

## EXECUTIVE SUMMARY

### A.1 BACKGROUND

APRDC has planned to improve the State road network by providing better quality and safer roads to the users in sustainable manner with loan assistance from World Bank. Improved quality of roads, better institutional operation and management system of APRDC and safe roads are important features of the project component. In this connection RDC has selected 38 corridors (cumulative length of 2002 km) of high-density (traffic) roads through Strategic Option Study (SOS) to be developed in phased manner.

### A.2 OBJECTIVES OF THE ASSIGNMENT

The main objective would be to alleviate the current unsafe and congested conditions of the road network connecting the villages and towns by providing better quality and safe roads to the users in a sustainable and environment friendly manner. Government of India, GoI through Ministry of Environment and Forest (MoEF) enforces **Environment (Protection) Rules, 1986** for environmental protection because of intervention of new projects or activities, or on expansion and modernization of existing projects or activity based on their environmental impacts.

### A.3 SCOPE OF ENVIRONMENTAL ASSESSMENT (EA)

The environmental assessment scope includes screening and scoping, environmental assessment and environmental management plans for the individual project roads as required. The EA process also envisages to develop a comprehensive environmental management frame work for the entire project which will adopted as part of the corporate environmental policy for AP Road Development Corporation.

### A.4 DESCRIPTION OF PROJECT ROAD

The Project road, Chittoor Puttur is a section of Major District Road, located in Rayalseema Region of Andhra Pradesh. The Project road starts at km 3/2 in Chittoor near FCI godown in Chittoor district and runs northeast direction connecting Gangadhara Nellore, Kondapalli, Thayyur, and Karvetinagar and terminates at km 64/0 near Puttur. Cumulative length of project road is 61/8 km. The project road provides connectivity between NH-4, NH-18 and NH-205 and is widely used by interstate traffic.

Based on the traffic demand the PR is proposed to be upgraded to 4lane configuration from Chittoor – Tirrutanni Jn (km 3/2 – 6/2) and the remaining length is proposed to be 2 lane paved shoulder configuration.

### A.5 KEY ENVIRONMENTAL LAWS AND REGULATIONS

Table 1 presents the environmental regulations and legislations relevant to AP state road project.

**Table 1: Environmental Regulations and Legislations**

SR. No	Act / Rules	Purpose	Applicable Yes/ No	Reason for Applicability	Authority
1	Environment Protection Act-1986	To protect and improve overall environment	Yes	As all environmental notifications, rules and schedules are issued under this act.	MoEF. Gol; DoE, State Gov. CPCB; SPCB
2	National Environment Appellate Authority Act (NEAA) 1997	Address Grievances regarding the process of environmental clearance.	Yes	Grievances if any will be dealt with, within this act.	NEAA
3	The Land Acquisition Act 1894 & 1989	Set out rule for acquisition. of land by government	Yes	This act will be applicable to as there will be acquisition of land for widening, geometric improvements and realignments.	Revenue Department State Government.
4	The Forest (Conservation) Act 1927 The Forest (Conservation) Act. 1980 forest (conversion ) Rules 1981	To check deforestation by restricting conversion of forested areas into non- forested areas	Yes	The project road between km 56/700 to 59/300 passes through reserved forest. 2.072 hectares area will be acquired from forest land.	Forest Department, GoAP
5	Air (Prevention and Control of Pollution) Act, 1981	To control air pollution by & Transport controlling emission of air Department. pollutants as per the prescribed standards.	Yes	This act will be applicable during construction; for obtaining NOC for establishment of hot mix plant, workers' camp, construction camp, etc.	SPCB
6	Water Prevention and Control of Pollution) Act1974	To control water pollution by controlling discharge of pollutants as per the prescribed standards	Yes	This act will be applicable during construction for (establishments of hot mix plant, construction camp, workers' camp, etc.	SPCB
7	Noise Pollution (Regulation and Control Act) 1990	The standards for noise for day and night have been promulgated by the MoEF for various land uses.	Yes	This act will be applicable as vehicular noise on project routes required to assess for future years and necessary protection measure need to be considered in design.	SPCB
8	Public Liability and Insurance Act 1991	Protection form hazardous materials and accidents.	Yes	Contractor need to stock hazardous material like diesel, Bitumen, Emulsions etc.	SPCB
9	Explosive Act 1984	Safe transportation, storage and <b>use of explosive</b> material	Yes	For transporting and storing diesel, bitumen etc.	Chief Controller of Explosives
10	Minor Mineral and concession Rules	For opening new quarry.	Yes	Regulate use of minor minerals like stone, soil, river sand etc.	District Collector
11	Central Motor Vehicle Act 1988 and Central Motor Vehicle Rules1989	To check vehicular air and noise pollution.	Yes	This rule will be applicable to road users and construction Machinery.	Motor Vehicle Department
12	The Mining Act	The mining act has been notified for safe and sound mining activity.	Yes	The construction of project road will require aggregates. These will be procured through mining from riverbeds and quarries	Department of mining, GoAP

On the basis of data and information collected during field survey and discussion with local expert and visualise potential associated impact, consultant has categorised this project as **category-B**, which requires a lesser level of environmental investigation.

**A.6 BASE LINE ENVIRONMENT**

Data was collected from secondary sources for the macro-environmental setting like climate, physiography (Geology and slope), biological and socio-economic environment within Project Influence Area, PIU/ Project District, PD . First hand information have been collected to record the micro-environmental features within Corridor of Impact, CoI. Collection of first hand (Primary) information includes preparation of base maps, extrapolating environmental features on proposed road design, tree enumeration, location and measurement of socio-cultural features abutting project road.

**A.7 STAKEHOLDER CONSULTATION**

Consultative procedure, since the inception of the project, has been continued during pre-feasibility, feasibility, Environmental Assessment and Management Plan preparation stage. Considering the fact that involving local communities in the project planning is basis of the participatory planning, often suggestion and option given by the people improves technical and economic efficiency of the project and suggested improvements proposals (if adopted by the project) of the people also generates sense of ownership within communities thus eases implementation process.

**A.9 ANALYSIS OF ALTERNATIVES**

The existing alignment, from km 52/400 to km 54/400, passes through congested areas of Karvetnagar, a major Panchayat village. The village has historical and religious importance.

The geometric along the existing alignment are beset with sharp and blind curves. Existing ROW, for around 400m length varies from 10.30m to 12.40m and all through this stretch the abutting buildings are residential cum commercial structures. For proposing the cross section Type III, which requires minimum 16m width, abutting building need to be acquired. Further to improve the geometric, the sharp curve at km 53/000 (90° bend), which is at the center of this stretch, would require more land for geometric improvement.

The approved alignment follow the existing road, locally called as Panchayat Road, located on southern outskirts, on RHS of town. The panchayat road has few residential and religious structures situated on both side of it. Moreover, this road is also used during the religious procession, twice a year. There is no apparent advantage to follow this bypass alignment along this road, but is the most suitable option available, as other options are eliminated/more problematic.

**A.10 POTENTIAL IMPACT**

Table 2 below presents the general environmental impacts expected due to the proposed upgradation of the project road. Impacts have been assessed based on the first hand information collected from the screening & scoping of environmental attributes. The quanta of all the impacts on Natural Environment are analyzed in detail.

**Table 2: General Impacts on Natural Environment**

Project Activity	Planning and Design Phase	Pre-construction Phase		Construction Phase					Road Operation	Indirect effects of operation or Induced development
		Removal of	Removal of trees and	Earth works including quarry-	Laying of	Vehicle & Machine op-	Asphalt & crusher	Sanitation & Waste		
Env. component Af-	Land ac-									

ected	quisition	Structures	vegetation	ing	pavement	eration & maintenance	plants	(labour campus)	operation	
<b>Air</b>		Dust generation during dismantling	Reduced buffering of air and noise pollution, Hotter, drier microclimate	Dust generation	Asphalt odour	Noise, dust, pollution	Noise, soot, odour, dust, pollution	Odour / smoke	Noise, dust, pollution	other pollution
<b>Land</b>	Loss of productive Land	Generation of debris	Erosion and loss of top soil	Erosion and loss of top soil		Contamination by fuel and lubricants Compaction	Contamination Compaction of soil	Contamination from wastes	Spill from accidents Deposition of lead	Change in cropping pattern
<b>Water</b>	Loss of water sources	Siltation due to loose earth	Siltation due to loose earth	Alteration of drainage Break in continuity of ditches Siltation, Stagnant water pools in quarries.	Reduction of ground water recharge area	Contamination by fuel and lubricants	Contamination by asphalt leakage or fuel	Contamination from wastes Overuse	Spill Contamination by fuel, lubricants and washing of vehicles	Increased contamination of ground water
<b>Noise</b>		Noise Pollution	Noise Pollution due to machinery	Noise Pollution		Noise pollution	Noise Pollution		Noise Pollution	Noise pollution
<b>Flora</b>		Loss of Biomass		Lowered productivity Loss of ground for vegetation		Removal of vegetation	Lower productivity Use as fuel wood	Felling trees for fuel	Impact of pollution on vegetation Lowered productivity Toxicity of vegetation.	
<b>Fauna</b>			Disturbance Habitat loss	Disturbance		Disturbance	Disturbance	Poaching	Collision with traffic	Distorted habitat

### A.11 AVOIDANCE, MITIGATION & ENHANCEMENT

Prevention or avoidance of impact is better than mitigation of impact. Hence avoidance and reduction of adverse impacts approaches were adopted during the design stage through continued interaction between the design and environmental teams. This is reflected in the designs of the horizontal & vertical alignment, cross sections adopted, construction methods and construction materials. In-depth site investigations have been carried out so that sensitive environmental resources are effectively avoided, leading to the environmentally best-fit alignment option. As a result many of the trees, cultural properties, water bodies etc. have been avoided at the design stage itself, as presented in Table 3 below.

**Table 3: Environmental features saved through Avoidance measure at design stage**

Environmental Features	Potential Impact	Under Direct Impact	Saved through alignment design
Surface Water source	6	3	3
Ground Water source	39	7	32

Schools and Hospitals	12	2	<b>10</b>
Sensitive Community Properties	24	4	<b>20</b>
Trees (nos.)	5310	1906	<b>3404</b>
Bus Shelters	27	7	<b>20</b>
Other Community Properties	8	0	<b>8</b>

**A.12 ENVIRONMENTAL MANAGEMENT PLAN**

Environmental Management Plan (EMP) deals with the implementation procedure of the guidelines and measures recommended to avoid, minimize and mitigate environmental impacts of the project. It also includes management of measures suggested for enhancement of the environmental quality along the highways.

The institutional arrangement made under project will look into the implementation of project as well as EMP and the various legal settings applicable to the project are briefly stated in chapter 3.

The avoidance, mitigation & enhancement measures for protection of the environment along highways have been discussed in detail in previous chapter. Although the social environmental impacts, its mitigation and management is an essential component of the EMP, this chapter excludes it for the purpose of clarity and procedural requirements. Social environmental elements have been separately dealt in separate volume namely, Resettlement and Rehabilitation Action Plan (RAP).

**A.13 OBJECTIVE OF EMP**

The EMP is a plan of action for mitigation / management / avoidance of the negative impacts of the project and enhancement of the project corridor. For each measure to be taken, its location, timeframe, implementation and overseeing / supervision responsibilities are listed. These components of the EMP have been given in Chapter 9 which explains the environmental issues and the avoidance/ mitigation/ minimization or enhancement measures adopted and/or to be adopted during different phases of the project. It also provide the references for the suggested measures, responsible agency for its implementation/ management as well as its timeframe.

**A.14 COST ESTIMATES FOR ENVIRONMENTAL MANAGEMENT**

Mitigation measures proposed in the EMP will be implemented by the Contractor. The works to be undertaken by the Contractor have been quantified and the quantities included in the respective BOQ items such as earth works, slope protection, noise barriers, road safety features, and shrub plantation.

Provisional quantities have also been included for additional measures that may be identified during construction and for silt fencing which will depend on the Contractors work methods and site locations. Items and quantities have also been included for enhancement measures.

More general environmental management measures to be followed by the contractor have been included in the specifications and this EMP. These cannot be quantified and are to be included in the contract rates. A total of Rs. 24.615 million has been allocated for the environmental management for the Project road.