

Glamis Gold Ltd.

Cerro San Pedro Project Feasibility Study November 2000

Project Location:

The project is located in the state of San Luis Potosi, approximately 400 km north of Mexico City, and 20 km east-northeast of the state capital of San Luis Potosi.

Feasibility Study Team:

William Dodge, Bachelor of Science in Mining Engineering, 1971
General Manager, Cerro San Pedro Project
General Oversight and Assemblage

Gary Boyle, Bachelor of Science in Mining Engineering, 1986
General Manager, Imperial Project
Ore Reserves and Mine Planning

Tim Haldane, P.Eng., Bachelor of Science in Metallurgical Engineering, 1978
Director of Process Engineering, Glamis Gold Ltd.
Process Design and Engineering

Table of Contents

Volume 1

1.0 Executive Summary

1.1	 Introduction and Project Description	1
1.2	Background Studies	8
1.3	Geology and Mineral Resources	9
1.4	Ore Reserves and Mine Planning	17
1.5	Metallurgical Investigations	31
1.6	Process Design and Engineering	43
1.7	Infrastructures.....	50
1.8	Electrical and Communications	53
1.9	General Administration and Services	54
1.10	Environmental and Socio-Economics	56
1.11	Reclamation and Closure	62
1.12	Organization, Structure and Operating Policies	66
1.13	Construction Management and Schedule	69
1.14	Operating Cost Estimate	72
1.15	Capital Cost Estimate	76
1.16	Economic Evaluation and Financial Analyses	78
1.17	Conclusions and Recommendations	91

1.0 EXECUTIVE SUMMARY

This run of mine feasibility study for the Cerro San Pedro Project has been completed with the purpose of improving economics by decreasing costs and simplifying operations.

At a gold price of \$275 per ounce and \$5.00 per ounce for silver, the run of mine option produces 870,391 gold equivalent ounces over an eight-year life at an average cash cost of \$166 per gold equivalent ounce. The project requires an initial investment of \$45 million to take it into production with a total investment over its life of \$51 million. Assuming that the initial investment is 100% financed at 9.5%, the project yields a Net Present Value of \$7.5 million at a 5% discount rate with an 8.4% Rate of Return.

Ore will be hauled directly from the pit to the leach pad via a 2-kilometer haul road. The leach pad will have the capacity for 50 million tonnes of ore and the precious metals are recovered from the pregnant heap leach solution in a typical Merrill-Crowe zinc precipitation plant.

Gold production is expected to reach 61,000 ounces the first year and then average 90,000 ounces for the next 6 years of production with the final year producing the remaining ounces for a grand total of 634,060 ounces of gold. On a gold equivalent basis, production is expected to reach 77,900 ounces the first year and then average 124,000 ounces for the next 6 years of production with the final year producing the remaining ounces for a grand total of 870,391 gold equivalent ounces.

Average unit operating costs over the life of the project are \$0.65 per total tonne for mining (mining, maintenance, and engineering), \$1.01 per ore tonne for processing, and \$0.25 per ore tonne for administrative costs.

All federal, state, and municipal permits required for the project have been approved and the project has maintained compliance with all permit conditions. It is recommended that the necessary funding be provided for maintaining the Cerro San Pedro Project on a ready status until metal prices improve.

This Executive Summary section of the Feasibility Study is intended to provide a summary of the significant aspects of the Cerro San Pedro Project. The reader is encouraged to refer to individual sections and appendices to gain more information that may not be included in the Executive Summary. All references to costs in this feasibility study are United States dollars estimated as of third quarter 2000 with the currency rate at 1 US dollar = 9.4 Mexican pesos. This section is organized so that the subsection headings refer to

the section headings in the remainder of this feasibility study (e.g.; information in Section 1.3 is detailed in Section 3.0).

1.1 Introduction and Project Description

The Cerro San Pedro gold and silver heap leach project is located in semi-arid central Mexico in the state of San Luis Potosi (SLP) approximately 400 kilometers (km) north of Mexico City along the interstate highway connecting Mexico City with Monterrey. The site is located 20 km east-northeast of the city of SLP, which is the state capital with a population of approximately one million people. The site can be easily reached via a 10 km secondary road extending from the Periferico Oriente to the village of Cerro de San Pedro. The SLP airport has many daily flights to Mexico City and Monterrey. Figure 1.1 shows the location of the Cerro San Pedro project.

The Cerro San Pedro district has undergone several periods of significant mineral production over the past 400 years. In recent history, Asarco, Geocon, Bear Creek Mining, and Compania Fresnillo conducted exploration and development programs. Minera San Xavier (MSX), a wholly owned subsidiary of Metallica Resources, Inc. (Metallica), began its exploration activity at Cerro San Pedro in April 1995. Metallica elected to seek a major mining company as a joint venture partner to further evaluate the property and executed an agreement with Cambior in early 1998.

In May 2000, Glamis Gold Ltd. (Glamis) acquired Cambior's Mexican holding company and assumed the terms of the joint venture agreement executed by Cambior with Metallica. As part of that agreement, Glamis has evaluated the resources and mining reserves developed by Cambior for the feasibility study completed in November 1999, prior to performing the detailed work that provides the basis for this feasibility study.

Under terms of the joint venture agreement, Glamis can retain ownership of its 50 percent interest in the project by contributing \$19,977,000 in equity to MSX by December 31, 2000.

Currently the joint venture controls 41 mineral concessions, totaling 9,295 hectares (ha). In addition to the mineral concessions, MSX has all the surface rights agreements in place for the operation. Originally MSX tried to establish an operating safety buffer zone encompassing much of the village of Cerro de San Pedro adjacent to the proposed pit and many properties within the buffer zone have been acquired.

Obtaining control of all the property within the safety buffer zone, either through private negotiations or requesting a temporary occupation from the Federal Mining Bureau, is not considered practical and the state government will not support restricting public access to the village. Instead, the village will remain open to the public, and MSX will formalize an agreement with the State and Municipal authorities to ensure public safety for the village. The agreement will include a joint effort to ensure that the proper safety precautions are taken.

MSX will continue to acquire property within the safety buffer zone from owners who choose to engage in private negotiations. This will provide the property owners with one of the following alternatives:

- Sale with buyback option at end of project
- Sale without buyback option
- Relocation to a MSX house in Cerro de San Pedro outside safety buffer zone

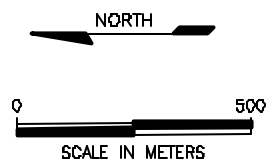
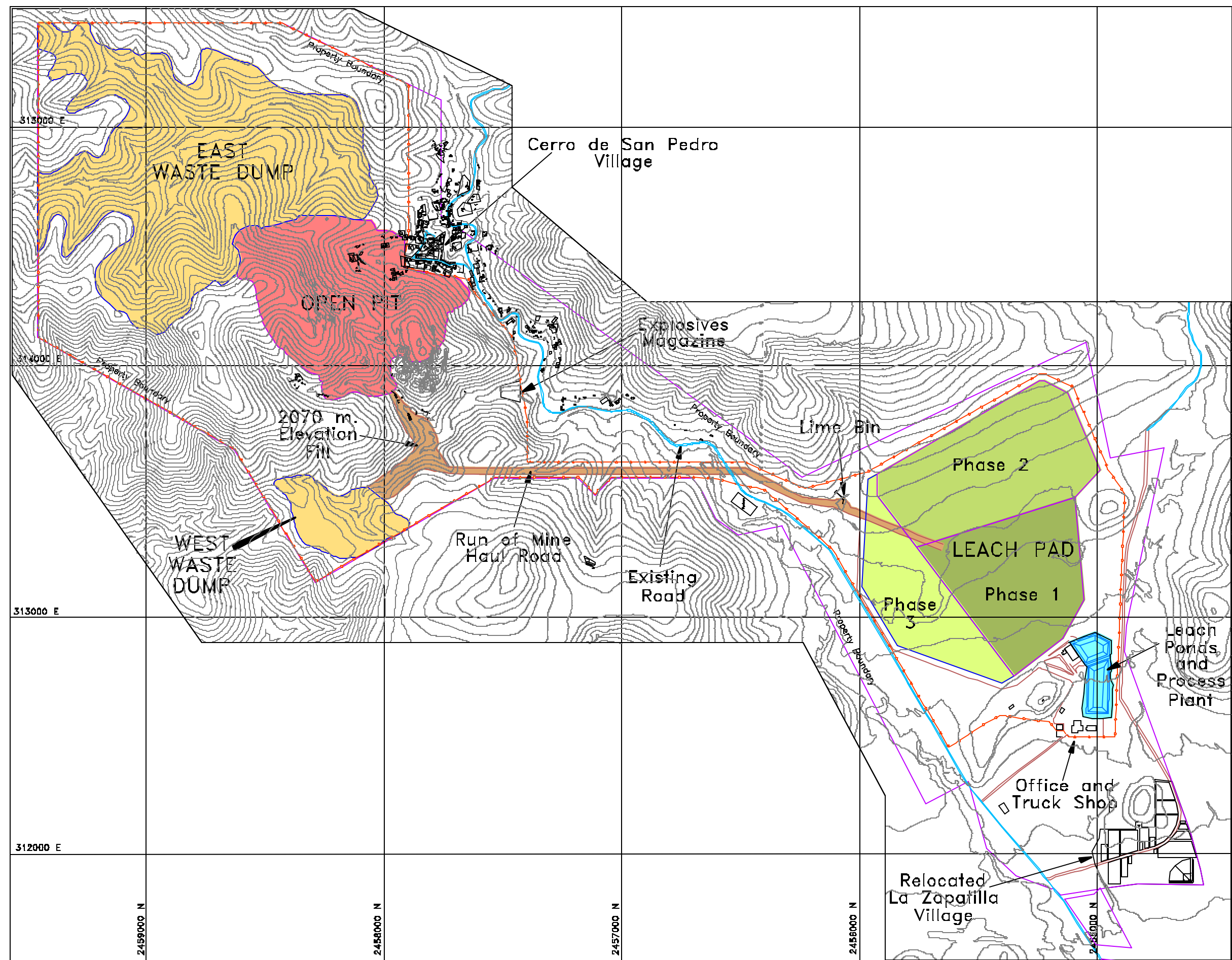
Table 1.1 summarizes the status of the property acquisitions in the buffer zone. MSX has also obtained the required power line rights of way and water rights to construct and operate the project. Figure 1.2 is a map of the project area showing the general layout of the proposed Cerro San Pedro Project and Figure 1.3 shows the southeastern margin of the proposed pit with respect to the buffer zone around the village of Cerro de San Pedro.

The small village of La Zapatilla is located in the middle of the proposed leach pad site. MSX has completed negotiations with all the permanent residents to acquire their properties and is in the process of building 20 houses in a new village two kilometers away for their relocation. The relocation will be completed in February 2000.

Water rights agreements with five parties for the annual use 992,000 cubic meters have been concluded and the National Water Commission has approved their transfer to the well site located approximately two kilometers from the leach pad.

Table 1.1

Summary of Property Acquisitions in Buffer Zone				
Properties in Safety Buffer Zone	# of Properties	# of ha	% of Total Properties	% of Total ha
Private Properties Acquired	21	1.8	28	50
Public Properties Agreements	0	0	0	0
Subtotal Acquired	21	1.8	28	50
Private Properties – Not Acquired	45	1.3	61	36
Public Properties – No Agreements	8	0.5	11	14
Subtotal Not Acquired/No Agreements	53	1.8	72	50
Total Properties	74	3.6	100	100



 **MINERA SAN XAVIER, S.A. de C.V.**

Figure 1.2 General Site Layout

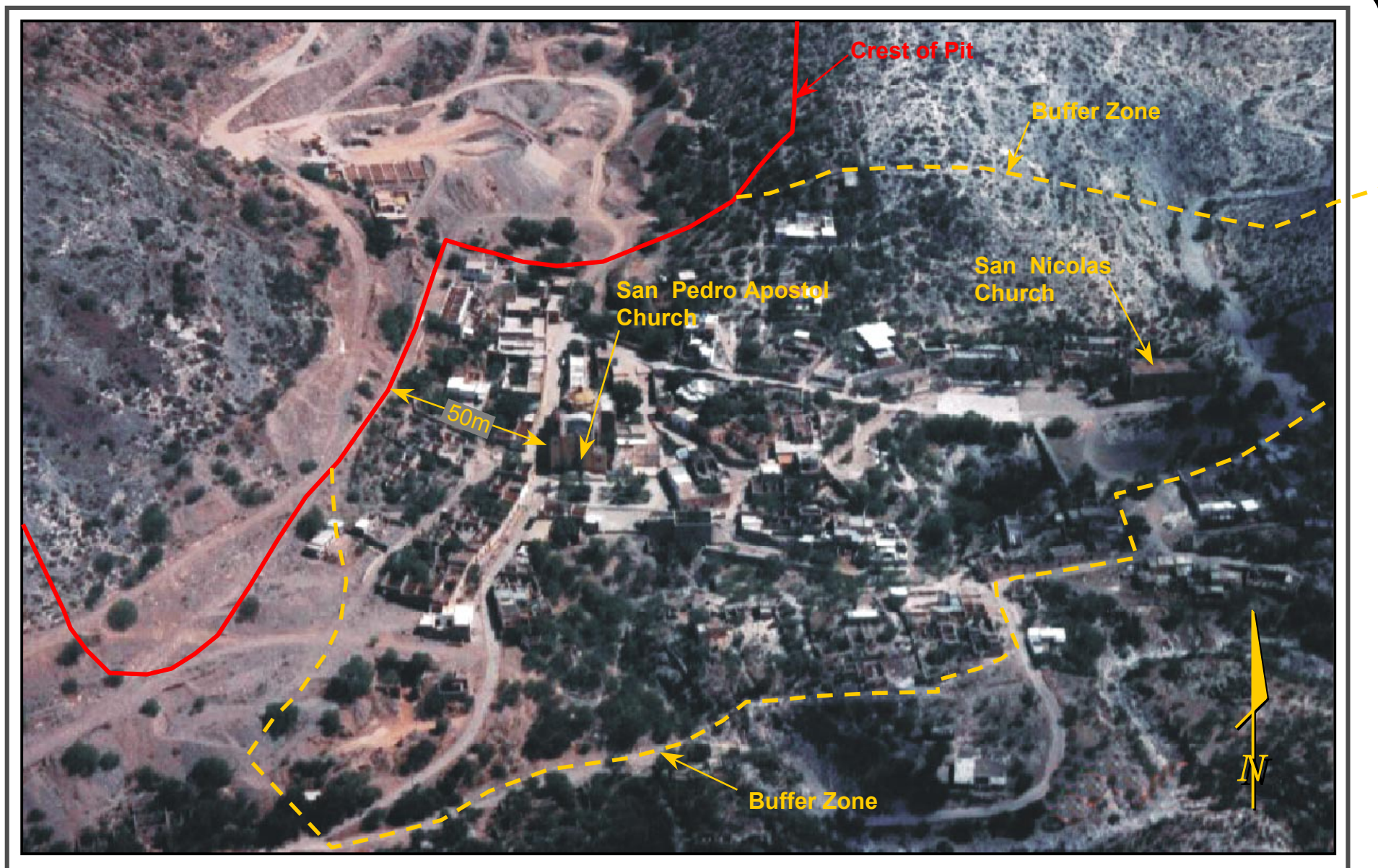

MINERA SAN XAVIER, S.A. de C.V.

Figure 1.3 Photograph Showing Village of Cerro de San Pedro and Buffer Zone Boundary

1.2 Background Studies

Areas of study and primary sources of information for the feasibility study are summarized in Table 1.2. Reference to these sources of information will be made where relevant in the main body of this Feasibility Study.

Table 1.2

Sources of Information Used in the Feasibility Study		
Area	Services Provided	Name of Company/Consultant
Geology	Management	Minera San Xavier
	Assaying	Bondar Clegg
	Modeling, Resource Estimation	Minera San Xavier
	Deposit Geology	Mark Peterson, Consultant/Formerly Metallica
	Mineralogy/Petrography	Petrographic Consultants, Intl.
Mining	Mine Design/Engineering	Glamis / Mine Reserves Associates
	Model Verification	Independent Mining Consultants, Inc.
		GeoSight, Inc.
	Previous Reserve Evaluations	Glamis / Mine Reserves Associates
		Cambior
Metallurgy	Slope Stability	Brawner & Associates
	Management	Glamis
	Bottle Rolls, Columns, CN Sol.	McClelland Laboratories
	Diagnostic Testing/Reagent Work	Resource Development Inc. (RDI)
	Ore Characterization	METCON Research, Inc.
	Database/Statistical Analysis	Ron Radzieta / Zuker Geochemistry Group
	Solution Chemistry	Unifield Engineering
		Times Ltd. (Mudder)
Processing	McClelland Laboratories	
	Management	Glamis
	Heap Modeling	Unifield Engineering
	Costing/Data Review	R. Hyppa
	Leach Pad	Westec / Amec
Electrical and Communication	Merrill-Crowe Plant Design	Summit Valley Equipment & Engineering
	Management	Glamis / Minera San Xavier
	Electrical Power Line	Procoin / CFE
	13.8 kV Distribution Line	Cypesa / Procoin
	Main Substation	Cypesa
Infrastructures	Communication	Telmex / Glamis
	Management	Glamis / Minera San Xavier
	Housing	Constructora Rosval / Constructora y Edificadora B&F
	Access Road	Minera San Xavier
	Water Management	Sodinco Group

Table 1.2 (continued)

Sources of Information Used in the Feasibility Study		
Area	Services Provided	Name of Company/Consultant
Environmental	Management	Minera San Xavier
	Baseline/impact Analysis	Behre Dolbear de Mexico
	ARD Evaluations	Chemac Environmental Services
		Geochemica, Inc.
	Water Balance Modeling	Womack and Associates
		Water Management Consultants
	Closure Planning	Shepherd Miller
		Closure Strategy Group (CSG)
Other	Permitting	Minera San Xavier
	Socioeconomics	Minera San Xavier
	Taxation	Minera San Xavier / Glamis

1.3 Geology and Mineral Resources

The Cerro San Pedro district lies along the boundary between the Sierra Madre Oriental (Eastern Sierra Madre) fold belt and the Mesa Central volcanic plateau physiographic provinces. Current exploration in this historic district has resulted in the delineation of a large body of low-grade gold-silver mineralization amenable to modern bulk mining and heap leach extraction methods.

Lithology, Structure, and Mineralization

A complex deformation history, including of pre-mineral folding, thrusting, normal, reverse, and wrench faulting, accompanied by porphyry dike intrusion are considered to be the primary factors behind the localization of mineralization at Cerro San Pedro. District geology is characterized by complexly folded and faulted Cretaceous limestones that have been intruded by a large dike or plug of diorite to quartz diorite porphyry of late Cretaceous to early Tertiary age. Gold-silver mineralization occurs in association with disseminated iron oxides and sulfides hosted within the porphyry intrusive (Porphyry Oxide, Mixed and Sulfide) and its surrounding limestone host rocks (from oldest to youngest – the Begonia, Hospital, and Barreno Limestones). Porphyry Oxide-hosted mineralization is distributed in a well-developed zone of stockwork fracturing and pervasive hydrothermal alteration developed around the intersection between several systems of cross-cutting north, east, northeast, and northwest trending shear zones. These structures extend into the surrounding limestone country rocks as higher grade veins, chimneys, and mantos. A large body of Porphyry Mixed and Porphyry Sulfide-hosted Au-Ag-Zn sulfide mineralization also

underlies the main zone of Au-Ag Porphyry Oxide mineralization. The bulk of the potentially economic mineralization is hosted within the porphyry diorite rock type. Figure 1.4 is a plan view showing the geology of the Cerro San Pedro resource area. Figure 1.5 is a typical cross-section through the deposit showing the typically moderate westward dip of the porphyry dike.

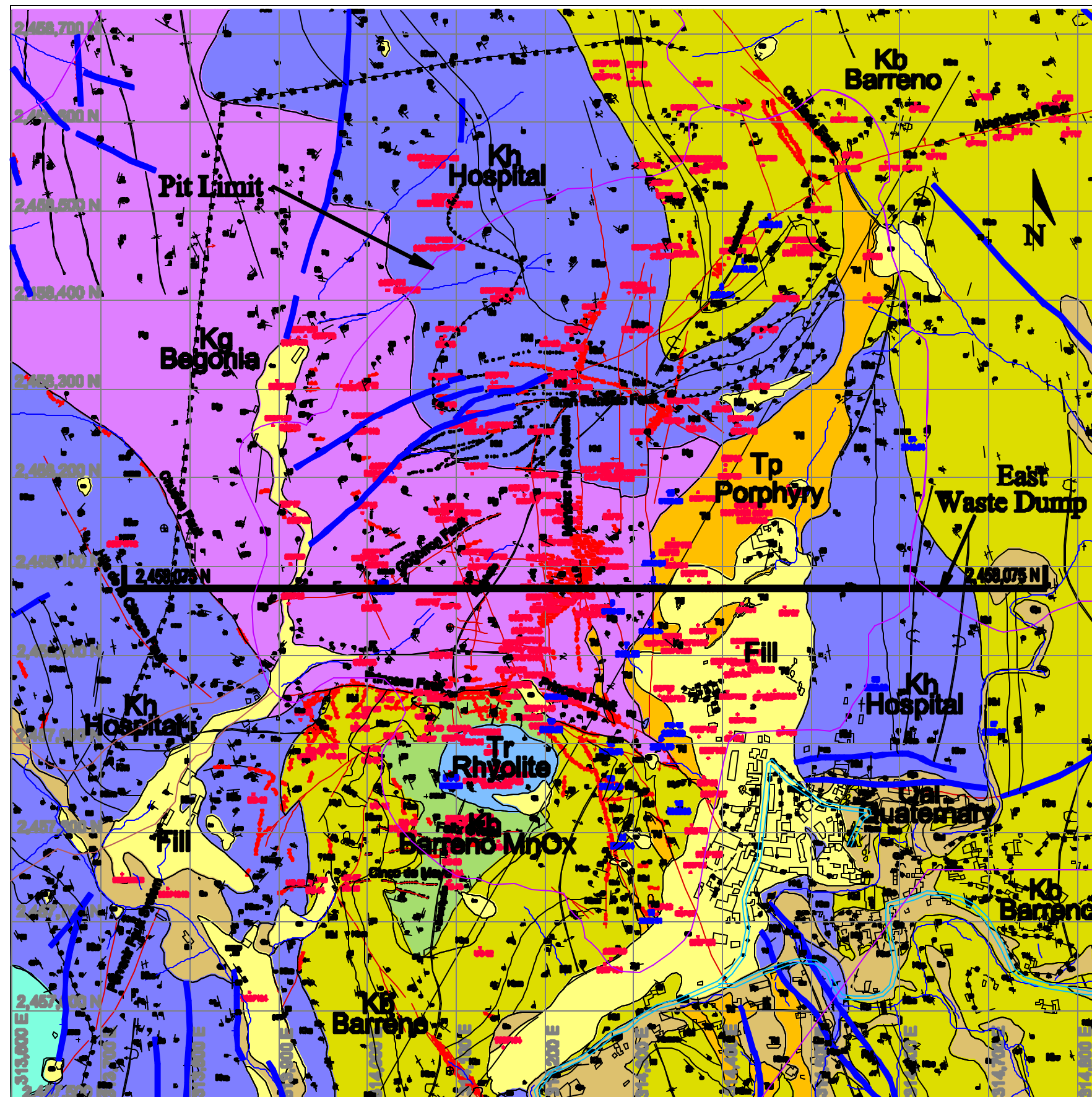
Drill Data

The exploration program begun by Metallica 1995 and expanded on by Cambior in 1997, utilized the database that had been developed from previous companies since the 1970s. MSX's efforts focused on expanding the previously defined oxide resource hosted in both limestone as well as in the underlying quartz diorite porphyry. This expansion has been accomplished through a systematic program of detailed surface and underground geological mapping, geochemical sampling, metallurgical testing, and the completion of approximately 58,000m of exploration and delineation drilling. The resource estimate uses the results of 36 reverse circulation holes from exploration prior to MSX and 219 drill holes completed by MSX, 125 of which are reverse circulation and 94 are core holes. The deposit has been drilled overall on a 50m by 50m grid with a closer spacing in some areas. Assay intervals, typically of 2 m length, which had less than 30 percent recovery were not used for grade estimation. In addition, a total of 2,153 channel samples representing about 4,600 m were collected from numerous accessible underground workings.

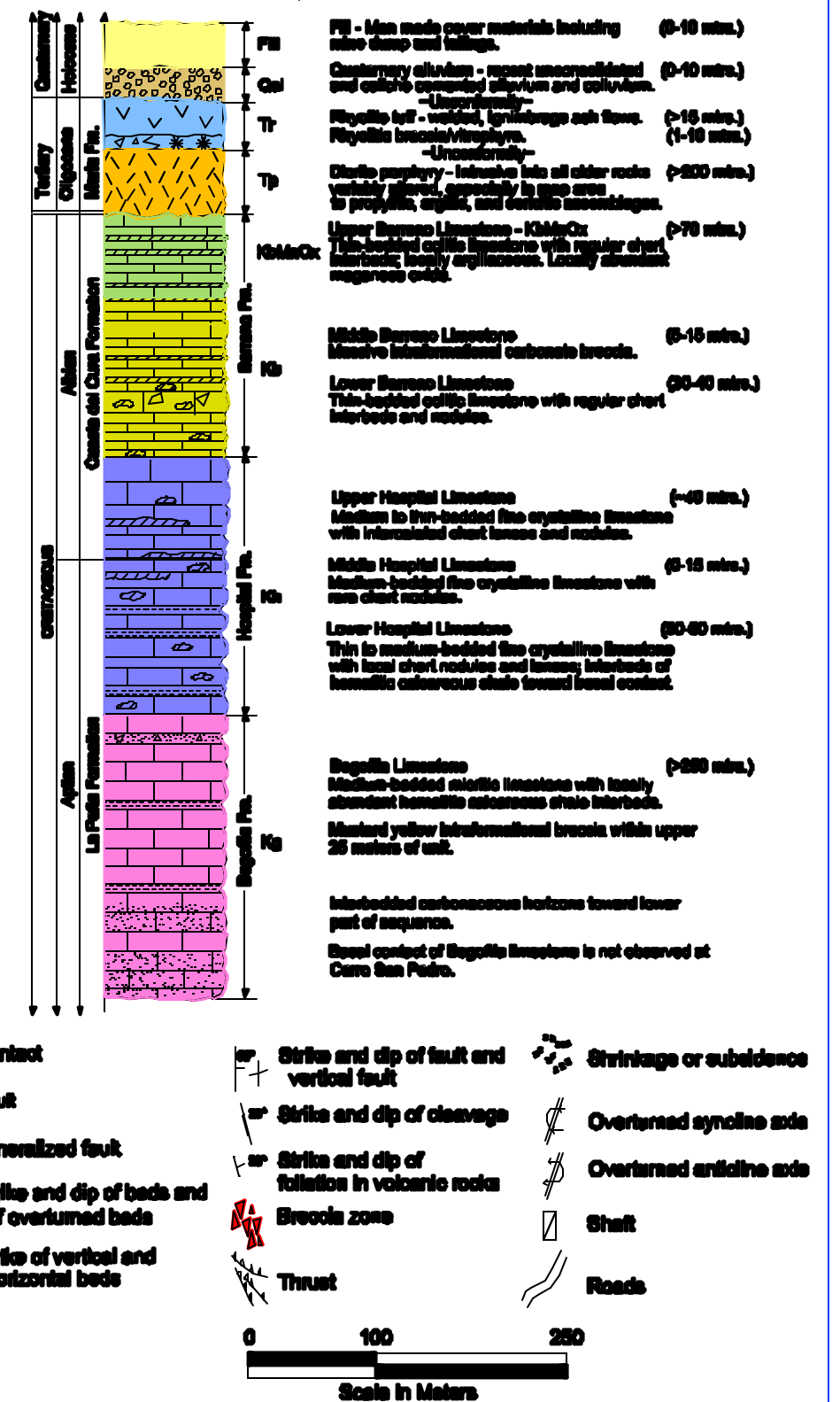
The geological block model for Cerro San Pedro was constructed with respect to both structural and lithological (rock type) control. The assay results from drill holes and channel samples were composited to 5m lengths by respecting these rock and structural domain boundaries. Cambior used standard industry practice to limit or cap the high-grade outliers and to develop indicators to reflect the boundary between low-grade mineralization and unmineralized or barren materials. Validation of the geological and assay database was done using software tools, plots on sections and plan view maps to ensure information stored in the database occurs in the correct position and conforms with the geological interpretation. Verification of assay results used in the database was also performed. Since 1995, an assay verification program has been in-place which systematically re-assays every twenty-fifth sample.

Silver Bias / Adjustment

Assay validation work performed in 1999 on pulps and assay reject material suggested that Bondar-Clegg silver assays performed prior to 1997 were lower than comparable assays performed since that time. In order to confirm this trend and to provide a statistical basis to adjust the original assays, an extensive re-assay program was performed. Bondar-Clegg collected a total of 14 percent of the overall

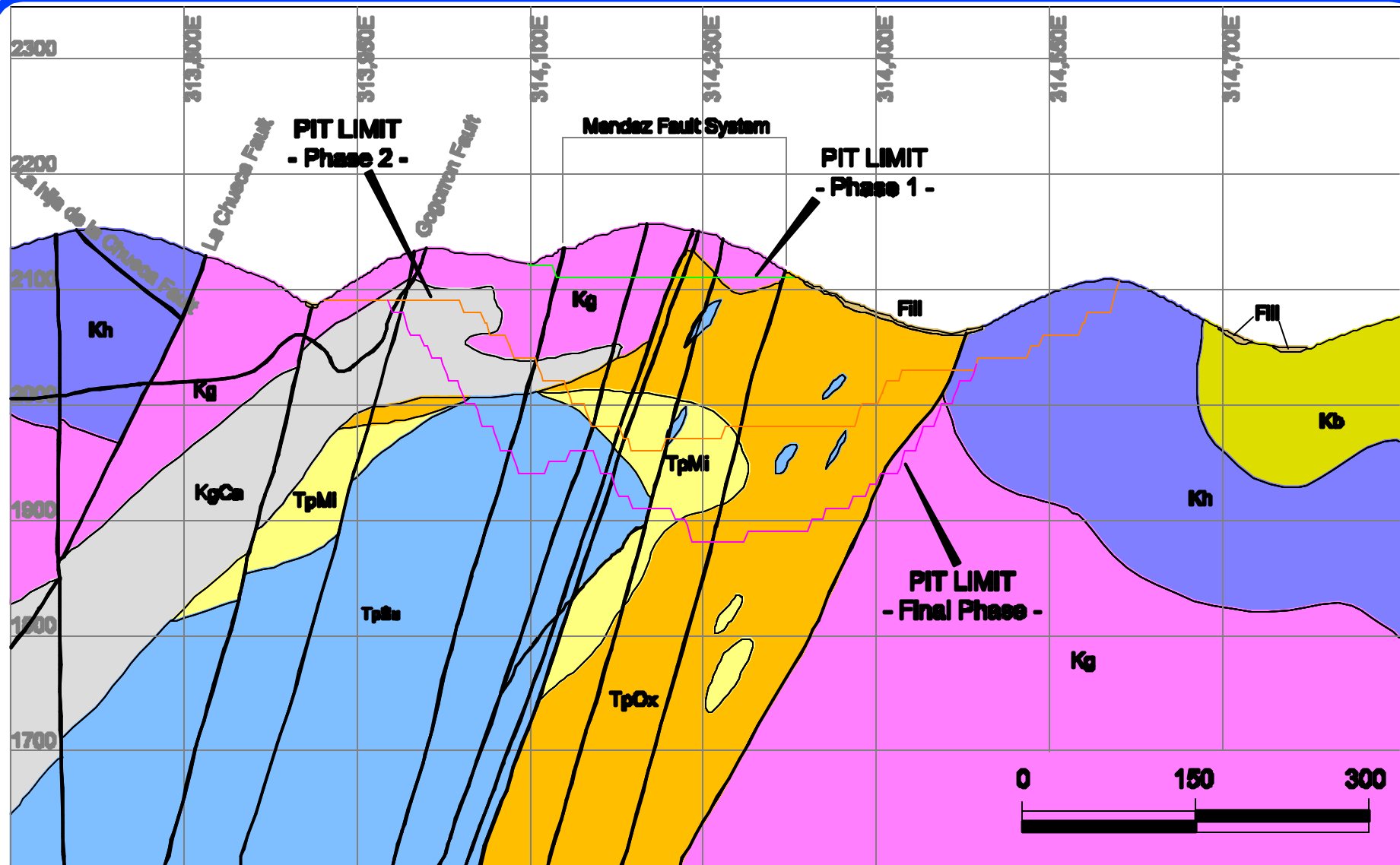


Explanation



MINERA SAN XAVIER, S.A. de C.V.

Figure 1.4 Geologic Map of a Portion of the Cerro San Pedro Mining District



Explanation

Fm Fill	TpMi Porphyry with Oxide/Sulfide	Kb Barreno Limestone	Kg Bagonia Limestone
Tr Rhyolite Tuff	TpSu Porphyry Sulfide	Kh Hospital Limestone	Fault
TpOx Porphyry Oxide	KbMa Barreno Manganese Limestone	KgCa Bagonia Carbonaceous Limestone	

MINERA SAN XAVIER, S.A. de C.V.

Figure 1.5 Geologic Cross Section
Along 2,458,075 N. Showing Drill Holes
- Looking North -

sample database within the conceptual pit limits, or some 2,120 samples, were collected and re-assayed in May-July 1999. Results confirmed no bias for Au, but a positive bias (averaging 28 percent) when compared with pre-1997 Ag assays. Another analysis was done which compared new assay results on 250 random samples by two different laboratories, one using the Ag procedure prior to September 1997 and one using the current procedure. Once again, no Au bias was observed, however, Ag was higher for the current technique. This work confirmed that the digestion technique used prior to September 1997 (agua regia) was insufficient to put all the Ag into solution for subsequent analysis by an AA instrument. An adjustment of approximately 30 percent was made to Ag values in the geologic database on samples assayed prior to September 1997, which resulted in raising the overall average Ag grade by 23 percent.

Mineral Resource Estimation Procedure

The resource has been evaluated using five different estimation techniques: ordinary kriging (OK), the inverse distance power cube (ID3), probability-assigned constrained kriging (PACK) with OK and PACK with ID3 and Restrictive Kriging (RK). Cross sections and bench level block model maps were compared for each method to determine the most representative method for estimating the CSP deposit. Cambior implemented the PACK method for estimating the Cerro San Pedro deposit. The RK method is a MEDSYTEM equivalent of the PACK technique. Either of these restrictive kriging methods would best characterize the grade distribution for the CSP ore deposit.

Mineral Inventory

A mineral inventory for the RK estimating method was calculated for the model by rock type and is summarized in Table 1.3. Modeled voids for underground workings were accounted for in this inventory but no attempt was made to remove unmodeled voids, which is estimated to 600,000 tonnes.

Table 1.3

Glamis 2000 Model Mineral Inventory									
	0.20 g/t Au			0.30 g/t Au			0.40 g/t Au		
Rock Type	Ktonnes	Au	Ag	Ktonnes	Au	Ag	Ktonnes	Au	Ag
Barreno Ox	10,408	0.51	20.85	6,281	0.69	23.51	4,390	0.84	25.94
BarrenoMnOx	3,042	0.73	30.44	2,390	0.87	32.83	1,889	1.01	35.99
Hospital Ox	5,789	0.57	27.29	3,652	0.76	31.22	2,645	0.92	35.23
Begonia Ox	10,675	0.56	25.01	7,452	0.71	28.79	5,699	0.82	31.65
Begonia Carb	3,835	0.52	24.66	2,463	0.68	29.51	1,934	0.77	31.53
Porphyry Ox	89,353	0.48	15.87	58,709	0.60	19.30	40,494	0.71	22.08
Porphyry Mix	37,931	0.45	14.28	28,314	0.52	16.46	18,847	0.60	19.22
Porphyry Sulf	77,162	0.38	10.01	50,247	0.46	12.03	28,832	0.54	14.14
Rhyolite	191	0.64	17.34	181	0.66	17.69	166	0.69	18.24
Total	238,386	0.45	14.95	159,689	0.56	17.75	104,895	0.67	20.81

The RK resource is presented by Resource Classification in the Table 1.4. These resources do not reflect economic pit designs, but rather are limited to reporting a geologic resource.

Resource Classification

The resource estimate is classified on the basis of these parameters:

- **Measured:** All estimated blocks that had a minimum of two drillholes within one-half of the variogram range from the block center.

- **Indicated:** All estimated blocks that had a minimum of two drillholes within the variogram range from the block center.
- **Inferred:** All other estimated blocks.

All estimation parameters, such as mineralization controls, were respected.

Within the confines of an engineered pit, these measured, indicated, and inferred classifications would translate into proven, probable, and possible categories respectively. This classification scheme adheres to standards set forth by Canadian and American securities authorities. The Mineral Resource is summarized at various cutoff grades by classification in Table 1.4 below.

Table 1.4

Mineral Inventory By Classification									
	0.20 g/t Au			0.30 g/t Au			0.40 g/t Au		
Rock Type	Ktonnes	Au	Ag	Ktonnes	Au	Ag	Ktonnes	Au	Ag
Measured	154,953	0.50	17.82	114,173	0.59	20.18	79,433	0.69	23.13
Indicated	61,849	0.38	10.12	33,866	0.49	12.55	18,546	0.61	14.84
Inferred	21,584	0.37	8.20	11,649	0.48	9.07	6,917	0.57	10.18
Total	238,386	0.45	14.95	159,689	0.56	17.75	104,895	0.67	20.81

Validation of Resource Estimate

Validating the resource model was performed by inspecting various plan and sectional areas of the model. Comparisons of exploration data composites with the block model grade estimates were made to insure structural domains where adhered to and that model grades represented the local composite grade data. The behavior of the RK estimating method shows a close relationship between the block grades and the assay composite grades, which demonstrates the model is valid and represents the Cerro San Pedro mineral deposit.

Five different estimation techniques have been used to estimate the CSP geological resources. Problems associated with the traditional modeling methods, such as Ordinary Kriging or Inverse Distance to a power, are that these methods tend to overly smooth grade and do not restrict unwanted interpolation of blocks without manually establishing physical limits, such as structural and/or rock boundaries. As such, tonnages may be overestimated and grades do not represent local information. The advantage of using the RK indicator kriging method is to limit the extent of grade interpolation within mineralized envelopes and to properly represent the grade within these mineralized zones. A comparison of the results between these resource estimation methods is presented in Table 1.5.

Table 1.5

Comparison of Mineral Resource Using Different Estimation Methods							
Method	Cutoff = 0.20 g/t Au						
	% Difference Tonnes	% Difference Ounces	Tonnes (000)	Au (g/t)	Ag (g/t)	Au Equiv. (g/t)	Ounces Au Eq (000)
Restrictive Kriging (MRA)	0%	0%	238,386	0.45	14.9	0.71	5,454
<i>Pack with ID3 (Cambior)</i>	<i>-17%</i>	<i>-7%</i>	<i>197,800</i>	<i>0.50</i>	<i>16.2</i>	<i>0.80</i>	<i>5,080</i>
Pack with OK (Cambior)	-16%	-10%	200,200	0.48	15.4	0.76	4,900
Inv Dist ³ (ID3) (Cambior)	-6%	<1%	224,200	0.47	15.8	0.76	5,480
Ordinary Kriging (Cambior)	-1%	<-1%	235,800	0.44	14.9	0.71	5,420

Independent Mining Consultants (IMC) was requested to determine if any grade dilution should be incorporated into the resource estimate. The IMC study is included as an appendix to this study. IMC does not foresee a requirement to apply a grade dilution factor or procedure to the Cerro San Pedro resource model. They further concluded that the model is probably somewhat conservative in grade, so that any further grade reduction due to dilution is not warranted.

Comparison with Previous Estimates

It is difficult to compare different resource estimates because the database information, estimation techniques, and grade interpolation parameters vary from one estimate to another. Comparing the Cambior

and Glamis/MRA models is not a true “apples to apples” comparison due to these variations. Differences between these models are: the method used to adjust high grade data for the silver bias correction, the use of exploration data with sample recovery between 15% and 35%, and the RK method of grade interpolation. The Glamis/MRA model did not negatively adjust higher grade silver data for the bias correction, as strict use of the polynomial correction equation would have performed. The bias proved to be real due to sample preparation not allowing all the available metal to be reported in the exploration.

1.4 Ore Reserves and Mine Planning

Mineable Reserves

Floating cone input parameters for this study used metallurgical recoveries, processing and mining costs derived from the results of Cambior metallurgical testing and historic Glamis operating parameters. Recovery, commodity prices, and operating costs criteria were varied to test the sensitivity of the resource to the key operating parameters. The base case commodity prices used were US \$275 per ounce gold and \$5.25 per ounce silver.

Mintec’s MEDSYSTEM software, using a Lerchs-Grossmann (LG) algorithm, was used to evaluate a run of mine (ROM), and two crusher scenarios. In the ROM scenario, once the ore is loaded in the pit it is hauled directly to the leach pad with a stop in the haul for lime addition. In the crusher scenarios, the ore is hauled to a crusher facility near the pit to be single-stage crushed to –6 inches or three-stage crushed to –3/4 inches. The crushed ore is then transported to a load-out facility at the edge of the leach pad by conveyor and trucks are used to stack the crushed ore on the leach pad. Appropriate costs and metallurgical recovery differences were applied for each operating scenario. The ROM scenario was limited to two rock types for ore bearing material, Porphyry Oxide and Begonia Limestone, while the crusher scenarios considered all material above a breakeven equivalency cutoff. These two ore types are considered to have sufficient metallurgical test data to support corresponding ROM recovery estimates.

Evaluation Input Parameters

The input parameters used for the MEDSYSTEM LG Pit include mining, processing, incremental capital, G&A, commodity price, pit slope angle, and metallurgical recovery. A mining cost of \$0.65 per tonne of material was applied to all rock types. Various costs were developed to represent three different process operating scenarios. An additional cost of \$0.25 per tonne of ore material was also applied to account for incremental capital. These costs were based on Glamis operating parameters from the Glamis Rand Mining Company operation, experience, manufacturer data, and from previous analysis performed by Cambior,

MRA and IMC for Cerro San Pedro resource study. Pit slope criteria follow guidelines established by C.O. Brawner Engineering. Process input criteria was established by Glamis through internal and third party verification of the Cambior metallurgical test data for the various processing scenarios.

Each block in the model was evaluated to have a positive or negative value using the following criteria:

- The revenue per tonne of gold equivalency was calculated assuming the block was potentially ore material and applying the appropriate metallurgical recoveries and commodity price.
- The cost per tonne was calculated as the sum of the mining, processing, G&A, and incremental capital costs.
- The net value per tonne was calculated by subtracting the costs from the revenue.

Table 1.6 provides the detail for the LG input parameters used.

Table 1.6

Lerchs - Grossmann Input Parameters						
Commodity Price (US \$ / oz)				ROM	1 Stage Crush	3 Stage Crush
	Gold			\$ 275	\$ 275	\$ 275
	Silver			\$ 5.25	\$ 5.25	\$ 5.25
Metallurgical Recovery (%)						
	Gold					
		Porphyry Oxide		75%	75%	78%
		Begonia Limestone		55%	55%	60%
	Silver					
		Porphyry Oxide		40%	41%	43%
		Begonia Limestone		25%	25%	25%
Unit Costs (US \$)						
	Mining			\$ 0.65	\$ 0.65	\$ 0.65
	Process					
		Leach		\$ 0.728	\$ 0.728	\$ 0.728
		Merrill Crowe		\$ 0.250	\$ 0.250	\$ 0.250
		Pad Haul		\$ 0.029	\$ 0.083	\$ 0.083
		Incremental Capital		\$ 0.250	\$ 0.250	\$ 0.250
		Stack/Spread		\$ 0.064	\$ 0.174	\$ 0.556
		G&A		\$ 0.260	\$ 0.290	\$ 0.290
Total Process Costs				\$ 1.581	\$ 1.775	\$ 2.157
Geotechnical Slope Angle (degrees)						
	NW, N, NE (wo haul road)			55	55	55
	E, SE, SW, W (w haul road)			45	45	45
Cutoff Grades (g/tonne Eqv Au)						
	Breakeven			0.34	0.37	0.41
	Internal			0.24	0.27	0.31

The various operating scenarios depart from the previous Cambior analysis. Glamis has extensive experience with ROM heap leach operations and their ability to apply highly productive and cost effective open pit mining operations was used as the basis for further evaluation of the Cerro San Pedro deposit, reflecting the current precious metals market. Table 1.7 summarizes the sensitivity evaluations performed and the respective input parameter for each of the cases.

Table 1.7

CASE ID	ORE DELIVERY TYPE	MINING COSTS	PROCESS COSTS	ROCK TYPES USED AS ORE	% RECOVERY	
					Au	Ag
1a	ROM	\$ 0.65	\$ 1.58	Porphyry	75%	40%
1b	ROM	\$ 0.65	\$ 1.58	Porphyry	70%	35%
2a	ROM	\$ 0.65	\$ 1.58	Porphyry	75%	40%
2b	ROM	\$ 0.65	\$ 1.58	Begonia Lmstone	55%	25%
				Porphyry	70%	35%
				Begonia Lmstone	55%	25%
3a	-6in crush	\$ 0.65	\$ 1.78	Porphyry	72%	40%
3b	-6in crush	\$ 0.65	\$ 1.78	Begonia Lmstone	55%	25%
				Porphyry	75%	41%
				Begonia Lmstone	55%	25%
4a	-3/4in crush	\$ 0.65	\$ 2.16	Porphyry	74%	42%
4b	-3/4in crush	\$ 0.65	\$ 2.16	Begonia Lmstone	55%	20%
				Barreno/Hospital Lmstone	30%	5%
				Porphyry	78%	43%
				Begonia Lmstone	60%	25%
				Barreno/Hospital Lmstone	30%	5%
5a	ROM (+10%mining cost)	\$ 0.72	\$ 1.58	Porphyry	75%	40%
5b	ROM (+5%mining cost)	\$ 0.68	\$ 1.58	Begonia Lmstone	55%	25%
				Porphyry	75%	35%
5c	ROM (-5%mining cost)	\$ 0.62	\$ 1.58	Begonia Lmstone	55%	25%
				Porphyry	75%	40%
5d	ROM (-10%mining cost)	\$ 0.59	\$ 1.58	Begonia Lmstone	55%	25%
				Porphyry	75%	35%
6a	ROM (\$300 gold)	\$ 0.65	\$ 1.58	Begonia Lmstone	55%	25%
				Porphyry	75%	40%
6b	ROM (\$325 gold)	\$ 0.65	\$ 1.58	Begonia Lmstone	55%	25%
				Porphyry	75%	40%

Note : the process costs include G&A costs.

Economic Cone Results

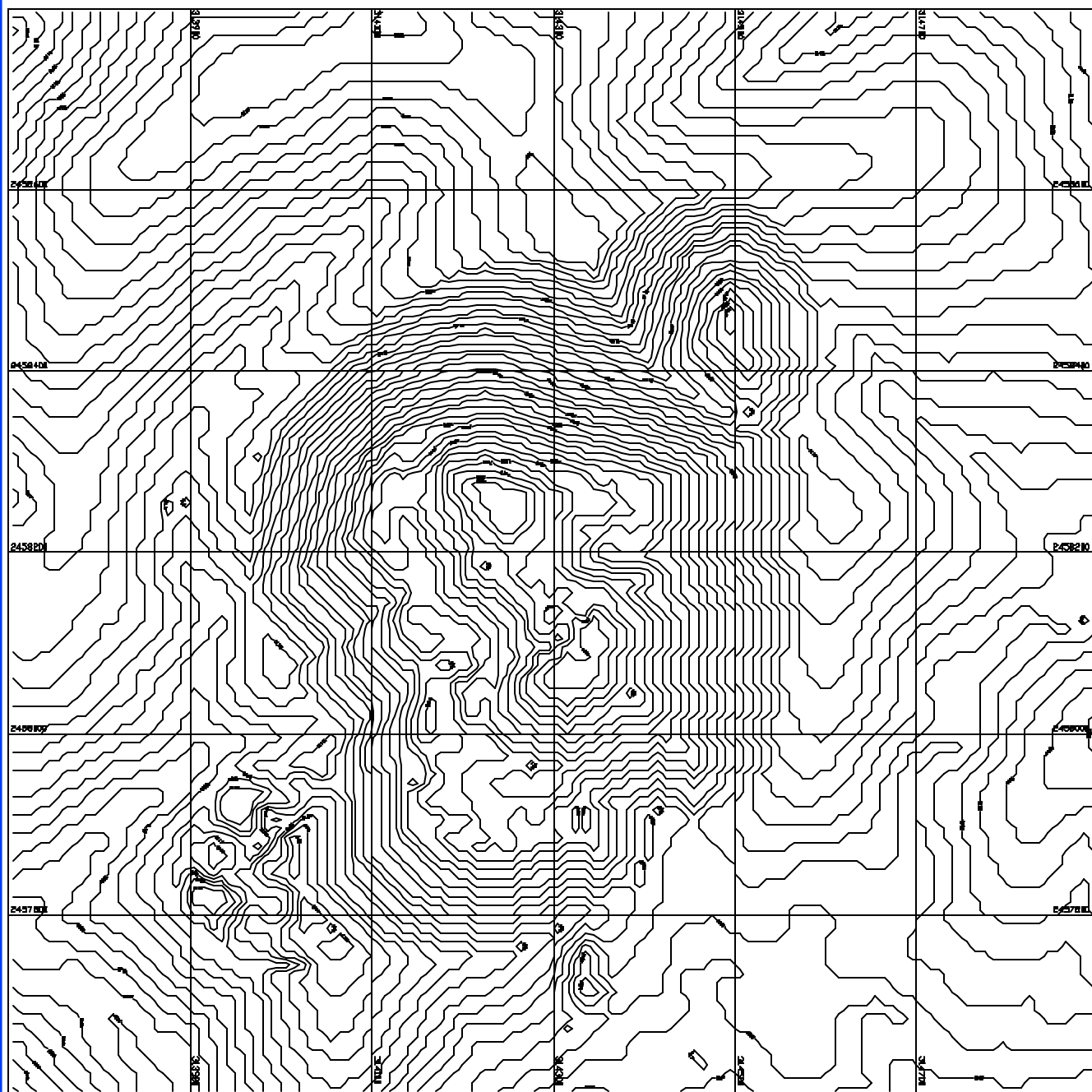
The various scenarios were evaluated by comparing Net Values of the various Lerchs-Grossmann pit shells and the results are summarized in Table 1.8. The respective costs/recovery operating parameters were applied to each economic shell. The information generated from this analysis identified the pit shell basis with that generated the highest pit value and provides a basis for future operational flexibility as the precious metal market evolves.

Table 1.8

Lerchs-Grossmann Net Value Pit Comparisons							
Pit Shell CASE ID	Pit Shell Gold Price	Total Tonnes	Ore Tonnes	Ore Grade gm/tonne	Contained Ounces EQUIV gold basis	Recoverable Ounces	Pit Value Base \$
CASE 1a	275	109,299,000	41,992,000	0.78200	1,055,757	791,818	80,358,212
CASE 1b	275	96,477,000	37,719,000	0.79600	965,304	675,713	63,514,895
CASE 2a	275	115,942,000	48,981,000	0.76600	1,206,277	904,708	96,042,413
CASE 2b	275	102,103,000	44,298,000	0.78400	1,116,583	781,608	78,584,392
CASE 3a	275	101,954,000	43,444,000	0.81200	1,134,166	816,599	80,964,421
CASE 3b	275	110,702,000	45,517,000	0.79900	1,169,260	876,945	88,183,345
CASE 4a	275	98,351,000	40,410,000	0.84800	1,101,731	815,281	72,988,442
CASE 4b	275	107,527,000	43,608,000	0.82600	1,158,076	903,299	84,321,411
CASE 5a	275	104,747,000	46,038,000	0.77600	1,148,600	861,450	89,264,657
CASE 5b	275	111,503,000	47,770,000	0.77000	1,182,597	886,948	92,333,195
CASE 5c	275	128,933,000	51,024,000	0.76700	1,258,232	943,674	99,276,229
CASE 5d	275	132,326,000	52,579,000	0.75700	1,279,673	959,755	103,446,985
CASE 6a	300	136,331,000	54,365,000	0.72800	1,272,452	954,339	111,789,917
CASE 6b	325	175,806,000	62,514,000	0.69900	1,404,899	1,053,674	129,398,189

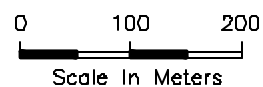
Glamis concluded that the CASE 2a best represents a mineable base for the Cerro San Pedro mineral resource, based on the Net Value comparisons. This base case, used for designing and ultimate mineable pit is a non-discounted cone calculated at a sales price of US\$275 per troy ounce gold and US\$5.25 per troy ounce silver. The mining method represented in this case utilizes a bulk mining method, taking advantage of unit costs economies of scale. The ore types identified and used for this case exhibited reliable metallurgical characteristics, require a low capital investment process facility, and has a low unit operating cost for processing the material. The rock types considered ore were limited to Porphyry Oxide and Begonia Limestone. The LG pit shell generated by CASE 2a was used to establish the final pit geometry for design purposes.

Additional non-discounted cones were run at select metal prices for the equivalent gold value to define starter pit and phase pit geometries. The phased LG runs identified pre-stripping requirements for the project, targeted higher grade material as early in the mine life as possible, helped define the number of phases to consider for the project, and provided a test to insure adequate mining widths for the desired mining method. Figure 1.6 shows the geometry of the \$275 gold LG pit shell.



MINERA SAN XAVIER, S.A. de C.V.

Figure 1.6 Lerchs–Grossmann (LG)
Pit Shell



Evaluation Verification

Mine Reserves Associates verified the pit-optimization process for Glamis. MRA utilized the Cambior geologic model, the MRA generated grade model, and utilized the MEDSYSTEM LG evaluation software to generate economic shells. No significant difference was recognized between the various modeling techniques or by the evaluation software used. The results between verifications varied, but the variations were a result of testing the resource for different commodity price and by the material designation for ore types. The various methods revealed total material quantities of approximately 120 million total tonnes and 50 million tonnes of ore, when considering the Porphyry Oxide and limestones with favorable metallurgical characteristics. Glamis proceeded confidently with its evaluation of the resource given the level of verification this deposit has received.

Final Pit Design Parameters

Given the results of the LG evaluation that identified the CASE 2a economic shell as the most suitable scenario, a final mineable pit was developed by MRA with Glamis involvement. Slope angles used for design held to criteria established in C.O. Brawner Engineering report dated August 18, 1999, attached in Section 4.0 of the Appendix. Final highwall slope angle criteria also accounted for wall height and proximity to haul roads for overall highwall slope angles, and the time the wall would be exposed during active mining operations. The MRA design eliminated placing haul roads in the north or west sectors of the pit as means of minimizing stripping for the project. Although slightly flatter slopes of these walls were used as compared to previous Cambior designs, improved stripping requirements resulted. Road geometry considered adequacy for the expected equipment fleet to be used for width and performance characteristics up to the maximum gradeability. Maintaining haulage ramps to a maximum of 10% has been proven to maintain fleet performance and equipment longevity. Minimum pushback widths accounted for fleet access and mobility within the active mining areas. The key design parameters are shown in Table 1.9.

Pit design not only considered the purely operational concerns such as highwall slopes, ramp placement and phase pit geometry, but also encompassed protection of important historical buildings in the village Cerro de San Pedro. The pit exits at the 2070 slot on the west allows for ore delivery to the leach pad and to haul waste for initial haul road construction and to a secondary west waste stockpile area. The pit has another primary exit to the east at the 2120 elevation to allow delivery of waste to the primary east waste stockpile area. The final pit is designed respecting the protection boundary set by the Instituto Nacional de Antropología e Historia (INAH) to protect historic structures. The pit design incorporates haul placement in the pit immediately adjacent to the INAH protection boundary to further buffer the village from long-term highwall exposure. In addition, design of the phased mine plan includes mining slots along the INAH

boundary. Mining during the early phase buffers the structures during later mining phases in the higher slopes above the INAH area. Incorporating protection for the INAH structures eliminates some economic ore on the eastern side of the mineralized area. Figure 1.7 shows the final pit design used in this study.

Table 1.9

Pit Design Parameters	
Parameter	Value
Slope Angles:	
Interramp – North & West	55 degrees
Interramp – East	52 degrees
Interramp – South	54 degrees
Bench Face Angle	75 degrees
Bench Height	10m
Vertical Interval between Catch Benches	20m
Catch Bench Width (toe to crest):	
North & West Wall	8.6m
East Wall	10.3m
South Wall	9.2m
Designed Road Width	32m
Designed Ramp Gradient	10 %
Minimum Designed Pushback	55m
Minimum Mining Width	30m

Mine Planning and Schedule

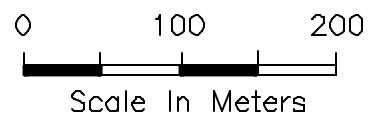
The final pit design was used to calculate the mineable reserves. Though economic pit shells considered only Porphyry Oxide and Begonia Limestone, the final mineable ore reported includes the Barreno and Hospital Limestones as well.

The Cerro San Pedro Pit was developed utilizing a 3D LG methodology based on a \$275 per ounce gold price and \$5.25 per ounce silver price. The large tonnage, low-grade nature of the deposit dictated the use of large-scale open pit mining methods for efficient and cost effective mine development. The pit was divided into three phases to provide early ore production and spread stripping throughout the mine life, build



MINERA SAN XAVIER, S.A. de C.V.

Figure 1.7 Final (Year 8) Design Pit on
Vertical Air Photo Base



to a sustainable annual ore quantity and provide relatively even ore production over the life of the project. The phased designs ensure that access is logical and available to all intermediate mining areas, and that adequate operating space was provided to achieve the proposed production rates. Haulage profiles were determined and calculated for each bench from each phase to an advancing leach pad or waste dump location for each production year. The mining schedule was based on an average annual ore production of 7 million tonnes of ROM material, with a maximum total production not to exceed 20 million tonnes. The life of the mine spans nine years including Pre-production (PP) and partial production in Year 8. Average mining cost per tonne of material over the life of mine is \$0.65.

The schedule was generated based on reserves within the designed pit phases using the following parameters and guidelines:

- An equipment fleet to take advantage of bulk unit cost economies, work within a minimum mining width of 55 meters, minimize loading machines, and keeping equipment needs constant through out the mine life.
- Minimize initial pre-stripping and construct a mine access road to the pit in the Pre-production period.
- Target of 750,000 tonnes of ore in Pre-production for bedding of the leach pad.
- Gradual ramp up of tonnage rates in Pre-production and Year 1.
- Target high grade and low stripping in early period and maintain consistent grades thereafter.
- Mine access road slot on 2070 bench as during pre-production activities.
- Minimize mining shift change over inefficiencies, by utilizing extended hour work shifts.
- No mining on Sundays as prescribed by project permitting.

The detailed mine schedule is summarized by year in Table 1.10.

Mine Equipment

Hydraulic shovels were chosen as primary loading units to reduce loading costs and increase productivity. The use of hydraulic shovels was chosen versus electric shovels to minimize the capital cost and power line network required for the mine site, provide the flexibility required in mining three phases, and provide a productive match with 172-tonne trucks. The 172-tonne haul trucks were selected as the largest practicable truck that would operate in the Cerro San Pedro resource and provide favorable unit costs due to the economies of scale.

Table 1.10

Annual Production Summary										
	Year									
	PP	1	2	3	4	5	6	7	8	TOTAL
Total Material (Ktonnes)	9,406	20,357	17,930	19,407	16,776	16,170	9,282	10,074	1,141	120,543
Waste Material (Ktonnes)	8,746	15,172	12,615	12,752	9,027	8,630	1,850	2,433	72	71,297
Ore Material (Ktonnes)	660	5,185	5,315	6,655	7,749	7,540	7,432	7,641	1,069	49,246
Grade gpt Ag	42.57	22.37	31.00	29.62	22.15	19.59	23.46	16.04	10.69	23.02
Oz Ag Stacked	903,365	3,729,182	5,298,112	6,337,381	5,518,387	4,748,034	5,605,403	3,940,955	367,378	36,448,197
Grade gpt Au	0.44	0.68	0.64	0.51	0.61	0.49	0.57	0.57	0.30	0.57
Oz Au Stacked	9,232	112,879	109,693	109,336	152,288	118,267	136,136	141,101	10,413	899,343
Strip Ratio	13.25	2.93	2.37	1.92	1.16	1.14	0.25	0.32	0.07	1.45

Note: Contractor to mine additional 741,000 tonnes in the Preproduction year to establish access to pit working faces.

Mine mobile equipment requirements were based on the annual mine production schedule for ore and waste, mine shift schedules, and equipment productivity estimates. Table 1.11 lists the major mine equipment fleet requirements.

Table 1.11

Major Mine Equipment Fleet Requirements									
Equipment Type	PP	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	Yr-6	Yr-7	Yr-8
Blast Hole Drill (171mm)	2	2	2	2	2	2	2	2	2
Secondary Drill (102mm)	1	1	1	1	1	1	1	1	1
Hydraulic Shovel (17.2m ³)	0	1	1	1	1	1	1	0	0
Hydraulic Shovel (25.2m ³)	1	1	1	1	1	1	1	1	1
Haul Trucks (172 tonne)	4	8	8	8	8	8	8	7	7
Water Trucks (68,000 lit)	2	2	2	2	2	2	2	2	2
Track Dozer (520 hp)	2	2	2	2	2	2	2	2	2
Tire Dozer (450 hp)	1	1	1	1	1	1	1	1	1
Motor Grader (4.88 m)	2	2	2	2	2	2	2	2	2

The mine work schedule will be two 10.5 hour shifts per day, 6 days per week. The mining operation will be idle on Sundays because of the close proximity of the village. If necessary, it will be possible to work on a restricted basis on Sundays, for example drilling or performing maintenance.

A truck shop complex that includes a three bay shop, a fuel/wash facility, maintenance offices, and warehouse will support the mine equipment fleet and other equipment. Most maintenance and repairs will be performed on site with company employees.

Mine Personnel

The mine personnel required to operate the Cerro San Pedro Mine are composed of the salaried staff in the mine operations, maintenance, and engineering departments as well as the daily rate personnel required to operate and maintain the equipment, and provide technical support such as grade control and surveying. Staffing levels for mining start at 100 during Pre-production and increase to 121 from Year 1 through Year 4 before decreasing to 99 by Year 8. A Mexican national contractor under the direct supervision of CSP personnel will perform the blasting operation.

Mine Operating Costs

Mine operating costs are based on the anticipated requirement to operate and maintain the planned equipment fleet. Labor rates used in the cost estimates are a result of recent wage and salary surveys conducted in the San Luis Potosi area for similar work including equipment operation, maintenance and support staff positions. Equipment operating costs were established by applying hourly costs estimated by reviewing equipment manuals, researching costs at similar operations, and from experience. The technical support required to generate mine plans, maximize ore recovery, optimize grade control, and give support to the production functions are planned for in the Engineering Department.

Total operating costs for the mining operation by year are summarized by area in Table 1.12.

Table 1.12

Summary of Mine Operating Costs (\$ Total)										
Period	Total Production (Ktonne)	Total Cost per Period (\$000)								
		Drill	Blast	Load	Haul	Roads	Mine Gen.	Mtce. Gen.	Engr.	Total
PP	9,406	535	816	674	1,501	1,401	321	881	576	6,705
YR1	20,357	1,076	1,725	1,456	3,480	1,591	321	929	846	11,423
YR2	17,930	956	1,523	1,276	3,442	1,591	321	929	786	10,823
YR3	19,407	1,029	1,646	1,386	3,467	1,591	265	929	801	11,113
YR4	16,775	899	1,427	1,190	3,416	1,591	265	804	736	10,327
YR5	16,170	869	1,377	1,160	3,150	1,591	265	718	721	9,851
YR6	9,282	522	805	708	2,747	1,450	265	670	552	7,719
YR7	10,074	547	857	739	2,914	1,450	265	670	571	8,013
YR8	1,141	98	116	142	553	858	185	479	351	2,784
Total	120,542	6,529	10,292	8,731	24,671	13,113	2,471	7,010	5,941	78,758
Percent of Total Cos		8%	13%	11%	31%	17%	3%	9%	8%	100%

Summary of Mine Operating Costs (\$/Tonne Total Material)										
Period	Total Production (Ktonne)	Total Cost per Period - Ore and Waste (\$ per Tonne)								
		Drill	Blast	Load	Haul	Roads	Mine Gen.	Mtce. Gen.	Engr.	Total
PP	9,406	0.057	0.087	0.072	0.160	0.149	0.034	0.094	0.061	0.713
YR1	20,357	0.053	0.085	0.072	0.171	0.078	0.016	0.046	0.042	0.561
YR2	17,930	0.053	0.085	0.071	0.192	0.089	0.018	0.052	0.044	0.604
YR3	19,407	0.053	0.085	0.071	0.179	0.082	0.014	0.048	0.041	0.573
YR4	16,775	0.054	0.085	0.071	0.204	0.095	0.016	0.048	0.044	0.616
YR5	16,170	0.054	0.085	0.072	0.195	0.098	0.016	0.044	0.045	0.609
YR6	9,282	0.056	0.087	0.076	0.296	0.156	0.029	0.072	0.059	0.832
YR7	10,074	0.054	0.085	0.073	0.289	0.144	0.026	0.067	0.057	0.795
YR8	1,141	0.086	0.101	0.125	0.485	0.752	0.162	0.420	0.308	2.440
Total	120,542	0.054	0.085	0.072	0.205	0.109	0.021	0.058	0.049	0.653
Percent of Total Cos		8%	13%	11%	31%	17%	3%	9%	8%	100%

Notes: Drill, Load, Haul, Roads (Roads & Dumps), include operating labor & supplies and maintenance labor & repair parts and supplies..

Mine Gen. Mine General - Mine operations salaries plus mine overhead.

Mtce. Gen. Maintenance General - Maintenance salaries and repair parts and supplies for small vehicle and support equipment.

Engr. Engineering - Salaries and supplies for engineering department.

Mine Capital Costs

Capital costs were developed for the mine major, mine support, light vehicles, and stationary equipment. The capital costs are a combination of new and used equipment quotes. It should be noted that the current condition of the mining industry has resulted in a very favorable used equipment market.

Table 1.13 summarizes the total capital cost for mining equipment. The costs include the cost of the machine, brokerage costs, freight costs, and the cost to dismantle and erect the unit. The costs utilized for used equipment reflect the current 'used' market values obtained from several industry sources and publications. Mine initial capital cost is \$22,709,469 with \$296,000 as sustaining capital in Year 4 for the replacement of light vehicles and support equipment, plus \$2,674,500 in Year 5 for major equipment rebuilds, for a total of \$25,679,969 for mine capital equipment over the life of the mine.

Table 1.13

Mine, Maintenance, and G&A Capital Costs Summary			
Capital Item	PP & Year 1	Year 4 & 5	Total Project
Mine Major Equipment	17,830,000	2,674,500 (Y-5)	20,504,500
Mine Support Equipment	417,400	120,000 (Y-4)	537,400
Maintenance Equipment	1,124,000	72,000 (Y-4)	1,196,000
G&A Equipment	473,000	104,000 (Y-4)	577,000
Maint. Facilities & Mine Roads	2,865,069		2,865,069
Total Capital	22,709,469	2,970,500	25,679,969

1.5 Metallurgical Investigations

The Cerro San Pedro project has been the subject of extensive metallurgical investigations that have evaluated the performance of a variety of ore types subjected to various processing flowsheets. The metallurgical testing described within this section of the feasibility report has supported the conclusion that the Porphyry Oxide and Begonia Limestone ore types, which represent 97% of the total ore to be processed, can be processed effectively with conventional run-of-mine heap leach technology. These conclusions are further supported by the independent data reviews by McClelland Laboratories, Inc. and Kappes, Cassiday & Associates, which are included in Section 5.1 of Appendix 5.0.

In addition to the Porphyry Oxide and Begonia Limestone, metallurgical information for other possible ore types has been included in Section 5.0 of this feasibility report. The current mine plan calls for processing minor quantities of Hospital and Barreno Limestones, which in total represent less than 3 per cent of the project ore tonnage and recoverable gold and silver ounces. Other ore types may be mined and processed in the future if precious metals prices rise sufficiently, but are not considered in this feasibility study.

Metallurgical information for crushed ore processing has also been included in this Section 5.0. Conventional run-of-mine heap leaching for Porphyry Oxide and Begonia Limestone is the preferred processing option evaluated in this feasibility study. Fine crushing of the ore may become economic at a later date in the event that precious metals prices increase substantially.

Table 1.14 below summarizes the key metallurgical parameters developed as a result of the metallurgical investigations described in this Section 5.0.

Table 1.14

Key Metallurgical Parameters by Ore Type				
Ore Type	% Recovery (run-of-mine)		Reagent Consumption (kg/t)	
	Au	Ag	NaCN	Pebble Lime
Porphyry Oxide	75	40	0.30	3.0
Begonia Limestone	55	25	0.30	3.0
Barreno Limestone	20	5	0.30	3.0
Hospital Limestone	35	10	0.30	3.0
Weighted Average	70.5	35.7	0.30	3.0

Background

Metallurgical testing was conducted to provide adequate data to conduct a feasibility evaluation of the project, based on a large tonnage, low grade, heap leach development plan. The purpose and objectives of the metallurgical test work performed for the Cerro San Pedro project were to:

- provide metallurgical characterization and understanding of the project ore reserves,
- identify significant or fatal flaws,
- establish metallurgical and plant design criteria,
- establish an operating strategy,

- define metal recoveries, leach kinetics, reagent consumption and operating costs, and
- establish criteria for a closure plan.

Test work has been performed at a number of laboratories and includes the standard bottle roll test, column testing, cyanide solubility testing, diagnostic leaches, ore characterization testing, high solids bottle stirs (HSBS) for heap simulation, solution chemistry analysis, and mineralogical examination. Tests were conducted at various particle sizes and test parameters. All references to particle size (e.g. 13mm, etc.) throughout Section 5.0 refer to the 80% passing particle size, unless otherwise stated. Figure 1.8 is a flow chart representing the progression of test work from standard Phase I tests, followed by more specific tests in Phase II to better characterize metallurgical behavior.

Strategy for Developing Reliable Estimates of Recoveries and Reagent Consumption

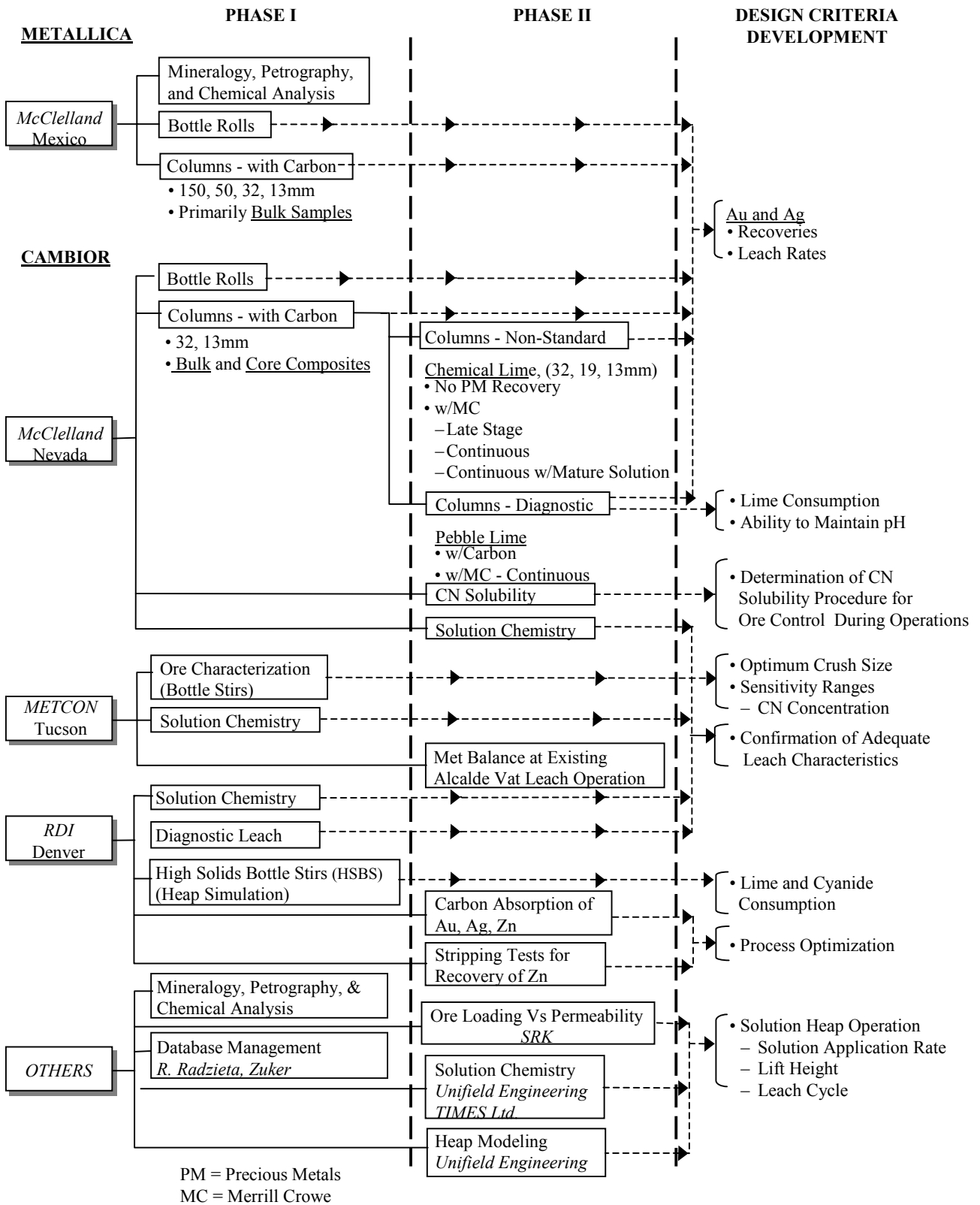
Two characteristics of Cerro San Pedro ores required some additional test work to facilitate development of operating parameters.

First, the reserves include a significant amount of recoverable silver (Ag) with Ag to Au ratios in solution being high enough that, by industry standard, a Merrill-Crowe recovery plant would be indicated.

The second characteristic relates to cyanide soluble zinc contained within the ore, and its potential effect on carbon plant or Merrill-Crowe operations. Zinc (Zn) at Cerro San Pedro is primarily in the form of either oxides or carbonates and only a small fraction as the less soluble Zn sulfides.

At Cerro San Pedro, the resource value is entirely precious metals (Au and Ag), therefore, the metallurgical investigation process focused on determining the ultimate precious metals recoveries that could be achieved. Typically Au recovery would be estimated by running bottle roll tests, generally at high solutions to solids ratios, to provide preliminary recoveries of precious metals. Scoping style bottle roll tests would be followed up by column tests. A significant number of both of these standard tests were conducted separately on three of the main Cerro San Pedro ores, Barreno, Begonia, and Porphyry Oxide. Other investigations have focused on determining the viability of adding Porphyry Mixed and Sulfide material as reserves, i.e. whether recoveries and reagent consumption would be favorable enough to allow inclusion of these materials as ore types.

Seven distinct mineral types have been determined by different geological and metallurgical characteristics and are listed below denoting their respective portion of the deposit as discussed in Section 4.0. Porphyry Oxide and Begonia Limestone are the two primary ore types that will be mined and processed under the



MINERA SAN XAVIER, S.A. de C.V.

Figure 1.8 Metallurgical and Process Design Test Work

plans developed in this feasibility study, along with small quantities of Barreno Limestone and Hospital Limestone. Higher metals prices and/or improved economics would be needed to support future processing of the other ore types, including mixed and sulfide porphyry ores. Table 1.15 below summarizes the process tonnage by ore type.

Table 1.15

Process Tonnage by Ore Type				
	Tons Ore	Tons ore % of total	Recoverable Au % of total	Recoverable Ag % of total
Porphyry Oxide	41,907,400	85.1%	88.5%	86.2%
Begonia Limestone	5,865,200	11.9%	9.4%	12.4%
Barreno Limestone	284,300	0.6%	0.4%	2.4%
Hospital Limestone	1,192,000	2.4%	1.6%	1.3%

No testing was performed on tailings from prior operations, which comprise approximately 0.5% of the potential available ore tonnes. Tailings were assigned a 40% recovery for both Au and Ag. Average reserve grades for tailings are 0.62 g/t Au and 29.0 g/t Ag. The majority of the tailings are comprised of leach residues from former vat leaching operations.

Beyond the standard bottle roll and column tests, additional tests were conducted as shown in Figure 5.1 that further provide ore characterization information, assess solution chemistry issues, and provide information on kinetics and reagent consumption. These tests also gave insight on the reliability of the standard tests as a predictor of ultimate precious metals recoveries.

A detailed Sulfide Study was conducted on Porphyry Oxide, Mixed and Sulfide materials to relate quantitative/economic-driven metallurgical information with the qualitative geological classification to determine ultimately which materials should be classed as ore or waste. A summary of the results of the Porphyry Sulfide Study is presented under the Related Investigations Section – Sulfide Study – Analysis of Porphyry Oxide, Mixed, and Sulfide Ore Types. Details of this study are included in Section 5.8 of the Appendix.

Description of Metallurgical Samples and Summary of Testing

Metallurgical testing has been performed on a total of 396 different samples (core, core composite, bulk, bulk composite, underground chip samples, and reverse circulation cuttings) collected throughout the known extents of the deposit. A complete listing of samples (for bottle roll testing and for column testing) appears in

Section 5.5 of the Appendix and includes location, domain, and coordinate information. An additional table provides details of the samples that comprise the composite samples (both core and bulk).

Table 1.16 on the next page summarizes the total number of tests by type of test and ore type that comprise the metallurgical data set.

The following summarizes sampling that was conducted for these tests:

Samples were taken by Metallica from surface outcrop locations and from underground drifts and crosscuts, from reverse circulation drill samples, and drill core intervals. Composites were also prepared from these various sample types to provide test samples that represented various deposit ore types for metallurgical testing. These included thoroughly oxidized material from the Porphyry Oxide (PO), Begonia Limestone (BG), Barreno Limestone (BA), Barreno Manganese (BAm), Hospital Limestone (H), and the Porphyry Mixed (PM – oxide and sulfide) and Porphyry Sulfide (PS).

Bulk samples were taken with both lump and fine material being collected in their approximate proportions as contained in the broken rock. No crushing or breaking of lump material was done at the site. Core and other drill interval samples were individually bagged according to their interval. No crushing or breaking of the core was done except to separate the interval being sampled. Additional bulk samples were collected by Cambior at sites previously sampled by Metallica and on new sites established by Cambior.

Cambior drilled and collected additional individual core intervals for bottle roll tests and some underground chip samples for additional work on the Hospital, Barreno, and Barreno Manganese. Cambior's work emphasized developing the second, third, and fourth Composite Series to further build upon Metallica's composite work (Series 1) and previous work for the three major ore types (Porphyry Oxide, Begonia, and Barreno). The Composite Series was used for testing by a full suite of metallurgical methods including bottle rolls, columns, bottle stirs, diagnostic testing, HSBS tests, etc. Column tests were performed only on composite samples, not on individual core or bulk samples.

These composite series of samples are identified as follows:

Comp 1 Series – a series of 3 bulk composites by ore type collected by Metallica from previously sampled and tested surface and underground Metallica bulk sample locations. These composites were intended to provide information from short duration column leach tests to be completed during Cambior due diligence.

Table 1.16

Metallurgical Test Work to Date for Cerro San Pedro											
Type of Test	Number of Tests										
	PO	BG	BA	Bam	All BA	H	PM	PS	Other	Total	
≥13mm – Primary Data Set for Recovery/Reagent Estimates*:											
Column Tests – Total	38	22	11	12	23	0	2	2	0	87	
Bulk + bulk composites	(27)	(15)	(11)	(10)	(21)	(0)	(1)	(1)	(0)	(65)	
Core + core composites	(11)	(7)	(0)	(2)	(2)	(0)	(1)	(1)	(0)	(22)	
McClelland – Hermosillo (Metallica)	[16]	[7]	[8]	[0]	[8]	[0]	[1]	[1]	[0]	[33]	
McClelland – Sparks (Cambior)	[22]	[15]	[3]	[12]	[15]	[0]	[1]	[1]	[0]	[54]	
Bottle Roll Tests – Total	121	54	51	49	100	23	43	19	8	368	
Bulk + bulk composites	(22)	(13)	(11)	(11)	(22)	(0)	(1)	(2)	(1)	(61)	
Core + core composites	(99)	(41)	(19)	(23)	(42)	(14)	(42)	(17)	(7)	(262)	
Underground chip	(0)	(0)	(21)	(15)	(36)	(9)	(0)	(0)	(0)	(45)	
McClelland – Hermosillo (Metallica)	[61]	[25]	[6]	[1]	[7]	[1]	[18]	[12]	[1]	[125]	
McClelland – Sparks (Cambior)	[60]	[29]	[45]	[48]	[93]	[22]	[25]	[7]	[7]	[243]	
Bottle Stirs – METCON	65	36								101	
High Solids Bottle Stirs – RDI	16	20					3	3	0	42	
TOTAL	240	132	62	61	123	23	48	24	8	598	
Research Tests ≥ 13mm	110	80			25					215	
Bottle Roll Tests <13mm/McClel	0	22	31	14	45	3	0	5	1	76	
TOTAL	350	234	93	75	193	26	48	29	9	889	

* Several samples with carbonaceous material and/or of lower grade than would be considered ore were also eliminated from this data set.

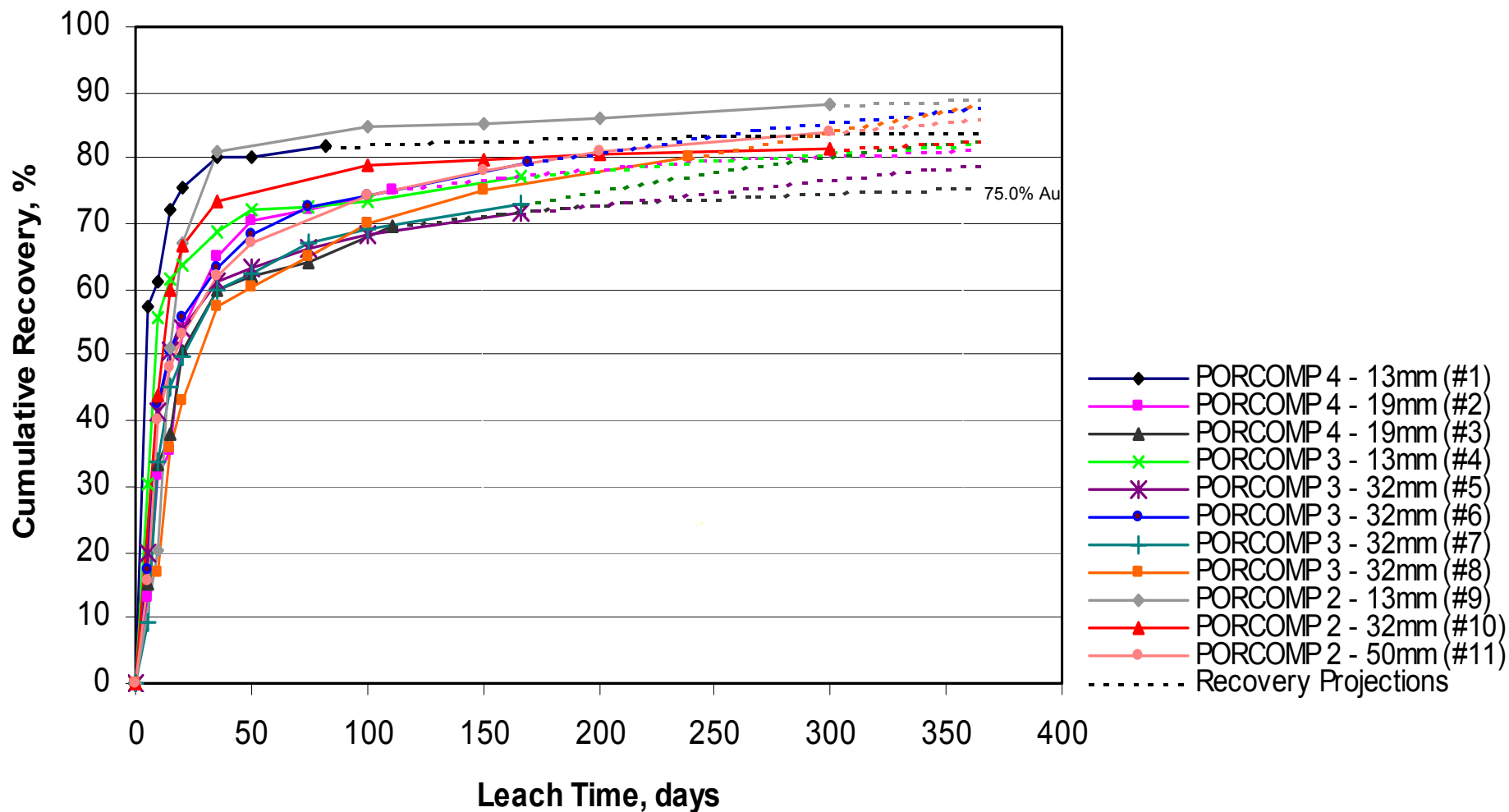
Comp 2 Series – a series of 3 bulk composites by ore type collected by Cambior from locations previously sampled and tested by Metallica to provide check metallurgical results of previously sampled sites. The sample locations were chosen to allow both rapid collection and a representative sample and to help establish if surface samples behave similarly to underground samples as represented in the Comp 3 Series.

Comp 3 Series – a series of 3 bulk composites by ore type collected by Cambior from new underground locations previously channel sampled and selected by Cambior to provide representative sampling of the ores throughout the deposit. Samples were selected to represent the average grade of the mineable ore, and provide a geographic spread through the deposit. The results from these Comp 3 Series samples can be compared to the surface samples of the Comp 2 Series.

Comp 4 Series – a series of 3 composites by ore type collected by Cambior from 1997 Cambior drill core generated during the 1997 due diligence period (holes 97SP-203C through 97SP-213C). These Comp 4 Series are thought to be the most representative of any of the composite samples and were selected to both approximate the average grade, geographic range, and geologic/mineralogical variability in the deposit. The core composites are comprised of a split or sawn one-half sample of the generally HQ-sized (38mm) core. The core samples were selected following receipt of assays performed on the other half of the core.

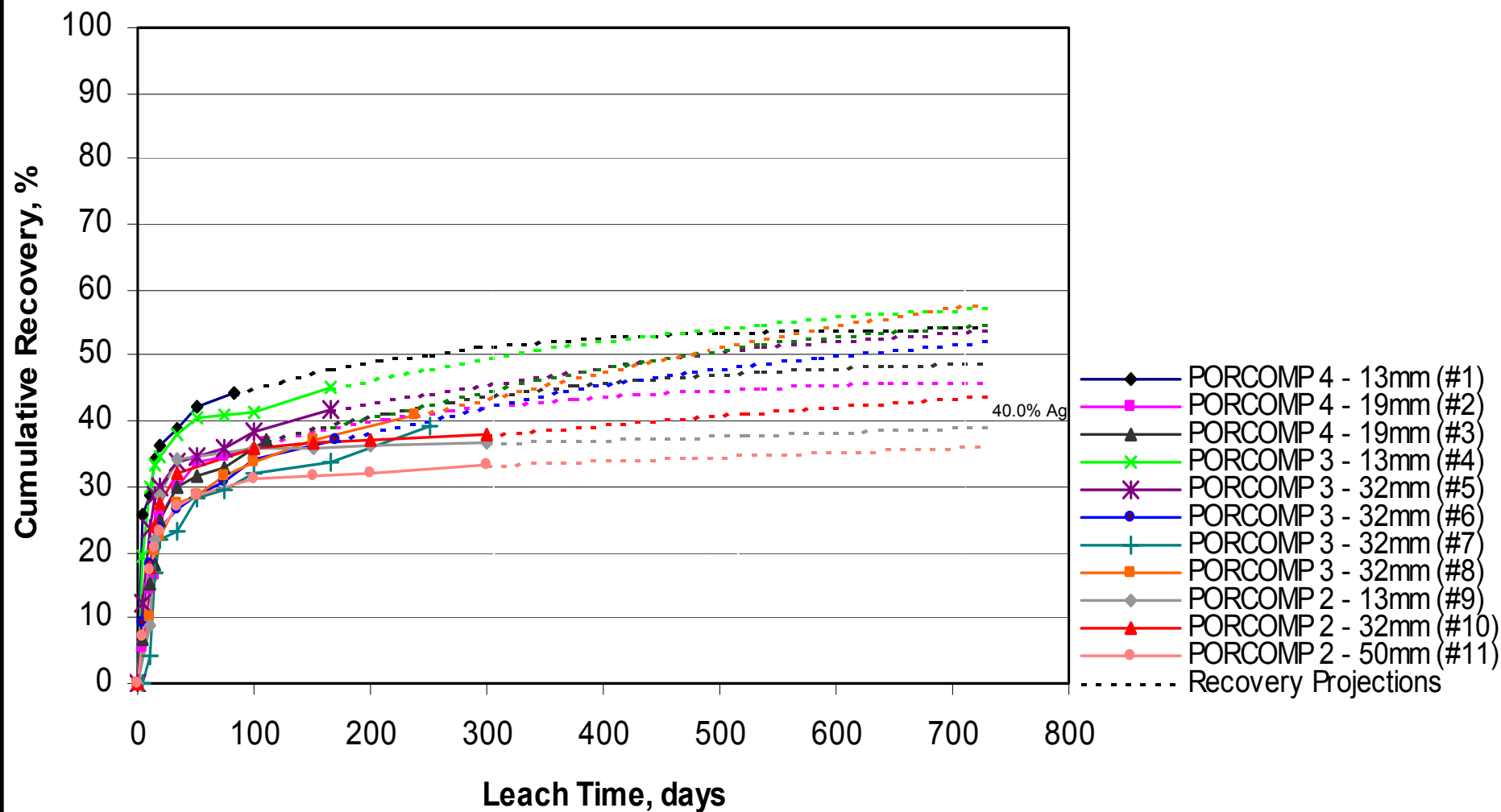
Recovery Curves Extended for Ultimate Time on the Heap

Extended recovery curves were not considered by McClelland Laboratories, Inc. or by Kappes, Cassiday & Associates in the determination of the projected recovery estimate for run-of-mine Porphyry Oxide or Begonia Limestone for this feasibility study. However, the extended curves are useful in demonstrating the potential long-term effect of multi-lift leaching and re-leaching in a full-scale commercial operation. The projection of Porphyry Oxide recoveries for ultimate time on the heap is presented in Figures 1.9 and 1.10, respectively for Au and Ag. The projection of Begonia Limestone recoveries are presented in Figures 1.11 and 1.12. The precious metals leach rate curves for the various column tests are all similar in shape. The difference in Au recovery at any point in time is fairly small between each column leach rate curve. The total difference in Ag recovery at any point between leach rate recovery curves is also small, but slightly greater than for Au.



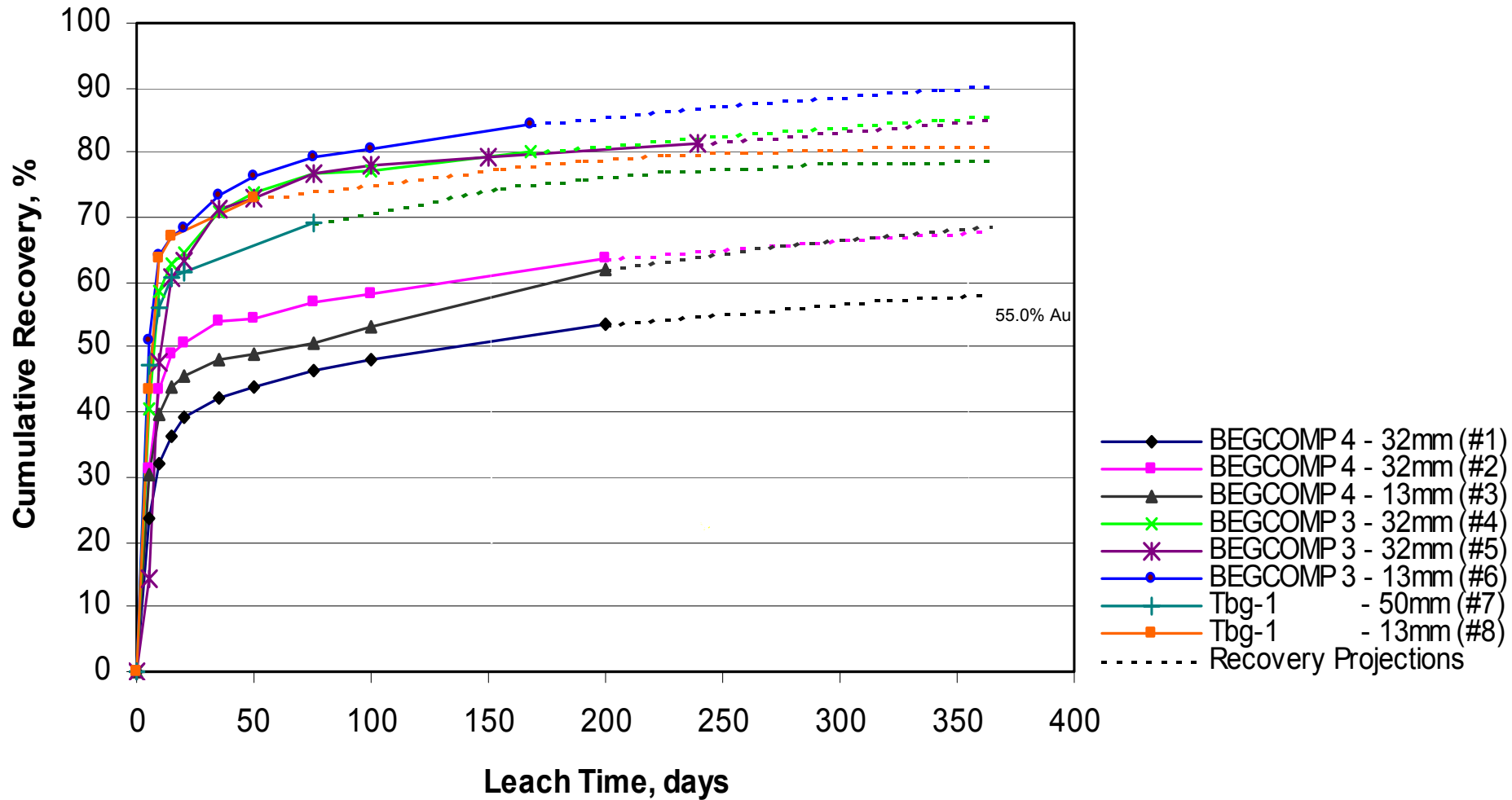
MINERA SAN XAVIER, S.A. de C.V.

Figure 1.9 Column Test Gold Recovery Curves with Ultimate Recovery Projections - Porphyry Oxide



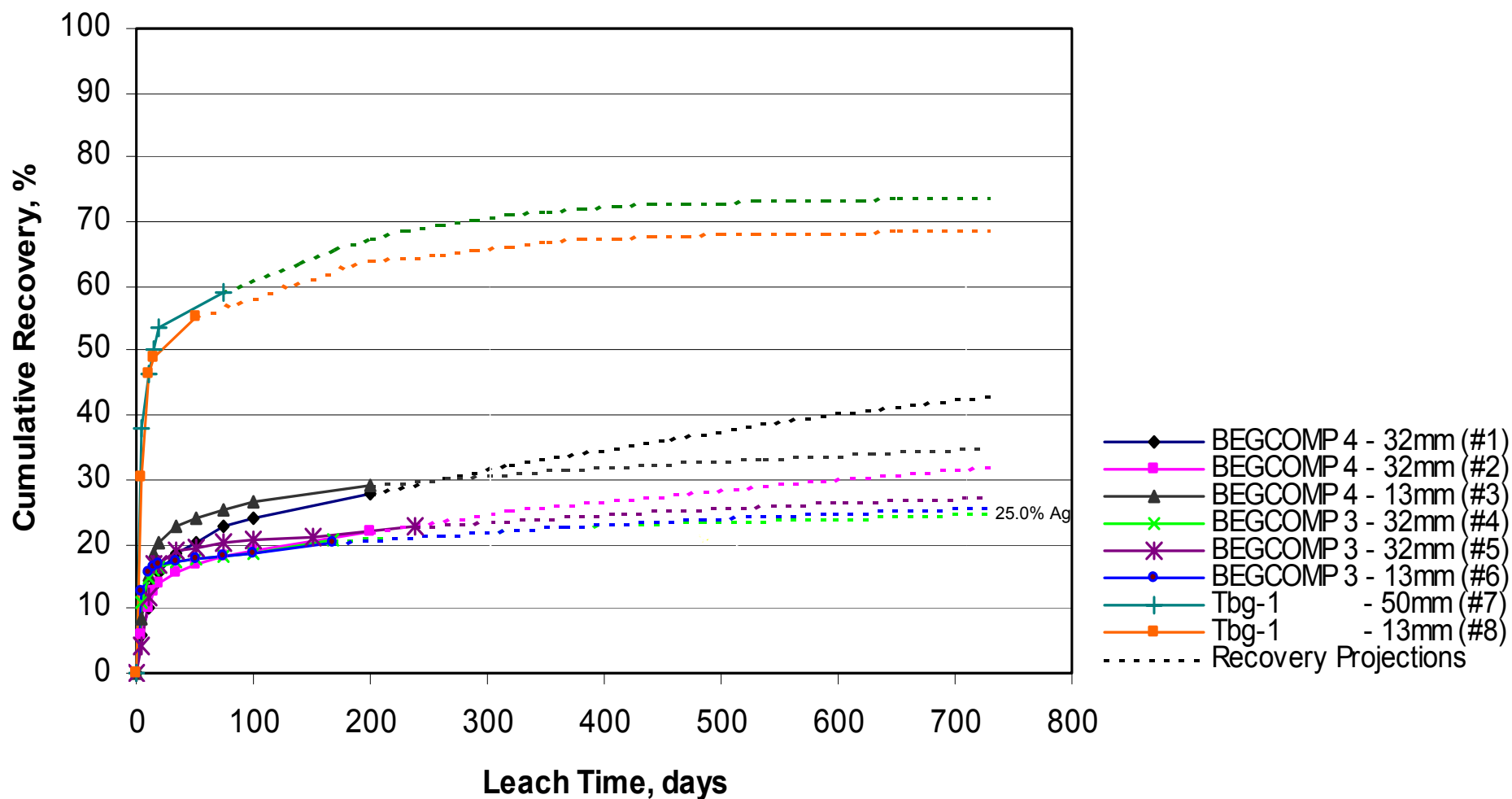
MINERA SAN XAVIER, S.A. de C.V.

Figure 1.10 Column Test Silver Recovery Curves with Ultimate Recovery Projections - Porphyry Oxide



MINERA SAN XAVIER, S.A. de C.V.

Figure 1.11 Column Test Gold Recovery Curves with Ultimate Recovery Projections - Begonia Limestone



MINERA SAN XAVIER, S.A. de C.V.

Figure 1.12 Column Test Silver Recovery Curves with Ultimate Recovery Projections - Begonia Limestone

1.6 Process and Design Engineering

The process flowsheet incorporates a conventional run-of-mine heap leach operation with a Merrill-Crowe zinc precipitation recovery plant. The ore processing rate will peak at 7 to 8 million tonnes per year (25,000 tonnes per day) based on a six-days-per-week operation. A simplified schematic flowsheet is presented as Figure 1.13.

Site Layout Considerations

Process plant facilities have been located based upon topographic constraints of the site. The leach pad is located in a broad, flat valley area along and to the south of the paved road leading to the Cerro de San Pedro Village (elevation: 1,935 m), approximately 2km from the pit exit ramp. The solution recovery plant is situated in close proximity to the leach pad (elevation: 1,930 m). A general layout of the Cerro San Pedro project site is presented on Figure 1.2 on page 4.

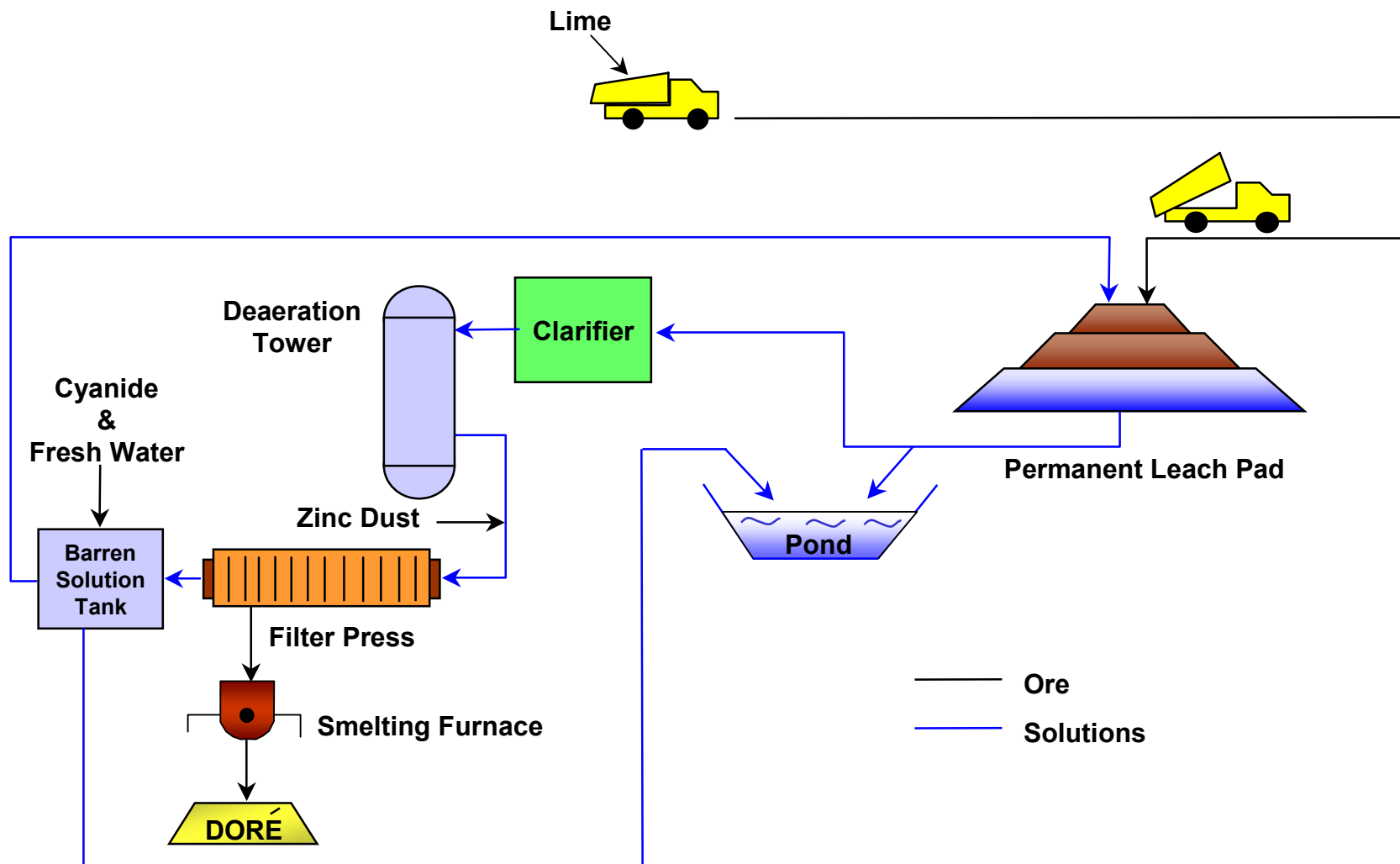
Process Design Criteria

The process plant is designed for a peak rate of 8,000,000 tonnes of ore per year and will treat a total of 49,249,000 tonnes over an eight-year mine life (mining and recovery). Average overall recoveries are expected at 70.5 percent for gold and 35.7 percent for silver, yielding an average annual production of 80,000 ounces of gold and 1.66 million ounces of silver, or approximately 107,000 gold equivalent ounces per year for a total recovery of 856,000 ounces of gold equivalent.

Metallurgical test work indicates that run-of-mine leaching is a viable processing option. The reserves are comprised mostly of Porphyry Oxide, which are particularly amenable to heap leaching without a requirement for crushing.

Run of Mine Haulage and Lime Addition

Run-of-mine ore will be trucked from the mine to the leach pad in 172-tonne haul trucks at a nominal rate of 23,333 tonnes per day. The 2 kilometer long, 29-meter wide haulage road will exit the open pit at elevation 2070 meters and enter the leach pad at elevation 1990 meters. A 300 tonne pebble lime silo with a high-speed discharge batch conveyor will be located at the entrance to the leach pad ramp. Each loaded haul truck will stop at the lime silo, where pebble lime will be added to the load at a rate sufficient to maintain the desired dosage (3kg lime per tonne of ore, or approximately 516 kg per 172-tonne



MINERA SAN XAVIER, S.A. de C.V.

Figure 1.13 Simplified Process Flowsheet

truckload). Ore is stacked by truck dump in 10-12 meter lifts. The ore will be spread by a track-mounted D-10 bulldozer, and ripped to a depth of 3-4 meters before leaching commences.

Heap Leach Pad

The design concept for the leach pad is to build the pad in two phases, with a third phase reserved for future expansion. Leach pad grading has been planned to follow existing topographic contours to minimize the earthworks. The leach pad drains internally to a common discharge point at the southwest corner, where solutions can be diverted into external solution storage ponds for processing. The first two phases will be stacked to 60 meters and will store 50 million tones of ore. The third phase, if constructed, will require blasting and removal of a rock knoll to create a maximum slope of 2:1 horizontal:vertical. The third phase will increase the storage capacity to 75 million tonnes by expanding the leach pad footprint and raising the heap height. Construction of the third phase will not be required unless the current mineable reserves are increased.

The preliminary design report by AGRA (Recently acquired by AMEC) is attached as Appendix 6.1 to this feasibility report.

The leach pad liner system will be a conventional composite liner, consisting of a 60 mil high density polyethylene (HDPE) primary liner underlain by a 0.3 meter compacted fine-grained low permeability soil (clay) liner in intimate contact with the HDPE. To protect against impact from truck dumping activities and to enhance solution percolation and drainage, the top surface of the leach pad liner will be overlain by a 0.5 meter bedding layer consisting of minus 19 mm crushed ore or rock. A network of perforated HDPE under-drain pipes will be placed on top of the HDPE liner to facilitate solution percolation and drainage. Solution will be collected and transported to an external solution pond system via a lined open channel.

Leach Solution Recovery and Distribution

Solution from leach pad will flow in an open ditch to the pregnant solution pond or the storm water pond. The bottom 3 meters of the storm water pond will be double lined to allow dual use of the storm water pond as working storage volume for re-circulation and enrichment of low-grade pregnant solutions discharging from the heap by diverting these solutions back into the barren solution tank. Bypassing the Merrill-Crowe plant and re-circulation of low-grade pregnant solutions in this manner is not expected to be a necessary part of the routine operating procedure, but may be desirable during periods of high solution flows or upset pond conditions.

Solution is pumped from the pregnant solution pond to the clarifier filters at the Merrill Crowe plant. Barren solution is pumped from the barren solution tank through solution distribution piping and irrigation type drip emitters for application onto the surface of the ore. Solution application under primary leach will average 90 days and will produce nearly 90 percent of the expected gold and silver recovery, with the balance being produced during subsequent re-leach as a result of the multiple lift operations.

Merrill-Crowe Recovery Plant

The precious metals are recovered from the pregnant heap leach solution in a typical Merrill-Crowe zinc precipitation plant. Pregnant solution is pumped from the pregnant solution to the clarification filters and the clarified solution is transferred to a de-aeration tower for removal of oxygen from the solution. Zinc dust is added to the solution to precipitate the precious metals. The solution containing the precipitated precious metals is filtered to recover the precious metals.

Refining

The precipitate is manually removed from the filter press and placed into a mercury retort furnace for mercury removal. From the retort, the precipitate is loaded into a gas-melting furnace and the molten metal is then poured into 31kg molds. Dore bullion is cleaned, weighed, sampled, and stored in a vault awaiting shipment. Once gold and silver are removed from the solution, the barren solution from the precipitate filters flows to the 2000 m³ barren solution tank.

The refinery area is a high security, limited-access area. A closed circuit television system with redundant video recording monitors the whole refinery area including the entrances (inside and outside). All refinery access doors are linked to an alarm system, which records every access door movement. Movement detectors are also linked to the alarm system.

Process Plant Services

The process building houses the overall plant facilities such as the Merrill-Crowe recovery plant, the refinery, and the reagent storage area. The refinery is enclosed in a secured building. Other facilities are under an open-sided roof, or are left uncovered. The metallurgical and assay laboratory is located adjacent to the process building.

The assay lab is sized to perform sample preparation and fire assay gold analyses on a nominal 200 samples in a 24 to 36-hour turnaround time.

Process Personnel

Process personnel are under the overall direction of an expatriate process manager. Staffing levels for process are fairly stable from year to year, starting at 17 during pre-production and 39 from Year 1 through Year 8. Activity after Year 8 will no longer involve placement of new ore on the heap, but only recovery of metals from heap solutions and operation of the Merrill-Crowe plant.

Process Operating Cost

Process operating cost estimates are based on information from test work, evaluations from consultants, and data from existing operations. Electrical costs are based on recent quotes from the National Electric Commission (CFE) for the San Luis Potosi area and electrical load studies developed by Summit Valley Equipment and Engineering. Reagent consumption for each ore type is based on extensive metallurgical test work as described in Section 5.0. Costs for the major reagents (sodium cyanide and lime) are based on written quotations for delivered costs from several different suppliers. Other reagent costs are based on data from existing operations and data from SVEE, the Merrill-Crowe plant consultant.

Water costs are based upon a regulated unit cost and a usage rate based upon a total evaporation and soak rate of 12% by weight of ore process tonnage. Operating and maintenance supplies are based upon information from consultants and upon historical data from existing operations.

Process operating costs are summarized in Table 1.17, which shows the average processing cost per tonne by major category. Most of the process operating costs at Cerro San Pedro will vary directly with process tonnage. Tonnage dependent reagents, supplies, and utilities account for about 90% of the total estimated process operating cost at Cerro San Pedro. Labor costs are less variable than the other process cost components and are not expected to rise or fall dramatically during the life of the mine except for start up and closure.

Costs for outside refinery services and security have not been included in the calculation for overall processing costs. These costs are reflected in General and Administration costs for Cerro San Pedro. Heap leach haulage, spreading, and ripping costs are included in the cost estimate for mine operations.

Table 1.17

Process Cost Summary		
Category	Cost/tonne	% of Total
Process Labor Costs	\$ 0.1186	12%
Process Reagents	\$ 0.6876	68%
Process Op. & Maint. Supplies	\$ 0.0712	7%
Process Utilities-Power	\$ 0.0904	9%
Process Utilities-Water	\$ 0.0465	4%
Total Process Cost/Ore Tonne	\$ 1.0143	100%

Reagents account for nearly two thirds of the estimated process operating costs at Cerro San Pedro. Table 1.18 shows the estimated cost and consumption rate for these reagents. Table 1.19 shows the expected annual cost for the reagents based upon scheduled processing rates and the average unit cost per tonne of ore processed. Predicted reagent consumption is based upon metallurgical test work and historical operating data from other large Merrill-Crowe heap leach operations.

Table 1.18

Reagent Consumption				
Process Reagent	Consumption	Consumption Units	Reagent Unit Cost	
Cyanide	0.3	kg/tonne ore	\$ 1.321	kg
Lime	3	kg/tonne ore	\$ 0.075	kg
Zinc	2	Gram Zn/gram precious metals	\$ 1.872	kg
Refinery fluxes	2	Gram flux/gram precious metals	\$ 0.440	kg
Lead Nitrate	0.03	gram/gram zinc	\$ 1.000	kg
Antiscalant	5	gram/tonne ore	\$ 3.787	kg
Caustic Soda	3	gram/tonne ore	\$ 0.700	kg
Diatomaceous Earth	0.034	kg/tonne ore	\$ 0.454	kg

Table 1.19

Annual Reagent Cost									
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	TOTAL
Cyanide	\$ 2,316,724	\$ 2,106,653	\$ 2,637,776	\$ 3,071,394	\$ 2,988,554	\$ 2,945,748	\$ 3,028,587	\$ 423,709	19,519,145
Lime	\$ 1,315,125	\$ 1,195,875	\$ 1,497,375	\$ 1,743,525	\$ 1,696,500	\$ 1,672,200	\$ 1,719,225	\$ 240,525	11,080,350
Zinc	\$ 114,987	\$ 228,961	\$ 272,078	\$ 241,602	\$ 206,828	\$ 243,889	\$ 175,195	\$ 75,488	1,559,028
Ref. fluxes	\$ 25,383	\$ 51,754	\$ 61,906	\$ 53,906	\$ 46,381	\$ 54,756	\$ 38,497	\$ 17,287	349,870
Lead Nitrate	\$ 1,843	\$ 1,843	\$ 1,843	\$ 1,843	\$ 1,843	\$ 1,843	\$ 1,843	\$ 1,843	14,744
Antiscalant	\$ 110,688	\$ 100,651	\$ 126,027	\$ 146,744	\$ 142,786	\$ 140,741	\$ 144,699	\$ 20,244	932,580
Caustic Soda	\$ 12,275	\$ 11,162	\$ 13,976	\$ 16,273	\$ 15,834	\$ 15,607	\$ 16,046	\$ 2,245	103,418
Diat. Earth	\$ 35,730	\$ 32,491	\$ 40,682	\$ 47,370	\$ 46,092	\$ 45,432	\$ 46,709	\$ 6,535	301,041
TOTAL	\$ 3,932,755	\$ 3,729,390	\$ 4,651,663	\$ 5,322,657	\$ 5,144,819	\$ 5,120,216	\$ 5,170,802	\$ 787,876	\$33,860,176
AVERAGE \$/TONNE									<u>\$0.6876</u>

Process Capital Cost

The dominant capital costs for the process facilities at Cerro San Pedro will be associated with the construction of the leach pad, ponds, Merrill-Crowe plant, refinery, lime silo, and solution pumping

facilities. Agra and SVEE have produced engineered “turn-key” construction estimates for the leach pad and plant processing facilities. Capital costs for other ancillary facilities (lime silo, security equipment, etc.) have been estimated based upon known costs at other facilities.

Mobile equipment associated with the process plant will include pickup trucks, a forklift, and a backhoe. A bulldozer will be required to spread, level, and rip ore on the leach pad. Much of the process plant mobile equipment will be pooled with mine operations equipment for dual use. All of the capital for the mobile equipment for the processing area is included in mine capital.

Table 1.20 depicts the initial process plant capital projected for Cerro San Pedro by category.

Table 1.20

Initial Process Capital	
Leach Pad & Solution Ponds	\$ 4,462,340
Merrill-Crowe Plant	\$ 1,784,906
Refinery	\$ 427,188
Solution Pumping/Distribution	\$ 900,272
Construction Mgmt, QA/QC	\$ 497,895
Engineering	\$ 334,037
Laboratory	\$ 394,200
Lime Silo	\$ 310,000
TOTAL	\$ 9,110,838

Phase II of the heap leach pad will be constructed in operating Year 3, requiring an additional \$3.5 million.

1.7 Infrastructures

Because the project site is in close proximity to the city of SLP, many of SLP’s support facilities will be used. Infrastructure required for project development includes all road work; raw water storage and distribution; relocation and development of community infrastructure; and stabilization of the San Pedro Apostol church.

Roads

Improvements will be completed by the end of 2000 to 8.5 kilometers of the existing 10.2 km off-site access road from the SLP Periferico road to the main entrance to the project site, including re-grading, widening to 10m, installing of additional drainage ditches, re-sloping, and improving a bridge crossing.

A 500-meter road from the public road to Cerro San Pedro to the project gatehouse will be constructed to provide access to the plant site. In addition, a 1.6 kilometer mine access road will be constructed 25 meters wide to accommodate the large mine equipment from truck shop area, to the run-of-mine haul road on the north corner of the leach pad.

Water Supply

Based on detailed water balance calculations, the project is estimated to require a peak of 47.4 l/s of raw water for processing and dust control. Average requirements are 31.7 l/s or a total of 986,000 m³/yr. MSX has developed a water production well near La Zapatilla, some 1.8km southwest of the process building, which is capable of producing 60 l/s of water. Water will be pumped to a tank above the process plant and will be distributed by gravity to the process plant and other facilities.

Other Project Facilities

A main office building will be located at the entrance of the plant site just north of the truck shop and warehouse building and adjacent to the gatehouse. The gatehouse will be equipped with a motorized access control gate and will provide 24 hour per day, seven day per week access control to the mine site. A parking area in front of the main office building will be provided for visitors.

A training building will be located just east of the main office. The building will serve as a general training and meeting facility, and also provide a staging room for the mine shift crews. The locations of the main office and training facilities have been designed to provide close access to the truck shop, warehouse, process plant, and assay lab.

Community Infrastructure

Up to ten houses will be constructed in Cerro de San Pedro to accommodate families who will be displaced from the security (safety buffer) zone. MSX will provide potable water, sewage disposal facilities, electrical power, and construct access roads and sidewalks to these new houses. The San

Pedro Apostol church will also be stabilized as a part of MSX's commitment to protect historic monuments and structures.

The entire La Zapatilla village is located in the area of the proposed leach pad. MSX will relocate 20 families to homes in the newly constructed village of Nueva La Zapatilla, 0.5km south-southwest of the process building. MSX will also construct other community infrastructures, including a school and a church. Municipal works will also include access roads, an electrical transmission line, potable water system, sewage disposal facilities, and a rainwater collection pond.

A contract was awarded to a local SLP contractor in August 2000 for the construction of the 20 new houses, a school, a church, a public plaza, and all municipal works. The project will be completed in January 2001 and is not considered as part of project capital in this study.

Capital Costs

A summary of the estimated initial capital costs for the infrastructures is presented in Table 1.21. The capital cost total of \$2.2 million includes \$0.6 million for the water supply and distribution utilizing the La Zapatilla well, and \$0.4 million for new housing at Cerro de San Pedro. An allocation of \$0.2 million has been provided to fund investigations of the structural integrity of the San Pedro Apostol Church and to perform repairs and stabilization prior to regular mine operations.

Table 1.21

Infrastructure Capital Cost Estimate	
Area	Cost
Roads	\$175,000
Office, Training Building, and Furniture	\$370,000
Site Preparation	\$475,000
Water Supply	\$645,000
Cerro de San Pedro Housing	\$350,000
Church Stabilization	\$200,000
Total	\$2,215,000

1.8 Electrical and Communications

The capital and operating costs for the two areas of infrastructure, electrical power, and communications are minimized because of the proximity of the project to the city of San Luis Potosi. The proximity also facilitates the rapid construction of these two important areas.

Electrical

MSX has negotiated an agreement for the electrical requirements of the Cerro San Pedro project with the governmental agency CFE, the sole electricity provider in Mexico. MSX will pay for one-sixth of the overall cost for the required modifications at the CFE Substation SLP II located near the city of SLP. MSX will construct an 11.3km transmission line (shown in Figure 1.17) from this substation to the mine site. CFE will provide engineering and quality control for construction and subsequently will become owner of the transmission line when completed. The total mine power demand is estimated at 2.5 megawatts (MW) and average price for energy delivered to the site is \$0.06 per kilowatt-hour (kWh). At the mine site MSX-constructed Main Substation, the electrical power at 115 kV from the SLP II Substation will be stepped down to an intermediate voltage of 13.8 kV for electrical distribution throughout the mine site via a distribution network.

The 13.8kV network supplies power to the process plant via secondary substations with a step down transformer 13.8 kV/480/277 V, 3 phases, 2,500 KVA. A 250kW diesel-driven standby generator will provide backup during power outages for the pregnant and barren solution pumps. The network also supplies power to the truck shop, administration office, and other facilities.

Communications

Communication requirements between the mine site and the city of San Luis Potosí are fulfilled by a microwave link that can transmit voice, fax, and data as described below:

- Local telephone services (10 circuits, voice and fax) between the main switchboard located in the administrative offices and the city of San Luis Potosí with the possibility of making long distance calls in Mexico;
- Electronic file exchange, Internet access, and email, via a reserved 128 kilobits per second (kbs) bandwidth channel.

TELMEX, the local telephone company, will supply, install, and commission the microwave equipment and MSX will provide the on-site telecommunication room, tower, and electrical power.

A standard twisted pair copper wire network will interconnect the process building and the truck shop to provide network and telephone connectivity. Due to the distance between the main process building and the lab, a short fiber optic connection will be implemented for network connectivity between the two buildings. All closed-circuit cameras will be interconnected via coaxial cable to central monitoring stations. The network outlined above will provide:

- Computer network, for data, E-mail, and Internet access to the administrative offices located in the process building, the truck shop, and the lab, and;
- Local telephone services, voice, and fax (up to 64 extensions grouped into 10 circuits) between the main switchboard located in the process building and truck shop, lab, and guard stations;
- Closed-circuit television coverage for the refining areas, and the guard station.

Capital Costs

A summary, by area of the estimated initial capital costs for the electrical and communication systems, is presented in Table 1.22.

Table 1.22

Electrical & Communications Capital Cost Estimate	
Area	Cost
115 kV Transmission Line	\$1,354,510
Main Substation 115 kV / 13.8 kV	\$566,425
13.8 kV Distribution Lines	\$250,000
Communications	\$35,745
Total	\$2,206,680

1.9 General Administration and Services

General Services and Administration (G&A) will provide upper-level management to the overall operation and handle administrative functions not directly related to specific operating areas. These functions include the following:

General Management, Accounting, and Services

General and senior management for the operations are part of the G&A budget. The finance and accounting area includes general accounting, payroll and tax administration, lease and acquisition administration, direction for procurement and logistics, purchasing and materials management, and systems and communications. Other general services include on and off-site bus transportation for employees and trash removal.

Human Resources

Recruitment and training of personnel, employee relations, benefits, and office administration will be an important G&A function. Included in this area is a contracted security force to protect assets and personnel and a transportation company with its own security to regularly pick up gold and silver dore. Medical services for employees and local area residents, provided by two contracted personnel, will be under supervision of G&A. Mechanical, electrical, and water maintenance and janitorial services for all non-operations areas will also be provided.

Environmental

Environmental management will include monitoring for compliance at all facilities, including water and air sampling and maintenance of an on-site nursery.

Public Relations

Government and local, state, regional and national public relations will be the responsibility of G&A staff. The management of the non-profit Cerro de San Pedro Foundation, established to provide assistance to the community, will also be administered by G&A staff.

Corporate Support

Contract and in-house legal, headquarters accounting support, reserve audits, etc., will be provided through corporate support.

G&A Personnel

G&A personnel remains constant in Years PP through 8 at 18, dropping to 4 in Years 9 through 12. All G&A positions are salaried. Additional personnel required for contracted services occur as a service cost, rather than labor.

G&A Operating Costs

Table 1.23 provides a summary of G&A operating costs. There are no capital costs associated with G&A.

Table 1.23

G&A Operating Costs by Area (\$000)							
Year	General Services	Human Resources	Environmental	Public Relations	Corporate Support	G&A Manpower	Total
PP	682	73	110	56	100	558	1,579
1	670	73	110	56	100	558	1,567
2	670	73	75	56	100	558	1,532
3	670	71	75	56	100	558	1,530
4	670	70	75	56	100	558	1,529
5	670	69	75	56	100	558	1,528
6	670	68	75	56	80	558	1,507
7	668	67	75	56	55	558	1,479
8	668	62	75	56	55	558	1,474
9	302	49	75	53	25	89	593
Total	6,340	675	820	557	971	5111	14,318

1.10 Environmental and Socioeconomics

Baseline environmental investigations and evaluation of impacts were conducted during the period 1996-1997. The Manifestacion de Impacto Ambiental (MIA - Environmental Impact Statement) was submitted by MSX in October 1997 to the Secretaria de Medio Ambiente Recursos Naturales y Pesca (SEMARNAP – Secretariat of the Environment, Natural Resources, and Fisheries). Subsequently, an MIA resolution was issued in February 1999 by the Instituto Nacional de Ecologia (INE – National Institute of Ecology) which set forth conditions for environmental protection and approval of the MIA. Development of a series of responses and environmental-related plans, as required by MIA resolution, are underway and will continue through the operational and closure phases of the project. In addition, all other necessary permits to begin construction and operations have been granted by the corresponding state and municipal authorities.

MSX has also developed baseline socioeconomic information and established plans to mitigate effects and enhance the socioeconomic status of inhabitants in the communities.

Environmental Baseline

Water Quality

Because there are no perennial streams and groundwater is limited or deep within and adjacent to the project area, there is little risk of impacting any surface or groundwater. With the arid climate and low precipitation in the region, there is low potential for production of large volumes of seepage from within the spent leach pad, mine open pit, or the waste rock facility.

Potable water in the SLP valley is contained in either permeable alluvium, conglomeratic to sandy rhyolite tuff, or fractured latite. Water quality testing in several wells within these aquifers show that metals and most other constituents are well below the maximum allowable limits. Limited deep groundwater is located in fractured limestone, porphyry, and latite beneath the project site, including the La Zapatilla heap leach area. No hydrogeological connection is believed to exist between the limited deep groundwater located near the project site and the down-gradient potable, uncontaminated SLP groundwater aquifers.

Water Supply

MSX will obtain its water supply from a well it recently drilled within the eastern limit of the potable SLP aquifers approximately 1.8km southwest of the process plant/western edge of the leach pad. Drawdown modeling of the effects of average pumping from this location for required Cerro San Pedro project water required shows that the surrounding potable aquifers will not be impacted.

Rock Geochemistry

A number of routine static-type acid-base accounting tests were conducted to determine if rock types present at Cerro San Pedro had the potential for acid generation. As expected, limestone rocks (the major waste rock type) have substantially high neutralization potential, while porphyry rock types (the major rock type) have the potential to produce acid depending on the amount of contained sulfide-bearing minerals. Further kinetic (humidity cell) testing was performed on the three porphyry rock types. This test work indicates that Porphyry Oxide (the majority of porphyry rock type mined as ore and waste) generates weakly acidic to slightly alkaline leachate with limited release of metals. Porphyry Mixed and Sulfide types, however, produce moderate to high acidic leachate with relatively high release rates of contained metals.

Biological

Three main vegetation types exist in the project area, all typical of plant communities established in an arid climate, hilly terrain and soil derived from limestone bedrock. These plant communities are characterized by Yucca species and some large and small cactus in the north half of the project area and with more abundant large and very thorny cactus species in the south and west portions of the project area. Over 100 vegetation species were identified in the project area. Three of these species found throughout the project area (all cactus) are considered endangered, rare, and subject to special protection.

Wildlife is limited by the natural characteristics of the project area, primarily the arid climate and low vegetation production. Several bird species typical of desert areas are present. and the State of SLP also falls within an important migration route for waterfowl (particularly ducks). Five species within the project area are considered endangered and/or protected and include the sparrow hawk, rattlesnake, whipping snake, desert turtle, and viper snake.

Archaeological / Historical

Historical buildings and monuments, including two churches, are common in the village of Cerro de San Pedro, and authorities have established a protection zone to ensure that these are preserved. The church closest to the proposed pit, the San Pedro Apostol church, has already suffered structural damage due to uneven settling of its foundation and poor maintenance over the years. A series of studies and tests have taken place in the past year, led by state authorities and supported/assisted by MSX, to determine means to stabilize and rehabilitate the church.

Environmental Permitting

The MIA was based on development of the Cerro San Pedro project, with an impacted area of 373.4 hectare (ha). The results of this Feasibility Study call for a somewhat smaller pit and waste dump and a modified leach pad and solution pond configuration than that proposed under the MIA. These modifications and others are in the process of being documented and will be forwarded to SEMARNAP. Table 1.24 compares the size of the areas to be impacted.

In addition to identifying baseline conditions, the MIA and MSX have also identified areas of potential environmental impacts and related mitigation strategies. The MIA Resolution documents these areas of impacts and presents a schedule for submission of plans and studies for their mitigation in order to obtain final MIA authorization. The following section summarizes the overall environmental management

plan that addresses prevention and protective measures to be taken during construction and operations included in these submittals.

Table 1.24

Comparison of Impacted Area in MIA versus Feasibility Study				
	Approved in MIA		Feasibility Study	
Site Facility	Has	Description	Has	Description
Open Pit Mine Area	67.58	194 M tonnes	47.34	163 M tonnes
Waste Rock Dumps	178.00	East Only, 117 M tonnes	123.70	East and West 99.6 M tonnes
Roads – Pit to Waste Dumps			2.08	
Areas of Backfill, Crusher Areas, Roads, Conveyors, etc.	15.65	Different layout than Feasibility	30.18	Includes all Crushing Plants
Leach Pad, Ponds, Process Plant, Soil Stockpile	103.01	External Ponds	152.70	New Pad Design, Internal Ponds
Nueva La Zapatilla	9.15	Includes Access Roads	15.66	
Total	373.39		371.66	

Environmental Management

Vegetation and Wildlife

To ensure protection of the biological resources of the area, particularly the three protected cactus species, MSX will rescue and protect these species (and others that will improve subsequent reclamation success) prior to operations. At the end of operations, these species will be re-established at properly prepared sites as summarized in Section 1.11. Wildlife species, particularly birds, will be protected from any hazardous ponds by using floating balls or nets to exclude birds. MSX will also establish sources of fresh water for wildlife.

Materials Management and Safety

All materials will be managed utilizing plans to prevent accidents and spills and to protect the safety of workers and the public. A plan for proper explosive handling and measures to ensure the safety of workers and any inhabitants or visitors in the safety buffer zone will be crucial. Blasting will occur at the end of each shift or at other times as coordinated with local authority assistance, to minimize disruption

and impact to the village of Cerro de San Pedro. Contingency plans will also be developed to address any emergency situations.

Waste Management

A plan to encapsulate potentially acid generating (PAG) waste rock will be incorporated into a waste rock management plan. MSX will conservatively classify Porphyry Oxide waste rock as PAG along with Porphyry Mixed and Sulfide to ensure there is no miss-classification of PAG during operations. Based on the mine schedule, the dump material will be comprised of a limestone (neutralizing/acid consuming) to porphyry (acid generating) waste rock ratio of 14:1. The dump is also constructed on limestone bedrock. Of the significantly lower proportion of PAG material in the dump, nearly 60 percent is Porphyry Oxide which will contribute very little to acidity. Because of the very high proportion of limestone, the selective handling, placement, and isolation of PAG material within the dump will prevent oxidation of sulfides and generation of acid rock drainage. Water balance modeling indicates that little or no effluent is expected to emanate from the waste rock dump.

Because groundwater is significantly below the mine pit, the only contribution to water in the pit will be from precipitation and run-off from surrounding areas. Based on the current design, the maximum accumulation of pit water is estimated at a depth of 5m following a large storm event. A total of 50 percent of pit exposures (primarily in pit walls) is comprised of limestone with high neutralization potential. Of the remaining 50 percent (primarily the pit floor), over half is Porphyry Oxide and the remainder is Porphyry Mixed and Sulfide. The overall arid conditions and deep groundwater at Cerro San Pedro should contribute to a low potential for development of an extensive acid lake in the open pit.

Studies will be conducted during operations to determine if spent ore on the leach pad will have the potential to generate acid leachate upon closure. The control of heap solutions and leachate is discussed under water management.

Hazardous wastes, such as lead-acid batteries, solvents, spent laboratory chemicals, etc. will be collected and properly disposed in an approved off-site facility. Non-hazardous (solid) wastes such as domestic garbage, sewage, construction debris, and plastic will be managed using waste minimization, on- and off-site recycling, or burial in an off-site disposal facility. Other industrial wastes such as scrap steel, used rubber, or empty plastic drums may be made available for resale, or returned to the supplier.

Water Management

The potential impacts to water at the site will be managed during operations and post-closure in several manners. Potable water will be conserved, particularly with regard to the closure strategy of detoxifying/depleting heap solutions by recirculation/evaporation of solutions versus rinsing with fresh

water. Collection of natural run-off into operational facilities (the pit, dump, and leach pad) will be limited by diversion structures, thereby decreasing the potential to generate leachate and/or acid rock drainage. During operations and post-closure, cyanide heap solutions and/or any potential residual leachate will be isolated from the underlying bedrock by a geo-synthetic liner system. Other operational controls include systems to monitor any potential solution leakage from the pad.

Air Quality and Noise Management

An air quality management plan will include measures to minimize air emissions from major sources (fugitive dust from haul trucks and air-borne metals from the Merrill-Crowe recovery plant). The effects of noise generated by blasting will be minimized through appropriate scheduling. Employees will be required to wear hearing protection in areas where noise exceeds safe levels. Monitoring of all blasts will be performed at the San Pedro Apostol church to ensure that vibration and air blast levels stay within the allowable standards.

Monitoring

Monitoring activities will be performed according to internationally accepted standards and the requirements of SEMARNAP. Identifying changes that could take place in the environment due to project development; evaluating effectiveness of preventive and control measures; and ensuring compliance with environmental regulations will be the main objectives of the monitoring program.

Socioeconomic Programs

The development of the Cerro San Pedro Project will require the relocation of the 21 families that live in the village of La Zapatilla to make room for the leach pad. In addition, the open pit mining operations will take place adjacent to the village of Cerro San Pedro where 24 families live as permanent residents. Of these families, 20 in La Zapatilla village will be relocated to a new village built by MSX approximately 2 km southwest of the present La Zapatilla village, and an undetermined number may choose to be relocated to new housing built by MSX within the village of Cerro de San Pedro. Other families have been compensated to relocate to other sites of their choice. Housing, other community infrastructure, and municipal services will be provided at or above the current standard of living conditions. As part of the community infrastructure that MSX will provide, a school will be constructed that can accommodate up to 40 children at the new La Zapatilla village. Currently, school children from La Zapatilla attend school in Portezuelo, 6km away.

The Cerro San Pedro project will create approximately 178 jobs during normal operations, with up to 420 jobs during construction. MSX has established policy to give preferential hiring consideration to people from communities nearby the project, providing direct improvement of economic status to many families. MSX has also committed to assist in the sustainable economic and social development of the area surrounding the project, including the villages of Cerro de San Pedro, Cuesta de Campa, Monte Caldera, and La Zapatilla. An urbanization plan for this area has been developed that considers the baseline socioeconomic and the future benefits that the project will generate. A non-profit foundation has been established by MSX to administer funding that MSX will provide for the preservation of the village of Cerro de San Pedro and donate assistance for the community. The foundation will be structured to require community participation and be self-sustaining for the long term. Programs the foundation will support include preservation of the two historical churches in Cerro de San Pedro, promotion of tourism by establishing cultural programs, and development of conservation programs such as the botanical gardens and self-sustaining cottage industries that will be compatible with tourism in the area.

1.11 Reclamation and Closure

The closure strategy for the Cerro San Pedro project has been developed with the specific objective of leaving the land in a useful, safe and stable configuration capable of supporting native plant communities, wildlife habitat, watershed functions, and limited livestock grazing. A closure strategy summary is presented in Figure 1.14.

Heap Leach Facility

The heap leach facility closure objective is the chemical and physical stabilization of the spent ore pile. Anticipated closure activities for the heap include detoxification and depletion of the heap effluent through volatilization/evaporation during recirculation of solution, growth medium placement of approximately 20 cm of soil on the top and side slopes of the heap, revegetation by transplanting seedlings and cuttings of native species, and monitoring to evaluate success. A finite quantity of residual effluent may require disposal, but passive disposal techniques (such as a Biopass system) are anticipated. Recontouring of the heap side slopes may be necessary to ensure long-term stability of applied cover soil which would also require installation of additional geosynthetic liner around the leach pad to accommodate regrading. Historic mine waste dumps (tailings) will have been removed during operations and disposed of within the heap.

<u>PIT</u>	<u>HEAP LEACH PAD</u>	<u>WASTE ROCK DUMP</u>	<u>ANCILLARY MINE FACILITIES</u>	<u>REVEGETATION</u>
• Storm water run-on diversion. – Along pit perimeter. – Potential additional in-pit diversion. • Passive chemical treatment. – Off pit water using on-site limestone backfill. • Pit slope stabilization. – Operational/final geotechnical assessment to maximize long-term stability. • Limited revegetation around crest.	• Storm water run-on diversion. • Evaporation of solution. – Using spray emitters. • Natural attenuation. – Of cyanide during evaporation/volatilization/re-carbonation. • Depletion of entire heap solution inventory within 4 years. • Incorporate kinetic testing results of spent ore after year 2 operations to determine any need for ARD management. • Passive treatment using BioPass system if needed to meet water discharge limits for land application. • Subsurface land application of any potential long-term residual seepage. • Limited surface recontouring to maximize run-off, minimize erosion, and encourage revegetation. • Infiltration barrier placement of 20 cm of cover soil. • Revegetation with rescued/protected species and other selected species.	• Storm water run-on diversion. – Upgradient of dump. • Placement of historic mining waste, spent ore and tailings in dump and/or leach pad. • Selective handling of PAG materials (only 7% of waste rock). – During operations to encapsulate completely in alkaline-generating limestone waste. • Control of erosion on dump surface with construction of moisture collection basins and limited recontouring of surface drainages/slopes. • Refinement of modelling upon closure which currently shows little or no leachate development. • Inherent passive chemical treatment and mixing of any PAG leachate with limestone leachate at 1:14 rock mass ratios (i.e., overall 1:175 acid/neutral ratios). • Revegetation with rescued/protected species and other selected species at micro-sites.	• Removal/salvage of processing facilities and/or on-site burial of non-hazardous, non-salvageable components. • Return administrative/process/shop/warehouse buildings to beneficial economic use of community where desirable or remove/salvage. • Revegetation of the footprint of all affected areas with rescued/protected species and other select species.	• Incorporate results of soil building and revegetation studies conducted during operations to maximize reclamation success at all facility areas. <u>POST-CLOSURE MONITORING AND MAINTENANCE</u> • Soil erosion inspection. • Monitoring. – Revegetation performance. – Presence/absence of seepage from heap pad and waste rock dump. • Monitoring/maintenance of post-closure seepage management systems for heap pad, if necessary. • Reporting information to regulators.

Figure 1.14 Closure Strategy - For Various Site Facilities

Mine Waste/Waste Rock Dumps

The waste rock disposal site closure objective is primarily the physical stabilization of the facility. Reclamation activities at the waste rock dump are expected to be limited to selective topsoil placement, revegetation and monitoring reclamation success. A limited quantity of growth medium application is anticipated because of the limited quantity of growth medium available from the facility footprint. Revegetation efforts will focus on growth medium placement in microsites, and primarily consist of transplanting mature plants in the manner described for the heap area. Revegetation of the dump side slopes will rely on volunteer invasion by native plants over a long time period. Potentially acid-generating (PAG) waste rock will be isolated within the crest confines of the dump in accordance with the waste rock management plan, within areas where vegetation may be established to inhibit deep infiltration. Existing historic waste rock within and adjacent to San Pedro Creek will have been removed during operations and placed within the waste rock dump.

Mine Pit

The mine pit closure objective is primarily one of securing the site. Key activities involve installing a barbed wire fence around the perimeter of the pit to prevent access by people, livestock, and wildlife. A perimeter diversion ditch is planned to limit surface water flow into the pit. To mitigate the potential for acid drainage in the pit floor where storm water may periodically accumulate and dissipate, partial backfilling with a small quantity of limestone waste rock has been accounted for in contingency costs. Limited revegetation efforts are anticipated around the pit crest in selected areas where visibility is a factor. Monitoring of the revegetation efforts and inspection of the fencing and ditch will be conducted in coordination with monitoring of the reclaimed heap.

Infrastructures

All other site facilities have been categorized under infrastructure and include roads, buildings, process facilities and any other foundation pads, tanks and pipelines. Reclamation objectives include the removal of any environmental liabilities and the return of the site to a condition that resembles pre-mining conditions or restores productivity. All salvageable items will be removed from the site. Potentially hazardous items will be disposed of in a licensed facility. Remaining items that are inert may be either demolished and buried on site in a construction debris landfill or buried in place. Particular structures may be preserved and donated to the local municipality for use by the community. Roads that will not be required after mine closure will be regraded and revegetated to approximate pre-mining conditions.

Capital Costs

All costs associated with closure and reclamation activities are considered capital costs and are summarized in Table 1.25.

Table 1.25

Closure and Reclamation Costs					
Facility/Activity	Year 9	Year 10	Year 11	Year 12	Total
Leach Pad					
Detoxification/pumping		200,000	200,000		400,000
Passive treatment		75,000	75,000		150,000
Physical stabilization:					
Geosynthetic liner			250,000	250,000	500,000
Slope regrading			630,600	900,000	1,530,600
Coversoil placement			220,000	228,000	448,000
Revegetation:					
Soil building				25,000	25,000
Planting			58,200	120,000	178,200
Subtotal		275,000	1,433,800	1,523,000	3,231,800
Waste Rock Dump					
Physical stabilization:					
Topsoil placement	30,800				30,800
Revegetation:					
Soil building	100,000	78,000			178,000
Planting	100,200	60,000			160,200
Subtotal	231,000	138,000			369,000
Mine Pit					
Pit floor backfilling w/ls	21,000				21,000
Institutional controls:					
Imp. Run-on diversion	1,100				1,100
Perimeter fencing	5,900				5,900
Revegetation/planting	10,000	10,000			20,000
Subtotal	38,000	10,000			48,000
Infrastructures					
Demo/salvage/removal	80,000	20,000			100,000
On-site disposal	40,000	10,000			50,000
Road recontour/reclam	20,000	20,000	7,500		47,500
Rehab disturbed areas	26,000	20,000	10,000		56,000
Subtotal	166,000	70,000	17,500		253,500
TOTAL	435,000	493,000	1,451,300	1,523,000	3,902,300
Contingency (10%)	43,500	49,300	145,100	268,200	390,200
TOTAL	478,000	542,300	1,596,400	1,675,300	4,292,500

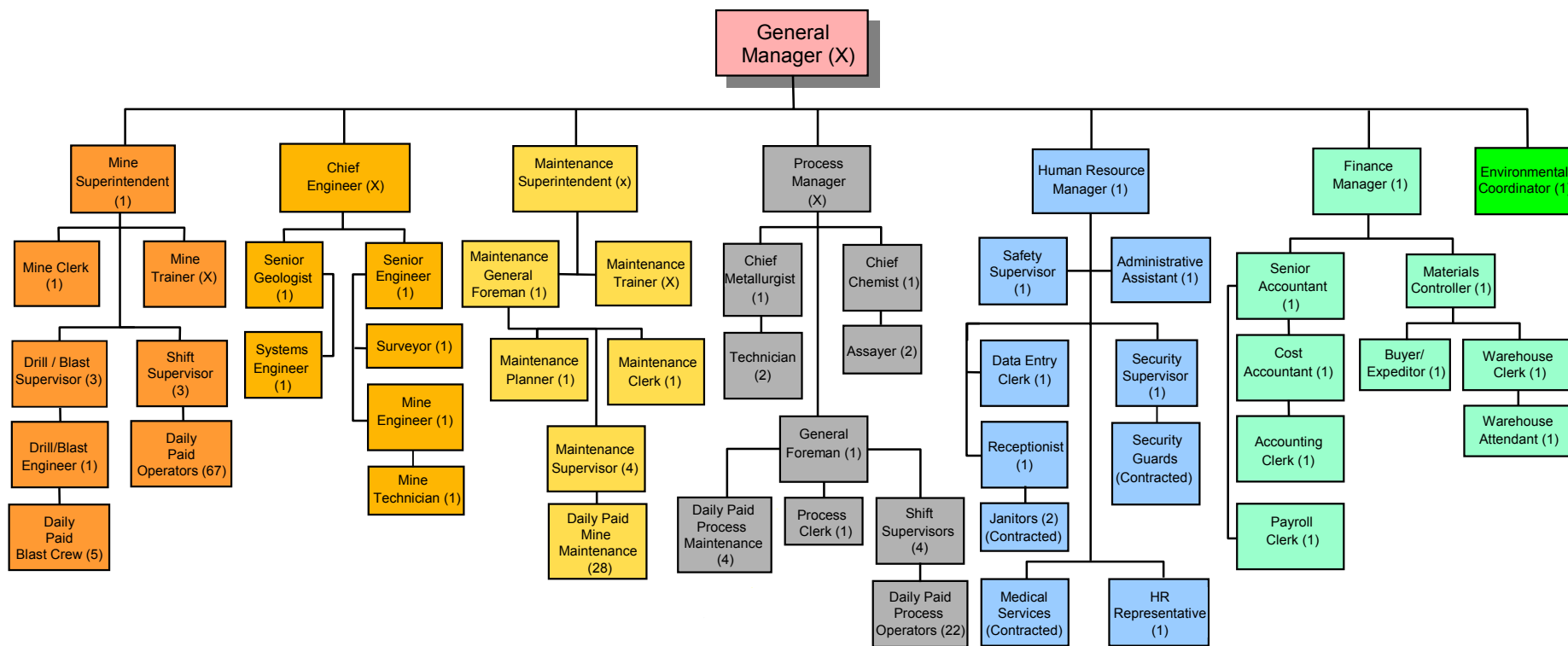
The schedule for completing the closure activities is controlled by the requirements contained in the MIA, specifically that completion of site reclamation shall be within four years of final processing. This timeframe allows for the depletion of heap effluent using evaporative recirculation without a need for

external management facilities. A two-year period of continued, but slowly reduced, solution flow through the heap is anticipated following the last placement of ore on the heap. The majority of the available precious metals should be recovered from the heap at the end of this two-year period, which would coincide with the conclusion of formal processing at the project. Formal reclamation and closure activities of the heap will then be initiated, starting with a two-year period of enhanced solution loss through evaporation and natural attenuation. At the end of this two-year period (Years 9-10), the residual solution should be totally drained from the heap. Following this period, the heap will be regraded, coversoil applied, and the heap revegetated and the process and recovery equipment removed. Reclamation and closure activities of the majority of the site buildings, the open pit, and the mine waste dump will be initiated starting immediately after the conclusion of mining. Annual monitoring would be conducted thereafter to ensure the successful development of vegetative communities and check the general physical stability of the reclamation measures.

1.12 Organization, Structure and Operating Policies

The Cerro San Pedro Project will employ a traditional organizational structure and is divided into three primary areas - Mining, Processing, and General Services and Administration (G&A). The number of expatriate employees will be kept to a minimum, with all but two expatriate employees being replaced by national employees by Year 5 of operations. An overall project organization chart is presented in Figure 1.15 for operations Year 1. A summary of the manpower by area and by year is presented in Figure 1.16. The total number of operations employees ranges from 135 during year Pre-production (PP), increasing to a maximum of 178 in Years 2 through 4, then decreasing to 156 in Year 8, the last year of ore production. The number of employees drops during Years 9 and 10 when only residual metal recovery from the heap and some reclamation are occurring, and drops further during final reclamation and closure. Approximately 63 to 69 percent of the total employees are daily paid, with the balance being salaried.

All national employees, both salaried and daily paid, will be employed by Servicios San Xavier (SSX), a wholly owned subsidiary of Glamis de Mexico, S.A. de C.V. SSX will supply employees to MSX under a Services Agreement. This arrangement will consolidate all employees under one Mexican company. Expatriate employees will work under a similar Services Agreement to MSX, but will be employed by newly created Canadian or U.S. companies to maintain existing benefits and simplify tax consequences.



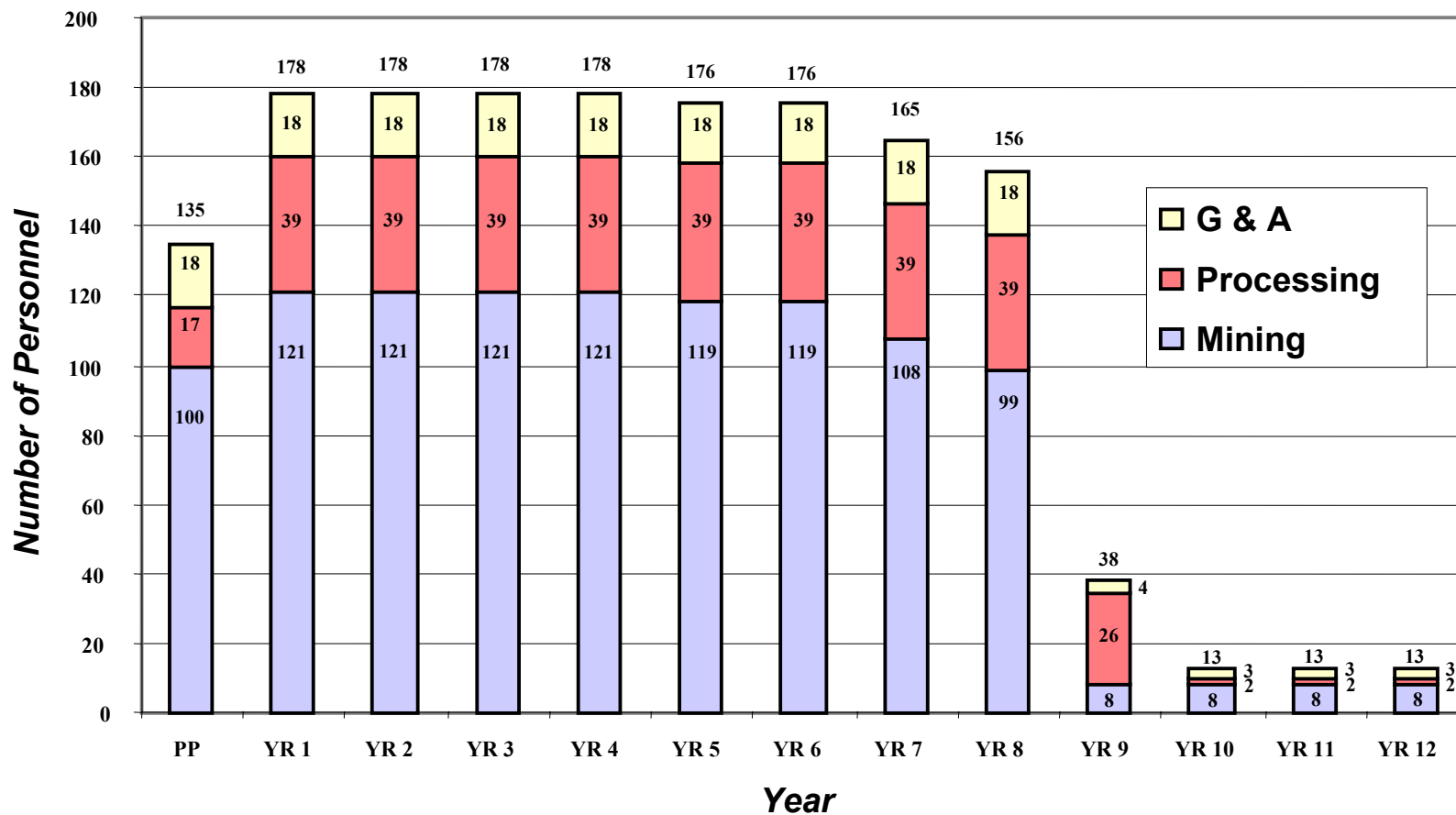
(X) = Expatriate



MINERA SAN XAVIER, S.A. de C.V.

Figure 1.15 Overall Project Organization Chart (Year 1)

Figure 1.16 Operations Manpower Summary
Preproduction through Closure



MINERA SAN XAVIER, S.A. de C.V.

Work Schedule

The work schedule for the Cerro San Pedro Project is based on compliance with Mexican Federal labor law, minimizing the amount of overtime pay and minimizing the amount of work performed on Sundays. Management staff will normally work day shift only, five or six days per week. Some supervisory and/or technical staff will work day shift only, while shift supervisors work a shift rotation schedule, the same as the daily paid employees. After operating experience is gained, it is assumed that the workers on shift rotations will rotate shifts in two to four week intervals.

Labor rates used in the cost estimates are based on recent wage and salary surveys conducted in the SLP area for similar work including equipment operation, maintenance, and support staff positions. Salaries range from \$4,200 to \$45,000 per year and daily paid labor rates average 109 pesos, or \$11.60 per day, equating to \$4,234 per year without burden. Benefit burdens, as a percentage of base salary, are approximately 65 percent.

1.13 Construction Management and Schedule

The major construction activities at Cerro San Pedro will be governed by “turn-key” contracts, which will include construction management, engineering, procurement, and safety functions for each construction area. Separate contracts will be awarded for general engineering and quality control/quality assurance; and for construction of the leach pad, process plant, electrical supply and distribution system, on-site buildings, and other small infrastructure packages. With the assistance of third-party engineer(s), the MSX construction management team will supervise and administer these contracts. The major construction contracts will be awarded on a lump-sum basis and will include requirements for contractor performance with regard to schedule, specifications, quality control and quality assurance, safety and environmental compliance, hiring, security, and procurement.

The Construction Project Manager, who will report to the project General Manager during the construction and commissioning period, will lead the MSX construction management team. In addition to the Construction Project Manager, other temporary MSX employees in the construction management team will include a safety officer, secretary, project accountant, clerk, and procurement manager. The Construction Project Manager will be hired only for a fixed term during construction, and will have previous experience with management of large multi-discipline construction projects. Other temporary MSX construction management team employees will have the opportunity to fill permanent operating positions with MSX following successful project construction and commissioning.

All engineering designs and specifications will be subjected to a third-party engineering review before lump-sum construction contracts are awarded. Conformance with the designs and specifications will be assured by the third party engineer(s) hired by MSX to perform this work during the construction period.

The construction management team will be technically supported by vendors' representatives assisting in most major mechanical equipment installation, and by a specialized consultant to manage the Construction Quality Assurance (CQA) program during leach pad and solution pond construction activities. The construction management team will establish procedures and work methods with its managers and in consultation with the MSX environmental coordinator to ensure the protection of the environment, as required under the MIA conditions. A detailed plan and schedule for testing, start-up, and turnover will be prepared by the construction management team. The team will work closely with the MSX operating personnel to ensure proper testing, safety, and operating procedures.

As construction progresses, MSX operating personnel will provide additional support relating to environmental matters, permitting, and communication with different local and federal agencies, human resources, accounting, site first aid service, and security. Minera San Xavier, S.A. de C.V. (MSX) recognizes that an effective safety program during site construction is an absolute requirement. Figure 13.1 presents an organization chart effective during Cerro San Pedro project construction activities.

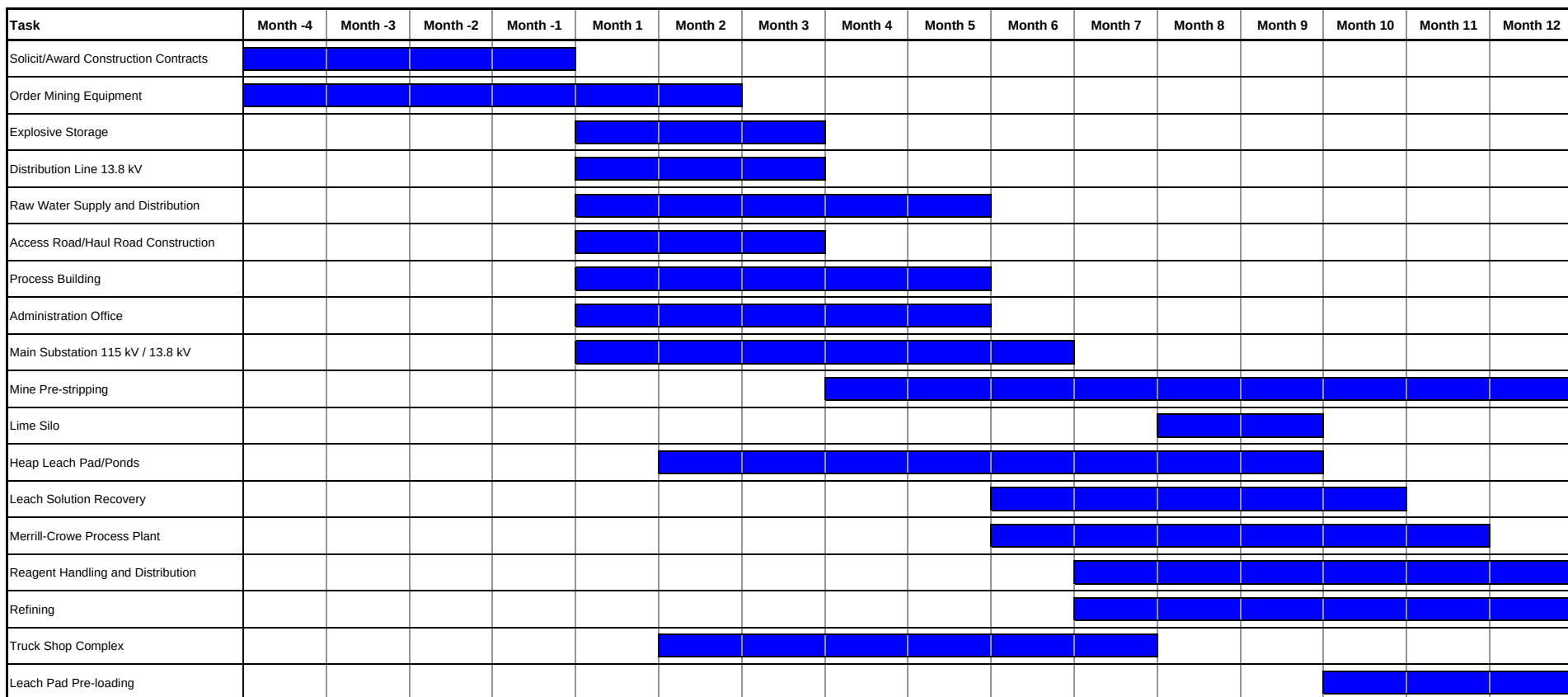
The combined capital budget for construction management, QA/QC and engineering at Cerro San Pedro is approximately \$832,000, or more than 5% of the total estimated construction value. This budget is considered typical for a large heap leach operation administering turn-key construction contracts.

The estimated daily average manpower by month for the construction effort builds from about 100 employees in Month 1 to about 420 employees in Month 5, and then drops off sharply to about 100 construction employees in Month 12. Estimated daily average manpower by month for MSX operations is about 50 in Month 1, gradually building to about 138 employees in Months 5 - 12. A maximum total employees on site occurs in Month 5 at about 555 employees.

The summarized construction schedule by area is illustrated in Figure 1.17.

Construction & Pre-production Time Line

Figure 1.17



1.14 Operating Cost Estimate

Operating costs are developed for all years, Pre-production (PP) through Year 8, and all costs (capital and operating) are treated as capital costs in Year PP. Labor costs and consumable costs are the two primary components of the operating costs.

No contingency has been developed for the operating costs, but the costs for both labor and the major areas of consumables have been confirmed by recent quotations.

Operating Cost Summary

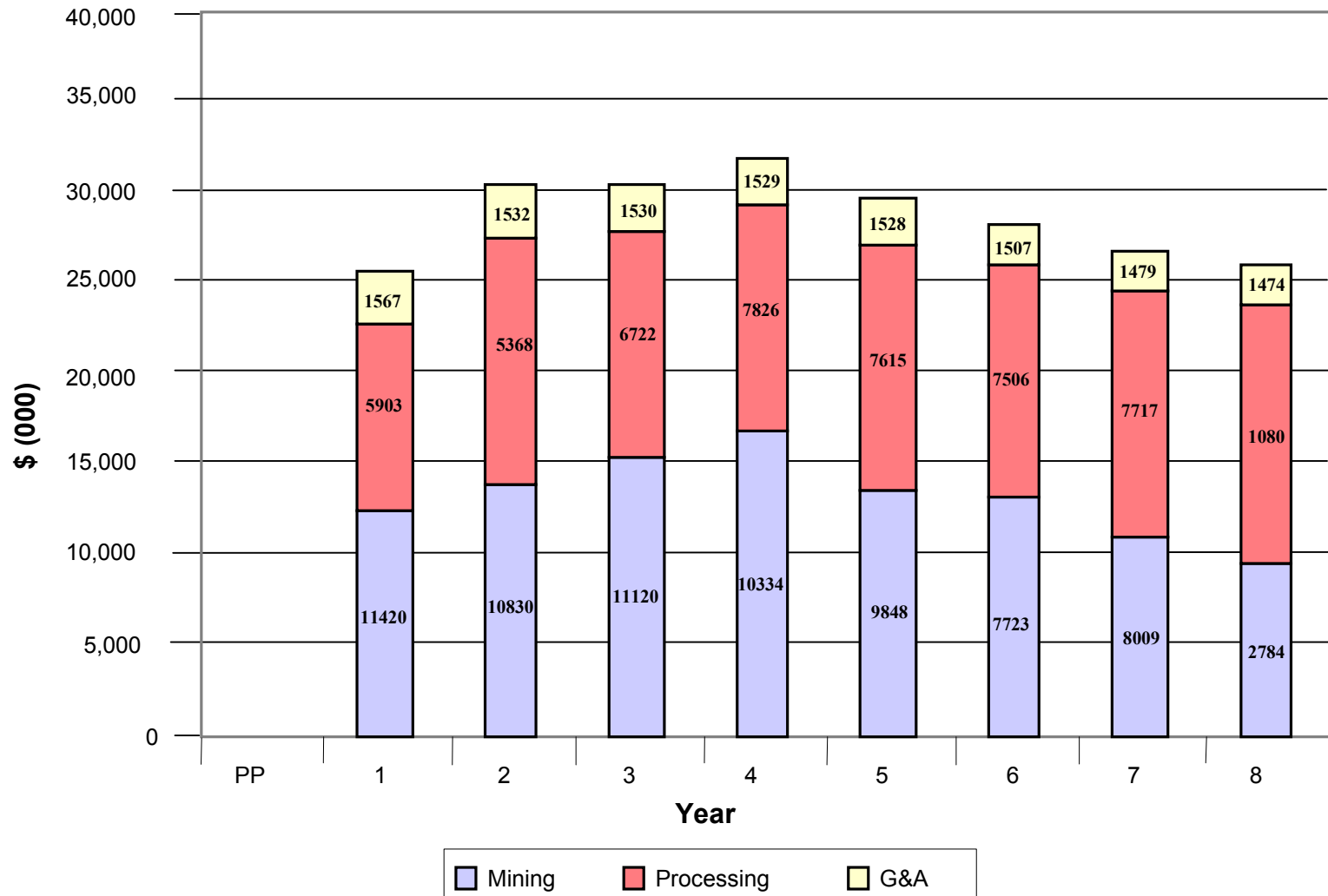
A summary of the operating costs by year by area is presented in Table 1.25. This table consolidates costs in the various areas into total costs per year as well as cost per tonne of ore. Total operating costs during the operating Years 1 through 8 range from \$18.9 million in Year 1 to a high of \$19.4 million in Year 3. Total operating cost per tonne of ore ranges from a low of \$2.25 in Years 6 and 7 to a high of \$4.99 in Year 8. Figure 1.18 shows the operating cost per year by area in total dollars, while Figure 1.19 shows the operating cost per year in terms of dollars per tonne of ore.

Mining and processing costs amount to 55 percent and 35 percent respectively of the total operating cost, leaving 10 percent for G&A costs.

Table 1.25

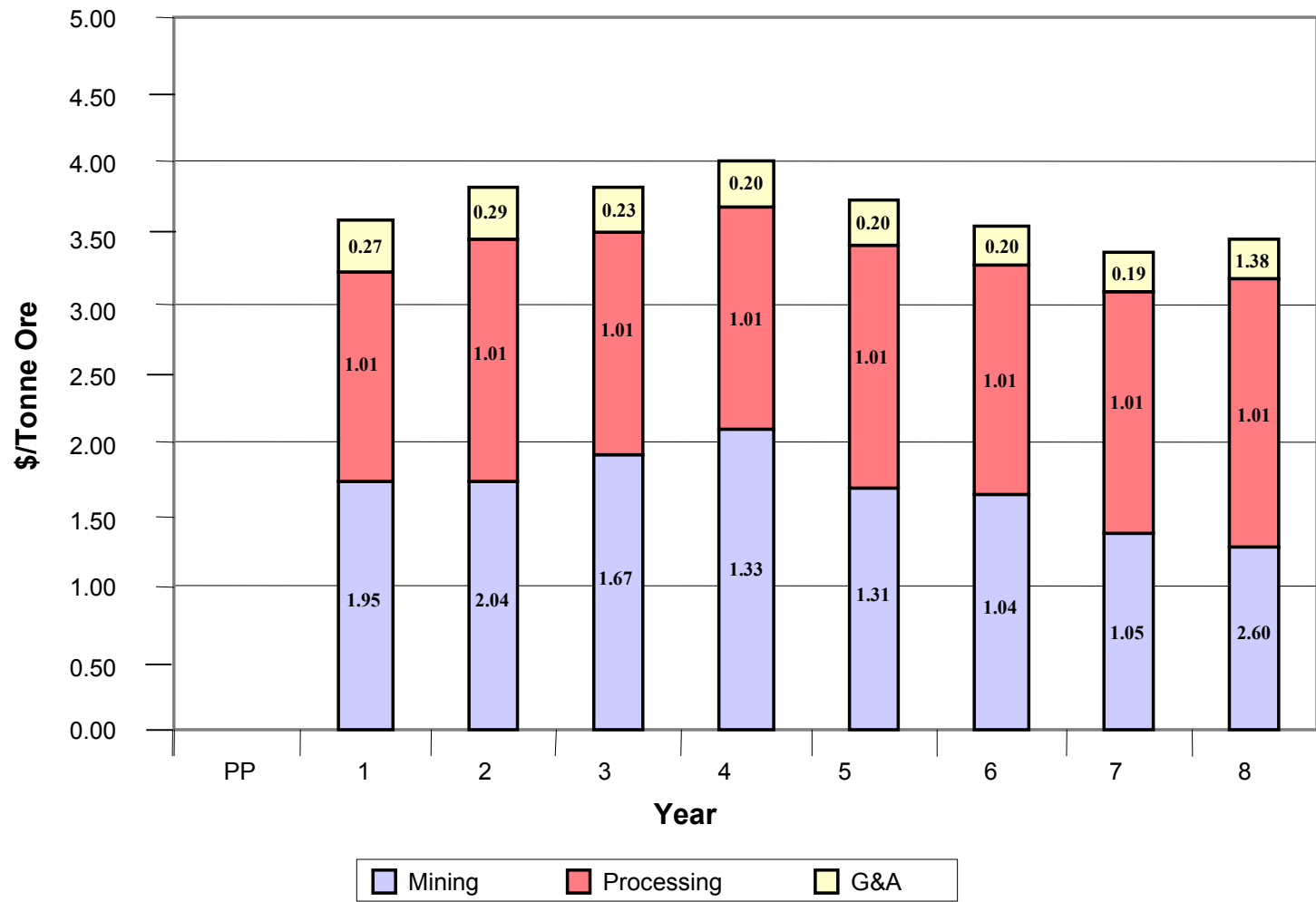
Annual Operating Cost Summary											
	Year									Totals	
	PP	1	2	3	4	5	6	7	8	Production	% of Total
Ore Tonnes	0	5845	5315	6655	7749	7540	7432	7641	1069	49246	
Waste Tonnes	9406	14512	12615	12752	9027	8630	1850	2433	72	71297	
Total Tonnes	9406	20357	17930	19407	16776	16170	9282	10074	1141	120543	
Mining											
Total Cost (\$000)	6706	11420	10830	11120	10334	9848	7723	8009	2784	78774	
Unit Cost (\$/ore tonne)		1.95	2.04	1.67	1.33	1.31	1.04	1.05	2.60	1.60	55%
Processing											
Total Cost (\$000)	0	5903	5368	6722	7826	7615	7506	7717	1080	49737	
Unit Cost (\$/ore tonne)		1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	35%
G&A											
Total Cost (\$000)	1579	1567	1532	1530	1529	1528	1507	1479	1474	13725	
Unit Cost (\$/ore tonne)		0.27	0.29	0.23	0.20	0.20	0.20	0.19	1.38	0.28	10%
Total Cost (\$000)	8285	18890	17730	19372	19689	18991	16736	17205	5338	142236	
Unit Cost (\$/ore tonne)		3.23	3.34	2.91	2.54	2.52	2.25	2.25	4.99	2.89	

Figure 1.18 Annual Operating Costs per Area



MINERA SAN XAVIER, S.A. de C.V.

Figure 1.19 Annual Operating Costs per Tonne of Ore



MINERA SAN XAVIER, S.A. de C.V.

1.15 Capital Cost Estimate

The capital cost estimate prepared by Minera San Xavier, S.A. de C.V. (MSX) and its consultants is represented in U.S. dollars as of the fourth quarter 2000. No adjustment has been provided for future price escalation or inflation.

Most of the construction material and skilled labor are available in Mexico. San Luis Potosí is a relatively large city and most of the services required for project construction are available within the local vicinity.

New and/or used material and equipment purchased outside of Mexico, will be imported under the North America Free Trade Agreement (NAFTA) and/or the Mexican PITEX program, which allows corporations exporting their finished product and operating under specific criteria, the ability to temporarily import equipment and material free of duties and sales tax.

The value-added tax (VAT) is excluded from the capital cost estimate.

Project Total Capital Cost Estimate - Summary by Area

A summary of the project construction, pre-production, and sustaining capital cost estimates is presented in Table 1.26.

The capital cost estimate is divided into major areas of Mining, Processing, and Administration Infrastructure and outlines the following:

- Initial capital expenditures in the pre-production and construction year and Year 1 totals \$45.3 million.
- Sustaining capital expenditures includes the construction of the second phase of the leach pad in Year 3 (\$3.5 million), replacement of some support equipment in Year 4 (\$0.3 million), and rebuilding of some mine equipment in Year 5 (\$2.7 million).
- Overall capital cost estimate, incorporating pre-production, construction costs, and sustaining capital totals \$51.7 million.

Table 1.26

Capital Cost Summary by Area (\$)											
Area	PP	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9-12	Total
Mining											
Capitalized Pre-strip (Owner Mining)	\$ 6,706,000										\$ 6,706,000
Major Mine Equipment	\$ 9,054,000	\$ 8,776,000				\$ 2,674,500					\$ 20,504,500
Mine Support Equipment	\$ 417,400				\$ 120,000						\$ 537,400
Maintenance Equipment	\$ 1,124,000				\$ 72,000						\$ 1,196,000
G & A Equipment	\$ 473,000				\$ 104,000						\$ 577,000
Maintenance Facilities & Mine Roads											
Shop/Warehouse/Fuel/Wash	\$ 826,000										
Run-of-Mine Haulroad (Contractor)	\$ 1,007,169										\$ 1,007,169
Explosives Storage	\$ 131,900										\$ 131,900
Pit Working Access (Contractor)	\$ 900,000										\$ 900,000
Mining - Subtotal	\$ 20,639,469	\$ 8,776,000	\$ -	\$ -	\$ 296,000	\$ 2,674,500	\$ -	\$ -	\$ -	\$ -	\$ 32,385,969
Processing											
Leach Pad and Solution Ponds	\$ 4,462,340			\$ 3,479,840							\$ 7,942,180
Merrill-Crowe Plant	\$ 1,784,906										\$ 1,784,906
Refinery	\$ 427,188										\$ 427,188
Solution Pumping & Distribution	\$ 900,272										\$ 900,272
Construction Management & QA/QC	\$ 497,895										\$ 497,895
Engineering	\$ 334,037										\$ 334,037
Laboratory	\$ 394,200										\$ 394,200
Lime Silo	\$ 310,000										\$ 310,000
Processing - Subtotal	\$ 9,110,838	\$ -	\$ -	\$ 3,479,840	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 12,590,678
Admin. & Infrastructure											
Roads	\$ 175,000										\$ 175,000
Office, Training Building, and Furniture	\$ 370,000										\$ 370,000
Site Preparation	\$ 475,000										\$ 475,000
Water Supply	\$ 645,000										\$ 645,000
Cerro de San Pedro Housing	\$ 350,000										\$ 350,000
Cerro de San Pedro Church Stabilization	\$ 200,000										\$ 200,000
Property Fencing	\$ -										\$ -
Electric Power and Communication	\$ 2,206,680										\$ 2,206,680
Owner's Cost (G&A)	\$ 1,579,000										\$ 1,579,000
Admin. & Infrastructure - Subtotal	\$ 6,000,680	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6,000,680
Project Expenditure Total	\$ 35,750,987	\$ 8,776,000	\$ -	\$ 3,479,840	\$ 296,000	\$ 2,674,500	\$ -	\$ -	\$ -	\$ -	\$ 50,977,327

1.16 Economic Evaluation and Financial Analyses

This section presents a summary of the project's financial analyses, as well as information on anticipated project preproduction and development costs, working capital, and taxes. This information has been formulated into an economic model that evaluates the project's financial criteria on an after-tax basis using constant dollars (fourth quarter 2000). Metal prices of \$275 per ounce of gold and \$5.00 per ounce of silver were used in the base case evaluation. Sensitivity analyses evaluating the impact of varying project capital and operating costs as well as gold and silver recoveries have been developed. Traditional financial evaluation criteria, such as internal rate of return (IRR) and net present value (NPV), have also been calculated.

Review of Significant Project Information

A total of 120.5 million tonnes of material will be mined and 49.2 million tonnes of ore will be processed at Cerro San Pedro over a mine life of 7.25 years, at an average processing rate of 22,000 tonnes per day or approximately 6.8 million tonnes per year. The grade of gold and silver is fairly stable over the life of the mine, as shown in Table 1.27. The mined grade and process recoveries have a major influence on the overall operating cash cost per ounce of gold, silver, and gold equivalent produced. In addition, the waste/ore ratio varies somewhat over the life of the mine, which also impacts the overall cash operating costs.

Table1.27

Mine Production Schedule						
Project Period	Ore ktonnes	Gold Grade g Au/t	Silver Grade g Ag/ t	Waste ktonnes	Total ktonnes	Strip Ratio
Pre-production	--	--	--	9,406	9,406	--
Year 1	5845	0.650	24.65	14,512	20,357	2.5
Year 2	5,315	0.642	31.01	12,615	17,930	2.4
Year 3	6,655	0.511	29.62	12,752	19,407	1.9
Year 4	7,749	0.611	22.15	9,027	16,776	1.2
Year 5	7,540	0.488	19.59	8,630	16,170	1.1
Year 6	7,432	0.570	23.46	1,850	9,282	0.2
Year 7	7,641	0.574	16.04	2,433	10,074	0.3
Year 8	1,069	0.303	10.69	72	1,141	0.1
Total	49,246	0.57	23.02	71,297	120,543	1.4

Gold and silver recoveries are estimated to average 70.5 percent and 35.7 percent, respectively, through the end of Year 8. However, re-circulation of heap solutions will be required for depletion and

detoxification and some residual metal recoveries will result in additional precious metal production through Year 9 but are not considered in the economics at this time.

The unit operating costs covering areas such as mining, processing, and G&A are relatively stable over the mine life. The average operating cost by area is shown in Table 1.28 and total \$2.72 per tonne of ore over the life of the project. Capital costs by area are summarized in Table 1.29. Initial capital costs are estimated at \$45.3 million and total capital costs are estimated at \$51.7 million over the project life.

Table 1.28

Summary of Operating Costs by Area			
	Operating Costs		
	Total (\$000)	Total \$/ore tonne	Percent of Total
Mining (\$0.65/t)	72,067	1.46	54
Processing	49,738	1.01	37
G&A	12,146	0.25	9
Total	133,952	2.72	100.0

Table 1.29

Summary of Capital Costs by Area (\$000)			
	Pre-production	Sustaining	Total
Mining	29,416	2,970	32,386
Processing	9,110	3,480	12,590
Admin. & Infrastructure	6,751	0	6,751
Total	45,277	6,450	51,727

Economic Model

The economic model used for financial evaluation of the Cerro San Pedro Project is based on an in-house derived spreadsheet generated using Excel software. The model is quite flexible and accounts for yearly variations in material mined and processed, recoveries, operating costs, and capital expenditures. From these input areas, the model generates cash flow estimates on an annual basis.

The entire economic model spreadsheet and results are included at the end of this section.

Treatment of Amortization and Taxation

For the purpose of this economic evaluation, Mexican income tax consists of four main provisions: deductions for depreciation and amortization, tax rates, alternative minimum asset tax, and loss carry forwards.

The economic model accounts for the various depreciation schedules allowed for the value of an asset or service, from the year that the asset is placed in service. Depreciation is not allowed for land or real property purchase payments, real property option payments, and some intangible property, such as water rights. These items are directly expensed in the year of acquisition or service.

The regular income tax rate applicable to corporations in Mexico is 35 percent on taxable income. An effective tax rate of 30% is used in the economic model to allow for additional tax credits that are anticipated during operations (such as the tax credit for diesel). The rate is applied to income after deductions for usual business expenses, asset depreciation, and prior year losses. Profit sharing with employees is not deductible. In addition to the direct income tax, a withholding, estimated at five percent, would apply on any payment of dividend. This will not apply if excess cash flow is reinvested in Mexico.

In addition to the regular tax, an alternative minimum tax on assets must also be considered because a Mexican taxpayer pays, in any given year, the higher of those two taxes. The asset tax commences in the second year of a commercial enterprise and is based on the net tangible asset base of the business for that year as determined after depreciation. The net asset base is then multiplied by 1.8 percent to obtain the asset tax. This tax is recoupable within ten years to the extent that in any of those following years, the regular income tax exceeds the asset tax for that particular year. Any losses (negative taxable income) incurred in a given year can be carried forward and applied to subsequent years to reduce positive taxable income.

The Value Added Tax (VAT) is assessed on all services and capital assets when purchased or imported into Mexico. The rate is 15 percent of the purchase price or imported value plus duties. An accelerated reimbursement provision is available for all VAT credits. The reimbursement period is generally three months, resulting in the repayment of the tax often in the same year in which it is paid.

Precious Metal Production

A summary of gold, silver, and gold equivalent production by year is provided in Table 1.30, with life-of-mine total recovered ounces of 634,060 ounces of gold and 13 million ounces of silver. As used in the economic evaluation, gold equivalent, for the base commodity price case, is defined as gold plus silver divided by 55 ($\text{Au Eq oz} = \text{Au oz} + \text{Ag oz}/55$). Gold equivalent production ranges from a low of 47,981 to a high of 143,143 and averages 108,799 ounces. Gold production as a proportion of total gold equivalent production varies from 65 percent to 80 percent over the years and averages 73 percent over the project life.

Table 1.30

Summary of Annual Precious Metal Production				
	Au Ozs	Ag Ozs	Au Eq Ozs	% Au Ozs of AuEq Ozs
Total Contained Ounces	899,345	36,448,197	1,506,983	60
Estimated Annual Production				
Year 1	61,056	926,509	77,901	78
Year 2	77,337	1,889,095	111,684	69
Year 3	77,085	2,259,657	118,170	65
Year 4	107,368	1,967,636	143,143	75
Year 5	83,382	1,692,959	114,163	73
Year 6	95,980	1,998,662	132,319	73
Year 7	99,480	1,405,187	125,029	80
Year 8	32,373	858,464	47,981	67
Total Project Life	634,060	12,998,169	870,391	73

Revenue and Cash Flow

A summary of mine net realization or revenue based on gold and silver sales, direct operating costs, operating cash flow, and operating cash cost per ounce on an annual basis is provided in Table 1.31.

Table 1.31

Summary of Annual Net Revenue, Operating Costs, Operating Profit, and Cash Cost/Au Eq Ounce				
Year	Net Revenue (Au + Ag) (\$000)	Cash Operating Costs (\$000)	Operating Profit (\$000)	Cash Cost \$/Au Eq
1	21,423	19,464	1,959	250
2	30,713	18,552	12,161	166
3	32,497	20,242	12,255	171
4	39,364	20,743	18,621	145
5	31,395	19,831	11,564	174
6	36,388	17,710	18,678	134
7	34,383	18,126	16,257	145
8	13,194	5,691	7,503	119
Total	239,357	144,652	94,705	166

Economic Results

The results of the economic model are presented in Table 1.32 which show the traditional valuation criteria of internal rate of return (IRR) and net present value (NPV) at various gold and silver prices for the designed pit.

At a gold price of \$275 per ounce and \$5.00 per ounce for silver, and assuming that the initial investment is 100% financed at 9.5%, the project yields a Net Present Value of \$7.5 million at a 5% discount rate with an 8.4% Rate of Return.

Table 1.32

Project Rate of Return and Net Present Value			
	\$275 Gold \$5.00 Silver	\$300 Gold \$5.25 Silver	\$325 Gold \$5.25 Silver
Life of Mine	7.25 years	7.25 years	7.25 years
NPV @ 5%	\$7.5 million	\$19.8 million	\$29.5 million
DCFROR	8.4%	13.9%	18.2%
Operating Cost	\$166 per AuEq Oz	\$167 per AuEq Oz	\$167 per AuEq Oz
Total Cost	\$199 per AuEq Oz	\$195 per AuEq Oz	\$195 per AuEq Oz
Pay Back Period	5.6 years	4.7 years	4.0 years

Sensitivity Analyses

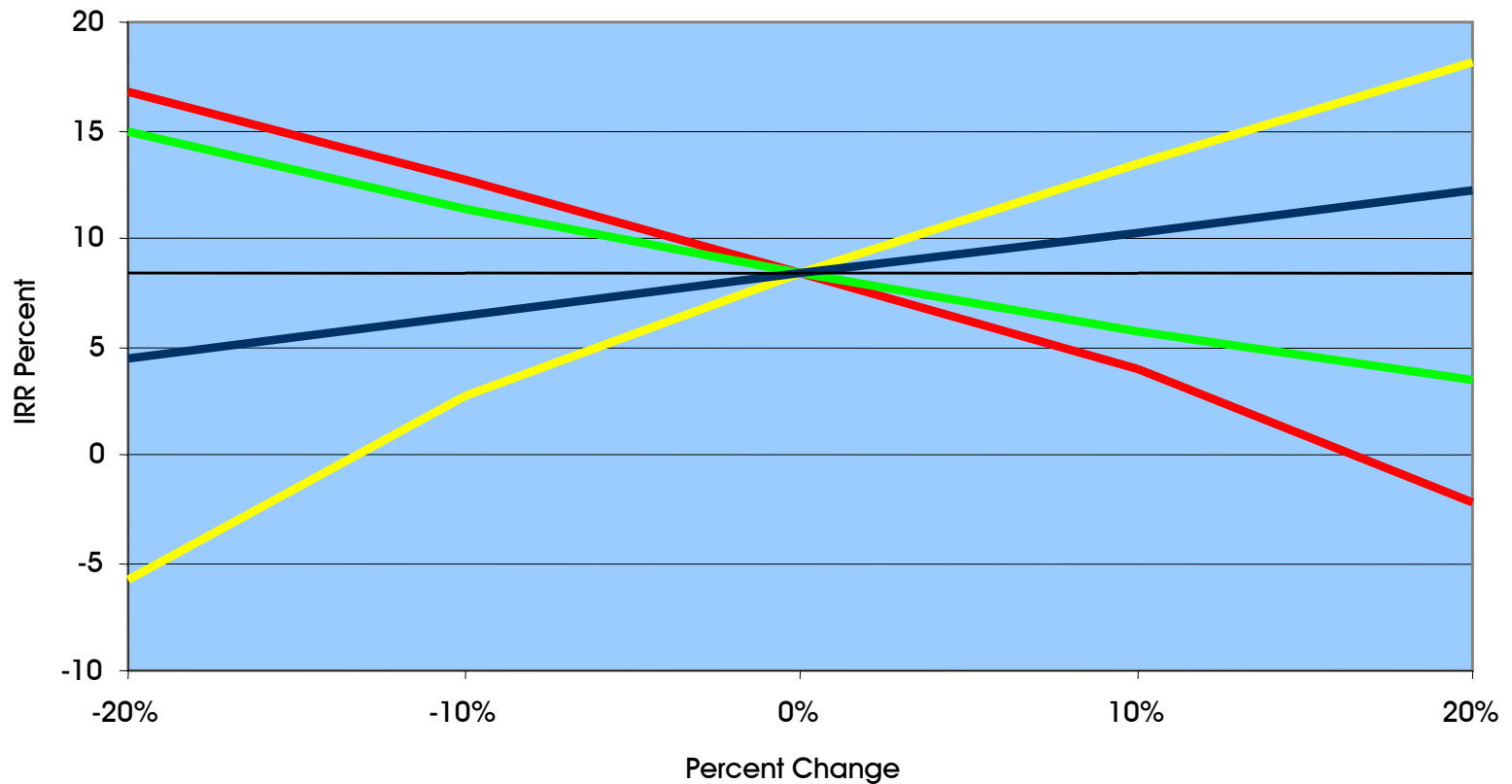
Sensitivities to changes in capital costs, operating costs, and gold and silver recoveries were evaluated on the base case, with changes of ± 10 and ± 20 percent being examined for costs and recoveries. As seen in Table 1.33 below, at a given percentage variation in costs, the project is much more sensitive to changes in operating costs than capital cost.

Table 1.33

Rate of Return Sensitivities				
Base Case \$275 Au and \$5.00 Ag				
Change	Capital Costs	Operating Costs	Gold Price	Silver Price
+20%	3.4	-2.2	18.2	12.2
+10%	5.7	3.9	13.4	10.3
0%	8.4	8.4	8.4	8.4
-10%	11.4	12.8	2.7	6.4
-20%	15.0	16.8	-5.8	4.4

Figure 1.20 graphically shows the sensitivity analysis results for the base case commodity prices.

Figure 1.20 IRR Sensitivity



Glamis Gold Ltd.
Cerro San Pedro Project

CERRO SAN PEDRO PROJECT - ECONOMIC MODEL

Final Base Case as of 24oct00
Pit Access included, \$0.653 mining cost , 9.5% financing

		Preproduction	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9-12
Production	TOTALS	constr/strip	operations	operations	operations	operations	operations	operations	operations	operations	closure
Leach Tonnes	49,246,000		5,845,000	5,315,000	6,655,000	7,749,000	7,540,000	7,432,000	7,641,000	1,069,000	
Grade Au g/t	0.57	-	0.650	0.642	0.511	0.611	0.488	0.570	0.574	0.303	
Ounces Contained Au	899,345		122,111	109,693	109,336	152,288	118,267	136,136	141,101	10,413	
Recovery Rate %Au AVG	70.5%		50.0%	70.5%	70.5%	70.5%	70.5%	70.5%	70.5%	70.5%	
Ounces Au Produced	634,060	-	61,056	77,337	77,085	107,368	83,382	95,980	99,480	32,373	
Grade Ag g/t	23.02	0.00	24.65	31.01	29.62	22.15	19.59	23.46	16.04	10.69	
Ounces Contained Ag	36,448,197	-	4,632,547	5,298,112	6,337,381	5,518,387	4,748,034	5,605,403	3,940,955	367,378	
Recovery Rate %Ag AVG	35.7%		20.0%	35.7%	35.7%	35.7%	35.7%	35.7%	35.7%	35.7%	
Ounces Ag Produced	12,998,169	-	926,509	1,889,095	2,259,657	1,967,636	1,692,959	1,998,662	1,405,187	858,464	
Waste Tonnes	71,297,000	9,406,000	14,512,000	12,615,000	12,752,000	9,027,000	8,630,000	1,850,000	2,433,000	72,000	
Total Surface Tonnes Mined	120,543,000	9,406,000	20,357,000	17,930,000	19,407,000	16,776,000	16,170,000	9,282,000	10,074,000	1,141,000	
Waste:Ore Strip Ratio	1.4		2.5	2.4	1.9	1.2	1.1	0.2	0.3	0.1	
Total Tonnes: Equiv Au Ounce S.R.	190		333	232	252	156	194	97	101	35	
Total Ore Tonnes	49,246,000		5,845,000	5,315,000	6,655,000	7,749,000	7,540,000	7,432,000	7,641,000	1,069,000	
Grade g/t Au Equivalent	0.952	-	1.061	1.159	1.005	0.980	0.814	0.961	0.842	0.481	
Ounces Contained Au Equivalent	1,506,983		199,320	198,020	214,987	244,293	197,426	229,589	206,810	16,538	
Average Recovery Rate Au Equivalent	57.8%	0.0%	39.1%	56.4%	55.0%	58.6%	57.8%	57.6%	60.5%	290.1%	
Ounces Produced Au Equivalent	870,391	-	77,901	111,684	118,170	143,143	114,163	132,319	125,029	47,981	
Revenue											
Gold Price	\$ 275	\$ 275	\$ 275	\$ 275	\$ 275	\$ 275	\$ 275	\$ 275	\$ 275	\$ 275	
Gold Revenue	174,366,585	\$ -	\$ 16,790,263	\$ 21,267,635	\$ 21,198,419	\$ 29,526,092	\$ 22,929,990	\$ 26,394,490	\$ 27,357,120	\$ 8,902,575	
Silver Price	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	
Silver Revenue	64,990,846	\$ -	\$ 4,632,547	\$ 9,445,474	\$ 11,298,283	\$ 9,838,180	\$ 8,464,795	\$ 9,993,312	\$ 7,025,935	\$ 4,292,320	
Total Revenue	239,357,431	\$ -	\$ 21,422,810	\$ 30,713,109	\$ 32,496,702	\$ 39,364,273	\$ 31,394,785	\$ 36,387,803	\$ 34,383,055	\$ 13,194,895	
Direct Operating Costs											
Surface Mining Cost	\$ 78,773,248	\$ 6,706,000	\$ 11,420,277	\$ 10,829,720	\$ 11,120,211	\$ 10,334,016	\$ 9,847,530	\$ 7,722,624	\$ 8,008,830	\$ 2,784,040	
Cost per Mined Tonne	\$ 0.653	\$ 0.71	\$ 0.56	\$ 0.60	\$ 0.57	\$ 0.62	\$ 0.61	\$ 0.83	\$ 0.80	\$ 2.44	
Leach Ore Processing Cost	\$ 49,738,460	\$ -	\$5,903,450	\$5,368,150	\$6,721,550	\$7,826,490	\$7,615,400	\$7,506,320	\$7,717,410	\$1,079,690	
Cost per Leach Tonne	\$ 1.01	\$ 1.01	\$ 1.01	\$ 1.01	\$ 1.01	\$ 1.01	\$ 1.01	\$ 1.01	\$ 1.01	\$ 1.01	
G&A Cost	12,146,000	\$ -	\$ 1,567,000	\$ 1,532,000	\$ 1,530,000	\$ 1,529,000	\$ 1,528,000	\$ 1,507,000	\$ 1,479,000	\$ 1,474,000	
Cost per Ore Tonne	\$ 0.25	\$ -	\$ 0.27	\$ 0.29	\$ 0.23	\$ 0.20	\$ 0.20	\$ 0.20	\$ 0.19	\$ 1.38	
prestrip credit		\$ (6,706,000)									
Total Direct Operating Costs	133,951,708	\$ -	\$ 18,890,727	\$ 17,729,870	\$ 19,371,761	\$ 19,689,506	\$ 18,990,930	\$ 16,735,944	\$ 17,205,240	\$ 5,337,730	
Cost per Ore Tonne	\$ 2.72	\$ -	\$ 3.23	\$ 3.34	\$ 2.91	\$ 2.54	\$ 2.52	\$ 2.25	\$ 2.25	\$ 4.99	
Other Cash Costs											
Royalties 1.95%	4,667,470	\$ -	417,744.79	598,905.63	633,685.69	767,603.32	612,198.31	709,562.15	670,469.57	257,300.45	
Transportation, Refining \$2.00/ AuEq oz.	1,740,781		\$ 155,802	\$ 223,368	\$ 236,340	\$ 286,286	\$ 228,326	\$ 264,639	\$ 250,059	\$ 95,963	
Reclamation	4,292,500										\$ 4,292,500
Exploration Expense	-										
Fees	-										
Total Other Cash Costs	10,700,751	\$ -	\$ 573,547	\$ 822,274	\$ 870,025	\$ 1,053,889	\$ 840,524	\$ 974,201	\$ 920,528	\$ 353,263	\$ 4,292,500
Total Cash Operating Costs	144,652,459.23	\$ -	\$ 19,464,274	\$ 18,552,144	\$ 20,241,786	\$ 20,743,395	\$ 19,831,454	\$ 17,710,145	\$ 18,125,768	\$ 5,690,993	\$ 4,292,500

CERRO SAN PEDRO PROJECT - ECONOMIC MODEL (cont.)

Final Base Case as of 24oct00
Pit Access included, \$0.653 mining cost , 9.5% financing

		Preproduction	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9-12
Non-Cash Costs											
Depreciation	\$ 46,550,284		\$ 9,194,907	\$ 6,726,567	\$ 6,726,567	\$ 10,206,407	\$ 3,959,467	\$ 2,434,092	\$ 2,434,092	\$ 2,434,092	\$ 2,434,092
Depletion	\$ -										
Reclamation Accrual	\$ -										
Total Non-Cash Costs	\$ 46,550,284	\$ -	\$ 9,194,907	\$ 6,726,567	\$ 6,726,567	\$ 10,206,407	\$ 3,959,467	\$ 2,434,092	\$ 2,434,092	\$ 2,434,092	\$ 2,434,092
Total Costs	\$ 191,202,743	\$ -	\$ 28,659,181	\$ 25,278,711	\$ 26,968,353	\$ 30,949,802	\$ 23,790,921	\$ 20,144,237	\$ 20,559,860	\$ 8,125,085	\$ 6,726,592
Financing Costs	\$ 15,652,574	\$ 2,419,241	\$ 4,069,108	\$ 4,002,900	\$ 3,008,438	\$ 1,721,190	\$ 428,539	\$ 3,160	\$ -	\$ -	\$ -
Gross Earnings	\$ 32,502,115	\$ (2,419,241)	\$ (11,305,479)	\$ 1,431,499	\$ 2,519,911	\$ 6,693,281	\$ 7,175,326	\$ 16,240,406	\$ 13,823,195	\$ 5,069,810	\$ (6,726,592)
Taxes (see detail below)											
Asset Tax or "Effective"											
Federal Income Tax @ 30%	\$ 6,068,612	\$ -	\$ -	\$ -	\$ 456,458	\$ 278,071	\$ 254,941	\$ -	\$ 3,558,199	\$ 1,520,943	\$ -
Total Taxes	\$ 6,068,612	\$ -	\$ -	\$ -	\$ 456,458	\$ 278,071	\$ 254,941	\$ -	\$ 3,558,199	\$ 1,520,943	
Net Earnings	\$ 26,433,503	\$ (2,419,241)	\$ (11,305,479)	\$ 1,431,499	\$ 2,063,453	\$ 6,415,210	\$ 6,920,384	\$ 16,240,406	\$ 10,264,996	\$ 3,548,867	\$ (6,726,592)
Capital Expenditures											
Exploration	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0
Development	\$ 1,907,169	\$ 1,907,169	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0
Capitalized Pre-Strip	\$ 6,706,000	\$ 6,706,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0
Mine & Mobile Equipment	\$ 23,772,800	\$ 12,026,300	\$ 8,776,000	\$ -	\$ -	\$ 296,000	\$ 2,674,500	\$ -	\$ -	\$ -	0
Process Facilities	\$ 12,590,678	\$ 9,110,838	\$ -	\$ -	\$ 3,479,840	\$ -	\$ -	\$ -	\$ -	\$ -	0
Administration/Infrastructure	\$ 6,000,680	\$ 6,000,680	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0
Total Capital	\$ 50,977,327	\$ 35,750,987	\$ 8,776,000	\$ -	\$ 3,479,840	\$ 296,000	\$ 2,674,500	\$ -	\$ -	\$ -	\$ -
After-Tax Cash Flow	\$ 22,006,459	\$ (38,170,228)	\$ (10,886,572)	\$ 8,158,066	\$ 5,310,180	\$ 16,325,617	\$ 8,205,351	\$ 18,674,498	\$ 12,699,088	\$ 5,982,959	\$ (4,292,500)
Cumulative Cash Flow	\$ 22,006,459	\$ (38,170,228)	\$ (49,056,800)	\$ (40,898,734)	\$ (35,588,554)	\$ (19,262,937)	\$ (11,057,586)	\$ 7,616,912	\$ 20,316,000	\$ 26,298,959	\$ 22,006,459
NPV @ 5%*	7,551,301.70										
IRR*	8.4%										
Cash Cost per AuEq Ounce	\$ 166	\$ -	\$ 250	\$ 166	\$ 171	\$ 145	\$ 174	\$ 134	\$ 145	\$ 119	\$ -
Cash Cost per Ounce (Ag Credit)	\$ 126		\$ 243	\$ 118	\$ 116	\$ 102	\$ 136	\$ 80	\$ 112	\$ 43	
Acquisition Cost per AuEq Ounce	\$ 8	\$ 7,000,000									
Total Cost/ Ounce incl acq.	\$ 207	\$ -	\$ 368	\$ 226	\$ 228	\$ 216	\$ 208	\$ 152	\$ 164	\$ 169	\$ -

CAPITAL BUDGET CERRO SAN PEDRO											
	Totals	Preproduction	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9-12
Exploration	\$ -										
Development (ROM haul road & Pit Access)	\$ 1,907,169	\$ 1,907,169									
Capitalized Pre-Strip	\$ 6,706,000	\$ 6,706,000									
Mine & Mobile Equipment											
Major Mine Equipment	\$ 17,830,000	\$ 9,054,000	\$ 8,776,000								
Mine Support Equipment	\$ 537,400	\$ 417,400				\$ 120,000					
Maintenance Equipment	\$ 1,196,000	\$ 1,124,000				\$ 72,000					
G&A Equipment	\$ 577,000	\$ 473,000				\$ 104,000					
Truck Shop/Fuel/Wash	\$ 826,000	\$ 826,000									
Explosives Storage	\$ 131,900	\$ 131,900									
Equipment Rebuilds	\$ 2,674,500	\$ -					\$ 2,674,500				
Total	\$ 23,772,800	\$ 12,026,300	\$ 8,776,000	\$ -	\$ -	\$ 296,000	\$ 2,674,500	\$ -	\$ -	\$ -	
Process Facilities											
Leach Pad and Solution Ponds	\$ 7,942,180	\$ 4,462,340			\$ 3,479,840						
Merrill-Crowe plant	\$ 1,784,906	\$ 1,784,906									
Refinery	\$ 427,188	\$ 427,188									
Solution Pumping/Distribution	\$ 900,272	\$ 900,272									
Construction Mgmt, QA/QC	\$ 497,895	\$ 497,895									
Engineering	\$ 334,037	\$ 334,037									
Laboratory	\$ 394,200	\$ 394,200									
Lime Silo	\$ 310,000	\$ 310,000									
	\$ -										
Total	\$ 12,590,678	\$ 9,110,838	\$ -	\$ -	\$ 3,479,840	\$ -	\$ -	\$ -	\$ -	\$ -	
Administration/Infrastructure											
Roads	\$ 175,000	\$ 175,000									
Office, Training Building, & Furniture	\$ 370,000	\$ 370,000									
Site Preparation	\$ 475,000	\$ 475,000									
Water Supply	\$ 645,000	\$ 645,000									
Cerro de San Pedro Housing	\$ 350,000	\$ 350,000									
Church Stabilization	\$ 200,000	\$ 200,000									
Property Fencing	\$ -										
Electric Power & Communication	\$ 2,206,680	\$ 2,206,680									
Owner's Costs (Year 1 - G&A)	\$ 1,579,000	\$ 1,579,000									
Total	\$ 6,000,680	\$ 6,000,680	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Total Capital	\$ 50,977,327	\$ 35,750,987	\$ 8,776,000	\$ -	\$ 3,479,840	\$ 296,000	\$ 2,674,500	\$ -	\$ -	\$ -	

TAX AND DEPRECIATION SCHEDULE CERRO SAN PEDRO

Asset Depreciation Schedule	annual rate	NOTES
Technical Assistance	10%	(used for engineering, construction mgmt, owners costs)
Pre Operating Expenses	10%	Pre strip and road development
Mining Concession Acquisition Cost	10%	does not include acquisition cost
Buildings and Structures	5%	too small-ignore
Process Plant and Equipment	6%	deduct engineering, construction mgmt,
Furniture and Office Equipment	10%	too small-ignore
Heavy Duty Trucks, Autos	25%	incl in mining equip
Mobile Mine Equipment	25%	incl in mining equip
Computers	30%	too small-ignore
Pollution Control Equipment	100%	leach pad qualifies (Dave says it's better spread over the heaped ounces)
Electrical Production and Distribution	10%	power line to site+transformers and distribution
Equipment and Activities unspecified	10%	use for all unspecified infrastructure

ANNUAL DEPRECIATION		Pre-strip	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9-12
Exploration		\$	-	\$	-	\$	-	\$	-	\$	-
TOTAL		\$	-	\$	-	\$	-	\$	-	\$	-
Development		\$	190,717	\$	190,717	\$	190,717	\$	190,717	\$	190,717
TOTAL		\$	190,717	\$	190,717	\$	190,717	\$	190,717	\$	190,717
Prestrip		\$	670,600	\$	670,600	\$	670,600	\$	670,600	\$	670,600
TOTAL		\$	670,600	\$	670,600	\$	670,600	\$	670,600	\$	670,600
Mobile Equipment		\$	2,767,100	\$	2,767,100	\$	2,767,100				
				\$	2,194,000	\$	2,194,000	\$	2,194,000		
						\$	-	\$	-		
						\$	-	\$	-	\$	-
						\$	-	\$	-	\$	-
shop and powder silo		\$	47,895	\$	47,895	\$	47,895	\$	47,895	\$	47,895
										\$	-
										\$	-
TOTAL		\$	2,814,995	\$	5,008,995	\$	5,008,995	\$	2,241,895	\$	716,520
Process Plant		\$	4,774,527	\$	312,187	\$	312,187	\$	312,187	\$	312,187
TOTAL		\$	4,774,527	\$	312,187	\$	312,187	\$	312,187	\$	312,187
Administration/Infrastructure		\$	744,068	\$	544,068	\$	544,068	\$	544,068	\$	544,068
TOTAL		\$	744,068	\$	544,068	\$	544,068	\$	544,068	\$	544,068
Total Depreciation BY YEAR		\$	-	\$	9,194,907	\$	6,726,567	\$	6,726,567	\$	10,206,407
Undepreciated Asset Base "UDAB"		\$	35,750,987	\$	35,332,080	\$	28,605,513	\$	25,358,786	\$	15,448,379
Asset Tax 1.8% of UDAB (start yr 3 as per regs.)		\$	-	\$	-	\$	-	\$	456,458	\$	278,071
Beginning Tax Loss Carry Forward		\$	19,000,000	\$	21,419,241	\$	32,724,720	\$	31,293,221	\$	28,773,310
Gross Income (Loss)		\$	(2,419,241)	\$	(11,305,479)	\$	1,431,499	\$	2,519,911	\$	6,693,281
Ending Carry Forward Balance		\$	21,419,241	\$	32,724,720	\$	31,293,221	\$	28,773,310	\$	22,080,029
Taxable Income										\$	-
Federal Tax @ 30% of Gross Earnings		\$	-	\$	-	\$	-	\$	-	\$	400,711
FEDERAL INCOME TAX PAID											
Greater of asset tax or 30%, less Tax Credit		\$	-	\$	-	\$	-	\$	456,458	\$	278,071
Beginning Asset Tax Credit Carryforward		\$	-	\$	-	\$	-	\$	456,458	\$	278,071
Asset Tax Credit Added		\$	-	\$	-	\$	-	\$	456,458	\$	278,071
Asset Tax Credit Carryforward Used		\$	-	\$	-	\$	-	\$	-	\$	-
Ending Asset Tax Carryforward Balance		\$	-	\$	-	\$	-	\$	-	\$	-

FINANCING CERRO SAN PEDRO

Assumptions:

Financing begins mid year 0.		
Payback begins when project has positive C.F.'s.		
Loan Repayment rate as % of C.F. =		100%
Interest Rate (LIBOR + Premium) =		9.500%
Loan Facility Expenses =	\$	250,000
Loan Commitment Fee =	\$	300,000
Facility Fee @ 0.1875% =	\$	90,406
Total Loan Cost	\$	640,406

	Pre-strip	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Project Free Cash Flow Before Taxes	\$ (35,750,987)	\$ (6,817,465)	\$ 12,160,966	\$ 8,775,076	\$ 18,324,878	\$ 8,888,831	\$ 18,677,658	\$ 16,257,287	\$ 7,503,902
Working Capital Need (1 mos Direct Op Cost)	\$	\$ 1,574,227							
Cummulative Cash Flow before interest costs	\$ (35,750,987)	\$ (44,142,679)	\$ (31,981,713)	\$ (23,206,638)	\$ (4,881,760)	\$ 4,007,072	\$ 22,684,729	\$ 38,942,016	\$ 46,445,918
Estimated Interest Costs	\$ (1,698,172)	\$ (4,073,590)	\$ (3,959,420)	\$ (2,870,484)	\$ (1,460,948)	\$ -	\$ -	\$ -	\$ -
Total Finance Requirement	\$ (37,449,159)	\$ (48,216,269)	\$ (35,941,133)	\$ (26,077,122)	\$ (6,342,708)	\$ 4,007,072	\$ 22,684,729	\$ 38,942,016	\$ 46,445,918
Beginning Loan Balance	\$ -	\$ (37,449,159)	\$ (48,216,269)	\$ (36,055,303)	\$ (27,280,227)	\$ (8,955,350)	\$ (66,518)	\$ -	\$ -
Draw	\$ (37,449,159)	\$ (10,767,110)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Repayment	\$ -	\$ -	\$ 12,160,966	\$ 8,775,076	\$ 18,324,878	\$ 8,888,831	\$ 66,518	\$ -	\$ -
Ending Balance	\$ (37,449,159)	\$ (48,216,269)	\$ (36,055,303)	\$ (27,280,227)	\$ (8,955,350)	\$ (66,518)	\$ -	\$ -	\$ -
Interest Costs	\$ (1,778,835)	\$ (4,069,108)	\$ (4,002,900)	\$ (3,008,438)	\$ (1,721,190)	\$ (428,539)	\$ (3,160)	\$ -	\$ -
Fees & Loan Expenses	\$ (640,406)								
Total Loan Costs	\$ (15,652,574)	\$ (2,419,241)	\$ (4,069,108)	\$ (4,002,900)	\$ (3,008,438)	\$ (1,721,190)	\$ (428,539)	\$ (3,160)	\$ -

1.17 Conclusions and Recommendations

This Feasibility Study was performed with the purpose of improving project economics by decreasing costs and simplifying operations. The results of this Feasibility Study are based on developing the Cerro San Pedro Project as a run of mine operation and utilizing large major mining equipment. Due to the relative short mine life, much of the major equipment will be purchased used and refurbished wherever possible.

The same general format and much of the relevant information contained in the feasibility study for the Cerro San Pedro Project completed by Cambior in 1999 has been utilized in this study. Both the Cambior study and the original 1997 feasibility study completed by Kilborn, included crushing the ore and conveying it to the leach pad which results in higher metal recoveries at higher capital and operating costs. Conversely, in a run of mine operation, the costs for crushing and conveying are eliminated by hauling the ore directly from the pit to the leach pad which reduces overall costs at the expense of decreasing metal recoveries.

The main parameters used in the Feasibility Study are as follows:

- Commodity Prices: \$275 per ounce for gold and \$5.00 per ounce for silver
- Process Rate: up to 8.0 million tonnes/year (22,000 tpd)
- Average Annual Production: 120,000 ounces gold equivalent
- Mine Life: 7.25 years
- Initial Capital Cost: \$45 million
- Total Capital Cost: \$51 million
- Operating Cost: \$2.78 per ore tonne
- Project financing interest rate: 9.5%
- Start of Construction: To be evaluated as metal prices improve.

Conclusions

Main conclusions regarding the economics of the project, as presented in Section 16.0, are summarized below:

- Initial capital cost is \$45 million that amounts to \$52 per ounce of gold equivalent produced.

- Average cash operating cost, including royalties, is estimated at \$166 per ounce of gold equivalent over the project life.
- At a base commodity price of \$275 per ounce of gold and \$5.00 per ounce of silver, the project after-tax rate of return is 8.4 percent.
- An increase in commodity prices to \$300 for gold and \$5.25 for silver yields an after-tax rate of return of 13.9 percent.
- Sensitivity analyses suggest that project economics are most sensitive to operating costs and less sensitive to capital costs.

Recommendations

Based on the results of this Feasibility Study, it is recommended that the necessary funding be provided for maintaining the Cerro San Pedro Project on a ready status until metal prices improve.

In order to be in a position to react quickly to a favorable change in metal prices, it is important that the project maintains an active presence at the local, state, and national levels. This will require a small staff in San Luis Potosi dedicated to follow up on permit requirements, land and mining concession issues, and community relations.

A budget has been developed for 2001 with this purpose in mind. Funding is provided for completing the construction of La Zapatilla village, fencing the property boundary, stabilizing the church, relocating the MSX office to the project site, and to cover G&A costs. In addition, there are two mineral rights payments due and the municipal construction permit must be renewed in June. The details are summarized below:

Cerro San Pedro Project – 2001 Budget	
La Zapatilla Village Construction	\$ 300,000
Property Fencing	\$ 200,000
Church Stabilization	\$ 300,000
Office Relocation	\$ 250,000
Administrative Holding Costs	\$ 825,600
Mineral Rights Payments	\$ 453,000
Municipal Permit	\$ 25,000
Total	\$ 2,333,600