EXECUTIVE SUMMARY OF ENVIRONMENTAL IMPACT ASSESSMENT REPORT

FOR

APOLLO TYRES LTD

"2 X 7.5 MW COAL BASED CAPTIVE THERMAL POWER PLANT"

AT

SIPCOT INDUSTRIAL GROWTH CENTER
VILLAGE: ORAGADAM
TEHSIL: SRIPERUMBUDUR,
DIST: KANCHEEPURAM
STATE: TAMIL NADU

[PROJECT TERMED UNDER SCHEDULE 1(d), CATEGORY B PROJECT, THERMAL POWER PLANTS (< 500 MW COAL BASED); LOCATED INSIDE NOTIFIED INDUSTRIAL AREA VIZ. ORAGADAM SIPCOT INDUSTRIAL GROWTH CENTER.]

REPORT PREPARED BY

HUBERT ENVIRO CARE SYSTEMS PVT LTD., CHENNAI

August, 2012

1. INTRODUCTION

1.1 PURPOSE OF THE REPORT AND ABOUT THE PROJECT

This is the Executive Summary for the Environmental Impact Assessment Report for Apollo Tyres Ltd proposed 2x7.5 MW captive Thermal Power Plant project at the existing tyre manufacturing unit in Oragadam SIPCOT (State Industries Promotion Corporation of Tamil Nadu), in Kancheepuram District of Tamil Nadu. The report is in accordance to the Terms of Reference (TORs) given for Environmental Clearance application by the Environmental Clearance Committee of the Ministry of Environment and Forestry, as vide their recommendation dated 25th January, and thus explores the scope of environmental impacts of the above plant. The proposed project involves the production of "7.5x2 MW of Coal based electricity" which falls under item no. 1(d) i.e. Thermal Power Plants, under the category "B**"** (ie less than 500 MW, coal based) as per the EIA notification 2006 and as amended in 2009. Oragadam-SIPCOT had allotted the plot number B25, measuring 128.56 acres to Apollo Tyres as per the order dated 16.11.2007. SIPCOT through the agreement on water supply as dated 22nd of April 2010 has agreed for the supply of the required water for Apollo Tyres. (Amounting to a maximum of 1500 KLD)

To be self sufficient in its power requirements and thus reduce the load on the external power sources, Apollo Tyres Ltd. is planning for the proposed thermal power plant. For establishing this proposed project, there is a need for environmental clearance. Due to the absence of a state committee during the application period, this clearance was sought from the Ministry of Environment and Forestry appointed committee, for which this given EIA report is being prepared as per the released TORs.

Table 1.1 Details of the Proposed Project

Name of the Project	2 x 7.5 MW Coal based Co-Gen Thermal Power plant
Location / site alternatives under consideration	Apollo Tyres, Oragadam,
Survey No	491
Village	Oragadam
Tehsil	Sriperumbudur
District	Kancheepuram
State	Tamil Nadu
Size of the Project	2 X 7.5 MW Co-Gen Thermal Generation
Land Area	100 x 100: 10000 Sq M. (2.471 acre)
Build up Area	7500 Sq m.
Expected cost of the project	80 Crore
Contact Information	Mr. C Krishna Kumar, Head Corporate Projects, Apollo Tyres Ltd, Sriperumbudur, Chennai
EIA Consultant	Hubert Enviro Care Systems Pvt. Ltd. (NABET : NABET/ EIA/ 1013/ 041)
Project termed under 1(d) i.e. Thermal Power Plants, under the category "B**"** (ie less than 500 MW, coal based) located inside notified industrial area, as per the EIA notification 2006 and as amended in 2009	

1.2 SCOPE AND METHODOLOGY OF THE STUDY

The study is limited to the project site, and a 10km radius around it, and is in accordance to the points as stated in the TOR. The current EIA study has been conducted to fulfill the requirement of the regulatory provisions as enacted in EPA, 1986 (as amended thereon). As per the EIA notification-2006 and its amendment, the company needs to get the *Environmental Clearance* prior to installation & commissioning of the above proposed project.

The EIA process followed for this EIA is composed of the following stages:

1) Study of project information
2) Screening & Scoping
3) Environmental Pre-feasibility study & Application for Approval of TOR
4) Collection of Detailed Project Management Plan/Report
5) Baseline Data Collection
6) Impact Identification, Prediction & Evaluation
7) Mitigation measures & Delineation of EMP
8) Risk assessment and Safety & Disaster Management Plan
9) Review & Finalization of EIA Report
10) Submission of report for Public hearing
11) Incorporation of issues raised in public hearing into the report, along with the response on the same from the proponent.
12) Submission of EIA Report for implementation of Mitigation Measures & EMP as well as necessary clearances from relevant Authority.

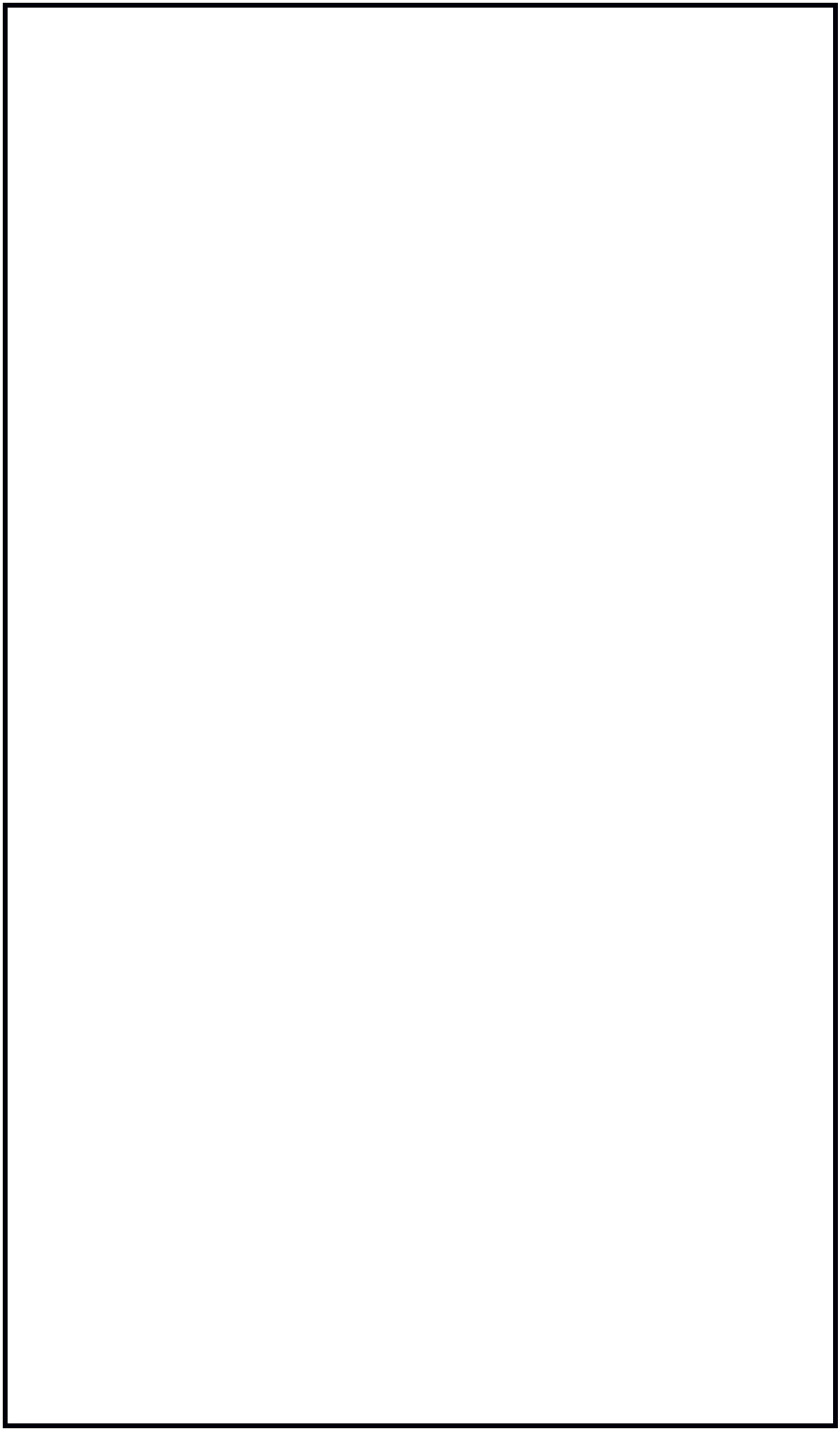
2. PROJECT DESCRIPTION

2.1. TYPE OF PROJECT

The proposed project involves the production of "7.5x2 MW of Coal based electricity" which falls under item no. 1(d) i.e. Thermal Power Plants, under the category "B**"** (ie less than 500 MW, coal based) as per the EIA notification 2006 and as amended in 2009.

2.2 PROJECT JUSTIFICATION

Apollo Tyres Ltd has an existing tyre manufacturing unit of at Oragadam SIPCOT, which has a tyre production capacity of 550 TPD. The proposed 7.5MW x 2 power generation project will be helpful in meeting with the power requirements for the above project, and not only be beneficial economically and reliability wise for Apollo Tyres Ltd, but also will reduce power requirement load on the Tamil Nadu state grid, thus making the same available for other activities. The proposed site being part of the tyre manufacturing unit, has all the required infrastructure like road connectivity, graded plots, water infrastructure, waste water collection system, and green belt development. The fuel, coal, is easily importable through the Chennai port, present about 52 kms from the site. Thus, the above points make it suitable for the proposed captive power plant to be set up here.



2.3 LOCATION

The proposed project, being a captive power plant, is been proposed inside the existing site of Apollo Tyre Ltd's tyre manufacturing unit. A 100.0 X 100.0 m square plot has been identified adjacent to the existing 24TPH FBC boiler. The existing covered coal shed has a capacity to store 7332 MT coal. The project is located at Oragadam-SIPCOT in Village: Oragadam, Tehsil: Sriperumbudur, District: Kancheepuram, State: Tamil Nadu.

Table 2.1 Salient Features of the Project Site

Features	Description
Name of the project	Apollo Tyres Limited 7.5*2MW Thermal power plant
Geographical Location	Between Latitude 12.859827-12.858174and Longitude 79.946559 -79.946221
Land Area	2.471 Acres
Nearest Village	Oragadam
Nearest Railway Station	Singaperumal Koil (14kms to the South East)
Highway	State highway 57 to the West and State Highway 48 to the South
Airport	Chennai Airport (40 kms to the North East)
Sea port	Chennai Port (50 kms to the North East)
Forest/Wildlife Sanctuary	Nil
Historical/ Archeological Place	Nil
Project site	Oragadam- SIPCOT

2.4 MAJOR COMPONENTS OF THE POWER PLANT

The major components of the power plant include:

A) BOILER: The boiler is of Atmospheric Fluidized Bed Combustor (AFBC) type, radiant furnace, single drum, natural circulation, semi outdoor type with two stage super heater. The steam generating unit is designed for 100% MCR flow of 60 TPH at 67 kg/cm^2(a) and 485+/- 5 deg.C while firing Imported Coal or Indian Coal or any combination of these two coals. The start up of the boiler will be with LDO assisted charcoal firing.

B) BOILER AUXILLIARIES

1) WATER TREATMENT PLANT: The water treatment plant consists of a Reverse Osmosis (RO) and Demineralization Plant (DM) plant.

2) ELECTRO STATIC PRECIPITATOR: The ESP for this AFBC Coal Fired boiler is designed for flue gas outlet dust concentration of 50mg/Nm^3 with all fields in service and while firing of the any of fuel /fuel combinations.

3) COAL HANDLING SYSTEM: The coal handling system is of completely enclosed gallery type designed for a fuel handling capacity of: 60TPH sufficient for both the boilers, the system consists of a grizzly hopper, from where the CB-

1A Conveyor, followed by main conveyor CB-1 transfers the coal to the crusher house. The coal bunker has a storage capacity of 350CuM.

4) ASH HANDLING SYSTEM: The ash handling system is dense phase pneumatic type. The ash from the Economizer zone, Air preheater and from the four (4) nos ESP fields will be collected in hoppers below each zone. Bed ash will be collected from the bottom of furnace separately.

5) CO-GENRATION PLANT: The co-gen plant has 2 nos 7.5 MW, 11KV, 3 PHASE 50HZ steam turbine generators. The system includes Two (2) numbers Steam Turbine Generator units with gear box and all other auxiliaries, with a nominal power output of 7.5 MW at the generator terminals at the site conditions at 0.8. power factor, 11 kV and 50 Hz.

2.5 RESOURCES REQUIREMENT

2.5.1 LAND REQUIREMENT

The total land requirement for the project is 2.471 acres ie 10,000 sq meters. The land is inside the already existing tyre manufacturing site at Oragadam-SIPCOT, and is located towards the north east of the tyre unit.

Table 2.2 Breakup of the Project Land Requirement

Sl No	Description	Land Req	
		Sq m	Acres
01	**Turbine**	3825	0.945
02	**Boilers, Auxiliaries & Substation**	5000	1.237
03	**Other units and roads**	475	0.117
04	**Greenbelt (in addition to the existing 33% greenbelt in the 128 acres tyre factory)**	700	0.172
	Total Land	**10,000**	**2.471**

2.5.2 RAW MATERIALS REQUIREMENT

The major raw materials required for this project includes water, fuel as coal and raw materials in the construction phase.

Table 2.3 Raw Materials Requirement

No	Material	Quantity	Source and Storage
1	Coal	152205MTA.	From approved vendor. Stored in a Coal Shed with capacity of 7332MT
2	Other Fuels	1. High Speed Diesel (HSD)	Maximum storage of 20KL
		2. Light Diesel Oil (LDO)	Maximum storage of 1KL
3	Water	1.Construction phase: 12m^3/day	SIPCOT
		2. Operation phase: 632.2 m^3/day	SIPCOT
4	Construction	1. Cement	1255 MT from market

	material	2. Blue metal	4171MT from approved quarries.
		3. River sand	4003MT from approved sand mining site.

3. DESCRIPTION OF THE ENVIRONMENT

3.1 AIR AND METEROLOGICAL ENVIRONNENT

The project site is located in North Eastern side of Tamil Nadu in Kancheepuram district. It is situated in a terrain with ground elevation varying from about 60 to 74 meters above mean sea level. The surrounding impact zone of 10 km radial distance consisting of the rural, urban and industrial areas in it is marked. In general the study area experiences predominant wind from SE direction during the season of February to April.

Table 3.1 Meteorological Observations

Parameter	Observation
Wind Direction	West, South-West, South, South-East, East
Resultant Wind Direction	East South East
Wind Speed Range	0 to 28.8 km/hr
Average Wind Speed	5.47 kmph
Calm Conditions	24.2%
Temperature Range	21.4-38.9^{O}C
Average Temperature	29 ^{O}C
Humidity Range	35-95%

3.2 NOISE ENVIRONMENT

The surrounding impact zone of 10 km radial distance consisting of the rural, urban and industrial areas in it is marked. State highways number SH48 and SH57 passes by the site. There are number of small scale and few large scale industries existing in the study area. The prevailing ambient noise levels along, the sites were monitored at 8 locations. During study period observed equivalent noise levels (Leq) in Residential areas within the study area varied in the range of 43.8 to 64.6 dB(A) during day time and 42.7 – 59.5 dB(A) at night time. In industrial areas varied from 62.3-60.8 dB(A) to 50.2-51.2 dB(A) and in the state highway between 64.6 dB(A) and 59.5 dB(A) (Tables 3.4). The field observations during study period indicate that the ambient noise levels in the study area were well within the prescribed standards for all the different noise zones.

3.3 WATER ENVIRONMENT

The study area does not consist of any rivers but there are a few lakes located in the area. Small, medium and large scale industries exist throughout, more concentrated towards the North, North West of the study area. The eastern and northern part of the study area consists of mostly rural environment with

villages. The project region falls in tropical dry and wet zone with average annual rainfall of about 1100 mm per year. Ground water irrigated agriculture (paddy, groundnut, cereals, pulses etc.) practice is predominant. Groundwater is the principal resource for domestic and irrigation purposes in almost all villages in the study area. The prevailing status of water quality has been assessed during February-March. Seven sampling locations for ground water and 4 sampling locations from surface water in the study area have been identified for water quality assessment. Groundwater sampling locations are selected in different villages around the site based on topography, land use and utility of groundwater in the study area. The different parameters monitored included, Physio-Chemical Parameters, Biological parameters, Bacteriological parameters, etc.

Baseline Status of all sorts of pollutants was monitored and was found to be within permissible limits.

Table 3.2 Ambient Air Quality Status (Feb-April 2012)

Sampling Time: 24 hours

			Heavy Metal					VOC				
Sr. No	**Sampling location**	**Coordinates (North, East)**	**PM_{10}**	**Hg**	**Pb**	**Ni**	**BaP**	**SOx**	**NOx**	**O_3**	**CO**	**C_6H_6**
1	Project site (South Gate)	12.853551, 79.944779	54-68	BDL	BDL	BDL	BDL	6-13	14-24	BDL	BDL	BDL
2	SaintGobain (On NH4)	12.934461, 79.909573	42-68	BDL	BDL	BDL	BDL	9-14	14-26	BDL	BDL	BDL
3	Aiyimicheri (on SH120)	12.87037, 79.859393	37-56	BDL	BDL	BDL	BDL	8-13	13-24	BDL	BDL	BDL
4	Ullaor (near junction)	12.795303, 79.889295	30-49	BDL	BDL	BDL	BDL	7-12	15-20	BDL	BDL	BDL
5	Kavanur (on SH113)	12.994512, 80.074398	41-58	BDL	BDL	BDL	BDL	7-14	12-20	BDL	BDL	BDL
6	Srikrishna EnggCollege (Entrance)	12.868565, 79.972405	39-59	BDL	BDL	BDL	BDL	6-13	13-21	BDL	BDL	BDL
7	Padappai (on SH 45)	12.885781, 80.01777	44-56	BDL	BDL	BDL	BDL	8-16	12-22	BDL	BDL	BDL
NAAQS (2009) 24 h			**-**	**60**	**1.0**	**6***	**1.0***	**80**	**80**	**400**	**2#**	**5**

*#CO- in mgs/ m^3, *As, Ni, BaP, in ng/ m^3, Rest in µg/m^3*

BDL limits

Hg	**Pb**	**As**	**Ni**	**BaP**	**NH_3**	**O_3**	**CO**	**C_6H_6**
0.01	0.5	1.0	1,.0	0.5	10	10	0.1	1.0

*#CO- in mgs/ m^3, *As, Ni, BaP, in ng/ m^3, Rest in µg/m^3*

Table 3.4 Ambient Noise Levels in Villages – Day/Night Time (Feb-April 2012)

Sr. No	Sampling location	Coordinates (North, East)	Noise Levels [dB(A)]	
			Day	Night
1	Project site (South Gate)	12.853551,79.944779	60.8	50.2
2	Saint Gobain (At gate facing NH4)	12.934461,79.909573	62.3	51.2
3	Aiyimicheri (near SH120)	12.87037,,79.859393	46.2	44.8
4	Ullaor (at junction)	12.795303,79.889295	44.3	43.4
5	Kavanur (near SH113)	12.994512,80.074398	43.9	41.6
6	Srikrishna Engg College (At Entrance)	12.868565,79.972405	47.4	40.1
7	Padappai (near SH 45)	12.885781,80.01777	43.8	42.0
8	State highways 48-57 junction (Next to ATL)	12.851589,79.94281	64.6	59.5

Exposure Limits:
a) Industrial Area : Day Time-75 dB(A); Night Time-70 dB(A) .
b) Commercial Area: Day Time-65 dB(A); Night Time-55 dB(A) .
c) Residential Area Area: Day Time-55 dB(A); Night Time-45 dB(A) .
d) Silence Zone: Day Time-50 dB(A); Night Time-40 dB(A) .

Table 3.5 Water Sampling Locations

Surface Water	**Coordinates (North, East)**
1) Apollo Pond (near SH57 near to ATL)	12.845005,79.94421
2) Pondur Lake (on SH 57)	12.9239,79.931142
3) Thenneri lake (on SH 120)	12.858906,79.853298
4) Salamangalam Lake (West of Paddy Fields)	12.899696,79.971391
Ground Water	
1) Apollo Tyres (Borewell in campus)	12.853551,79.944779
2) Saint Gobain (Tubewell outside of main gate)	12.934461,79.909573
3) Aiyimcherri (Tubewell at house on SH120)	12.87037,79.859393
4) Ullaor (well at shop near junction)	12.795303,79.889295
5) Sri Krishna Engineering College(Well opposite to entrance)	12.868565,79.972405
6) Kavanur(Tubewell from house on SH113)	12.994512,80.074398
7) Padappai (Tube well near fields on SH 45)	12.885781,80.01777

Table 3.6 Water Quality Baseline Status

No	Parameters	Unit	IS:10500: 1991Norms	G1	G2	G3	G4	G6		G7
1.	Color	HU	5	<5	<5	<5	<5	<5		<5
2.	Odor	-	Agr	Agr	Agr	Agr	Agr	Agr		Agr
3.	Taste	-	Agr	Agr	Agr	Agr	Agr	Agr		Agr
4.	Temperature	Deg Cel.	-	30	30	30	30	30		30
5.	PH @ 25^0C	-	6.5-8.5	8.17	8.05	7.33	6.09	7.66		7.72
6.	Turbidity	NTU	5	0.5	2.1	2.4	3.0	2.3		<1
7.	Total Dissolved Solids	mg/l	500	324	360	355	292	159		162
8.	Total Hardness	mg/l as $CaCO_3$	300	112	142	100	140	62		72
9.	Conductivity	mhos/cm	-	589	655	647	533	289		331
10.	Calcium	mg/l as Ca	75	34	38	26	35.2	21		16
11.	Magnesium	mg/l as Mg	30	6.5	11.5	8.6	12.5	2.4		7.7
12.	Sodium	mg/l as Na	-	25	17	7	22	35		17
13.	Potassium	mg/l as K	-	7	5	3	15	12		3
14.	Phosphate	mg/l as P	-	0.49	0.21	0.19	0.39	0.35		0.259
15.	Chloride	mg/l as Cl^-	250	106.6	130	164	78.2	31.3		68.5
16.	Iron	mg/l as Fe	0.3	BDL	BDL	BDL	BDL	BDL		BDL
17.	Sulfate	mg/l as SO_4	200	44.8	55.0	67.0	27.0	15		12
18.	Sulphide	mg/l as S_2^-	0.05	BDL	BDL	BDL	BDL	BDL		BDL
19.	Manganese	mg/l as Mn	0.10	BDL	BDL	BDL	BDL	BDL		BDL
20.	Copper	mg/l as Cu	0.05	BDL	BDL	BDL	BDL	BDL		BDL
21.	Nitrate	mg/l asNO_3	45	3.70	4.38	4.69	3.00	5.90		20.00
22.	Fluorides	mg/l as F^-	1.0	0.6	0.3	0.6	0.7	0.6		0.8
23.	Lead	mg/l as Pb	0.05	BDL	BDL	BDL	BDL	BDL		BDL
24	Zinc	mg/l as Zn	5	0.09	0.06	0.07	0.17	1.7		0.1

25.	Chromium	mg/l as Cr^{6+}	0.05	BDL	BDL	BDL	BDL	BDL		BDL
26.	Residual Chlorine	mg/l as Cl_2	0.2	BDL	BDL	BDL	BDL	BDL		BDL
27.	Alkalinity	mg/l as $CaCO_3$	200	110	160	70	65	90		90
28.	Boron	mg/l as B	1	BDL	BDL	BDL	BDL	BDL		BDL
29.	Phenolic compounds	mg/l asC_6C_5OH	0.001	BDL	BDL	BDL	BDL	BDL		BDL
30.	Aluminum	mg/l as Al	0.03	BDL	BDL	BDL	BDL	BDL		BDL
31.	Mercury	mg/l as Hg	0.001	BDL	BDL	BDL	BDL	BDL		BDL
32.	Cadmium	mg/l as Cd	0.01	BDL	BDL	BDL	BDL	BDL		BDL
33.	Arsenic	mg/l as As	0.01	BDL	BDL	BDL	BDL	BDL		BDL
34.	Cyanides	mg/l as CN	0.05	BDL	BDL	BDL	BDL	BDL		BDL
35.	Mineral Oil	mg/l	0.01	BDL	BDL	BDL	BDL	BDL		BDL
36.	Anionic detergents	mg/l	0.2	BDL	BDL	BDL	BDL	BDL		BDL
37.	Selenium	mg/l as Se	0.01	BDL	BDL	BDL	BDL	BDL		BDL
38.	Pesticides	µg/l	Abs	BDL	BDL	BDL	BDL	BDL		BDL
39.	PAH	µg/l	Abs	BDL	BDL	BDL	BDL	BDL		BDL
40.	Dissolved Oxygen	mg/l	-	4.5	4.1	3.5	4.2	5.3		4.8
41.	Chemical Oxygen Demand	mg/l	-	BDL	BDL	BDL	BDL	BDL		BDL
42.	Biological Oxygen Demand	mg/l	-	BDL	BDL	BDL	BDL	BDL		BDL
43.	Total Coliform	CFU/100ml	ND	ND	ND	ND	ND	ND		ND
44.	Faecal Coliform	CFU/100ml	ND	ND	ND	ND	ND	ND		ND

**ND- Not Detected, Agr- Agreeable, Stds- IS 10500 Drinking Water Standards, BDL- Below Detection Level*

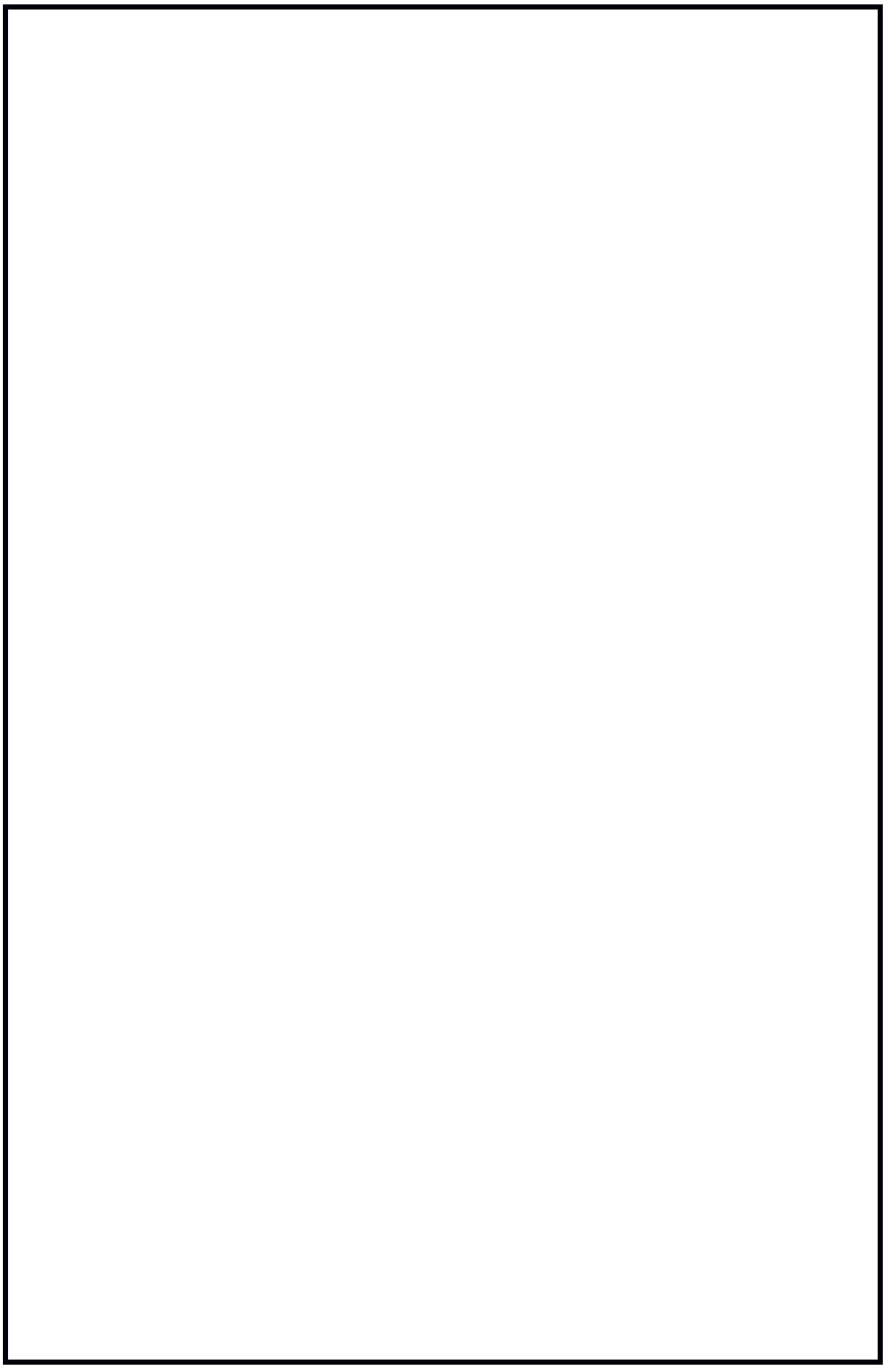
IS 10500:1991-Drinking Water Standards; #: Permissible Limit
* As per IS standard testing method

Sampling Sites:

Ground Water	***Surface Water***
G1) Apollo Tyres (Borewell in campus)	S1) Apollo pond (near SH57 near to ATL)
G2) Saint Gobain (Tubewell outside of main gate)	S2) Pondur Lake (on SH 57)
G3) Aiyimcherri (Tubewell at house on SH120)	S3) Thenneri lake (on SH 120)
G4) Ullaor (well at shop near junction)	S4) Salamangalam Lake (West of Paddy Fields)
G5) Sri Krishna Engineering College (Well opposite to entrance)	
G6) Kavanur (Tubewell from house on SH113)	
G7) Padappai (Tube well near fields on SH 45)	

No	**Parameters**	**Unit**	**BDL**
1.	Aluminum	mg/l as Al	<0.01
2.	Anionic detergents	mg/l	<0.2
3.	Arsenic	mg/l as As	<0.001
4.	B.O.D	mg/l	<1.0
5.	Boron	mg/l as B	<0.5
6.	C.O.D	mg/l	<0.4
7.	Cadmium	mg/l as Cd	<0.01
8.	Chromium	mg/l as Cr^{6+}	<0.01
9.	Copper	mg/l as Cu	<0.01
10.	Cyanides	mg/l as CN	<0.02
11.	Iron	mg/l as Fe	<0.01
12.	Lead	mg/l as Pb	<0.1
13.	Manganese	mg/l as Mn	<0.01
14.	Mercury	mg/l as Hg	<0.001
15.	Mineral Oil	mg/l	<0.01
16.	PAH	µg/l	<5.0
17.	Pesticides	µg/l	<0.1
18.	Phenolic compounds	mg/l as C_6C_5OH	<0.001
19.	Residual Chlorine	mg/l as Cl_2	<0.1
20.	Selenium	mg/l as Se	<0.001
21.	Sulphide	mg/l as S_2^-	<0.05

No	**Parameters**	**Test Method**
1.	Color	IS 3025 (Part 4) -1983
2.	Odor	IS 3025 (Part 5) - 1983
3.	Taste	IS 3025 (Part 7 and 8) - 1984
4.	PH @ 25^0C	IS 3025 (Part 11) – 1983
5.	Turbidity	IS 3025 (Part 10) – 1984
6.	Total Dissolved Solids	IS 3025 (Part 16) – 1984
7.	Total Hardness	IS 3025 (Part 21) – 1983
8.	Calcium	IS 3025 (Part 40) – 1991
9.	Magnesium	IS 3025 (Part 46) – 1994
10.	Chloride	IS 3025 (Part 32) – 1988
11.	Iron	IS 3025 (Part 53) – 2003
12.	Sulphate	IS 3025 (Part 24) – 1986
13.	Manganese	IS 3025 (Part 59) – 2006
14.	Copper	IS 3025 (Part 42) – 1992
15.	Nitrate	IS 3025 (Part 34) – 1988
16.	Fluorides	IS 3025 (Part 60) – 2008
17.	Lead	IS 3025 (Part 47) – 1994
18.	Zinc	IS 3025 (Part 49) – 1994
19.	Chromium	IS 3025 (Part 52) – 2003
20.	Residual Chlorine	IS 3025 (Part 26) – 1986
21.	Alkalinity	IS 3025 (Part 23) – 1986
22.	Boron	IS 3025 (Part 57) – 2005
23.	Phenolic compounds	IS 3025 (Part 43) – 1992
24.	Aluminum	IS 3025 (Part 55) – 2003
25.	Mercury	IS 3025 (Part 48) – 1994
26.	Cadmium	IS 3025 (Part 41) – 1991
27.	Arsenic	IS 3025 (Part 37) – 1988
28.	Cyanides	IS 3025 (Part 27) – 1986
29.	Mineral Oil	IS 3025 (Part 39) – 1991
30.	Anionic detergents	Annex K to IS 13428- 2005
31.	Selenium	IS 3025 (Part 56) – 2003
32.	Pesticides	AOAC 990.06
33.	PAH	APHA 6440

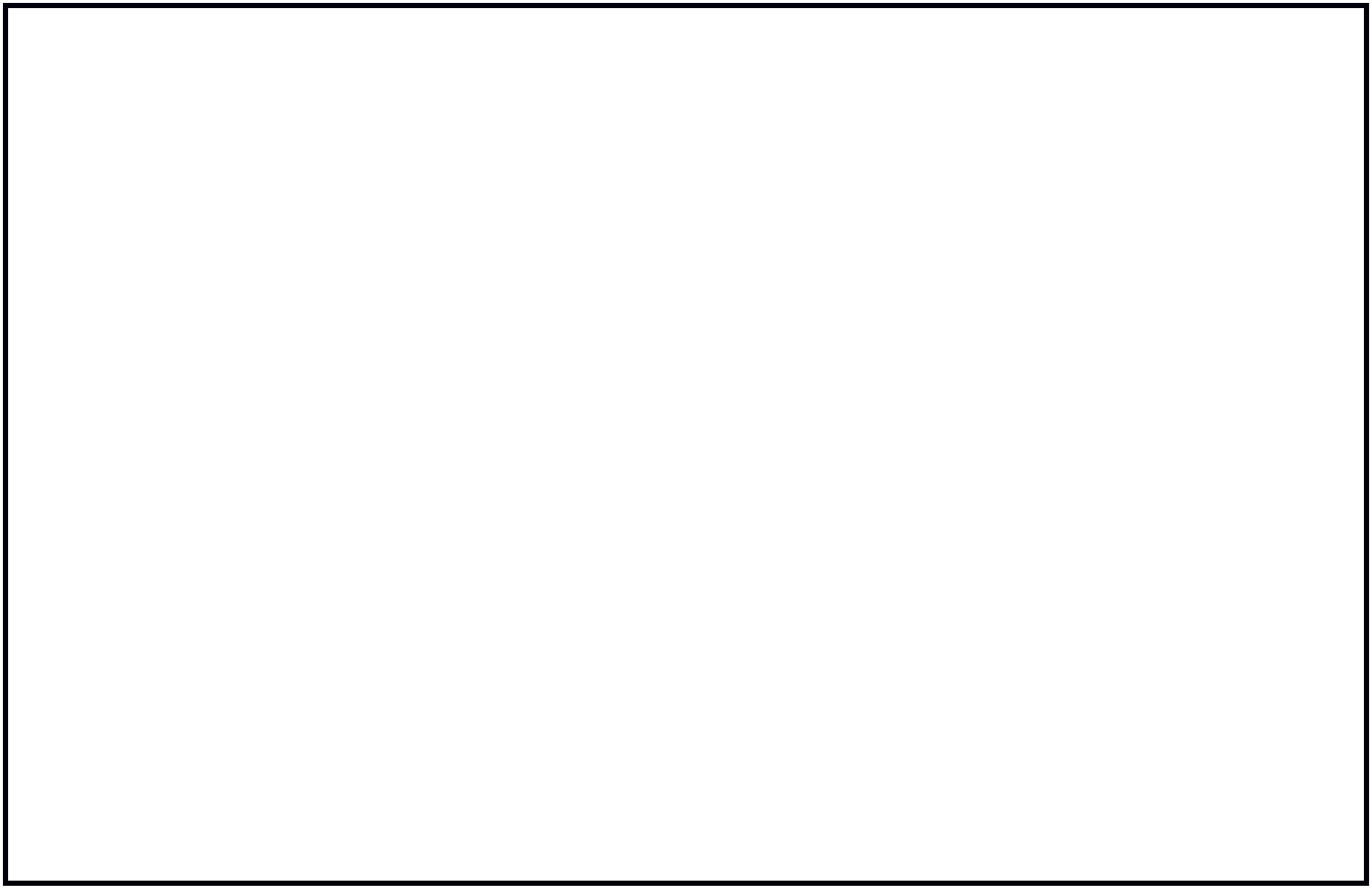


3.4 LAND ENVIRONMENT

Standard methods have been followed for analyzing the soil samples for physic-chemical characteristics and parameters related to agriculture productivity.

Table 3.7 Soil Quality Data

No	Parameters	Units	Project site	Saint Gobain	Aiyimicheri	Ullaor	Kavanur	Srikrishna College	Padappai
1.	PH	-	7.52	7.73	7.15	6.91	7.08	7.21	7.34
2.	Electrical Conductivity	dS/m	0.341	0.376	0.315	0.327	0.396	0.367	0.381
3.	Alkalinity	mg/l as $CaCO_3$	0.05	0.05	0.07	0.03	0.04	0.07	0.05
4.	Magnesium	mg/Kg	12	13.2	12.0	14.4	13.2	14.4	14.4
5.	Calcium	mg/Kg	36	42.0	44.0	42.0	38.0	44.0	54.0
6.	Sodium	mg/Kg	0.552	0.736	0.8	0.53	0.97	0.71	0.6
7.	Potassium	mg/Kg	2.64	5.07	5.46	6.2	4.7	5.07	3.12
8.	Organic Carbon	%	0.65	0.67	0.54	0.56	0.49	0.58	0.60
9.	Nitrogen	Kg/Ha	302.4	303.4	290.5	342.2	288.3	290.2	300.5
10.	Phosphorous Pentoxide	Kg/Ha	20.3	21.2	19.6	15.4	26.5	28.7	23.1
11.	Potassium Oxide	Kg/Ha	78.3	80.4	72.6	70.3	67.4	88.5	67.0
12.	Cobalt	mg/Kg	43.3	40.2	39.6	37.5	40.8	41.8	37.4
13.	Copper	mg/Kg	13.2	12.8	11.8	11.1	11.6	9.4	8.3
14.	Zinc	mg/Kg	23.9	22.4	21.1	22.4	22.1	17.6	16.2
15.	Nickel	mg/Kg	22.3	18.0	20.7	20.5	21.0	17.2	16.7
16.	Cadmium	mg/Kg	0.8	0.6	0.5	0.8	0.7	0.6	0.7
17.	Chromium	mg/Kg	32.8	15.4	28.1	25.1	21.0	19.2	20.9
18.	Manganese	mg/Kg	45.7	46.2	38.3	36.1	40.3	49.3	42.1
19.	Iron	mg/Kg	120.5	135.7	145.4	150.2	138.	153.8	177.4
20.	Lead	mg/Kg	0.95	0.68	0.67	1.05	0.86	0.90	0.75
21.	Textural Class	-	Silty Loam	Silty Loam	Silty Loam	Silty Loam	Silty Loam	Silty Loam	Silty Loam
26	*Grain Size Distribution*								
i	Sand	%	4	11	8	12	5	7	9
Ii	Silt	%	78	69	77	64	66	72	77
iii	Clay	%	18	20	15	22	29	21	14
27	Bulk Density	g/cc	1.44	1.48	1.46	1.54	1.56	1.83	1.25
28	Porosity	%	42.2	42.4	44.1	43.6	42.8	43.8	42.1
29	Water Holding Capacity	%	60.2	58.4	59.6	57.6	60.0	59.9	59.1



3.4.1 CROPPING PATTERN

Paddy, i.e. Rice is the staple food of the region. Kharif is the main season of paddy cultivation. Apart from paddy, black gram, green grams, sugarcane, groundnut, gingelly, cotton are also cultivated. Out of the total area covered for different crops, about 78% area is confined to paddy crop and commercial crops occupy 22% area. Gingelly and cotton plants are grown in all villages, and roughly occupies about 3% of the agriculture area, which is the lowest as compared to other plantation crops.

3.4.2 LANDUSE

The landuse distribution is given in the subsequent table.

Table 3.8 Landuse / Land Cover in Study Area Around the Site

Sr. No.	Land use/Land Cover Classes	Area in(Km^2)	Area in(%)
1.	Vegetation	40.82	13
2.	Land with shrub/waste	135.02	43
3.	Agriculture	125.6	40
5.	Built-up Area	9.42	3
6.	Water body	6.28	1
	Tot	**314**	**100.0**

3.5 BIOLOGICAL ENVIRONMENT

Flora: There is very little natural vegetation within the study area. The predominant species are small trees and bushes. The growth of natural flora is very limited. It is observed that *Prosopis juliflora* is a predominant species present on uncultivable waste land. Due to absence of any perennial surface water bodies, there is abundance of lotus and water lily in seasonal surface water bodies. *Azadirachta indica* and *Borassus flabelliform* have better adaptability among naturally growing species. The villages in study area are covered with cashew tree & coconut plantation. Plantation of fruit trees & decorative plants like Guava, Papaya, Banana, China rose, Coconut etc. are seen. Paddy is the main crop but pulses, Sugarcane & Groundnut are also grown is this area. Many medicinal plants are found in the study area.

Fauna: No wild lives of Schedule 1 are found in the core zone. Jungle cat, Rhesus macaque, Indian fox etc. are found amongst mammals. Indian cobra and other common snakes are found amongst reptiles. Amongst aves, Storks, Kingfishers, Flamingos, etc are found besides other common birds.

Fishery Resource: Since both the Core zone and buffer zone mostly covers industrial areas, hence the whole area has only limited water bodies. No Perennial rivers are located, but some small lakes are found around in both core zone and buffer zone. Fishing is not abundant in this place. Since, there is only limited numbers of water bodies, only limited aquatic animals were found to be predominant, except a few like snails, frogs and water snakes.

3.6 SOCIO-ECONOMIC ENVIRONMENT

The project is located in Oragadam-SIPCOT, in the outskirts of Chennai. The town of Oragadam is known for its various industries and workshops pertaining to the automobile sector. Oragadam has seen major investments from foreign companies in recent times and they together make up one of the largest Automobile hubs in the world. International Automobile majors like Daimler, Renault - Nissan, Komatsu have set up their car manufacturing plants here and are using it as a base for sourcing for their international markets, apart from supplying to meet the fast growing Indian market.

Oragadam SIPCOT, located in Oragadm Village, Sriperumbudur Taluk in Kancheepuram District, consists of an allotment of 2939.5 acres. The nearest Railway Station is Singaperumal Koil at 14 Kms, Nearest Airport is Chennai Airport at 40 kms, Nearest Seaport is Chennai Port at 50 kms and nearest NH is NH4 which passes 9 kms from it.

The Tamil Nadu government is building the Rs. 300 crores Oragadam Industrial Corridor Road. The project, executed by the Tamil Nadu Road Infrastructure Development Corporation (TNRIDC) and funded through the State Highways Department, is expected to give a thrust to industrial activity in the Oragadam-Sriperumbudur cluster. It will also provide additional connectivity between Grand Southern Trunk Road (GST Road i.e. National Highway 45) and Grand Western Trunk Road (NH 4 or Chennai - Bengaluru Highway). There are no mineral deposits in the area.

Table 3.9 Socio-Economic Baseline Status for the District

Description	2011	2001
Actual Population	3,990,897	2,877,468
Male	2,010,309	1,457,242
Female	1,980,588	1,420,226
Population Growth	38.69%	19.15%
Area Sq. Km	4,307	4,307
Density/km2	927	668
Proportion to Tamil Nadu Population	5.53%	4.61%
Sex Ratio (Per 1000)	985	975
Child Sex Ratio (0-6 Age)	967	961
Average Literacy	85.29	76.85
Male Literacy	90.34	84.73
Female Literacy	80.17	68.79
Total Child Population (0-6 Age)	396,254	337,259

Male Population (0-6 Age)	201,499	171,997
Female Population (0-6 Age)	194,755	165,262
Literates	3,065,799	1,952,198
Male Literates	1,634,114	1,088,943
Female Literates	1,431,685	863,255
Child Proportion (0-6 Age)	9.93%	11.72%
Boys Proportion (0-6 Age)	10.02%	11.80%
Girls Proportion (0-6 Age)	9.83%	11.64%

4: ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

4.1 AIR

4.1.1 PREDICTED GROUND LEVEL CONCENTRATIONS FROM PROPOSED PROJECT

For the proposed plant, the predicted ground level concentration for the pollutants is calculated using the sources of pollution from the plant, the meteorological data and the baseline air data. ISC model was used for calculating these ground level concentrations. Screen View software was used in modeling the same.

Table 4.1 Air pollution sources

S.No.	Source	Emission	Conc
1	Boiler	SOx	0.368 µg/m3
		NOx	0.153 µg/m3
		SPM	0.042 µg/m3
2	DG Sets (During Construction)	SO2	Negligible
		NOx	Negligible
		SPM	Negligible

4.1.1.2 Predicted GLC as per ISC Model

Table 4.2 Calculated GLC levels

Pollutant	Baseline concentration µg/m3 (24hrly)	Concentration from the proposed plant, µg/m3(24hrly)	Calculated Ground Level Concentrations, µg/m3 (24hrly)	Distance w.r.t. site, ms	Direction w.r.t. site	Allowed (µg/m3)
SPM	120	0.042	120.042	400	NW	-
SOx	9	0.368	9.368	400	NW	80
NOx	12	0.153	12.153	400	NW	80

The above GLCs were found to be far below permissible standards.

4.2 NOISE

The impacts of the proposed plant on the noise levels of the surrounding areas were modeled using CUSTIC software. The thermal power plant is proposed with all equipments in the power plant designed/operated to have a noise level not exceeding 85 to 90 dBA as per the requirement of Occupational Health and Safety Administration Standard (OHSAS). In addition, since most of the noise generating equipment would be in closed structures, the noise transmitted outside would be still lower. From the below model it can be inferred that the noise level at the surrounding vicinity of the site is anticipated to be under the prescribed standards.

4.3 LAND USE

One of the other factor that usually is considered as a major impact from any project is the land use change. But since the proposed project is under the Oragadam-Sipcot, and that too inside the tyre manufacturing unit, no land use change is foreseen, as the current land use is that of industries.

4.4 WATER POLLUTION

The total effluent produced from the process, cooling towers and utilities is 737.62 KLD, and along with the sewage produced from domestic use (25KLD) is 762.62 KLD (Since the plant is going to run for 18 hours a day, with an effluent generation of 40.98 KL per hour). This is planned to be treated in the existing water treatment plant of the tyre manufacturing unit.

4.5 HAZARDOUS SUBSTANCES

The HSD (High Speed Diesel) storage of 20 KL volume capacity being used in the current tyre manufacturing unit will be used in the Power plant too. The LDO (Light Diesel Oil) storage is of a capacity of 1KL. A risk assessment has been done on the HSD storage and is found to be devoid of any considerable risk.

4.6 WASTE GENERATION

The different wastes generated and their quantities and disposal methods have been given in the table.

Table 4.3 Generation of solid and liquid wastes during construction and operation phases

No	Waste	Quantity	Disposal Method
1	Municipal waste (MT/month)	1. Construction waste: Domestic waste : 1.125 Commercial waste: 0.05 2. Operational waste : Domestic waste : 0.1125 Commercial waste: 0.05	Will be discarded through CPCB authorized vendors or Organic Waste Converters
2	Hazardous	1. Construction waste:	Will be sold to CPCB authorized vendors

	wastes (MT/month)	Diesel tank sludge: 0.00015 Spent oil: 0.0003 2. Operational waste: Diesel tank sludge: 0.000075 Spent oil: 0.00015	
3	Sludge from effluent treatment (kg/month)	Operational Phase: ETP Sludge: 5 STP sludge: 100	Will be used for greenbelt development
4	Construction & demolition wastes (MT/month)	Construction Waste: Bags: 0.5 Packing material: 2 Demolition waste: Nil	Will be used in land filling and road development
5	Flyash (MT/Day)	100	Will be sold to govt approved fly ash vendors (like brick makers) every 2nd day
6	Bed Ash (MT/Day)	6	Will be sold to govt approved vendors every 10thday

4.7 FUGITIVE EMISSIONS AND CONTROL MEASURES

The fugitive emissions from coal transportation, storage, burning etc has been assessed in the following table with mitigation measures for the same.

Table 4.4 List of fugitive emission and control measures

S. No	Source of emission	Detailed plan for prevention and control of fugitive emission/ dusting at each and every stage of fuel handling
1	Coal transportation	1. Transportation of coal will be by road and all equipment will be maintained properly to meet the norms.(By the vendor) 2. Maintenance and monitoring of this equipment will be strictly adhered to as per the preventive maintenance schedule of the plant. 3. The trucks will be covered with tarpaulin sheets to prevent the coal ash from spilling / creating air pollution nuisance.
2	Coal loading and unloading	1. All handling & transport will be exercised in totally covered and enclosed containers/belt transfer system.
3	Emission from coal storage yard	1. Emissions from coal yard will be reduced by sprinkling water. 2. A centralized control room with latest microprocessor based control system will be provided for safe and reliable operation of this system. 3. TNPCB guidelines for coal handling units will be followed.
4	Coal crushing and screening	1. Coal crushing & grinding operations will be provided with bag dust collectors of high efficiency and performance to reduce emissions of coal dust.
5	Coal burning	1. High efficiency Electro Static Precipitator will be provided to control the particulate matter emission in the form of fly ash from boilers.

		2. SO2 emissions will be widely dispersed by providing an adequate stack height of 75 m as per the regulation in the EPA, 1986. 3. Adequate dust suppression/extraction system at crusher house as well as for the coal stock yard will be provided to abate dust nuisance. 4. Sprinkling of water will be applied at the dust generating areas. 5. A green belt will be developed all around the plant boundary and also along the roads to mitigate fugitive & transport dust emission

4.8 TRANSPORT ROUTE FROM CHENNAI PORT

Road Distance from Chennai Port to Apollo Tyres via Sriperumbudur is about **55.8 km** – and takes about **2 hours.**

4.9 IMPACT FROM FLOODING

There is no chance of flooding as there are no natural water body near the site. There is a small man made pond near the lake which has very little water and works solely as a rain water storage pond. Apollo Tyres is situated in a terrain with ground elevation varying from about 60 to 74 meters above mean sea level, the pond being at a level of 15-20 meters above mean sea level. It is seen that the distance for the lake in peak rainy season comes to 630meters from the proposed site and distance in summer season is 830 meters. So there is absolutely no chance of flooding in the site.

4.10 IMPACT PREDICTION

4.10.1 MATRIX METHOD

Through matrix method it was concluded that the project does not have any considerable negative impacts on the society or the environment.

Table4.5 Environmental Impact Matrix for the Proposed Activities

Sl No	Impacting Activities	Environmental Parameters								Cumulative Effect
		Ambient air	Water	Land	Noise	Flora/Fauna	Infra	Socio-eco	Safety	
1	Construction Phase									
a.	Camps – workforce arrangement and wastes emanating from associated services.	NA	NA	NA	NA	-	-	NB	-	NA
b.	Excavation work and filling of foundations	NA	NA	NA	NA	-	-	-	-	NA
c.	Plain concreting, RCC civil foundations and erection activities	NA	NA	NA	NA	-	-	-	NA	NA
d.	Heavy fabrication work	NA	NA	NA	NA	-	-	-	-	NA
e.	Laying of underground and above ground structures	NA	NA	NA	NA	-	-	-	-	NA
f.	Surface treatment, coating and painting	NA	NA	NA	NA	-	-	-	-	NA
g.	Final clearing of site	NA	NA	NA	NA	-	-			NA
2.	Operation Phase	NA	NA	NA	NA	NB	NB	SB	NA	NA
CUMULATIVE IMPACTS		**NA**	**NA**	**NA**	**NA**	**NB**	**NB**	**SB**	**NA**	**NB**

*** Negligible Adverse Impact (NA) / Negligible Beneficial Impact (NB)**

5: ANALYSIS OF ALTERNATIVES

5.1 SITE ALTERNATIVE

The proposed project, being a captive power plant, is been proposed inside the existing site of Apollo Tyre Ltd's tyre manufacturing unit. A 100 X 100 m square plot has been identified adjacent to the existing 24TPH FBC boiler. No other site alternative is considered

5.2 PROJECT ALTERNATIVE

The purpose of having a captive power plant at Apollo Tyres site at Oragadam is to reduce the cost on buying power from the Tamil Nadu grid. Such a project would help reduce stress on the power deficient condition of the state of Tamil Nadu. Also, transmission and distribution losses continue to remain a problem throughout the country, which is not the case in captive power plants. Moreover Oragadam being an industrial area, a captive power plant for this Apollo tyre project will avoid usage of power for the other smaller industries in the area, along with safeguarding power supply for the localities. The project being a co-generation project, envisages utilization of steam for both power production as well as steam consumption for process requirements. Consequently, thermal energy is utilized more efficiently than a conventional power plant. Therefore, the 'no project' alternative is considered to be less advantageous.

5.3 FUEL ALTERNATIVES

A wide variety of fuels can be used for power plants including wind, coal / lignite, gas, hydro, nuclear and other hydrocarbons. Looking at the project requirements (a small, captive power plant with co-generation facilities for a continuous load application) wind, hydro and nuclear options get annulled. Gas is not easily available in the area, whilst coal is easily importable through the Chennai Port. Considering the same, coal (imported) has been selected as fuel for the power plant.

5.4 WATER SUPPLY ALTERNATIVES

As per agreement attached in the annexure, the entire water requirement (1414.6 m^3/day at peak requirement) is to be met by SIPCOT. So an alternative source of water is not considered.

5.5 TECHNOLOGY ALTERNATIVES

The following benefits arise as co-generation is a well proven technology, recognized world over as a cleaner alternative to traditional centralized generation:

a) Base load electrical supply	b) Security of supply
c) Increased diversity on heating and hot water	d) Steam raising capabilities

Considering the above points, Apollo Tyres Ltd has selected co-generation as its chosen power generation option over a conventional option.

6: ENVIRONMENTAL MONITORING PROGRAM

6.1POST PROJECT ENVIRONEMNT MONITORING PROGRAM

The summarized form of post monitoring details is presented in the following Table

Table: 6.1- Environmental Monitoring Plan

S. No	Area of Monitoring	Frequency of Sampling	Parameters to be Analyzed
1	Ambient Air Quality	Twice a week:24 hourly period	SPM, RPM, SO_2 and NOx
2.	Noise	Once every season	Ambient Equivalent continuous Sound Pressure Levels (Leq) at day and Night-time.
3.	Stack Emission	Continuous -online	SPM, SO_2 and NOx
4.	Liquid Effluents	Monthly	pH, Temp, Conductivity, TSS, TDS, BOD, O&G, Phenolics.
		Quarterly	Heavy Metals
		Monthly	pH, TSS, TDS, O&G
		Quarterly	Heavy Metals
		Monthly	pH, TSS, BOD
5.	Water Quality	Quarterly	pH, Temp, Conductivity, TSS, TDS, BOD, O&G Heavy metals
6.	Soil	Once in three years	Physicochemical properties, Nutrients, Heavy metals
7.	Stack monitoring	Continuous	PM, SO_2, NOx
8.	Noise monitoring	Once in a month	Noise level in dB (A)
9.	Workplace monitoring	Quarterly	VOC & Lux Level

7: RISK ASSESSMENT

7.1 Results of the Risk Analysis for High Speed Diesel (HSD) Oil

The results of the different scenarios modeled for the risk from the 20 KL of HSD stored is given in the following section. The storage tank for HSD is located about 200ms south of the proposed thermal power plant. The risks calculated are not of any considerable consequence.

A) Leaking Tank , no Chemical burning

There is a leaking tank but the chemical is not burning but forms an evaporating puddle. The potential hazards from such a situation include downwind toxic effects, Vapour Cloud Flash Fire, Overpressure (blast cloud) from vapor cloud explosion.

B) Leaking tank, Chemical is burning

The second scenario is when the tank leaks , and the chemical is burning with a pool of fire being formed. Potential hazards from this kind of a scenario is thermal radiation from the pool of fire, BLEVE (if heat raises the internal tank

temperature and causes the tank to fail) or it can cause downwind toxic effects of fire byproducts.

C) BLEVE
In the third scenario it is modeled as if the tank explodes and the chemical burns as a fireball. Potential hazards from the BLEVE include, Thermal Radiation form fireball and pool fire, hazardous fragments and blast force from explosion, or downwind toxic products of fire byproducts.

Based on the above risks, a elaborate disaster management plan, both off site and on site has been formulated by Apollo Tyres Ltd.

8: ENVIRONMENT MANAGEMENT PLAN

8.1 ENVIRONMENTAL ASPECTS IN THE PROJECT PLANNING

The environmental aspects taken into consideration in planning the project include the ones as shown in table.

Table 8.1 Environmental Aspects in the project planning

1) Air Pollution	
1) Sulphur dioxide in flue gas: 0.014% at 100% MCR of the boiler. 2)Absence of Nitrogen oxides in the flue gas 3) A 4 field ESP is provided in the flue gas path which will filter the flue gas and limit the suspended particulate matter in the flue gas within 50Mg/Nm3. 4) 75 M high main stack for main boiler with online gas monitoring system has been considered.	
2)Water Pollution	
Steam Generator Blow down	a) The temperature of the Blowdown water would be < 100°C b) Collected in the common neutralization pit for the boiler and auxiliaries from where it is passes through the recycling RO (10*2 CuM/Hr capacity) c) Recycled water and the reject from the RO is used for coal dust suppression, ash handling system, toilet washing etc.
Auxiliary cooling tower blow down	a)It is taken to the central ETP for treatment
DM plant Effluents	a)Hydrochloric acid and caustic soda would be used as regenerants in the proposed water treatment plant. b)The neutralized effluent is passed through the recycling RO and the permeate and reject is used for Auxiliary cooling tower make up, coal dust suppression, ash handling system etc.

Sewage Disposal	a)Sewage from the plant would disposed to the sewage pits from where it is pumped to the main STP for treatment of capacity 150KL/day and the treated water is used in the greenbelt.
3)Noise	
a) All equipment in the power plant would be designed/ operated to have a noise level not exceeding standards as per the requirement of Occupational Health and Safety Administration Standard (OHSAS). b) All noise generating equipment would be in closed structures, the noise transmitted outside would be contained	
4)Fuel	
Imported coal is considered to be main fuel. In the present study coal with gross calorific value as 8500 kCal/SM3 (LHV as 8087) has been considered.	

Other than the above elaborate mitigation plans have been made for pre construction, construction and operation phase impacts on factors like land environment, water environment , air quality, noise generation, biological environment and social environment which have been elaborated in the report.

Table 8.2 Concise Environmental Management Plan

S. No.	Potential Impact	Action	Parameters for Monitoring
1.	Air Emissions	Stack emissions from boiler to be optimized and monitored.	The ambient air quality will conform to the standards for PM, SO2 and NOx as per specified guidelines.
		Ambient air quality within the premises of the proposed unit to be monitored.	The ambient air quality will conform to the standards for PM, SO2 and NOx as per guidelines of CPCB.
		Exhaust from vehicles to be minimized by use of fuel-efficient vehicles and well-maintained vehicles having PUC certificate.	Vehicle logs to be maintained.
		Vehicle trips to be minimized to the extent possible.	Vehicle logs.
		Electrostatic Precipitator will be installed	Maintenance of ESP

2.	Noise	All equipment will be designed to have noise level not exceeding 75–80 dB(A) measured at a distance of 1.5 m from the equipment. The ambient noise level at 120 meters from any part of the plant boundary shall not exceed 63 dB (A). The enclosure of major equipments in plant area will be designed for noise attenuation to reduce noise level to 85 d B(A) at 1m distance.	Maintain records of noise generated from various equipment. The organization should ensure proper usage of PPE's by workers and explore methods for reducing the coal dust explosion
		Generation of vehicular noise.	Maintain records of vehicles.
3.	Wastewater Discharge	No untreated discharge to be made to surface water, groundwater or soil.	No discharge hoses in vicinity of watercourses.
		Take care in disposal of wastewater generated such that soil and groundwater resources are protected.	Discharge norms for effluents as per TNCB/CPCB guidelines.
4.	Hazardous waste generation	Generated hazardous waste will be handed over to authorized dealer	Record of discarded container should be maintained. Record of generation of fly ash and handed over to fly ash utilizing unit should be maintained.
		Fly ash will be given for secondary usage	
5.	Drainage and effluent Management	Ensure drainage system and specific design measures are working effectively.	Visual inspection of drainage and records thereof. Maintenance of Rain Water Harvesting pits and storage tank
		Design to incorporate existing drainage pattern and avoid disturbing the same.	
		Rain water harvesting system will be installed	
6.	Energy Usage	Energy usage to be minimized and optimized.	Findings of energy audit report.
		Conduct annual energy audit.	
7.	Emergency preparedness	Fire protection and safety measures to be taken.	Mock drill records, on site emergency plan and evacuation plan.
		Quality control procedures and personnel training to avoid accidents.	
8.	Environment Management Cell/Unit	The Environment Management Cell/Unit to be set up to ensure implementation and monitoring of environmental safeguards.	A formal letter from the management indicating formation of Environment Management Cell.

8.3 GREENBELT DEVELOPMENT

700 sq ms area of green belt will be provided all around the plant boundary limits. In addition, avenue trees will be planted all along the roads. This will be in addition to the already existing 33% greenbelt in the 128 acres tyre factory.

8.4 OCCUPATIONAL HEALTH & SAFETY PLAN

Other than the above , Apollo Tyres has made elaborate occupational health and safety plans have been made for pre construction, construction and operation phase impacts on factors like air and water pollution, noise pollution, hazardous wastes, working conditions, which have been elaborated in the report. Fire safety plans for the proposed plant have also been elaborated in the report.

8.5 CORPORATE SOCIAL AND ENVIRONMENTAL RESPONSIBILITY

8.5.1 INTEGRATED MANAGEMENT SYSTEM POLICY

Apollo Tyre Ltd's IMS policy is as follows:

"We, at Apollo Tyres, will ensure that all our manufacturing and associated functions use a fact-based approach to continually improve systems and processes, which create excellence in product and service quality, minimizes environmental impact, safeguards employee health and safety, and strives to exceed requirements and expectations of our customers, business partners and statutory authorities."

8.5.2 CURRENT CORPORATE SOCIAL AND ENVIRONMENTAL RESPONSIBILITY PROGRAMS

The objectives of ATL's CSR activities are:

a) To make vulnerable communities self reliant

b) To actively engage with identified key stakeholders through targeted activities

c) To expand to focus and support issues of national interest

8.5.3 COMMUNITY AND PLANT INITITIATIVES BY APOLLO TYRES LIMITED

The following are the current initiatives by Apollo Tyres Ltd:

A) COMMUNITY INITIATIVES

1) Youth Skill Building & Livelihood Generation
2) Health & Sanitation
3) Solid Waste Management

B) PLANT INITIATIVES

1) HIV Initiative
2) Environment Initiative
3) Tobacco Chewing Initiative

9: PROJECT BENEFITS

The benefits of the proposed thermal power plant of Apollo Tyres Ltd includes:

a) By providing captive power plant, there would be decreased load on the state electricity grid

b) The project site to be suitable from feasibility of power evacuation point of view since it is situated just next to the manufacturing unit. So the energy efficiency will be high

c) The transmission loss will be low

d) The project site shall require no displacement of habitation and away from the habitation area, as it is located inside the SIPCOT industrial area.
e) Socio-economic benefit to the locals as it would provide employment during construction and in operation phase
f) Good Techno-commercial viability of the project
g) The project will be surrounded by additional greenbelts
h) Water is being planned to be recycled and reused in this project
i) Overall it will benefit the tyre industry as a whole since the power generated will be utilized for tyre manufacturing
j) The project site to be closer to highway with hindrance free approach for transportation of heavy equipment and the required fuel ie coal.
k) The land allotted for the project site is flat and stable to increase its resistance against any natural disturbances like earthquake.
l) The project site is above the flood level and thus will avoid any accident in case of any severe flooding from the nearby lake.

10: SUMMARY & CONCLUSION

The Environmental Impact Assessment report studied the proposed project and assessed its predicted impacts on land, water, air, soil and biological environment of the region. The proposed project was found to be complying with all the environmental, health and safety standards, and is planning to use efficient equipments and advanced technologies to reduce its air emission, water and waste generation. It is also taking proper care in its hazardous chemicals and waste handling. It has also laid down solid plans to monitor and combat any disaster or emergency situation in the project.

Other than the above, proposed project will be bringing in various economical, social and environmental benefits to Oragadam region and to the county. With the benefits as mentioned earlier, and along with the environmental commitment and readiness of the project, the environmental impact assessment report strongly affirms and recommends the proposed project.