n. Annex II Attachment 14-6

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

1. General Information

a. Environmental Monitoring Results: 1st Quarter of 2024

b. Date of Preparing This form: 15 April 2024

c. Person Preparing This form: Environmental Consideration 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 1st Quarter of 2024	
							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 the mechanical equipment. See **Annex A**	Environmental Walkthrough Dates: 09, 15, 22 & 25 January 2024; 12, 13 & 20 February 2024; 4, 5, 18 & 19 March 2024
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 German Federal Soil Protection and Contaminated Site Ordinance: 200 mg/kg DAO 2013-22: <1 mg/L	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 Facility. Certificate of Treatment was provided in previous reports	N.A.

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Latest Monitoring Result in 1st Quarter of 2024	
							Result	Monitoring Date
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: 804.453 tons/quarter - Recyclable: 395.978 tons/quarter - Biodegradable: 14.182 tons/quarter - Residual: 394.293 tons/quarter	N.A.

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Latest Monitoring Result in 1st Quarter of 2024	
							Result	Monitoring Date
							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: 0.898 ton - Lead Compounds: 0.361 ton - Used Industrial Oil including sludge: 6.800 tons - Oil Contaminated materials: 0.564 ton - Containers previously cont. toxic chemicals: 7.555 ton - Waste Electrical and Electronic Equipment: 0.091 ton - Pathological Waste: 0.047 ton - Solvent Based: 10.0 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	

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Latest Monitoring Result in 1st Quarter of 2024	
							Result	Monitoring Date
							portalets) are siphoned regularly twice a week by a licensed sewage treater service (Soliman, New Ezkleen, and Envirokonsult). 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 the two transplanted trees survived. 2. CP02 2.1 Replacement seedlings - 33,650 seedlings in Mt. Balagbag (52.8 ha)* - 4,000 seedlings in Mt. Balagbag (4.0 ha)* - 4,700 seedlings in Mt. Balagbag (4.0 ha) Note: *Protection and maintenance already done in 2021. Note: Protection and maintenance	N.A.

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Latest Monitoring Result in 1st Quarter of 2024	
							Result	Monitoring Date
							activities for the planted seedlings were completed in 2022. DENR-NCR and DENR-Region 3, through CENRO Guiguinto, issued a Certificate of Completion for the Planting and Maintenance Activities. Copy of Certificate of Completion annexed in the 4th quarter 2024 report.	
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 and Notarized. The documentary requirements for the Disbursement of Fund were requested to DENR-NCR on 15 September 2023. On 30 November 2023, a response letter was received from DENR-NCR. On 12 January 2024, DOTr and DENR-NCR conducted an online meeting to discuss the issues and concerns on the proposed site. Assessment for possible alternative sites for the offset wetland is ongoing.	N.A.

(2) Impact on Water

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Baseline		Latest Monitoring Result in 1st Quarter of 2024	
							Feasibility Study Phase (2013)	Pre-construction Phase (2019)	Result (Annex D)[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: 7.23 2. DO: 1.94 mg/L 3. Oil & Grease: 1.30 mg/L 4. BOD: 3.16 mg/L 5. Fecal Coliform: 22,000 MPN/100mL 6. TSS: 13.8 mg/L	Guiguinto River: 19 February 2024
					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: 7.47 2. DO: 2.06 mg/L 3. Oil & Grease: 1.74 mg/L 4. BOD: 12.2 mg/L 5. Fecal Coliform: 13,000 MPN/100 mL 6. TSS: 47.5 mg/L	Santol(Balagtas) River: 19 February 2024
					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: 7.30 2. DO: 1.2 mg/L 3. Oil & Grease: 7 mg/L 4. BOD: 59 mg/L 5. Fecal Coliform: 3,500,000 MPN/100mL 6. TSS: 18 mg/L	Bocaue River: 08 February 2024

[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

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Baseline		Latest Monitoring Result in 1st Quarter of 2024	
							Feasibility Study Phase (2013)	Pre-construction Phase (2019)	Result (Annex D)[1]	Monitoring Date
					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: 7.23 2. DO: 1.6 mg/L 3. Oil & Grease: 8 mg/L 4. BOD: 248 mg/L 5. Fecal Coliform: 230,000 MPN/100mL 6. TSS: 17 mg/L	Marilao River: 07 February 2024
					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: 7.16 2. DO: 1.8 mg/L 3. Oil & Grease: 12 mg/L 4. BOD: 283 mg/L 5. Fecal Coliform: 1,300,000 MPN/100mL 6. TSS: 21 mg/L	Meycauayan River: 07 February 2024
					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: 6.58 2. DO: 1.4 mg/L 3. Oil & Grease: 6 mg/L 4. BOD: 169 mg/L 5. Fecal Coliform: 24,000,000 MPN/ mg/L 6. TSS: 15 mg/L	Valenzuela Depot: 08 February 2024
					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.

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

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Baseline		Latest Monitoring Result in 1st Quarter of 2024	
							Feasibility Study Phase (2013)	Pre-construction Phase (2019)	Result (Annex D)[1]	Monitoring Date
					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) Impact on Air

No.	Potential Impact	Parameter	Method	Frequency	Location[4]	Standard	Baseline		Latest Monitoring Result in 1st Quarter of 2024	
							Feasibility Study Phase[5]	Pre-construction Phase (2019)	Result[6,7] (Annex E)	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 Reaction	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: 187 µg/Ncm 2. PM_{10}: 65.1 µg/Ncm 3. $PM_{2.5}$: 53.6 µg/Ncm 4. SO_2,: <13.5 µg/Ncm 5. NO_2: 50.0 µg/Ncm	**24-Hr Monitoring:** Malolos: 30 January 2024
					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: 160 µg/Ncm 2. PM_{10}: 47.6 µg/Ncm 3. $PM_{2.5}$: 39.6 µg/Ncm 4. SO_2,: <13.5 µg/Ncm 5. NO_2: < 35.3 µg/Ncm	Guiguinto and Malolos Boundary: 31 January 2024
					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: 119 µg/Ncm 2. PM_{10}: 33.8 µg/Ncm 3. $PM_{2.5}$: 29.3 µg/Ncm 4. SO_2,: <13.6 µg/Ncm 5. NO_2: 51.9 µg/Ncm	Balagtas: 01 February 2024
					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: 93.02 µg/Ncm 2. PM_{10}: 6.29 µg/Ncm 3. $PM_{2.5}$: 4.17 µg/Ncm 4. SO_2,: 1.24 µg/Ncm 5. NO_2: 16.24 µg/Ncm	Bocaue: 08 February 2024

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 is not yet handed over to the contractor.
7 Dust mitigation measures are presented in **Annex F**.
8 DAO 2013-13 – Establishing the Provisional National Ambient Air Quality Guideline Values for Particulate Matter 2.5 ($PM_{2.5}$)

No.	Potential Impact	Parameter	Method	Frequency	Location[4]	Standard	Baseline		Latest Monitoring Result in 1st Quarter of 2024	
							Feasibility Study Phase[5]	Pre-construction Phase (2019)	Result[6,7] (Annex E)	Monitoring Date
							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: 55.85 µg/Ncm 2. PM_{10}: 2.40 µg/Ncm 3. $PM_{2.5}$: 3.18 µg/Ncm 4. $SO_{2,}$: 0.78 µg/Ncm 5. NO_2: 14.69 µg/Ncm	Marilao: 07 February 2024
					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: 78.14 µg/Ncm 2. PM_{10}: 18.46 µg/Ncm 3. $PM_{2.5}$: 5.76 µg/Ncm 4. $SO_{2,}$: 1.06 µg/Ncm 5. NO_2: 21.13 µg/Ncm	Meycauayan: 06 February 2024
					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: 56.25 µg/Ncm 2. PM_{10}: 13.64 µg/Ncm 3. $PM_{2.5}$: 4.57 µg/Ncm 4. $SO_{2,}$: 1.22 µg/Ncm 5. NO_2: 18.21 µg/Ncm	Valenzuela: 05 February 2024
					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.

No.	Potential Impact	Parameter	Method	Frequency	Location[4]	Standard	Baseline		Latest Monitoring Result in 1st Quarter of 2024	
							Feasibility Study Phase[5]	Pre-construction Phase (2019)	Result[6,7] (Annex E)	Monitoring Date
					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 5. SO_2,: 0.9 µg/Ncm	Solis – N.A.	Solis – N.A.	Solis – N.A.
					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 1st Quarter of 2024	
							Feasibility Study Phase[10]	Pre-construction Phase (2019)	Result (Annex G)[11]	Monitoring Date
2	Noise pollution	Noise level	Noise level meter	Monthly, immediately based on complaints	Abangan Norte Elementary School, Marilao	Class AA - Morning: 50 dB - Daytime: 55 dB - Evening: 50 dB - Nighttime: 45 dB	N.A.	- Morning: 70.1 dB - Daytime: 71.84 dB - Evening: 70.83 dB - Nighttime: 63.5 dB	- Morning: 53.8 dB - Daytime: 61.2 dB - Evening: 56.2 dB - Nighttime: 51.4 dB	12-13 January 2024
									- Morning: 59.2 dB - Daytime: 61.8 dB - Evening: 57.2 dB - Nighttime: 54.3 dB	16-17 February 2024
									- Morning: 54.2 dB - Daytime: 57.4 dB - Evening: 53.4 dB - Nighttime: 53.6 dB	08-09 March 2024
					Tabing Ilog Elementary School, Marilao	Class AA[12] - Morning: 50 dB - Daytime: 55 dB - Evening: 50 dB - Nighttime: 45 dB	N.A.	- Morning: 77.8 dB - Daytime: 78.93 dB - Evening: 76.8 dB - Nighttime: 68.42 dB	- Morning: 67.7 dB - Daytime: 71.0 dB - Evening: 68.0 dB - Nighttime: 60.5 dB	11-12 January 2024
									- Morning: 68.5 dB - Daytime: 71.2 dB - Evening: 71.5 dB - Nighttime: 62.3 dB	14-15 February 2024
									- Morning: 69.5 dB - Daytime: 70.8 dB - Evening: 67.4 dB - Nighttime: 62.1 dB	07-08 March 2024

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

12 With Correction factor of +5 dBA applicable for areas directly facing 2-lane road

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard[9]	Baseline		Latest Monitoring Result in 1st Quarter of 2024	
							Feasibility Study Phase[10]	Pre-construction Phase (2019)	Result (Annex G)[11]	Monitoring Date
					Near St. Mary Meycauayan College	Class AA[13] - 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	- Morning: 80.0 dB - Daytime: 79.5 dB - Evening: 79.9 dB - Nighttime: 79.1 dB	10-11 January 2024
									- Morning: 80.8 dB - Daytime: 80.2 dB - Evening: 80.5 dB - Nighttime: 79.3 dB	15-16 February 2024
									- Morning: 79.8 dB - Daytime: 78.9 dB - Evening: 79.5 dB - Nighttime: 79.1 dB	06-07 March 2024
					Front of Meycauayan College	Class AA[14] - Morning: 55 dB - Daytime: 60 dB - Evening: 55 dB - Nighttime: 50 dB	N.A.	- Morning: 86.28 dB - Daytime: 86.58 dB - Evening: 86.73 dB - Nighttime: 86.41 dB	- Morning: 80.2 dB - Daytime: 79.9 dB - Evening: 79.8 dB - Nighttime: 78.5 dB	09-10 January 2024
									- Morning: 81.1 dB - Daytime: 80.2 dB - Evening: 80.4 dB - Nighttime: 78.4 dB	13-14 February 2024
									- Morning: 80.0 dB - Daytime: 79.8 dB - Evening: 80.4 dB - Nighttime: 78.2 dB	05-06 March 2024
					Malinta Elementary School	Class AA - Morning: 45 dB - Daytime: 50 dB	N.A.	Inside Malinta Elementary School (Class AA): - Morning: 65.25 dB	- Morning: 61.9 dB - Daytime: 63.9 dB - Evening: 57.3 dB - Nighttime: 51.2 dB	08-09 January 2024

[13] With Correction factor of +10 dBA applicable for areas directly facing 4-lane or wider
[14] With Correction factor of +10 dBA applicable for areas directly facing 4-lane or wider

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard[9]	Baseline		Latest Monitoring Result in 1st Quarter of 2024	
							Feasibility Study Phase[10]	Pre-construction Phase (2019)	Result (Annex G)[11]	Monitoring Date
						- Evening: 45 dB - Nighttime: 40 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	- Morning: 63.0 dB - Daytime: 60.5 dB - Evening: 58.1 dB - Nighttime: 53.4 dB - Morning: 63.4 dB - Daytime: 63.4 dB - Evening: 56.9 dB - Nighttime: 50.9 dB	12-13 February 2024 04-05 March 2024
					Holy Infant Elementary School, Malolos	Class AA[15] - Morning: 50 dB - Daytime: 55 dB - Evening: 50 dB - Nighttime: 45 dB	N.A.	- Morning: 66.62 dB - Daytime: 65.71 dB - Evening: 67.05 dB - Nighttime: 64.7 dB	- Morning: 61.2 dB - Daytime: 59.9 dB - Evening: 59.2 dB - Nighttime: 57.1 dB - Morning: 62.5 dB - Daytime: 60.2 dB - Evening: 61.1 dB - Nighttime: 58.3 dB - Morning: 65.1 dB - Daytime: 63.3 dB - Evening: 60.7 dB - Nighttime: 56.3 dB	16-17 January 2024 15-16 February 2024 05-06 March 2024

[15] Additional +5 dBA since the sampling point is located beside/facing the access road which is also connected to the T-intersection highway (4 lanes)

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Baseline		Latest Monitoring Result in 1st Quarter of 2024	
							Feasibility Study Phase[16]	Pre-construction Phase (2019)	Result (Annex H)	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	[17]55 dB or 0.0056 m/s^2	N.A.	- Daytime: 0.69 mm/s or 0.00069 m/s2	Morning (0500H-0900H) - x: 36.7 VdB y: 33.1 VdB z: - Daytime (0900H-1800H) - x: - y: 33.8 VdB z: - Evening (1800H-2200H) - x: 36.7 VdB y: 30.5 VdB z: - Nighttime (2200H- 0500H) - x: - y: 30.1 VdB z: 34.0 VdB	14-15 March 2024

16 Source: NSCR EPRMP, March 2015
[17] "Technology and Laws Regulation for Pollution Control, 2000", Japan Environmental Management Association for Industry

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Baseline		Latest Monitoring Result in 1st Quarter of 2024	
							Feasibility Study Phase[16]	Pre-construction Phase (2019)	Result (Annex H)	Monitoring Date
					Abangan Norte Elementary School, Marilao	[18]55dB or 0.0056 m/s^2	N.A.	- Morning: 53 VdB - Daytime: 63 VdB - Evening: 57 VdB - Nighttime: 56 VdB	Morning (0500H-0900H) - x: 48 VdB y: 50 VdB z: 52 VdB Daytime (0900H-1800H) - x: 48 VdB y: 50 VdB z: 53 VdB Evening (1800H-2200H) - x: 49 VdB y: 51 VdB z: 51 VdB Nighttime (2200H- 0500H) - x: 49 VdB y: 50 VdB z: 52 VdB	16-17 February 2024

[18] "Technology and Laws Regulation for Pollution Control, 2000", Japan Environmental Management Association for Industry

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Baseline		Latest Monitoring Result in 1st Quarter of 2024	
							Feasibility Study Phase[16]	Pre-construction Phase (2019)	Result (Annex H)	Monitoring Date
					Tabing Ilog Elementary School, Marilao	[19]55dB or 0.0056 m/s^2	N.A.	- Morning: 63 VdB - Daytime: 70 VdB - Evening: 68 VdB - Nighttime: 60VdB	Morning (0500H-0900H) - x: 49 VdB y: 50 VdB z: 51 VdB Daytime (0900H-1800H) - x: 51 VdB y: 52 VdB z: 56 VdB Evening (1800H-2200H) - x: 49 VdB y: 51 VdB z: 56 VdB Nighttime (2200H- 0500H) - x: 48 VdB y: 51 VdB z: 51 VdB	14-15 February 2024
					St. Mary College, Meycauayan	[20]55dB or 0.0056 m/s^2	N.A.	- Morning: 72 VdB - Daytime: 76 VdB - Evening: 77 VdB - Nighttime: 78 VdB	Morning (0500H-0900H) - x: 51 VdB y: 53 VdB z: 57 VdB Daytime (0900H-1800H) - x: 51 VdB y: 53 VdB z: 58 VdB Evening (1800H-2200H) - x: 51 VdB y: 52 VdB z: 58 VdB	15-16 February 2024

[19] "Technology and Laws Regulation for Pollution Control, 2000", Japan Environmental Management Association for Industry
[20] "Technology and Laws Regulation for Pollution Control, 2000", Japan Environmental Management Association for Industry

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Baseline		Latest Monitoring Result in 1st Quarter of 2024	
							Feasibility Study Phase[16]	Pre-construction Phase (2019)	Result (Annex H)	Monitoring Date
									Nighttime (2200H- 0500H) - x: 50 VdB y: 53 VdB z: 58 VdB	
					Meycauayan College	[21]55dB or 0.0056 m/s^2	N.A.	Meycauayan College (Category 3): - Morning: 66 VdB - Daytime: 68 VdB - Evening: 70 VdB - Nighttime: 67 VdB	Morning (0500H-0900H) - x: 50 VdB y: 51 VdB z: 53 VdB Daytime (0900H-1800H) - x: 51 VdB y: 52 VdB z: 53 VdB Evening (1800H-2200H) - x: 51 VdB y: 51 VdB z: 53 VdB Nighttime (2200H- 0500H) - x: 50 VdB y: 51 VdB z: 52 VdB	13-14 February 2024
					Malinta Elementary School, Valenzuela City (Category 3)	[22]55dB or 0.0056 m/s^2	Valenzuela: - ND	- Morning: 59 VdB - Daytime: 57 VdB - Evening: 58 VdB - Nighttime: 55 VdB	Morning (0500H-0900H) - x: 49 VdB y: 51 VdB z: 51 VdB Daytime (0900H-1800H)	12-13 February 2024

[21] "Technology and Laws Regulation for Pollution Control, 2000", Japan Environmental Management Association for Industry
[22] "Technology and Laws Regulation for Pollution Control, 2000", Japan Environmental Management Association for Industry

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Baseline		Latest Monitoring Result in 1st Quarter of 2024	
							Feasibility Study Phase[16]	Pre-construction Phase (2019)	Result (Annex H)	Monitoring Date
									- x: 50 VdB y: 51 VdB z: 52 VdB Evening (1800H-2200H) - x: 50 VdB y: 51 VdB z: 52 VdB Nighttime (2200H- 0500H) - x: 49 VdB y: 51 VdB z: 51 VdB	

(4) Impact on People

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Latest Monitoring Result in 1st Quarter of 2024	
							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	N.A.

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Latest Monitoring Result in 1st Quarter of 2024	
							Result	Monitoring Date
							in the delivery of segments. 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	

No.	Potential Impact	Parameter	Method	Frequency	Location	Standard	Latest Monitoring Result in 1st Quarter of 2024	
							Result	Monitoring Date
							route. See **Annex I**	
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 J** for the observations and findings during inspections.	Valenzuela Old PNR Station: 18 January 2024 27 February 2024 20 March 2024 Meycauayan Old PNR Station: 18 January 2024 27 February 2024 20 March 2024 Bigaa (Balagtas) Old PNR Station: 25 January 2024 27 February 2024 21 March 2024 Guiguinto Old PNR Station: 25 January 2024 27 February 2024 21 March 2024 Malolos Old PNR Station: 25 January 2024 27 February 2024 21 March 2024

Data Prepared by:

Noted by:

[redacted]