

**Environmental Pollution
Abatement Action Plans
for the Industrial Clusters
in West Bengal**

**Compre
hensive**



Action Plan for Asansol
[Burnpur area surrounding ISSCo]

FRAMEWORK OF MODEL ACTION PLAN
FOR
CRITICALLY POLLUTED INDUSTRIAL AREAS/ CLUSTERS

1. INTRODUCTION

1.1 Area Details including brief history (background information):

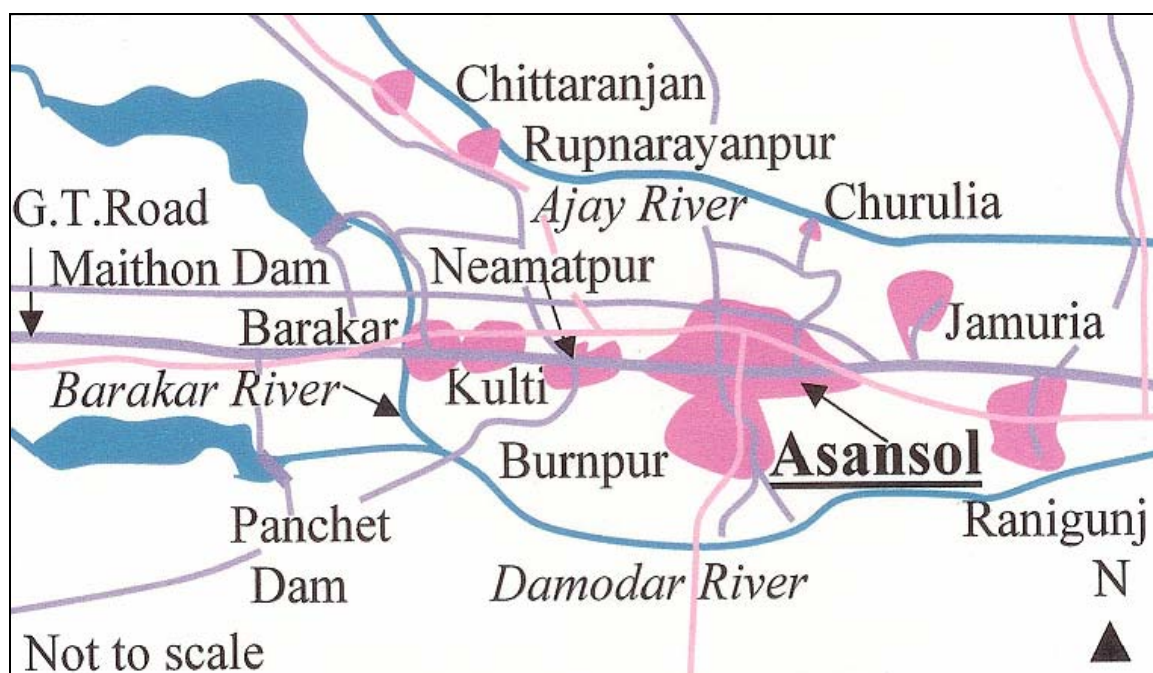
The Asansol-Burnpur area is located in the land area between the river Ajoy on northern side and river Damodar on the southern side. The area is located within the Raniganj-Asansol coal mine belt. Topography of this area is generally flat and sloping from north to south. Number of canals passing through the area ultimately led to the river Damodar, acting as drainage canals of the area. Municipal area is 127.24 sq.km.

1.2 Location:

Asansol is located at 23.03 degrees 40 minutes 25 second N & 86 degrees 56 minutes 45 second East. It has an average elevation of 110-130 metres MSL.

1.3 Digitized Map with Demarcation of Geographical Boundaries and Impact Zones:
Given in Fig. 1 & 2.

Fig. -1 : Geographical location of Asansol-Burnpur Area



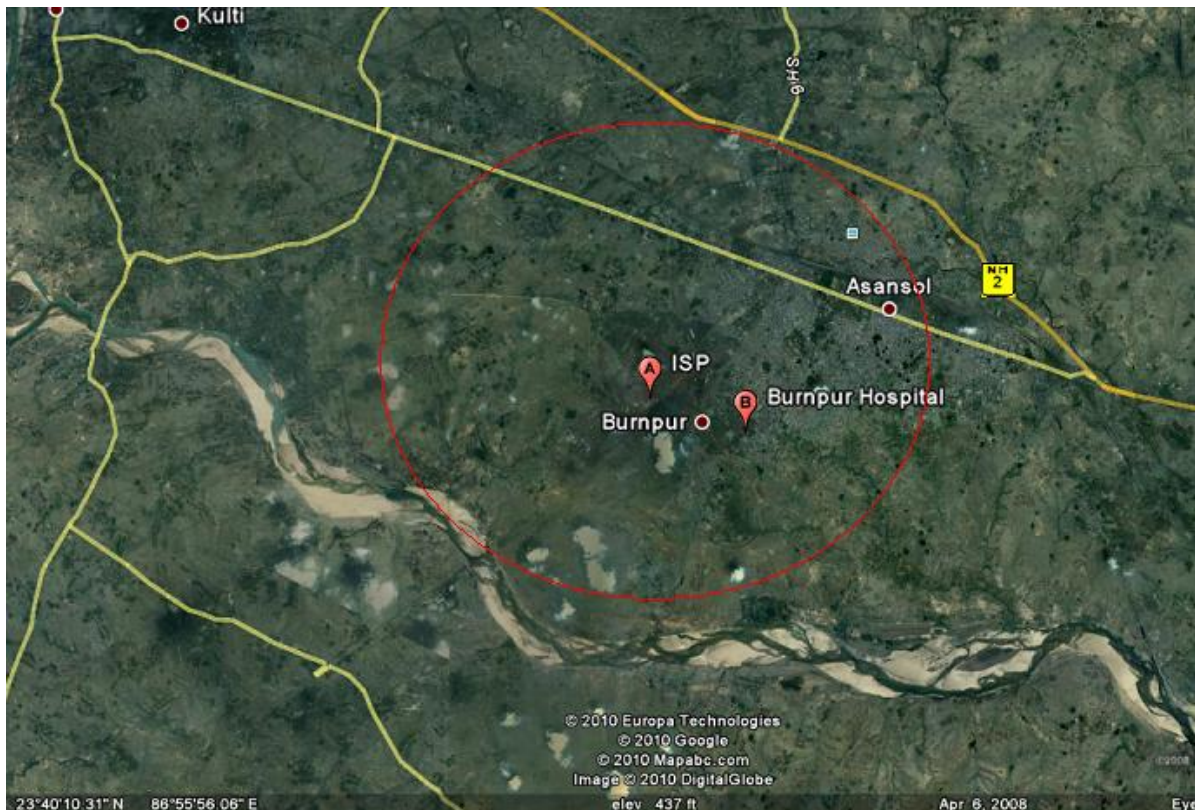


Fig. 2: Boundary (in Red line) of critically polluted area in Asansol-Burnpur demarcated by CPCB

- 1.4. **CEPI Score** (Air, Water, Land and Total): 58.38, 56.25, 50.50 and 70.20 (CPCB).
- 1.5. Total Population and sensitive receptors (hospitals, educational institutions, courts, etc.) 3,80,563 residing in the area comprising of geographical area of the cluster and its impact zone 98,0000 (minimum 2km):

The total population of the area under question is around 4,78,563 (as per 2001 census)
 The sensitive receptors include one sub-divisional hospital, 38 nos. nursing homes, 56 nos. educational institutions, one sub-divisional court are located within Asansol-Burnpur Municipal region.

1.6 Eco-geological features Impact Zones [the area comprising of geographical area of the cluster and its impact zone (minimum 2 km)]

- 1.6.1 Major river Water Bodies (Rivers, Lakes, Ponds etc): The major rivers are Damodar and Barakar. Other than these major rivers there are a number of nullahas of which the important are Nunia, Dihika, Damra and Gharui.
- 1.6.2 Ecological Parks, Sanctuaries, flora and fauna or any eco -sensitive zones: Nehru Park (formerly Lahmeyer Park) was built utilising the natural contour of the terrain on the banks of the Damodar. The airstrip at Burnpur can handle small aircraft.
- 1.6.3 Buildings or Monuments of Historical / archaeological / religious importance: NA.
- 1.7 **Industry Classification and distribution** (no. of industries per 10 sq. km. area or fraction)
 - 1.7.1 Highly Polluting Industries (17 Categories)- 1 no.(List enclosed)
 - 1.7.2 Red Category Industries (54 Categories)- 23 nos. (List enclosed)
 - 1.7.3 Orange and Green Category industries- 100 nos.(List enclosed)
 - 1.7.4 Grossly Polluting Industries- 1 no.(List enclosed)

2. WATER ENVIRONMENT

2.1 Present status of water environment supported with minimum one year analytical data:-

2.1.1 Water bodies / effluent receiving drains in the area important for water quality monitoring:

The major rivers are Damodar and Barakar. Other than these major rivers there are a number of nallahs of which the important are Nunia, Dihika, Damra and Gharai. The treated effluents discharged by the industries are directly or indirectly fall into main stream. The West Bengal Pollution Control Board conducts monitoring of the water quality on a regular basis.

2.1.2 Present levels of pollutants in water bodies / effluent receiving drains / ground water (routine parameters, special parameters and water toxics relevant to the area in three categories – known carcinogens, probable carcinogens and other toxics): Given in Table 1 , 2 & 3.

Table -1 Station Details: River Damodar at Dishergarh Village, Station Code: 1331 (Monthly Station)

Parameters	Jan 09	Feb 09	Mar 09	Apr 09	May 09	Jun 09	Jul 09	Aug 09	Sep 09	Oct 09	Nov 09	Dec 09
pH	8.16	8.13	8.06	7.96	7.75	7.88	8.35	7.36	7.65	7.37	7.28	8.19
EC in $\mu\text{S/cm}$	236.00	251.00	245.00	205.00	265.00	237.00	265.00	238.00	253.00	118.00	179.00	210.00
Total Alkalinity in mg/l	-	-	-	207.0	-	-	-	-	-	-	-	-
Phen. Alkalinity in mg/l	-	-	-	4.50	-	-	-	-	-	-	-	-
NO ₃ -N in mg/l	0.57	0.140	0.03	0.349	0.261	0.37	0.334	0.59	0.49	0.39	0.46	0.31
DO in mg/l	8.40	9.50	8.30	9.00	8.90	8.40	7.80	7.20	7.80	7.50	7.60	9.60
BOD in mg/l	0.95	2.20	3.30	1.90	2.95	1.65	1.90	3.65	1.80	2.45	2.50	2.10
COD in mg/l	-	-	-	3.92	-	-	-	-	-	-	-	-
Chloride in mg/l	-	-	-	7.99	-	-	-	-	-	-	-	-
Sulphate in mg/l	-	-	-	6.83	-	-	-	-	-	-	-	-
Ca-Hardness in mg/l	-	-	-	52.00	-	-	-	-	-	-	-	-
Mg-Hardness in mg/l	-	-	-	18.00	-	-	-	-	-	-	-	-
Total Hardness in mg/l	-	-	-	70.00	-	-	-	-	-	-	-	-
FC in MPN/100 ml	11000	700	1700	9000	5000	1700	8000	2200	7000	90000	400	700
TC in MPN/100 ml	22000	1700	3000	17000	7000	2100	30000	3400	11000	160000	2300	1100
NH ₄ -N in mg/l	0.28	0.672	0.061	0.022	0.712	0.267	0.344	0.149	0.643	0.004	0.002	0.005
NH ₃ in mg/l	-	-	-	0	-	-	-	-	-	-	-	-
TKN in mg/l	-	-	-	2.112	-	-	-	-	-	-	-	-
TDS in mg/l	-	-	-	54.00	-	-	-	-	-	-	-	-
TFS in mg/l	-	-	-	84.00	-	-	-	-	-	-	-	-
TSS in mg/l	-	-	-	10.00	-	-	-	-	-	-	-	-

Parameters	Jan 09	Feb 09	Mar 09	Apr 09	May 09	Jun 09	Jul 09	Aug 09	Sep 09	Oct 09	Nov 09	Dec 09
Turbidity in NTU	-	-	-	5.32	-	-	-	-	-	-	-	-
PO ₄ in mg/l	-	-	-	0.146	-	-	-	-	-	-	-	-
Boron in mg/l	-	-	-	0.073	-	-	-	-	-	-	-	-
Fluoride in mg/l	-	-	-	0.384	-	-	-	-	-	-	-	-
As in mg/l	-	-	-	NT	-	-	-	-	-	-	-	-
Ni in mg/l	-	-	-	BDL	-	-	-	-	-	-	-	-
Cu in mg/l	-	-	-	BDL	-	-	-	-	-	-	-	-
Cr in mg/l	-	-	-	BDL	-	-	-	-	-	-	-	-
Cd in mg/l	-	-	-	0.00004	-	-	-	-	-	-	-	-
Hg in mg/l	-	-	-	BDL	-	-	-	-	-	-	-	-
Zn in mg/l	-	-	-	0.0009	-	-	-	-	-	-	-	-
Pb in mg/l	-	-	-	0.005	-	-	-	-	-	-	-	-
Fe in mg/l	-	-	-	0.264	-	-	-	-	-	-	-	-

Table – 2 : River Damodar at Dhenna Village (D/s of IISCO after 3rd outfall), Station Code: 1332 (Monthly)

Parameters	Jan 09	Feb 09	Mar 09	Apr 09	May 09	Jun 09	Jul 09	Aug 09	Sep 09	Oct 09	Nov 09	Dec 09
pH	8.08	8.06	8.32	8.01	7.30	7.95	8.33	7.53	7.57	7.62	7.67	8.21
EC in μ S/cm	255.00	273.00	250.00	235.00	235.00	184.00	276.00	317.00	287.00	205.00	206.00	215.00
Total Alkalinity in mg/l	-	-	-	193.50	-	-	-	-	-	-	-	-
Phen. Alkalinity in mg/l	-	-	-	4.50	-	-	-	-	-	-	-	-
NO ₃ -N in mg/l	0.23	0.47	0.068	0.935	0.707	0.830	0.920	0.979	0.814	0.351	0.694	0.522
DO in mg/l	10.00	9.40	9.80	8.00	9.30	8.80	7.90	8.50	7.50	7.40	7.30	9.80
BOD in mg/l	1.75	3.15	3.30	1.45	2.35	1.75	1.65	5.25	3.65	4.05	2.20	2.30
COD in mg/l	-	-	-	3.92	-	-	-	-	-	-	-	-
Chloride in mg/l	-	-	-	8.99	-	-	-	-	-	-	-	-
Sulphate in mg/l	-	-	-	13.24	-	-	-	-	-	-	-	-
Ca-Hardness in mg/l	-	-	-	50.00	-	-	-	-	-	-	-	-
Mg-Hardness in mg/l	-	-	-	30.00	-	-	-	-	-	-	-	-
Total Hardness in mg/l	-	-	-	80.00	-	-	-	-	-	-	-	-
FC in MPN/100 ml	35000	400	1700	2700	1400	800	11000	2600	8000	17000	200	1300
TC in MPN/100 ml	160000	1100	5000	3300	1700	1100	50000	22000	24000	90000	1300	2300
NH ₄ -N in mg/l	0.392	0.840	0.030	0.024	0.469	0.193	0.209	0.262	0.684	0.006	0.028	0.003
NH ₃ in mg/l	-	-	-	0	-	-	-	-	-	-	-	-
TKN in mg/l	-	-	-	2.752	-	-	-	-	-	-	-	-

Parameters	Jan 09	Feb 09	Mar 09	Apr 09	May 09	Jun 09	Jul 09	Aug 09	Sep 09	Oct 09	Nov 09	Dec 09
TDS in mg/l	-	-	-	184.00	-	-	-	-	-	-	-	-
TFS in mg/l	-	-	-	128.00	-	-	-	-	-	-	-	-
TSS in mg/l	-	-	-	16.00	-	-	-	-	-	-	-	-
Turbidity in NTU	-	-	-	16.30	-	-	-	-	-	-	-	-
PO ₄ in mg/l	-	-	-	0.27	-	-	-	-	-	-	-	-
Boron in mg/l	-	-	-	0.228	-	-	-	-	-	-	-	-
Fluoride in mg/l	-	-	-	0.481	-	-	-	-	-	-	-	-
As in mg/l	-	-	-	NT	-	-	-	-	-	-	-	-
Ni in mg/l	-	-	-	BDL	-	-	-	-	-	-	-	-
Cu in mg/l	-	-	-	0.005	-	-	-	-	-	-	-	-
Cr in mg/l	-	-	-	BDL	-	-	-	-	-	-	-	-
Cd in mg/l	-	-	-	BDL	-	-	-	-	-	-	-	-
Hg in mg/l	-	-	-	BDL	-	-	-	-	-	-	-	-
Zn in mg/l	-	-	-	BDL	-	-	-	-	-	-	-	-
Pb in mg/l	-	-	-	BDL	-	-	-	-	-	-	-	-
Fe in mg/l	-	-	-	0.648	-	-	-	-	-	-	-	-

Table –3 : River Damodar at Narayankuri after confluence of Nuniah Nullah, Station Code: 1333 (monthly)

Parameters	Jan 09	Feb 09	Mar 09	Apr 09	May 09	Jun 09	Jul 09	Aug 09	Sep 09	Oct 09	Nov 09	Dec 09
pH	8.01	8.12	8.44	8.41	7.60	7.09	8.29	7.67	7.37	7.40	8.15	8.19
EC in μ S/cm	290.00	312.00	328.00	495.00	388.00	365.00	357.00	354.00	299.00	400.00	247.00	256.00
Total Alkalinity in mg/l	-	-	-	189.00	-	-	-	-	-	-	-	-
Phen. Alkalinity in mg/l	-	-	-	4.50	-	-	-	-	-	-	-	-
NO ₃ -N in mg/l	0.84	0.55	0.089	1.037	0.595	1.058	1.004	0.826	0.846	0.46	0.688	0.462
DO in mg/l	9.50	10.80	9.00	8.00	5.00	9.30	8.20	6.40	6.00	8.20	8.40	9.70
BOD in mg/l	3.95	3.90	1.65	1.75	4.85	2.30	2.00	3.35	3.00	4.05	1.35	3.00
COD in mg/l	-	-	-	8.82	-	-	-	-	-	-	-	-
Chloride in mg/l	-	-	-	13.00	-	-	-	-	-	-	-	-
Sulphate in mg/l	-	-	-	30.67	-	-	-	-	-	-	-	-
Ca-Hardness in mg/l	-	-	-	92.00	-	-	-	-	-	-	-	-
Mg-Hardness in mg/l	-	-	-	42.00	-	-	-	-	-	-	-	-
Total Hardness in mg/l	-	-	-	134.00	-	-	-	-	-	-	-	-
FC in MPN/100 ml	3300	2100	1400	8000	50000	2300	17000	8000	24000	2700	800	1700
TC in MPN/100 ml	9000	5000	5000	13000	90000	3000	90000	14000	50000	13000	1700	2200

Parameters	Jan 09	Feb 09	Mar 09	Apr 09	May 09	Jun 09	Jul 09	Aug 09	Sep 09	Oct 09	Nov 09	Dec 09
NH ₄ -N in mg/l	0.448	1.064	0.020	0.013	0.314	0.211	0.464	0.109	0.796	0.003	0.113	0.109
NH ₃ in mg/l	-	-	-	0	-	-	-	-	-	-	-	-
TKN in mg/l	-	-	-	2.132	-	-	-	-	-	-	-	-
TDS in mg/l	-	-	-	188.0 0	-	-	-	-	-	-	-	-
TFS in mg/l	-	-	-	140.0 0	-	-	-	-	-	-	-	-
TSS in mg/l	-	-	-	6.00	-	-	-	-	-	-	-	-
Turbidity in NTU	-	-	-	7.16	-	-	-	-	-	-	-	-
PO ₄ in mg/l	-	-	-	0.167	-	-	-	-	-	-	-	-
Boron in mg/l	-	-	-	0.144	-	-	-	-	-	-	-	-
Fluoride in mg/l	-	-	-	0.701	-	-	-	-	-	-	-	-
As in mg/l	-	-	-	NT	-	-	-	-	-	-	-	-
Ni in mg/l	-	-	-	BDL	-	-	-	-	-	-	-	-
Cu in mg/l	-	-	-	0.007	-	-	-	-	-	-	-	-
Cr in mg/l	-	-	-	BDL	-	-	-	-	-	-	-	-
Cd in mg/l	-	-	-	0.000 04	-	-	-	-	-	-	-	-
Hg in mg/l	-	-	-	BDL	-	-	-	-	-	-	-	-
Zn in mg/l	-	-	-	0.003 7	-	-	-	-	-	-	-	-
Pb in mg/l	-	-	-	0.009 6	-	-	-	-	-	-	-	-
Fe in mg/l	-	-	-	0.341	-	-	-	-	-	-	-	-

Table 4: Ground water quality at Asansol-Burnpur

Station	Month	Nitrate Nitrogen	pH	Fecal Coliform	Conductivity	Ammonia Nitrogen	Fluoride
Burnpur Town, near IISCO	Apr. 2009	1.438	7.58	0	1088	0.025	0.135
Burnpur Town, near IISCO	Oct. 2009	0.31	7.17	NIL	1079	0.013	--
Mine Pit water, Asansol	Apr. 2009	1.168	8.65	30	701	0.014	0.402
Mine Pit water, Asansol	Oct. 2009	0.235	8.27	80	752	0.002	--

2.1.3 Predominant sources contributing to various pollutants: One Integrated Steel Plant(IISCO Burnpur)

2.2 Sources of water pollution

2.2.1 Industrial- effluent generated by the various process industries- About 40,000KLD.

2.2.2 Domestic- municipal sewage arising out of the residential establishments . About 20,000 KLD.

2.2.3 Others (Agricultural runoff, leachate from MSW dump, illegal dump site etc.)- NA.

2.2.4 Impact on surrounding area under consideration- (Already given in Table-1)

2.3. Details of Water Polluting Industries in the area / cluster: Integrated Steel Plant at Burnpur. Other than effluent from the Integrated Steel Plant, some amount of effluent generated in the industrial area at Kanyapur also reaches river Damodar via Damra canal.

2.4. Effluent Disposal Methods – Recipients water bodies etc.

The effluent is discharged directly or indirectly to River Damodar.

2.5. Quantification of wastewater pollution load and relative contribution by different sources viz industrial / domestic-

The treated effluents of IISCO Steel plant and effluent generated at the township of IISCO is discharged to river Damodar through Damra & Dihika nullahs. Other industrial and domestic effluents of Asansol area are carried through Nunia & Gharui nullahs which leads to river Damodar. Pollutational load carried through these nullahs are tabulated below :

Table:5 Pollutational loads for Waste Water

Sl no	Sources of waste water	Quantity of waste water (KLD)	BOD in mg/ltr	Pollution load in kg/day
1	Damra outfall	12000.0	21.0	252.0
2	Dihika outfall	15000.0	22.0	330.0
3	Nunia	18000.0	3.0	54.0
4	Gharui	15000.0	3.0	45.0

2.6 Action Plan for compliance and control of pollution

2.6.1 Existing infrastructure facilities – Water quality monitoring networks, ETPs, Sewerage Treatment Plant of industry (STPs), surface drainage system, effluent conveyance channels / outfalls etc.:

The State Board monitors the level of pollutants in the River Damodar and Barakar regularly. Besides this the individual units are monitored w.r.t. their effluent discharge by maintaining a proper schedule. All the units have established Effluent Treatment Plants (ETPs) of their own. One STP exists for the industrial township. Recently 1(One) more S.T.P. (Capacity – 0.7 MLD) has been installed at ‘Shristinagar’ township at Kalyanpur ,Asansol which is operated by M/s. Bengal Shristi Ltd.

2.6.2 Pollution control measures installed by Industries-

- i) New BOD plant with physical, chemical and three stage biological treatment facilities is commissioned at M/s. IISCO Steel plant on 29th June, 2010 at a cost of Rupees 6.18 crores.
- ii) M/s.Vamshi Chemicals Ltd , located at Kanyapur industrial area has installed an ETP with chemical & biological treatment facilities which is already operational.
- iii) M/s. United spirits ltd , located at Kumarpur , Asansol is operating an E.T.P. which mainly consists of chemical dosing and activated charcoal filter before being discharged outside. Most of the treated effluent is recycled back in process.
- iv) M/s. S.G Pulp & Paper ltd, located at Sitarampur has installed an E.T.P. consisting of chemical ,physical and biological treatment facilities. The unit has recently started partial recycling of treated effluent.
- v) One slaughter house exists at Asansol town. The waste water generated from slaughtering activity is discharged to Garui nullah after lime addition and settling. The facility provided is found to be inadequate.

2.6.3 Technological Intervention

2.6.3.1 Inventorisation of prominent industries with technological gaps-

- i) M/s IISCO Steel Plant (SAIL), Burnpur : This Integrated Steel Plant was established in 1950. A modernisation programme has been undertaken by the industry which is scheduled to be complete by 2011. Specific water consumption achieved 3.93 cu.m/tcs has been achieved by the unit.
- ii) Underground collieries (4 nos.) : M/s. ECL Authorities have proposed to set up treatment facilities for underground mine pit water.
- iii) Adequate waste water treatment facility to be provided at the Slaughter House.

2.6.3.2 Identification of low cost and advanced cleaner technology for pollution control.- Settling ponds for treatment of underground mine pit water before final discharge.

2.6.4 Infrastructure Renewal

2.6.4.1 Details of existing infrastructural facilities- The waste water generated at different sources are carried through the existing drainage network ultimately reaching to river Damodar.

2.6.4.2 Need of upgradation of existing facilities- proper maintenance (by dredging/desilting) of the nullahs/ canals/drains connected to the main river) : Entire area will be covered with sewage network facility .DPR has already been prepared for the same. Please refer 2.6.5.1.

2.6.4.3 De-silting of water tanks, drains, rivulets, etc.- Not contemplated.

2.6.4.4 Construction of lined drains/ connections- Please refer 2.6.5.1.

2.6.4.5 Treatment and management of contaminated surface water bodies-

One STP exists for the industrial township. Recently 1(One) S.T.P. (Capacity – 0.7 MLD)has been installed at ‘Shristinagar’ township at Kalyanpur ,Asansol which is operated by M/s. Bengal Shristi Ltd. Another S.T.P. is under installation by Asansol Municipal Corporation at Kalipahari, Asansol.

2.6.4.6 Rejuvenation/ Management Plan for important eco-geological features- Action has been initiated to beautify the holding lagoon area (previously called as alkatra talao) at Burnpur and budgetary offer has been invited from leading architectural firms by M/s.IISCO Steel plant.

2.6.4.7 Carrying of effluent from industrial units located in non-industrial locations to CETP facilities by lined drains/ pipelines only and prevention of their disposal into city sewerage/ surface drains- Not contemplated.

2.6.4.8 Installation of Gen sets at CETPs- Not contemplated.

2.6.5 Managerial and Finance aspects

2.6.5.1 Cost and Time estimate-

Table 5.1 : Project details with ost involved and specific Time frame

Sl no	Project details	Implementing agency	Cost of project	Time required
1	S.T.P.at Kalipahari	Asansol Municipal Corporation jointly with MH & PE, GoI	6.5 crores	December 2010
2	2 Nos. of STPs (21 MLD & 29 MLD with associated Sewage Network)	ADDA jointly with MH & PE, GoI	172 Crores	December, 2012

Sl no	Project details	Implementing agency	Cost of project	Time required
3	Municipal Solid waste management for Asansol	ADDA jointly with MH & PE, GoI	43.5 crores	December 2011
4	South City Road (From G.T. Road to Proposed Bridge over Damodar River-12.2 K.M.)	ADDA jointly with MH & PE, GoI	81.19 crores	December 2012
5	Road from Jubilee Dhaba to Scope Gate of IISCO-4.604 K.M.	ADDA jointly with MH & PE, GoI	43.38 Crores	December, 2012
6	Expansion of G.T.Road (Ashram more to Chelidanga)	Asansol Municipal Corporation jointly with MH & PE, GoI	40.0 crores	December 2012
7	7.4 KM Road from IISCO to NH-2	IISCO	27.0 crores	Completed
8	Road Bridge over Damodar from Burnpur to Madhukunda	IISCO	20.0 crores	December 2012
9	S.T.P. at IISCO Township	IISCO	7.4 crores	December 2011
10	S.T.P.at Shristinagar	Bengal Shristi Infrastructure	3.5 crores	December 2011

2.6.5.2 Identified Private / Public sector potential investors and their contribution / obligation-

Environment Management of ISP

Environment Management & Pollution Control has been given special priority in the proposed modernisation of IISCO as evident through the EIA Clearance application for modernisation. This environmental management proposal is being implemented as per the time schedule.

Rolling Mill Complex of ISP is certified for ISO 14001: 2004, Environment Management System and it is being maintained.

Online Ambient Air Quality Monitoring and Meteorological Station installed at Township on 15th December, 2009 at a cost of rupees 93 lakhs.

Four (4) nos. of real-time ambient air station is being set up at a cost of rupees 243 lakhs. The monitoring parameters are SPM, PM10, PM 2.5, SO₂, NO_x, CO, Ozone, Ammonia, Benzene, Hydrocarbon (methane, non-methane). Meteorological station is also set up to monitor Wind speed, Wind Direction, Temperature, Humidity, Solar radiation.

About 9000 saplings were planted at modernization site.

About 7000 saplings planted on both sides of road connecting ISP with NH₂ by WWF India. Around 2000 saplings planted at Township.

16000 saplings are being planted at modernization site.

Disposal of hazardous waste (Bengal Acid Sludge) is being done through BWML, as per direction of WBPCB.

Disposal of Bio-medical waste is being done through M/s. Semb Ramky.

A new BOD plant with physical, chemical and three stage biological treatment facilities is commissioned on 29th June, 2010 at a cost of Rupees 6.18 crores.

Two nos. of sewage treatment plants are being constructed (one inside plant and one in township) at a cost of rupees 14.25 crores.

Waste pits are being constructed inside the works to store the hazardous wastes at a cost of rupees 1.24 crores.

Use of carbon tetra chloride, CTC (ozone depleting substance) has been phased out and tri chloro ethylene (TCE) is being used as solvent.

Specific water consumption achieved 3.93 cu.m/tcs.

Rain water harvesting project has been implemented at RC&RD building. Moreover, most of the rain water from plant has been channelised to reach works reservoirs for use as industrial water.

Solid waste utilisation achieved 92.2% and the rest used for land filling

GCPs of Twin Hearth Furnaces are renovated at a cost of Rs. 8.5 crores.

Stack emission for particulate matter achieved 0.516 kg/tcs for 2009-10 combining coke oven, BF, SMS and Rolling Mills.

Specific effluent load reduced to 0.147 kg/tcs for the year 2009-10.

One Block of Coke Oven Battery No. 9 closed from 27th April, 2009.

No. 10 Coke Oven Battery is commissioned on 10th August after rebuilding and incorporation of pollution control measures. List of pollution control measures are:

HPLA (High Pressure Liquid Aspiration), Water Sealed AP Caps, Hydro-jet cleaning for doors and door frame, Coke pushing emission control by guide car mounted hood with spraying arrangement, Hermetically sealed charging sleeves and screw feeder, magnetic lid lifter along with lid and frame cleaning., Computerised combustion control system, Air cooled self sealing doors

Action has been initiated to beautify the holding lagoon area (previously called as alkatra talao) and budgetary offer has been invited from leading architectural firms.

To develop infrastructure 7.4 km road has been constructed connecting NH2 with ISP at a cost of Rupees 27 crores (approx). A road bridge over river Damodar has been planned to connect Burnpur with Madhukunda.

A new BOD plant is being constructed at the expansion site at a cost of rupees 8.14 crores.

ISP was awarded Greentech Environment Excellence Silver Award by Greentech Foundation

Project level interaction of the industry with Technical / Research Institution and its utility may be outlined.

ISP is interacting / engaged the following agencies for different assignments.

(i) M/s MECON as consultant for Expansion cum Modernisation Project (2.5 MTPA Crude Steel) of ISP

(ii) WWF India for Green Belt Development

(iii) West Bengal Bio-diversity Board & DFO for Eco-Development.

(iv) SAIL – RDCIS, Ranchi for Technological development / up-gradation.

(v) M/s RITES are consultants for railway yards upgradation and augmentation.

**New Technologies introduced during expansion / modernization of the projects.
Further research needs to be identified.**

Following Clean Technologies introduced for expansion / modernization of the project :

- Installation of Coke Dry Quenching (CDQ) at Battery no. 11
- Installation of Top Gas Recovery Turbine (TRT) at BF no. 5
- Introduction of Coal Dust Injection (CDI) at Blast Furnace No. 5.
- Waste Heat Recovery in Sinter Plant
- Waste Heat Recovery at Blast Furnace Stove
- Use of By-product Fuel for power generation

Implementation of Peripheral Development Schemes.

ISP has implemented following projects / schemes in different villages for peripheral development.

SL. No	Description of Jobs
1.	New Construction of Community Centre /Adult education centre/Multipurpose Hall & electrification of existing Comm. Centre.
2	Contraction /Renovation / Extension of School building /Improvement of School Library with furniture & sanitation facilities. Repair /modification of Community Centre /Adult education centre.
3.	Construction /Repair /resurfacing of roads in Villages.
4.	Improvement of Road lights (electric & solar) in the Villages.
5.	Improvement in Drainage and Sanitation system in the Villages.
6.	Assistance to physically and mentally challenged inmates of Home
7.	Development of ponds/wells /Bathing ghats in Villages.
8.	Provision for drinking water in villages
9.	Construction of low cost sanitation unit in villages.
10.	Development of Children's Parks/play Ground in Villages.
11.	Development of Sports & provide Gymnasium Unit in villages.
12.	Development of Folk, Social & Cultural Activities in Villages.
13.	Vocational Training / Self employment generation scheme for Youth
14.	Self help group for income generating scheme for women
15	Other misc project for Social development of Rural Tribal people
16.	Help to Social Service Organization for enhancing their effectiveness for organizing social initiatives.
17.	Medical camps in different villages including .Model Steel Villages (including free distribution of medicines, immunization programme of non employees in villages. Emergency Flood Relief Camp
18.	Installation of solar street light and solar home light in different villages in the periphery of the plant.

2.6.5.3 Government Budgetary support requirement- As given in 2.6.5.1

2.6.5.4 Hierarchical and structured managerial system for efficient implementation- Not yet formulated

2.6.6 **Self Monitoring System in Industries (ETPs)-** exist.

2.6.7 **Data Linkages to SPCB/ CPCB (of monitoring devices)-** under consideration.

3. AIR ENVIRONMENT:

3.1 Present status of Air Environment supported with minimum one year analytical data

3.1.1 Critical locations for air quality monitoring- IISCO has installed one Automatic Ambient Monitoring Station at a cost of rupees 93 lakhs. Additional four (4) nos of online ambient air stations will be set up at a cost of rupees 243 lakhs.

3.1.2 Present levels of pollutants in air (routine parameters, special parameters and air toxics relevant to the area in three categories – known carcinogens, probable carcinogens and other toxic) Report given in Table 6.

Table 6: Ambient air quality at Asansol-Burnpur

Station	Month	RPM ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)
Asansol	Nov. 2009	178	9.0	56.3
	Dec. 2009	300	10.9	76.2
	Apr. 2010	137	9.0	73.8
	May. 2010	76	8.2	67.8
Burnpur	Nov. 2009	224	8.5	52.9
	Dec. 2009	267	10.0	71.1
	Apr. 2010	173	8.5	70.3
	May. 2010	82	8.0	65.0
National Standard		100	80	80

3.1.3 Predominant sources contributing to various pollutants – Industrial pollution arising out from different industries like Integrated steel plants, Refractory manufacturing units, Sodium silicate manufacturing units, Cement plants, Bottling plants, Chemical unit, Paper manufacturing unit,.

3.2 Sources of Air Pollution viz industrial, domestic (Coal & Biomass Burning), natural and Transport & Heavy Earth Movers.- Other than industrial pollution, vehicular pollution and pollution generated from fossil fuel burning in domestic settlement.

3.3 Air Polluting Industries in the area/ cluster- 23 nos. List given below.

Table 7: List of different types of industries with their existing air pollution control measures

Sl.No	Name	Type	Pollution control measures
1	M/s ISP,SAIL	Grossly polluting industries	i) Dolomite plant-Dust Extraction System (FD Cooler & Bag Filter)ii) SMS-Gas cleaning Plant (F.D Cooler & Bag Filter)iii) Twin hearth Furnace-started on GCP, (Bag Filter, F.D. Cooler) iv) Blast Furnace-(Primary catcher, scrubber Static, Water Tower, ESP(wet) & ESP (dry) v) COBP (Luting of charging lids, door cleaning, water sealed A P caps.) vi) Power Plant Boiler-Multicyclone.
2	M/s Majumdar Industries	Cement grinding unit	Bag Filter with Ball Mill & Cyclone Separator with Coal fired Slag drier.
3	M/s Mansarovar Cement	Cement grinding unit	Bag Filter with Ball Mill & Cyclone Separator with Coal fired Slag drier.
4	M/s Calcutta Cement	Cement grinding unit	Bag Filter with Ball Mill & Cyclone Separator with Coal fired Slag drier.
5	M/s Hanuman Cement	Cement grinding unit	Bag Filter with Ball Mill & Cyclone Separator with Coal fired Slag drier.
6	M/s Omni Cement	Cement grinding unit	Bag Filter with Ball Mill & Cyclone Separator with Coal fired Slag drier.
7	M/s Ambey Super Cement	Cement grinding unit	Bag Filter with Ball Mill & Cyclone Separator with Coal fired Slag drier.
8	M/s Kalika Cement	Cement grinding unit	Bag Filter with Ball Mill & Cyclone Separator with Coal fired Slag drier.
9	M/s A.T.C International (P) Ltd	Cement grinding unit	Bag Filter with Ball Mill & Cyclone Separator with Coal fired Slag drier.
10	M/s Asansol Ceramics	Refractory manufacturing	Wet scrubber with coal fired DD Kilns furnace.
11	M/s Sree Ganesh Silicate & Soda.	Sodium silicate manufacturing	Wet scrubber with coal fired boiler.
12	M/s National Glass Works	Sodium silicate manufacturing	Wet scrubber with producer gas plant
13	M/s Burnpur Ceramics	Refractory manufacturing	Wet scrubber with coal fired DD Kilns furnace.
14	M/s Bejdih Colliery	Colliery	Mobile water tankers incorporated with sprinkling arrangement in use on roads & mineral stock piles for suppression of dust for vehicle movements. Drill machines are operated either in conjunction with water or with dust trap.
15	M/s Dhemomain Colliery	Colliery	
16	M/s Patmohona Colliery	Colliery	
17	M/s Narsamuda Colliery	Colliery	
18	M/s Methani Colliery	Colliery	

Sl.No	Name	Type	Pollution control measures
20	M/s United spirits Ltd.	Bottling Plant	Coal fired Boiler without APCD
21	M/sVamshi Chemicals	Ethyl acetate manufacturing	Bag Filter with coal fired Boiler.
23	S.G Pulp & Paper (P) Ltd.	Kraft paper manufacturing	Bag Filter with husk fired Boiler.

3.4 Impact of activities of nearby area on the CEPI Area-Ambient air quality data enclosed. (Refer to Table-6 of point 3.1.2).

3.5 Quantification of the air pollution load and relative contribution by different sources-

Table 8: A study on IISCO, Burnpur made & the report highlighted below.

Sources	P.M.emission standard (mg/Nm ³)	kg/t	kg/day	mg/Nm ³
COKE OVEN	50	0.175	192	46
B.FCE.	150	0.063	69	22
SMS	150	0.114	125	19
H.S.MILL	150	0.025	27	38
L.S.MILL	150	0.014	15	19
MERCHANT MILL	150	0.018	20	32
SOAKING PIT	150	0.108	118	36
DOLOMITE PLANT	150	0.000	0	

3.6 Action Plan for compliance and control of pollution.

Table 9: Action taken/to be taken by the industries with specific Time frame given below

Sl no.	Action points (Including source & mitigation measures)	Responsible stake holders	Time limit
1	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Majumdar Industries	31.12.2011
2.	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Mansarovar Cement	31.12.2011
3	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Calcutta Cement	31.12.2011
4	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Hanuman Cement	31.12.2011
5	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Omni Cement	31.12.2011
6	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Ambey Super Cement	31.12.2011
7	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Kalika Cement	31.12.2011
8	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s A.T.C International (P) Ltd.	31.12.2011
9	Coal fired boilers should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s United Spirits Ltd.	31.12.2011
10	Refractory manufacturing units should switch over to new generation producer gas fired Shuttle kiln, Tunnel Kiln or Push-bat kiln which are much more fuel efficient kiln for environment friendly smoother operation, improvement in quality of the product.	M/s Asansol Ceramics	31.12.2011
11	Coal fired boilers should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Shree Ganesh Silicate & Soda.	31.12.2011
12	This unit has installed producer gas based regenerative furnace which is less polluting and will enhance fuel efficiency.	M/s National Glass Works	
13	Refractory manufacturing units should switch over to new generation producer gas fired Shuttle kiln, Tunnel Kiln or Push-bat kiln which are much more fuel efficient kiln for environment friendly smoother operation, improvement in quality of the product.	M/s Burnpur Ceramics	31.12.2011

Sl no.	Action points (Including source & mitigation measures)	Responsible stake holders	Time limit
15	Coal fired boilers should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Vamshi Chemicals	31.12.2011
16	Coal fired boilers should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Vedant Retreads	31.12.2011
17	Husk fired boilers should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance). 100% water recirculation or 'Zero Discharge' system should be adopted.	S.G Pulp & Paper (P) Ltd.	31.12.2011
18 to 22	<ol style="list-style-type: none"> 1. Dedicated coal transport corridor to be constructed. 2. Enhancement of loading & unloading facility with proper dust suppression facility. 3. Use of surface miner as much as possible. 4. Trapping of Methane from underground mines prior mining. To be completed by December 2012 <p>5 area wise common reservoir for storage of mine drainage water, storm water and to provide necessary treatment facility prior discharge. To be completed by December, 2012.</p> <ol style="list-style-type: none"> a. Backfilling of mine voids with overburden. b. Utilisation of ash from thermal power plants to be adopted for mine filling. c. Pond ash to be utilized along with sand for stowing underground mines. <ol style="list-style-type: none"> 6. To intimate surrounding locality about blasting well in advance and to adopt best practices. Noise generation to be minimized from heavy earth moving machines, drilling etc. 	M/s Bejdih Colliery, M/s Dhemomain Colliery, M/s Methani Colliery, M/s Narsamuda Colliery, M/s Patmohona Colliery under E.C.L.	31.12.2012

3.6.1 Existing infrastructure facilities – ISP, SAIL has already constructed a 7.4 km road connecting NH₂ with ISP at a cost of Rupees 27 crores (approx). Ambient air quality monitoring network has been set up.

3.6.2 Pollution Control Measures installed by the individual sources of pollution- Report enclosed. (Refer to table 7)

3.6.3 Technological Intervention:

Sodium Silicate manufacturing units to install producer gas based regenerative furnace which is less polluting and will enhance fuel efficiency. One of the units located at Asansol has already retrofitted to this system. Introduction of Coal Bed Methane (CBM) as a cleaner fuel in refractory and bakeries.

Utilisation of CBM in Transport Sector: Total 1800 Kg (Approx.) of CBM is utilised everyday in mass transport vehicles (Around 200 Auto Rickshaw) in Asansol.

DETAILED COMPARISON STATEMENT OF REVERBERATORY & REGENERATIVE FURNACE:

Table 10: A study report in tabular form of M/s National Glass Works.

SL NO.	REVERBERATORY FURNACE	REGENERATIVE FURNACE	Advantage of regenerative furnace
Production Capacity	TOTAL- 5 T/ Day Of Glass	TOTAL - 20 T/ Day of Glass Or 40 T/ of Sodium Silicate	
Coal consumption	2.5 T/Day I.e. 50 % of product.	5 T/Day i.e. 12.5 % of product.	All most One fourth. Less impact
Flow Rate	5000 NM ³ /hr TOTAL Emmission – 3.0x10 ⁶ NM ³ /Month	12000 NM ³ /hr TOTAL Emmission – 7.2x10 ⁶ NM ³ /Month	
Solid Waste Generation	Bottom Ash – 0.7 T 15% of product.	Bottom Ash – 1.4 T 7% of product.	All most half Less impact
Water Requirement	4– 5 Cu.M/Day	2 – 2.5 Cu.M/Day	Less

Waste Heat Utilisation	Less scope	Utilised for preheating of air & Steam Generation.	Additional advantage
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Refractory manufacturing units should switch over to cleaner fuel option such as producer gas/ CBM in Shuttle kiln, Tunnel Kiln or Push-bat kiln which are much more fuel efficient for environment friendly smoother operation, improvement in quality of the product.

A comparative cost Analysis Study by adopting cleaner fuel:

Average caloric value of coal – 4000Kcal/kg

Specific fuel consumption for Down Draft kilns – 300/ton of refractory

One 50ton/cycle capacity DD kiln consume 15 ton of coal for a complete cycle.

Landed price of coal required for refractory units – Rs 3500/ton

Cost of coal for a complete cycle operation – Rs 52,500/-

Total heat value of coal for a complete cycle- $15000 \times 4000 = 60000000$ Kcal

Average Calorific value of CBM – 8500 Kcal/kg

Quantity of gas required for a complete cycle – 7059.0 m^3

Cost of CBM – Rs 17 / m^3

Cost of CBM for complete cycle operation – $17 \times 7059.0 = \text{Rs } 119999$ /-

ISP, SAIL, Burnpur has taken some technological renovation. Details listed below.

GCPs of Twin Hearth Furnaces are renovated at a cost of Rs. 8.5 crores.

One Block of Coke Oven Battery No. 9 closed from 27th April, 2009.

No. 10 Coke Oven Battery is commissioned on 10th August after rebuilding and incorporation of pollution control measures. List of pollution control measures are:

HPLA (High Pressure Liquid Aspiration), Water Sealed AP Caps, Hydro-jet cleaning for doors and door frame , Coke pushing emission control by guide car mounted hood with spraying arrangement, Hermetically sealed charging sleeves and screw feeder, magnetic lid lifter along with lid and frame cleaning., Computerised combustion control system, Air cooled self sealing doors.

Expansion Project of SAIL-IISCO Steel Plant – Environmental issues

The brief write up of the expansion plan which is at different stages of implementation are given below:-

Table 11: A comprehensive report of action plan of existing and expansion project of IISCO.

SN	Plant / Unit	Existing Facilities	Facilities up to 2.5 MTPA
1.	Coke Oven	Battery No. 7 (72 Ovens) - closed Battery No. 8 (78 Ovens) Battery No. 9 (78 Ovens) Battery No. 10 (78 Ovens)	Rebuild battery No. 10 and Half of battery No. 8 with 39 oven will remain. Additional 7 m tall battery with coke dry quenching will come. Battery No. 9 (78 Oven) will be phased out.
2.	Sinter Plant	No such facilities in the existing plant.	1 no. sinter plant with two nos. sinter machine of 204m2 each

SN	Plant / Unit	Existing Facilities	Facilities up to 2.5 MTPA
3.	Blast Furnace	BF-1 : 1 x 500 cu.m – phased out BF-2 : 1 x 500 cu.m – under rebuilding BF-3 : 1 x 1170 cu.m– will be phased out BF-4 : 1 x 1170 cu.m– phased out	Rebuild BF no. 2 of 530m ³ volume will remain. New BF no 5 of 4060 m ³ volume with CDI and TRT
4.	Pig Casting Machine	Four nos. of pig casting machine of capacity 500 t/d each exists, which produces about 183600 t/yr of cold pigs.	Existing PCM will remain Additional two no. 1500 t/day capacity pig-casting machine will be added. Total cold pig production will be 3,08,200 t/yr.
5	Slag Granulation Plant (SGP)	One no. SGP.	Existing slag granulation plant will remain An additional SGP will be installed
6.	Basic Oxygen Furnace (BOF)	No such facilities in the existing plant. 2 x 110 t twin hearth furnace- 2 No.	3x 150 t Twin Hearth Furnaces will be phased out
7.	Secondary Refining Facilities: Ladle Furnace	No such facilities in the existing plant.	2 x 150 t
8.	Continuous Casting Facilities	No such facilities in the existing plant.	100% production through continuous casting route.
	Beam Blank Caster	No such facility in the existing plant.	One 4 strands caster machine.
	Billet Caster	No such facility in the existing plant.	A new caster of 2 x 6 - strand.
9	Rolling Mills		
	Blooming Mill , Billet Mill and soaking pits	2 No. high reversing type size 1066/941 mm x 2438 mm with 32 nos. soaking pits. Billet mill with 2 No. roughing train, 4 No. intermediate train and 4 No. finishing train	Soaking Pits, Blooming Mill and Billet Mill will be phased out.
	Heavy Structural Mill	34 inch Mill with 2No. regenerative batch type reheating furnace, 2 high reversing roughing and 1 high intermediate	The existing mill to produce 150,000 t/yr.
	Merchant and Rod Mill	1No.recuperative continuous pusher type reheating furnace	The existing mill to produce 180,000 t/yr.
	Light Structural Mill	18 inch Mill with 2 No. recuperative continuous pusher type reheating furnace	The existing mill to produce 100,000 t/yr.
	New Heavy Section Mill	No such facilities in the existing plant.	A new mill installed with capacity 600,000 t/yr.
	New Wire & Rod Mill	No such facilities in the existing plant.	A new mill with capacity 1,250,000 t/yr
10	Dolomite Plant	1 x 100 t dolo kiln – will be phased out	One new 1 x 200 t capacity.
11.	Lime Calcin. Plant	4 x 30 t lime kiln– closed	One new 3 x 330 t/d capacity.
12.	Oxygen Plant	1x 50 t/d	1 x 50 t/d One new 2 x 750 t/d capacity on BOO basis.
13	Power Plant	3 No. steam turbine stoker fired boilers of capacity 40 MW, 5 No. steam turbine for blast furnace & 3 No. Steam turbine for pumps	Existing power plant will remain 3 x 200 t/h Gas Fired Boiler 3X60% Steam Turbine driven Turbo Blowers 3 X 18 MW Turbo generators 7.5 MW Back pressure turbo generator

New Technologies introduced during expansion / modernization of the projects. Further research needs to be identified.

Following Clean Technologies introduced for expansion / modernization of the project:

- Installation of Coke Dry Quenching (CDQ) at Battery no. 11
- Installation of Top Gas Recovery Turbine (TRT) at BF no. 5
- Introduction of Coal Dust Injection (CDI) at Blast Furnace No. 5.
- Waste Heat Recovery in Sinter Plant
- Waste Heat Recovery at Blast Furnace Stove
- Use of By-product Fuel for power generation

3.6.3.1 Inventorisation of prominent industries with technological gaps. Pl.see Table 9.

3.6.3.2 Identification of low cost and advanced cleaner technology for pollution control:

Proposals are under active consideration regarding replacement of Down Draft Kilns with gasfired shuttle kilns. Refractory manufacturing units should switch over to cleaner fuel option such as producer gas/ CBM in Shuttle kiln, Tunnel Kiln or Push-bat kiln which are much more fuel efficient for environment friendly smoother operation, improvement in quality of the product. CBM may be introduced as cleaner fuel option in silicate industries and reheating furnaces.

3.6.3.3 Introduction and switch over to cleaner fuel- 05 nos. industries.

Following units (located at Kanyapur industrial area) have switched over from coal to CBM.

- a. Arti Bakery.
- a. Angel Bakery
- b. Bhawani biscuit
- c. Punam Bakery
- d. Vedant Retread

M/s National Glass Works: This unit has installed producer gas based regenerative furnace in place of coal fired reverberatory furnace which is less polluting and will enhance fuel efficiency. Utilisation of CBM by IISCO – presently the unit is consuming 40,000 kg of CBM daily.

3.6.4 Need of Infrastructure Renovation -

3.6.4.1 Development of Roads-Under progress but periodic maintenance is required.

To develop infrastructure 7.4 km road has been constructed connecting NH2 with ISP at a cost of Rupees 27 crores (approx). A road bridge over river Damodar has been planned to connect Burnpur with Madhukunda.

CBM distributions network commissioned by M/s. GEECL. Cost of the project is Rs. 160 crores.

3.6.5 Impact on CEPI score after installation / commissioning of full fledged air pollution control systems - Significant improvement is expected.

3.6.6 **Managerial and Finance aspects- Cost and time estimates**

3.6.6.1 Cost and Time estimate- See Table under 12.2 Long Term Action Plan

3.6.6.2 Identified Private / Public sector potential investors and their contribution / obligation- As given in Table 12.1 & 12.2

3.6.6.3 Government Budgetary support requirement-Yes

3.6.6.4 Hierarchical and structured managerial system for efficient implementation- Not yet formulated.

3.6.7 Self monitoring system in industries (Stacks, APCDs) - Almost all the industries having APCDs as suggested by WBPCB for controlling process emission.

3.6.8 Data Linkages to SPCB/ CPCB (of monitoring devices)- One AAAQMS installed by IISCO, Burnpur. Data linkage with WBPCB will be established soon.

4. LAND ENVIRONMENT (Soil and Ground Water)

4.1 Soil contamination

4.1.1 **Present Status of land environment supported with minimum one year analytical data-** Tar from IISCO was discharged through Damra outlet. Action has been initiated by the concerned authority to beautify the holding lagoon area (previously called as alkatra talao) of Damra outlet and budgetary offer has been invited from leading architectural firms by IISCO.

4.1.2 **Critical locations for land / soil pollution assessment and ground water monitoring-** Proper actions for reclamation of land degradation and compensatory forestation for deforestation during mining activity to be undertaken by E.C.L.. For stowing of U/G mines, sand as well as fly ash may be used by E.C.L. Four (4) U/G Mine Pits (Path Mohona, Methani, Narsamuda, Dhemomaint Pit and Dhemomaint Inc.) in Asansol are critical locations..

Ground Water Quality Monitoring Data are already given in Table;4

4.1.3 **Present levels of pollutants in land/ soil and ground water (routine parameters, special parameters and water toxics relevant to the area in three categories) –**

Table: 12 Present Ground Water Quality Monitoring Data: Tube Well near IISCO, Burnpur, Station Code: 1767 (Half yearly)

Parameters	Apr'06	Oct'06	Apr'07	Oct'07	Apr'08	Oct'08	Apr'09	Oct'09	Apr'10
pH	7.32	7.19	7.16	7.27	7.43	7.76	7.58	7.17	7.13
EC in $\mu\text{S}/\text{cm}$	914.00	946.00	1025.00	904.00	988.00	984.00	1088.00	1079.0	888.00
Total Alkalinity in mg/l	639.40	-	764.40	-	365.20	-	432.70	-	568.00
Phen. Alkalinity in mg/l	9.90	-	10.50	-	35.20	-	31.5	-	28.00
$\text{NO}_3\text{-N}$ in mg/l	0.160	0.250	0.645	0.248	0.506	0.386	1.438	0.31	0.359
DO in mg/l	Nil	0.30	0.60	0.80	1.80	0.80	1.80	2.00	2.00
BOD in mg/l	0.42	0.07	0.30	0.30	1.00	0.20	0.65	0.10	0.95
COD in mg/l	7.50	-	8.80	-	5.76	-	3.92	-	3.12
Chloride in mg/l	77.68	-	90.97	-	83.97	-	103.96	-	66.98
Sulphate in mg/l	12.88	-	22.61	-	18.57	-	27.00	-	21.966
Ca-Hardness in mg/l	124.00	-	246.00	-	128.04	-	120.00	-	130.00
Mg-Hardness in mg/l	74.00	-	148.00	-	124.16	-	232.00	-	106.00
Total Hardness in mg/l	198.00	-	394.00	-	252.20	-	352.00	-	236.00
FC in MPN/100 ml	Nil	Nil	Nil	Nil	14	9	Nil	Nil	Nil
TC in MPN/100 ml	Nil	Nil	Nil	Nil	33	34	Nil	Nil	Nil
$\text{NH}_4\text{-N}$ in mg/l	0.158	0.183	0.502	0.282	0.180	0.197	0.025	0.013	0.024

4.1.4 **Predominant sources contributing to or posing danger of pollution of land and ground water such as hazardous / toxic wastes or chemicals dumps/ storage etc.** - All hazardous waste generating industries dump their waste in the TSDF facility at Haldia. Proper remediation measure is already taken by IISCO for previous Tar Disposal Site (Alkatra Talao) at Damra.

- 4.1.5 Sources of Soil Contamination- under assessment.
- 4.1.6 Types of existing pollution- under assessment.
- 4.1.7 Remedies for abatement, treatment and restoration of normal soil quality-As per serial no. 4.1.2 & 4.1.4

4.2 Ground water contamination

4.2.1 Present Status / quality of ground water – The Central Ground Water Board is of the view that the underground water situation at Asansol is fragile and advises against indiscriminate sinking of tube wells for fresh water. The ground water in this region is characterised hydro chemical situation in which fractured fresh water group of aquifers occurs within span of 120-150 m.

4.2.2 Source Identification (Existing sources of Ground water Pollution) – Proper actions for reclamation of land degradation and compensatory forestation for deforestation during mining activity to be taken by E.C.L.. For stowing of U/G mines, sand as well as fly ash may be used by E.C.L. Four (4) U/G Mine Pits (Path Mohona, Methani, Narsamuda, Dhemomaint Pit and Dhemomaint Inc.) in Asansol are critical locations..

4.2.3 Ground water quality monitoring program- SPCB does periodical monitoring at one station near IISCO Steel Plant.(Please ref. Table 4 & 7).

4.2.4 Action Plan for control of pollution including cost/ time aspects- Waste pits are being constructed inside the works to store the hazardous wastes at a cost of rupees 1.24 crores by IISCO Steel Plant.

4.2.5 Treatment and management of contaminated ground water bodies etc. – No such observation noticed from ground water report (Please Ref. Table 4 & 7) .

4.2.6 Impact on CEPI score after abatement of pollution- .Significant impact is expected.

4.3. Solid Waste Generation and Management

4.3.1 Waste Classification and Quantification

4.3.1.1 Hazardous waste – 35934.94 MT/year

4.3.1.2 Bio-medical waste – 409.75 Kg/day

4.3.1.3 Electronic waste – Not measured.

4.3.1.4 Municipal Solid waste / Domestic waste / Sludges from ETPs / CETPs / STPs and other industrial sources – 200 MT/day(MSW)

4.3.1.5 Plastic Waste-.For exact quantification of Plastic Waste, a project is undertaken by CPCB in association with WBPCB.CIPET is now doing this job at Asansol Municipal Corporation.

4.3.1.6 Quantification of wastes and relative contribution from different sources-As per serial nos. 4.3.1.1 to 4.3.1.5.

4.3.2 Identification of waste minimization and waste exchange options- Proper actions for reclamation of land degradation and compensatory forestation for deforestation during mining activity to be undertaken by E.C.L.. For stowing of U/G mines, sand as well as fly ash may be used by E.C.L. Four (4) U/G Mine Pits (Path Mohona, Methani, Narsamuda, Dhemomaint Pit and Dhemomaint Inc.) in Asansol are critical locations.

4.3.3 Reduction / Reuse / Recovery / Recycle options in the co-processing of wastes-

IISCO steel plant has proposed following options in their expansion unit.

- Installation of Top Gas Recovery Turbine (TRT) at BF no. 5
- Introduction of Coal Dust Injection (CDI) at Blast Furnace No. 5.
- Waste Heat Recovery in Sinter Plant
- Waste Heat Recovery at Blast Furnace Stove
- Use of By-product Fuel for power generation.

4.3.4 Infrastructural facilities-Infrastructure already exists but need further expansion/up-gradation under Ministry of Housing & Poverty Elevation, Govt. of India..

Sl no	Project details	Implementing agency	Cost of project	Time required
1	S.T.P.at Kalipahari	Asansol Municipal Corporation jointly with MH & PE, GoI	6.5 crores	December 2010
2	2 Nos. of STPs (21 MLD & 29 MLD with associated Sewage Network)	ADDA jointly with MH & PE, GoI	172 Crores	December, 2012
2	Municipal Solid waste management for Asansol	ADDA jointly with MH & PE, GoI	43.5 crores	December 2011
3	South City Road (From G.T. Road to Proposed Bridge over Damodar River-12.2 K.M.)	ADDA jointly with MH & PE, GoI	81.19 crores	December 2012
4	Road from Jubilee Dhaba to Scope Gate of IISCO-4.604 K.M.	ADDA jointly with MH & PE, GoI	43.38 Crores	December, 2012
4	Expansion of G.T.Road (Ashram more to Chelidanga)	Asansol Municipal Corporation jointly with MH & PE, GoI	40.0 crores	December 2012
5	7.4 KM Road from IISCO to NH-2	IISCO	27.0 crores	Completed
6	Road Bridge over Damodar from Burnpur to Madhukunda	IISCO	20.0 crores	December 2012
7	S.T.P. at IISCO Township	IISCO	7.4 crores	December 2011
8	S.T.P.at Shristinagar	Bengal Shristi Infrastructure	3.5 crores	December 2011

4.3.4.1 Existing TSDF / Incineration facilities including capacities-

- 01 (one) Common Bio- Medical Waste TDSF for Asansol area .
- Common MSW TSDF at Kalipahari of capacity 200TPD (Segregation, Composting, Palletisation and Brick).
- Common TSDF facility for Haz. Waste at Haldia is used.

4.3.4.2 Present status / performance and need of up gradation of existing facilities including enhancement of capacities- Satisfactory but required for up gradation.

4.3.4.3 Treatment and management of contaminated waste disposal sites etc.- Proper remediation measure is already taken by IISCO for previous Tar Disposal Site (Alkatra Talao) at Damra.

4.3.4.4 Impact on CEPI score after proper management of Solid Wastes- Significant impact is expected.

5. PPP Model

5.1 Identification of project proposals (for both the options i.e. technology intervention and infrastructure renewal) for implementation under the PPP model under the Action Plan-

ETP for the existing Slaughter house at Asansol.

5.2 Identification of stakeholders / agencies to be involved and to evolve financial and managerial mechanisms for implementation of PPP projects- ADDA, AMC , Industrial entrepreneur and WBPCB for Common MSW TSDF at Kalipahari for AMC area

6. Other Infrastructural Renewal Measures:

6.1 Green Belts-

Green Belts of IISCO

- ❖ About 9000 saplings were planted at modernization site.
- ❖ About 7000 saplings planted on both sides of road connecting ISP with NH-2 by WWF India. Around 2000 saplings planted at Township.
- ❖ 16000 saplings are being planted at modernization site.

6.2 Development of Industrial Estate(s)- Infrastructure of existing small scale industrial estate to be upgraded.

6.3 Development / shifting of industries located in the non-industrial areas to the existing / new industrial estates- under consideration.

7. Specific Schemes:

7.1 GIS-GPS system for pollution sources monitoring- Currently not available. But it is to be undertaken under W.B. Project aids

7.2 Hydro-geological fracturing of water bodies rejuvenation- Not available.

7.3 In-situ remediation of sewage- During renovation and modernisation work of the existing sewerage network in CEPI area adequate measures will be taken by the concerned authority.

7.4 Utilization of MSW inert by gas based brick kilns- Not available

7.5 Co-processing of wastes in cement industries- Not available

8. Public Awareness and Training Programmes- Always to be encouraged.

9. Overall Impact of Installation / commissioning of pollution control equipments / measures on the CEPI score- Significant reduction is expected.

10. Assessment of Techno-economical feasibility of pollution control systems in clusters of small / medium scale industries. - Not assessed.

11. Efforts shall be made to encourage use of Bio-compost and Bio-Fertilizer alongwith the chemical fertilizer in the state to minimize the unutilized chemical fertilizer run-off into the natural water resources from agriculture fields (through Govt. policy)- Efforts are being made .

12. Summary of proposed action points:

12.1 Short Term Action Points (up to 1 year, including continuous Activities)

Sl no.	Action points (Including source & mitigation measures)	Responsible stake holders	Time limit	Cost	Remarks
1.	On-main charging system with high pressure liquor aspiration (HPLA) in Coke oven battery nos. 10 Zero leakage door & hydrojet cleaner	M/s.IISCO Steel plant ,SAIL.Burnpur	Completed for Coke oven Battery no. 10	45 crore	to be born by the industry

Sl no.	Action points (Including source & mitigation measures)	Responsible stake holders	Time limit	Cost	Remarks
	Screw feeder charging system and water sealed AP Caps Rectification in oven doors, leads in Coke oven Battery no. 8&9.				
2.	Installation of a three stage BOD Plant at Coke Oven (For Battery no. 8,9,10) is completed . Separate BOD plant for Battery no. 11 will be installed and existing BOD plants (8&9) will be phased out.	M/s.IISCO Steel plant ,SAIL.Burnpur	31.12.2011 BOD plant for Coke oven 8,9& 10 commissioned.	40 crore	to be born by the industry
3.	Blast furnace no.5 (Under installation) to have following facilities : Coal dust injection , top pressure recovery turbine , Cast house dedusting facility and on line slag granulation Pulverized coal injection system , oxygen enrichment and BF flue dust granulation to be installed in BF – 2 & 3.	M/s.IISCO Steel plant ,SAIL.Burnpur	31.12.2011	1000 crore	to be born by the industry
4.	Unit to install following facilities at new BOF in modernization plant e.g. Stage wise Ventury scrubber for gas cleaning station,De-dusting facility with ESP for dog house, On line stack monitoring facility. Existing Twin hearth furnaces (2x110 TPD) will be phased out.	M/s.IISCO Steel plant ,SAIL.Burnpur	31.12.2011	1200 crore	to be born by the industry
5	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Majumdar Industries	31.12.2011	50.0 lakh	to be born by the industry
6	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Mansarovar Cement	31.12.2011	50.0 lakh	to be born by the industry
7	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Calcutta Cement	31.12.2011	50.0 lakh	to be born by the industry
8	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Hanuman Cement	31.12.2011	50.0 lakh	to be born by the industry
9	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Omni Cement	31.12.2011	50.0 lakh	to be born by the industry
10	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within essible distance).	M/s Ambey Super Cement	31.12.2011	50.0 lakh	to be born by the industry
11	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Kalika Cement	31.12.2011	50.0 lakh	to be born by the industry
12	Coal fired slag drier should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s A.T.C International (P) Ltd.	31.12.2011	50.0 lakh	to be born by the industry
13	Coal fired boilers should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s United Spirits Ltd.	31.12.2011	1.2 crores	to be born by the industry
14	Refractory manufacturing units should switch over to new generation producer gas fired Shuttle kiln, Tunnel Kiln or	M/s Asansol Ceramics & M/s Burnpur Ceramics	31.12.2011	40.0 lakhs each	to be born by the industry

Sl no.	Action points (Including source & mitigation measures)	Responsible stake holders	Time limit	Cost	Remarks
	Push-bat kiln which are much more fuel efficient kiln for environment friendly smoother operation, improvement in quality of the product.				
15	Coal fired boilers should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Sree Ganesh Silicate & Soda.	31.12.2011	30.0 lakhs	to be born by the industry
16	This unit has installed producer gas based regenerative furnace which is less polluting and will enhance fuel efficiency.	M/s National Glass Works	Installed	60.0 lakhs	-----
17	Coal fired boilers should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Vamshi Chemicals	31.12.2011	1.2 crores	to be born by the industry
18	Coal fired boilers should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	M/s Vedant Retreads	31.12.2011	30.0 lakhs	to be born by the industry
19	Husk fired boilers should be converted to Oil/Gas fired drier. (Preferably with CBM which is available within accessible distance).	S.G Pulp & Paper (P) Ltd.	31.12.2011	25.0 lakhs	to be born by the industry

12.2 Long Term Action Points (more than 1 year)

Sl no.	Action points (Including source & mitigation measures)	Responsible stake holders	Time limit	Cost	Remarks
1.	1. Dedicated coal transport corridor to be constructed. 2. Enhancement of loading & unloading facility with proper dust suppression facility. 3. Use of surface miner as much as possible. 4. Trapping of Metahne from underground mines prior mining. To be completed by December 2012	1. M/s Bejdih Colliery, 2. M/s Dhemomain Colliery, 3. M/s Methani Colliery, 4. M/s Narsamuda Colliery, 5. M/s Patmohona Colliery under E.C.L.	31.12.2012	180 crores	to be born by the concerned Authority
2.	Area wise common reservoir for storage of mine drainage water, storm water and to provide necessary treatment facility prior discharge. To be completed by December 2012.				
3.	<ul style="list-style-type: none"> ● Backfilling of mine voids with overburden. ● Utilisation of ash from thermal power plants to be adopted for mine filling. ● Pond ash to be utilized along with sand for stowing underground mines. 				
4.	<ul style="list-style-type: none"> ✓ To intimate surrounding locality about blasting well in advance and to adopt best practices. ✓ Noise generation to be minimized from heavy earth moving machines, drilling etc. 				