Metro Rail Transit Line 3 ("MRT-3") Rehabilitation Project Procurement Of Supervision Consultant

Environmental Quarterly Report

Reporting Period: July-August-September, 2021

7 October, 2021

Oriental Consultants Global Co., Ltd.

And

Tonichi Engineering Consultants, Inc.

Joint Venture ("OCG-MRT-3")

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Contents

1. PRIMARY PURPOSE:

Ensure that all activities related to the MRT3 Maintenance and Rehabilitation project is environmentally sound, socially acceptable and sustainable.

2. OBJECTIVES

1. Monitor compliance of the project vis-a -vis the Environmental Management Plan (EMP) using the Environmental Monitoring Plan (EMoP);
2. Ensure that DOTr and Contractor comply with JICA Environmental Guidelines;
3. Compliance with the GOP/DENR/DOLE-OSH applicable laws, rules and regulations;
4. Monitor action(s) taken based on the Environmental Assessment during the rehabilitation and maintenance phase;
5. Monitor Action(s) taken based on the condition and required social and environmental safeguard documents;
6. Provide bases for timely decision making with regards to mitigation, monitoring and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts; and
7. Conduct educational training on environmental awareness/mitigation measures on pollutants at the depot, stations, and Train operations.

3. GENERAL ENVIRONMENTAL MONITORING:

DOTr/Contractor's tasks of Environmental Monitoring, especially at the Depot is in the Environmental Monitoring Plan (EMoP). This EMoP has been updated in response to mitigations of the latest environmental issues of the project, i.e. the Depot and COVID19 pandemic. Impacts and mitigation/control measures are in the EMP. As per DENR/EMB and JICA Guidelines, EMP and EMoP should be updated depending on the actual environmental conditions at the project site. Moreover, Meetings were conducted, discussing WTP effluent sampling and laboratory analysis, which result will be used for the application of "Discharge Permit", from DENR/EMB/LLDA. Conducting this will ensure that the contractor had effectively rehabilitated the WTP at the depot. Application for discharge permit from LLDA is in process.

4. MAJOR ACTIVITIES (April, May and June 2021)

- Updates on WTP and the monitoring parameters, wastewater and the domestic water laboratory analysis and Permit to Discharge.
- Air Quality Monitoring status, ventilation design, and the WTO, Solid waste and Hazardous waste disposal at the depot.
- DISPOSAL OF HAZARDOUS WASTE AND TOXIC SUBSTANCES AS RECOMMENDED FOR THE DEPOT, AN INQUIRY BY SAFETY OFFICER
- VOC Monitoring at the paint booth
- RMA Review for the Wastewater Monitoring.
- PROPER DISPOSAL OF HAZARDOUS WASTE AND TOXIC SUBSTANCES AS RECOMMENDED FOR THE DEPOT, AN INQUIRY BY SAFETY OFFICER.

- Meeting with OCG Consultant- Engr. Jason Rocha to discuss the Mechanical Parts of the WTP at the Depot, particularly to check the specifications of the motors, pipes, capacity of tanks, and the possible addition of equalization tank.
- Site Visit at the Depot with Engr. Jason Rocha to inspect the WTP facility.
- Correspondence with Engr Jason Rocha -OCG and Rhenz of TESP regarding the Mechanical part of the Depot WTP for upgrading and improvement of efficiency in anticipation to the future.
- Discussion during meeting on: WTP Equipment and parts schedules, in coordination with Engr. Jason Rocha and TESP Engineers; a.) Coordinated with the OGM on the WTP Laboratory parameters (DAO 20016-08- WQG and GES) that passed the limiting standards and the volume of water utilized in Septic Tanks and Domestic Wastewater; b.) Sent to Engr. Celso, the provision based from the RMA regarding who is responsible in the payment of government fees (i.e. Permit to Discharge from Laguna Lake Development Authority)
- Visit in the Depot Facility: WTP, Solid Waste Storage Area; Haz-waste Storage Area;
- Discussion with Jason Rocha on his request for the copy of the Train Wash manual showing the train wash area location and the sump pit and its pipe link to the WWTP.
- Meeting with Kenichi Kuramoto san, Engr. Eula Escober – OGM; Jason Caro-DOTr; Arman Geraldine- TESP; PCO Rhenz Rosaga – TESP; and Dominador Eusebio – OCG Consultant on the following topics: Discussion on the Site Visit at Depot last Sept. 13, 2021; Compliance of contractor to the environmental findings last Sept. 13, 2021; Discussion on EMP/EMoP.

Discussion on OJT, attendees, schedules and programs; EMP compliance, Environmental update, WTP and proposed OJT Sept. 13, 2021 Site Visit and Findings/ Recommendation.

1. Virtual Meeting with Mr. Kurimoto, Engr. Jason Rocha, and Mr. Paul Southern on the investigation and design of the WTP and WTP efficiency. Review of WTP and response to Jason and Kotani Inquiry.
2. Discussion on OJT on Environmental Monitoring and Management with Mr. Kuramoto.

5. WASTEWATER TREATMENT PLANT

Discussions with focal of DOTR, Office of the General Manager (OGM), and TESP/MHI included the background of the wastewater, particularly the WTP design and features, of the depot. It was reiterated that WTP WASTEWATER, SEPTAGE WASTEWATER, and SUMP PITS are main sources of wastewater. Inefficient wastewater treatment will not be able to discharge effluent which quality does not pass the DENR standards, thus will require storage and disposal by other means. As listed from the EMoP given to the contractor, the following are the mitigation measures suggested:

- O&M provider shall monitor and control wastewater in the depot quarterly or as needed using portable water quality meter or any DENR accredited laboratory. If the results exceed the allowable limits, the water treatment method shall be considered.
- Quarterly monitoring has to consider proper storage and disposal by an accredited transporters/hauler for further treatment while WTP is undergoing rehabilitation. Effluent quality shall be monitored based on the GES for Class C in accordance with the requirement of discharge permit and the Effluent Quality Monitoring manual issued through EMB M.C. 2008-008.
- Conduct of water quality monitoring in compliance with (RA 9275) Clean Water Act Effluent Standard to be conducted by a DENR accredited laboratory. It has 12 water quality parameters to be monitored.

- Ensure that there are available parts for replacement for the continuous operation of WTP in case of equipment break off.
- Maintain good housekeeping at the Depot that is by keeping solid waste on bins with covers, plastic bags and/or sealed containers. Coordinate with accredited haulers/transporters for timely and immediate disposal of wastewater and septage.
- Refrain from storing wastewater in the Depot because the production of gases like H2S and Methane could be very fast.
- Review of the Operations Manual of the Depot WTP.

A. It was also presented to inquiries on the WTP Operations Manual interpretations: Upon review of the Contractor's Maintenance Progress Reports, the following concerns on Wastewater Treatment Plant (WTP) at depot were brought to the discussions.

1. The Depot is consuming approximately 3,000 cu. meter per month fresh water (as per Engr. Caesar Hieras). The wastewater goes to the following destination:
   - Industrial wastewater (WTP) produced from the washing of MRT3 trains etc. is an approximately volume of 860.5 cu. meter (as per MHI PCO).
   - Domestic wastewater that goes to the sump-pit;
   - The wastewater from Septic Tanks as sludge.

   It was also discussed that the 3 wastewaters have different destinations and should all be contained and treated separately. Septage from Septic tanks should be hauled and treated by the third party TSD. WTP treats the Industrial wastewater produced by the depot. The sump-pit wastewater should be treated using biological reactors while the third wastewater, the sludge, should be administered to the accredited haulers for treatment and disposal.
2. Internally, with the OCG Consultants and Engineers - Mr. Kotani inquiry on DOTr request of more train wash by Sumitomo and how it fitted to the WTP capacity per day. According to Sumitomo, the limit capacity of the Wastewater: Facility is 6 cars/hour, for 3 hours it is 18 cars/day (3hrs); For 4 days, it's 72 cars that can be washed. DOTR requested 69 cars in 4 days. Based on SCs comment, they can satisfy the DOTr request. Part of the inquiry was that, if there's a need to increase the washing capacity, then provision of equalization tank be proposed to hold the water before treatment or improve the WTP treatment capacity. WTP requires time and enough volume to treat wastewater.
3. Laboratory Analysis of June 2021, showed favorable results, all parameters passed the standards.

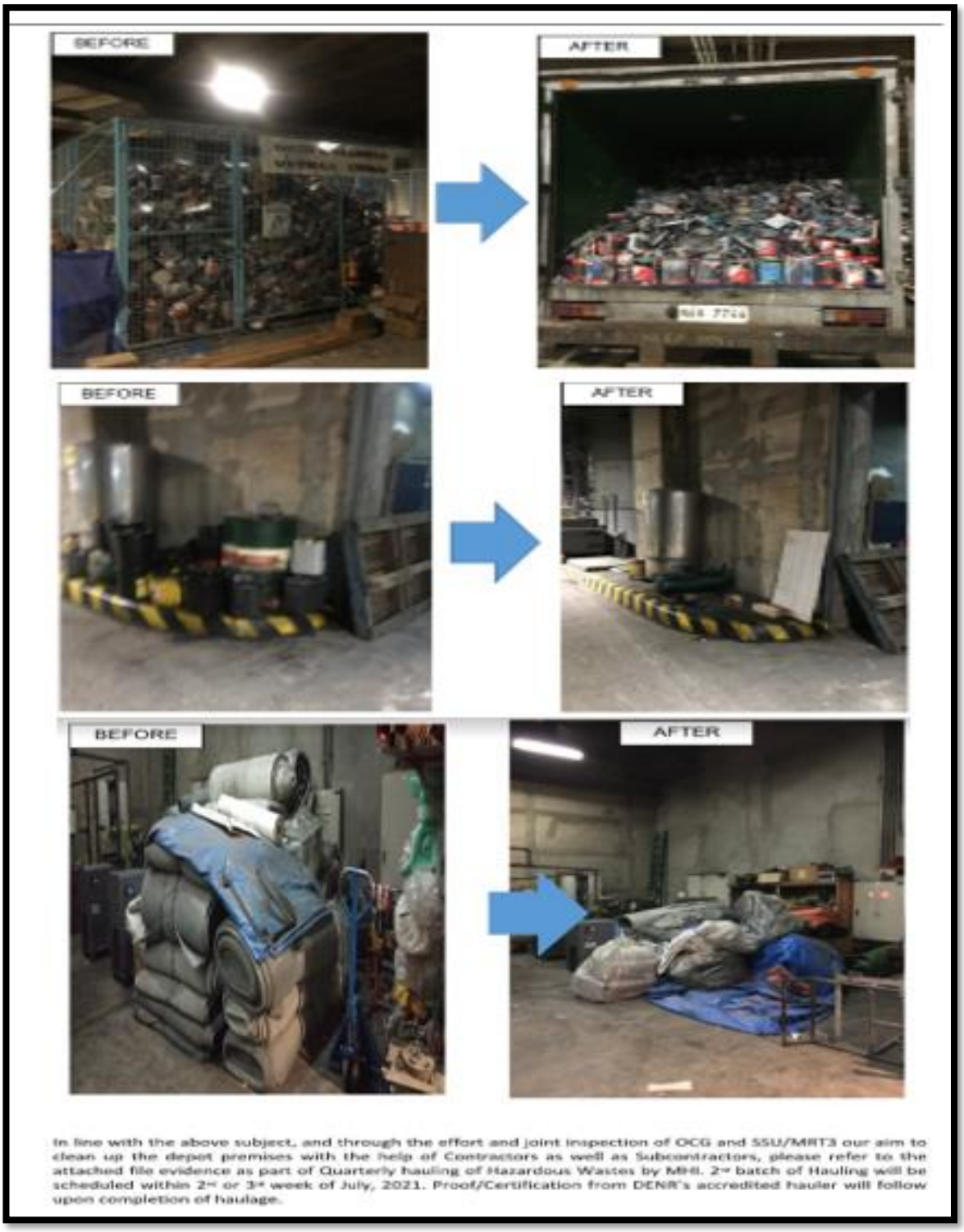
B. REVIEW OF THE WTP OPERATIONS MANUAL

It was also presented in the meeting with TESP, DOTr, OGM, and internal consultants, the review of the WTP Operations Manual, the following key points described the process:

1.	Volume and Quality of raw wastewater: Vol.= 1.5 m^3/hr; pH=6 to 12; N-Hex= 50 mg/L; SS 500 mg/L, discharge time=24 hrs;
2.	After Treatment: pH=6.5 - 9; n-Hex = 5 mg/L or below; SS= 70 mg/L or below; Time = 24 hrs;
3.	The Manual also discussed 3 parameters such as: pH; n-Hex; and Suspended Solids (SS);
4.	And WTF efficacy was based on the removal of n-Hex (generic term for chemicals containing gasoline based, chemicals, solvents, paint thinners, mineral oi, crude oil) and SS and a more balanced pH;

5.	Free oil separated;
6.	SS and n-Hex are coagulated by coagulant AL2(SO4)3 with Na(OH), 01% polymer in the Coagulating Tank;
7.	In the coagulating tank, flocs are formed;
8.	Floc can be separated from the dissolved air floatation system, floc will float;
9.	Floated slurry (floc) separated and removed;
10.	Treated wastewater at the bottom will be filtered;
11.	Filtration uses sand filters to remove SS;
12.	Treated effluents that pass the standard final disposal to the main sewer.

6. Solid Wastes and Hazardous Wastes for Disposal



7. AIR QUALITY ENVIRONMENTAL MONITORING PLAN AT THE DEPOT

Office of the Director 9OOD) had the inquiry on the Air Quality Monitoring

METRO RAIL TRANSIT LINE 3 REHABILITATION PROJECT: PROCUREMENT OF SUPERVISION CONSULTANT. Monitoring form which may be utilized (and adapted as needed) to record the results of a compliance inspection or source or ambient monitoring at the rehabilitation/maintenance areas.

Emission Discharge Monitoring/ Ambient Air Quality Monitoring: Project site/location where there are equipment regularly in use. Equipment/Activity that potentially emit air pollutants and noise: Total Suspended Particulates (TSP); Sulfur Dioxide (SO2); Nitrogen Dioxide (NO2); Noise Level (dB); Meteorological/Atmospheric Condition (weather condition, temp) should be monitored.

Table 1: INDOOR - US-EPA Standard Limit for Ambient Air Quality

Monitoring Parameter	NAAQGV* LIMIT VALUES	LOCATION OF MONITORING	FREQUENCY	REMARKS
TSP	Annual – 90 µg/Nm^3 (long term exposure); 24 hr - 230 µg/Nm^3 (short term exposure)	Inside the depot:1- at the working area of the people; 1- at the parking area; and in location of potential spot with high particulates	Before the ventilation rehabilitation work; after the rehab work and Quarterly & Semi-annual monitoring during operation period.	Annual Average; 24-hour average exposure. The 90 µg/Nm3 is for long term exposure; 230 µg/Nm3 is for short term exposure
PM $_{2.5}$	25µg/m^3 in 24h	Inside the depot:1- at the working area of the people; 1- at the parking area; and in location of potential spot with high particulates	-do-	
NO_2	100 ppb in 1 hr	Inside the depot: 1- at the working area of the people; 1- at the parking area; and in location of potential spot with high particulates	-do-	
SOx	5ppm	-do-	-do-	
CO	25ppm – 8h work/d (long term exposure); 35ppm-8h work/d (short term exposure)	-do-	-do-	The 25ppm is for long term exposure and 35ppm is for short term exposure
CO_2	5000ppm (ACGIH)	Inside the depot: 1- at the working area of the people; 1- at the parking area; Offices and in location of potential spot with high particulates	Daily using CO_2 monitoring device at the Office Areas	
Benzene	1 ppm (8h) US-DOL 5 ppm(15 min) OSHA	-do-	Before the ventilation rehabilitation work; after the rehab work and Quarterly & Semi-annual monitoring during operation period.	
PAH	10ppm	-do-	-do-	

O_2 Level	19.5%-22% OSHA Regulation	At Office areas; all sides of the depot at all levels, top and bottom space at the site of working area.	Daily using O_2 monitoring device at Office Areas	
Lead	20 µg/m^3	Inside the depot: 1- at the working area of the people; 1- at the parking area	Before the ventilation rehabilitation work; after the rehab work and Quarterly & Semi-annual monitoring during operation period.	From NAAQS for Source Specific Air Pollutants from Industrial Source
Temperature	68-76° F	Inside the depot: 1- at the working area of the people; 1- at the parking area	Daily	
Humidity	20%-60%.	Inside the depot: 1- at the working area of the people; 1- at the parking area	Daily	
Noise	85dB	Inside the depot: 1- at the working area of the people; and as many as at the working site in parking areas.	Daily	
VOC/ Formaldehyde	PEL = 0.75 ppm for an 8hr time weighted average (TWA); STEL = 2.0ppm for Short Term Exposure Limit for a 15 min. exposure. (OSHA)	At the Painting Booth, fuel areas, and areas with VOC applications	Daily using VOC monitoring device at the Painting Booth	

US EPA- United States Environmental Protection Agency; **ACGIH**-American Conference of Governmental Industrial Hygienist; **PAH**-Polycyclic Aromatic Hydrocarbons; Note: As per **DOLE-OSHA** Carbon Monoxide (CO) limiting standard should be less than 50 ppm as per 8 hr. Personal Exposure Limit (PEL). Carbon Dioxides (CO_2) OSHA Permissible Exposure Limit is 5000 ppm per 8 hr. exposure. Additional Note: When new paint is drying, indoor Volatile Organic Compounds (VOC) levels can be 1,000 times higher than outdoor levels. Paint releases VOCs into the air. (US EPA, Air Quality Standards Studies). VOC component such as formaldehyde may be generated as by-products or by chemical reactions during coating application. (US-EPA, AQS Studies).

Table 2: OUTDOOR - Philippine National Air Quality Standards for Source Specific Air Pollutants from Industrial Sources/Operation

Monitoring Parameter	NAAQGV* LIMIT VALUES	LOCATION OF MONITORING	FREQUENCY	REMARKS
TSP	300 µg/Nm^3	Outside the depot, near the source(s) of fresh air where the intake vents are pointed and at the air exhaust(s) point.	Once prior to the ventilation design.	
$PM_{2.5}$	24 µg/Nm^3	Outside the depot, near the source(s) of fresh air where the intake vents are pointed and at the air exhaust(s) point.	-do -	
PM 10	200 µg/Nm^3	-do -	-do -	
NO_2	260 µg/Nm^3	-do -	-do -	
SO_2	340 µg/Nm^3	-do -	-do -	
CO	35mg/Ncm in hr averaging time 10 mg/Ncm in 8 hrs averaging time	-do -	-do -	Taken from NAAQV* Guidelines
CO_2	5000 ppm	-do -	-do -	
Lead	3 months – 1.5 µg/Nm^3	-do -	-do -	
Temperature		-do -	-do -	
Humidity		-do -	-do -	
Noise	90 dB			

NAAQGV* - National Ambient Air Quality Guidelines Values; Nm^3 – Normal Cubic Meter
Source: DENR-EMB Clean Air Act of the Philippines RA 9749

7.1. Internal Testing of Volatile Organic Compounds (VOC), Air Quality Monitoring Results at the Painting Booth, Date: Oct. 20, 2020.

I. SAMPLING AND ANALYSIS

Parameters	Method
Xylene	NIOSH 1501
N-Butyl Acetate	NIOSH 1300
Cyclohexanone	NIOSH 1450

NIOSH – National Institute for Occupational Safety and Health

II. THRESHOLD LIMIT VALUES REFERENCE GUIDELINES
The standards or limits used by SGC Philippines Incorporated are based on the following:
Rule 1070 Table8 Occupational Safety and Health Standards of the Philippines

III. Table 1: Internal Testing of **VOC Air Quality Monitoring Results** at the Painting Booth (Date: Oct. 20, 2020)

Number of sampling stations: 10

STATIONS	LOCATION Date	Xylene		N-Butyl Acetate		Cyclohexanone		REMARKS
		Air Concentration, mg/m^3	TLV, mg/m^3	Air Concentration, mg/m^3	TLV, mg/m^3	Air Concentration, mg/m^3	TLV, mg/m^3	
001	TOP COATING-C1	2	435	2	710	2	200	PASSED
002	TOP COATING-C2	2.2	435	2	710	2	200	PASSED
003	TOP COATING-C3	2	435	2	710	2	200	PASSED
004	TOP COATING-C5 Carbon Filter	2	435	2	710	2	200	PASSED
005	TOP COATING C4 Entrance near traction motor shop	8.8	435	2	710	2	200	PASSED
006	FINAL Coating – C5 Carbon Filter	4.8	435	2	710	2	200	PASSED
007	FINAL COATING C1	2	435	5	710	2	200	PASSED
008	FINAL COATING C2	2	435	2	710	2	200	PASSED
009	FINAL COATING C3	2	435	3.4	710	2	200	PASSED
10	FINAL COATING C4 Entrance near traction motor shop	2.4	435	2	710	2	200	PASSED

TLV-Threshold Limit Value

The following are the assessment of the risk of exposure to VOC:

7.2. Health Effects of VOCs

7.2.1. Health Effects:

- Breathing Xylene vapors in small amount can cause headache, dizziness, drowsiness, and nausea. With more serious exposure, xylene can cause sleepiness, stumbling, irregular heartbeat, fainting, or even death. Xylene vapors are mildly irritating to the skin, eyes, and lungs.

- N-butyl acetate can affect you by ingestion and may be absorbed through the skin. Contact can severely irritate and burn the skin and eyes. Prolonged or repeated contact can cause a skin rash, dryness and redness.
- Cyclohexanone exposure can cause headache, dizziness, lightheadedness, and passing out. Chronic and acute effects refer to the persistence of the health effect.

7.2.2. SGS Recommendation

- At the time of measurements, the air concentration of Xylene, N-Butyl Acetate, and Cyclohexanone did not exceed the Threshold Limit Value (TLV), Base on the TLV for airborne contaminants provided by the OSHS/DOLE, as amended 2006. It must be emphasized that the results were individual measurements during a certain point in time. They should not be considered as universal condition of the area or process involve.
- Regular Monitoring of air concentration of Organic Solvents in the areas measured should be performed annually to ensure that the level is still within the allowable limit.
- Monitoring of Ventilation System is very important to eliminate the air contaminants in the area.

7.2.3. OCG Recommendation

- Chronic exposure of workers to Xylene, N-Butyl Acetate, and Cyclohexanone may accumulate the toxic substances to their bodies. Poor ventilation will not eliminate the suspended particles in the depot, and workers are exposed and may ingest them thru respiration and skin contacts.
- The Xylene, N-Butyl Acetate, and Cyclohexanone concentration levels, as monitored, are not constant. They vary depending on the painting activity and chemical use frequency. The workers should be provided with complete PPEs and the local area should be provided with fans for air diffusion.
- Ventilation of the entire Depot will have to be designed, installed to resolve the issue of air pollution in the depot.
- Provision of SDS of the known chemical substances for emergency references during incident of exposure.
- Workers should be oriented about these substances during the Safety tool box meeting. Awareness could prevent them from being carefree of wearing PPEs during exposure.

7.3. Inquiry on RMA Review for Environmental concerns, specifically on wastewater

Have to review the RMA whether monitoring and reporting of the water quality of sum pits and sewage of the Depot and Stations are included in the contractor's responsibility. The monitoring and that all work regarding the ductwork is outside the scope of Services

Section 2.1 (a) (iv) Other Activities prior to Services Start Date. After the Effective Date, Contractor shall commence performing the activities expressly set forth in the Rehabilitation Specifications and Maintenance Specifications that are to commence prior to the Services Start Date.

SECTION 18.2 Effective Date. Upon the parties mutually agreeing in writing as to the satisfaction of all of the condition's precedent referred to in Section 18. 1, subject to any waivers that may be granted in writing by the applicable party, all rights and obligations of the parties under this

Agreement shall come into full force and effect (the "Effective Date"). Lf all of the condition's precedent referred to in Section 18.1 have not been fulfilled or duly waived on or before March 31, 2019, each party shall have the unconditional right prior to the satisfaction, or waiver by the applicable party, of the conditions lo its obligations set Forth in Section 18. To terminate this Agreement upon written notice to the other party. In the event of any termination of this Agreement pursuant to this Section 18.2 then this Agreement shall become null and void, and neither of the parties shall have any of the obligation or liability to the other party.

The monitoring and reporting of water quality of sump pits and sewage at the Depot and Stations were discussed in the Term of Reference (TOR) for Supervision Consultant for Works under MRT Line 3 Rehabilitation Project., Environmental Management Plan (EMP) Table 1-1, and EMoP Table 2-1 (see attachment).

The RMA doesn't specify the responsibilities of the Contractor to monitor the quality of water to be discharged from the station, nor from the depot. The RMA has no details about this, but it was discussed in the TOR as mentioned.

The Contractor is now continuing monitoring of 3 items and we will request them to continue this activity. As mentioned, they should do it quarterly, and monthly as needed, but the parameters were 12 for Water Quality Depot and 7 for Water Quality Sewage based from the EMoP.

Need clarification of who has the responsibility for monitoring of the additional 9 items from the WTP in the Depot and monitoring of the water quality from the sump pits and sewage from the Depot and Stations. Thus, referring to the EMP Table 1-1, and EMoP Table 2-1 in the TOR, Implementing Agency is the R&M Provider while DOTr is the Responsible Agency.

It was also requested to remind DOTR that, as mentioned in the RMA, Article 3, Section 3-1.g, DOTR is responsible for all Envi. Permits; TOR EMP Table 1-1 stated that DOTR to apply for the Wastewater Discharge Permit.

The following Articles and Sections were from Rehabilitation and Maintenance Agreement (RMA) between the Contractor and DOTr and TOR for Supervision Consultants.

The Consultant will guide both Contractor and DOTR and check their compliance.

ITEMS	RMA Conditions	Implementing Organization	Responsible Organization	Responsible for the Cost
A.	**Article 3: Employer's Responsibilities and Rights.**			
Section 3-1. (g), Permits	*Permits.* Employer shall be responsible for obtaining and maintaining (or causing to be obtained and maintained) any and all Permits necessary (i) for the performance by Employer, Contractor and any Subcontractor engaged by Contractor pursuant to Section 16.3 of its and their obligations under this Agreement, including any Permits issued by the Philippine Contractors Accreditation Board (PCAB), the MMDA, or similar agencies and (ii) to operate the System	CONTRACTOR	DOTR	Employer
	In addition, Employer shall use its best efforts to assist Contractor in obtaining and maintaining all Permits that are required to be obtained by Contractor pursuant to Section 3.H.	CONTRACTOR	DOTR	Employer
	2.4. Employer shall provide copies and otherwise keep Contractor reasonably informed with respect to any and all such Permits. With respect to all Permits that either Contractor or Employer is required to obtain pursuant to this Agreement, Employer shall be responsible	CONTRACTOR	DOTR	Employer

	for administrative matters (including maintaining communications with Governmental Authorities) and Contractor shall be responsible for providing technical support and related assistance, in each case with respect to the obtaining and maintaining of such Permits			
SECTION 2.2. Reporting Obligations (pp.14)	Contractor shall provide such information and other assistance as Employer may reasonably request to comply with Employer's reporting requirements under (i) any Permit that is required to be obtained by Employer pursuant to Section 3. Hg}, (ii) Item 2.2.2(4) of the Rehabilitation Specifications and (iii) Applicable Law as it relates to the maintenance and repair of the System.	CONTRACTOR	CONTRACTOR	CONTRACTOR
RMA Section 2.9	The RMA Section 2.9 set forth as following; "Contractor shall, in providing any Services hereunder, comply with all Applicable Laws and Permits as they related to the performance of the Services.	CONTRACTOR	CONTRACTOR	CONTRACTOR
B.	**Rehabilitation Specifications**			
3.2.4 OBTAINING PERMIT	The Employer shall be responsible for obtaining and maintaining all Permits from authorities.	CONTRACTOR	DOTR/Contractor	
C.	**TERM OF REFERENCE**			
EMP Table 1-1; EMoP Table 2-1	For the monitoring of the additional 9 items from the WTP in the Depot and monitoring of the water quality from the sump pits and sewage from the Depot and Stations.	CONTRACTOR	DOTR	Contractor
	The Contractor is now continuing monitoring of 3 items and we will request them to continue this activity. As mentioned, they should do it quarterly, and monthly as needed, but the parameters were 12 for Water Quality Depot and 7 for Water Quality Sewage (see EMP Table 1-1, and EMoP Table 2-1 in the TOR herewith).	CONTRACTOR	DOTR	Contractor
D.	**CONTRACTOR'S Scope of Environmental Services (pp. RP-7, 156)**			
RP-7, 156	Table 2.2-1 MATRIX of the Scope of rehabilitation Services			
	1.DEPOT EQUIPMENT: Wastewater Treatment Plant, Sump Pit and Septic Tank are under the Contractors Scope of Rehabilitation	CONTRACTOR	DOTR	Contractor
	1.Removal of all general wastes in the depot; (Contractor)	CONTRACTOR	DOTR	Contractor
	2.Removal of all general wastes in the stations and wayside (DOTR).			
	3. Collection of all industrial wastes (Contractor).	CONTRACTOR	Contractor	Contractor
	4.Transportation and unloading of all industrial wastes to the temporary storage area which is prepared by Employer. (Contractor).	CONTRACTOR	Contractor	Contractor
	5.Waste Removal and disposal of all industrial wastes from temporary storage area (DOTR).	CONTRACTOR	DOTR/Contractor	Employer
E.	**REHABILATION SPECIFICATIONS**			
	3.3.4 DISPOSAL OF SALVAGED MATERIALS			
	Any Salvage Materials such as replaced old materials, especially rail materials shall be temporarily laid down by contractor in places/areas which as designated and provided by Employer and then employer shall proceed to dispose of the materials. Contractor is responsible for the cost and expenses only to shift the removed equipment and materials to the designated places/ areas. Further transportation from the designated places/areas to another and/or disposal removed equipment and materials is not included in Contractor 'scope and those associated costs and expenses shall be borne by employer.	Contractor	DOTR	Employer
F.	**WASTEWATER TREATMENT PLANT**			

14 DEPOT EQUIPMENT	14.2.3 Wastewater Treatment Facility This facility has not been operational since Year 2013, a major concern is that the wastewater coming from maintenance area has not been treated and disposed to city sewer. This affects the environment for the long run and may violate environmental laws. Another problem is the damaged embedded pipe from sump pit to receiver tank and it causes flooding on affected areas. Replacement and restoration of the worn-out parts and defects will be conducted. Cleaning the entire system and disposal of the sludge and wastewater in accordance with environmental laws will be conducted.	Contractor	Contractor	Contractor

7.4. REHABILATION SPECIFICATIONS:

- **CONTRACTOR'S Scope of Environmental Services (pp. RP-7, 156)**

Table 2.2-1 MATRIX of the Scope of rehabilitation Services

1. DEPOT EQUIPMENT: Wastewater Treatment Plant, Sump Pit and Septic Tank are under the Contractors Scope of Rehabilitation.
2. WASTE MANAGEMENT:
   a. Removal of all general wastes in the depot; (Contractor),
   b. Removal of all general wastes in the stations and wayside (DOTR),
   c. Collection of all industrial wastes (Contractor),
   d. Transportation and unloading of all industrial wastes to the temporary storage area which is prepared by Employer. (Contractor),
   e. Waste Removal and disposal of all industrial wastes from temporary storage area (DOTR) .

7.5. DISPOSAL OF SALVAGED MATERIALS

Sec. 3.3.4: Disposal of Salvaged Materials: Any Salvage Materials such as replaced old materials, especially rail materials shall be temporarily laid down by contractor in places/areas which as designated and provided by Employer and then employer shall proceed to dispose of the materials. Contractor is responsible for the cost and expenses only to shift the removed equipment and materials to the designated places/ areas. Further transportation from the designated places/areas to another and/or disposal removed equipment and materials is not included in Contractor 'scope and those associated costs and expenses shall be borne by employer.

- **From TOR for Supervision Consultants**

Table 2-1 Environmental Monitoring Plan (EMoP) includes the following monitoring parameters for laboratory analysis during rehabilitation as per TOR for Supervision Consultants.

Item	Parameters	Units	Limiting Standards	Survey Points/Frequency	Implementing Agency	Responsible Agency
Water Quality (Depot)	Color	TCU	150	Depot/Quarterly (After Rehabilitation of wastewater treatment system)	R&M Provider	DOTR
	pH	-	6-9.5			
	TSS	mg/L	100			
	Ammonia	mg/L	0.5			
	Nitrate	mg/L	14			
	Nickel	mg/L	1			
	Cadmium	mg/L	0.01			
	Mercury	mg/L	0.004			
	Lead	mg/L	0.1			
	Oil and Grease	mg/L	5			

	Benzo(a)pyrene	mg/L	3			
	Surfactants	mg/L	15			
Water Quality (Sewage)	BOD	mg/L	50	Depot and Stations /Quarterly (After Rehabilitation of sump pumps system)	R&M Provider	DOTR
	Fecal Coliform	MPN/100mL	400			
	Ammonia	mg/L	0.5			
	Nitrate	mg/L	14			
	Phosphate	mg/L	1			
	Oil & Grease	mg/L	5			
	Surfactants	mg/L	15			

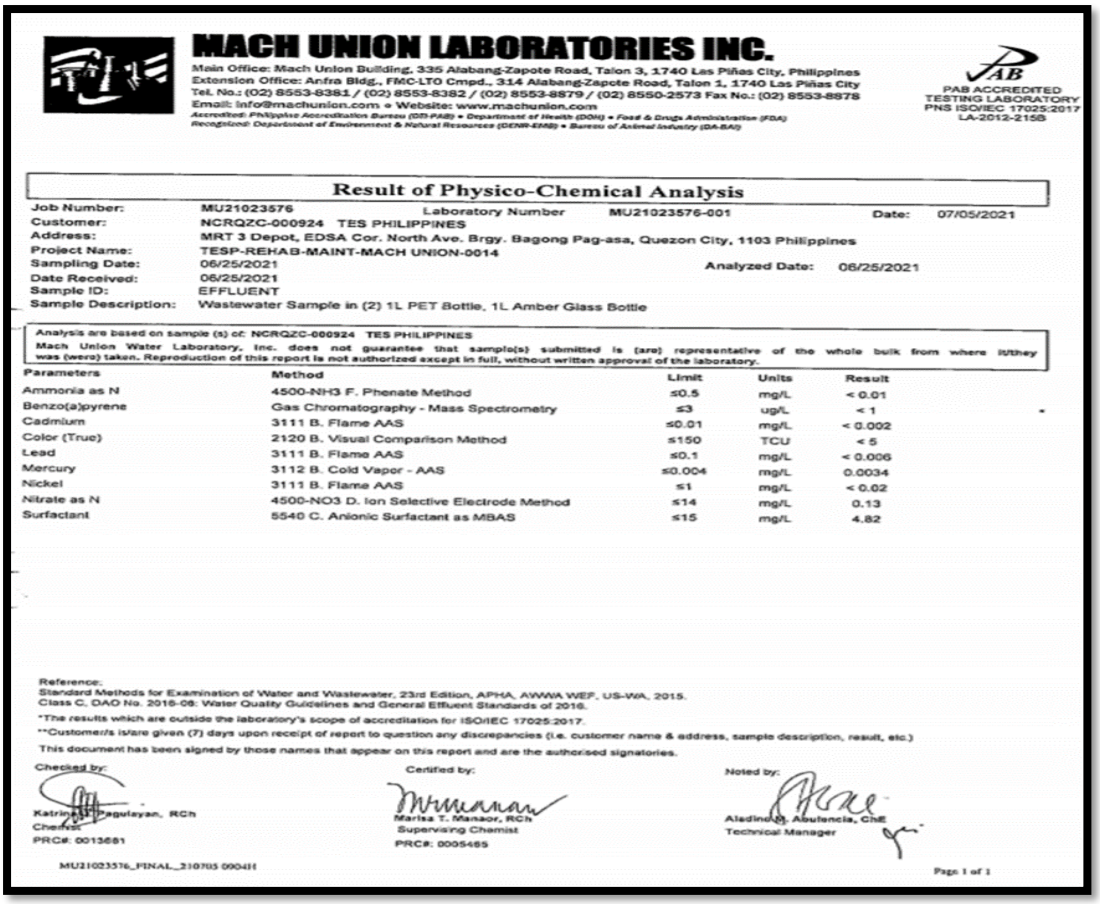
This Table 2-1 shows that R&M Provider is the implementing agency, and DOTr is the Responsible Agency.

8. PROPER DISPOSAL OF HAZARDOUS WASTE AND TOXIC SUBSTANCES AS RECOMMENDED FOR THE DEPOT, AN INQUIRY BY SAFETY OFFICER

Office of the director was also oriented on the ff.:

1. As stipulated from the EMoP, hazardous wastes and toxic substances (to include paints containers, fuel cans etc.) should be disposed of in compliance with RA 6969.
2. A DENR accredited TSD hauler should be engaged to treat these wastes. However, for temporary transport for another storage area prior to treatment/disposal, ensure that these wastes are stored in an area with proper ventilation, not exposed to rain thus not allowing contaminated run-off to flow to the drainage, and will not leak to the soil. See item no. 6 of the EMoP attached.
   a. DOTR shall register on the Online Hazardous Waste Manifest System as generator and properly manage it according to the Revised Procedures and Standards for the Management of Hazardous Wastes (DAO 2013-22);
   b. Proper Management includes the following: R&M Provider and DOTr shall comply with the storage, transport, handling, and disposal requirement;
   c. As per transport requirement, R&M Provider and DOTr shall comply with the package and labeling requirements appropriate to the waste being transported. In addition, spill response plan shall be prepared and given to the designated waste transported. Transporter shall notify EMB and related parties in case of accidents, spills and clean up the contamination and file a detailed Incident Report to EMB;
   d. DOTr is required to avail of the services of waste transporters and TSD facilities that are duly registered by EMB-CO and whose permits are valid within the period that the wastes are being transported and treated, stored, or disposed of.
   e. DOTr is required to use the Online Hazardous Waste Manifest System in transporting for offsite treatment, storage, and disposal. DOTr shall secure the original copy of Certificate of Treatment issued by TSD facility. Copy of the document shall be included as part of SMR to EMB.
   f. In case wastes including chemicals listed under Priority Chemical List such as lead, cadmium, mercury, PCB, Ozone depleting substances etc. are found, R&M Provider and DOTr shall refer to Chemical Control Order (CCO) under their DAOs in handling, storage, and transport according to the respective rules and regulations. DAO 2019-17 CCO FOR ARSENIC, DAO 2013-24 CCO FOR PCB DAO 2004-01 CCO FOR ASBESTOS DAO 1997-39 CCO CYANIDE DAO1997-38 CCO MERCURY;
   g. Contractor to register with DENR as a hazardous waste generator as outlined and in DAO 2013-22. Hazardous wastes will be segregated labeled and stored as outlined in DAO 2013-22 and send for disposal at an accredited treatment (TSD) facility. The contractor will use the waste manifest system as described in Chapter 6 of the above administrative Order.

h. There are secondary uses for waste oils and solvents such as for Alternative Fuels (typically in cement factories or for refining into fuel oils). EMB publishes a list of accredited TSD facilities for hazardous wastes. The contractor should explore the options for reuse of the oil-based waste.



MACH UNION LABORATORIES INC.

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Email: info@machunion.com • Website: www.machunion.com
Accredited: Philippine Accreditation Bureau (DTI-PAB) • Department of Health (DOH) • Food & Drugs Administration (FDA)
Recognized: Department of Environment & Natural Resources (DENR-EMB) • Bureau of Animal Industry (DA-BAI)

PAB ACCREDITED TESTING LABORATORY PNS ISO/IEC 17025:2017 LA-2012-215B

Result of Physico-Chemical Analysis

Job Number: MU21023576 Laboratory Number MU21023576-001 Date: 07/05/2021
Customer: NCRQZC-000924 TES PHILIPPINES
Address: MRT 3 Depot, EDSA Cor. North Ave. Brgy. Bagong Pag-asa, Quezon City, 1103 Philippines
Project Name: TESP-REHAB-MAINT-MACH UNION-0014
Sampling Date: 06/25/2021 Analyzed Date: 06/25/2021
Date Received: 06/25/2021
Sample ID: EFFLUENT
Sample Description: Wastewater Sample in (2) 1L PET Bottle, 1L Amber Glass Bottle

Analysis are based on sample (s) of: NCRQZC-000924 TES PHILIPPINES
Mach Union Water Laboratory, Inc. does not guarantee that sample(s) submitted is (are) representative of the whole bulk from where it/they was (were) taken. Reproduction of this report is not authorized except in full, without written approval of the laboratory.

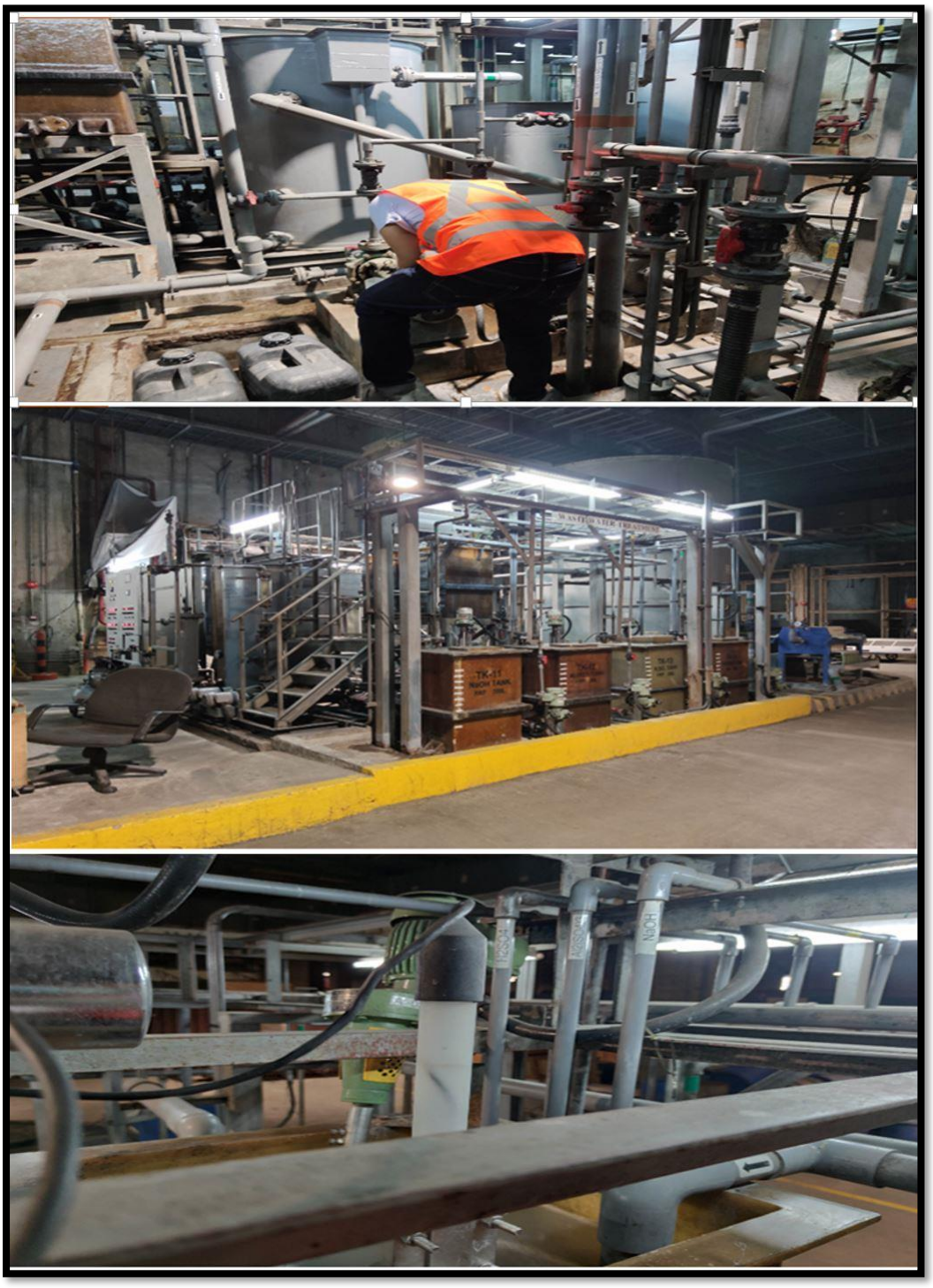
Parameters	Method	Limit	Units	Result
Ammonia as N	4500-NH3 F. Phenate Method	≤0.5	mg/L	< 0.01
Benzo(a)pyrene	Gas Chromatography - Mass Spectrometry	≤3	ug/L	< 1
Cadmium	3111 B. Flame AAS	≤0.01	mg/L	< 0.002
Color (True)	2120 B. Visual Comparison Method	≤150	TCU	< 5
Lead	3111 B. Flame AAS	≤0.1	mg/L	< 0.006
Mercury	3112 B. Cold Vapor - AAS	≤0.004	mg/L	0.0034
Nickel	3111 B. Flame AAS	≤1	mg/L	< 0.02
Nitrate as N	4500-NO3 D. Ion Selective Electrode Method	≤14	mg/L	0.13
Surfactant	5540 C. Anionic Surfactant as MBAS	≤15	mg/L	4.82

Reference:
Standard Methods for Examination of Water and Wastewater, 23rd Edition, APHA, AWWA WEF, US-WA, 2015.
Class C, DAO No. 2016-08: Water Quality Guidelines and General Effluent Standards of 2016.
*The results which are outside the laboratory's scope of accreditation for ISO/IEC 17025:2017.
**Customer/s is/are given (7) days upon receipt of report to question any discrepancies (i.e. customer name & address, sample description, result, etc.)
This document has been signed by those names that appear on this report and are the authorised signatories.

Checked by: Katrina [illegible]agulayan, RCh, Chemist, PRC#: 0013681
Certified by: Marisa T. Manaog, RCh, Supervising Chemist, PRC#: 0005485
Noted by: Aladino G. Abulencia, ChE, Technical Manager

MU21023576_FINAL_210705 090411 Page 1 of 1

In line with the above subject, and through the effort and joint inspection of OCG and SSU/MRT3 our aim to clean up the depot premises with the help of Contractors as well as Subcontractors, please refer to the attached file evidence as part of Quarterly hauling of Hazardous Wastes by MHI. 2nd batch of Hauling will be scheduled within 2nd or 3rd week of July, 2021. Proof/Certification from DENR's accredited hauler will follow upon completion of haulage.



Some Environmental concerns and Findings in the MRT3 line outside the Depot

3/20/2021	Station 6-7 (Ortigas to Shaw Blvd.) Ch. 22+554-22+914 NB	Foot Patrol Inspection Wayside cleaning					
	Station 12-13 (Magallanes to Taft Ave.)	Foot Patrol Inspection Wayside cleaning					
	Station 2-3 (Quezon Av. To Kamuning) Ch. 16+142-16+202 NB	Foot Patrol Inspection Uprooting of grass					

8/19/2021	Station 12-13 (Magallanes to Taft Ave.) Ch. 30+240-30+290 SB	Foot Patrol Inspection Uprooting of grass					
8/22/2021	Station 5-6 (Santolan to Ortigas) Ch. 22+120-20+932 NB SB	Foot Patrol Inspection Wayside cleaning					
	Station 11-12 (Ayala to Magallanes) Ch. 28+035-28+085 NB SB	Foot Patrol Inspection Uprooting of grass					
	Station 10-11 (Buendia to Ayala) Ch. 26+885-27+620 NB SB	Foot Patrol Inspection Wayside cleaning					
	Station 1-2 Removal Area and Insertion Area	Foot Patrol Inspection Wayside cleaning					
8/21/2021	Station 11-12 (Ayala to Magallanes) Ch. 27+835-27+875 NB Ch. 27+875-27+925 NB	Foot Patrol Inspection Uprooting of grass					
8/23/2021	Station 9-10 (Guadalupe to Buendia) CH. 25+112-25+797 NB SB	Foot Patrol Inspection Wayside cleaning					
	Station 12-13 (Magallanes to Taft Ave.) Ch. 30+329-30+712 NB SB	Foot Patrol Inspection Wayside cleaning					
	Station 8-9 (Boni to Guadalupe)	Foot Patrol Inspection Wayside cleaning					

9. INVESTIGATION OF WASTEWATER TREATMENT AND INCREASE IN TRAIN WASH PLANT CAPACITY

1. Previous Discussions on Waste Water Treatment

Discussions on WWTP and the monitoring parameters. Monitoring of the wastewater and the domestic water laboratory analysis and Permit to Discharge have been discussed between OCG / DOTr, OOD and TESP.

2. Wastewater Treatment Plant (WWTP)

Discussion with DOTR, OOD, and TESP included the background of the various ways that wastewater is produced in the MRT3 Depot. It was reiterated that Wash Train Plant (WTP) WASTEWATER, SEPTAGE WASTEWATER, and SUMP PITS are main sources of wastewater.
Inefficient wastewater treatment will not be able to discharge effluent which quality fails the limiting Standards, thus will require storage and disposal by other means. As listed from the EMoP, the following are the mitigation measures:

- O&M body shall monitor and control wastewater in the depot monthly, or as needed using portable water quality meter or external laboratory. If the results exceed the allowable limits, the water treatment method shall be considered. Quarterly monitoring was considered and proper storage and disposal by an accredited transporters/hauler for further treatment while WWTP was undergoing rehabilitation.
- Effluent quality shall be monitored based on the GES for class C in accordance with the requirement of discharge permit and the Effluent Quality Monitoring manual issued through EMB M.C 2008-008 (see EMoP).
- Conducting of water quality monitoring in compliance with Clean Water Act Effluent Standard to be conducted by a DENR accredited laboratory. The EMoP has the water quality parameters to be monitored.
- Ensure that there are available parts for replacement for the continuous operation of WWTP in case of equipment break off.
- Maintain good housekeeping at the Depot that is by keeping solid waste in bins with covers, plastic bags and/or sealed containers. Coordinate with the accredited haulers/transporters for timely and immediate disposal of wastewater and septage.
- Refrain from storing wastewater in the Depot because the production of gases like H2S and Methane could be very fast.
- Review of the Operations Manual of the Depot WWTP.
  It was also presented to some inquiries on the WWTP Operations Manual interpretations: Upon review of the Contractor's Maintenance Progress Reports, the following concerns on Wastewater Treatment Plant (WWTP) at MRT3 Depot were brought to the discussions.

The Depot is consuming approximately 3,000 cu. m. per month fresh water (as reported). The wastewater goes to the following destination:

- Industrial wastewater from the washing of MRT3 trains (WTP) etc. produces an approximate volume of 860.5 cu. m. (per MHI PCO reports).
- Domestic wastewater that goes to the sump-pit; and Approx. volume.
- The wastewater from Septic Tanks as sludge. (Approx. Volume, refer to the TSD Hauler data).
  It was also discussed that the 3 wastewater sources have different destinations and should all be contained and treated separately. Septage from Septic tanks should be hauled and treated by the third party TSD.

WWTP treats the Industrial wastewater produced by the MRT3 Depot. The sump-pit wastewater should be treated using biological reactors while the third wastewater, the sludge, should be administered to the accredited haulers for treatment and disposal.

2. Internally, within the OCG Consultants and Engineers Group: - Mr. Kotani's enquired on DOTr's request for more train washing by SUMITO. Train car washing and the WTP capacity per day. According to Sumitomo, the limit capacity of the Wastewater Train Wash plant is:
   Facility is 6 trains/hour, for 3 hours it is 18 trains/day (3hrs); (note 3 cars = 1 train)
   For 4 days, it's 72 trains that can be washed. DOTR requested 69 trains in 4 days. Based on SCs comment, they can satisfy the DOTr's request.
   Part of the inquiry was that, if there's a need to increase the train washing capacity, then they should provide an equalization tank to hold the water before treatment or improve the WWTP treatment capacity. WTP requires time and enough volume to treat wastewater, approximately 24 hours. WWTP capacity is 1.8m^3 per Hour.
3. Laboratory Analysis of June 2021 water treatment showed favourable results, with all tested parameters passing the standards.

9.1. Incorporation of Wastewater Holding Tank

- To enable car washing to continue during maintenance/breakdown of the WWTP it is proposed that a Wastewater equalization/holding tank be added to enable the raw wastewater from the TWP to be stored for a period of time until the WWTP is returned to service.
- The capacity of the proposed Wastewater equalization/Holding Tank should be in the region of 41.1 m^3.
- If the use of a Wastewater equalization/Holding tank is agreed, it should also be considered to be able to pump wastewater from both the TWP sump as well as the Wastewater Holding Tank to the WWTP. This will allow a window for maintenance/breakdown of the Wastewater equalization/Holding Tank without disruption to the car washing at the TWP.

9.2. Investigation of Train Wash Plant Capacity

- As indicated above OCG have been tasked by DOTr to check what will be required to enable 69 trains to be washed in a 4-day period. At present;

TECHNICAL DATA

Pump flow rates.	
Detergent solution pump	50 l/min
Water wash pump	250 l/min
Fresh water rinse pump	120 l/min
Sump pump	333.3 l/min
Detergent tank capacity	200 litres
Collection sump capacity	approx. 6,800 litres
Final rinse tank capacity	2,270 litres
Wash tank capacity	650 litres
Brush drive unit speed	175 rpm (brush speed)
Operating noise level	<85 dB(A)
LRV speed through wash plant	3 to 5 km/h

1ST WASH	WASTE WATER DRAINING TIME	2ND WASH	WASTE WATER DRAINING TIME	3RD WASH	TOTAL CAR
1 HOUR	30 Minutes or 1 HOUR	1 HOUR	30 Minutes or 1 HOUR	1 HOUR	
6	-	6	-	6	18

- 6 Trains can be washed in a 1-hour period
- Therefore 18 trains' can we washed in a 3-hour period (1-day wash)
- Therefore, it is possible to wash 72 trains in a 4-day period

1. GENERAL

The waste water treatment plant is designed to treat car wash waste water.

SS and N-Hex in the waste water are coagulated by adding coagulant $Al_2(SO_4)_3$ with pH of waste water being maintained at around neutral pH.

The said pollutants are coagulated when $Al_2(SO_4)_3$ is converted into precipitation of $Al(OH)_3$.

The precipitation in waste water are separated in the air floatation system.

Water treated by the air floatation system is further treated by the sand filter for removal of fine SS priot to being discharged.

2. DESIGN BASIS

2.1 Volume and quality of raw waste water

Volume	:	1.5 m³/Hr
Discharge time	:	24 Hr/Day
pH	:	6～12
N-Hex	:	50 mg/L
SS	:	500 mg/L

2.2 Treated water quality

pH	:	6.5～9.0
N-Hex	:	5 mg/L or below
SS	:	70 mg/L or below

2.3 Operating time

24 Hr/Day

Page 1 / 1

DETAIL CURRENT STATUS CO ATTACHMENT

DEPOT EQUIPMENT — SUB-SYSTEM

No	DESCRIPTION/EQUIPMENT	REFER TO PICTURE, IF NECESSARY
3	Waste Water Treatment Plant	  Over flowing sump pit of waste water treatment plant Damageed embedded pipe from sump pit4 going to receiver tank of waste water

Table 5: Technical Data of the Train Wash Plant

Equipment Description	Rate / Size
Pump Flowrates	
- Detergent Solution Pump	50 l/min
- Wash Water Pump	250 l/min
- Fresh Water Rinse Pump	120 l/min
- Sump Pump	333.3 l/min
Sump / Tank Capacity	
- Detergent Tank	200 Litres
- Collection Sump	Approx. 6,800 Litres
- Final Rinse Tank	2,270 Litres
- Wash Tank	650 Litres
- Brush Drive Unit Speed	175 rpm
- Operation Noise Level	<85 dB(A)
- LRV Speed through Wash Plant	3 to 5 km/h

9.3. Initial Information received from Site/OCG/Sumitomo

We have gathered data from site, OCG Environmental Section and Sumitomo, who carried out data collection on the quantity of water that is utilised during the train washing activities as follows:

1 train will consume 0.57 cubic metres (570 litres) of wash and rinse water per wash with a duration for washing time of 2.5 minutes.

Therefore 6 trains including washing and drainage time of TWP sump will generate; 0.57 cubic metres x 6 trains = 3.42 cubic metres (3,420 litres) over 1 hour.

Note: a drainage time of approximately 45 minutes is allowed for the TWP sump pit to drain the raw water collected to disperse to the WWTP.

18 trains washed over a 3-hour period will generate = 10.26 cubic metres (10,260 litres)

9.3.1. Technical Specifications

The following Draft Specifications have been prepared to further clarify the extent of work required for adding the Wastewater Holding Tank:

- Water Tanks Draft Specification
- Pumps Draft Specification
- Piping and Accessories Draft Specification

9.3.2. WTP Major Equipment

DATA SHEET – WASTE WATER TREATMENT PLANT – MAJOR EQUIPMENT AND TANKS

Item No	Equipment No	Equipment Description	Quantity	Details	Remarks
26		Control Panel	1		
25		Compressor	1	0.75Kw	
24	P-14	Polymer Supply Pump	1	0.2Kw	
23	P-13	$H_2(SO_4)$ Supply Pump	1	0.2Kw	
22	P-12	$Al_2(SO_4)_3$ Supply Pump	1	0.2Kw	
21	P-11	NaOH Supply Pump	1	0.2Kw	
20	P-08	Transfer Pump	1	0.75Kw	
19	P-07 A & B	Effluent Pump	2	0.75Kw	
18	P-71	Back Wash Pump	1	2.2Kw	
17	P-06 A & B	Filtrate Pump	2	A=0.75Kw / B=0,75Kw	
16	P-05 A & B	Pressure Pump	2	A=2.2Kw / B=2.2Kw	
15	P-02 A & B	Drawing-Up Pump	2	A=0.75Kw / B=0,75Kw	
14	TK-14	Polymer Tank (A)	1	FRP 200 Litres	
13	TK-13	$H_2(SO_4)_3$ Tank	1	FRP 200 Litres	
12	TK-12	$Al_2(SO_4)_3$ Tank	1	FRP 200 Litres	
11	TK-11	NaOH Tank	1	FRP 200 Litres	
10	TK-08	Sludge Tank	1	RC 2m³	
9	TK-07	Treated Water Tank	1	RC 3m³	
8	SF-07	Sand Filter	1	CS Dia 800	
7	TK-06	Filtrate Tank	1	CS 1m³	
6	TK-051	Pressure Tank	1		
5	TK-05	Dissolved Air Filtration	1	CS Dia 1200 x 2000 H	
4	TK-04	Coagulation Tank	1	FRP 200 Litres	
3	TK-03	Reaction Tank	1	FRP 200 Litres	
2	TK-02	Oil Separation Pit (2)	1	RC 6m³	
1	TK-01	Oil Separation Pit (1)	1	RC 3m³	

VIRTUAL MEETING WITH KURAMOTO on on-the Job Training as stipulated in Chapter 5. Scope of Consulting Services. The Contract stipulates following tasks:

"(2)(h) Provide assistance to the Employer in the capacity building of the Employer staff on environmental management through on-the-job training on environmental assessment techniques, mitigation measure planning, supervision and monitoring and reporting;

(3) Knowledge and Technology transfer and building in-house Capability."

OCG environmental team is now developing the on-the Job-Training (OJT) to ensure that the DOTr/MRT3 focals are equipped on the environmental monitoring basic using the EMP/EMoP.

INVESTIGATION OF WASTEWATER TREATMENT AND INCREASE IN TRAIN WASH PLANT CAPACITY

Since DOTR/MRT3 would want to enhance the treatment capability of the existing WTP,

9.3.3. Previous Discussions on Waste Water Treatment

Discussions on WWTP and the monitoring parameters. Monitoring of the wastewater and the domestic water laboratory analysis and Permit to Discharge have been discussed between OCG / DOTr, OOD and TESP.

9.3.4. Wastewater Treatment Plant (WWTP)

Discussion with DOTR, OOD, and TESP included the background of the various ways that wastewater is produced in the MRT3 Depot. It was reiterated that Wash Train Plant (WTP) WASTEWATER, SEPTAGE WASTEWATER, and SUMP PITS are main sources of wastewater.

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- The wastewater from Septic Tanks as sludge. Refer to the TSD Hauler data).

It was also discussed that the 3 wastewater sources have different destinations and should all be contained and treated separately. Septage from Septic tanks should be hauled and treated by the third party TSD.

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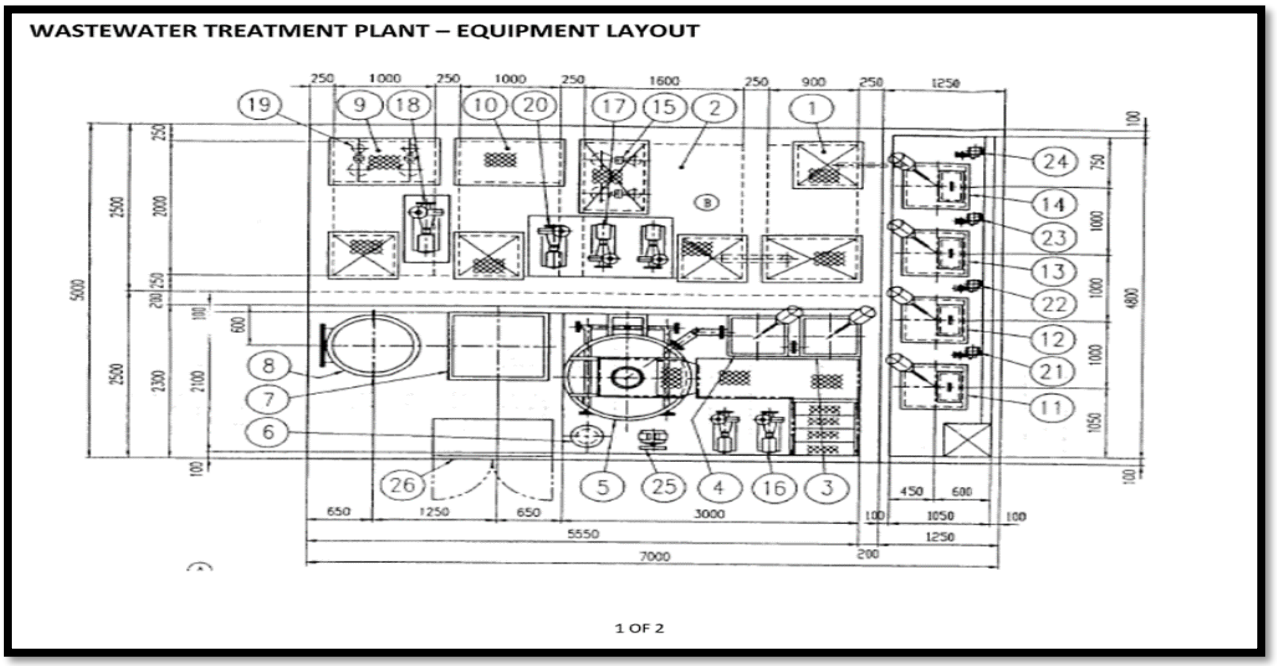
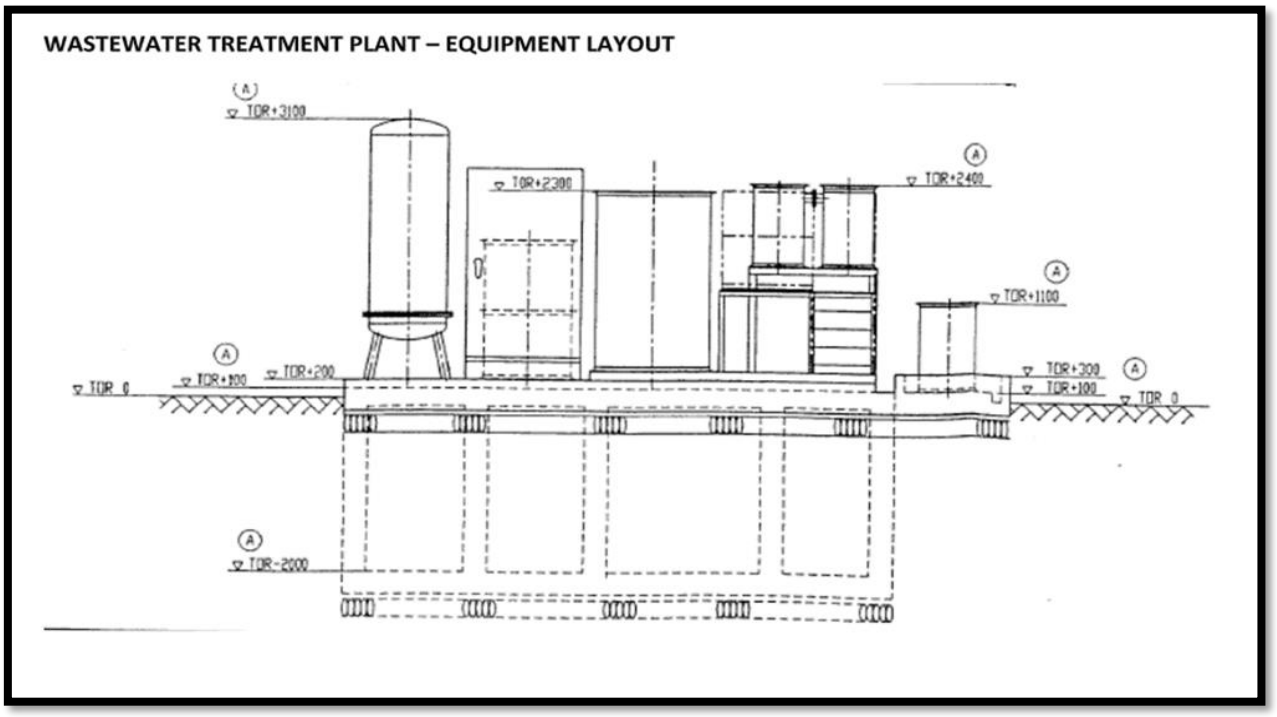
Part of the inquiry was that, if there's a need to increase the train washing capacity, then they should provide an equalization tank to hold the water before treatment or improve the WWTP treatment capacity.

WWTP requires time and enough volume to treat wastewater, approximately 24 hours.

WWTP capacity is 1.8m3 per hour. Need verification on this

2. Laboratory Analysis of June 2021 water treatment showed favourable results, with all tested parameters passing the standards.





9.3.5. MINUTES OF THE MEETING

The meeting was held last September 28, 2021 at 15:00-16:30 with the following attendees: Mr. Jason Caro, DOTrMr; Arman Geraldino, DOTr; Ms. EulaEscober, DOTr; Mr. Renz Rosaga, TESP
Engr. Dominador Eusebio, OCG-MRT3; Mr. Kenichi Kuramoto, OCG-MRT3

10. DISCUSSION POINTS: EMP compliance, Environmental update, WTP and proposed OJT

Topic 1: Discussion on findings of the Depot site visit last September 13, 2021

- Engr. Dominador explained results of site observation at the depot particularly on current condition on solid wastes, WTP, Electronic wastes, Used Oil drums, Toxic and hazardous materials stored at Depot.
- Included in the discussions are the current conditions of the WTP and the design update by Engr. Jason Rocha, on the WTP to meet increasing wash water demand in the future.
- TESP PCO, Engr. Renz Rosaga, explained types of wastewaters in the depot stating that there are 3 types of wastewaters: Industrial wastewater from the washing of trains etc. ▪Domestic wastewater that goes to the sump-pit. ▪Wastewater (sludge) from Septic Tanks.
- Engr. Dominador and Mr. Kuramoto confirmed method of treatment and parameters to be monitored. As per discussion, in the review of the WTP Manual, it was designed to treat/remediate the 3 parameters (pH, TSS and oil/ n-hexane). Discussion clarified that the coagulation, pH control, diffused aeration, and filtration methods employed in the WTP can **remove** other metal ions and among others. Since laboratory analysis of water sample showed the 12 regulated parameters had passed the criteria.
- Mr. Kuramoto likewise tackled the Proposed On-job Training (OJT) explained outline of proposed OJT. The target participants include key environmental focal from DOTr-MRT3. While, because main implementer of EMP is contractor, cooperation from them is expected.
- Major components of the program will be 1) desk session, 2) site observation at the depot, and 3) discussion and conclusion.
- For preparation and scheduling, Kuramoto proposed to take OJT in early next week. Engr. Eusebio gave supplementary comments on environmental compliance on waste management, wastewater treatment and verification of the EMoP compliance
- Mr. Jason Caro asked for the regular meeting.
- It was also suggested to hold regular meeting so that we can share current condition, issues, etc.
- Mr. Kuramoto will continue modification of the OJT outline, and then make detailed program for implementation.

10.1. OTHER Matters:

- Upon Engr. Eusebio suggestion, regular coordination meeting will be set monthly.
- Laboratory analysis monthly then discussion on the result.
- There will be a monthly site/depot visit and after that will be the monthly meeting and update with environmental focal from DOTr, MRT#, TESP/MHI and OCG.
- Mr. Kuramoto explained that OJT outline and program are modified and updated; and then shared in the regular meeting.
- Run down on the discussion stipulated on the monthly monitoring schedule in the last of each month. Dr. Dominador asked about October schedule.
- Lastly, Mr. Kuramoto asked comments from all participants for further comments, suggestion tin the OJT program.
- Meeting adjourned at 4:30 PM.

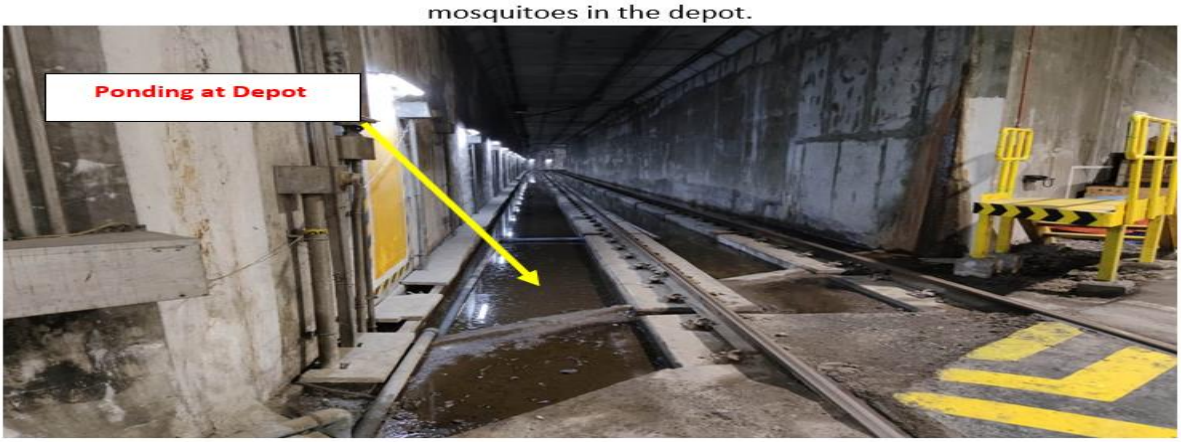
Contractor Environmental Recommendations for Sept. 13, 2021 findings.

Environmental Issues	Mitigation Measure
1.Accumulated SOLID WASTE, stock pile in the project site/ DEPOT that becomes a nuisance to the normal activity, movement of workers and equipment. And affect Occupational Health and Safety.	• Solid wastes and scrap materials shall be recycled and reused as much as possible. • If necessary, Contractoir/DOTr will obtain agreement from MRTC in timely manner to treat and dispose the wastes and scrap materials. • Contractor/DOTr shall develop Solid Waste Management Plan in coordination with LGUs including following items: ▪ Segregation of wastes into biodegradable, non-biodegradable, recyclable, special wastes, bulky wastes and hazardous waste (hazardous waste shall be treated separately). ▪ Designation of containers and area in which to accumulate segregated wastes to be collected. (MRF Facility). ▪ Frequency and method of wastes collection for each stored waste by LGUs or through private contractors. If necessary, agreement of bulky wastes collection would be made. ▪ Accumulation, storage, bid and collection of scrap materials. Scrap material with value shall be bid out according to the Government Procurement Act. Clarification of role and responsibility of R&M Provider (Contractor), DOTr and LGUs.
2. Dumping of solid waste at the Depot that becomes a nuisance and health hazards to the people and work environment. Solid waste becomes a breeding ground for rodents and mosquitoes. Possible spread of disease. May cause respiratory illness.	• Ensure that Ecological Solid Waste Management (RA9003) is implemented in the project site. • Segregate solid wastes from biodegradable to non-biodegradables and recyclables. • Segregate construction debris (i.e., broken concrete, ceramics, wood). • Maintain proper housekeeping. • Install a Material Recovery Facility (MRF). • Ensure the regular collection of solid waste by the BLGU/MLGU. • Isolate and regularly dispose hazardous wastes and toxic substances. • Isolate electronic/electrical waste (WEEE) for separate treatment. Disinfect the area and provide necessary PPEs if the situation worsens. • Remove flamable solid wastes.
Hazardous Waste and Toxic Substances	• Agency shall register on the Online Hazardous Waste Manifest System as generator and properly manage it according to the Revised Procedures and Standards for the Management of Hazardous Wastes (DAO 2013-22). • Proper Management includes the following: • R&M Provider and Agency shall comply with the storage and handling requirements. • As per transport requirement, R&M Provider and Agency shall comply with the package and labeling requirements appropriate to the waste being transported. In addition, spill response plan shall be prepared and given to the designated waste transported. Transporter shall notify EMB and related parties in case of accidents, spills and clean up the contamination and file a detailed Incident Report to EMB. • Agency is required to avail of the services of waste transporters and TSD facilities that are duly registered by EMB-CO and whose permits are valid within the period that the wastes are being transported and treated, stored, or disposed of. • Agency is required to use the Online Hazardous Waste Manifest System in transporting for offsite treatment, storage, and disposal. • Agency shall secure the original copy of Certificate of Treatment issued by TSD facility. Copy of the document shall be included as part of SMR to EMB. In case wastes including chemicals listed under Priority Chemical List such as lead, cadmium, mercury, PCB, Ozone depleting substances etc. are found, R&M Provider and DOTr shall refer

	to Chemical Control Order (CCO) under their respective DAOs in handling, storage, and transport according to the respective rules and regulations.
Contamination by oil and grease and fuel spills from heavy equipment and storage areas.	• Provide ring canals around fueling tanks/ motor pool / maintenance areas, and oil pan basin with 110% capacity • Collect used oils in containers and sell to licensed recyclers or engage an accredited Transporter. • Collect oil contaminated soil, consider washing for treatment.
Water Ponding at the Depot can be a breeding ground for dengue causing mosquitoes	• Ensure that water ponding, from whatever sources, be cleaned/removed to avoid dengue causing mosquitoes to breed and proliferate. • Civil Team to look at the sources of water ponding and construct necessary prevention measure.

Solid Wastes dumped at theDepot

Water ponding at the Depot will be a possible breeding ground of Dengue Mosquitos Contractor has to address this issue by removing stagnant water to prevent dengue mosquitoes in the depot.



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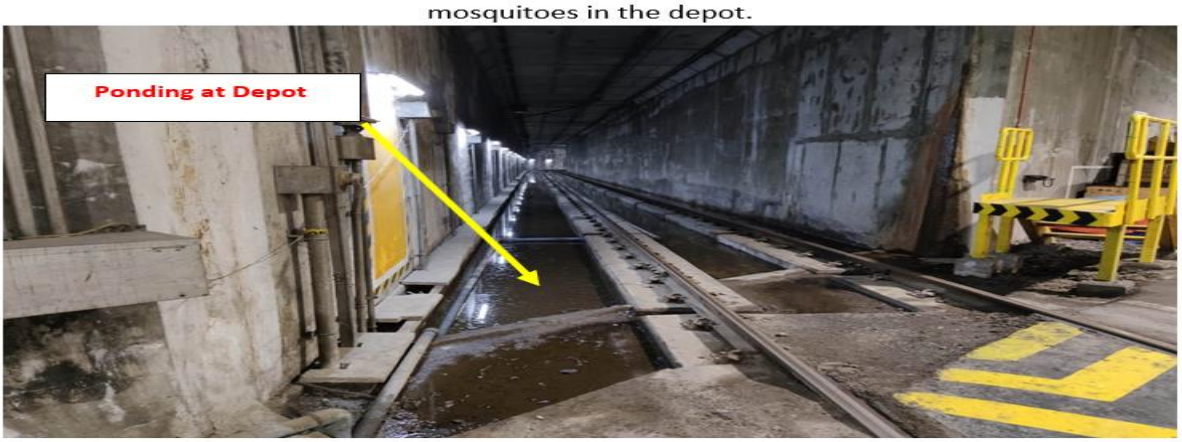
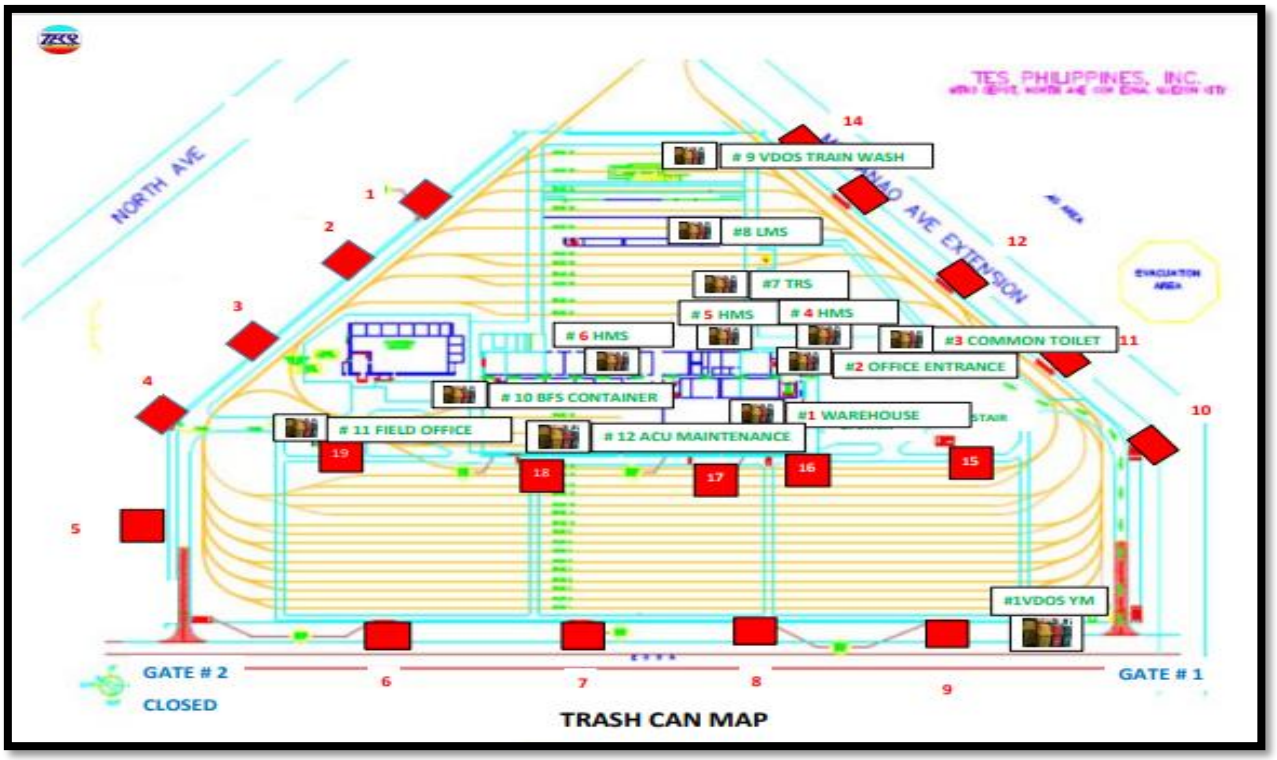


Ensure that used oil are prevented from spilling to the soil.
Used soil should be contained and properly disposed for treatment.

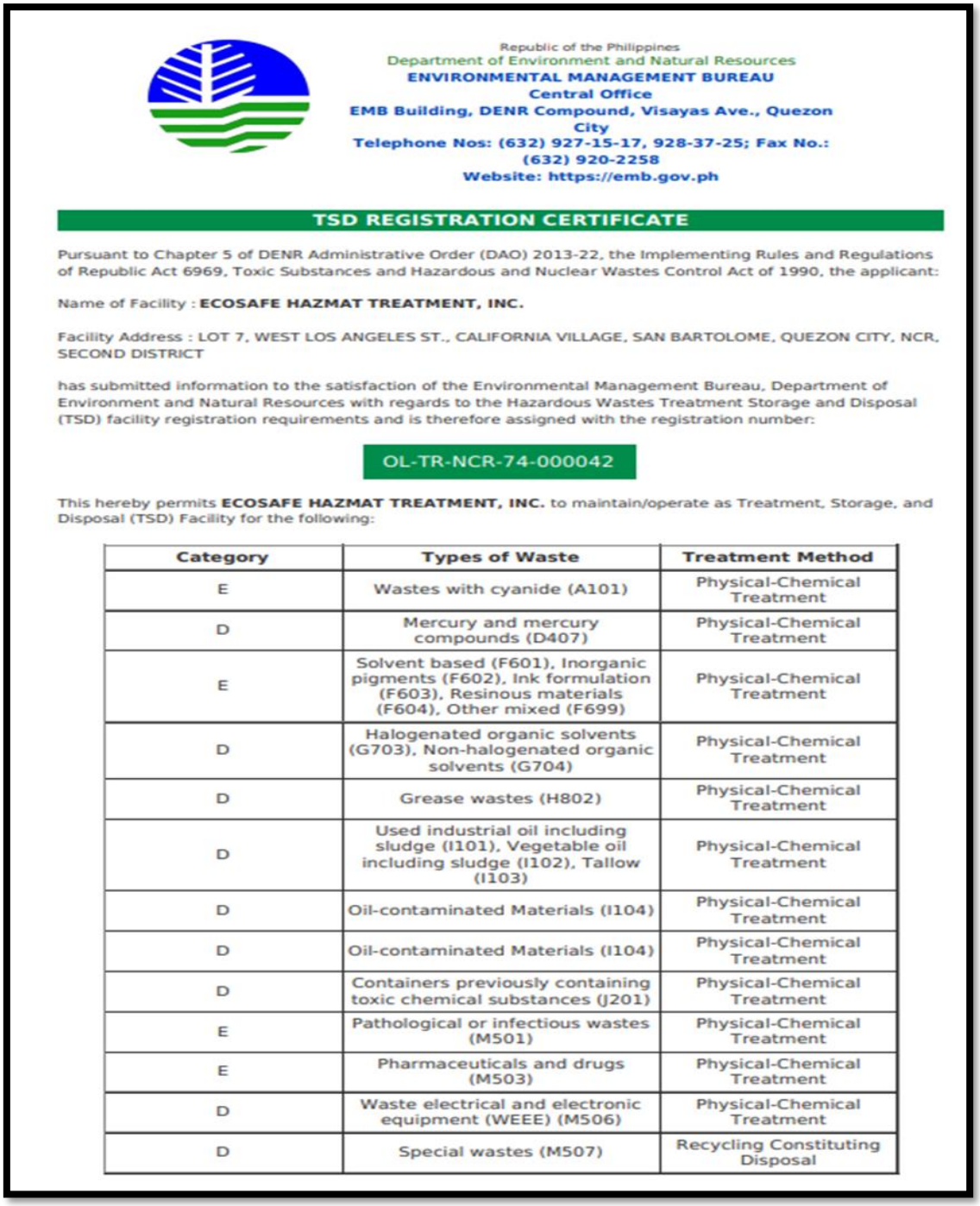
5. Hazardous wastes and toxic materials removed from the storage at the Depot.

10.2. Contractor Compliance as of Sept. 28, 2021

Trash Can Map in the Depot - the contractor stationed trash cans in the different locations at the depot to ensure that the solid wastes are being collected.



The contractor engaged a **TSD, ECOSAFE HAZMAT TREATMENT, INC**. to treat wastewater, hazardous wastes and toxic substances.



Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Central Office
EMB Building, DENR Compound, Visayas Ave., Quezon City
Telephone Nos: (632) 927-15-17, 928-37-25; Fax No.: (632) 920-2258
Website: https://emb.gov.ph

TSD REGISTRATION CERTIFICATE

Pursuant to Chapter 5 of DENR Administrative Order (DAO) 2013-22, the Implementing Rules and Regulations of Republic Act 6969, Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990, the applicant:

Name of Facility : **ECOSAFE HAZMAT TREATMENT, INC.**

Facility Address : LOT 7, WEST LOS ANGELES ST., CALIFORNIA VILLAGE, SAN BARTOLOME, QUEZON CITY, NCR, SECOND DISTRICT

has submitted information to the satisfaction of the Environmental Management Bureau, Department of Environment and Natural Resources with regards to the Hazardous Wastes Treatment Storage and Disposal (TSD) facility registration requirements and is therefore assigned with the registration number:

OL-TR-NCR-74-000042

This hereby permits **ECOSAFE HAZMAT TREATMENT, INC.** to maintain/operate as Treatment, Storage, and Disposal (TSD) Facility for the following:

Category	Types of Waste	Treatment Method
E	Wastes with cyanide (A101)	Physical-Chemical Treatment
D	Mercury and mercury compounds (D407)	Physical-Chemical Treatment
E	Solvent based (F601), Inorganic pigments (F602), Ink formulation (F603), Resinous materials (F604), Other mixed (F699)	Physical-Chemical Treatment
D	Halogenated organic solvents (G703), Non-halogenated organic solvents (G704)	Physical-Chemical Treatment
D	Grease wastes (H802)	Physical-Chemical Treatment
D	Used industrial oil including sludge (I101), Vegetable oil including sludge (I102), Tallow (I103)	Physical-Chemical Treatment
D	Oil-contaminated Materials (I104)	Physical-Chemical Treatment
D	Oil-contaminated Materials (I104)	Physical-Chemical Treatment
D	Containers previously containing toxic chemical substances (J201)	Physical-Chemical Treatment
E	Pathological or infectious wastes (M501)	Physical-Chemical Treatment
E	Pharmaceuticals and drugs (M503)	Physical-Chemical Treatment
D	Waste electrical and electronic equipment (WEEE) (M506)	Physical-Chemical Treatment
D	Special wastes (M507)	Recycling Constituting Disposal

The contractor engaged a **TSD, ECOSAFE HAZMAT TREATMENT, INC**. to treat wastewater, hazardous wastes and toxic substances.

Category	Types of Waste	Treatment Method
E	Sulfuric acid (B201), Hydrochloric acid (B202), Nitric acid (B203), Phosphoric acid (B204), Hydrofluoric acid (B205), Mixture of sulfuric and hydrochloric acid (B206), Other inorganic acid (B207), Organic acid (B208), Other acid wastes (B299)	Physical Chemical Treatment
E	Caustic soda (C301), Potash (C302), Alkaline cleaners (C303), Ammonium hydroxide (C304), Lime slurries (C305), Other alkali wastes (C399)	Physical-Chemical Treatment
E	Selenium and its compounds (D401), Arsenic and its compounds (D402), Barium and its compounds (D403), Cadmium and its compounds (D404), Chromium compounds (D405), Lead compounds (D406), Mercury and mercury compounds (D407), Fluoride and its compounds (D408), Other wastes with inorganic chemicals (D499)	Physical-Chemical Treatment

Subject to the following conditions:

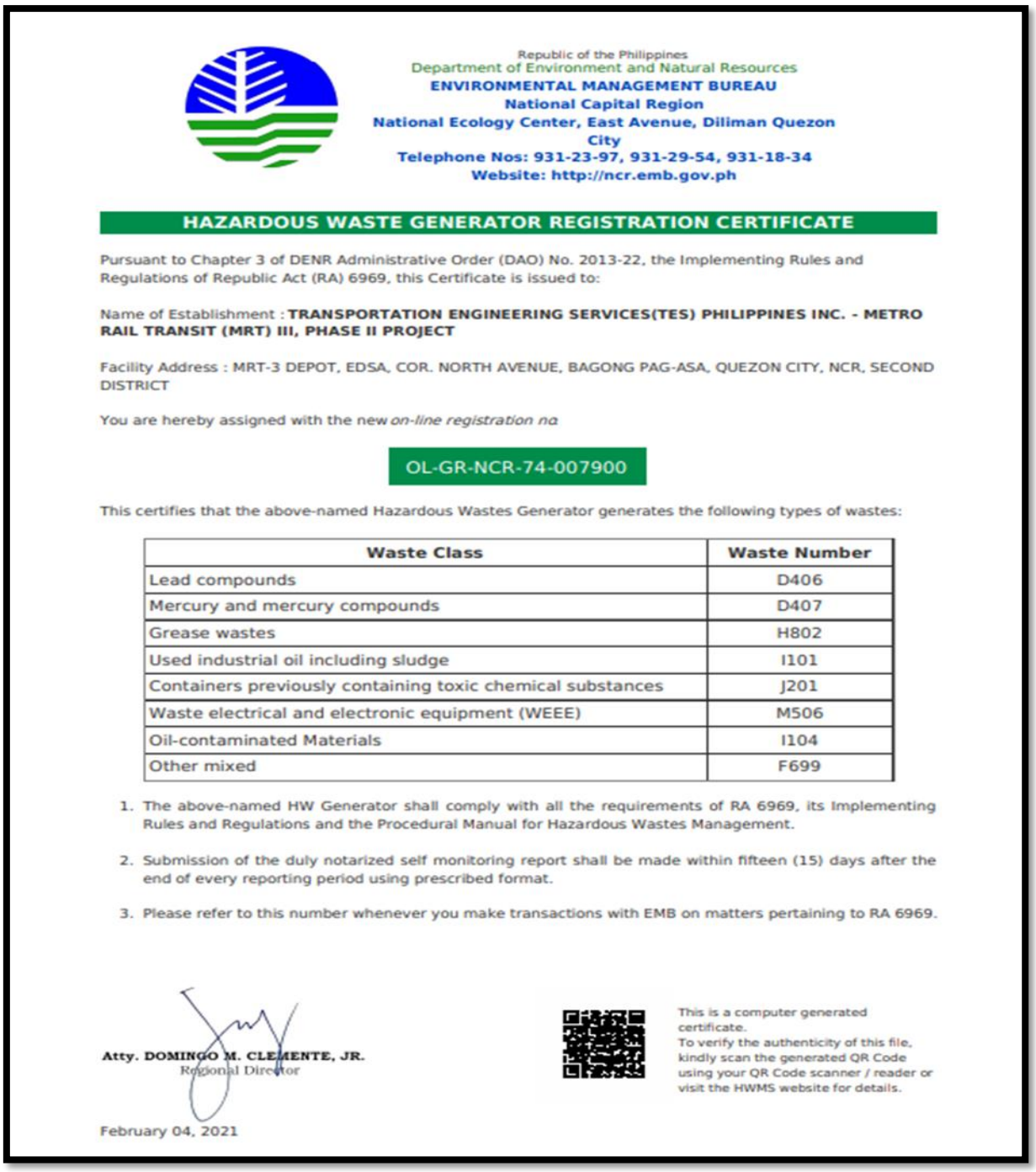
1. The TSD facility shall comply with all the requirements of R.A. 6969, its Implementing Rules and Regulation and the Procedural Manual for Hazardous Waste Management.
2. The TSD facility shall not exceed the capacity indicated in the Environmental Compliance Certificate (ECC), and the transported wastes shall be treated within forty-five (45) days from the date of receipt as indicated in the Hazardous Waste Manifest Form.
3. All residues generated shall be disposed of in a third-party TSD facility for further treatment or disposal.
4. Non-compliance to the above stipulations shall be subjected to the penalty provisions as provided under Section 41 of DAO 92-92 and Chapter 11 of DAO 2013-22.
5. This certificate is valid for one (1) year from approved date unless sooner revoked or suspended for cause by this Bureau. The application for renewal hereof should be filed with this Bureau at least one (1) month prior to the date of expiration.

ENGR. WILLIAM P. CUÑADO
OIC - Director, Environmental Management Bureau

October 09, 2020

This is a computer generated certificate.
To verify the authenticity of this file, kindly scan the generated QR Code using your QR Code scanner / reader or visit the HWMS website for details.

Hazardous Waste Generator Registration Certificate



Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
National Capital Region
National Ecology Center, East Avenue, Diliman Quezon City
Telephone Nos: 931-23-97, 931-29-54, 931-18-34
Website: http://ncr.emb.gov.ph

HAZARDOUS WASTE GENERATOR REGISTRATION CERTIFICATE

Pursuant to Chapter 3 of DENR Administrative Order (DAO) No. 2013-22, the Implementing Rules and Regulations of Republic Act (RA) 6969, this Certificate is issued to:

Name of Establishment : **TRANSPORTATION ENGINEERING SERVICES(TES) PHILIPPINES INC. - METRO RAIL TRANSIT (MRT) III, PHASE II PROJECT**

Facility Address : MRT-3 DEPOT, EDSA, COR. NORTH AVENUE, BAGONG PAG-ASA, QUEZON CITY, NCR, SECOND DISTRICT

You are hereby assigned with the new *on-line registration no*

OL-GR-NCR-74-007900

This certifies that the above-named Hazardous Wastes Generator generates the following types of wastes:

Waste Class	Waste Number
Lead compounds	D406
Mercury and mercury compounds	D407
Grease wastes	H802
Used industrial oil including sludge	I101
Containers previously containing toxic chemical substances	J201
Waste electrical and electronic equipment (WEEE)	M506
Oil-contaminated Materials	I104
Other mixed	F699

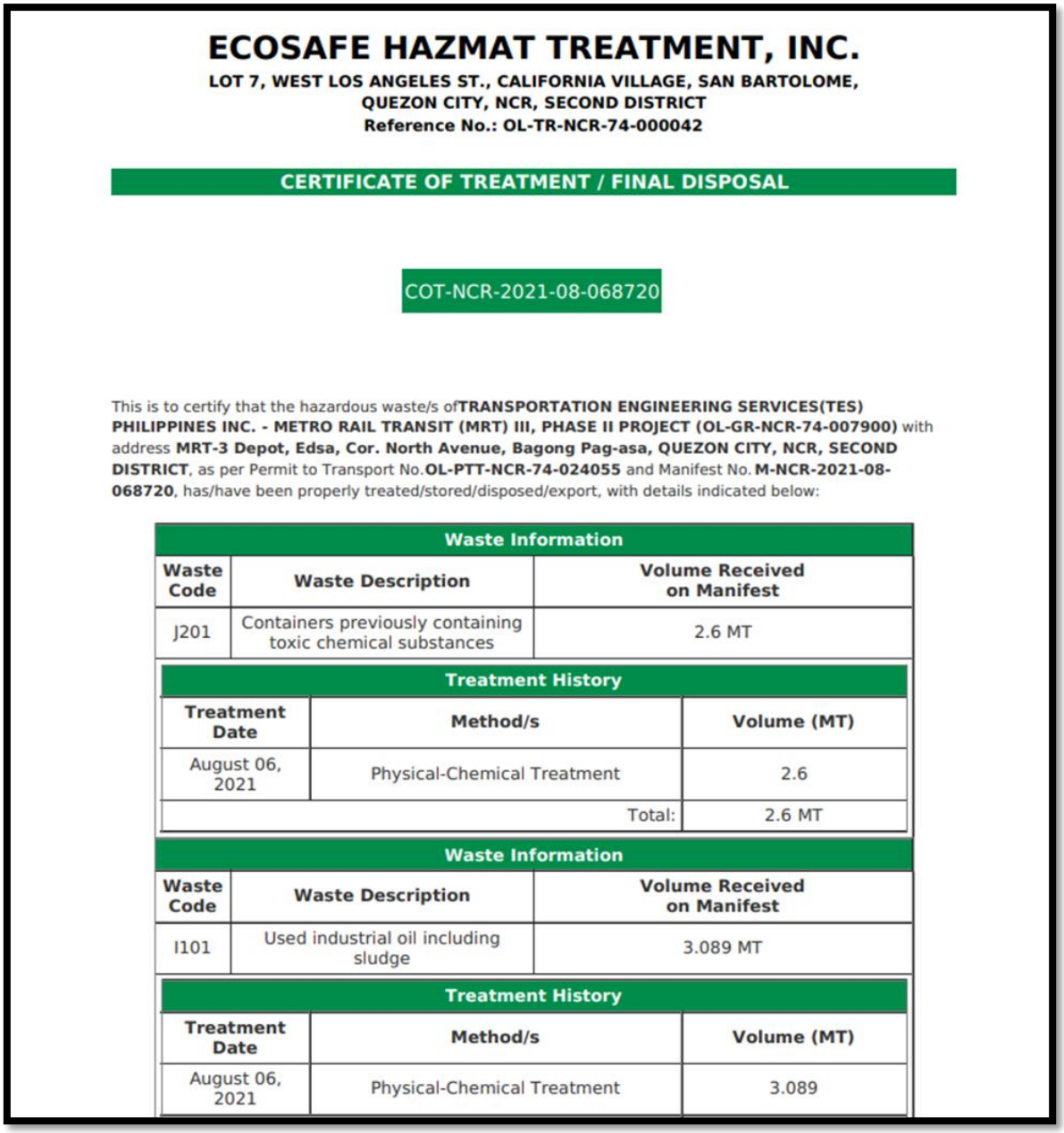
1. The above-named HW Generator shall comply with all the requirements of RA 6969, its Implementing Rules and Regulations and the Procedural Manual for Hazardous Wastes Management.
2. Submission of the duly notarized self monitoring report shall be made within fifteen (15) days after the end of every reporting period using prescribed format.
3. Please refer to this number whenever you make transactions with EMB on matters pertaining to RA 6969.

Atty. DOMINGO M. CLEMENTE, JR.
Regional Director

February 04, 2021

This is a computer generated certificate.
To verify the authenticity of this file, kindly scan the generated QR Code using your QR Code scanner / reader or visit the HWMS website for details.

Certificate of Treatment/Final Disposal – proving that the wastewater was treated.



ECOSAFE HAZMAT TREATMENT, INC.

LOT 7, WEST LOS ANGELES ST., CALIFORNIA VILLAGE, SAN BARTOLOME, QUEZON CITY, NCR, SECOND DISTRICT
Reference No.: OL-TR-NCR-74-000042

CERTIFICATE OF TREATMENT / FINAL DISPOSAL

COT-NCR-2021-08-068720

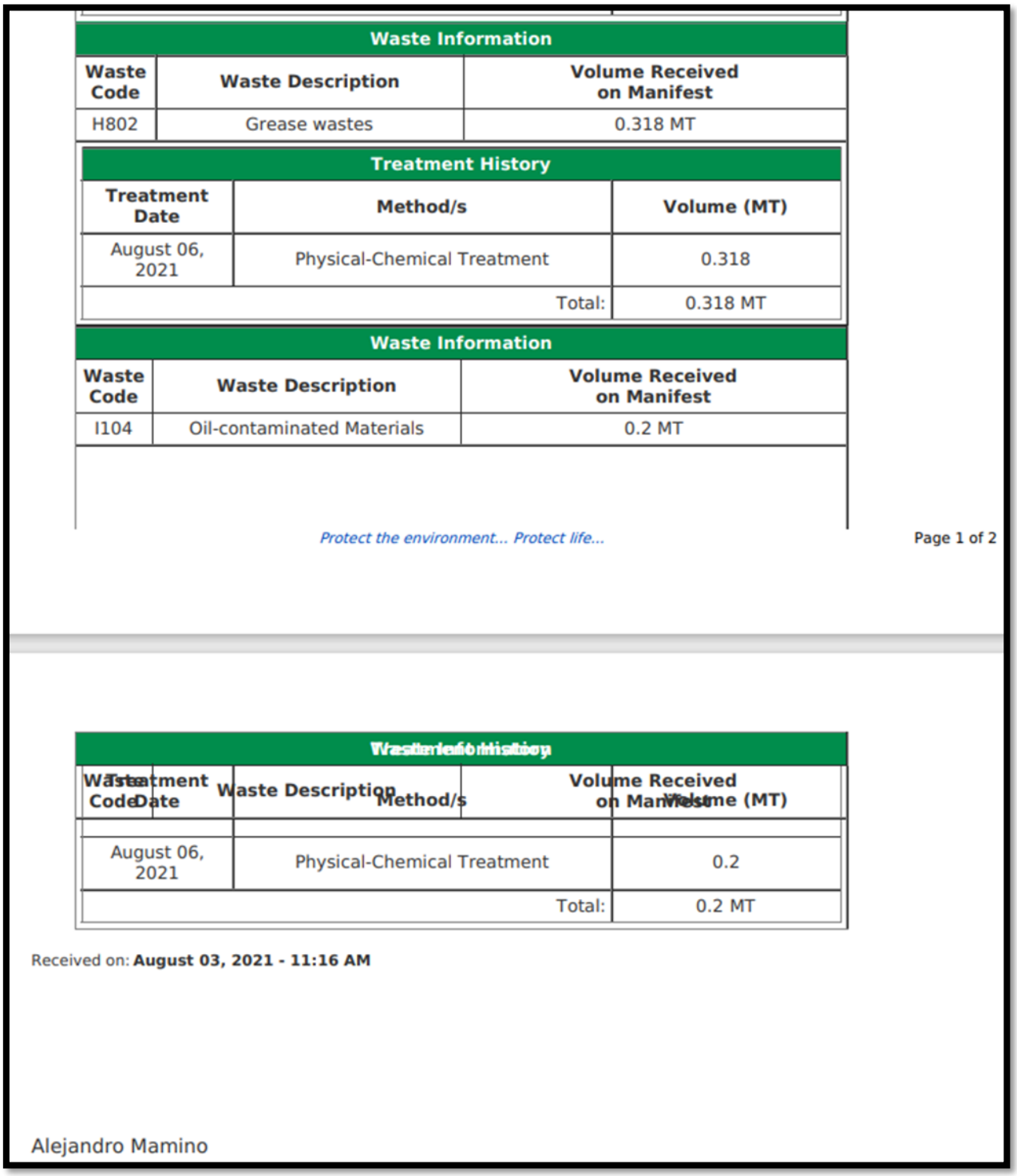
This is to certify that the hazardous waste/s of**TRANSPORTATION ENGINEERING SERVICES(TES) PHILIPPINES INC. - METRO RAIL TRANSIT (MRT) III, PHASE II PROJECT (OL-GR-NCR-74-007900)** with address **MRT-3 Depot, Edsa, Cor. North Avenue, Bagong Pag-asa, QUEZON CITY, NCR, SECOND DISTRICT**, as per Permit to Transport No.**OL-PTT-NCR-74-024055** and Manifest No. **M-NCR-2021-08-068720**, has/have been properly treated/stored/disposed/export, with details indicated below:

Waste Information		
Waste Code	**Waste Description**	**Volume Received on Manifest**
J201	Containers previously containing toxic chemical substances	2.6 MT

Treatment History		
Treatment Date	**Method/s**	**Volume (MT)**
August 06, 2021	Physical-Chemical Treatment	2.6
	Total:	2.6 MT

Waste Information		
Waste Code	**Waste Description**	**Volume Received on Manifest**
I101	Used industrial oil including sludge	3.089 MT

Treatment History		
Treatment Date	**Method/s**	**Volume (MT)**
August 06, 2021	Physical-Chemical Treatment	3.089



Waste Information		
Waste Code	Waste Description	Volume Received on Manifest
H802	Grease wastes	0.318 MT

Treatment History		
Treatment Date	Method/s	Volume (MT)
August 06, 2021	Physical-Chemical Treatment	0.318
	Total:	0.318 MT

Waste Information		
Waste Code	Waste Description	Volume Received on Manifest
I104	Oil-contaminated Materials	0.2 MT

Protect the environment... Protect life...

Page 1 of 2

Treatment History		
Treatment Date	Method/s	Volume (MT)
August 06, 2021	Physical-Chemical Treatment	0.2
	Total:	0.2 MT

Received on: **August 03, 2021 - 11:16 AM**

Alejandro Mamino