

**MONITORING FORM (FRIMP-CDOR)**  
**4th Quarter 2023**

1. Responses/Actions to Comments and Guidance from Government Authorities and the Public is presented in Table 1.

**Table 1: Summary of Monitoring Results**

<b>Monitoring Item</b>	<b>Monitoring Results during Report Period</b>
Ambient Noise	Based on the result of monitoring during this quarter, all results are exceeded the environmental standard of NPCC Memorandum Circular No. 002, Series of 1980 except for the morning time of station AQ6. The exceedance of noise level can be linked to the high volume of vehicles passing by the road including heavy trucks. It is also observed during survey that the noise from people and sounds from the animals contributed to the exceeded readings of noise level.
Ambient Air	Based on the results of this monitoring, all results at all station for PM10, SO2 and NO2 are within the National Ambient Air Quality Guideline Values except for TSP at station AQ2. The level of TSP can be correlated to the high volume of vehicles passing by the road including heavy trucks. Based on the observations made during the monitoring, dust particles coming from the vehicles contribute to the high concentration of TSP. The station is located on the main road where the volume of vehicles is observed.
Vibration Level	All the vibration level readings are within the standard limit of the Vibration Criteria of The Environmental Protection Agency New South Wales. This minimal vibration level will not affect any structures within the project.  The contractor ensures the reduction of vibration produced by the engines of the equipment by regular maintenance of the main equipment used for the construction.
Water Quality	All parameters tested are within the environmental guidelines for Class C water except fecal coliform. There are no set environmental guidelines based on DAO 16-08 for total coliform, salinity, TDS, and turbidity. High level of fecal coliform this quarterly monitoring might be the effect of direct discharge of wastewater from nearby structures in the river.  In addition, results of salinity, TDS and turbidity are still minimal which does not harm the river except for total coliform. High total coliform concentration might be also the result of direct discharge of wastewater from nearby structures.
River Water Flow	Regular river water flow is not affected by project.

## 2. Mitigation Measures

### 2.1 Ambient Noise

Ambient Noise levels were measured Centertek 323 Sound Level Meter at the vicinity of the established sampling points for ambient air quality monitoring on January 11-17, 2024 in accordance with the standard procedures prescribed under Presidential Decree No. 984 (National Pollution Control Decree of 1976), and NPCC MC No. 1980-002. All four stations of ambient noise levels were compared to DENR Standard for Class AA. The Class AA refers to a section or contiguous area that requires quietness, such areas within 100m from school sites, nursery schools, hospitals, and special homes for the aged. The results of the 24-hours ambient noise level are presented in Table 3.

**Table 2: Summary of Ambient Noise Level Results**

Station	Description	Time Period	Unit	Limit (Class AA)*	Results
AQ1	Adjacent to Bonbon Elementary School, Brgy Bonbon CDO	Morning	dBA	45	57
		Daytime	dBA	50	52
		Evening	dBA	45	52
		Nighttime	dBA	40	48
		<b>Average</b>			
AQ2	Immaculada Conception Chapel along Kauswagan-Puntod Road	Morning	dBA	50	64
		Daytime	dBA	45	66
		Evening	dBA	45	62
		Nighttime	dBA	40	56
		<b>Average</b>			
AQ3	Inside Consolacion Elementary School, Brgy. Consolacion CDO	Morning	dBA	50	50
		Daytime	dBA	45	54
		Evening	dBA	45	52
		Nighttime	dBA	40	44
		<b>Average</b>			
AQ4	Burgos Street – Iglesia Ni Cristo Church	Morning	dBA	50	58
		Daytime	dBA	45	54
		Evening	dBA	45	58
		Nighttime	dBA	40	48
		<b>Average</b>			
AQ5	Acacia Street, Kagay-an Bridge,	Morning	dBA	50	58
		Daytime	dBA	45	57
		Evening	dBA	45	59
		Nighttime	dBA	40	44
		<b>Average</b>			
AQ6	Carmen Balulang – Sharief Alawi Islamic Centre	Morning	dBA	50	47
		Daytime	dBA	45	55
		Evening	dBA	45	50
		Nighttime	dBA	40	41
		<b>Average</b>			

Note: \*NPCC MC

Red font = Exceeded the NPCC prescribed standard

Based on the result of monitoring during this quarter, all results are exceeded the environmental standard of NPCC Memorandum Circular No. 002, Series of 1980 except for morning time of station AQ6.

High level of noise might be related to the high volume of vehicles passing by the road including heavy trucks. It is also observed during survey that the noise from people and sounds from the animals

contributed to the exceeded readings of noise level.

The Project related works might have contributed to the noise levels in the area but these are in minimal and short-term only. Contractor ensures the reduction of noise produced by the engines of the equipment by regular maintenance of the main equipment used for the construction.

## 2.2 Ambient Air Quality

The ambient air quality samplings were conducted on January 11-17, 2024 to measure the ground level concentrations (GLCs) of PM<sub>10</sub>, TSP, NO<sub>2</sub> and SO<sub>2</sub> at six sampling stations.

Ambient air samples were collected for a period of 24-hour averaging time for all air quality parameters for all stations. The collected samples were brought to Ostrea Mineral Laboratories, In., a DENR recognized laboratory, for analysis. Table 4 presented the details of the ambient air monitoring.

**Table 3: Details of Ambient Air Monitoring**

Stations	Description	Coordinates
AQ1	Adjacent to Bonbon Elementary School, Brgy Bonbon CDO	8°30'27.20"N, 124°38'54.70"E
AQ2	Immaculada Conception Chapel along Kauswagan-Puntod Road	8°30'03.50"N, 124°38'51.70"E
AQ3	Inside Consolacion Elementary School, Brgy. Consolacion CDO	8°29'28.70"N, 124°38'44.90"E
AQ4	Burgos Street – Iglesia Ni Cristo Church	8°28'58.70"N, 124°38'31.60"E
AQ5	Acacia Street, Kagay-an Bridge, Carmen	8°28'21.20"N, 124°38'19.80"E
AQ6	Balulang – Sharief Alawi Islamic Centre	8°26'45.40"N, 124°38'20.90"E

The monitoring was conducted in accordance with the standard methods of the DENR as prescribed in its DAO No. 2000-81, the Implementing Rules and Regulations of the Philippine Clean Air Act of 1999. The results of ambient air are presented in Table 5.

**Table 4: Result of 24-hours Ambient Air Monitoring**

Parameters	DENR Guidelines*	Stations					
		AQ1	AQ2	AQ3	AQ4	AQ5	AQ6
PM <sub>10</sub>	150	59	143	31	39	145	42
TSP	230	185.4	271.7	98.6	67	103.6	52
NO <sub>2</sub>	150	3.3	0.2	<0.1	<0.1	<0.1	<0.1
SO <sub>2</sub>	180	<1	<1	<1	<1	<1	<1

Note: \*NAAQG

Red font = Exceeded the NPCC prescribed standard

Based on the results of this monitoring, all results are within the National Ambient Air Quality Guideline Values except for TSP of station AQ2. The level of TSP can be correlated to the high volume of vehicles passing by the road including heavy trucks.

Based on the observations made during the monitoring, dust particles coming from the vehicles contribute to the high concentration of TSP. The station is located on the main road where the volume of vehicles is observed.

The Project-related works might have contributed to the dust in the area but these are minimal and short-term only. Nevertheless, the Contractor consistently ensures that the daily check-up routine of all the equipment being used is undertaken to minimize the emission of pollutants into the air.

## 2.3 Vibration

The vibration samplings were conducted on January 11-17, 2024 using a PCE VD-3 vibration meter. The PCE VD-3 meter measures acceleration in three axes (along x, y and z), the meter recorded acceleration in terms of g-force units. The meter could detect vibration plus/minus 18 g with a resolution of 0.00625 g.

The vibration meter is mounted on a fixed structure using the built-in magnet or using an adhesive over the platform to measure such as flagpole, benches, fences and any other fixed structures. The y-axis is oriented to the north using a compass and as much as possible horizontally leveled. The vibration meter was set up to collect vibration acceleration every 30-second in one-hour duration simultaneous with the noise level measurement at the same six (6) sampling locations.

The units reported by the PCE VD-3 is in g-force and can be readily convertible to m/s<sup>2</sup> by dividing the vibration acceleration in g-force by 9.81. The vector sum or resultant of the 3-axis vibration was presented to eliminate the effect of the negative value.

For human response, average vibration amplitude is more appropriate because it takes time for the human body to respond to the excitation (the human body responds to average vibration amplitude, not a peak amplitude. For vibrations by traffic:

- a. The frequency range is normally from 4 Hz to 80 Hz; sometimes up to 125 Hz; and
- b. Amplitudes are generally in the range 0.005 m/s<sup>2</sup> to 2 m/s<sup>2</sup> for acceleration.

The equivalent measured vibration acceleration is in the range 2 m/s<sup>2</sup> for a traffic related source at a maximum range of 125 Hz.

Comparison to the Vibration Criteria of Environmental Protection Agency New South Wales EPA-NSW), Australia as shown in the table below, the maximum value for intermittent acceleration is 0.8 m/s<sup>2</sup> (preferred value is 0.40 m/s<sup>2</sup>) for daytime and nighttime period. Table 7 presented a summary of the vibration acceleration level.

**Table 5: Acceptable vibration dose values for intermittent vibration (m/s<sup>1.75</sup>)**

Location	Daytime <sup>1</sup>		Night-time <sup>1</sup>	
	Preferred value	Maximum value	Preferred value	Maximum value
Critical areas <sup>2</sup>	0.10	0.20	0.10	0.20
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80

Note: <sup>1</sup> Daytime is 7.00 am to 10.00 pm and night-time is 10.00 pm to 7.00 am.

<sup>2</sup>Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. These criteria are only indicative, and there may be a need to assess intermittent values against the continuous or impulsive criteria for critical areas.

**Table 6. Results of Vibration Acceleration Level**

Station	Range	Acceleration in m/s <sup>2</sup>			
		Morning (0500H-0900H)	Daytime (0900H-1800H)	Evening (1800H-2200H)	Nighttime (2200H-0500H)
AQ1 (Roadside beside Bonbon Elementary School)	Min	0.1286	0.1389	0.0901	0.0823
	Max	0.1326	0.1486	0.1089	0.0975
AQ2 (Roadside between Bonbon and Kauswagan sections, front of Immaculada Concepcion Chapel)	Min	0.2526	0.2879	0.1490	0.1778
	Max	0.2864	0.3214	0.1594	0.1952
AQ3 (Burgos St. inside Consolacion Elementary School)	Min	0.0856	0.0988	0.0589	0.0721
	Max	0.0948	0.1142	0.0648	0.0845
AQ4 (Burgos St. Cor. Montalban St. front of Iglesia Ni Cristo Chapel)	Min	0.1465	0.1656	0.1320	0.1229
	Max	0.1578	0.1791	0.1421	0.1348
AQ5 (Beside Acacia Street, Roadside under Kagay-an Bridge)	Min	0.2621	0.2918	0.1854	0.1982
	Max	0.2774	0.3047	0.1974	0.2047
AQ6 (Roadside front of Sharief Alawi Islamic Centre (Mosque))	Min	0.0819	0.1119	0.0643	0.0512
	Max	0.0976	0.1246	0.0697	0.0632
Vibration Criteria		Preferred Value – 0.4 Maximum Value – 0.8			

Red font = Exceeded the prescribed standard

All vibration level readings are within the standard limit of the Vibration Criteria of The Environmental Protection Agency New South Wales. This minimal vibration level will not affect any structures within the project.

The Project related works might have contributed to the noise levels in the area, but these are in minimal and short-term only. Contractor ensures the reduction of vibration produced by the engines of the equipment by regular maintenance of the main equipment used for the construction.

### Surface Water Quality

The surface water quality monitoring was conducted along the Cagayan de Oro River on February 6, 2024, 2023. This monitoring was being conducted in compliance with the Self-Monitoring Report (SMR) and Compliance Monitoring Report (CMR) to be prepared by the Consultants and will be submitted thru the UPMO-FCMC Project Director to the DENR-EMB Region X.

Information such as date and time of sampling, observation of surroundings, odor and apparent color of water were also recorded during the actual conduct of quarterly monitoring. The results of the water quality analyses were compared to standards set by DENR specified in the DAO No. 08 series of 2016. Table 8 summarized the results of surface water quality in the Cagayan de Oro River.

**Table 7: Water Quality Monitoring Results in Cagayan de Oro River**

Parameter	Unit	Envi Guidelines* (Class C)	Monitoring Results					
			P1-WQ1	P1-WQ2	P2-WQ3	P2-WQ4	P3-WQ5	P3-WQ6
Total Coliform	MPN/100ml	-	-	-	-	-	54,000	5,400
Fecal Coliform	MPN/100ml	200	-	-	-	-	5,400	2200
BOD	mg/L	7	-	-	-	-	1	<1
Color	TCU	75	-	-	-	-	10	5
Cyanide	mg/L	0.1	-	-	-	-	0.01	<0.01
Mercury	mg/L	0.002	-	-	-	-	<0.0004	<0.0004
Oil & grease	mg/L	2	-	-	-	-	<1	2
pH	-	6.5-9.0	-	-	-	-	7.5	7.9
Salinity	g/L	-	-	-	-	-	0.015	0.076
TDS	mg/L	-	-	-	-	-	130	107
TSS	mg/L	80	-	-	-	-	18	11
Turbidity	NTU	-	-	-	-	-	11.57	5.50
Temperature	°C	25-31	-	-	-	-	29.8	30.1

Red font = Exceeded the DENR prescribed standard

All parameters tested are within the environmental guidelines for Class C water except fecal coliform. There are no set environmental guidelines based on DAO 16-08 for total coliform, salinity, TDS, and turbidity.

High level of fecal coliform this quarterly monitoring might be the effect of direct discharge of wastewater from nearby structures in the river.

In addition, results of salinity, TDS and turbidity are still minimal which does not harm the river except for total coliform. High total coliform concentration might be also the result of direct discharge of wastewater from nearby structures.

### 3. Compliance with good practices in WASTE Management

#### 3.1 HAZARDOUS WASTE Management

##### a) Contract Package 1

TYPE OF WASTE	QUANTITY	HANDLING/ STORAGE	DISPOSAL	REMARKS
Civil Works done				

##### b) Contract Package 2

TYPE OF WASTE	QUANTITY	HANDLING/ STORAGE	DISPOSAL	REMARKS
Civil Works done				

c) Contract Package 3

TYPE OF WASTE	QUANTITY	HANDLING/ STORAGE	DISPOSAL	REMARKS
Used Oil	890L	Stored in a sealed drum at Motorpool located in Barangay Balulang, Cagayan de Oro Ciy	To be transported by designated transporters accredited by the govt.	[REDACTED] is the designated transporter.
Oil and Fuel Filters	66pcs			

Remarks: The Work Camp including Batching Plant and Motorpool was under construction during the reporting period. The Work Camp was made mostly of Pre-fabricated materials.

3.2 SOLID WASTE Management

a) Contract Package 1:

TYPE OF WASTE	HANDLING	STORAGE	DISPOSAL	REMARKS
Works done				

b) Contract Package 2

TYPE OF WASTE	HANDLING	STORAGE	DISPOSAL	REMARKS
Works done	-	-	-	No construction

c) Contract Package 3:

TYPE OF WASTE	HANDLING	STORAGE	DISPOSAL	REMARKS
Recyclable (Cans/Bottles)	18kg	Stored at Site Office located in Barangay Balulang, Cagayan de Oro City. To be collected and disposed to MRF (Balulang, Cagayan de Oro City).	To be transported by designated transporters accredited by the govt.	[REDACTED] is the designated transporter.
Used tires	8pcs			
Non-Biodegradable (Plastic/Styropor)	1kg			

Natural Environment

- Ecosystem

Monitoring Item	Monitoring Results during Report Period
Endangered Species (Trees) Mangrove Forest (ha.)	No endangered trees species affected

- Tree Planting

Monitoring Item	Monitoring Results during Report Period
93	Re-planting of withered bamboo trees
Bamboo trees	
93 sites	

