 A Maharatna Company	<b>Executive Summary of Draft  Environmental Impact Assessment Report for  Telangana Super Thermal Power Project  Stage-I (2 X 800 MW)</b>	<b>Doc No.9591/999/GEG/S/001</b>
		<b>Rev No. 0</b>
		<b>Issue Date: 27.03.2015</b>
		<b>Page 1 of 16</b>

## 1.0 INTRODUCTION

M/s NTPC Limited, the largest power generating company in the country, intends to set up Telangana Super Thermal Power Project, Stage-I (2X800) MW capacity near Ramagundam, Karimnagar district of Telangana State.

It is noted that as per Andhra Pradesh Re-organization Act 2014, NTPC has been mandated to set up 4000 MW coal fired thermal power plant for Telangana State. The proposed Telangana STPP Stage-I (2x800 MW) is a base load project in Karimnagar district of Telangana state. The project is being implemented for meeting the power demand of Telangana State and is expected to start yielding benefits during early 13<sup>th</sup> Plan Period.

The capital cost provision for the total project is about Rs. 9,954.20 Crores, which includes Rs. 834.81 Crores for environmental protection measures.

### 1.1 Purpose of the Report

As per the Environmental Impact Assessment (EIA) notification dated 14.09.2006, the proposed project falls under category 'A' of schedule 1(d). Hence, construction and operation of Telangana STPP, Stage-I (2x800 MW) requires environmental clearance from Ministry of Environment, Forests and Climate Change (MOEF & CC).

The Terms of Reference (TOR) for Environmental Impact Assessment (EIA) study for Telangana STPP, Stage-I (2x800) MW was accorded by MOEF&CC vide Letter No. J-13012/112/2010-IA.II (T) dated 16.09.2014 and its amendment dated 12.12.2014. In accordance with the TOR conditions, the draft EIA report is prepared by M/s Vimta Labs Limited, Hyderabad based on one season (three months) site specific baseline data monitored during December'2014 to February'2015.

## 2.0 BRIEF DESCRIPTION OF PROJECT

### 2.1 Environmental Setting of the Site

The proposed site is located at a Latitude of 18<sup>o</sup> 44' 50" North to 18<sup>o</sup> 45' 29" North and Longitude of 79<sup>o</sup> 28' 5.35" East to 79<sup>o</sup> 28' 37" East near Ramagundam village, Karimnagar district of Telangana State. The site is approximately 51 km from district headquarter Karimnagar and about 1 km from Ramagundam. The nearest railway station, Ramagundam is about 5 km from the plant which lies on the main Kazipet - Balharshah broad gauge railway line of South Central Railway. The area is accessible by SH-1 Hyderabad-Mancherial Road popularly known as Rajiv Rahadari. The nearest commercial airport is at Hyderabad approximately at an aerial distance of 210 km. Environmental setting of the site is given in **Table-1**. The study area map of 10 km radius is shown in **Figure-1**.

**TABLE-1**  
**ENVIRONMENTAL SETTING OF THE PROJECT SITE**

Sr. No.	Particulars	Details																								
1	Plant location	Ramagundam, Karimnagar district, Telangana State																								
2	Topo sheet No.	56 N/5, 56 N/6, 56 N/9 and 56 N/10																								
3	Site Coordinates	<table border="1"> <thead> <tr> <th colspan="3">Proposed Plant Site Coordinates</th> </tr> <tr> <th>Corner</th> <th>Latitude</th> <th>Longitude</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>18° 45' 17.4" N</td> <td>79° 28' 37" E</td> </tr> <tr> <td>B</td> <td>18° 45' 29" N</td> <td>79° 28' 30" E</td> </tr> <tr> <td>C</td> <td>18° 45' 27" N</td> <td>79° 28' 12" E</td> </tr> <tr> <td>D</td> <td>18° 45' 05" N</td> <td>79° 28' 5.35" E</td> </tr> <tr> <td>E</td> <td>18° 44' 50" N</td> <td>79° 28' 18" E</td> </tr> <tr> <td>F</td> <td>18° 44' 57.2" N</td> <td>79° 28' 31" E</td> </tr> </tbody> </table>	Proposed Plant Site Coordinates			Corner	Latitude	Longitude	A	18° 45' 17.4" N	79° 28' 37" E	B	18° 45' 29" N	79° 28' 30" E	C	18° 45' 27" N	79° 28' 12" E	D	18° 45' 05" N	79° 28' 5.35" E	E	18° 44' 50" N	79° 28' 18" E	F	18° 44' 57.2" N	79° 28' 31" E
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4	A	Climatic conditions (IMD, Ramagundam)																								
	a)	Maximum temperature 41.7 °C																								
		Minimum temperature 14.0 °C																								
	b)	Annual rainfall (total) 1147.7 mm																								
	c)	Relative humidity Maximum- 83 % (August) Minimum- 35 % (March)																								
	d)	Predominant wind directions Annual:- NW, NE, SE, S and SW Pre-Monsoon:- SE, S, SW and SSE Monsoon:- NW, W and SW Post Monsoon:- NW, NE, E and SE Winter:- NE, SE and S																								
	B	Climatic conditions at site [December, 2014 to February, 2015]																								
	a)	Maximum temperature 36.4 °C																								
	b)	Minimum temperature 9.1 °C																								
	c)	Maximum relative humidity 93.8 %																								
	d)	Rainfall 21.8 mm																								
	e)	Predominant wind directions NE, S, SE, SSW, SSE																								
5		Plant site elevation above MSL RL 152.50 m																								
6		Plant site topography Plain																								
7		Present land use at the site Land use pattern is notified for industrial use																								
8		Nearest highway Rajiv Rahadari SH-1 (Hyderabad-Mancherla road)- 0.4 km, N																								
9		Nearest railway station Ramagundam RS- 5.0 km, WNW																								
10		Nearest Airport Hyderabad, 210 km, SSW																								
11		Nearest major water bodies • Godavari River- 4.0 km, NE • Jyothi Sagar (NTPC Balance Reservoir) - 0.9 km, S																								
12		Water source for the project Yellampally Barrage, 14.0 km, NW																								
13		Nearest town/City Godavarikhani, 3.0 km, E																								
14		Nearest village Malyalapalli, 2.5 km, W																								
15		Archaeologically important places None in 15 km radius																								
16		Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves) Nil																								
17		Reserved / Protected Forests As per toposheet no. 56 N/5, 56 N/6, 56 N/9 and 56 N/10 • Ramagundam RF- 0.6 km, NNW • Putnur RF- 3.0 km, W • Raidandi RF- 4.0 km, WNW • Indaram RF- 9.3 km, NE																								
18		Defence Installations Nil																								

Sr. No.	Particulars	Details
19	List of Industries in 10 km radius	<ul style="list-style-type: none"> <li>• NTPC Ramagundam STPP, 2600 MW (Adjacent)</li> <li>• Fertilizer Corporation of India, (not in Operation)- 1.7 km, SE</li> <li>• TSGENCO, 62.5 MW- 2.1 km, NW</li> <li>• SCCL OCP-IV - 2.9 km, N</li> <li>• RG Coal Washery- 3.5 km, SE</li> <li>• 18 MW Singareni Power House at Godavarikhani- 3.7 km, ENE</li> <li>• SCCL OCP-III - 4.5 km, SE</li> <li>• Kesoram Cements Ltd, Basanth nagar- 7.3 km</li> </ul>
20	Seismicity	Seismic Zone-II as per IS 1893 (Part I): 2002

## 2.2 Project Features

### 2.2.1 Land Requirement

The proposed project will be set up in the available land of about 235 acres in MGR unloading bulb area within existing premises of RSTPP and no additional land will be required for main plant and township area. However, about 400 acres of land will be required for ash dyke area for the project.

### 2.2.2 Water Source and Requirement

The source of water for the project will be from Yellampally barrage on Godavari River, at a distance of about 14 km from the proposed plant. As per the letter of Irrigation & CAD Department, Govt. of Andhra Pradesh (GoAP) dated 18.06.2001, NTPC can draw 6.5 TMC of water from Yellampaly barrage. Moreover, Special Chief Secretary (Energy) have assured that water shall be made available for the proposed power plant.

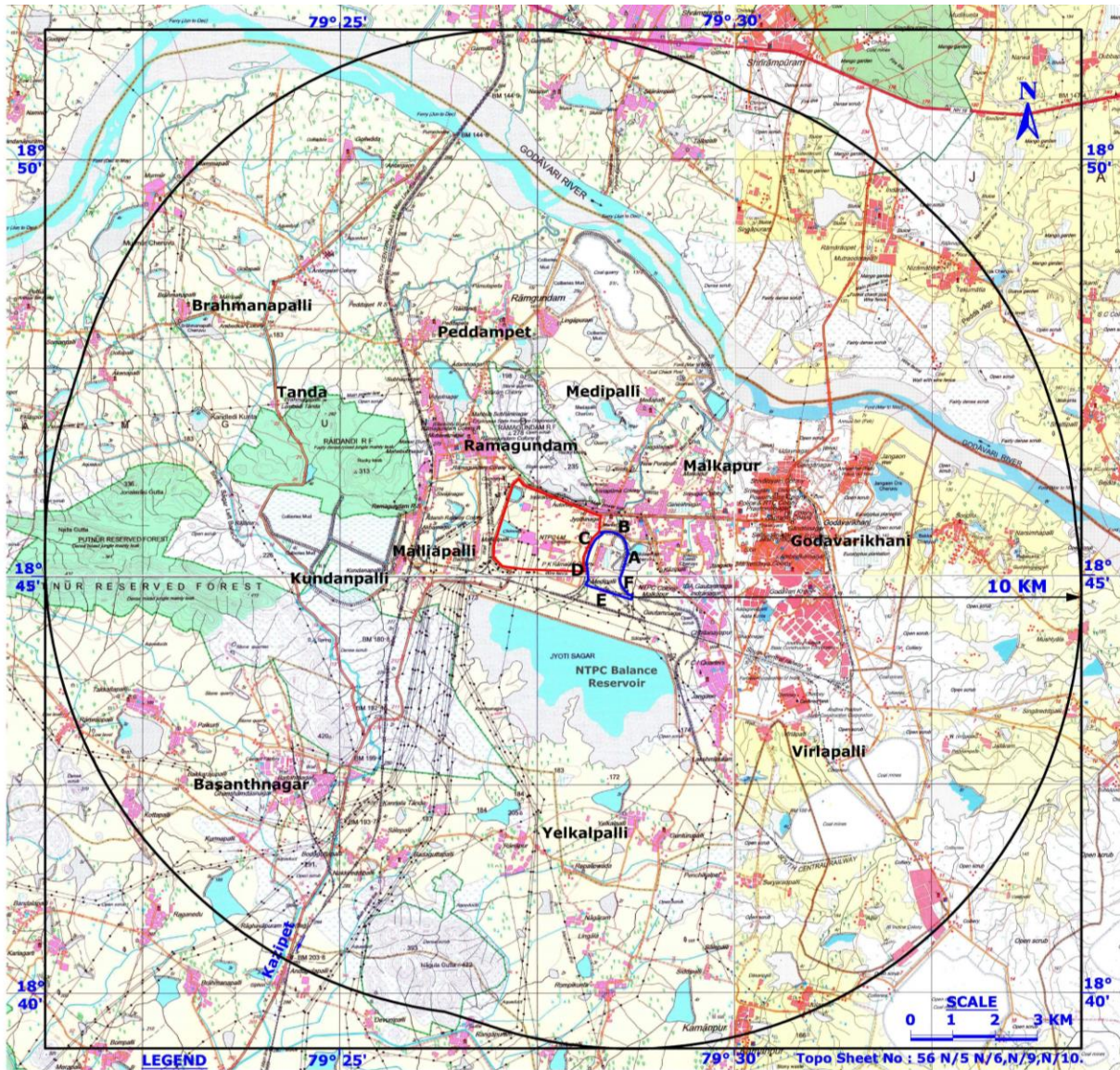
Make up water requirement for this project would be about 4525 m<sup>3</sup>/hr (about 45 cusec) with ash water recirculation system and about 5825 m<sup>3</sup>/hr (about 58 cusec) with once through ash water system.

### 2.2.3 Coal Requirement, Availability and Linkage

Coal requirement for the project is estimated as 8.0 MTPA. Govt. of Telangana has requested Ministry of Coal (MoC), Govt. of India vide letter dated 04.10.2014 to allot 8 MTPA coal for Telangana STPP Stage-I (2x800 MW) starting from 01.04.2018.

The salient features of proposed power plant are presented in **Table-2**.





**FIGURE-1  
STUDY AREA MAP OF TSTPP, STAGE-I (2X800 MW) IN 10 KM RADIUS**

**TABLE-2  
DETAILS OF PROPOSED POWER PLANT**

Sr. No.	Features	Description
1	Capacity	1600 MW
2	Configuration	Stage-I (2 X 800) MW
3	Technology	Super Critical Technology
4	Start-up Power	From 400 kV existing Ramagundam switchyard
5	Source of coal	Coal fields of SCCL
6	Coal requirement	8 MTPA
7	Sulphur content	0.5 %
8	Ash content in coal	37 - 43 %
	Total ash generation	3.20 MTPA
	Fly ash	2.56 MTPA
	Bottom ash	0.64 MTPA
9	Mode of Transportation	Rail and Underground Conveyor system
10	ESP efficiency	99.90%
11	Stack	One bi flue stack of 275 m height
12	Water requirement	5825 m <sup>3</sup> /hr (with once through ash water system)
13	Land requirement	Plant 235 acres and 400 acres for ash dyke
14	Source of water	Yellampally barrage on Godavari river, 14 km from the proposed plant
15	Project cost	Rs. 9954.20 Crores

Source: Project Report

### 3.0 **BASELINE ENVIRONMENTAL STATUS**

The baseline data was monitored from December'2014 to February'2015 representing winter season to reflect the background environmental conditions in the 10 km radius study area. The baseline environmental disciplines studied includes meteorology, air quality, water quality, noise, soil, ecology, demographic & socio-economic and land use.

#### 3.1 **Meteorology**

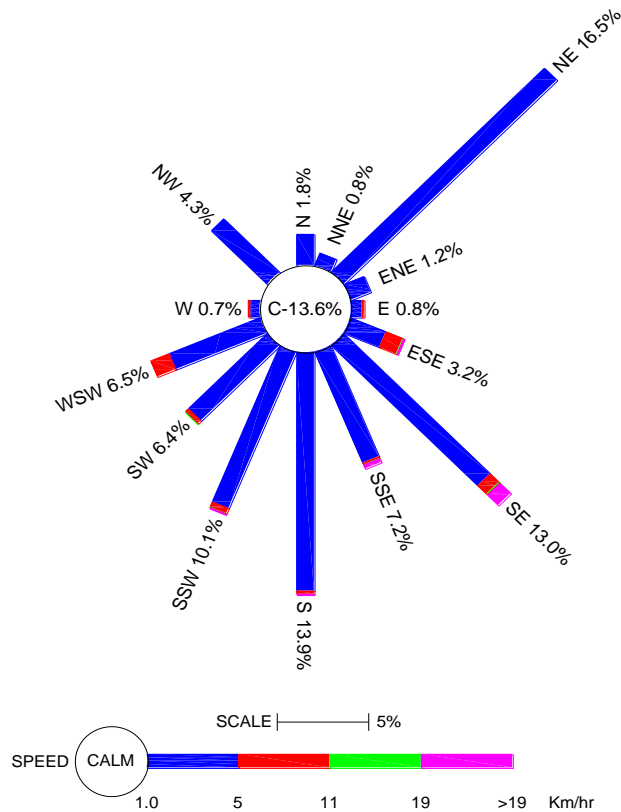
The meteorological parameters were recorded on hourly basis during the study period near proposed plant site and comprises of parameters like wind speed, wind direction (from 0 to 360 degrees), temperature, relative humidity, atmospheric pressure, rainfall and cloud cover in **Table-3**. Site specific wind rose is presented in **Figure-2**.

- Temperature - Min: 9.1°C and Max: 36.4°C
- Relative Humidity - Min: 20.6% and Max: 93.8%
- Wind speed - 0.2-19 kmph
- Predominant Wind Direction - NE, S and SE



**TABLE-3**  
**SITE SPECIFIC METEOROLOGICAL DATA**

Month	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Cloud Cover (Oktas)	Solar Radiation (W/m <sup>2</sup> )
	Max	Min	Max	Min			
December 2014	31.9	9.1	93.8	36.5	12.1	4/8	1.6-479.5
January 2015	30.3	14.9	86.4	28.1	6.5	4/8	1.2-237.4
February 2015	36.4	12.5	80.3	20.6	3.2	3/8	5.5-253.4
<b>Range</b>	<b>9.1-36.4</b>		<b>20.6-93.8</b>		<b>21.8</b>	--	--



**FIGURE-2**  
**SITE SPECIFIC WINDROSE**

### 3.2 Air Quality

Ambient air quality was monitored at four locations during the period of December 2014 to February 2015 in the study area. The monitoring locations are selected in consideration of the prevailing wind pattern, type of location, accessibility and availability of continuous power. The summarized results of ambient air quality monitoring are given in **Table-4**. The results indicate that the background levels of all the parameters in the study area are within the permissible limit of National Ambient Air Quality Standards 2009 for industrial, rural, residential and other areas.

**TABLE-4**  
**SUMMARY OF BASELINE AIR QUALITY IN THE STUDY AREA**

Discipline	Main Parameter	Range Measured During the Study Period ( $\mu\text{g}/\text{m}^3$ )	NAAQ Standards (2009)* ( $\mu\text{g}/\text{m}^3$ )
Ambient Air Quality	PM (PM <sub>10</sub> )	41.1- 68.5	100
	PM <sub>2.5</sub>	20.2 – 40.2	60
	SO <sub>2</sub>	12.1 – 23.5	80
	NO <sub>x</sub>	14.6 – 32.8	80
	Ozone	5.4-15.1	100 (8 hrly)
	CO	261-605	2000 (8 hrly)
	Hg	<0.001	-

\* 24 hourly average for Industrial, Rural, Residential and Other areas

### 3.3 Water Quality

To assess the background water quality, three (3) surface water locations and three (3) ground water locations were selected and samples were drawn and analysed on monthly basis during the study period. Analysis of all ground water samples reveal that the water quality conforms to the drinking water standards prescribed in IS: 10500. Water quality of some of the important parameters are shown in **Table-5**.

**TABLE-5**  
**WATER QUALITY**

Sr. No	Main Parameters	Units	Range
<b>Surface Water Quality</b>			
1	pH		7.07-8.46
2	Total Dissolved Solids	mg/l	278 – 790
3	Total Hardness	mg/l	153 – 357
4	B.O.D	mg/l	<3 – 10.6
<b>Ground Water Quality</b>			
1	pH		6.92 – 7.69
2	Total Dissolved solids	mg/l	737 – 883
3	Total Hardness	mg/l	359 – 456

### 3.4 Noise

Noise levels were measured in and around the proposed site at ten (10) locations. The noise level in the residential area during daytime were in the range of 41.3 to 48.0 dB (A). While during night time it was 38.1 to 44.8 dB (A). The noise levels at all the monitoring locations in the study area during the day time and night time were found to be within the permissible limits as per ambient air quality standards with respect to noise.

### 3.5 Soil

To assess the soil quality, soil samples from ten (10) different locations were collected and analysed in the laboratory. The soil in the study area is grey and

brown in colour with pH varying from 7.60 to 8.27. The electrical conductivity was observed in the range of 95.6  $\mu\text{mhos/cm}$  to 353.1  $\mu\text{mhos/cm}$ . Nitrogen content and phosphorous content in the soil is found to be in the range of 13.8 to 218.60 kg/ha and 734.8 to 1501.3 kg/ha respectively. The potassium concentrations range between 138.56 to 641 kg/ha.

### 3.6 Ecology

The study area has sparse vegetation mainly open scrub type. The land proposed for the project does not have any dense vegetation cover. The study area is under different land uses such as agriculture land, plantation, forest, open scrubland, fallow land and grasslands. The reserve forest of the study area have vegetation cover that shows mixed deciduous forest with severe anthropogenic pressure.

There are four reserve forests i.e Raidandi R.F, Puntur R.F, Ramagundam R.F and Indaram R.F in the study area. From the primary survey and as per forest department records and review of literature, there are no ecologically sensitive areas such as wildlife sanctuaries, national park, biosphere reserves in the study area.

The baseline monitoring of study area has not recorded the presence of any critically threatened species. The records of Botanical Survey of India and forest department also did not indicate presence of any endangered or rare and vulnerable plant species in this area.

### 3.7 Land Use

The study area has varied land use pattern ranging from human settlements, agricultural fields to forest areas. As per census 2001, majority of the land is urban area (42.10 %), unirrigated land (25.44%) followed by area not available for cultivation (13.15 %), cultivable waste land (9.36 %), irrigated land (7.34 %) and forest land (2.62 %).

Remote sensing satellite imageries were also collected (2<sup>nd</sup> February' 2014) and interpreted for the 10 km radius study area for analyzing the land use pattern of the study area. Based on the satellite land use imagery/land use classification map it is understood that the majority of land is agricultural land is about 40.2 %, waste land is about 25.42 %, built-up land area is about 12.99 %, forest land is about 10.48 % & water body is about 10.81 % of total study area.


### 3.8 Demography and Socio-Economic Status

The demography and socio-economic profile of population in the study area has been studied based on census data, 2011.

The salient features of the demography and socio-economic profile are as follows:

- Total population is 3,66,601;
- The sex ratio (Female per 1000 Male) is 962;
- The scheduled castes (SC) is 22.23 % and scheduled tribes (ST) is 2.16 %;



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		<b>Rev No. 0</b>
		<b>Issue Date: 27.03.2015</b>
		<b>Page 9 of 16</b>

- Overall literacy rate in the study area according to 2011 census is 72.40 %, out of which male literacy is 56.06 % while female literacy is 43.94 %; and
- The percentage of main workers and marginal workers are 81.76 % and 18.24 % respectively.

#### **4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

The impact of the project during construction and operation phase is described below:

##### **4.1 Land Use**

No additional land is proposed to be acquired for main plant and township for Telangana STPP, Stage-I. The main plant will be built in an area of 235 acres, which is already in possession. However, an additional area of about 400 acres is proposed to be acquired for ash disposal area.

The present land-use of the project site and proposed ash dyke area belongs to industrial land as the proposed power plant will be setup within the existing premises of Ramagundam STPP. Hence, the project site will not be having any significant adverse impact on the surrounding land use during the construction period.

The construction activity would bring immediate changes in the land use pattern of the proposed plant area as well as in the vicinity. The land required for the project will undergo a change only due to stripping, excavation, levelling and erection of structures of the proposed project.

##### **4.2 Soil**

Construction activities involving site levelling and excavation would invariably disturb the soil of the area. The impacts on soil during construction phase shall be mainly due to loss of top soil in the construction areas and contamination of the soils of surrounding area due to construction materials such as cement, sand etc. The disturbances would be more pronounced during the summer and monsoon seasons with strong rains. However, it shall be temporary and shall be confined to the areas of construction only. Generally, such disturbances are confined to the area of activity i.e. the main plant and ash disposal area.

Appropriate soil conservation measures associated with improved construction techniques would minimize such impacts. Apart from localized construction impacts at the plant site, no adverse impacts on soil in the surrounding area are anticipated.

The impact on soil during operation phase of the project could result due to deposition of residual particulate matter and gaseous emissions on the soil. The soils within the deposition zone of pollutants may undergo physico-chemical changes due to deposition of particulate matter and washout of gases (SO<sub>2</sub> and NO<sub>x</sub>) during the rains. The impacts on soil due to operation of the power plant and gaseous emission are likely to be negligible as the incremental concentration of particulate matter (PM), SO<sub>2</sub> & NO<sub>x</sub> levels are observed within limit.

### 4.3 Hydrology and Water Use

The water for the project will be drawn from Yellampally barrage on River Godavari which is located at a distance of about 14 km. The entire water requirement for the project would be about 5,825 m<sup>3</sup>/hr. The Godavari River is the largest River in south India and hence drawl of water for the project may not have significant adverse impact on water potential of the barrage.

### 4.4 Air Quality

- **Impact during Construction Phase**

The main sources of emission during the construction period are the movement of equipment at site and dust emitted during the levelling, grading, earthworks, foundation works and other construction related activities. The impact of construction activities would be temporary and restricted to the construction site. The impact will be confined within the project boundary and is expected to be negligible outside the plant boundaries. Proper maintenance of vehicles and construction equipment will help in controlling gaseous emissions. Water sprinkling on roads and construction site will prevent fugitive dust.


- **Impact during Operation Phase**

Prediction of impacts on air environment has been carried out employing mathematical model based on a steady state Gaussian Plume Dispersion model designed for multiple point sources for short term. In the present case, AERMOD has been used.

The maximum GLCs for PM, SO<sub>2</sub> and NO<sub>x</sub> after implementation of the proposed project are likely to be within the prescribed standards for industrial areas. The maximum incremental GLCs due to the proposed project are superimposed on the maximum baseline PM, SO<sub>2</sub> and NO<sub>x</sub> concentrations recorded at the monitoring locations during the study period. The resultant concentrations after implementation of the project are given in **Table-6**.

**TABLE-6**  
**RESULTANT CONCENTRATIONS FOR**  
**TELANGANA STPP, STAGE-I (2X800) MW**

Pollutant	Concentrations (µg/m <sup>3</sup> )			
	Baseline Max. AAQ Conc.	Incremental Conc.	Resultant Value	NAAQS Limits
PM	68.5	0.52	69.02	100
SO <sub>2</sub>	23.5	34.22	57.72	80
NO <sub>x</sub>	32.8	13.04	45.84	80

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		<b>Rev No. 0</b>
		<b>Issue Date: 27.03.2015</b>
		<b>Page 11 of 16</b>

#### 4.5 Water Quality

The impact on water quality during construction phase will be mainly due to runoff from the construction area. Flow of loose material into the drain especially during monsoon will result in higher turbidity & higher TSS content. Adequate arrangements for proper drainage and disposal of wastewater and routing of the effluents from construction area through sedimentation basins and provision of proper sanitary facilities i.e. septic tanks and soak pits with treatment will eliminate problems of water pollution during construction phase.

The impacts of the project during operation phase could result from discharge of hot cooling water, discharge of main plant effluents and sanitary effluents and discharge of ash pond overflow. Also the high concentration slurry disposal system (HCSD) for fly ash and ash water recirculation system (AWRS) for the bottom ash shall reduce the quantity of effluent generation. These effluents will be treated adequately to conform to the regulatory standards to minimize the impacts and regular quality check will be carried out.

Further, no ground water will be used during operation phase. Only during construction period of the project, it will be tapped for short duration. Hence, impact on ground water availability will be negligible.

#### 4.6 Noise

The predicted noise levels at the boundary due to various plant activities will be ranging in between 38 dB(A) to 48 dB(A). The incremental noise levels will be less than 40 dB (A) at all the surrounding habitations. It is seen from the simulation results that the incremental noise levels are well within the National Ambient Air Quality in respect noise standards 2000. As the ambient noise levels are higher than the predicted noise levels, due to masking effect, no increase in ambient noise levels during construction and operation phase is envisaged.

#### 4.7 Ecology

- **Terrestrial Ecology**

The initial construction works at the project site involves land clearance. During construction activities, vegetation may be disturbed which can be considered insignificant. Deposition of fugitive dust on pubescent leaves of nearby vegetation may lead to temporary reduction of photosynthesis. Such impacts would, however, be confined mostly to the initial periods of the construction phase and would be minimized through water sprinkling.

Impact due to fugitive dust generated during construction will be confined to the project site and will be minimized through paving and water sprinkling. The option of transplantation of trees will also be studied to save the existing matured trees and replant them in the area earmarked for greenbelt development.

During operation phase, since the predicted ground level concentration of pollutant in ambient air is well within the National Standards for Ambient Air

Quality, the impact on the surrounding agricultural field and trees will be insignificant.

- **Aquatic Ecology**

The runoff from construction area may lead to a short-term increase in suspended solids and decrease in dissolved oxygen near the discharge point in receiving water body. This may lead to a temporary decrease in the photosynthetic activity of phytoplanktons, rise in anaerobic conditions, habitat destruction and food chain modification. However, for major part of the year during construction phase, no detectable impact is expected because water quality will not change significantly.

The project will draw water from Yellampally barrage on Godavari River. Therefore, there is a likelihood of entrapment or impingement of phytoplankton/zooplankton in the water intake system. However, as the water system of the project has been designed with maximum recycle/ reuse of water, and a small quantity shall be drawn as a make-up to the system, this impact shall be negligible.

Further, as the project will have a close cycle cooling system with cooling towers and clarified water as make-up to the cooling system, there will be no thermal impact on aquatic ecosystem due to operation of the project.

It may therefore, be concluded that there would be no significant impact on aquatic life of the river.

#### **4.8 Socio-Economic**

Services of skilled and unskilled workers of different trades are required in large numbers. The project will provide either direct or indirect job opportunities to the local population as far as possible. These earnings are likely to change the economic status of local people.

#### **5.0 ENVIRONMENT MANAGEMENT & MONITORING PLAN**

NTPC is already operating various coal based thermal power projects of various capacities all over India. Based on its vast experience, NTPC has envisaged various pollution control / environmental mitigative measures for the project. Following measures are recommended for implementation during construction and operation phases of the project.

##### **5.1 Construction Phase**

During construction phase, water will be sprinkled in the vulnerable areas to suppress the dust generated during excavation, levelling and other operations. The effluents from construction area will be channelled through sedimentation tanks to remove suspended solids.

Suitable water supply and sanitation facilities will be provided to the labour colonies housing the construction work force. The sanitary waste from these areas will be accorded suitable treatment measures such as septic tanks.

Safety equipment such as earplugs and earmuffs, helmets, face shields, safety goggles etc. will be provided to workers engaged in high risk area. A first aid





center will be established to provide immediate medical aid to the workers and their family members. An ambulance will also be made available at site to transport injured workers to nearby hospitals.

## 5.2 Operation Phase

### 5.2.1 Air Pollution Control System

- High efficiency electrostatic precipitators (ESPs) will be installed to limit the particulate emission to 50 mg/Nm<sup>3</sup>;
- To facilitate wider dispersion of pollutants one stack with twin flue of height 275 m above plant grade level will be provided;
- Space provision will be kept in the layout for establishing Flue Gas Desulphurisation (FGD) system, if required in future; and
- For control of fugitive dust emissions within and around the coal handling plant and coal / stockyard dust extraction / suppression systems will be provided.

### 5.2.2 Water Pollution Control System

An effluent management scheme, consisting of collection, treatment, recirculation and disposal of effluents will be implemented in order to optimize the makeup water requirement as well as liquid effluent generation. The liquid effluents will be collected and treated/ recycled as per the following design philosophy:

- The filter backwash water of PT plant will be collected and recycled back to the DM system clarifier;
- The sludge from clarifiers of water PT plant will be collected in a sump/ pit and will be pumped to bottom ash slurry sump for disposal to bottom ash dyke;
- The waste effluents from neutralization pits of DM plant and condensate polishing plant will be collected in the respective neutralization pits and neutralized before pumping to the central monitoring basin / ash slurry sump before final disposal;
- Re-circulating type cooling water (CW) system with cooling towers, with CW blow down from cold water side to ensure no thermal pollution;
- Part of CW system blow down would be used for service water system, fly ash handling, bottom ash handling and coal dust suppression. The unused blow down will be led to central monitoring basin after treating through clarifiers/ tube settlers. The sludge from clarifier/ tube settler will be disposed off in bottom ash dyke along with bottom ash slurry;
- A coal settling pond will be provided to remove coal particles from coal handling plant waste. Decanted water will be pumped back to the coal dust suppression system;



- Service water effluent collected from plant drains will be led to a sump. From the sump the service water will be pumped up to tube settler/ clarifier for treatment of suspended solids. Treated service water will be sent back to service water tank to the extent possible for re-use;
- Ash water re-circulation system will be provided for utilization of decanted water from bottom ash pond for ash handling purpose;
- All the plant liquid effluents will be mixed in central monitoring basin (CMB) and treated conforming to the statutory standards;
- Efficient operation of various treatment schemes will be ensured so that the quality of treated effluent from CMB conforms to relevant standards, prescribed by regulatory agencies. The treated effluents will be released to the existing drainage system; and
- The sewage from plant and township will be treated in a sewage treatment plant. The treated effluent conforming to prescribed standards will be utilized for plantation to the extent possible. The balance effluent after treatment will be discharged.

### 5.2.3 Noise Pollution

The major noise generating sources are the turbines, turbo-generators, compressors, pumps, fans, coal handling plant etc. from where noise is continuously generated. Acoustic treatment will be provided to control the noise level below 90 dB (A). Wherever required, the workers will be provided with protective equipment such as ear plugs/ ear muffs.


## 6.0 ASH UTILIZATION

NTPC - a socially conscious utility considers utilization of ash produced at its coal based power station as a thrust area of its activities. Telangana STPP Stage-I (2x800 MW) will produce about 9000 tonne of ash per day i.e. about 3.2 million tonne ash per annum in the power generation process. In order to have maximum ash utilization in various areas and also to comply with the requirements of MoEF's Gazette Notification on fly ash dated 03-11-2009, following actions are proposed to be taken up by NTPC:

NTPC will provide a system for extraction of dry fly ash along with suitable storage facilities. Provision will also be kept for segregation of coarse and fine ash, loading this ash to closed/ open trucks and also for loading fly ash into rail wagons.

Fly ash will be utilized in fly ash based portland pozzolana cement (FAPPC) for cement plants and ready mix concrete plants located in the vicinity of proposed project. Ash based building products such as fly ash bricks, blocks tiles and other fly ash based products from proposed power plant.

Fly ash generated at proposed project will be utilized in the areas of cement, concrete & building products manufacturing, road embankment construction and land development.

 A Maharatna Company	<b>Executive Summary of Draft  Environmental Impact Assessment Report for  Telangana Super Thermal Power Project  Stage-I (2 X 800 MW)</b>	<b>Doc No.9591/999/GEG/S/001</b>
		<b>Rev No. 0</b>
		<b>Issue Date: 27.03.2015</b>
		<b>Page 15 of 16</b>

## **7.0 AFFORESTATION AND GREENBELT DEVELOPMENT**

To keep up its promise and commitment to ecological balance and environment protection NTPC- Ramagundam has taken up afforestation programme in several areas, within NTPC as well as outside the plant. It has also successfully planted plants and grown trees in large numbers in the abandoned old temporary ash pond as well as some areas around permanent ash pond. Altogether more than 13,00,000 lakh trees were planted covering within the existing premises of RSTPP. The efforts of the station towards tree plantation have brought out a big change in the greenery and Ramagundam once known as AGNIGUNDAM for its high ambient temperatures has become an island of greenery.

## **8.0 REHABILITATION & RESETTLEMENT**

The proposed units will be set up within the existing land of Ramagundam STPP, hence it is envisaged that there is no R&R obligations. However, as per current extant policies & procedures for granting clearances for new project a comprehensive Community Development (CD) plan will be formulated as per need & requirement in consultation with stakeholders & district administration for taking up community development activities, mainly in the area of education, health, drinking water, sanitation, infrastructure, women empowerment, welfare etc. in the periphery of the project site in a defined geographic area.

## **9.0 POST OPERATIONAL MONITORING PROGRAMME**

Post project environmental monitoring is important in terms of evaluating the performance of pollution control equipment installed in the project. The sampling and analysis of the environmental attributes will be as per the guidelines of CPCB/ State Pollution Control Board. Following attributes will be covered in the post project environmental monitoring in and around the project site:

- Both ambient air quality and stack emissions will be monitored. The ambient air will be monitored twice in a week [In line with the guidelines of CPCB] at three locations. An auto meteorological station was already installed at the plant site to monitor met data continuously;
- All the effluents emanating from the plant will be monitored monthly for physico-chemical characteristics. Heavy metals will be monitored on a quarterly basis. Similarly, the temperature at the discharge point in the drain will be monitored on fortnightly basis;
- Noise levels in the work zone environment such as generator and compressor I.D fan, F.D. Fan, P.A. Fan Cooling Towers etc. will be monitored. The frequency will be once in three months in the work zone. Similarly, ambient noise levels at three locations will be monitored on a seasonal basis;
- The results will be reported on regular basis to the Telangana State Pollution Control Board (TSPCB) and regional office of MoEF&CC.



## **10.0 INSTITUTIONAL SET-UP**

The post operational monitoring programme will be under the supervision of the Environmental Management Group (EMG) at the project site. The project will be equipped with all necessary instruments/ equipment and man power required for ensuring effective monitoring. The EMG at site will interact with State Pollution Control Board on all environmental issues during operation phase of the Project.

## **11.0 COST PROVISION FOR ENVIRONMENTAL MEASURES**

Environmental protection will be monitored and executed by a centralized environmental management cell. A cost provision of Rs 834.81 Crores has been kept towards providing environmental measures.

## **12.0 RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN**

Hazard analysis involves the identification and quantification of the various hazards (unsafe conditions) that exist in the proposed power plant. On the other hand, risk analysis deals with the recognition and computation of risks, the equipment in the plant and personnel are prone to, due to accidents resulting from the hazards present in the plant.

Risk analysis follows an extensive hazard analysis. It involves the identification and assessment of risks the neighboring populations are exposed to as a result of hazards present. This requires a thorough knowledge of failure probability, credible accident scenario, vulnerability of population etc. Much of this information is difficult to get or generate. Consequently, the risk analysis is often confined to maximum credible accident studies and are discussed in detail in the EIA report.

## **13.0 PROJECT BENEFITS**

Telangana STPP stage-I (2x800 MW) is being implemented for meeting the power demand of Telangana state and is expected to start yielding benefits during early 13<sup>th</sup> Plan Period. The proposed project will provide either direct or indirect job opportunities to the local population as far as possible. These earnings are likely to change the socio-economic status of local people.

## **14.0 CONCLUSION**

The proposed power plant has certain level of marginal impacts on the local environment. However, with the implementation of the proposed pollution control and environment management measures, even the minor impacts anticipated due to construction and operation of the proposed power plant will be mitigated. Further, development of this project has certain major beneficial impact/ effects in terms of bridging the electrical power demand and supply gap and providing employment opportunities that will be created during the course of its setting up and as well as during the operational phase of the project.

Thus, in view of considerable benefits from the project without any major adverse environmental impact, the proposed project is most advantageous to the power deficit region as well as to the nation.