

MONITORING 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.

1.0. Response/Actions to Comments and Guidance from Government Authorities and the Public

Monitoring Item: Construction Phase	Monitoring Results During Report Period
Number of Response/Actions to Comments and Guidance from Government Authorities (DENR, NIA, LGUs, DA, DOLE, DSWD)	<p>4th Quarter of 2019</p> <ol style="list-style-type: none"> 1. DENR-EMB ECC Compliance: SMR & CMR - To submit the 4th Quarter of 2019 the Self-Monitoring Report (SMR) to EMB-Region 3. Stamped received copy will be forwarded by each PCO to the Core Office and DPWH Office. 2. DOLE-EHS. The regular and continuous monitoring on Environmental Safety and Health (EHS) is included in the Monthly Accomplishment Report of the Contractor for each Contract Package. 3. DENR RA 6969, Hazardous Waste Monitoring Report is included in the Monthly Accomplishment Report of the Contractor and prepared by the Materials Engineer 2. 4. LGU The DPWH Team is regularly conducting the Information Education Campaign (IEC) to each affected Barangays. See updates under "3. Social Environment" and regularly included in the Monthly Progress Report of each Contract Package Contractor.

2.0. Water Quality (Effluent/Wastewater/Ambient Water Quality)

The 4th Quarter of 2019 Water Quality monitoring and sampling was conducted on a sunny day of the **21st of November between 2nd of December 2019**. Laboratory testing and analyses was done by PURE JJEM Environmental Corporation, a DENR Accredited Laboratory with C.R. No. 074/2017, until October 16, 2020. PURE JJEM Environmental Corporation is located in #10 Quezon Road, San Isidro, San Simon, Pampanga. Seven (7) water samples, SW1, SW2, SW3, SW4, SW5, SW6 and SW7 were brought to the said laboratory covering seven stations.

Station/ Contract Package	Parameter/Unit	Measured Value (Median) 2019				Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
		1st	2nd	3rd	4th			
SW1/CP4 Caalibangban Creek 15° 31' 43" N, 120° 56' 3" E (location within the main alignment) Sampling station 1, SW1, has water during sampling. This station is near the CLLEX Main alignment. Sampling date: 21 November 2019, Sunny day SW1 Monitoring Results: - The results of the 4 th Quarter 2019 Monitoring indicate that, at the time of sampling, pH, Temperature, Color, DO, BOD, Oil and Grease, Nitrate, and Phosphate were found to be within the applicable National Water Quality Guideline Values/Standards. Fecal Coliform count and TSS results, however, failed to meet the National Water Quality Standards.	pH	-	8.1	7.62	6.5 to 9.0		Measurement Points: -The same sampling points in the baseline survey as per CLLEX-EIS 2010. However, the Water Quality Monitoring update for the 4 th Quarter of 2019 will cover the seven sampling stations, SW1, SW2, SW3, SW4, SW5, SW6 and SW7. Monitoring Frequency: -Quarterly monitoring during construction phase -Twice a year during operation Monitoring Method: - Grab sampling failed to meet the National Water Quality Standards.	
	Temperature ¹ , Celsius	-	25.0	25.0	25 to 31			
	Color, TCU	-	8	25	75			
	Dissolved Oxygen (DO), mg/L	-	8	8.7	Min. of 5.0			
	Total Suspended Solids (TSS), mg/L	-	101	212	80			
	Biological Oxygen Demand (BOD), mg/L	-	1	4	7			
	Oil and grease, mg/L	-	1.1	1.0	2			
	Nitrate (as NO ₃ ⁻ -N), mg/L	-	0.9	0.65	7			
	Phosphate (as PO ₄ ³⁻ -P), mg/L	-	0.04	0.11	0.5			
	Fecal Coliform, MPN/100ml	-	4,900	27,000	200			
	pH	-	7.5	7.44	6.5 to 9.0			
	Temperature ¹ , Celsius	-	25.0	25.00	25 to 31			
	Color, TCU	-	20	25	75			
	Dissolved oxygen (DO), mg/L	-	8	2.5	Min. of 5.0			
Total Suspended Solids (TSS), mg/L	-	16	25	80				
Biological Oxygen Demand (BOD), mg/L	-	1	7	7				
Oil and grease, mg/L	-	1.1	1.0	2				
Nitrate (as NO ₃ ⁻ -N), mg/L	-	0.2	< 0.10	7				
Phosphate (as PO ₄ ³⁻ -P), mg/L	-	0.06	470	0.5				
SW2/CP4 Umangan Creek N 15° 31' 42.4", E 120° 55' 35.0" Date: 06 June 2019 The second sampling site is approximately less than 500 m from the CLLEX Project alignment. SW2 station is at the back of residential houses. The presence of garbage is visible during the time of sampling. SW2 station has water during sampling. Sampling date: 21 November 2019, Sunny day SW2 Monitoring Results:								

Station/ Contract Package	Parameter/Unit	Measured Value (Median) 2019				Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
		1st	2nd	3rd	4th			
<p>SW3/CP4</p> <p>Bibiciat Creek N 15° 30 '28.76", E 120° 51 '00.36" Date: 06 June 2019, Sunny</p> <p>Sampling station 3, SW3, is approximately 5 meters away from the CILEX project alignment. SW3 station has water during sampling.</p> <p>Sampling date: 21 November 2019, Sunny day</p> <p>SW3 Monitoring Results:</p> <p>- The results of the 4th Quarter 2019 Monitoring indicate that, at the time of sampling, pH, Temperature, Color, BOD, Oil and Grease, TSS, Nitrate, and Phosphate were found to be within the applicable National Water Quality Guideline Values/Standards. Fecal Coliform count and DO result, however, failed to meet the National Water Quality Standards.</p>	Fecal Coliform, MPN/100mL	-	2,300	470	200			
	pH	7.1	7.5	7.85	6.5 to 9.0			
	Temperature ¹ , Celsius		25.0	25.0	25 to 31			
	Color, TCU	32	40	25.0	75			
	Dissolved oxygen (DO), mg/L	6	<2	7.3	Min. of 5.0			
	Total Suspended Solids (TSS), mg/L	11	13	57	80			
	Biological Oxygen Demand (BOD), mg/L	3	4	11	7			
	Oil and grease, mg/L	2.1	1.3	1.0	2			
	Nitrate (as NO ₃ ⁻ -N), mg/L	0.03	0.06	1.3	7			
	Phosphate (as PO ₄ ³⁻ -P), mg/L	0.5	1.7	1.5	0.5			
	Fecal Coliform, MPN/100mL	92,000	7,900	140	200			
	pH	7.0	7.4	7.84	6.5 to 9.0			
	Temperature ¹ , Celsius		25.0	25.0	25 to 31			
Color, TCU	80	32	25.0	75				
Dissolved oxygen (DO), mg/L	5	5	5.2	Min. of 5.0				
Total Suspended Solids (TSS), mg/L	18	75	138	80				
Biological Oxygen Demand (BOD), mg/L	3	2	46	7				
<p>SW4/CP3</p> <p>Sapang Kuryente Creek 1.5° 28' 22" N, 120° 46' 53" E.</p> <p>The 4th Quarter 2019 Monitoring water samples for SW4 were taken in this station. The SW4 station is near the alignment.</p> <p>Sampling date: 29 November 2019, Sunny day</p>								

Station/ Contract Package	Parameter/Unit	Measured Value (Median) 2019				Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
		1st	2nd	3rd	4th			
		<p>SW4 Monitoring Results: - The results of the 4th Quarter 2019 Monitoring indicate that, at the time of sampling, pH, Temperature, Color, DO, BOD, Oil and Grease, TSS, Nitrate, and Phosphate were found to be within the applicable National Water Quality Guideline Values/Standards. TSS count results, however, failed to meet the National Water Quality Standards.</p> <p>SWS/CP3</p> <p>Mamagting Creek 15° 30' 5" N, 120° 49' 0" E.</p> <p>The 4th Quarter 2019 Monitoring water samples for SWS were taken in this station. The SWS station is near the alignment.</p> <p>Sampling date: : 29 November 2019, Sunny day</p> <p>SWS Monitoring Results: - The results of the 4th Quarter 2019 Monitoring indicate that, at the time of sampling, pH, Temperature, Color, BOD, Oil and Grease, TSS, DO, Nitrate, and Phosphate were found to be within the applicable National Water Quality Guideline Values/Standards.</p> <p>SW6/CP2</p> <p>Rio Chico River (Upstream) N 15° 28'37.9", E 120° 44'51.3"</p> <p>The sampling station 6 is an upstream part of the Rio Chico River and running water is turbulent. SW6 is near the CLELEX Project Alignment.</p> <p>The 4th Quarter Monitoring water samples were taken in this station. Date: 2 December 2019, Sunny day</p>	Oil and grease, mg/L		1.0			
Nitrate (as NO ₃ ⁻ -N), mg/L		0.04	0.1	0.59	7			
Phosphate (as PO ₄ ³⁻ -P), mg/L		0.1	0.09	0.10	0.5			
Fecal Coliform, MPN/100mL		790	2,400	17	200			
pH		8	7.4	7.78	6.5 to 9.0			
Temperature ¹ , Celsius			25	25	25 to 31			
Color, TCU			40	20	75			
Dissolved oxygen (DO), mg/L			12	<2	Min. of 5.0			
Total Suspended Solids (TSS), mg/L			32	24	66	80		
Biological Oxygen Demand (BOD), mg/L			2	3	3	7		
Oil and grease, mg/L			0.75	1.3	<1	2		
Nitrate (as NO ₃ ⁻ -N), mg/L			0.08	0.1	0.31	7		
Phosphate (as PO ₄ ³⁻ -P), mg/L			0.05	0.2	0.08	0.5		
Fecal Coliform, MPN/100mL			2.0	1,300	9.3	200		
pH			7.8	7.8	7.34	6.5 to 9.0		
Temperature ¹ , Celsius				25.0	30.4	25 to 31		
Color, TCU			20	15	10	75		
Dissolved oxygen (DO), mg/L			9	9	8.3	Min. of 5.0		
Total Suspended Solids (TSS), mg/L			60	198	73	80		
Biological Oxygen Demand (BOD), mg/L			1	1	2	7		

Station/ Contract Package	Parameter/Unit	Measured Value (Median) 2019				Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
		1st	2nd	3rd	4th			
SW6 Monitoring Results: - The results of the 4 th Quarter 2019 Monitoring indicate that, at the time of sampling, pH, Temperature, Color, BOD, Oil and Grease, TSS, Nitrate, and Phosphate were found to be within the applicable National Water Quality Guideline Values/Standards. Fecal Coliform count and DO results however, failed to meet the National Water Quality Standards.	Oil and grease, mg/L		1.0	0.53	<1	2		
	Nitrate (as NO ₃ ⁻ -N), mg/L		0.3	0.6	0.54	7		
	Phosphate (as PO ₄ ³⁻ -P), mg/L		0.08	0.06	0.09	0.5		
	Fecal Coliform, MPN/100mL		16,000	54,000	330	200		
	pH		8.1	7.6	7.25	6.5 to 9.0		
	Temperature ¹ , Celsius			25.0	30.8	25 to 31		
	Color, TCU		20	20	10	75		
	Dissolved oxygen (DO), mg/L		9	8	2	Min. of 5.0		
	Total Suspended Solids (TSS), mg/L		57	221	75	80		
	Biological Oxygen Demand (BOD), mg/L		2	1	2	7		
SW7/CP2 Rio Chico River (Downstream) 15° 28.328' N, 120° 44.914' E The sampling station 7 is the downstream portion of the Rio Chico River where water is continuously flowing. SW7 is near the CLEX Project Alignment. The 4 th Quarter Monitoring water samples for SW7 were taken in this location. Date: 2 December 2019, Sunny day SW4 Monitoring Results: - The results of the 4 th Quarter 2019 Monitoring indicate that, at the time of sampling, pH, Temperature, Color, BOD, Oil and Grease, Nitrate, and Phosphate were found to be within the applicable National Water Quality Guideline Values/Standards. Fecal Coliform count and DO results, however, failed to meet the National Water Quality Standards.	Oil and grease, mg/L		0.73	0.74	<1	2		
	Nitrate (as NO ₃ ⁻ -N), mg/L		0.4	0.5	0.56	7		
	Phosphate (as PO ₄ ³⁻ -P), mg/L		0.07	<0.01	0.09	0.5		
	Fecal Coliform, MPN/100mL		9,200	54,000	1700	200		

*Note: Red Font means exceedance from the Class C water quality guideline; 1 - Temperature levels were tested in the laboratory but samples were already ice-chilled for preservation

- Waste: Monitoring covers all Contract Packages, CP1, CP2, CP3 and CP4

Monitoring Item	Monitoring Results During Report Period, 4th Quarter 2019
Solid Wastes (ton/day)	Zero waste on domestic waste.
Sanitary Waste (ton/day)	
Unsuitable Soil (cubic meter/day)	The CLLEX Phase 1- Is a road project hence no known excavated waste nor domestic waste will be generated in the site. The construction waste is regularly collected from the site and brought to the Contractor's campsite. Oil and grease are included in the daily regular monitoring of all Contract Packages. Used oil and grease are stored in tight containers and recycled. Hazardous wastes monitoring of the materials in the laboratory are also included in the regular monitoring and incorporated in the Monthly Accomplishment Report of each contract.
Spill-out oil from equipment (liter/month)	
Hazardous Wastes (liquid: liter/month)	
Hazardous Wastes (solid: kg/month)	

3.0. Mitigation Measures Air Quality (Emission Gas/Ambient Air Quality)
 CLLEX-Phase1 Ambient Air Quality Monitoring Update for the 4th Quarter of 2019: Covering 3 Ambient Air Sampling Stations

Station/ Contract Package/Physical Assessment During the Time of Sampling	Parameter/Unit	Measured Value (Laboratory Results)				Country's Standards	Refamed International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
		2019						
		1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter			
AA3/CP2 Guevarra Road along National Highway, La Paz-Victoria Road (CP2 Underpass) Lat 15°28'20" N, Long 120°43'01" E Date: 2 December 2019 Time: 1530H - 1630H The A3 sampling station is beside the CLLEX alignment, CP3 underpass. The Contractor was advised to take mitigating measures to help suppress dust in the area. Water sprinkling was done in the area prior to sampling.	SO ₂ µg/Nm ³	1.03	0.925	ND	6.90	340	Measurement Points: -The same sampling points in the baseline survey as per CLLEX-EIS 2010. Ambient Air Quality Monitoring Update for the 4 th Quarter of 2019 will cover three (3) stations only. AA1 had completed the construction works thus it was not included in the 4 th Quarter 2019 Monitoring. Monitoring Frequency: -Quarterly monitoring during construction phase -Twice a year during operation Monitoring Method: -Air sampler: high volume sampler Monitoring Results: - The results of the 4 th Quarter 2019 Monitoring indicate that, at the time of sampling, Sulfur Dioxide (SO ₂), Nitrogen Dioxide (NO ₂) and TSP in all three (3) stations (AA3, and AA5) are within the applicable National Ambient Air Quality Guideline Values/Standards. The TSP level recorded at station AA4 exceeded National Ambient Air Quality Standards.	
	NO ₂ µg/Nm ³	3.43	0.97	ND	1.06	260		
	CO mg/Nm ³ **	-	-	-	-	-		200 (IFC)
	DUST (TSP)µg/Nm ³	283	8	18.16	57.0	300		-
AA4/CP3 Sto. Rosario, Nueva Ecija 15°31'11.3"N, 120°49'44.7"E Date: 29 November 2019 Time: 1120H - 1125H The AA4 sampling station is within a two-lane concrete road and adjacent to a major unpaved site access. At the time of testing traffic along the road and into and out of the site access was heavy. The Contractor has been instructed to increase the frequency and intensity of water spraying to suppress dust.	SO ₂ µg/Nm ³	0.23	1.96	ND	NA	340	-Quarterly monitoring during construction phase -Twice a year during operation Monitoring Method: -Air sampler: high volume sampler Monitoring Results: - The results of the 4 th Quarter 2019 Monitoring indicate that, at the time of sampling, Sulfur Dioxide (SO ₂), Nitrogen Dioxide (NO ₂) and TSP in all three (3) stations (AA3, and AA5) are within the applicable National Ambient Air Quality Guideline Values/Standards. The TSP level recorded at station AA4 exceeded National Ambient Air Quality Standards.	
	NO ₂ µg/Nm ³	7.05	0.14	1.26	NA	260		
	CO mg/Nm ³ **	-	-	-	-	-		200 (IFC)
	DUST (TSP) µg/Nm ³	110	108	43.19	1315.3	300		-

Contract Package/Physical Assessment During the Time of Sampling	Station/ AAS/CP4 Brgy. Caalibangban Road, Cabanatuan City 15°31'44" N, 120°56'02" E (CP4 Main alignment) Date: 21 November 2019 Time: 0920H – 1020H	Parameter/Unit	Measured Value (Laboratory Results) 2019				Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
			1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter			
			0.93	1.33	1.86	4.0			
		SO ₂ µg/Nm ³	4.31	0.14	2.19	0.31	340	-	
		NO ₂ µg/Nm ³	-	-	-	-	260	200 (IFC)	
		COmg/Nm ³ **	400	77	74.55	12.5	300	-	
		DUST (TSP) µg/Nm ³							

Red Font means exceedance from the standard of Total Suspended Particulate.

**Note: Only the parameters TSP, SO₂, and NO₂ are collected following the data in the EIS during the construction phase.

- Noise/Vibration Monitoring during the 4th Quarter of 2019

Station/ Contract Package	Parameter/Unit	Measured Value (Median) 2019				Country's Standards	Category of the Area	Remarks (Measurement Point, Frequency, Method, etc.)
		1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter			
AA3/CP2 Guevarra Area along National Highway, La Paz-Victoria Road (CP2 Underpass) 15°31'11.3"N, 120°49'44.7"E Date: 02 December 2019 Time: 1245H - 1250H Same station with Ambient Air	Noise/dBA	66.60	66.86	67.80	56.40	70	C	Measurement Points: -The same sampling points in the baseline survey as per CLLEX- EIS 2010 Ambient Air Quality Monitoring Update for the 4 th Quarter of 2019 will cover three stations only: AA3, AA4 and AA5. Monitoring Frequency: -Quarterly monitoring during construction phase -Twice a year during operation Monitoring Method: -Noise meter for the Noise measurement Monitoring Results: -The results of the 4 th Quarter 2019 Monitoring showed that the Noise Level measured in stations AA3, AA4 and AA5 are within the DENR Standard limit.
AA4/CP3 Sto. Rosario, Nueva Ecija (CP3 Underpass) 15°31'11.3"N, 120°49'44.7"E Date: 29 November 2019 Time: 1100H - 1210H Same station with Air	Noise/dBA	77.60		65.05	65.00	70	C	
AA4/CP4 Brgy. Caalibang Road, Cabanatuan City (CP4 Main Alignment) 15°31'44" N, 120°56'02" E Date: 21 November 2019 Time: 1415H-14200H Same station with Air	Noise/dBA	76.02	65.29	65.25	68.00	70	C	

Red Font means exceedance from the standard limit for Noise Class C Light Industrial Area.

1. Natural Environment

- ECOSYSTEM

**TREE INVENTORY MONITORING
CLLEX PHASE 1 PROJECT
As of December 2019**

**TREE INVENTORY SUMMARY
As of December 2019**

Under Contract Package	Total Number of Trees Inventoried	Total Number of Trees Cut	Total Number of Trees Uncut
1	119	119	0
2	56	56	0
3	77	31	46
4	842	301	541