



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
MANILA, PHILIPPINES

DAVAO CITY BYPASS CONSTRUCTION PROJECT (DCBCP)

Package I-1

JICA L/A No. PH-P261 & JICA L/A No. PH-P273

ENVIRONMENTAL AND RESETTLEMENT MONITORING REPORT No. 12

(01 OCTOBER 2023 - 31 DECEMBER 2023)

January 2024

Joint Venture of:

 NIPPON KOEI CO.,LTD.



Katahira &
Engineers
International



Nippon Engineering
Consultants Co., Ltd

In Association with:

 PHILKOEI INTERNATIONAL, INC.
CONSULTANTS • PLANNERS • ENGINEERS

Environmental and Resettlement Monitoring Report (October 2023 – December 2023)

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Abbreviations

BOD	biological oxygen demand
CMR	Compliance Monitoring Report
DCBCP	Davao City Bypass Construction Project
DENR	Department of Environment and Natural Resources
DOLE	Department of Labor and Employment
DO	dissolved oxygen
DPWH	Department of Public Works and Highways
ECC	Environmental Compliance Certificate
EIA	Environmental Impact Assessment
EMB	Environmental Management Bureau
EMP	Environmental Management Plan
EMoP	Environmental Monitoring Plan
GRM	Grievance Redress Mechanism
IEC	Information, Education, and Communication
LGU	Local Government Unit
NK	Nippon Koei
PAP	Project Affected Person
RAP	Right of Way Action Plan
RROW	Road Right of Way
SDP	Social Development Plan
SMR	Self-Monitoring Report
SUTJV	Shimizu-Ulticon-Takenaka JV
TSS	total suspended solids
TSP	total suspended particulate

Executive Summary

This is the twelfth quarterly Environmental and Resettlement Monitoring Report (ERMR) for the Davao City Bypass Construction Project (DCBCP) Package I-1, covering the monitoring period 01 October 2023 to 31 December 2023.

During this monitoring period, construction activities include construction of roads and drainage structures, bridge, tunnel, tunnel facilities and buildings, and the combined field office and laboratory for the Engineer. The Contractor's Environmental Section for DCBCP Package I-1 are implementing the requirements of the Environmental Compliance Certificate (ECC), the project's Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP). Regular environmental monitoring activities were conducted for ambient air quality, water quality, and noise levels. In summary, no exceedances were recorded for ambient air quality, while exceedance is recorded for water quality, specifically for dissolved oxygen (DO), biological oxygen demand (BOD), and total suspended solids (TSS). Ambient noise levels during morning and daytime were also exceeded at Waan National High School.

Regular environmental site inspection and audit were conducted by the implementing office facilitated by the Engineer, Nippon Koei Joint Venture (NK-JV) during this monitoring period to ensure the environmental compliance of the DCBCP Package I-1. The site inspections and audit include monitoring implementation of the Contractor's activities for the project's social development program (SDP), information, education, and communication (IEC) campaigns, and tree-cutting related requirements. Non-compliances are monitored and corrective actions identified, as applicable, including implementation of mitigation measures.

Key project compliances for environmental and social safeguards for this quarter include the following:

- Submission of Self-Monitoring Report (SMR) covering 3rd Quarter 2023
- Drafting of SMR for 4th Quarter 2023 and Compliance Monitoring Report (CMR) covering 3rd and 4th Quarter 2023
- Monitoring implementation of IEC program
- Monitoring implementation of Social Development Program (SDP)
- Implementation of mitigation measures in compliance with environmental laws relevant to the project, including Republic Act (RA) 9003 (Solid Waste Management System), RA 6969 (Toxic Substances and Hazardous and Nuclear Wastes Control Act), RA 8749 (Philippine Clean Air Act of 1999), RA 9275 (Philippine Clean Water Act of 2004)
- Coordination with Department of Environment and Natural Resources - Environmental Management Bureau (DENR-EMB) for revision of memorandum of agreement (MOA) for the Creation of Multipartite Monitoring Team (MMT)
- Facilitate acquisition of road right-of-way (RROW)

This report provides the status of each monitoring item in the project's Environmental Monitoring Plan (EMoP) and serves as the quarterly internal monitoring report for Resettlement Action Plan (RAP) implementation. Environmental and social safeguards monitoring activities conducted for this period are summarized in the table below.

No.	Monitoring Item	Monitoring Activity
1	Air quality	Quarterly air quality tests for TSP, NO ₂ , SO ₂ , CO at 2 locations
2	Water quality (Surface water)	Quarterly surface water quality tests for pH, DO, Oil & Grease, BOD, TSS at 9 locations
3	Water quality (Groundwater)	Measurement of groundwater volume at existing water tank, and water level at tunnel top observation well
4	Waste	Check records of amount and type of waste, and disposal method
5	Noise	Quarterly noise quality test for ambient and road side noise at 2 locations during morning, daytime, evening, and night time
6	Ground subsidence	Daily measurement of volume of groundwater seepage at tunnel section
7	Natural environment - Terrestrial flora and fauna	Daily visual check of condition of vegetation
8	Natural environment - Aquatic flora and fauna	Quarterly surface water quality tests for pH, DO, Oil & Grease, BOD, TSS at 9 locations
9	Social environment - Land use	Check site condition for trees cut
10	Social environment - Water use	Monitoring of complaints from downstream area and groundwater users
11	Social environment - Existing social infrastructure and service	Monitoring of complaints from surrounding communities
12	Health and safety - Infectious disease	Check records of awareness activities on infectious disease
13	Health and safety - Occupational health	Check record of accidents in the construction site
14	Health and safety - Community health and safety	Record of traffic accidents in the surrounding communities
15	Emergency risk - Flood	Condition of flood
16	Emergency risk - Fire	Condition of fire
17	Involuntary Resettlement*	Check relocation and payment records
18	Vulnerable Groups*	
19	Livelihood and Local Economy*	
20	Misdistribution of Benefit and Damage	
21	Local Conflict of Interest	Monitoring of complaints

1 General Background

1.1 Project Background and Objectives

The Davao City Bypass Construction Project (DCBCP) involves the construction of a 4-lane, 45.5 km highway in the City of Davao, province of Davao del Sur. The DCBCP is composed of the following components:

Unit: km.					
Component	Package I-2	Package I-1	Package I-3	Package II	Total
Road Section	11.9	7.9	5.5	13.2	38.5
Bridge Section	0.9	0.5	0.1	2.7	4.2
Tunnel Section	-	2.3	0.5	-	2.8
Total	12.8	10.7	6.1	15.9	45.5

The objectives of the project are:

- To divert the traffic to the Bypass, instead of passing through the Urban Center, relieving chronic traffic congestion;
- To expand urban areas towards the inland areas guided by the new road network of the Bypass;
- To support economic activities, particularly for manufacturing and agri-business industries, by providing easier transport access to seaports and airports

1.2 Project Profile

DCBCP Package I-1 is a 10.7 km dual carriageway road which begins at Mintal Road Intersection at Sta. 12+800 and ends at Mandug Road Intersection at Sta. 23+500 (See Figure 1 below).

Package I-1 is composed of roads, bridges and tunnel sub-sections. There are three (3) river bridges for a total 0.5 km length, two (2) overpasses, two (2) underpasses and two tunnels (2 lanes x 2) of 2.3 km long. (See summary of project general information/contract data below)

Contract Data	
Project Component	Tunnel, Road, Bridges, Underpasses, Overpasses, Waterways and Road Crossings
Province / Region	Davao Del Sur / Region XI
Funding Source	GOP, JICA Loan No. PH-P261 & PH-P273
Contractor	Shimizu-Ulticon-Takenaka Joint Venture
Consultant	NK, KEI and NE in association with PKII
Contract Amount:	PhP 13,230,000,000.00
Effectivity of Contract	21 December 2020
Original Contract Duration	37 months (1,110 Calendar Days)
Contract Time Extension No. 1	314 CD (Approved 18 Aug. 2022)
Contract Time Extension No. 2	24 CD (Approved 23 Sep. 2022)
Contract Time Extension No. 3	97 CD (Approved 26 Apr. 2023)
Revised Contract Duration	51.50 months (1,545 Calendar Days)
Original Expiry Date	04 January 2024
Revised Expiry Date	14 March 2025

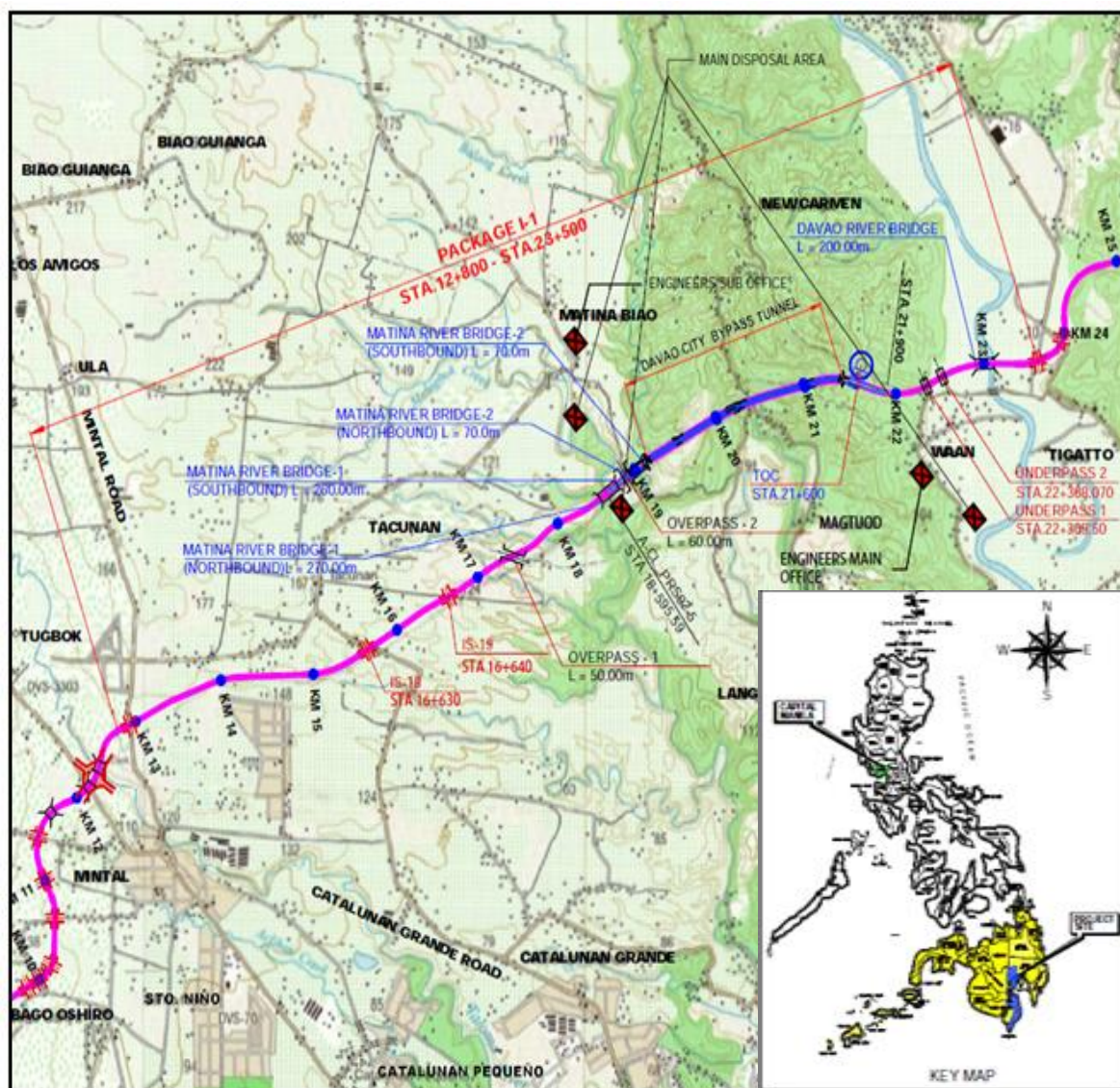


Figure 1 Project Location Map

1.3 Activities Undertaken for the Monitoring Period

No.	Activity
1	Preparation of As-Staked Plans
2	Acquisition of Road Right-of-Way (RROW)
3	Construction of roads and drainage structures
4	Bridge construction
5	Tunnel civil works
6	Construction of buildings and tunnel facilities
7	Construction of combined field office and laboratory for the Engineer

2 Environmental Monitoring

Monitoring for environmental and social considerations is conducted in accordance with the project's Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP). The primary purpose of this monitoring is to ensure the judicious implementation of sound environmental management within the project and its areas of operation.

Implementation of the EMoP started during the pre-construction phase and is continued during the construction period and operation phase. For 4th quarter 2023, the following monitoring items indicated in the prescribed monitoring forms¹ (See Annex 1) were covered for DCBCP Package I-1.

No.	Monitoring Item	Activity
1	Air Quality	Quarterly monitoring of TSP, SO ₂ , NO ₂ , CO ₂ at beginning and end of Package I-1
2	Surface Water Quality	Quarterly monitoring of pH, DO, Oil and Grease, BOD, TSS at Davao River (3 stations), Matina River (4 stations), and Tunnel Section (2 stations)
3	Surface Water Quality	Quarterly monitoring of pH, DO, Oil and Grease, BOD, TSS at downstream areas of construction yards and workers camps (North and South Yard)
4	Groundwater Quality	Monitor groundwater level at existing well (OTBH-4)
5	Groundwater Quality	Monitor groundwater volume discharged at the existing water tank at Sta. 20+350
6	Waste	Monitor records of amount and type of waste and disposal method at cut sections of the alignment, tunnel section, tree cutting areas, and workers camps
7	Ambient and roadside noise	Quarterly monitoring of ambient and roadside noise during morning, daytime, evening and night time at beginning and end of Package I-1
8	Terrestrial flora and fauna	Daily visual check of vegetation condition
9	Aquatic flora and fauna	Quarterly monitoring of pH, DO, Oil and Grease, BOD, TSS at Davao River (3 stations), Matina River (4 stations), and Tunnel Section (2 stations)
10	Land Use	Check site conditions of areas with tree cutting activities
11	Water Use	Check records of complaints from downstream area or from groundwater users
12	Social Infrastructure and Service	Check records of complaints from surrounding communities
13	Infectious Disease	Check records of project activities for raising awareness of infectious diseases
14	Occupational Health	Check records of accidents in the construction site
15	Community Health and Safety	Check records of traffic accidents in the surrounding communities
16	Flood	Check site conditions at left and right bank of Davao River for flood condition
17	Fire	Check site conditions at camps and construction sites

Tables 1 to 10 below summarize the results of environmental monitoring activities for this period using prescribed monitoring forms.

¹ Attachment I-20 and I-21 of Loan Agreement No. PH-P273

2.1 Air Quality

Table 1. Results of Air Quality Monitoring during Construction Stage, 4th Quarter 2023

Monitoring Item	Unit	Measured Value (Mean) Along road/residential area	Baseline Value (Mean) Along road/residential area	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc.)
TSP	µg/Ncm	S1: 208 / 77 S2: 243 / 226	216.4 / 69.9 S1: 3.2 / 8.18 S2: 349.1 / 78.62	300 (1hr) / 230 (24hr)	SPM (0.1mg/m ³)	Measurement Point <Package I-1> <ul style="list-style-type: none"> Beginning point of Package I-1 (S1, Elenita Heights) Ending point of Package I-1 (S2, Waan NHS) Frequency <ul style="list-style-type: none"> Quarterly Method <ul style="list-style-type: none"> TSP: Gravimetric Method SO2: Pararosaniline Method NO2: Griess-Saltzman Reaction CO: Direct Reading (Gas Analyzer)
SO2	µg/Ncm	S1: 10 / 2.68 S2: 10 / 2.90	4.0 / 1.3 S1: 19.4 / 4.85 S2: 22.2 / 5.75	340 (1hr) / 180 (24hr)	0.04ppm	
NO2	µg/Ncm	S1: <2 / <0.07 S2: <2 / 0.09	6.6 / 1.0 S1: 11 / 0.85 S2: 9 / 1.03	260 (1hr) / 150 (24hr)	0.04-0.06ppm	
CO	ppm	S1: <1 / <1 S2: <1 / <1	<1.0/1.0 S1: 1 / 1 S2: 2 / 1	30 (Every 8 hours) / 9 (24hr)	10ppm	

The baseline air quality data were taken in 2014. Much of the area has since undergone different stages of development before the start of the project. These sampling locations were also found to be too far from the final road alignment. New test locations closer to the project alignment were thus established to better monitor the effects of the project on air quality. The figures below show the locations of the quarterly ambient air quality sampling stations relative to the final road alignment.



Figure 2 Location of sampling station at beginning point of Package I-1 (Elenita Heights)

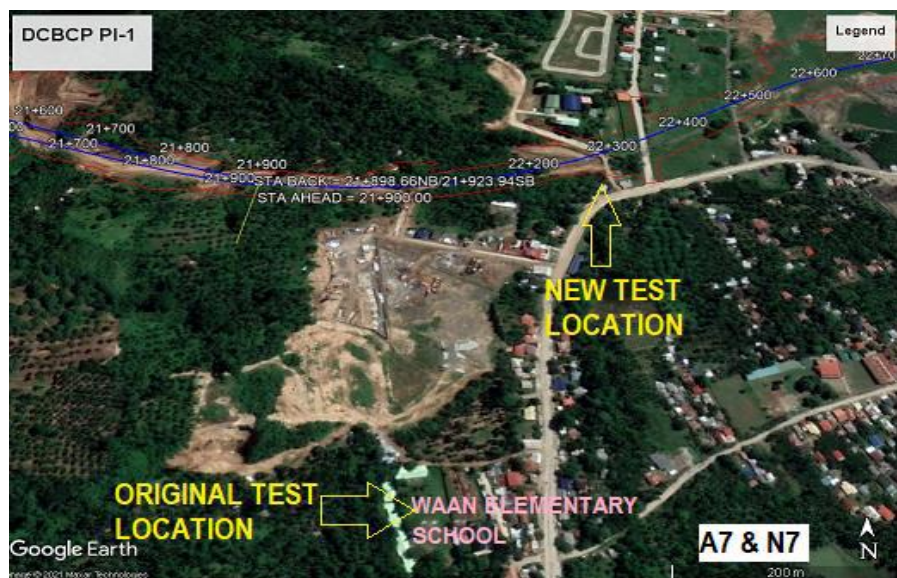


Figure 3 Location of sampling station at ending point of Package I-1 (Brgy. Waan)

No exceedances were recorded for any of the parameters monitored for this period. The results of the ambient air and noise quality sampling are presented in Annex 3 of the report.

2.2 Water Quality (Surface Water)

Table 2. Results of Surface Water Quality Monitoring during Construction Stage, 4th Quarter 2023

Monitoring Item	Unit	Measured Value (Mean)	Baseline Value (Mean)	Country's Standard	Referred International Standards (Japanese Standard, B category river)	Remarks (Measurement Point, Frequency, Method, etc.)
pH	-		7.8	6.5-8.5	6.5-8.5	Measurement Point <Package I-1> [Davao River] <ul style="list-style-type: none"> 1 location at 100 m upstream from the proposed bridge location (S1) 2 locations at 100 m downstream from the proposed bridge location (S2, S3) [Matina River-1] <ul style="list-style-type: none"> 1 location at 100 m upstream from the proposed bridge location (S4) 1 location at 100 m downstream from the proposed bridge location (S5)
		S1: 8.23	S1: 8.27			
		S2: 8.40	S2: 8.29			
		S3: 8.24	S3: 8.37			
		S4: 7.97	S4: 8.28			
		S5: 7.89	S5: 8.09			
		S6: 7.48	S6: 7.97			
		S7: 8.26	S7: 8.18			
		S8: 7.95	S8: 8.17			
S9: 8.48	S9: 8.13					
DO	mg/l		7.4	5.0	5	[Matina River-2] <ul style="list-style-type: none"> 1 location at 100 m upstream from the proposed bridge location (S6) 1 location at 100 m downstream from the proposed bridge location (S7) [Tunnel Construction Stage] <ul style="list-style-type: none"> 1 point at upstream of tunnel section, Sta. 18+900 (S8) 1 point at Station 22+200 (S9) Frequency <ul style="list-style-type: none"> Quarterly Method <ul style="list-style-type: none"> Site measurement in accordance with the methodologies described in DAO 34-1990 and EMB-DENR, Manual for Ambient Water Quality Monitoring Volume 1
		S1: 4.6	S1: 7.3			
		S2: 5.2	S2: 7.4			
		S3: 4.6	S3: 7.3			
		S4: 6.4	S4: 7.2			
		S5: 5.8	S5: 6.9			
		S6: 2.1	S6: 6.0			
		S7: 4.0	S7: 5.7			
		S8: 7.7	S8: 6.2			
S9: 8.0	S9: 7.7					

(cont.) Table 2

Monitoring Item	Unit	Measured Value (Mean)	Baseline Value (Mean)	Country's Standard	Referred International Standards (Japanese Standard, B category river)	Remarks (Measurement Point, Frequency, Method, etc.)
Oil and Grease	-		-	2.0	-	Measurement Point <Package I-1> [Davao River] <ul style="list-style-type: none"> 1 location at 100 m upstream from the proposed bridge location (S1) 2 locations at 100 m downstream from the proposed bridge location (S2, S3) [Matina River-1] <ul style="list-style-type: none"> 1 location at 100 m upstream from the proposed bridge location (S4) 1 location at 100 m downstream from the proposed bridge location (S5)
		S1: <0.5	S1: <0.5			
		S2: <0.5	S2: 2.6			
		S3: <0.5	S3: 7.2			
		S4: <0.5	S4: 0.86			
		S5: <0.5	S5: 1.1			
		S6: <0.5	S6: 3.4			
		S7: <0.5	S7: 2.5			
		S8: 0.75	S8: 0.7			
BOD	mg/l		2.0	7.0	3	[Matina River-2] <ul style="list-style-type: none"> 1 location at 100 m upstream from the proposed bridge location (S6) 1 location at 100 m downstream from the proposed bridge location (S7) [Tunnel Construction Stage] <ul style="list-style-type: none"> 1 point at upstream of tunnel section, Sta. 18+900 (S8) 1 point at Station 22+200 (S9) Frequency <ul style="list-style-type: none"> Quarterly Method <ul style="list-style-type: none"> Site measurement in accordance with the methodologies described in DAO 34-1990 and EMB-DENR, Manual for Ambient Water Quality Monitoring Volume 1
		S1: 7.6	S1: 5.5			
		S2: 4.4	S2: 2.8			
		S3: 1.8	S3: 5.9			
		S4: 7.8	S4: 1.8			
		S5: 9.2	S5: 2.0			
		S6: 10.7	S6: 12.3			
		S7: 3.4	S7: 7.7			
		S8: 7.1	S8: 8.7			
S9: 4.9	S9: 3.2					

(cont.) Table 2

Monitoring Item	Unit	Measured Value (Mean)	Baseline Value (Mean)	Country's Standard	Referred International Standards (Japanese Standard, B category river)	Remarks (Measurement Point, Frequency, Method, etc.)
TSS	mg/l		22.5	Not more than 30g/l increase	SS 25	Measurement Point <Package I-1> [Davao River] <ul style="list-style-type: none"> 1 location at 100 m upstream from the proposed bridge location (S1) 2 locations at 100 m downstream from the proposed bridge location (S2, S3) [Matina River-1] <ul style="list-style-type: none"> 1 location at 100 m upstream from the proposed bridge location (S4) 1 location at 100 m downstream from the proposed bridge location (S5) [Matina River-2] <ul style="list-style-type: none"> 1 location at 100 m upstream from the proposed bridge location (S6) 1 location at 100 m downstream from the proposed bridge location (S7) [Tunnel Construction Stage] <ul style="list-style-type: none"> 1 point at upstream of tunnel section, Sta. 18+900 (S8) 1 point at Station 22+200 (S9) Frequency <ul style="list-style-type: none"> Quarterly Method <ul style="list-style-type: none"> Site measurement in accordance with the methodologies described in DAO 34-1990 and EMB-DENR, Manual for Ambient Water Quality Monitoring Volume 1
		S1: 1,004	S1: 61			
		S2: 952	S2: 168			
		S3: 902	S3: 645			
		S4: 8.0	S4: 3			
		S5: 32.0	S5: 3			
		S6: 14.0	S6: <3			
		S7: 12.0	S7: <3			
		S8: 62.0	S8: 14			
S9: <3	S9: 14.5					

The original locations of the water quality sampling given in the EIS (2014) were plotted and found to be too far from the final project alignment. The sampling locations were thus moved closer to the road alignment to make the tests results more indicative of the actual effects the project will have on the ecosystem of Matina and Davao rivers.

Original		Updated	
Location	Coordinates	Location	Coordinates
W3 - Matina River Brgy. Langub ~ 1.9km SE of Sta. 18+100	7°06'21.7"N 125°33'02.2"E	MATINA 1 (US)	7°07'25.26"N 125°32'42.01"E
		MATINA 1 (DS)	7°07'20.94"N 125°32'45.68"E
		MATINA 2 (US)	7°07'25.26"N 125°32'42.01"E
		MATINA 2 (DS)	7.12454° 125.54831°
W2 - Davao River Brgy. Tigatto ~ 2.1km SE of Sta. 23+500	7°06'51.9"N 125°35'15.1"E	DAVAO (US)	7°08'3.57"N 125°34'56.93"E
		DAVAO (DS)	7°07'59.01"N 125°34'58.47"E
		STA. 22+200	7°07'54.85"N 125°34'33.24"E

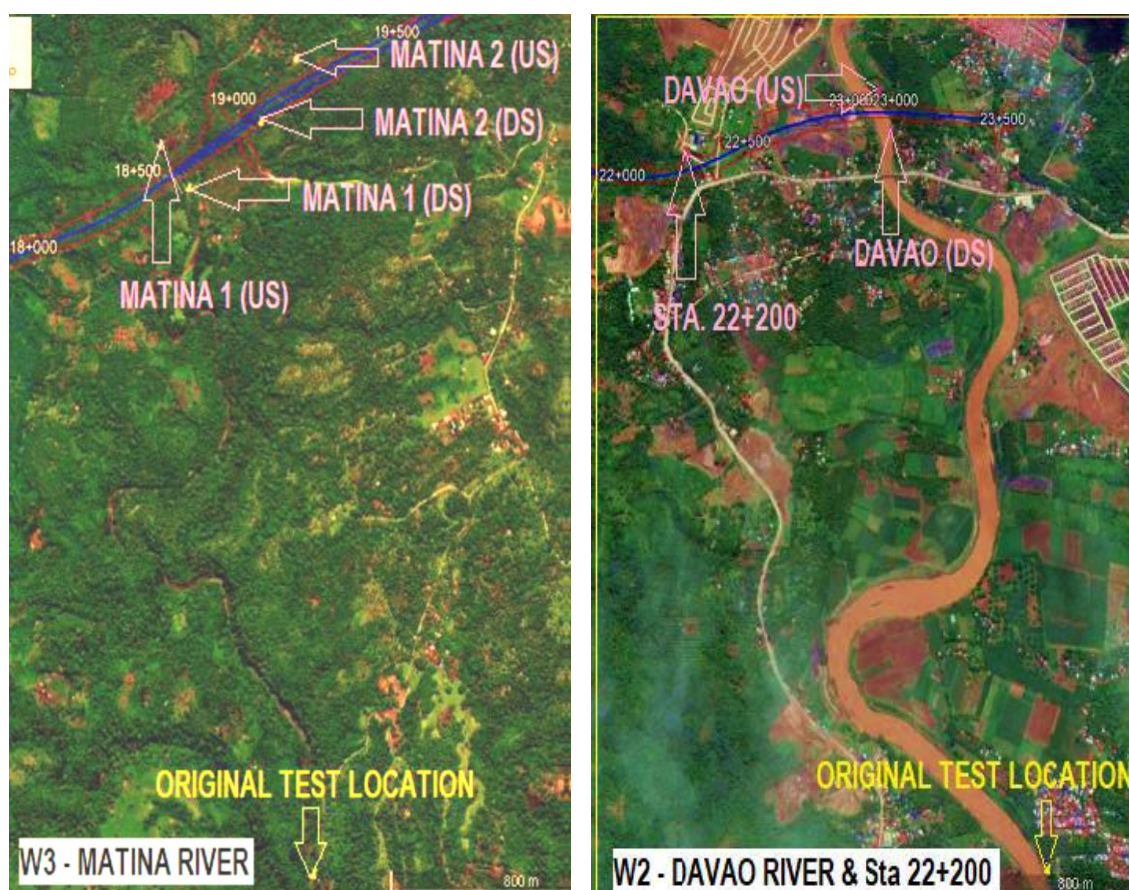


Figure 4 Location of surface water quality sampling stations Package I-1

The DENR Water Quality Guidelines and General Effluent Standards of 2016 sets the limit for total suspended solids (TSS) at a maximum of 80 mg/L for Class C water bodies. Exceedance was recorded during baseline monitoring at Davao River downstream in March 2021, with on-going quarrying observed. TSS exceedance were recorded at Davao River this quarter, and quarrying remains prevalent and ubiquitous. Exceedances were also recorded for DO and BOD at Matina and Davao Rivers. The test results of the water quality sampling are presented in Annex 2 of the report.

2.3 Water Quality (Groundwater)

Table 3. Results of Groundwater Quality Monitoring during Construction Stage, 4th Quarter 2023

Monitoring Item	Unit	Measured Value (Mean)	Baseline Value (Mean)	Remarks (Measurement Point, Frequency, Method, etc.)
Water quality (Groundwater volume)	m ³	Oct. 2023: 543 Nov. 2023: 353 Dec. 2023: 575		<u>Measurement Point</u> <Package I-1> At 2 measurement points <ul style="list-style-type: none"> 1 point at the existing well for observation of groundwater level at Station 20+350 1 point at the existing water tank at Station 20+350 for local residents <u>Frequency</u> Quarterly <u>Method</u> Measurements of groundwater volume and groundwater level
Water quality (Groundwater level)	m	Oct. 2023: 17.0 Nov. 2023: 17.5 Dec. 2023: 17.7		

The measurement points for groundwater level and groundwater volume identified during detailed engineering design (DED) are shown in the figure below.



TBH No. 09 – Groundwater Level

Water Supply Tank - Groundwater Volume

Figure 5 Measurement points for groundwater level and groundwater volume (DED)

Groundwater volume is monitored through a flow meter installed at the identified measurement point at the elevated water supply tank in Brgy. Magtuod, around 130 m away from Sta. 20+350. For this monitoring period, the total volume of groundwater discharged at the elevated water tank is 1,471 m³.

The measurement point for groundwater level meanwhile, was identified to be at Tunnel Borehole (TBH) No. 9, also located near Sta. 20+350. When Construction Stage (CS) started with issuance of Notice to Proceed in December 2020 however, TBH No. 09 could no longer be located. An alternative location at Old Tunnel Borehole (OTBH) No. 4 was thus identified for use in monitoring groundwater level during construction stage. The location of the new monitoring station relative to the tunnel alignment between Sta. 19+900 to 20+000 is shown below.



Baseline data for monitoring of groundwater level was obtained from OTBH 4 in May 2023, with monthly monitoring starting in June 2023. Tunnel excavation reached this tunnel section after June 2023.

2.4 Waste

Table 4. Results of Waste Monitoring during Construction Stage, 4th Quarter 2023

Monitoring Item	Monitoring Results during Report Period	Remarks (Measurement Point, Frequency, Method, etc.)
Volume and type of waste, cutting trees, and domestic garbage	10.73 metric ton	<p><u>Measurement Point</u></p> <ul style="list-style-type: none"> Cutting land section, tunnel section, cutting tree section, and worker's camp <p><u>Frequency</u></p> <ul style="list-style-type: none"> As per disposal of waste <p><u>Method</u></p> <ul style="list-style-type: none"> Check records of amount and type of waste, and disposal method

Soil, trees and vegetation wastes generated from excavations are disposed in designated areas, including concrete and asphalt wastes, at plant and at site, and domestic wastes from workers camps. Hauling and disposal of generated solid and domestic wastes to sites duly approved by the Davao City LGU is monitored for the period, with regular collection of solid waste done on a weekly basis by a 3rd party hauler (GENAB Services) accredited by the Davao City LGU. Hauling is conducted at the materials recovery facility (MRF) located at each of the temporary yards. For the monitoring period, a total of 10.7320 metric tons of non-hazardous waste was generated and collected, and disposed at the Davao City landfill. The composition of waste per month for this monitoring period is detailed in the table below.

Month	Recyclables	Biodegradable	Residual	Total
Oct-23	2.36	0.56	0.98	3.90
Nov-23	1.92	0.35	1.23	3.50
Dec-23	2.01	0.67	0.67	3.34
Total	6.2810	1.5730	2.8780	10.7320

2.5 Noise

The same sampling locations are used for monitoring ambient air quality and noise levels. Similar to ambient air, new test locations closer to the project alignment were established to better monitor the effects of the project on ambient noise. Details of the original and adjusted locations are summarized below.

Sta. No.	Original Location (EIS 2014)		Adjusted Locations	
	Location	Coordinates	Location	Coordinates
A6	Along Little Mermaid St, Elenita Heights, Brgy. Catalunan Grande, Davao City (Sta. 14+480, 250m RS)	N 07° 07' 42.5" E125° 34' 24.3"	Sta. 13+850, 150m RS	7.10608° 125.50764°
A7	Waan Elementary School Grounds, Brgy. Waan, Davao City (Sta. 22+100, 400m RS)	N 07° 08' 42.5" E125° 39' 34.6"	Sta. 22+280, 60m RS	7.13122° 125.57671°

For this quarter, exceedance in noise levels were recorded during Morning and Daytime at the monitoring station at Waan National High School. Monitoring in the next quarter will include corrective actions implemented by the Contractor.

Table 5. Results of Ambient and Roadside Noise Monitoring during Construction Stage, 4th Quarter 2023

Monitoring Item	Unit	Measured Value (Mean) Along road/residential area	Baseline Value (Mean) Along road/residential area	Country's Standard	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc.)
Ambient and road side noise (dB(A))	dB(A)	<p>S1 Morning :43 Daytime:47 Evening: 48 Night Time: 42</p> <p>S2 Morning:53 Daytime:53 Evening: 42 Night Time:41</p>	<p>Along the road 74 (daytime) Residential area 64 (daytime)</p> <p>S1 Morning:50 Daytime:51 Evening:50 Night Time: 48</p> <p>S2 Morning: 60 Daytime: 62 Evening: 57 Night Time:57</p>	<p>Category AA* Morning 45 Daytime 50 Evening 45 Night Time 50</p> <p>Category A (general areas) Morning 50 Daytime 55 Evening 50 Night Time 45</p> <p>Category A (directly facing / fronting 4-lane road) Morning 50 Daytime 60 Evening 50 Night Time 45</p> <p>Category B (general commercial areas) Morning 60 Daytime 65 Evening 60 Night Time 55</p>	<p>Residential area 55 (daytime) Commercial area 60 (daytime) Along the trunk road 70 (daytime)</p>	<p>Measurement Point <Package I-1></p> <ul style="list-style-type: none"> Beginning point of Package I-1 (S1, Elenita Heights) Ending point of Package I-1 (S2, Waan NHS) <p>Frequency</p> <ul style="list-style-type: none"> Quarterly <p>Method</p> <ul style="list-style-type: none"> LAeq, 10min during morning, daytime, evening and night time

*An area that requires quietness, such as an area within 100 m from school sites, nursery schools, hospitals, places of worships, and special homes for the aged

2.6 Ground Subsidence

Table 6. Results of Groundwater Seepage Monitoring during Construction Stage, 4th Quarter 2023

Monitoring Item	Monitoring Results during Report Period ²	Remarks (Measurement Point, Frequency, Method, etc.)
Groundwater seepage	178.06 (L/min)	<u>Measurement Point</u> <Package I-1> <ul style="list-style-type: none"> Tunnel section <u>Frequency</u> <ul style="list-style-type: none"> Daily <u>Method</u> <ul style="list-style-type: none"> Record of seepage

Ground subsidence resulting from tunnel construction is not anticipated. Regular monitoring of groundwater seepage is done as a precautionary measure. The daily groundwater discharge data from the tunnels monitored from October 2023 to December 2023 is summarized below.

Groundwater Discharge Average for 4th Quarter 2023 (L/min)

Tunnel Name	Oct-23	Nov-23	Dec-23	Daily Average
NPNB	25.52	14.6	11.57	17.23
NPSB	67.49	35.28	27.88	43.55
Subtotal North Portal	93.01	49.88	39.45	60.78
SPNB	17.72	16.79	17.52	17.34
SPSB	80.4	101.62	117.8	99.94
Subtotal South Portal	98.12	118.41	135.32	117.28
Total Daily Average	191.13	168.29	174.77	178.06

2.7 Natural Environment

Table 7. Results of Monitoring for Terrestrial and Aquatic Flora and Fauna during Construction Stage, 4th Quarter 2023

Monitoring Item	Monitoring Results during Report Period	Remarks (Measurement Point, Frequency, Method, etc.)
Terrestrial flora and fauna (condition of vegetation)	- Vegetation clearing confined within project RROW	<u>Measurement Point</u> <Package I-1> <ul style="list-style-type: none"> Project sites <u>Frequency</u> <ul style="list-style-type: none"> Daily <u>Method</u> <ul style="list-style-type: none"> Visual check of vegetation condition

² SUTJV Geotechnical Team, as reported in monthly monitoring report for Groundwater Discharge from the Tunnels

Monitoring Item	Monitoring Results during Report Period	Remarks (Measurement Point, Frequency, Method, etc.)
Aquatic Flora and Fauna (Checking condition of water quality)	See Table 2.	<p><u>Measurement Point</u> <Package I-1></p> <p>[Davao River]</p> <ul style="list-style-type: none"> 1 location at 100 m upstream from the proposed bridge location (S1) 2 locations at 100 m downstream from the proposed bridge location (S2, S3) <p>[Matina River-1]</p> <ul style="list-style-type: none"> 1 location at 100 m upstream from the proposed bridge location (S4) 1 location at 100 m downstream from the proposed bridge location (S5) <p>[Matina River-2]</p> <ul style="list-style-type: none"> 1 location at 100 m upstream from the proposed bridge location (S6) 1 location at 100 m downstream from the proposed bridge location (S7) <p>[Tunnel Construction Stage]</p> <ul style="list-style-type: none"> 1 point at upstream of tunnel section (S8) 1 point at Station 22+200 (S9) <p><u>Frequency</u></p> <ul style="list-style-type: none"> Quarterly <p><u>Method</u></p> <p>Site measurement in accordance with the methodologies described in DAO 34-1990 and EMB-DENR, Manual for Ambient Water Quality Monitoring Volume 1</p>

Dissolved oxygen (DO) at some stations along Davao River and Matina River dropped below the minimum national standard of 5 mg/L during 4th quarter 2023 monitoring. These DO levels signify the water is nearly hypoxic, which is detrimental to aquatic flora and fauna. It is to be noted during baseline monitoring, Matina River 2 station registered DO level of 2 mg/L, and may also be considered severely polluted, given BOD values exceeding the DENR's standard maximum limit of 7 mg/L for class C water bodies. Monthly survey of flora and fauna signifies presence of native animals/insects along the alignment, signifying that the habitat of most animals/insects are not adversely impacted by project activities.

2.8 Social Environment

Table 8. Results of Monitoring for Land Use, Water Use, and Existing Social Infrastructure during Construction Stage, 4th Quarter 2023

Monitoring Item	Monitoring Results during Report Period	Remarks (Measurement Point, Frequency, Method, etc.)
Land Use (Condition of trees cut)	<ul style="list-style-type: none"> - RROW clearly marked on-site prior to tree cutting activity - Vegetation clearing implemented only for areas within RROW - Observed compliance of Contractor to conditions of tree cutting permits 	<p><u>Measurement Point</u> <Package I-1></p> <ul style="list-style-type: none"> Project sites <p><u>Frequency</u></p> <ul style="list-style-type: none"> As necessary <p><u>Method</u></p> <ul style="list-style-type: none"> Check site condition

Monitoring Item	Monitoring Results during Report Period	Remarks (Measurement Point, Frequency, Method, etc.)
Water Use (Complaints from downstream area, Complaints from groundwater users)	- No complaints received from communities at downstream area, or from groundwater users	<u>Measurement Point</u> <Package I-1> <ul style="list-style-type: none"> Project sites <u>Frequency</u> <ul style="list-style-type: none"> As necessary <u>Method</u> <ul style="list-style-type: none"> Check complaint record
Existing Social Infrastructure and Service (Complaints from surrounding communities)	- No complaints received from surrounding communities	<u>Measurement Point</u> <Package I-1> <ul style="list-style-type: none"> Project sites <u>Frequency</u> <ul style="list-style-type: none"> As necessary <u>Method</u> <ul style="list-style-type: none"> Check complaint record

2.9 Health and Safety

Table 9. Results of Monitoring for Health and Safety during Construction Stage, 4th Quarter 2023

Monitoring Item	Monitoring Results during Report Period	Remarks (Measurement Point, Frequency, Method, etc.)
Infectious Disease (Awareness of infectious disease)	- Ten (10) awareness activities conducted for the period, orienting 111 personnel on environmental awareness, including awareness of infectious diseases as part of the project's IEC Program - Annual physical exam of personnel shows no reports of HIV/AIDS cases within this period	<u>Measurement Point</u> <Package I-1> <ul style="list-style-type: none"> Project sites <u>Frequency</u> <ul style="list-style-type: none"> As necessary <u>Method</u> <ul style="list-style-type: none"> Check records of awareness activities on infectious diseases
Occupational Health (Record of accidents in the construction site)	- Work Accident and Illness Report (WAIR) monthly reports submitted to the Department of Labor and Employment (DOLE) reflect no accidents for the monitoring period	<u>Measurement Point</u> <Package I-1> <ul style="list-style-type: none"> Project sites <u>Frequency</u> <ul style="list-style-type: none"> As necessary <u>Method</u> <ul style="list-style-type: none"> Check record of accidents in the construction site

2.10 Emergency Risk

Table 10. Results of Emergency Risk Monitoring during Construction Stage, 4th Quarter 2023

Monitoring Item	Monitoring Results during Report Period	Remarks (Measurement Point, Frequency, Method, etc.)
Flood (Condition of flood)	- Daily monitoring at Davao River shows average of 3.81 m as recorded from installed water level gauge at Waan Bridge	<u>Measurement Point</u> <Package I-1> <ul style="list-style-type: none"> Two (2) points at Davao River (Left and Right Banks) <u>Frequency</u> <ul style="list-style-type: none"> Quarterly <u>Method</u> <ul style="list-style-type: none"> Check the site conditions
Fire (Condition of fire)	- No record of fire incidents recorded for the monitoring period	<u>Measurement Point</u> <Package I-1> <ul style="list-style-type: none"> Project sites <u>Frequency</u> <ul style="list-style-type: none"> As necessary <u>Method</u> <ul style="list-style-type: none"> Check the site conditions

The average water level at Davao River through the installed water level gauge at Waan Bridge monitored daily for October 2023 to December 2023 is summarized below, and presented with results of monitoring for the same period in 2022.

Comparison of Average Water Level at Waan Bridge for 4th Quarter 2022 and 4th Quarter 2023

Month	2022	2023
October	3.70	4.08
November	3.60	3.55
December	3.40	3.80
Monthly Average	3.57	3.81

3 Monitoring RAP Implementation

The monitoring items on involuntary resettlement, vulnerable groups, livelihood and local economy, misdistribution of benefit and damage, and local conflict of interests are indicated under Pre-Construction Stage in the JICA monitoring form (See Annex 1). The conduct of Pre-Construction Stage activities were significantly hindered however by the issuance of COVID-19 community quarantine orders.

RAP implementation started during the pre-construction phase and is continued during the construction period. Results of monitoring using the prescribed forms are reported in the table below.

Table 11. Results of Social Monitoring during Construction Stage, 4th Quarter 2023

Monitoring Item	Monitoring Results during Report Period	Remarks (Measurement Point, Frequency, Method, Etc.)
Involuntary Resettlement *	<ul style="list-style-type: none"> - Self-relocation opted for by all affected PAPs with residential structures - For affected structures, 24 are partially paid, 4 are fully paid, 9 are for processing of partial payment, and 3 are included in expropriation complaints. Validation is ongoing for additional structures affected by the project. 	<p><u>Measurement Point</u> <All Packages></p> <ul style="list-style-type: none"> • Project sites <p><u>Frequency</u></p> <ul style="list-style-type: none"> • Monthly (Involuntary Resettlement, Vulnerable Groups, Livelihood and Local Economy) • As necessary (Misdistribution of Benefit and Damage, Local Conflict of Interest) <p><u>Method</u></p> <ul style="list-style-type: none"> • Check relocation and payment records
Vulnerable Groups*	<ul style="list-style-type: none"> - No payments made yet for vulnerable groups 	
Livelihood and Local Economy	<ul style="list-style-type: none"> - Community-Based Employment Program (CBEP), which is part of the project's Social Development Plan (SDP) shows 90.6% of Contractor's personnel are from Davao Region 	
Misdistribution of Benefit and Damage	<ul style="list-style-type: none"> - No complaint/s received pertaining to misdistribution of benefit and damage or local conflict of interest 	
Local Conflict of Interest		

The objective of this quarterly monitoring is to assess the progress of RAP implementation for Package I-1 of the DCBCP. Results of the monitoring from 01 October 2023 to 31 December 2023 for progress of land acquisition and handing over of RROW to Contractor and implementation of the Grievance Redress Mechanism (GRM) are presented in the report.

3.1 Status of Handing Over of Land to Contractor

A total of 442,720 sq.m. of the RROW area was handed to the Contractor as of end of December 2023. This is equal to 82.9% of the total project RROW. The table below shows the progress of handing over of land to the Contractor.

Table 12. Status of Handing Over of RROW Area to Contractor, 4th Quarter 2023

BARANGAY	TOTAL PROJECT RROW (sq.m)	PRIVATELY-OWNED	GOV'T-OWNED LAND	RROW AREA WITH PTE/WOP and/or ADRI/ARI or GOV'T OWNED	RROW AREA WITHOUT PTE/WOP and/or ADRI/ARI	% RROW AREA HANDED OVER TO CONTRACTOR	% OF REMAINING RROW AREA TO BE HANDED OVER TO CONTRACTOR
TACUNAN	307,425	280,005	27,420	241,010	66,415	78.4	21.6
MATINA BIAO	72,125	72,125	0	66,883	5,242	92.7	7.3
MAGTUOD	69,047	69,047	0	69,018	29	100.0	0.0
WAAN	33,213	33,213	0	14,539	18,674	43.8	56.2
TIGATTO	51,923	21,995	29,928	51,270	653	98.7	1.3
TOTAL	533,733	476,385	57,348	442,720	91,013	82.9	17.1

Lots obstructing implementation of project activities for critical sections of the alignment are prioritized for land acquisition.

3.2 Status of Recorded Grievances

The local help desk is set up at the RROW Office situated at the project field office to ensure grievances raised by stakeholders are attended to efficiently. The RROW Office is headed by RROW In-charge (Engineer IV), and manned by DPWH personnel dedicated to RROW acquisition. In addition, the Barangay LGUs of Brgy. Tacunan, Matina Biao, Magtuod, Waan and Tigatto, as well as staff of the Contractor, relay details of grievances to the project office. The table below shows the status of recorded grievances for the period.

Table 13. Status of Recorded Grievances, 4th Quarter 2023

BARANGAY	RECEIVED GRIEVANCES				RESOLVED GRIEVANCES				UNRESOLVED GRIEVANCES			
	RAP-related	Env't-related	Others	Total	RAP-related	Env't-related	Others	Total	RAP-related	Env't-related	Others	Total
TACUNAN	2	0	0	2	2	0	0	2	0	0	0	0
MATINA BIAO	0	0	0	0	0	0	0	0	0	0	0	0
MAGTUOD	0	0	0	0	0	0	0	0	0	0	0	0
WAAN	1	1	0	2	1	1	0	2	0	0	0	0
TIGATTO	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	1	0	4	3	1	0	4	0	0	0	0

The City Resettlement Implementation Committee (CRIC), created through a Memorandum of Understanding (MOU) signed by DPWH and the Davao City LGU during the DED stage, is yet to be convened. For construction stage, grievances are recorded through official correspondence and verbal complaints received at the local help desk, the Barangay LGUs, and by the Contractor. Thus far, no complaints related to the project have been reported through the city government's central hotline for inquiries and concerns.

4 Planned Activities for the Next Monitoring Period

Implementation of the conditions of the ECC, the EMP and EMoP, and adherence to site instructions issued to the contractor will be checked continuously.

Planned activities for the next monitoring period are as follows:

- 1 Supervise the implementation of EMP and EMoP;
- 2 Supervise RAP implementation;
- 3 Submit Self-Monitoring Report No. 13 for submission to DENR-EMB;
- 4 Prepare Environmental and Resettlement Monitoring Report No. 13;
- 5 Monitor the progress of RROW acquisition and compensation and provide assistance to PAPs

Annex 1
Attachment I-20 and I-21 of
Loan Agreement

Attachment I-20

Environmental Monitoring Plan

Pre-Construction Stage

Item	Monitoring Item	Monitoring Method	Monitoring Site	Frequency	Package	Responsibility
1. Social Environmental						
Involuntary Resettlement*	Progress of relocation and payment in accordance with RAP	Check relocation and payment records	Project Sites	Monthly	All Package	UPMO-RMC1
Vulnerable Groups*	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto
Livelihood and Local Economy	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto
Misdistribution of Benefit and Damage	Ditto	Ditto	Ditto	As necessary	Ditto	Ditto
Local Conflict of Interests	Ditto	Ditto	Ditto	As necessary	Ditto	Ditto

* Monitoring for Involuntary Resettlement, Vulnerable Groups and Livelihood and Local Economy is to be done by Internal and External Monitoring defined in RAP.

Construction Stage

Item	Monitoring Item	Monitoring			Package	Environmental Requirement		Implementing Organization	Responsible Organization
		Method	Site	Frequency		Level	Concerned Regulation		
1. Pollution									
Air Quality	Level of TSP, NO2, SO2, CO2 and CO	Site measurement using the following methods: TSP - Gravimetric Method; SO2 - Pararosaniline Method; NO2 - Griess Saltzman Reaction; CO - Direct Reading (Gas Analyzer)	At 2 measurement points: Beginning point of Package, I-1, Ending point of Package, I-1	Quarterly	Package I-1	TSP 1 hr – 300 µNcm 24 hr – 230 µNcm SO2 1 hr – 340 µNcm 24 hr – 180 µNcm NO2 1 hr – 260 µNcm 24 hr – 150 µNcm CO 1 hr – 30 ppm 24 hr – (Every 8 hrs) 9 ppm	Clean Air Act (RA 8749) DENR AO #14, S. 1993	Contractor	UPMO-RMC1 of DPWH
	Ditto	Ditto	At 2 measurement points: In front of University of Southern Philippines (USeP) along Davao-Bukidnon National Highway Brgy. Mintal Beginning of the Project along the Davao Digos National Highway 500m South of Lipadas Bridge, Brgy. Sirawan	Ditto	Package I-2	Ditto	Ditto	Ditto	Ditto
	Ditto	Ditto	Ditto	At 2 measurement point: Residential area around Station 23+900	Ditto	Package I-3	Ditto	Ditto	Ditto

Environmental Monitoring Plan

Item	Monitoring Item	Monitoring			Package	Environmental Requirement		Implementing Organization	Responsible Organization
		Method	Site	Frequency		Level	Concerned Regulation		
			Residential area around Station 27+900						
Water Quality ³ (Surface Water)	Level of pH, DO, Oil & Grease, BOD, Fecal Coliform/ Total Coliform, and TSS	Site measurement in accordance with the methodologies described in DAO 34- 1990 and EMB-DENR, Manual for Ambient Water Quality Monitoring Volume I	At 9 measurement points: [Davao River] 1 location at 100 m upstream from the proposed bridge location 2 locations at 100m downstream from the proposed bridge location [Matina River-1] 1 point at 100m upstream from the proposed bridge location 1 point at 100m downstream from the proposed bridge location [Matina River-2] 1 point at 100m upstream from the proposed bridge location 1 point at 100m downstream from the proposed bridge location [Tunnel Construction Section] 1 point at upstream of tunnel section 1 point at Station 22+200	Quarterly	Package I-1	pH: 6.5 to 8.5 DO: 5.0 mg/L Oil & Grease: 2.0 mg/L BOD: 7.0 mg/L TSS: not more than 30 g/L increase	DENR AO No. 34 (Water Quality Criteria for Inland Waters Class C)	Contractor	UPMO-RMCI of DPWH
Water Quality ³ (Surface Water)	Ditto	Ditto	At 2 measurement points at Talomo River: 1 point at 100m upstream from proposed bridge location 1 point at 100m downstream from proposed bridge location	Ditto	Package I-2	Ditto	Ditto	Ditto	Ditto
	Ditto	Ditto	At 2 measurement point at Lasang River: 1 point at 100m upstream from the proposed bridge location 1 point at 100m downstream from the proposed bridge location	Ditto	Package I-3	Ditto	Ditto	Ditto	Ditto
Water Quality (Groundwater) ¹	Water Volume and Water Level	Site measurement in accordance with the methodologies described in DAO 34- 1990 and EMB-DENR, Manual for Ambient Water Quality Monitoring Volume I	At 2 measurement points around 1 point at the existing well for observation of groundwater level at Station 20+350 1 point at the existing water tank at Station 20+350 for local residents	Quarterly	Package I-1			Contractor	UPMO-RMCI of DPWH
Waste	Volume and type of waste, cutting trees and domestic garbage	Check records of amount and type of waste, and disposal method	Cutting land section, tunnel section, cutting tree section and workers' camp	As per disposal of waste	All Package	-	-	Contractor	UPMO-RMCI of DPWH

Environmental Monitoring Plan

Item	Monitoring Item	Monitoring			Package	Environmental Requirement		Implementing Organization	Responsible Organization
		Method	Site	Frequency		Level	Concerned Regulation		
Noise	Ambient and road side noise (dB(A)LAeq)	LAeq, 10min during morning, daytime, evening and night time	Same as Air Quality	Quarterly	Package I-1	For "AA" categorized areas (an area requires quietness, such as an area within 100 m from school sites, nursery schools, hospitals, places of worships, and special homes for the aged) Morning: 45 db Daytime: 50 db Evening: 45 db Night Time: 40 db For "A" categorized areas (general areas) Morning: 50 db Daytime: 55 db Evening: 50 db Night Time: 45 db For "A" categorized areas (directly facing/fronting a 4-lane road) Morning: 50 db Daytime: 60 db Evening: 50 db Night Time: 45 db For "B" categorized areas (general commercial areas) Morning: 60 db Daytime: 65 db Evening: 60 db Night Time: 55 db		Contractor	UPMO-RMC1 of DPWH
	Ditto	Ditto	Same as Air Quality	Ditto	Package I-2	Ditto	Ditto	Ditto	Ditto
	Ditto	Ditto	Ditto	Same as Air Quality	Ditto	Package I-3	Ditto	Ditto	Ditto
Ground Subsidence ²	Volume of groundwater seepage	Record the seepage volume	Tunnel section	Daily	Package I-1	-	-	Contractor	UPMO-RMC1 of DPWH
2. Natural Environment									
Terrestrial Flora and Fauna	Condition of Vegetation	Visual check of vegetation condition	Project Sites	Daily	All Package	-	-	Contractor	UPMO-RMC1 of DPWH
Aquatic Flora and Fauna	Checking the conditions of Water	Same as Water Quality	Same as Water Quality	Same as Water Quality	Same as Water Quality	Same as Water Quality	Same as Water Quality	Contractor	UPMO-RMC1 of DPWH

Environmental Monitoring Plan

Item	Monitoring Item	Monitoring			Package	Environmental Requirement		Implementing Organization	Responsible Organization
		Method	Site	Frequency		Level	Concerned Regulation		
	Quality								
3. Social Environment									
Land Use	Condition of trees cut	Check site condition	Project Sites	As necessary	All Package	-	-	Contractor	UPMO-RMC1 of DPWH
Water Use	Complaints from downstream area Complaints from groundwater users	Check complaint records	Project Sites	As necessary	All Package	-	-	Contractor	UPMO-RMC1 of DPWH
Existing Social Infrastructure and Service	Complaints from surrounding communities	Check complaints records	Project Sites	As necessary	All Package	-	-	Contractor	UPMO-RMC1 of DPWH
4. Health and Safety									
Infectious Disease	Awareness of infectious disease	Check records of awareness activities on infectious diseases	Project Sites	As necessary	All Package	-	-	Contractor	UPMO-RMC1 of DPWH
Occupational Health	Record of accidents in the construction site	Check record of accidents in the construction site	Project Sites	As necessary	All Package	-	-	Contractor	UPMO-RMC1 of DPWH
Community Health and Safety	- Records of traffic accidents in the surrounding communities	Check records of traffic accidents in the surrounding communities	Project Sites	As necessary	All Package	-	-	Contractor	UPMO-RMC1 of DPWH
5. Emergency Risk									
Flood	Condition of flood	Check the site conditions	Two (2) Points at Davao River (Left and Right Banks)	Quarterly	Package I-1	-	-	Contractor	UPMO-RMC1 of DPWH
Fire	Condition of fire	Check the site conditions	Construction sites and workers' camp	As necessary	All Package	-	-	Contractor	UPMO-RMC1 of DPWH

Notes:

1. Although impact to groundwater is considered as small, monitoring for groundwater shall be done during the construction phase based on a discussion result with a local community.
2. Although impact to ground subsidence due to tunnel construction work is not anticipated, regular monitoring on groundwater seepage will be done as a precaution measure.
3. In addition to the listed monitoring points for surface water quality, surface water quality at the downstream areas from construction yard(s) and workers' camp(s) shall be monitored at each Package.

Environmental Monitoring Plan

Operation Stage

Item	Monitoring Item	Monitoring			Package	Environmental Requirement		Implementing Organization	Responsible Organization
		Method	Site	Frequency		Level	Concerned Regulation		
1. Pollution									
Air Quality	Level of TSP, NO ₂ , SO ₂ , CO	Site measurement using the following methods: > TSP - Gravimetric Method; > SO ₂ - Pararosaniline Method; > NO ₂ - Griess Saltzman Reaction; > CO - Direct Reading (Gas Analyzer)	Same as Air Quality at Construction Phase	Semi-annual (up to 3 years after starting operation)	Package I-1	TSP 1 hr – 300 µNcm 24 hr – 230 µNcm SO ₂ 1 hr – 340 µNcm 24 hr – 180 µNcm NO ₂ 1 hr – 260 µNcm 24 hr – 150 µNcm	> Clean Air Act (RA 8749) > DENR AO #14, S. 1993	Region XI of DPWH	Region XI of DPWH
	Ditto	Ditto	Ditto	Ditto	Package I-2	Ditto	Ditto	Ditto	Ditto
	Ditto	Ditto	Ditto	Ditto	Ditto	Package I-3	Ditto	Ditto	Ditto
Noise	Ambient and road side noise (dB(A)LAeq)	LAeq, 10min during morning, daytime, evening and night time	Same as Air Quality	Semi-Annual (up to 3 years after starting operation)	Package I-1	For "AA" categorized areas (general areas) Morning: 45 db Daytime: 50 db Evening: 45 db Night Time: 40 db For "A" categorized areas (general areas) Morning: 50 db Daytime: 55 db Evening: 50 db Night Time: 45 db For "A" categorized areas (directly facing/fronting a 4-lane road) Morning: 50 db Daytime: 60 db Evening: 50 db Night Time: 45 db For "B" categorized areas (general commercial areas) Morning: 60 db Daytime: 65 db Evening: 60 db Night Time: 55 db		Region XI of DPWH	Region XI of DPWH
	Noise-	Ditto	Ditto	Ditto	Package I-2	Ditto	Ditto	Ditto	Ditto
		Ditto	Ditto	Ditto	Ditto	Package I-3	Ditto	Ditto	Ditto
2. Health and Safety									
Community Health and Safety	Accident records	Check accident records	Project site	As necessary	All Package	-	-	Region XI of DPWH	Region XI of DPWH
3. Emergency Risk									
Flood Risk	Drainage condition	Check drainage condition	Project site	As necessary	All Package	-	-	Region XI of DPWH	Region XI of DPWH

Attachment I-21

MONITORING FORM (JICA Form)

-If environmental reviews indicate the need of monitoring by JICA, JICA undertakes monitoring for necessary items that are decided by environmental reviews. JICA undertakes monitoring based on regular reports including measured data submitted by the project proponent. When necessary, the project proponent should refer to the following monitoring form for submitting reports.

-When monitoring plans including monitoring items, frequencies and methods are decided, project phase or project life cycle (such as construction phase and operation phase) should be considered.

Pre-Construction Stage**1. Social Environment**

Monitoring Item	Monitoring Results during Report Period	Remarks (Measurement Point, Frequency, Method, etc.)
Involuntary Resettlement*		<u>Measurement Point</u> <All Packages>
Vulnerable Groups*		• Project sites
Livelihood and Local Economy		<u>Frequency</u> • Monthly (Involuntary Resettlement, Vulnerable Groups, Livelihood and Local Economy)
Misdistribution of Benefit and Damage		• As necessary (Misdistribution of Benefit and Damage, Local Conflict of Interests)
Local Conflict of Interests		<u>Method</u> • Check relocation and payment records

* Monitoring for Involuntary Resettlement, Vulnerable Groups and Livelihood and Local Economy is to be done by Internal and External Monitoring defined in RAP.

MONITORING FORM (JICA Form)

Construction Stage

1 Air Quality (Traffic/ Ambient Air Quality)

Item	Unit	Measured Value (Mean) Along road/residential area	Baseline Value (Mean) Along road/residential area	Country's Standards	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc.)
TSP	µg/Ncm		216.4/69.9	300 (1hr) 230 (24hr)	SPM (0.1mg/m ³)	<u>Measurement Point</u> < Package I-1> <ul style="list-style-type: none"> Beginning point of Package I-1 Ending point of Package I-1 < Package I-2> <ul style="list-style-type: none"> In front of University of Southern Philippines (USEP) along Davao-Bukidnon National Highway, Brgy. Mintal Beginning of the Project along the Davao Digos National Highway 500m south of Lipadas Bridge, Brgy. Sirawan < Package I-3> <ul style="list-style-type: none"> Residential area around Station 23+900 Residential area around Station 27+900 <u>Frequency</u> <ul style="list-style-type: none"> Quarterly <u>Method</u> <ul style="list-style-type: none"> TSP: Gravimetric Method SO₂: Pararosaniline Method NO₂: Griess Saltzman Reaction CO: Direct Reading (Gas Analyzer)
SO ₂	mg/Ncm		4.0/1.3	340 (1hr) 180 (24hr)	0.04ppm	
NO ₂	µg/Ncm		6.6/1.0	260 (1hr) 150 (24hr)	0.04-0.06ppm	
CO	ppm		<1.0/1.0	30 (1hr) (Every 8hrs) 9 (24hr)	10ppm	

MONITORING FORM (JICA Form)

2 Water Quality (Surface Water) ^{*1}

Item	Unit	Measured Value (Mean)	Baseline Value (Mean)	Country's Standards	Referred International Standards (Japanese Standard/ B category river)	Remarks (Measurement Point, Frequency, Method, etc.)
pH	-		7.8	6.5-8.5	6.5-8.5	<p><u>Measurement Point</u></p> <p>< Package I-1 ></p> <p>[Davao River]</p> <ul style="list-style-type: none"> • 1 location at 100 m upstream from the proposed bridge location • 2 locations at 100 m downstream from the proposed bridge location <p>[Matina River-1]</p> <ul style="list-style-type: none"> • 1 point at 100m upstream from the proposed bridge location • 1 point at 100m downstream from the proposed bridge location <p>[Matina River-2]</p> <ul style="list-style-type: none"> • 1 point at 100m upstream from the proposed bridge location • 1 point at 100m downstream from the proposed bridge location <p>[Tunnel Construction Section]</p> <ul style="list-style-type: none"> • 1 point at upstream of tunnel section • 1 point at Station 22+200 <p>< Package I-2 ></p> <p>At 2 measurement points at Talomo River:</p> <ul style="list-style-type: none"> • 1 point at 100m upstream from proposed bridge location • 1 point at 100m downstream from proposed bridge location <p>< Package I-3 ></p> <p>At 2 measurement point at Lasang River:</p> <ul style="list-style-type: none"> • 1 point at 100m upstream from the proposed bridge location • 1 point at 100m downstream from the proposed bridge
DO	mg/l		7.4	5.0	5	
Oil & Grease	mg/l			2.0		
BOD	mg/l		2.0	7.0	3	
TSS	mg/l		22.5	not more than 30g/l increase	SS 25	

MONITORING FORM (JICA Form)

						location <u>Frequency</u> • Quarterly <u>Method</u> • Site measurement in accordance with the methodologies described in DAO 34-1990 and EMB-DENR, Manual for Ambient Water Quality Monitoring Volume I
--	--	--	--	--	--	---

3 Water Quality (Ground Water) *2

Item	Unit	Measured Value (Mean)	Baseline Value (Mean)	Country's Standards	Referred International Standards (Japanese Standard/ B category river)	Remarks (Measurement Point, Frequency, Method, etc.)
pH	-		7.8	6.5-8.5	6.5-8.5	<u>Measurement Point</u> < Package I-1 > At 2 measurement points around <ul style="list-style-type: none"> • 1 point at the existing well for observation of groundwater level at Station 20+350 • 1 point at the existing water tank at Station 20+350 for local residents <u>Frequency</u> • Quarterly <u>Method</u> • Site measurement in accordance with the methodologies described in DAO 34-1990 and EMB-DENR, Manual for Ambient Water Quality Monitoring Volume I
DO	mg/l		7.4	5.0	5	
BOD	mg/l		2.0	7.0	3	
TSS	mg/l		22.5	not more than 30g/l increase	SS 25	

MONITORING FORM (JICA Form)

Monitoring Item	Monitoring Results during Report Period	Remarks (Measurement Point, Frequency, Method, etc.)
Volume and type of waste, cutting trees and domestic garbage		<p><u>Measurement Point</u></p> <ul style="list-style-type: none"> Cutting land section, tunnel section, tutting tree section and worker's camp <p><u>Frequency</u></p> <ul style="list-style-type: none"> As per disposal of waste <p><u>Method</u></p> <ul style="list-style-type: none"> Check records of amount and type of waste, and disposal method

5 Noise

Item	Unit	Measured Value (Mean)	Baseline Value (Mean)	Country's Standards	Referred International Standards (Japanese Standard)	Remarks (Measurement Point, Frequency, Method, etc.)
Ambient and road side noise (dB(A) _{L_{eq}})	dB(A)		Along the road 74 (daytime) Residential area 64 (daytime)	For "AA" categorized areas (an area requires quietness, such as an area within 100 m from school sites, nursery schools, hospitals, places of worships, and special	Residential area 55 (daytime) Commercial area 60 (daytime) Along the trunk road 70 (daytime)	<p><u>Measurement Point</u></p> <p>< Package I-1 ></p> <ul style="list-style-type: none"> Beginning point of Package I-1 Ending point of Package I-1 <p>< Package I-2 ></p> <ul style="list-style-type: none"> In front of University of Southern Philippines (USEP) along Davao-Bukidnon National Highway, Brgy. Mintal Beginning of the Project along the Davao Digos National Highway 500m south of Lipadas Bridge, Brgy. Sirawan <p>< Package I-3 ></p> <ul style="list-style-type: none"> Residential area around Station 23+900 Residential area around Station 27+900 <p><u>Frequency</u></p> <ul style="list-style-type: none"> Quarterly

MONITORING FORM (JICA Form)

				<p>homes for the aged) Morning: 45 db Daytime: 50 db Evening: 45 db Night Time: 40 db</p> <p>For "A" categorized areas (general areas) Morning: 50 db Daytime: 55 db Evening: 50 db Night Time: 45 db</p> <p>For "A" categorized areas (directly facing/fronting a 4-lane road) Morning: 50 db Daytime: 60 db Evening:</p>	<p><u>Method</u> • L_{Aeq}, 10min during morning, daytime, evening and night time</p>
--	--	--	--	---	--

MONITORING FORM (JICA Form)

				50 db Night Time: 45 db For "B" categorized areas (general commercial areas) Morning: 60 db Daytime: 65 db Evening: 60 db Night Time: 55 db	
--	--	--	--	---	--

6 Ground Subsidence⁴³

Monitoring Item	Monitoring Results during Report Period	Remarks (Measurement Point, Frequency, Method, etc.)
Volume of groundwater seepage		<u>Measurement Point</u> <Package I-1> <ul style="list-style-type: none"> • Tunnel section <u>Frequency</u> <ul style="list-style-type: none"> • Daily <u>Method</u> <ul style="list-style-type: none"> • Record the seepage volume

Annex 2
Results of Water Quality
Monitoring

S1. Davao River, 1 location at 100 m upstream from the proposed bridge location



DAVAO ANALYTICAL LABORATORIES, INC.

Mc Arthur Hi-way, Corner Union Avenue, Matina, Davao City
Telefax No. (082) 297-3278 E-mail: dalinc_03@yahoo.com

Rév. No. 0 / Issue No. 1

TEST REPORT

CLIENT NAME: Shimizu- Ulticon- Takenaka JV
ADDRESS: Shoppes at Woodlane, Unit 4A 2nd floor Diversion Road, Brgy. Ma-a

CONTROL NO.: 23-16646
DATE RECEIVED: 17 Oct-23
DATE ANALYZED: 17-26 Oct-23
DATE REPORTED: 26 Oct-23

SAMPLE INFORMATION

Sample Type: Water (01) **Packaging:** Stored in a plastic/glass container
Description: Surface Water **Sampling Date:** October 17, 2023
Sample Condition: At 4°C temperature **Sampling Time:** 09:27 AM

PARAMETERS	Lab. Reference No. / Sample ID		METHODS
	W ₃ -23-6067		
	Davao River Upstream		
BOD ₅ , mg/L	7.6		SMEWW 5210 B
DO, mg/L	4.6		SMEWW 4500-O C
TSS, mg/L	1,004		SMEWW 2540 D
pH @ 25.0 °C	8.23		SMEWW 4500-H ⁺ B
Oil and Grease, mg/L	<0.50		SMEWW 5520 B
Nothing Follows			

Remarks:

1. Result(s) is/are based on sample(s) submitted to DALINC unless otherwise indicated. The Laboratory does not guarantee that the sample(s) is/are representative of the whole bulk from where it was/were drawn.
2. Method(s) used is/are in accordance with the Standard Methods for the Examination of Water & Wastewater, 23rd ed.
3. The determination of pH and DO were done in the laboratory of DALINC.
4. This test report may not be reproduced unless in full.

S2. Davao River, location 1 at 100 m downstream from the proposed bridge location



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Mc Arthur Hi-way, Corner Union Avenue, Matina, Davao City
Telefax No. (082) 297-3278 E-mail: dalinc_03@yahoo.com

Rev. No. 0 / Issue No. 1

TEST REPORT

CLIENT NAME: Shimizu- Ulticon- Takenaka JV
ADDRESS: Shoppes at Woodlane, Unit 4A 2nd floor Diversion Road, Brgy. Ma-a

CONTROL NO.: 23-16646
DATE RECEIVED: 17 Oct-23
DATE ANALYZED: 17-26 Oct-23
DATE REPORTED: 26 Oct-23

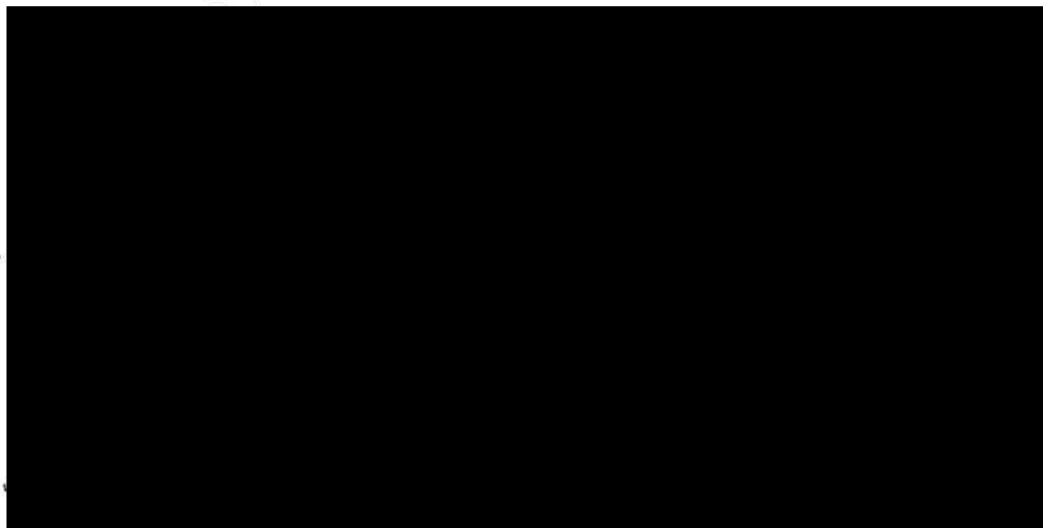
SAMPLE INFORMATION

Sample Type: Water (01) **Packaging:** Stored in a plastic/glass container
Description: Surface Water **Sampling Date:** October 17, 2023
Sample Condition: At 4°C temperature **Sampling Time:** 09:55 AM

PARAMETERS	Lab. Reference No. / Sample ID		METHODS
	W ₃ -23-6068		
	Davao River Downstream 1		
BOD ₅ , mg/L	4.4		SMEWW 5210 B
DO, mg/L	5.2		SMEWW 4500-O C
TSS, mg/L	952		SMEWW 2540 D
pH @ 25.0 °C	8.40		SMEWW 4500-H ⁺ B
Oil and Grease, mg/L	<0.50		SMEWW 5520 B
Nothing Follows			

Remarks:

1. Result(s) is/are based on sample(s) submitted to DALINC unless otherwise indicated. The Laboratory does not guarantee that the sample(s) is/are representative of the whole bulk from where it was/were drawn.
2. Method(s) used is/are in accordance with the Standard Methods for the Examination of Water & Wastewater, 23rd ed.
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S3. Davao River, location 2 at 100 m downstream from the proposed bridge location



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Telefax No. (082) 297-3278 E-mail: dalinc_03@yahoo.com

Rev.'No. 0 / Issue No. 1

TEST REPORT

CLIENT NAME: Shimizu- Ulticon- Takenaka JV
ADDRESS: Shoppes at Woodlane, Unit 4A 2nd floor Diversion Road, Brgy. Ma-a

CONTROL NO.: 23-16646
DATE RECEIVED: 17 Oct-23
DATE ANALYZED: 17-26 Oct-23
DATE REPORTED: 26 Oct-23

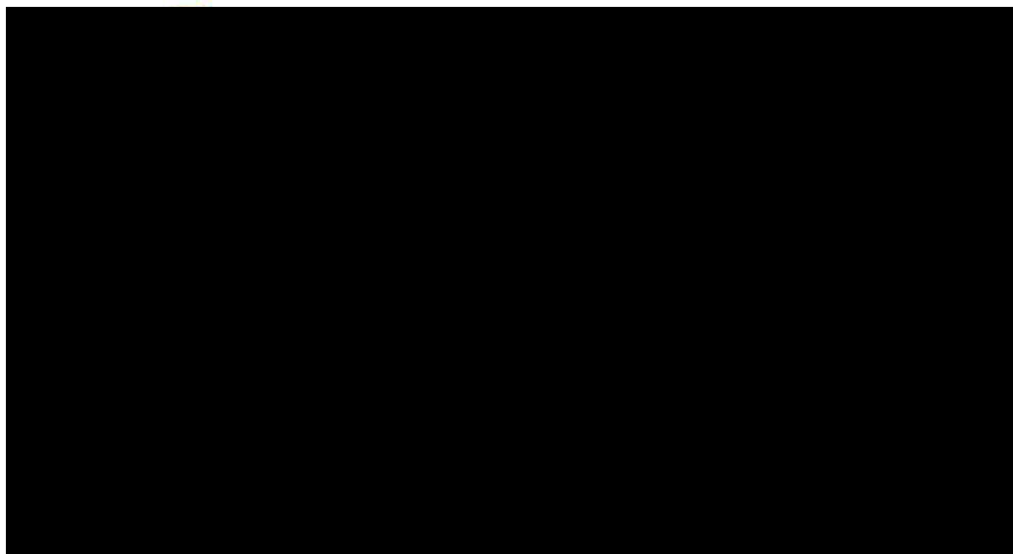
SAMPLE INFORMATION

Sample Type: Water (01) **Packaging:** Stored in a plastic/glass container
Description: Surface Water **Sampling Date:** October 17, 2023
Sample Condition: At 4°C temperature **Sampling Time:** 09:15 AM

PARAMETERS	Lab. Reference No. / Sample ID		METHODS
	W ₃ -23-6069		
	Davao River Downstream 2		
BOD ₅ , mg/L	7.2		SMEWW 5210 B
DO, mg/L	4.6		SMEWW 4500-O C
TSS, mg/L	902		SMEWW 2540 D
pH @ 25.0 °C	8.24		SMEWW 4500-H ⁺ B
Oil and Grease, mg/L	<0.50		SMEWW 5520 B
Nothing Follows			

Remarks:

1. Result(s) is/are based on sample(s) submitted to DALINC unless otherwise indicated. The Laboratory does not guarantee that the sample(s) is/are representative of the whole bulk from where it was/were drawn.
2. Method(s) used is/are in accordance with the Standard Methods for the Examination of Water & Wastewater, 23rd ed.
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S4. Matina River 1, 1 location at 100 m upstream from the proposed bridge location



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Rev. No. 0 / Issue No. 1

TEST REPORT

CLIENT NAME: Shimizu- Ulticon- Takenaka JV
ADDRESS: Shoppes at Woodlane, Unit 4A 2nd floor Diversion Road, Brgy. Ma-a

CONTROL NO.: 23-16646
DATE RECEIVED: 17 Oct-23
DATE ANALYZED: 17-26 Oct-23
DATE REPORTED: 26 Oct-23

SAMPLE INFORMATION

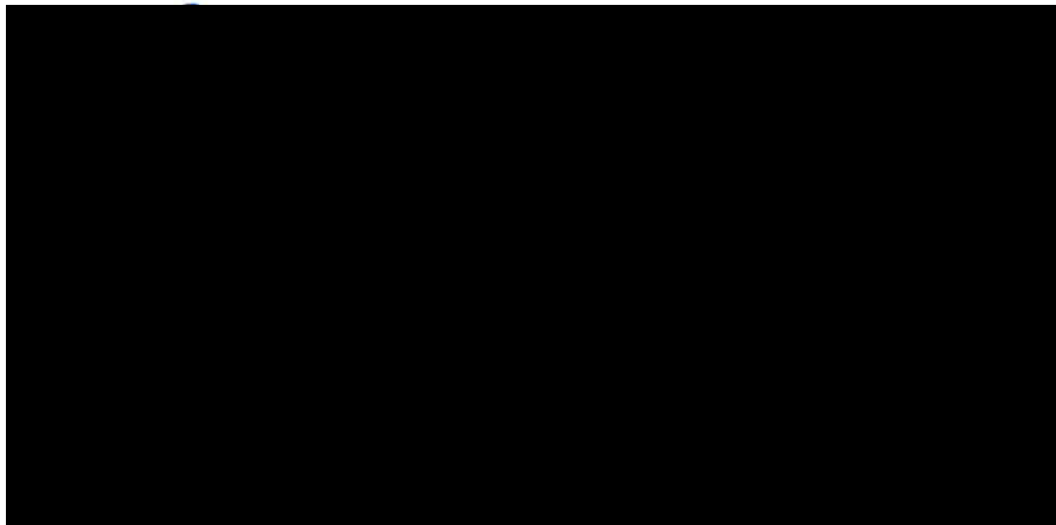
Sample Type: Water (01)
Description: Surface Water
Sample Condition: At 4°C temperature

Packaging: Stored in a plastic/glass container
Sampling Date: October 17, 2023
Sampling Time: 10:59 AM

PARAMETERS	Lab. Reference No. / Sample ID		METHODS
	W ₃ -23-6070		
	Matina River 1 Upstream		
BOD ₅ , mg/L	7.8		SMEWW 5210 B
DO, mg/L	6.4		SMEWW 4500-O C
TSS, mg/L	8.0		SMEWW 2540 D
pH @ 25.0 °C	7.97		SMEWW 4500-H ⁺ B
Oil and Grease, mg/L	<0.50		SMEWW 5520 B
Nothing Follows			

Remarks:

1. Result(s) is/are based on sample(s) submitted to DALINC unless otherwise indicated. The Laboratory does not guarantee that the sample(s) is/are representative of the whole bulk from where it was/were drawn.
2. Method(s) used is/are in accordance with the Standard Methods for the Examination of Water & Wastewater, 23rd ed.
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S5. Matina River 1, location at 100 m downstream from the proposed bridge location



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Rev. No. 0 / Issue No. 1

TEST REPORT

CLIENT NAME: Shimizu- Ulticon- Takenaka JV
ADDRESS: Shoppes at Woodlane, Unit 4A 2nd floor Diversion Road, Brgy. Ma-a

CONTROL NO.: 23-16646
DATE RECEIVED: 17 Oct-23
DATE ANALYZED: 17-26 Oct-23
DATE REPORTED: 26 Oct-23

SAMPLE INFORMATION

Sample Type: Water (01)
Description: Surface Water
Sample Condition: At 4°C temperature

Packaging: Stored in a plastic/glass container
Sampling Date: October 17, 2023
Sampling Time: 11:07 AM

PARAMETERS	Lab. Reference No. / Sample ID		METHODS
	W ₃ -23-6071		
	Matina River 1 Downstream		
BOD ₅ , mg/L	9.2		SMEWW 5210 B
DO, mg/L	5.8		SMEWW 4500-O C
TSS, mg/L	32.0		SMEWW 2540 D
pH @ 25.0 °C	7.89		SMEWW 4500-H ⁺ B
Oil and Grease, mg/L	<0.50		SMEWW 5520 B
Nothing Follows			

Remarks:

1. Result(s) is/are based on sample(s) submitted to DALINC unless otherwise indicated. The Laboratory does not guarantee that the sample(s) is/are representative of the whole bulk from where it was/were drawn.
2. Method(s) used is/are in accordance with the Standard Methods for the Examination of Water & Wastewater, 23rd ed.
3. The determination of pH and DO were done in the laboratory of DALINC.
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S6. Matina River 2, 1 location at 100 m upstream from the proposed bridge location



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Rev. No. 0 / Issue No. 1

TEST REPORT

CLIENT NAME: Shimizu- Ulticon- Takenaka JV
ADDRESS: Shoppes at Woodlane, Unit 4A 2nd floor Diversion Road, Brgy. Ma-a

CONTROL NO.: 23-16646
DATE RECEIVED: 17 Oct-23
DATE ANALYZED: 17-26 Oct-23
DATE REPORTED: 26 Oct-23

SAMPLE INFORMATION

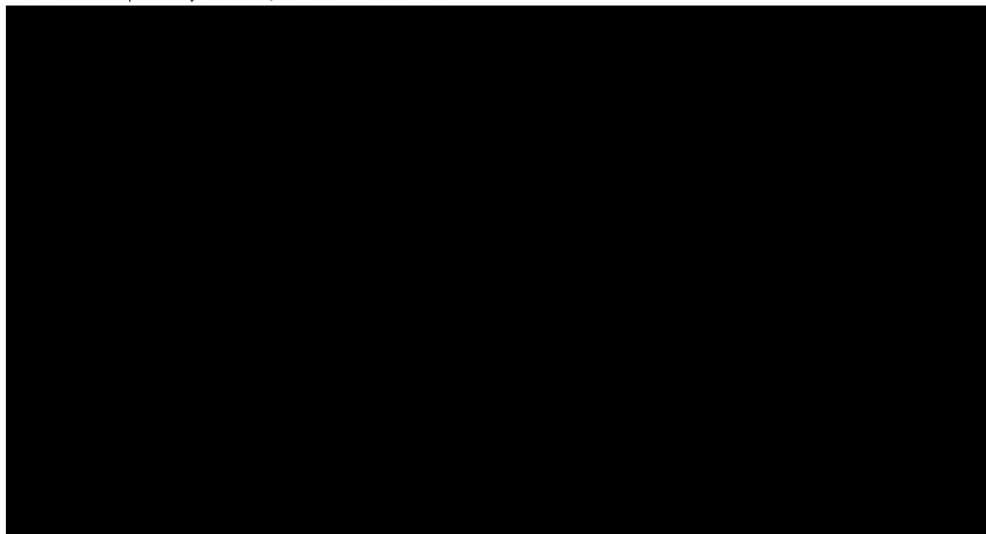
Sample Type: Water (01)
Description: Surface Water
Sample Condition: At 4°C temperature

Packaging: Stored in a plastic/glass container
Sampling Date: October 17, 2023
Sampling Time: 10:32 AM

PARAMETERS	Lab. Reference No. / Sample ID		METHODS
	W ₃ -23-6072		
	Matina River 2 Upstream		
BOD ₅ , mg/L	10.7		SMEWW 5210 B
DO, mg/L	2.1		SMEWW 4500-O C
TSS, mg/L	14.0		SMEWW 2540 D
pH @ 25.0 °C	7.48		SMEWW 4500-H ⁺ B
Oil and Grease, mg/L	<0.50		SMEWW 5520 B
Nothing Follows			

Remarks:

1. Result(s) is/are based on sample(s) submitted to DALINC unless otherwise indicated. The Laboratory does not guarantee that the sample(s) is/are representative of the whole bulk from where it was/were drawn.
2. Method(s) used is/are in accordance with the Standard Methods for the Examination of Water & Wastewater, 23rd ed.
3. The determination of pH and DO were done in the laboratory of DALINC.
4. This test report may not be reproduced unless in full.



S7. Matina River 2, 1 location at 100 m downstream from the proposed bridge location



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Rev. No. 0 / Issue No. 1

TEST REPORT

CLIENT NAME: Shimizu- Ulticon- Takenaka JV
ADDRESS: Shoppes at Woodlane, Unit 4A 2nd floor Diversion Road, Brgy. Ma-a

CONTROL NO.: 23-16646
DATE RECEIVED: 17 Oct-23
DATE ANALYZED: 17-26 Oct-23
DATE REPORTED: 26 Oct-23

SAMPLE INFORMATION

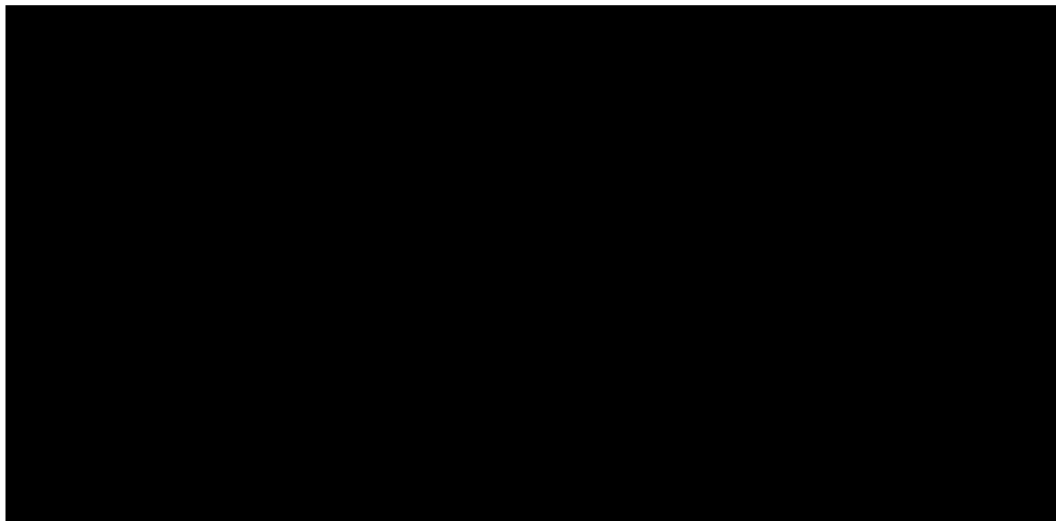
Sample Type: Water (01)
Description: Surface Water
Sample Condition: At 4°C temperature

Packaging: Stored in a plastic/glass container
Sampling Date: October 17, 2023
Sampling Time: 11:26 AM

PARAMETERS	Lab. Reference No. / Sample ID		METHODS
	W ₃ -23-6073		
	Matina River 2 Downstream		
BOD ₅ , mg/L	3.4		SMEWW 5210 B
DO, mg/L	4.0		SMEWW 4500-O C
TSS, mg/L	12.0		SMEWW 2540 D
pH @ 25.0 °C	8.26		SMEWW 4500-H ⁺ B
Oil and Grease, mg/L	<0.50		SMEWW 5520 B
Nothing Follows			

Remarks:

1. Result(s) is/are based on sample(s) submitted to DALINC unless otherwise indicated. The Laboratory does not guarantee that the sample(s) is/are representative of the whole bulk from where it was/were drawn.
2. Method(s) used is/are in accordance with the Standard Methods for the Examination of Water & Wastewater, 23rd ed.
3. The determination of pH and DO were done in the laboratory of DALINC.
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S8. Tunnel Construction Stage, 1 point at upstream of tunnel section (Sta. 18+900)



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 Telefax No. (082) 297-3278 E-mail: dalinc_03@yahoo.com

Rev. No. 0 / Issue No. 1

TEST REPORT

CLIENT NAME:	Shimizu- Ulticon- Takenaka JV	CONTROL NO.:	23-16742
ADDRESS:	Shoppes at Woodlane, Unit 4A 2nd floor Diversion Road, Brgy. Ma-a	DATE RECEIVED:	07 Nov-23
		TIME RECEIVED:	1:45 PM
		DATE ANALYZED:	07-16 Nov-23
		DATE REPORTED:	16 Nov-23

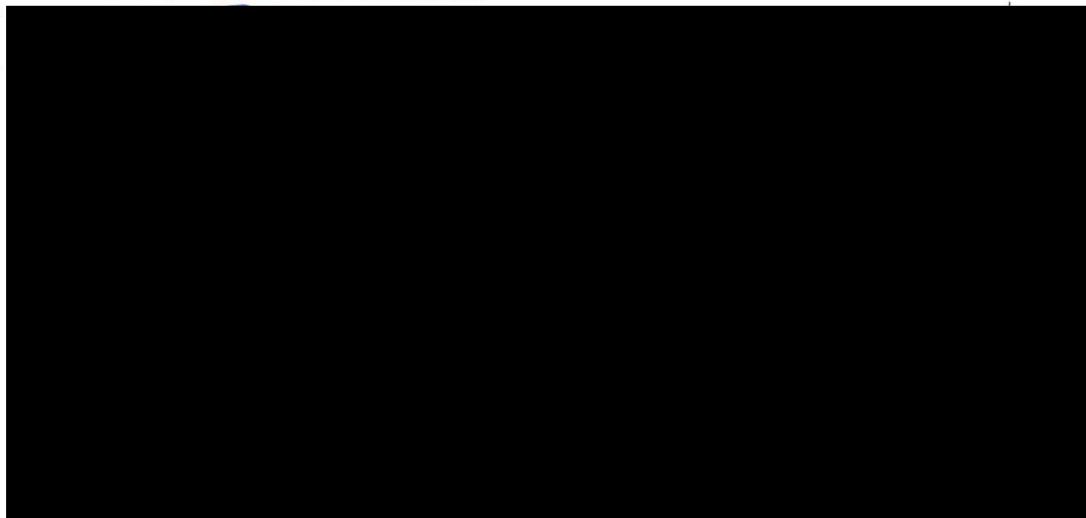
SAMPLE INFORMATION

Sample Type:	Water (01)	Packaging:	Stored in a plastic container
Sample Name:	Surface Water	Sampling Date:	November 07, 2023
Sample Condition:	At 4 °C temperature	Sampling Time:	11:03 AM

PARAMETERS	Lab. Reference No. / Sample ID		METHODS
	W ₃ -23-6346		
	Sta. 18+900		
BOD ₅ , mg/L	7.1		SMEWW 5210 B
DO, mg/L	7.7		SMEWW 4500-O C
TSS, mg/L	62.0		SMEWW 2540 D
Oil and Grease, mg/L	0.75		SMEWW 5520 B
pH @ 25.0 °C	7.95		SMEWW 4500-H ⁺ B
Nothing Follows			

Remarks:

1. Result(s) is/are based on sample(s) submitted to DALINC unless otherwise indicated. The Laboratory does not guarantee that the sample(s) is/are representative of the whole bulk from where it was/were drawn.
2. Method(s) used is/are in accordance with the Standard Methods for the Examination of Water & Wastewater, 23rd ed.
3. The determination of pH and DO were done in the laboratory of DALINC.
4. This test report may not be reproduced unless in full.



S9. Tunnel Construction Stage, Sta. 1 point at Station 22+200



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Mc Arthur Hi-way, Corner Union Avenue, Matina, Davao City
 Telefax No. (082) 297-3278 E-mail: dalinc_03@yahoo.com

Rev. No. 0 / Issue No. 1

TEST REPORT

CLIENT NAME: Shimizu- Ulticon- Takenaka JV
ADDRESS: Shoppes at Woodlane, Unit 4A 2nd floor Diversion Road, Brgy. Ma-a

CONTROL NO.: 23-16742
DATE RECEIVED: 07 Nov-23
TIME RECEIVED: 1:45 PM
DATE ANALYZED: 07-16 Nov-23
DATE REPORTED: 16 Nov-23

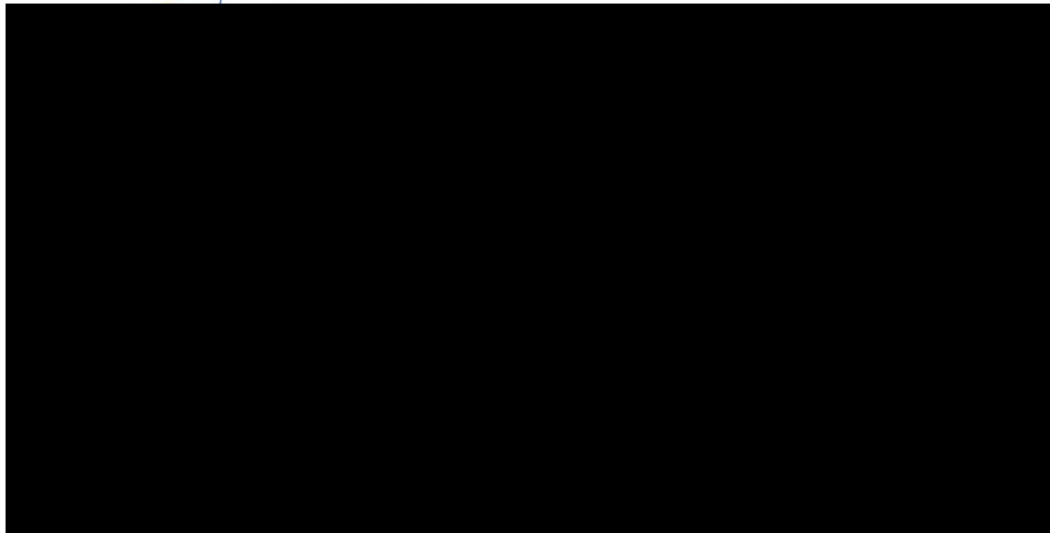
SAMPLE INFORMATION

Sample Type: Water (01) **Packaging:** Stored in a plastic container
Sample Name: Surface Water **Sampling Date:** November 07, 2023
Sample Condition: At 4 °C temperature **Sampling Time:** 09:59 AM

PARAMETERS	Lab. Reference No. / Sample ID		METHODS
	W ₃ -23-6345		
	Sta. 22+200		
BOD ₅ , mg/L	4.9		SMEWW 5210 B
DO, mg/L	8.0		SMEWW 4500-O C
TSS, mg/L	<3.0		SMEWW 2540 D
Oil and Grease, mg/L	<0.50		SMEWW 5520 B
pH @ 25.0 °C	8.48		SMEWW 4500-H ⁺ B
Nothing Follows			

Remarks:

1. Result(s) is/are based on sample(s) submitted to DALINC unless otherwise indicated. The Laboratory does not guarantee that the sample(s) is/are representative of the whole bulk from where it was/were drawn.
2. Method(s) used is/are in accordance with the Standard Methods for the Examination of Water & Wastewater, 23rd ed.
3. The determination of pH and DO were done in the laboratory of DALINC.
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Annex 3
Results of Ambient Air Quality
and Noise Monitoring

S1. Beginning point of Package I-1, Elenita Heights (1 Hour Ambient Air Monitoring)



OSTREA MINERAL LABORATORIES, INC.

Assaying and Environmental Testing Specialist

RJ Ouano Bldg., M. C Briones St., Highway, Bakilid, Mandaue City, Cebu
 Telephone : (032) 343-6472; (32) 363-8077
 Email : customerservice.ostrealabs@gmail.com

DENR Recognized
 Laboratory with
 C.R No. 041/2023

Original Issue	<input checked="checked" type="checkbox"/>
Duplicate issue by request	<input type="checkbox"/>
Revision Copy	<input type="checkbox"/>

CERTIFICATE OF ANALYSIS

Customer : SHIMIZU-ULTICON-TAKENAKA JV	CAN : C23-10-361-2C
Address : Shoppes at Woodlane, Unit 4A, 2nd F, Diversion Road, Brgy. Ma-a, Talomo District, Davao City	Date of Issue : 10/24/2023
Location : Purok 5, Brgy. Matina Biao, Tugbok District, Davao City	RAN : R23-10-015G
Attention : Ms. Mary Ann de Casa	INVOICE # : --
Contact Info. : 09674199395/decasa.maryann@shimz.biz	Date Received : 10/4/2023
	Date Sampled : 10/4-6/2023
	Date Analyzed : 10/4-19/2023

RESULTS OF ANALYSIS

Sample Descriptions	Parameters	Results	Units	DAO 2000-81 Standards	Methods
1 Hour Ambient Air Monitoring					
Station 3: South Yard (01:48 PM-02:48 PM)	Total Suspended Particulates (TSP) ^a	748	µg/Ncm	300	Gravimetric
	Nitrogen Dioxide (NO ₂) ^b	2	µg/Ncm	260	Griess-Saltzman
	Sulfur Dioxide (SO ₂) ^c	11	µg/Ncm	340	Pararosaniline
	Carbon Monoxide (CO)	<1	ppm	30	Direct Reading-Using Electrochemical Sensor
Station 4: Elenita Heights (05:12 PM-06:12 PM)	Total Suspended Particulates (TSP) ^a	208	µg/Ncm	300	Gravimetric
	Nitrogen Dioxide (NO ₂) ^b	<2	µg/Ncm	260	Griess-Saltzman
	Sulfur Dioxide (SO ₂) ^c	10	µg/Ncm	340	Pararosaniline
	Carbon Monoxide (CO)	<1	ppm	30	Direct Reading-Using Electrochemical Sensor
Station 5: UBI Batching Plant (03:27 PM-04:27 PM)	Total Suspended Particulates (TSP) ^a	1703	µg/Ncm	300	Gravimetric
	Nitrogen Dioxide (NO ₂) ^b	<2	µg/Ncm	260	Griess-Saltzman
	Sulfur Dioxide (SO ₂) ^c	8	µg/Ncm	340	Pararosaniline
	Carbon Monoxide (CO)	<1	ppm	30	Direct Reading-Using Electrochemical Sensor

Note : The customer is given 7 days upon receipt to raise questions or clarifications on any part or content of the certificate, otherwise the result(s) is/are deemed accepted.

Total No. of Samples: 3

Total Analysis : 12

Sample Submission : Sampled by the OMLI-GenSan Staff

Reference : USEPA 40 CFR, Part 50, Appendices ^a B and ^c A ; ^b Methods of Air Sampling and Analysis 3rd ed. by J.P. Lodge

Remarks : Results relate only to the items tested and received by the laboratory



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S2. Ending point of Package I-1, Waan National HS (1 Hour Ambient Air Monitoring)



OSTREA MINERAL LABORATORIES, INC.

Assaying and Environmental Testing Specialist

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CERTIFICATE OF ANALYSIS

Customer :	SHIMIZU-ULTICON-TAKENAKA JV	CAN :	C23-10-361-1C
Address :	Shoppes at Woodlane, Unit 4A, 2nd F, Diversion Road, Brgy. Ma-a, Talomo District, Davao City	Date of Issue :	10/24/2023
Location :	Brgy. Waan, Buhangin District, Davao City	RAN :	R23-10-015G
Attention :	Ms. Mary Ann de Casa	INVOICE # :	--
Contact Info. :	09674199395/decasa.maryann@shimz.biz	Date Received :	10/2/2023
		Date Sampled :	10/2-3/2023
		Date Analyzed :	10/2-19/2023

RESULTS OF ANALYSIS

Sample Descriptions	Parameters	Results	Units	DAO 2000-81 Standards	Methods
1 Hour Ambient Air Monitoring					
Station 1:	Total Suspended Particulates (TSP) ^a	243	µg/Ncm	300	Gravimetric
Wa-an National High School	Nitrogen Dioxide (NO ₂) ^b	<2	µg/Ncm	260	Griess-Saltzman
(10:00 AM-11:00 AM)	Sulfur Dioxide (SO ₂) ^c	11	µg/Ncm	340	Pararosaniline
	Carbon Monoxide (CO)	<1	ppm	β0	Direct Reading-Using Electrochemical Sensor
Station 2:	Total Suspended Particulates (TSP) ^a	212	µg/Ncm	300	Gravimetric
Wa-an Elementary School	Nitrogen Dioxide (NO ₂) ^b	<2	µg/Ncm	260	Griess-Saltzman
(11:20 AM-12:20 PM)	Sulfur Dioxide (SO ₂) ^c	10	µg/Ncm	340	Pararosaniline
	Carbon Monoxide (CO)	<1	ppm	30	Direct Reading-Using Electrochemical Sensor

Note : The customer is given 7 days upon receipt to raise questions or clarifications on any part or content of the certificate, otherwise the result(s) is/are deemed accepted.

Total No. of Samples: 2

Total Analysis : 8

Sample Submission : Sampled by the OMLI-GenSan Staff

Reference : USEPA 40 CFR, Part 50, Appendices ^a B and ^c A ; ^b Methods of Air Sampling and Analysis 3rd ed. by J.P. Lodge

Remarks : Results relate only to the items tested and received by the laboratory



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S1. Beginning point of Package I-1, Elenita Heights (24 Hours Ambient Air Monitoring)



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CERTIFICATE OF ANALYSIS

Customer : SHIMIZU-ULTICON-TAKENAKA JV	CAN : C23-10-361-8C
Address : Shoppes at Woodlane, Unit 4A, 2nd F, Diversion Road, Brgy. Ma-a, Talomo District, Davao City	Date of Issue : 10/24/2023
Location : Purok 5, Brgy. Matina Biao, Tugbok District, Davao City	RAN : R23-10-015G
Attention : Ms. Mary Ann de Casa	INVOICE # : --
Contact Info. : 09674199395/decasa.maryann@shimz.biz	Date Received : 10/4/2023
	Date Sampled : 10/4-7/2023
	Date Analyzed : 10/4-19/2023

RESULTS OF ANALYSIS

Sample Descriptions	Parameters	Results	Units	DAO 2000-81 Standards	Methods
24 Hours Ambient Air Monitoring					
Station 3: South Yard (02:55 PM-02:55 PM)	Total Suspended Particulates (TSP) ^a	226	µg/Ncm	230	Gravimetric
	Nitrogen Dioxide (NO ₂) ^b	<0.07	µg/Ncm	150	Griess-Saltzman
	Sulfur Dioxide (SO ₂) ^c	2.29	µg/Ncm	180	Pararosaniline
	Carbon Monoxide (CO)	<1	ppm	9	Direct Reading-Using Electrochemical Sensor
Station 4: Elenita Heights (06:15 PM-06:15 PM)	Total Suspended Particulates (TSP) ^a	77	µg/Ncm	230	Gravimetric
	Nitrogen Dioxide (NO ₂) ^b	<0.07	µg/Ncm	150	Griess-Saltzman
	Sulfur Dioxide (SO ₂) ^c	2.68	µg/Ncm	180	Pararosaniline
	Carbon Monoxide (CO)	<1	ppm	9	Direct Reading-Using Electrochemical Sensor
Station 5: UBI Batching Plant (04:30 PM-04:30 PM)	Total Suspended Particulates (TSP) ^a	171	µg/Ncm	230	Gravimetric
	Nitrogen Dioxide (NO ₂) ^b	<0.07	µg/Ncm	150	Griess-Saltzman
	Sulfur Dioxide (SO ₂) ^c	2.80	µg/Ncm	180	Pararosaniline
	Carbon Monoxide (CO)	<1	ppm	9	Direct Reading-Using Electrochemical Sensor

Note : The customer is given 7 days upon receipt to raise questions or clarifications on any part or content of the certificate, otherwise the result(s) is/are deemed accepted.

Total No. of Samples: 3

Total Analysis : 12

Sample Submission : Sampled by the OMLI-GenSan Staff

Reference : USEPA 40 CFR, Part 50, Appendices ^a B and ^c A ; ^b Methods of Air Sampling and Analysis 3rd ed. by J.P. Lodge

Remarks : Results relate only to the items tested and received by the laboratory



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S2. Ending point of Package I-1, Waan National HS (24 Hours Ambient Air Monitoring)



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Customer :	SHIMIZU-ULTICON-TAKENAKA JV	CAN :	C23-10-361-7C
Address :	Shoppes at Woodlane, Unit 4A, 2nd F, Diversion Road, Brgy. Ma-a, Talomo District, Davao City	Date of Issue :	10/24/2023
Location :	Brgy. Waan, Buhangin District, Davao City	RAN :	R23-10-015G
Attention :	Ms. Mary Ann de Casa	INVOICE # :	--
Contact Info. :	09674199395/decasa.maryann@shimz.biz	Date Received :	10/2/2023
		Date Sampled :	10/2-4/2023
		Date Analyzed :	10/2-19/2023

RESULTS OF ANALYSIS

Sample Descriptions	Parameters	Results	Units	DAO 2000-81 Standards	Methods
24 Hours Ambient Air Monitoring					
Station 1: Waan National High School (11:05 AM-11:05 AM)	Total Suspended Particulates (TSP) ^a	226	µg/Ncm	230	Gravimetric
	Nitrogen Dioxide (NO ₂) ^b	0.09	µg/Ncm	150	Griess-Saltzman
	Sulfur Dioxide (SO ₂) ^c	2.90	µg/Ncm	180	Pararosaniline
	Carbon Monoxide (CO)	<1	ppm	9	Direct Reading-Using Electrochemical Sensor
Station 2: Waan Elementary School (12:26 PM-12:26 PM)	Total Suspended Particulates (TSP) ^a	101	µg/Ncm	230	Gravimetric
	Nitrogen Dioxide (NO ₂) ^b	<0.07	µg/Ncm	150	Griess-Saltzman
	Sulfur Dioxide (SO ₂) ^c	3.39	µg/Ncm	180	Pararosaniline
	Carbon Monoxide (CO)	<1	ppm	9	Direct Reading-Using Electrochemical Sensor

Note : The customer is given 7 days upon receipt to raise questions or clarifications on any part or content of the certificate, otherwise the result(s) is/are deemed accepted.

Total No. of Samples: 2

Total Analysis : 8

Sample Submission : Sampled by the OMLI-GenSan Staff

Reference : USEPA 40 CFR, Part 50, Appendices ^a B and ^c A ; ^b Methods of Air Sampling and Analysis 3rd ed. by J.P. Lodge

Remarks : Results relate only to the items tested and received by the laboratory



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S1. Beginning point of Package I-1, Elenita Heights (24 Hours Ambient Noise Monitoring)


OSTREA MINERAL LABORATORIES, INC.
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 Telephone : (032) 343-6472; (32) 383-8077
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CERTIFICATE OF ANALYSIS

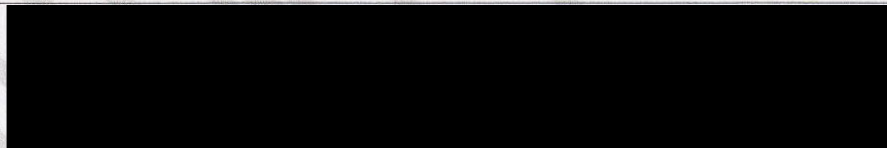
Customer :	SHIMIZU-ULTICON-TAKENAKA JV	CAN :	C23-10-361-10C
Address :	Shoppes at Woodlane, Unit 4A, 2nd F, Diversion Road, Brgy. Ma-a, Talomo District, Davao City	Date of Issue :	10/24/2023
Location :	Purok 5, Brgy. Matina Biao, Tugbok District, Davao City	RAN :	R23-10-015G
Attention :	Ms. Mary Ann de Casa	INVOICE # :	--
Contact Info. :	09674199395/decasa.maryann@shimz.biz	Date Received :	10/6/2023
		Date Measured:	10/6-7/2023

RESULTS OF ANALYSIS

Location	Morning 5:00am- 9:00am dBA	Daytime 9:00am - 6:00pm dBA	Evening 6:00pm - 10:00pm dBA	Night Time 10:00pm - 05:00am dBA
24 Hours Noise Monitoring Station 4: Elenita Heights	43	47	48	42
NPCC Memorandum Circular No. 002 Series of 1980, Class A	50	55	50	45

Note : The customer is given 7 days upon receipt to raise questions or clarifications on any part or content of the certificate, otherwise the result(s) is/are deemed accepted.

Total No. of Sample: 1 **Total Analysis :** 4
Sample Submission : Measured by the OMLI-GenSan Staff
Method : Sound Level Meter
Remarks : Results relate only to the item measured by OMLI-GenSan Staff


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S2. Ending point of Package I-1, Waan National HS (24 Hours Ambient Noise Monitoring)


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CERTIFICATE OF ANALYSIS

Customer	: SHIMIZU-ULTICON-TAKENAKA JV	CAN	: C23-10-361-9C
Address	: Shoppes at Woodlane, Unit 4A, 2nd F, Diversion Road, Brgy. Ma-a, Talomo District, Davao City	Date of Issue	: 10/24/2023
Location	: Brgy. Waan, Buhangin District, Davao City	RAN	: R23-10-015G
Attention	: Ms. Mary Ann de Casa	INVOICE #	: --
Contact Info.	: 09674199395/decasa.maryann@shimz.biz	Date Received	: 10/2/2023
		Date Measured	: 10/2-4/2023

RESULTS OF ANALYSIS

Locations	Morning	Daytime	Evening	Night Time
	5:00am- 9:00am	9:00am - 6:00pm	6:00pm - 10:00pm	10:00pm - 05:00am
	dB(A)	dB(A)	dB(A)	dB(A)
24 Hours Noise Monitoring				
Station 1: Wa-an National High School	53	53	42	41
Station 2: Wa-an Elementary School	42	55	41	39
NPCC Memorandum Circular No. 002 Series of 1980, Class AA	45	50	45	40

Note : Please refer to the contributing factors of noise in Annex B (Records of Measurement and Meteorological Observations); The customer is given 7 days upon receipt to raise questions or clarifications on any part or content of the certificate, otherwise the result(s) is/are deemed accepted.

Total No. of Samples: 2 **Total Analysis :** 8
Sample Submission : Measured by the OMLI-GenSan Staff
Method : Sound Level Meter
Remarks : Result relates only to the items measured by OMLI-GenSan Staff

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