Sangilo Mines Expansion Project

PROJECT DESCRIPTION FOR SCOPING

Prepared for:

Itogon-Suyoc Resources Inc. (ISRI)
3303-D West Tower PSE Centre
Ortigas, Pasig City

Prepared by:

Lichel Technologies, Inc.
Unit 1403 Prestige Tower Condominium
F. Ortigas Jr. Road, Ortigas Center Pasig City

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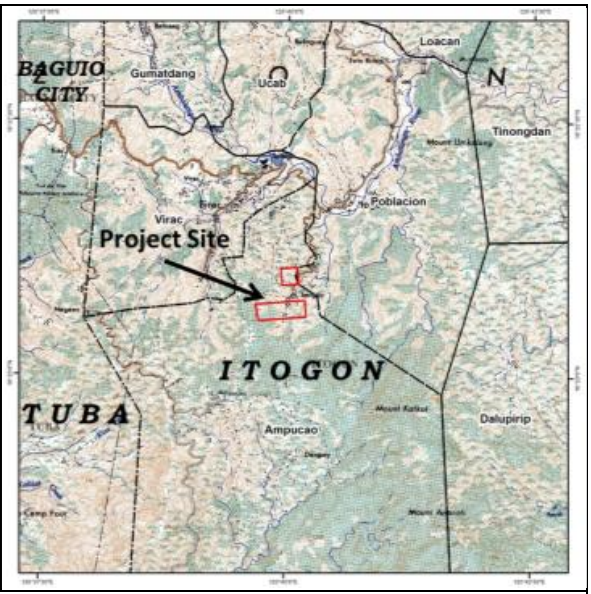
1 BASIC PROJECT INFORMATION

Name of Project:	**Sangilo Mines Expansion Project**	
Project Location:	Barangays Ampucao and Poblacion, Itogon, Benguet	
Project Capacity:	From 200 tpd to 500 tpd (175,000 tons per year)	
Project Proponent:	**Itogon-Suyoc Resources Inc. (ISRI)**	
Proponent's Address	Sangilo, Itogon, Benquet, P.O. Box 463, Baguio City ,2600	
Contact Persons:	Name : Eric S. Andal Designation/ Position : Vice President for Geology and Exploration OIC Resident Manager Address : Sangilo, Poblacion, Itogon, Benguet Contact Number : 09294245087 Email-Add : esandal@apexmining.com Name : Marcela C. Lumbania Designation/ Position : MEPEO Manager & PCO-Sangilo Mine Site Address : Sangilo, Poblacion, Itogon, Benguet Contact Number : 09479216035 Email-Add : mcl@itogonsuyoc.com	
Contact Information:	Tel: (074) 423-1570; (02) 706 2805/06 Fax No.: (02) 633 706 Email Add: mgt@itogonsuyoc.com	
Name of Consultant:	**Lichel technologies inc.**	
Consultant's Address:	Unit 1403 Prestige Tower Condominium, F. Ortigas Jr. Road, Ortigas Center, Pasig City	
Contact Person:	**Rachel A. Vasquez**	
Position/ Designation:	Managing Director	
Contact No:	02-86330094	
E-mail Address	ravasquez@licheltechnologies.com	
Estimated Project Cost	**PhP 507.14 Million**	

2 PROJECT DESCRIPTION

2.1 Project Location and Area

2.1.1 Project Location

ISRI's mining claims, including the patented claims are within the 120°39'36" to 120°40'44" east longitude and 16°19'18" to 16°21'55" north latitude. It is about 270 km northwest from Manila, and 23 km by mountain road southeast of Baguio City. The Sangilo Mine of ISRI is located in Sitio Sangilo, Brgy. Poblacion, within the Itogon Municipality, Province of Benguet.

The company owns four (4) Mining Patents namely Taka, Tabaan, King and Sesame. They are all located in Sitio Sangilo, Brgy. Poblacion, Itogon, Benguet. The lode claims that were not patented used to be covered by a Mining Lease Contract (MLC) that has expired September 28, 2012. Before the expiration of MLC ISRI filed an application for production sharing agreement denominated as APSA-103.

Figure 2-1 shows the location map of the proposed project. **Figure 2-2** shows the mining tenements of Itogon-Suyoc Res. Inc. APSA 103 is indicated as the green-filled polygon. Indicated in yellow-filled box are the patented claims: King, Tabaan, Taka and Sesame, where the underground mining operation is located.

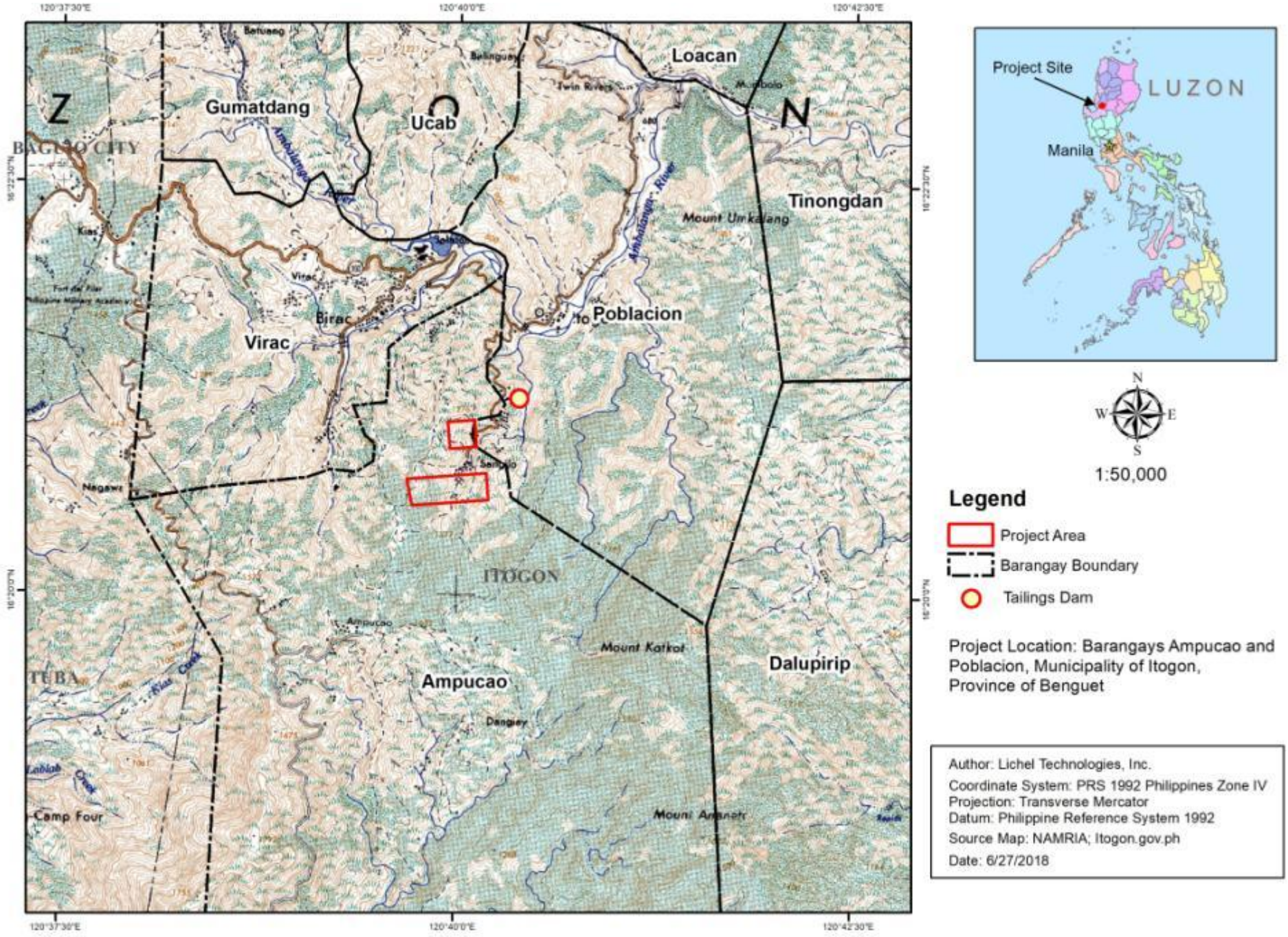
2.1.2 Accessibility of Project Site

The project is accessible via a 5-hour road travel from Manila through NLEX, SCTEX , TPLEX and Marcos Highway. From the Rosario Exit of TPLEX, th site is reached in two hours via Marcos Higway and Loakan Road (**Figure 2-3**).

2.2 Project Rationale

Since the resumption of Sangilo Mine operation in 2012, ISRI is gradually increasing the production capacity of the plant. Starting from 30 tpd, the plant has increased its capacity to 50 tpd in 2014. ISRI plans to expand the production to 200 tpd in 2018 taking advantage of the high price of gold metal which can cover the cost of mining and milling operation taking into consider ation the environmental and social programs among others.

A two (2)-stage program is planned for the development and resumption of ISRI's Sangilo Mine. The first stage is a 200 tpd operation mining from L-0 to L-6 and below L-0 down to L-500 underground levels. Improvements in existing Mine and Mill facilities will bring the operation to the planned scale in 15 months and will involve US$14M USD. Management have started incremental addition of equipment that brought Sangilo Mine from 30 tpd to 50 tpd, and eventually to an interim 75 tpd by 2017, operating inside the company's 35ha Patented Claims. An additional US$8.3M is required to bring the project to its 500 tpd target. Based on available geological data, remaining resources inside the Patented Claims can support a 500 tpd operation for 10 years.



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Unit 1403 Prestige Tower Condominium
F. Ortigas, Jr. Road, Ortigas Center, Pasig City

FIGURE TITLE :

Project Location Map

FIGURE NO.:

2-1

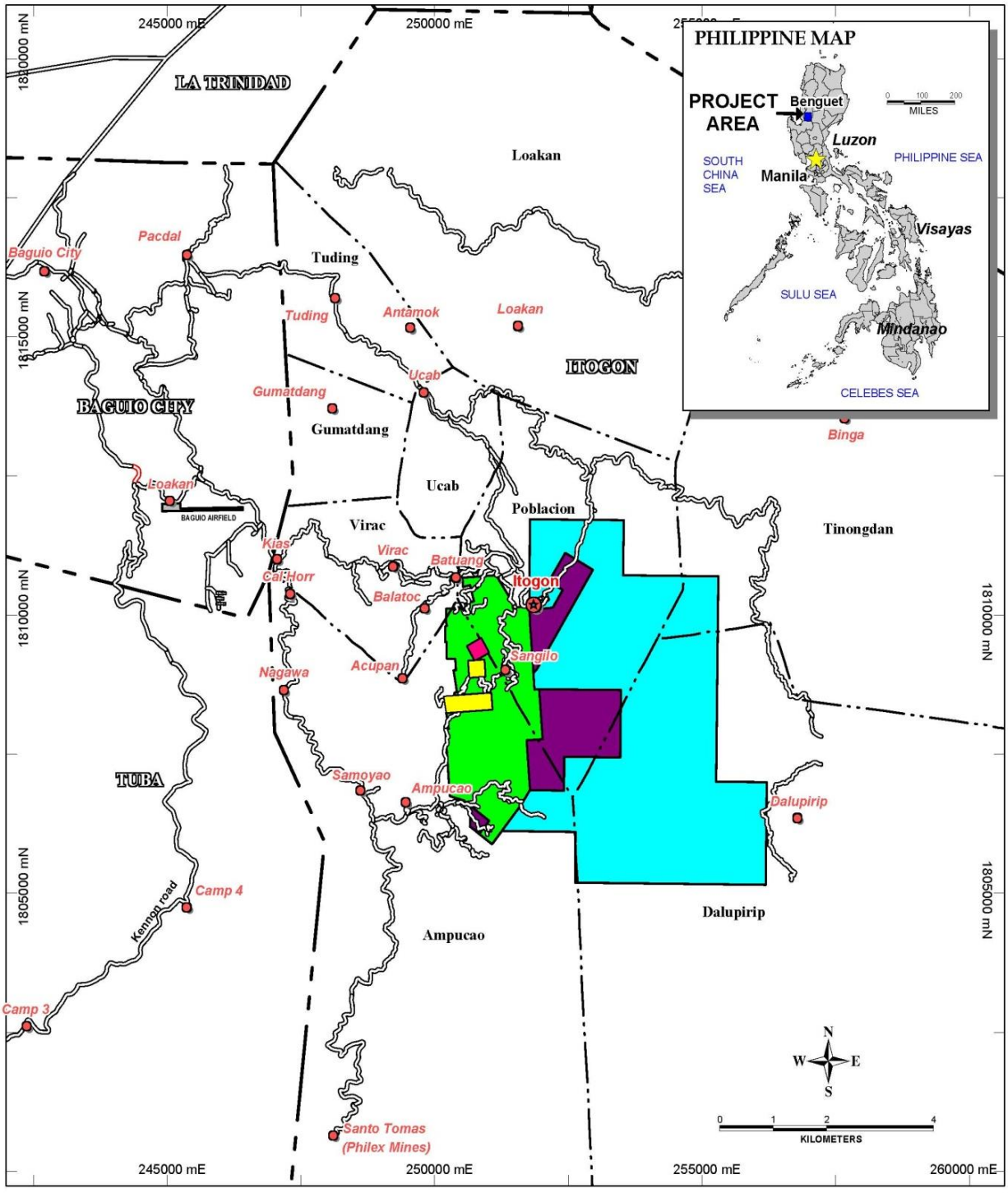

Figure 2-2: Tenement Map of ISRI

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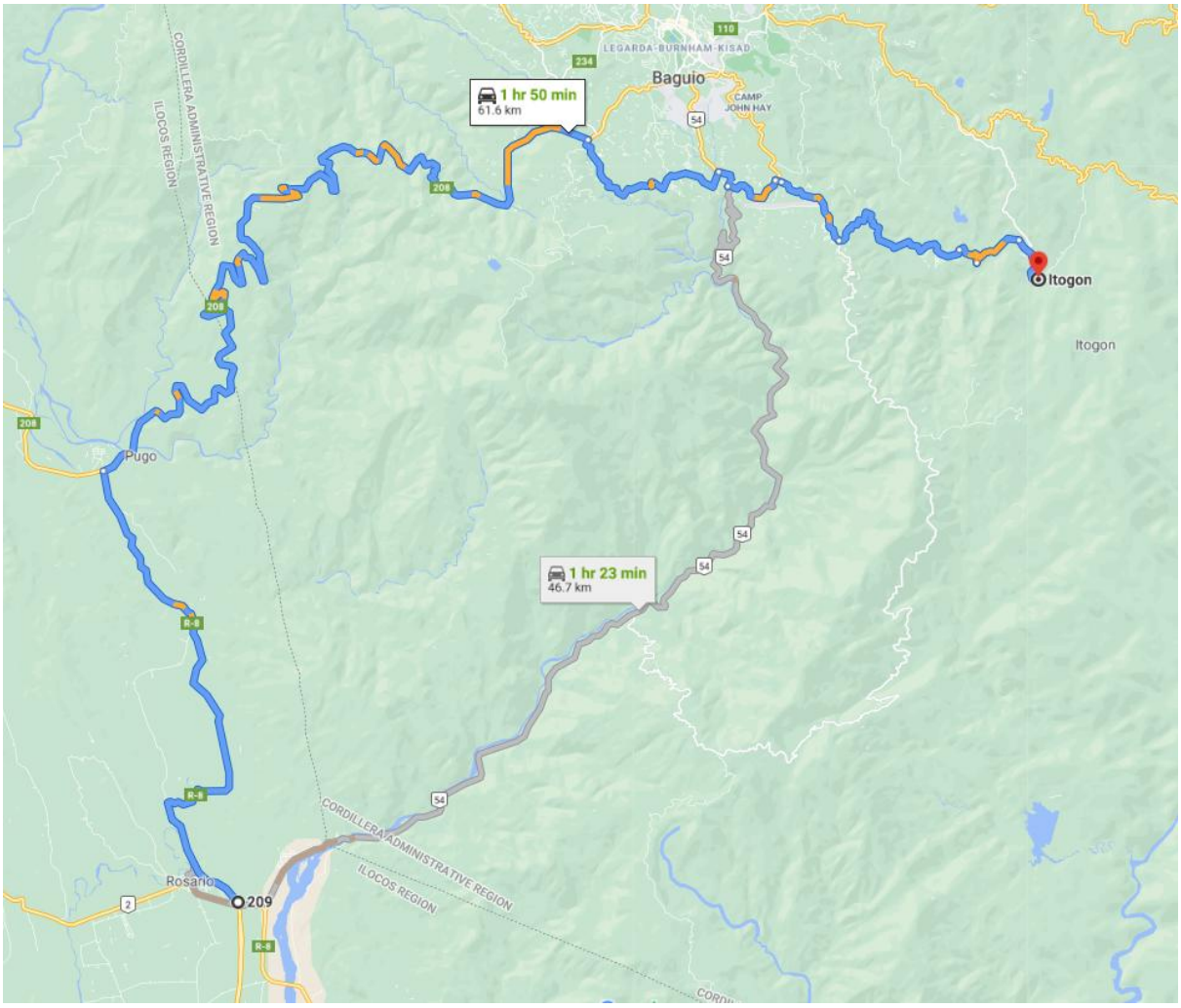

Figure 2-3: Project Site Accesibility

Aside from the 35 ha Patented Claims, the Sangilo Mine has also its pending Application for Mineral Property Sharing Agreement denominated as APSA-103-CAR. APSA-103 is an intended renewal of the company's Lease Mining Contract (LMC) area that expired in 2012. Approval of APSA-103 will increase the available area to 617 ha, giving access to the 22M tons of Ore Resource. Approval and access to the Resources inside APSA-103 is one of the pre-requisites to initiating Stage 2 which is a 1500 tpd operation. This is independent of the 500 tpd in Stage 1. After completion, the total operating capacity of Sangilo Mine will be 1900 tpd.

For the initial period of 500 tpd operation, the main ore source will be the Taka Barr Vein and adjacent splits, which are all inside the Patented Claims from L-0 down to L-500. Underground development will later proceed below L-500, and after the approval of APSA-103-CAR it will expand outside of the Patented Claims.

Dalton Pacific Resources, Inc, an Australia-based mining company conducted a thorough review of available data from ISRI. They estimated 646,365 tons of ore at 5.83 g/t Au average grade remains in the Taka Barr Vein alone from the surface down to L-1300. This can provide 4.5 years of ore from one vein only. In an in-house resource estimation using available data from seventeen (17) veins and veinlets inside the Patented Claims, from L-6 down to L-500 only, 701,778 tons is estimated at 75% recoverability. It is logical to assume that below L-500 there is at least the same volume, or much bigger as the levels below L-500 is less developed by previous operations. This

assures 10 years or more of available ore for the 500 tpd operation from inside the Patented Claims alone.

Based on the resource estimated by Dalton for APSA-103 the gold veins can sustain the mine for 86 years at 500 tpd, or 18 years at 1900 tpd. Additional resource from the Go-Wrong Breccia will add another ~16 years to the mine life, for a possible 34 years of operation at 1900 tpd.

Mining will be a combination of Conventional and Trackless using Shrinkage, Top Slice and Cut-and-fill methods. Ore from below L-0 above will the trammed using locomotives and mine cars, below L-0 ore will be hoisted by the Taka Shaft to the Mill. Rock waste will be used to fill voids to minimize dumping outside.

Carbon-in-pulp cyanidation gold recovery process will be used in the plant. An efficiency of 87.5% recovery is expected. Barren pulp will be stored in the Tailings Storage Facility. A separate processing plant will be constructed for the second phase 1400 tpd, which will bring the total capacity to 1900 tpd.

At 500 tpd Sangilo Mine is expected to have an annual production of 19,580oz, generating estimated net revenue of $24.68M per year. Earnings before income tax, depreciation and depletion are estimated at $11.7M. The target 500 tpd mine development will require a total project investment of $22.3M, with 30% equity and 70% financing from debt financing. Based on financial projections, a sustained operation with gold within $1,250 will have a payback period of 2.75 years and an internal rate of return of 37.6%.

2.3 Project Alternatives

2.3.1 Siting

Due to the nature of the Project, no other sites were considered for the project.

2.3.2 No Project Option

If the Project Expansion is not implemented, the opportunity to economically operate the project at higher capacity will be lost. The viability of the project is basically based on metal price particulary gold which has steadily increased in the past 20 years from a low of 8.46 USD/g (2001) to a high of 66.55 USD/g (2020).

2.4 Project Components

In general, the selection of dredging equipment for any one project is determined by the Contractor appointed to the work based on the current availability of and geotechnical considerations.

Table 2-1 is list of available dredging equipment that could, in principle, be used to dredge the assigned segment area of the Cagayan River:

Table 2-1: Summary of Project Components

Particulars	No. of Units for 200 TPD (Existing)	No. of Units for 500 TPD (Expansion)
MINE		
Mucking Machine	7	
Locomotive	5	
Battery Locomotive Power Device	18	

Particulars	No. of Units for 200 TPD (Existing)	No. of Units for 500 TPD (Expansion)
Battery Locomotive Charger	7	
Mine Car	27	
Ventilation Blower	7	
Rock Drill	64	
Tugger Hoist	3	
Load, Haul, Dump (LHD)	5	2
LHD mini		2
UG Air Compressor	7	
Slusher	7	
Jumbo Drill Machine	4	
UG Truck	3	
Pressure Vessel	7	
Submersible Pumps	4	
Shotcrete	1	
Dump Truck	1	2
Electric Chain Hoist		2
Blower		11
4.3 HP Submersible Water Pump		1
2.5 HDPE Pipe, Pumping		45
ANFO Loader		2
Power Device, 2.5T Loco		3
Battery Rectifier, 2.5T Loco		7
LHD Overhauling Kit		1
Spare LHD Bucket		1
MILL		
Jaw Crusher	1	
Cone Crusher	1	
Classifier	3	
Conveyor	1	
Motor	3	
Scrubber	1	
Grinding Tank	2	
Ball Mill	2	
Slurry Pump	10	
CIP Tank	11	
CIP Control Panels	2	
CIP Motors	4	
Agitator	1	
Heater	1	
Cyclone	2	
Blower Compressor	7	
Vibrating Screen	5	
Refinery Ashing Vessel	5	
Refinery Scrubber	1	2
Geared Motor for Leach Tank: 22km, 440.3 Phase, 50 rpm output		4
Auto-dosing Pum, 10 to 100 l/hr, chemical resistant		1
Payloader		2
Density Meter with complete accessories		1
Lubricator for trunnion gear of 9'x15' Ball Mill		1
Lubricator for ring gear of 9'x15' Ball Mill		2

Particulars	No. of Units for 200 TPD (Existing)	No. of Units for 500 TPD (Expansion)
Conveyor: 610 mm width, 3 ply belt conveyor		8
Screw Classifier: 145-260 t/d roating sand, 21-75 t/d overflow		1
Vibrating Screen: 1.25m W x 3m L, 2 deck		1
Cone Crusher: 3' short head, 40 cu m /h		2
Belt Conveyor Weightometer: 0-40 t/h		1
Slurry Pump: 6/4 D SC; 440 volts; 3 phase		2
Trash Screen: 1.25m W x 3m L		1
Knelson Concetrator		1
Jig Concentrating Table: 4' W x 7' L; 440 volts, 4 phase		1
Carbon Transfer Screen: Swept Axial, Apperture: 0.8 mm Kambalda		4
Thickener Underflow Slurry Pump: Size 6/4 D SC;		2
Carbon Transfer Screen Pump: vertical spindle recessed impeller		4
Sump Pump CIP/CIL Area: Capacity 25 cu m/h, vertical spindle		1
Reclaim Solution Pump: 4/3 AH		2

2.5 Process Technology

2.6 Project Size

ISRI is currently operating at 200 tpd. It plans to increase the plant rated capacity to 500 tpd or 175,000 tons per year (350 working days per year).

The estimated life of mine for the expansion based on the mineral resources (**Table 2-2**) is more than ten (10) years. The current mineral resource will be upgraded as exploration and mining development proceeds.

Table 2-2: Mineral Resource

Category	Tonnage (MT)	Grade/Assay (g/t Au)
Measured	219,552	4.18
Indicated	231,430	3.91
Inferred	18,475,350	3.27
TOTAL	**18,926,332**	**3.29**

2.7 Development Plan, Description of Project Phases and Corresponding Timeframes

2.7.1 Pre-Construction Phase

2.7.1.1 Permitting

Necessary permits/clearances will be acquired during this phase. This will include the acquisition of ECC and permits for construction of facilities.

2.7.1.2 Planning

This will include the finalization of mine and mill design. Awarding of work to contractors may also occur during this stage of the pre-construction phase.

2.7.2 Construction/ Development Phase

2.7.2.1 Mine Development

Developments are continuous process to sustain production and are done in all mine levels from L-0 (mine portal, starting level) to L-500 (500 m from L-0). Development activities include rehabilitation, driving ramp, counter drives, raises and crosscuts to access target veins.

Rehabilitation activities include installation of ground supports, cleaning, and widening of openings, which will be done in different levels. A spiral ramp is constructed to access all levels. It is driven from a lower level going up to higher level by a continuous sequence of drilling, blasting, and mucking until the target level is reached.

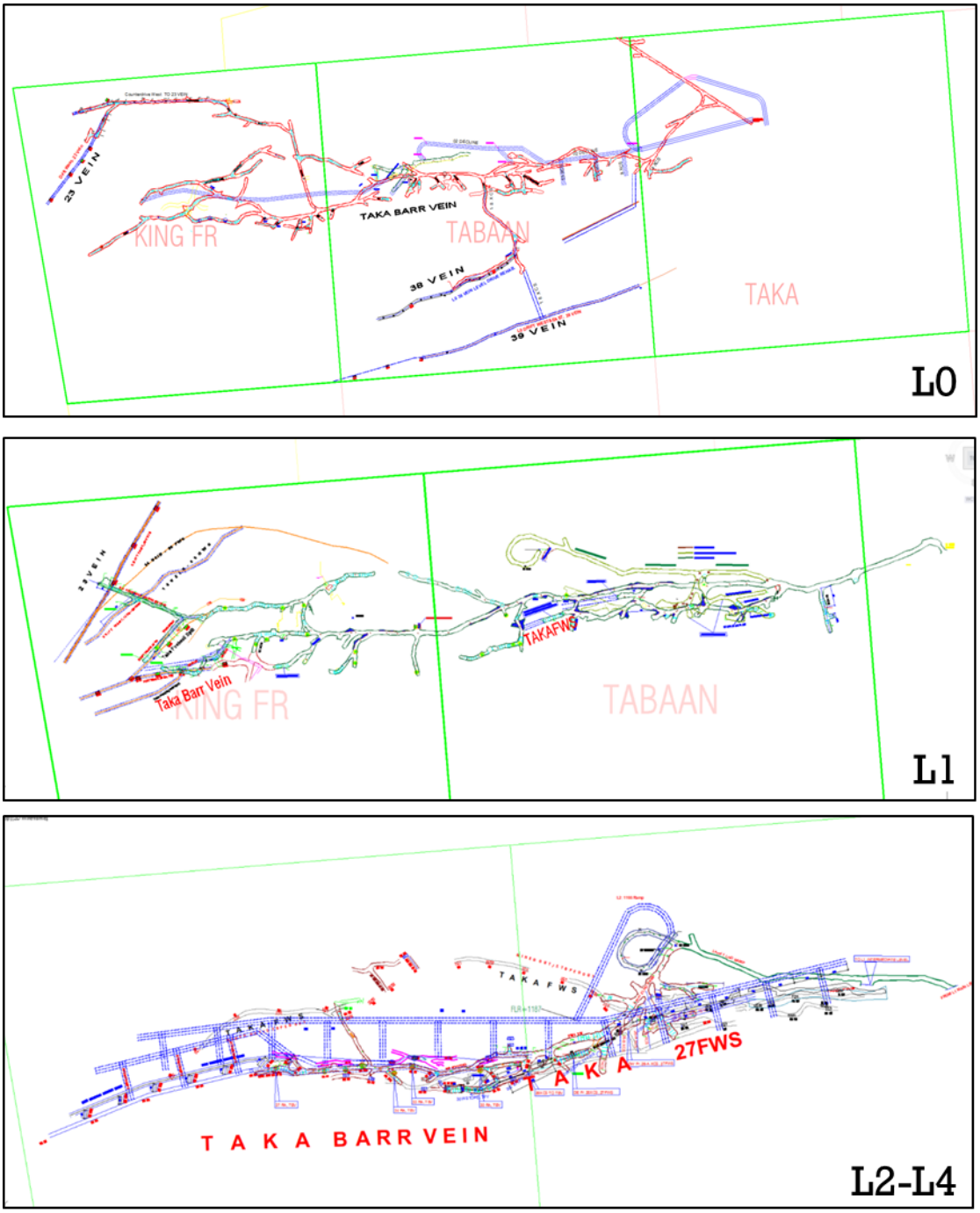

Figure 2-4: Underground Development (Upper Levels)

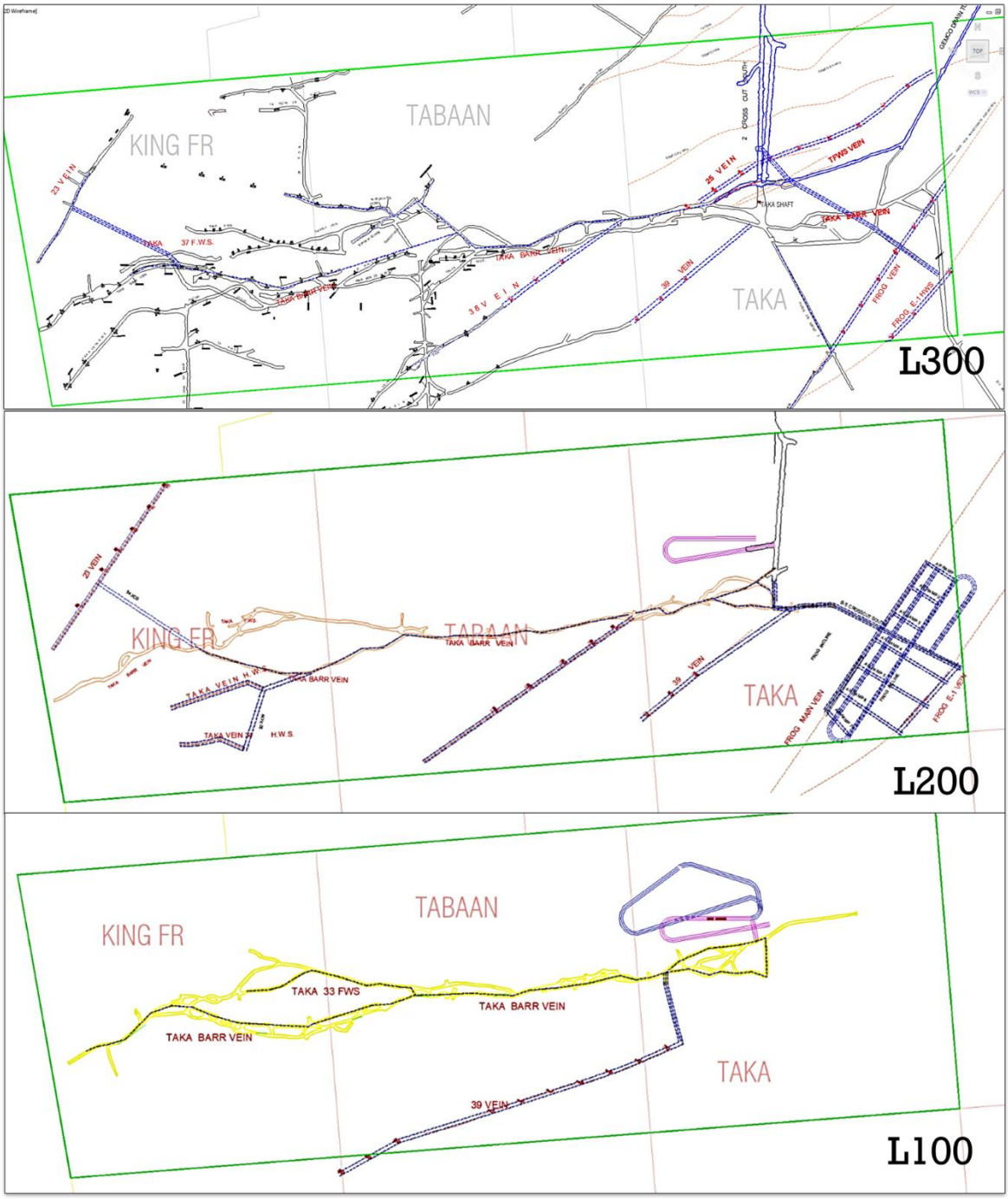

Figure 2-5: Underground Development (L-0 to L-300)

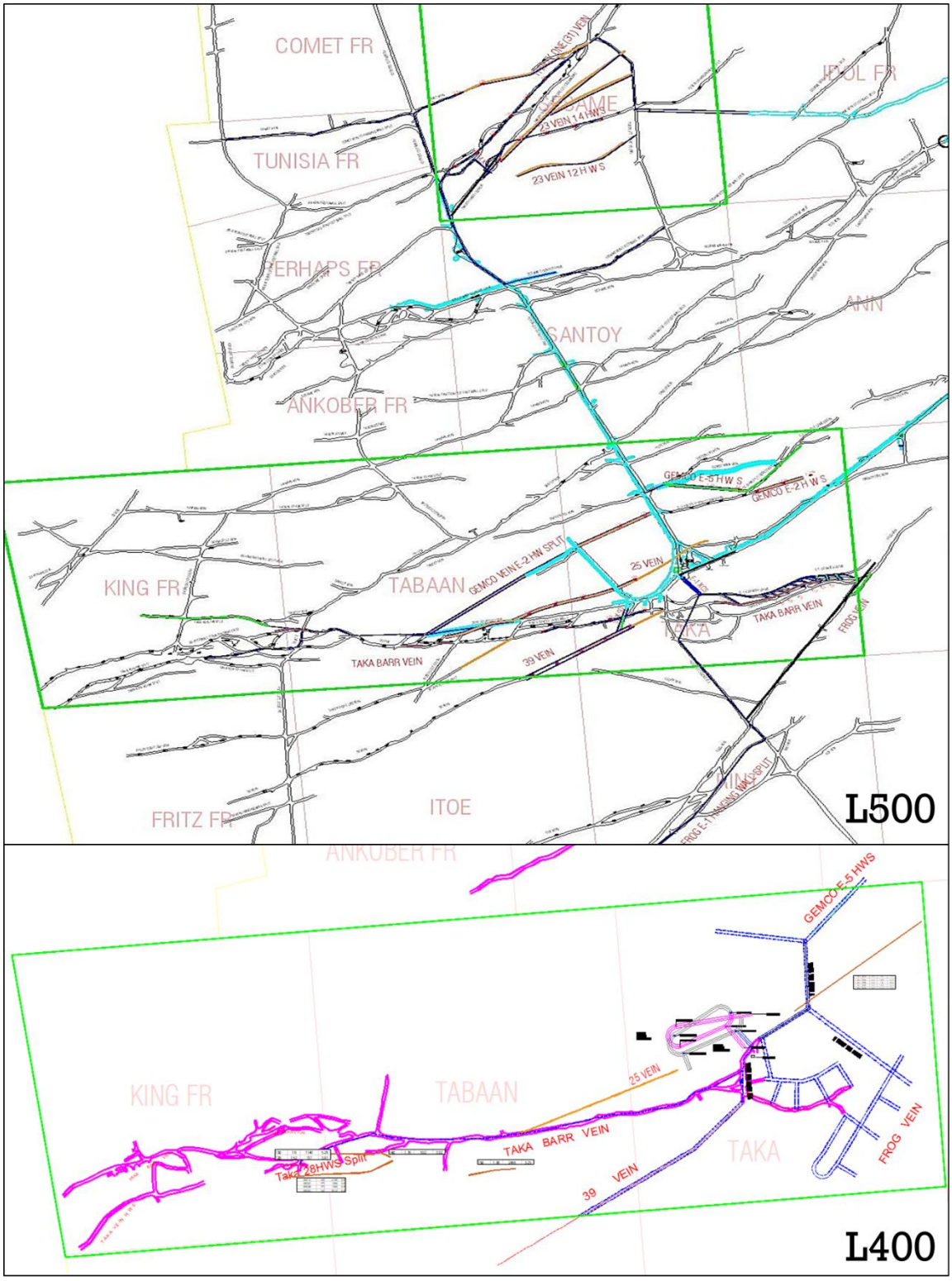

Figure 2-6: Underground Development (L-400 to L-500)

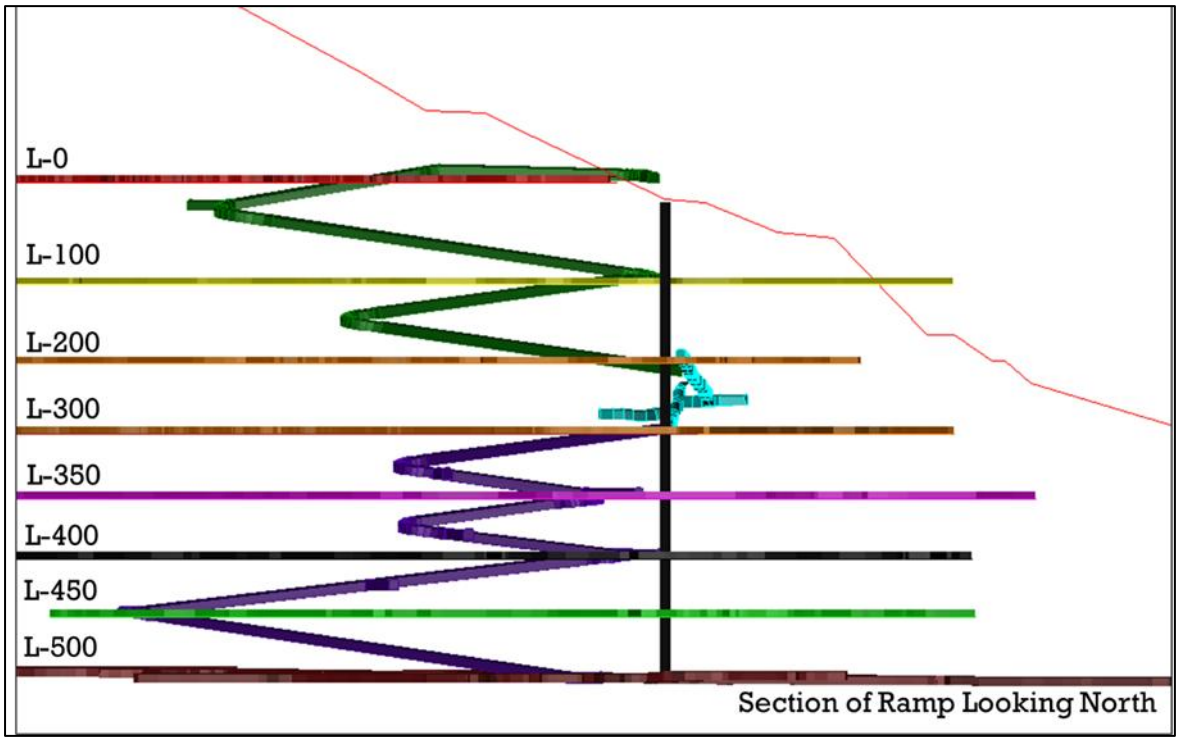

Figure 2-7: Central Ramp from L500 to Mine Yard

For 500 TPD operation, ore will be coming from different underground mining (UG) levels from L500 and above. Initially, mining will be limited on patented claims but will expand once the application for the APSA 103 is approved.

Mining started through conventional mining from L-0 and above (Upper levels) at 75 tpd operation. This was increased to 200 tpd using combined trackless and conventional methods from L-300 and L-0.

Currently L-0 and above (Upper Level) is already undergoing development and mining. Development proceeds horizontally within the boundaries of the Patented Claims and vertically until the crown pillar in L-6. Stoping started using conventional mining methods from 75tpd to 100tpd operation this can be increaseup to 200tpd-300tpd through introduction of trackless equipment particularly Load-Haul-Dump(LHD) using cut and fill method. This semi-conventional mining will employ the usual drill and blast method using hand held rock drills machines, mucking or loading using pneumatic rocker shovel or LHD and haulingusinglocomotiveandminecarstothemine ore yard.

Operations of L-300 and L-500 (Lower Level) will employ trackless equipment although rock drill machines are still being used. The development and rehabilitation aims to access target veins and open every available levels for the additional 200tpd during 500tpd operation. Trackless equipment including Jumbo Drill Machine (JDM) aims to fast track development of the ramp which connects and opens working levels.This will also serve as main hauling of ore using LPTs to the mill. Currently, incline to L0 and decline to L500 are simultaneously being driven from L300.The ramp can open 7 previous working levels which will be re-establish through rehabilitation and development once connected. Stoping will employ cut and fill mining method using trackless equipment to maximize production. Ores are hauled from underground through central ramp that connects different levels to the surface or mill.

Various ground supports are used to stabilize working areas depending on ground condition.For moderate to hard ground, either bolts or timber stulls are used as support. Rockbolts is coupled with wiremesh, timber sets, steel sets and/or shotcrete is used for ground with heavily fractured rock.

2.7.2.2 Mining Method

Proposed mining method were chosen on the basis of ore geometry, competency of wall rock and vein, and safety of workers and equipment. Deposit shape are vein type with dip averaging from 50 to 90 degrees. Ore strength is moderately weak to strong while host rock is competent to fairly weak. For narrow veins with less than 1.5 meters vein width, conventional mining method is being practice while mechanized cut and fill stoping will be used wide veins.

In conventional mining methods, one stope length can vary from 15 meters to 30 meters depending on ground condition while stope height is maintained to 20 meters. Breaking width of stopes depends on vein width but the allowed minimum breaking width is 1.0 m. Options for conventional methods are Inclined or Rill Stoping, Flat-back Cut and Fill Stoping, Shrinkage Stoping, and Top Slice Stoping.

2.7.2.2.1 Shrinkage Stoping

Shrinkage stoping is a vertical, overhand mining method where by most of the broken ore remains in the stope to form a working floor for the miners. Another reason for leaving the broken ore in the stope is to provide additional wall support until the stope is completed and ready for draw down.

Stopes are mined upward in horizontal slices. Normally, about 35% of the ore derived from the stope cuts (the swell) can be drawn off ("shrunk") as mining progresses. As a consequence, no revenues can be obtained from the ore remaining in the stope until it is finally extracted and processed for its mineral values.

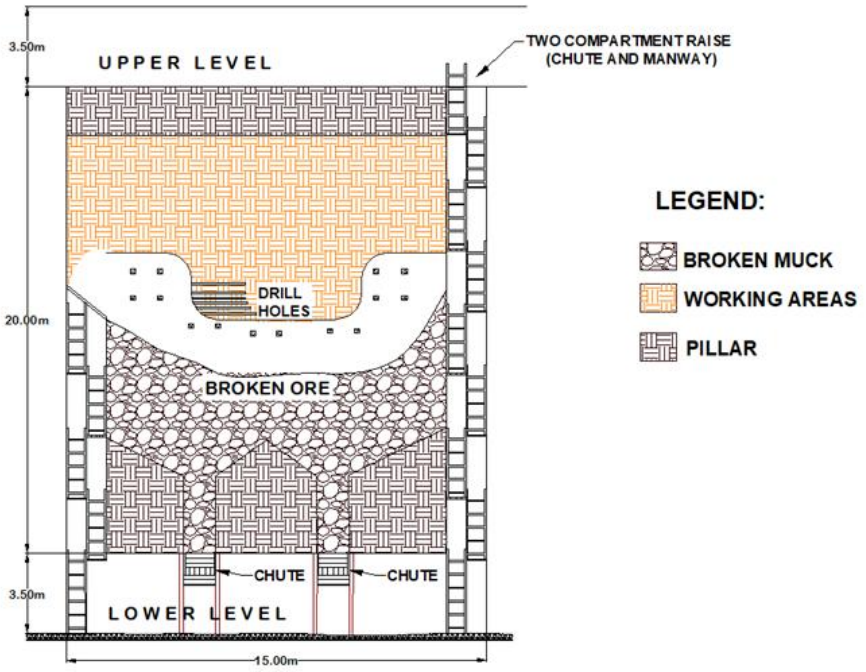

Figure 2-8: Shrinkage Stoping

2.7.2.2.2 Top Slice Stoping

Top Slice Stoping is an underhand method in which the ore is mined horizontal slices from top to bottom. A crown pillar provides support from upper level while stoping undertakes every 3 floors simultaneously then a stull pillar is left for the next cut.

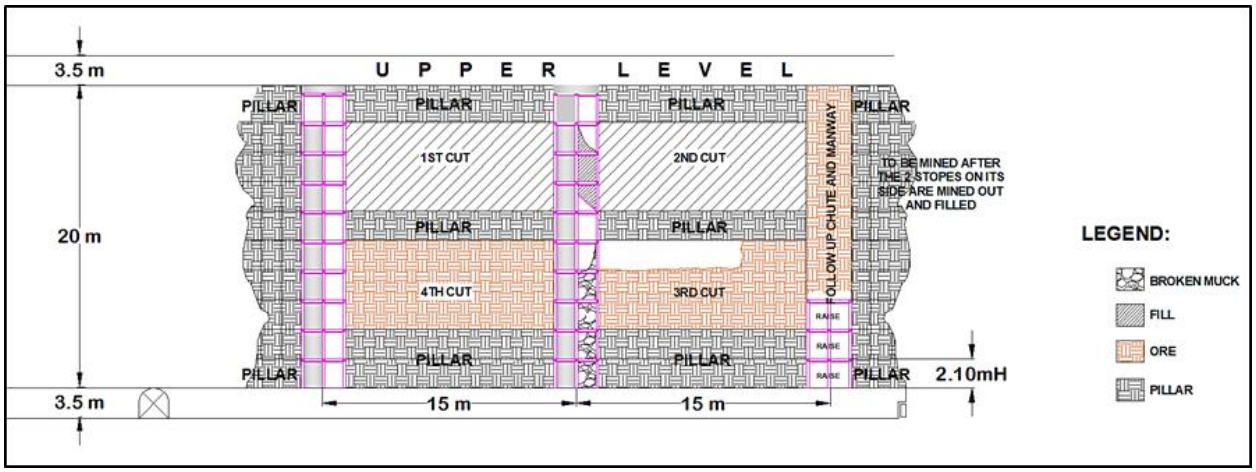

Figure 2-9: Top Slicing

2.7.2.2.3 Cut and Fill Stoping

Cut and Fill Stoping is a method in which a single excavation pass (cut) is completed and backfilled before another cut is made (Figure9). Open stoping methods often use backfill, but these are not considered as cut and fill mining methods. Cut and fill mining is primarily utilized for steeply dipping vein deposits and large, irregularly-shaped deposits. A listing of the work elements involved in completing one cut and fill mining cycle is useful in describing the method. The cycle begins with the first round after backfilling on the previous cycle. The drill-blast-mucking-ground suppor tcycle is a subcycle of the cut and fill cycle.

In this method, an attack ramp will be driven from the ramp. Waste generated from development will be use as waste fill to be able to proceed on the next cut. Backfill also serves as a wall support of the stope.

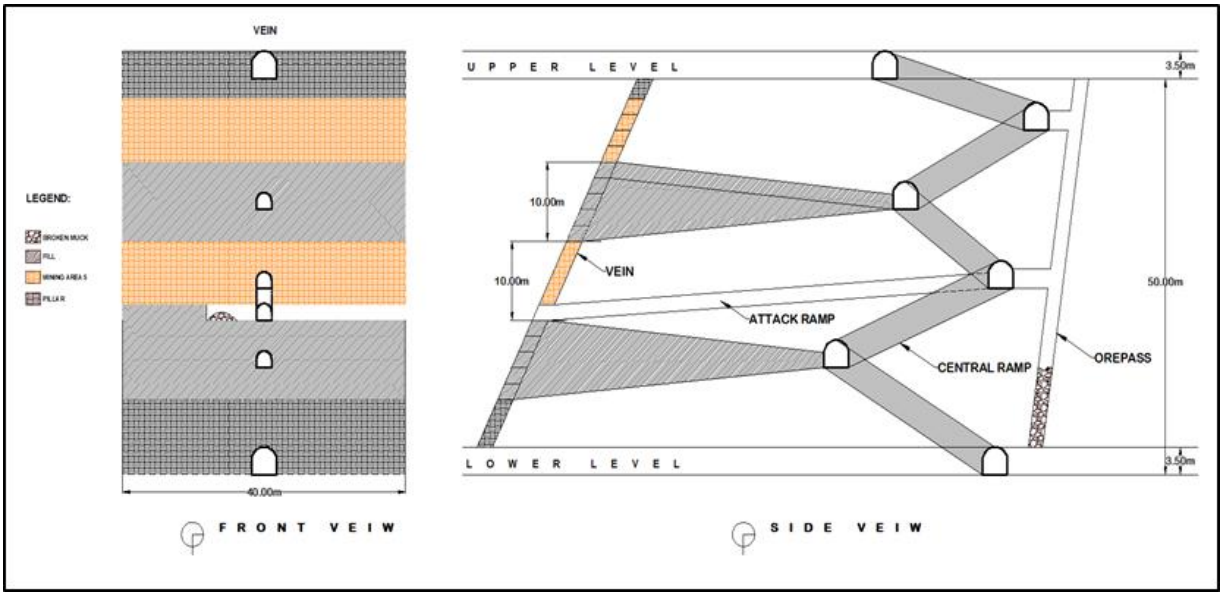

Figure 2-10: Mechanized Cut and Fill

2.7.2.2.4 Inclined or Rill Stoping

The inclined or "rill" variation of cut-and-fill stoping possesses the advantage of gravity movement of the ore to the ore passes and of filling into the stopes. It eliminates hand-shoveling for handling the ore and for placing fill in the stopes. Stope preparation will start by driving 20 m raises connecting to the upper level.

Mining starts underhand then progresses upward maintaining inclined/rill slope. Pillars will be left as support aside from installing stulls or posts. Ore is drawn and hauled at the drift by a locomotive. Filling of the stope comes from upper level where muck waste are directed into the stopes after the block is mined out.

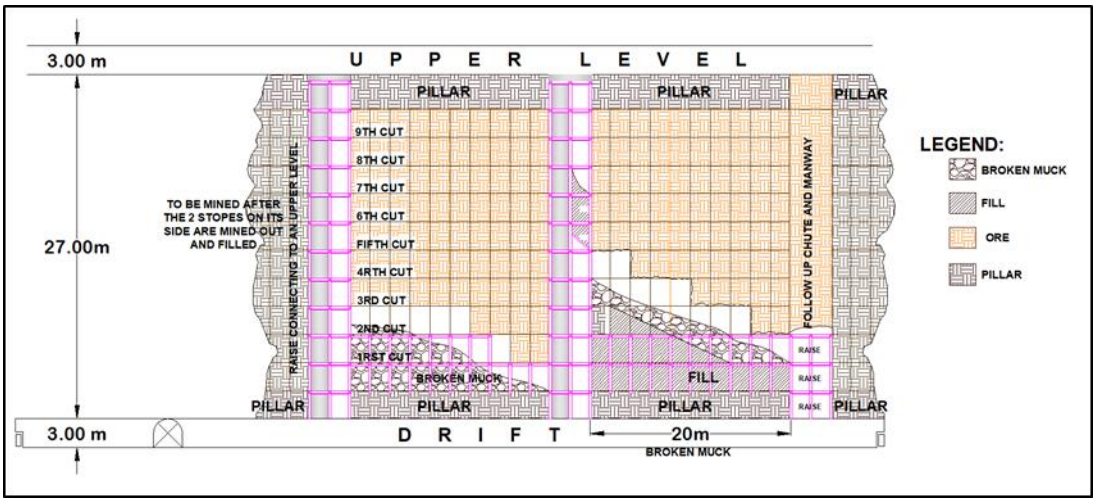

Figure 2-11: Cross Section of Inclined or Rill Stoping

2.7.2.2.5 Flat-back Cut and Fill Stoping

Flat-back cut-and-fill stoping is a method of extracting a block of ore by mining successive horizontal slices (cuts). Mining progresses upwards from a lower level to an upper level. Using handheld drilling machine, horizontal holes are drilled in the face. After the ore has been blasted, the walls and back are scaled, and temporarily supported by timber and/or rock bolts. The broken ores are scrapped into the chutes using slushers. When the cut is completed, the orepasses are extended upward, the stope is backfilled, and another cut is mined.

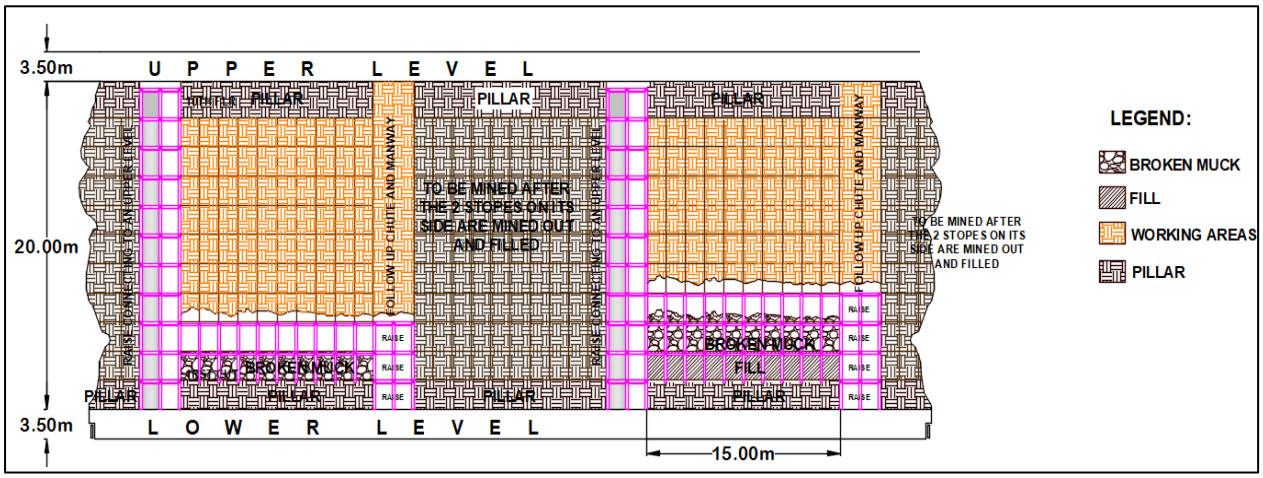

Figure 2-12: Cross Section of Flat-Back Cut and Fill Stoping

2.7.2.3 Haulage

Initially, ore haulage system will utilize trackless equipment to facilitate delivery of ore to the Mill via road network. This is while the central ramp is under development which connects different levels from Mine Ore Yard down to Level 500. Hauling broken ore from stopes will be stored in ore passes which connects sub-levels to the main haulage drift. Ore is drawn and loaded into a Low Profile Truck (LPT) to be hauled to the mine yard or mill.

2.7.2.4 Waste Disposal

Waste rock generated from initial stage of development was used as fill materials on different construction projects. Excess waste rock will be brought to waste dump area located at Corral Claim adjacent to L500 Santoy portal. This will later on be used as backfill materials for dam raising which will take place proximately.

During production phase, waste from development will be used as waste fill for the mined out stopes. Waste can be stored on waste passes and will be drawn for backfilling of stopes. Backfill material are essential during operation, these serves as a platform on Cut-and-Fill mining method. Most importantly, the wall-supporting function of backfill aids in the prevention of massive wall failures in stopes. Limited open spans help prevent caving failure in the stope back. Thus, waste disposal to the surface is limited during production to hauling cost for the operation.

2.7.2.5 Mine Drainage

With the company's operation limited within the patented area, it will utilize the gravity method of mine dewatering. Earth sump were constructed at Level 0 and Level 300 portals, where silts are collected and clear water before discharge. In addition, ponds were constructed underground as silt collectors. The plan to drain all excess water from higher level to L-300 Gemco Portal will be realized in a span of at least 6 months.

2.7.2.6 Ventilation

Effective and efficient ventilation circuits create an ideal underground working environment. All portals shall be maintained to ensure that they are free of obstructions.

The Taka Shaft and the rehabilitated raises will enhance the ventilation circuit creating a natural flow of ventilation. A 100 HP Exhaust blower will be installed as main fan along the Gemco Portal at level 300. Ventilation raise will be driven at upper level to be connected on the surface which will serve as main exhaust.

Airflow in a section of the mine must be adjusted to a level beyond that obtainable from the open system, a booster fan/auxiliary fan, such as 20-25 HP and 50 HP fans, may be used to enhance the airflow through that part of the mine. When booster fans are used, they should be designed into the system in order to help control leakage, without causing undesirable recirculation in either normal or emergency situations. Likewise, ventilation doors, regulators, bulkheads and curtains will be maintained to direct airflow to the destined areas.

The most ideal set-up for ventilating development drives or working face is two-way ventilation. Wherein, air is ejected towards the advance face then suction blowers are used to increase the speed of contaminated air to be discharged to exhaust. Accumulated smokes and possible gas concentrations are diluted with cleaner air while regulating the working environment with the desired temperature.

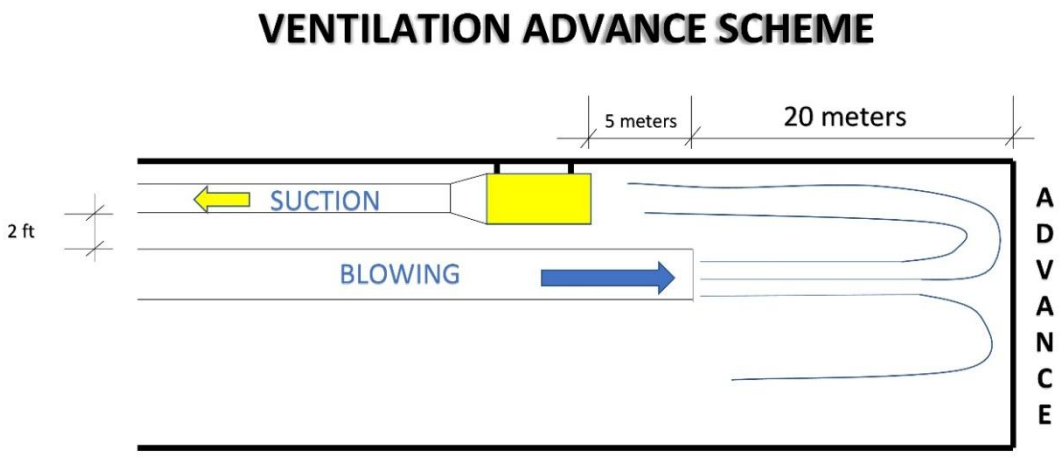

Figure 2-13: Ideal set-up for ventilating development drives or working face

2.7.2.7 Infrastructures and support facilities

Aside from existing mine infrastructures, the following additional projects will be installed and constructed such as:

1) Underground Sub-stations
2) Underground repair bays
3) Underground Bodegas
4) L0 new portal
5) Mine Office

2.7.2.8 Mine Production Capacity

Production capacity of mine will be 7-10% higher compared to mill to compensate for ore losses which normally incur during hauling or sorting. Thus, mine daily target can reach up to 550 tons per day or 191,400 tons annually. The Mill will maintain 500 tons per day capacity and/or an annual production of 174,000 tons at 348 working days.

2.7.3 Operation Phase

2.7.3.1 Mining Operation

A mechanized system of mining can attain efficiency three times that of conventional mining. The use of trackless equipment such as JDM, LHD and LPT will increase productivity and bring down costs. It will also result to manageable number of workforce and simplified stope planning and scheduling. Choosing the nominal mining method for ISRI requires flexibility as the available mineable ore are categorized as remaining Reserves from previous operation. Ore are either at the hanging wall or footwall or sandwich by fill material. Pillars from previous operation are sources of fresh break ore. Old pre-war fill materials are also ore sources as they still carry economic grades.

Since Sangilo Mine has existing underground workings, foremost in the choice of the mining method are the type and condition of available mine openings. These openings will reduce development cost and time. The existing openings can also be improved to suit other mining methods. In the case of our planned use of trackless equipment, the existing drifts will be widened to accommodate the fleet of underground wheel-based machines. Previous ore passes and manways built during past operations can still be used provided the walls remained intact.

Conventional operation uses mining methods applicable to narrow veins such as Shrinkage Stoping and Modified Top Slice Stoping. In these methods, production is maximized without using too much timber support. Stopes are usually spaced at 15 meter interval. The raises are driven at the sides of the stope, the sill level is developed with wooden chutes at 5 meters intervals. Mining is done with successive drilling, blasting, scraping and filling. Machine drilling are done either breast-cuts horizontally, or vertical slabbing rounds or angled slabbing rounds, depending upon how the ore breaks and safest for the miners.

For L-0, ore are drawn out from chutes into 3 tonner side dump cars and pulled by a 3.5 tonner battery locomotive outside to the coarse ore bin (COB). At sub-levels, ore is loaded into 1 ton mine cars and hand trammed to ore passes dropping down into the main haulage level.

In L-500 and L-300, ore is drawn at the bottom of the crosscuts by LHDs. Ore is loaded into LPTs which will dump the ore into measuring pocket at the shaft. From the pockets, ore will be loaded into 2 skips where it is eventually hoisted up to the mill at L-0. At the head frame, the skip loaded with ore are tipped using a mechanism wherein the loaded ore will fall into the COB, surge bin or hopper.

The operation cycle involves the following:

1. Drilling and Blasting – mine openings such as drift, crosscuts and raises will be developed by drilling and blasting;
2. Ventilation – installation of ventilation doors, regulators, blowers, fans, bulkheads and curtains to direct airflow to destined areas;

3. Load, Haul and Dump – hauling of blasted materials (ore and muck) using hand tramming (for sub-levels), battery-operated locomotive, LHD and hoisting (transfer of ore from one level to another);
4. Scaling – involves removing of any unstable slabs of rock hanging from the roof and walls;
5. Installing Underground Mine Support and Backfilling – mine openings stability will be programmed by installing support such as timbering, shotcreting, rock bolting, steel setting, concreting and cable bolting. The type of support to be used will base on the application of rock mechanics;
6. Surveying Blastholes – uses survey method and equipment for borehole tracking and designing;

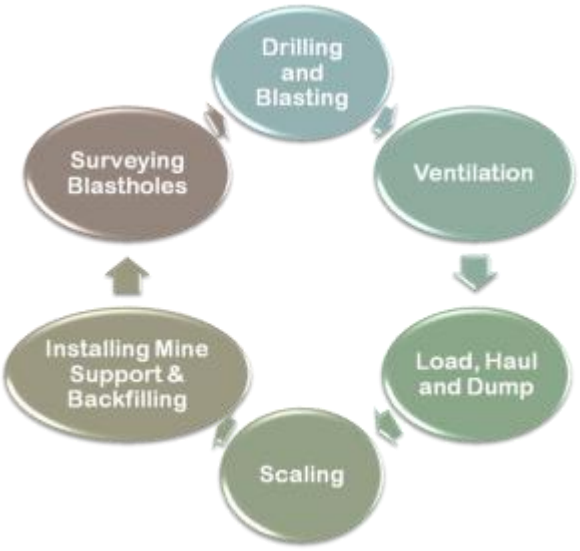

Figure 2-14: Mining Operation Cycle

2.7.3.2 Ventilation

Effective and efficient ventilation circuits create an ideal underground working environment. All portals of L-500 and L-300 shall be maintained as previously rehabilitated to ensure that they are free of obstructions.

The Taka Shaft and the rehabilitated raises will enhance the ventilation circuit creating a natural flow of ventilation. A 250 HP Exhaust blower will be installed as main fan along the L-500 old drift. When the airflow in a section of the mine must be adjusted to a level beyond that obtainable from the open system, a booster fan/auxiliary fan, such as 25 HP and 50 HP fans, may be used to enhance the airflow through that part of the mine. When booster fans are used, they should be designed into the system in order to help control leakage, without causing undesirable recirculation in either normal or emergency situations. Likewise, ventilation doors, regulators, bulkheads and curtains will be maintained to direct airflow to the destined areas.

2.7.3.3 Mine Drainage

A drainage canal system was incorporated on Level 0 where silt settles and clear water leaves the pond. Earth sump was constructed at the Level 0 Portal where remaining silt is collected and clear water is pumped back to the mine and mill for re-use. The system will also be integrated in all levels.

2.7.3.4 Backfilling

Mined out stopes are backfilled using waste material generated from mine development. Stope at lower level is backfilled through gravity from a winze, chute or raise that connects to an upper level. Backfilling is also done by using loaders or trucks.

Backfilling is done after each cut of ore to serve as platform to the next cut and/or after the ore block is mined out. It also prevents subsidence since it provides support on the stope walls.

2.7.3.5 Milling Operation

2.7.3.5.1 Crushing and Grinding Stage

Run-of mine ore is delivered from underground workings by mine cars from L-0 and those from L-300, L – 500 and below delivered by LPT and dumped to the Mine Ore Yard and or to the Surge bin or hopper using LHD or mini Loader. Ore is drawn from the hopper by a vibrating plate feeder with grizzly and fed to the 26"x30" primary Jaw Crusher. The product of the Primary Jaw Crusher is conveyed by a 24" inclined conveyor that feeds the 1.5 m x 3.0 m Rotary Drum Scrubber with Trommel. The oversize product of the Rotary Scrubber is conveyed by an inclined conveyor equipped with a Tramp Magnet to the Standard Secondary 3 FT. Cone Crusher and the undersize products (sand and slime) gravitate to the Double Pitch 18 Inch D x 18 Ft L Screw Classifier. The Classifier oversize product (sand: -3/4" size) is delivered by conveyor belt #8 to the Fine Ore Bin (FOB), and the overflow product (slimes) gravitate to the 8 m D x 4 m H slime Thickener, the underflow will be pumped to the Grinding Area while the clear overflow will be pumped as wash water to the Rotary Scrubber and dust suppressant spray at the vibrating screen. The product of the 3 FT Secondary Cone Crusher passes thru a double deck Vibrating Screen with final product size of -1/2" that is conveyed to the Fine Ore Bin (FOB) while the Vibrating Screen oversize is fed to the 3 Ft Short Head Tertiary Cone Crusher that is set at -1/2"and in closed circuit to the Vibrating screen.

Two (2) units 610 mm Belt Feeder draw ore from the FOB that feed the 9' x 15' (EGL) Allis Chalmers Ball Mill. The Ball Mill feed is monitored thru a Belt Scale. Ball Mill discharge is pumped to the Cyclone by 2 units 6" x 4" Slurry Pumps for size classification. The cyclone overflow of 80% minus 75 microns pass to a Trash Screen and into the Thickener. Coarser materials reporting in the cyclone "underflow" at 70% solids is recirculated to the Ball Mill. Thickener overflow is used as dilution to the Ball Mill and the underflow regulated at 41 % solids by weight is pumped to the First leaching tank. This feed is sampled automatically by an Auto Sampler Cutter.

2.7.3.5.2 Carbon-in-Pulp Stage

The two (6) units 21' x 22' Leaching Tanks (Figure 11) are equipped with 3-blade turbine-type double impeller fitted with air spargers from the Electric Blower (Roots Blower) to ensure at least 20 ppm oxygen level. Total retention time is approximately 33.6 hours for pulp density of 41 % solid. Provision is made for controlled cyanide solution addition to each tank. Required cyanide concentration is maintained for effective leaching.

The solution is then fed into three (3) units 21' x 22' Adsorption Tanks (Reactor) that operate in series and fitted with 3-blades turbine-type double impeller. Each tank is loaded with carbon at a concentration of 15-30 grams-carbon per liter of pulp. The tanks are fitted with Carbon Transfer Screens that are sized to allow pulp to flow from CIP tank to tank but keeps the carbon particles within each tank. Pulp discharge from the final tank in the train is screened on a horizontal vibrating screen prior to feeding into the two (2) units 16 Ft D x 19 Ft H detoxification Tank before gravitating to the Tailings Storage Facility. This screen collects near-size carbon and carbon passing damaged, worn or leaking inter stage screen in the final tank. A line is provided to bypass the carbon catch screen to facilitate screen maintenance.

Carbon transfer from tank to tank is counter-current to the pulp flow and is achieved by Carbon Transfer Pumps with vertical spindle recessed impeller. Loaded carbon is harvested from the Lead Adsorption Tank which is the final stage of the carbon transference from the 1st CIP stage. Another

Carbon transfer pump delivers loaded carbon, via a screen to remove surplus pulp, to the elution column. The surplus pulp is returned to the first adsorption tank. Carbon in the last CIP stage is replaced with barren or fresh carbon.

Figure 2-15: Existing 200TPD CIP Plant Set-up.

2.7.3.5.3 Elution and Refinery Stage

The loaded carbon transferred to the Elution tank undergoes a process based on the Anglo American Research Laboratories (AARL) system in which gold is stripped off the loaded carbon. The loaded carbon with gold and silver is acid washed, pre-treated with caustic-cyanide solution and then eluted using hot water. The design uses a single elution column which is used for both acid washing and caustic cyanide elution.

The electrolyte produced from the elution process is circulated through rectangular electrowinning cells in which the gold is electrowon onto steel wool, the barren solution is then returned to the first leach tank.

The gold and silver laden steel wool is removed from the electrowinning cells, oxidized in a calcining oven and smelted directly with fluxes into an Electric Furnace. Gold/silver/slag melt is poured into bullion molds.

The entire flow of materials is illustrated in **Figure 2-19**, the proposed 00TPD Flowsheet.

Figure 2-16: Construction of Refinery Circuit and Metallurgical Laboratory

2.7.3.5.4 Tailings Disposal and Detoxification Facility

After Adsorption, the slurry is diluted to 25% solids with incoming process water at the first tailings Drop Box before gravitating to the Tailings Storage Facility (TSF).

The slurry at the two (2) units Detox tank reacted with hydrogen peroxide and copper sulphate or sodium methabisulphite before being gravitated in the 90' tailings impoundment (**Figure 2-17**) and then to the tailings dam (**Figure 2-18**). Residual cyanide levels are reduced in the Detox Tanks and the tailings impoundment to levels acceptable to the environmental standards.

Figure 2-17: Existing 90' Impoundment Tank

Figure 2-18: Existing Tailings Storage Facility

2.7.3.5.5 Thickener

After Adsorption, the slurry is diluted to 25% solids with incoming process water and gravitates to the Thickener. Here flocculant is introduced and the slurry settles to 45% solid. Water overflowing from the Thickener gravitates to the Process Water tanks for recirculation into the circuit.

2.7.3.5.6 Cyanide Treatment

The treatment method used for neutralizing or detoxifying cyanide solutions, spent leached ores and tailings is sulfur dioxide process. Cyanide solution is oxidized to cyanate using sulfur dioxide and air. The working equation is given as:

$$CN^- + SO_2 + O_2 + H_2O \rightarrow CNO^- + H_2SO_4$$

Copper sulphate or sodium metabisulfite is used as the source of the SO_2. The sulfuric acid formed is neutralized by lime or NaOH.

The cyanide treatment is done at the underflow of the thickener before flowing to the impoundment tank and finally discharged in the Tailings Storage Facility.

The tailings dam is equipped with standby pump. In an event of imminent overflow of the tailing dam, the pump will automatically turn on and direct the pumped water to the neutralizing chamber before discharging to the creek.

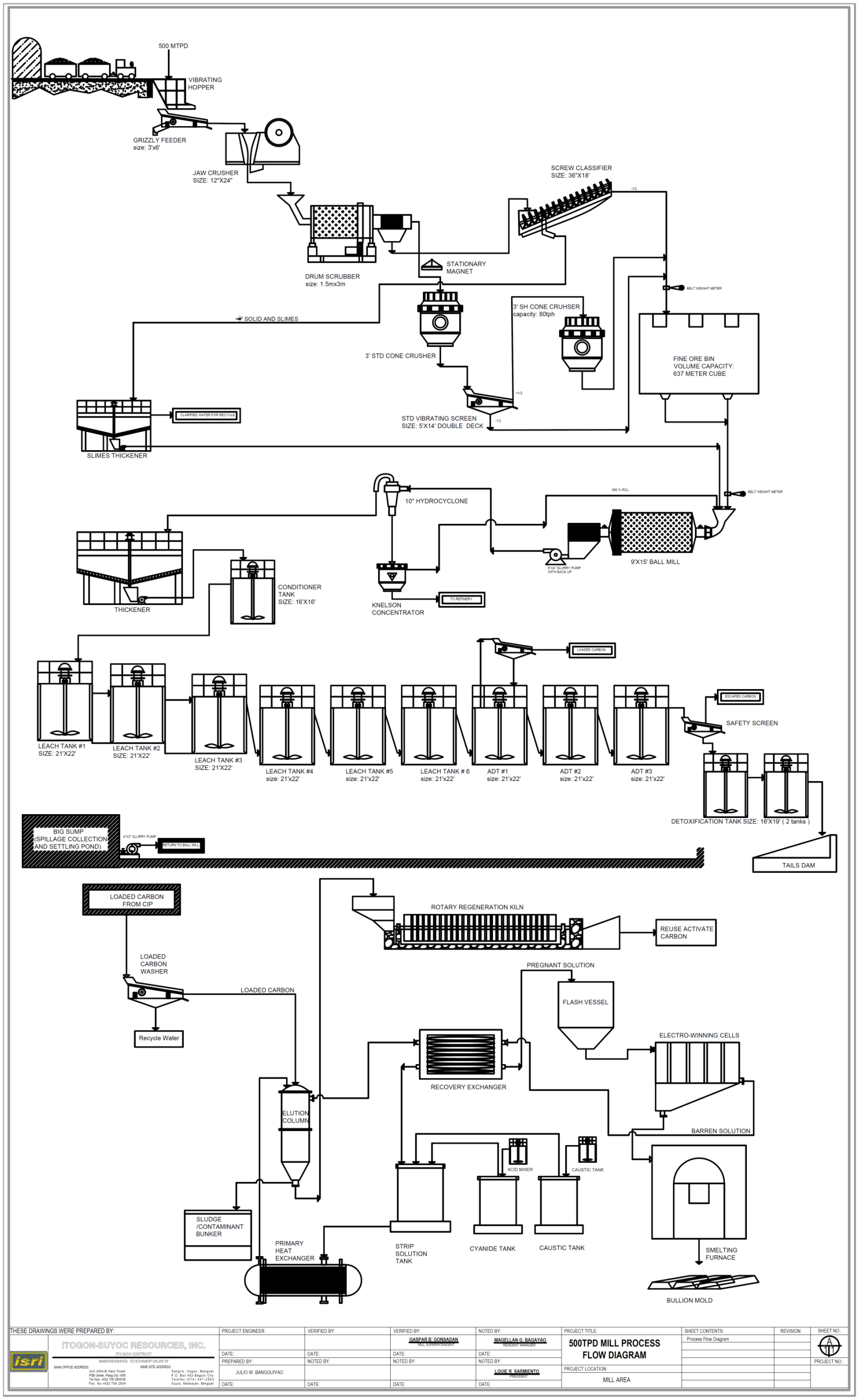

Figure 2-19: Process Flow for 500 tpd Operation

2.7.4 Decommissioning Phase

The proponent will prepare a Final Mine Rehabilitation and/or Decommissioning Plan (FMR/DP) for the project. The FMR/DP will describe the possible mine closure scenarios and the measures that the proponent may implement. The scenarios are:

Scenario 1: Planned Closure

Planned closure occurs when the Project attained its programmed life due to expiration of permits or mine life. In this scenario, the FMR/DP that has been developed and updated over the life of the Project will be implemented.

Scenario 2: Temporary Closure

Temporary closure (care and maintenance) occurs when project operations temporarily ceases due to predictable economic or operational constraints. Temporary closure is normally planned beforehand by the proponent. The proponent will immediately prepare and implement a Care and Maintenances Program (CMP) with considerations the possible reopening of the Project in the future. If temporary closure is imminent, the proponent will notify all stakeholders three (3) months prior to temporary closure. Essential personnel such as department managers, security personnel and care and maintenance personnel will be maintained during the scenario. The company will immediately review the FMR/DP. If reopening is not an option, the final decommissioning and rehabilitation plan will be retrofitted and implemented.

Scenario 3: Sudden or Unplanned Closure

The sudden or unplanned closure occurs when the Project suddenly ceases due to financial constraints (or similar economic imperatives) or if operation is instructed to closure due to non-conformances/with regulatory requirements.

The company will immediately prefer and implement a decommissioning plan, based on pre-existing FMR/DP. In spite of the unfavorable condition, the company will keep the safe and environmentally acceptable condition and taking into account the sites non operational status. If the Project is suspended due to non-conformance with regulatory requirements the Company will exhaust all legal avenues and options to resolve the non-compliance.

In case the Project suddenly closes prematurely, the Company will dialogue with all stakeholders on how it will soften the impact of the sudden closure. A decommissioning plan based on the pre-existing FMR/DP will be prepared and implemented considering the conditions and circumstances surrounding the closure of the Project at the time.

Final mine rehabilitation plan covers the total areas affected and disturbed by the operations during the actual operating years of the mine. Revision or modification shall be made on this plan every two years from its implementation or as soon as appropriate and deemed necessary.

2.8 Manpower Requirements

In order to achieve a unified management and ensure the quality and management of the dredging project, the following project organization will be fully responsible for the command and coordination and organization of the project activities, so as to ensure its efficient and high quality completion.

Table 2-3 below shows the manpower requirements for the project.

Table 2-3: Manpower Requirements

Department	200 TPD (Actual)	500 TPD
Mine	285	300
Mill	32	63
Geology	20	20
Assay	8	8
POMELECT	46	46
Construction	22	22
PICW	12	12
ADMIN		
Actg./Fin.	6	6
HRD	4	4
Legal	1	1
Camp Housing/Mess	7	7
Security	1	1
Medical	5	5
Dispatching	1	1
IT	1	1
Safety	6	6
MEPEO	6	6
COMREL	2	2
Total	465	511

2.9 Project Cost

Estimated cost of the project implementation is PhP 507.14 Million.

3 PUBLIC SCOPING REQUIREMENTS

3.1 Proposed List of Invitees

Atty. Victorio T. Palangdan	Mayor
Hon. Adriano R. Carantes Jr	Municipal Vice Mayor
Municipal Planning and Development Coordinator	
Municipal Environment and Natural Resources Officer	
Municipal Health Officer	
Municipal Social Welfare and Development Officer	
Municipal Disaster Risk and Reduction Management Officer	
Municipal Engineer	
Hon. Albert Carantes Jr.	Punong Barangay Brgy Poblacion
Hon. Eddie P. Amuasen	Punong Barangay Brgy Ampucao
President, Women's Organization	
President, Senior Citizen's Organization	
Chairperson, Sangguniang Kabataan	

3.2 Draft Invitation Letter

27 May 2021

Hon._____
Mayor
_____, Province of Benguet

Dear Hon. _____,

RE: Invitation to attend the Public Scoping for the proposed Sangilo Mines Expansion Project

The Itogon-Suyoc Resources Inc. (ISRI) intends to develop the **proposed Sangilo Mines Expansion Project** ("Project") to be located in Barangays Ampucao and Poblacion, Municipality of Itogon, Province of Benguet. The proposed Project plans to increase the plant rated capacity to 500 tpd or 175,000 tons per year (350 working days per year) from the current operation at 200 tpd.

In line with the proposed Project, we would like to invite you to attend the Public Scoping scheduled on:

DATE : May 27, 2021

TIME : 9:00 AM

VENUE : _____

ONLINE (ZOOM): Meeting ID: 942 6514 6013 I Passcode: 635582

The Public Scoping will be a venue for the proponent to provide an overview of the proposed project, and for the stakeholders to raise their issues, questions and concerns regarding the proposed project. The concerns that will be gathered will be considered in the Environmental Impact Assessment that will be conducted, the objective of which is to identify the possible environmental impacts of the proposed projects and to formulate appropriate and effective mitigating measures for the perceived negative impacts and enhancement measures for the perceived benefits of the Project.

For more details, you may contact the EMB Regional Office at telephone number _____.
Thank you and we look forward to your participation.

Sincerely yours,

Annexes

Annex 1: Previous Environmental Compliance Certificates

Annex 2: Transfer Certificate of Title for the Patented Claim

Annex 3: Proof of Submission of Monitoring Reports

Annex 4: ISRI Table of Organization

Annex 5: ISO Certificate

Annex 6: Drawings of ISRI Tailings Storage Facility Design

Annex 7: Conduct of IEC and Perception Survey

Annex 8: Draft Presentation Material for Public Scoping