EXECUTIVE SUMMARY

CSIDC has its Corporate Office at Raipur and it has developed various Industrial Growth Centers and Industrial Areas namely Urla, Sarora, Bhanpuri, Amaseoni, Rawabhata, Siltara in Raipur District., Borai in Durg District., Sirgitti, Tifra, Rani Durgawati industrial area in Bilaspur District.

1 PROJECT DESCRIPTION

Chhattisgarh State Industrial Development Corporation Ltd., (CSIDC) proposes to develop a Large Industrial Area (LIA), Tilda, Raipur district by acquiring approximately 6136.471 Acres (2483.342 ha.) of land falling in nine revenue villages of the district namely Roykheda, Nakti-Khapri, Khapri, Bahesar, Konari, Gaitra, Bartauri, Khamhariya and Madahi. The proposed Large Industrial Area, Tilda is close to capital head quarter of the state i.e. only about 25 km from the city.

Content	Details			
General data				
	Village: Roykheda, Nakti-Khapri, Khapri, Bahesar, Konari,			
Location	Gaitra, Bartauri, Khamhariya and Madahi, Raipur district			
	(C.G.)			
Nearest City/Town	Raipur (C.G.)			
Nearest railway station	Raipur on Mumbai-Howrah railway line			
Nearest high way	Raipur-Bilaspur NH – 200			
Nearest Air Port	Raipur			
	Climatic conditions			
Maximum Temperature	43.9 [°] C Max			
Minimum Temperature	10.4 [°] C Min			
Average Rain Fall	1358.8 mm.			
Wind direction &	NE to SW & a 5 to 11 1 VMDU			
Velocity Range	NE to SW & 0.5 to 11.1 KMPH			
	Site Characteristics			
Area	6136.471 Acres			
Housing	Rural & Semi Urban Housing			
Lang shaping	Nearly plane with very little variation of contours			
Land bearing capacity				
Possibility of Flooding	Very Low			
Standing Water Level	Nil			

Salient features of the Project Area

Expected industrial Units in the proposed LIA- Tilda, Raipur

The following types of industrial units are the expected in proposed Large Industrial Area, Tilda (Raipur).

- Iron and Steel Industries
- Power Plants
- Mineral Based industries
- Food Processing Industries and Engineering Based industries

Details of land and water requirements

S.No	Type of Industry	Nos	Land in Acres	Water in KLD		
	A-Based on MoU(Collectively 5 Units)					
1	Integrated Steel Plant (1350TPD)	1	350.000	1350.00		
2	Captive Power Plant (25 MW)	1	150.000	2500.00		
3	Captive Power Plant (10 MW)	2	120.000	2000.00		
4	Thermal Power Plant(100 MW)	2	400.000	20000.00		
5	Mini Steel Plant (350TPD)	1	35.000	122.50		
6	Mini Steel Plant (500TPD)	2	100.000	350.00		
7	Sponge Iron (500 TPD)	3	375.000	375.00		
8	Auto.Component Plant (85 TPD)	1	15.000	21.25		
9	Fly Ash Material(200 TPD)	1	50.000	50.00		
	Sub-Total-A	5	1595.000	26768.75		
	B-Bas	sed on Potentia	al			
1	Bio-Mass Power Plant	1	125.000	900.00		
2	Captive Power Plants	5	190.000	3200.00		
3	Thermal Power Plants	2	400.000	20000.00		
4	Sponge Iron Plants	9	505.000	650.00		
5	Mini Steel Plants	9	120.000	372.40		
6	Rolling/ Re-Rolling Mills	9	80.000	135.80		
7	Ferro-Alloys Plant	1	50.000	25.00		
8	Iron Ore Crushing Plants	2	40.000	40.00		
9	Chemical/Allied Engg. Based Plants	15	120.000	77.10		
10	Mineral Based Plants	3	40.000	31.50		
11	Mech., Elect., Auto. Engg.based Plants	36	111.000	28.40		
12	Civil Engineering Based Plants	3	4.000	0.54		
	Sub-Total-B	95	1785.000	25460.74		
	Grand Total (A + B)	100	3380.000	52229.49		

Facilities provided by the proposed project

The Large Industrial Area, Tlda, Raipur district will provide the following facilities in the part of infrastructure development project.

- Site development
- Barbed wire fencing
- Security post, time office and steel gates
- Eco-development like greenbelt, garden development
- Internal roads
- Common toilets
- Culverts
- External drains
- Water supply system
- Electrification
- Ware house
- Administrative block
- Export promotion center
- Office building for logistic bay and laboratory
- Effluent treatment plant
- Telecommunication facilities
- Plant and machinery for testing laboratory
- Approach roads
- Miscellaneous fixed assets like electrical, electronic and computer appliances, furniture, fixtures, vehicles.
- Miscellaneous common facilities and amenities like banks, petrol pump, police station, post office, weigh bridge, dispensary, primary health centre, and restaurant.

2 ENVIRONMENTAL STUDY

Environmental base line study is carried out to evaluate the existing conditions in and around the proposed project area. In this project the following environmental components were considered to study the base line conditions.

- Meteorological Conditions
- Ambient Air Quality
- Ambient Noise Quality
- Water Quality
- Soil Characteristics
- Land Use Pattern
- Ecology of the Area
- Socioeconomic Conditions

Monitoring Location

S. No	Location/ Village	S. No	Location/ Village
1	Roykheda	16	Khauna
2	Nakti-Khapri	17	Siliari
3	Khapri	18	Khurd
4	Bahesar	19	Nagargaon
5	Konari	20	Saragaon
6	Gaitra	21	Mohrenga

7	Bartauri	22	Murra
8	Khamhariya	23	Moth
9	Madahi	24	kesla
10	Tarashiv	25	Goniari
11	Gaurkhera	26	Seoni Belda
12	keotara	27	Baikunth
13	Khurmuri	28	Tulsi
14	Bhimbhari	29	Gujra
15	Kathiya	30	Mohda

Meteorological Conditions

The most predominant direction from which winds were blowing was from south west direction with a speed of 8.8 m/sec (0-24 hour).

Temperature Pattern

During the study period, the maximum and minimum temperature observed to be 43.9° C and 10.4° C respectively.

Relative Humidity

During the study period, the maximum and minimum relative humidity observed was 82.00% and 7.83% respectively.

Ambient Air Quality

Ambient Air Quality was monitored at 30 locations both in core zone i.e. within the industry area and in the buffer zone i.e. in a radius of 25 km around the Large Industrial Area, Tilda are given below.

Location		SPM	RPM	SO2	NOx
	Standard	200	100	80	80
A-1 to A-30	Observed Values	82-166	25.8 to 69.8	3.2 – 12.4	4.3 - 20.4

Note: HC &CO values at all locations were found to be < 1ppm

The ambient air quality result shows that the SPM, RPM, SO2, NOx, HC &CO values were within the (NAAQ) standards.

Ambient Noise level monitoring

The ambient noise levels were monitored during March to May, 2007 at different 30 locations in the project study area. In the day equivalent (Ld) the minimum noise level was recorded at location no NQ12 i.e. Keotara was 50.1 dBA and maximum was at location no NQ20 i.e. Sagargaon was 52.3 dBA. In the night equivalent (Ln) the minimum noise level was recorded at location no NQ12 i.e. Keotara was 40.1 dBA and maximum was at location no NQ9 i.e. Madahi was 42.8 dBA.

Water quality monitoring

All samples quality which was collected from the study area, was well within the drinking water standards IS 10500 and individual observations made for surface water and ground water quality and presented below.

Ground Water quality

S.No.	Parameter	Unit	GW1-GW30
1	pH	-	6.8 - 8.0
2	Total Dissolve Solids	mg/l	156 - 370
3	Total Hardness as CaCO3	mg/l	64-252
4	Nitrate as NO3	mg/l	1.2-10.0

Surface Water quality

S.No.	Parameter	Unit	SW 1- SW 30
1	pH	-	6.7 - 7.9
2	Total Dissolve Solids	mg/l	146 - 378
3	Total Hardnessas CaCO3	mg/l	78 - 136
4	Nitrate as NO3	mg/l	0.7 - 3.4

Soil Quality:

S.No.	Parameters	Unit	SQ1 - SQ30
1	pH	-	6.3 - 7.9
2	Available Nitrogen	Kg/hec	86 - 920
3	Available Phosphorous	Kg/hec	15 – 196
4	Available Potassium	Kg/hec.	132 - 1305
5	Organic Carbon	%	0.16 – 1.22

Socioeconomic:

The present study area covers 102 villages

The total population as per 2001 census is 133029

Total male and female percentage in the study area is 50.65% and 49.35% respectably.

The population in the study area depends upon agriculture, cultivation and labour for their livelihood

Flora & Fauna

Details of flora in the study area

S. No	Scientific Name	Common Name	Family Name
	Core Zon	e	
1	Acacia Arabica	Babul	Leguminosae
2	Albizzica procera	Safed	Leguminosae
3	Azadiracta indica	Neem	Meliaceae
4	Eucalyptus Spp	Nilgiri	Myrtaceae
5	Dalbergia latifolia	Shisham	Leguminosae
6	Dalbergai Sisoo	Sissoc	Leguminosae
7	Chloroxylon Swietenia	Bhirra	Caesalpiniaceae
8	Bridelea retusa	Kasai	Euphorbiaceae
9	Diosphyros melanoxylon	Tendu	Ebenaceae
10	Madhuca indica	Mahua	Sapotaceae

11	Pongamia Pinnats	Karanj	Papilionsceae		
	Buffer Zone				
1	Acacia Arabica	Babul	Leguminosae		
2	Albizzica procera	Safed	Leguminosae		
3	Azadiracta indica	Neem	Meliaceae		
4	Eucalyptus Spp	Nilgiri	Myrtaceae		
5	Dalbergia latifolia	Shisham	Leguminosae		
6	Dalbergai Sisoo	Sissoc	Leguminosae		
7	Chloroxylon Swietenia	Bhirra	Caesalpiniaceae		
8	Bridelea retusa	Kasai	Euphorbiaceae		
9	Diosphyros melanoxylon	Tendu	Ebenaceae		
10	Madhuca indica	Mahua	Sapotaceae		
11	Pongamia Pinnats	Karanj	Papilionsceae		

Details of fauna in the study area

Avifauna

Species present in the study area are Chilla (*Milvus migrans*), Baja Pakhi (*Astur badius*), Harada Chadei (*Crocopus phoenicopterus*), Daulipara (*Columba livia*), Bana Kukuda (*Gallus gallus*), Painted Spur Fowl (*Galloperdix lunulata*), Jungle Bush Quail (*Perdicula asiatica*), Teetri or Partridge (*Francolnus Spp.*), Dahuka (*Amauronis phoenicurvus*), Kaligoudini or White Necked Stork (*Dissoura espiscpus*), Baga (*Ergretta grazetta, Babulus ibis* etc), Ducks or Teals (*Anaspoecil orhynca*), Bhaliakai or Common Grey Hornbill (*Tikos birostris*).

Reptiles

Among the reptile population Chameleon (*Chameleon zevlanicus*), Gokhara (*Naja naja*), Common Krait (*Bungarus fasciatus*), Dhamana (*Ptyas mucosus*) are the common species can be seen in the study area.

Mammals

Monkey, langur, jungle cat, jackel, Striped hyena, etc. can be seen in the study area.

3. ENVIRONMENTAL IMPACT & MITIGATION

The study is focused on the significant areas which will have major impact on environment and those areas are addressed in the study.

Land Acquisition	:	Impact on Social Environment
Layout Planning	:	Impact on Land Use
Air Environment	:	Impact on Ambient Air
	:	Impact on Ambient Odour
Water Environment	:	Impact on Surface Water
	:	Waste water discharge

	:	Storm water
Acoustic Environment	:	Impact on Ambient Noise
Biological Environment	:	Impact on habitat & flora & fauna
Social Environment	:	Impact on demand-supply
		Impact on natural resources
		Impact on infrastructure
		Impact on employment
		Resettlement & Rehabilitation
Occupational Health & Safety	:	Impacts on Public Health & Safety
Solid Waste Disposal	:	Impacts on Solid waste

A. Impacts during construction phase

NATURE OF IMPACTS DURING CONSTRUCTION PHASE

Activity	Impact			
Acquisition of land for	Affect the present land use pattern. The presence of			
industrial development	nsitive areas, archeological sites, human settlements			
	may create conflicts.			
Removing undulating ground	Affects air quality due to increase in SPM levels, impact			
to facilitate construction	on flora and fauna, impact on noise quality.			
Construction of roads and	Affects air quality due to increase in SPM and NO_x			
civil engineering structures	levels, impact on noise quality.			
Migration of Labour	Impact on infrastructure like housing, creates health			
	hazards due to poor sanitation problems.			

B. Impacts during Operational Phase

Air Environment

The Air Polluting Sources from the proposed Large Industrial Area –Tilds, Raipur will be from the Proposed Integrated Steel Plant and Thermal Power Plant Steel manufacturing process mainly comprises melting of various metallic raw material and furnace. The proposed induction furnace will electrically operated no fuel will be used. Hence no major emissions are envisaged. During the loading of raw material into the furnace the particulate emission resulting in the form of fugitive dust will be removed through suction and is released into the atmosphere through wet scrubbers.

Water Environment

Water requirements for the proposed project, which include different plants like steel, sponge iron, power etc. for processing, drinking and sanitary purposes. Industrial

requirement of water is 52.23 MLD (11.58 MGD) when the site is fully developed. Summary of water requirement is given below:

S. No	Particulars	MoUs	Proposed	Total
1	Assumed Units	5	95	100
2	Requirement of water (KLD)	26768.75	25460.74	52229.49
3	Requirement of water (MLD)	26.77	25.46	52.23

The source of water for the operations will be Sheonath River near Temri village of Simga Tehsil. In operation phase wherever possible the recycle of water will be in placed after proper treatment. Sanitary and drinking water needs as per scope of work of proposed project will negligible. Therefore, no exhaustion of water resources were anticipated from proposed project. Overall impact on water resources from proposed project is minimal.

Waste Water

Wastewater obtained from industries is generally much more polluted then the domestic or even commercial wastewater. Suitable pre-treatment to the wastewater of industries before subjecting to biological treatment is thus the prime requirement for designing and planning the treatment plant. Possible large scale reuse of the treated water in the industries is another important factor which must be considered while deciding the sequence of treatment process. Such a possible reuse if can made be possible will help in large scale economy in the industry.

Effluent treatment plant will be proposed in the project site for the treatment of waste water. There shall, thus be no adverse impact on the surface water quality. A common effluent treatment plant is proposed to be constructed in the proposed Large Industrial Area at Tilda (Raipur).

Noise Environment

The main sources of noise are due to:

- Foundation construction including pile driving.
- Infrastructure construction.
- Plant erection.

Mitigation measures:

- Proper maintenance is being done of noise generating machinery including the transport vehicles.

- Silencers are provided to modulate the noise generated by machines.
- Provision of protective devices like ear muffs / ear plugs.

Impact on Biological Environment

The proposed area does not intrude with habitat of any flora and fauna. Extensive plantation shall be undertaken to provide green cover all around. The effluent from the site shall be treated to the tertiary level and recycled so as not to discharge of any pollutants into surface water bodies nor there are such bodies within the impact area to affect the aquatic environment.

Impact on Land Use

The likely changes in the land use would be in the following areas.

- \checkmark Labour population attraction and construction of temporary hutments.
- \checkmark Pressure on land would increase due to ancillary industries and other service stations. Overall, there will not be any adverse impact on the surrounding land use during the construction period.

Impact on Soil Quality (Solid Waste)

The disposal of solid wastes will have impact on ground water sources and it has to be considered while setting up such industries. The contamination risk due to release of leachate from solid wastes will be high if ground water table is nearer to the ground and infiltration rates are high. Proper segregation of hazardous and non hazardous solid waste and disposal of hazardous waste in a Engineered Storage and Disposal facility (TSDF) is recommended. It helps in maintaining soil quality of the area.

Demography and Socio-Economics

The impact of the proposed plant on demography and socio economic conditions of the study area is as follows.

- ✤ Increase of floating population.
- Additional strain on civic amenities like road, transport, communication, drinking water, sanitation and other facilities to meet the work force requirement
- Increase in demand of services includes hotels, lodges, public transport (including taxis), etc.
- Employment Opportunities for construction labourers, skilled and unskilled workers, local population,
- ✤ Economic up-liftment of the area.
- Raising of Home rents and land prices and increase in Labour rates.

- Rapid growth of service sector will result in increase of incomes in the area.
- Beneficiation of the civil construction and transportation companies
- Expanding of services like retail shops, banks, automobile workshops, school, health care, etc.
- ✤ Increase in literacy rates.

Impact on Human Settlements

Due to the support services requirement of the guest community in the proposed Large Industrial Area – Tilda, Raipur, the host community will be benefited by way of generation of employment opportunities, increased demand for the local produce and services. Hence, there will be rise in the income level of the host community.

Impact on Terrestrial Environment

As most of the land identified for the project is dry there would not be any loss of trees and shrubs. Proper Rehabilitation package as developed by Government of Chhattisgarh will be undertaken for the loss of any private land, homestead land, agricultural land by CSIDC.

Impact on Health

Adequate air pollution, water and noise control measures will be provided in proposed project to conform regulatory standards.

Social Impacts

Most of the land has already been acquired by CSIDC for the proposed project. However as per the State Government rules & regulations CSIDC will be implementing R&R plan for any displacement of the local community. The management has proposed to give preference to local people for recruitment in semi skilled and unskilled categories. A total of about 5000 persons would be given indirect employment during construction and installation.

Transportional Impacts

Pollution from transportation is anticipated during both the phases i.e construction & operational phases. During construction phase pollution in the form of gaseous emissions will be emitted from the trucks and as well dust from the trucks carrying raw materials. However this is temporary but will be effectively controlled by water sprinkling on dusty roads. During operational phase every unit will be working under the following stipulated conditions

- Proper maintenance of transportation vehicles
- Covering of trucks which are filled with raw materials

• Thick green belt, to act as pollution sink for dust & noise

Disaster Management Plan

A major emergency is one, which has the potential to cause serious injury or loss of life. It may cause extensive damage to property and serious disruption both inside and outside the premises. Sometimes, it would require the assistance of outside agencies. Emergency may be caused by a number of different factors, e.g. plant failure, and it will normally manifest itself in three basic forms, viz fire, explosion or toxic release.

Identification And Assessment Of Hazards

This stage is crucial to both on site and off site emergency planning, as it requires systematic identification of emergencies that could arise at LIA- Tilda. These should range from small events, which can be dealt with plant personnel without outside help to the largest event for which it is practical to have a plan. Experience has shown that for every occasion that the full potential of an accident is realized, there are many occasions when some freak event occurs or when a developing incident is made safe before reaching full potential.

Disaster Preventive Measures

It is not easy to control any disaster if contingency plans are not available. For effective control of disaster adequate manpower, technical know- how, alertness and internal help are the prime requirements. It is always better to take preventive measures to avoid any disaster. In the proposed project following prevention measures will be taken to prevent disaster:

- Design, manufacture and construction of all plant and machinery's and buildings will be as per national and international codes as applicable in specific cases and laid down by the appropriate statutory authorities.
- ii) Provision of adequate access ways / walk ways for the movement of equipment and personnel are kept.
- Minimum two numbers of routes for escape during disaster are provided and a separate escape route plan is in place.

4. ENVIRONMENTAL MONITORING PROGRAM

In order to maintain the environmental quality within the standards, regular monitoring of various environmental components is necessary. Every industry will establish a dedicated Environmental cell to monitor and analyse the various environmental components of the plant.

Environmental Monitoring

Monitoring of various environmental parameters will be carried out on a regular basis to ascertain the following:

- ✓ State of pollution within the plant and in its vicinity;
- ✓ Generate data for predictive or corrective purpose in respect of pollution;
- ✓ Examine the efficiency of Pollution Control Systems installed in the complex
- \checkmark To assess and monitor environmental impacts

The following monitoring programme has been proposed to monitor various environmental components.

A. Meteorology

An automatic weather monitoring station would be installed within the plant premises for a proper measurement and record of meteorological parameters.

B. Ambient Air Quality Monitoring

To determine the extent to which the plant contributes to pollution in the area, a AAQ monitoring will be carried out with respect to SPM, RSPM, SO_2 , NO_x , Hydrocarbons, Metal Content in dust, PAH and ground level Ozone concentration.

C. Wastewater Sampling

The wastewater samples will be collected regularly both at inlet and outlet of sewage treatment plant to assess the performance and compliance as per the norms.

D. Water Sampling

The water samples will be collected regularly both in core & buffer zone area for quality and as well ground water table level. Any depletion observed in the nearby areas will be given immediate concern and necessary action will be undertaken to increase the ground water table.

E. Environmental Laboratory

- 1. Stack Monitoring Kit
- 2. Ambient Air Quality Monitoring Equipment
- 3. Dust Samplers
- 4. Noise Level Meter
- 5. BOD Incubator
- 6. pH Meter
- 7. Spectrophotometer
- 8. Portable Flue Gas Analyzer
- 9. Continuous Weather Monitoring Station

5. **PROJECT BENEFITS**

- ✤ Increase of floating population.
- Additional strain on civic amenities like road, transport, communication, drinking water, sanitation and other facilities to meet the work force requirement
- Increase in demand of services includes hotels, lodges, public transport (including taxis), etc.
- Employment Opportunities for construction labourers, skilled and unskilled workers, local population,
- Economic up-liftment of the area.
- Raising of Home rents and land prices and increase in Labour rates.
- Rapid growth of service sector will result in increase of incomes in the area.
- Beneficiation of the civil construction and transportation companies
- Expanding of services like retail shops, banks, automobile workshops, school, health care, etc.
- ✤ Increase in literacy rates.

6. ENVIRONMENT MANAGEMENT PLAN

Water Environment

Infrastructural measures for pollution control in an industrial estate under water environment are:

- ✓ Collection, Treatment and Disposal of storm water
- ✓ Collection, Treatment and Disposal of sanitary and industrial waste water

Underground sewers are preferable to collect the Storm waters.

ETP for the Industrial area is located on the western side of the proposed development area. The wastewaters are categorized as follows:

- Biodegradable (without pre-treatment)
- Biodegradable (after pre-treatment)
- Non-Biodegradable
- Toxic to biological systemsFpark

Collection of Non-Biodegradable wastewaters has to be done separately and should be sent to separate treatment units.

Air Pollution

Individual industries should take care of the pollution generated from their industries and use appropriate methods of control like

- Control at source for minimizing air pollution

- Greenbelt development around the estate reduces odour and noise pollution

- A common incinerator at places like landfill or CETP is preferred rather than having individual incinerator

Noise Environment

The following are the noise control measures proposed to be undertaken in the proposed project.

- Provision of acoustic dampeners in foundations and insulators in the interiors
- Encasement of noise generating equipment.
- ▶ A thick greenbelt will be developed to act as noise attenuator.
- In addition personnel working near high noise level generating sources will be provided with ear muffs.

Solid Waste Collection and Disposal

Solid wastes from industrial sources treated and disposed separately and the priority should be given to the resource recovery from the solid wastes.

- Incinerator for thermal treatment of hazardous waste, if needed, should be a common facility to optimize the cost and easier to maintenance.
- In order to lower the cost of transportation and for better safety, the disposal site of solid waste is preferred near the industrial estate with monitoring facility both from the point of view of surface run-off and ground water protection.

Green Belt Design & Development

The main purpose of green belt development is to contribute to the following factors:

- Improve the aesthetics of the area.
- Trap the vehicular emissions and fugitive dust emissions.
- Prevent soil ecological homeostasis.
- Prevent soil erosion and to protect the natural vegetation.
- Utilize the treated wastewater.

Every new industrial set up should also include interior greenery and a surrounding interior greenbelt. Their design and planning should be based on their function, which include:

- ✓ Spatio-visual separation of larger parts of the estate
- ✓ Provision of an interior pedestrian network
- ✓ Provision of (smaller) resting areas for the workforce during breaks (park benches etc,)

✓ Provision of reserve sites eventually becoming necessary at a later development stage.