3. DESCRIPTION OF ENVIRONMENT

3.1 INTRODUCTION

Information on the existing environmental status is essential for assessing the likely Environmental impacts of the project. In order to get an idea about the existing state of the environment, various environmental attributes such as meteorology, air quality, water quality, soil quality, noise level, ecology and socio- economic environment have been studied/ monitored. The base line environment status around the project site serves as the basis for identification, prediction and evaluation of the impacts due to proposed activity. In order to predict anticipated of the project, it is necessary to have baseline information of environment.

3.2 PURPOSE

Baseline monitoring for different components are carried out for the purpose to determining the range of variation of the system and establishing reference point against which changes can be measured.

Baseline studies include collection of data on relevant biophysical, social and economic aspects provide a reference point against which the characteristics and parameters of impact related changes are analyzed and evaluated. The interaction of baseline environment and anticipated impacts are the basis for the environmental management plan for the proposed activity.

3.3 STUDY AREA

The present report covers baseline environmental data generated in the study area (10 km radius all around the project site for land use and the sample selection for monitoring.

Baseline environmental data generation for air, water, noise and soil quality monitoring around the project site was conducted in the month of December 2014.

3.4 BASELINE MONITORING OF ENVIRONMENTAL COMPONENT

In order to get an idea about the existing state of the environment, various environmental attributes such as meteorology, air quality, water quality, soil quality, noise level, ecology and socio-economic environment have been studied/monitored.the Basemonitoring photos are attached as **Annexure-II.**

3.5 Meteorology

The climate is characterized by an intensely hot summer and a cold winter. November

to March is winter; summer season prevails during May and June. Rainy season is from July to September.

i) **Temperature.** The winter starts in December when day and night temperatures fall rapidly. January is the coldest month when the mean daily minimum temperature is 6 to 7 Degree C. During cold waves, the minimum temperature may go down to the freezing point of water, and frosts can occur. During the summer months of May and June, the maximum temperature sometimes reaches 47 Degree Centigrade. Temperature drops considerably with the advancement of monsoon in June. However, the night temperature during this period continues to be high.

ii) **Humidity**. Humidity is considerably low during the greater part of the year. The district experiences high humidity only during the monsoon period. The period of minimum humidity (less than 20%) is between April and May.

iii) **Rainfall.** The annual rainfall varies considerably from year to year. However, the maximum rainfall is experienced during the monsoon season, which reaches its peak in the month of July. In fact, the monsoon period accounts for 75% of the annual rainfall in the district. On an average there are 24 days in a year with rainfall of 2.5 mm (or more) per day in district Jhajjar. Annual average rainfall in the district is 511.4 mm.

iv) **Wind.** During the monsoon, the sky is heavily clouded, and winds are strong inthis period. Winds are generally light during the post-monsoon and winter months. Similarly, in the monsoon periods winds are strong, and in post- monsoon and winter months it is light. Thunder storm and dust storm, often accompanied with squalls (andhis) experienced during the period April to June.

v) **Region Specific Weather Phenomena.** The climate of the district can be classified as tropical steppe semi-arid and hot which is mainly characterized by the extreme dryness of the air except during monsoon months, intensely hot summers and cold winters. During three months of south west monsoon from last week of June to September, the moist air of oceanic origin penetrate into the district and causes high humidity, cloudiness and monsoon rainfall.

Mean and extreme monthly data of Rainfall (in mm) of Jhajjar district during the period from 2009 to 2013 is given in Table 3.1 below

Table 3-1: Rainfall Data (Average of 5 years data) (2009-2013)(in mm)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	0	0	0.3	14	9	4.3	97.7	72.6	183	0	0	0
2010	0	5.3	0	0	0	0	99.7	238.3	142.4	0	0	0
2011	0	5.2	0	0	24.5	52.5	108.8	50.8	89.5	0	0	0
2012	0.8	0	0	5.5	2	3	24.3	144.2	44	4	1.3	3.7
2013	12	32	0	0	0	28	71.9	124.3	40.6	1.3	0.8	0

(Source: IMD, Jhajjar)

Methodology

On-site monitoring was undertaken for various meteorological parameters as per BIS and IMD guidelines to generate the site-specific data. The generated data was then compared with the meteorological data of Delhi (A), IMD.

Methodology of Data Generation

The automatic meteorological data recording instrument was installed near to the project site to record wind speed, wind direction, relative humidity and temperature. Cloud cover was recorded by visual observation. Rainfall was monitored by rain gauge.

Hourly average, maximum, and minimum values of wind speed, direction, relative humidity, rainfall, and temperature were recorded continuously at this station during December month, 2014.

Analysis of Meteorological Data Recorded Near the Project Site

The meteorological data recorded at the project site and Windrose diagrams are presented in Figure **7**

It was observed that the temperature at the proposed site during the study period ranged from 7^{o}C to 26^{o}C. Whereas the relative humidity ranged from 45% to 96%. Avg wind speed is 3.5 to 7.5 mts/sec.

Predominant winds from SE direction, followed by West and NW of the total time, the clam conditions were observed for 20.1% of the total time during study period.

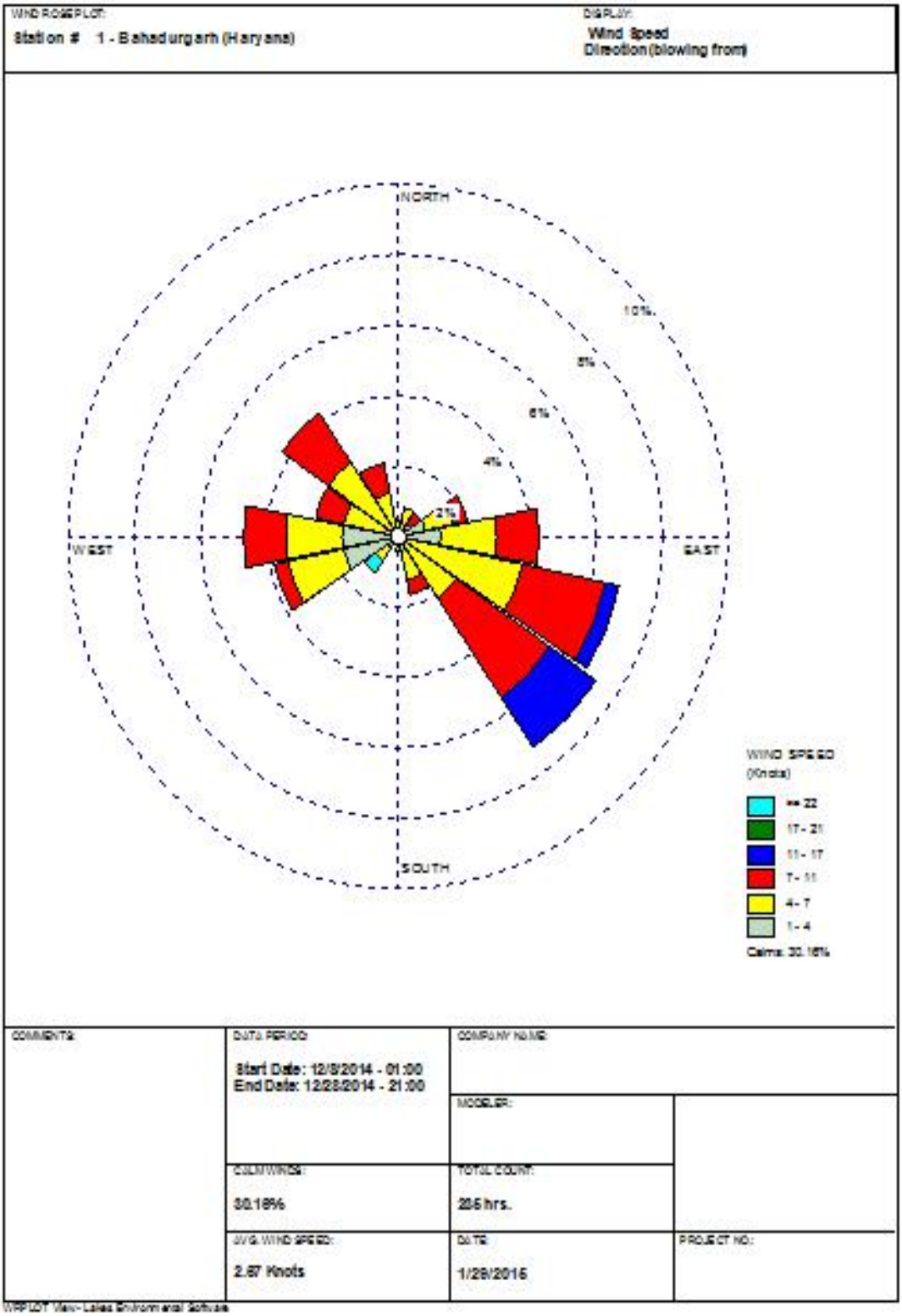

Figure-7: The Wind-rose Diagram for the Season-2014

3.6 Air Environment

To quantify the impact of the project on the ambient air quality, it is necessary at first to evaluate the existing ambient air quality of the area. The existing ambient air quality, in terms of Particulate Matter - 10(PM10), Particulate Matter- 2.5(PM2.5), Sulphur-dioxide (SO), Oxides of Nitrogen (NOx), Ozone (O3) and Carbon Monoxide (CO) has been measured through a planned field monitoring. To assess the ambient air quality level, 5 (five) monitoring stations were set up.

Location of the ambient air quality monitoring stations are given in **Figure 8 & Table 3.2**

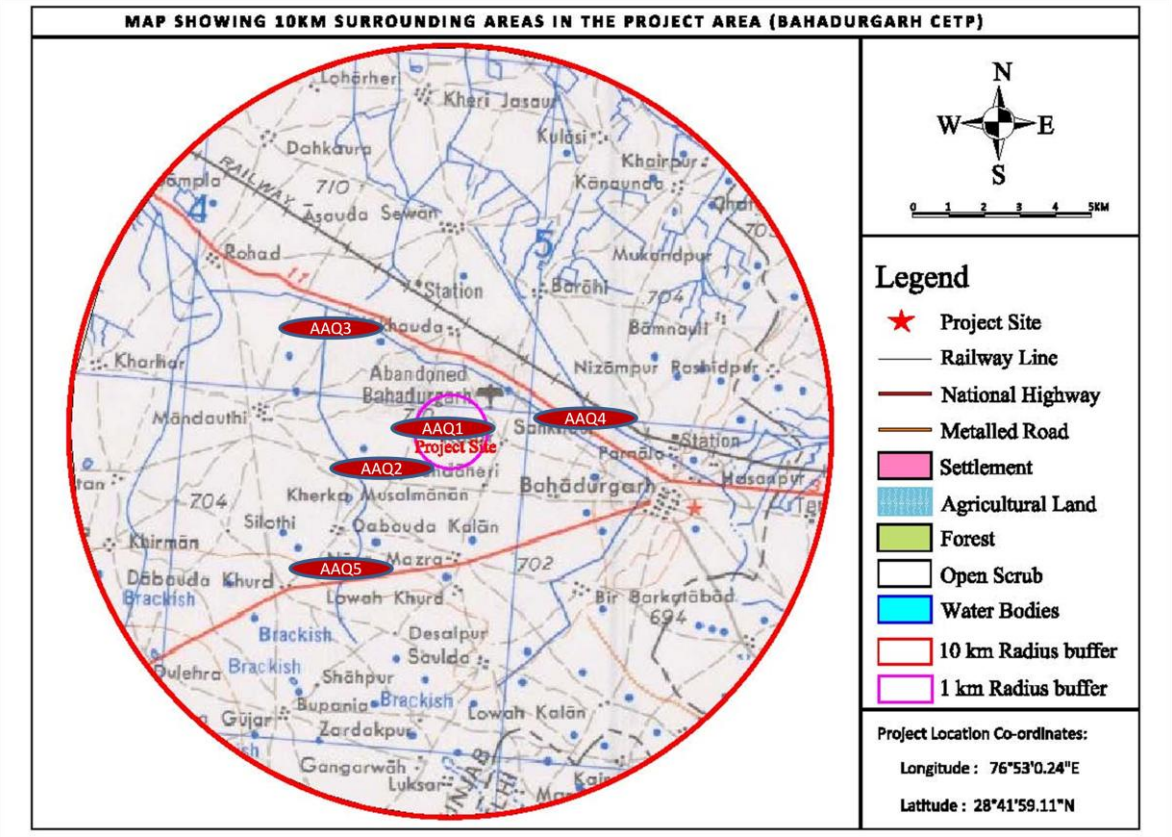

Figure-8: Locations of Ambient Air Monitoring

Monitoring Schedule

Ambient air quality monitoring was carried out twice a week with a frequency of 24 hours.

Methods of Sampling and Analysis

Fine particulate Sampler APM MFC550 was used for monitoring Particulate

Matter ($PM_{2.5}$ and PM_{10}); gaseous pollutants like SO2, and NOx were collected by Gaseous Pollutant Sampler APM 433 and CO was monitored by Serinous 30 CO Analyser with NDIR detector by the MoEF Recognized Laboratory M/s. **Analitika Ecolab Pvt** Ltd, Gwalior. (MP)

Table 3-2: Location of Ambient Air Quality Monitoring Stations

Code	Name of the Locations	W.R.T. Site		Remarks
		Distance (km)	Direction	
A1	CETP site	-	-	Industrial Estate
A2	Tandaheri village	2.8 km	SW	Residential area
A3	Near BLS institute of technology	3.15km	NW	Institutional area
A4	Sankhol village	2.63	ENE	Residential area
A5	Nuna majra village	3.15	SW	Residential area

Method for Measurement of Particulate Matter, SO_2 & NO_x

Method for measurement of Particulate Matter (PM_{10}) in ambient air is done by Cyclonic Flow Technique. Particles with aerodynamic diameter less than the cut-point of the inlet are collected by a filter. Ambient air at the monitoring location is sucked through a cyclone. Coarse and non-reparable dust is separated from the air stream by centrifugal forces acting on the solid particles and these particles fall through the cyclone's conical hopper and get collected in the sampling cap placed at the bottom. The fine dust (<10 microns) forming the particulate matter (PM_{10}) passes the cyclone and is retained on the filter paper The mass of these particles is determined by the difference in filter weights prior to and after sampling. The concentration of PM_{10} in the designated size range is calculated by dividing the weight gain of the filter by the volume of air sampled. A tapping is provided on the suction side of the blower to provide suction for sampling air through a set of impingers for containing absorbing solutions for SO_2 and NOx. Samples of gases are drawn at a flow rate of 0.2 liters per minute. The APM MFC 550 is used for $PM_{2.5}$. This system is a manual method for sampling fine particles ($PM_{2.5}$ fraction) and is based on Impactor designs standardized by USEPA for ambient air quality monitoring.

$PM_{2.5}$ & PM_{10} have been estimated by gravimetric method. Improved West and Gaeke method (IS-5182 part-II, 1969) has been adopted for estimation of SO_2 and Modified Jacobs- Hochheiser method (IS-5182 part-VI, 1975) has been adopted for

the estimation of NO_X.

Method for Measurement of Carbon Monoxide – NDIR method

Instrument used: Ecotech Serinus 30 Carbon Monoxide: This analyser is used to measure CO in ambient air, in the range of 0-200 ppm (220mg/m^3) to a sensitivity of 0.05 ppm i.e. 55µg/m^3). The Serinus 30 combines the benefits of Microprocess control with Non- Dispersive Infrared Spectrophotometry technology. CO Concentration is automatically corrected for gas temperature and pressure changes.

RESULTS AND DISCUSSION

The summary results of AAQ monitoring i.e. minimum, maximum for five stations are given in **Table 3-3.**The results when compared with National Ambient Air Quality Standards (NAAQS) of Ministry of Environment and Forests (MoEF), 16th November 2009 for “Industrial, Residential, Rural and Other Areas" show that the range of percentile values of ambient air quality parameters are within the stipulated limits as below:

The maximum & minimum values of PM10 observed at Nuna Majra village were148 µg/m^3, and Near BLS institute of technology were 104.1µg/m3 respectively.

The maximum & minimum values of PM2.5 observed at the Nunamajra village were 72.2µg/m3, and at Tandaheri village 57 µg/m3 respectively.

The maximum & minimum values of SO_2observed at the Nunamajra village were 30.9 µg/m3, and at Near BLS institute of technology 23.2 µg/m3 respectively. All these values are below the stipulated standard of 80 µg/m^3.

Themaximum & minimum values of NO_xobserved at the Nunamajra village were 18.9 µg/m3, and CETP project site 11.5 µg/m^3 respectively. All the values are below the stipulated standard of 80µg/m^3.

The maximum & minimum values of CO observed at the Nunamajra village were 678µg/m3, and Tandaheri village 521 µg/m3 respectively. All the values are below the stipulated standard of 2000µg/m^3.

Table 3-3: Summary of Ambient Air Quality Results

Code	Location	PM_{10}		$PM_{2.5}$		So_2		NOx		CO	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A1	CETP site	110	144.5	58.6	69.2	25.2	28.9	11.5	14.1	560	644
A2	Tandaheri village	118	136	57	67.2	25.2	28.9	12.5	15.2	521	604
A3	Near BLS institute of technology	104	115	57.9	64.9	23.2	26.9	12.5	13.5	566	598
A4	Sankhol village	118	144	61	68	24.1	30.1	12.5	18.1	590	642
A5	Nuna majra village	122	148	68.2	72.2	25.1	30.9	12.5	18.9	594	678
NAAQ Standards(µg/m^3)		100		**60**		**80**		**80**		**2000**	

Source: Primary Monitoring

3.7 Noise Levels

Noise is one of the most undesirable and unwanted by-products of our modern life style. It may not seem as insidious or harmful as air and water pollutants but it affects human health and well-being and can contribute to deterioration of human well-being in general and can cause neurological disturbances and physiological damage to the hearing mechanism in particular. It is therefore, necessary to measure both the quality as well as the quantity of noise in and around the site.

Methodology

The intensity of sound energy in the environment is measured in a logarithmic scale and is expressed in a decibel, dB (A) scale. In a sophisticated type of sound level meter, an additional circuit (filters) is provided, which modifies the received signal in such a way that it replicates the sound signal as received by the human ear and the magnitude of sound level in this scale is denoted as dB(A). The sound levels are expressed in dB(A) scale for the purpose of comparison of noise levels, which is universally accepted by the international community.

Noise levels were measured using an Integrating sound level meter manufactured by Pulsar Instruments Plc, Model NO. 91 (SL.No. B21625). It has an indicating mode of Lp and Leq. Keeping the mode in Lp for few minutes and setting the corresponding range and the weighting network in “A” weighting set the sound level meter was run for one hour time and Leq was measured at all locations.

The day noise levels have been monitored during 6.00am to 10.00pm and night

noise levels, during 10.00 pm to 6.00 am at all the 5 locations, which covers residential areas, highways, Industrial Estates, commercial areas, and silence zones, if available within 10 km radius of the study area.

Sampling Locations

A preliminary survey was undertaken to identify the major noise generating sources in the area. The noise survey was conducted to assess the background noise levels in different zones. Gazettes Notification (S.O. 123(E)) of MoEF dated February 14, 2000 on ambient air quality standards has different noise levels for different zones viz. industrial, commercial, and residential and silence zones. Four sampling locations were selected for the sampling of noise levels. The sampling locations are given in **Figure 9** & **Table 3.4**.

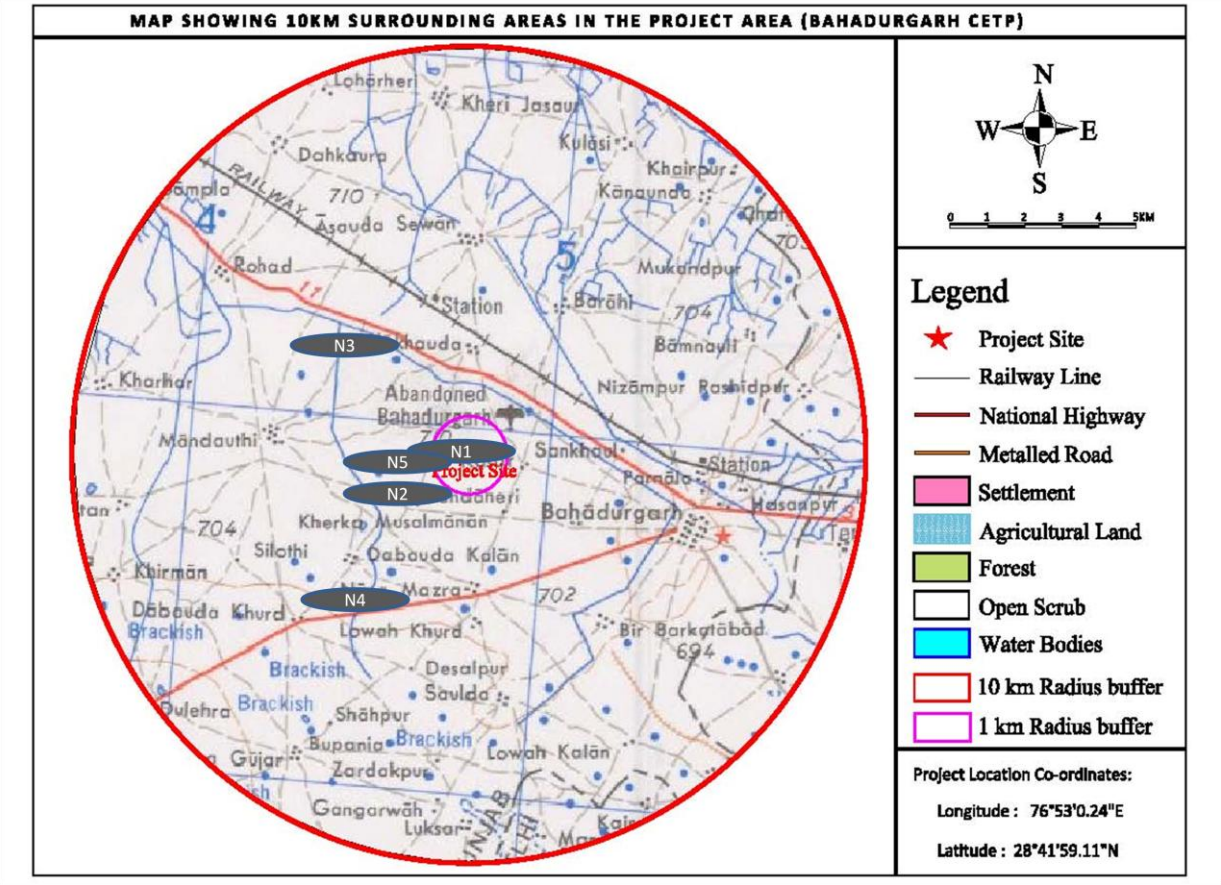

Figure-9: Locations of Ambient Noise Monitoring

Table 3-4: Noise Level Monitoring Stations in the Study Area

Code	Name of the Locations	W.R.T. Site		Remarks
		Distance (km)	Direction	
N1	CETP site	-	-	Industrial Estate
N2	Tandaheri village	2.8 km	SW	Residential area
N3	Near BLS institute of technology	3.15km	NW	Institutional area
N4	Nuna majra village	3.15	SW	Residential area
N5	NH-10(Bahadurgarh bypass)	0.5	W	Road

Ambient Noise Standards

Ministry of Environment & Forests (MoEF) has notified the noise standards vide gazette notification dated February 14, 2000 for different zones under the Environment Protection Act (1986). These standards are given in **Table-3.5.**

Table 3-5: Ambient Quality Standards in respect of Noise

Area Code	Category of Area	Noise dB (A) L_{eq}	
		Daytime*	Night time*
A	Industrial Estate	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

(Source: CPCB Guidelines)

Note:

1. Daytime is from 6.00am to 10.00 pm and Nighttime is from 10.00 pm to 6.00 am.
2. Silence zone is defined as area up to 100 meters around premises of hospitals, Educational institutions and courts. Use of vehicle hours, loud speakers and bursting of crackers are banned in these zones.

Table 3-6: Hourly Leq Noise Level in the Study Area

Code	Name of the Locations	daytime Leq (Ld)	night time Leq (Ln)
N1	CETP site	**65.2**	**51.2**
N2	Tandaheri village	**55.5**	**50.8**
N3	Near BLS institute of technology	**66.3**	**43.12**

N4	Nuna majra village	**67.4**	**52.80**
N5	NH-10(Bahadurgarh bypass)	**69.3**	**57.58**

Source: Primary Monitoring

RESULTS AND DISCUSSION

The noise data compiled on noise levels during December 2014 is given in **Table 3.6**. It can be seen that the night time Leq (Ln) varies from 43.12 to 57.58(A) and the daytime Leq (Ld) varies from 55.5 to 69.3 (A) within the study area. The noise levels are higher at industrial zone and commercial zone than those recorded at project site, residential zone and silence zone which is due to lesser human activity in these areas. The status of noise quality within the 5 km zone of the study area is, therefore, within the CPCB standards.

3.8 Water Environment

Water Quality

Water quality assessment is one of the essential components of EIA study. Such assessment helps in evaluating the existing health of water body and suggesting appropriate mitigation measures to minimize the potential impact from development projects. Water quality of ground water has been studied in order to assess proposed water-uses in construction, drinking, cooling and horticulture purpose.
The water quality at the site and other locations within the 5 km impact zone was monitored in December 2014. The locations of the monitoring sites are depicted in **Figure 10 & Table 3.8** and the result of the monitoring and analysis of ground water and surface water is presented in the **Table 3.9.**

Sampling Frequency and Sampling Techniques

Parameters for analysis of water quality were selected based on the utility of the particular source of water as per MoEF guidance. Hence quality of ground water was compared with IS: 10500: 1991 (Reaffirmed 1993 with Amendment No.3 July 2010) for drinking purposes. Surface water quality was analyzed for parameters as mentioned in the 'Methods of Monitoring & Analysis published by CPCB (in Annexure IV of CPCB guidelines)' and it was rated according to the CPCB'S Designated-Best-Use Water Quality Criteria as presented in Table 3-7. Grab water samples were collected from sampling locations in a 5 liter plastic jerrycan and 250 ml sterilized clean glass/pet bottles for complete physico-chemical and bacteriological tests respectively. The samples were analyzed as per standard procedure / method given in IS: 3025 (Revised Part) and Standard Method for Examination of Water and Wastewater Ed. 21st (2005), published jointly APHA, AWWA and WPCF.

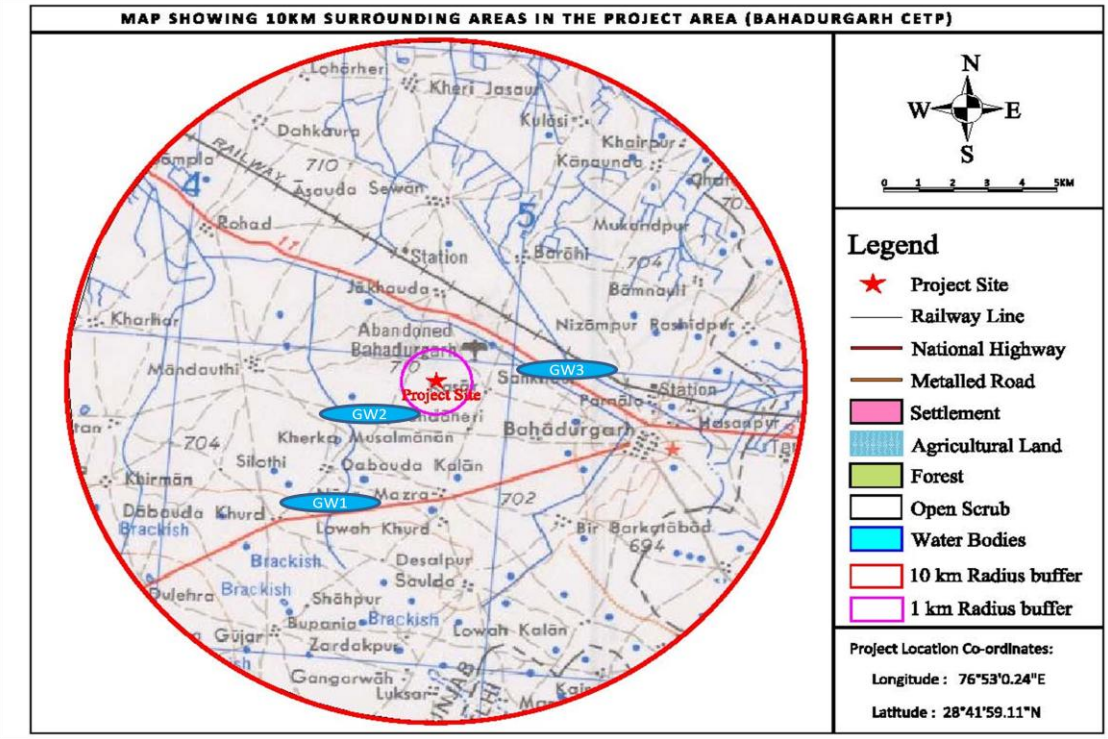

Figure-10: Locations of water sampling Sites

Table 3-7: Water Quality Criteria as per Central Pollution Control Board

Designated-Best-Use	Class of water	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	• Total Coliforms Organism MPN/100ml shall be 50 or less • pH between 6.5 and 8.5 • Dissolved Oxygen 6mg/L or more • Biochemical Oxygen Demand 5 days
Outdoor bathing (Organized)	B	• Total Coliforms Organism MPN/100ml shall be 500 or less; • pH between 6.5 and 8.5; • Dissolved Oxygen 5mg/L or more • Biochemical Oxygen Demand 5 days
Drinking water source after conventional treatment and disinfection	C	• Total Coliform Organism MPN/100ml shall be 5000 or less;
		• pH between 6 to 9; • Dissolved Oxygen 4mg/L or more • Biochemical Oxygen Demand 5 days
Propagation of Wild life and Fisheries	D	• pH between 6.5 to 8.5 • Dissolved Oxygen 4mg/L or more • Free Ammonia (as N) 1.2 mg/L or
Irrigation, Industrial Cooling, Controlled Waste disposal	E	• pH between 6.0 to 8.5 • Electrical Conductivity at 25°C micro mhos/cm Max.2250 • Sodium absorption Ratio Max. 26 • Boron Max. 2mg/L
	Below-E	Not Meeting A, B, C, D & E Criteria

As per the standard practice, one sample from each station was taken each month in the study period. Sampling was done by standard sampling technique as per the Standard Methods. Necessary precautions were taken for preservation of samples.

Table 3-8: Location of Water Sampling Sites

Code	Name of the Locations	W.R.T. Site		Remarks
		Distance (km)	Direction	
GW1	Nuna majra village	3.15	SW	Residential area
GW2	Tandaheri village	2.8 km	SW	Residential area
GW3	Sankhol village	2.63	ENE	Residential area

Source: Primary Monitoring

RESULTS & DISCUSSION

The results of the Ground Water analysis are given in Tabble 3-9:

Table 3-9 : Ground Water Quality

S.No.	Parameters	Standard Limits IS: 10500-2012		Reference Method	GW1 (Nuna majra)	GW2 (Tandaheri)	GW3 (Sankhol)
PHYSICO-CHEMICAL TESTs		Requirement (Acceptable Limit)	Permissible Limit in absence of Alternate source				
1.	pH Value	6.5-8.5	6.5-8.5	APHA, 4500H+,B/4-92-96, 22nd ED. 2012	8.18	8.42	8.12
2.	Color (Hazen Units)	5.0	15	APHA, 2120B/2-6 to2-7, 22nd ED. 2012	1.2	2.1	1.2
3.	Odour	Un Objectionable	Un Objectionable	APHA,2150B/2-16, 22nd ED. 2012	Un objectionable	Un objectionable	Un objectionable
4.	Taste	Agreeable	Agreeable	APHA, 2160B-2-20, 22nd ED. 2012	Agreeable	Agreeable	Agreeable
5.	T.D.S. (mg/L)	500	2000	APHA, 2540C /2-65 to2.65, 22nd ED. 2012	1560	4142	1540
6.	Turbidity (NTU)	1.0	5.0	APHA, 2340B/2.13 to2-15, 22nd ED. 2012	0.9	2690	996
7.	EC			APHA,3113B 3-28 to3-33, 22nd ED. 2012	2410	1.2	0.9
8.	Total Hardness (mg/L)	200	600	APHA,2340C/2-44 to2-47, 22nd ED. 2012	644	1312	512
9.	Nitrate (mg/L)	45	45	APHA,4500NO_3 b/4-122 to4-123,	5.2	8.8	6.2

S.No.	Parameters	Standard Limits IS: 10500-2012		Reference Method	GW1 (Nuna majra)	GW2 (Tandaheri)	GW3 (Sankhol)
PHYSICO-CHEMICAL TESTs		Requirement (Acceptable Limit)	Permissible Limit in absence of Alternate source				
				22nd ED. 2012			
10.	Sulphate (mg/L)	200	400	APHA,4500SO_4E/4-190 to4-191, 22nd ED. 2012	188	312	156
11.	Chloride	250	1000	APHA, 4500Cl^-B/4-72 to4-73, 22nd ED. 2012	456	880	280
12.	Calcium (as Ca) (mg/L)	75	200	APHA,3500 Ca B-3-67 to3-68,22nd ED. 2012	168	324	122.4
13.	Magnesium (as Mg) (mg/L)	30	100	APHA, 3500 Mg B/3-84 to3-85, 22nd ED. 2012	54.43	ND	50.06
14.	Alkalinity as $CaCO_3$ (mg/L)	200	600	APHA, 2320 2-34 to2-36, 22nd ED. 2012	390	121.50	312
15.	Fluoride (mg/L)	1.0	1.5	APHA,4500F^-D/4-87 to4-89, 22nd ED. 2012	0.49	544	0.68
16.	Manganese (as Mn) (mg/L)	0.1	0.3	APHA,3113B 3-28 to3-33, 22nd ED. 2012	ND	0.92	ND
17.	COD	--	--	5220 B, 5-17 to 5-18, APHA 22nd Edition, 2012	48	0.25	ND
18.	BOD	--	--	IS:3025 (Part 44) :1993	5.7	0.1	39
19.	Residual Chlorine (mg/l)	0.2	1.0	APHA,4500Cl-B4-60 to 4-62, 22nd ED. 2012	ND	52	4.6
20.	Iron (mg/L)	0.3	0.3	APHA,3500-Fe-B-3-77 to3-80, 22nd ED. 2012	0.18	6.2	0.12
MICROBIOLOGICAL TEST							
21.	Thermotolerant Coliform (No./100ml)	Absent	Absent	APHA, 9221F/9-75 to9-76, 22nd ED. 2012	Absent	Absent	Absent
22.	E-Col	Absent	Absent	APHA, 9221F/9-75 to9-76, 22nd ED. 2012	Absent	Absent	Absent

Results of Ground Water Analysis

Preliminary survey was carried out to identify ground water sampling location, considering its uses for domestic and drinking purposes and other activities. Based on this different locations were selected for ground water sampling in all direction in different villages. The physico-chemical characteristics of ground water samples are given in the **3.9**

- The total dissolved solids were observed in the range 996 to 2690 mg/L which is above than the desirable limit.
- The total hardness, as $CaCO_3$ was observed in the range of 512 to 1312 mg/L, which is above than the desirable limit.
- The concentrations of calcium observed in the range range of 122-324 mg/L,, which is above than the permissible limit of 200 mg/L and the concentrations of magnesium was observed in the range 54 to 121 mg/L.
- The concentration of chloride was observed in the range 280 to 880mg/L which is above than the desirable limit
- The concentrations of sulphate were observed in the range 156 to 312 mg/L, which is below to above than the desirable limit of 200 mg/L.
- The concentrations of nitrate were observed in the range 5.2 to 8.8 mg/L which is well within the desirable limit.

It is, therefore, concluded that the ground water at the site is not safe for use as potable water. All the parameters are within and above the permissible limit. There is no alternative source of drinking water. So this water can be cleaned and used as drinking purpose.

3.9 Land environment

Land is the most vital resource for sustenance of life and degradations of land due to industrialization, urbanization and population growth is a matter of concern. Therefore, it is necessary to establish the existing land use pattern to optimize the land use as well as minimize degradation due to the developmental activities. Also it is necessary to study the landform of the project site and the quality of the soil as soil erosion further deteriorates the quality of the land.

Topography

Government of Haryana has established Industrial Estate at Bahadurgarh. This estate is known as HSIIDC Bahadurgarh. This is one of the largest industrial estates in the State of Haryana. HSIIDC is located 28 km away from Delhi on the Northen Railway track and 0.5 km away from lhi-Punjab National Highway No. 10 in the District of Jhajjar.

The overall Topography of the area is marked by alluvial plain and at some places by undulating dunes. The average plain elevation of the Distt is about 222 meters above mean sea level. There is a gentle slope from North South. The Hydraulic gradient of ground water is very gentle. Ground water movement in the North Western part is from S.E. to N.W. in the South Western part is from S.W. to N.E.

Geology

The area forms a part of in Dugan ethic plain ranging from Pleistocene to recent in age Aeolian deposits of Sub- recent age cap the plains. The sediments comprise of clay, sand and Kankar mixed in different proportions. No exposure of hard rock farming the basement is seen in the area.

Soil

Dist. Jhajjar is a part of in digenetic alluvial plain. The sediment consists of sand, silt, gravel and kankar etc. The soil texture varies from sandy to clay having a heterogeneous composition with frequent calcium carbonate layers at shallower depths. The sahibi river basin in parts of Jhajjar and Bahadurgarh blocks are sandy loam in rexture yellowish and brown in colour. The organic Carbon, Nitrogen and Phosphorous are low with medium to high Potash. The soil of Sahlawas and Mattanhail Block are sandy to sandy loam in texture, Light in colour deficient in organic carbon, low in Nitrogen and Phosphorous with medium to high available potash. 10% of the area is affected by salinity and alkalinity problem due to poor drainage brackish water and compact kankar layer below root zone.

Soil Characteristics

The composite soil samples were collected from project site and the study area and were analyzed for characterization. The locations of the monitoring sites are depicted in **Figure11** & **Table 3.11**, **and** the result of the monitoring and analysis is presented in the **Table 3.12**

Methodology for Soil Sampling and Monitoring

The soil samples were collected from 2 locations as given in **Table 3.11.** At each of these locations, sub-locations were identified randomly from where soil samples were collected from surface to 30 cm below the surface. These samples collected from four places for each location were homogenously mixed. The samples were filled in polythene bags, labeled in the field with number and site name and sent to laboratory for analysis. **Table 3.10** gives the idea of the frequency and

methodology of selection of soil sampling stations and monitoring process.

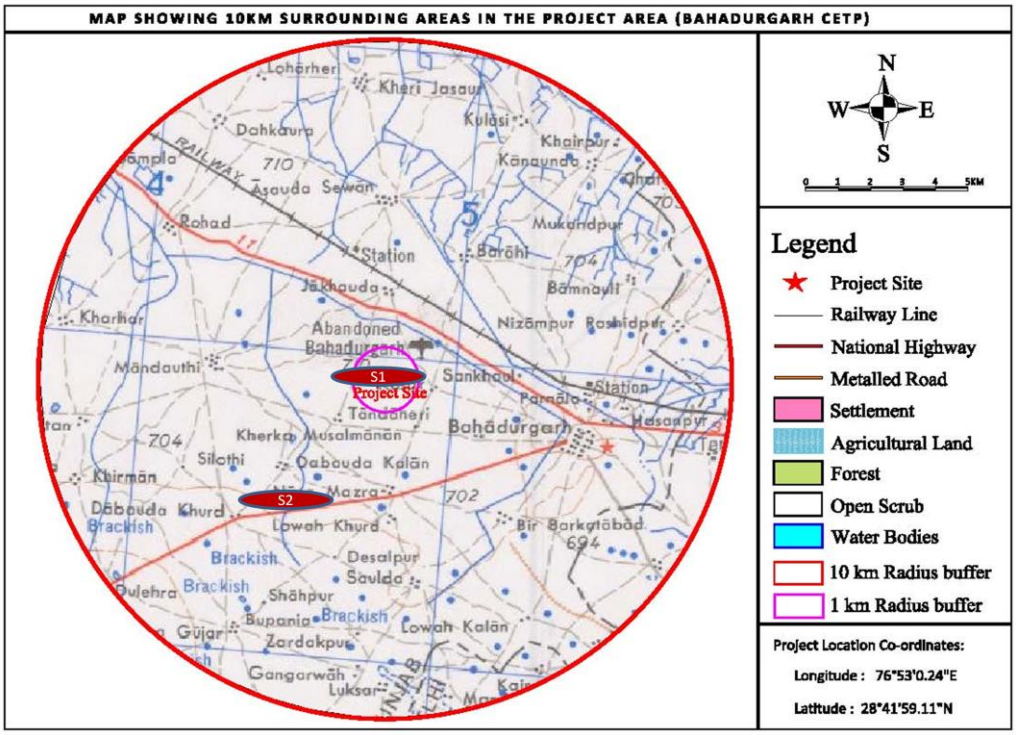

Figure-11: Locations of Soil Sampling Sites

Table 3-10: Frequency and Methodology for Soil Sampling & Monitoring

Particulars	Details
Frequency	One *grab sample from each station– once during the Study Period
Methodology	Composite grab samples of the topsoil were collected from 5 places and mixed to provide a representative sample for analysis. They were stored in air tight Polythene Bags and analyzed at the laboratory

**Grab sample- a single sample or measurement taken at a specific time or over as short period as feasible*

Table 3-11: Soil Sample Collection Points

Code	Name of the Locations	W.R.T. Site		Remarks
		Distance (km)	Direction	
S1	CETP site	-	-	Industrial Estate

S2	Nuna majra village	3.15	SW	Residential area

Table 3-12: Physico-Chemical Properties of Soil

S.No.	Parameters	UNIT	Result	
			S-1	S-2
1.	pH(1:5)	--	7.9	7.78
2.	Electrical Conductivity	µmhos/cm	1244	1379
3.	Colour	--	Yellowish/ Brown	Yellowish/ Brown
4.	Soil Type	--	Sandy Loam	Sandy Loam
5.	Sodium	mg/Kg	155	156
6.	Potassium	mg/Kg	102	108
7.	Phosphorus	gm/Kg	0.92	1.01
8.	SAR	meq/100g	2.12	3.22
9.	Cation Exchange Capacity	meq/100g	9.38	9.48
10.	Bulk Density	g/cc	0.89	0.85
11.	Water Holding Capacity	ml/g	0.59	0.55
12	Texture	%	Sand-39.0% Silt-40% Clay-21.0%	Sand-38.0% Silt-42.0% Clay-20.0%

Results of Physico-chemical Analysis of the Soil

On the basis of physical analysis of the soil of the study area, most of them are black soils which contain more sand, with predominant gray colour.

- Electrical conductivity of the soil measured is 1244 to 1379
- The value of Phosphorous was in the range 0.92 to 1.01 mg/kg.
- The soil shows a pH range of 7.78-7.9, which is acidic, probably, due to presence of oxides and hydroxides of the basic metals in Moderate amount.

The results show that the soils in the study area are low fertile in nature

3.10 Biological Environment

Literally environment stands for the totality of surrounding conditions. Animals and plants form a vital part of this sum total. Flora and fauna of an area are inter-related to each other and have a very crucial impact on human life. With changes in environmental conditions, structure, density and composition of plants and animals undergo changes as well. The present study was carried out to account for floral and

faunal community in study area.

The project site is a vacant plot without any vegetation. Only some herbs and grasses are present in the project site.

3.10.1 Biological Environment: Terrestrial Ecology/Aquatic Ecology

Haryana is primarily an agriculture state with almost 80% of its land under cultivation. The geographical area of the state is 44212 sq. km which is 1.3% of India's geographical area. It is not bestowed with bounty of natural forests and only 3.9% of its geographical area is under notified forests. As per India State of Forest Report, FSI, 2011, the Forest Cover in the state is 1608 sq.km which is 3.64% of the state's geographical area and the Tree Cover in the state is 1395 sq. km which is 3.16% of the geographical area. Thus the Forest and Tree Cover of the Haryana state is 6.80% of its geographical area.

The information has been collected through field studies, enquiry with local people, consultation with various government departments and collation of available literature with various institutions and organizations. The summary of data collected from various sources as a part of the EIA study is outlined in **Table 3.13**.

Table 3-13: Summary of data collected from various sources

Aspect	Mode of data collection	Parameters monitored	Frequency	Source(s)
Terrestrial Ecology	Primary data and secondary data	Floral and Faunal Inventory/ Importance	One Season (Winter)	Field studies, literature review
Aquatic Ecology	Primary data	Presence of various species/Importance	One Season (Winter)	Field studies

Methodology

Survey was conducted to evaluate flora and faunal composition of the study area (core and buffer zone). Flora was studied by collecting secondary data and by verifying it through visits to different areas in the study area and through enquiry with the local people.

Primary data on faunal composition was recorded during site visit, interview with local people and secondary data was collected from various sources to get the

correct picture of the study area. The major portion of the study consists of forests and agricultural fields and human settlements.

The survey methods used for faunal assessment are:

1. Walkthrough method

2. Direct Observation Method- birds, mammals

3. Enquiry with local people

The 10 km radius range from the project site comprised of number of habitats. Some of the major habitats are; Coast lines, Mangrove systems in Drains, Scrublands, Forest fragments of Mixed dry deciduous nature, Small Ponds and Forested hills.

A survey was conducted to study the flora around 10 km radius. Some of the information was gathered from the local habitants. All the collected data were classified to interpret the impact of pollution on the flora and fauna of that region. Survey of the mild plants as well as cultivated crop plants was made and all the available information was recorded.

3.10.2 Floral Diversity

A floral enlistment of trees, shrub & climbers, herbs with their scientific names, common names and the family to which they belong are presented in a tabular format as Table 3.14. The contents of this subsection are based primarily on reconnaissance survey carried out by our team & available information from forest department.

The floral diversity in the region can be categorized as mixed deciduous forest. Thorny, dry, deciduous forest and thorny shrubs can be found all over the state. During the monsoon, a carpet of grass covers the hills. Mulberry, eucalyptus, pine, kikar, shisham and babul are some of the trees found here.

The species of fauna found in the state of Haryana include black buck, nilgai, panther, fox, mongoose, jackal and wild dog. Some of the species of plants observed during the survey, given in table 3.15 to 3.17. Out of this around 50 % of these plant species were native and wild species.

Table 3-14 : List of Plant Species observed in the study area

S. No	Scientific Name	Family	Common Name
1.	*Azadirachta indica*	Meliaceae	Neem
2.	*Melia azederach*	Meliaceae	Bakain

3.	*Morus alba*	Moraceae	Sahtut
4.	*Pongamia glabra*	Fabaceae	Papri
5.	*Albizia lebbek*	Fabaceae	Siris
6.	*Prosopis cineraria*	Fabaceae	Jand
7.	*Acacia nilotica*	Fabaceae	Kikar
8.	*Tamarix articulatae*	Tamaricaceae	Fransh
9.	*Syzygium cumini*	Myrtaceae	Jamun
10.	*Ageal marmelas*	Rutaceae	Bel Patha
11.	*Zizyphus mauritana*	Rhamnaceae	Ber
12.	*Ficus religiosa*	Moracea e	Peepal
13.	*Acacia leacophloea*	Fabaceae	Raunj
14.	*Dalbergia sissoo*	Fabaceae	Shisham
15.	*Accacia nilotica*	Fabaceae	Babool
16.	*Calotropis procera*	Asclepiadaceae	Mudar
17.	*Achyranthus aspra*	Amaranthaceae	Apamarga
18.	*Zizyphus jujude*	Rhamnaceae	Jujube
19.	*Achnatherum hymenoides*	Acanthaceae	Indian rice grass
20.	*Carnegiea gigantica*	Cactaceae	Cactus
21.	*Anogeissus latifolia*	Combretaceae	Dhawada

3.10.2.1 Faunal Diversity

There is a relatively poor sighting of animals in the core and buffer areas of the Project site

Table 3-15: List of Domesticated Fauna

Sr.no.	Common name	Scientific name
1	Dog	Canis lupus familiaris
2	Cat	Felis catus
3	Hen	Gallus gallus domesticus
4	Cattle	B. primigenius/ Taurus/
5	Goats	Capra aegagrus hircus
6	Buffalo	Bubalus bubalis

Table 3-16: List of Bird Species found in the study area

Sr. no.	Common name	Bird species	Family
1.	Ashy Prinia	*Prinia socialis*	Cisticolidae
2.	Asian Drongo-Cuckoo	*Surniculus lugubris*	Cuculidae
3.	Asian koel	*Eudynamys Scolopaceus*	Cuculidae

4.	Asian Palm Swift	*Cypsiurus*	Apodidae
5.	Asian Paradise-flycatcher	*Terpsiphone*	Monarchidae
6.	Baya weaver	*Ploceus philippinus*	Passeridae
7.	Black Drongo	*Dicrurus*	Dicruridae
8.	Black Kite	*Milvus migrans*	Accipitridae
9.	Black shouldered kite	*Elanus caeruleus*	Accipitridae
10.	Black-winged stilt	*Himantopus*	Charadriidae
11.	Brown-headed Barbet	*Megalaima*	Ramphastidae
12.	Cattle Egret	*Bubulcus ibis*	Ardeidae
13.	Common Cuckoo	*Cuculus canorus*	Cuculidae
14.	Common kingfisher	*Alcedo atthis*	Alcedinidae
15.	Common Koel	*Eudynamys Scolopaceus*	Cuculidae
16.	Common myna	*Acridotheres tristis*	Sturnidae
17.	Common sandpiper	*Actitis hypoleucos*	Scolopacidae
18.	Common stonechat	*Saxicola torquata*	Muscicapidae
19.	Common Tailorbird	*Orthotomus*	Genera Incertae
20.	Coppersmith Barbet	*Megalaima*	Ramphastidae
21.	Crested serpent eagle	*Spilornis cheela*	Accipitridae
22.	Greater coucal	*Centropus sinensis*	Cuculidae
23.	Green bee eater	*Merops orientalis*	Meropidae
24.	Green sandpiper	*Tringa ochropus*	Scolopacidae
25.	Grey heron	*Ardea cinerea*	Ardeidae
26.	Grey Junglefowl	*Gallus sonneratii*	Phasianidae
27.	House Crow	*Corvus splendens*	Corvidae
28.	House Sparrow	*Passer domesticus*	Passeridae
29.	House swift	*Apus affinis*	Apodidae
30.	Indian pond heron	*Ardeola grayii*	Ardeidae
31.	Indian Robin	*Saxicoloides*	Muscicapidae
32.	Indian roller	*Coracias*	Coraciidae
33.	Intermediate egret	*Mesophoyx*	Ardeidae
34.	Jungle Babbler	*Turdoides striata*	Timaliidae
35.	Jungle myna	*Acridotheres fuscus*	Sturnidae
36.	Jungle Prinia	*Prinia sylvatica*	Cisticolidae
37.	Large-billed Crow/Jungle Crow	*Corvus*	Corvidae
38.	Little cormorant	*Phalacrocorax niger*	Phalacrocoracidae
39.	Little egret	*Egretta garzetta*	Ardeidae
40.	Long tailed shrike	*Lanius schach*	Laniidae
41.	Oriental Magpie-Robin	*Copsychus saularis*	Muscicapidae
43.	Plain prinia	*Prinia inornata*	Cisticolidae
44.	Purple sunbird	*Nectarinia asiatica*	Nectariniidae
45.	Purple-rumped Sunbird	*Leptocoma*	Nectariniidae

46.	Red avadavat	*Amandava*	Estrildidae
47.	Red whiskered bulbul	*Pycnonotus jocosus*	Pycnonotidae
48.	Red-vented bulbul	*Pycnonotus cafer*	Pycnonotidae
49.	Red-wattled lapwing	*Vanellus indicus*	Charadriidae
50.	Rose-ringed parakeet	*Psittacula krameri*	Psittacidae
51.	Shikra	*Accipiter badius*	Accipitridae
52.	Small minivet	*Pericrocotus*	
53.	Spotted dove	*Streptopelia*	Columbidae
54.	Thick-billed Flowerpecker	*Dicaeum agile*	Dicaeidae
55.	Whiskered tern	*Chlidonias hybridus*	Laridae
56.	White-breasted waterhen	*Amaurornis*	Rallidae
57.	White-eyed buzzard	*Butastur teesa*	Accipitridae
58.	White-throated kingfisher	*Halcyon*	Halcyonidae

Table 3-17: List of Other Fauna's found in the study area

Sr. no.	Butterfly species	Common
1.	Weaver ants	Insect
2.	Pagoda ants	Insect
3.	Dung beetle	Insect
4.	Red silk cottin bug	Insect
5.	Short horned grasshopper	Insect
6.	Dragon fly	Insect
7.	Antlion larvae	Insect
8.	Wood borer	Insect
9.	Harvester ants	Insect
10.	Termites	Insect
11.	Honey bee (Apis cerana)	Insect
12.	Rock bee (Apis dorsata)	Insect
13.	Tunnel web spider	Spider
14.	Colonial spider	Spider
15.	Tent spider	Spider
16.	Forest calotes	Reptile
17.	Brookes gecko	Reptile
18.	Common skink	Reptile
19.	Garden calotes	Reptile
20.	Indian bull frog	Amphibian
21.	Common Indian Toad	Amphibian
22.	Fruit bats	Mammal
23.	Five striped squirrel	Mammal

3.11 Cropping Pattern

Jhajjar has a great historical background with connections to various periods of the Indian history. The district's economy is equally balanced with industrialization and agriculture. Jhajjar is considered as a rich agricultural area. This small town has a strong agricultural belt with plenty of grains. The soil is more alluvial, and it is useful for agricultural purposes. The yields for most of the crops are good. The climatic conditions are also suitable for agriculture. The major produces are that of wheat, maize, oilseeds, gram & cluster bean.

The overall topography of the area consists mainly of alluvial plains and undulating dunes at some places. The sub tropical climate witnesses heavy rainfall during July to September. Kharif and Ravi are the main crops under which Rice, wheat bajra, jowar; barley, wheat and sugarcane are grown.around 67,000 hectares of land is under Agricultural utilization.

3.12 SOCIO ECONOMIC ENVIRONMENT

Introduction

In this section of the report an attempt has been made to guesstimate Socio-economic effect of a Common Effluent Treatment Plant (CETP) of 12.5 (2X6.25) MLD capacities, proposed to be set up at Bahadurgarh HSIIDC, District Jhajjar, Haryana state.

The key objective of the study is to identify those areas where impact is imminent and make an attempt to assess their intensity. The other objectives of the current study are as follows:

a. To collect baseline data of the study area and build up a data base.
b. To be aware of current socio-economic status of the people living in the study area.
c. To assess the potential impact of the project on socio-economic aspects of the people living in the study area and categorize them on the basis of their gravity.
d. To assess the impact of the project on Quality of Life (QoL) of the people in the study area.

Approach & Methodology

a. A mixture of both quantitative and qualitative approach has been adopted in the current socio-economic study.

b. The study has been conducted based on primary and secondary data. While primary data has been collected through a sample survey of

selected households in the study area, the secondary data has been collected from the administrative records of the Government of Haryana, Census 2011, district hand books and from the Government portal**.**

c. The details regarding population composition, number of literates, workers, etc have been collected from secondary sources and analyzed. Also village/city/town wise details regarding amenities available in the study area have been collected from secondary sources like Census 2011, and analyzed.
d. Two stage sampling design has been adopted to select the sampling units. The first stage units are census villages in the rural areas and towns/cities in urban areas. The ultimate stage units are households in the selected villages and towns/cities. Probability sampling has been adopted to select the sampling units.
e. Estimation of various parameters has been made based on sample data and bottom top approach has been adopted.
f. The data collected during the above survey was analyzed to evaluate the prevailing socio-economic profile of the area.
g. Based on the above data, impacts due to proposed project on the community have been assessed and recommendations for improvement have been made.

Concept & Definition of Terms

a. **Study Area:** The study area, also known as impact area has been defined as the sum total of core area and buffer area with a radius of 5 Kilometers from the periphery of the project site. The study area includes all the land marks both natural and manmade, falling therein.
b. **QoL**: The Quality of Life (QoL) refers to degree to which a person enjoys the important possibilities of his/her life. The 'Possibilities' result from the opportunities and limitations, each person has in his/her life and reflect the interaction of personal and environmental factors. Enjoyment has two components: the experience of satisfaction and the possession or achievement of some characteristic.
c. **Household**: A group of persons who normally live together and take their meals from a common kitchen are called a household. Persons living in a household may be related or unrelated or a mix of both. However, if a group of related or unrelated persons live in a house but do not take their meals from the common kitchen, then they are not part of a common household. Each such person is treated as a separate household. There may be one member households, two member households or multi-member households.
d. **Sex Ratio:** Sex ratio is the ratio of females to males in a given

population. It is expressed as 'number of females per 1000 males'.

e. **Literates:** All persons aged 7 years and above who can both read and write with understanding in any language are taken as literate. It is not necessary for a person to have received any formal education or passed any minimum educational standard for being treated as literate. People who are blind but can read in Braille are also treated as literates.

f. **Literacy Rate:** Literacy rate of population is defined as the percentage of literates to the total population aged 7 years and above.

g. **Labour Force:** The labour force is the number of people employed and unemployed in a geographical entity. The size of the labour force is the sum total of persons employed and unemployed. An unemployed person is defined as a person not employed but actively seeking work. Normally, the labour force of a country consists of everyone of working age (commencing from 14 to 16 years) and below retirement (around 65 years) that are participating workers, that is people actively employed or seeking employment. People not counted under labour force are students, retired persons, stay-at home people, people in prisons, permanently disabled persons and discouraged workers.

h. **Work:** Work is defined as participation in any economically productive activity with or without compensation, wages or profit. Such participation may be physical and/or mental in nature. Work involves not only actual work but also includes effective supervision and direction of work. The work may be part time or full time or unpaid work in a farm, family enterprise or in any other economic activity.

i. **Worker:** All persons engaged in 'work' are defined as workers. Persons who are engaged in cultivation of land or milk production even solely for domestic consumption are also treated as workers.

j. **Main Workers**: Those workers who had worked for the major part of the reference period (i.e. 6 months or more in the case of a year) are termed as Main Workers.

k. **Marginal Workers:** Those workers who did not work for the major part of the reference period (i.e. less than 6 months) are termed as Marginal Workers**.**

l. **Work participation rate**: The work participation rate is the ratio between the labour force and the overall size of their cohort (national population of the same age range). In the present study the work participation rate is defined as the percentage of total workers (main and marginal) to total population.

The economy of India is mainly based on agriculture sector and the main activity of

rural population being agriculture; the entire infrastructure is oriented towards this activity.

An area is said to be developed, if it contains the facilities like pakka houses, metalled roads, hospitals, qualified private doctors, higher secondary schools and degree colleges, adequate water supply, electric supply, easily available transport and recreational facilities etc.

Socio-economic study of an area gives an opportunity to assess the socio-economic conditions of an area. By this study, the changes likely to occur in living and social standards of the study area due to this mine can also be assessed. It can undoubtedly be said that due to this mine area gross economic production of the area will increase substantially. This CETP project may provide direct and indirect employment and will improve the infrastructural facilities and standards of living of the area.

An integral part of environmental study, which deals with the total environment, is socio- economic environment incorporating various facts related to socio-economic condition in the area. These includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases, pattern as well as feature of aesthetic significance such as temples, historical monuments, etc. at the baseline level. This would help in visualizing and predicting the likely impact depending upon the nature and magnitude of the project.

3.12.1 Demographic Particulars of Jhajjar District

In 2011, Jhajjar had population of 958,405 of which male and female were 514,667 and 443,738 respectively. In 2001 census, Jhajjar had a population of 880,072 of which males were 476,475 and remaining 403,597 were females. Jhajjar District population constituted 3.78 percent of total State population. In 2001 census, this figure for Jhajjar District was at 4.16 percent of Total State population. The population rate was increased as 8.90 percent compared to 2001 census.

As per 2011 the density of population is 523 persons per sq.km compare to 480 persons per sq.km.avg literacy in 2011 were 80.65 compared to 72.40 of 2001.male and female literacy were 89.31 and 72.40 respectively.sex ratio is 862 females per 1000 males in jhajjar dist where as 847 in 2001.the avg national sex ratio of india is 940.and child sex ratio is 782 girls per 1000 boys compared to 800 girls per 1000 boys of 2001 census data.where as children population of 0-6 age group for all dists including jhajjar .there was a total 120,051 children under age of 0-6 against 69,741 of

2001 census.of total 120,051 male and female were 67,380 and 52,671 respectively. In the 2011 National Census, it was found that Jhajjar district has the lowest sex ratio in India of the 0-6 group, with just 782 girls to 1,000 boys. Two villages in Jhajjar have extremely low gender-ratios: Bahrana and Dimana have gender ratios of 378 girls to 1,000 boys and 444 girls to 1,000 boys respectively. In Jhajjar, parents are able to illegally learn the gender of the fetus through secret early morning ultrasounds at registered clinics and through the use of code-words, Ladoo for boy and Jalebi for girl; these families often go on to abort female fetuses.Census data is given in Table 3.18 below:

Table 3-18: Demographic Particulars of Jhajjar district as per 2011 census

Descriion	**2011**	**2001**
Actual Population	**958,405**	**880,072**
Male	514,667	476,475
Female	443,738	403,597
Population Growth	**8.90%**	**23.06%**
Area Sq. Km	1,834	1,834
Density/km2	**523**	**480**
Proportion to Haryana Population	3.78%	4.16%
Sex Ratio (Per 1000)	**862**	**847**
Child Sex Ratio (0-6 Age)	782	800
Average Literacy	**80.65**	**72.40**
Male Literacy	89.31	83.30
Female Literacy	70.73	59.60
Total Child Population (0-6 Age)	**120,051**	**69,741**
Male Population (0-6 Age)	67,380	38,751
Female Population (0-6 Age)	52,671	30,990
Literates	**676,091**	**364,178**
Male Literates	399,480	221,785
Female Literates	276,611	585,963
Child Proportion (0-6 Age)	**12.53%**	**7.92%**
Boys Proportion (0-6 Age)	13.09%	8.13%
Girls Proportion (0-6 Age)	11.87%	7.68%

3.12.2 Demographi details of Bahadurgarh & surrounding villages

According to the 2011 census, the population of Bahadurgarh is 170,426: 91,736 men and 78,690 women. There are 20,374 total children (0-6) 11,420 boys and 8,954 girls. The child gender ratio is 784 girls per 1000 boys. The average literacy rate in Bahadurgarh is 88.04%; the male and female literacy rates were 94.27 and 80.87 percent.

As per provisional reports of Census India, population of Bahadurgarh in 2011 is 170,426; of which male and female are 91,736 and 78,690 respectively. In education section, total literates in Bahadurgarh city are 132,108 of which 75,714 are males while 56,394 are females. Average literacy rate of Bahadurgarh city is 88.04 percent of which male and female literacy was 94.27 and 80.87 percent. The sex ratio of

Bahadurgarh city is 858 per 1000 males. Child sex ratio of girls is 784 per 1000 boys. Total children (0-6) in Bahadurgarh city are 20,374 as per figure from Census India report on 2011. There were 11,420 boys while 8,954 are girls. The child forms 11.95% of total population of Bahadurgarh City.

Total villages around Industrial Estate Bahadurgarh are namely Jakhauda, Bahadurgarh, Mondcuthi ,Tandaheri, Kherkeb,Musalmanan, Silothi, Dabauda,Kalan,Numa,Mazra,Lowha Khurd, DeasaDesalpur, Savado, Bir Barkatabad,.Parnala,Sankhal,Nizampur,Rashidpur,Bamnauli and Barohi. Bahadurgarh is main residential area located within in 5 .0 km radius from HSIIDC Bahadurgarh.There are 22 villages in and around Industrial Estate Bahadurgarh come under radius of 5.0 km compromising total population 2,18378(including Bahadurgarh city population 170426) as per year 2011 census. Details of population in surrounding villages are given Table 3.19.

Table 3-19: pulation in surrounding at HSIIDC, Bahadurgarh area (Year 2011)

S.No	Name	Type	Total Population	male	Female	Total SC Population	Total ST Population	Total Workers	Total Main Workers	Total Marginal Workers	Number of Household
1	Jakhouda	Rural	3799	2026	1773	375	0	1170	876	294	737
2	Bahadurgarh city	Urban	170426	91736	78690						34085
3	Mandothi	Rural	10612	5824	4788	1702	0	3699	2642	1057	1985
4	Tandaheri	Rural	1910	1053	857	253	0	714	671	43	339
5	Kherka Musalman	Rural	29	26	3	0	0	28	28	0	26
6	Silothi	Rural	1376	759	617	173	0	570	299	271	289
7	Daboda Kalan	Rural	1947	1046	901	326	0	610	515	95	378
8	Daboda Khurd	Rural	4096	2228	1868	553	0	1205	838	367	776
9	Nuna majra	Rural	4830	2560	2270	909	0	1497	1250	247	919
10	Lawa Khurd	Rural	3430	1838	1592	553	0	1303	1092	211	625
11	Desalpur	Rural	665	353	312	116	0	252	165	87	127
12	Salodha	Rural	3745	2013	1732	584	0	1975	867	1108	705
13	Barkatabad	Rural	4282	2340	1942	458	0	1252	1196	56	760
14	Bamnoli	Rural	5141	2847	2294	1187	0	1619	1417	202	983
15	Sankhol	Rural	5178	2816	2362	0	0	-	-	-	-
16	Barahi	Rural	5539	3037	2502	727	0	1796	1560	236	1057

3.12.3 Economic Resource Base

Agriculture and is the basic profession in the study area and plays an important role in economy. Agriculture production has been lowered down due to insufficient facility and poor resources of irrigation. The impact of poor agriculture production leads to insufficient income generation and people on the move to work as a labour in nearby industry. To develop their economic strength villagers prefer construction related work, fishery, dairy and other live stock related activity. The agricultural land is not that much productive hence the yield is not satisfactory therefore local people have developed and adopted other skills to earn money for their daily requirement. Youth of the project area are literate and have the capacity to grasp any occupation, hence project area has a potential to develop their economy.Major Khariff crop in the entire project area is paddy,maise wheat.

3.12.4 Awareness and opinion about the project

There was average awareness of the proposed project activity amongst all respondents from almost all the villages. Minimization of environmental pollution during and after project activity was the demand made by most of the villagers.

3.13 Conclusion

Jhajjar district in which the mine lease falls is an agriculturally based district. All the basic facilities like road and rail network, medical facilities, post & telegraph, market, drinking water facilities and education facilities are available. This CETP would be boon for the district as it will not only result in employment opportunity but also sustainableIndustrial and infrastructure development and overall growth of the area.