

Quaternary Report No. 4

2016 (April, May and June)

**New Bohol Airport Construction
and
Sustainable Environmental Protection Project**

Quaternary Environmental Monitoring Report

July 2016

Department of Transportation

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 DOTC.

DOTC prepared Quaternary Environmental Monitoring Report (July 2016) based on the field survey report being carried out by Chiyoda-Mitsubishi JV.

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. Tawal, 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

Sta. ID No.	GPS Readings		Description of Sampling Station
	Longitude	Latitude	
			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-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"	It is located along access road of the proposed new Bohol airport in Brgy Tawala, Panglao, Bohol.
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/m3)	Sta.1	April	<1.7	12.07	32.9	230
		May	<1.6			
		June	32.9			
	Sta.2	April	169.3	72.27	169.3	
		May	<1.6			
		June	45.9			
	Sta.3	April	<1.7	17.73	49.9	
		May	49.9			
		June	<1.6			
	Sta.4	April	661.7	294.23	661.7	
		May	31.5			
		June	189.5			
Sta.5	April	82.4	80.37	94.7		
	May	64.0				
	June	94.7				
TSP/Fugitive Dust-(Visual)	Sta.1, 2, 3, 5	April - June	Weekly inspection: Negative			
	Sta.4	April	(1)*: 1 st , 2 nd , 3 rd and 4 th week: Dust from Construction Work			
		May	(2)*: 1 st , 2 nd , 3 rd , 4 th week: Negative			
		June	(3)*: 1 st , 2 nd , 3 rd , 4 th week: Dust from Construction Work			

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

Note:

(1)*: 1st week: Wind Direction ENE-E-E-ENE, 2nd week: ENE-E-ESE-ESE, 3rd week: E-NW-ESE-E and 4th week: ESE-SE-S-SSE, the on-going construction activities affect the quality of the ambient air on this area in terms of dust

(2)*: 1st week: Wind Direction ENE-ENE-ENE-NE, 2nd week: ENE-ENE-ENE-ENE, 3rd week: NE-SSE-SSE-SSE and 4th week: ENE-S-S-SSE, the directions show that on-going construction activities doesn't show any trace of dust

(3)*: 1st week: Wind Direction S-S-SSE-SSE, 2nd week: ESE-S-SSW-SSE, 3rd week: NW-NNW-N-NE and 4th week: NE-SW-SSW-SSE, the on-going construction activities affect the quality of the ambient air on this area in terms of dust

• Water Quality (Ambient Water Quality)

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

Well Water Quality

Point	Parameter	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*1) Country's Standards
GW.1	pH	April	7.80	7.80	7.80	6-9
		May	7.67			
		June	7.80			
	SS (mg/L)	April	<0.1	<0.1	<0.1	No more than 60 mg/L increase
		May	<0.1			
		June	<0.1			

Point	Parameter	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(1) Country's Standards
	BOD (mg/L)	April	2	1.67	2	15
		May	2			
		June	1			
	COD (mg/L)	April	4	5.33	6	-
		May	6			
		June	6			
	Nitrogen (mg/L)	April	1.088	1.416	1.704	10
		May	1.704			
		June	1.456			
	Phosphorus (mg/L)	April	0.058	0.037	0.058	0.4
		May	0.031			
		June	0.022			
	Oil/Grease (mg/L)	April	<1	<1	<1	5
		May	<1			
		June	<1			

Point	Parameter	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(2) Country's Standards
GW.2	pH	April	7.73	7.80	7.97	6 - 9
		May	7.97			
		June	7.80			
	SS (mg/L)	April	<0.1	<0.1	<0.1	No more than 60 mg/L increase
		May	<0.1			
		June	<0.1			
	BOD (mg/L)	April	1	1	1	15
		May	1			
		June	1			
	COD (mg/L)	April	4	3.67	4	-
		May	4			
		June	3			
	Nitrogen (mg/L)	April	1.758	2.642	3.528	10
		May	3.584			
		June	2.583			
	Phosphorus (mg/L)	April	<0.009	0.012	0.020	0.4
		May	0.020			
		June	0.006			
	Oil/Grease (mg/L)	April	<1	<1	<1	5
		May	<1			
		June	<1			

*(1) Standard: DAO34 (Class C/D)

Note: Phenols is excluded from monitoring parameters, because Phenols come from industrial activities. The industrial activities do not exist in this area.

Sea Water Quality

Parameter	Point	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(4) Country's Standards
Color	SW-1	April	20	20	20	No abnormal discoloration from unnatural
		May	20			
		June	20			

Parameter	Point	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(4) Country's Standards
	SW-2	April	20	20	20	causes
		May	20			
		June	20			

*(4) Standard: DAO34 (Class SB)

- Waste

The generated waste amount in April, May and June 2016 is shown in Attachment 1.

- Noise

Item	Point	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(5) Country's Standards
Noise, db(A)	Sta.1	April	59	59	60	50
		May	59			
		June	60			
	Sta.2	April	64	69	73	65
		May	70			
		June	73			
	Sta.3	April	66	67	67	65
		May	67			
		June	67			
	Sta.4	April	63	65	70	55
		May	61			
		June	70			
	Sta.5	April	57	63	66	50
		May	65			
		June	66			
Hearing	Sta.1-Sta.5	April-June	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

3. Natural Environment

- Ecosystem

Monitoring Item	Monitoring Results during Report Period
The two 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	The Reforestation Project for New Bohol Airport is not yet implemented since it is still subject for bidding. The bidding documents were already submitted to DOTC-Bids and Awards Committee (BAC). However, BAC requested to submit additional documents. The NBACSEPP-PMO hold-

Monitoring Item	Monitoring Results during Report Period
	<p>in-abeyance the submission of the additional documents because the NBACSEPP-Multi-Partite Monitoring Team (MMT) passed a Resolution requesting the Department of Transportation that the Procurement of the Reforestation Project will be undertaken and implemented by the Provincial Government of Bohol (PGBh) and the production of seedlings will be done in the Province of Bohol to enable the participation of the Local PO's and seedlings producers. The said Resolution is now being routed for signature of the MMT Executive Committee members.</p> <p>The two identified endangered species will be planted in the Municipalities of Loay, Guindulman, Dausi and Dimiao.</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 is consists 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. In the Terms of Reference (TOR) for the procurement of seedlings, 20% of mortality was considered.

The list of trees identified for planting is shown below.

PROPOSED SEEDLING DISTRIBUTION PER MUNICIPALITY												
Municipality	Total No. of Seedlings	Species Category										
		Fruit Trees Assorted	Coconut	Coffee	Cacao	Timber Species	Mangrove Propagule	Mangrove Beach Type	Ornamentals	Bamboo	Rattan	
1	Dimiao	141,500	25,750	-	-	-	61,750	54,000	-	-	-	-
2	Guindulman	33,333	-	-	18,333	5,000	10,000	-	-	-	-	-
3	Loay	86,244	5,247	-	-	-	3,497	70,000	7,500	-	-	-
4	San Miguel	120,300	38,900	-	18,750	18,750	42,500	-	-	1,400	-	-
5	Dauis	20,389	2,445	-	-	-	2,444	14,000	1,500	-	-	-
6	Panglao	6,825	4,236	1,342	-	-	889	179	179	-	-	-
7	Tagbilaran City	1,144	1,144	-	-	-	-	-	-	-	-	-
8	Cortes	88,611	-	-	-	-	7,778	70,000	10,833	-	-	-
9	Bilar	16,668	4,557	-	-	-	9,333	-	-	-	1,389	1,389
10	Baclayon	5,556	3,333	557	-	-	833	-	833	-	-	-
11	Loon	20,000	14,000	-	-	-	-	-	6,000	-	-	-
12	Maribojoc	37,500	-	-	-	-	-	30,000	7,500	-	-	-
13	Pilar	15,743	1,333	-	445	445	12,500	-	-	-	510	510
14	Alburquerque	5,000	-	-	-	-	5,000	-	-	-	-	-
15	Sikatuna	4,445	2,666	-	890	889	-	-	-	-	-	-
16	Sevilla	2,222	1,333	-	445	444	-	-	-	-	-	-
17	Alicia	13,520	3,750	-	-	-	8,750	-	-	-	510	510
18	Resettlement Site	5,104	3,573	510	-	-	510	-	-	511	-	-
Grand Total		624,104	112,267	2,409	38,863	25,528	165,784	238,179	34,345	1,911	2,409	2,409

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 DOTC and LGU before the implementation of the reforestation project. Although a copy of the draft MOU has been provided to the LGUs, DOTC-PMO need to visit again these offices to update since some of the local officials had been changed after the May election. The table below shows the plantation sites and the required land area.

Plantation Site	Area (Has.)
Dimiao	84.57
Guindulman	28.5
Loay	29
San Miguel	103
Dauis	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 type="checkbox"/> within set standards <input checked="" type="checkbox"/> exceeding set standards	Continuous monitoring
Water Quality	<input checked="" type="checkbox"/> within set standards <input type="checkbox"/> exceeding set standards	Continuous monitoring
Noise	<input type="checkbox"/> within set standards <input checked="" type="checkbox"/> exceeding set standards	Continuous monitoring. The access route for the deliveries of the construction materials is now being implemented.
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
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
Others	<input checked="" type="checkbox"/> within set standards <input type="checkbox"/> exceeding set standards	Continuous monitoring

TSP value on Station 4 for the month of April 2016 exceeded the allowable limit. High level of TSP was observed since Station 4 is located within the construction site. Construction activities are on-going and considering also that this months' weather condition is dry, with the effect of El Niño phenomena. Mitigating measures were included in the construction activities to address the impacts of dust accumulating due to the construction activities such as regular watering of the unpaved roads and strict implementation of speed limits of vehicular activities.

There is no exceedance on any of the parameters being analyzed for the well and sea water qualities.

All stations for noise level quality monitoring exceeded the allowable limit because the island is now a busy area compared to the time when the baseline survey was conducted. The causes of the high records of noise level quality are due to the passing vehicles, nocturnal insects, videoke playing, carpentry works nearby and children playing inside the school compound.

Attachment 1: Waste Management

1.1 April 2016

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)	1,439 kg	0	0	1,439 kg	1,439 kg	The landfill site is at Panglao Municipality
Waste from Construction work	Area of Temporary Facilities	Compostable	802 kg	802 kg	0	0	0	Composted
		Plastic Bottles	17 kg	0	0	0	17 kg	Recycled
		Cartons	18 kg	0	0	0	18 kg	Recycled
		Tin Cans	4 kg	0	0	0	4 kg	Recycled
		Mixed Hard Plastics	2 kg	0	0	0	2 kg	Recycled
		Used Oil	4 drums	4 drums	0	0	0	Temporary Stored
		Used Lead-Acid Battery	4 pcs	4 pcs	0	0	0	Temporary Stored
	Busted Fluorescent Bulb	1 pc	1 pc	0	0	0	Temporary Stored	
	Working area at the Site	Excavated Soil	0	0	0	0	0	Recycled

1.2 May 2016

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)	1,890 kg	0	0	1,890 kg	1,890 kg	The landfill site is at Panglao Municipality
Waste from Construction	Area of Temporary Facilities	Compostable	852 kg	852 kg	0	0	0	Composted
		Plastic Bottles	9 kg	0	0	0	9 kg	Recycled

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	
Construction work.		Cartons	6 kg	0	0	0	6 kg	Recycled
		Tin Cans	1 kg	0	0	0	1 kg	Recycled
		Mixed Hard Plastics	0	0	0	0	0	Recycled
		Used Oil	3 drums	3 drums	0	0	0	Temporary Stored
		Used Lead-Acid Battery	3 pcs	3 pcs	0	0	0	Temporary Stored
		Busted Fluorescent Bulb	1 pc	1 pc	0	0	0	Temporary Stored
	Working area at the Site	Excavated Soil	0	0	0	0	0	Recycled

1.3 June 2016

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)	1,287 kg	0	0	1,287 kg	1,287 kg	The landfill site is at Panglao Municipality
Waste from Construction work	Area of Temporary Facilities	Compostable	753 kg	753 kg	0	0	0	Composted
		Plastic Bottles	7 kg	0	0	0	7 kg	Recycled
		Cartons	5 kg	0	0	0	5 kg	Recycled
		Tin Cans	1 kg	0	0	0	1 kg	Recycled
		Mixed Hard Plastics	0	0	0	0	0	Recycled
		Used Oil	3 drums	3 drums	0	0	0	Temporary Stored
		Used Lead-Acid Battery	2 pcs	2 pcs	0	0	0	Temporary Stored
	Busted Fluorescent Bulb	3 pcs	3 pcs	0	0	0	Temporary Stored	
	Working area at the Site	Excavated Soil	0	0	0	0	0	Recycled