Table 3: Summary of Findings - Environmental and Social Management System

ID	Aspect	Issue Description	Phase	Standard	IESC Recommendations prior to the December 2019 site visit	December 2019 Update	Significance
001	Operations phase ESMS	The operations phase ESMP was implemented via the Project's HSE Management System (HSE- MS), which was based on Sembcorp's corporate HSSE-MS. Seven (7) operational phase plans have been developed. However, not all of the recommendations for improvements provided by the Lenders and IESC have been incorporated into the plans.	Operations	• IFC PS1 • ADB-ES Principle 4	An operations phase ESMS should be developed for the project prior to commencement of operations. The ESMS should include an ESMP, which could include several individual plans if necessary. Lessons learned from the construction phase ESMP should be applied.	7 operations phase plans have been developed, as listed in Section 5.2.2. These plans were reviewed by the Lenders and IESC prior to Project COD and recommendations for improvement were submitted on February 12, 2019. Based on review of the final operations phase plans, most of the IESC recommendations have been incorporated. However, there are some gaps remaining and these are discussed under specific topics in subsequent sections of the report.	**Minor**

5.3 Air Quality and Dust

For the operational phase, air quality and dust management has been included in the site's Environmental Management Plan (EMP) dated May 30, 2018. The key emission source associated with the operation of the Plant is the stack emissions from the combustion of natural gas during combined cycle and simple cycle operations i.e. the main and by-pass stacks of 40m and 30m height.

5.3.1 Combustion Gases

All vehicles and equipment use premium diesel, which is the highest quality diesel available in Myanmar, to reduce sulphur emissions. For the operations phase, issues related to fugitive emissions of volatile substances is considered minimal. The details of the operations phase emissions monitoring from the main and by-pass stacks are discussed in **Section 5.3.3** below.

5.3.2 Dust

The construction phase is 100% complete and the site has been completely laid with asphalt, gravel or grass cover. No dust related issues were noted during the December 2019 monitoring visit.

Site management reported that soil stockpiles were removed from the site in June 2018. As noted in the fourth monitoring visit, no remaining stockpiles of soil and sand were noted and this issue is no longer considered relevant for the operations phase. All issues raised in the previous monitoring visit has now been closed or is considered not relevant for the operations phase of the project.

5.3.3 Operations Phase Emissions Monitoring

The Project consists of two sets of gas turbine generating unit, two sets of heat recovery steam generator (HRSG) and one steam turbine generating unit with associated auxiliary equipment. The Project is designed to operate continuously throughout the year in either simple cycle or combine cycle mode. Each gas turbine is equipped with one bypass stack for simple cycle mode and one main stack for combined cycle mode. The main stack and the bypass stack do not operate concurrently at any one time.

Key emission sources associated with the operation of the Project is stack emissions from the combustion of natural gas during combined cycle and simple cycle operation. The main air pollutant of concern for a gas-fired combined cycle power plant is nitrogen dioxide (NO2) whilst emissions of sulphur dioxide (SO2) and particulate matters (PM) including respirable suspended particulates (PM10) and fine suspended particulates (PM2.5) is considered minimal provided that the combustion process is efficient.

Continuous Emissions Monitoring Systems (CEMS) supplied by Yokogawa, have been installed for both Gas Turbines and have been calibrated. They provide continuous monitoring of NOx, SO2, CO2, CO, O2, dust and flow. However, particulate matter (PM10 and PM 2.5) was monitored using a portable monitoring device from November 2019 onwards. The IESC was informed that the sensors were not functioning and it was being fixed. A summary of the stack emissions monitoring results from April 2019 to November 2019 and the particulate matter monitoring in December 2019 via portable device is provided in **Appendix 4**. Based on the available results, there was no exceedances noted from April 2019 to November 2019 for all parameters except CO where exceedances were noted in April and May 2019 and again from July to September 2019. However, the CO levels were below the stipulated limits in the last two monitoring events in October and November 2019. The IESC recommends that the Project should include more detailed analysis, discussion and conclusions when assessing the monitoring results and the overall trends. The IESC

notes that results for all other parameters were well within the stipulated limits. In addition, ambient air quality and noise were monitored at monthly intervals for the first three months of operation, followed by quarterly monitoring. The ambient air quality monitoring includes 1-hour and 24-hour averaged NO2 and SO2, and 24-hour averaged PM, PM10 and PM2.5 monitoring at the following locations:

- one village house at Hnan Ywa village (ASR3);
- one village house at Sa Khar village (ASR4);
- one village house at Gyoke Pin village (ASR5); and
- one village house at Nyaung Kan village (ASR14).

During the operations phase, ambient air quality and noise is monitored by a contractor called E Guard Environmental Services.

Ambient Air Quality Monitoring

Monitoring data for ambient air quality of four external locations for December 2018 (sampling period from November 30, 2018 to December 4, 2018), April 2019 (sampling period from April 3, 2019 to April 7, 2019), July 2019 (sampling period from June 28, 2019 to July 2, 2019) and September 2019 (sampling period from September 10, 2019 to September 14, 2019) were reviewed. The ambient air monitoring is conducted by a third party appointed by SMPC called E Guard Environmental Services.

The parameters monitored were for Sulphur dioxide (SO2), Nitrogen Dioxide (NO2), Particulate Matter (PM 10 and PM 2.5), carbon monoxide (CO)and carbon dioxide (CO2). The ambient air quality monitoring stations are as follows:

- Hnan Ywa village (ASR3);
- Sa Khar village (ASR4);
- Gyoke Pin village (ASR5); and
- Nyaung Kan village (ASR14).

The monitoring results were compared against the Myanmar National Environmental Quality (Emission) (NEQ) Guidelines (2015), World Health Organization (WHO) Air Quality Guidelines Global Update 2005 as well as the National Ambient Air Quality Standards (NAAQS) issued by the US Environmental Protection Agency (US EPA). The parameters monitored were compliant against the stipulated standards at all four monitoring locations with the exception of one-time exceedance of $PM_{2.5}$. at the Gyoke Pin Village (2,720 m from the site) and Nyaung Kan Village (2,760 m from the site) in April 2019. No exceedances were noted in subsequent monitoring events. A summary of the results is provided in **Appendix 4**.

Table 4: Summary of Findings - Air Quality and Dust

ID	Aspect	Issue Description	Phase	Standard	IESC Recommendations prior to the December 2019 site visit	December 2019 Update	Significance
001	Operations phase air emissions	The particulate matter sensors were not functioning during the site visit. Portable monitoring devices were being used to monitor particulate matter.	Operations	• Management Plan • IFC PS3 • General EHS Guidelines • ADB-ES Principle 9	Ensure that the monitoring data from the CEMS is compiled, reviewed for potential exceedances and documented.	Data from the CEMS for continuous monitoring of NOx, SO2, CO2, CO and O2 is available and tabulated in **Appendix 4**. As the particulate matter sensors were not functioning during the site visit, the site was conducting monitoring for PM_{10} and $PM_{2.5}$ via a portable particulate monitoring device. The site shall ensure that the particulate matter sensors are fixed.	**Minor**

5.4 Plant and Vehicle Management and Maintenance

Plant and vehicle management and maintenance requirements have been incorporated into the operations phase Occupational Safety and Health (OSH) Management Plan (PPMS Document Reference: 3.02.01.010, First Issue, 2nd October 2018). The OSH plan describes the Project's operational phase occupational health and safety requirements and includes some elements related to plant vehicle management and maintenance in Section 17.2 of the OSH plan.

No significant issues were identified related to the condition of the plant or equipment for the Project during the IESC fifth monitoring visit in December 2019. Operators complete a daily checklist before operating equipment and send the completed forms to their supervisors. Should any maintenance issues be identified, the maintenance department is immediately notified.

5.5 Traffic Management

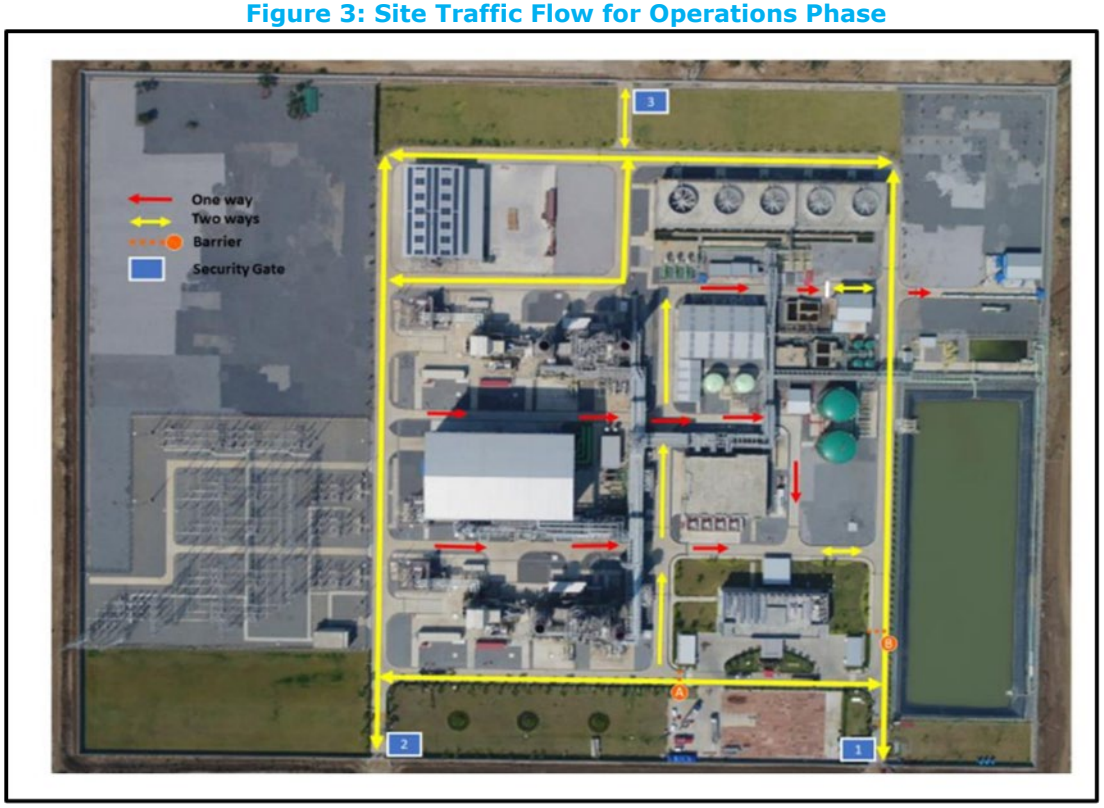
5.5.1 General Traffic Management

The operations phase Occupational Safety and Health (OSH) Management Plan (PPMS Document Reference: 3.02.01.010, First Issue, 2nd October 2018) describes the Project's operational phase occupational health and safety requirements and includes some elements related to traffic safety in Section 17.2 of the plan. The OSH Management plan specifies speed limits, requirement to wear seat belts and vehicle maintenance requirements.

5.5.2 Onsite Traffic Management

Figure 3 shows the internal traffic layout within the site. There are several signs clearly displaying the speed limit of 15 km/hour at various locations within the site. There are three (3) security gates and security personnel at the entrance check that all vehicle occupants are wearing a seat belt before vehicles are allowed to enter.

Figure 3: Site Traffic Flow for Operations Phase



5.5.3 Offsite Traffic Management

Figure 4 shows the approved access routes to the Project site during the construction phase. Heavy loads were conveyed by barge to Nyaung Hla jetty, approximately 32 km South-West of the Project site, and then by road using a route which enters the site from the West, thereby avoiding impacts on nearby communities such as the small informal settlement near the main site entrance (Route 2 (ii)).

Deliveries of heavy loads have now been completed and is no longer considered an issue for the operational phase of the project.

Figure 4: Approved Site Access Routes

5.5.4 Deficiencies Against Applicable Standards

All issues raised in the past monitoring visits have been closed, largely via modifying the requirements of the construction phase Traffic Management Plan.

Requirements related to traffic for the operational phase have been incorporated into the Occupational Safety and Health (OSH) Management Plan (PPMS Document Reference: 3.02.01.010, First Issue, 2nd October 2018).

No significant issues were identified related to overall management of traffic for the Project during the IESC fifth monitoring visit in December 2019. The use of seatbelts was excellent, and no deficiencies on seatbelt use was noted during the site visit. Examples of good practice include random breath tests of workers and security staff are trained to look for signs of intoxication in drivers.

Table 5: Summary of Findings – Traffic Management

ID	Aspect	Issue Description	Phase	Standard	IESC Recommendations prior to the December 2019 site visit	December 2019 Update	Significance
001	Management Plan	Requirements related to traffic for the operational phase have been incorporated into the Occupational Safety and Health (OSH) Management Plan (PPMS Document Reference: 3.02.01.010, First Issue, 2nd October 2018). However, the OSH Management Plan refers to a Site Traffic Plan in Section 17.2. which is a document that does not exist for the operational phase as the traffic requirements have already been incorporated into the OSH plan itself.	Operations	• Management Plan	The IESC recommends that the OSH Management Plan is reviewed and updated to remove irrelevant information and accurately describe measures relevant for traffic management during the operations phase.	References to a Site Traffic Plan in the OSH Management Plan remains despite there being no such standalone document. The OSH Management Plan shall be reviewed and updated to ensure that information that is no longer relevant for the operations phase is removed.	**Minor**

5.6 Noise and Vibration

The Noise and Vibration Management Plan (SDC-HSSEC-SMP-004, Rev D, 14th July 2016) details measures to mitigate and monitor noise and vibration for the construction phase as specified in the Project ESIA. For the operational phase, noise and Vibration management has been included in the site's Environmental Management Plan (EMP) dated May 30, 2018.

5.6.1 Mitigation Measures

The construction phase is 100% complete. Issues such as Piling work, which created significant noise and vibration, is no longer relevant. Given the lack of sensitive nearby receptors, noise and vibration are not a significant concern at this stage. Workers were observed using hearing protection in relatively noisy areas.

Ambient Noise Monitoring for Construction Phase

Noise monitoring for the construction phase was conducted monthly by trained Project personnel at several locations within the CCPP construction site (at eight (8) locations along the site boundary) and at the six (6) noise- sensitive receptors monitored in the ESIA.

The WBG General EHS Guidelines specify that daytime noise levels should not exceed 70 dBA in industrial areas or 55 dBA in residential areas. Ambient noise monitoring data for the construction phase has been provided in August 2018 construction phase E&S monitoring report.

Ambient Noise Monitoring for Operations Phase

Noise monitoring for the operations phase was conducted quarterly by trained Project personnel at two (2) locations i.e. at the Project site and Sa Khar Village (closest residential area) located approximately 1040 m from the site. The WBG General EHS Guidelines specify that daytime noise levels should not exceed 70 dBA in industrial areas and 55 dBA (daytime) and 45 dBA (night-time) for residential areas.

The average ambient noise levels recorded are as follows in **Table 6** below:

Table 6: Average Ambient Noise Levels for the Operations Phase

Name of Sampling Location	Noise monitoring location (time)	September 2018 Report (Leq)	December 2018 Report (Leq)	April 2019 Report (Leq)	July 2019 Report (Leq)	September 2019 Report (Leq)	Project Standard
Myingyan CCPP Plant	N1 (daytime)	57.10	52.26	57.70	52.60	66.37	70
	N1 (night time)	54.72	42.84	59.27	52.23	67.31	70
Sa Khar Village (1040 m from the site)	N2 (daytime)	50.02	**58.32**	**56.96**	51.41	52.19	55
	N2 (night time)	**50.29**	**56.62**	**55.39**	**51.31**	**50.59**	45

The ambient noise levels for the site were well below the stipulated limits of 70 dBA in industrial areas. However, the closest residential area (N2 - Sa Khar Village) which is located approximately 1040 m from the site indicated an exceedance of the daytime noise limit in December 2018 and April 2019 and exceedances of the night- time limit for all five (5) monitoring events (September 2018 to September 2019).

The environmental and social impact assessment (ESIA) baseline noise measurements conducted in 2015 at each noise receptors (NR) provided measured background noise levels which were in the range of 50 – 69 dB(A) during the daytime and 44 – 67 dB(A) during the night-time. The averaged background noise level at each NR was obtained by averaging the noise levels measured over an eight (8) months period.

It is important to note that the initial baseline noise monitoring in 2015 indicated daytime averaged background noise levels at Sa Khar Village had exceeded the Myanmar NEQ / IFC Guidelines on some of the months. Night-time averaged background noise levels at all the NRs (including Sa Khar Village) had also exceeded the Myanmar NEQ / IFC guideline values.

5.7 Surface Water

The Surface Water Management Plan (SDC-HSSEC-SMP-005, Rev E, 24th January 2018) describes measures required to minimize adverse environmental impacts and specifies standards for water use, protection of surface and groundwater from contamination and the management of wastewater generated by the project. The IESC recommended in the Second Environmental and Social Monitoring Report that the plan be reviewed and comprehensively updated to remove irrelevant information and accurately describe measures taken to manage water and wastewater during the Project's construction phase. Some improvements were made to the January 2018 revision of the plan. The IESC notes from the December 2019 visit that construction is 100 % complete and that the construction plan documentation issues are minor. Therefore, further review of the construction plans during the operations phase is considered no longer relevant.

For the operational phase, surface water management has been included in the site's Environmental Management Plan (EMP) dated May 30, 2018.

5.7.1 Water Use

Operations Phase

During the operations phase, 340 m3/hour of water is abstracted from the Ayeyarwady River, via two pumps on a floating river water intake (RWI) barge at Seik Yan, and pumped to a 20,000 m3 capacity river water reservoir on site (**Photo 6**). Over 9,000 m3 per day of water from the reservoir is treated on-site to provide water for cooling tower, service water and a potable supply. The process includes the following main steps:

- Dosing with sodium hypochlorite, iron (III) chloride, sodium hydroxide and polymer before clarification.
- Clarified water passes through a sand filter, a multimedia filter, then a carbon filter.
- Water destined for the cooling tower also passes through a reverse osmosis process and a mixed bed exchanger.

  Sludge from the clarifier is dewatered in a sludge thickener and a filter press, which produces over 1,000 l/day of sludge. The sludge is transferred from hoppers to trucks for disposal. SMPC has ear marked a suitable site for sludge disposal and this location was visited by the IESC during the 5th monitoring visit in December 2019. The sludge disposal site is surrounded a one (1) meter concrete wall and the area is not under roof cover. In the event of heavy rains, there is a potential for the sludge to flow out of the demarcated area into the surrounding land.

The IESC notes that there was some faulty equipment that resulted in an overflow of water sludge mixture into the recycle water tank, the gravel layer surrounding the tank and an adjacent internal drain during the August 2019 visit. However, all of these issues have since been rectified and no new issues were noted with the operations of the water treatment infrastructure during the December 2019 visit. In general, adequate secondary containment was provided for chemical storage tanks that is used for water treatment chemicals. However, further improvements could be made to the containment area underneath the sludge hoppers (**Photo 7**).

5.7.2 Sanitary Wastewater Management in the Operations Phase

The main sources of sanitary wastewater generated during the Project's operations phase are:

- Sewage and wash water effluent from administration/office block; and
- Sewage and wash water effluent from canteen.

Sewage

In April 2018, the construction of the sanitary wastewater treatment plant was completed. Therefore, all sanitary wastewater from the administration/ office block is routed to the onsite sanitary wastewater treatment plant from April 2018 onwards. Untreated sanitary wastewater from the site is no longer disposed offsite.

During the December 2019 visit, the IESC was informed that the wash water effluent from the canteen is passed through a grease trap and the water is used for gardening. The sanitary wastewater from the canteen toilet is collected in a cess pit and will be removed by the Myingyan Municipality, using vacuum tankers periodically. During the monitoring visit, the IESC was informed that there has been no collection by the municipal council for this cess pit as yet due to the very small quantities of domestic wastewater being generated from the canteen toilet.

The contents of the cess pit will be taken to a municipal wastewater disposal site adjacent to the Myingyan cemetery and graveyard, approximately 7 km South of the centre of Myingyan (**Figure 5**). Once collected by the Municipal council, it will be pumped into an unlined soil pit, measuring around 5 m x 4 m (**Figure 6**).

Figure 5: Location of Sanitary Wastewater Disposal Site and Landfill Site

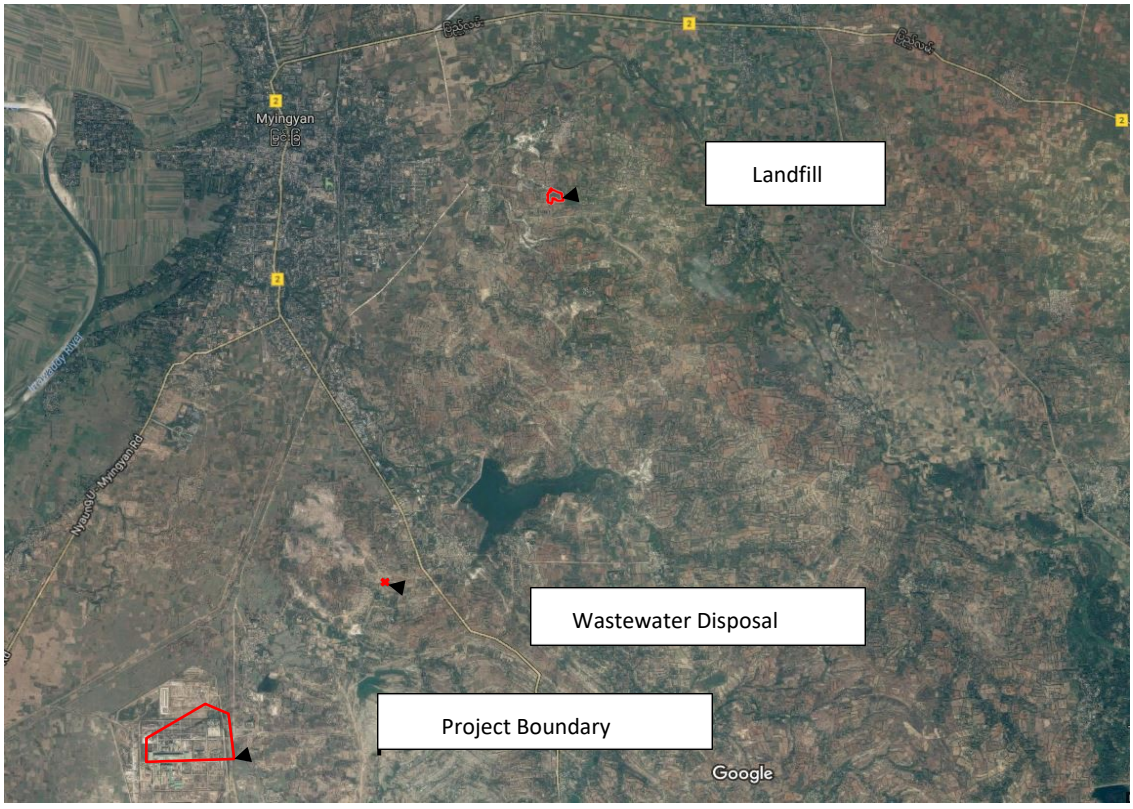


Figure 6: Sanitary Wastewater Disposal Site

No sensitive receptors were identified around the wastewater disposal site. The nearest building is the town's crematorium, 110 m to the South of the pit, and the nearest residential dwelling appears to be around 600 m to the North-East. The site is otherwise surrounded by agricultural land, and a wooded area immediately to the West, between the pit and the graveyard.

5.7.3 Surface Water Runoff

Drains from all equipment containment drainage, spills, floor wash downs and fire protection discharges lead to an oil-water separator after which it is channeled to the Central Monitoring Basin (CMB). The CMB collects all the water from the containment drainage, the oil-water separator and cooling tower blow down water for monitoring to ensure compliance to wastewater effluent quality before discharge. The wastewater discharge is discussed in **Section 5.7.5** of the report.

The IESC site visit was conducted during a period of dry weather, and no issues were observed with surface water runoff. A concrete hard standing area has been constructed outside the Administration Building, which is used as a car park now during the operations phase. Runoff, which could potentially be contaminated with oil or fuel from vehicles could contaminate surface water drainage. It is recommended that SMPC considers installing an oil interceptor on the drainage system serving this car parking area.

5.7.4 Wastewater Treatment in the Operations Phase

The main wastewater streams during the operations phase are:

- 65 m^3/hour from cooling tower blowdown into the CMB.
- 35 m^3/hour from the oil water interceptor (intermittent source i.e. only when raining) into the CMB.
- 1.0 m^3/hour from the neutralising pit (as part of the raw water treatment process), after treatment.
- 0.1 m^3/hour from the sewage treatment plant (**Photo 11**) after treatment. Sewage will be treated using methanol (for denitrification), sodium hydroxide (for pH control), ferric sulphate

(a coagulant) and chlorine (for disinfection).

Each of these wastewater streams is collected in the 500 m^3 capacity central monitoring basin. On average, approximately 80 to 116 m^3/hour of treated wastewater is monitored and then discharged from the central monitoring basin to the Ayeyarwady River, via a pipe 1 m above the river bed, and 80 m downstream of the RWI pump barge.

The Project has committed to meeting the discharge limits, which are based on the WBG EHS Guidelines for Thermal Power Plants (2008) and the IFC General EHS Guideline: Environmental Wastewater and Ambient Water Quality (2007). The quality of wastewater is monitored during the operations phase by a contractor called Golden Dowa Eco-System Myanmar Co. Ltd. The detailed results of the wastewater discharge monitoring from November 2018 to November 2019 are graphically depicted in **Appendix 4.** The plant designated discharge sampling location is shown in **Photo 18**.

Additionally, the temperature of the wastewater discharge from the CMB is monitored in real time from the Plant Control Room. The average temperature differentials per quarter is summarised below:

- 1st quarter of 2019 (1/1/2019 to 1/4/2019): Average river water intake (RWI) temp is 24.01 C and CMB water discharge temp: 22.8 C.
- 2nd quarter of 2019 (1/4/2019 to 1/7/2019): Average RWI temp is 29.31 C and CMB water discharge temp: 29.31 C
- 3rd quarter of 2019 (1/7/2019 to 1/10/2019): Average RWI temp is 28.67 C and CMB water discharge temp is 27.8. One temperature spike was noted for the RWI temperature in July 2019 and this was due to accumulation of debris at the RWI causing a faulty sensor. The issue was rectified in the same month (July 2019). However, the IESC notes that in December 2019, accumulation of debris was noted at the RWI again. It is recommended that regular housekeeping is conducted at the RWI area to ensure that the accumulation of debris is minimized.
- 4th quarter of 2019 (1/10/2019 to 6/ 12/2019): Average RWI temp is 27.70 C and CMB water discharge temp: 26.4 C. Some irregularities were noted during the planned outage which started between October 5th/6th and October 22nd but the temperature trends indicated a quick stabilization. The overall average temperature differentials were maintained within the allowable limits over that monitoring period.

Based on the above, the average data indicates that the CMB discharge temperatures did not exceed 3°C of the RWI ambient temperature.

5.7.5 Surface Water Quality Monitoring

The Surface Water Management Plan for the construction phase requires six-monthly monitoring of surface water quality at two locations on the Ayeyarwady River (upstream and downstream of the jetty) and monthly monitoring of water quality at the jetty for the duration of its use by the Project. The IESC inspected the jetty area in July 2017 and no visible evidence of soil or water contamination was found at the time. As the jetty has not been used since 2017, no further action is required for the operational phase.

Sembcorp has conducted three (3) surface water monitoring events upstream and downstream of the wastewater discharge point on December 11 and December 24, 2019 as well as January 2, 2020. The summary results of the surface water sampling events are presented in **Appendix 5A**. The results were in compliance to the stipulated limits with the exception of exceedance of Total Phosphorus in the December 24, 2019 monitoring results which was attributed to a lab error. The exceedance was noted to be a one-off event as the December 11, 2019 and January 2, 2020

monitoring did not indicate a similar exceedance for Total Phosphorus.

In January 28, 2020, Sembcorp conducted an additional surface water monitoring event in the presence of 20 villagers (including some village heads) and the results are provided in **Appendix 5B.** The January 28, 2020 monitoring event was conducted at four (4) locations i.e. the discharge pipeline point, 100 m upstream from discharge point, upstream mid river and 100 m downstream. Iron exceedances were noted at the discharge point (1.706 mg/L), 100 m upstream (1.138 mg/L) and upstream mid river (1.048 mg/L). However, the Iron results 100 m downstream was only 0.854 mg/L which is below the stipulated limit of 1.0 mg/L for Iron. The details of the local community participation including attendance records for the January 28, 2020 monitoring event is provided in **Appendix 5C**.

5.7.6 Other Observations

The construction phase Surface Water Management Plan requires the Project to carry out contaminated land assessments to identify legacy contaminated areas. No such assessments have been carried out but Project HSE management representatives reported that no evidence of contamination was detected during site excavations. Based on the limited industrial development in the area, contamination at the site from industrial activities is considered low. Other potential site contamination sources could be from illegal dumping of wastes and from application of chemicals for agriculture. As noted, no visual evidence of wastes was detected during site excavations, and the area where the power plant is located was not heavily used for agricultural purposes. No further action is recommended by the IESC for the operations phase.

Table 7: Summary of Findings – Surface Water

ID	Aspect	Issue Description	Phase	Standard	IESC Recommendations prior to the December 2019 site visit	December 2019 Update	Significance
001	Wastewater discharge for operations phase	Some wastewater quality parameters were not meeting the discharge standards.	Operations	• IFC PS3 • WBG EHS Guidelines • ADB-ES Principle 9	All wastewater should be treated to meet Applicable Standards before its disposal.	Monitoring of wastewater discharges from November 2018 to November 2019 identified one-off exceedances for Total Coliform and Zinc in February 2019 and Total Phosphorus in August 2019. Site personnel identified the root cause (damaged wall of a sewage tank) and this issue was rectified. No exceedances were noted for any of these parameters in subsequent monitoring events. Iron exceedances ranged from 1.45 mg/L in May 2019 to 2.258 mg/L in August 2019 at the discharge monitoring point. However, the January 28, 2020 monitoring results indicate that while iron levels were recorded at 1.706 mg/l at the discharge point, the level just 100 m downstream from that point was recorded at 0.854 mg/L (lower than the stipulated limit of 1 mg/L). Similarly, a review of the river water monitoring conducted on December 11 and 24, 2019 and January 2, 2020 indicate iron levels well below the stipulated limits just 30 meters downstream from the discharge point. Therefore, the IESC recommends that site continues to monitor upstream and downstream of the discharge monitoring location periodically for better comparison of results and analysis of trends. Where possible, the monitoring reports should be clearer in attributing the cause of the recorded exceedances and in demonstrating and documenting the corrective measures that have been undertaken.	**Minor**

ID	Aspect	Issue Description	Phase	Standard	IESC Recommendations prior to the December 2019 site visit	December 2019 Update	Significance
002	Car park runoff	A concrete hardstanding area has been constructed outside the Administration Building, which serves as the car park during the operations phase. Runoff, which could potentially be contaminated with oil or fuel from vehicles could contaminate surface water drainage.	Operations	• IFC PS3 • WBG EHS Guidelines • ADB-ES Principle 9	-	It is recommended that SMPC consider installing an oil interceptor on the drainage system serving this area.	**Minor**

5.8 Soil and Groundwater

For the operational phase, soil and groundwater issues arising from accidental spills and leaks has been included in Section 7.7 of the site's Environmental Management Plan (EMP) dated May 30, 2018 and spill response and management details are provided in the Plant Emergency Preparedness and Response Plan

The December 2019 IESC monitoring inspection did not identify any new issues related to the storage of chemicals and oils in drums. Several deficiencies in the storage of materials that could lead to soil and groundwater contamination noted previously have largely been addressed, and the IESC observed a dramatic improvement in the most recent site inspections. The IESC understands that there are two spill kits available. However, the IESC recommends that the location of the spill kits be clearly indicated in a site layout and included in the operational phase Plant Emergency Preparedness and Response Plan.

During the visit, the IESC was informed that SMPC has ongoing discussions with a chemical supplier to potentially located a warehouse in Myingyan for chemical storage, thereby reducing the quantity of chemicals stored onsite. Discussions with this supplier is also being held to accept used empty chemical and oil containers/drums for recycling/reuse. The waste oil, used containers and drums are all currently being stored and reused onsite pending confirmation of acceptance by the chemical supplier. This issue is discussed in further detail in **Section 5.10** of the report.

Table 8: Summary of Findings – Soil and Groundwater

ID	Aspect	Issue Description	Phase	Standard	IESC Recommendations prior to the December 2019 site visit .	December 2019 Update	Significance
001	Spill kits	There are two spill kits available but the locations have not been clearly demarcated in the operational phase emergency response plan.	Operations	• Management Plan • IFC PS3 • WBG EHS Guidelines • ADB-ES Principle 9	Provide spill kits at all locations where fuel and chemicals are stored and in vehicles used to carry hazardous liquids.	IESC recommends that the location of the spill kits be clearly indicated in a site layout and included in the operational phase emergency response plan.	**Minor**

5.9 Biodiversity

No non-conformities were found against the requirements of the construction phase Biodiversity Management Plan (SDC-HSSEC-SMP-007, Rev D, 20th July 2016). The IESC has not identified any issues relating to biodiversity for the operations phase. Waste Management

For the operational phase, waste management has been included in the site's Environmental Management Plan (EMP) dated May 30, 2018.

5.10 Waste Management

For the operational phase, waste management has been included in the site's Environmental Management Plan (EMP) dated May 30, 2018.

5.10.1 On-site Waste Management

Clearly labelled and colour-coded bins were observed on site, facilitating collection of recyclable materials. Waste storage areas are generally of an adequate standard, and the two waste storage opportunities for improvement identified in the Fourth Environmental and Social Monitoring Report have been rectified.

Based on waste disposal records reviewed from January 2018 to November 2019, the IESC notes that general waste disposal quantities have significantly reduced which is expected mainly due to the reduction of the workforce from 1,139 people working at the Project site in January 2018 to a project workforce of only 119 people in December 2019. The IESC was informed that approximately 1.5 metric tons (MT) of domestic waste is generated monthly during the operations phase and it is transported via OK Company, a local licensed waste contractor to a designated municipal waste disposal area.

In addition, the IESC notes that the site is still in discussions with a chemical supplier to have a chemical warehouse located in Myingyan for chemical storage to reduce the quantity of chemicals stored onsite and potentially, to accept used empty chemical and oil containers/drums for recycling/reuse. It is understood that empty chemical and oil containers/ drums are currently being stored and reused onsite due to the ongoing discussions.

5.10.2 Off-site Waste Disposal

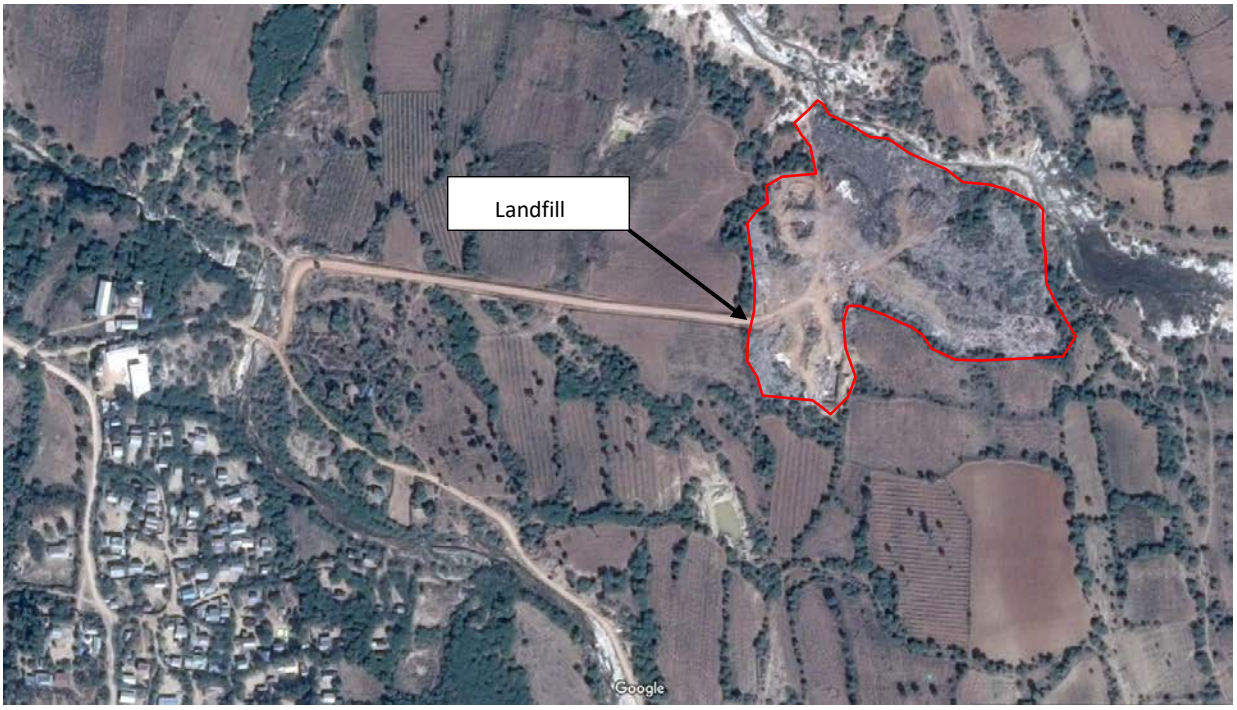
All waste produced during the Project's operations phase, with the exception of materials sent for off-site recycling, is disposed of by a company called OK Service. It is the only waste management company in the Myingyan region that has been approved by the regulatory agencies, and it also disposes of all municipal waste collected in Myingyan.

Solid general waste is collected from the site twice per month by OK Service, then transported to a landfill site operated by the Myingyan Municipality, around 4 km East of the centre of Myingyan (**Figure 7**). This facility, which was opened around three years ago, is not an engineered landfill but a poorly controlled and unlined waste dump. Most waste appears to be deposited on the surface, where it is neither compacted nor buried. During the August 2018 visit, it was noted that the waste across much of the site is smoldering and that the waste is routinely burned. It is understood that smoke sometimes blows towards Myingyan, where it causes a nuisance. The Project keeps records of the type and volume of waste deposited at the municipal landfill site.

The IESC was informed that the site generates approximately 10 metric tons of sludge per month from the water treatment plant. Based on the December 2019 visit, the site has assessed options for sludge treatment and the IESC was informed that discussions with OK service has been completed and the off-site location (**Photo 13**) has been identified for the sludge to be dried and potentially used for land farming/ fertilizer. The IESC visited the off-site location for the sludge storage and noted that the bunding at this area could be improved. In the event of heavy monsoon type rains, there is a potential for the sludge to flow outside of the containment area. The IESC recommends that the sludge storage area is roofed to prevent rainwater infiltration and runoff.

The suitability of the sludge for land farming has been confirmed upon testing of the sludge characteristics for ignitability, corrosivity, reactivity and toxicity.

Figure 7: Municipal Waste Disposal Site



In previous monitoring visits, approximately ten scavengers were seen collecting waste materials for recycling. They appeared to live in simple shacks made of waste materials, within the site, close to the entrance. The disposal site was visited again during the August 2018 monitoring visit and the scavengers remain and live in simple shacks, within the site as noted previously. Waste is not properly contained in the disposal site as much of it is left on the surface and not covered with soil. Reportedly only hazardous waste is buried in unlined pits within the site. In addition, a considerable amount of wind- blown litter was observed in trees and on the ground surrounding the site. During fourth monitoring visit, there was no fence and demarcation of SMPC's disposal area was not very clear.

The IESC did not visit the waste disposal site in December 2019. However, as noted in Section 5.10.1 of the report, waste quantities for the operations phase has been drastically reduced. Therefore, SMPC no longer maintains a specially demarcated area at this disposal site specifically for its waste.

SMPC has constructed a medical waste incinerator at the Myingyan Hospital, which has been used to dispose of medical waste produced at the hospital and from the Project site since September 2017.

5.10.3 Waste Hierarchy

Some waste streams are segregated on site for off-site recycling, most notably wood, scrap metal, waste oil and plastics. No data were available on the amount of waste recycled nor the contractors engaged for recycling of each type of material.

Table 9: Summary of Findings – Waste Management

ID	Aspect	Issue Description	Phase	Standard	IESC Recommendations prior to the December 2019 site visit	December 2019 Update	Significance
001	Waste management	Information in the Environmental Management Plan (EMP) dated May 30, 2018 is lacking some details related to offsite waste disposal routes for each waste stream, information on expected quantities and on-site storage arrangements for each type of waste.	Operations	• IFC PS1 • WBG EHS Guidelines • ADB-ES Principle 4	Update the plan to include a description of each type of waste generated during operations phase, details of how much is produced per year, where it is stored, and how it is disposed of.	Waste management has been included in the site's Environmental Management Plan (EMP) dated May 30, 2018. There are some minor gaps of waste related information in the EMP. Specifically, it shall be expanded to include precise details of the waste generated during the operational phase including the estimated quantity of sludge from the wastewater treatment plant, sanitary sludge from the STP as well as used chemical drums and containers. The EMP should clearly state the use of licensed contractors and specific disposal locations and names of the supplier if drums and containers are being returned to the supplier.	**Minor**
002	Waste management monitoring and targeting	Waste minimisation targets have not been established and waste records do not meet the requirements of the management plan which requires chain-of custody documentation.	Operations	• Management plan • IFC PS3 • WBG EHS Guidelines • ADB-ES Principle 9	Evaluate opportunities to avoid or minimise waste, set reduction targets and maintain records as prescribed in the management plan, which as a minimum include the amount of each waste stream sent to off-site disposal and recycling each month. This should include hazardous and non-hazardous wastes.	The site is evaluating opportunities to minimise waste. The IESC notes that the site has assessed its options for the sludge generated from the raw water treatment and a suitable location has been found for sludge storage. However, the progress of discussions with suppliers to potentially return used empty chemical drums and containers is not clear. No specific waste reduction targets have been set. The IESC also notes that approximately 1000 cleaned drums have been provided to the local	**Minor**

ID	Aspect	Issue Description	Phase	Standard	IESC Recommendations prior to the December 2019 site visit	December 2019 Update	Significance
						community for reuse. As the drums were previously filled with bleach solution of 10%, the site conducted a representative pH test of the cleaned drums (after double rinsing) to ensure that it is safe for use. The site has also developed a drum cleaning procedure which requires the drums to be washed under continuously running water for 15 minutes followed by a second rinse after which it is pH tested prior to being provided to the local community. The IESC recommends that the drum cleaning process for community reuse is conducted under the close supervision of the HSE team and batch testing of pH is conducted at regular intervals for these drums. The test results for each batch shall be recorded and maintained by the site.	
003	Off-site waste disposal	The municipal waste disposal site operates at a level well below what is considered Good International Industry Practice (GIIP).	Operations	• IFC PS3 • WBG EHS Guidelines • ADB-ES Principle 9	Work with OK Service and the municipality to improve conditions at the waste disposal site. In particular, effort should focus on improving containment of waste.	The waste is collected and disposed at the municipal waste disposal site every two weeks for the operations phase. However, the quantity of municipal waste generated during the operations phase has been drastically reduced compared to the construction phase due to a reduction in workforce. Therefore, this issue is considered to be minor for the operations phase.	**Minor**

5.11 Oil and Chemical Spill Contingency

Oil and Chemical Spill Contingency has been incorporated into the site's Plant Emergency Preparedness & Response Management Plan approved on August 31, 2018. **Section 6.3** of the Plant Emergency Preparedness & Response Management Plan details the approach taken by the site for the management of oil and chemical spills. Measures have been taken to prevent spills and leaks (e.g. use of secondary containment around bulk storage containers and the main drum storage areas).

Based on the site visit, the IESC notes that there are spill kits available near the chemical storage areas and in maintenance areas where oil and waste oil is stored in drums. However, the IESC recommends that the location of the spill kits be clearly indicated in a site layout and included in the operational phase emergency response plan.

The Fourth Environmental and Social Monitoring Report highlighted opportunities for improvement in the Oil and Chemical Spill Contingency Management Plan. One, which related to detailing chemicals stored at the construction site, has been closed following a revision of the management plan, but the following two noteworthy issues remain for the operations phase and should be included in the operational phase Plant Emergency Preparedness & Response Management Plan as follows:

- There is no information on unloading and loading protocols. No such procedures have been written, but it is understood that all deliveries of hazardous substances are supervised.
- Section 12 of the plan (Emergency response flowchart for Fire Outbreak, Hazardous Substances Spillage and Gas Pipe Leak) provides a basis for spill response but it lacks detail. For example, it is not clear how recommendations from an incident investigation will be implemented after submission of the incident report.