



DEPARTMENT OF TRANSPORTATION

The Columbia Tower, Ortigas Avenue

Barangay Wack-Wack, Mandaluyong City

Quaternary Report No. 10

2017 (October, November and December)

**NEW BOHOL AIRPORT CONSTRUCTION AND
SUSTAINABLE ENVIRONMENTAL PROTECTION PROJECT**



Quaternary Environmental Monitoring Report

January 2018

The Monitoring Form is prepared based on Attachment 8 (1) of the Appraisal MD.

1. Responses/Actions to Comments and Guidance from Government Authorities and the Public

Monitoring Item	Monitoring Results during Report Period
Water Quality, Air Quality, Noise Level, Dust and Solid Waste	The environmental monitoring is carried out once a month during Construction/Operation Phase. The total number of monitoring is 42 times. The Quaternary Environmental Monitoring Report (QEMR) will be submitted to JICA quarterly by DOTr.

DOTr prepared Quaternary Environmental Monitoring Report (January 2018) based on the field survey report carried out by Chiyoda-Mitsubishi Joint Venture (CMJV).

2. Mitigation Measures

(A) Pre-Construction/Construction Phase

• Sampling/Measurement Points

Sampling Points of Water

Sta. ID No.	GPS Reading		Description of Sampling Stations
	Longitude	Latitude	
GW-1	N 09°35'05.7"	E 123°46'14.5"	It is located at Airport Site Brgy. Tawala, Panglao, Bohol. Owned by deceased Mr. Leoncio Boncaron.
GW-2	N 09°33'30.6"	E 123°45'28.4"	It is located inside the compound of former Brgy. Captain Mr. Avito Arcay which is in front of the Brgy. Hall of Brgy. Danao crossing the municipal road in the municipality of Panglao, Bohol.
SW-1	N 09°32'51.1"	E 123°46'22.2"	This is situated about 100 meters away from the seashore which is in front of the Alona Kew Beach in Brgy. Tawala, Panglao, Bohol.
SW-2	N 09°34'05.0"	E 123°45'03.1"	This is located inside mangrove trees about 150 meters away from seashore in Brgy. Danao, Panglao, Bohol

Air Quality, Noise Level and Dust

Sta. ID No.	GPS Readings		Description of Sampling Station
	Longitude	Latitude	
Sta-1	N 09°33'42.3"	E 123°46'40.1"	It is located in front of Tawala Elementary School in Brgy. Tawala, Panglao, Bohol. It is situated about 10 meters away from center of the municipal road and about 35 meters from the classrooms.
Sta-2	N 09°33'32.9"	E 123°45'27.0"	It is situated almost in front of the Brgy Hall of Brgy Danao, Panglao, Bohol. It is about 7 meters away from the center of the municipal road.

Sta. ID No.	GPS Readings		Description of Sampling Station
	Longitude	Latitude	
Sta-3	N 09°34'50.4"	E 123°45'08.4"	It is about 30 meters away in front of the municipal hall building of Panglao and about 25 meters from center of the municipal road.
Sta-4	N 09°34'19.9"	E 123°46'28.9"	The original location. It is located along the access road of the New Bohol Airport in Brgy Tawala, Panglao, Bohol.
	N 09°35'37.7"	E 123°47'04.0"	A relocated station. It is located about 2.4 km Northeast of the original station (Access Road to Airport). It is situated in front of Ericflo Inn/restaurant and is about 10 meters away from the center of the national road.
Sta-5	N 09°34'10.4"	E 123°47'14.5"	It is located in front of Bohol Elementary School in Brgy Bolod, Panglao. It is about 2 meters away from the perimeter fence of the school and 5 meters away from center of the municipal road.



Figure 1. Location of Samplings and Measurement

• Air Quality (Ambient Air Quality)

Remarks: Measurement Point-shown in **Figure 1**. Frequency – once a month, Method-High Volume Sampler/Gravimetric Method

Item	Point	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*1) Country's Standards
TSP/Fugitive Dust (ug/m ³)	Sta.1	October	<1.7	2.3	3.4	230
		November	3.4			
		December	<1.7			
	Sta.2	October	15.5	34.2	53.2	
		November	33.9			
		December	53.2			
	Sta.3	October	1.7	8.5	18.7	
		November	18.7			
		December	5.2			
	Sta.4	October	13.8	22.8	39.2	
		November	39.2			
		December	15.4			
	Sta.5	October	76.8	67.6	79.6	
		November	79.6			
		December	46.4			
TSP/Fugitive Dust-(Visual)	Sta.1, 2, 3, 4, 5	October - December	Weekly inspection: Negative in all sampling stations			

*1) Standard: DAO 14/DAO2000-81 National Ambient Air Quality Guideline Values

Note:

- (1)*: 1st week: Wind Direction NNW-W-WSW-SSW, 2nd week: SWS-SSW-SW-SW, 3rd week: WSW-SW-SW-SW and 4th week: S-SW-SW-WSW, the directions show that on-going construction activities doesn't show any trace of dust in all sampling stations
- (2)*: 1st week: Wind Direction SE-SW-SWS-SW, 2nd week: ENE-ENE-ENE-ENE, 3rd week: SW-SWS-SW-S and 4th week: NE-NE-NE-NE, the directions show that on-going construction activities doesn't show any trace of dust
- (3)*: 1st week: Wind Direction SWS-SW-SW-SW, 2nd week: ENE-ENE-SW-SW, 3rd week: NE-ENE-SE-ESE and 4th week: NE-ENE-N-ENE, the directions show that on-going construction activities doesn't show any trace of dust

** - A relocated station which is 2.4 km northeast of the original station (Access Road to Airport)

The results of the ambient air quality show that there is no exceeded on the environmental standard set by the DENR National Ambient Air Quality Standards for source specific pollutants for the Total Suspended Particulates (TSP) or dust in all sampling stations.

• Water Quality (Ambient Water Quality)

Remarks: Measurement Point-shown in **Figure 1** (there is no water in soaking area), Frequency – once a month

Groundwater Quality

Point	Parameter	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(1) Country's Standards
GW-1	pH	October	8.3	7.8	8.3	6.5-8.5
		November	7.0			
		December	8.0			

Point	Parameter	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(1) Country's Standards
	SS (mg/L)	October	<0.1	<0.1	<0.1	-
		November	<0.1			
		December	<0.1			
	BOD (mg/L)	October	1	2.3	4	-
		November	4			
		December	2			
	COD (mg/L)	October	2	7.7	12	-
		November	12			
		December	9			
	Nitrogen (mg/L)	October	1.85	2.13	2.53	7
		November	2.53			
		December	2.0			
	Phosphorus (mg/L)	October	<0.005	0.008	0.014	0.5
		November	0.014			
		December	0.006			
	Oil/Grease (mg/L)	October	1	1	1	1
		November	1			
		December	<1			

Point	Parameter	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(2) Country's Standards
GW-2	pH	October	8.2	7.8	8.2	6.5 – 8.5
		November	7.0			
		December	8.1			
	SS (mg/L)	October	<0.1	<0.1	<0.1	-
		November	<0.1			
		December	<0.1			
	BOD (mg/L)	October	2	3.0	5	-
		November	5			
		December	2			
	COD (mg/L)	October	6	12	16	-
		November	16			
		December	14			
	Nitrogen (mg/L)	October	0.615	0.92	1.07	7
		November	1.07			
		December	1.07			
	Phosphorus (mg/L)	October	0.047	0.029	0.047	0.5
		November	0.023			
		December	0.018			
	Oil and Grease (mg/L)	October	2	1.3	2	1
		November	<1			
		December	<1			

*(1) Standard: DAO 2016-08

Note: Phenols and Siltation were excluded from the monitoring parameters. Phenols come from industrial activities and no industrial exist in the area. Siltation does not exist since no surface water exist at the site. There is no available water at the soaking pond.

For the groundwater quality, only Oil & Grease for the month of October 2017 only in GW-2 exceeded the standard set by the government as stated in DAO 2016-08 Water Quality Guidelines for Groundwater. Other parameters are within the limits. The exceedance of Oil & Grease is due to the improper maintenance of the dug well since it is open and not constantly covered. The owner was already advised about the quality of the water and should use for domestic use only and never as drinking water.

Sea Water Quality

Parameter	Point	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(4) Country's Standards
Color	SW-1	October	10	13.3	20	50 (Class SB) 75 (Class SC)
		November	20			
		December	10			
	SW-2	October	10	13.3	20	
		November	20			
		December	10			

*(4) Standard: DAO 2016-08 (Class SB/SC)

For the color of the sea water, the qualities for both stations are within the standard set in DAO 2016-08 Water Quality Guidelines for marine water.

- Noise

Item	Point	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(5) Country's Standards
Noise, db(A)	Sta.1	October	56	57	60	50
		November	56			
		December	60			
	Sta.2	October	59	65	68	65
		November	68			
		December	67			
	Sta.3	October	59	61	64	65
		November	61			
		December	64			
	Sta.4	October	59	57	59	55
		November**	54			
		December	59			
	Sta.5	October	56	59	65	50
		November	65			
		December	57			
Hearing	Sta.1-Sta.5	October-December	Weekly hearing: no complain			

*(5) Standard: PD984

Area Classification: Sta. 1 – Class AA; Sta. 2 – Class B; Sta. 3 – Class B; Sta. 4 – Class A; Sta. 5 – Class AA

** - A relocated station which is 2.4 km northeast of the original station (Access Road to Airport)

Regarding the noise quality, Stations 1, 4 and 5 for October 2017; Stations 1, 2 and 5 for November 2017; and Stations 1,2,4 and 5 exceeded the environmental standards. Overall, only Sta. 3 is still within the standard noise quality. The fact that the area is very busy now compared during the time when the baseline survey was conducted for the Environmental Impact Assessment (EIA) study. The other sources of noise are the passing of vehicles, blowing of horns, conversation of the people near the stations, conversation from the people around and other human activities. The exceedance is not cause by the on-going construction of the airport.

- Waste

The generated wastes for the months of October, November and December 2017 are shown in Attachment 1.

3. Natural Environment

- Ecosystem

Monitoring Item	Monitoring Results during Report Period
<ul style="list-style-type: none"> • The two (2) endangered species (<i>molave</i> [<i>Vitex parviflora</i> Juss.] and <i>bolong-eta</i> [<i>diospyros pilosathera</i>]) listed in the Biodiversity Assessment Report of the Bohol New Airport site. 	<p>The procurement of Biodiversity Conservation Project (Reforestation) will be undertaken by the DENR Region VII through PENRO-Bohol thru a Memorandum of Agreement (MOA). Said MOA was already signed by DENR Region VII and DOTr. DENR-EMB Region VII was provided a copy by DOTr on July 2017. The DOTr will download and transfer the funds allocated for the Reforestation Project of the NBACSEPP to DENR-Region VII through PENRO-Bohol. Refer to Attachment 2 for the copy of the letter from DOTr to DENR-PENRO-Bohol regarding the details of the bank for downloading the funds. The downloading is now on process.</p> <p>The DOTr-PMO will do the monitoring on the implementation of the BCP by PENRO-Bohol.</p> <p>DENR Region VII will designate a Project Management Office (PMO) that will provide fulltime supervision in the planning, procurement and implementation of the Project, maintaining a continuing and close liaison and cooperation with the authorized representative(s) of the DOTr to ensure that the implementation conforms with the plans and specifications mutually approved by the DOTr and DENR-Region VII. It should also monitor that all activities are within the allotted budget and time schedule.</p> <p>The two (2) identified endangered species will be planted in the Municipalities of Loay, Guindulman,</p>

Monitoring Item	Monitoring Results during Report Period
<ul style="list-style-type: none"> As indicated in the 2nd Amended ECC for NBACSEPP issued on July 25, 2017, another condition is the establishment of reforestation using endemic/indigenous species or other carbon sink programs such as the use of biochar to mitigate greenhouse gas (GHG) emission of the project in line with the DENR's thrust for GHG emission reduction program. 	<p>Davis and Dimiao.</p> <p>Using of biochar or other carbon sink programs will be considered in the implementation of the BCP. DOTr will monitor the implementation by the PENRO-Bohol in addressing this ECC condition.</p>

• **Tree Planting (Revised ECC requirements is 572,500 seedlings)**

Monitoring Item	Monitoring Results during Report period
Number of trees planted	Not yet implemented, subject for bidding
Number of species	Not yet implemented, subject for bidding
Number of locations	Not yet implemented, subject for bidding

Information on Tree Species to be Planted and those Species are Selected

The species/seedlings considered in the reforestation project for NBACSEPP are consisting of the following: 572,000 seedlings as condition in the ECC issued by DENR-EMB7; 5,104 seedlings as ECC condition for the resettlement site; and 46,500 seedlings as replacement to the other trees identified by DENR-CENRO in Tagbilaran City. The total number of seedlings is 624,104. For the procurement of seedlings, 20% of mortality will be considered.

The list of trees identified for planting is shown below.

Plantation Site	Fruit Assorte	Timber Indign's	Mangrove	Beach Forest	Coffee	Cacao	Bamboo	Rattan	Ornamentals	Coconut	Total
Dimiao	25,750	61,750	54,000								141,500
Guindulman		10,000			18,333	5,000					33,333
Loay	5,246	3,497	70,000	7,500							86,243
San Miguel	38,900	42,500			18,750	18,750			1,400		120,300
Davis	2,445	2,444	14,000	1,500							20,389
Panglao	4,238	889	179	179					1,342		6,827
Tagbilaran	1,144										1,144
Cortes		7,778	70,000	10,833							88,611
Bilar	4,556	9,333					1,389	1,389			16,667
Baclayon	3,333	833		833						557	5,556
Loon	14,000			6,000							20,000
Maribojoc			30,000	7,500							37,500
Pilar	1,333	12,500			445	445	510	510			15,743
Alburquerque		5,000									5,000
Sikatuna	2,666				890	889					4,445
Sevilla	1,333				445	444					2,222
Alicia	3,750	8,750					510	510			13,520
Resettlement Site	3,573	510							511	510	5,104
GRAND TOTAL											624,104

Information on the Location for Planting

There are 16 municipalities and 1 city identified as the locations for planting. The total area needed is 374.92 hectares. All the identified planting sites are government-owned lands. A Memorandum of Understanding (MOU) will be signed between PENRO-Bohol and LGU before the implementation of the reforestation project. PENRO-Bohol representatives with DOTr personnel will revisit the LGUs to update and to verify on the availability of the land previously compromised verbally by the LGUs to DOTr. Since PENRO-Bohol will now do the implementation of the BCP, they will be in-charged in preparing and signing of the MOA together.

The table below shows the plantation sites and the required land area. But there is also possibility that these areas might change because the tree planting has been planned for about 3 years and not yet implemented. Possible areas are the NGP sites wherein PENRO-Bohol will request to DENR to use these lands in case other areas are already not available during implementation. Updates on this matter will be reported quarterly.

Plantation Site	Area (Has.)
Dimiao	84.57
Guindulman	28.5
Loay	29
San Miguel	103
Dausi	13
Panglao	16.82
Tagbilaran	1.03
Cortes	18
Bilar	17
Baclayon	5
Loon	14
Maribojoc	8
Pilar	12
Alburquerque	3
Sikatuna	4
Sevilla	2
Alicia	11
Resettlement Site	5
GRAND TOTAL	374.92

4. Results of Environmental Monitoring

Item	Evaluation	Mitigation/Remediation Measures taken
Air Quality	<input checked="" type="checkbox"/> within set standards <input type="checkbox"/> exceeding set standards	Continuous monitoring
Water Quality	<input type="checkbox"/> within set standards <input checked="" type="checkbox"/> exceeding set standards	Only Oil and Grease at GW-2 exceeded and continuous monitoring will be done
Noise	<input type="checkbox"/> within set standards <input checked="" type="checkbox"/> exceeding set standards	Continuous monitoring to Stations 1, 2, 4 and 5 where exceedance occurred.
Waste	<input checked="" type="checkbox"/> within set standards <input type="checkbox"/> exceeding set standards	Continuous monitoring
Odor	<input checked="" type="checkbox"/> within set standards <input type="checkbox"/> exceeding set standards	Continuous monitoring

Item	Evaluation	Mitigation/Remediation Measures taken
Odor	<input checked="" type="checkbox"/> within set standards <input type="checkbox"/> exceeding set standards	Continuous monitoring
Natural Environment	<input checked="" type="checkbox"/> impacts properly mitigated <input type="checkbox"/> mitigation measures need to be followed	Continuous monitoring
Heritage	<input checked="" type="checkbox"/> impacts properly mitigated <input type="checkbox"/> mitigation measures need to be followed	Continuous monitoring
Other Environmental Concerns	<input checked="" type="checkbox"/> impacts properly mitigated <input type="checkbox"/> mitigation measures need to be followed	Continuous monitoring

Attachment 1: Waste Management

1.1 October 2017

Type of Waste	Generation Point	Category	Responsibility and methodology of Waste Management					Remark	
			Collection on Site	Storage on site	Transportation to outside storage site	Collection	Dumping Site/ Recycling		
Domestic Waste	Working area at the Site	Residual waste (Food wrappers, construction debris, used sacks, Styrofoam, etc)	210 kg	0	0	0	210 kg	Collected by Barangay Lourdes SWM and brought to Panglao Dumpsite	
Waste from Construction work	Area of Temporary Facilities	Compostable	0	0	0	0	0		
		Plastic Bottles	315 kg	0	0	0	315 kg	Recycled	
		Mixed Hard Plastics	105 kg	0	0	0	105 kg	Recycled	
		Scrap Metals	0	0	0	0	0		
		Scrap Woods	986 kg	0	0	0	986 kg	Recycled	
	Hazardous Waste		Empty Bitumen Drums	0	0	426 pcs	0	0	Contracted to Accredited TSD
			Fluorescent Bulb	0	0	75 pcs	0	0	Contracted to Accredited TSD
			Used Oil	0	0	66 drums	0	0	Contracted to Accredited TSD
			Oil Contaminated Materials	0	0	214 kg	0	0	Contracted to Accredited TSD
		Working area at the Site	Excavated Soil	0	0	0	0	0	

Note: See Attachment 3 for the filled-up Hazardous Waste Manifest Form and Accreditation of TSD Contractor

1.2 November 2017

Type of Waste	Generation Point	Category	Responsibility and methodology of Waste Management					
			Collection on Site	Storage on site	Transportation to outside storage site	Collection	Dumping Site/ Recycling	Remark
Domestic Waste	Working area at the Site	Residual waste (Food wrappers, construction debris, used sacks, Styrofoam, etc)	811 kg	0	0	0	811 kg	Collected by Barangay Lourdes SWM and brought to Panglao Dumpsite
Waste from Construction work	Area of Temporary Facilities	Compostable	0	0	0	0	0	Composted
		Plastic Bottles	366 kg	0	0	0	366 kg	Recycled
		Scrap Metals	0	0	0	0	0	Recycled
		Mixed Hard Plastics	314 kg	0	0	0	314 kg	Recycled
	Hazardous Waste	Oil Contaminated Materials	0	0	0	0	0	
	Working area at the Site	Excavated Soil	0	0	0	0	0	

Note: No hazardous wastes generated on November 2017 as per Contractor's record.

1.3 December 2017

Type of Waste	Generation Point	Category	Responsibility and methodology of Waste Management					
			Collection on Site	Storage on site	Transportation to outside storage site	Collection	Dumping Site/ Recycling	Remark
Domestic Waste	Working area at the Site	Residual waste (Food wrappers, construction debris, used sacks, Styrofoam, etc)	391 kg	0	0	0	391 kg	Collected by Barangay Lourdes SWM and brought to Panglao Dumpsite
Waste from Construction work	Area of Temporary Facilities	Compostable	0	0	0	0	0	Composted
		Plastic Bottles	91 kg	0	0	0	91 kg	Recycled
		Scrap Metals	0	0	0	0	0	Recycled
		Mixed Hard Plastics	120 kg	0	0	0	120 kg	Recycled
	Hazardous Waste	Oil Contaminated Materials	0	0	0	0	0	
	Working area at the Site	Excavated Soil	0	0	0	0	0	

Note: No hazardous wastes generated on December 2017 as per Contractor's record.