Quaternary Report No. 8

2017 (April, May and June)

New Bohol Airport Construction
and
Sustainable Environmental Protection Project

Quaternary Environmental Monitoring Report

July 2017

JAPAN AIRPORT CONSULTANTS, INC.

in association with

PHIL. JAC, INC.

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 (July 2017) based on the field survey report 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 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

Sta. ID No.	GPS Readings		Description of Sampling Station
	Longitude	Latitude	
			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"	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. Sampling activities is being done alternately in the original and new location in consideration of the delivery route of the construction materials for the project.
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.

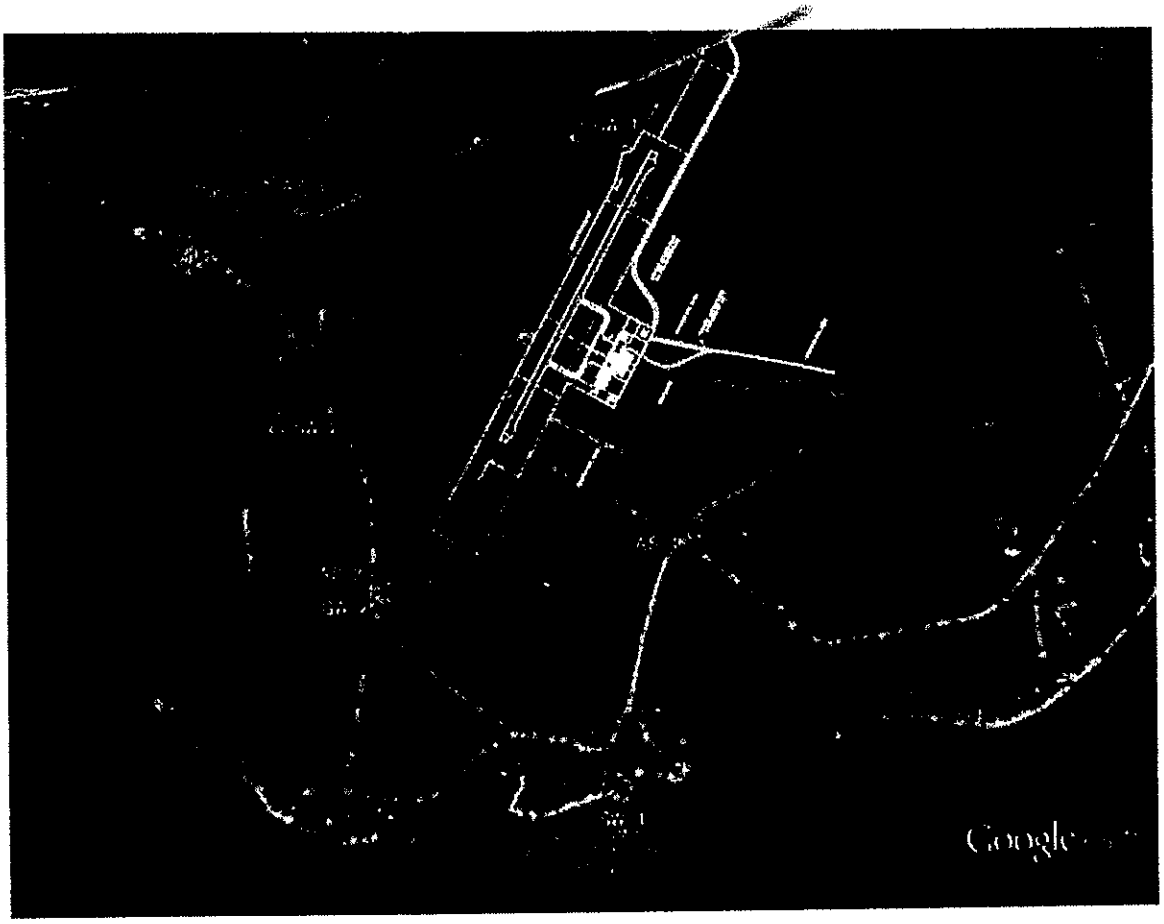


Figure 1. Location of Samplings and Measurement

- **Air Quality (Ambient Air Quality)**

Remarks: Measurement Point-shown in **Figure 1**, Frequency – once a month, Methoc-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	April	23.4	17.4	23.4	230
		May	10.3			
		June	18.5			
	Sta.2	April	21.8	27.3	30.6	
		May	30.6			
		June	29.5			
	Sta.3	April	14.0	12.6	20.6	
		May	20.6			
		June	3.1			
	Sta.4	April	1.6	10.4	27.9	
		May**	<1.7			
		June	27.9			
	Sta.5	April	27.9	26.0	41.7	
		May	8.5			
		June	41.7			
TSP/Fugitive Dust-(Visual)	Sta.1, 2, 3, 4, 5	April - June	Weekly inspection: Negative except for Sta. 4 on April wherein traces were observed since it is near the construction site			

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

Note:
(1)*: 1st week: Wind Direction NE-NE-NE-ENE, 2nd week: NNE-NNE-NNE-NNE, 3rdweek: ENE-E-SSE-S and 4th week: ESE-SE-S-S, the directions show that on-going construction activities doesn't show any trace of dust except for Sta. 4 wherein due to the extent of construction activities traces of dust were observed along the access road
(2)*: 1st week: Wind Direction NE-NE-NE-NE, 2nd week: ENE-ENE-E-E, 3rdweek: SSW-SSW-S-SSE and 4th week: NE-E-S-SSE, the directions show that on-going construction activities doesn't show any trace of dust
(3)*: 1st week: Wind Direction SW-ENE-SSW-S, 2nd week: ENE-E-SSE-E, 3rdweek: WNW-WSW-SSW-S and 4th week: SSW-SSW-S-SSE, 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)

- **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	April	9.4	8.7	9.4	6.5-8.5
		May	9.2			
		June	7.4			
	SS (mg/L)	April	<0.1	<0.1	<0.1	-
		May	<0.1			
		June	<0.1			
	BOD (mg/L)	April	1	1.3	2	-
		May	1			
		June	2			

Point	Parameter	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(1) Country's Standards
	COD (mg/L)	April	5	8.33	17	-
		May	3			
		June	17			
	Nitrogen (mg/L)	April	2.64	1.70	2.64	7
		May	2.34			
		June	0.13			
	Phosphorus (mg/L)	April	0.017	0.017	0.020	0.5
		May	0.020			
		June	0.014			
	Oil/Grease (mg/L)	April	<1	<1	<1	1
		May	<1			
		June	<1			

Point	Parameter	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(1) Country's Standards
GW-2	pH	April	9.9	9.2	10.0	6.5 – 8.5
		May	10.0			
		June	7.7			
	SS (mg/L)	April	<0.1	<0.1	<0.1	-
		May	<0.1			
		June	<0.1			
	BOD (mg/L)	April	2	2.3	4	-
		May	4			
		June	1			
	COD (mg/L)	April	7	11	18	-
		May	8			
		June	18			
	Nitrogen (mg/L)	April	1.26	0.81	1.26	7
		May	1.11			
		June	0.07			
	Phosphorus (mg/L)	April	<0.003	0.034	0.072	0.5
		May	0.072			
		June	0.028			
	Oil/Grease (mg/L)	April	<1	<1	<1	1
		May	<1			
		June	<1			

*(1) Standard: DAO No. 2016-08 Water Quality Guidelines for Ground Water (Class A WQG).

Since January, 2017 to present, the Country's Standard for Groundwater Quality have been based on DAO No. 2016-08 Class A instead of DAO 34 (Class C/D). In the January to March 2017 report, there was a typographical error in the country's standard for parameter Ph. The value should have been 6.5 to 8.5.

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.

Sea Water Quality

Parameter	Point	Month	Measured Value	Measured Value (Mean)	Measured Value (Max.)	*(4) Country's Standards
Color	SW-1	April	10	13	20	50 (Class SB) 75 (Class SC)
		May	10			
		June	20			
	SW-2	April	20	20	20	
		May	20			
		June	20			

*(4) Standard: DAO No. 2016-08 (Class SB and SC)

Since January, 2017 to present, the Country's Standard for Seawater Quality have been based on DAO No. 2016-08 Class SB and SC instead of DAO 34 (Class SB).

- **Waste**

The generated wastes for the months of April, May and June 2017 are 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	46	54	60	50
		May	60			
		June	56			
	Sta.2	April	61	65	71	65
		May	63			
		June	71			
	Sta.3	April	60	60	60	65
		May	60			
		June	59			
	Sta.4	April	58	58	62	55
		May	54			
		June	62			
	Sta.5	April	54	59	63	50
		May	61			
		June	63			
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

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

3. Natural Environment

- **Ecosystem**

Monitoring Item	Monitoring Results during Report Period
The two (2) endangered species (*molave [Vitex parviflora Juss.] and bolong-eta [diospyros pilosathera])* listed in the Biodiversity Assessment Report of the Bohol New Airport site	The MMT-Executive Committee, approved a Resolution recommending to DOTr that the bidding for the procurement of Biodiversity Conservation Project (Reforestation) will be undertaken by the PENRO-Bohol thru a Memorandum of Agreement (MOA). Said MOA was already signed by DENR-Region VII and now for signature of the DOTr concerned official. The Technical Working Group of the MMT-NBACSEPP will undertake the monitoring while the over-all supervision will be under the DOTr. The two (2) identified endangered species will be planted in the Municipalites of Loay, Guindulman, Dauis and Dimiao.

- **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 a 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 will be considered.

The list of trees identified for planting is shown below.

Plantation Site	Fruit Assorte	Timber Indign's	Mangrov e	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
Dauis	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 DOTr and LGU before the implementation of the reforestation project. The DOTr-PMO will revisit the LGUs to update on the status of reforestation project and to verify on the availability of the land previously compromised verbally by the LGUs. 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 more than 2 years and not yet implemented. Possible areas are the NGP sites wherein PENRO 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
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	☑within set standards ☐exceeding set standards	Continuous monitoring
Water Quality	☐within set standards ☑exceeding set standards	Continuous monitoring
Noise	☐within set standards ☑exceeding set standards	Continuous monitoring. The access route for the deliveries of the construction materials is now being implemented.
Waste	☑ within set standards ☐exceeding set standards	Continuous monitoring
Odor	☑ within set standards ☐exceeding set standards	Continuous monitoring
Natural Environment	☑ impacts properly mitigated ☐mitigation measures need to be followed	Continuous monitoring
Heritage	☑impacts properly mitigated ☐mitigation measures need to be followed	Continuous monitoring
Others	☑ within set standards ☐exceeding set standards	Continuous monitoring

There is no exceedance on the air quality analyzed for TSP.

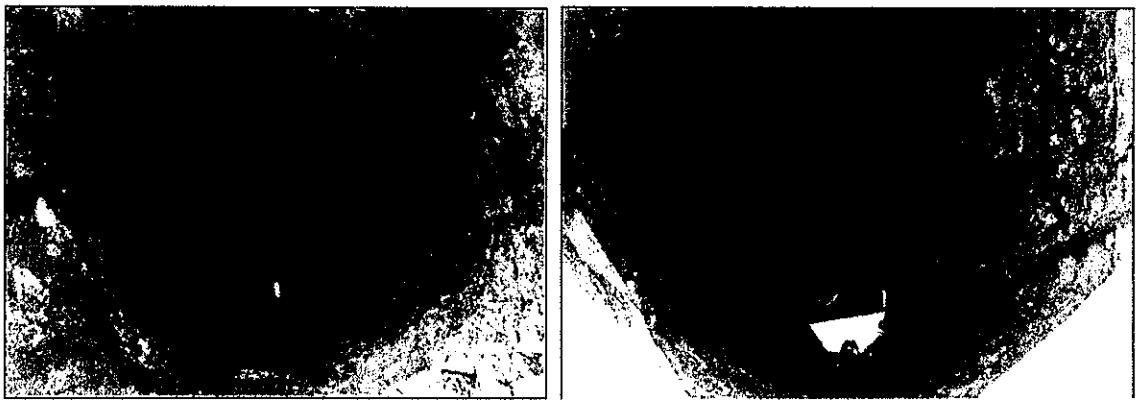
For sea water, the quality is within the standard for the two sampling stations.

The increase in pH value for both groundwater stations was due to the human activities and the wells were not properly covered wherein rainwater mixed with it that caused acid increase. The high values resulted during the April and May sampling while on June, the result is within the standard.

The photos below showed the current conditions of the two sampling stations for groundwater. Based on the photos, another cause for high Ph is the interactions of water with the surrounding rocks and other materials.

The previous excess in pH for groundwater in March 2007 has the same reasons as stated above and for Oil and Grease at GW-2, the high value is since it is an open dug well, it is more prone to contaminants that would affect the result of the particular parameter. Probably during sampling, oil or grease had been mixed to the source and during analysis it was found in the water sample.

The said excesses of parameter pH and Oil & Grease are not due to the on-going construction of the airport project. Continuous monitoring is being undertaken and the *owner of the well was advice to cover the well to prevent more contaminations.*



Mostly of the stations for noise monitoring exceeded the allowable limit aside from Station 3. This is because the island became busy area compared to the time when the baseline survey was conducted. The causes of the high records of noise quality are passing vehicles, nocturnal insects, activities by the residents nearby and children playing inside the school compound.

Attachment 1: Waste Management

1.1 April 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)	200 kg	0	0	0	200 kg	The dumping site is at Panglao Municipality
Waste from Construc-tion work	Area of Temporary Facilities	Compostable	386 kg	386 kg	0	0	0	Composted
		Plastic Bottles	13 kg	0	0	0	13 kg	Recycled
		Cartons	35 kg	0	0	0	35 kg	Recycled
		Mixed Hard Plastics	92 kg	0	0	0	92 kg	Recycled
	Hazardous Waste	Oil Contaminated Materials	119 kg	119 kg	0	0	0	To be collected by Third Party
	Working area at the Site	Excavated Soil	0	0	0	0	0	

1.2 May 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)	432 kg	0	0	0	432 kg	The dumping site is at Panglao Municipality
Waste from Construc-tion work	Area of Temporary Facilities	Compostable	501 kg	501 kg	0	0	0	Composted
		Plastic Bottles	56 kg	0	0	0	56 kg	Recycled
		Cartons	49 kg	0	0	0	49 kg	Recycled
		Mixed Hard Plastics	290 kg	0	0	0	290 kg	Recycled
	Hazardous Waste	Oil Contaminated Materials	0 kg	0 kg	0	0	0	
	Working area at the Site	Excavated Soil	0	0	0	0	0	

1.3 June 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)	313 kg	0	0	0	313 kg	The dumping site is at Panglao Municipality
Waste from Construc-tion work	Area of Temporary Facilities	Compostable	209 kg	209 kg	0	0	0	Composted
		Plastic Bottles	62 kg	0	0	0	62 kg	Recycled
		Cartons	51 kg	0	0	0	51 kg	Recycled
		Metals	0	0	0	0	0	
		Mixed Hard Plastics	338 kg	0	0	0	338 kg	Recycled
	Hazardous Waste	Used Lead Acid Battery	13 pc	13 pc	0	0	0	To be collected by Third Party
	Working area at the Site	Excavated Soil	0	0	0	0	0	