ENVIRONMENTAL STATEMENT FOR THE YEAR 2014 – 2015

KSK
Power from knowledge

SITAPURAM POWER LIMITED

Dondapadu (V), Mellacheruvu (M) NALGONDA DISTRICT, TELANGANA STATE

Index of the Audit Report:

The environmental statement report is based on data generated for twelve months during the period from April 2014 to March 2015. The report consists of the following chapters:

- ✓ **Chapter 1.0 – Introduction**

This chapter provides background information, location of the plant, process being adopted and scope of the study.

- ✓ **Chapter 2.0 – Form – V**

The Ministry of Environment and Forests made it mandatory for all industries which require authorization under Environmental (Protection) Act, 1986 to submit an Environment Statement for each financial year to the concerned State Pollution Control Board. This chapter presents filled in Form-V along with the supporting documents.

- ✓ **Chapter 3.0 – Pollution Audit**

This chapter presents detailed studies on Air Quality, Noise Quality in the 10 km radius taking the plant as a center. 2 sampling locations have been identified in 10 km radius in different directions and ambient air quality has been studied for twelve months during the period April 2014 to March 2015. The noise levels have been measured both in the plant for various equipments and at various human settlements within 10 km radius.

This chapter provides an insight of the existing pollution levels and provides overall description of the existing environmental status during the operation of the plant.

- ✓ **Chapter 4.0 - Safety and Energy Aspects**

This chapter provides information about various safety measures taken by the company to safe guard the manpower from occupational health problems.

- ✓ **Chapter 5.0 – Comments**

This chapter presents the exclusive comments on the existing pollution levels, measures taken for abatement of pollution and recurring investment on operational maintenance of pollution control equipment.

Chapter 1.0 – Introduction

1.0 INTRODUCTION:

Industrial pollution in our country is on increase and is creating a high-risk environment. Legislations pertaining to environment viz., Water (Prevention & Control of Pollution) Act, 1974 and Environment (Protection) Act, 1986 have come into force. Gone are the days when industrialization meant profit making and environment was grossly neglected. It is being realized that industry and environment should go hand–in–hand so as to achieve sustainable development. Also over the years, awareness has brought in realization to consider environmental protection a bare necessity. Yet, the investments for such a protection are still considered a liability by many industrialists mainly due to lack of up-to-date scientific practices of environmental management. Consideration of environmental factors at par with production helps in minimizing material loses and also in reduction of liabilities in the long run.

Environmental Audit is a technique being introduced for integrating the interest of the industry and the environment so that these could be mutually supportive. This technique is basically a part of industry's internal procedures in meeting their responsibilities towards better environment. Also, the policy statement for abatement of pollution by the Govt. of India provides for submission of Environmental Statement by all concerned industries, which would subsequently evolve into an environmental audit. A notification under the Environment (Protection) Rules, 1986 has been issued on 1991, requiring industries to submit an Environmental Statement for the Financial Year ending on March 31 in Form V to the concerned State Pollution Control Boards on or before September 30 every Year beginning 1993. The Department of Company Affairs also agreed to include this requirement as a part of the Director's Annual Report. The submission of an environmental statement is applicable to the following.

i) Who require consent under the Water (Prevention & Control of Pollution) Act, 1974;
ii) Who require consent under the Air (Prevention & Control of Pollution) Act, 1986 and
iii) Who require authorization under Hazardous wastes (Management & Handling) Rules, 1989.

1.1 PHILOSOPHY OF ENVIRONMENTAL AUDIT:

Definition: Environmental Auditing is a management tool comprising a systematic, documented, periodic and objective evaluation of how well the management systems are performing with the aim of:

i) Waste prevention and reduction;
ii) Assessing compliance with regulatory requirements;
iii) Facilitating control of environmental practices by a company's management; and
iv) Placing environmental information in the public domain.

In the industries, especially the chemical industries, raw materials are used in excess of the stoichiometric requirements because of the limitations on practically achievable operational efficiencies and the raw materials purity. These excess usages of raw materials, unless recovered, find their way include non-product discharges in gaseous, liquid and solid phases. End-of–the-pipe waste treatment techniques, wherein all the wastes are carried to a common facility for treatment, is proving to be ineffective and uneconomical due to the complexity of problems associated with waste generation, their quantity and characteristics.

The waste generation may vary hourly, daily and seasonally, especially in case of the multiplicity of manufacturing product in the same premises. The wastewater characteristics also widely vary from stream to stream discharged from various unit operations of a particular product. In this growing complexity of problems, the concept of waste prevention and reduction can workout to be more effective.

It is important to find out whether the industry is complying with environmental standards and other regulatory requirements. It is also very essential to periodically monitor this aspect, determine the gaps and workout action plans for implementation within a reasonable time frame keeping in view the financial and other considerations of a company. In cases of gaps for compliance with the regulatory requirements, the regulatory bodies could be apprised of these action plans and time obtained for implementation. Thus the regulatory risk can overcome and effective steps taken for pollution control.

Many times, the top management of a company or an industry may not be aware of the factual situation of their industry from environmental angle. Such unknown facts form hidden liabilities more often than not expose an industry to regulatory risks. The management should be able to periodically review those environmental practices of the company to formulate / modify the company's environmental policy accordingly.

It is also imperative that the management of a company should have a clear picture of attitudes and technical capabilities of their organizational set-up for protecting environment, pollution control status, and their bounden social obligation related to environment so as to decide on the future mode of actions. Public are to be made aware of the environmental information of the company, especially to those who are shareholders so as to build in among them confidence.

Environmental auditing can be viewed as a management tool internally, and liaison externally with the public and regulatory bodies.

1.2 BENEFITS OF ENVIRONMENTAL AUDIT

Environmental auditing has far reaching benefits to the industry, to the society and the nation at large. The benefits of environmental audit are:

i) Determines how well the process systems and pollution control systems are performing and identifies the operations of poor performance;
ii) Identifies potential cost savings which can be accrued through reduction in raw material consumption by way of waste minimization, and adoption of recycle / recovery/ reduction in pollution load;
iii) Increases awareness of environmental requirements, policies and responsibilities;
iv) Helps in understanding the technical capabilities and attitude of the environmental organization in a company;
v) Provides up-to-date environmental data base for use in plant modification, emergencies etc;
vi) Unravels surprises and hidden liabilities due to which regulatory risk and exposure to litigation can be reduced;
vii) Ensures independent verification identifies matters needing attention, and provides timely warning to management on potential future problems and
viii) Helps to safeguard environment, and assists in complying with local, regional and national laws and regulations, with the company's policy and with the environmental standards.

1.3 OBJECTIVES:

The environmental audit helps in pollution control, improving production, safety and health and conservation of natural resources. Hence overall objective can be stated as achieving of sustainable development. However for conducting environmental audit, objectives are to be defined clearly or else the audit procedure will be subject to varying interpretations, which may yield and contribute to differences in approach thereby influencing the end results. The objectives of environmental audit in an industry are:

i) To determine the mass balance of various materials used and the performance of various process equipment so as to identify usage of materials in excess than required, to review to conversion efficiencies of process equipment and accordingly fix up norms for equipment / operations performance and minimization of the wastes.

ii) (a) To identify the areas of water usage and wastewater generation and determine the characteristics of wastewater;

(b) To determine the emissions, their sources, quantities and characteristics and

(c) Determine the solid wastes and hazardous wastes generated, their sources, quantities and characteristics

iii) To identify the possibilities of waste minimization, and recovery and recycling of wastes;

iv) To determine the performance of the existing waste treatment/control systems so as to modify or install additional or alternative control equipment accordingly; to determine the impact on the surrounding environment (groundwater, stream, residential area, agricultural area, sensitive zone, etc.)

v) Due to the disposal of wastewater, emissions and solid wastes from the industry and accordingly identify suitable preventive measures, if necessary;

vi) To verify compliance with the standards and conditions prescribed by the regulatory bodies under the Water Act, the Air Act and the Environmental (Protection) Act; and

vii) To check the effectiveness of :-

(a) Organizational set-up of the industry for decision making and environmental management with special reference to their 'technical' view point, 'attitudinal' view point and training, and

(b) Environmental Policy of the company recognizing the importance of the structured and comprehensive mechanism for ensuring that the activities and products do not have any adverse affects on environment.

1.4 PROJECT SETTING:

Sitapuram Power Limited (SPL) is promoted by the KSK Energy Ventures Limited (KSKEVL), a company engaged in power generation projects. The SPL is a coal based thermal power plant of 43 MW located opposite to Zuari Cement Limited, near Dondapadu Village, Mellacheruvu Mandal, Nalgonda District, Telangana State commissioned in March 2008.

KSKEVL is successful in operating power plants with an installed capacity of 2062 MW in states of Telangana, Chhattisgarh, Maharashtra, Rajasthan and Tamilnadu which are listed below:

- Sitapuram Power Limited – (1×43 MW) captive thermal power plant for M/s. Zuari Cement Limited, Dondapadu (V), Mellacheruvu (M), Nalgonda District, Telangana;
- KSK Mahanadi Power Company Limited – (6×600 MW) Nariyara village, Akaltara Tehsil, Janjgir-Champa District, Chhattisgarh; (as on day 2×600 MW in operation)
- Sai Lilagar Power Limited (Formerly known as Arasmeta Captive Power Company Limited- (2×43 MW) Gopal Nagar, Janjgir - Champa District, Chhattisgarh;
- Sai Wardha Power Limited – (4×135 MW) Warora Growth Center, Chandrapur district, Maharashtra;
- VS Lignite Power Private Limited – (1×135 MW) Gurha village, Bikaner District , Rajasthan;
- Sai Regency Power Corporation Private Limited – (1×58 MW) natural gas based combined cycle power plant at Ramanathapuram, Tamilnadu.

SPL entered into a long term Power Purchase Agreement (PPA) with Zuari Cements Limited (ZCL) to supply to its cement manufacturing facilities at Dondapadu and Yerraguntla, Kadapa district, Andhra Pradesh. SPL also acts as a load manager for ZCL and arranges alternate supplies of power. The SPL is also entitled to sell unconsumed power to third parties in the event of non-consumption by ZCL.

The index map of the Power plant 10 km radius study area map shown in **figure-1** and **figure-2** respectively.

A 96 m stack is the main source of air pollution from the power plant. Fugitive emissions are expected from coal handling area, coal storage area and ash handling area.

1.5 Process Description :

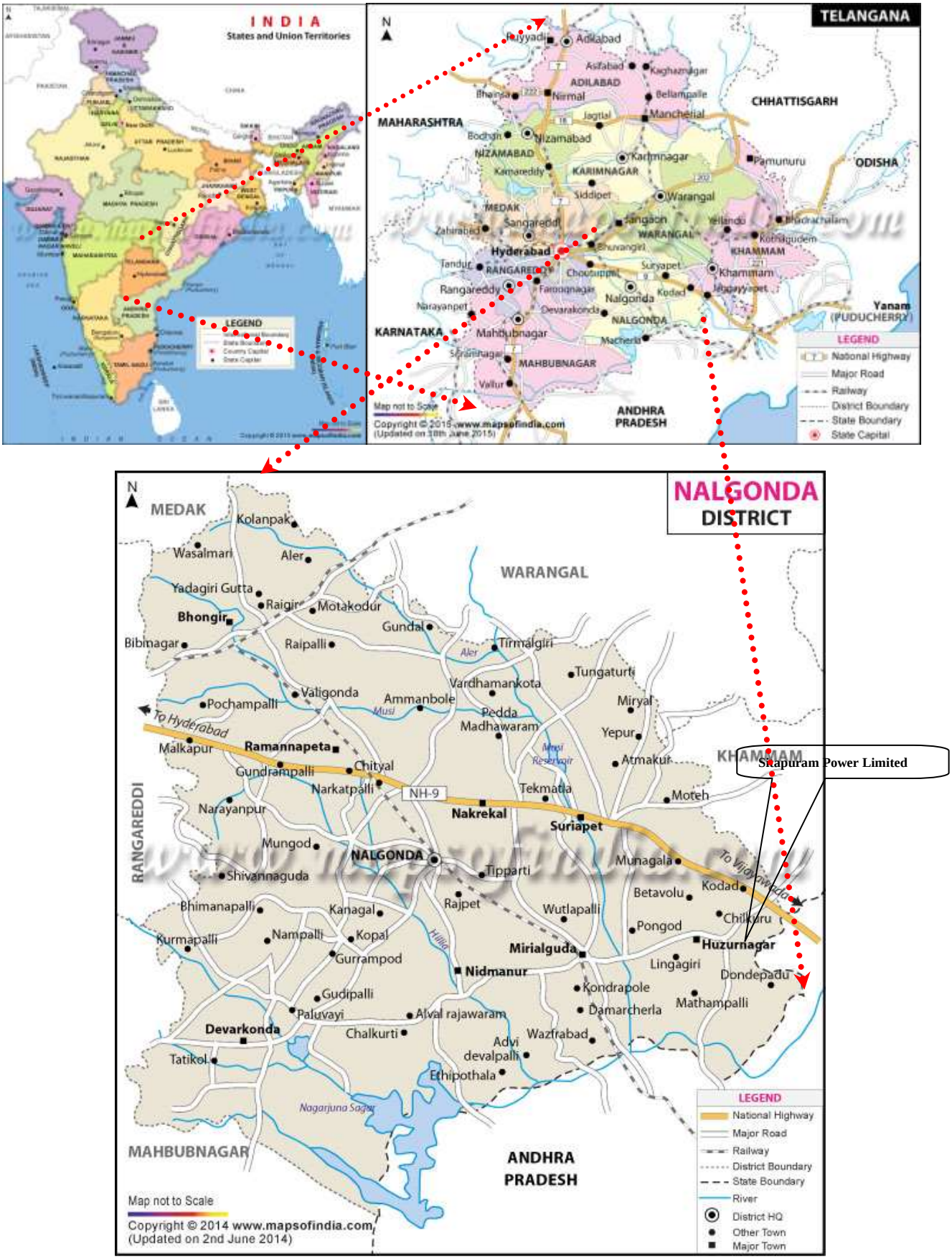
The Sitapuram Power Limited is a unit with configuration of with one steam turbine of 43 MW and two boilers, generating steam at 89 bars at 515˚C.

The salient features of the power plant are given in **Table-1.**

TABLE - 1

SALIENT FEATURES OF SITAPURAM POWER LTD

S.No.	Description	
1.	Plant capacity	43 MW
2.	Capacity of steam generator	180 (2×90 TPH)
3.	Generator	43 MW, 11 KV
4.	Type of Boiler	Atmospheric Fluidizing Bed Combustion
5.	Fuel	Indian Coal 30 MT/hr.
6.	Water requirement and source	6000 KLD from river Krishna
7.	Total waste water generation	1569 KLD with total recycle and reuse (as per CFO)
8.	Waste water treatment	• Neutralization pit • Guard pond
9.	Firefighting System	Fire fighting system as per Tariff Advisory Committee (TAC)
10.	Stack height and diameter (at top)	96 m and 4.0 m
11.	Air pollution control equipment	ESP's with four fields for each boiler outlet (With 3 field in operation & 1 redundant)



SOURCE: MAPS OF INDIA

FIGURE -1

INDEX MAP

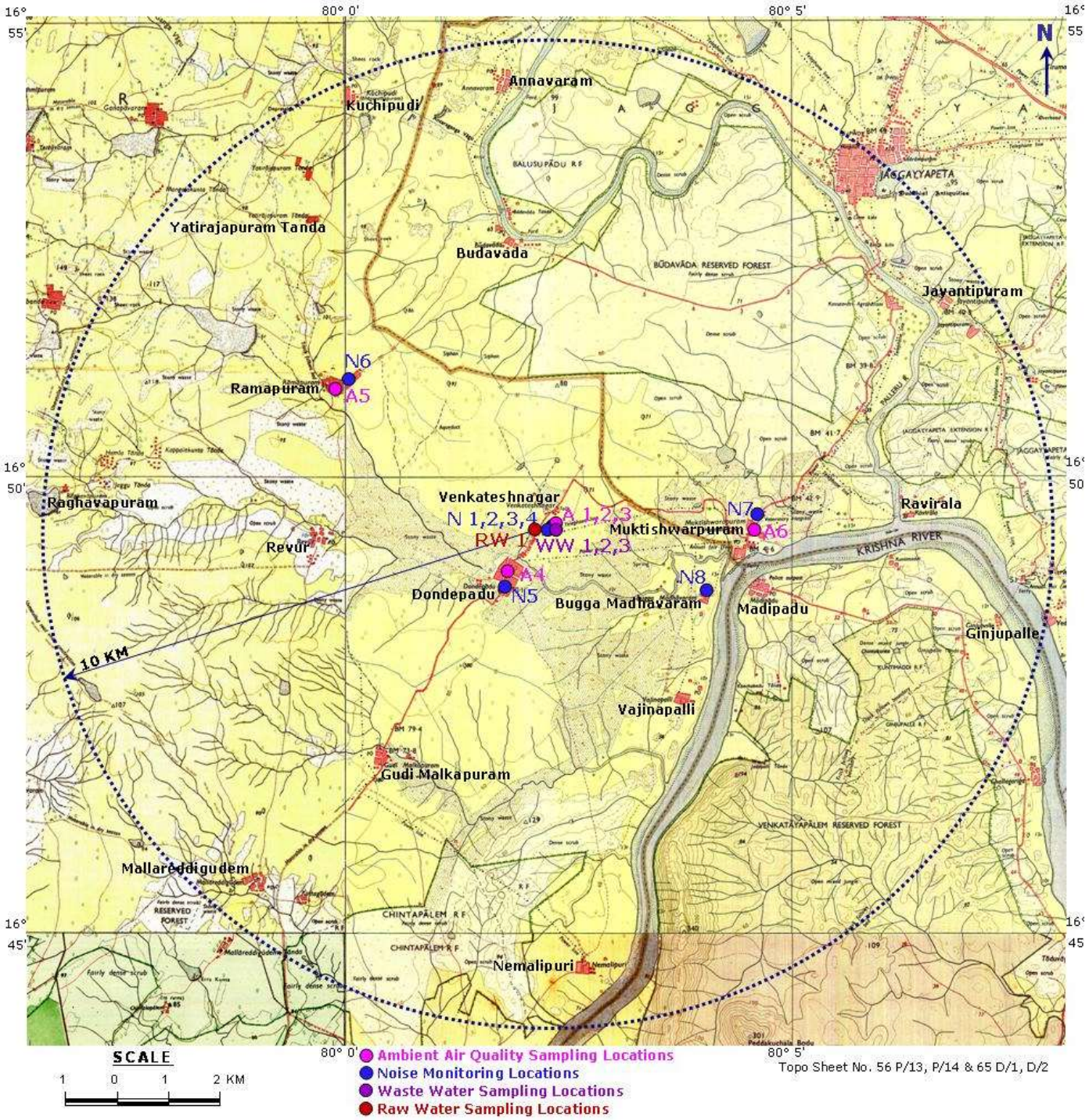


FIGURE-2

STUDY AREA MAP OF 10 KM RADIUS SHOWING SAMPLING LOCATIONS

CHAPTER 2.0 – **Form – V**

(See Rule 14)

Environmental Statement for the Financial Year ending 31st March 2015

PART-A

(i)	Name and address of the Owner/Occupier of the Industry, Operation or process	Mr. M. Venu Kumar, Plant Head M/s. Sitapuram Power Limited Dondapadu (V), Mellacheruvu Nalgonda District 508246 Telangana State Tel. & Fax No.: 08683- 235248.
(ii)	Industry Category	Red Category - Coal based power plant
(iii)	Production capacity	43 MW
(iv)	Year of Establishment	2008
(v)	Date of the last Environmental Statement submitted	September 2014
(vi)	Total Gross Generation	**342578 MWH (as on 31.03.2015)**

PART – B

Water Consumption

Water Consumption, m^3/day	Please refer **Annexure 1A**	
	During the previous FY 2013-2014	***During the current FY 2014-2015***
Cooling Tower makeup	*2969.397*	*3034.685*
DM Plant	*91.89*	*130.553*
Boiler makeup	32.90	39.39
P&V makeup	16.00	12.49
Gardening	37.29	78.74

Name of the Product, L/KWH	Water consumption per unit of power generation	
	During the previous FY 2013-2014	***During the current FY 2014-2015***
Power generated	3.3154 L/KWH	3.483 L/KWH

Raw Material Consumption

Name of raw material	Name of Product	Consumption of raw material per unit of power generated	
		Financial Year 2013-2014	***Financial Year 2014-2015***
Coal, MT/KWH	Electricity	8.8987×10^{-4}	8.7438×10^{-4}
Light Diesel Oil, L/KWH		7.29×10^{-6}	7.59×10^{-6}

PART – C

POLLUTION GENERATED

(Parameters as specified in the consent issued)

Pollution discharged to Environment / Unit of output

Pollutant	Quantity of Pollution generated	Percentage of variation from prescribed standards
a) Water	Refer Annexure 1B & IC	
b) Air	Refer Annexure 1D	

PART – D

HAZARDOUS WASTES

(As specified under Hazardous Wastes Management and Handling Rules, 1989)

Hazardous Wastes	Total Quantity	
	During the previous FY 2013-2014	During the current FY 2014-2015
(a) From Process Waste oil,	525 Lit	Nil
(b) From Pollution Control Facility	Nil	Nil
(c) Quantity recycled or re-utilized	Nil	Nil

Any waste/spent oil generated in the process is disposed to APPCB authorized waste recycler.

PART-E

SOLID WASTES

	Total Quantity	
	During the previous FY 2013-2014	During the current FY 2014-2015
(a) From Process		
(1) Fly ash	1,34,565.344 MT	1,25,214.201MT
(2) Bottom Ash	19,842.339 MT	19,681.6705MT
(b) From Pollution Control Facility	Nil	Nil
(c) Quantity recycled or re-utilised i) Bottom ash and fly ash	The total generated (i.e., 100%) fly ash was sent to M/s. Italcementi Group (Zuari Cement Limited) for use in manufacture of Portland Pozzolona Cement (PPC).	

PART – F

Please specify the characteristics in terms of composition and quantum of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes.

1. No waste oil/used oil is disposed in in the FY 2014-2015.

PART – G

Impact of the pollution control measures on conservation of natural resources and on the cost of production.

Monthly monitoring of ambient air quality, stack emissions and effluent quality is done through recognized laboratory to evaluate the efficiency of the pollution control systems and control measures on the overall emissions from stack and ambient air.

The expenditure incurred towards air pollution control measure & monitoring, green belt maintenance and statutory payment details for the FY 2014 - 2015 are as follows:

I. Total Expenditure in FY 2014-15

S. No.	Description	Amount incurred
1.	Air Pollution Control (including stores & spares)	₹.6,41,256
2.	Environmental Monitoring (by recognized laboratory M/s. Vison Labs, Hyderabad)	₹.6,42,200
3.	Greenbelt Development / Maintenance	₹.2,39,431
4.	Water Cess payment	₹.1,27,302
5.	Power consumption for pollution control equipments	₹.14,73,617
6.	Environment Management Department	₹.6,40,000
Total		**₹.37,63,806**

PART – H

Additional measures investment proposal for environmental protection including abatement of pollution, prevention of pollution.

1. Housekeeping is taken up on top priority and engaged sufficient manpower for maintenance of the plant premises.
2. A water sprinkling arrangement is made to suppress the fly ash and coal dust to avoid emission.
3. All internal roads are of BT and RCC at lorry bay to reduce the dust emission.
4. 4 nos. of road sweeping machine are used on the roads vehicle movement is there.
5. Tree plantation was done inside as well as outside of the plant. Also small patches of gardens are developed inside of the plant premises wherever the open space is available to improve the plant beautification.
6. A guard pond exists for storage of blow down water from cooling tower and boiler which is reused for plantation and coal dust suppression and major part is pumped to M/s. Italcementi Group (Zuari Cement Limited) for recycle/ reuse.

Adequate measures are been taken for pollution control and as per the requirement additional measures will be taken.

PART – I

Any other particulars for improving the quality of the environment.

- Plantation on the World Environment day on 5th June 2015 celebrated and green belt area is further developing.

M. Venu Kumar
Plant Head

ANNEXURE – I A

WATER BALANCE STATEMENT

Total Raw Water Consumption : 1193237 cum. (Avg. 3269.142 m^3 per day)

Total Effluent Generated : 251627 cum.

Total Raw Water consumption, m^3/day	3269.142 m^3 per day		
	Utilization	**Losses**	**Effluent**
A. Industrial			
Cooling Tower	3034.685	2472.017	562.668
DM Plant	130.553	-	91.23
Boiler	-	-	33.34
HRSCC Reject	-	-	2.137
B. Domestic			
Gardening	48.901	-	-
P&V makeup	15.44	-	-
Total	3229.579	2472.017	689.389

Note: The generated effluent is stored in a guard pond from where it is pumped to M/s. Italcementi Group (Zuari Cement Limited) for use at their end and part of effluent is used by SPL for green belt development and coal dust suppression in the plant.

ANNEXURE- I B

DATA OF INDUSTRIAL EFFLUENT (Guard Pond)

Month	pH	Suspended Solids	Oil & Grease
April - 2014	8.24	<05	<1.0
May - 2014	7.86	<05	<1.0
June - 2014	7.52	<05	<1.0
July - 2014	8.10	<05	<1.0
August - 2014	7.92	<05	<1.0
September - 2014	7.50	<05	<1.0
October - 2014	8.02	<05	<1.0
November - 2014	8.42	<05	<1.0
December - 2014	9.02	<05	<1.0
January - 2015	8.24	<05	<1.0
February - 2015	8.38	<05	<1.0
March - 2015	8.00	34	<1.0

Units are reported in mg/L except pH

ANNEXURE – I C

WASTE WATER GENERATION AND POLLUTANT DISCHARGE

Parameter	Quantity of Pollution Generated, TPA	Quantity of Pollution generated, Kg/unit of Electricity
Total Suspended Solids (TSS)	Nil	Nil
Oil & Grease (O&G)	Nil	Nil

- ***Average flow considered (Effluent) is 689.389 m^3/ Day***
- ***Total quantity of wastewater generated during April 2014 to March 2015 is 251627 m^3***

ANNEXURE – I D

STACK EMISSION

Month	Flue Gas Temperature (°C)	Velocity (m/s)	Volumetric Flow (m^3/s)	PM (mg/Nm^3)	SO_2 (mg/Nm^3)	NO_x (mg/Nm^3)	CO (PPM)
April-2014	140	13.25	326	71.60	298.2	186.4	48
May-2014	152	14.32	352	78.20	364.5	191.4	56
June-2014	146	13.73	338	81.60	396.2	204.8	64
July-2014	148	14.00	344	82.46	422.8	212.5	72
August-2014	148	15.00	369	84.20	395.3	246.2	86
September-2014	138	14.90	366	90.40	424.5	262.8	72
October - 2014	136	13.00	320	81.00	386.2	240.6	64
November - 2014	130	11.00	270	85.8	396.2	280.5	62
December - 2014	131	13.79	339	86.5	364.6	292.4	88
January - 2015	132	13.92	342	89.40	320.2	276.5	80
February – 2015	130	13.30	327	91.00	358.6	254.2	98
March - 2015	134	13.50	332	79.4	322.8	230.5	83
MAXIMUM	152	15	369	91	424.5	292.4	98
AVERAGE	138.75	13.64	335.42	83.46	370.84	239.90	72.75
MINIMUM	130	11	270	71.6	298.2	186.4	48

Stack Diameter: 5.6 m Cross Sectional Area: 24. 6 m^2

Chapter 3.0 – Pollution Audit

3.0 Pollution Audit

The basic objective of pollution audit is to investigative the status/ efficiency of environmental management system and equipment vis-à-vis the regulatory requirements. The environmental quality can be assessed by studying the following**:**

3.1 Ambient Air Quality

3.2 Noise Monitoring

3.3 Water and Waste Water Quality

3.1 Ambient Air Quality

The ambient air quality monitoring was carried out in there locations during April-2014 to March-2015 covering to the baseline details of ambient air quality monitoring locations are given in **Table 3.1**

TABLE-3.1

DETAILS OF AMBIENT AIR QUALITY MONITORING LOCATIONS

Location	Location Name	Direction	Distance (km)
Inside the Premises			
AAQ 1	Near Security office (Material gate)	Within the plant	
AAQ 2	Near ENMAS Building		
AAQ 3	Near SPL Admin Building		
Outside the Premises (In Villages)			
AAQ 4	Dondapadu	South West	1.5
AAQ 5	Ramapuram	North West	5.0

3.1.1 Sampling and Analytical Techniques:

Whatman GF/A filter paper was used in PM_{10} & $PM_{2.5}$ and computed as per standard methods.

Ambient Air samples were analyzed for:-

- SO_2 concentration levels using Improved West–Gaeke method using preprogrammed HACH spectrophotometer at a wavelength of 540nm.
- NOx concentration levels were estimated using Jacob and Hocheiser modified (Na-As) method using preprogrammed HACH spectrophotometer at a wavelength of 540 nm.
- Ozone (O_3) concentration levels, using Improved IS: 5182 (Part –9) 1974.
- Ammonia (NH_3) concentration levels using Improved APHA-401.
- Lead (Pb) , Arsenic (As), Nickel (Ni) concentration levels using improved ASTM D 4185-90.
- Benzene (C_6H_6) concentration levels using Improved APHA-401.
- Benzo (a)Pyrene (BaP) concentration levels using Improved APHA-401 and
- Carbon-monoxide concentration levels using indicator tube method. The details are given below in Table-3.1.1:

- **TABLE-3.1.1**

TECHNIQUES USED FOR AMBIENT AIR QUALITY MONITORING

S.No	Parameter	Testing Method to be Followed	MDL
1.	PM_{10}	IS 5182 (P-4): 1999; (Reaffirmed 2005)	4.0 µg/m³
2.	$PM_{2.5}$	RTI (Research Triangle Institute) (Gravimetric Ana Revision-07 Aug14-2003)	
3.	SO_2 (Sulfur Dioxide)	IS 5182 (P-2): 2001, Improved West & Gaeke Method	4.0 µg/m³
4.	NO_x (Oxides of Nitrogen)	IS 5182 (P-6): 2006, Modified Jacobs – Hochheiser Method/Sodium Arsenite Method	5.0 µg/m³
5.	Ozone (O_3)	IS 5182 (P-9): 1974	1.0 µg/m³
6.	Ammonia (NH_3)	APHA 401	10.0 µg/m³
7.	Lead (Pb)	ASTMD 4185	0.1 µg/m³
8.	Arsenic(As)	ASTMD 4185	0.06 ng/m³
9.	Nickel (Ni)	ASTMD 4185-90	1.0 ng/m³
10.	Benzene (C_6H_6)	1005 OSHA	0.01µg/m³
11.	Benzo(α)Pyrene (BαP)	58 OSHA	0.01 ng/m³
12.	Carbon Monoxide	IS 5182 (P-10): 1999 - Indicator Tube Method	1.0 mg/m³

MDL: Minimum Detectable Limit

3.1.2 Presentation of Primary Data

The various statistical parameters viz., 98th percentile, Average, Maximum and Minimum concentrations for the study period have been computed from the observed raw data for all the AAQ monitoring stations. The summary of results is presented in Table - 3.1.3.

TABLE – 3.1.3 Ambient Air Quality (Onsite)

Location	PM_{10}				$PM_{2.5}$				SO_2			
	Min.	Max.	Avg.	98th %tile	Min.	Max.	Avg.	98th %tile	Min.	Max.	Avg.	98th %tile
At Material Gate Security Office	63.5	**89.6**	77.49	88.43	32.4	**46.3**	39.98	45.84	8.4	**11.6**	9.48	11.31
Backside of ENMAS Admin	68.3	88.0	76.38	86.99	35.6	45.0	39.19	44.52	8.1	11.9	9.57	11.75
At SPL Admin Building	**54.6**	72.6	64.98	72.47	**30.1**	38.1	34.05	37.75	**7.2**	9.1	8.10	9.06

Location	NO_x				O_3				CO			
	Min.	Max.	Avg.	98th %tile	Min.	Max.	Avg.	98th %tile	Min.	Max.	Avg.	98th %tile
At Material Gate Security Office	22.1	**26.5**	23.81	26.26	4.8	**6.8**	5.36	6.65	520	**612**	563.58	611.56
Backside of ENMAS Admin	19.4	28.5	23.66	28.46	4.5	6.5	5.28	6.41	518	584	553.83	583.56
At SPL Admin Building	**16.9**	21.6	19.83	21.53	**4.3**	5.3	4.72	5.30	**492**	534	509.67	531.36

Note:

1. *The values of Pb, As, Ni, C_6H_6, BaP are Below Detectable Limit.*
2. *The concentrations of PM_{10}, $PM_{2.5}$, SO_2, NO_x, O_3 and CO are expressed in $\mu g/m^3$*

Observations on Primary Data (Onsite)

PM_{10} : The minimum and maximum concentrations observed to be *54.6 $\mu g/m^3$* and 89.6 *$\mu g/m^3$* respectively.

$PM_{2.5}$: The minimum and maximum concentrations observed to be *30.1 $\mu g/m^3$* and 46.3 *$\mu g/m^3$* respectively.

SO_2 : The minimum and maximum concentrations observed to be *7.2 $\mu g/m^3$* and *11.6 $\mu g/m^3$* respectively.

NO_x : The minimum and maximum concentrations observed to be *16.9 $\mu g/m^3$* and *26.5 $\mu g/m^3$* respectively.

O_3 : The minimum and maximum concentrations observed to be *4.3 $\mu g/m^3$* and *6.8 $\mu g/m^3$* respectively.

CO : The minimum and maximum concentrations observed to be *492 $\mu g/m^3$* and *612 $\mu g/m^3$* respectively.

The values of Lead (Pb), Arsenic (As), Nickel (Ni), Benzene (C_6H_6) and Benzo(a) pyrene observed in all locations were Below Detectable Limit.

3.1.4 Ambient Air Quality (Off site)

Village	PM_{10}				$PM_{2.5}$				SO_2			
	Min.	Max.	Avg.	98th %tile	Min.	Max.	Avg.	98th %tile	Min.	Max.	Avg.	98th %tile
Dondapadu	39.2	**64.50**	52.37	63.24	20.4	**33.10**	26.54	32.58	5.0	**8.4**	6.63	8.00
Ramapuram	**32.8**	59.5	45.38	56.88	**16.8**	40.1	23.32	29.19	**4.6**	6.7	5.77	6.50

Village	NO_x				O_3				CO			
	Min.	Max.	Avg.	98th %tile	Min.	Max.	Avg.	98th %tile	Min.	Max.	Avg.	98th %tile
Dondapadu	13.80	18.60	16.56	18.39	4.0	6.40	4.73	6.19	402	536	471.80	524.94
Ramapuram	13.0	17.4	15.34	17.09	3.6	5.8	4.50	5.60	382	494	441.68	485.64

Note:

1. *The values of Pb, As, Ni, C_6H_6, BaP are Below Detectable Limit.*
2. *The concentrations of PM_{10}, $PM_{2.5}$, SO_2, NO_x, O_3, Pb, NH_3 and CO are expressed in $\mu g/m^3$*

Observations on Primary Data (Off site)

PM_{10}: The Minimum and Maximum concentrations observed to be *32.8 $\mu g/m^3$* and *64.50 $\mu g/m^3$* respectively.

$PM_{2.5}$: The Minimum and Maximum concentrations observed to be *16.8 $\mu g/m^3$* and *33.10 $\mu g/m^3$* respectively.

SO_2: The Minimum and Maximum concentrations observed to be *4.6 $\mu g/m^3$* and *8.4 $\mu g/m^3$* respectively.

NO_x: The Minimum and Maximum concentrations observed to be *13.0 $\mu g/m^3$* and *18.60 $\mu g/m^3$* respectively.

O_3 : The minimum and maximum concentrations observed to be *3.6 $\mu g/m^3$* and *6.40 $\mu g/m^3$* respectively.

CO : The minimum and maximum concentrations observed to be *382 $\mu g/m^3$* and *536 $\mu g/m^3$* respectively.

The values of Lead (Pb), Arsenic (As), Nickel (Ni), Benzene (C_6H_6) and Benzo(a) pyrene observed in all locations were Below Detectable Limit.

Noise Level Monitoring

The ambient noise levels monitoring were carried out in 10 locations identified inside of the plant area and in villages, day time and night time only.

3.2.1 Method of Monitoring

Noise levels were measured at all locations; one reading for every hour was taken for 24 hours. The day noise levels have been monitored during 6 am to 10 pm and night levels during 10 pm to 6 am at all the locations in the plant area.

The details of sampling locations along with the monitoring results are presented in the **Table - 3.2.1**

TABLE - 3.2.1

S. No.	Locations	Leq, [db(A)]	
		Max.	Min.
1.	Primary Crusher	69.3	60.3
2.	Near FD Fan#2	86.3	82.6
3.	Turbine area (Ground Floor)	85.2	81.2
4.	Near Chlorine tonner	65.2	58.3
5.	between PCB & SCB	66.8	59.6
6.	Near Compressor Room	87.8	83.2
7.	Inside DCS	64.1	60.4
8.	Near SPL office	54.6	50.1

S. No.	Locations	L_{day}, [dB(A)]		L_{night}, [dB (A)]	
		Max	Min	Max	Min
9.	Dondapadu village	54.3	50.6	43.2	39.2
10.	Ramapuram village	52.5	49.2	42.6	38.6

The noise levels in the villages are within the prescribed standards.

3.2 Water Quality

One water sample in the plant area was collected and analyzed at a frequency of once in a month during the study period i.e. April-2014 to March-2015. The minimum and maximum of result of the water sample is given **Table 3.3.1**

TABLE - 3.3.1

S. No.	Parameter	Unit	RAW WATER	GUARD POND
			MIN - MAX	
1.	pH	-	7.95 – 8.5	7.5 – 9.02
2.	Turbidity (NTU)	mg/L	1.14 – 2.8	NA
3.	Total Dissolve solids	mg/L	242 - 425	820 - 1790
4.	Dissolved Oxygen	mg/L	4.6 – 5.2	4.2 – 5.2
5.	Total Suspended Solids	mg/L	18 - 40	<05
6.	Total Hardness as $CaCO_3$	mg/L	74 - 298	NA
7.	Residual Free Chlorine	mg/L	NA	<0.02
8.	Chloride as Cl	mg/L	31.3 - 76	68.3 - 520
9.	Sulfate as SO_4	mg/L	4.2 – 18.3	29.4 - 522
10.	Copper as Cu	mg/L	0.12 – 0.32	0.1 – 0.28
11.	Iron as Fe	mg/L	0.06 – 0.38	0.14 – 0.42
12.	Chromium as Cr^{6+}	mg/L	BDL	0.12 – 0.28
13.	Zinc as Zn	mg/L	BDL	0.08 – 0.22
14.	Phosphates as PO_4	mg/L	BDL	0.1 – 0.18
15.	Chemical Oxygen Demand	mg/L	12 - 28	20 - 80
16.	Biochemical Oxygen Demand*	mg/L	3 - 10	4 - 26
17.	Oil & Grease	mg/L	BDL	1.1 – 1.8

* (3-day @ 27°C)

Chapter 4.0 - Safety and Energy Aspects

4.0 Safety Aspects

The following are the identified fire/ accident-prone areas in captive power plant are coal yard, ESP and boiler area etc.

4.1 Fire Fighting System

Sitapuram power limited has taken up adequate measure to safeguard the worked and property with the following steps.

I. Availability of 48 nos. of portable fire extinguishers consisting of Carbon dioxide, Dry Chemical Powder and Mechanical Foam.
II. The belt conveyors are provided with heat sensing cable along the electrical lines and sprinkler nozzles system over the entire conveyor belt to meet fire emergency.
III. Fire hydrant system consisting of 21 nos. single hydrant, 12 nos. of wet riser and 6 nos. of water monitor.
IV. Fire detection & alarm system and manual call points are installed in the TG building and electrical control rooms.
V. CO_2 flooding system for the turbine generator.
VI. High Velocity Water Spray System (HVWSS) for the transformer yard.

4.2 Safety function

Some of the important safety related activities viz. plant safety audits, safety training, safety committee meetings, testing of lifting equipments/tackles, procurement & inventory control of various personal protective equipments & maintaining of safety statistics etc are looked by the Safety & Environment Department.

4.3 Specific Energy Consumption

Sitapuram Power Limited is commissioned in January 2008 and to set up an energy conservation cell to monitor and implement various conservation measures to reduce the specific energy consumption per unit of electricity generated.

Chapter 5.0 – Comments

This report presents the findings of study carried out to prepare the Environmental Statement for the year 2014-2015, for M/s. Sitapuram Power Limited, Nalgonda District, Telangana State.

1. The present air quality concentration in the plant and out side the plant area shows that the PM_{10}, $PM_{2.5}$, SO_2 and NO_x are well within the permissible limits prescribed by CPCB.
2. Good house keeping is in practice to reduce the emissions from the operations.
3. The total of the fly ash generated in the process is being sent to M/s. Italcementi Group (Zuari Cement Limited) for use in Portland Pozzolona Cement manufacturing.
4. The water quality is observed to be without any significant change that can cause damage to the existing biotic systems.
5. The spent oils/used oils generated from the plant machinery is disposed to sold to APPCB authorized agency with validity.
6. Nearly 10,000 plants are surviving in the plant and developed good grass lawn and avenue plantation and flowering plants.
7. A recharge trench cum well (Rain Water Harvesting pit) constructed by investing around ₹ 2, 00,000 for recharge of ground water.

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