



# Environmental Monitoring Report

---

Project Number: 35335-01  
March 2010

## IND: National Highway Sector II Project

Prepared by  
National Highways Authority of India

For  
Executing Agency  
National Highways Authority of India

This report has been submitted to ADB by the National Highways Authority of India and is made publicly available in accordance with ADB's public communications policy (2005). It does not necessarily reflect the views of ADB.

**Asian Development Bank**



Loan 2154  
भारतीय राष्ट्रीय राजमार्ग प्राधिकरण

(पोत परिवहन, सड़क परिवहन और राजमार्ग मंत्रालय)

**National Highways Authority of India**

(Ministry of Road Transport and Highways, Govt. of India)

P.I.U. : 6-4-239, 3rd Cross, Maruthi Nagar, Anantapur - 515 004

AM/CM

दूरभाष / Phone : 91-8554-275599

Fax 248136

फैक्स / Fax : 91-8554-275599

Website: www.nhai.org

email: anantapur@nhai.org

16 May 10

No.NHAI/PIU-ATP/ENV/ADB/2009/0225

Dt. 04.05.10

To  
Shri Girish Mahajan,  
Asian Development Bank (INRM),  
4, San Martin Marg,  
P. O. Box No.5331,  
Chankayapuri Head Post Office,  
New Delhi - 110021



Sub: NHAI - PIU, Anantapur - Rehabilitation and upgrading of existing two lane NH-7 road to four lane divided carriageway from Km 211 to km 336 of Hyderabad - Bangalore Section in the state of Andhra Pradesh under NHDP Phase-II - **Environmental Monitoring Report** for the period January - March 2010 - Reg.

Sir,

Please find enclosed herewith the Environmental Monitoring Report for the packages C-10, 11 & 12 for the period January 2010 - March 2010 under PIU, Anantapur for favour of information, please .

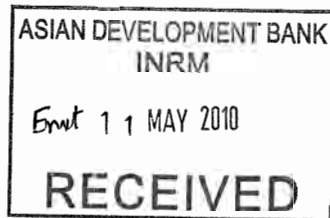
Thanking you,

Yours faithfully,

  
For Project Director,  
NHAI, PIU, Anantapur

CC: Shri V. K. Sharma, Chief General Manager (Env.), NHAI, New Delhi

Encl: As above



*Environmental Monitoring Report*

Loan Number: ADB – 2154- IND  
Reporting period: (January – March 10)

***Four Laning of Hyderabad-Bangalore Section of NH-7 from Km 211to Km 251 in the State of Andhra Pradesh - Contract Package ADB-II/ C-10 –C-11/C-12 -Environmental Compliances***

Prepared by: Nagendra Kumar

Implementing Agency: **CONSULTING ENGINEERING SERVICES (INDIA) PVT.LTD.**

*In association with*  
**The ESS GROUP INC**

Executing Agency: M/S Continental Engineering Corporation (for package-ADB-C-12  
M/S CGGC-SOMA JV (for package –ADB-C-10/C-11)

21/04/2010

## TABLE OF CONTENTS

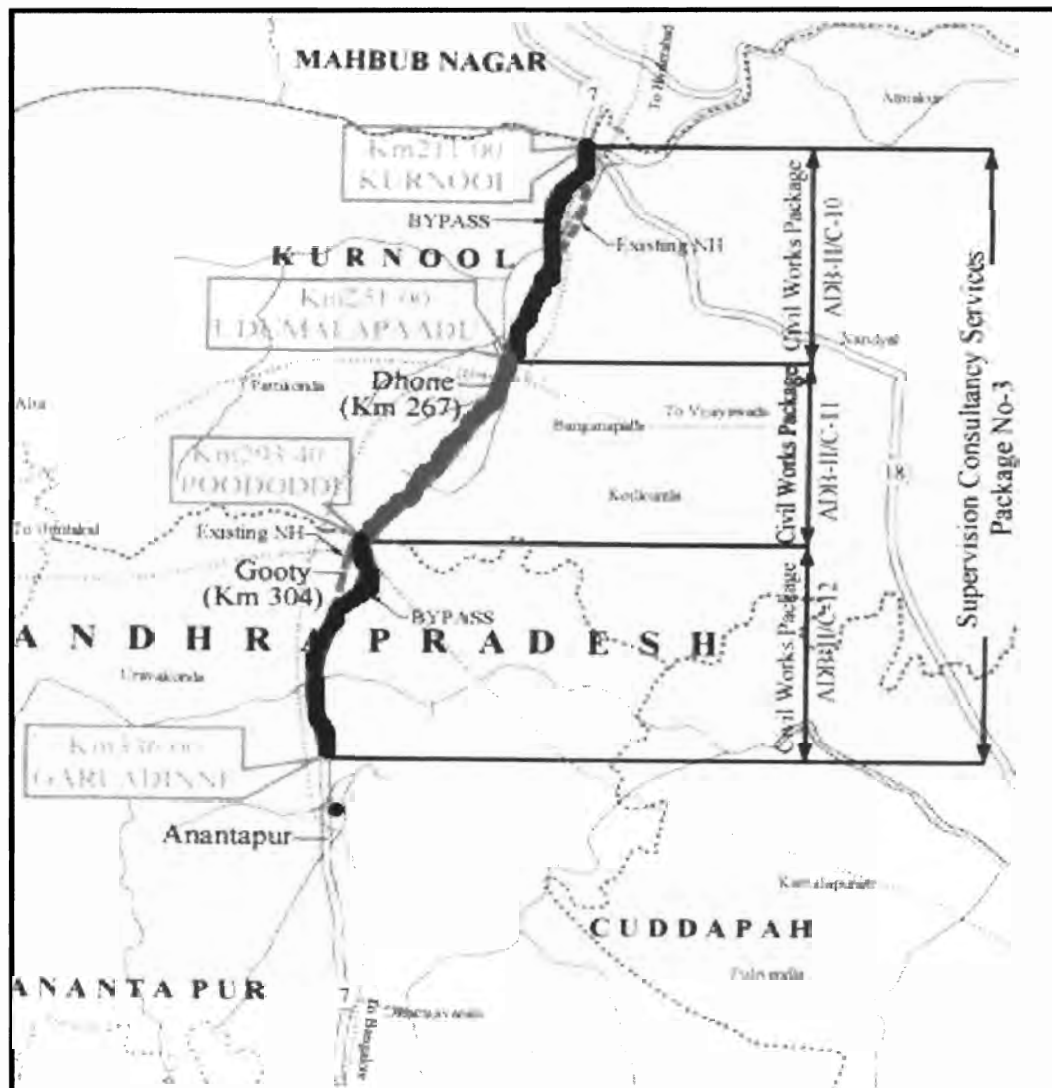
<b>Serial Number</b>	<b>Particulars</b>	<b>Page Numbers</b>
1	Introduction	(2-5)
2	Statutory Legal Requirements	(6-7)
3	Environmental covenants as stipulated in the Loan Agreement - Environmental Management and Monitoring Plan	7
4	Compliance status with environmental management and monitoring plans and environmental assessment and review framework/procedures as stipulated in the environmental documentation as agreed with ADB	(8-13)
5	Methodology for Environmental Monitoring	13
6	Environmental Receptors/ Attributes	(15-16)
7	Environmental Aspects	17
8	Complaints from Public and Actions Taken thereof to resolve	17
9	Follow-up Actions and Conclusions	(17-17)

## 1. Introduction

The project road is the section of National Highway-No-7, start from km **211.000 at Kurnool** and passes through **Udumalapaddu, Poododdi** and ends at km 336.000 in **Gerladinne**.The project road is divided into three Contract Package. The Contract package ADB-II/C-10 and ADB-II/C-11 falls under the Kurnool district and the Contract package ADB-II/C-12 comes in Anantapur district in the state of Andhra Pradesh having total length of 125.00 Km. An Index Map showing the location of the project road is present in **Exhibit No – 1A**.

- Kurnool (km 211) to Udumalapaddu (km 251): ADB-II/C-10 : 40.0 km
- Udumalapaddu (km 251) to Poododdi (km 293.4): ADB-II/C-11 : 42.4 km
- Poododdi (km 293.4) to Gerladinne (km 336.00) : ADB-II/C-12 : 42.6 km

**Exhibit No – 1A**



### **1.1 Objectives;**

The Govt. of India has come-up with major investment plan, to overcome the traffic growth which includes up-gradation, construction of new corridor ensuring safe, smooth and uninterrupted traffic flow and the maintenance of roads with modification, repairs and improvement in compliance with specifications and standards.

In order to achieve a time bound and cost effective implementation of Projects, the Ministry of Shipping, Road Transport and Highways (MoSRTTH) entrusted the National Highways authority of India (NHAI) for strengthening and widening to four lanes of existing two lanes highway of different corridors under National Highways Development Programme (NHDP) in order to achieve the objective of an efficient, safe, and affordable road network. The accelerated growth of traffic on these corridors may become inadequate to cater for the future traffic expected. Keeping this likely capacity constraint in mind, it was resolved to convert some of the two-laned sections into four-laned highways under NHDP. This includes National Highway No.7 (NH-7), which is being executed through a separate contract agency.

The report deals with the project corridor coming under the contract Package no.1) ADBII-C-10, 2) ADBII-C-11 and 3) ADBII-C-12, the section of NH-7 under the National Highway Development Programme.

### **1.2 Environmental Category :**

The project corridor is categorized as **Category-B**, which requires a special care for safeguarding and protection of environmental during the construction by effective implementation of EMP.

### **1.3 Environmental Performance Indicators :**

In view of the limited scope of work as also development in precise evaluation of environmental quality, a subjective approach is considered acceptable tool for evaluation of environmental quality of completed Highway Project. In the present case, the completed project is an up-gradation and rehabilitation of existing transportation facility. Therefore, a performance and evaluation of environmental quality before and after project is briefly elaborated in relation to the following factors :

- A) Construction,
- B) Traffic and
- C) Highway factors

#### **A) Environmental quality due to Construction factor,**

The environmental quality during the construction process shall be deteriorated with regard to an Air, Water and Noise quality, ecological and natural damage, greenery loss etc. The environmental quality consistently maintained by following the schedule of mitigative measures for adverse environmental impacts. The ecological features can be recovered soon if effective step shall be taken for minimal loss and damage to environment. Therefore, the construction activities with sound environmental management practices and successful implementation of afforestation programme may recover the environmental quality.

The other performance indicator of environmental quality is Traffic and Highway factors to which can be taken for evaluation of environmental quality at the operation phase .

**(B). Environmental quality relative to Traffic Factor:**

1. **Improvement in Air quality:** Air and dust pollution (RSPM/SPM) in inhabitations particularly through emissions shall be reduced due to construction of flyovers, underpasses, service roads and afforestation along the project corridor.
2. **Reduction in roadside Noise level :-** Whereas plantation of trees along the right of way and shrub in central verge of divided carriageways have contributed substantially in noise reduction in rural Sections, the construction of Flyovers, Underpasses and Service roads have contributed to it on the other hand due to segregation of main traffic away from population in horizontal and vertical directions.
3. **Improvement in Pollution Level: -** Riding quality of road has increased manifold by upgradation and rehabilitation of existing highway. This has resulted in not only reduction in average travel time and vehicles maintenance cost, but also reduced the pollution level due to protection of degradable shoulder materials and reduction in spills due to reduced repair/occasion for ailing vehicles.
4. **Improvement in Vibration Level :-** Multiple division of travel path by increasing lanes, provision of service roads and segregation of traffic at urban settlement etc have drastically cut down resonance of vibration.

**(C). Environmental quality relative to Highway Factor:**

1. **Induced roadside development of Commercial, Industrial and Residential structure :** - Hotel, Dhabas, Motel, Restaurant, petrol pumps will be opened in large number by the end of the Project that would provide direct and indirect generations of employment resulting in better living environment.
2. **Access for settlement dwellers:** - Settlement dwellers shall enjoy better access to the workplace/seasonal gathering at junctions and Underpasses/Flyovers locations by reduction/segregation from interference with main traffic on the highways that results in prevention of accidents.
3. **Reduction in Erosion of Road Embankments: -** Vegetation by turfing in embankments and plantation of trees along the available land of right of way coupled with pitching and protection works shall reduce erosion of road embankments.
4. **Improvements in Safety for Road Users :-** Metal Beam Crash Barriers along the steep curve and high embankments, Cats eyes along the lane divider of carriageways, Pedestrian Guard Rail in service road, delineators along the curve edge and Retro-reflective sign-board along the both side of the project corridor shall provide better safety for the road users.
5. **Rehabilitation of Environmental quality by Afforestation: -** The compensatory afforestation, shall restore the greenery loss natural features of the surrounding environment.

**1.3 Project progress, agreed milestones and implementation schedules**

**1.3.1 PROGRESS DETAIL**

The actual physical progress achieved on the permanent items of work (BOQ item) upto the end of reporting month i.e. March 2010 for the Four laning of Hyderabad-Bangalore in the State of Andhra Pradesh (NH-7).

**PHYSICAL PROGRESS (%)**

Package/ Project	End Previous Month (Cumulative)		This Month		Cumulative		Balance period As Per Action Plan/Catch-up Programme (Month)
	Scheduled	Actual	Scheduled	Actual	Scheduled	Actual	
C-10	93.220	74.727	6.780	2.785	100.000	77.512	0
	-	(74.451)	-	(2.715)	-	(77.166)	
C-11	88.060	75.796	5.360	2.860	93.420	78.656	4
	-	(76.544)	-	(5.220)	-	(81.764)	
C-12	83.160	71.600	4.500	2.242	87.660	73.84	3
	-	(71.786)	-	(2.191)	-	(73.977)	
Project	87.552	73.795	5.418	2.589	92.970	76.384	4
	-	(74.017)	-	(3.275)	-	(77.292)	

1.3.2 DETAILS OF PROJECT COST

The details of project cost including utility shifting works are as under:-

Package / Project	Contract Price (BOQ Cost) (Rs. In Lacs)	Estimated Cost of Utility shifting (Rs. In Lacs)	Total cost including BOQ cost and Utility shifting (Rs. In Lacs)
ADB-II/C-10	16739.12693	391.30	17130.42693
ADB-II/C-11	17481.02331	226.39	17707.41331
ADB-II/C-12	21345.69713	498.00	21843.69713
<b>Total Project Cost</b>	<b>55565.84737</b>	<b>1115.69</b>	<b>56681.53737</b>

1.3.3 FINANCIAL PROGRESS :

**FINANCIAL PROGRESS (%)**

The financial progress based on IPC upto the end of reporting month (March 2010) are given below

Package/ Project	End Previous Month (Cumulative)	This Month	Cumulative
C-10	74.091	2.837	76.928
C-11	69.063	3.142	72.205
C-12	67.440	1.954	69.394
<b>Project</b>	<b>69.954</b>	<b>2.594</b>	<b>72.548</b>

Financial Progress shown above is calculated on BOQ cost plus material at hand i.e. materials calculated with respect advance less recovery.

## 2. Statutory and Legal Requirements

The compliance status of statutory requirements are presented as follows

Sl. No.	Description	Reason for Applicability (Act / Rules)	Authority	Contract Package		
				ADB-II-C-10	ADB-II-C-11	ADB-II-C-12
<b>1</b>	<b>Consent for Establishment of plant</b>					
1.1	Crusher Plant	Air (Prevention and Control of Pollution) Act, 1981; Water (Prevention and Control of Pollution) Act1974	APPCB	Obtained 20.05.2012	Obtained Validity: 3 10.2012	Obtained Validity: 20.07.2012
1.2	HMP	Air (Prevention and Control of Pollution) Act, 198; Water (Prevention and Control of Pollution) Act1974	APPCB	Obtained 22.02.2012	Obtained Validity: 3.10.2012	Obtained Validity: 20.07.2012
1.3	Diesel Pump	Explosive Act 1984	Chief Controller of Explosives	Validity: 31.12.2009. Renewal In Progress	Validity: 31.12.2009. Renewal In Progress	Obtained Validity: 31.12.2010
<b>2</b>	<b>Consent for Operation of plant</b>					
2 1	Crusher Plant	Air (Prevention and Control of Pollution) Act, 1981, Water (Prevention and Control of Pollution) Act1974	APPCB	Obtained Validity : June 2010	Obtained Validity : September 2010	Obtained Validity : September 2010
2.2	HMP	Air (Prevention and Control of Pollution) Act, 1981, Water (Prevention and Control of Pollution) Act 1974	APPCB	Obtained Validity : June 2010	Obtained Validity : September 2010	Obtained Validity : September 2010
<b>3</b>	<b>Consent for Quarry and Blasting Operation</b>	The Mining Act	Department of mining. Andhra Pradesh	Obtained Validity: 30.04.2010	Obtained Validity: 02.02.2017	Obtained Validity: 17.05.2017
<b>4</b>	<b>Permission for withdrawal of Ground water</b>	Water Conservation Act.	Ground Water Board	Applied on date : 07.12.2009. In Progress	Applied on date: 07.12.2009. In Progress	Obtained Validity: Valid until it has been duly cancelled.
<b>5</b>	<b>Construction Machinery.</b>	Central Motor Vehicle Act 1988 and Central Motor Vehicle Rules1989	Motor Vehicle Department	Complied Periodical check –up for vehicular air and noise.	Complied Periodical check –up for vehicular air and noise.	Complied Periodical check –up for vehicular air and noise.
<b>6</b>	<b>Land fill site for Asphalt &amp; Concrete wastes.</b>	Hazardous Wastes (M&H) Rules - 1986	-	As per EMP In Progress	As per EMP In Progress	As per EMP In Progress

### 3. Compliance status with the environmental covenants as stipulated in the Loan Agreement

This is an extract of schedule -6 and a part of environmental covenant as stipulated in the Loan Agreement. The compliance status is presented in tabular form as follows

Sl. No	Environmental covenants as stipulated in the Loan Agreement	Status of Compliances
17	NHAI shall implement the Project in accordance with ADB's Environment Policy, 2002; prepare and implement for each Subproject, the IEE including an EMP with budget, and ensure adequate funds for its timely implementation.	The Project is being implemented following the ADB's environmental policy 2002.
18	For each Subproject, NHAI shall	
(a)	ensure that all environmental mitigation measures identified in the IEE and EMP are incorporated into the designs (including detailed designs) and are implemented during construction, operation, and maintenance of the Subproject highway; and	The mitigation measures are incorporated and being implemented in the construction phase
(b)	Monitor, audit and report semi-annually, the implementation of the IEE and EMP to ADB.	It is being monitored and environmental audit has been conducted periodically for effective implementation of environmental requirements.
19	NHAI shall ensure that for any Subproject involving acquisition of land for a Section or part thereof under a civil works contract, that passes through forest land and / needs diversification from use of forest land, relevant statutory clearances under the Borrower's Forest Conservation Act, 1980, related pollution control, and environmental clearances under Indian Environmental Impact Assessment Notification, 1994, shall be obtained, prior to commencement of civil work for that Section of the civil works contract under the Subproject.	Relevant statutory clearance has been obtained under Forest Conservation Act, 1986 and Andhra Pradesh State Pollution Control Board and environmental clearance under Indian Environmental Impact Assessment Notification, 1994. Environmental Clearance MoEF Consent is <b>5-4/2005-1A-III</b>
20	NHAI shall continue with training program for environmental management for its staff and staff of civil works contractors engaged under the Subprojects.	Training Programme has been conducted subject Environmental Management with the participant of the Contractor, Consultant and Client/NHAI.
26	NHAI shall appoint resettlement officers in the PIUs, and hire NGOs from its resources to address resettlement issues. NHAI shall ensure that a local resettlement specialist and the ESDU officials undertake resettlement-training programs for NGOs and resettlement officers of NHAI.	Noted

Sl. No	Environmental covenants as stipulated in the Loan Agreement	Status of Compliances
27	NHAI shall also ensure that essential public infrastructure that may be affected under land acquisition and resettlement is replaced as appropriate in an expeditious manner.	All public infrastructure which is affected under the land acquisition and resettlement is being rehabilitated as appropriate.
<b>Social Measures</b>		
28	NHAI shall ensure public awareness and acceptance of the Project and Subprojects through participation of NGOs and local community.	Noted.
29	Within 3 months of Effective Date, NHAI shall ensure that a Manager each in the PIUs shall be made responsible to address environmental, resettlement, and other social issues in a timely manner. NHAI shall also ensure that Grievance Redress Committees in accordance with the RPs / RF are formed in each district for resolution of disputes concerning land acquisition and resettlement, environment and other social issues in a timely manner.	The PIU, Anantapur, has designated a Manager, responsible for environment and social resettlement programme
30	Within 6 months of Effective Date, NHAI through its HIV/AIDS and anti-trafficking cell within the ESDU, assisted by consultants, shall develop and implement a program for preventing HIV/AIDS and promoting anti-trafficking along the Project highways. The PIUs shall additionally, assisted by the NGOs, assist in implementation of Component D in close coordination with the Borrower's National AIDS Control Organisation, the relevant state AIDS Control Societies, Department of Women and Child Development and other government agencies responsible for women and children empowerment.	Noted
31	NHAI shall ensure that civil works contracts under the Subprojects incorporate provisions to the effect that contractors shall (i) carry out HIV/AIDS awareness and prevention programs for labour, (ii) not employ or use children as labour; (iii) disseminate information at worksites on risks of sexually transmitted diseases and HIV/AIDS as part of health and safety measures for those employed during construction; and (iv) follow and implement all statutory provisions on labour (including equal pay for equal work), health, safety, sanitation, and working conditions. The civil works contracts shall also provide for termination of the contract by NHAI in case of breach of any of the stated provisions by the contractors.	HIV/AIDS programme has been conducted in all Subcontract, two times annually.
32	NHAI shall ensure that the locally-based NGOs to be recruited to assist in implementation of relevant Components as referred in this schedule in accordance with its procedures and as acceptable to ADB.	An NGO has been deployed for implementation of relevant component as referred in this schedule

#### 4.Environmental Management and Monitoring Plans

##### 4.1. Schedule of Mitigative Measures :-

Environmental issues and schedule of mitigative measures to be taken as per contractual provisions were monitored periodically during the construction phase. The compliance status for all three packages were illustrated in the tabular form as given bellows :

List of Environmental issues and measures taken for minimal Environmental Impacts are illustrated as below :

Monitoring Attributes	Environmental Management Plan	Environmental Compliances		
		ADB-II/C-10	ADB-II/C-11	ADB-II/C-12
1. Impacts due to project location	(a) <i>Compensatory afforestation should be followed on equivalent land.</i>	Trees in ROW and Shrubs in median are being executed by the Contractor	Trees in ROW and Shrubs in median are being executed by the Contractor	Trees in ROW and Shrubs in median are being executed by the Contractor
2 Safety for road -users and Diversion	a)Construction Sites b)Deep Excavations c)Diversion d)Drainage e)Safety for the Workers	Effort being taken for improvements. In Safety – Audit the point is 55/100, conducted on 22 <sup>nd</sup> January-10.	Moderately Satisfactory In Safety – Audit the point is 65/100, conducted on 18 <sup>th</sup> January-10.	Satisfactory; In Safety – Audit the point is 70/100 conducted on 15 <sup>th</sup> February-10.
3 Impacts from Construction Camp:	(a) <i>Barren land for campsites.</i>	Yes Barren lands	Yes Barren lands	Yes Barren lands
	(b) <i>Camp site should be away from forest areas</i>	Site is environmentally sound and safe	Site is environmentally sound and safe	Site is environmentally sound and safe
	(c) <i>Provision for lavatory and separate disposal wastes etc.</i>	Site plan is approved	site plan is approved	site plan is approved
	(d) <i>Health check- up programme</i>	Yes	Yes	Yes
4 Impact due to Quarries	a)Safety Procedure	Yes	Yes	Yes
	b)License of quarry	Yes	Yes	Yes
	c)Control blasting	Yes	Yes	Yes
	d)Rehabilitation plan	In Progress, Instructed to submit the action plan	In Progress, Instructed to submit the action plan	In Progress, Instructed to submit the action plan
5. Impact due to borrow	a) <i>Area is access control</i>	Yes	Yes	Yes
	b) <i>Maintained haul road</i>	Yes	Yes	Yes
	c) <i>Minimal alteration of topography</i>	Yes	Yes	Not Satisfactory
	d) <i>Other environmental requirements</i>	Satisfactory	Moderately satisfactory	Moderately satisfactory
	e) <i>Rehabilitation Plan</i>	Yes	Yes	In Progress, Reminded
6 Impact Due to HMP/Crusher	a) <i>Management Practices</i>	Yes	Yes	Yes
	b) <i>Minimal dust fumes</i>	Yes	Yes	Yes

Monitoring Attributes	Environmental Management Plan	Environmental Compliances		
		ADB-II/C-10	ADB-II/C-11	ADB-II/C-12
	c) Away the Settlements	Yes	Yes	Yes
	d) Located at barren land	Yes	Yes	Yes
7 Asphalt wastes / Spoils Material	a) No impact on water and land resources	Measures have been taken to avoid contamination	Measures have been taken to avoid contamination	Measures have been taken to avoid contamination
	b) Disposal at environmentally safe site/landfill	Yes	Yes	Yes
	c) Maximum possible re-utilize.	Yes	Yes	Yes
8 Impact due to dust fumes	a) Minimal impact on human health and vegetations.	Yes , periodical watering on access and approach to arrest dust fumes.	Yes , periodical watering on access and approach to arrest dust fumes.	Yes , periodical watering on access and approach to arrest dust fumes.
9 Impact due to withdrawal of ground Water	a) Control upon the wastes of water.	Yes	Yes	Yes
	b) Recharging measures	Yes Recharge pit shall be constructed as per drawing.	Yes Recharge pit shall be constructed as per drawing.	Yes Recharge pit shall be constructed as per drawing

#### 4.2 Environmental Issues Attended by the Contractor :

Initially, the Contractor was not taking environmental measures After the long efforts and periodical site monitoring, the Contractor started taking environmental consideration in the methodology of construction procedure. The status of implementation and action required (If any) are illustrated in the following table:

Sl. No.	Environmental Issues		Corrective Measures		
			ADB-II/C-10	ADB-II/C-11	ADB-II/C-12
1	Rehabilitation of borrows	Implementation Status	Satisfactory Implementation	Satisfactory Implementation	Not Yet.
		Action :	Presently, no action is required	Presently, no action is required	<b>Yes</b> Action is required
2	Stockyard Planning : 1. Solid platform. 2. Material covered. 3. Segregation of	Implementation Status	Satisfactory Implementation.	Satisfactory Implementation	Satisfactory Implementation

Sl. No.	Environmental Issues	Corrective Measures			
		ADB-II/C-10	ADB-II/C-11	ADB-II/C-12	
	materials. 4. Layout of yard. 5. Routing of vehicles. 6. Ground leveling. 7.Lorry covers for fine material.	Action	No Action	No Action	No Action
3	<b>Oil and Grease Traps :</b> 1.Solid platform provided. 2.Fuel storage. 3.Fuelling equipment.	Implementation Status	Satisfactory Implementation	Satisfactory Implementation	Satisfactory Implementation
		Action	No Action	No Action	No Action
4	<b>Dust Suppression</b> 1.Haul roads. 2. Access/approach 3.Camp Sites	Implementation Status	Moderately Satisfactory	Moderately Satisfactory	Moderately Satisfactory
		Action	<b>Yes</b> Action is required	<b>Yes</b> Action is required	<b>Yes</b> Action is required
5	<b>Asphalt wastes / Spoils Material</b> 1. Reuse of the materials 2. Identification of landfill site 3. Treatment measures	Implementation Status	Moderately Satisfactory	Moderately Satisfactory	Slight satisfactory
		Action	No; Made full effort by the Contactor for safe disposal	No; Made full effort by the Contactor for safe disposal	No; An effort is being taken for safe disposal.
5	<b>Blasting of Quarry</b> 1. Control ballasting 2. Safety procedure 3. Management measures 4. Rehabilitation plan	Implementation Status	Moderately Satisfactory	Moderately Satisfactory	Moderately Satisfactory
		Action	<b>Yes,</b> Action required for rehabilitation Plan	<b>Yes,</b> Action required for rehabilitation Plan	<b>Yes,</b> Action required for rehabilitation Plan
6	<b>Safety aspects:</b> 1. Construction Sites 2. Deep Excavations 3. Diversion 4. PPEs for the Workers	Implementation Status	Slight Improvement	Slight Improvement	Satisfactory for road safety.
		Action	<b>Yes,</b> Action required for road safety and PPEs	<b>Yes,</b> Action required for road safety and PPEs	No Action (satisfactory safety arrangements)
7	<b>Afforestation Programme</b> 1. Plantation as per specification 2. Maintenance work	Implementation Status	Need Improvements	Need Improvements	Need Improvements
		Action	<b>Yes,</b> Actions for maintenance activities (watering and manuring)	<b>Yes,</b> Actions for maintenance activities (watering and manuring).	<b>Yes,</b> Actions for maintenance activities (watering and manuring )

Sl. No.	Environmental Issues	Corrective Measures			
		ADB-II/C-10	ADB-II/C-11	ADB-II/C-12	
8	<b>Machinery/ Maintenance Yards</b> • <i>Pollution Control :</i> i) Fuel Storage ii) Fueling Equipment iii) Scrubbers iv) Sprinkling of water along the haul road • <i>License of Vehicle, Drivers etc.</i>	Implementation Status	Satisfactory	Satisfactory	Satisfactory
		Action	No Action	No Action	No Action
9	<b>Labour Camps</b> 1 ancillary facilities 2.size of dwelling etc 3. drinking Water 4. lavatories etc. 5. septic tank and soak pit	Implementation Status	Slight Satisfactory	Slight Satisfactory	Satisfactory
		Action	Yes, Size of dwelling and ancillary facilities are concern.	Yes, Size of dwelling and ancillary facilities are concern.	No Action
10	<b>Diesel Pump</b> 1.Fire Extinguisher. 2.Fueling platform 3. Define area 4.Pump shed 5. hazardous safety 6. Sand bags etc	Implementation Status	Satisfactory	Satisfactory	satisfactory
		Action	No Action	No Action	No Action

Note : We are taking stringent action for the further improvements and satisfactory implementation of EMP

#### 4.3 Hot Spot of Environmental Practices :

In the beginning, the environmental management measures was not satisfactory. There was no environmental consideration at borrows. there was no care upon the trees and vegetation in borrow and quarry sites, there was no action plan for scarified asphalts. Dust generation was high at the plant sites. Poor management at Diesel pumps i.e. fueling platform, lack of fire extinguisher, No pump shade etc. The site was not defined. Almost no tail gate in the back of Dumpers, carrying boulders and stones etc.

The Contractor has taken Corrective measures after the long efforts:

Sl. No	Environmental Issues		ADB-II/C-10	ADB-II/C-11	ADB-II/C-12
1	Borrows • Damage the ecosystem of surrounding area. • No Protection measures for trees • No Plan for borrowing operation.	Corrective Action	a)Rehabilitation with satisfaction. b)Existing surrounding is restored with effective measures c) Trees inside borrow were saved. This is for <b>Lakshmipuram Borrow Ch : 218.120,L/S</b>	N/A	N/A
		Improvement	No	-	-

Sl. No	Environmental Issues		ADB-II/C-10	ADB-II/C-11	ADB-II/C-12
		Required			
2	Work shop/Camp Site <ul style="list-style-type: none"> <li>Area was not defined.</li> <li>Contamination of Oil and grease.</li> <li>No measures for dust control</li> </ul>	Corrective Action	a) Oil and grease Trap has been developed. b) Started watering with tankers for dust control. c)Area has been defined for storage yards , maintenance yards, Iron & steel yards etc.	Do ; The Contractor did the same efforts in this Package also	Do ; The Contractor did the same effort in this Package also
		Improvement Required	No Action	No Action	No Action
3	HMP/Crusher <ul style="list-style-type: none"> <li>No dust Control Measures.</li> <li>No maintenance of site approach</li> </ul>	Corrective Action	N/A	N/A	a)Develop Water Sprinkling system at HMP. b) Approach and Site is keeping maintained for dust control.
		Improvement Required			No
4	Monitoring of Air, Water and Noise <ul style="list-style-type: none"> <li>No actions for evaluation of impacts.</li> </ul>	Corrective Action	Conducted monitoring for air, water and noise near camps, HMP, Crusher plant and construction sites. Recently conducted in January -2010.	Do, The same for this package also. Recently conducted :June -2009	Do, The same for this package also. Recently conducted : June - 2009
		Improvement Required	No Action	No Action	No Action
5	Safety for road –users <ul style="list-style-type: none"> <li>Diversions</li> <li>Deep excavation</li> <li>Construction sites</li> <li>PPEs for workers and staff.</li> </ul>	Corrective Action	The Contractor has started taking effort for strengthening of safety arrangement.	The Contractor has started taking effort for strengthening of safety arrangement.	Arrangement of Safety during construction is satisfactory.
		Improvement Required	Need Improvement	Need Improvement	N/A

## 5. Environmental Monitoring :

### 5.1 Phase of Project :

The total project cycle of road development works can be grouped under three phases, namely Pre-construction, Construction, operation phase.

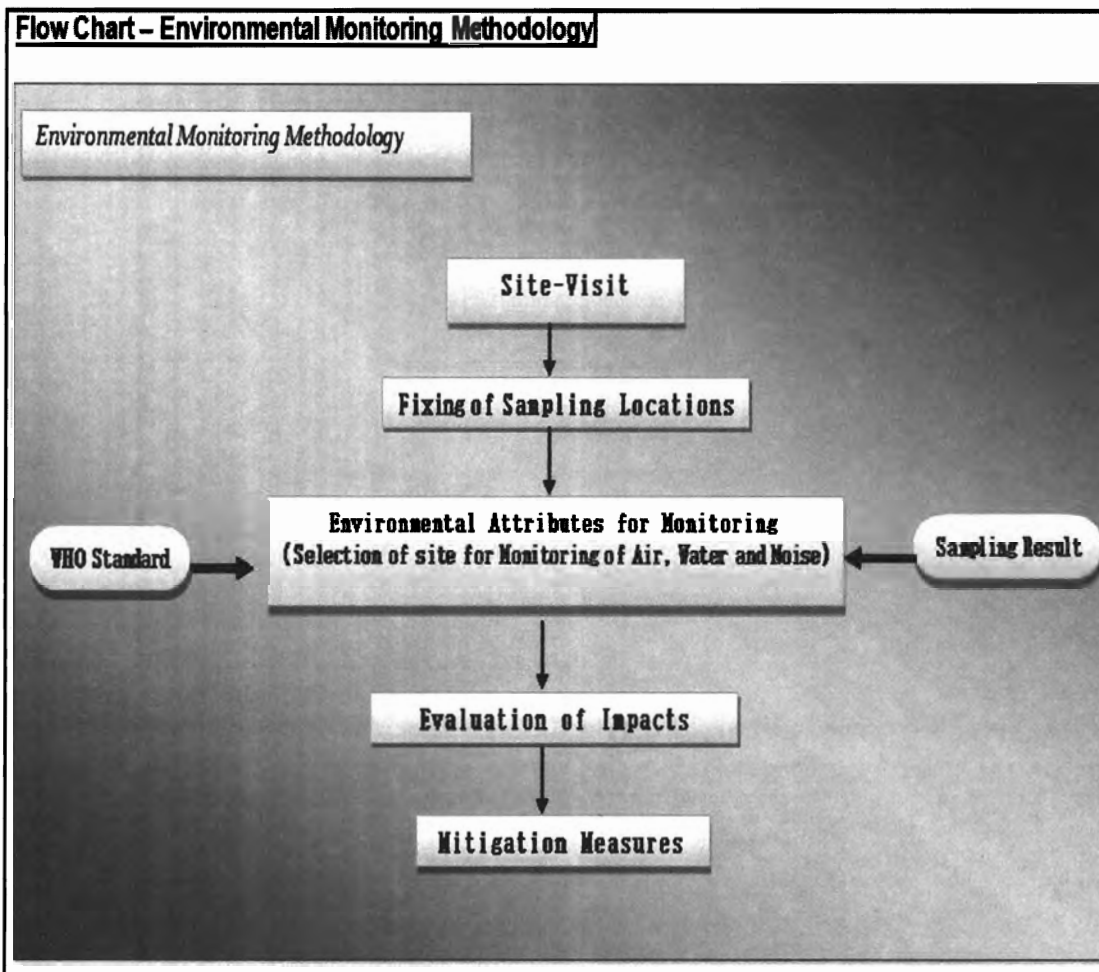
The Project is at the construction phase where we examine the impacts on the surrounding environment due to the construction activities. The construction phase is most crucial and active stage. Therefore, we have to take all precautionary measures for the safeguard of environment.

### 5.2 Approach and methodology:

To determine the magnitude of significant potential impacts and to ensure environmental considerations, the monitoring for different performance indicator of air, water and noise was carried out. The sampling station was selected as per observation of consistent impacts on the surrounding environment due to the construction.

The environmental impacts are examined for SPM, RSPM, Sox, Nox, quality of drinking water and surface water and the noise. The standard norms are correlated with the monitoring results to describe the existing environmental impacts. The mitigation measures are advised as per evaluation of impacts.

The methodology adopted is presented in the form of a flow chart.



## 6. Monitoring of environmental Receptors/ Attributes :

### 6.1 Environmental Attributes :

These are the following attributes which are taken for monitoring for the evaluation of impacts during the road construction activities.

#### 6.1.1 Air Environment :

Monitoring of ambient air quality has been conducted at sampling sites, where has consistent impacts. Different pollution parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM), Sulphur Dioxide (SO<sub>2</sub>) and Oxides of Nitrogen (NO<sub>x</sub>) were measured for evaluation of impacts of ambient air quality within the project influence area. Respirable Dust Sampler with gaseous attachment has been used for RSPM/SPM. RDS with assembly of gaseous attachment is used for the collection of gaseous pollutants i.e. Sox and Nox.

#### Air Quality Monitoring Equipment

Equipment	Model	Equipment Number	Sensitivity	
			SPM/RSPM	Gases
Respirable Dust Sampler (RDS)	APM-460BL&411	SAL/RDS/01	0.02- 01.8 m <sup>3</sup> /min	0.02-3 ± LPM

#### 6.1.2 Monitoring Locations :

The monitoring stations have been selected in accordance with the Ministry of Environment and Forest (MoEF) guidelines applicable pertaining to IS – 5182 (Part-14), 1985. The locations are fixed at : a) Crusher Plant , b) Hot Mix Plant, c) Camp sites, d) Villages exist 2-3 km away the plant sites.

## 6.2 WATER ENVIRONMENT

The study on water environment broadly covers the following :

- 1) Study of existing ground and surface water resources with respect to quality & quantity within the study area.
- 2) The parameters of prime importance selected under physico-chemical characteristics were estimated to describe the environmental status of the water resources during pre-monsoon season.

### 6.2.1 Water Monitoring:

Standard method is used for examination of surface water and ground water. This is 21<sup>st</sup> edition, edited by Lenore S. Clesceri, Arnold E. Greenberg, Andrew D Elton is followed for analysis.

The sampling was collected for: TSS, TDS, PH, DO, COD, BOD, Oil and Grease, Chloride, Sulphates, Phosphate, Zinc, Chromium, Copper, Iron.

## 6.3 NOISE ENVIRONMENT

Noise pollution survey has been carried out in the study area to assess the impacts of Crusher, HMP, Batching plant, vehicular movements and other associated activities. Measurement of noise intensity has been taken for evaluation of impacts due to any anticipated rise in noise levels on the surrounding environment

### 6.3.1 Noise Monitoring:

Instant sound level meter is used for the collection of data related to noise at an interval of one hour per reading. Noise level for 24 hours was conducted during one week period at pre-decided locations.

#### Noise Quality Monitoring Equipment

Equipment	Model	Equipment Number	Detection	
			Low	High
Integrating Sound Level Meter Instrument.	Lutron (Make) SL-4001	SAL/NOISE/1/NT/01	30-80 dB	80-130 bB

### 6.4 LAND ENVIRONMENT

The study on land environment broadly covers the following:

- Estimation and characterization of solid waste, disposal methods and delineation of management options
- Estimation of impacts of mining on the agricultural lands in the vicinity

#### Environmental Attributes & Frequency of Monitoring

Sl. No.	Attribute	Parameters	Frequency of Monitoring
1	Ambient Air Quality	SPM, RSPM	24 hourly samples. By each quarter as per EMP excluding monsoon, till end of Construction.
2	Ambient Air Quality	Sox, Nox	24 hourly samples. By each quarter as per EMP excluding monsoon, till end of Construction.
3	Water Quality	Physical, Chemical and Bacteriological Parameters	By each quarter during the study period, till end of Construction.
4	Noise Levels	Noise levels in db (A)	Hourly observations for 24 hours per location by each quarter, till end of Construction.

### 6.5 Monitoring Attributes:

**6.5.1 Detail Analysis of Monitoring Report:** The monitoring of different performance indicators for evaluation of air, water and noise has been conducted in the month of January-2010 in the Contract Package ADB-II/C-10.

**6.5.1.1 Ambient Air Quality:** The monitoring of ambient air quality for different performance indicator SPM, RSPM, Sox and Nox is found within the permissible limit of prescribed standard of APPCB norms.

#### 6.5.1.2 Monitoring of Surface Water-quality :

Biological and chemical analysis of surface water quality indicates that water quality of all fixed sampling location are within the permissible of APPCB standard except the parameter of TDS at Veldurthy Village is high.

#### 6.5.1.3 Monitoring of Noise Quality :

The noise level is consistent high at the construction sites. Therefore, measurement of noise intensity has been conducted at fix sampling locations. It observed that the noise level within the premise of Crusher site and Camp site is slightly high the prescribed limit of APPCB.

The Other Package has not monitored the different performance indicator for Air Water and Noise quality in the quarter end January -10. Therefore, the result is not available. However, the earlier report of other two packages i.e. ADB-II/C11 and ADB-II/C-12, which has conducted the monitoring by June-09 and June-09 are found within the limit of prescribed standard of APPCB norms.

#### 7. Any other environmental aspects, impacts observed during implementation which were not covered earlier

No issues are observed till now pertaining to the environmental aspects which is not covered earlier.

#### 8. Details of Grievance Redress Committee and complaints received from public and actions taken thereof to resolve

Presently, there are no issues pertaining to the environment received from public as complain.

#### 9. Follow-up actions and conclusions

It is an important to take environmental monitoring, periodically. Environmental management plan should be strictly followed. The afforestation programme should be successful ensuring an application of manures and fertilizers, and other maintenance work in order to recover the greenery loss due to felling of trees in the widening process. Any scars created by the Contractor during the construction shall be filled –up or redeveloped with effective measures. The scarified asphalt materials should be disposed-off by following effective mitigative measures ensuring no pollution problems. It is to be ensured that salutatory requirements should be completed well on time. The contractor should take environmental considerations in the construction procedures for safeguarding the natural features. The recharge pit should be constructed in the compensations for the withdrawal of ground water taken out for the road construction works.

The monitoring of different performance indicator for Air, Water and Noise should be conducted as per schedule time. The mitigation measures should be followed for the minimal impacts. For an effective implementation of EMP, an environmental monitoring cell should be constituted and the entire sites of project influence area should be verified, jointly.

Signed by:



Nagendra Kumar  
Environmental Expert  
M/s Consulting Engineering Services (India) Pvt Ltd