHOWN	TITLE	CROSS-SECTIONS A, B AND C TAILINGS FACILITY EXPANSION
DATE	APR. 2013		
DESIGN	RMC		
CAD	TDR / MY		
CHECK	RMC		SONG TOH MINE - THAILAND
REVIEW	WPM / SNK	FIGURE	5

FILE No. 1211180011BB005.dwg
PROJECT No. 12-1118-0011 REV. B

PLOT DATE: April 4, 2013
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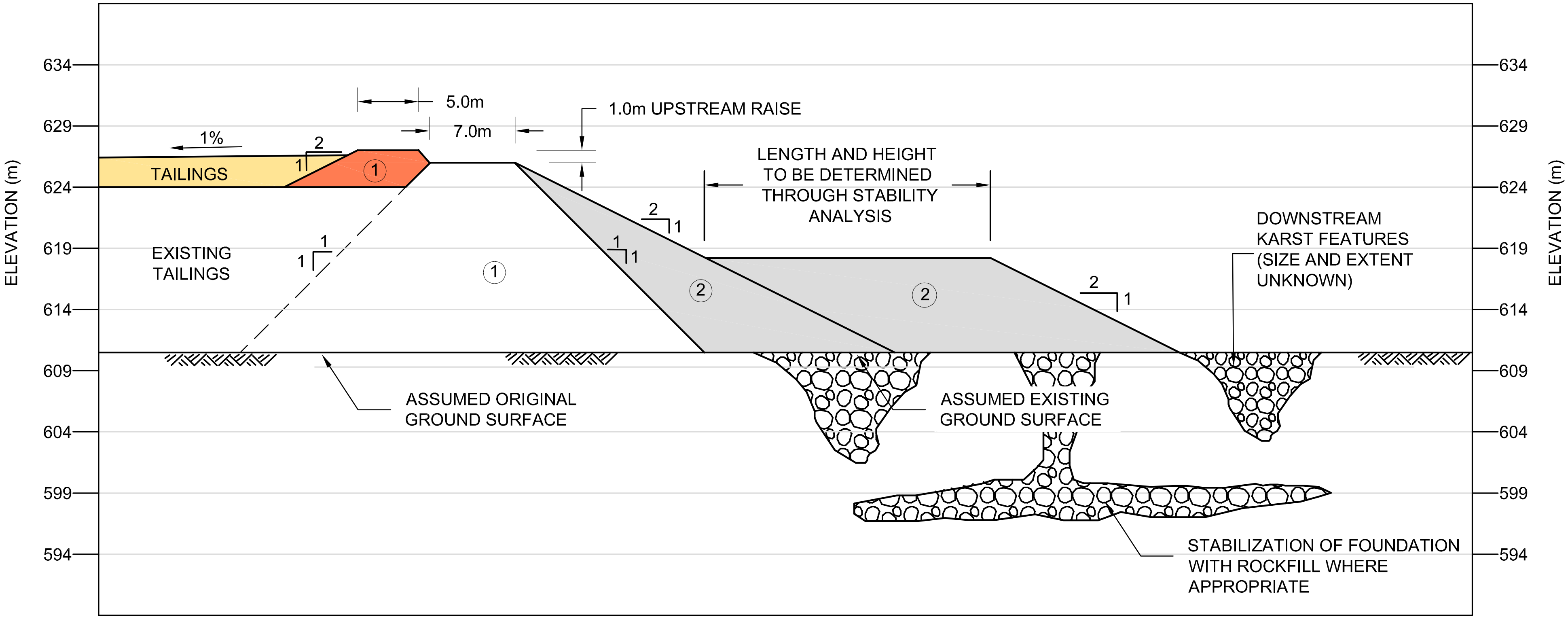
PLOT DATE: March 26, 2013
FILENAME: T:\Projects\2012\12-1118-0011 (SAMC, Thailand)\-AB-\1211180011AB006.dwg



MATERIALS:

1. LATERITE (LOCALLY OBTAINED)
2. WASTE ROCK

NOTES:

1. EXISTING GROUND IS SCHEMATIC AND IS FOR ILLUSTRATIVE PROPOSES ONLY.
2. STABILIZATION TOE BERM CAN BE CONSTRUCTED WITH WASTE ROCK TO ACT AS A DRAIN.
3. EXISTING DOWNSTREAM SLOPE ANGLE IS APPPROXIMATE ONLY AND BASED ON VISUAL SITE INSPECTION.

10 0 10
SCALE 1:500 METRES

Golder Associates
Mississauga, Ontario, Canada

SCALE	AS SHOWN
DATE	Jul. 3, 2012
DESIGN	RMC
CAD	TDR / MY
CHECK	RMC
REVIEW	WPM / SNK

FILE No. 1211180011AB006.dwg
PROJECT No. 12-1118-0011 REV. A

TITLE

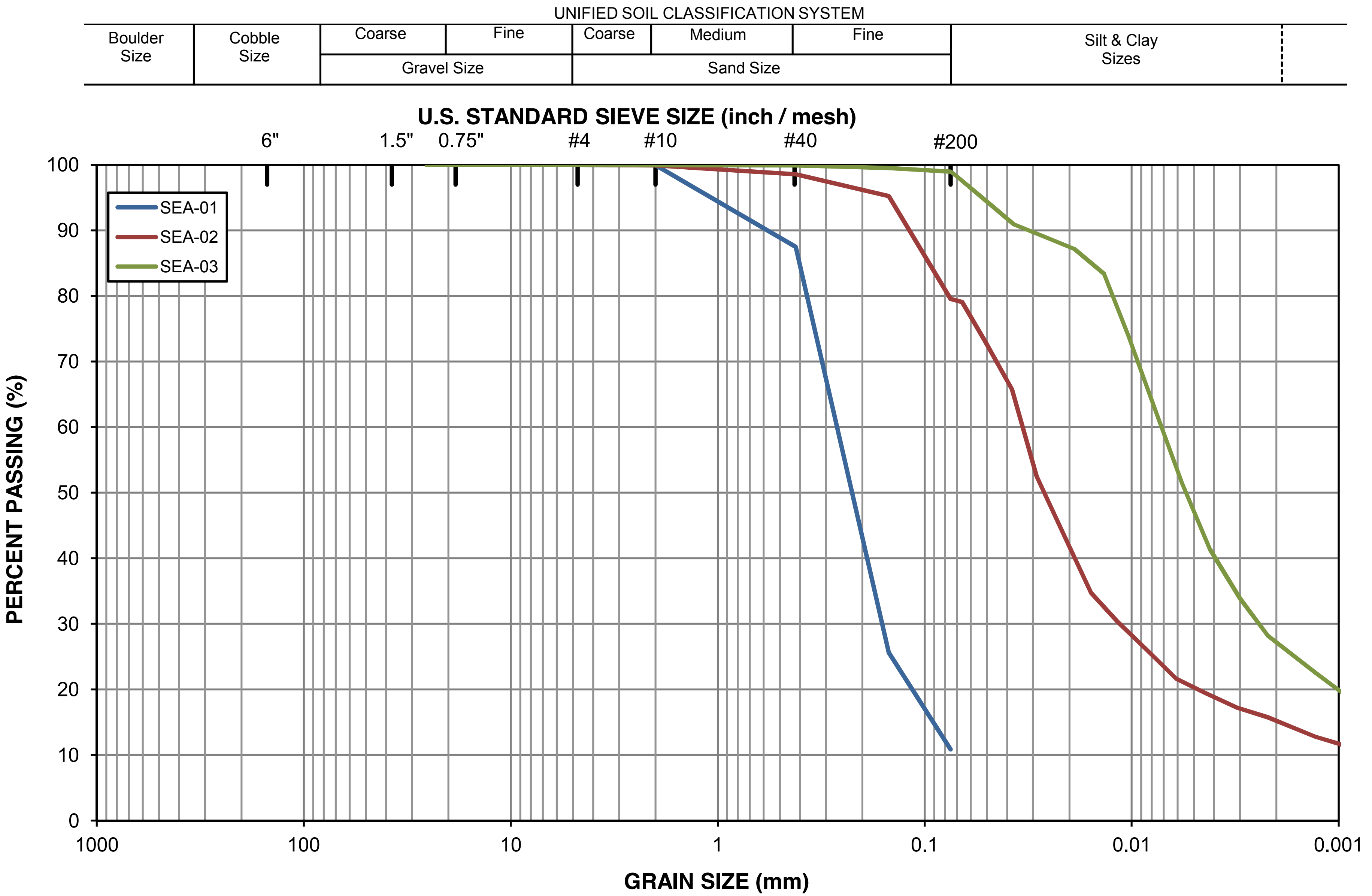
RECOMMENDED DOWNSLOPE STABILITY FOR AREA A DAM

SONG TOH MINE - THAILAND

FIGURE 6

APPENDIX A

Geotechnical Laboratory and Field Test Results - Tailings



Golder Associates

GRAIN SIZE DISTRIBUTION - SONG TOH TAILINGS

PROJECT NO: 11-1118-0025		DATE:	23-Apr-11
BY:	RMC	CHECK:	WPM

SONG TOH MINE
TAILINGS FACILITY

FIGURE A-1

GMT Corporation Ltd. **SPECIFIC GRAVITY OF SOIL**

ASTM D 854

Project:		**Hole No.:**	-
Location:		**Sample No.:**	SEA-01
Sample Description:		**Depth, m.:**	-

SPECIFIC GRAVITY DETERMINATION

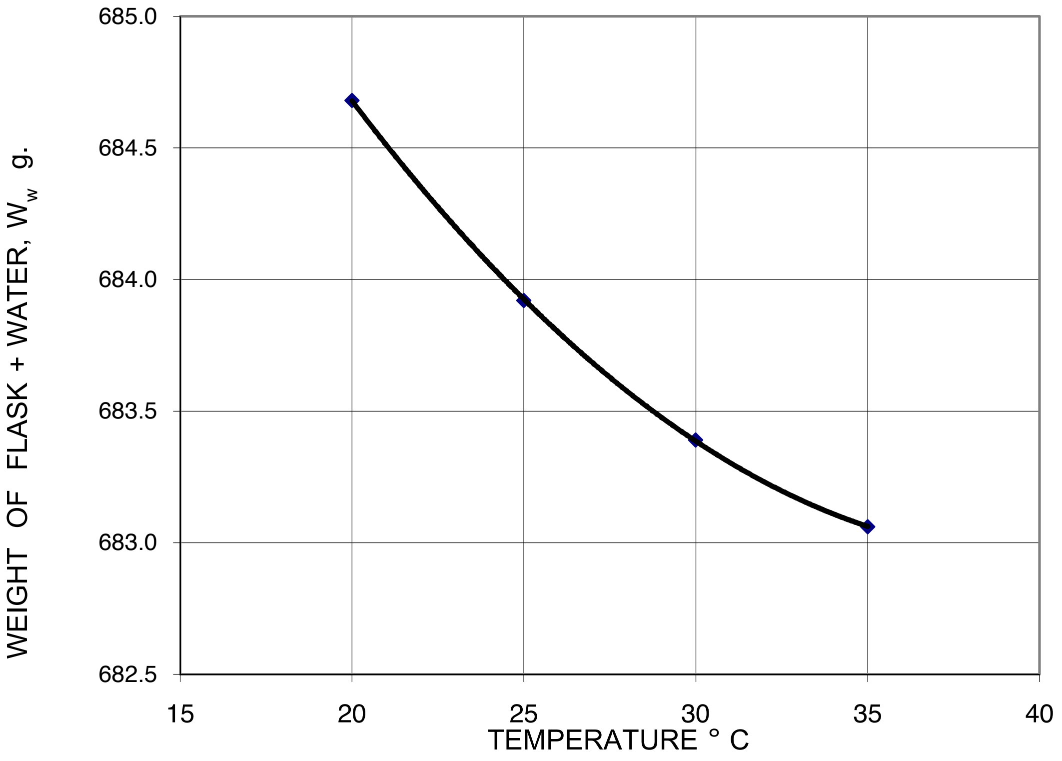
	Trial no.	1	2
1	Temperature , ° c	24	24
2	Flask + water , gm.	684.05	684.05
3	Flask + water + soil , gm.	714.95	714.83
4	Can no.	E-99	C-57
5	Dry soil + can , gm.	169.53	139.64
6	Wt. of can , gm.	119.67	89.8
7	Dry soil , gm.	49.86	49.84
8	Sp. gr. of water	0.9973	0.9973
9	Sp. gr. of soil	2.62	2.61
	AVERAGE SP. GR. OF SOIL, G_S		2.61

FLASK CALIBRATION NO. 1

	1	2	3	4
Temperature , ° c	20	25	30	35
Flask + water , gm.	684.68	683.92	683.39	683.06

Remark:

Method A : Procedure for Oven-Dry Specimen



Tested By:	Thongbai Srikarasin	*Date:*	14 Mar 12
Approved By:	Arkom Sawangkarn	*Date:*	16 Mar 12

GMT Corporation Ltd. **SPECIFIC GRAVITY OF SOIL**

ASTM D 854

Project:		**Hole No.:**	-
Location:		**Sample No.:**	SEA-02
Sample Description:		**Depth, m.:**	-

SPECIFIC GRAVITY DETERMINATION

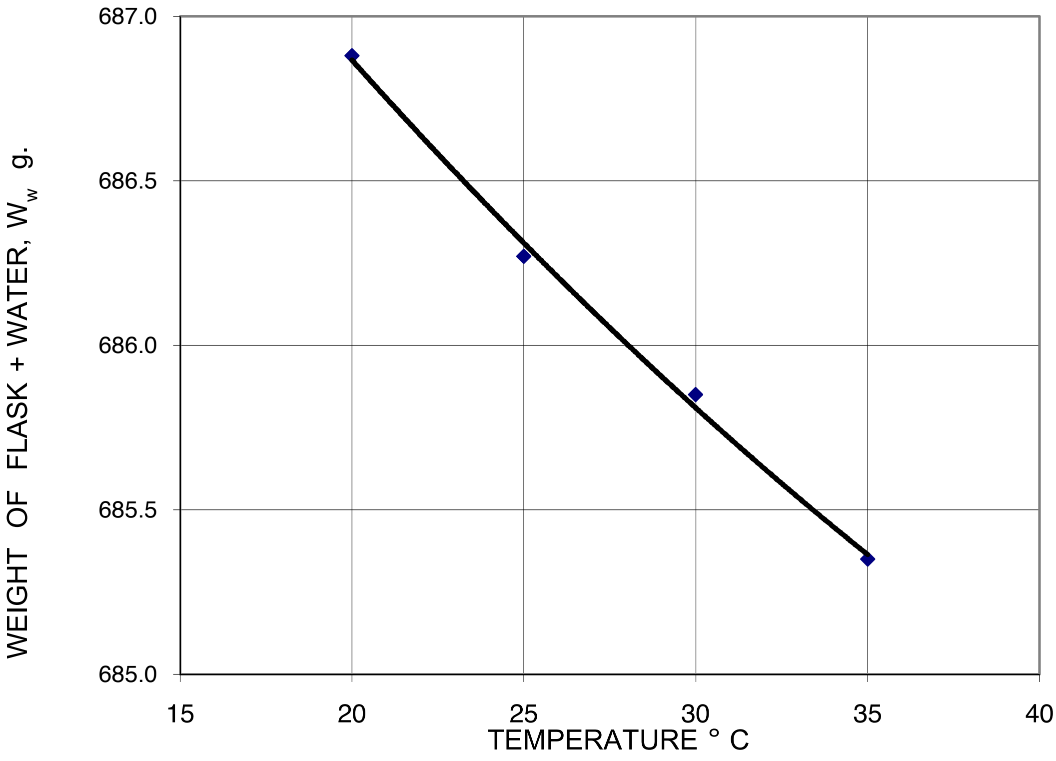
	Trial no.	1	2
1	Temperature , ° c	24	24
2	Flask + water , gm.	686.42	686.42
3	Flask + water + soil , gm.	717.6	717.52
4	Can no.	E-06	C-09
5	Dry soil + can , gm.	144.6	144.64
6	Wt. of can , gm.	94.74	94.83
7	Dry soil , gm.	49.86	49.81
8	Sp. gr. of water	0.9973	0.9973
9	Sp. gr. of soil	2.66	2.66
	AVERAGE SP. GR. OF SOIL, G_S		2.66

FLASK CALIBRATION NO. 6

1	2	3	4
20	25	30	35
686.88	686.27	685.85	685.35

Remark:

Method A : Procedure for Oven-Dry Specimen



Tested By:	Thongbai Srikarasin	*Date:*	14 Mar 12
Approved By:	Arkom Sawangkarn	*Date:*	16 Mar 12

GMT Corporation Ltd. **SPECIFIC GRAVITY OF SOIL**

ASTM D 854

Project:		**Hole No.:**	-
Location:		**Sample No.:**	SEA-02
Sample Description:		**Depth, m.:**	-

SPECIFIC GRAVITY DETERMINATION

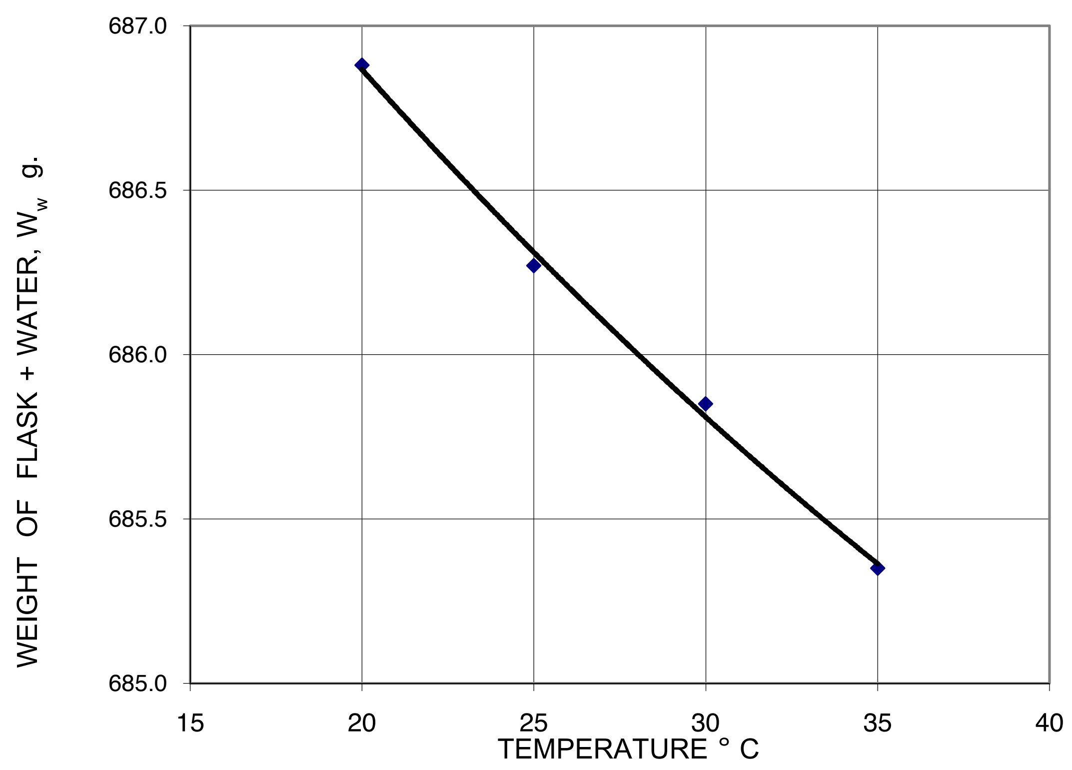
	Trial no.	1	2
1	Temperature , ° c	24	24
2	Flask + water , gm.	686.42	686.42
3	Flask + water + soil , gm.	717.6	717.52
4	Can no.	E-06	C-09
5	Dry soil + can , gm.	144.6	144.64
6	Wt. of can , gm.	94.74	94.83
7	Dry soil , gm.	49.86	49.81
8	Sp. gr. of water	0.9973	0.9973
9	Sp. gr. of soil	2.66	2.66
AVERAGE SP. GR. OF SOIL, G_S			2.66

FLASK CALIBRATION NO. 6

1	2	3	4
20	25	30	35
686.88	686.27	685.85	685.35

Remark:

Method A : Procedure for Oven-Dry Specimen



Tested By:	Thongbai Srikarasin	*Date:*	14 Mar 12
Approved By:	Arkom Sawangkarn	*Date:*	16 Mar 12

GMT Corporation Ltd.	SPECIFIC GRAVITY OF SOIL
	ASTM D 854

Project:		**Hole No.:**	-
Location:		**Sample No.:**	SEA-03
Sample Description:		**Depth, m.:**	-

SPECIFIC GRAVITY DETERMINATION

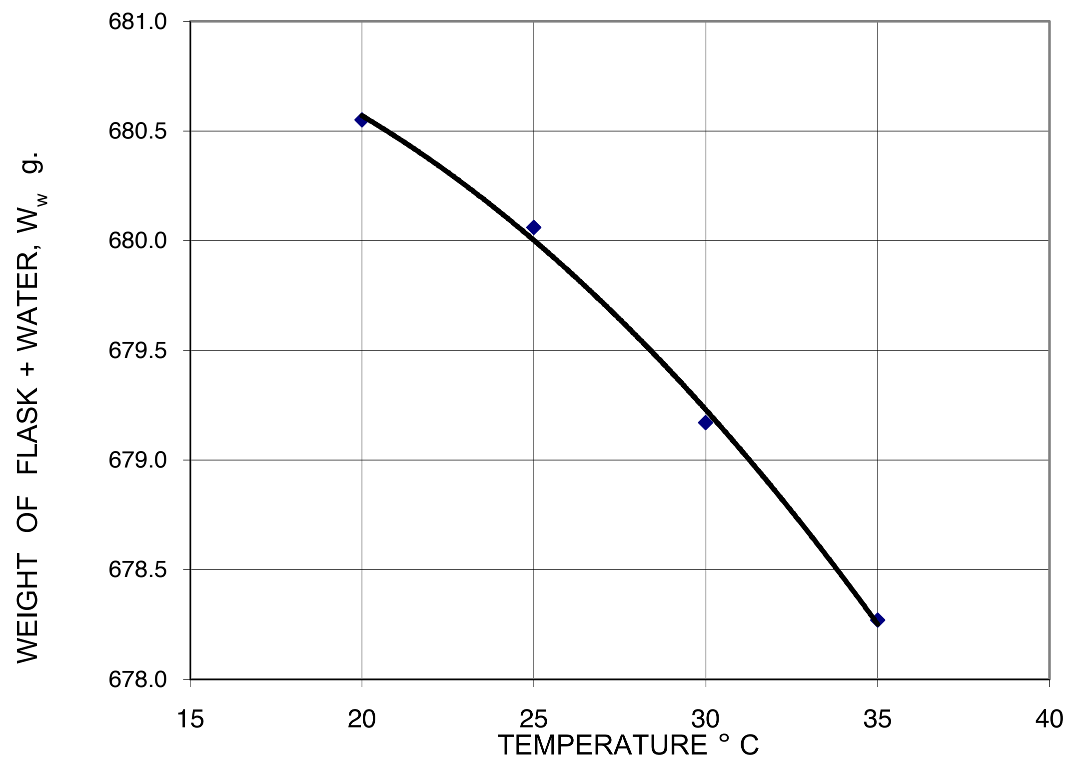
	Trial no.	1	2
1	Temperature , ° c	24	24
2	Flask + water , gm.	680.13	680.13
3	Flask + water + soil , gm.	711.5	711.44
4	Can no.	A-009	E-7
5	Dry soil + can , gm.	140.34	120.65
6	Wt. of can , gm.	90.47	70.83
7	Dry soil , gm.	49.87	49.82
8	Sp. gr. of water	0.9973	0.9973
9	Sp. gr. of soil	2.69	2.68
	AVERAGE SP. GR. OF SOIL, G_S		2.69

FLASK CALIBRATION NO. 12

1	2	3	4
20	25	30	35
680.55	680.06	679.17	678.27

Remark:

Method A : Procedure for Oven-Dry Specimen



Tested By:	Thongbai Srikarasin	*Date:*	14 Mar 12
Approved By:	Arkom Sawangkarn	*Date:*	16 Mar 12

APPENDIX A2

In-Situ Tailings Density Testing Summary

Put steel box with size 25 cm x 25 cm into tailing and muck it to scale.

Test No.	Volume	Weight	Density
	litre	Kg	t/m^3
1	15.63	27.20	1.74
2	15.63	29.84	1.91
3	15.63	29.38	1.88
	46.89	**86.42**	**1.84**

Notes:

1) Testing completed by SEAM staff on May 11, 2012
2) Refer to Figure 3 for test locations
3) Test method as described by SEAM staff included putting a steel box (25 cm by 25 cm) into tailings and mucking it to scale

At Golder Associates we strive to be the most respected global company providing consulting, design, and construction services in earth, environment, and related areas of energy. Employee owned since our formation in 1960, our focus, unique culture and operating environment offer opportunities and the freedom to excel, which attracts the leading specialists in our fields. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees who operate from offices located throughout Africa, Asia, Australasia, Europe, North America, and South America.

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APPENDIX IX. CAPITAL COST SCHEDULE

SOUTHEAST ASIA MINING CORP.

SONG TOH – BOH YAI PROJECTS, THAILAND
CAPITAL COST SCHEDULE
(US$ thousands)

A.C.A. HOWE INTERNATIONAL LIMITED
Mining and Geological Consultants

Capital Cost Schedule US $'000	**Year 0 Pre Production**	**Year 1 5 months Pre Production**	**Total Pre Production**	**Year 1 7 months Post Production**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**	**Total Post Production**	**Total**
Feasibility & Permitting	600		**600**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**600**
Infrastructure																				
Camp		791	791	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**140**	**931**
Road upgrades		32	32	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**32**	**65**
Office refurbishment		48	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**48**
Lab		148	148	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**148**
Truck Scale refurbishment		16	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**16**
Workshop refurbishment		48	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**48**
Boh Yai Workshop		129	129	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**129**
Communications upgrades		32	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**32**
		1,244	**1,244**	**172**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**172**	**1,416**
Tailings Containment and Water Treatment																				
Settling Pond		32	32																**-**	**32**
Tailings Storage		1,167	1,167	49	42	43	40	41	-	43	-	52	-	17	33	-	-		**360**	**1,527**
Water Treatment, allowance		2,803	2,803	-	-	-	-	-	-	-	-	-	-	-	-	-	-		**-**	**2,803**
	-	**4,004**	**4,004**	**49**	**42**	**43**	**40**	**41**	**-**	**43**	**-**	**52**	**-**	**17**	**33**	**-**	**-**	**-**	**360**	**4,364**
Underground Mining and Surface Support Equipment																				
Service Trucks		97	97																**-**	**97**
Light Vehicles		318	318	8						326									**334**	**652**
Explosives magazines		32	32																**-**	**32**
Compressors		39	39																**-**	**39**
Mining Equipment		4,885	4,885	2,801	585	1,452	1,452	-	-	3,226	1,452	-	-	-	-	-	-		**10,967**	**15,853**
Front-End-Loader		210	210	-	-	-	-	-	-	-	-	-	-	-	-	-	-		**-**	**210**
	-	**5,581**	**5,581**	**2,809**	**585**	**1,452**	**1,452**	**-**	**-**	**3,552**	**1,452**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**11,301**	**16,882**
Processing Plant Refurbishment		**105**	**105**	**65**	-	-	-	-	-	-	-	-	-	-	-	-	-		**65**	**170**
																			-	**-**
Underground Development																			**-**	**-**
Development ST MSW		-	-	-	-	161	161	161	-	-	-	-	-	-	-	-	-		**484**	**484**
Development ST Camp Zone		291	291	407	588	121	121	121	121	121	-	-	-	-	-	-	-		**1,600**	**1,891**
Development BY		80	80	-	32	202	202	202	363	363	484	484	484	484	484	226	65		**4,073**	**4,153**
Dewatering ST MSW		711	711																**-**	**711**
	-	**1,082**	**1,082**	**407**	**621**	**484**	**484**	**484**	**484**	**484**	**484**	**484**	**484**	**484**	**484**	**226**	**65**	**-**	**6,157**	**7,238**
Sustaining	**-**	**-**	**-**	**-**	**242**	**484**	**484**	**484**	**484**	**484**	**484**	**484**	**484**	**484**	**242**	**97**	**48**	**-**	**4,984**	**4,984**
Closure																				
Tailings			-		-	-	-	-	-	-	-	-	-	-	-	-	366	366	**732**	**732**
Other			-		56	56	56	56	56	56	56	56	56	56	56	56	167	167	**1,000**	**1,000**
Salvage			-														-	(194)	**(194)**	**(194)**
	-	**-**	**-**	**-**	**56**	**56**	**56**	**56**	**56**	**56**	**56**	**56**	**56**	**56**	**56**	**56**	**533**	**339**	**1,538**	**1,538**
Total	**600**	**12,016**	**12,616**	**3,502**	**1,545**	**2,518**	**2,515**	**1,064**	**1,023**	**4,618**	**2,475**	**1,075**	**1,023**	**1,041**	**814**	**378**	**646**	**339**	**24,576**	**37,192**

APPENDIX X. CASH FLOW ANALYSIS DETAIL

SONG TOH – BOH YAI PROJECTS, THAILAND
NET CASH FLOW CALCULATION
(US$ thousands)

	Units	Total/ Average	Year 0	Year 1		Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
				5 mon.	7 mon.														
PRODUCTION																			
Boh Yai Pb																			
Ore Mined	**tonnes**	**246,500**	-	-	-	40,400	50,000	50,000	50,000	56,100	-	-	-	-	-	-	-	-	
Metal Grades																			
Lead	**%**	**5.46%**	-	-	-	5.30%	5.49%	5.49%	5.49%	5.49%	-	-	-	-	-	-	-	-	
Zinc	**%**	**0.01%**	-	-	-	0.01%	0.01%	0.01%	0.01%	0.01%	-	-	-	-	-	-	-	-	
Silver	**g/t**	**156**	-	-	-	183	150	150	150	150	-	-	-	-	-	-	-	-	
Recoveries to Lead Conc.																			
Lead	**%**	**90%**	-	-	-	90%	90%	90%	90%	90%	-	-	-	-	-	-	-	-	
Zinc	**%**	**60%**	-	-	-	60%	60%	60%	60%	60%	-	-	-	-	-	-	-	-	
Silver	**%**	**90%**	-	-	-	90%	90%	90%	90%	90%	-	-	-	-	-	-	-	-	
Lead Concentrate	**tonnes**	**16,150**	-	-	-	2,569	3,295	3,295	3,295	3,697	-	-	-	-	-	-	-	-	
Grades																			
Lead	**%**	**75%**	-	-	-	75%	75%	75%	75%	75%	-	-	-	-	-	-	-	-	
Zinc	**%**	**0.08%**	-	-	-	0.09%	0.08%	0.08%	0.08%	0.08%	-	-	-	-	-	-	-	-	
Silver	**g/t**	**2,137**	-	-	-	2,590	2,051	2,051	2,051	2,051	-	-	-	-	-	-	-	-	
Net Smelter Return	**$/t**	**3,130.62**	-	-	-	3,531.69	3,054.74	3,054.74	3,054.74	3,054.74	-	-	-	-	-	-	-	-	
Less: Trucking	**$/t**	**25.92**	-	-	-	25.92	25.92	25.92	25.92	25.92	-	-	-	-	-	-	-	-	
Ocean Freight	**$/t**	**32.40**	-	-	-	32.40	32.40	32.40	32.40	32.40	-	-	-	-	-	-	-	-	
Royalty to Government	**$/t**	**401.34**	-	-	-	445.04	393.07	393.07	393.07	393.07	-	-	-	-	-	-	-	-	
NSR after shipping	**$/t**	**2,670.96**	-	-	-	3,028.33	2,603.35	2,603.35	2,603.35	2,603.35	-	-	-	-	-	-	-	-	
NSR - Boh Yai Pb	**k$**	**43,136**	-		**-**	**7,781**	**8,577**	**8,577**	**8,577**	**9,623**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Boh Yai Mixed																			
Ore Mined	**tonnes**	**2,792,800**	-	-	106,600	141,300	75,000	65,000	59,900	168,900	225,000	260,300	300,000	300,000	300,000	300,000	300,000	190,800	-
Metal Grades																			
Lead	**%**	**2.08%**	-	-	4.50%	4.10%	1.87%	1.87%	1.87%	1.87%	1.87%	1.87%	1.87%	1.87%	1.87%	1.87%	1.87%	1.87%	-
Zinc	**%**	**3.18%**	-	-	4.50%	4.70%	3.04%	3.04%	3.04%	3.04%	3.04%	3.04%	3.04%	3.04%	3.04%	3.04%	3.04%	3.04%	-
Silver	**g/t**	**44**	-	-	67	70	41	41	41	41	41	41	41	41	41	41	41	41	-
Lead Concentrate																			
Recoveries to Lead Conc.																			
Lead	**%**	**83%**	-	-	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%	-
Zinc	**%**	**6%**	-	-	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	-
Silver	**%**	**75%**	-	-	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	-
Lead Concentrate	**tonnes**	**67,072**	-	-	5,530	6,678	1,617	1,401	1,291	3,641	4,851	5,612	6,467	6,467	6,467	6,467	6,467	4,113	-
Grades																			
Lead	**%**	**72%**	-	-	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	-
Zinc	**%**	**7.95%**	-	-	5.20%	5.97%	8.46%	8.46%	8.46%	8.46%	8.46%	8.46%	8.46%	8.46%	8.46%	8.46%	8.46%	8.46%	-
Silver	**g/t**	**1,359**	-	-	969	1,111	1,428	1,428	1,428	1,428	1,428	1,428	1,428	1,428	1,428	1,428	1,428	1,428	-
Net Smelter Return	**$/t**	**2,383.46**	-	-	2,036.62	2,163.96	2,445.13	2,445.13	2,445.13	2,445.13	2,445.13	2,445.13	2,445.13	2,445.13	2,445.13	2,445.13	2,445.13	2,445.13	-
Less: Trucking	**$/t**	**25.92**	-	-	25.92	25.92	25.92	25.92	25.92	25.92	25.92	25.92	25.92	25.92	25.92	25.92	25.92	25.92	-
Ocean Freight	**$/t**	**32.40**	-	-	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	-
Royalty to Government	**$/t**	**337.29**	-	-	291.76	307.08	343.01	343.01	343.01	343.01	343.01	343.01	343.01	343.01	343.01	343.01	343.01	343.01	-
NSR after shipping	**$/t**	**1,989.93**	-	-	1,686.55	1,798.56	2,043.80	2,043.80	2,043.80	2,043.80	2,043.80	2,043.80	2,043.80	2,043.80	2,043.80	2,043.80	2,043.80	2,043.80	-
NSR - Boh Yai Mixed Lead Conc.	**k$**	**133,469**	-	**-**	**9,326**	**12,011**	**3,305**	**2,864**	**2,639**	**7,442**	**9,914**	**11,469**	**13,218**	**13,218**	**13,218**	**13,218**	**13,218**	**8,407**	**-**

SONG TOH – BOH YAI PROJECTS, THAILAND
NET CASH FLOW CALCULATION
(US$ thousands)

	Units	Total/ Average	Year 0	Year 1		Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
				5 mon.	7 mon.														
Zinc Concentrate																			
Recoveries to Zinc Conc.																			
Zinc	**%**	**78%**	-	-	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	78%	-
Lead	**%**	**6%**	-	-	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	-
Silver	**%**	**12%**	-	-	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	-
Zinc Concentrate	**tonnes**	**128,318**	-	-	6,929	9,593	3,295	2,855	2,631	7,420	9,884	11,435	13,179	13,179	13,179	13,179	13,179	8,382	-
Grades																			
Zinc	**%**	**54.00%**	-	-	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	-
Lead	**%**	**2.72%**	-	-	4.15%	3.62%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	-
Silver	**g/t**	**114**	-	-	124	124	112	112	112	112	112	112	112	112	112	112	112	112	-
Net Smelter Return	**$/t**	**722.43**	-	-	729.00	729.02	721.46	721.46	721.46	721.46	721.46	721.46	721.46	721.46	721.46	721.46	721.46	721.46	-
Less: Trucking	**$/t**	**25.92**	-	-	25.92	25.92	25.92	25.92	25.92	25.92	25.92	25.92	25.92	25.92	25.92	25.92	25.92	25.92	-
Ocean Freight	**$/t**	**32.40**	-	-	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	-
Royalty to Government	**$/t**	**132.88**	-	-	137.53	136.15	132.26	132.26	132.26	132.26	132.26	132.26	132.26	132.26	132.26	132.26	132.26	132.26	-
NSR after shipping	**$/t**	**531.28**	-	-	533.15	534.55	530.89	530.89	530.89	530.89	530.89	530.89	530.89	530.89	530.89	530.89	530.89	530.89	-
NSR - Boh Yai Mixed Zinc Conc.	**k$**	**68,173**	-	-	3,694	5,128	1,749	1,516	1,397	3,939	5,247	6,071	6,996	6,996	6,996	6,996	6,996	4,450	-
Total NSR - Boh Yai Mixed				-	13,021	17,139	5,054	4,380	4,036	11,381	15,161	17,540	20,215	20,215	20,215	20,215	20,215	12,857	-
Song Toh Pb																			
Ore Mined	**tonnes**	**397,600**	-	-	6,000	66,500	100,000	110,000	115,100	-	-	-	-	-	-	-	-	-	-
Metal Grades																			
Lead	**%**	**3.18%**	-	-	5.20%	6.00%	2.56%	2.56%	2.56%	-	-	-	-	-	-	-	-	-	-
Zinc	**%**	**0.17%**	-	-	0.80%	0.50%	0.09%	0.09%	0.09%	-	-	-	-	-	-	-	-	-	-
Silver	**g/t**	**76**	-	-	106	113	67	67	67	-	-	-	-	-	-	-	-	-	-
Recoveries to Lead Conc.																			
Lead	**%**	**83%**	-	-	83%	83%	83%	83%	83%	-	-	-	-	-	-	-	-	-	-
Zinc	**%**	**40%**	-	-	40%	40%	40%	40%	40%	-	-	-	-	-	-	-	-	-	-
Silver	**%**	**80%**	-	-	80%	80%	80%	80%	80%	-	-	-	-	-	-	-	-	-	-
Lead Concentrate	**tonnes**	**14,969**	-	-	370	4,731	3,035	3,339	3,494	-	-	-	-	-	-	-	-	-	-
Grades																			
Lead	**%**	**70.00%**	-	-	70%	70%	70%	70%	70%	-	-	-	-	-	-	-	-	-	-
Zinc	**%**	**1.81%**	-	-	5.19%	2.81%	1.20%	1.20%	1.20%	-	-	-	-	-	-	-	-	-	-
Silver	**g/t**	**1,605.32**	-	-	1,375	1,271	1,774	1,774	1,774	-	-	-	-	-	-	-	-	-	-
Net Smelter Return	**$/t**	**2,563.43**	-	-	2,359.73	2,267.03	2,713.17	2,713.17	2,713.17	-	-	-	-	-	-	-	-	-	-
Less: Trucking	**$/t**	**25.92**	-	-	25.92	25.92	25.92	25.92	25.92	-	-	-	-	-	-	-	-	-	-
Ocean Freight	**$/t**	**32.40**	-	-	32.40	32.40	32.40	32.40	32.40	-	-	-	-	-	-	-	-	-	-
Royalty to Government	**$/t**	**267.14**	-	-	325.75	310.60	355.76	355.76	355.76	-	-	-	-	-	-	-	-	-	-
NSR after shipping	**$/t**	**2,164.37**	-	-	1,975.67	1,898.11	2,299.09	2,299.09	2,299.09	-	-	-	-	-	-	-	-	-	-
NSR - Song Toh Pb	**k$**	**32,399**	-	-	731	8,980	6,979	7,677	8,033	-	-	-	-	-	-	-	-	-	-

SONG TOH – BOH YAI PROJECTS, THAILAND
NET CASH FLOW CALCULATION
(US$ thousands)

	Units	Total/ Average	Year 0	Year 1 5 mon.	Year 1 7 mon.	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Song Toh Mixed																			
Ore Mined	**tonnes**	**457,600**	-	-	37,400	5,500	75,000	75,000	75,000	75,000	75,000	39,700	-	-	-	-	-	-	-
Metal Grades																			
Lead	**%**	**6.08%**	-	-	6.10%	5.00%	6.09%	6.09%	6.09%	6.09%	6.09%	6.09%	-	-	-	-	-	-	-
Zinc	**%**	**1.71%**	-	-	2.00%	1.80%	1.68%	1.68%	1.68%	1.68%	1.68%	1.68%	-	-	-	-	-	-	-
Silver	**g/t**	**51**	-	-	111	92	45	45	45	45	45	45	-	-	-	-	-	-	-
Recoveries to Lead Conc.																			
Lead	**%**	**81%**	-	-	81%	81%	81%	81%	81%	81%	81%	81%	-	-	-	-	-	-	-
Zinc	**%**	**20%**	-	-	20%	20%	20%	20%	20%	20%	20%	20%	-	-	-	-	-	-	-
Silver	**%**	**78%**	-	-	78%	78%	78%	78%	78%	78%	78%	78%	-	-	-	-	-	-	-
Lead Concentrate	**tonnes**	**33,124**	-	-	2,718	328	5,440	5,440	5,440	5,440	5,440	2,880	-	-	-	-	-	-	-
Grades																			
Lead	**%**	**68.00%**	-	-	68%	68%	68%	68%	68%	68%	68%	68%	-	-	-	-	-	-	-
Zinc	**%**	**4.72%**	-	-	5.50%	6.04%	4.64%	4.64%	4.64%	4.64%	4.64%	4.64%	-	-	-	-	-	-	-
Silver	**g/t**	**546.68**	-	-	1,192	1,205	481	481	481	481	481	481	-	-	-	-	-	-	-
Net Smelter Return	**$/t**	**1,565.21**	-	-	2,158.37	2,170.16	1,505.04	1,505.04	1,505.04	1,505.04	1,505.04	1,505.04	-	-	-	-	-	-	-
Less: Trucking	**$/t**	**25.92**	-	-	25.92	25.92	25.92	25.92	25.92	25.92	25.92	25.92	-	-	-	-	-	-	-
Ocean Freight	**$/t**	**32.40**	-	-	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	-	-	-	-	-	-	-
Royalty to Government	**$/t**	**239.62**	-	-	303.49	305.92	233.13	233.13	233.13	233.13	233.13	233.13	-	-	-	-	-	-	-
NSR after shipping	**$/t**	**1,267.27**	-	-	1,796.56	1,805.92	1,213.59	1,213.59	1,213.59	1,213.59	1,213.59	1,213.59	-	-	-	-	-	-	-
NSR - Song Toh Mixed	**k$**	**41,977**	-	-	4,882	592	6,602	6,602	6,602	6,602	6,602	3,495	-	-	-	-	-	-	-
Total Production																			
Ore Mined																			
Boh Yai																			
Boh Yai Pb	**tonnes**	**246,500**	-	-	-	40,400	50,000	50,000	50,000	56,100	-	-	-	-	-	-	-	-	-
Boh Yai Mixed	**tonnes**	**2,792,800**	-	-	106,600	141,300	75,000	65,000	59,900	168,900	225,000	260,300	300,000	300,000	300,000	300,000	300,000	190,800	-
Total Boh Yai Mined	**tonnes**	**3,039,300**	-	-	106,600	181,700	125,000	115,000	109,900	225,000	225,000	260,300	300,000	300,000	300,000	300,000	300,000	190,800	-
Song Toh																			
Song Toh Pb	**tonnes**	**397,600**	-	-	6,000	66,500	100,000	110,000	115,100	-	-	-	-	-	-	-	-	-	-
Song Toh Mixed	**tonnes**	**457,600**	-	-	37,400	5,500	75,000	75,000	75,000	75,000	75,000	39,700	-	-	-	-	-	-	-
Total Song Toh Mined	**tonnes**	**855,200**	**-**	**-**	**43,400**	**72,000**	**175,000**	**185,000**	**190,100**	**75,000**	**75,000**	**39,700**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Ore Mined	**tonnes**	**3,894,500**	**-**	**-**	**150,000**	**253,700**	**300,000**	**300,000**	**300,000**	**300,000**	**300,000**	**300,000**	**300,000**	**300,000**	**300,000**	**300,000**	**300,000**	**190,800**	**-**
GOVERNMENT ROYALTIES																			
Boh Yai Lead Concentrate	**k$**	**6,482**	-	-	-	1,143	1,295	1,295	1,295	1,453	-	-	-	-	-	-	-	-	-
Boh Yai Mixed Lead Concentrate	**k$**	**22,483**	-	-	1,613	2,051	555	481	443	1,249	1,664	1,925	2,218	2,218	2,218	2,218	2,218	1,411	-
Boh Yai Mixed Zinc Concentrate	**k$**	**17,045**	-	-	953	1,306	436	378	348	981	1,307	1,512	1,743	1,743	1,743	1,743	1,743	1,109	-
Song Toh Lead Concentrate	**k$**	**5,101**	-	-	121	1,469	1,080	1,188	1,243	-	-	-	-	-	-	-	-	-	-
Song Toh Mixed Lead Concentrate	**k$**	**7,937**	-	-	825	100	1,268	1,268	1,268	1,268	1,268	671	-	-	-	-	-	-	-
Total Government Royalties	**k$**	**59,047**	**-**	**-**	**3,512**	**6,070**	**4,633**	**4,609**	**4,597**	**4,951**	**4,239**	**4,108**	**3,961**	**3,961**	**3,961**	**3,961**	**3,961**	**2,519**	**-**

SONG TOH – BOH YAI PROJECTS, THAILAND
NET CASH FLOW CALCULATION
(US$ thousands)

	Units	Total/ Average	Year 0	Year 1 5 mon.	Year 1 7 mon.	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
CONCENTRATE PRODUCTION																			
Lead Concentrate																			
Boh Yai **PbS**	**tonnes**	**16,150**	-	-	-	2,569	3,295	3,295	3,295	3,697	-	-	-	-	-	-	-	-	-
Boh Yai Mixed	**tonnes**	**67,072**	-	-	5,530	6,678	1,617	1,401	1,291	3,641	4,851	5,612	6,467	6,467	6,467	6,467	6,467	4,113	-
Song Toh PbS	**tonnes**	**14,969**	-	-	370	4,731	3,035	3,339	3,494	-	-	-	-	-	-	-	-	-	-
Song Toh Mixed	**tonnes**	**33,124**	-	-	2,718	328	5,440	5,440	5,440	5,440	5,440	2,880	-	-	-	-	-	-	-
Total Lead Concentrate	**tonnes**	**131,315**	-	-	8,617	14,306	13,387	13,475	13,520	12,778	10,290	8,491	6,467	6,467	6,467	6,467	6,467	4,113	-
Zinc Concentrate																			
Boh Yai Mixed	**tonnes**	**128,318**	-		6,929	9,593	3,295	2,855	2,631	7,420	9,884	11,435	13,179	13,179	13,179	13,179	13,179	8,382	-
LEAD CONCENTRATE REVENUE																			
Boh Yai Lead																			
NSR after Freight	**k$**	**49,617**	-	-	-	8,925	9,872	9,872	9,872	11,077	-	-	-	-	-	-	-	-	-
Less: Government Royalties	**k$**	**6,482**	-	-	-	1,143	1,295	1,295	1,295	1,453	-	-	-	-	-	-	-	-	-
Boh Yai Lead NSR	**k$**	**43,136**	**-**	**-**	**-**	**7,781**	**8,577**	**8,577**	**8,577**	**9,623**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Boh Yai Mixed																			
NSR after Freight	**k$**	**155,952**	-	-	10,940	14,062	3,859	3,345	3,082	8,691	11,578	13,394	15,437	15,437	15,437	15,437	15,437	9,818	-
Less: Government Royalties	**k$**	**22,483**	-	-	1,613	2,051	555	481	443	1,249	1,664	1,925	2,218	2,218	2,218	2,218	2,218	1,411	-
Boh Yai Mixed NSR	**k$**	**133,469**	**-**	**-**	**9,326**	**12,011**	**3,305**	**2,864**	**2,639**	**7,442**	**9,914**	**11,469**	**13,218**	**13,218**	**13,218**	**13,218**	**13,218**	**8,407**	**-**
Song Toh Lead																			
NSR after Freight	**k$**	**37,499**	-	-	851	10,449	8,059	8,865	9,276	-	-	-	-	-	-	-	-	-	-
Less: Government Royalties	**k$**	**5,101**	-	-	121	1,469	1,080	1,188	1,243	-	-	-	-	-	-	-	-	-	-
Song Toh Lead NSR	**k$**	**32,399**	-	-	731	8,980	6,979	7,677	8,033	-	-	-	-	-	-	-	-	-	-
Song Toh Mixed																			
NSR after Freight	**k$**	**49,914**	-	-	5,707	692	7,870	7,870	7,870	7,870	7,870	4,166	-	-	-	-	-	-	-
Less: Government Royalties	**k$**	**7,937**	-	-	825	100	1,268	1,268	1,268	1,268	1,268	671	-	-	-	-	-	-	-
Song Toh Mixed Lead NSR	**k$**	**41,977**	-	-	4,882	592	6,602	6,602	6,602	6,602	6,602	3,495	-	-	-	-	-	-	-
Total Lead Concentrate Revenue	**k$**	**250,980**	-	-	14,940	29,364	25,462	25,719	25,851	23,667	16,515	14,964	13,218	13,218	13,218	13,218	13,218	8,407	-
ZINC CONCENTRATE REVENUE																			
Boh Yai Mixed																			
NSR after Freight	**k$**	**85,217**	-	-	4,647	6,434	2,185	1,894	1,745	4,920	6,555	7,583	8,739	8,739	8,739	8,739	8,739	5,558	-
Less: Government Royalties	**k$**	**17,045**	-	-	953	1,306	436	378	348	981	1,307	1,512	1,743	1,743	1,743	1,743	1,743	1,109	-
Total Zinc Concentrate Revenue	**k$**	**68,173**	-	-	3,694	5,128	1,749	1,516	1,397	3,939	5,247	6,071	6,996	6,996	6,996	6,996	6,996	4,450	-
TOTAL CONCENTRATE REVENUE	**k$**	**319,153**	**-**	**-**	**18,634**	**34,492**	**27,211**	**27,235**	**27,248**	**27,606**	**21,763**	**21,034**	**20,215**	**20,215**	**20,215**	**20,215**	**20,215**	**12,857**	**-**
CONCENTRATE REVENUE DISTRIBUTION																			
Concentrate Revenue after Freight	**k$**	**378,200**	-	-	22,145	40,562	31,845	31,845	31,845	32,558	26,002	25,143	24,176	24,176	24,176	24,176	24,176	15,376	-
Less: Government Royalties	**k$**	**59,047**	-	-	3,512	6,070	4,633	4,609	4,597	4,951	4,239	4,108	3,961	3,961	3,961	3,961	3,961	2,519	-
TOTAL NET CONCENTRATE REVENUE	**k$**	**319,153**	**-**	**-**	**18,634**	**34,492**	**27,211**	**27,235**	**27,248**	**27,606**	**21,763**	**21,034**	**20,215**	**20,215**	**20,215**	**20,215**	**20,215**	**12,857**	**-**

SONG TOH – BOH YAI PROJECTS, THAILAND
NET CASH FLOW CALCULATION
(US$ thousands)

	Units	Total/ Average	Year 0	Year 1 5 mon.	Year 1 7 mon.	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
OPERATING COSTS																			
Mining																			
Labour	k$	**15,070**	-		667	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140	725	-
Materials	k$	**50,754**	-		2,071	3,298	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	2,481	-
Sub-Total	k$	**65,823**	-		2,738	4,438	5,040	5,040	5,040	5,040	5,040	5,040	5,040	5,040	5,040	5,040	5,040	3,206	-
Plus: Haulage from Boh Yai	k$	**11,553**	-		456	812	483	446	427	856	835	966	1,113	1,113	1,113	1,113	1,113	708	-
Net Direct Mining Cost	k$	**77,377**	-		3,194	5,250	5,523	5,486	5,467	5,897	5,875	6,006	6,153	6,153	6,153	6,153	6,153	3,913	
Auxiliary (Maintenance, Geology, Survey, Lab, Warehouse)																			
Labour	k$	**6,323**	-		287	478	478	478	478	478	478	478	478	478	478	478	478	304	-
Materials	k$	**1,565**	-		61	102	121	121	121	121	121	121	121	121	121	121	121	77	-
Sub-Total	k$	**7,888**	-		348	580	598	598	598	598	598	598	598	598	598	598	598	380	-
Total Mining	k$	**85,264**	-		**3,542**	**5,830**	**6,121**	**6,084**	**6,065**	**6,495**	**6,473**	**6,604**	**6,751**	**6,751**	**6,751**	**6,751**	**6,751**	**4,294**	**-**
Processing																			
Labour	k$	**3,448**	-		156	261	261	261	261	261	261	261	261	261	261	261	261	166	-
Materials	k$	**31,197**	-		1,134	2,037	2,409	2,409	2,409	2,409	2,409	2,409	2,409	2,409	2,409	2,409	2,409	1,532	-
Water Treatment	k$	**3,895**	-		150	254	300	300	300	300	300	300	300	300	300	300	300	191	-
Total Processing Costs	k$	**38,540**	-		**1,440**	**2,551**	**2,969**	**2,969**	**2,969**	**2,969**	**2,969**	**2,969**	**2,969**	**2,969**	**2,969**	**2,969**	**2,969**	**1,888**	**-**
General & Administration (Admin, Camps, Clinics, Vehicles, Road & Powerline Maintenance)																			
Labour	k$	**3,369**	-		153	255	255	255	255	255	255	255	255	255	255	255	255	162	-
Materials	k$	**4,094**	-		194	309	309	309	309	309	309	309	309	309	309	309	309	196	-
Total G&A	k$	7,462	-		347	563	563	563	563	563	563	563	563	563	563	563	563	358	-
TOTAL OPERATING COSTS	k$	**131,266**	**-**		**5,329**	**8,944**	**9,654**	**9,617**	**9,598**	**10,027**	**10,005**	**10,136**	**10,283**	**10,283**	**10,283**	**10,283**	**10,283**	**6,540**	**-**
EBITDA	k$	**187,887**	-	-	13,305	25,548	17,558	17,619	17,650	17,579	11,758	10,898	9,931	9,931	9,931	9,931	9,931	6,316	-
Less: Depreciation (UOP)	k$	**36,853**	-	-	621	1,155	1,582	1,818	1,929	2,047	2,652	3,025	3,216	3,436	3,723	4,031	4,263	3,357	-
Corporate Income Tax	k$	**30,462**	-	-	2,016	4,403	2,704	2,616	2,580	3,169	1,882	1,712	1,576	1,578	1,577	1,729	1,813	1,107	-
EARNINGS AFTER TAX & DEPR.	k$	**120,572**	-	-	**10,668**	**19,990**	**13,272**	**13,185**	**13,142**	**12,363**	**7,224**	**6,161**	**5,140**	**4,917**	**4,632**	**4,171**	**3,856**	**1,853**	**-**
NET CASH FLOW To PROJECT																			
Earnings after Tax & Depr	k$	**120,572**	-	-	10,668	19,990	13,272	13,185	13,142	12,363	7,224	6,161	5,140	4,917	4,632	4,171	3,856	1,853	-
Plus: Depreciation	k$	**36,853**	-	-	621	1,155	1,582	1,818	1,929	2,047	2,652	3,025	3,216	3,436	3,723	4,031	4,263	3,357	-
Less: Capital Investment	k$	**37,192**	600	12,016	3,502	1,545	2,518	2,515	1,064	1,023	4,618	2,475	1,075	1,023	1,041	814	378	646	339
Working Capital	k$	-	-	-	3,760	3,410	-863	59	19	-504	-1,621	-375	-414	-0	0	-2	-4	-1,211	-2,254
Net Cash Flow to Project	k$	**120,233**	**-600**	**-12,016**	**4,027**	**16,190**	**13,198**	**12,429**	**13,988**	**13,891**	**6,879**	**7,087**	**7,694**	**7,331**	**7,314**	**7,390**	**7,744**	**5,774**	**1,915**
Accumulated NCF to Project	k$	**120,233**	**-600**	**-12,616**	**-8,590**	**7,600**	**20,798**	**33,227**	**47,215**	**61,106**	**67,985**	**75,071**	**82,765**	**90,096**	**97,410**	**104,800**	**112,543**	**118,318**	**120,233**
Internal Rate of Return	%	**112%**																	
Net Present Value	k$				**5%**	**82,631**		**7.5%**	**69,614**		**10%**	**59,192**		**12.5%**	**50,749**		**15%**	**43,832**	
Payback Period (From start of Construction)		**1.53 Years**																	

SONG TOH – BOH YAI PROJECTS, THAILAND
NET CASH FLOW CALCULATION
(US$ thousands)

	Units	Total/ Average	Year 0	Year 1		Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
				5 mon.	7 mon.														
PRE-TAX NET CASH FLOW																			
EBITDA	**k$**	**187,887**	**-**	**-**	**13,305**	**25,548**	**17,558**	**17,619**	**17,650**	**17,579**	**11,758**	**10,898**	**9,931**	**9,931**	**9,931**	**9,931**	**9,931**	**6,316**	**-**
Less: Depreciation (UOP)	**k$**	**36,853**	**-**	**-**	**621**	**1,155**	**1,582**	**1,818**	**1,929**	**2,047**	**2,652**	**3,025**	**3,216**	**3,436**	**3,723**	**4,031**	**4,263**	**3,357**	**-**
Corporate Income Tax	**k$**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
EARNINGS AFTER DEPR.	**k$**	**151,034**	**-**	**-**	**12,684**	**24,393**	**15,976**	**15,801**	**15,721**	**15,532**	**9,106**	**7,873**	**6,716**	**6,495**	**6,209**	**5,900**	**5,669**	**2,960**	**-**
NET CASH FLOW To PROJECT																			
Earnings before Tax & Depr	**k$**	**151,034**	-	-	12,684	24,393	15,976	15,801	15,721	15,532	9,106	7,873	6,716	6,495	6,209	5,900	5,669	2,960	-
Plus: Depreciation	**k$**	**36,853**	-	-	621	1,155	1,582	1,818	1,929	2,047	2,652	3,025	3,216	3,436	3,723	4,031	4,263	3,357	-
Less: Capital Investment	**k$**	**37,192**	600	12,016	3,502	1,545	2,518	2,515	1,064	1,023	4,618	2,475	1,075	1,023	1,041	814	378	646	339
Working Capital	**k$**	**-**	-	-	3,760	3,410	-863	59	19	-504	-1,621	-375	-414	-0	0	-2	-4	-1,211	-2,254
Net Cash Flow to Project	**k$**	**150,695**	**-600**	**-12,016**	**6,043**	**20,593**	**15,902**	**15,045**	**16,567**	**17,060**	**8,761**	**8,799**	**9,270**	**8,908**	**8,891**	**9,119**	**9,557**	**6,882**	**1,915**
Accumulated NCF to Project	**k$**	**150,695**	**-600**	**-12,616**	**-6,573**	**14,019**	**29,922**	**44,967**	**61,534**	**78,594**	**87,355**	**96,154**	**105,424**	**114,332**	**123,223**	**132,342**	**141,898**	**148,780**	**150,695**
Internal Rate of Return	**%**	**148%**																	
Net Present Value	**k$**				**5%**	**104,730**		**7.5%**	**88,768**		**10%**	**75,963**		**12.5%**	**65,567**		**15%**	**57,031**	
Payback Period (From start of Construction)		**1.32 Years**																	
NET CASH FLOW where Tax Rate is 30%																			
EBITDA	**k$**	**187,887**	**-**	**-**	**13,305**	**25,548**	**17,558**	**17,619**	**17,650**	**17,579**	**11,758**	**10,898**	**9,931**	**9,931**	**9,931**	**9,931**	**9,931**	**6,316**	**-**
Less: Depreciation (UOP)	**k$**	**36,853**	**-**	**-**	**621**	**1,155**	**1,582**	**1,818**	**1,929**	**2,047**	**2,652**	**3,025**	**3,216**	**3,436**	**3,723**	**4,031**	**4,263**	**3,357**	**-**
Corporate Income Tax	**k$**	**45,693**	**-**	**-**	**3,024**	**6,605**	**4,056**	**3,924**	**3,869**	**4,754**	**2,823**	**2,568**	**2,364**	**2,366**	**2,365**	**2,594**	**2,720**	**1,661**	**-**
EARNINGS AFTER DEPR. & TAXES	**k$**	**105,341**	**-**	**-**	**9,660**	**17,789**	**11,919**	**11,877**	**11,852**	**10,778**	**6,283**	**5,305**	**4,352**	**4,128**	**3,843**	**3,306**	**2,949**	**1,299**	**-**
NET CASH FLOW To PROJECT																			
Earnings after Tax & Depr	**k$**	**105,341**	-	-	9,660	17,789	11,919	11,877	11,852	10,778	6,283	5,305	4,352	4,128	3,843	3,306	2,949	1,299	-
Plus: Depreciation	**k$**	**36,853**	-	-	621	1,155	1,582	1,818	1,929	2,047	2,652	3,025	3,216	3,436	3,723	4,031	4,263	3,357	-
Less: Capital Investment	**k$**	**37,192**	600	12,016	3,502	1,545	2,518	2,515	1,064	1,023	4,618	2,475	1,075	1,023	1,041	814	378	646	339
Working Capital	**k$**	**-**	-	-	3,760	3,410	-863	59	19	-504	-1,621	-375	-414	-0	0	-2	-4	-1,211	-2,254
Net Cash Flow to Project	**k$**	**105,001**	**-600**	**-12,016**	**3,018**	**13,988**	**11,846**	**11,121**	**12,698**	**12,306**	**5,938**	**6,231**	**6,906**	**6,542**	**6,525**	**6,525**	**6,837**	**5,221**	**1,915**
Accumulated NCF to Project	**k$**	**105,001**	**-600**	**-12,616**	**-9,598**	**4,390**	**16,236**	**27,357**	**40,055**	**52,362**	**58,299**	**64,530**	**71,436**	**77,978**	**84,503**	**91,029**	**97,866**	**103,087**	**105,001**
Internal Rate of Return	**%**	**95%**																	
Net Present Value	**k$**				**5%**	**71,582**		**7.5%**	**60,037**		**10%**	**50,807**		**12.5%**	**43,340**		**15%**	**37,232**	
Payback Period (From start of Construction)		**1.69 Years**																	

APPENDIX XI. SENSITIVITY ANALYSIS OF NPV, IRR, PAYBACK

Sensitivity of NPV discounted at 7.5%, Internal Rate of Return and Payback period to changes in all metal prices, individual metal prices, metal grades, capital costs and operating costs.

		Net Present Value Discounted at 7.5%		**Internal Rate of Return**		**Payback from the Start of Construction**	
	% Change	**Pre Tax ($ millions)**	**After Tax ($ millions)**	**Pre Tax (%)**	**After Tax (%)**	**Pre Tax (Years)**	**After Tax (Years)**
Metal Prices	+30%	155.4	122.7	254.8%	189.8%	1.04	1.19
	+20%	133.6	105.4	218.9%	163.8%	1.11	1.27
	+10%	111.4	87.6	183.3%	137.8%	1.20	1.38
	Base Case	88.8	69.6	148.3%	112.1%	1.32	1.53
	-10%	66.2	51.6	114.3%	87.0%	1.49	1.75
	-20%	43.6	33.6	81.3%	62.1%	1.77	2.1
	-30%	21.0	15.6	48.2%	36.5%	2.38	2.94
Lead Price	+30%	116.2	91.5	192.2%	144.4%	1.17	1.35
	+20%	107.3	84.4	177.8%	133.8%	1.22	1.4
	+10%	98.2	77.1	163.3%	123.2%	1.26	1.46
	Base Case	88.8	69.6	148.3%	112.1%	1.32	1.53
	-10%	79.3	62.1	133.4%	101.1%	1.38	1.61
	-20%	69.9	54.6	118.6%	90.1%	1.46	1.7
	-30%	60.5	47.1	103.9%	79.1%	1.55	1.81
Silver Price	+30%	114.0	89.7	187.7%	141.3%	1.19	1.37
	+20%	105.6	83.0	174.5%	131.6%	1.23	1.42
	+10%	97.2	76.3	161.4%	121.8%	1.27	1.47
	Base Case	88.8	69.6	148.3%	112.1%	1.32	1.53
	-10%	80.3	62.9	135.2%	102.4%	1.37	1.6
	-20%	71.9	56.2	122.1%	92.6%	1.44	1.68
	-30%	63.5	49.5	109.0%	82.8%	1.51	1.77
Zinc Price	+30%	102.7	80.8	167.9%	126.2%	1.23	1.42
	+20%	98.2	77.2	161.5%	121.6%	1.26	1.45
	+10%	93.5	73.4	154.8%	116.8%	1.29	1.49
	Base Case	88.8	69.6	148.3%	112.1%	1.32	1.53
	-10%	84.0	65.8	141.9%	107.5%	1.35	1.57
	-20%	79.3	62.0	135.6%	103.0%	1.39	1.62
	-30%	74.5	58.2	129.5%	98.6%	1.43	1.67
Metal Grades	+30%	146.3	115.5	239.7%	179.0%	1.07	1.22
	+20%	127.1	100.2	208.5%	156.2%	1.13	1.3
	+10%	107.9	84.9	178.0%	133.9%	1.21	1.4
	Base Case	88.8	69.6	148.3%	112.1%	1.32	1.53
	-10%	69.6	54.3	119.3%	90.7%	1.46	1.71
	-20%	50.4	39.0	91.0%	69.4%	1.67	1.96

		Net Present Value Discounted at 7.5%		Internal Rate of Return		Payback from the Start of Construction	
	% Change	Pre Tax ($ millions)	After Tax ($ millions)	Pre Tax (%)	After Tax (%)	Pre Tax (Years)	After Tax (Years)
	-30%	31.2	23.7	62.9%	48.0%	1.99	2.49
Operating Costs	+30%	66.1	51.5	119.4%	90.1%	1.46	1.71
	+20%	73.7	57.5	129.0%	97.4%	1.41	1.64
	+10%	81.2	63.6	138.6%	104.7%	1.36	1.58
	Base Case	88.8	69.6	148.3%	112.1%	1.32	1.53
	-10%	96.3	75.7	158.0%	119.5%	1.28	1.48
	-20%	103.9	81.7	167.8%	127.0%	1.24	1.44
	-30%	111.4	87.7	177.7%	134.5%	1.21	1.4
Capital Costs	+30%	80.5	62.8	103.9%	79.7%	1.57	1.83
	+20%	83.3	65.0	116.0%	88.6%	1.48	1.73
	+10%	86.0	67.3	130.5%	99.2%	1.40	1.63
	Base Case	88.8	69.6	148.3%	112.1%	1.32	1.53
	-10%	91.5	71.9	170.3%	128.0%	1.24	1.43
	-20%	94.3	74.2	198.4%	148.3%	1.16	1.33
	-30%	97.0	76.5	235.5%	174.7%	1.08	1.24