Implementation of Environmental Management Plan Report

For the period covered July to December 2015
Project Number: 38412-023
March 2016

India: Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program – Project 1

Prepared by the Flood and River Erosion Management Agency of Assam (FREMAA) for the State Government of Assam for the Asian Development Bank.

BI-ANNUAL REPORT ON IMPLEMENTATION OF EMP

Project No 38412
Loan No 2684-IND

India: Multitranche Financing Facility –
AssamIntegrated Flood and Riverbank Erosion Risk Management Investment Program

Reporting Period – July 2015 to December 2015

Submitted by Executing Agency
Flood and River Erosion Management Agency of Assam (FREMAA)

Prepared for FREMAA by Project Management Consultancy (PMC-FREMAA)

Bi-Annual Report on Implementation of Environmental Management Plan
July 2015 to December 2015

Table of Contents

ABBREVIATIONS

ADB – Asian Development Bank
AIFRERMIP – Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program
CBFRML – Community based flood risk management and livelihood
EIA – Environmental impact assessment
EMP – Environmental management plan
EMoP – Environmental Monitoring Plan
FRERM – Flood and riverbank erosion risk management
FREMAA - Flood and River Erosion Management Agency of Assam
MFF – Multitranche financing facility
MIS – Management information system
MoEF&CC – Ministry of Environment Forestsand Climate Change
GOI – Government of India
NGOs – Nongovernment organizations
PMU – Project management unit
SEIA – Summary environmental impact assessment
SGOA – State government of Assam
SIO – Subproject implementation office
SPCB – State Pollution Control Board
UNDP – United Nations Development Program
WRD – Water Resources Department

LOAN PROCESSING HISTORY

Approval of PPTA 26 September 2008
Fact-finding Mission 27 January-7 February 2009
Management Review Meeting (MRM) 9 October 2009
Appraisal Mission-1 1-16 February 2010
Appraisal Mission (Final) 27 April – 10 May 2010
Staff Review Meeting (SRM) 29 July 2010
Loan Negotiations for MFF and Tranche 1 7-8 September 2010
Board Circulation 29 September 2010
Board Approval 19 October 2010
Project 1 Approval IV October 2010
Loan Agreement Signing November/December 2010
Loan Effectiveness December/January 2010
Physical Completion Date 31 March 2017
Loan Closing Date 30 September 2017

1. Introduction :

ADB’s environmental safeguards aim to ensure the environmental soundness and sustainability of projects, and to support the integration of environmental considerations into the project decision-making process.

ADB's environmental and social safeguards are cornerstone of its support to inclusive economic growth and environmental sustainability. The objectives of the Safeguard Policy Statement (2009) is to avoid, or when avoidance is not possible, to minimize and mitigate adverse project impacts on the environment and affected people. Sound environmental management is critical to sustainable development and poverty reduction. Without committed efforts to safeguard the environment, pressure will continue to build on the land, forests, water systems, wetlands, and other natural resources on which people depend for their livelihoods.

The ADBs Safeguard Policy Statement (SPS),requires borrowers to identify project impacts and assess their significance; examine alternatives; and prepare, implement, and monitor environmental management plans.

In complying with the SPS requirements:

(i) environmentally sustainable projects are primarily achieved through a good project design during project preparation and effective environmental management during project implementation;
(ii) integrating environmental considerations into the project feasibility study and design calls for the incorporation of environmental assessment and management into the economic, financial, institutional, social, and technical analysis of a project; and
(iii) good environmental assessment and management enables the continued improvement of environmental performance throughout the life of a project, and can lead to enhanced economic, financial, and social outcomes.

The Flood and River Erosion Management Agency of Assam (FREMAA) under the state government of Assam is responsible for the implementation of ADB-financed Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program(AIFRERMIP), as agreed jointly between the SGOA, Government of India and ADB, and in accordance with government and ADB’s policies and procedures. ADB staff is responsible to support implementation including compliance by FREMAA of their obligations and responsibilities for program implementation in accordance with ADB’s policies and procedures.

Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program is likely to affectan area larger than the sites or facilities subject to physical works. The project under the program therefore come under **Category A**. Overall, the two subprojects (Dibrugarh, Palasbari and Gumi)are needed primarily to

safeguard the people, property and environment from frequent floods of the Brahmaputra River, and strongly supported by the stakeholders. The AIFRERMIP aims to integrate key Environmental Safeguards at all the levels of planning and implementation so that critical natural ecosystem. The flood plains of Brahmaputra and the resources, are not destroyed. Nevertheless, close monitoring will be operationalized so that any unforeseen impact will be detected and mitigation measures provided. Possible negative impacts include those associated with construction, which are temporary and can be mitigated through prescribed mitigation measures under the environmental monitoring and management plan to be operationalized under the Project, with the necessary capacity building of the executing agency and outsourcing. This will help in maintaining environmental sustainability along with inclusive economic growth. The FREMAA aims to integrate key Environmental Safeguards at all the levels of planning and implementation so that the natural ecosystem are maintained and are least disturbed.

Provisions for compliance:

The AIFRERMIP also aims to integrate key Environmental Safeguards at all the levels ofplanning and implementation so that critical natural ecosystem and the resources are not destroyed in this biodiversity hotspot. There is a need for recognition and following the compliance with national and state system and regulations on environmental standards by the contractors. Some of the specific environmental parameters are to be monitored periodically to check the compliance. This helps in maintaining environmental sustainability along with inclusive economic growth. Besides above, for achieving the compliance following specific arrangements are made in the contract.

The Contractor shall employ one fulltime inspector for supervising compliance with the environmental management plan. The environmental inspector shall keep one set of current environmental standards and regulations at the site at all times, available for consultation.

The environmental inspector shall submit an Environmental Management Plan and a monthly environmental report. The report shall be written in English language in a format acceptable to the Engineer.

Measures for monitoring and preventing pollution of air, water, noise, vehicle, waste. No part of the work shall be started before environmental and safety inspectors and first aid nurse are present at the site.

Other measures like, Borrow pit management, maintenance of access road, compensatory afforestation, emergency response plan, etc. are also under the preview of the environmental safeguard measures under the project.

Structural works of the two subproject areas under Tranche-1 are:

Palasbari Sub Project:
Palasbari Reach

1. Palasbari Erosion Protection under water works below LWL (4.9 Km).
2. Construction of ofPalasbari Embankment and slope protection work above LWL along Brahmaputra river at Palasbari. (5.1 Km.)

Gumi Reach

3. Construction of under water and Bank Revetment with loose boulder crates over geobag apron including supply of boulders and wire mesh nets for Gumi erosion Protection works along the Brahmaputra river. (4.5 Km)

Dibrugarh Subproject

(i) Raising, Strengthening Upgradation and Construction of Road Works for Dibrugarh Town protection (DTP) Dyke along the Brahmaputra River in Dibrugarh – 8.53 Km,

(ii) 1.8 km of bank protection through pro-siltation measures along the town protection dykes, (Fabrication and Launching of Porcupines Lot-1, Lot 2, Lot 3 and Lot 4)and

(iii) Construction of Revetments, Geobag Aprons for Mothola Oakland Bank Area, Dibrugarh Erosion Protection Works from Ch. 000 to ch 2400m

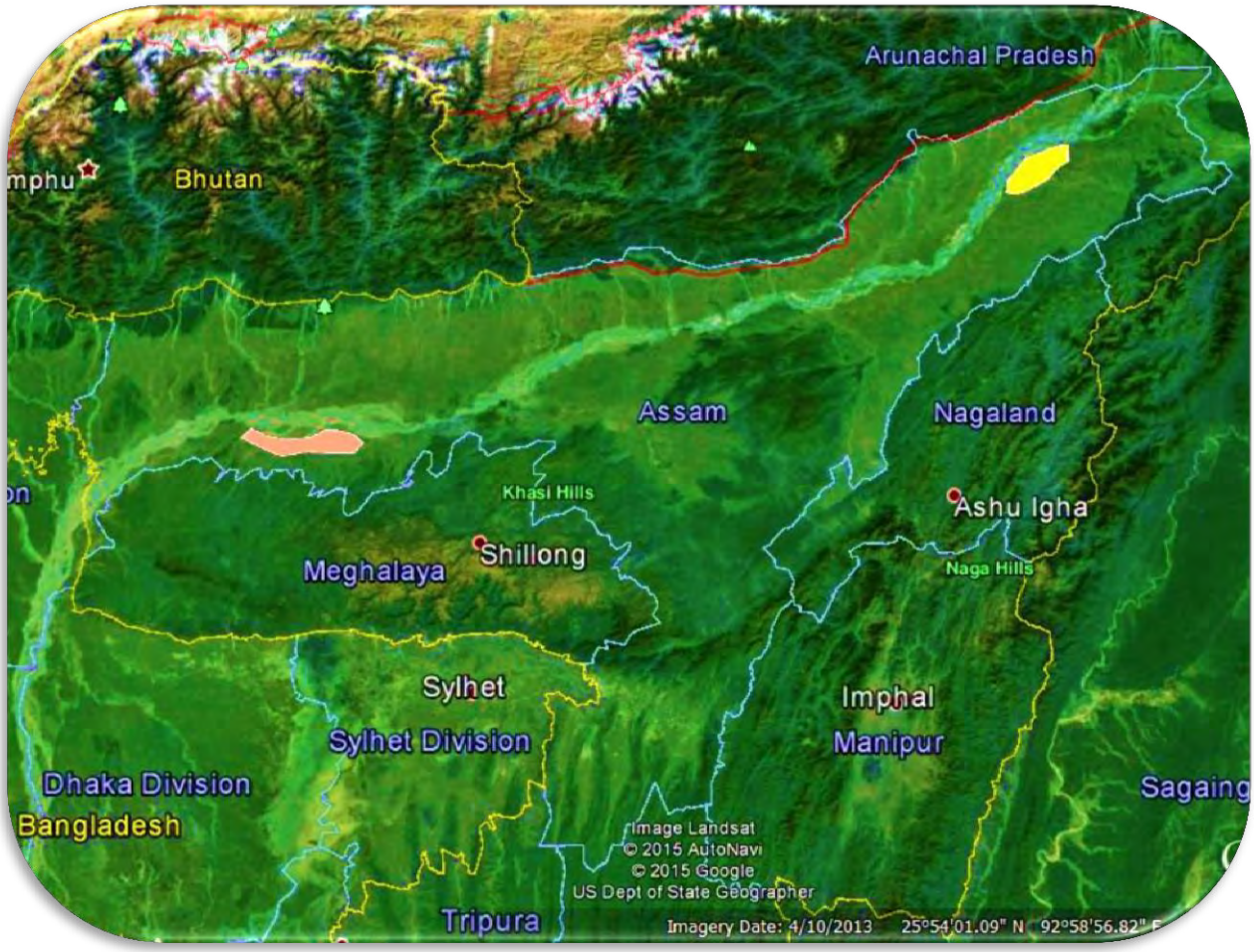
(**Kaziranga Sub Project**– shifted to Tranche-2)

1.1. Report Purpose :

This project at two sub project sites (Dibrugarh, Palashbari and Gumi) in Assam is implemented by FREMAA through Water Resource Department, Assam in accordance with ADB's Safeguard Policy Statement, 2009 and Ministry of Environment, Forest and Climate Change (GOI) Guidelines so as to ensure that all environmental monitoring measures and whenever applicable Environmental mitigation measures as given in Environmental Impact Assessment and subsequent Environmental Management Plans incorporating all the Environmental concerns of the project.

The principle objectives of the report are to:

- To ensure environmentally compatible project implementation by avoiding and mitigation of negative impacts that arise from the project during the period July to December, 2015.
- To ensure that EIA recommendations are adequately followed in EMP and EMoP to meet the Environmental Compliances of statutory requirements of MoEF&CC, GOI.



Dibrugarh sub project Palasbari Sub Project

Project sites in Assam along the river Brahmaputra

The Bi Annual Report on the implementation of Environmental Management Plan ending December, 2015 delineates:

- Environmental Monitoring of the project from July 2015 to December, 2015 considering the environmental activities along with environmental compliances of statutory requirements of MoEF&CC, GOI and agreement conditions.
- This report also highlights the gaps and deficiencies while executing the environmental management.

1.2. Project Implementation Progress :

Although the effectiveness of the loan started from December, 2010 and January 2011, consideration of the environment safeguard of the project started in the early part of 2013. Construction works started in February-2012 in both the subprojects of Dibrugarh and Palasbari and Gumi. Kaziranga subproject could not be started as required environmental clearance from the standing committee for National Board of Wildlife, MoEF&CC, GOIin 3rd quarter of 2014 and hence, the work shifted to tranche-2. Several meetings, trainings and workshops were conducted jointly by PMC and FREMAA with the contractors and SIO's in the month of April, 2013, May, 2014and in subsequent months at the respective SIO office and in the site offices of the contractor for generating the awareness about the environmental safeguard and stipulations of the contract document on environment.

1.2.1. Provisions for compliance :

The AIFRERMIP aims to integrate key Environmental Safeguards at all the levels of planning and implementation so that critical natural ecosystem and the resources are not destroyed in this biodiversity hotspot. There is a need for recognition and following the compliance with national and state system and regulations on environmental standards by the contractors. Some of the specific environmental parameters are to be monitored periodically to check the compliance. This helps in maintaining environmental sustainability along with inclusive economic growth. Besides above, for achieving the compliance following specific arrangements are made in the contract.

- The Contractor shall employ one fulltime inspector for supervising compliance with the environmental management plan. The environmental inspector shall keep one set of current environmental standards and regulations at the site at all times, available for consultation. The environmental inspector shall submit an

Environmental Management Plan and a monthly environmental report. The report shall be written in English language in a format acceptable to the Engineer.

- Measures for monitoring and preventing pollution of air, water, noise, vehicle, waste.
- No part of the work shall be started before environmental and safety inspectors and first aid nurse are present at the site.
- Other measures like, Borrow pit management, maintenance of access road, compensatory afforestation, emergency response plan, etc. are also under the preview of the environmental safeguard measures under the project.

2. Incorporation of Environmental Requirements into Project Contractual Agreements

Manner by which EMP requirements are incorporated into contractual arrangements, such as with contractors or other parties.

Each project requires a suite of environmental safeguards defined by impact mitigations and environmental monitoring requirements that are specific to the project type, scale, activities, and location.

The key design considerations and elements of environmental monitoring are incorporated in the contract agreement enabling with ADB's Safeguard Policies and with environmental compliances of statutory requirements of MoEF&CC, GOI.

FIDIC-BASED BID DOCUMENTS

GC 4.18 Protection of the Environment

Contractor shall protect the environment on and off site and limit damage/nuisance to public from water/soil/air pollution, noise and other adverse impacts.

Section 6, Clause 2.1 - Environment

Contractor must submit EMP for approval, employ full time environmental inspector, and submit monthly reports to Engineer and monitor impacts and the success of mitigation measures.

Section 6, Clause 2.3 – Safety Precautions & Medical Attendance

Contractor shall employ a full time safety inspector, provide safety and first aid equipment, access to nurse and doctor, etc.

In terms of allowable pollutant values and occupational health and safety, the laws, standards and regulations in force in India will be the references to be adhered to by the Contractor.

Following the above clause of the ADB contract document were prepared.

- **Environmental Management Plan (EMP) Compliance as per Bid Document**

Procurement of Works, Section 6 - Employers Requirements, Subsection 2

2A. Components of Environmental Safeguards:

To look after the safeguard issues FREMAA and PMC has one unit comprising of Environmental expert, Land acquisition expert, resettlement expert and Social safeguard expert. Environmental Safeguards are against the work packages executed under the project. These are as mentioned below.

- **Compliance to Environmental Management and Environmental Monitoring**
  Under each packages of works, contract documents were prepared to safeguard the environment under subsection 2 of the Section 6.

  - **Environmental Management Plan and Environmental Inspector**: In that section the Contractor have to appoint one fulltime Environmental Inspector for supervising compliance with the environmental management plan. The environmental inspectors have to keep one set of current environmental standards and regulations at the site at all times, available for consultation. The environmental inspector has to submit an ***Environmental Management Plan*** including the Monitoring Plan and a ***Monthly environmental report***. The report should be acceptable to the Engineer in Charge.

  - Provisions were also made in the contract document that, the Contractor shall remedy any damages resulting from non-compliance of stipulations of this Sub-section 2 at his own cost. All work shall be stopped until compliance is assured.

  - **Monitor Pollution and measures for prevention**: To monitor the effect of the civil work on the local environment following provisions were kept in the contract.

    - Prevention of spills of oil and lubricants from vehicles, engines, etc at work sites are required. Used engine oil must be removed in an environmentally acceptable manner in accordance with current legislation of India.
      In the event of any spoil, debris, waste or any deleterious substance from the Site being deposited on any adjacent land, the Contractor shall immediately remove all such material and restore the affected area to its original state to the satisfaction of the Engineer.

    - **Measures for prevention of Air Pollution**

The Contractor shall devise and arrange methods of working to minimize dust, gaseous or other air-borne emissions and carry out the Works in such a manner as to minimize adverse impacts on air quality.
The Contractor shall utilize effective water sprays during delivery manufacture, processing and handling of materials when dust is likely to be created, and to dampen

stored materials during dry and windy weather. Stockpiles of friable materials shall be covered with clean tarpaulins, with application of sprayed water during dry and windy weather. Stockpiles of material or debris shall be dampened prior to their movement, except where this is contrary to the Specification.
Any vehicle with an open load-carrying area used for transporting potentially dust producing material shall have properly fitting side and tail boards. Materials having the potential to produce dust shall not be loaded to a level higher than the side and tail boards, and shall be covered with a clean tarpaulin in good condition. The tarpaulin shall be properly secured and extend at least 300 mm over the edges of the side and tail boards.
In the event that the Contractor is permitted to use gravel or earth roads for haulage, he shall provide suitable measures for dust palliation, if these are, in the opinion of the Engineer, necessary. Such measures may include spraying the road surface with water at regular intervals.

- **Measures for prevention of Noise Pollution**

The Contractor shall: consider noise as an environmental constraint in his planning and execution of the Works.
The Contractor shall take all necessary measures so that the operation of all mechanical equipment and construction processes on and off the Site shall not cause any unnecessary or excessive noise, taking into account applicable environment requirements. The Contractor shall use all necessary measures and shall maintain all plant and silencing equipment in good condition so as to minimize the noise emission during construction works.
The Contractor shall avoid unnecessary noise, especially at night.

- **Measures for prevention of Water Pollution**

The Contractor shall prevent any interference with the supply to or abstraction from, and prevent any pollution of, water resources (including underground percolating water) as a result of the execution of the Works.
Areas where water is regularly or repetitively used for dust suppression purposes shall be laid to fall to specially-constructed settlement tanks to permit sedimentation of particulate matter. After settlement, the water may be re-used for dust suppression and rinsing.
All water and other liquid waste products arising on the Site shall be collected and disposed of at a location on or off the Site and in a manner that shall not cause either nuisance or pollution.
The Contractor shall not discharge or deposit any matter arising from the execution of the Works into any waters except with the permission of the Engineer and the regulatory authorities concerned.
The Contractor shall at all times ensure that all existing stream courses and drains within, and adjacent to, the Site are kept safe and free from any debris and any materials arising from the Works.
The Contractor shall protect all watercourses, waterways, ditches, canals, drains, lakes and the like from pollution as a result of the execution of the Works.

- **Measures to prevent Vehicular Pollution**

The Contractor shall regulate vehicle emission and noise in accordance with current legislation of India.

- **Control of Wastes**

The Contractor shall control the disposal of all forms of waste generated by the construction operations and in all associated activities. No uncontrolled deposit ion or dumping shall be permitted. Wastes to be so controlled shall include, but shall not be limited to, all forms of fuel and engine oils, all types of bitumen, cement, surplus aggregates, gravels, bituminous mixtures etc. The Contractor shall make specific provision for the proper disposal of these and any other waste products, conforming to local regulations and acceptable to the Engineer.

- **Land Use**

The Contractor shall remove and store topsoil for replacement after construction. The Contractor shall restore the surface vegetation in his work areas to the level found before the start of work. This includes the replacement of topsoil removed before construction.

- Disruption of Agricultural Activities

The Contractor shall minimize the disruption of any agricultural activities within the flood embankments. To the extent possible, land outside the flood embankments used for construction purposes shall consist of WRD property. Any disruption of private agricultural land used shall be compensated by the Contractor at the current market value.

- **Access Routes**

Roads -The Contractor shall inspect all access roads for their appropriateness for moving construction equipment or materials. Roads found inappropriate shall be strengthened by the Contractor. If the access road degrades, by more than expected normal use, due to the Contractor's activities, it will be repaired by the Contractor at his own cost.

- **Site Installations**

The Contractor must provide and maintain reasonable sanitary facilities, proper lighting and adequate protection of the Site against accidents and the like. The Contractor shall organize the disposal of wastes in an environmentally acceptable manner, in accordance with environmental standards and regulations of India.

- **Excavation and Filling of Earth for Raising and Strengthening works**

Earth excavation and filling activities shall take place after the area has been surveyed and inspected by the Engineer. The Contractor shall submit a map indicating the areas of planned earth excavation and filling activities; together with cross-sections showing earth cut and fill areas, based on the results of the baseline survey, within one week of survey completion. These earth excavation and fill volumes must be confirmed and revised during the subsequent pre-work survey, before actual excavation and filling work can proceed.

- **Borrow materials** :

Where the materials are to be obtained from designated borrow areas, the location, size and shape of these areas shall be as indicated by the Engineer and the same shall not be opened without his written permission. Where specific borrow areas are not designated by the Employer/the Engineer, arrangement for locating the source of supply of material for embankment and subgrade as well as compliance to environmental

requirements in respect of excavation and borrow areas as stipulated, from time to time by the Ministry of Environment and Forests, Government of India and the local bodies, as applicable, shall be the sole responsibility of the Contractor, Borrow pits along the road shall be discouraged. If permitted by the Engineer, these shall not be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding 300 m. Small drains shall be cut through the ridges to facilitate drainage. The depth of the pits shall be so regulated that their bottom does not cut an imaginary line having a slope of 1 vertical to 4 horizontal projected from the edge of the final section of the bank, the maximum depth in any case being limited-to 1.5 m. Also, no pit shall be dug within the offset width from the toe of the embankment required as per the consideration of stability with a minimum width of 10 m. Haulage of material to embankments or other areas of fill shall proceed only when sufficient spreading and compaction plant is operating at the place of deposition. No excavated acceptable material other than surplus to requirements of the Contract shall be removed-from the site. Should the Contractor be permitted to remove acceptable material from the site to suit his operational procedure, then he shall make good any consequent deficit of material arising there from. Where the excavation reveals a combination of acceptable and unacceptable materials, the Contractor shall, unless otherwise agreed by the Engineer, carry out the excavation in such a manner that the acceptable materials are excavated separately for use in the permanent works without contamination by the unacceptable materials. The acceptable materials shall be stockpiled separately. The Contractor shall ensure that he does not adversely affect the stability of excavation or fills by the methods of stockpiling materials, use of plants or siting of temporary buildings or structures. The Contractor shall obtain representative samples from each of the identified borrow areas and have these tested at the site laboratory following a testing programme approved by the Engineer. It shall be ensured that the subgrade material when compacted to the density requirements shall yield the design CBR value of the subgrade.

- **Emergency Response**

The Contractor shall plan and provide for remedial measures to be implemented in the event of occurrence of emergencies such as spillages of oil or bitumen or chemicals.
The Contractor shall, provide the Engineer with a statement of the measures he intends to implement in the event of such an emergency which shall include a statement of how he intends to provide personnel adequately trained to implement such measures.

- **Measurement and Payment**

Protecting the Environment
The Bill of Quantities contains a separate line item to include all costs for protecting the environment. Cost for complying with all requirements related to construction of labour camps/ancillary sites, strengthening and/or repair of roads, rehabilitation of ancillary sites etc. are deemed to be included in the bill of quantities. Cost for specific activities related to the work, such as stripping and replacing top soils (agricultural soil), dust suppression, water supply, sanitation facilities, camp site waste disposal, control of pollution from leakage and spill of oils and lubricants, safety and warning signs/signals etc., should be included in this line item in the bill of quantities.

2B. Monitoring Contractors activities

The activities that may have environmental impact are to be checked periodically or by recurrent spot checks. Contractor's activities are looked after by one Environmental

Inspector for each site. In all the field visits the following activities of the contractors were checked by FREMAA officers PMC experts and by the SIOs:

a. Sprinkling of water during movement of trucks
b. The vehicles used during the work has due pollution control certificate
c. Solid waste management in the labour camps
d. Quality checks for drinking water in the camps
e. Sanitary toilets in the camps
f. Use of LPG gas for preparing food in the labour camps,
g. Burrow pit areas
h. Oil and grease spilling
i. Test to check the ambient environment

2C. Tests to check the ambient environment

The following parameters are to be monitored with the frequencies described.

For Air Quality : SPM, RSPM, SO2, NOx, CO, Pb - With in 100 m of Hot mix plant, construction camp, crusher and near sensitive locations/ settlement –Continuous 24-hourly, twice a week, for two weeks once every year (summer).
For Dust & Smoke- Details of water sprinkling and frequency of sprinkling per day
Vehicular pollution - Emission records of vehicular pollution of all the vehicles used (updated PUC)
Surface Water - pH, BOD, COD, TDS, TSS, DO, Oil and Grease – from Brahmaputra River - Once during the dry season.
Ground water - pH, BOD,DO, total coliform, As, Cd, Mn and Ground Water levels – Construction site, Rehabilitation site, service areas, - Once at the start of construction
Noise - Noise Level in dB (A) – Near the construction sites and sensitive locations close to embankment – One day hourly measurement, once in six months

2.D Environmental Clearances required during Construction Stage

(this list excludes clearance from MOEF&CC for forest land diversion and areas falling under critical habitats)

Sl. No	**Description**	**Approval from Assam Forest Department**	**Approval from SIO, WRD**	**Approval from Pollution Control Board, Assam**	**Responsibility**
1	Camp Site	X	√	X	Contractor
2	Borrow area for soil	√	√	√	Contractor
3	Stone from Quarry	√	X	√	Contractor
4	Borrow area for sand	√	√	X	Contractor
5	Top soil monitoring	X	√	X	Contractor
6	DG set noise and oil spill monitoring	X	X	√	Contractor
7	PUC certificate for Vehicles	X	X	√	Contractor
8	Loss of agricultural land	X	√	X	Contractor
9	Environment Monitoring	√	√	√	Contractor, SIO, FREMAA

Required √ Not Required X

2.5 Compliance with Environmental Management Plan.

2.5.1: "*The Contractor shall work in strict compliance with the principles of the Environmental Management Plan. No part of the work shall be started before environmental and safety inspectors and first aid nurse are present at the site. No part of the work shall be started, or if defects are found later, continued or restarted before complying with all conditions of Sub-section 2 in this Section."*

2.5.2 "*The Contractor shall remedy any damages resulting from non-compliance of stipulations of this Sub-section 2 at his own cost. All work shall be stopped until compliance is assured."*

2.5.3 "*If the Contractor is not able or unwilling to start remedial work within five working days after detection of any defect or omission, the Engineer can order remedial works through third parties. The cost for third-party services are to be borne by the Contractor and shall be deducted from the Contractor's invoices or from the Retention Money."*

2.6 Measurement and Payment.

2.6.1 Protecting the Environment:
"*The Bill of Quantities contains a separate line item to include all costs for protecting the environment. Cost for complying with all requirements related to construction of labour camps/ancillary sites, strengthening and/or repair of roads, rehabilitation of ancillary sites etc. are deemed to be included in the bill of quantities. Cost for specific activities related to the work, such as stripping and replacing top soil (agricultural soil), dust suppression, water supply, sanitation facilities, camp site waste disposal, control of pollution from leakage and spill of oils and lubricants, safety and warning signs/signals etc., should be included in this line item in the bill of quantities. Payments will be made on the basis of available market rates and prevailing schedule of rates of Government of Assam."*

3. Summary of Environmental Mitigation and Compensation Measures Implemented

Based on EMP, may include measures related to air quality, water quality, noise quality, pollution prevention, biodiversity and natural resources, health and safety, physical cultural resources, capacity building and others.

3.1. Preparation of site specific EMPs :

Following the contract stipulations Environmental Inspectors prepared the site specific EMPs following the EIA and the EMPs on DTP Dyke works, Mothola Oakland works, Porcupine liot-3 under Dibrugarh subproject, Palasbari and Gumi work packages and was approved by the concerned SIO. EMP of

Palasbariembankment and Porcupine lot IV prepare the EMP and EMoP and submitted to SIO during July to December, 2015.

Environmental Management Plan

Construction of Palasbari Embankment with black topped road and slope protection works

Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program

Palasbari Sub Project

Contract No : FREMAA/ Palasbari/ West of 2013/3 AGREEMENT No. : 232
Date of Commencement 18-10-2013 Actual Date of Commencement : 29-11-2014

Sree Gautam Construction Company Limited
Address : Above Vishal Shoping Mall, Paltanbazar, Guwahati-8

Environmental Management Plan

Fabrication and supply of pre stressed concrete porcupines at Oakland area for use in establishment of anti erosion measures in critical sections of the river Brahmaputra in Dibrugarh district.

Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program
Dibrugarh Sub Project

Contract Agreement No **AFRERM(P)/PROJ/23-2010/Pt-IV/13**
dated Guwahati, 16th May, 2014.

-: **Prepared By** :-

Chandan Deka
H/No-14, Amrit Nagar, Basistha Chariali, Ghy-781029
Mobile No- 9435103043

3.2. Measures taken to reduce pollution:

Several measures taken to reduce the environmental pollution, some of them are :

- **Air**
  - Spray water on dry surface to reduce dust in the air
  - Use tarpaulins to cover sand and other loose materials where transported by vehicles
  - Clean wheels and undercarriage of vehicles while leaving the site
  - Certificates on Vehicular Emission of all the vehicles used in the site
  - Checked air quality by PCB approved lab
- **Noise**
  - Plan activities in consultation with SIO, community to reduce noise level
  - Provide information to public about work schedule
  - Horns not used, unless essential
  - Minimize the noise by silencers
  - Do not allow workers to an exposure of 80 dBA or above without ear plug
  - Use of heavy vehicles during specified period of day
  - Use of Generators during specified period of day
  - Checked Noise level by PCB approved lab
- **Surface water quality**
  - Avoid stockpiling of earth fill, especially during monsoon unless covered by tarpaulin or plastic sheets
  - Install temporary silt traps or sedimentation basins along the drainage leading to water bodies
  - Store fuel and lubricants away from the drains
  - Checked surface water quality by PCB approved lab
- **Pollution**
  - Spills of oils on the site and on river regularly checked
  - Specific measures taken to remove the Used engine oils
  - Surface discharges monitored
- **Site Installations**
  - Protection of trees for their preservation
  - temporary roads were constructed
  - environmental friendly waste disposal system properly monitored and executed in the work sites
- **Labour Camps**
  - Minimize the removal of vegetation and donot allow cutting of trees
  - Provide safe drinking water to the camp inhabitants
  - Sanitation facility to the camp inhabitants
  - Solid waste management practiced in the camps
  - before vacating the camp after the work, SIO and fringe community inspect the labour camp sites

3.3. Status of the mechanisms present for the Implementation of EMP

STATUS REPORT ON IMPLEMENTATION OF EMP

Table :1 . Status of implementation of EMP as on 31.12.15

Following the contract stipulations Compliance Inspectors in the form of Environmental Inspector were deployed by all the contractors and Safety Inspectors are also recruitment by all the contractors.

Table-1

	Sub Projects according to the contract packages	**Environmental Inspector appointed**	**EMP prepared**	**EMP approved by SIO**	**EMoP**	**Safety Inspector appointed**	**Monthly Environmental report**	**First aid Nurse engaged**
1	Palasbari Apron	√ - Same Inspector for Palsbari and Gumi as the work is done by same contractor.	√- Submitted to SIO	√	√- Submitted to SIO	√	Prepared & submitted to SIO	√ - Agreement has been made with the local Pharmacy
2	Gumi	√ - Same Inspector for Palsbari and Gumi as the work is done by same contractor.	√- submitted to SIO	√	√- submitted to SIO	X	√- submitted to SIO	√- Agreement has been made with the local Pharmacy
3	Palasbari Embankment	√- Appointed	√- submitted to SIO	√	√- submitted to SIO	√	Initiated	Initiated
4	DTP Dyke	√ – Appointed	√- EMP submitted to SIO and approved by SIO	√	√- submitted to SIO	√	√- submitted.	√- Agreement with local nursing home
5	Mothola Oakland	√ – Appointed	√- EMP submitted to SIO	√	√- submitted to SIO	√	√- Test reports not submitted	Agreement with local nursing home
6	Porcupine Lot-3 (work completed)- EMP and reports submitted							
7	Porcupine Lot-4	Not required	√- submitted to SIO	√	√- submitted to SIO	Not required	Initiated	Not required

As most of the contractors doing the ADB supported works for the first time, they do not have the knowledge about the safeguards requirements by the ADB. To improve the scenario following Actions were taken :

- Several meetings and training were organized (detail in QPRs and Bi annual reports) to aware the contractors on the environmental safeguard of ADB (Strategy and directions), stipulations of the contract document, testing of selected environmental parameters, national environmental standards, acts and rules of MoEF&CC, GOI and Government of Assam.
- Helped in the preparation of EMP and EMoP,
- Assisted in preparation of monthly environmental Reports
- In the training workshop and in all the meetings with contractors and SIO's during field visits and review meetings it has been emphasized to carry out the required numbers of tests as per EMP.
  Moreover, special efforts has been made so that that the contractors adheres to the EMP norms.

Most of the contractors has employed Environmental Inspectors and they have submitted the Environmental Management Plans to the respective Engineers in Charge. In most of the cases the compliance were now net but are in different level of compliance (Package wise details in table-2).

Table -2: Environmental Clearances during Construction Stage

Sl. No	Description	Approval from Assam Forest Department	Approval from SIO, WRD	Approval from Pollution Control Board, Assam	Responsi-bility	Status
1	Camp Site	X	√	X	Contractor	Obtained
2	Borrow area for soil	√	√	√	Contractor	Obtained, by DTP dyke
3	Stone from Quarry	√	X	√	Contractor	Obtained
4	Borrow area for sand	√	√	X	Contractor	Obtained
5	Top soil monitoring	X	√	X	Contractor	Obtained
6	DG set noise and oil spill monitoring	X	X	√	Contractor	Obtained
7	PUC certificate for Vehicles	X	X	√	Contractor	Obtained
8	Loss of agricultural land	X	√	X	Contractor	Monitored
9	Environment Monitoring	√	√	√	Contractor, SIO, FREMAA	Obtained

Required √ Not Required X

4. Summary of Environmental Monitoring

4.1. Compliance Inspectors (if relevant)

Following the contract stipulations Compliance Inspectors in the form of Environmental Inspector were deployed by all contractors and Safety Inspectors were also recruited by all the contractors (detail in Table-1).

4.1.1. Summary of Inspection Activities

Environmental Inspectors monitors the day to day environmental safeguards at the site and reports to the SIO. Moreover, FREMAA along with PMC also monitors the implementation of the EMP (Table- 3).

Table 3.Showing the site inspections by FREMAA and PMC during July, 2015 to December, 2015.

Date	Site inspected, Meeting	FREMAA	PMC
13.12.15	Kaziranga- ADB- MTR	SIO,	√
14.12.15	Kaziranga- ADB- MTR	SIO	√
15.12.15	Dibrugarh- ADB- MTR	√, SIO	√
16.12.15	Palasbari- ADB- MTR	√, SIO	√

Inspection activities on Environmental Safeguards are done in several stages :

- Monthly Environmental Reporting Formats were developed at PMC to check the compliance. These reports are to be complied by the Environmental Inspector and to be submitted to the SIO for his approval (Form-1).
- Site Engineers of PMC also monitor the Environmental Safeguards (Form-2).
- SIO also monitor the implementation of EMP during their inspection (Form-3)

Form-1

Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program	
Tranche-1	Sub Project :
Contractor :	Project No : 38412
Date of Agreement :	Contract Period :
Target Date of Completion :	Extended upto :
Name of the Environmental Inspector :	Month : Year:

Monthly Environmental Report

.		Status	Remarks
	Environment		
1	**Sources of materials**		
1.a	Use quarry sites and sources permitted by Government		
1.b	Verify suitability and approval by SIO		
1.c	Submission of monthly documentation of all material sources		
2	**Air**		
2.a	Spray water on dry surface to reduce dust in the air		
2.b	Use tarpaulins to cover sand and other loose materials where transported by vehicles		
2.c	Clean wheels and undercarriage of vehicles while leaving the site		
2.d	Certificates on Vehicular Emission of all the vehicles used in the site		
2.e	Checked air quality by PCB approved lab		
3	**Noise**		
3.a	Plan activities in consultation with SIO, community to reduce noise level		
3.b	Provide information to public about work schedule		
3.c	Horns not used, unless essential		
3.d	Minimize the noise by silencers		
3.e	Do not allow workers to an exposure of 80 dBA or above without ear plug		
3.f	Use of heavy vehicles from to		
3.g	Use of Generators KV from to		
3.h	Checked Noise level by PCB approved lab		
4	**Surface water quality**		
4.a	Avoid stockpiling of earth fill, especially during monsoon unless covered by tarpaulin or plastic sheets		
4.b	Install temporary silt traps or sedimentation basins along the drainage leading to water bodies		
4.c	Store fuel and lubricants away from the drains		
4.d	Checked surface water quality by PCB approved lab		
5	**Land Use**		
5.a	Has the contractor preserved the top soil for replacement after construction		
5.b	Status of the surface vegetation on the construction site prior to the initiation of the work (Detail report with number of trees cut and initial photographs of the area)		
5.c	Borrow pit – Rehabilitation of the borrow pit was done		
6	**Pollution**		
6.a	Spills of oils on the site and on river regularly checked		
6.b	Necessary measures taken to stop it		
6.c	What measures taken to remove the Used engine oils		
6.d	Surface discharges monitored		
7	**Disruption of Agricultural activities**		
7.a	Any agricultural activity in the flood embankment		
7.b	Any measures taken to minimize the impact on agricultural activity in the flood embankment		
7.c	Land used outside the flood embankment belongs to WRD or private		
7.d	If private agricultural land is used proper compensation is made by the Contractor at current market value		
	Access routes (River)		
a	Whether the Navigation routs are blocked ?		
b	How interference with the riverine traffic is minimized ?		
c	All the floating equipments following navigation standards applicable in India.		

d	All the floating equipments following safety standards applicable in India.		
e	Any dredging operation done ?		
	Road		
a	All the access roads inspected for their appropriateness for moving construction equipments		
b	If found inappropriate, strengthened by Contractor		
c	Due to the movement of the heavy vehicles, the access road is degraded more than normal use		
d	Contractor repaired the degraded access road		
e	Access road for the fringe community is used / blocked and alternate route provided		
f	Conduct the work during light traffic		
	Excavation and filling of Earth in Slope Protection		
a	Whether the area has been surveyed, inspected and approved by the SIO after the identification of excavation and filling site.		
b	Whether contractor has submitted a map indicating the area of earth excavation and filling activities showing the earth cut and fill areas, based on the baseline survey.		
	Sand Excavation		
	Whether the sand excavation area was approved by the SIO in writing.		
b	Whether contractor has submitted a map indicating the area of planned sand excavation		
c	Whether the sand excavation area is close to the work site or to char inhabitants		
	Site Installations		
a	Protection of trees for their preservation		
b	Whether temporary roads were constructed ?		
c	Whether environmental friendly waste disposal system properly monitored and executed in the work sites ?		
	Labour Camps		
a	Consult SIO and fringe community for establishing the temporary office shed, camp and plant		
b	Minimize the removal of vegetation and donot allow cutting of trees		
c	Provide safe drinking water to the camp inhabitants		
d	Sanitation facility to the camp inhabitants		
e	Solid waste management practiced in the camps		
f	Report SIO and fringe community before vacating the camp after the work		
	Agricultural Land and Crop Loss		
a	Any loss or damage of agricultural land and crops due to project construction activities		
	Homestead Loss		
a	Any home stead loss (including loss of trees, ponds, shifting of any other installations)		Addressed by RAP
)	**Drainage from Adjacent Area**		
).a	Natural drainage system blocked or disrupted.		
l	**Wildlife**		
l.a	Sighting of Dolphin (National Aquatic Animal)		
2	**Fish productivity**		
2.a	Fish productivity increased or decreased (survey in the boat ghats)		
2.b	Landing facility- Change of Boat Ghats		
3	**Display Materials**		
3.a	Signs like “Only Staff”, “Restricted Area” displayed in relevant area		
3.b	Safety (including traffic signs), notice board is available		
4	**Health and Safety**		
4.a	Provision of First Aid and medical service available		

Provide GPS coordinates for most of the descriptions so that map can be prepared.

5	Additional comments or actions required :

	Signature by Environmental Inspector Date : Contact Details :	Accepted/ Approved by SIO Date : Contact Details :

Form-2

Environmental Safeguards : Monitoring at site

Location : _____ Month : _____

(Give √ as applicable)

	Item	Yes	No	Remarks
1	Environmental Inspector present in all the works carried out at site			
2	EMP			
3	EMoP			
4	Baseline information of environment are present at site office			
5	Relevant Acts and Rules are available at site camps			
6	Air, water and Noise standards present at site			
7a	Air water and noise test results are kept in the site office			
7b	If Yes, Name the company performing the test			
7c	Test conducted			
8	Vehicles are checked in the camp before the work			
9	Oil seepage are checked for generators and motors of boats daily			
10	Oils are stored safely (to avoid soil & water contamination)			
11	Solid waste management practiced at the site			
12	Measures taken to reduce the dust pollution			
13	Access roads and navigation routes obstructed			
14	Access road maintained by the contractor			
15	Sand collected from the chars which are not inhabited			
16	Borrow pit rehabilitation done			
17	Loss of agricultural area if any			
18	Sanitation facility at campus is adequate			
19	Quality of drinking water tested			
20	Quantity of drinking water is sufficient.			
21	Record kept for cutting of trees			
22	Sitting of dolphin, If yes give dates and mention site			
23	Register checked weekly (attendance of Environmental Inspector, PUC certificate of all the vehicles used at site)			
24	Meeting related to awareness on environmental safeguards carried out during the month			
25	Any grievances lodged / discussed during the meeting related to Environment			
26	Monthly environmental report submitted to SIO . If submitted give the date.			
Remarks:				

*Take photographs of the important events with date and location,

**Mention any other measures taken to protect the environment and the people.

Date : Signature

Form-3

SIO CHECKLIST FOR ENVIRONMENTAL SUPERVISION AND MONITORING DURING CONSTRUCTION

Contractor's Name : _____

Month : _____ Dates of Inspection :

1	2	3	4	5		6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

1. Is the Environmental Management Plan being implemented during the construction phase of the river bank protection work ?	Yes	No
2. Environmental Inspector present during the construction work ?	Yes	No
3. Are there sufficient measures incorporated in the subproject to prevent water pollution of nearby water bodies ?	Yes	No
4. Are there adequate erosion control measures to prevent erosion and sedimentation during the riverbank protection works ?	Yes	No
5. Is the project taking adequate measures to control dust and noise pollution ?	Yes	No
6. Is the project providing adequate alternative traffic routes (diversion/temporary access roads, etc) during the riverbank protection work ?	Yes	No
7. Is the subproject avoiding mining of sand from locations adjacent to inhabited char land areas, where applicable ?	Yes	No
8. Has the contractor used permitted sites for collection of materials (Boulders, Soil, etc)	Yes	No
9. Has the project resolved issues related to land accusation and compensation under the RAP ?	Yes	No
10. Have the Labour Camps and project Site Office and storage areas been constructed with sufficient sanitation and water supply facilities and other environmental and social associates with the construction ?	Yes	No
11. Is the sub project taking adequate measures to avoid spills of oil/lubricants smoke and noise pollution ?	Yes	No
12. Is the composite generated waste / garbage being disposed in an environmentally acceptable manner ?	Yes	No
13. Is there sufficient safety looked after by Safety Inspector at the work place and health care facilities (First Aid Nurse, and regular visit by Physician) or clinic close by to composites ?	Yes	No
14. Is the construction contractor adequately prepared to handle emergency situations like accidents and illness ?	Yes	No
15. Is the contractor keeping the records of the trees destroyed during the construction work ?	Yes	No
16. Is the subproject taking adequate measures to preserve the topsoil for later replacement ?	Yes	No
17. Are there adequate measures to avoid disturbances to the habitat of fish and other aquatic fauna and flora ?	Yes	No
18. Do the vehicles used in the site has valid PUC certificates ?	Yes	No
19. Is there any complaints lodged by the local community on environmental issues ?	Yes	No
20. **Major observations, Conclusion, Recommendations** :		

_____ _____

Contractor or his representative Name and Signature of the Supervisor

Designation _____

Date _____

4.1.2. Mitigation Compliance :

Although during this period the working months were very less due to flood. Following measures were taken to meet the compliance.

Construction Site Set-Up

- Contractor comply with Section 6, Clause 2.4 – Site installations for construction camp, and all working and storage areas
- Safe drinking water and adequate sanitation facilities to be provided.

Waste Materials

- solid waste were either reused or recycled when practical,
- waste lubricant oils and spent oils will be stored in proper containers in a designated area until recycled or properly disposed offsite.
- general waste (metal, paper, cardboard, plastics, etc) are stored in bins and removed to suitable disposal site
- no hazardous wastes are anticipated to be generated from the site.

Noise

- Major construction activities were scheduled during normal daylight working hours and consistent with applicable standards.
- Contractor use equipment that is operated with appropriate noise muffling devices resulting in the least possible noise.

Air Quality and Emissions Management

- Most of all transport vehicles moving soil, granular material and rock to and from the site were covered
- The Contractor implement dust control measures at the source of emissions. The standard method is to wet dry surfaces, over which traffic passes; and encouraged natural re-vegetation or replant as early as practical after the completion of construction
- suitable emission controls and exhaust systems for all equipment will be maintained, and regular inspection and maintenance of trucks were conducted to control pollutants from exhaust fumes

Spills Prevention

- specific sites with barrier protection and impervious pads for fuelling and servicing were established at sites
- fuel, lubricants and chemical products were kept in special, water tight area, without drainage exit to the river; material to be kept in drums or safe tanks as per practicable
- appropriate pumps and nozzles for refueling were used. Disconnected hoses were placed in containers to prevent spills of residual fuel
- off-site spent lubricants mostly collected and safely disposed
- storm water that collects in secondary containment areas were inspected before release

		Explanatory comments
Overall Compliance	**Good**	1. Sanitary toilets are installed in all the site camps. As most of the labours are local, sanitary toilets are not present at the temporary labour camps. Suggestions has been made to develop the facility in the labour camps particularly at the 'char areas' (Sand bars) in the next working season. 2. Safe drinking water used in all the site camps. 3. Awareness meeting has been carried out on solid waste management in all the camps 4. Generators are used during the daylight hours 5. Contractors use dust control measures 6. Soil and granular materials are mostly covered by tarpaulin during transport 7. Fuel and lubricants are kept far away from river 8. Oil checks of the vehicles and generators are done regularly 9. The environmental standards (Central Pollution Control Board, MoEF&CC, GOI) applicable for the sites are kept at the site for reference.

4.1.3. Mitigation Effectiveness

- To monitor the mitigation effectiveness the parameters mentioned in EMP were monitored.
- No complaints were lodged to SIO on environmental pollution by any of the fringe villagers, NGO's or other institutions
- Results of the ambient environmental tests were within the permissible limit of Central Pollution Control Board, MoEF&CC, GOI.
- Frequency of monitoring (particularly the Test frequency) were not as par the EMP schedule.

To monitor the mitigation effectiveness the following parameters were monitored.

Table-4 :Mitigation Effectiveness during July to December, 2015

	Dibrugarh – Mothola (Test Carried out Oct, 2015)	Porcupine (Lot-4) (Tests not carried out)
Ambient Air quality	Within the permissible limit	
Surface Water Quality	Within the permissible limit	
Ground Water Quality	Within the permissible limit	
Noise level	Within the permissible limit	
Pollution level of the vehicles used at site	PUC certificates present	PUC certificates present
Complain lodged by the local residents on Environmental pollution by the construction activity. July to December, 2015	No complaints lodged	No complaints lodged

Mitigation Effectiveness	**Good**

4.2. Emission Discharge (Source) Monitoring Program (if Relevant)

Not relevant to this project..

4.3. Ambient Monitoring Program (if Relevant)

To monitor the ambient environment the following parameters are to be monitored with the frequencies described in the SEIA. All the tests were performed from the Pollution Control Board, Assam and its approved labs..

- For **AirQuality** :
  SPM, RSPM, SO2, NOx, CO, Pb - With in 100 m of Hot mix plant, construction camp, crusher and near sensitive locations/ settlement – Continuous 24- hourly, once every year (summer).

- For **Dust & Smoke** :
  Details of water sprinkling and frequency of sprinkling per day

- **Vehicular pollution** :
  Emission records of vehicular pollution of all the vehicles used

- **Surface Water** :
  pH, BOD, COD, TDS, TSS, DO, Oil and Grease – from Brahmaputra River - Once during the dry season.

- **Ground water** :
  pH, BOD,DO, total coliform, As, Cd, Mn and Ground Water levels – Construction site, Rehabilitation site, service areas, - Once at the start of construction

- **Noise** :
  Noise Level in dB (A) – Near the construction sites and sensitive locations close to embankment – One day hourly measurement, once in six months

4.3.1. Summary of Monitoring

Table-5 : Ambient Environment Monitoring Plan

Attribute	Parameter	Special Guidance	Standards	Frequency	Duration	Location	Implementation
Air	SO_2, NO_x, SPM, RSPM, CO, Pb	High volume sampler to be located 50m from the river bank site Downwind direction. Use method specified by PCB, Assam for analysis	Air (prevention and Control of Pollution) Rules, CPCB, 2009	Six times	24 hours Sampling	Along the river bank area	Contractor
Surface Water	pH, BOD, COD, TDS, TSS, DO	Grab sample collected from source and Analyse as per Standard Methods for Examination of Water	Indian Standards for Inland Surface Waters (IS: 2296, 1982	Two times including baseline	Grab Sampling	Along the Surface water sources	Contractor
Ground Water	pH, BOD, DO, Total Coliform, As, Cd, Mn			Two times including baseline			Contractor
Noise	Noise levels on dB (A) scale	Equivalent noise levels using an integrated noise level meter kept at a distance of 15 m from the river bank construction area.	MoEF Noise Rules, 2000	One time including baseline	Leq in dB(A) of day time and night time	Along the river bank	Contractor

4.3.3. Results

Results of the specific tests on the selected parameters (during January 2015 to June, 2015), for Air Quality, noise, surface water and ground water from Pollution Control Board approved labs provide some indicators to compare them with the baseline information and national permissible standards. The test results of the samples collected lies within permissible limits described in the '*Environmental Standards for Ambient Air, Automobiles, Fuels, Industries and Noise, 2000'* (Central Pollution Control Board) and a minor difference between the baseline and the test results during the work being observed, this suggest that the contractor's activity has complied with the contract stipulations on protection of environment.

Table-6. Quality of ambient Air at the site during July- December, 2015

Parameter	Mothola Oakland (July, 2015)	Palasbari Embankment (October, 2015) Site-1	Palasbari Embankment (October, 2015) Site-2
PM10	51.6	62.6	60.8
NO2	10.9	4.5	3.7
SO2	ND	3.1	2.1
Weather		Clear	clear

(Ref: Appendix-1)

Table-7. Quality of Noise at the site during July- December, 2015

Parameter	Mothola Oakland (July, 2015)	Palasbari Embankment- Oct, 2015 (Ch. 3560)	Palasbari Embankment- Oct, 2015 (Ch. 2560)
Noise levels on dB (A) scale	67- Day 60 - Night	47.4	44.9

Table-8. Surface water quality July to December, 2015

Parameter	Mothola Oakland (July, 2015
pH	6.8
DO	4.1 mg/l
COD	39 mg/L
BOD	14 mg/L
TSS	66 mg/l
TDS	987 mg/l
Oil and grese	1.1 mg/l

Table-9. Ground water quality

Parameter	Mothola Oakland (July, 2015
pH	6.6
DO	4.2 mg/l
COD	25 mg/L
BOD	6 mg/L

		Explanatory comments
Ambient Environment condition	**Good**	• For those site where the tests are being conducted, the results are within the prescribed limits of the Central Pollution Control Board, MoEF&CC, GOI. • As the surface water at the working site contains grease and oils below the detectable level, it indicates that the contractor is following the environmental norms prescribed to reduce water pollution. Surface water at Oakland site contain grease as the site is also used by other transportation boats • All the works are limited within daylight hours.

4.3.3. Assessment

Table-8.Comparison of ambient Air, and Noise at the site with the baseline data and National Standards.

	Parameter	National Standard	Palashbari dyke Ch 3560m (Oct, 2015)	Palashbari dyke Ch 250m (Oct, 2015)
	PM10	100 μg/m3	62.6	60.8
	NO2	80 μg/m3	4.5	3.7
	SO2	80 μg/m3	3.1	2.1
	Pb	1.00 μg/m3	-	-
	Weather		clear	clear
Noise on dB (A) scale		75 Industrial area in daytime		
		55 residential area in daytime	47.7	44.9

		Explanatory comments
Ambient Environment condition	**Good**	• Noise pollution was within the prescribed limit for rural areas under palasbari works and within the prescribed limit of Industrial areas in Oakland works • Surface Water quality of the river in Dibrugarh was polluted because of the Dibrugarh municipality garbage damping site within the reach of the DTP works • Air quality was within the prescribed standards of residential or rural area.

5. Key Environmental Issues

5.1.1. Key Issues Identified

- Environmental Inspector was not recruited by the contractor in time.
- Preparation of EMP, EMoP, monthly environmental Reports
- Documentation of environmental safeguards.
- Contractors usually do not go through the environment section of the contract document thoroughly.
- Contractors were not aware of the tests to be conducted to know the ambient air quality, surface water quality ground water quality and noise levels.
- Frequency of the tests for ambient environment to be followed
- Contractors were also not aware of the solid waste management at worksite, Use of vehicles with PUC, etc.
- Monitoring by SIO's should be improved on safeguard issues and they must be trained on ADB's safeguard procedures

5.1.2. Action Taken

- Meetings were organized (Table-3) to aware the contractors on the environmental safeguard of ADB (Strategy and directions), stipulations of the contract document, testing of selected environmental parameters, national environmental standards, acts and rules of MoEF&CC, GOI and Government of Assam.
- Helped in the preparation of EMP and EMoP, Palasbari embankment and Lot IV porcupine.
- Assisted in preparation of monthly environmental Reports

- Check list given to SIOs to check the environmental safeguards followed or not during preparation of the bills by the contractors.

5.1.3. Additional Action Required

- Constant monitoring and providing suggestions on the implementation of the EMP by FREMAA and PMC.
- Frequency of the tests to be maintained as per EMP submitted by the contractors
- Awareness on environmental safeguards – contractor, SIO and local residents / fringe communities

6. Conclusion

6.1. Overall Progress of implementation of Environmental Management Measures

		Explanatory comments
Overall Project implementation measures	**Good**	• After the previous trainings the contractors become aware about the importance of the environmental safeguards. • The contractors after few trainings developed perceptions on the National Acts and Rules and standards. • 7 contractors prepared the EMP. • Monthly environmental reporting on the implementation of EMP has started. 5 of the contractors in Palasbari, Gumi and Dibrugarh already prepared the Monthly Environmental Reports and are submitting regularly to SIO. 2 yet to start. • They also developed few mitigation measures like spraying or water, covering the sand and soil with tarpaulin while transport. Solid waste management at camp sites • Drinking water facility at work site or camp site

6.2. Problems Identified and Actions Recommended

Problems

- Awareness about the importance of environmental safeguards in the construction works, particularly in this part of India is very poor
- Local people have less knowledge on the environmental issues and environmental standards
- Officials of Water Resource Department do not practice the Environmental Safeguards for the projects of the State or Central Government of India, so they are not trained for such implementation of the EMP prescribed measures. Hence the implementation of the EMP were not as per the schedule including the frequency of the tests to be performed by the contractors. But at the later stages they are now following the procedures as per EMP.

Actions Recommended

- Awareness Training on Environmental Safeguards required for the contractors
- Awareness required for the implementing officers on the ADB's safeguard policy statements
  - Awareness and training required to incorporate basic ideas on current environmental safety issues and relate it with the development and economy.

7. **Public consultation for update EIA for tranche 2** (appendix 2)

Date	Location	Details
04.11.15	Gumi	Went to Gumi with FREMAA for public hearing. Local MLA of Chaygaon was also present along with circle officer, officers from FREMAA and PMC. Local Villagers were also present along with jila parisad members.
05.11.15	Palasbari	Went to Palasbari -Simina with FREMAA for public hearing. Officers from FREMAA and PMC, local villagers were also present along with jila Parisad members.
9.11.2015	Kaziranga	Attended public hearing at Japoripathar school with the villagers, Gaon Buras, school teachers and WRD officials.
11.11.2015	Dibrugarh	Public hearing. WRD officials, Circle officer, villagers, officers from FREMAA and PMC were present.

Appendix 1 Ambient Monitoring Results(Scanned copy of the reports)

en-vision

Enviro Technologies North East — *Technologies for better tomorrow*

Recognized by Pollution Control Board, Assam.

AMBIENT AIR ANALYSIS REPORT

Rep.No. 151015_1503048_01_1004 242 **Date: 15/10/2015**

Name & Address:

M/s. Shree Gautam Construction Co. Ltd.
Project Name: (Construction of palasbari Embankment with black topped road and slop protection works above LWL along the Brahmaputra River), Dist: Kamrup, Assam.

SL. NO.	DATE OF SAMPLING	LOCATION/ SOURCE	WEATHER	PARAMETERS			
				PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_X ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)
i)	12/10/15	Near Palasbari Ward No. 7 (Ch. 3560m)	Clear	62.6	32.8	4.5	3.1
ii)		Near Palasbari Ward No. 1 (Ch. 250m)		60.8	31.3	3.7	2.1

Remarks: -*Parameters are within the permissible limit.

NATIONAL AMBIENT AIR QUALITY STANDARDS:

SL.No	Pollutant	Time Weighted Average	Concentration in Ambient Air
			Industrial, Residential, Rural and Other Area
1	Sulphur Dioxide (SO_2), $\mu g/m^3$	24 hours	80
2	Nitrogen Dioxide (NO_x), $\mu g/m^3$	24 hours	80
3	Particulate Matter (PM_{10}), $\mu g/m^3$	24 hours	100
4	Particulate Matter ($PM_{2.5}$), $\mu g/m^3$	24 hours	60

Envision Enviro Technologies North East, Guwahati

(Quality control Manager)

Note: i) The results relate only to the parameters tested
ii) The test report shall not be reproduced except in full, without written approval of laboratory.

Page 1 of 1

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ENVIROCON
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Website: www.envirocon.net.in

Report Ref. No.: *ENV/BNG/Air/JULY/01/2015*

AMBIENT AIR QUALITY TEST RESULTS

M/s. B. N. Garodia
Jyoti Nagar
Jalan Nagar, Dist: Dibrugarh
Assam- 786005

(Mothalla Site Lot I & II)

(JULY - 2015)

Location Code:

A 1: Near Mothalla Construction Site

LOCATION ↓	Date of Sampling	PM 2.5 (µg/m³)	PM 10 (µg/m³)	NO_2 (µg/m³)	SO_2 (µg/m³)	CO (mg/m³)	Lead (µg/m³)
LIMITS →	--	60	100	80	80	4.0 (1 hr. limit)	1.0
A 1	20.07.2015	17.4	51.6	10.9	ND	ND	ND

Analysis Protocol: **IS 5182**

ND: Not Detected

Report Verified By:

Bivash Mahanta
ENVIROCON

NOTE:
1. Results reported are valid at the time of and under the prevailing conditions of measurement.
2. Results refer only to the particular parameters tested.
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Noise

en-vision

Enviro Technologies North East

Technologies for better tomorrow

Recognized by Pollution Control Board, Assam.

AMBIENT NOISE LEVEL MEASUREMENT REPORT

Rep No.:151015_1503048_06A_1003 **Date: 15/10/2015**

Name & Address:

M/s. Shree Gautam Construction Co. Ltd.
Project Name: (Construction of palasbari Embankment with black topped road and slop protection works above LWL along the Brahmaputra River), Dist: Kamrup, Assam.

SL. NO.	DATE OF SAMPLING	LOCATION /SOURCE	NOISE LEVEL in dB(A)Leq
i)	12/10/15	Near Palasbari Ward No. 7 (Ch. 3560m)	47.4
ii)		Near Palasbari Ward No. 1 (Ch. 250m)	44.9

Remarks: Noise level are carried out during day time.

Ambient Noise Standards:

Area Code	Category of area	Limits in dB(A) Leq	
		Day (6:00 am to 10:00 pm)	Night (10:00 pm to 6:00 am)
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Envision Enviro Technologies North East, Guwahati.

(Quality Control Manager)

Note: i) The results relate only to the parameters tested
ii) The test report shall not be reproduced except in full, without written approval of laboratory.

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ENVIROCON
Recognised By
Pollution Control Board, Assam

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Website: www.envirocon.net.in

ISO 9001 Certified
OHSAS 18001 Certified

Report Ref. No.: *ENV/BNG/Noise/JULY/01/2015*

NOISE LEVEL MEASUREMENT RESULTS

M/s. B. N. Garodia
Jyoti Nagar
Jalan Nagar, Dist: Dibrugarh
Assam- 786005

(Mothalla Site Lot I &II)

(JULY - 2015)

Noise Levels in dB (A) during day time in a normal day at different locations of Mothalla Site, Lot I & II Measured on 20.07.2015

Sl. No.	Location	9.00 am to 12.00 noon			3.00 pm to 6.00 pm		
		Maximum (dB-A)	Minimum (dB-A)	Leq (dB-A)	Maximum (dB-A)	Minimum (dB-A)	Leq (dB-A)
1	Near Office Area	68	63	67	62	58	60
2	Near Construction Site	73	67	70	66	60	63
3	Near Camp House	63	57	59	57	53	55

Report Verified By:

Bivash Mahanta
ENVIROCON

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Surface Water Quality

ENVIROCON
Recognised By
Pollution Control Board, Assam

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Website: www.envirocon.net.in

ISO 9001 DNV Certified
OHSAS 18001 DNV Certified

Report Ref. No.: *ENV/BNG/SW/JULY/01/2015*

SURFACE WATER ANALYSIS RESULTS

M/s. B. N. Garodia
Jyoti Nagar
Jalan Nagar, Dist: Dibrugarh
Assam- 786005

(Mothalla Site Lot I & II)

(JULY – 2015)

Sample Type : Surface Water
Sample Source : Sample Collected from Brahmaputra River (Mothalla Site)
Collected By : Envirocon & Client Jointly
Collected On : 20.07.2015

Sl. No.	Parameters	Results
1	pH	6.8
2	DO	4.1 mg/l
3	COD	39 mg/l
4	BOD	14 mg/l
5	TSS	66 mg/l
6	TDS	987 mg/l
7	Oil & Grease	1.1 mg/l

Report Verified By:

Bivash Mahanta
ENVIROCON

NOTE:
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2. Results refer only to the particular parameters tested.
3. This test report shall not be reproduced except in full, without the written permission of ENVIROCON, Digboi Stores Building, New Market, Digboi – 786171, Assam.

Ground water Quality

ENVIROCON
Recognised By
Pollution Control Board, Assam

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Digboi, Assam – 786 171
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Website: www.envirocon.net.in

ISO 9001 Certified
OHSAS 18001 Certified

Report Ref. No.: *ENV/BNG/GW/JULY/01/2015*

GROUND WATER ANALYSIS RESULTS

M/s. B. N. Garodia
Jyoti Nagar
Jalan Nagar, Dist: Dibrugarh
Assam- 786005

(Mothalla Site Lot I & II)

(JULY - 2015)

Sample Type : Ground Water
Sample Source : Sample Collected from Tube Well of the Camp Site (Mothalla Site)
Collected By : Envirocon & Client Jointly
Collected On : 20.07.2015

Sl. No.	Parameters	Results
1	pH	6.6
2	DO, (mg/l)	4.2 mg/l
3	COD, ,(mg/l)	25 mg/l
4	BOD, (mg/l)	06 mg/l
5	Arsenic (as As), (mg/l)	ND
6	Cadmium (as Cd), (mg/l)	ND
7	Manganese (as Mn), (mg/l)	ND
8	Total Coliform, MPN/100 ml	Nil

Report Verified By:

Bivash Mahanta
ENVIROCON

NOTE:
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2. Results refer only to the particular parameters tested.
3. This test report shall not be reproduced except in full, without the written permission of ENVIROCON, Digboi Stores Building, New Market, Digboi – 786171, Assam.

Appendix 2

○Public hearing was conducted on 09th November, 2015 at Japoripather School.

Attendance sheet of the recent public hearing at Japoripathar School, Kaziranga Sub project area.

9th November, 2015

Meeting: KAZIRANGA SUB PROJECTVenue : Dikholupathar School Date: 09/11/15

Sl No	Name	Designation	Address (with contact no)	signature
1	P. Konwar	DEO (PM)	9435036074	9.11.15
2	A.J. Chetia	NEO(T)	8011240936.	A.J.Chetia
3	Dipak Bezbaruo.	Sub-Engr	9954247138	
4	Dr Jayanta Das	NES, PMC	9435406966	
6	Anjuman Ahmed.	J.E.	Bokakhat W.R. Sub Div.	
7	Lokhan Ch. Das	Teacher	8011578193	
8			9706791238	
9	NARJAHAN	Teacher	9946467692	
10				
11	om PRAKASH Sonar			
12	Bipul Das	Sub-Engg.	W.R. Sub-Divn. Bkt. 99540-26393	
13	Dwijen Bora	"	7086464273	
14	Reshu Das	Sec Assistant	Bokakhat WR sub division	
15	Gotap Hazarika.	FIELD	9859689228	
16	Shri Ranjeet Bhumij		- Dikhlopathar	
17	Shyamlal Pokhrel	teacher	Japoripathar NE. 9854673456	
18				
19		Gr.S.D.C.C	9954424547	
20			9613766402	
21				

PHOTO DOCUMENTATION (PLATES)

Kaziranga sub project




PPublic hearing at Japoripathar School, Kaziranga Sub project area. 9th November, 2015

Appendix 3 Photographs

Kaziranga Visit with ADB, 13.12.2015

DTP Dyke, Dibrugarh visit with ADB, 14.12.15

DTP Dyke, Dibrugarh visit with ADB, 14.12.15

Mothola, Dibrugarh visit with ADB, 14.12.15

Meeting with villagers at Palasbari visit with ADB, 15.12.15

Meeting with villagers at Palasbari visit with ADB, 15.12.15

<table>
<tr><td> 
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<tr><td>Water Sprinkling</td><td>Camp- Waste management</td></tr>
<tr><td colspan="2"> 
</td></tr>
<tr><td colspan="2">Use of Signage</td></tr>
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