

**NOTE ON
AMENDMENT TO ENVIRONMENT CLEARANCE**

**OF
3X 660 MW SUPER CRITICAL COAL BASED THERMAL POWER PLANT
THERMAL POWERTECH CORPORATION INDIA LTD
at**

**Painapuram, Nelatur Villages, Muthkur mandal,
SPSR Nellore District,
Andhra Pradesh**

October 2015

Project Developer	Environment Consultant
<i>Thermal Powertech Corporation India Ltd SPSR NELLORE, Andhra Pradesh</i>	<i>B.S.ENVI-TECH PVT LTD, Secunderabad - 17</i> <i>NABET Accreditation: NABET/EIA1316/RA002</i>

PROJECT: **3x660 MW SUPER CRITICAL COAL BASED THERMAL POWER PLANT**

PROPONENT: **THERMAL POWERTECH CORPORATION INDIA LTD**

REFERENCE: **Environment Clearance issued by MOEF&CC vide Letter No J 13012/02/2009-IA.II (T) Dated 04, November 2009**

SUBJECT: **Request for Amendments to Environment Clearance**

Background

Thermal Powertech Corporation India Ltd (TPCIL) had obtained the Environment Clearance (EC) from Ministry of Environment, Forests and Climate Change (MoEF&CC), Government of India vide reference cited above. Two units of 660 MW each (Stage I) have been commissioned and are in operation out of the sanctioned capacity of 3x660 MW capacity. The third unit (Stage II – 1x660 MW) will be implemented in due course of time.

Based on implementation of the Stage – I, TPCIL had observed that certain conditions stipulated in the Environment Clearance granted by MoEF&CC need amendments. The following conditions stipulated in the Environment Clearance need amendments. This report highlights the need for amendments and justification for the same.

Summary of Conditions stipulated in the Environment Clearance which require amendments.

- **Increase in land requirement from 1467 acres to 1476.47 acres**
- **Change in coal configuration from 70:30 (indigenous:imported) to 70:30 (imported : indigenous)**
- **Installation of feeder shaver (at port end)**
- **Greenbelt around the plant of 100m width**
- **Sulphur content in the liquid fuel will not exceed 0.5%**
- **Hydrogeological study of the area shall be reviewed annually**

1. Land required will be 1367 acres

The total land estimated for the project at the time of finalization of draft EIA was 1367 acres and another 100 acres for the coal corridor etc. However during final handover of the land by APIIC to the project proponent, it was found that the total land is 1408.70 acres based on survey. Thus, the total land allotted by APIIC is 1408.70 acres instead of 1367 acres for the main plant area.

DETAILS OF LAND

Table -1 ORIGINAL ENVISAGED LAND DURING 2009 (as per Draft EIA)

Sr. No.	Particulars	Land (Acre)
1	APIIC land to be acquired	1367.0
2	Land for coal corridor & other accessories	100.0
	Total Land	1467.0

Table – 2 FINAL LAND ACQUISITION FOR PROJECT

Sr. No.	Particulars	Land (Acre)
1	Land allocated by APIIC	1408.70
2	Leftover land in small bits & plots (Private Patta Land)	16.15
3	Land for coal corridor	23.34
4	Land for Sea Water Pump House (SWPH)	16.00
5	Land for approach road	12.28
	Total Land	1476.47

Apart from this, TPCIL had to procure additional land (items 2 to 5 as given in Table 2 above) due to below mentioned reasons:

Justification for left over land in small bits and plots

These were small bits of land aggregating to 16.15 acres, which were either in the middle of main allocated lands or were contiguous lands. TPCIL had to procure this additional land.

Justification for coal corridor, SWPH, Approach Road

TPCIL had purchased 30 m wide corridors for passage of its Coal Conveyor (23.34 Acres) and construction of Plant Approach Road (12.28 Acres). The original area envisaged for coal corridor was about 100 acre, which has now been optimized to 23.34 acre.

The area acquired for plant approach road is 12.28 acre. Part of the above two lands is under CRZ and CRZ Clearance for the same has been obtained vide Central CZMA letter dated 5th Dec 2011. The copy of the CRZ clearance letter is attached with the document.

Justification for Plant Accessories

Sea Water Pump House is required for the plant as the plant water requirement is 100% dependent on seawater.

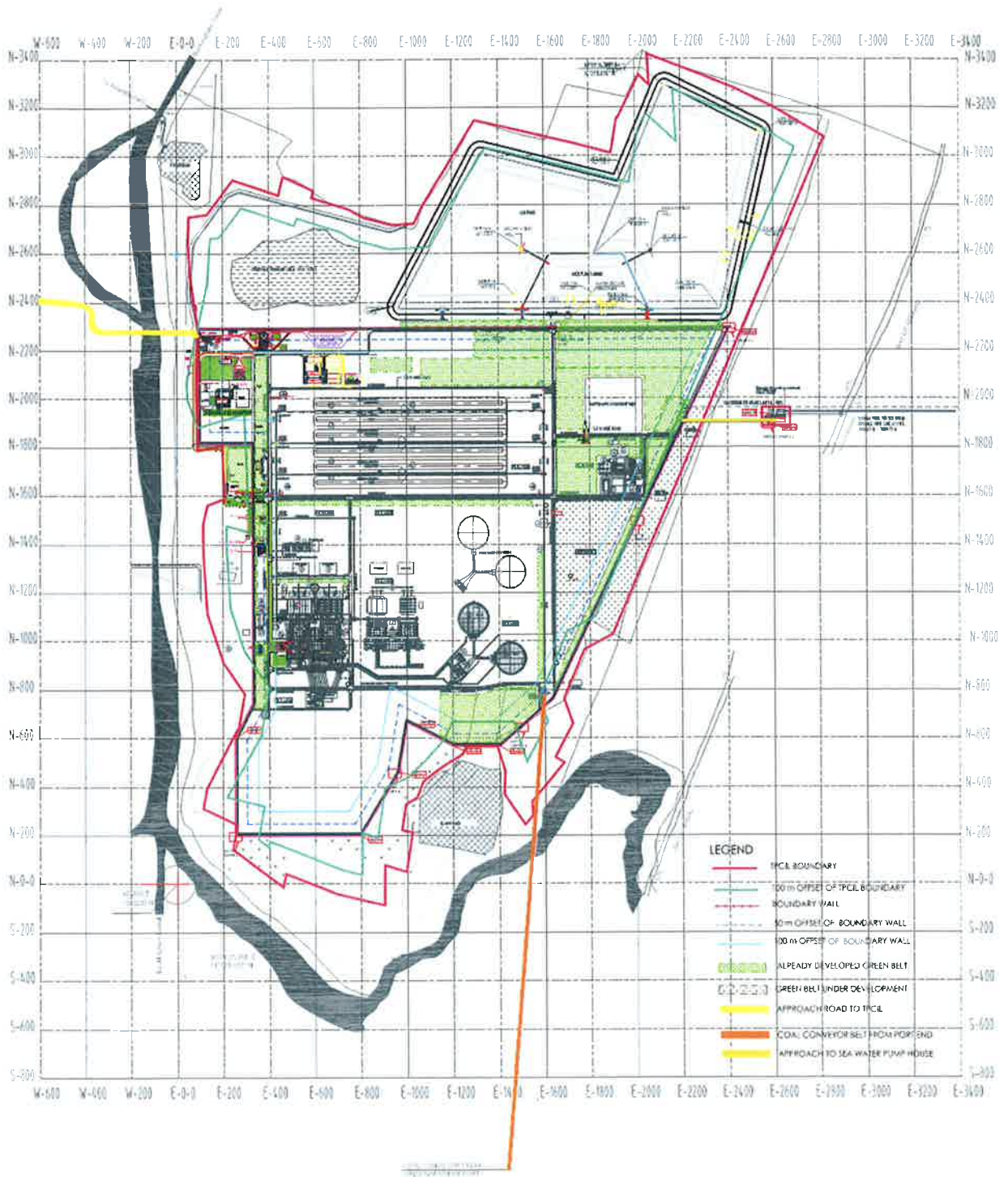
An area of 16 acres has been acquired from private parties for construction of TPCIL Sea Water Pump House. This land is within CRZ and Clearance of Central CZMA has been obtained for the same vide letter dated 5th Dec 2011. The copy of the CRZ clearance letter is attached with the document.

Thus the increase of land is 9.47 acres (i.e.) from 1467 acres as given in the EIA report to 1476.47 acres as procured by TPCIL.

Request:

TPCIL requests MoEF&CC to approve the increase of land requirement from 1467 acres to 1476.47 acres as per justification given above.

FIG – 1 MAP SHOWING THE TPCIL SITE AND ACCESSORIES



2. Indian and imported coal will be used in the ratio of 70:30. The blended coal will have about 26% ash content and Sulphur content of 0.59%

It was envisaged to use blended coal in the boilers at a ratio of 70% indigenous coal (from Mahanadi coal fields) and 30% imported coal. However, to improve project life cycle and to benefit environment, the boilers have been designed for firing up to 100% imported coal. Therefore, TPCIL requests MoEF&CC to approve to use imported coal in any ration from 0 % to 100% and the rest domestic coal instead of the earlier permitted configuration of 70% indigenous and 30% imported. There will be no additional pollution load by using the imported coal as imported coal has better ash & Sulphur content than indigenous coal.

Apart from this, the coal quality of both imported and indigenous as received today in comparison to that mentioned in the EIA report has changed. The details of the same are given below:

Table – 3 Summary of coal quality (imported and indigenous)

Parameter	As per EC / EIA	Request for amendment	Remarks
Proportion of Imported coal	30%	0 - 100%	Usage of better coal
Coal Quantity			
Blend Coal requirement (MTPA)	6.9	10.31	Coal calculations are done as per 30% indigenous & 70% imported coal configuration. Increase in coal due to reduction in GCV & increase in PLF from 85% to 100%
Quality of Coal			
GCV in domestic coal (Kcal/kg)	4135	3400	It was envisaged to use washed domestic coal, which is not available. Hence, reduction in GCV
GCV in imported coal (Kcal/kg)	5750	3950	The average GCV of imported coal is only 3950.
GCV in blend coal (Kcal/kg)	4620	3785	GCV got reduced due to usage of unwashed coal
Ash content in blend coal	26 %	17%	Ash content is reduced. Hence less impact to environment.
Sulphur content blend in coal	0.59%	0.40%	Sulphur content is reduced, Hence less impact to environment.
Pollution Load			
Total Ash per Annum (Million TPA)	1.79	1.75	Reduction in ash owing to use of imported coal
Total SO ₂ emissions per annum (Million TPA)	0.08	0.08	Usage of better coal

Note: The above calculations are done as per imported coal and indigenous coal in the ratio 70:30.

With the proposed use of imported coal and indigenous coal in the ratio 70:30, there will be no increase in total pollution load per annum (ash generation or SO₂ emissions).

Also the ash content in the blend coal during operation will be 17% as against the value of 26% given earlier in the Environment Clearance. Similarly, the Sulphur content in blended coal is reduced from 0.59% to 0.40%. The detailed air quality modelling with the proposed coal quality parameters was done and the results are presented in Annexure -1 of this report.

Request:

TPCIL requests MoEF&CC to approve the coal configuration of usage of imported coal up to 100% instead of 30% imported by keeping a tab on Ash and Sulphur content in blend coal.

3. Total cost of the project is Rs. 10,153 Crores.

The Project cost mentioned in the EIA report was Rs. 10,153 Crores. However, due to fluctuations in foreign exchange component, cost of machinery, pile foundations and other reasons, the revised Project cost is Rs. 13636 Crores. An amount of Rs 9136 crores has been spent for implementing Stage I (2x660 MW) and an amount of 4500 crores is envisaged for implementing Stage- II (1x660MW).

Request:

TPCIL requests MoEF&CC to approve the increase in Project Cost from Rs.10,153 crores to Rs.13,636 Crores as per justification given above.

4. Include Feeder Shaver (this is a coal breaker with dust extraction system) at port end

TPCIL has implemented an environment friendly PIPE CONVEYOR for conveying coal from the Krishnapatnam Port (North) to the coal handling plant located inside the power plant. During operation, it was observed that large lumps of indigenous coal were received and this could not be fed into the PIPE CONVEYOR. To overcome this problem a Feeder Shaver (A small scale coal breaker with dust extraction system) has been implemented which was not envisaged at the time of construction of the power plant. Location map of the feeder shaver and photograph of the same is given below:

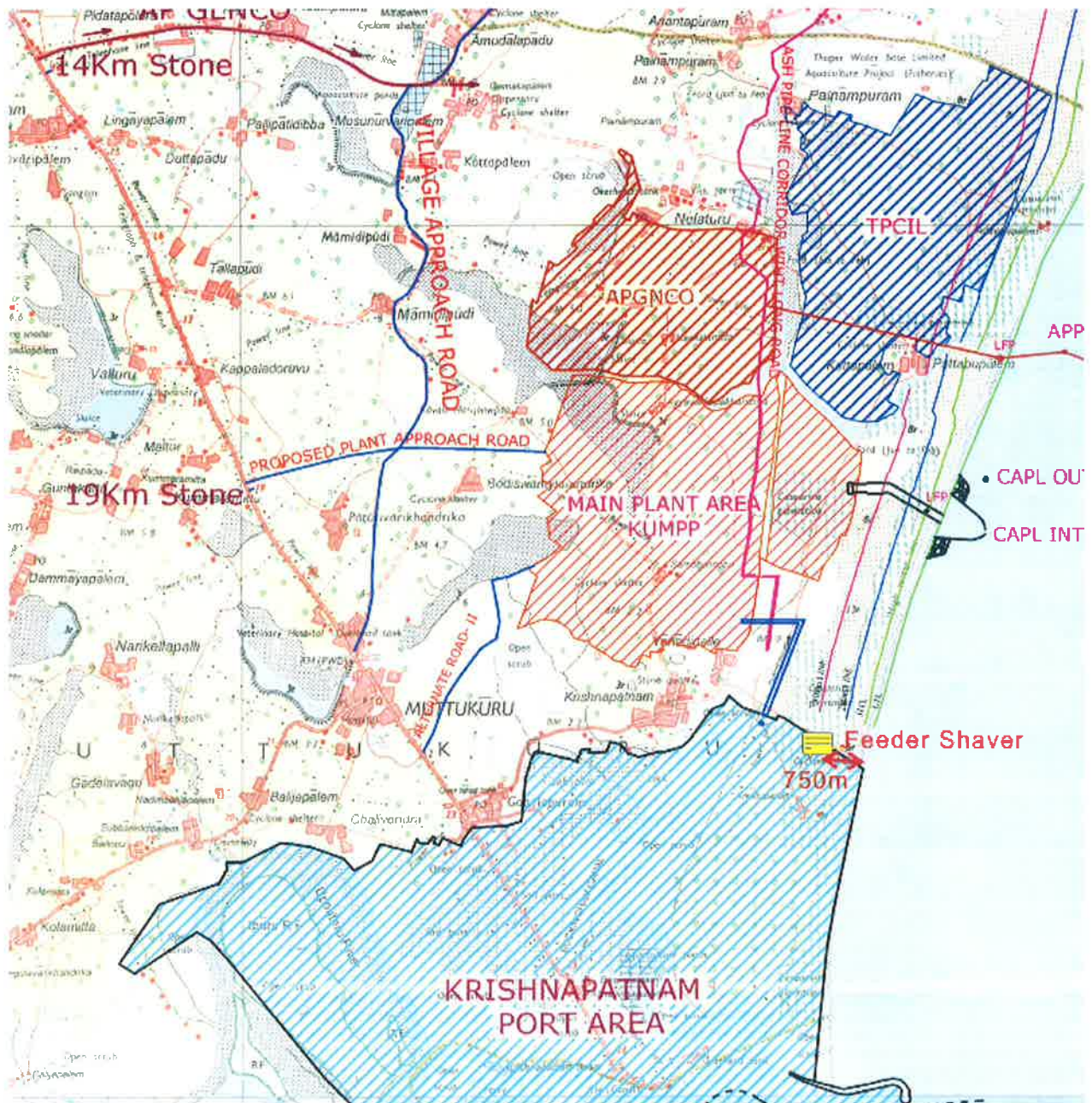


FIG-2 Location of feeder shaver on toposheet

Photographs of Feeder Shaver:



Request:

TPCIL requests MoEF&CC to approve the installation of Feeder Shaver at Krishnapatnam Port as per justification given above.

xviii. Shelter belt consisting of 3 tiers of plantations around the plant of 100 m width and adequate tree density shall be developed.

TPCIL has initiated the development of greenbelt during construction stage itself. Out of the total area 1408 acres, an area of 396 acres has been earmarked for greenbelt which is 28.13%. The EC has stipulated green belt of 100 m width on all sides. Based on the layout design, it has been found that the feasibility of developing green belt of 100 m was difficult in the Eastern and Western sides of the power plant area due to construction of non-plant buildings. However TPCIL is developing green belt of 50 m width in the Eastern and Western side. The following table summarizes the same.

Sr. No.	Direction	Length (meter)	Width to be maintained	Area of green belt (acre)
1	North boundary wall	2318	100 m	57.3
2	East boundary wall	1718	50 m	21.2
3	South boundary wall	3590	100 m	88.8
4	West boundary wall	2114	50 m	26.1
5	Other area plantation	-	-	202.6
	Total Plantation			396.0

TPCIL will maintain the total area of 396 acres green cover as committed. TPCIL has established a Nursery with in the plant premises and the photographs of the nursery and greenbelt developed as on date is given below.

Request:

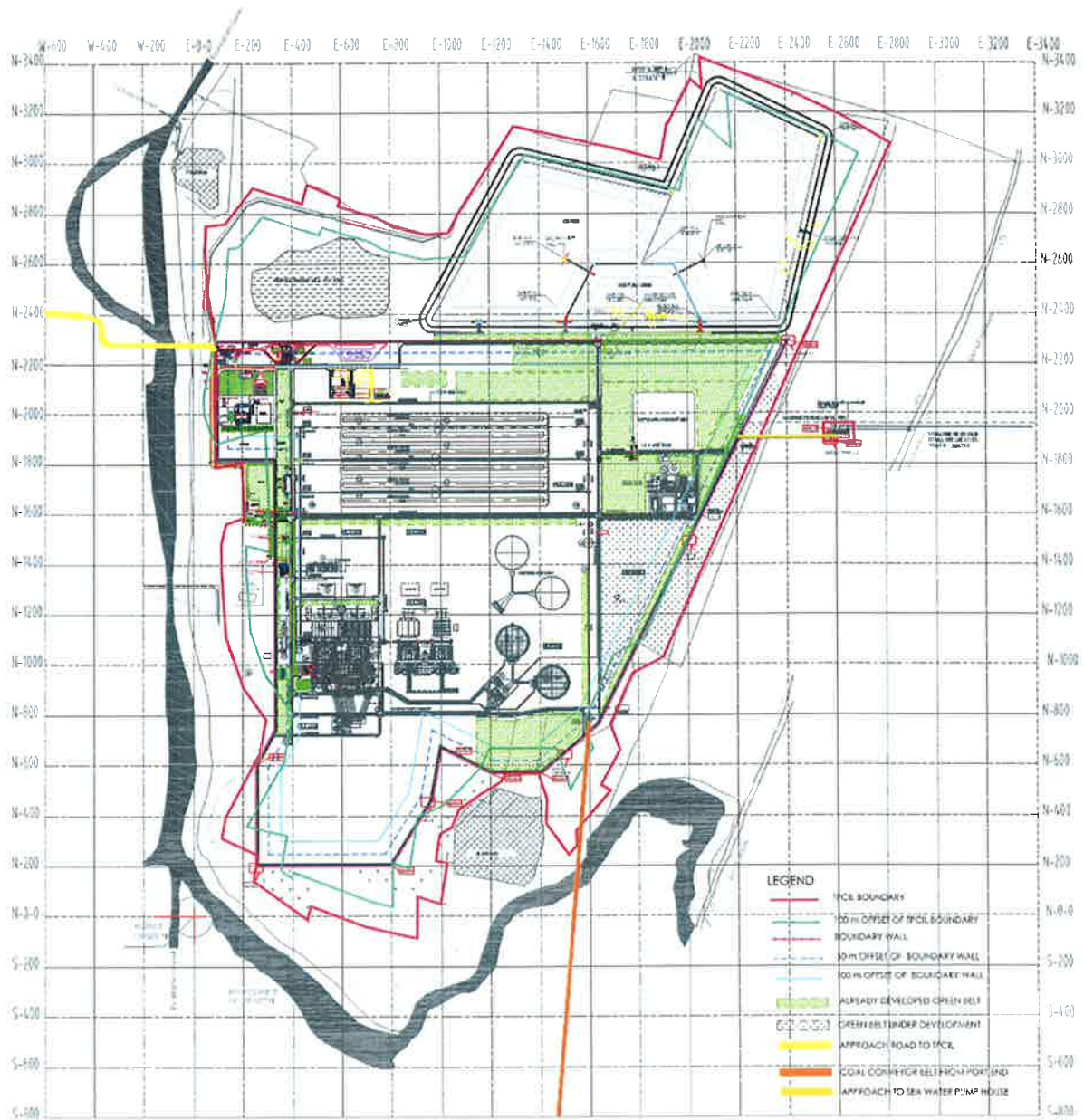
TPCIL requests MoEF&CC to approve the development of greenbelt with a width of 50 m – 100 m instead of 100m width as justified above.

Photographs showing current plantations






FIG – 3 PLOT PLAN SHOWING THE GREENBELT DEVELOPMENT



vi Sulphur content in the liquid fuel will not exceed 0.5%

The power plant is operated on coal as primary fuel. However, HFO will be used as a start-up fuel in case of shut down of the boilers. The same has been presented in the EIA report. However, the EC condition stipulated that the Sulphur content in the liquid fuel will not exceed 0.5%. The available HFO in Indian market is as per IS: 1593 specifications and has 4% (approx.) Sulphur content. The fuel analysis report is given below:

IS : 1593 - 1982 SPECIFICATIONS FOR FUEL OILS						
Sr.No.	Characteristics	Requirements for				Method of test, Ref. to
		Grade	Grade	Grade	Grade	
		LV	MV 1	MV 2	HV	P: of IS:1448
1	Acidity, Inorganic, mgKOH/gm	Nil	Nil	Nil	Nil	P:2
2	Ash % by mass, max.	0.1	0.1	0.1	0.1	P:4 (Method A)
3	Gross calorific value	Not limited but to be reported ✓				P:6 for reference and
		(Note 1)				P:7 for routine
4	Relative density at 15/15°C	Not limited but to be reported (Note 2)				P:32
5	Flash point, PMCC, °C min.	66	66	66	66	P:21
6	Kinematic viscosity at 50°C, cSt					P:25
	Above	-	80	125	180	
	Upto	80	125	180	370	
7	Sediments, % by mass, max.	0.25	0.25	0.25	0.25	P:30
8	Sulphur, total, % by mass, max.	3.5	4.0	4.0	4.5	P:33 for reference and
		(Note 3)				P:35 for routine
9	Water content, % by vol., max.	1.0	1.0	1.0	1.0	P:40
Note 1:- Normally the gross calorific value is of the order of 10,000 cal/g.						
Note 2:- Fuel oil for marine uses in diesel engines shall not exceed a limit of 0.99						
Note 3:- Recognizing the necessity for low-sulphur fuel oils in some specialized uses,						
a lower limit may be specified by mutual agreement between the purchaser						
and the supplier.						

Sarvesh
SARVESH KUMAR SINGH
 प्रबंधक - अति उच्च श्रेणी
 Manager - I & C


P.S. Gupta
 2/6/14
 Bow Point 15 max powder
 2A max (Sulphur)

MoEF&CC to permit use the above HFO as startup fuel since the shutdown of boilers is expected only a few times in a year (generally 2-3 times in a year).

Request;

TPCIL requests MoEF&CC to approve use of HFO with Sulphur content of 4% as startup fuel.

- x. ***Hydro-geological study of the area shall be reviewed annually and results submitted to the Ministry and concerned agency in the State Government.***

The entire plant water requirement is being obtained from seawater. No ground water will be extracted for plant operations and hence, there will be no impact on ground water resources with respect to plant operations.

Also the Ash Pond is provided with HDPE liners to prevent any seepage of the ash pond water to the ground. Hence, there will be no seepage of ash pond water. TPCIL is regularly monitoring the water quality surrounding the ash pond.

Ash Pond under construction with HDPE lining



Ash Pond under Operation



Baseline data of Hydrogeological study has already been carried out by TPCIL. **The conclusions and recommendations of the Hydrogeological study is given below** and all of these recommendations will be followed by TPCIL:

(1) Air emissions are chief source of pollution to the land and water environment.

As mandated effective Electro Static Precipitators are being installed to minimize air pollutants. Dust suppressors, water sprayers are used to control the particulate matter.

(2) Strong Embankment of sufficient height and suitable lining to the bottom of Raw Water Reservoir and Ash Ponds are to be provided to avoid seepage of water and breaches.

(3) Sewage Treatment Plant and Effluent Treatment plants may be constructed separately and treated water can be reused in the plant site and sludge may be disposed off suitably.

(4) The plant site has shallow ground water level and has less requirement of ground water recharge. The roof top rain water harvested from the building areas may be considered for rain water harvesting.

(5) Storm water harvested in the plant area may be de-silted and used to neutralize plant effluent in ETP or used for green belt development.

(6) A guard trench may be dug around the Ash dyke and collected seepage water may be pumped back to re-use in the plant.

(7) Piezometer bore wells may be monitored regularly for the water quality and water level.

(8) Green belt with suitable tree species may be developed all along the main plant periphery, peripheries of Ash Pond and Raw Water reservoirs and road margins.

(9) Twelve Rain Water Harvesting ponds of 5 m X 4 m of 1-2 m depth are suggested in the greenbelt area adjacent to the drains. The following design criteria may be adopted:

(i) Sufficient side slope may be kept to maintain stability.

(ii) Sides may be clad with Cuddapah limestone slabs

(iii) Bottom of the pond may be filled with pebble/ gravel lined to enable rainwater infiltration in to the sand horizons.

(iv) Silt trap may be provided near the inlet to prevent siltation of pond and to allow only clean water

(10) A major Rain Water Harvesting Reservoir is suggested at the North Eastern corner of the Plant site in an area of about 20 - 36 Acres.

(i) Reservoir floor area may be of 2.0 m depth from the adjacent surface level.

(ii) Embankment clay bund of 1.5 m around the pond with spill way of 0.50 m below the top surface of bund.

(iii) Embankment top width 3 m and bottom width 5 m.

(iv) Consolidation of embankment and rising of suitable plant species for keeping safety and stability of bund.

(v) Silt trap pits of suitable dimensions before drain inlets to allow only clear water, free from suspended solids.

(vi) In order to avoid breaching of the reservoir suitable outlet may be planned to evacuate storm water easily.

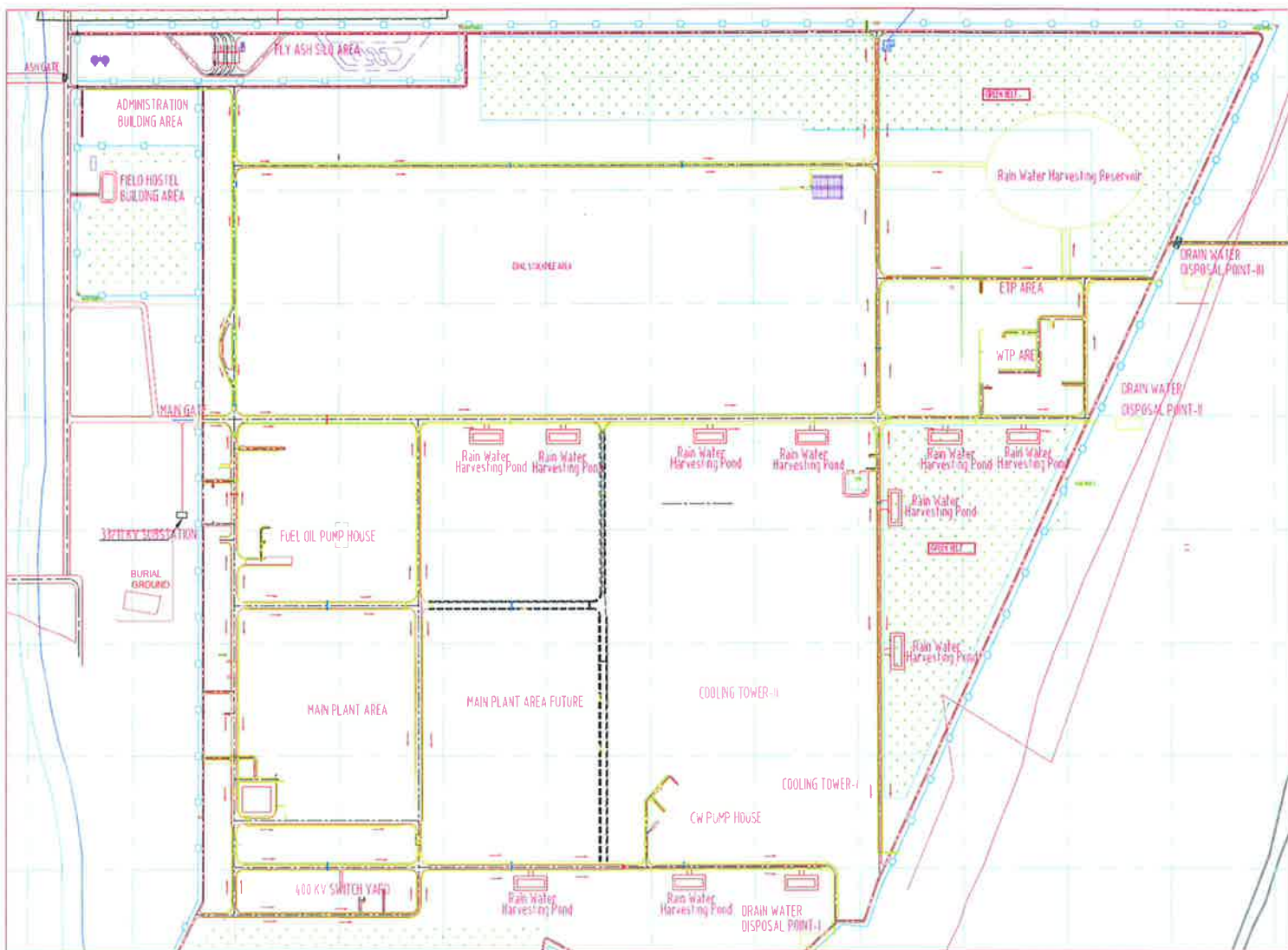
(vii) Internal drainage water, coal dust settling pond excess water, ETP and STP water is to be prevented in mixing with storm water.

(11) Monitoring of Piezometer Wells and other Net Work Observation Wells need to be undertaken four times in a year

Request:

TPCIL requests MoEF&CC to exempt TPCIL from conducting the Hydro-geological study on an annual basis.

Fig - 4 Surface Storm Rainwater Harvesting Plan



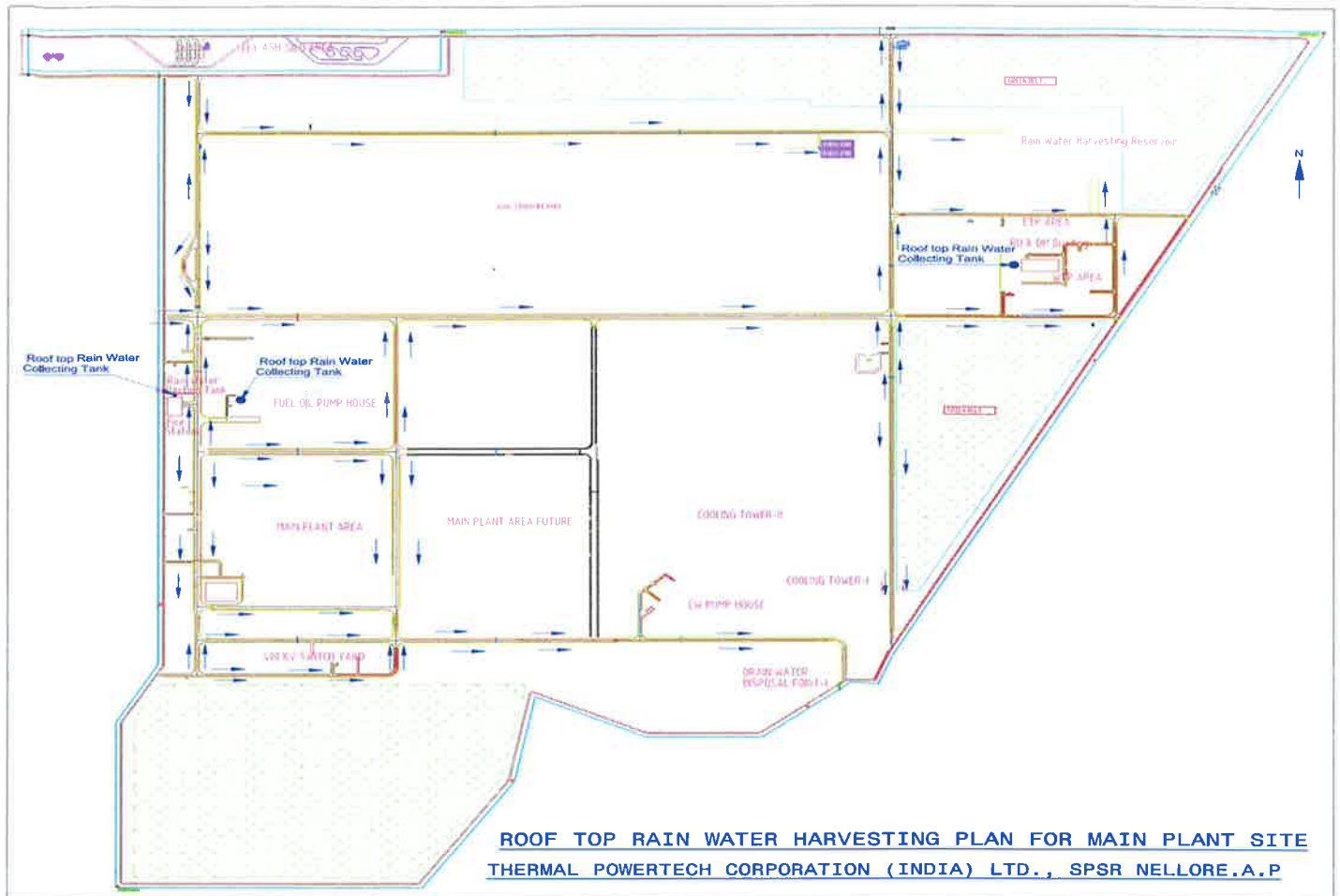


Fig – 5 Plan showing Roof top rainwater harvesting for main plant site.