EXECUTIVE SUMMARY

DIDIPIO GOLD-COPPER PROJECT

INCREASE IN ANNUAL PLANT THROUGHPUT RATE

(3.5 Mtpa to 4.3 Mtpa)

OCEANAGOLD (PHILIPPINES), INC. (OGPI)

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EXECUTIVE SUMMARY

ES.1 PROJECT FACT SHEET

ES.1.1 SUMMARY OF PROJECT DESCRIPTION

Project Name:	**Didipio Gold-Copper Project Increase in Annual Plant Throughput Rate (3.5 Mtpa to 4.3 Mtpa)**	
ECC Ref. No.	ECC-CO-1112-0022	
Project Type:	Mining Project	
Project Location:	Didipio Valley, Barangay Didipio, Municipality of Kasibu, Nueva Vizcaya	
Total Project Area:	975 hectares Partial Declaration of Mining Project Feasibility (DMPF) area within its Financial and Technical Assistance Agreement (FTAA) 001	
PROPOSED MODIFICATION	**ECC Coverage**	**Proposed Modification**
Plant throughput rate:	3.5 Million tonnes per annum (Mtpa)	**4.3 Million tonnes per annum**

ES.1.2 PROFILE OF THE PROPONENT

Name of Proponent:	**OceanaGold (Philippines), Inc. (OGPI)**
Office Address:	2nd Floor, Carlos J. Valdes Bldg., 108 Aguirre St. Legaspi Village, 1229 Makati City
Authorized Representative:	Jose P. Leviste, Jr. Chairman, OGPI Mr. David Way General Manager
Tel. No./Fax No.:	T (02) 779 6600; F (02) 892 8399

ES.1.3 PROFILE OF THE PREPARER

EIA Preparer:	**RHR Consult Services, Inc.**
Office Address:	9999-A Mt. Pulog St., Umali Subd., Los Banos, Laguna
Contact Persons:	Ryan Filiberto P. Botengan Managing Director Jess M. Addawe Project Manager Henry James P. Botengan Co-Project Manager
Tel. No.:	T (02) 411 5763

ES.1.4 CURRENT STATUS OF PROJECT IMPLEMENTATION (KEY PROJECT COMPONENTS LISTED IN THE ECC)

Project Component / Aspect	Current Status
Total Project Footprint	391 hectares Within the approved 975-hectare project area (Partial DMPF area) as of 2nd quarter of 2018
Open Pit	Approximately 53.14 hectares Length: 850 m NS Width: 800 m EW Final Pit Floor: 460 masl (RL 2460)
Underground Mine	Under development (started 1st quarter of 2015). Development as of January 2019 is for panel 2 (2250RL and Below), whilst production stoping is being conducted for Panel 1 (2280RL and above). Stope design: Long Hole Open Stope (LHOS)
Processing Plant	Operational Plant throughput: 3.5 Mtpa (proposed to be increased to 4.3 Mtpa) Area: 11.61 ha (approximate)
Paste Plant	For commissioning and operation Rated capacity: 150 m3/hr Area: 2 ha (approximate)
Tailings Storage Facility	Operational and ongoing development Capacity: 50.74 Mt Maximum embankment height: 100 m (RL 2820) Area: 65 ha (approximate)
Waste Rock Dump	Operational and ongoing development 33 million tonnes remaining capacity (based on WRD concept) The WRD design to natural ground is 89.5 meters in height at 800 meter base. Area: 70 ha (approximate)
Activated Sludge Sewage Treatment Plant	Operational Capacity: capacity to treat domestic sewage water equal to 2,000 person wastes generation. **Didipio Water Recycling and Purification Plant (DWRAPP) still in commissioning stage – treatment of sewage to potable water via hyperoxidation method by ozonation, light polarization and Ultraviolet light disinfection*
Administration and Housing Areas	Operational Operation/Accommodation Village Administration Buildings: - Administration 1 building - Light Vehicle Workshop & Mobile Services Office and Site Services Maintenance and Office Area - Core Shed and Exploration Office Area
Powerhouse (on-site power supply)	Operational Type: Diesel Generator Capacity: 16 MW
Road Networks (All-	Operational with ongoing maintenance

Project Component / Aspect	Current Status
weather access road)	Length: 30 km

ES.2 Process Documentation

ES.2.1 EIA Team

The Environmental Impact Assessment (EIA) Team is composed of the following specialists:

EIA Team Member	Module / Field of Expertise	IPCO No.
Mr. Jess M. Addawe	Environmental Impact Assessment (EIA), Geographic Information System (GIS)	056
Engr. Catherine L. Addawe	Land Use (LU), Hydrology (H), Water Quality (WQ), EPRMP Integrator (EI)	055
Engr. Gilbert B. Belason	Mining (MN)	--
Mr. Henry James P. Botengan	Social Impact Assessment (S)	063
For. Armando V. Gillado, Jr.	Terrestrial Ecology (TE), Freshwater Ecology (FE)	312
Mr. Arnel M. Mendoza	Geology (G)	--
Engr. Louie June D. Sioson	Air Quality (AQ), Environmental Risk Assessment (ERA)	095

ES.2.2 EIA Study Schedule and Area

The EIA study for the proposed increase in annual plant throughput rate from 3.5 Mtpa to 4.3 Mtpa for the Didipio Copper-Gold Project focused on the potential impacts of the proposed modification and on the environmental performance of the Project's current operation. The proposed increase in annual throughput rate is a result of OGPI's plan to optimize existing operations due to the combined effects of the following:

- (1) the commencement of the underground mining operations to produce a higher-average grade ore to be blended with the surface stockpile ore for a higher mine throughput, and
- (2) the increased capability of the current process plant to handle increased mine production capacity resulting from the series of de-bottlenecking activities conducted by OGPI.

The increase in annual plant throughput will neither involve any area expansion nor changes in process technology. Thus, this EIA study covered the previously identified direct and indirect impact areas of the project which is regularly being monitored by OGPI. The assessment of project performance was based on OGPI's 5-year monitoring activities (since 2013) within the identified direct and indirect impact areas.

The project's direct impact area is confined within the 391-hectare project footprint (as of 2nd quarter of 2018) which is within the 975-hectare total project area (Partial DMPF area). Included in the direct impact area, aside from the project footprint (land use, geology, terrestrial ecology), are the sections of surface water bodies directly draining the project footprint area (hydrology, water quality, freshwater ecology), the communities surrounding the project boundaries (impact on noise and air quality), and the jurisdiction of Barangay Didipio (socio-economic impact). Indirect impact areas include those undisturbed areas within the Partial DMPF area and FTAA area (terrestrial ecology), downstream portions of streams draining the project (water quality), and the jurisdiction of the Municipality of Kasibu (socio-economic).

The schedule of the EIA activities conducted for this EPRMP is summarized below:

Date	EIA Activity
June 4-6, 2016	Initial site reconnaissance; Coordination with OGPI
June 21, 2016	1st Public Scoping
February 19, 2018	Submission of request for scoping requirements to EMB
April 6, 2018	2nd Public Scoping (conforming to the new DENR Administrative Order

Date	EIA Activity
	2017-15)
May 5, 2018	Submission of Request for Technical Scoping Requirements (with endorsed Public Scoping Report)
May 15, 2018	Technical Scoping
June 4-8, 2018	2nd site visit Conduct of perception survey, Focus Group Discussions (FGD), Key Informant Interviews (KII)

ES.2.3 KEY EIA METHODOLOGIES

The EIA conducted for this EPRMP made use of the secondary data from previous EIA reports, special studies conducted for the project, OGPI monitoring reports submitted to various regulatory agencies including DENR EMB and MGB, existing environmental management plans implemented by OGPI, and from reports from various government agencies with pertinent information relating to the project. Primary data gathering, through consultations, surveys and interviews, was also conducted for the assessment of project's social impacts.

Summarized below are the key methodologies used in this EIA study.

Module	EIA Methodology
LAND	
Land Use and Classification	- Review of secondary data and actual site visit - Updating of project area land use - Assessment of compatibility with ECA classification using DENR maps - Updating of maps using ArcMap 10.1, NAMRIA topographic maps and DENR base maps
Geology/Geomorphology	- Review of previous EIA reports for the Project - Updating of information on local geology based on OGPI's recent technical reports on Geology
Terrestrial Ecology	- Desktop review of publicly available documents - Review and processing of previous monitoring data and studies conducted by OGPI on flora and fauna - Updating of flora and fauna sampling maps integrating the previous and existing monitoring stations
WATER	
Hydrology/Hydrogeology	- Site visit, reconnaissance - Watershed approach – delineation of watershed boundaries using ArcMap 10.1 and NAMRIA topographic map - Review of OGPI's documents regarding water resource and management - Review of previous EIA and baseline studies
Water Quality	- Site visit, reconnaissance - Review and processing of OGPI's 5-year water quality monitoring data since 2013 and other documents relating to water management and water quality - Generate water quality monitoring graphs using a spreadsheet for trend analysis
Freshwater Ecology	- Review and processing of information from OGPI's previous EIA studies, special studies and monitoring reports
AIR	
Meteorology/Climatology	- Secondary data gathering and interpretation of data and maps from PAGASA - Interpretation of rainfall data from Didipio Weather Station
Air Quality and Noise	- Review and processing of OGPI's air quality and noise monitoring data

Module	EIA Methodology
	and other documents relating to air quality - Generate air quality monitoring graphs using a spreadsheet for trend analysis
PEOPLE	
Demography	- Use of secondary data from municipal and barangay profiles - Site visit, reconnaissance - Public Scoping - Perception Survey - Key informant interview - Focus group discussion
Socio-economic Profile	
Culture/Lifestyle (Indigenous People)	
Public Perception	

ES.3 EIA SUMMARY

ES.3.1 PROJECT ALTERNATIVES

ES.3.1.1 TECHNOLOGY SELECTION/OPERATION PROCESS AND DESIGN

The OGPI Didipio mining operations is a combination of open-pit and underground mining to maximize the operating life and financial performance of the project. The open pit operations ran from 2012 up to 2017 for the production of the surface stockpiled ore, which sustained the mill operations for the same period while the development of the underground operations started in 2015 and started producing ore in December 2017.

The plan on operating the mine as a combination of open pit and underground mining has been mainly due to the geometry and ground conditions of the Didipio resource. For the expanded operations, the ROM from the open pit operations will be blended with the ROM from the underground operations to produce the 4.3 Million MT/annum ore throughput for the plant. The technique to be implemented for the underground operations is the Long-Hole Open Stoping (LHOS) with paste back-filling. The LHOS mining method is a commonly employed, high-production, low-cost mining method that is suited to steeply dipping tabular-like orebodies. The method allows a high degree of mechanisation and offers good mining selectivity, good recovery and is relatively flexible to suit variable geometries and ground conditions. It is also considered to be relatively simple to implement.

With the improvements and optimization of the mine production, OGPI has undertaken a series of studies to determine the capability of the mill plant to accommodate the ROM throughput increase. These studies focused on the de-bottlenecking of key unit operations, such as improvements to the components of the Semi-Autogenous Mill, Ball Mill, Cyclone (SABC) circuit, as well as different configurations in the recovery circuits. The copper-gold processing plant has an original nameplate capacity of 2.5 Million MT/annum which was commissioned in 2012 and reached design capacity in 2013. The plant has since expanded in 2015 with the installation of the pebble crusher, which is essentially a cone crusher that is installed specifically to de-stress the circulating load of the SAG mill. This, in effect, effectively increases the throughput of the SAG mill and by extension, the plant itself to the current capacities of about 3.5 Million MT/annum.

OGPI has conducted several optimization studies on the improvements/adjustments than can be done on the existing equipment such as the primary crusher, SAG mill, ball mill, cyclone classifier cluster, flotation circuit, thickeners, and pumps, as well as the proposed installation of additional equipment at minimal capital cost, such as the additional classification units, a tertiary VertiMill grinding unit, and gravity concentration units. From these tests and simulations, OGPI found an optimized combination of configurations that would maximize the throughput of process bottlenecks, mainly on the comminution circuit, with their corresponding down-stream adjustments in the recovery and dewatering circuits that allowed the process to be ramped-up from 3.5 Million MT/annum to 4.3 Million MT/annum.

ES.3.2 Summary of Impact Assessment

The increase in annual mill plant throughput capacity from 3.5 million tonnes per annum (Mtpa) to 4.3 Mtpa will not cause any changes in terms of the total project area, total project footprint, process technology or any other changes in the project components such as the mine pit, tailings storage facility (TSF), etc. thus most of the impacts presented in the table below are the previously identified project impacts or the impacts of the current project operations. The mitigation measures presented are currently being implemented by OGPI or are part of OGPI's Environmental Management Plan (EMP), Environmental Protection and Enhancement Program (EPEP), Social Development and Management Plan (SDMP), Information, Education and Communication (IEC) Program and Final Mine Rehabilitation and/or Decommissioning Plan (FMRDP) duly approved by the DENR EMB and MGB.

Summary of key impacts on land, water, air and people and the corresponding proposed mitigating measures are presented in the table below.

ES.3.2.1 Environmental Performance

Detailed assessment of the Environmental Performance of the project operations are presented in Chapter 6. From the start of the commercial operation in April 2013 to date, the project has a total disturbed area of 393.52 hectares as of Q4 of 2018 within its approved PDMF area. Currently, the company has established a total of 1,285.4712 hectares reforestation/revegetation areas. 113.33 of which are within the 975.00 hectares PDMF area and 1,172.1412 hectares are planted outside the FTAA area.

The current FTAA area after relinquishment in CY 2017 is 11,488.8811 hectares or equivalent to 38% from its original FTAA area which is 30,000 hectares. The approved PDMF area is 975 hectares or 8.5% from the current FTAA area. Furthermore, the current disturbed area of 393.52 hectares is equivalent to 40.1% from the PDMF and only 3.4% from the current FTAA area of the Company.

MAIN IMPACTS OF EXISTING PROJECT*	PREVENTION, MITIGATION OR ENHANCEMENT MEASURES	RESIDUAL EFFECTS
LAND		
LAND USE Compatibility with existing land use - Permanent facilities such as the open pit (OP), tailings storage facility (TSF) and waste rock stack (WRS) will permanently change the land use and topography of the area	Implementation of the Final Land Use Plan (revert the conditions of the land to its condition before it was mined as much as possible): WRS: - Establishing forest tree species at the WRS through progressive rehabilitation OP: - Fencing the OP and installation of a safety berm at the top of the pit - Allow the pit to become a lake as part of its final mine rehabilitation and decommissioning plan at the end of mine life which could possibly be used for domestic and irrigation water supply or for aquaculture TSF - Option 1: create dry beaches and establish a river channel along one edge of the tailings impoundment. These dry beaches will then have top soil added and be available for agriculture or be revegetated with indigenous plants. - Option 2: Utilize the inundated area as a water reservoir; maintain the wet cover of the tails, for hydropower as raised during the stakeholder consultation for the final land use	New topography and permanent change in land use.
LAND USE / GEOLOGY Compatibility with classification as an Environmentally Critical Area (ECA) - Highly susceptible to landslide and high risk to typhoons Inducement of subsidence, liquefaction, landslides, mud/debris flow, etc.	- Implementation of progressive rehabilitation which includes reconfiguring the slope into stable angle, benching, covering the slopes with topsoil, matting, planting of selected plant species and casting of seeds - Open pit design and engineering measures to ensure pit stability; continuous monitoring of slope movement - Application of seismic design criteria (for OP, TSF, WRS and general facilities) rated to ground acceleration in accordance with existing national structural codes. - Slope stabilization and engineering measures for haul roads and general facilities - Geotechnical and structural monitoring - Implementation of existing Emergency Response Plan (ERP) and Dam Safety Emergency Management Plan; installation of emergency warning systems - Prevention and control of erosion and sedimentation via progressive rehabilitation and installation of drainage networks connected to sedimentation ponds - The TSF embankment is constructed from rockfill and earthfill that is adequately grouted and lined to allow for minimal movement during seismic events. - In the unlikely potential event of TSF failure, the WRD basin downstream of the TSF would fully contain the released tailings and water. It is assumed should a TSF dam break occur and the WRD was	Possible slope failure, structural failure or overtopping due to extreme events but risk can be considered low with proper implementation of mitigation measures.

MAIN IMPACTS OF EXISTING PROJECT*	PREVENTION, MITIGATION OR ENHANCEMENT MEASURES	RESIDUAL EFFECTS
	at risk of failure the pit and underground would be evacuated allowing the Dinauyan River and tailings flow to be diverted into to pit via an excavated channel to fully contain the released material.	
LAND USE Impairment of visual aesthetics – WRS & TSF embankment across the Dinauyan Valley are perceived to cause impairment of visual aesthetics in the area	- The Company has been progressively rehabilitating inactive waste dumps, portions of TSF embankment and slopes to mitigate visual impacts in accordance with the closure plan for the site - Decommissioning, removed from site or transfer to the community of other mine facilities in accordance with the closure plan	Permanent changes to visual amenity i.e. formation of a lake out of the decommissioned open pit.
GEOLOGY/GEOMORPHOLOGY Change in surface landform/ geomorphology/ topography/ terrain/ slope	- Implementation of the Final Land Use Plan (revert the conditions of the land to its general condition before it was mined as much as possible) - Implementation of progressive rehabilitation which includes reconfiguring the slope into stable angle, benching, covering the slopes with topsoil, matting, planting of selected plant species and casting of seeds	Permanent changes in topography.
GEOLOGY/GEOMORPHOLOGY Change in sub-surface geology/underground conditions	- Implementation of engineering measures to prevent subsurface collapse (i.e. rock bolting, meshing, and shotcrete); Optimization of blast requirements to prevent potential subsurface collapse	Permanent changes in sub-surface geology and underground conditions.
PEDOLOGY Soil erosion/Loss of topsoil/overburden	- Revegetation - Seedling production for progressive rehabilitation activities - Installation of erosion control blankets to cover exposed areas - Hydroseeding - Gravelling or rock surfacing - Surface roughening - Rock lining of drainage systems	Minimal. Accelerated erosion may happen in case of extreme storm events.
PEDOLOGY Loss of soil quality/fertility	- Progressive rehabilitation; covering of topsoil - Use of drip pans during vehicle and equipment maintenance - Collection and proper storage of used oil and lubricants in storage tanks or bins - Collection, transport and treatment of waste oil by a DENR-accredited hauler and treater - Implementation of industry protocols for oil clean-up in case of spilled hydrocarbons - Utilization of the existing volatilization pad to cater the contaminated soils and rocks for treatment - Fuel and process reagents storage tanks/containers are bunded per industry specifications. Bunds	None.

MAIN IMPACTS OF EXISTING PROJECT*	PREVENTION, MITIGATION OR ENHANCEMENT MEASURES	RESIDUAL EFFECTS
	may be in the form of concrete or any non-reactive impermeable material and are sized per 110% of the volume of the largest storage tank in the circuit to ensure effective containment of spilled material in case of a breach or spill. - Posting of Material Safety Data Sheet (MSDS) of process reagents; reinforcing containers or storage tanks depending on the volume of chemicals to be stored	
TERRESTRIAL ECOLOGY Vegetation removal and loss of habitat Threat to the existence and/ or loss of important local species Threat to abundance, frequency, and distribution of important species Hindrance to wildlife access	Continuous implementation of the following: - Implementation and maintenance of reforestation programs such as the Mining forest Program - Donation of seedlings for the carbon sink and National Greening Program - Progressive rehabilitation and re-vegetation of disturbed areas such as slopes - Maintenance of the nursery for the propagation of seedling of indigenous species for reforestation efforts - Implementation of conservation programs identified in the EPEP - Regular annual monitoring of terrestrial flora and fauna in direct and indirect impact areas of the project	None.
WATER		
HYDROLOGY Change in drainage morphology (Dinauyan River and its tributaries(	- Progressive rehabilitation of the waste rock stack and of the TSF embankment to reduce surface runoff and erosion - Affected river channels were lined to prevent scouring and seepage of water into the mine pit. - Surface water management systems on site also include sediment ponds, sumps and surface water drains - An emergency spillway was constructed upstream of the waste rock stack and TSF to allow for flows greater than the normal flow particularly during flood or high rainfall events	Permanent changes in drainage morphology due to river diversion and changes in topography.
HYDROLOGY Change in stream water depth – increased river discharge due to increased surface runoff resulting to stream bed and stream bank erosion and sedimentation downstream	- Continuous implementation of progressive rehabilitation to reduce rainfall impact and increase infiltration rates - Implementation of slope control measures such the use of cocomatting or geomembranes for erosion control, implementation of engineering measures such as use of riprap, gabions, and shotcrete along valleys or slopes - Installation of silt traps and sedimentation ponds, gravelling of roads, and rock lining of drainage systems and water ways.	None.
HYDROLOGY/ HYDROGEOLOGY Depletion of water resources / water use competition	- Establishment of Didipio Water Supply System as committed by OGPI in the 2013 Memorandum of Agreement with Barangay Didipio. Project is under commissioning stage. - Water Resource Study for Barangay Didipio Domestic Water Supply (2018) was conducted by OGPI to	None.

MAIN IMPACTS OF EXISTING PROJECT*	PREVENTION, MITIGATION OR ENHANCEMENT MEASURES	RESIDUAL EFFECTS
- Water withdrawal for mine use Dinauyan watershed and groundwater within the mine area may lead to reduction in flow for springs and tributaries although modeling shows impact would be localized - Increase in economic development leading to rise in population growth exert pressure on water supply	confirm potential impact of underground and mine operation on nearby communities and on the project water balance. - Continuous monitoring of groundwater levels - Implementation of water conservation measures through water treatment and recycling, and use of water associated with mine dewatering. - Installation of Didipio Water Recycling and Purification Plant (DWRAPP) in the Mine Services Area Sewage Treatment Plant to further treat sewage to a potable water quality (under commissioning stage)	
WATER QUALITY Degradation of surface and groundwater quality - Possible contamination of surface and groundwater in case of leaks/breach in containment in the process circuit and TSF - Mine dewatering	- The TSF base and its embankment is lined with clay sourced from the open pit to inhibit water transmission. - Filter drains are constructed in the embankment and its toe to prevent water transmission. - TSF embankment is regularly monitored for cracks, movement, or leaks. - Piezometers were also installed at the TSF wall to monitor any seepage and water pressure. - Pit water is pumped out of the pit flowing into a series of sediment ponds. With the use of coagulating agents, sediment will precipitate faster and any hydrocarbon is skimmed off the water.	None.
WATER QUALITY Degradation of surface and groundwater quality - Erosion from stockpiles and waste dumps resulting to siltation of receiving surface water bodies - Possibly contaminated seepage from WRS	- A vegetated buffer zone, planted with locally grown trees, is also established and maintained around the TSF to contain run-off from the surrounding catchment. - Settling ponds are established and maintained to contain settled out solids - The flow through drain is constructed and stabilized per the appropriate engineering rating. It is designed such that it can allow 100% passage of the Dinauyan River to the downstream channel to prevent scouring of the WRS. - Installation of check dams to control flow velocities within unlined drains and trap small quantities of sediments - Installation of rock filter dams and sediment fences - Waste rocks are stacked per engineering guidelines for minimal water transmission. - Also, waste rocks are isolated from non-reactive rocks and soil. A detailed net acid production potential (NAPP) and acid-base account (ABA) for the waste rocks at different alteration types and depths of extraction to determine the possibility of acid generation is continuously being monitored in the water quality monitoring program.	Minimal. Siltation may occur during extreme storm events.
WATER QUALITY Degradation of surface and groundwater	- All sewage produced on site is currently treated in the activated sludge sewage treatment plant. - Sewage from isolated locations like guard posts are stored in holding tanks and transported to the	None.

MAIN IMPACTS OF EXISTING PROJECT*	PREVENTION, MITIGATION OR ENHANCEMENT MEASURES	RESIDUAL EFFECTS
quality due to generation of sewage and solid wastes	sewage treatment plant by tanker on an as need basis or when the sewage holding tanks reach its full capacity. - Sludge from the sewage treatment plant is hauled out and treated by a sewage sludge third party contractor.	
WATER QUALITY Acid Mine Drainage	- High Sulphur rocks coming out of the pit are being monitored. - If present, procedures in ensuring that these are blended with high neutralizing rock will be implemented (this has not occurred to date and expected not to occur as supported by the 1994 report by Mountford and Wall) - If acid mine drainage (acidic water) will be present, it will be mitigated via treatment with neutralizing reagents such as lime, diluted with alkaline water, or collected and pumped to the water treatment plant for treatment. - Continuous monitoring of water quality for potential presence of ARD	None.
FRESHWATER ECOLOGY Threat to existence and/or loss of important local species and habitat Threat to abundance, frequency and distribution (A decline in the taxa richness of aquatic fauna composition in the area from 1997 to 2012 has been observed but apparently, data from the 2012 study up to the 2016 study shows significant recovery of the aquatic communities, which is almost similar to the aquatic community prior to the project implementation.)	- Implementation and maintenance of bank stabilization and erosion control measures (e.g. siltation/sedimentation ponds) - Progressive rehabilitation and re-vegetation of disturbed areas such as slopes - Implementation of water treatment plant and proper management of wastewater - Implementation of proper solid (e.g. maintenance of sanitary landfill) and hazardous waste management - Implementation of conservation programs identified in the EPEP - Regular annual monitoring of freshwater ecology in direct and indirect impact areas of the project	None.
AIR		
AIR QUALITY Degradation of air quality - Dust from mining activities, processing area (crushers), exploration activities such as drilling and forming of access tracks	- Dusts from each of the identified sources are suppressed using water sprays. - Haul and other roads are watered with a water cart. - Water sprays are employed to suppress the dust on the crusher or conveyor. - Dust from drilling activities is controlled by using water sprays, and shielding as appropriate. - OGPI and contractor's vehicles are required to slowdown when significant dust emission is generated while travelling on the road. Speed humps are installed and maintained near residential areas to	

MAIN IMPACTS OF EXISTING PROJECT*	PREVENTION, MITIGATION OR ENHANCEMENT MEASURES	RESIDUAL EFFECTS
	ensure vehicles will slow down at sensitive areas. - Signages are established in Km 0 and Km 22 to remind drivers to slow down.	
AIR QUALITY Emissions from engine-driven equipment and blasting Greenhouse gas (GHG) emissions	- Emissions from the power station are controlled by the manufacturer design and regular maintenance of the generator sets. - Carbon sink tree plantation areas (National Greening Program (NGP), reforestation on site Adopt-a-Mining Forest Program and other new plantation areas) are established to offset carbon emission from the project. - A project greenhouse gas and energy management plan (GHGEMP) was developed to provide details on carbon emission reduction programs being implemented on site. - Reduction of greenhouse gas emission from reduced use of engine driven power generator sets by connecting to the power grid through the Nueva Vizcaya Electric Cooperative (NUVELCO) which was already established. - Effective maintenance of equipment to ensure efficient operation and correspondingly reduce unnecessary carbon emissions - Use of biodiesel in the project site	
AIR QUALITY Odor from the sewage treatment plant (STP)	- Minimize odor from STPs by ensuring that the plants are maintained in good working condition, and operated are by trained personnel. - Regular maintenance is conducted to ensure that diffusers and blowers remain efficient in supplying aeration to the sewage loads to hasten bacterial digestion of organics. - The plant also has chlorination process to lower down harmful bacteria in the effluent. - To mitigate odor emission, an enclosure system with carbon filter on the surge tank of the STP is installed.	
NOISE AND VIBRATION Increase in ambient noise level Impact (stress, annoyance, diminished productivity and concentration, interference with communication) to workers, passage of vehicles producing noise, blasting Impact (annoyance) of the crusher and process plant to the nearby community	- Personal Protective Equipment (PPE) (i.e. mufflers or ear plugs) are issued to workers. - Restriction of hours of activity particularly on rock breaking activities near the crusher during the night shift. Wherever possible, hauling to the ROM pad is done during daylight hours since dumping on the ROM pad has been identified as the greatest source of noise in the neighbouring community. - Equipment and vehicle maintenance - Construction of sound barriers - Generator sets are housed within clad containers and the exhausts are fitted with appropriate silencers to reduce noise. - Tree lines are also being established in applicable areas to serve as sound barriers.	
PEOPLE		
In-migration	- A “local first” hiring policy is instituted. This is assumed to lessen the likelihood of massive migration	

MAIN IMPACTS OF EXISTING PROJECT*	PREVENTION, MITIGATION OR ENHANCEMENT MEASURES	RESIDUAL EFFECTS
	to the project-affected communities, and thereby avoid the stress and competition on local resources, job opportunities, and public services because of newcomers.	
Traffic	- A local traffic management is instituted in coordination with the concerned local government unit to control the traffic flow as necessary. - OGPI vehicle operators are equipped with road and equipment safety trainings and protocols prior to deployment to the site. - The same induction training is carried out to mine staff and visitors. - Traffic signages are strategically installed on roadways.	
Physical and economic displacement	- A compensation package conforming to national laws and international protocols, e.g., Performance Standard No. 5 (Land Acquisition and Involuntary Resettlement) of the International Finance Corporation will be implemented for project-affected persons.	

* The increase in annual mill plant throughput capacity from 3.5 million tonnes per annum (Mtpa) to 4.3 Mtpa will not cause any changes in terms of the total project area, total project footprint, process technology or any other changes in the project components such as the mine pit, tailings storage facility (TSF), etc. thus most of the impacts presented are the previously-identified project impacts or the impacts of the current project operations.

ES.4 AVAILABILITY OF THE REPORT

This report is available through the following:

a. **ENVIRONMENTAL MANAGEMENT BUREAU**
DENR Compound, Visayas Avenue, Diliman, Quezon City 1116
Telephone Nos.: 927-1517, 928-3742

b. **EMB website**
www.emb.gov.ph

c. **Municipal Planning and Development Office**
Kasibu Municipal Hall
Municipality of Kasibu, Province of Nueva Vizcaya