ENCLOSURE : VII

PRE-FEASIBILITY REPORT

FOR

PROPOSED 20 MW
(8 MW WHRB + 12 MW AFBC)
POWER PLANT WITHIN EXISTING
PREMISES OF SPONGE IRON PLANT
(5x100 TPD)

AT

VILLAGE: KARAKOLHA
DISTRICT: KEONJHAR, ODISHA

OF

M/S RUNGTA MINES LIMITED

SEPTEMBER, 2016

Submitted by:

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1.0 EXECUTIVE SUMMARY

Project name	Proposed 20 MW (8 MW WHRB+12 MW AFBC) power plant within existing premises of Sponge Iron Plant (5X100 TPD) at village Karakolha, district Keonjhar, Odisha of M/s Rungta Mines Limited (Sponge Iron Division)
Location	Karakolha
Total Area	25.149 acres (existing)
Present Land status	25.149 acres private land in possession and already under industrial purpose
Product	DRI (present) and Power (proposed)
Rated capacity	0.15 MTPA DRI and 20 MW (8 MW WHRB + 12 MW AFBC)
Working days	300 days
Manpower	Present- 207, additional – 105, Total 312
Implementation Schedule	50 Months from date of environmental clearance
cost of the project	Rs.90 Crores
Topography	Flat
Water requirement	28.54 cum/hr or 685 m^3/day
Source of water	Ground water and Harvested Rain water
Power description	Total power generation = 20 MW, Which will be utilised as follows: (1) DRI - 1.5 MW (2) Power plant (self) - 2.0 MW (3) SMS, caster & rolling mill etc - 15 MW (4) Other - 0.5 MW (5) Losses - 1.0 MW
Power source	Captive Power Plant

2.0 INTRODUCTION

2.1 Identification of project and project proponent

The existing Sponge Iron plant is one of the projects of M/s Rungta Mines Limited (RML), which is one of the leading and the oldest mining group of the mineral rich belt of Odisha & Jharkhand.

The company's vision & mission is to utilise its core values & strengths, complemented with the vast experience gained, to help it keep pace with the changing times and respond to domestic & international market forces

by maintaining consistent quality & despatch schedules, making RML synonymous with reliability.

2.2 Brief description of nature of the project

The nature of the project is ferrous metallurgical industries and power plant, which fall under the category of 3(a) and 1(d), respectively under the category "A" of the schedule of EIA Notification, 2006 due to its location within 10 km of interstate Jharkhand - Odisha boundary

2.3 Need for the project and its importance to the country and/or region

Steel: India's economic growth is contingent upon the growth of the Indian Steel Industry. Consumption of steel is taken to be an indicator of economic development. While steel continues to have a strong hold in traditional sectors such as construction, housing and ground transportation, special steels are increasingly used in engineering industries such as power generation, petrochemicals and fertilizers.

Power: The DRI kiln operation produces substantial quantity of hot gases, which can be utilised to power generation, further large quantity of waste produce char. So company will also installed 12 MW AFBC based power plant. The generated power will meet the power requirement of DRI as well as proposed SMS, caster, Rolling mill. Thus, power demand from the state grid will be not be there and will improve the power scenario locally as well as at state level.

2.4 Demand-supply gap

Steel: The Indian Steel industry has entered into new development stage from 2005-2006 riding high on the resurgent economy and rising demand of Steel. Rapid rise in production has resulted in India to become 5th largest producer of steel. It is estimated that, India's Steel consumption will continue to grow at nearly 16% rate annually, fuelled by the demand of construction project. The National Steel Policy envisaged steel production to reach 110 million tonnes by 2020. So considering the huge demand of steel, this project is important for partially fulfilling of demand.

Power: Over the year electricity industry has made significant progress. It may be seen that average gap between generation and demand in India is -1.9 %. Power supply position are given **Table 1**.

TABLE1
POWER SUPPLY POSITION

Region	Peak demand		Peak met		Deficit %	
	Jan 15	Jan 16	Jan 15	Jan 16	Dec 14	Dec 15
All Northern	42387	44124	40774	42019	-3.8	-4.6
Western	42247	45236	41553	45173	-1.6	-0.1
Southern	37004	37301	35446	36745	-4.2	-1.5

Region	Peak demand		Peak met		Deficit %	
	Jan 15	Jan 16	Jan 15	Jan 16	Dec 14	Dec 15
Eastern	15575	17343	15373	17198	-1.3	-0.8
North eastern	2455	2367	2202	2332	-1.03	-1.5
All India	139662	140782	135348	138075	-3.1	-1.9

Source: CEA

2.5 Imports vs. indigenous production

Steel : Imports from China had adversely affected the Indian Steel Market and the policy change by Govt of India is now leading to recovery of the sector. There is no proposal for import of steel.

Power: There is no possibility of import and will be produced at plant site.

2.6 Export possibility

Steel: First priority to meet domestic demand, should also take into account the large export possibilities.

Power: There is no possibility of export of power.

2.7 Domestic / Export markets

20 MW power plant shall be established within existing sponge iron plant. Sponge iron will be used as raw material in proposed SMS/Caster/ Rolling mill unit proposed in village Karakhendra for producing steel. The steel shall be sold in domestic market. Total power generated from the 20 MW captive power plant will be utilized in the DRI, SMS, Billets/ slab / Bloom caster, TMT/Flat, Round/ Wire rod/ Structural mill.

2.8 Employment generation (Direct and Indirect)

Total manpower currently is 207 in DRI plant and additional approximately 105 will be required for power plant. An equal number are expected to be in indirect employment. The estimate, however, does not cover the personnel for proposed township, medical facilities, etc.

3.0 PROJECT DESCRIPTION

3.1 Type of project including interlinked and interdependent projects

There are two interlinked projects to the proposed 20 MW power plant as follows:

(i) The power plant will consist of 8 MW WHRB and 12 MW AFBC. The WHRB will be based on the Waste Heat Recovery from flue gas of existing 5 nos. X 100 TPD kilns. The AFBC will be based on

dolochar (part fuel), which is generated from DRI kilns. Hence, this project is for energy & saving in existing DRI plant

(ii) The power generated shall be consumed in the proposed SMS(IF 2x15T), Billets/Bloom/Slab caster & TMT/Flat /Round/wire rod/Structural mill to be constructed in village Karakhendra, District Keonjhar, Odisha at distance of 0.50 km (aerial).

3.2 Location with Coordinates

District & State : Keonjhar, Odisha
Village : Karakolha

The coordinates of the project based on Google Earth are:

Latitude : 22°07'47.36" to 22°08'03.65" N
Longitude : 85°25'15.80" to 85°25'15.80" E

Location map showing general location, specific location and project boundary enclosed as ***Enclosure II to the Form 1*****.** The location of the project on toposheet can be seen in the 15 km radius map in ***Enclosure IV*** to the ***Form 1***. The coordinates on toposheet do not match with google earth, hence, superimposition has been carried out using roads & village as reference.

3.3 Details of Alternate Sites & Environmental Considerations

No alternatives under consideration. The expansion project will be incorporated within the existing DRI plant premises (25.149 acres)

Environmental considerations: There are no National parks, Wildlife Sanctuary, Biospheres reserves within 15 km radius. The nearest National Park is Simlipal at a distance of 76 km in ESE direction. The nearest Simlipal sanctuary is at a distance of 108 km in ESE direction. There are several water bodies and forests present within the study area of the project. The distance to various water bodies, forest, etc are given in **Table 2**.

TABLE 2
DISTANCE AND DIRECTION (WITHIN 15 KM) OF WATER BODIES, FORESTS & MOUNTAINS FROM PROJECT BOUNDARY

Name	Distance (km)	Direction
Forests		
Uliburu R.F.	1.8	W
Pandrasali PF	2.3	NE
Thakurani RF	0.8	E
Baitarni RF	10.0	SSE
Siddhamath RF	9.2	SW

Name	Distance (km)	Direction
Karo RF	7.5	WSW
Tabiba PF	7.5	W
Tabiba PF	5.8	WNW
Gua PF	7.7	NNW
Jampani PF	11.6	E
Kurti PF	6.4	E
Noamundi PF	4.3	ENE
Gundijora PF	9.3	ENE
Kumirta PF	10.4	NE
Kuchibera PF	11.7	ENE
Nuia PF	3.4	NNW
Ghatkuri RF	6.0	NW
Karapada RF	7.2	W
Kodolibad RF	14.3	WNW
Sonapi PF	14.2	NW
Jojogutu PF	13.4	NW
Baraiburu PF	11.2	N
Raika PF	11.3	NNE
River / Nala		
Betlata Nala	2.0	E
Karo River	5.1	W
Limtur Nala	5.5	W
Koina River	13.5	NW
Kumirta Nala	12.6	NNE
Barnal Lor	10.1	E
Kantorla Nala	10.4	NNE
Mahadiba Nala	4.5	SE
Kundra Nala	9.3	SSE
Baitarni River	13.2	SSE
Gamale Nala	13.7	SW
Katro Gara nala	7.5	ENE

3.4 Size/Magnitude of operation

Plant area: 25.149 acres

Existing:

We are operating 5X100 TPD DRI for which consent to Established has been obtained from OSPCB vide letter no.4243/Ind-II.NOC-1748 dated 13.03.2002 for Kiln I (100 TPD), Letter no. 7533 /Ind-II.NOC-2144 dated

21.02.2004 for Kiln II (100 TPD), letter no 7527 /Ind-II.NOC-2472 dated 21.02.2004 for Kiln III (100 TPD) and letter no 7530 /Ind-II.NOC-2550 dated 21.02.2004 for Kiln IV, V and VI (100 TPD each).

Consent to operate obtained vide letter no 12252 SPCB/BBSR-IND-I(CON)-2836 dated 31.05.2006 for Kiln I, II and III (3x100 TPD= 300 TPD) under section 21 of the Air (Prevention& Control of Pollution) Act 1981 and letter no 12254 SPCB/BBSR-IND-I(CON)-2836 dated 31.05.2006 for Kiln I, II and III (3X100 TPD= 300 TPD) under section 25/26 of the Water (Prevention& Control of Pollution) Act 1974. Subsequently vide letter no 12248 SPCB/BBSR-IND-I(CON)-2836 dated 31.05.2006 for Kiln IV and V (2x100 TPD =200 TPD) under section 21 of the Air (Prevention& Control of Pollution) Act 1981 and letter no 12250 SPCB/BBSR-IND-I(CON)-2836 dated 31.05.2006 for Kiln IV and V (2X100 TPD=200 TPD) under section 25/26 of the Water (Prevention& Control of Pollution) Act 1974. Thereafter Consent to Operate has been periodically renewed and is valid till 31.03.2018

Proposed:

20 MW Power Plant (8 MW WHRB+ 12 MW AFBC Air Cooled)

3.5 Project description with process details

Existing Sponge Iron Plant (0.15 MTPA)

Production Capacity= 5 nos. kiln X 100TPD X 300 days = 150,000 TPA

3.5.1 Process

Iron Ore is reduced by heating with solid carbonaceous material, such as coal, in a Rotary Kiln to temperature of about 1000°C. If low volatile coal is used as the reductant, the kiln is fired by gas or oil. The use of high volatile coal, however, eliminates the need for this additional source of heat. After reduction, products are cooled in a drum type rotary cooler and then separated into Sponge Iron and Char by magnetic separation. High degree of reduction and thermal efficiency can be obtained by controlling process parameters such as reduction temperature, rate of feed, size of feed, grade of feed, etc.

3.5.1.1 Raw Material Handling System

Main Raw Materials Iron Ore, Coal & Dolomite are being fed to the ground hoppers with the help of Pay loaders and Tippers and carried by belt conveyors to the Crusher House. Screened and Crushed Material will be carried out by belt Conveyers to the stock house, having 5 days bins. The main raw material handling system consists of iron ore crusher, vibrating screen and conveyor belts for preparation of raw material as mentioned above.

3.5.1.2 Raw Material Feed System

The stored Raw Material are calibrated by Weigh Feeders separately for Iron Ore, Feed coal, Lump Coal, Injection Coal and Dolomite and fed to the Kiln through a Rotary Airlock Feeder. The feed mix will be fed through feed tube, which is being sealed for leakage of gases with a sealing air fan, which creates a positive pressure to avoid the gas escape. The Injection Coal system injects coal at the discharge end of rotary kiln to avoid Coal starvation with 1 bar pressure at which leakages are not possible. There is a burner system, which is being used for initial heating of the Kiln up to 400°C. The calibrated quantity of combustion air is also fed through the same opening.

3.5.1.3 Main Processing System - Kiln

The main reduction process occurs in a Rotary Kiln of 42 m length and 3.0 m diameter and cooler discharge of 28 m length and 2.0 m diameter made by boiler quality plate. The drive unit consists of 2 nos. main drive gearbox and 1 no. aux gearbox. Calibrated quantity of air is fed to the kiln by shell air fans mounted on the kiln shell. The iron ore is reduced by the carbon monoxide generated by burning coal.

The product of kiln is taken to a sealed rotary cooler where the product is cooled by indirect water spray, which is discharged to a conveyor at about 90°C.

The cooler discharge is also sealed with a collecting hopper. There are 4 nos. slip seals at Kiln Inlet, Kiln Outlet, Cooler Inlet & Cooler Outlet being made up of Ni hard steel. The seals are also being lubricated to avoid false air entry into the kiln and gas leakage from the kiln. At inlet side of the Kiln a back flow chute is made which is sealed with a Double Pendulum Flap Gate Valve.

3.5.1.4 Cooling System

The material is discharged in the Rotary Cooler at a temperature of about 700ºC, which is cooled up to 90^{o} C. The Drive Unit consists of one Main gearbox and one Auxiliary gearbox. The cooler is supported by Two Tyres and four support rollers. This is being cooled by indirect circulating cooling water system, the hot water being collected and passed through the cooling systems. The evaporation loss is made up with makeup water.

3.5.1.5 Product Separation System

The Cooler Discharge material consists of Sponge Iron lumps, fines and ash of coal (char), and is taken to a vibratory screen and two nos. magnetic separators by belt conveyor. The Magnetic and Non Magnetic material are separated here and stored in fully closed hoppers. The Product House consists of silo for sponge iron lumps, sponge iron fines and char. The char shall be used as fuel in the proposed Power Plant.

3.5.1.6 Flue Gas Cleaning and Pollution Control

The flue gas coming out from the Rotary Kiln is passed through a Dust Settling Chamber, in which the heavier dust is settled down. The bottom of the dust settling chamber is immersed in the wet scrapper water which is working as the sealing to avoid the gas leakage and false air entry. The gas next passes through the After Burning Chamber (A.B.C.) in which the carbon monoxide and un-burnt carbon are burnt completely.

The flue gas is taken to the Waste Heat Recovery Boiler (WHRB), where the recoverable heat is utilized for generation of high pressure steam. The flue gas is next passed through an electro static precipitator (ESP), where the gas is cleaned up to maximum level. The clean gas passes to the atmosphere through the Chimney with the emission level of less than 100 mg/Nm^3.

The boiler bottom hoppers and E.S.P hoppers are provided with a dense phase ash handling system. The dust collected from these hoppers is sent to an ash silo by pneumatic conveying system. Finally the stored dust in the ash silo is taken to the solid waste disposal site for storage and final disposal to brick manufacturing plants/cement plants.

3.5.1.7 Requirement of Raw Materials

The main raw materials for sponge iron production are iron ore, coal, and dolomite.

3.5.2 Captive Power Plant (Air cooled)

3.5.2.1 WHRB Power Generation Unit

Sponge Iron is produced by heating Iron with coal and other additives under controlled conditions in Rotary Kiln. The outlet gases are mixed with air and burnt to convert CO into CO_2. As the flue gases contain substantial sensible heat, it is proposed to utilize the heat for power generation through waste heat recovery boilers.

The waste heat recovery boilers consist of radiation chambers with water walls just like conventional boiler with a drum to evaporate steam at 88 kg/cm^2 pressure. The steam is carried to super heater system where the temperature is maintained at 515°C. The boiler has an economizer, which utilises the heat of outgoing gases to raise the temperature of feed water from 100 to 200°C. The steam is used to rotate the turbine and to generate power. The condensed steam is collected and recycled to the boilers as boiler feed water. A DM water plant is provided for preparation of de-mineralized water for make-up to the steam-condensate cycle. The output of the boilers will be used to generate electricity through Steam Turbo Generator Sets of capacities as mentioned above. The flue gases leave the economizer zone at about 150°C. The gases are passed through ESPs,

where the dust concentration is brought down to below 100 mg/m^3. Three ESPs and stacks of appropriate heights are provided, one for each boiler.

Total WHRB based power generation will be 8 MW. Technical parameters for proposed WHRB based power plant are given in **Table 3**.

TABLE 3
TECHNICAL PARAMETERS OF WHRB

Sl. No.	Description	Value
1	Type	Single drum, vertical, multipass, Semi- outdoor, natural circulation
2	Steam output, maximum continuous rating (MCR), TPH	10 TPH
3	Steam pressure at super-heater Outlet, ksca	80 ATA
4	Steam temperature at superheater Outlet, °C	515 °C +5^0 C
5	Feed water temp. Economiser, °C	126°C

3.5.2.2 AFBC Based Power Plant

Total AFBC based power generation will be 12 MW. The boiler will be of natural circulation, balanced draft, single drum type will be equipped with fluidized bed firing system.The boiler will be provided with Electrostatic Precipitator.Overall efficiency of ESP will be around 99.50% to maintain particulate concentration in flue gas at chimney outlet below 100 mg/Nm^3. Technical parameter of AFBC are given in **Table 4**.

TABLE 4
TECHNICAL PARAMETERS OF AFBC

Sl. No.	Description	Technical parameter
1	Type of Boiler	Single drum, vertical, multipass, Semi outdoor, natural circulation
2	Capacity & No of Boilers	1 No., 10 TPH
3	Steam generating capacity	80 ATA (at MSS outlet) and 515+/-5^0 C
4	Feed water temperature at Economiser inlet	126°C for 100 % MCR
5	Design Ambient Dry Bulb Temperature °C	40°C
6	Design Ambient Relative Humidity	60 %
7	Boiler Thermal Efficiency	83.34+/-1% at MCR, based on performance fuel firing

3.6 Raw material required along with estimated quantity, likely source, marketing area of final product's Mode of transport of raw material and Finished product

The detail of raw material and their sources is given below in **Table 5**.

TABLE 5
ANNUAL RAW MATERIAL REQUIREMENT AND THEIR SOURCES

Sl. No.	Material	TPA	TPM	TPD	Sources	Mode of transport
1	Iron ore	258,000	21,500	860	Own mines Odisha / Jharkhand	Road
2	Dolomite	10,500	875	35	Rourkela	Road
3	Coal	127,500	10,625	425	imported	Rail/ road
4	Char	34,500	2,875	115	In house	-
5	Coal for CPP	64,800	5,400	216	MCL	Rail/ road

3.6.1 Mode of transport of Raw material

Raw material will be transport through Rail/ Road. Presently raw material is being transport by Rail/ Road.

3.7 Resource optimization/ recycling and reuse envisaged in the project

Recirculating cooling water system shall be provided in the plant. The recirculating cooling water pumps to the various consumers in the plant will pump cold water from the cooling tower basin. The hot water return from the consumers will return to the cooling tower for cooling and recirculation.

To meet the requirement of demineralization water as make-up water for boiler, de-mineralization plant of suitable capacity will be provided. Water quality shall meet the Turbine and Boiler Manufacturers' recommendation.
Entire waste water from CPP complex shall be treated and reused for afforestation, green belt watering, sprinkling and dust suppression. There shall be no liquid waste discharge from the plant premises except during monsoon when the sprinkling and watering demand will be almost negligible.

The main solid waste generated would be bottom and fly ash in 20:80 ratio. Bed ash will be collected in bottom ash hopper which will have effective 8 hours storage capacity. The bed ash collected in bottom ash hopper will be removed in 60 minutes once in every shift of 8 hours

Fly ash from economizer, air pre-heater and ESP hoppers will be automatically extracted one after another in sequence. A steel silo will be constructed for fly ash collection via which ash will be discharged from the bottom of silo into trucks for utilizing it for various applications such as brick making, road embankments, etc. Other solid wastes such as dust particles

collected in the hoppers (below ESP) will be conveyed pneumatically and will be stored in Silos. This will be further disposed by trucks.

Domestic waste shall be generated from the plant office, organic component of which shall be composted/ vermi composted. The sewage from the Plant shall be led to Sewage Treatment Plant. It will be provided with biological treatment facility to control BOD and suspended solids. The treated effluent conforming to prescribed standards will continue to be used for watering plantation. Wastes such as used oils/ spent oil shall be generated periodically, which shall be sold to authorized recycling vendors in drums.

3.8 Availability of water its source, energy / power requirement and source

The water required for the plant shall be sourced from bore well as per sanctioned capacity and rain water harvesting. Total water consumption shall be 28.54 m^3/hr after implementation of power plant.

The plant will generate 20 MW energy in form of electricity from its captive power plant and will utilize it in its DRI as well as proposed Karakhendra Steel Plant which is 0.50 km away from proposed power plant.

3.9 Quantity of wastes likely to be generated (liquid and solid) and scheme for their management /disposal

The main solid waste generated will be would be bottom and fly ash generated from power plant. Bed ash will be collected in bottom ash hopper and removed in the form of ash slurry. The ash slurry will be collected in slurry pump from where it will be pumped to ash dyke area through slurry pumps. Fly ash from economizer, air pre-heater and ESP hoppers will automatically extracted one after another in sequence. A Silo will be constructed for fly ash collection via which ash will discharged from the bottom of silo into trucks for utilizing it for various applications such as brick making, road embankments, etc.

Electrostatic Precipitator and Bag Filters Systems are proposed to be installed for pollution control of air emissions. Dust particles collected in the hoppers (below ESP) are conveyed pneumatically and stored in Silos. This is further disposed by trucks. Domestic waste is generated from the plant office, organic component of which shall be composted/ vermi composted. Quantity of waste generation is estimated and given in **Table 6**.

TABLE 6
WASTE GENERATION (TPA)

Sl. No.	Source	Total (TPY)	Reuse/ Sale (TPY)	Remarks	Balance for Disposal (TPY)*
1	Used Oil	1 KL	1 KL	Shall be sold	0
2	Waste Containing Oil	30 kg	30	Shall be disposed in properly constructed pit as	0

Sl. No.	Source	Total (TPY)	Reuse/ Sale (TPY)	Remarks	Balance for Disposal (TPY)*
				per CPCB norms	
3	Discarded oil & Grease containers	15 nos.	15	Into disposal site	5
DRI Plant					
4	Char	34500	34500	AFBC boiler	0
5	ESP & In plant Dust	7500	7500	Into disposal site	7500
6	Kiln accretion	750	750	Into disposal site	750
Power Plant					
7	Fly Ash	57000	57000	To bricks manufacturing units	0

3.10 Schematic Representations of the Feasibility drawing which give information of EIA purpose

Process Flow sheet is given in **Fig 1** for sponge iron plant; **Fig 2** for power plant sheet is annexed to the end of project feasibility report.

4.0 SITE ANALYSIS

4.1 Connectivity

The existing plant is located in village Karakolha, Tehsil Barbil, District Keonjhar, Odisha.

Road link

The plant is accessible by all weather road from the Tehsil headquarter Barbil at distance of 2.9 km, and district headquarter Keonjhar at 59 km. The site is located near to SH 10 B, at a distance of 1.7 km, which connects Bhadrasahi to Gua.

Rail link

The nearest railway station is Barajamda at a distance of 3.2 km from the plant.

Air link

The nearest air port is at Ranchi, which is approximately 210 km from the plant.

4.2 Land form, land use and land ownership

Company has purchased directly 25.149 acres private land, which is already under industrial usage.

4.3 Topography

The core zone represents nearly flat land (about 465 to 477 m. amsl) devoid of any significant drainage or topographical features.

The study area falls in Baitarni watershed which mainly falls in Kendujhar district, Orissa and partly in West Singhblum of Jharkhand State. It lies in the watershed of Karo Nala a tributary to the river Baitarni, the major drainage system of the study area. The drainage network is typical dendritic. The entire area is hilly and undulating with maximum elevation of 868 a.m.s.l. while the lowest elevation of around 390 m a.m.s.l. is observed

4.4 Existing land use pattern

There are no National parks, wildlife sanctuary, biospheres reserves within 15 km radius. The nearest Wildlife Sanctuary is Simplipal Sanctuary at a distance of 108 km in ESE. The nearest National Park is Simlipal National park at a distance of 76 km in ESE direction.

There are several water bodies and forest present within the study area of the project. The distance to various water bodies, forest, etc are given in para-3.3, **Table 2**.

4.5 Existing infrastructure

Existing infrastructure like office building, canteen and road shall be used while additional facilities like DM plant, control room, waste or waste water systems, etc are proposed. Temporary sheds for workers will be established at the site. Karakolha village have a primary school and power supply for domestic use.

4.6 Soil classification

Broadly the soil of the locality is classified as lateritic soil, laterite with iron ore on the basis of its layer of formation. There is a little transported soil due to eroded materials because of mining activity in the region. The primary factors responsible for soil pattern in the area appear to be parent materials, relief and ore morphology. Influence of biotic factor and time are of secondary nature.

4.7 Climatic data from secondary sources

Temperature

As per the nearest IMD station, Keonjhar, the monthly mean of minimum temperature ranges from 10.82°C in December to 23.84°C in May. The monthly mean of maximum temperature ranges from 25.81°C in December to 36.64°C in May.

Rainfall

Rainfall shows wide and erratic variations. The average annual rainfall at IMD station Keonjhar was recorded as 1369.50 mm from 1996 to 2001. The monsoon season is spread over the months from June to September.

Relative Humidity

The average daily relative humidity (RH) data, obtained from IMD station Keonjhar shows that at 08.30 hrs, the RH varied from 49.3% in March to 84.2% in August while at 17.30 hrs the RH varied from 26.5 to 75.5 % from March to July.

4.8 Social infrastructure available

Hospitals, school, community facilities are present in the villages in buffer zone within 10 Km of study area. Social infrastructures existing as per Census 2011 is given in ***Enclosure V*** to the Form 1.

5.0 PLANNING BRIEF

5.1 Planning concept

Presently the company is operating 5X100 TPD DRI plant at village Karakolha in Keonjhar District of Odisha which is under operation. M/s Rungta Mines Limited is expanding the project by addition of 20 MW power plant (8 MW WHRB+12 MW AFBC) within existing DRI plant.

5.2 Population projection

Total manpower currently is 207 and additional approximately 105 will be required for power plant. An equal number are expected to be in indirect employment. The estimate, however, does not cover the personnel for township, medical facilities, etc. Many more persons will also get employment in the ancillary & other services connected with this project. Unskilled and semi skilled (after training) will be hired from in and around the Plant while skilled, engineers, managerial staff and technical experts will have to be hired from outside.

5.3 Land use planning (break up along with green belt etc.)

The Power Plant will be set up in existing Sponge plant premises. Total plant premises are 25.149 acres. Proposed break up of total land use after power plant installation are given **Table 7.**

TABLE 7
PROPOSED BREAK UP OF TOTAL PLOT AREA

Sl. No.	Description	Area (Acres)	Percent
1.	Plants & facilities	7.95	31.61
2.	Stock yards	2.0	7.95

Sl. No.	Description	Area (Acres)	Percent
3.	Area for solid waste disposal	4.0	15.90
4.	Green belt & plantation	8.30	33.0
5.	Administration building	0.20	0.80
6.	Water reservoir	2.4	9.54
7.	Roads	0.299	1.2
	Total	**25.149**	**100.00**

5.190 acres land is additional available near plant which can be utilized for fly ash and other solid waste disposal, if required.

5.4 Assessment of infrastructure demand (physical & social)

An assessment of the facilities available in the villages around plant site has been done for education, hospitals, drinking water, communication and approach road. An assessment of the facilities available in the villages in the study area based on Census 2011 has been done and given in **Table 8**.

TABLE 8
NEED EVALUATION FOR VILLAGES IN AND AROUND PLANT AREA

Sl. No.	Parameter	Present Status in village of study area	Present Status in Towns in study area	Scope for improvement
1.	Education	Primary School-44 Middle school- 10 Secondary school – 3	Govt Primary Schools-33 Private primary school - 13 Govt middle school - 18 Private middle school- 11 Govt. Secondary school – 12 Private Secondary School-7	Provision of secondary school in village
2.	Hospitals	Primary health centre- 1 Primary Health sub centre- 17 Maternity & Child welfare centre- 6	Hospital Allopathic -7 Hospital Alternative medicine – 3 Dispensary -14 Maternity & Child welfare - 3	• Provision of medical facilities in plant • Medicals camps as part of CSR • Ambulance on call
3.	Drinking water	For drinking purpose the village has well and HP as source.	Protected water supply source 5 Nos	Provision of potable drinking water supply through hand pumps, tankers etc. already provided.
4.	Power supply	The village has power supply for domestic purpose	Electricity Domestic connection-23795 nos. Electricity industrial connection - 812 nos Electricity commercial	Solar lighting, solar lamps and similar solar based facilities can be provided

Sl. No.	Parameter	Present Status in village of study area	Present Status in Towns in study area	Scope for improvement
			connection - 1660 nos Electricity road lighting connection - 2045 nos Electricity others connection - 13 nos	
5.	Communication	Post office – 8 Sub Post office – 1	Post office is present and telephone facility is available in the town.	Transportation facility to hospital and nearest town could be maintained and strengthened.
6.	Approach to village	NH- 5 SH- 6 Major district road- 7 Other district road- 9 Black taped road- 29	Same	Approach road to the village to be strengthened.
7.	Post and Telegraph	Post office is present and telephone facility is available in the village.	Post office is present and telephone facility is available in the town	Access to internet will be provided to villagers
8.	Banks and commercial societies	Agricultural credit society-1 SHG- 32 Public distribution systems – 30 etc are available in the village	National Banks- 10, Private commercial banks- 4, Cooperative banks- 2, Agricultural society – 2, etc available in the town.	ATM at plant site can be provided

5.5 Amenities / facilities

Education, hospitals, drinking water, power supply, post and telegraph, banks, communication and approach roads are present in the villages in buffer zone within 10 Km of study area.

6.0 PROPOSED INFRASTRUCTURE

6.1 Industrial area (processing area)

The Power plant will be established in the existing DRI plant premises.

6.2 Residential area (non processing area)

Residential colony shall be constructed near plant.

6.3 Green belt

The green belt equivalent to 33% of the plot area will be developed. Part of the greenbelt has been made.

6.4 Social infrastructure

The social infrastructure in the surrounding villages will be improved as a part of the CSR activities of the company. Approximate expenditure for CSR Initiatives activities already taken up by the Company for the year 2006 - 2015 is given **Table 9**.

TABLE 9
CSR ACTIVITIES TAKEN UP BY M/S RUNGTA MINES LIMITED (SPONGE IRON DIVISION)

Sl. No.	Year	Amount (Rs.)
1.	2004-2005	1941444
2.	2005-2006	239490
3.	2006-2007	298726
4.	2007-2008	1647713
5.	2008-2009	706071
6.	2009-2010	875686
7.	2010-2011	4244466
8.	2011-2012	2151750
9.	2012-2013	3247092
10.	2013-2014	7578323
11.	2014-2015	3625820
12.	2015-2016	8426122
	Total	**34982703**

6.5 Connectivity

Refer section 4.1

6.6 Drinking water management (source & supply of water)

Refer section 3.8

6.7 Sewerage system & industrial waste management

Domestic waste shall be generated from the plant office, organic component of which shall be composted/ vermi composted. The plant will be based on zero discharge principle. All the domestic and industrial effluents will be properly treated and completely recycled in the system. Thus there will be no discharge of effluents envisaged from the plant.

6.8 Solid waste management

The main solid waste generated would be bottom and fly ash in 20:80 ratio. Bed ash will be collected in bottom ash hopper which will have effective 8 hours storage capacity. The bed ash collected in bottom ash hopper will be removed in 60 minutes once in every shift of 8 hours

Fly ash from economizer, air preheater and ESP hoppers will be automatically extracted one after another in sequence. A steel silo will be constructed for fly ash collection via which ash will be discharged from the bottom of silo into trucks for utilizing it for various applications such as brick making, road embankments, filling the low lying areas, etc. Other solid wastes such as dust particles collected in the hoppers (below ESP) will be conveyed pneumatically and will be stored in Silos. This will be further disposed by trucks.

The municipal solid waste generated from the plant will be segregated and separated as combustible and non-combustibles wastes. The combustible wastes will be used as fuel in the kiln. This will solve the problem of solid waste disposal and will also reduce the fuel requirement for the kiln.

The kiln will act as an incinerator in this case. The non-combustible wastes will be land filled for composting and other (non-compostable) waste will be sold to the authorised recycling vendors.

The hazardous waste like transformer oil, spent oil etc will be utilized in kiln as a source of high calorific fuel which will also reduce the fuel consumption and solve the problem of hazardous waste disposal.

Provision of 4.0 acres land for solid waste storage has been made.

6.9 Power requirement & supply / source

Refer section 3.8

7.0 REHABILITATION AND RESETTLEMENT PLAN

No rehabilitation and resettlement plan has been made as no displacement of population is there. Company has purchased directly 25.149 acres private land, which is already under industrial usage since inception of the plant.

The plant and allied activities have and will provide job opportunities for eligible persons and many will find employment in ancillary & other services connected with this project.

Thus, the impact will be significantly beneficial since un-employment and under employment is the main socio-economic problem faced by the people in this area.

8.0 PROJECT SCHEDULE & COST ESTIMATES

8.1 Project Schedule

The completion schedule of the proposed plant = 50 month after receipt of Environmental Clearance.

8.2 Cost of the Project

The total cost of the project Rs 90 crores.

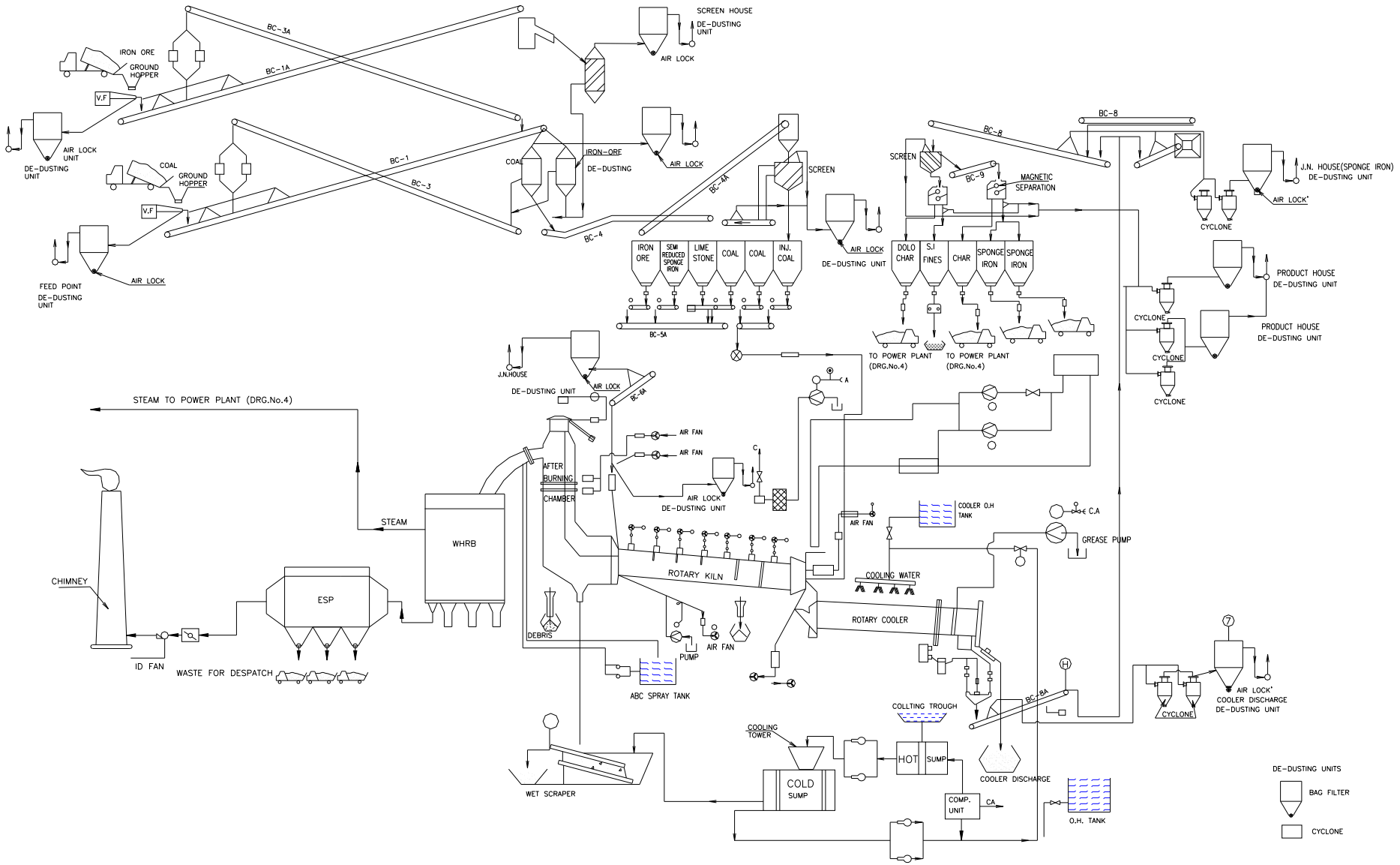
9.0 ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

The establishment of the power plant will recover the waste heat from DRI kiln emissions as well as utilize the solid waste char. Thus, it will increase energy efficiency of the DRI plant. Also the generated power will meet the power requirement of DRI as well as proposed SMS, Caster & rolling mill of the company proposed to be established at a distance of 0.5 km in village Karakhendra. Thus, the requirement of power from grid will be eliminated.

Local people will be provided with both direct and indirect employment. They would be mostly recruited in unskilled, semi skilled office assistant categories, etc. This will improve the economic condition of the local people. The employment of local people in primary and secondary sectors of project will upgrade the prosperity of the region.

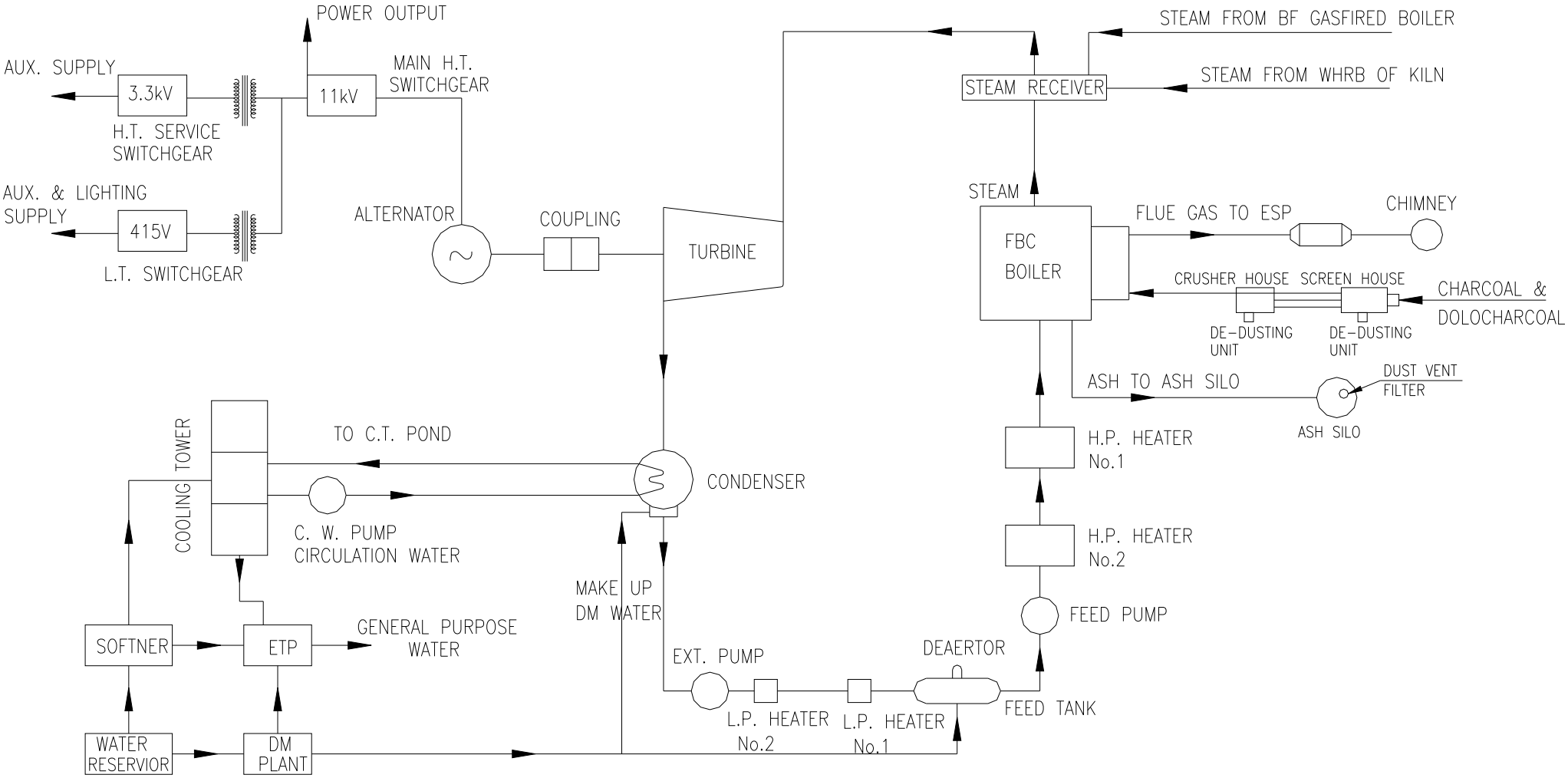
With the advancement in technology and the stringency in permissible limits of emission along with regular monitoring, it is possible to operate small plant of this type by having minimal impact on the environment.

FIG 1: PROCESS FLOW CHART FOR SPONGE IRON PLANT



ENCLOSURE : VII Contd..

FIG 2: PROCESS FLOW SHEET OF POWER PLANT



ENCLOSURE : VII Contd..