n. Annex II Attachment 14-6

Environmental Monitoring Form
North-South Commuter Railway (Malolos – Tutuban) Project

1. General Information

a. Environmental Monitoring Results: 2nd Quarter of 2023

b. Date of Preparing This form: 15 July 2023

c. Person Preparing This form: Environmental Considerations Unit
Department/Organizations: North-South Commuter Railway (Malolos – Tutuban) Project

2. Monitoring Results - Construction Phase

(1) Impact on Land

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Latest Monitoring Result in 2nd Quarter of 2023	
							Result	Monitoring Date
1	Soil contamination due to oil and lubricant spill	Oil spill	Ocular inspection	Weekly, immediately after spills	All construction sites (Malolos,Guiguinto, Balagtas, Bocaue,Marilao, Meycauayan and Valenzuela City)	N.A.	Minor spills were commonly observed near/adjacent to the mechanical equipment. See **Annex A.**	Envi Walkthrough Dates: 10-11, 24-25, April, 8-9,22-23 May; and 5-6 & 19-20 June.
2.	Worker and community exposure to health and safety hazards due to working in areas with the excavation of such soils	Proper removal and disposal of excavated soil from RAMCAR battery site	Compliance to RA 9003, RA 6969 and DAO 2013-22	N.A.	RAMCAR battery site	Environmental Standard for Soil Pollution (Japan): 150 mg/kg Dutch Standards of References Values for Soil: 85 mg/kg	Excavation of contaminated soil in Meycauayan was completed. Appropriate PPE was provided to workers directly involved in the hauling of the contaminated soil. Contaminated soil was treated and disposed to a DENR-accredited TSD	N.A.

						German Federal Soil Protection and Contaminated Site Ordinance: 200 mg/kg DAO 2013-22: <1 mg/L	Facility. Certificate of Treatment was provided in previous reports	
3.	Generation of solid waste; land and water contamination; aesthetic impacts; spread of diseases	Proper waste management and disposal	Checking compliance with RA 9003 and RA 6969	Weekly	All construction sites (Malolos, Guiguinto, Balagtas, Bocaue,Marilao,Meycauayan and Valenzuela City)	N.A.	**Solid Waste Management** 1. Appropriate waste bins with cover are provided in active construction sites. 2. Color coded waste bins are properly, labeled recyclables (red), non-recyclables/residuals (blue), biodegradables (green), and special waste, household healthcare waste (yellow). 3. The recyclables were segregated from residuals. The residual wastes are being collected by the LGUs and some private haulers and disposed to the disposal facility. 4. Recoverable waste materials are recycled and reuse on site. Non-recyclable scrap materials will be disposed to junkshops. 5. In response to COVID-19 pandemic, particularly disposal mask/ gloves and tissues are directly stored and disposed in a separate waste bag/bin (yellow). Solid Waste Generated for the Quarter: - Total Solid Waste Generated:	N.A.

							226.278 tons/qtr - Recyclable: 130.51 tons/qtr - Biodegradable:17.66 tons/qtr - Residual: 101.11 tons/qtr **Hazardous Waste Management** 1. The hazardous wastes are stored in separate containers according to its classification and are labeled. 2. Hazardous wastes are stored in bunded area or with secondary containment to avoid direct spillage to the ground. 3. These wastes are temporarily stored at temporary storage facility. An accredited TSD facility is employed for the proper disposal of the hazardous wastes generated on site. Hazardous Waste Generated for the Quarter: - Mercury and Mercury Compounds: 0.014 ton - Lead Compounds: 0.0 ton - Used Industrial Oil including sludge: 4.723 tons - Oil Contaminated Materials: 0.216 ton - Containers previously cont. toxic chemicals: 1.349 ton - Waste Electrical and Electronic Equipment: 0 ton	

							- Pathological Waste: 0.047 ton **Grey water disposal and treatment** Provision of septic tanks, sanitation facilities and portable toilets are available within construction areas. Liquid wastes (i.e., grey water from portalets) are siphoned regularly twice a week by a licensed sewage treater service (Soliman, IWMI and Pinas). Grey water from kitchen sinks, clean water from washing go through a grease trap before discharge to local drainages See **Annex B and C**	
4.	Ground subsidence	Level of ground subsidence	Measurement of level	Monthly	Valenzuela Depot	N.A.	N.A.	N.A.
5.	Removal of Narra trees along with alignment form Caloocan to Tutuban and at Valenzuela depot, and other trees.	1. Number of trees cut 2. Number of trees replaced 3. The survival rate of species introduced 4. Provision of the corresponding number of tree seedlings	Ocular inspection	N.A.	Designated tree planting site and/or reforestation area designated by DENR-EMB National Capital Region (NCR)	85-90% survival rate of trees planted as prescribed by the LGU	1. CP01 1.1 Replacement seedlings - 71,000 seedlings in Mt. Balagbag (84.5 ha) - 18,500 seedlings in Mt Balagbag (16.65 ha) - 8,000 seedlings in La Mesa Watershed (20 ha) -300 bamboo seedlings handed over to Meycauayan LGU 1.2 Transplanted Trees in NFA Compound, Malanday, Depot - One of two transplanted trees survived. 2. CP02 2.1 Replacement seedlings - 33,650 seedlings in Mt. Balagbag (52.8 ha)	N.A.

							- 4,000 seedlings in Mt. Balagbag (4.0 ha) - 4,700 seedlings in Mt. Balagbag (4.0 ha) Note: Protection and maintenance activities for the planted seedlings were completed in 2022. Coordination with DENR-NCR and Region 3 is ongoing for the official turnover of the adopted site.	
5	Loss of small swampy area used for migratory and resident birds due to development of depot	Seasonal bird count	Ocular Survey	Annually	Adjacent offset wetland of Valenzuela depot	N.A.	Bird count at the offset wetland (Tanza Marine Tree Park) are not yet conducted. The Memorandum of Agreement between DOTr and DENR-National Capital Region (NCR), and Work and Financial Plan (WFP) for the conservation of TMTP, as part of the NSCR offset wetland management project, is already signed. Disbursement of Fund to DENR is currently being processed. Bird count will be conducted once TMTP project is implemented. **See Annex D** for copy of signed MOA	N.A.

(2) Impact on Water

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Baseline		Latest Monitoring Result in 2nd Quarter of 2023	
							Feasibility Study Phase (2013)	Pre-construction Phase (2019)	Result (Annex E)[1]	Monitoring Date
1	Increase in suspended solid of receiving water/ pollution of receiving water bodies	1. pH 2. DO 3. Oil & Grease 4. BOD 5. Fecal 6. TSS	Water sampling (DAO 34-1990), DENR-EMB Manual for Ambient Water Quality Monitoring Volume I (2008), and Water Quality Guidelines and General Effluent Standards of (DAO 2016-08)	Quarterly	1. Guiguinto River 14.830339 N; 120.878609 E	For Class "C" freshwater[2]: 1. pH: 6.5 to 9.0 2. DO: 5.0 mg/L 3. Oil & Grease: 2.0 mg/L 4. BOD: 7.0 mg/L 5. Fecal Coliform: 200 MPN/100mL 6. TSS: 80 mg/L	Guiguinto River 1. pH: 8.8 2. DO: 2.3 mg/L 3. Oil & Grease: 0.8 mg/L 4. BOD: 12 mg/L 5. Fecal Coliform: 44 MPN/100mL 6. TSS: N.A.	Guiguinto River 1. pH: 7.43 2. DO: ND 3. Oil & Grease: ND 4. BOD: 3.26 mg/L 5. Fecal Coliform: $4.9x10^3$ MPN/100mL 6. TSS: 8.6 mg/L	Guiguinto River 1. pH: 7.08 2. DO: 0.25 mg/L 3. Oil & Grease: ND 4. BOD: 19.9 mg/L 5. Fecal Coliform: 28,000 MPN/100mL 6. TSS: 7.75 mg/L	Guiguinto River: 20 April 2023
					2. Santol (Balagtas) River 14.818506 N; 120.913071 E		Santol (Balagtas) River 1. pH: 7.6 2. DO: 4.5 mg/L 3. Oil & Grease: 0.6 mg/L 4. BOD: 2 mg/L 5. Fecal Coliform: $1.3x10^4$ MPN/100mL 6. TSS: 8.8 mg/L	Santol (Balagtas) River 1. pH: 7.63 2. DO: 2.39 mg/L 3. Oil & Grease: ND 4. BOD: 8.01 mg/L 5. Fecal Coliform: $3.5x10^3$ MPN/100mL 6. TSS: 26.3 mg/L	Santol (Balagtas) River: 1. pH: 7.29 2. DO: 2.86 mg/L 3. Oil & Grease: ND 4. BOD: 45.6 mg/L 5. Fecal Coliform: 54,000 MPN/100 mL 6. TSS: 27.1 mg/L	Santol(Balagtas) River: 20 April 2023
					3. Bocaue River 14.80575 N; 120.9268 E		Bocaue River: 1. pH: 7.9 2. DO: 8.2 mg/L 3. Oil & Grease: 0.7 mg/L 4. BOD: 4 mg/L 5. Fecal Coliform: $3.5x10^4$ MPN/100mL 6. TSS: 44 mg/L	Bocaue River: 1. pH: 7.4 2. DO: 7.2 mg/L 3. Oil & Grease: 3 mg/L 4. BOD: 12 mg/L 5. Fecal Coliform: $3.3x10^4$ MPN/100mL 6. TSS: 46 mg/L	Bocaue River: 1. pH: 7.00 2. DO: 6.7 mg/L 3. Oil & Grease: <0.004 mg/L 4. BOD: 240 mg/L 5. Fecal Coliform: 4.9×10^6 MPN/100mL 6. TSS: 3.57 mg/L	Bocaue River: 18 May 2023

1 **Annex B** and **C** presents some measures implemented on-site to mitigate possible impact on water quality.
2 DAO 2016-08: Water Quality Guidelines and Effluent Standards of 2016

					4. Marilao River 14.76135 N; 120.9507 E		Marilao River: 1. pH: 7.8 2. DO: 7.1 mg/L 3. Oil & Grease: 0.8 mg/L 4. BOD: 8 mg/L 5. Fecal Coliform: $3.5x10^4$ MPN/100mL 6. TSS: 36 mg/L	Marilao River: 1. pH: 7.6 2. DO: 7 mg/L 3. Oil & Grease: <1 mg/L 4. BOD: 18 mg/L 5. Fecal Coliform: $3.1x10^5$ MPN/100mL 6. TSS: 17 mg/L	Marilao River: 1. pH: 7.06 2. DO: 4.7 mg/L 3. Oil & Grease: 0.005 mg/L 4. BOD: 266 mg/L 5. Fecal Coliform: 5.4×10^8 MPN/100mL 6. TSS: 1.03 mg/L	Marilao River: 17 May 2023
					5. Meycauayan River 14.73063 N; 120.9644 E		Meycauayan River: 1. pH: 7.4 2. DO: <2.0 mg/L 3. Oil & Grease: 0.6 mg/L 4. BOD: 9 mg/L 5. Fecal Coliform: N.A. 6. TSS: 17 mg/L	Meycauayan River: 1. pH: 7.5 2. DO: 6.8 mg/L 3. Oil & Grease: <1 mg/L 4. BOD: 25 mg/L 5. Fecal Coliform: $1.3x10^6$ MPN/100mL 6. TSS: 33 mg/L	Meycauayan River: 1. pH: 7.03 2. DO: 7.4 mg/L 3. Oil & Grease: 0.01 mg/L 4. BOD: 371 mg/L 5. Fecal Coliform: 1.6×10^8 MPN/100mL 6. TSS: 4.84 mg/L	Meycauayan River: 17 May 2023
					6. Valenzuela Depot 14.713699 N; 120.961019 E		Valenzuela Depot: 1. pH: 6.6 2. DO: <2.0 mg/L 3. Oil & Grease: 0.7 mg/L 4. BOD: 55 mg/L 5. Fecal Coliform: N.A. 6. TSS: 9 mg/L	Valenzuela Depot: 1. pH: 7.6 2. DO: 4.2 mg/L 3. Oil & Grease: 2 mg/L 4. BOD: 65 mg/L 5. Fecal Coliform: $4.9x10^5$ MPN/100mL 6. TSS: 9 mg/L	Valenzuela Depot: 1. pH: 6.72 2. DO: 3.1 mg/L 3. Oil & Grease: 0.008 mg/L 4. BOD: 240 mg/L 5. Fecal Coliform: $7.9x10^6$ MPN/100mL 6. TSS: 0.079 mg/L	Valenzuela Depot: 18 May 2023
					7. Tullahan River 14˚40.672'N 120˚58.315'E		Tullahan River[3] - N.A.	Tullahan River - N.A.	Tullahan River - N.A.	Tullahan River: N.A.
					8. Estero de Maypajo 14˚38.113'N 120˚58.6'E		Estero de Maypajo - N.A	Estero de Maypajo - N.A.	Estero de Maypajo - N.A.	Estero de Maypajo: N.A.

3 Water quality monitoring was not conducted at Tullahan River, and Estero de Maypajo since Section1 of Contract Package 01 and Contract Package 05 are not yet handed over to the contractor.

(3) Impact on Air

No.	Potential Impact	Parameter	Method	Frequency	Location[4]	Standard	Baseline		Latest Monitoring Result in 2nd Quarter of 2023	
							Feasibility Study Phase[5]	Pre-construction Phase (2019)	Result[6,7] (Annex F)	Monitoring Date
1	Generation of dust and particulate matter, and gas emissions.	1. TSP 2. $PM_{2.5}$ 3. PM_{10} 4. NO_2 5. SO_2,	Clean Air Act of 1999 (RA 8749) 1. TSP: High Volume Gravimetric Method 2. $PM_{2.5}$: High Volume w/2.5-micron particle size inlet, Gravimetric 3. PM_{10}: High Volume w/10-micron particle-size inlet, Gravimetric 4. SO_2: Pararosaniline Method 5. NO_2: Griess Saltzman	Quarterly, immediately based on complaints	1. Malolos 14°51'14.53"N 120°48'50.96"E	**National Ambient Air Quality Guideline Values (NAAQGV)** **24-Hr Monitoring:** 1. TSP:230 µg/Ncm 2. $PM_{2.5}$:50 µg/Ncm[8] 3. PM_{10}: 150 µg/Ncm 4. SO_2: 180 µg/Ncm 1. NO_2: 150 µg/Ncm **National Ambient Air Quality for Source-Specific Air Pollutants from Industrial Sources / Operations** **1-Hr Monitoring:** 2. TSP:300 µg/Ncm 3. $PM_{2.5}$: N.A 4. PM_{10}:200 µg/Ncm 5. SO_2: 340 µ/Ncm 6. NO_2: 260 µ/Ncm	**24-Hr Monitoring:** Malolos (2012): 1. TSP: 95 µg/Ncm 2. $PM_{2.5}$: N.A. 3. PM_{10}: 61.8 µg/Ncm 4. NO_2: 3.093 µg/Ncm 5. SO_2,: <0.05 µg/Ncm 1. TSP: 585 µg/Ncm 2. $PM_{2.5}$: N.A. 3. PM_{10}: 91.3 µg/Ncm 4. NO_2: 2.7 µg/Ncm 5. SO_2,: <0.05 µg/Ncm	**24-Hr Monitoring:** Malolos: 1. TSP: 297 µg/Ncm 2. $PM_{2.5}$: 94.1 µg/Ncm 3. PM_{10}: 198 µg/Ncm 4. NO_2: 18.9 µg/Ncm 5. SO_2,: <25.5 µg/Ncm	**24-Hr Monitoring:** Malolos: 1. TSP: 89.0 µg/Ncm 2. PM_{10}: 60.8 µg/Ncm 3. $PM_{2.5}$: 28.7 µg/Ncm 4. SO_2,: <13.80 µg/Ncm 5. NO_2: 4.66 µg/Ncm	**24-Hr Monitoring:** Malolos: 06 June 2023
					2. Guiguinto 14°49'31.06"N 120°54'21.05"E		Guiguinto (2013): 1. TSP: 20.20 µg/Ncm 2. $PM_{2.5}$: N.A. 3. PM_{10}: 26.83 µg/Ncm 4. NO_2: 8.67 µg/Ncm 5. SO_2,: 3.68 µg/Ncm	Guiguinto: 1. TSP: 188 µg/Ncm 2. $PM_{2.5}$:<47.2 µg/Ncm 3. PM_{10}: 187 µg/Ncm 4. NO_2: 11.3 µg/Ncm 5. SO_2,: <25.5 µg/Ncm	Guiguinto and Malolos Boundary: 1. TSP: 44.2 µg/Ncm 2. PM_{10}: 30.4 µg/Ncm 3. $PM_{2.5}$: 15.1 µg/Ncm 4. SO_2,: <13.70 µg/Ncm 5. NO_2: < 3.03 µg/Ncm	Guiguinto and Malolos Boundary: 07 June 2023
					3. Balagtas 14°50'21.90"N 120°51'31.28"E		Balagtas: N.A.	Balagtas: 1. TSP: 271 µg/Ncm 2. $PM_{2.5}$: 67.9 µg/Ncm 3. PM_{10}: 189 µg/Ncm 4. NO_2: 19.7 µg/Ncm 5. SO_2,: 25.7 µg/Ncm	Balagtas: 1. TSP: 35.0 µg/Ncm 2. PM_{10}: 24.0 µg/Ncm 3. $PM_{2.5}$: 12.2 µg/Ncm 4. SO_2,: <13.80 µg/Ncm 5. NO_2: 14.5 µg/Ncm	Balagtas: 08 June 2023
					4. Bocaue 14°48'2"N 120°55'53"E		Bocaue (2012): 1. TSP: 133 µg/Ncm 2. $PM_{2.5}$: N.A. 3. PM_{10}: 67.9 µg/Ncm 4. NO_2: 2.7 µg/Ncm 5. SO_2,: <0.05 µg/Ncm	Bocaue: 1. TSP: 98.8 µg/Ncm 2. $PM_{2.5}$: 17.3 µg/Ncm 3. PM_{10}: 43.8 µg/Ncm 4. NO_2: 3.6 µg/Ncm 5. SO_2,: 1.0 µg/Ncm	Bocaue: 1. TSP: 45.25 µg/Ncm 2. PM_{10}: 26.49 µg/Ncm 3. $PM_{2.5}$: 26.2 µg/Ncm 4. SO_2,: 1.85 µg/Ncm 5. NO_2: 11.86 µg/Ncm	Bocaue: 18 May 2023

4 Indicates the location of the 2021 1st quarter air quality monitoring station.
5 Source: NSCR EPRMP, March 2015
6 Ambient air quality monitoring was not conducted in Caloocan, Manila, Solis and Tutuban stations since Section1 of Contract Package 01 and Contract Package 05 are not yet handed over to the contractor.
7 Dust mitigation measures are presented in **Annex G.**
8 DAO 2013-13 – Establishing the Provisional National Ambient Air Quality Guideline Values for Particulate Matter 2.5 ($PM_{2.5}$)

			Reaction				1. TSP: 145 µg/Ncm 2. $PM_{2.5}$: N.A. 3. PM_{10}: 104.4 µg/Ncm 4. NO_2: 2.7 µg/Ncm 5. SO_2,: <0.05 µg/Ncm			
					5. Marilao 14°45'44"N 120°57'2"E		Marilao: N.A.	Marilao: 1. TSP: 55.2 µg/Ncm 2. $PM_{2.5}$: 6.1 µg/Ncm 3. PM_{10}: 47.5 µg/Ncm 4. NO_2: 4.1 µg/Ncm 5. SO_2,: 0.6 µg/Ncm	Marilao: 1. TSP: 35.88 µg/Ncm 2. PM_{10}: 13.13 µg/Ncm 3. $PM_{2.5}$: 21.27 µg/Ncm 4. SO_2,: 1.86 µg/Ncm 5. NO_2: 9.29 µg/Ncm	Marilao: 17 May 2023
					6. Meycauayan 14°44'20"N 120°57'39.32"E		Meycauayan: N.A.	Meycauayan: 1. TSP: 61.6 µg/Ncm 2. $PM_{2.5}$: 14.6 µg/Ncm 3. PM_{10}: 15 µg/Ncm 4. NO_2: 5.1 µg/Ncm 5. SO_2,: 0.8 µg/Ncm	Meycauayan: 1. TSP: 33.58 µg/Ncm 2. PM_{10}: 16.79 µg/Ncm 3. $PM_{2.5}$: 24.29 µg/Ncm 4. SO_2,: 2.10 µg/Ncm 5. NO_2: 14.35 µg/Ncm	Meycauayan: 16 May 2023
					7. Valenzuela 14˚42'51" N 120°57'39"E		Valenzuela (2013): 1. TSP: 37.52 µg/Ncm 2. $PM_{2.5}$: N.A. 3. PM_{10}: 49.68 µg/Ncm 4. NO_2: 10.43 µg/Ncm 5. SO_2,: 3.96 µg/Ncm	Valenzuela: 1. TSP: 27.3 µg/Ncm 2. $PM_{2.5}$: 5.3 µg/Ncm 3. PM_{10}: 12.5 µg/Ncm 4. NO_2: 4.9 µg/Ncm 5. SO_2,: 1.2 µg/Ncm	Valenzuela: 1. TSP: 43.4 µg/Ncm 2. PM_{10}: 13.21 µg/Ncm 3. $PM_{2.5}$: 17.98 µg/Ncm 4. SO_2,: 2.20 µg/Ncm 5. NO_2: 6.38 µg/Ncm	Valenzuela: 15 May 2023
					8. Caloocan 14˚39'28.3" N 120°58'26.2"E		Caloocan (2014): 1. TSP: 97.28 µg/Ncm 2. $PM_{2.5}$: N.A. 3. PM_{10}: 97.60 µg/Ncm 4. NO_2: 30.81 µg/Ncm 5. SO_2,: 15.53 µg/Ncm 1. TSP: 86.3 µg/Ncm 2. $PM_{2.5}$: N.A. 3. PM_{10}: 30.5 µg/Ncm 4. NO_2: 10.6 µg/Ncm 5. SO_2,: 0.4 µg/Ncm	Caloocan – N.A.	Caloocan – N.A.	Caloocan: N.A.
					9. Manila 14˚37'26.75" N 120°58'25.52"E		Manila – N.A.	Manila – N.A.	Manila – N.A.	Manila – N.A.
					10. Solis 14˚37'56" N 120°58'34.6"E		Solis (2014). 1. TSP: 84.6 µg/Ncm 2. $PM_{2.5}$: N.A. 3. PM_{10}: 30.5 µg/Ncm 4. NO_2: 10.9 µg/Ncm	Solis – N.A.	Solis – N.A.	Solis – N.A.

							5. $SO_{2,}$: 0.9 µg/Ncm			
					11. Tutuban 14˚36'22" N 120°58'17"E		Tutuban (2014): 1. TSP: 81.3 µg/Ncm 2. $PM_{2.5}$: N.A. 3. PM_{10}: 46.7 µg/Ncm 4. NO_2: 12.7 µg/Ncm **5.** $SO_{2,}$: 2.3 µg/Ncm	Tutuban – N.A.	Tutuban – N.A.	Tutuban – N.A.

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard[9]	Baseline		Latest Monitoring Result in 2nd Quarter of 2023	
							Feasibility Study Phase[10]	Pre-construction Phase (2019)	Result (Annex H)[11]	Monitoring Date
2	Noise pollution	Noise level	Noise level meter	Monthly, immediately based on complaints	Westside of NSCR alignment, residential area, Taal, Bocaue*	Class 3-4 - Morning: 75 dB - Daytime: 75 dB - Evening: 75 dB - Nighttime: 75 dB	N.A.	N.A.	- Morning: 68.3 dB - Daytime: 69.7 dB - Evening: 65.1 dB - Nighttime: 65.7 dB	21-22 April 2023
									- Morning: 68.0 dB - Daytime: 67.4 dB - Evening: 62.1 dB - Nighttime: 64.5 dB	12-13 May 2023
									- Morning: 68.3 dB - Daytime: 69.0 dB - Evening: 65.7 dB - Nighttime: 64.8 dB	09-10 June 2023
					Westside of NSCR alignment, inside Violeta Metroville Homes, Biñang 2nd, Bocaue*	Class 3-4 - Morning: 75 dB - Daytime: 75 dB - Evening: 75 dB - Nighttime: 75 dB			- Morning: 61.6 dB - Daytime: 63.6 dB - Evening: 56.6 dB - Nighttime: 58.9 dB	20-21 April 2023
									- Morning: 63.6 dB - Daytime: 61.0 dB - Evening: 55.3 dB - Nighttime: 58.8 dB	11-12 May 2023
									- Morning: 60.5 dB - Daytime: 61.4 dB - Evening: 55.8 dB - Nighttime: 56.9 dB	08-09 June 2023

9 Environmental Quality Standards for Noise in General Areas (NPCC, Memorandum Circular No. 002 Series of 1980). Note: For stations which indicates "Class 3-4; Class A", Standard for 'Class 3-4 Construction activities' was adopted for Morning and Daytime, and Standard for 'Class A General Areas' was adopted during Evening and Nighttime. Also, a corrective factor was applied for stations directly facing 2-lane and 4 or more-lane road as indicated in the NPCC MC No. 1980-002.

10 Source: NSCR EPRMP, March 2015

					Tabig Ilog Elementary School, Marilao	Class AA - Morning: 45 dB - Daytime: 50 dB - Evening: 45 dB - Nighttime: 40 dB	N.A.	- Morning: 77.8 dB - Daytime: 78.93 dB - Evening: 76.8 dB - Nighttime: 68.42 dB	N.A.	N.A.
					Abangan Norte Elementary School, Marilao	Class AA - Morning: 45 dB - Daytime: 50 dB - Evening: 45 dB - Nighttime: 40 dB	N.A.	- Morning: 70.1 dB - Daytime: 71.84 dB - Evening: 70.83 dB - Nighttime: 63.5 dB	N.A.	N.A.
					Eastside of NSCR alignment (Near Medallion Homes), Marilao	Class 3-4 - Morning: 75 dB - Daytime: 75 dB - Evening: 75 dB - Nighttime: 75 dB	N.A.	N.A	- Morning: 72.5 dB - Daytime: 74.1 dB - Evening: 69.9 dB - Nighttime: 68.3 dB - Morning: 68.4 dB - Daytime: 69.6 dB - Evening: 66.1 dB - Nighttime: 64.0 dB - Morning: 71.4 dB - Daytime: 69.8 dB - Evening: 67.4 dB - Nighttime: 65.6 dB	19-20 April 2023 10-11 May 2023 07-08 June 2023
					Near St. Mary Meycauayan College	Class AA - Morning: 55 dB - Daytime: 60 dB - Evening: 55 dB - Nighttime: 50 dB	N.A.	- Morning: 86.45 dB - Daytime: 86.0 dB - Evening: 87.760 dB - Nighttime: 86.90 dB	N.A.	N.A.

					Front of Meycauayan College	Class AA - Morning: 45 dB - Daytime: 50 dB - Evening: 45 dB - Nighttime: 40 dB	N.A.	- Morning: 86.28 dB - Daytime: 86.58 dB - Evening: 86.73 dB - Nighttime: 86.41 dB	N.A.	N.A.
					Eastside of Old PNR Meycauayan, near Little Grace Park Subd., Malhakan, Meycauayan, Bulacan	Class 3-4 - Morning: 75 dB - Daytime: 75 dB - Evening: 75 dB - Nighttime: 75 dB	N.A.	N.A.	- Morning: 64.7 dB - Daytime: 64.4 dB - Evening: 66.0 dB - Nighttime: 63.8 dB - Morning: 65.2 dB - Daytime: 67.3 dB - Evening: 69.1 dB - Nighttime: 60.6 dB - Morning: 64.8 dB - Daytime: 66.0 dB - Evening: 63.8 dB - Nighttime: 60.7 dB	18- 19 April 2023 09- 10 May 2023 06-07 June 2023
					Residential area, Eastside of Depot, Viente Reales, Valenzuela City:	Class 3-4 - Morning: 75 dB - Daytime: 75 dB - Evening: 75 dB - Nighttime: 75 dB	N.A.	N.A.	- Morning: 60.5 dB - Daytime: 62.8 dB - Evening: 64.1 dB - Nighttime: 57.3 dB - Morning: 59.0 dB - Daytime: 62.2 dB - Evening: 66.2 dB - Nighttime: 58.1 dB - Morning: 61.8 dB - Daytime: 68.1 dB - Evening: 65.8 dB - Nighttime: 60.0 dB	17-18 April 2023 15-16 May 2023 05-06 June 2023

					Malinta Elementary School	Class AA - Morning: 45 dB - Daytime: 50 dB - Evening: 45 dB - Nighttime: 40 dB	N.A.	Inside Malinta Elementary School (Class AA): - Morning: 65.25 dB - Daytime: 60.88 dB - Evening: 66.85 dB - Nighttime: 61.61 dB Outside campus Malinta Elementary School - Morning: 85.68 dB - Daytime: 85.53 dB - Evening: 85.3 dB - Nighttime: 85.86 dB	N.A.	N.A.
					Holy Infant Elementary School, Malolos	Class 3-4 - Morning: 75 dB - Daytime: 75 dB - Evening: 75 dB - Nighttime: 75 dB	N.A.	- Morning: 66.62 dB - Daytime: 65.71 dB - Evening: 67.05 dB - Nighttime: 64.7 dB	- Morning: 72.3 dB - Daytime: 74.4 dB - Evening: 71.3 dB - Nighttime: 66.8 dB - Morning: 73.8 dB - Daytime: 74.1 dB - Evening: 72.3 dB - Nighttime: 67.4 dB - Morning: * - Daytime: - Evening: - Nighttime:	17-18 April 2023 09-10 May 2023 06-07 June 2023

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Baseline		Latest Monitoring Result in 2nd Quarter of 2023	
							Feasibility Study Phase[12]	Pre-construction Phase (2019)	Result (Annex I)	Monitoring Date
3	Increase in ground vibration level due to the operation of heavy equipment and machinery	Vibration level	Vibration level meter	Quarterly, immediately based on complaints	Holy Infant School, Malolos City (Category 3)	**Perceptive threshold of vibration for Human[13]** 55 VdB or 0.0056 m/s^2	N.A.	- Daytime: 0.69 mm/s or 0.00069 m/s2	- * m/s^2	20 April 2023 Waiting for report
					Westside of NSCR alignment, inside Violeta Metroville Homes, Biñang 2nd, Bocaue (alternative station)		N.A.	N.A.	Morning - x: 0.0009 m/s2 y: 0.0009 m/s2 z: 0.0024 m/s2 Day - x: 0.0010 m/s2 y: 0.0011 m/s2 z: 0.0032 m/s2 Evening - x: 0.0012 m/s2 y: 0.0008 m/s2 z: 0.0041 m/s2 Nighttime - x: 0.0005 m/s2 y: 0.0004 m/s2 z: 0.0008 m/s2	08-09 May 2023

12 Source: NSCR EPRMP, March 2015

13 In the absence of a standard for vibration in the Philippines, the Project adopted the Perceptive threshold of vibration for human referenced from the "Technology and Laws Regulation for Pollution Control, 2000" Japan Environmental Management Association for Industry" as indicated in the EPRMP

					Westside of NSCR alignment, residential area, Taal, Bocaue		N.A.	N.A	Morning - x: 0.0011 m/s2 y: 0.0020 m/s2 z: 0.0062 m/s2 Day - x: 0.0009 m/s2 y: 0.0022 m/s2 z: 0.0065 m/s2 Evening - x: 0.0022 m/s2 y: 0.0021 m/s2 z: 0.0050 m/s2 Nighttime - x: 0.0007 m/s2 y: 0.0006 m/s2 z: 0.0033 m/s2	12-13 May 2023
					Tabing Ilog Elementary School, Marilao (Category 3):		N.A.	- Morning: 63 VdB - Daytime: 70 VdB - Evening: 68 VdB - Nighttime: 60VdB	N.A.	N.A.
					Abangan Norte Elementary School, Marilao (Category 3)		N.A.	- Morning: 53 VdB - Daytime: 63 VdB - Evening: 57 VdB - Nighttime: 56 VdB	N.A.	N.A.

					Eastside of NSCR alignment, Residential area, Medallion Subd., Ibayo, Marilao (alternative station)		N.A.	N.A.	Morning - x: 0.0039 m/s2 y: 0.0012 m/s2 z: 0.0011 m/s2 Day - x: 0.0017 m/s2 y: 0.0015 m/s2 z: 0.0012 m/s2 Evening - x: 0.0012 m/s2 y: 0.0010 m/s2 z: 0.0013 m/s2 Nighttime - x: 0.0007 m/s2 y: 0.0011 m/s2 z: 0.0009 m/s2	10-11 May 2023
					St. Mary Meycauayan College (Category 3)		N.A.	- Morning: 72 VdB - Daytime: 76 VdB - Evening: 77 VdB - Nighttime: 78 VdB	N.A.	N.A.
							N.A.	Meycauayan College (Category 3): - Morning: 66 VdB - Daytime: 68 VdB - Evening: 70 VdB - Nighttime: 67 VdB	N.A.	N.A.

					A6 Eastside of Old PNR Meycauayan, near Little Grace Park Subd., Malhakan, Meycauayan, Bulacan (alternative station)		N.A.	N.A.	Morning - x: 0.0016 m/s2 y: 0.0012 m/s2 z: 0.0094 m/s2 Day - x: 0.0018 m/s2 y: 0.0029 m/s2 z: 0.0192 m/s2 Evening - x: 0.0012 m/s2 y: 0.002 m/s2 z: 0.0154 m/s2 Nighttime - x: 0.0015 m/s2 y: 0.0010 m/s2 z: 0.0129m/s2	09-10 May 2023
					Malinta Elementary School, Valenzuela City (Category 3)		Valenzuela: - ND	- Morning: 59 VdB - Daytime: 57 VdB - Evening: 58 VdB - Nighttime: 55 VdB	N.A.	N.A.
					A5 Residential area, Eastside of Depot, Viente Reales, Valenzuela City (alternative station)		N.A.	N.A	Morning - x: 0.0049 m/s2 y: 0.0059 m/s2 z: 0.0039 m/s2 Daytime: - x: 0.0035 m/s2 y: 0.0043 m/s2 z: 0.0039 m/s2 Evening - x: 0.0039 m/s2 y: 0.0052 m/s2 z: 0.0044 m/s2 Nighttime - x: 0.0068 m/s2 y: 0.0083 m/s2 z: 0.0061 m/s2	08-09 May 2023
					Old PNR Stations		N.A.	Malolos Old PNR Station	Point 1 - * m/s^2	20 April 2023 Waiting for report

					Malolos Old PNR Station (Category 3)			(Category 3): - Daytime: 0.76 mm/s	Point 2 - * m/s^2 -	
					Guiguinto Old PNR Station (Category 3):		Guiguinto Old PNR Station (Category 1): - 0.002 mm/s^2	Guiguinto Old PNR Station (Category 3): - Daytime: 0.56 mm/s	Point 1 - * m/s^2 Point 2 - * m/s^2	20 April 2023 Waiting for report
					Balagtas Old PNR Station (Category 3)		N.A.	Balagtas Old PNR Station (Category 3): - Daytime: 0.38 mm/s	Point 1 - * m/s^2 Point 2 * m/s^2	20 April 2023 Waiting for report
					Meycauayan Old PNR Station (Category 3)		N.A.	Meycauayan Old PNR Station (Category 3):[14] - Morning: 83 VdB - Daytime: 84.67 VdB - Evening: 84.33 VdB - Nighttime:83.33 VdB	N.A.	N.A.
					Valenzuela Old PNR Station (Category 3)		N.A.	Valenzuela Old PNR Station (Category 3): [15] - Morning: 83.67 VdB - Daytime: 85.33 VdB - Evening: 84.67 VdB - Nighttime:84.00 VdB	N.A.	N.A.

14 Date of Sampling: January 2020
15 Date of Sampling: January 2020
18 In the absence of standard for vibration in the Philippines, the Project adopted the Perceptive threshold of vibration for human referenced from the "Technology and Laws Regulation for Pollution Control, 2000" Japan Environmental Management Association for Industry as indicated in the EPRMP.
Based on the result of monitoring conducted on 06-11 February 2023 (CP01), the vibration levels vary from 55 VdB to 62 VdB.(0.0063 m/s2- 0.0126 m/s2) These values are generally low and are not considered as annoyance to residential areas. Below are the monitoring period and monitoring stations.

(4) Impact on People

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Latest Monitoring Result in 2nd Quarter 2023	
							Result	Monitoring Date
1	Traffic conditions	Traffic flow (congestion)	Ocular inspection	Weekly	A major intersection in the vicinity of constriction sites	N.A.	To manage traffic flow, the contractors provided flagmen with proper traffic gears, and cautionary signages. **Contract Package 01** Provision of flagmen with proper traffic gears: 1. Mc Arthur Hi-way, Malinta, Valenzuela City – 2 (On an 8-hour shift with night duty flagman). 2. ACA Rd, Brgy Malanday, Valenzuela City – 4 (Flagman is on a 4-hour shift, two shifts per day). 3. Bancal, Meycauayan, Bulacan - 2 (Flagman is on a 4-hour shift, two shifts per day) 4. CW3 Entrance- 2 (On an 8-hour shift with night duty flagman) 5. Gov. Halili Ave., Biñang 2nd, Bocaue-4 flagmen (Deployment during the PC Segment Erection with day and night shifts) 6. Ciudad de Victoria (CDV) Bypass Road – 2 flagmen (Deployment during the PC Segment Erection with day and night shifts) 7. Meycauayan Traffic and Parking Bureau has 5 personnel deployed to assist in the delivery of segments.	N.A.

							8. Marilao Traffic Sector has 5 traffic enforcers- assisting the delivery of segments and are on an on-call status, when needed can be deployed to assist and manage traffic at their AOR. 9. Bocaue Traffic Management Division has 5 10. Traffic Enforcers - deployed to assist traffic management during the deliveries of segments. **Contract Package 02** Provisions being implemented on site such as cautionary signages, re-routing schemes, banksmen, traffic assessment and traffic engineering works. Traffic Management Officer is full time designated on site. Conducted monthly traffic impact assessment at Malolos, Guiguinto, and Balagtas area along major routes of third-party vehicles as required by DOTr. Malolos, Guiguinto and Balagtas Project Site have pedestrian access routes. Each Site has 10, 15, and 8, respectively. TMP provisions the placement of traffic and safety signages and deployment of flagmen in all road intersections of the transportation route. See **Annex J**	

2	Loss of old PNR stations	Status of old PNR stations	Ocular inspection and Monitoring	Monthly until preservation work of station is completed	Malolos Station, Guiguinto Station, Bigaa station.,Meycauayan Station, Polo/Valenzuela Station, and Tutuban Station	Status of old PNR stations	See **Annex K** for the observations and findings during inspections.	Valenzuela Old PNR Station: 20 April 2023 25 May 2023 29 June 2023 Meycauayan Old PNR Station: 20 April 2023 25 May 2023 29 June 2023 Bigaa (Balagtas) Old PNR Station: 14 April 2023 16 May 2023 26 June 2023 Guiguinto Old PNR Station: 14 April 2023 16 May 2023 26 June 2023 Malolos Old PNR Station: 14 April 2023 16 May 2023 26 June 2023

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