

PROJECT PRE FEASIBILITY REPORT

On

Proposed Project

For

Manufacturing of Carbon Black

At

Survey No. 3705, 3708, 3719, 3725, 3738, 4108, 4110, 4318,

Village: Karanj, Taluka: Umbergaon

Dist.: Valsad, Gujarat

Project proponent



Madura Carbon India Ltd.

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CHAPTER – 1

EXECUTIVE SUMMARY

The project is summarized in the below table:

Table 1.1: Project Summary

PARTICULARS	DETAILS		
Name of the unit	M/s. Madura Carbon India Ltd.		
Occupier	Mr. Vipin Kalra (CMD)		
Products	S. No.	Name of the Product	Quantity
	1.	Carbon Black	230000 TPA
	2.	Thermal Power plant	45 MW
Location	Survey no. 3705, 3708, 3719, 3725, 3738, 4108, 4110, 4318, Village: Karanj, Taluka: Umbergaon, Dist.: Valsad, Gujarat		
Nature of project	Proposed project by manufacturing of Carbon Black (2,30,000 TPA) & Power Generation (45 MW)		
RESOURCES			
Resource type	Requirement	Source	
Land	94499 m ²	NA land	
Water	Total: 3220 kL/day (Fresh – 2890 kL/day + Recycle – 330 kL/day) <ul style="list-style-type: none"> • Domestic: 110 kL/day • Gardening: 175 kL/day • Industrial: 2935 kL/day 	Damanganga Canal Distry.	
Power	13 MW	TPP & DGVCL	
Fuel	CBFS (Carbon black feed stock)/ LDO/	Imported Local market	
POLLUTION POTENTIAL & MITIGATION MEASURES			
Parameter	Potential	Mitigation	
Wastewater	Total: 347 kL/day <ul style="list-style-type: none"> • Domestic: 100 kL/day • Industrial: 247 kL/day 	<ul style="list-style-type: none"> • The total domestic wastewater generated will be 100 kL/day which will be treated in STP. Treated water from STP will be used for gardening. • Wastewater generated from industrial activities will be 247 kL/day, from which 30 kL/day will be treated in ETP and the treated wastewater will be recycled for plant washing. Remaining water like boiler blowdown, CT blowdown & DM plant reject will be directed to RO. Permeate from RO will be recycled for plant uses. • Reject from RO-1 & RO-2 @84 kL/day will be evaporated in MEE. MEE condensate will be collected in plant water tank, from where it will be recycled for plant uses. Hence, there will be no discharge of treated effluent outside premises. 	
Air Emissions	<u>Emission from utility stack</u> <ul style="list-style-type: none"> • Boiler – 92 TPH x 2 nos. • Dryer – one no. • DG set – 1000 kVA x one no. 	<ul style="list-style-type: none"> • The utility emissions are likely to occur from boiler, DG set & dryer due to proposed project. • Mixed Gas/ Tail Gas from Carbon 	

PARTICULARS	DETAILS																						
					<p>Black Unit will be used as fuel in boiler & dryer. LDO/ HSD will be used as fuel in DG Set.</p> <ul style="list-style-type: none"> • Adequate chimney height will be provided. • Bag filter will be used as APCM • Good housekeeping will be maintained in the plant. 																		
Hazardous & solid waste	<table border="1"> <thead> <tr> <th data-bbox="475 539 523 600">Sr. No</th> <th data-bbox="523 539 644 600">Type of Waste</th> <th data-bbox="644 539 759 600">Category</th> <th data-bbox="759 539 887 600">Quantity (T/Annum)</th> </tr> </thead> <tbody> <tr> <td data-bbox="475 600 523 680">1</td> <td data-bbox="523 600 644 680">ETP Sludge + MEE Salt</td> <td data-bbox="644 600 759 680">35.3</td> <td data-bbox="759 600 887 680">200</td> </tr> <tr> <td data-bbox="475 680 523 761">2</td> <td data-bbox="523 680 644 761">Oily Cotton Waste</td> <td data-bbox="644 680 759 761">28.1</td> <td data-bbox="759 680 887 761">2</td> </tr> <tr> <td data-bbox="475 761 523 822">3</td> <td data-bbox="523 761 644 822">Spent used Oil</td> <td data-bbox="644 761 759 822">5.1</td> <td data-bbox="759 761 887 822">100</td> </tr> <tr> <td data-bbox="475 822 523 875">4</td> <td data-bbox="523 822 644 875">Discarded Bags</td> <td data-bbox="644 822 759 875">33.1</td> <td data-bbox="759 822 887 875">5</td> </tr> </tbody> </table>	Sr. No	Type of Waste	Category	Quantity (T/Annum)	1	ETP Sludge + MEE Salt	35.3	200	2	Oily Cotton Waste	28.1	2	3	Spent used Oil	5.1	100	4	Discarded Bags	33.1	5		<ul style="list-style-type: none"> • The Hazardous wastes will be handled, stored & transported as per CPCB/ MoEF Guidelines • ETP sludge will be disposed to TSDF site • Oily cotton waste will be incinerated at CHWIF. • Spent used oil & Discarded bags will be sold to registered re-processor..
Sr. No	Type of Waste	Category	Quantity (T/Annum)																				
1	ETP Sludge + MEE Salt	35.3	200																				
2	Oily Cotton Waste	28.1	2																				
3	Spent used Oil	5.1	100																				
4	Discarded Bags	33.1	5																				
Noise	<p>Proposed operations</p> <ul style="list-style-type: none"> • Inside the plant: <85 dB(A) 				<ul style="list-style-type: none"> • The major sources of noise generation in plant area will be equipment, boilers and pumps • DG sets will be provided with acoustic enclosure • Regular maintenance will be carried out. • Ear plugs and Ear muffs will be provided to the workers in Utility Section • Turbine will be equipped with sound proof chamber. 																		

CHAPTER – 2

INTRODUCTION OF THE PROJECT

2.1 IDENTIFICATION OF THE PROJECT AND PROJECT PROPONENT

2.1.1 IDENTIFICATION OF THE PROJECT

Madura Carbon India Limited, is to be located at survey no. 3705, 3708, 3719, 3725, 3738, 4108, 4110, 4318,, Village: Karanj, Taluka: Umbergaon, Dist. Valsad.

The list of products is provided in table 2.1.

Table 2.1: List of Product

S. No.	Name of the Product	Quantity
1.	Carbon Black	230000 TPA
2.	Thermal Power Plant (TPP)	45 MW

2.1.2 PROJECT PROPONENT

The list of directors for Madura Industrial Textiles Ltd. is given below –

Table 2.2: List of Directors

S. No.	Name of Directors	Residential Address
1.	Mr. Vipran Ramnath Kalra	21 A/ 21B, Royal Accord III, Lokhandwala Complex, Andheri (W), Mumbai – 400 053
2.	Mr. Anil Radheshyam Kalra	12 A/ 12B, Royal Accord III, Lokhandwala Complex, Andheri (W), Mumbai – 400 053
3.	Mr. Sanil Radheshyam Kalra	11 A/ 11B, Royal Accord III, Lokhandwala Complex, Andheri (W), Mumbai – 400 053
4.	Mrs. Promilla Raman Kalra	51, Royal Accord III, Lokhandwala Complex, Andheri (W), Mumbai – 400 053
5.	Mr. Gautam Kalra	21 A/ 21B, Royal Accord III, Lokhandwala Complex, Andheri (W), Mumbai – 400 053
6.	Mr. Rishi Kalra	51, Royal Accord III, Lokhandwala Complex, Andheri (W), Mumbai – 400 053
7.	Mr. Varun Kalra	12 A/ 12B, Royal Accord III, Lokhandwala Complex, Andheri (W), Mumbai – 400 053

2.1.3 NATURE OF THE PROJECT

The proposed project falls under **item no. 5(e) i.e. “Petroleum products and petrochemical based processing such as production of carbon black and electrode grade graphite (processes other than cracking and reformation and not covered under the complexes)”** and under the category **A** as it is not located in GIDC, as per the EIA notification, 14 September 2006 (& amendments).

Moreover, the project of power generation of 45 MW falls under item no. 1(d) i.e. Thermal Power Plants and under the category B (<50 MW and ≥ 5 MW (all other fuels except biomass and municipal solid non-hazardous waste) as per the EIA notification, 14 September 2006 (& amendments).

2.1.4 NEED OF PROJECT & DEMAND-SUPPLY GAP

Carbon black is reinforcing material & filler in rubber products. There is severe crisis, due to lack of availability of Carbon Black. Currently, the carbon black demand, including that of tyre manufacturers, is at 12.85 lakh tonnes while the country's manufacturing capacity is at 9.5 lakh tonnes.

Apparently the Carbon Black manufacturers were not aware that imposition of Anti-Dumping on Chinese Tyres would create a huge spike in demand for Carbon Black. Further, global supply constraints were causing increase in prices of Carbon Black.

Due to acute shortage and spiraling prices of Carbon Black in last months, all Rubber goods manufacturers are struggling to maintain their production and supply.

The industry are in a dilemma, that there is a serious shortfall leading to non-availability of Carbon Black, along with spiraling prices, and many of the small & medium industries are on the verge of closing down. Hence, this project will bridge for demand & gap.

2.1.5 IMPORTS VS. INDIGENOUS PRODUCTION

At present the carbon black from international market is not available at competitive prices. Increase in production can fill the gap.

2.1.6 EXPORT POSSIBILITY

The domestic production in the current scenario will have a competitive edge over the international prices which will help in bridging the gap of demand and supply for export.

2.1.7 DOMESTIC / EXPORT MARKETS

The rubber industry is growing domestically fast. There has been no increase in capacity of carbon black in last few years. The gap between demand and supply is increasing consistently.

2.1.8 EMPLOYMENT GENERATION DUE TO PROJECT

The proposed project will provide direct employment opportunity to 385 persons. The man-power required for the proposed project will be employed locally from the nearby areas.

CHAPTER – 3

PROJECT DESCRIPTION

3.1 TYPE & LOCATION OF THE PROJECT

3.1.1 TYPE

The proposed project is the new project for manufacturing of Carbon Black @230000TPA along with power generation @45 MW for utilization of the off-gas generated from the process.

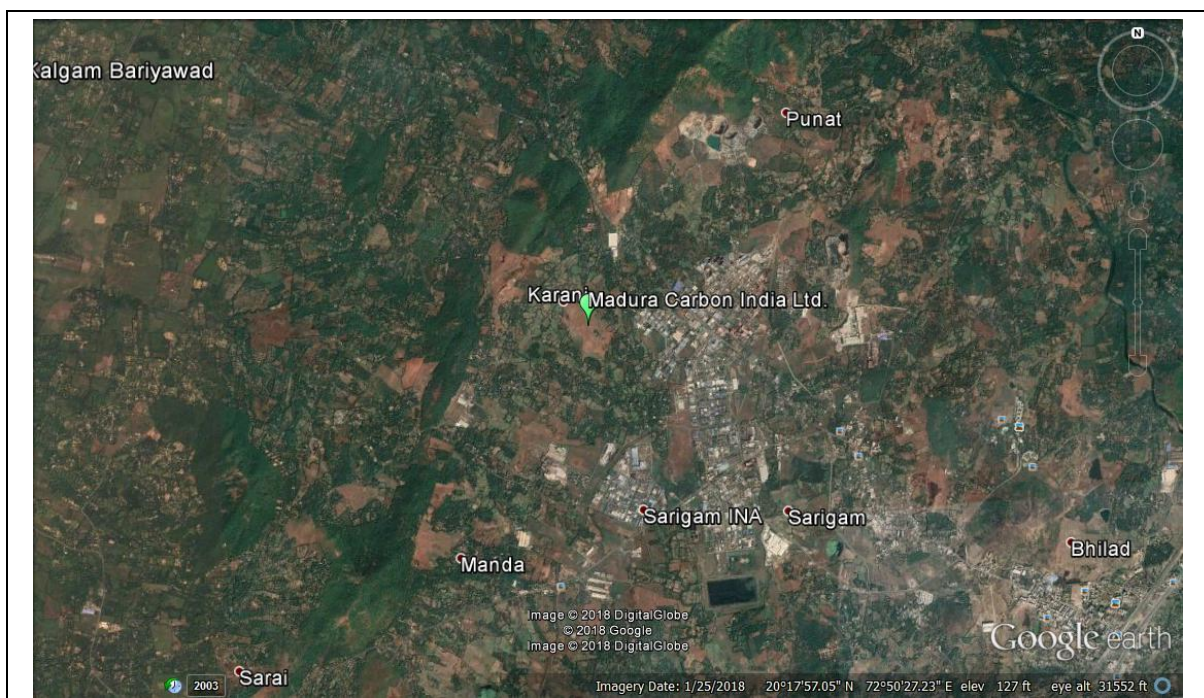
3.1.2 LOCATION

The project is to be located at survey no. 3705, 3708, 3719, 3725, 3738, 4108, 4110, 4318, Village: Karanj, Taluka: Umbergaon, Dist.:Valsad, Gujarat. The nearest town to the project site is Sarigam.

Sarigam GIDC is a cluster of profuse large-scale, medium scale and small-scale industries, engaged in manufacturing of various products, bulk drugs, organic pigments, Organic and Inorganic Chemicals,

The site is approximately 10-15 km from Vapi - a well-known industrial town. It is situated on the banks of Damanganga River in southern Gujarat, India. The satellite image of the project site is provided in figure 3.1 and the site layout plan of the project site in figure 3.2.

Figure 3.1: Satellite image of the project site



(Source: Google Earth)

3.2 DETAILS OF THE ALTERNATIVE SITE

Many sites were opted for plant but due to non-availability of such large area in GIDC Sarigam and due to vicinity of MCIL's sister concern unit, the particular site is selected.

- Sister concern unit of Madura Carbon India Ltd. is close to the GIDC Sarigam.
- Due to Sarigam industrial area, required skilled man power will be available easily.
- Location of site is approximately 6 km from NH8, which is very suitable for transportation of raw materials & finished products from proposed site.

Based on the above reasons, this location is most suitable for the proposed project.

3.3 SIZE & MAGNITUDE OF OPERATION

The proponent plans to establish a new project for manufacturing of carbon black 230000 T/annum along with a Thermal Power Plant of 45 MW for utilization of the off-gas generated from the process.

3.4 PROJECT DESCRIPTION WITH PROCESS DETAILS

3.4.1 CARBON BLACK

3.4.1.1 PROCESS DESCRIPTION

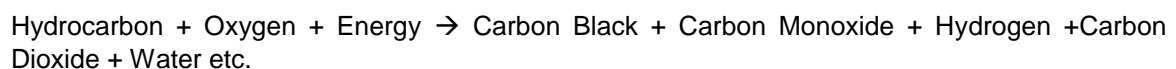
In this project, oil furnace black process will be used for producing carbon black.

Heavy aromatic oils of petroleum oil refinery or coal tar distillation units are used as main feedstock. The furnace is basically a specially designed refractory lined horizontal steel vessel having different segments like combustion zone, venture zone, reaction zone, quench zone & evaporation cum conveying sections.

Combustion zone or hot flue gas generating section: Secondary feed stock e.g., natural gas or fuel oil or sometimes the main feed stock in proper ratio with preheated air is introduced in this section to produce hot gas. Adiabatic flame Temperature is maintained nearly 1900°C-2000°C.

Venture section: Preheated main feed stock (aromatic oil) is introduced in atomized form under controlled conditions on the hot gas where liquid oil vaporizes. Velocity of gas stream maintained ~ 2000 FPM.

Reaction section: Pyrolysis of oil takes place in the vapour phase to form microscopic carbon particles. The basic reaction is dehydrogenation.



Quench zone: the reaction rate is controlled by using water sprays.

Evaporation cum conveying sections: Water vaporizes in this zone. After all, carbon particles along with combustion gas convey to the next downstream equipment.

Furnace black process consists of several downstream sections after reactor e.g., Heat recovery sections, filtration sections, conveying section, beading & drying sections and finished product transportation & storage, ware housing, pulling & dispatch section. The process which is selected for this project is illustrated below.

Heat recovery sections: Hot reactor combustion gas along with carbon black particles are cooled down by air. Preheated air is used in combustion section of reactor. Relatively cooled combustion gas along with carbon black again passes through oil preheater to preheat main feed stock. After passing

through oil preheater, the combustion gas has sufficient sensible heat. In most of the energy efficient carbon black plants have in line sensible heat recovery (waste heat recovery) boilers. Saturated Steam is generated from waste heat recovery boilers which are used for steam tracing, & other equipment heating purposes.

Main Filtration section: High filtration efficiency pulsejet bag filter modules (main filter) will be used for filtering carbon black from carbon black laden gas (process gas). A specially designed agglomerator unit will be installed before bag house to agglomerate carbon black particles. This agglomerator unit will not only enhance filtration efficiency, it will also enhance life of the filter cloth. Agglomerated carbon black particles will be deposited on the outer surface of the cloth and compressed air pulse will release carbon black particles from bags. A sequential timer will be used in pulsing system. Gas will pass through bags and finally it will be passed through a common header which is connected to other downstream unit e.g., dryer combustor etc. Carbon black dislodge from the bags will be collected in hopper. Accumulated carbon black powder will be transported to the conveying system via rotary air locks.

Conveying system: It consists of drop box of rotary air locks, suction conveying ducts, conveying fans, conveying fan discharge ducts, conveying bag filter, conveying bag filter vent scrubber & a surge tank at the bottom of conveying bag house. All the rotary air locks placed at the bottom of main bag filter modules will be discharging carbon black particles to a common duct which is connected with a pneumatic conveying fan. In this process, air will be used for conveying carbon black. All carbon black particles from the rotary air locks discharge will be picked up by air and conveyed to another bag filter called conveying bag filter by conveying fans. Air from the bag filter can be vented to atmosphere after passing through venture scrubber. Carbon black collected from bag filter will be stored in surge tank to remove adsorbed air from carbon black.

Beading & drying system: The beading & drying system consists of pelletizer, polisher, rotary dryer with insulated jacket and combustor as hot gas generator and purge gas filter. Fluffy carbon black, water and molasses solution (used as binder) mixed in pelletizer to form beads. Polishers are also used for making uniform diameter beads or pallets. This polisher also helps to reduce fines in carbon black. After polishing the pallets, the wet pallets pass through indirect heating rotary dryer to remove water from pallets. Hot gas required for drying is generated in refractory lined combustor. Process combustion gas from main bag filter is used as fuel in combustor. Vapour generated inside dryer along with fines is sucked by purge gas fan and filter through purge gas filter. Carbon black from purge gas filter is connected in main conveying line and vapour is vented to atmosphere after passing through venture scrubber.

Product transportation & storage: This section consists of elevator, screw conveyors magnetic separator, rotary screen, storage silos, off spec silo & de dusting bag house. Dried carbon black is transported to final storage silos by above mentioned material handling equipment.

Warehouse, pulling & dispatch section: Depending on customer requirement, the granular carbon black is packed in 25 kg paper bag or in 1 m PP jumbo bulk bags.

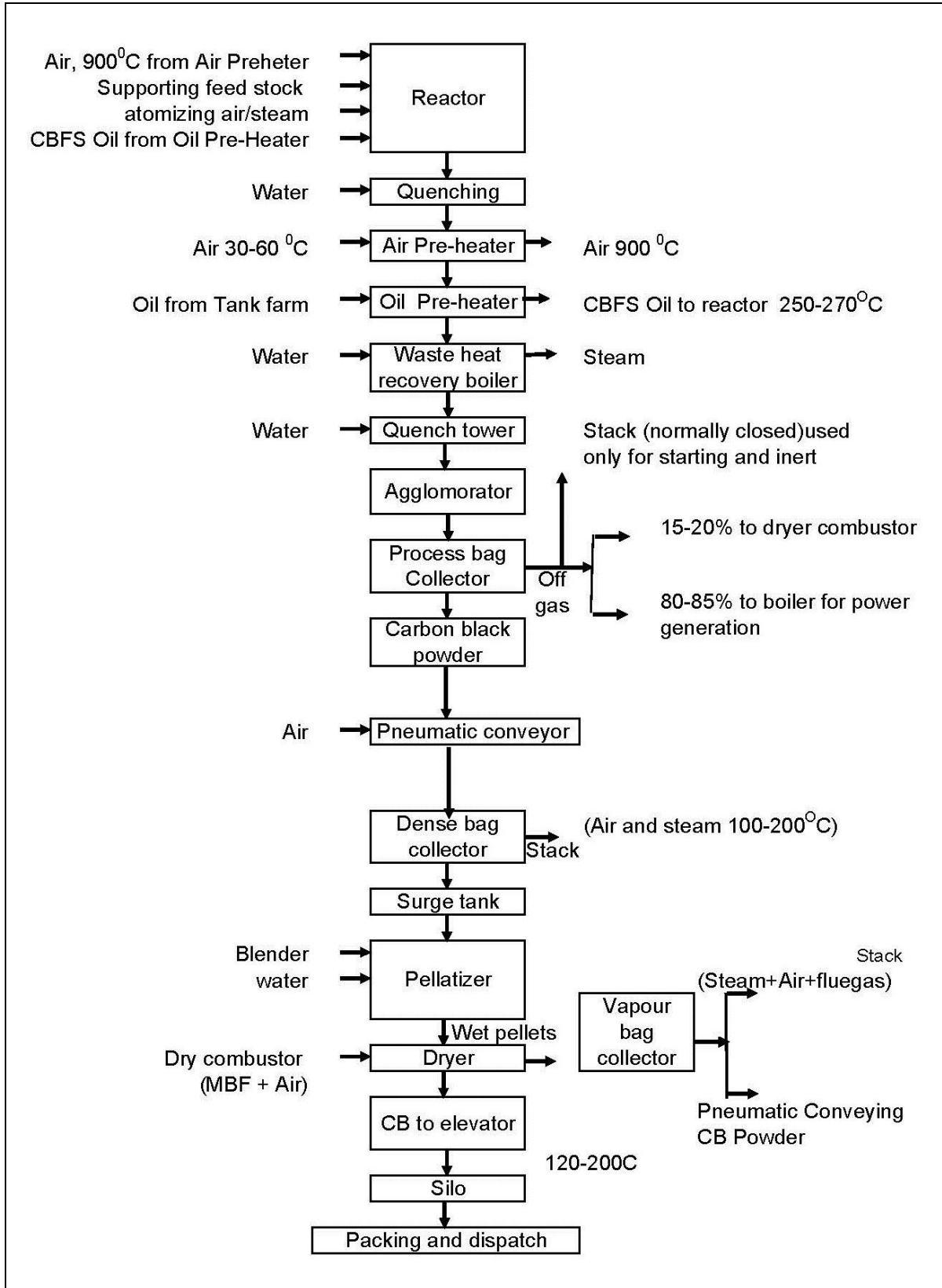
Capacity & Conversion: The capacity of the reactor is mainly dependent on air rate and oil BMCI. The reactor is designed for an air rate of 13500 nm³/hr. An output of 78 T/day/reactor for N-330 grade will be produced based on 130 BMCI oil. The yield for N-330 grade will be 56% on total oil. The production capacity & yield will be different for other grades.

Energy efficiency: The system will be designed to extract heat up to 80%. Approximately 7.5 T steam/ton of carbon black will be generated. The major part of steam will be used for sale to other process industry and some will be used for power generation at a later stage in co-generation system. The power consumption for the process would be 350 kWh/T of carbon black.

Emission: The system would be designed to control particulate matter well within the GPCB & CPCB norms, around 50-60 mg/Nm³. The stacks for gas emission would be designed for height and velocity

to comply with the GPCB & CPCB laid norms to ensure minimum impact from NO_x and SO_x emissions. The pollution control system will be designed to ensure zero discharge from the plant.

3.4.1.2 PROCESS FLOW DIAGRAM



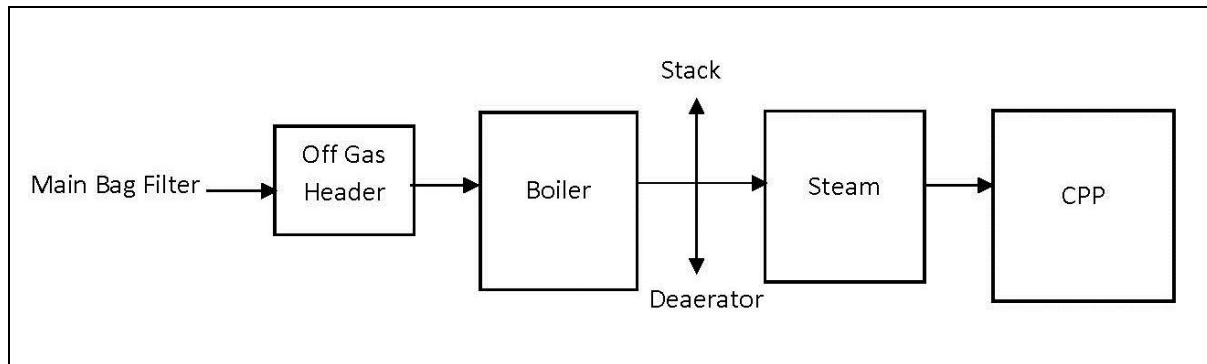
3.4.1.3 MATERIAL BALANCE

Table 3.1: Material balance for carbon black

S. No.	Raw material	Input/T of Product	Quantity(T/T)		Remarks
			Output/T of Product		
1	Carbon Black Feed Stock as raw material	1.71	Carbon black	1	--
2	CBFS / LDO as secondary fuel	0.15	Off gas	3.2647	Off gas will be used for dryer combustor and boiler for power plant
3	Molasses	0.0045	--	--	--
4	Potassium Nitrate	0.0002	--	--	--
5	Water	2.4	--	--	--
	Total	4.2647	--	4.2647	--

3.4.2 THERMAL POWER PLANT

3.4.2.1 PROCESS FLOW DIAGRAM



3.4.2.2 PROCESS DESCRIPTION

Low Btu off gases generated in the manufacturing process of CB in the reactor section and separated from accompanying CB particles in PBC section are collected in the off gas header. In spite of their low calorific value, these gases can be utilized to recover their calorific value in a specially designed boiler system to generate high pressure steam and in a specially designed dryer combustor furnace to supply the heat energy requirements in the pelletizing and drying section.

The quantum of high pressure steam which can be generated through burning of these off gases meets the plant requirement of steam and power.

So the benefit of above scheme is being fully taken care of by installing the following system:

1. High pressure boiler system
2. Turbo Generators
3. Power Export

High pressure boiler which can be run on a combination of off gases generates high pressure superheated steam at 88atm & 525°C. This high-pressure steam is used to generate sufficient power required for plant consumption through turbo generator system.

3.5 RAW MATERIAL FOR FINISHED PRODUCTS

The raw materials for the proposed range of products will be indigenously available and will be also imported. The product-wise raw-material consumption is given in Table 3.1.

Table 3.2: List of Raw Materials

Name of product	Raw material	Requirement (T/T of product)
Carbon Black	Carbon Black Feed Stock as raw material	1.71
	CBFS / secondary fuel	0.15
	Molasses	0.0045
	Potassium Nitrate	0.0002

3.6 STORAGE & TRANSPORT OF RAW MATERIAL

The details of storage and transportation of raw materials & products are given in Table 3.2 below:

Table 3.3: Details of storage of materials

Name	Source	Means of transportation	Means of storage (No. of containers & size)	Storage Location	Max. Qty. to be stored at any given time i.e. storage capacity
Product					
Carbon Black	--	Trucks	Bulk Bag & Paper Bag	Ware House	3000 T
Raw Materials					
Carbon Black Feed Stock as raw material	Import & Indian Market	Tankers	6 x 5000 kL (Tanks) 6 x 1250 kL (Tanks)	Tank Farm	20000 kL
Molasses	Local	Tankers	60 kL (1 Tank)	Tank	60 kL
Potassium Nitrate	Local	Truck	50 kg Bags	In Store	3 T

3.7 RESOURCE OPTIMIZATION & AVAILABILITY

The major resources for the proposed project will be plant & machinery, raw-materials, power, fuel, water, man-power, etc.

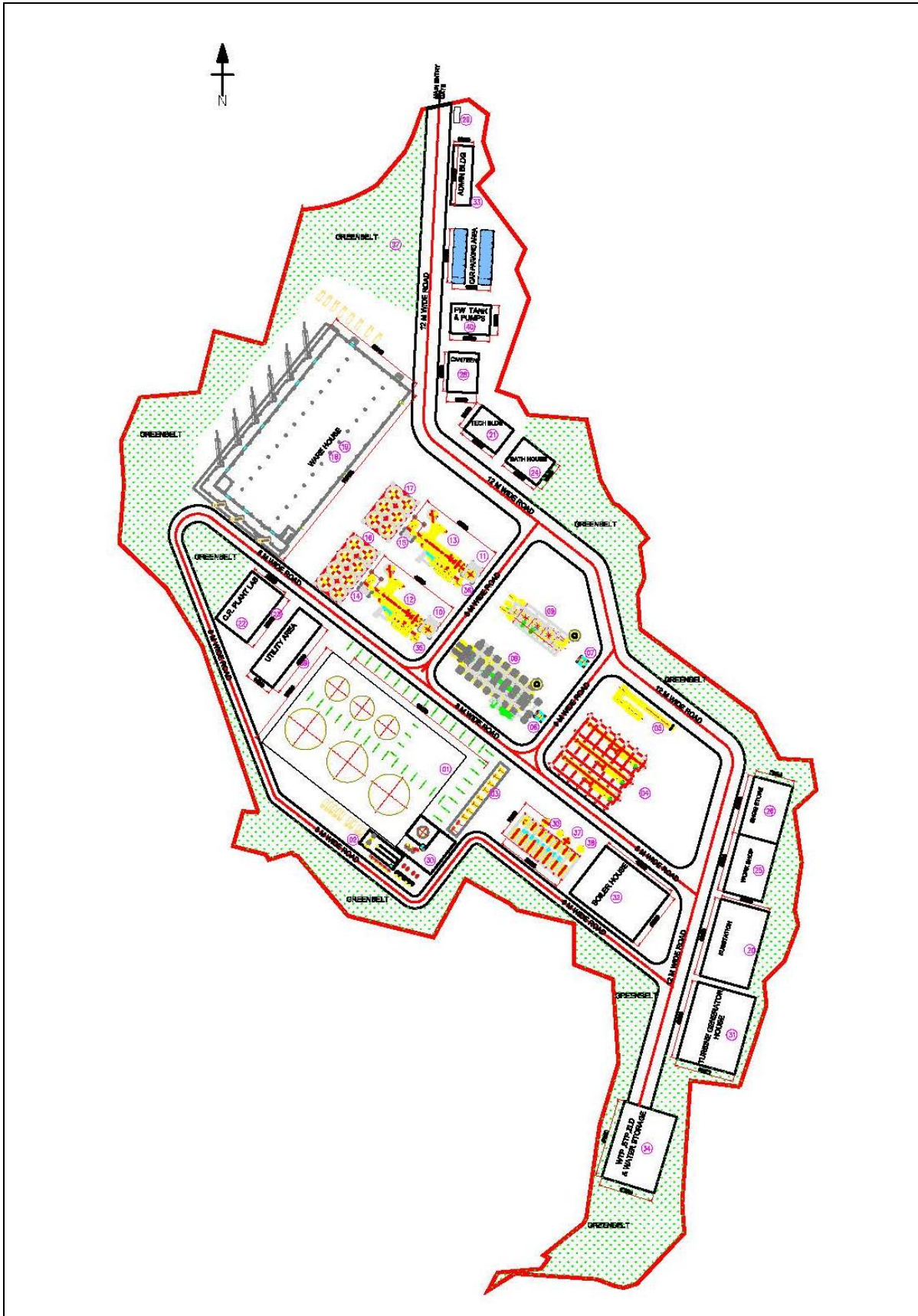
3.7.1 Land & Building Requirement

Total plot area for proposed project will be 94499 m². The 63AA permission for proposed land is obtained.

Table 3.4: Area Statement

Sr. No.	Description	Area (m ²)
1.	Built-up Area	30307
2.	Open Area (Roads, Drains, Space)	40755
3.	Greenbelt Area	23437
	Total	94499

Figure 3.2: Layout of Project Site



3.7.2 Equipment

Based on process necessity, list of the proposed equipment's and machinery is given in table 3.5.

Table 3.5: List of Proposed Equipment

Sr. No.	Equipment	Capacity x Size
1	Oil Tank Storage and Unloading / Charging System (Day Tanks)	6 Nos X 5000 kL + 6Nos X 1250 kL
2	Process Air Blowers	8 Nos.
3	Air Compressors (Normal & HP)	5 X 2 Nos.
4	KNO ₃ Dosing System	2 X 2 Nos.
5	Reactors	8 Nos.
6	Air Preheater	8 Nos.
7	Oil Preheater	8 Nos.
8	In-line Boiler	6 Nos. X 3 TPH 2 Nos. X 3.5 TPH
9	Quench Tower	4 Nos.
10	Agglomerator	4 Nos.
11	Process Bag Collectors	13 X 2 Modules
12	Pneumatic Conveying System	2 X 2 Nos.
13	Dense Tank Bag Collectors	4 X 2 Nos.
14	Dense (Surge) Tank	3 X 2 Nos.
15	Pelletizing System	4 Nos.
16	Dryer System along with Vapor Bag Collectors	2 Nos. X 240 TPD
17	Dryer System along with Vapor Bag Collectors	2 Nos. X 180 TPD
18	Fugitive Dedusting bag filter Systems	Lot
19	Elevator	4 Nos.
20	Screw Conveyors & Product Distribution System	Bulk
21	Product Silos	2 X 14 Nos. X 150 T
22	Packing Machines with Rerun System including Palletizer	Lot
23	Water pumps & Storage Tanks	Lot
24	Electrical Distribution System	Lot
25	Instrumentation System	Lot
26	Civil, Structure, Warehouse, Non-Plant Building & Roads	Lot
27	Piping System	Lot
28	Fire Fighting System	Lot
29	Cooling tower	2400 m ³ /day
30	Power Plant with Tail Gas Boiler & Air Cooled Condensers	2 X 16 MW + 2 X 6.5 MW Boiler (2 Nos. X 92 TPH)
31	Reject silos	2 X 2 Nos.

3.7.3 Power Requirement

For proposed project 13 MW power will be required. The total requirement will be fulfilled by in-house TPP & Dakshin Gujarat Vij Co. Ltd. (DGVCL).

3.7.4 Fuel Requirement

LDO /FO/CBFS will be used as auxiliary fuel for startup in boilers & dryer. HSD will be used as fuel in D.G. Set. CBFS will be Imported & sourced from Indian Market also. LDO, HSD & FO sources from local market. Tail gas will be generated during carbon black manufacturing process.

3.7.5 Water Requirement

Necessary water requirement for the proposed project will be fulfilled from Damanganga Canal Distry. Total water requirement for proposed project will be 3220 kL/day. From which 2890 kL/day will be fresh water & remaining 330 kL/day will be recycled water

The category wise bifurcation of the water requirement is given in the Water Balance Data in Table 3.6.

Table 3.6: Total Water Consumption (kL/day)

S. No.	Particulars	Requirement (kL/day)		
		Fresh	Recycle	Total
1.	Domestic	0	110	110
2.	Gardening	0	175	175
3.	Industrial			
4.	Process	1500	0	1500
5.	Cooling Tower (Make-up)	84	16	100
6.	Boiler (Make-up)	220	0	220
7.	DM plant Regeneration	16	0	16
8.	Plant Washing	1	29	30
9.	Dryer	1040	0	1040
10.	RO Reject	29	0	29
	Sub-Total: Industrial	2890	45	2935
	Grand Total	2890	330	3220

3.7.6 Man-Power Requirement

The man-power required for the project will be employed locally from the nearby areas. Skilled as well as unskilled labor will be employed for the project. Due to proposed project, 385 persons will be employed. The man-power requirement for the proposed expansion project is provided in table 3.7.

Table 3.7: Man-power requirement

S. No.	Types of Employee	Numbers of Manpower
1	Managerial	15
2	Supervisory	60
3	Skilled	100
4	Unskilled	160
5	Others	50
Total		385

3.8 QUANTITY OF WASTE TO BE GENERATED

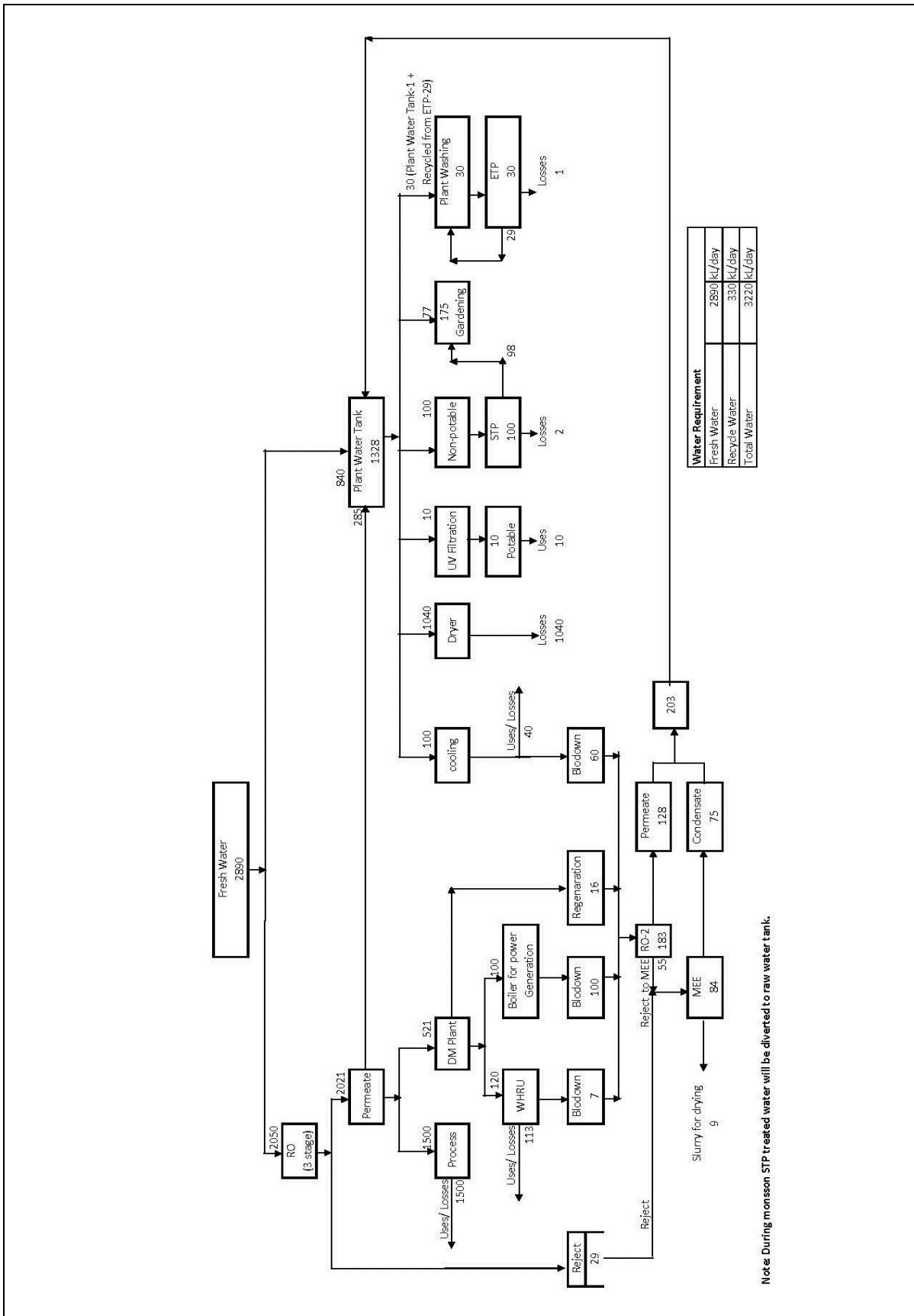
3.8.1 WASTE WATER GENERATION & MANAGEMENT

The category wise bifurcation of the wastewater generation is given in table 3.8.

Table 3.8: Category-wise Wastewater Generation

Particulars	Wastewater Generation (in kl/day)
Domestic	100
Industrial	
Process	0
Cooling tower blow down	60
Plant Washing	30
Boiler blow down	107
DM plant Regeneration	16
RO Reject	34
Sub – Total: Industrial	247
Grand Total	347

Figure 3.3: Water Balance Diagram (kL/day)



3.8.1.1 WASTE WATER TREATMENT AND DISPOSAL

The total domestic wastewater generated will be 100 kL/day which will be treated in STP. Treated water from STP will be used for gardening.

Industrial waste water is Categorized in two section as following:

1. Effluent from Plant wash: It is further sub categorized in two section which are:

- i) Effluent containing free floating oil particles from tank farm & reactor section of plant passes through Oil Skimmer to reduce the oil content and then passes through Pressure sand bed filter before being recycled back either for plant wash.
- ii) Effluent containing Suspended carbon black particle from Bag filter, Silo & Packing area passes through Pressure sand bed filter before being recycled back for plant wash.

2. Effluent from DM Unit, boiler & CT blowdown: Boiler blowdown, CT blowdown & DM plant reject will be directed to Neutralization cum collection pit before being sent to RO. Permeate from RO will be recycled back for plant uses

3. Reject from RO-1 & RO-2: Reject from RO-1 & RO-2 will be directed to MEE for evaporation. Recovered condensate will be recycled back for plant uses.

Table 3.8: ETP units

Sr. No.	Unit	Quantity (Nos.)	Capacity
1	Oil & Grease Trap	1	30 kL/day
2	Collection cum Neutralization Tank	1	100 kL/day
3	Multi Effect Evaporator	1	100 kL/day

3.9 AIR EMISSION AND CONTROL

3.9.1 PROCESS EMISSIONS

The details of process vents are provided in table 3.9.

Table 3.9: Details of process vents

Sr. No	Stack attached to	No of Stack	Height (m)	Emissions	Air Pollution Control Measures Attached
1	Process Bag Collector	4	35	Normally closed	Stack (Normally closed)
2	Dense Bag collector	4	35	PM	Bag Filter/Adequate stack Height
3	Vapor Bag collector	4	35	PM, SO ₂ , NO _x (as NO ₂)	Bag Filter /Adequate stack Height

3.9.2 UTILITY EMISSIONS

The details of utility stacks are provided in table 3.10.

Table 3.10: Details of utility emissions

Sr. No	Locations	Fuel	Stack Height	Emissions
1	Boiler – 2 nos. Capacity: 92 TPH	Mixed Gas/ Tail Gas from CB Unit/ Fuel Oil	100 m	PM, SO ₂ , NO _x
2	DG Set - stand by – one no. Capacity: 1000 kVA	LDO /HSD	35 m	PM, SO ₂ , NO _x
3	Dryer – 4 nos.	Mixed Gas/ Tail Gas from CB Unit / Fuel Oil	Common stack -2 nos. 60 m (each)	PM, SO ₂ , NO _x

3.9.3 FUGITIVE EMISSIONS

The fugitive emissions are likely to occur from following sources:

- Equipment leaks like pumps, pipelines, reactors etc.
- Process venting
- Evaporation losses
- Accident and equipment failures

Following measures will be adopted to control fugitive emissions:

- All vessels used in the manufacturing areas shall be closed and the transfer of material within the plant shall be through pipelines.
- A Leak detection and repair (LDAR) will be prepared and implement.
- Pumps will have double mechanical seal to prevent any chance of emission.
- Detectors will be installed near all potential sources of leakage to detect and provide alarm in case of any leakage.

3.10 HAZARDOUS AND NON-HAZARDOUS WASTE MANAGEMENT

The detail of the hazardous waste and its management is given below in table 3.11.

Table 3.11: Hazardous and Solid waste generation, management and disposal

Sr. No	Type of Waste	Category	Quantity (T/Annum)	Disposal
1	ETP Sludge+ MEE Salt	35.3	200	Disposal at TDSF
2	Oily Cotton Waste	28.1	2	Incineration at CHWIF
3	Spent used Oil	5.1	100	Sale to reprocessor
4	Discarded Bags	33.1	5	Sale to reprocessor

3.11 NOISE CONTROL

Noise are likely to generate in the process area mainly from operation of heavy duty motors, blowers and compressors in various sections of the manufacturing plant area. The compressors and blowers' operation in utility area also result in high noise generation viz. above 85 dB (A). Due to power plant operations, noise pollution is arising from turbine, compressor, generator room, etc. Also there will no generation of noise from soot blowing. The control measures to be taken for reduction in noise levels are as below:

- The plant and equipment will be specified and designed with a view to minimize noise pollution.
- The major noise producing equipment such as turbine will be provided with acoustic enclosure.
- Sturdy foundation & pads to all the noise generating equipment will be provided.
- Ear Plugs and Ear muffs will be provided to the workers in Utility Section.

- Regular maintenance of equipment's will be carried out to minimize the noise generated by the equipment's.
- Regular monitoring of noise levels at all areas will be carried out.
- Greenbelt will be maintained.

3.12 HEALTH AND SAFETY MEASURES

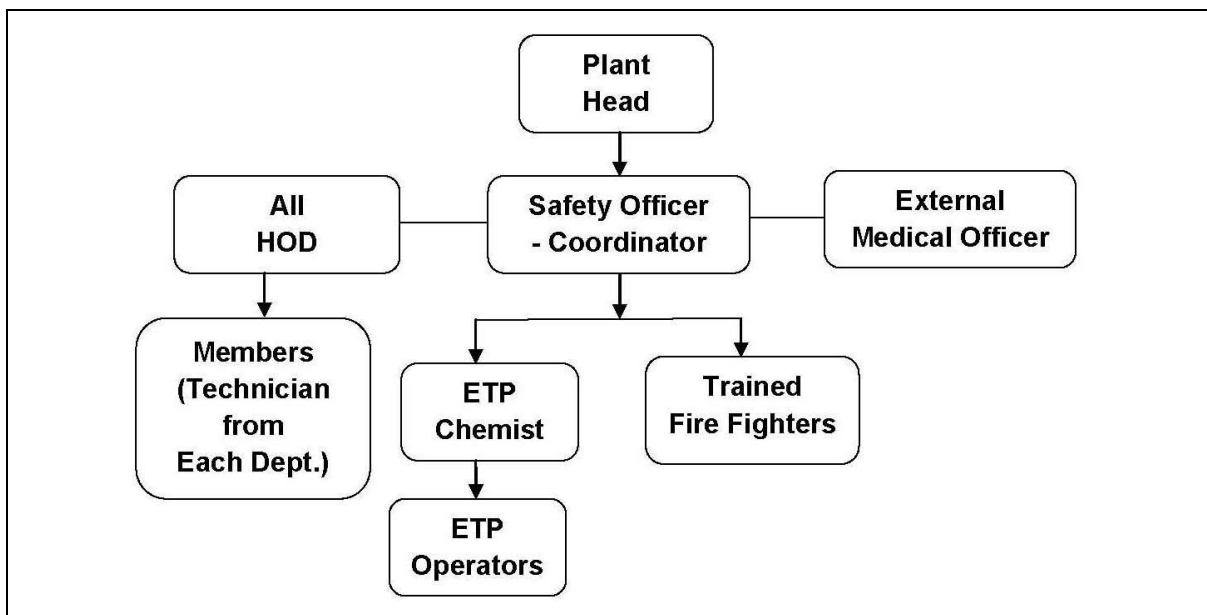
In proposed operations, following safety measures to be implemented:

- Fire hydrant system will be provided.
- Automatic hydrant sprinkler system will be provided.
- Fire extinguishers of proper type & size will be placed in complete plant as per rules & regulations.
- All other area of the plant will be fully ventilated for human comfort.
- First Aid facility will be provided at all the necessary locations.
- Personal protective gears and equipment's will be provided to the employees.
- Health check-ups will be organized at regular intervals.
- Safety Training will be provided to the employees timely.
- Manual call bells in case of emergency will be provided.
- Emergency Control Room with emergency sirens will be established.

3.13 ENVIRONMENTAL HEALTH & SAFETY CELL

The environment cell will also be responsible to plan, implement and monitor the environmental performance of the proposed project.

Figure 3.4: Organogram of proposed EHS Cell



CHAPTER – 4

SITE ANALYSIS

4.1 CONNECTIVITY

The proposed project is located in Village: Karanj, Taluka: Umbergaon, Dist.:Valsad, Gujarat. The nearest town to the project site is Sarigam which is situated at about 2.59 kms from project site. The site is approximately 6.1 km from National Highway. The land and infrastructure is already available and the raw material is easily available through the easy transport via road connectivity. The nearest Railway station is Bhilad railway station which is approximately 5.85 km from the project site.

4.2 LANDFORM, LAND USE & LAND OWNERSHIP

The land is currently vacant land purchased from private owners. The total land area is 235239 m².

4.3 TOPOGRAPHY

The topography of land is flat.

4.4 SALIENT FEATURES

Table 4.1: Salient Features of the Project Site

S. No.	Particulars	Details
1	Village	Karanj
2	Taluka/ Tehsil	Umbergaon
3	District	Valsad
4	Nearest Town	Sarigam ≈ 2.59 km (SE)
5	Approx. Geographical positioning	Lat.: 20°18'7.41"N, Long: 72°50'20.66"E
6	Nearest Water body	River Damanganga ≈ 6.66 km. (NE) River Darotha ≈ 5.00 km (E)
7	Nearest Highway	N.H. 8 ≈ 6.1 km (E)
8	Nearest Railway line/ Railway station	Bhilad ≈ 5.85 km (SE)
9	Nearest Airport/ Airbase	Airport - Daman ≈ 14.5 km (N)
10	Reserved Forests	Patches of RF within 10 km radial periphery of project site.
11	Protected Areas/ Sanctuaries	No
12	State/ International boundary	UT of Daman & Diu ≈ 7.65 km (NE)
13	Defense installations	No
14	CRZ applicability	No
15	Seismicity	Seismic Zone-III (Moderate)

Note: All the above mentioned distances are the aerial distance from the project site

4.5 EXISTING INFRASTRUCTURE

Well-developed infrastructure is available around the site.

4.6 SOIL CLASSIFICATION

About 60% of the Umbergaon taluka is covered by Ustropepts, of which Calcarious Typic Ustropepts soil is predominant. Typic Chromusterts with small amount of Vertic Ustropepts are the other soil types found in Umbergaon taluka along.

4.7 CLIMATE & METEOROLOGY

The year can be divided into four seasons. Climate is warm and dry from mid-March to June, during season of summer, climate remains warm and dry, while during rainy season, from mid-June to end of

September, climate is humid and pleasant. From October to November mild warm climate prevails, and from December to February climate is cold.

The Table 4.2 indicates the summary of meteorological pattern at the nearest observatory of IMD, Dahanu published by IMD.

Table 4.2: Summary Meteorological Data at nearest IMD Station –Dahanu

Location: In the compound of Old Girdhardhas Dispensary, DAHANU, Maharashtra (Lat: N 19° 58', Long: E 72° 43')									
Aerial Dist from Project Site: Approx.40.48 km (SSW)									
Height of installation: 11m above MSL,									
Month	Temperature (°C)		Relative Humidity (%)		Cloud Cover (Oktas)		Mean Wind Speed (m/s)	Pre-dominant Wind Direction	Rainfall (mm)
	Max.	Min.	Mor.	Eve.	Max.	Min.			
January	27.7	16.5	67	69	1.3	1.1	11.3	N	0.2
February	28.3	17.4	66	69	1.1	0.8	11.7	N	0.2
March	30.3	20.7	68	67	1.4	1.1	12.9	N	0.1
April	32.2	24.0	74	69	2.1	1.4	13.7	W	0.1
May	33.1	26.8	77	73	3.8	2.3	15.5	W	5.2
June	32.2	26.3	85	80	6.1	5.6	17.7	SW	522.1
July	30.1	25.0	89	84	7.1	6.8	22.6	SW	771.7
August	29.5	24.7	88	83	6.9	6.7	22.6	W	502.3
September	30.0	24.0	87	79	5.4	4.9	14.6	W	319.1
October	32.1	23.1	77	72	2.8	2.4	10.0	E	44.4
November	32.1	20.5	67	71	1.9	1.9	9.4	N	17.1
December	29.8	18.0	67	71	1.6	1.5	10.0	N	0.3

(Source: Book "Climatological tables of Observatories in India (1951 - 1980)" published by IMD)

4.7.1 TEMPERATURE

The summer season from March to May is a one of continuous increase in temperatures which decreases during monsoons, increases slightly during the post-monsoon season and again decreases during the winter. May is generally the hottest month with the mean daily maximum temperature recorded at 33.1 °C and mean daily minimum temperature recorded at 26.8°C. January is the coldest month with the mean daily maximum temperature as 27.7 °C and mean daily minimum temperature observed as 16.5 °C.

4.7.2 HUMIDITY

The climate of the region is characterized by a humid summer because of the closeness to coastline. Humidity is usually high during the monsoon months, with average relative humidity generally exceeding 80%. Humidity decreases gradually during the post-monsoon months and for rest of the year i.e. the period of December to April, the average relative humidity ranges around 50-70%.

4.7.3 RAINFALL

About 95% of the annual rainfall is received during the southwest monsoon season i.e. from June to September, July being the month with highest rainfall. The total annual rainfall observed from the historical data of year 1951-1980 is 2182 mm.

4.7.4 WIND PATTERN

The annual resultant vector for wind direction shows winds blowing from WSW. During summers and monsoon, the winds blow mostly from the sea i.e. the SW or WSW direction. The post-monsoon & winter seasons experience a change in direction, with the winds blowing from NE, ENE or NNE. The

wind speed is high during monsoon and post monsoon seasons, slightly moderate during summer and winter seasons.

4.8 SOCIAL INFRASTRUCTURE

The infrastructure available in the study area denotes the economic well-being of the region. There are about 43 villages and 7 Towns in the Umbergaoun Taluka.

4.8.1 EDUCATIONAL FACILITIES

As per census of India, 113 Primary school, 0 Middle School, 13 Secondary School, 6 senior secondary school and 0 Training institute were found in 43 villages. The female literacy rate is 59%.

4.8.2 MEDICAL FACILITIES

Out of the 43 villages, There is no hospital in villages, There is no Dispensary in villages, Primary health centers in 6 villages and Primary health sub center in 39 villages.

CHAPTER – 5

PLANNING BRIEF

5.1 PLANNING CONCEPT

The project is to be located in Village: Karanj, Taluka: Umbergaon, Dist.:Valsad, Gujarat. The nearest town to the project site is Sarigam which is situated at about 2.59 kms from project site. The region is well planned with all the basic infrastructural facilities like internal roads, water supply, arrangements for power, streetlights, solid waste disposal sites etc.

5.2 DEMOGRAPHIC DETAILS

The average household size is around 4 to 5.

Table 5.1: Distribution of population

Sr. No.	Particulars	Observed values in Umbergaoun Taluka
1	Total Population	522408
2	No. of Households	109628
3	Avg. household size (persons)	5
4	Male population	270118
5	Male population (in %)	51.7%
6	Female population	252290
7	Female population (in %)	48.3
8	Sex ratio	934

(Source: Primary Census Abstract – Census of India, 2011)

5.3 AREA STATEMENT

The proposed project will be established in an area of approx. 94499 m². The establishment will include required buildings for manufacturing facilities, utilities including additional ETP, admin building and internal roads for proper movement. A thick greenbelt will be developed around the periphery of the plant area.

5.4 ASSESMENT OF INFRASTRUCTURE DEMAND (PHYSICAL & SOCIAL)

In this proposed project the company will acquire plant and machinery so there will be some demand of change in physical infrastructure and social infrastructure. As manpower requirement for the proposed project shall be fulfilled locally, employment generation will lead to additional benefits to social infrastructure.

5.5 AMENITIES/ FACILITIES

5.5.1 DRINKING WATER FACILITIES

Tap water is available in 34 villages as per the Census 2011. 8 had Wells, 16 villages had tanks and all vilages had hand pumps. 31 Villages had River passing. Power supply was also available in all the villages.

5.5.2 POWER SUPPLY FACILITIES

As per census 2011, all the villages have power supply facilities in the study region.

5.5.3 COMMUNICATION & BANKING FACILITIES

Communication facilities like Post and telegraph, telephones exist in almost all the villages as per the 2011 census.

5.5.4 TRANSPORT FACILITIES

Bus service is available in the study region. The villages are well connected with the State Highways. National Highway-8 also passes from Bhilad. The Western railway line between Bombay to Ahmedabad passes from the study region and Bhilad Town has a railway station on the same.

CHAPTER – 6

PROPOSED INFRASTRUCTURE

6.1 INDUSTRIAL AREA

The total area of the land will be 235239 m².

6.2 RESIDENTIAL AREA

In the said proposal, temporary residence will be provided to no proposed construction workers.

6.3 GREENBELT AREA

Maximum open land will be allotted for green belt development. If required, experts will also be consulted for selection of species for the development of the greenbelt.

6.4 SOCIAL INFRASTRUCTURE

6.5 CONNECTIVITY

The proposed project is located in Village: Karanj, Taluka: Umbergaon, Dist.:Valsad, Gujarat. The nearest town to the project site is Sarigam which is situated at about 2.59 kms from project site. The site is approximately 6.1 km from National Highway. The land and infrastructure is already available and the raw material is easily available through the easy transport via road connectivity. The nearest Railway station is Bhilad railway station which is approximately 5.85 km from the project site.

6.6 DRINKING WATER MANAGEMENT

The fresh water to be sourced from Damanganga Canal Distributory. Adequate treatment will be provided to source water before use.

6.7 SEWARAGE SYSTEM

From proposed operation, the domestic waste water generated @100 kl/day will be treated in STP.

6.8 INDUSTRIAL WASTE MANAGEMENT

Industrial Effluent will be treated in the Effluent Treatment Plant at the site. Details are explained in Chapter 03, Section 3.8.1.

6.9 SOLID WASTE MANAGEMENT

Hazardous wastes generated will be in the form of ETP waste from Effluent Treatment Plant, Used oil from gear boxes of the machineries, Used Containers/ Bags/ Carboys from storage of raw materials. Adequate storage area for proper storage of wastes will be provided. Details of solid waste generation are given in table 3.11.

6.10 POWER REQUIREMENT & SOURCE OF SUPPLY

The power requirement for the proposed project will be 13 MW which will be sourced from Captive Power Plant / Dakshin Gujarat Electricity Board.

CHAPTER – 7

REHABILITATION & RESETTLEMENT (R&R) PLAN

7.1 POLICY TO BE ADOPTED

The proposed project is to be established in NA land. Hence, no displacement of any population is required for the proposed project. Therefore, detailed Social Impact Assessment studies or R&R action study has not been proposed.

CHAPTER – 8
PROJECT SCHEDULE & COST ESTIMATES
8.1 TIME SCHEDULE OF THE PROJECT

The installation/ construction will be started after getting approval for Environmental Clearance and NOC from authorities.

8.2 ESTIMATED PROJECT COST

The approx. capital cost for proposed project will be 415 Cr. (in INR). The bifurcation is as below

Table 8.1: Total Capital Cost Projection

Sr. No.	Purpose	Capital Cost in Crore (INR)
1.	Land	20
2.	Building	35
3.	Plant & Machinery	325
4.	Electrification and Administrative set-up	25
5.	Safety instruments	5
6.	Chartered services/ Government fees	5
TOTAL		415

Table 8.2: Recurring cost provision for EHS

Sr. No.	Purpose	Recurring Cost (Lakhs per annum)
1.	ETP operations (chemicals/electricity/manpower)	50
2.	Air pollution control device	4
3.	Fees for Common disposal facilities	20
4.	Env. Monitoring expenses	20
5.	Safety instruments maintenance	20
6.	Environment & safety training	10
7.	Chartered services/ Government fees	10
8.	Green belt maintenance	10
9.	Corporate Environment Responsibility (@1.5% of capital cost)	622.5
10.	Medical surveillance	10
TOTAL		776.5

CHAPTER – 9

ANALYSIS OF PROPOSAL

9.1 FINANCIAL & SOCIAL BENEFITS

The project benefits from proposed project are as below -

- Large demand of carbon black due to serious shortfall in domestic market & increased prices, many small & medium scale rubber industries are closing down. The new project will bridge the gap between demand & supply.
- There will be reduction in the total load on the electricity department due to power generation from waste gas.
- Considerable employment & trade opportunities in India.
- Considerable benefit to public infrastructure of this region.
- The company will carry out the social development activities in surrounding area.