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Quaternary Report No. 1

2015 (July, August and September)

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

**Quaternary Environmental Monitoring Report**

**October 2015**

**Department of Transportation and Communication (DOTC)**

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 in Construction/Operation Phase. The number of total monitoring times is estimated at 42 times. The monitoring report will be submitted quarterly by DOTC to JICA. |

**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 09o33'32.9" | E 123o45'27.0" | 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 09o34'50.4" | E 123o45'08.4" | 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 09o34'19.9" | E 123o46'28.9" | It is located along access road of the proposed New Bohol Airport in Brgy. Tawala, Panglao, Bohol.  |
| Sta-5 | N 09o34'10.4" | E 123o47'14.5" | 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. |

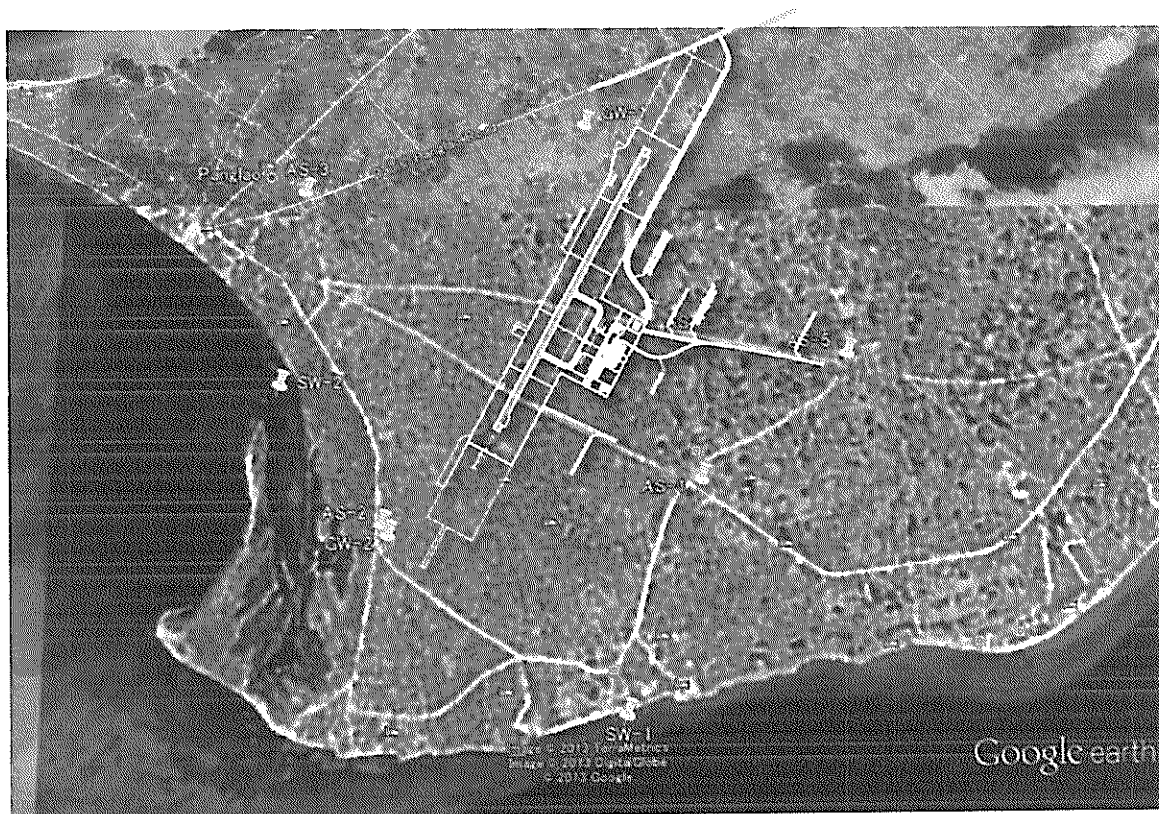


Figure 1. Location of Samplings and Measurement

**- 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.) | Country's Standards |
|----------------------------|-------------|----------------|---|-----------------------|-----------------------|---------------------|
| TSP/Fugitive Dust (mg/m3)  | Sta.1       | July           | 36.5  | 32.7                  | 60.0                  | 230                 |
|                            |             | August         | 60.0  |                       |                       |                     |
|                            |             | September      | <1.6  |                       |                       |                     |
|                            | Sta.2       | July           | 67.6  | 53.0                  | 89.7                  |                     |
|                            |             | August         | <1.6  |                       |                       |                     |
|                            |             | September      | 89.7  |                       |                       |                     |
|                            | Sta.3       | July           | 87.0  | 30.1                  | 87.0                  |                     |
|                            |             | August         | <1.6  |                       |                       |                     |
|                            |             | September      | <1.6  |                       |                       |                     |
|                            | Sta.4       | July           | 11.1  | 56.4                  | 136.3                 |                     |
|                            |             | August         | 136.3   |                       |                       |                     |
|                            |             | September      | 21.8  |                       |                       |                     |
|                            | Sta.5       | July           | 62.1  | 44.8                  | 62.1                  |                     |
|                            |             | August         | 44.0  |                       |                       |                     |
|                            |             | September      | 28.3  |                       |                       |                     |
| TSP/Fugitive Dust-(Visual) | Sta.1-Sta.5 | July-September | Weekly inspection: There is no impact from the construction work. |                       |                       |                     |

Standard: DAO14/DAO2000-81

**- Water Quality (Ambient Water Quality)**

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

**Ground Water Quality**

| Point | Parameter | Month     | Measured Value | Measured Value (Mean) | Measured Value (Max.) | Country's Standards           |         |
|-------|-----------|-----------|----------------|-----------------------|-----------------------|-------------------------------|---------|
|       |           |           |                |                       |                       | DAO34 (Class C/D)             | PDWS    |
| GW.1  | PH        | July      | 8.70           | 8.58                  | 8.70                  | 6-9                           | 6.5-8.5 |
|       |           | August    | 8.51           |                       |                       |                               |         |
|       |           | September | 8.53           |                       |                       |                               |         |
|       | SS (mg/L) | July      | <0.1           | <0.1                  | <0.1                  | No more than 60 mg/L increase | -       |
|       |           | August    | <0.1           |                       |                       |                               |         |
|       |           | September | <0.1           |                       |                       |                               |         |
| BOD   |           | July      | <1             | 1                     | 2                     | 15                            | -       |

|                    |           |   |       |       |   |      |
|--------------------|-----------|---|-------|-------|---|------|
| (mg/L)             | August    | <1  |       |       |   |      |
|                    | September | 2   |       |       |   |      |
| COD (mg/L)         | July      | 22  | 9     | 22    | -   | -    |
|                    | August    | <1  |       |       |   |      |
|                    | September | 4   |       |       |   |      |
| Nitrogen (mg/L)    | July      | 0.54  | 0.52  | 0.54  | 10  | -    |
|                    | August    | 0.5   |       |       |   |      |
|                    | September | For verification  |       |       |   |      |
| Phosphorus (mg/L)  | July      | 0.054   | 0.024 | 0.054 | 0.4   | -    |
|                    | August    | <0.003  |       |       |   |      |
|                    | September | For verification  |       |       |   |      |
| Oil/Grease (mg/L)  | July      | <1  | <1    | <1    | 5   | -    |
|                    | August    | <1  |       |       |   |      |
|                    | September | <1  |       |       |   |      |
| Phenol             | July      | This parameter indicates the effluent material density in the operation of industrial facilities. This parameter is not necessary in the operation of local industries. |       |       |   | 0.02 |
|                    | August    |   |       |       |   |      |
|                    | September |   |       |       |   |      |
| Siltation (Visual) | July      | The Surface water does not exist at the site. There is no available water at the soaking pond.  |       |       |   | -    |
|                    | August    |   |       |       |   |      |
|                    | September |   |       |       |   |      |
| Color              | July      | 30  | 17    | 30    | No abnormal discoloration from unnatural causes | 5    |
|                    | August    | 10  |       |       |   |      |
|                    | September | 10  |       |       |   |      |

| Point             | Parameter       | Month            | Measured Value   | Measured Value (Mean) | Measured Value (Max.) | Country's Standards            |         |
|-------------------|-----------------|------------------|------------------|-----------------------|-----------------------|--------------------------------|---------|
|                   |                 |                  |                  |                       |                       | DAO34 (Class C/D)              | PDWS    |
| GW.2              | PH              | July             | 9.10             | 8.69                  | 8.70                  | 6-9                            | 6.5-8.5 |
|                   |                 | August           | 8.21             |                       |                       |                                |         |
|                   |                 | September        | 8.77             |                       |                       |                                |         |
|                   | SS (mg/L)       | July             | <0.1             | <0.1                  | <0.1                  | Not more than 60 mg/L increase | -       |
|                   |                 | August           | <0.1             |                       |                       |                                |         |
|                   |                 | September        | <0.1             |                       |                       |                                |         |
|                   | BOD (mg/L)      | July             | <1               | 3.1                   | 6.4                   | 15                             | -       |
|                   |                 | August           | 2                |                       |                       |                                |         |
|                   |                 | September        | 6.4              |                       |                       |                                |         |
|                   | COD (mg/L)      | July             | 70               | 26.7                  | 70                    | -                              | -       |
|                   |                 | August           | 6                |                       |                       |                                |         |
|                   |                 | September        | 4                |                       |                       |                                |         |
|                   | Nitrogen (mg/L) | July             | 6.5              | 2.50                  | 6.5                   | 10                             | -       |
|                   |                 | August           | 0.95             |                       |                       |                                |         |
|                   |                 | September        | For verification |                       |                       |                                |         |
| Phosphorus (mg/L) | July            | 0.040            | 0.014            | 0.04                  | 0.4                   | -                              |         |
|                   | August          | <0.003           |                  |                       |                       |                                |         |
|                   | September       | For verification |                  |                       |                       |                                |         |
| Oil/Grease (mg/L) | July            | <1               | <1               | <1                    | 5                     | -                              |         |
|                   | August          | <1               |                  |                       |                       |                                |         |

|                    |           |   |    |    |   |      |
|--------------------|-----------|---|----|----|---|------|
|                    |           | September   | <1 |    |   |      |
| Phenol             | July      | This parameter indicates the effluent material density in the operation of industrial facilities. This parameter is not necessary in the operation of local industries. |    |    |   | 0.02 |
|                    | August    |   |    |    |   |      |
|                    | September |   |    |    |   |      |
| Siltation (Visual) | July      | The Surface water does not exist at the site. There is no available water at the soaking pond.  |    |    |   | -    |
|                    | August    |   |    |    |   |      |
|                    | September |   |    |    |   |      |
| Color              | July      | 30  | 17 | 30 | No abnormal discoloration from unnatural causes | 5    |
|                    | August    | 10  |    |    |   |      |
|                    | September | 10  |    |    |   |      |

Standard: DAO34 (Class C/D), PDWS: Philippines Drinking Water Standard

### Sea Water Quality

| Point                        | Parameter         | Month   | Measured Value | Measured Value (Mean) | Measured Value (Max.) | Country's Standards |
|------------------------------|-------------------|---|----------------|-----------------------|-----------------------|---------------------|
| SW.1                         | PH                | July  | 8.30           | 8.17                  | 8.30                  | 6.5 – 8.5           |
|                              |                   | August  | 8.07           |                       |                       |                     |
|                              |                   | September   | 8.13           |                       |                       |                     |
|                              | DO (mg/L)         | July  | 3.9            | 5.63                  | 6.5                   | 5                   |
|                              |                   | August  | 6.5            |                       |                       |                     |
|                              |                   | September   | 6.5            |                       |                       |                     |
|                              | BOD (mg/L)        | July  | <1             | 1.3                   | 2                     | 5                   |
|                              |                   | August  | 2              |                       |                       |                     |
|                              |                   | September   | <1             |                       |                       |                     |
|                              | MBAS (mg/L)       | July  | <0.1           | 0.13                  | 0.2                   | 0.3                 |
|                              |                   | August  | 0.2            |                       |                       |                     |
|                              |                   | September   | <0.1           |                       |                       |                     |
|                              | Nitrogen (mg/L)   | July  | 0.024          | 0.030                 | 0.047                 | -                   |
|                              |                   | August  | 0.018          |                       |                       |                     |
|                              |                   | September   | 0.047          |                       |                       |                     |
|                              | Phosphorus (mg/L) | July  | 0.017          | 0.008                 | 0.017                 | -                   |
|                              |                   | August  | <0.003         |                       |                       |                     |
|                              |                   | September   | <0.003         |                       |                       |                     |
|                              | Oil/Grease (mg/L) | July  | <1             | <1                    | <1                    | 2                   |
|                              |                   | August  | <1             |                       |                       |                     |
|                              |                   | September   | <1             |                       |                       |                     |
| Total Suspended Solid (mg/L) | July              | 97  | 36             | 97                    | <30                   |                     |
|                              | August            | <5  |                |                       |                       |                     |
|                              | September         | <5  |                |                       |                       |                     |
| Phenol                       | July              | This parameter indicates the effluent material density in the operation of industrial facilities. This parameter is not necessary in the operation of local industries. |                |                       |                       | 0.02                |
|                              | August            |   |                |                       |                       |                     |
|                              | September         |   |                |                       |                       |                     |
| Siltation (Visual)           | July              | Siltation was not identified.   |                |                       |                       | -                   |
|                              | August            |   |                |                       |                       |                     |
|                              | September         |   |                |                       |                       |                     |
| Color                        | July              | 40  | 20             | 40                    | 3                     |                     |
|                              | August            | 10  |                |                       |                       |                     |
|                              | September         | 10  |                |                       |                       |                     |

| Point              | Parameter         | Month                         | Measured Value   | Measured Value (Mean) | Measured Value (Max.) | Country's Standards |      |
|--------------------|-------------------|-------------------------------|--|-----------------------|-----------------------|---------------------|------|
| SW.2               | PH                | July                          | 8.50   | 8.34                  | 8.50                  | 6.5 – 8.5           |      |
|                    |                   | August                        | 8.20   |                       |                       |                     |      |
|                    |                   | September                     | 8.33   |                       |                       |                     |      |
|                    | DO (mg/L)         | July                          | 3.4  | 5.4                   | 6.5                   | 5                   |      |
|                    |                   | August                        | 6.5  |                       |                       |                     |      |
|                    |                   | September                     | 6.3  |                       |                       |                     |      |
|                    | BOD (mg/L)        | July                          | <1   | 2                     | 3                     | 5                   |      |
|                    |                   | August                        | 2  |                       |                       |                     |      |
|                    |                   | September                     | 3  |                       |                       |                     |      |
|                    | MBAS (mg/L)       | July                          | <0.1   | 0.1                   | 0.1                   | 0.3                 |      |
|                    |                   | August                        | 0.1  |                       |                       |                     |      |
|                    |                   | September                     | <0.1   |                       |                       |                     |      |
|                    | Nitrogen (mg/L)   | July                          | 0.006  | 0.016                 | 0.028                 | -                   |      |
|                    |                   | August                        | 0.015  |                       |                       |                     |      |
|                    |                   | September                     | 0.028  |                       |                       |                     |      |
|                    | Phosphorus (mg/L) | July                          | 0.033  | 0.013                 | 0.033                 | -                   |      |
|                    |                   | August                        | <0.003   |                       |                       |                     |      |
|                    |                   | September                     | <0.003   |                       |                       |                     |      |
|                    | Oil/Grease (mg/L) | July                          | <1   | <1                    | <1                    | 2                   |      |
|                    |                   | August                        | <1   |                       |                       |                     |      |
|                    |                   | September                     | <1   |                       |                       |                     |      |
|                    | Phenol            | July                          | This parameter indicates the effluent material density in the operation of industrial facilities. This parameter is not necessary in the operation of local industries.. |                       |                       |                     | 0.02 |
|                    |                   | August                        |  |                       |                       |                     |      |
|                    |                   | September                     |  |                       |                       |                     |      |
| Siltation (Visual) | July              | Siltation was not identified. |  |                       |                       | -                   |      |
|                    | August            |                               |  |                       |                       |                     |      |
|                    | September         |                               |  |                       |                       |                     |      |
| Color              | July              | 30                            | 20   | 30                    | 3                     |                     |      |
|                    | August            | 10                            |  |                       |                       |                     |      |
|                    | September         | 20                            |  |                       |                       |                     |      |

Standard: DAO34 (Class SB)

**- Waste**

There was no waste from the project in July and August.

The generated waste amount in September is shown in Attachment-1.

- Noise

| Item    | Point       | Month          | Measured Value               | Measured Value (Mean) | Measured Value (Max.) | Country's Standards |
|---------|-------------|----------------|------------------------------|-----------------------|-----------------------|---------------------|
| db(A)   | Sta.1       | July           | --                           | 62                    | 72                    | 50                  |
|         |             | August         | 60                           |                       |                       |                     |
|         |             | September      | 64                           |                       |                       |                     |
|         | Sta.2       | July           | -                            | 68                    | 74                    | 65                  |
|         |             | August         | 64                           |                       |                       |                     |
|         |             | September      | 72                           |                       |                       |                     |
|         | Sta.3       | July           | -                            | 64.5                  | 74                    | 65                  |
|         |             | August         | 60                           |                       |                       |                     |
|         |             | September      | 69                           |                       |                       |                     |
|         | Sta.4       | July           | -                            | 47.5                  | 60                    | 55                  |
|         |             | August         | 41                           |                       |                       |                     |
|         |             | September      | 54                           |                       |                       |                     |
|         | Sta.5       | July           | -                            | 66                    | 75                    | 50                  |
|         |             | August         | 61                           |                       |                       |                     |
|         |             | September      | 71                           |                       |                       |                     |
| Hearing | Sta.1-Sta.5 | July-September | Weekly hearing: no compliant |                       |                       |                     |

Standard: PD984

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 proposed site | (Number of newly planted endangered species)<br>Species: ( <i>molave</i> [ <i>Vitex parviflora</i> Juss.] and <i>bolong-eta</i> [ <i>diospyros pilosathera</i> ])<br>Number: None<br>MMT will request DENR that the species shall be included in the BCP. |

-Tree Planting (Revised ECC requests 572,500 seedlings)

| Monitoring Item         | Monitoring Results during Report period |
|-------------------------|---|
| Number of trees planted | None                                    |
| Number of species       | None                                    |
| Number of locations     | None                                    |

Information on tree species to be planted and those species are selected.



The different species of trees to be planted are native (indigenous or hardwood) tree species, fruit (assorted), bamboo and rattan, ornamentals, coconut, mangroves and beach forest species.

To determine these types of tree species, the Technical Working Group (TWG) of the Biodiversity Conservation Plan (BCP), composed of the Department of Transportation and Communications (DOTC)-Project Management Office (PMO), Provincial Environment and Natural Resources Office (PENRO) and Bohol Environment Management Office (BEMO), went to the different Local Government Units (LGUs) to survey the appropriate trees that are growing in the areas depending on the soil characteristics. After having the inventory of the appropriate trees, the TWG checked with PENRO if said species were considered in the National Greening Program (NGP) of the Government. The TWG conducted thorough site validation and continuous coordination with the LGUs to ensure their support to the BCP project. The selection was based on the actual type of tree species needed in a particular municipality/city to support NGP and for the conservation of the environment.

**Information on the location for planting.**

The sites for planting seedlings (572,000 seedlings based on amended ECC in 2013) has already been identified. The TWG conducted site selection on where those trees should be planted in coordination with the LGUs. The areas identified are government-owned land. There were 17 municipalities/city that expressed their willingness to participate and to support the project. The memorandum of understanding stating the roles of the LGUs and DOTC is now being reviewed by DOTC Legal Division. The total requirement is 624,104 and the locations were already identified by the mayor of each municipalities/city. This also includes the seedlings required for the resettlement site and additional seedlings required by the City Environment Natural Resources Office (CENRO). To date, the documents for the procurement of seedlings were already submitted to DOTC BAC for bidding. The duration of the project is 3 years, and the planting program of first year is scheduled from year 2016 to 2018.

Attachment -1 shows the MAP indicating the locations for planting and TABLE indicating the number and kind of species to be planted.

**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"/> *1)exceeding set standards | Continuous monitoring                 |

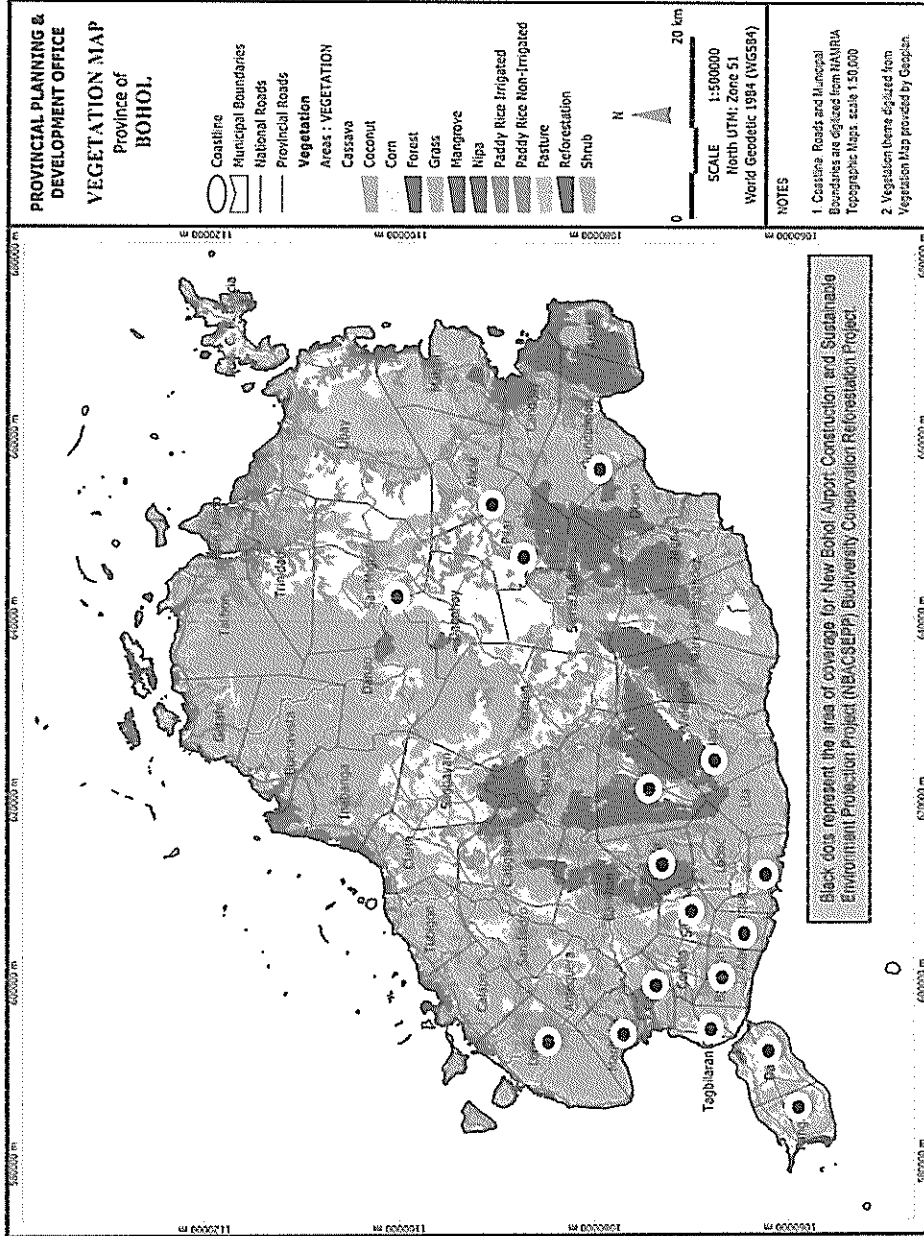
|                     |   |   |
|---------------------|---|---|
| Noise               | <input type="checkbox"/> within set standards <input checked="" type="checkbox"/> exceeding set standards                 | Continuous monitoring, and Access route for transportation of construction materials shall be considered. |
| 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"/> *2) impacts properly <input type="checkbox"/> mitigation measures need to be followed | Continuous monitoring   |
| Heritage            | <input checked="" type="checkbox"/> impacts properly <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   |

\*1) Color parameter (water quality analysis): the values/results are comparatively larger than the average values as experienced engineers would normally encounter. The Contractor will be requested to review the method of analysis and closely monitor the laboratory tests to obtain the accurate values.

\*2) The sites for planting seedlings (572,000 seedlings based on amended ECC in 2013) has already been identified. The total requirement targeted by DOTC is 624,104. The duration of the project is 3 years, and the planting program of first year is scheduled by year 2016.

Attachment 1

LOCATION OF PLANTING SITES AND LIST OF SEEDLINGS SPECIES





**Attachment 1: Waste Management (September, 2015)**

| 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 (Package of lunch and snacks) | 36kg   | 0               | 0                                      | 36kg       | 36kg                   | The landfill site of Panglao Municipality |
|                              |                              |  | 306.5 kg   | 0               | 0                                      | 306.5 kg   | 306.5 kg               |   |
| Waste from Construction work | Area of Temporary Facilities | Styrofoam                                    | 13.5kg   | 0               | 0                                      | 13.5kg     | 13.5kg                 | Recycled or disposal by sell              |
|                              |                              |  | 24kg   | 0               | 0                                      | 24kg       | 24kg                   |   |
|                              |                              | Broken Tiles                                 | 121kg  | 0               | 0                                      | 121kg      | 121kg                  |   |
|                              |                              |  | 54kg   | 0               | 0                                      | 54kg       | 54kg                   |   |
|                              |                              | Cans   | 18kg   | 0               | 0                                      | 18kg       | 18kg                   |   |
|                              |                              |  | Excavated soil                                     | 0               | 0                                      | 0          | 0                      |   |
| Working area at the Site     |                              |  |  |                 |  |            | 0                      | Recycled                                  |