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Environmental Impact Assessment (EIA) for the Proposed Landfill Establishment at C11 Main Electrical and Mechanical BLP6 Project, Baleh, Sarawak

REF.: CK/EV103-810/21

DATE: APRIL 2022

EXECUTIVE SUMMARY

Executive Summary

1 Introduction

This Environmental Impact Assessment (EIA) report details the environmental issues associated with the “Proposed Landfill Establishment at C11 Main Electrical and Mechanical BLP6 Project, Baleh, Sarawak”.

2 Project Proponent and Consultants

The Proponent of this Project is Sinohydro Corporation (M) Sdn Bhd and Chemsain Konsultant Sdn Bhd is the EIA consultant.

3 Project Location

The Project site is located at the Baleh Hydroelectric Project (Baleh HEP) site, which is within Kapit division. The dam area is approximately 250 km from Sibu Town and is accessible by 4WD vehicle via logging road from Kapit to Nanga Entawau, followed by using the access road to the Baleh HEP site. Alternatively, the site is also accessible via river using express boat to a temporary jetty near Dapu Camp followed by the access road to the site.

4 Legal Requirement

The proposed Project is a prescribed activity under Sub-item 6A(i) of the First Schedule of the Natural Resources and Environment (Prescribed Activities) Order 1994¹. Sub-item 6A(i) has been incorporated into the First Schedule of the order in year 2004.

6A. Facilities for Disposal and Treatment of Wastes:

- (i) The development of landfill for municipal wastes or any site or area used or to be used for the storage, disposal, treatment, recycling or decomposition of municipal solid wastes.

¹ Incorporating all amendments up to 4 November, 2004

5 Statement of Need

Landfill is defined as a method of disposing refuse on land without creating nuisance or hazard to the public health or safety, by utilizing the principles of engineering to control or minimise the pollution generated from the landfilling activities. A proper management of waste generated during the construction of the Main Electrical and Mechanical BLP6 Project is important to prevent contamination of the environment as well as pest and disease infestation. The landfill is proposed to cater for the need of proper solid waste management at the site.

6 Project Description

6.1 Project Component

The Project consists of two main components, i.e.:

1. Level-one landfill – The proposed conceptual landfill has a designed stock capacity of 4500 m³. The total landfill area allocated for the landfill area (Lot A32) is approximately 1,200 m². It has an expected lifespan of at least 6 years based on the daily uncompacted solid wastes volume of 200-300 kg/day.
2. Access road – An access road shall be constructed to connect the existing earthen track to the landfill.

6.2 Project Activities

Site Preparation and Construction Stage

The excavation scope of the Project mainly includes the removal of topsoil in the landfill site as well as leveling of the landfill area and the access road zone. The excess soil shall be temporarily stockpile within the site. The landfill will be dug up to a depth of approximately 4.5 m. The access road to the proposed landfill shall be constructed from the existing earth road and shall be used for the subsequent clearing and earthworks in the landfill.

Operational Stage

The landfill method adopted is fundamentally the area method, adapted for hilly area. The operation and disposal measures for the landfill are outlined as follows:

1. The lorry shall be used to gather the garbage/waste and transport it to the landfill site.
2. An excavator shall be arranged for the periodic spreading of the garbage in the landfill. After spreading, the excavator shall roll the garbage surface back and forth to make them dense.

Landfill Closure

Landfill closure indicates the termination of the landfill operation or that the landfill has already reached its lifespan or its capacity. Proper decommissioning needs to be applied to ensure all waste are properly buried and the Project site is clear before impoundment activity commences.

An abandonment and rehabilitation plan will be submitted to NREB at least 3 – 4 months prior completion of the Project. Site visit shall be carried out together with SEB and NREB 3 months after the last work of abandonment activity to validate the progress of the abandonment plan.

6.3 Project Implementation Schedule

The Project shall commence with the construction on the platform and area clearing in April 2022. The whole construction period to the beginning of landfill operation is foreseen to span over a period of approximately 6 years.

7 Existing Environment

7.1 Physical Environment

Geology

Based on the Geological Map published by the Geological Survey Department of Malaysia (2nd ed. 1992), it showed that the bedrock of the Project site consists of the Sedimentary Late Cretaceous Period. The general geological characteristics of the Project site is rhythmically-interbedded shale, mudstone, slate, phyllite, metagreywacke with some conglomerate lenses and shows strong regional metamorphism.

Soil

The Project site is located on an area of mainly of Merit / Bekenu / Kapit soils with main characteristics of fine clayey, fine loamy and residual.

Meteorology

Meteorological data were obtained from the nearest meteorological station operated by the MMSD located in Kapit (2° 0'0.1"N, 112°55'31.00"E). In general, the site subjected to an equatorial type of climate consistent with the rest of the State, characterized by hot and humid weather all year round. It is under the influence of the Asian monsoon system.

Mean daily maximum temperature range between 31.8 °C and 33.2 °C with the highest temperature occurring in May, July and August. Mean daily minimum temperatures range between 23.5 °C and 24.1 °C with the lowest temperature occurring in July, August and September.

Similar to the rest of the State, Kapit region generally has rainfall all year round. However, fluctuations are observed from year to year with total annual rainfall fluctuating between 3,114 mm and 4,994.8 mm.

Annually, Kapit experiences 4.3% calm wind. The mean surface wind speed observed for the last 13 years (2007 – 2019) was consistent at 0.9 m/s. It was observed that the wind flow patterns were uniform throughout this duration.

River System and Hydrology

Btg. Baleh is one of the several main tributaries of Btg. Rajang. Downstream of the proposed Baleh HEP, Btg. Baleh flows westward for 97 km before joining with Btg. Rajang. Tributaries of the Batang Baleh located downstream of the proposed dam site includes Sungai Putai, Sungai Merirai, Sungai Putang, Sunagai Gaat, Sungai Mujong and Sungai Git. The nearest river to the proposed landfill site is Sg. Putai, about 200 m north and Batang Baleh, about 500 m southwest,

Water Quality

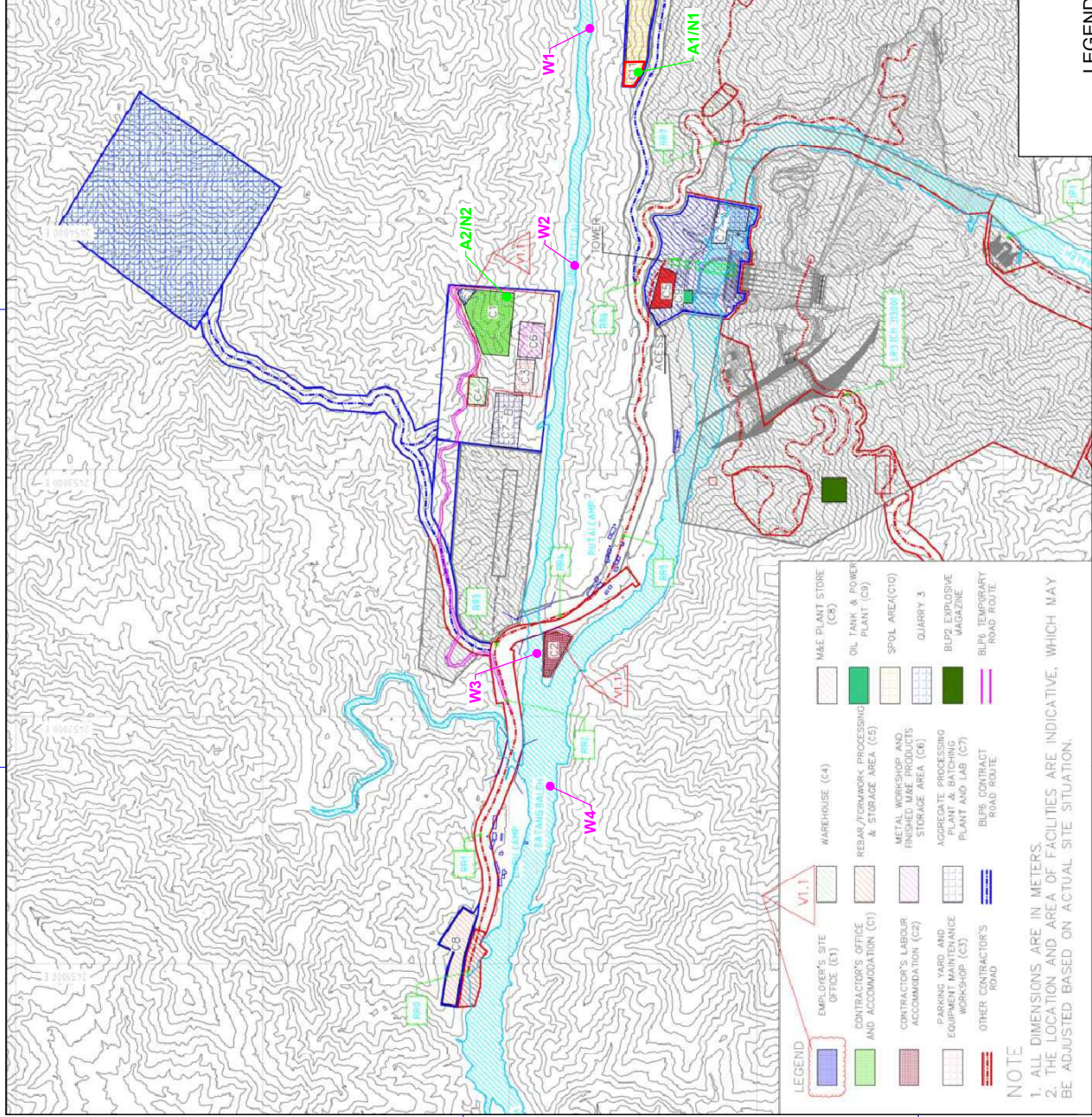
Four (4) surface water samples were collected from the river near the Project site (refer **Figure ES-2**). All water samples reported DO level above the Class IIB range except for W1. The fast-flowing river water may have increased aeration which contributed to the higher DO level recorded. All water samples reported COD well within the Class IIB limit (25 mg/L) except for W2, and W4. The high oxygen demand for chemical breakdown process can be attributed to the presence of organic matter such as detritus in the water from upstream sources. Ammonical nitrogen reported for all water samples exceeded the Class IIB limit of 0.3 mg/L which may indicate contamination by decay organic nitrogen compounds. Except for copper and iron, all other metals analysed were well below the stipulated Class IIB limit of NWQSM.

Air and Noise Quality

The level of Particulate Matter, PM₁₀ was measured over a period of 24 hours using a High Volume Sampler (HVS). The levels of methane was also measured over a period of 1 hour using a direct reading Aeroqual. The levels of PM₁₀ recorded were below the stipulated limit of the MAAQS and the methane recorded was well below the stipulated limit as well.

The noise level recorded at N1 during day time exceeded the stipulated for daytime noise limit while N2 daytime noise level showed compliance. The main sources of daytime noise at N1 is mainly from the sound of vehicular movement and Baleh HEP site activity. With the ongoing construction of the Baleh HEP, noise levels may vary depending on the construction activities. As for night time, N1 and N2, recorded noise level well within stipulated noise limit.

DESIGNATED NO.	DESCRIPTION	OCCUPIED AREA (m2)	REMARK
E1	EMPLOYER'S SITE OFFICE	2,000	
C1	CONTRACTOR'S OFFICE AND ACCOMMODATION	16,000	
C2	CONTRACTOR'S LABOUR ACCOMMODATION	10,000	
C3	PARKING YARD AND EQUIPMENT MAINTENANCE & REPAIR WORKSHOP	5,000	
C4	WAREHOUSE	4,000	
C5	COMPLEX WORKSHOP	12,000	
C6	METAL WORKSHOP	14,000	
C7-A	BATCHING PLANT AND LAB	16,000	
C7-B	AGGREGATE PROCESSING PLANT	24,000	
C8	M&E PLANT STORE	32,700	
C9	OIL DEPOT	2,000	
C10	SPOIL AREA	136,000	
C11	WASTE DISPOSAL AREA	1,200	



LEGEND	DESCRIPTION
[Blue box]	EMPLOYER'S SITE OFFICE (E1)
[Green box]	CONTRACTOR'S OFFICE AND ACCOMMODATION (C1)
[Red box]	CONTRACTOR'S LABOUR ACCOMMODATION (C2)
[Grey box]	PARKING YARD AND EQUIPMENT MAINTENANCE WORKSHOP (C3)
[Light blue box]	OTHER CONTRACTOR'S ROAD
[Dark blue box]	WAREHOUSE (C4)
[Light green box]	REBAR/FORMWORK PROCESSING & STORAGE AREA (C5)
[Light purple box]	METAL WORKSHOP AND FINISHED M&E PRODUCTS STORAGE AREA (C6)
[Light yellow box]	AGGREGATE PROCESSING PLANT & BATCHING (C7)
[Light blue box]	BLP6 CONTRACT ROAD ROUTE
[Light blue box]	M&E PLANT STORE (C8)
[Light green box]	OIL TANK & POWER PLANT (C9)
[Light yellow box]	SPOIL AREA (C10)
[Light purple box]	QUARRY 3
[Light green box]	BLP6 EXPLOSIVE MAGAZINE
[Light blue box]	BLP6 TEMPORARY ROAD ROUTE
[Red triangle]	V1.1

NOTE

- ALL DIMENSIONS ARE IN METERS.
- THE LOCATION AND AREA OF FACILITIES ARE INDICATIVE, WHICH MAY BE ADJUSTED BASED ON ACTUAL SITE SITUATION.

LEGEND:

- C11 PROJECT BOUNDARY
- BASELINE WATER SAMPLING LOCATIONS - (W1-W4)
- AIR AND NOISE SAMPLING LOCATIONS - (A1/N1, A2/N2)

SCALE IN KILOMETRES (1:10,000) - A3 MEDIUM

0 200 400 600 800 1000m

62.0
The outer ticks indicate the Latitude and Longitude

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)
FOR THE PROPOSED LANDFILL ESTABLISHMENT
AT C11 MAIN ELECTRICAL AND MECHANICAL
BLP6 PROJECT, BOLEH, SARAWAK

BASELINE SAMPLING LOCATIONS

7.2 Biological Environment

Flora

The Project site is largely composed of secondary forest. The areas along the river are composed of a range of young and old secondary forests. Shifting cultivation along Batang Baleh and Sungai Mengiong are still active and patches of newly slashed and burned areas, and areas planted with hill paddy are common along the rivers. Vegetation around the proposed Baleh HEP site is largely dominated by agricultural crops. From the proposed dam site downstream to the Entawau settlement the forests are predominantly agricultural land. Besides secondary forest, also reported are logged-over lowland mixed dipterocarp forest, unlogged lowland mixed dipterocarp forest, lower vascular plants, non-vascular plants and fungi and medicinal plants around the proposed dam site.

Fauna

Avifauna surveys reported that the most abundant species was the Pacific Swallow with the next most abundant species was the (endemic to Borneo) Dusky Munia. The most common bird observed was the Little Spiderhunter based on the number of sites where it was encountered (37 out of 54 sites) and the total number of birds recorded (107 individuals).

At least 16 species of mammals are present in the Baleh HEP SEIA study area. This includes two species of bats, three species of rodents, two species of Viverids and one Mustelid, wild pig, a species of mousedeer, two species of deer, two species of monkey and one species of ape.

A total of 34 species of frogs and 29 species of reptiles (snakes, lizards and turtles) were found within 15 sites sampled. The common frog species found were White-lipped Frog, Kuhl's Creek Frog, *Myoberg's Dwarf Litter Frog* and the Greater Swamp Frog.

Seventy-four species and 47 families comprising aquatic insects, crabs, shrimps, snails, aquatic worms, aquatic leaches and nematodes were recorded from the 56 surveyed streams. Aquatic insects were represented by 61 species from 37 families and nine orders, which is equal to 82% of the total macroinvertebrate species.

The three dominant families of fish found in the study area are Cyprinidae, Balitoridae and Bagridae. Cyprinidae is dominant in the study area and this is typical of the freshwater rivers in the whole of South East Asia.

7.3 Land Use

The existing longhouses generally lie along the riverbanks and tributaries from the confluence of Sungai Putai such as Nanga Entawau. Above that point, there are only logging camps and the Kenyah settlement in Singut near the Upper Baleh. Other than the components and facilities of the Baleh HEP, there are no special land use featuring 3 km of the Project site.

7.4 Human Environment

The nearest human settlement to the Project site shall be the ones employed for the Baleh HEP. Besides that, the second nearest human settlement is Nanga Entawau which is located approximately 10 km away from the Project site.

There are nine longhouses located in the vicinity of Nanga Entawau, Nanga Sepanggih, Nanga Entelawan, Nanga Serengat and Nanga Entelangau – downriver of the proposed HEP Dam site (Baleh SEIA, 2014). Upriver, at Long Singut there is only one settlement bearing the same name. The predominant ethnic group in the nine longhouses is Iban, while Long Singut is predominantly Kenyah.

8 Impacts and Mitigation Measures

The prediction of impacts and recommended mitigation measures were made based on the assessment of Project activities. The **key environmental impacts** identified during the Project activities are:

- Soil Erosion and Potential Slope Failure
- Potential Soil Contamination
- Water Quality Impact
- Noise Pollution
- Air Pollution
- Waste Generation and Management
- Health and Safety Impact
- Socio-Economic Impact

Table ES-1: Summary of Impacts and Recommended Mitigating Measures

NO.	POTENTIAL IMPACTS/ISSUES	MITIGATING MEASURES	REFERENCE IN REPORT	MONITORING
1.	<p>Soil Erosion and Potential Slope Failure</p> <p>Site Preparation and Construction The direct effect of vegetation and topsoil removal in the Project site is soil erosion. Earthworks tend to escalate the soil erosion caused by the exposure of the site to rainfall impact, due to disturbance of soil integrity caused. Eroded soil particles will follow the flow of the runoff and eventually enter the natural waterways though there is no river crossing the Project site.</p> <p>Operation Cover material, particularly soil covering, temporarily stored at the open space near the landfill area will be subjected to erosion by rainfall and wind actions if not adequately protected. Where the slopes surrounding the landfill have already been cleared, potential slope failure may result.</p>	<ul style="list-style-type: none"> • Site clearing shall be confined to the areas that are necessary for landfill development and access road establishment; • Clearing and earthworks must be carried out in stages and scheduled to be concurrent with dry periods; • As garbage filling shall take place from the lowest point of the proposed landfill to higher area, site clearing shall be staged from the lower elevation of the landfill to the higher elevation; • Plastic sheets or mulches from felled vegetation to be laid on bare slopes as temporary surface protection from raindrop impact; • Consolidation works for open slope must be carried out immediately and simultaneously during the site clearing phases; • The filling elevation of every layer of the landfill shall be labeled by the survey team to allow the timing of clearing; and • Soil covering material shall be placed on stable high ground away from water bodies. 	Section 4.2.1	Every three (3) months or as per NREB requirement.
2.	<p>Potential Soil Contamination</p> <p>Rainfall seepage will leach out harmful substances in the waste matter, leading to the contamination of the underlying and the surrounding soil.</p>	<ul style="list-style-type: none"> • Ensure that the garbage is adequately compacted and the cover material is placed and compacted over the garbage layer. • Ensure adequate drainage is provided at the Project site. 	Section 4.2.2	-

NO.	POTENTIAL IMPACTS/ISSUES	MITIGATING MEASURES	REFERENCE IN REPORT	MONITORING
	<p>For a level-one, controlled tipping landfill, this concern is not to a large extent as only solid wastes will be disposed off in the landfill. The landfill is intended for solid waste and daily garbage from the workers' camps. It is not intended for the disposal of scheduled wastes.</p>	<p>The drainage system shall be periodically inspected to ensure no blockage.</p>		
<p>3.</p>	<p>Water Quality Impact</p> <p>During construction stage, clearing and earthworks at the Project site will expose the site to soil erosion and the eroded soil will exit the site via surface runoff and eventually enter the surrounding waterways, contributing to their sedimentation.</p> <p>During the operational stage, some rainfall seepage will eventually pass through the landfill. Nonetheless, the runoff and water seepage will be collected by sedimentation basin and a filtering cofferdam to filter the effluent before final discharge.</p>	<ul style="list-style-type: none"> • The landfill must be at least 100 m away from the nearest river, stream or other water bodies; • All surface drains and culverts shall be regularly maintained and inspected to ensure no blockages; • Perimeter drains shall be installed, with proper grading provided to channel the surface runoff from the Project site into the river; and • Quarterly water quality monitoring shall be carried out from the commencement of the landfill construction. Monitoring of landfill leachate shall be incorporated during the operational stage. • The sedimentation basin shall be regularly desludged and the filtering cofferdam maintained to ensure their effectiveness. • Final discharge of the landfill leachate shall meet Schedule 2 of the Environmental Quality (Control of Pollution from Solid Waste Transfer Station and Landfill) Regulation 2009. 	<p>Section 4.2.3</p>	<p>Every three (3) months or as per NREB requirement.</p>



NO.	POTENTIAL IMPACTS/ISSUES	MITIGATING MEASURES	REFERENCE IN REPORT	MONITORING
4.	<p>Noise Pollution</p> <p>Noise is generated from the operation of machineries and vehicles at the Project site. The concern of noise is low as there is no permanent settlement at the vicinity of the Project site.</p> <p>During the operational stage, dump trucks will be used to transport the wastes to the landfill site and bulldozers will be used to spread out the wastes. The noise impact is similar to that during construction stage though the duration is foreseen to be much shorter.</p>	<ul style="list-style-type: none"> Workers exposed to noisy machinery and/ or are involved with activities which generate high noise levels shall be provided with proper Hearing Protection Devices (HDP) such as earplugs and earmuffs. No employee shall be exposed to the daily noise exposure level exceeding 85 dB(A) or daily personal noise dose exceeding hundred per cent, the daily maximum sound pressure level exceeding 115 dB(A) at any time or the peak sound pressure level exceeding 140 dB(C). All equipment used during construction and operation of the landfill must be periodically and properly maintained and serviced to reduce the generation of noise. Quarterly monitoring of noise shall be carried out from the commencement of the landfill construction. 	Section 4.2.4	Every three (3) months or as per NREB requirement.
5.	<p>Air Pollution</p> <p>Methane is one of the primary constituents of emitted landfill gas. In addition to these air pollutants, suspended solids is also emitted due to related landfill activities such as motorized vehicles on unpaved roads and wind-blown dust from exposed surfaces.</p>	<ul style="list-style-type: none"> Vehicles transporting construction materials should be covered with canvas or tarpaulin to prevent spillage. Access road should be cleared of spilled materials as to avoid dispersion of dust. No open burning should be permitted unless with written approval from NREB. Construction vehicles and associated equipment should be properly maintained through regular servicing to reduce the emission of pollutants. Quarterly monitoring of Particulate Matter, PM₁₀ and methane once the landfill operation commences. 	Section 4.2.5	Every three (3) months or as per NREB requirement.

NO.	POTENTIAL IMPACTS/ISSUES	MITIGATING MEASURES	REFERENCE IN REPORT	MONITORING
6.	<p>Waste Generation and Management</p> <p>The concern of waste generation is during the construction stage of the Project where the landfill area will be cleared and vegetative wastes will be generated.</p>	<ul style="list-style-type: none"> • Vegetative wastes shall be stacked at designated area near the Project site for natural decomposition. • No open burning is allowed at the landfill area both during construction and operational stage. • Suitable vegetative wastes shall be used as mulches for the temporary control of soil erosion during clearing of the landfill area. • The landfill shall not be used to dispose any type of Scheduled Wastes and other toxic wastes. • Earth wastes shall be temporary deposited at an appropriate location area near the Project site and protected from being washed by rainfall. • Non-reusable earth matter shall be disposed off at suitable approved area. • Waste compaction is a primary responsibility of the landfill management team. It's fundamental for protecting the environment and the surrounding population. Optimum compaction increases the life expectancy of the landfill by maximizing the use of available space. It's also a clear indicator of a well-managed land. • It is recommended that areas and facilities for separation of recyclable or reusable materials be provided to encourage the salvaging of wastes. 	Section 4.2.6	-

NO.	POTENTIAL IMPACTS/ISSUES	MITIGATING MEASURES	REFERENCE IN REPORT	MONITORING
7.	<p>Health and Safety Hazards</p> <p>Site Preparation and Construction The construction works associated with the landfill will expose the workers to risks such as accidents involving vehicles, respiratory problems and skin conditions and manual handling injuries as well as slips and trips.</p> <p>Operation During the operational stage of the proposed landfill, the concerns are accidents involving vehicles, fire due to the potential release of methane, odour which may become a nuisance, propagation of pests, outbreak of diseases and potential collapse of waste piles.</p>	<ul style="list-style-type: none"> • All health and safety requirements shall be incorporated into contractual agreement with the contractors. • All workers involved in the construction and operation of the landfill shall be trained in the aspect of health and safety at a landfill. • Workers shall be provided with Personal Protective Equipment (PPE) such as gloves, hard hats, safety boots, earmuffs, face masks or respirators, etc. • Ensure that the necessary basic first aid and medical services to workers including transport for injured personnel to the nearest medical facility are provided as and when required. • Due to poor illumination in the area, it is essential that any construction activities extending beyond the day-light hours shall be provided with sufficient illumination at the work site. • It is recommended that the landfill area be fenced to restrict unauthorized access to the landfill and to keep out the vermin and stray animals. • Only authorized personnel are allowed to enter the landfill site. Public entry is not allowed under with permission to avoid scavenging. • Equipment defects or safety hazard identified during the construction and operational stage shall be promptly reported and dealt with. • Operations shall be stopped immediately if a severe safety hazard is identified. • Ensure the availability of adequate first-aid facility at or near 	Section 4.2.7	-



NO.	POTENTIAL IMPACTS/ISSUES	MITIGATING MEASURES	REFERENCE IN REPORT	MONITORING
8.	<p>Socio-Economic Impacts</p> <p>Adverse Impacts</p> <p>1. Site Preparation and Construction</p> <p>Non-existence of any permanent settlements within and near the Project site eliminates the major socio-economic concerns.</p> <p>2. Operation</p> <p>The operation of landfill gives rise to odour which may potentially affect the nearby worker quarters and office. Concerns on waterway contamination may be caused by the landfill leachate.</p>	<p>the landfills and the ready-mobilization of emergency vehicles, in case of emergency.</p> <ul style="list-style-type: none"> A sign shall be placed at the entrance of the landfill, displaying information regarding the landfill. 		
	<p>Beneficial Impacts</p> <p>The establishment of the proposed landfill will provide a proper disposal area for the municipal wastes generated from the BHEP site. It will improve the overall waste management at Baleh, thus eliminating many health issues associated with improper waste management such as propagation of disease vectors and diseases.</p>	<ul style="list-style-type: none"> Concerns from the site office and quarters (accommodation) located about 950 m northwest of the landfill site shall be promptly addressed. Re-vegetation shall be carried out on the outer surface of the landfill. 	Section 4.2.8	-
		<ul style="list-style-type: none"> None 	Section 4.2.8	-

NO.	POTENTIAL IMPACTS/ISSUES	MITIGATING MEASURES	REFERENCE IN REPORT	MONITORING
12.	<p>Closure and Abandonment</p> <p>Closure Emission of landfill gases is particularly crucial as the release of combustible gases such as methane can lead to fire or explosion upon exposure to ignition source. Upon closure, the landfill will still be exposed to rain seepage and produce leachate which can contaminate the surrounding waterways.</p> <p>Abandonment The main concerns for abandonment during construction are soil erosion where clearing has already been carried out, hence the potential waterway pollution, as well as aesthetic and health and safety issues related to the exposed condition of the Project site. Abandonment during the operational stage of the landfill will pose issues related to landfill leachate and emission in addition to aesthetic and health and safety matters.</p>	<p>Closure A closure plan for landfill shall be submitted and approved by NREB at least six (6) months before its closure. The closure plan must specify at least the following items:</p> <ul style="list-style-type: none"> • Anticipated total waste volumes and tonnage and life of landfill (closure date). • A topographic plan showing the final elevation contours of the landfill and surface water diversion and drainage control. • Rodent and nuisance wildlife pest control procedures. • Design of the final cover including the thickness and permeability of barrier layers and drainage layers, and information on topsoil, vegetation cover and erosion prevention controls. • Proposed end use of the landfill after closure. <p>Abandonment</p> <ul style="list-style-type: none"> • During abandonment, a proper landfill closure plan is also necessary. • All vegetative matters shall be disposed of at appropriate location for natural decomposition. • All temporary structures (if any) shall be dismantled or as per the directives of the Project Proponent or Sarawak Energy Berhad. • All machinery and equipment shall be removed from site. • All earth wastes shall be disposed of at appropriate location or, where suitable, used as the covering material for the landfill during its closure for abandonment. 	Section 4.2.9	-

9 Residual Impacts and Monitoring Programmes

Residual impacts identified as a result of the operation of the proposed landfill are as follows:

- ❖ Water quality degradation – This shall arise where untreated landfill leachate finds its way into the surrounding waterways.
- ❖ Air quality degradation – particularly due to odour dispersion from the landfill site.
- ❖ Safety and health – in terms of work-related injuries both during the construction and operation of the landfill.

The main environmental parameters that are to be monitored are surface water quality, discharge monitoring, air quality as well as noise monitoring.

Monitoring shall be undertaken on a quarterly basis. Environmental audit shall be done quarterly and an environmental management plan is recommended to ensure that all impacts and mitigation measures are managed and monitored properly.

10 Conclusion

The EIA study covered the description of the Project components and activities, the physical, chemical, biological and human environment of the proposed Project site as well as the assessment of the environment impacts in relation to the Project activities and the proposition of the associated mitigation measures.

This EIA has identified specific mitigation measures to be implemented in order to lessen, if not, to prevent these impacts. With the proper implementation of the proposed mitigation measures, the overall impact of the Project to the environment can be effectively reduced to a controlled level. With regular monitoring and proactive measures, immediate corrective actions can be carried out to rectify any environmental problems identified.