BMA Stainless Ltd.

June 21, 2018

Director (Industry 1)
Ministry of Environment, Forests & Climate Change
Indira ParyavaranBhawan, Jor Bagh Road, New Delhi

Sub: Expansion from 1,20,000 TPA to 2,07,360 TPA MS Billets / Rolled products by replacement of existing 4 x 8 Tons Induction Furnaces with 4x12 Tons Induction Furnaces at Village Debipur, P.O. Kalyaneshwari, District Burdwan of WestBengal by M/s BMA Stainless Limited – Reply to observations environmental clearance regarding

Ref: 1. F.No-J-11011/192/2013-IA.II (I) dated 17.11.2016
2. 28th EAC (Industry-1) item no. 28.3

Dear Sir,

Our project for proposed Expansion from 1,20,000 TPA to 2,07,360 TPA MS Billets / Rolled products by replacement of existing 4 x 8 Tons Induction Furnaces with 4x12 Tons Induction Furnaces at Village Debipur, P.O. Kalyaneshwari, District Burdwan of West Bengal was considered for appraisal of envrionemtnal clearance in the 28th EAC (Industry-1) meeting held of February 5, 2018 at item no. 28.3 wherein the EAC had some observations. The point-wise reply of the observations is as follows:

#	Observation	Reply
1.	Revised water balance and rainwater harvesting scheme.	Revised water balance given in EIA Report in Chapter 2 in Figure 2.9 at Page No. 35. Revised rainwater harvesting scheme is given in Chapter 4 in Para No. 4.13 at Page No. 142.
2.	Revised material balance	Revised material balance given in EIA Report in Chapter 2 in Figure 2.6 at Page No. 33.
3.	Revised greenbelt development plan to complete 2.3 ha. as per the earlier Environmental Clearance.	An undertaking/commitment is given by PP to complete the greenbelt development area of 2.3 ha. in six months' time from May 2018. Greenbelt development programme is given in EIA report in chapter 4 in Para No.4.12 and undertaking is enclosed as Annexure XI at page No. 335.
4.	Complete details of raw material, source, mode of transport and distance from source.	Complete details of raw material, source, mode of transport and distance from source are given in EIA report in chapter 2 in Para No. 2.7.2, table No. 2.3 at page No. 31.
5.	Scheme for 100% utilization of solid waste including hazardous waste generated from producer gas plant.	Scheme for 100 % utilization / disposal of Solid waste including hazardous waste generated from producer gas plant is given in the EIA Report in Chapter 4 at ParaNo.-4.8, Table 4.8 at Page No. 131.
6.	Revised table of issues raised during PH, commitment of PP, time bound action plan along with fund provision.	Action Plan of the issues raised during Public Hearing with commitment of PP and time bound action plan along with fund provision is enclosed in the EIA Report in chapter 7 in Table No. 7.2 at page no. 173.

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CIN No. : U27109WB2003PLC097108

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7.	Revised ESC programme based on the issues emerged during PH and social impact assessment. The activity shall be for asset creation and capacity building in CAPEX mode.	Revised CER programme as per MoEF&CC O.M. dated 01.05.2018 is given in EIA Report in Chapter 7 at ParaNo.7.4 at Page No. 176-177.
8.	Power supply arrangement details	In this regards, the power assurance obtained from DVC vide letter no. Coml/CD/17-18/ Kalyaneswari/ BMA/601 dated 12.02.2018, permitted for enhancement of power from DVC is enclosed as Annexure V at page No. 249.
9.	Closure report on non-compliances reported by Regional Officer on earlier ECconditions from Regional officer of MoEFCC	Closure report on non-compliances reported by Regional Officer on earlier EC conditions from Regional officer of MoEF&CC is obtained and enclosed in EIA Report as Annexure XVII at Page No. 359.
10.	Hazardous waste generated in the existing and proposed expansion shall be clearly addressed.	No hazardous waste was/shall be generated from the process except the 'Used Oil'. Approximate quantity of 'Used Oil' generated from the proposed expansion will be approx. 35 KL per year and 'Used Oil' will be sold to the register recycler.
11.	The revised project and site-specific HIRA	Site specific HIRA is included in the EIA Report in Chapter 7 at table no. 7.5at page no. 185.
12.	Corporate Environmental Policy addressing the reporting mechanism of non-compliances to the board of directors directly.	Revised Corporate Environmental Policy is enclosed in the EIA Report as Annexure XIII at Page No. 337.

We hope that the above information is in line and we request you to take up thematter in the next EAC meeting for reconsideration.

Thanking You

For BMA Stainless Ltd.

Director

ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

FOR

Capacity Expansion of BMA Stainless Ltd. for production of Billets/Rolled products from 1,20,000 TPA to 2,07,360 TPA by replacement of Existing 4x8 Tons Induction Furnace with 4x12 Tons Induction Furnaces and Modernization of Rolling Mill

Village: Debipur, P.O.: Kalyaneshwari, District:Burdwan, West Bengal

PLOT AREA-6.920 Ha.

[ToR LETTER NO: F.No. J-11011/192/2013-IA II(I) on DATED 17th Nov 2016]
STUDY PERIOD: 1ST OCTOBER TO 31st DECEMBER, 2016
MONITORING DONE BY M/S. VARDAN ENVIROLAB (NABL ACCREDITATIONT-6299 & MOEFCC NO. S.O. 1783 (E))

[Project or Activity 3(a) due to Metallurgical industries (ferrous & non ferrous) and Category-A (due to interstate boundary of West Bengal and Jharkhand Border at a distance of 1.3 Km)

APPLICANT
Mr. Avinash Agrawalla
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ENVIRONMENT CONSULTANT
VARDAN ENVIRONET
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CONTACT: 0124-4291036, 09899651342

DOCUMENT NO. 2016_VI _00005 FINAL EIA

JUNE 2018

REVIEW AND REVISION HISTORY

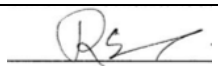
History of revisions of the present report:

Table I: History of the Revisions

S.No.	Rev.	Date	Modifications	Remarks
1.	Rev.02 Final	20.06.2018	Final EIA /EMP Report	Report has been prepared by team Vardan and all comment of reviewers has been incorporated in Final EIA/EMP Report.

DOCUMENT NO. 2016_VI _00005

Table III: Record of Review

Rev.	Date	Description	Review-1	Review-2	Approval
Rev.02	20.06.2018	Final EIA/EMP Report	Mr. K.M. Khare	Mr. S.K. Sharma	Mr. R.S. Yadav
-	-	-			

This Report has been prepared by **VardanEnviroNet** on behalf of and for the use of the **M/s BMA Stainless Limited**with due consideration and skill as per our general terms and conditions of business and terms of agreement with the**M/s BMA Stainless Limited.**

DISCLAIMER

VardanEnviroNet has taken all reasonable precautions in the preparation of this report as per its auditable quality plan. VardanEnviroNet also believes that the facts presented in the report are accurate as on the date it was written. However, it is impossible to dismiss absolutely, the possibility of errors or omissions. VardanEnviroNet therefore specifically disclaims any liability resulting from the use or application of the information contained in this report. The information is not intended to serve as legal advice related to the individual situation.

DECLARATION BY CONSULTANT

NABET Annexure – VII

Declaration by Experts contributing to the EIAof M/s BMA Stainless limited

Declaration by Experts contributing to the EIA:

I, hereby, certify that I was part of the EIA team in the following capacity that developed the above EIA.

EIA Co-ordinator:

Name : Mr. K. M.Khare

Signature & Date :

Period of involvement : July 2016 – Till date

Contact information: D-142, Sector-57, SushantLok-III, Golf Course Extension Road,
Gurgaon (Haryana)
Contact no: 9899651342
Email: vardanenviro165@gmail.com

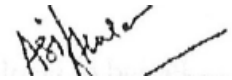
Team Member:

Mr. R.S Yadav	Mr. AnshulYadav	Mr. Nemichand

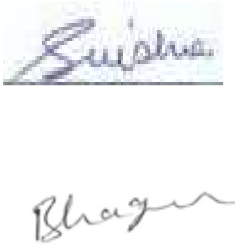
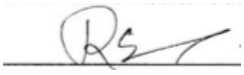
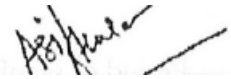
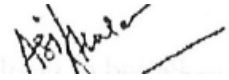
Functional Area Experts (FAEs):

S. No	Functional Areas	Name of the expert/s	Involvement during October – December, 2016	Signature
1.	**AP**	**FAE** Mr. K. M.Khare **FAA** Ms. Monika Gupta	**October – December, 2016** a) Identifying the sources of emissions and mitigation measures. b) Inventorisation of point Source Stacks emissions details. c) Site-specific micrometrology Monitoring.	Monika

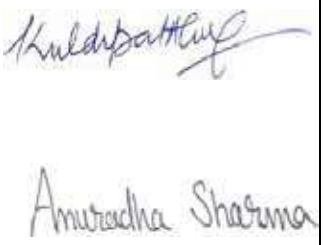
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			d) Ambient Air Quality (AAQ) monitoring Impact predictions and mitigations. e) Budget Allocation	
2.	**WP**	**FAE** Mr. K. M.Khare **FAA** Ms. Monika Gupta	**October – December, 2016** a) Surface water and ground water quality monitoring and assessment, impacts on Water environment and mitigations. b) Identification, characterisation of effluent streams and treatments there of c) Water balance and conservation measures d) Budget Allocation	 
3.	**AQ**	**FAE :** Mr. Asif Hussain	**October – December, 2016** a) Processing of site- specific micro-meteorological data b) Collection and use of inversion/ mixing Height data for modelling. c) Air dispersion modelling for prediction of GLCS due to PM10, SO_2 and NO_x	
4.	**ISW**	**FAE** Mr. S. K. Sharma	**October – December, 2016** a) Non-hazardous solid wastes generation, recycling and disposal b) Storage and management of hazardous solid wastes c)Budget Allocation	

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5.	**SE**	**FAE** Ms. Shilpa Mishra **<u>FAA</u>** Mr. Bhagwan Sahay	**October – December, 2016** a) Determination of demographic profile including socio economy & livelihood b) Assessing the changes in socio economic pattern c)Budget Allocation	
6.	**EB**	**FAE** Dr. Vivek N Singh (**December 2016 – August, 2017**)	**October – December, 2016** a) Biological environment status in respect of terrestrial faun and aquatic eco system b) Impact on ecological environment	
7.	**HG**	**FAE** Mr. R. S. Yadav	**October – December, 2016** a) Ground water resource assessment b) Impact on ground water potential and mitigation measures for avoiding Ground water contamination.	
8.	**HW**	**FAE** Mr. S. K. Sharma	**October – December, 2016** a) Non-hazardous solid wastes generation, recycling and disposal b) Storage and management of hazardous solid wastes c)Budget Allocation	
9.	**NV**	**FAE** Mr. Asif Hussain	**October – December, 2016** a) Analysis of ambient noise quality data b) Impact due to plant noise and abatement measures	
10.	**LU**	**FAE :** Mr. Asif Hussain	**October – December, 2016** a) Analysis of data related to land use pattern	

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		FAA Mr. Bhagwan Sahay	b) Land use map development. c) Impact on land environment in respect to land form change	
11.	**RH**	**FAE** Mr. Kuldipak Ahuja **Assisted by:** Mrs. Anuradha Sharma	**October – December, 2016** a) Identification of hazardous prone areas b) Environment risk evaluation c) On-site and Off-site emergency planning	

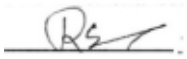
Declaration by the Head of the accredited consultant organization/ authorized person

I, R.S. Yadav, hereby, confirm that the above mentioned experts prepared the EIA Expansion of Steel Plant of **M/s BMA Stainless limited** at Village: Debipur, P.O: Kalyaneshwari, District: Burdwan, West Bengal.

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

I also confirm that I shall be fully accountable for any misleading information mentioned in this statement.

Name: **R.S.Yadav**



Signature

Designation: **Managing Director**

DECLARATION BY CONSULTANT

Name of the EIA Consultant Organization: Vardan Environet, QCI/NABET Accredited Environment Consultancy

NABET Certificate No.& Issue date: **NABET/EIA/1619/RA0037** issued on 28.03.2017 and valid upto9.11.2019.

NABET CERTIFICATE



Quality Council of India

National Accreditation Board for Education & Training

CERTIFICATE OF ACCREDITATION

Vardan Environet

D-142, Ground Floor, Sushant Lok-III, Golf Course Ext. Road, Sec-57, Gurgaon -122001

are accredited as Category - A organization under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations: Version 3 for preparing EIA/EMP reports in the following sectors:

Sl. No.	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including opencast / underground mining	1	1 (a) (i)	A
2	Mineral beneficiation	7	2 (b)	A
3	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	A
4	Cement plants	9	3 (b)	B
5	Coke oven plants	11	4 (b)	B
6	Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)	20	5 (e)	B
7	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	21	5 (f)	A
8	Distilleries	22	5 (g)	A
9	Sugar industry	25	5 (j)	B
10	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	27	6 (a)	A
11	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	28	6 (b)	B
12	Highways	34	7 (f)	A
13	Common Effluent Treatment Plants (CETPs)	36	7 (h)	B
14	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B
15	Building and construction projects	38	8 (a)	B
16	Townships and Area development projects	39	8 (b)	B

Note: Name of approved EIA Coordinators and Functional Area Experts are mentioned in RA AC minutes dated November 18, 2016 and April 21, 2017 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/17/0279 dated 28 March 2017.The accreditation needs to be renewed before the expiry date by Vardan Environet, following due process of assessment.

Sr. Director |NABET
Dated: July 12, 2017

Certificate No.
NABET/ EIA/1619/ RA 0037

Valid till Date
09.11.2019

For the updated List of Accredited Consultants with approved sectors please refer QCI-NABET website.

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ABBREVIATIONS	
AAQM	Ambient Air Quality Monitoring
APCD	Air Pollution Control Devices
cm	Centimeter
CPCB	Central Pollution Control Board
dB	Decibel
DG	Diesel Generator
E	East
ECC	Emergency Control Centre
EIA	Environmental Impact Assessment
EMC	Environmental Management Cell
EMP	Environmental Management Plan
ENE	East of North- East
EPA	Environmental Protection Agencies
ESE	East of South East
ETP	Effluent TreatmentPlant
FCC	False Colour Composite
GIS	GeographicalInformation System
GLC	GroundLevelConcentration
GPS	Global Positioning System
IMD	IndianMeteorologicalDepartment
IRS	IndianRemoteSensing Satellite
ISCST	Industrial Source Complex, Short Terms
ISO	International Organization of Standardization
ISS	Indian Standard Specification
KLD	Kilo Litre Per Day
Km	Kilometer
KVA	Kilo Volt Ampere
KW	Kilo Watt
m	Meter
M bgl	MeterBelowGroundLevel
mg	Milligram
MoEF&CC	Ministry of Environment, Forest and Climate Change
mRL	Mean Reference Level
MSMEs	Micro, Small and Medium Enterprises
N	North
NE	North-East
NH	National Highway
NNE	North of North-East
NNW	North ofNorth-West
NO2	NitrogenDioxides

ABBREVIATIONS	
NW	North-West
OHSA	OccupationalHealth&SafetyAssessment
JSPCB	Jharkhand State Pollution Control Board
PPE	PersonalProtective Equipment
PPM	Part Per Million
Pvt.	Private
QC	Quality Council
QCI	Quality Council of India
QRA	Quantitative RiskAssessment
R&R	Rehabilitation&Resettlement
RDS	Respirable Dust Sampler
RSPM	Respirable SuspendedParticulateMatter
RO	Reverse Osmosis
SE	South- East
SEIAA	State LevelEnvironmentalAssessmentAuthority
SO2	Sulphur-Dioxide
SOI	Survey of India
SPM	SuspendedParticulateMatter
SSE	South of South-East
SSW	South of South-West
STP	SewageTreatmentPlant
TAC	TrafficAdvisoryCommittee
TDS	Total Dissolve Solid
TOR	Terms of Reference
TPH	Tones Per Hour
TS	Total Solid
TSDF	Treatment Storage and DisposalFacility
US EPA	United State Environmental Protection Agencies
$\mu g/m^3$	Micro gram per meter cube
w.e.f.	With Effective From
w.r.t.	With Reference To
W/W	Weight By Weight
WNW	West Of North-West
WSW	West Of South-West
ZLD	ZeroLiquidDischarge

F. No. J-11011/192/2013-IA.II(I)
Government of India
Ministry of Environment, Forest and Climate Change
(I.A. Division)

Indira Paryavaran Bhawan
Jor Bagh Road, Aliganj,
New Delhi - 110003
E-mail: satish.garkoti@nic.in
Tel: 011-24695316

Dated: 17th November, 2016

To

M/s BMA Stainless Limited.
10A, Shakespeare Court,
21A Shakespeare Sarani,
Kolkata, West Bengal-700017.

Subject: Expansion of steel plant for production of MS Billets / rolled products (TMT) bars (1,20,000 TPA to 2,07,360 TPA) by replacement of existing 4 x 8 Tons Induction Furnaces with 4x12 Tons Induction Furnaces by M/s BMA Stainless Limited, located at Village Debipur, P.O. Kalyaneshwari, District Burdwan, West Bengal - prescribing of ToRs regarding.

Sir,

This has reference to your online application No. IA/WB/IND/58221/2016 dated 8th August, 2016 along with the application in prescribed format (Form-I), copy of pre-feasibility report and proposed TORs for undertaking detailed EIA study as per the EIA Notification, 2006 for the project mentioned above. Though it is a Category 'B' project (Secondary Metallurgical Industry), however, due to location of project within 5 km from the interstate boundary (boundary of Jharkhand and West Bengal- 1.3 KM), it became Category 'A' and considered in the Ministry.

2.0 Environmental Clearance for the existing units was granted by the Ministry *vide* letter No. J-11011/192/2013-IA-II (I) dated 29.09.2014. It has been proposed to enhance the capacity of BMA Stainless Limited from 1,20,000 TPA to 2,07,360 TPA Billet / Rolled product by capacity enhancement of existing unit. The detail of the existing and the proposed unit is presented in the following table:

Plant	Existing as per the Present Environment Clearance		Additional production as per the proposed expansion		Total (after the proposed expansion)	
	Unit	Capacity	Unit	Capacity	Unit	Capacity
Induction Furnace	4x8 Tons	1,20,000 TPA	Replacement of existing Induction Furnace	87,360 TPA	4x12Tons	2,07,360 TPA

Continuous Casting Machine (CCM)	2 Strand, 4/7 m radius	1,20,000 TPA	-	87,360 TPA	2 Strand, 4/7 m radius	2,07,360 TPA
Producer Gas plant	1 x 3750 Nm^3/hr	27,00,000 Nm^3/month			1 x 3750 Nm^3/hr	27,00,000 Nm^3/month
Rolling Mill	1x20 TPH	1,20,000	Modification of existing Rolling Mill	87,360 TPA	1x30 TPH	2,07,360 TPA

3.0 Water requirement shall be met from Damodar Valley Corporation (DVC), Borewell and Rain water harvesting pond. Permission from DVC shall be obtained for withdrawal of 0.8 MGD water.

4.0 The proposal was considered by the Expert Appraisal Committee (Industry-I) during its 10th meeting held on 29th to 31st August, 2016 for prescribing TORs for undertaking detailed EIA/EMP study and recommended prescribing following specific TORs for undertaking detailed EIA and EMP study in addition to the generic TOR enclosed at **Annexure I read with additional TORs at Annexure-2 and Annexure - 3.**

i. The Public Hearing for the project should be conducted by West Bengal Pollution Control Board
ii. The issues raised during public hearing and commitment of the project proponent on the same along with time bound action plan to implement the commitment and financial allocation thereto should be clearly provided.
iii. The project proponent should carry out social impact assessment of the project as per the Office Memorandum No. J-11013/25/2014-IA.I dated 11.08.2014 issued by the Ministry regarding guidelines on Environment Sustainability and CSR related issues. The social impact assessment study so carried out should form part of EIA and EMP report.
iv. Compliance report for the earlier EC should be submitted.

5.0 The undersigned is directed to inform that the Ministry of Environment, Forest and Climate Change (MoEFCC) after accepting the recommendation of the EAC (Industry-I), hereby decided to accord ToRs for the above project.

6.0 It is requested that the draft EIA Report may be prepared in accordance with the above mentioned specific TORs and enclosed generic TORs and additional TORs and thereafter further necessary action including conduct of public consultation may be taken for obtaining Environment Clearance in accordance with the procedure prescribed under the EIA Notification, 2006 as amended.

7.0 The TORs are valid for a period of three years from today i.e 17.11.2016 and will expire on 16.11.2019. However, this period could be further extended by a maximum period of one year provided an application is made by the project proponent at least three months

before the expiry of the validity period, together with updated Form-I, based on proper justification.

17/11/2016

(Dr. Satish C. Garkoti)
Scientist 'F'

Copy to:-

1. The Secretary, Department of Environment, Government of West Bengal.
2. The Additional Principal Chief Conservator of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (EZ), A/3, Chandersekharpur, Bhubaneswar – 751023

(Dr. Satish C. Garkoti)
Scientist 'F'

ANNEXURE –I

GENERIC TERMS OF REFERENCE (TOR) IN RESPECT OF INDUSTRY SECTOR

1. Executive Summary
2. Introduction
   - i. Details of the EIA Consultant including NABET accreditation
   - ii. Information about the project proponent
   - iii. Importance and benefits of the project

3. Project Description
   - i. Cost of project and time of completion.
   - ii. Products with capacities for the proposed project.
   - iii. If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.
   - iv. List of raw materials required and their source along with mode of transportation.
   - v. Other chemicals and materials required with quantities and storage capacities
   - vi. Details of Emission, effluents, hazardous waste generation and their management.
   - vii. Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)
   - viii. Process description along with major equipments and machineries, process flow sheet (quantative) from raw material to products to be provided
   - ix. Hazard identification and details of proposed safety systems.
   - x. Expansion/modernization proposals:
     - a. Copy of all the Environmental Clearance(s) including Amendments thereto obtained for the project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Regional Office of the Ministry of Environment and Forests as per circular dated 30th May, 2012 on the status of compliance of conditions stipulated in all the existing environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing /existing operation of the project from SPCB shall be attached with the EIA-EMP report.
     - b. In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted.

4. Site Details

   - i. Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered.
   - ii. A toposheet of the study area of radius of 10km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet. (including all eco-sensitive areas and environmentally sensitive places)
   - iii. Co-ordinates (lat-long) of all four corners of the site.
   - iv. Google map-Earth downloaded of the project site.

v. Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.

vi. Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.

vii. Landuse break-up of total land of the project site (identified and acquired), government/private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (not required for industrial area)

viii. A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area

ix. Geological features and Geo-hydrological status of the study area shall be included.

x. Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided. (mega green field projects)

xi. Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.

xii. R&R details in respect of land in line with state Government policy

5. **Forest and wildlife related issues (if applicable):**

i. Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable).

ii. Landuse map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland (*in case of projects involving forest land more than 40 ha).*

iii. Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.

iv. The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden-thereon.

v. Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area.

vi. Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife

6. **Environmental Status**

i. Determination of atmospheric inversion level at the project site and site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall.

ii. AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO2, NOX, CO and other parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests.

iii. Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM Notification of Nov. 2009 along with – min.,

max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.

iv. Surface water quality of nearby River (60m upstream and downstream) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines.

v. Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC.

vi. Ground water monitoring at minimum at 8 locations shall be included.

vii. Noise levels monitoring at 8 locations within the study area.

viii. Soil Characteristic as per CPCB guidelines.

ix. Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc.

x. Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule-I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished.

xi. Socio-economic status of the study area.

7. Impact Assessment and Environment Management Plan

i. Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modelling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be well assessed. Details of the model used and the input data used for modeling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.

ii. Water Quality modelling – in case, if the effluent is proposed to be discharged in to the local drain, then Water Quality Modelling study should be conducted for the drain water taking into consideration the upstream and downstream quality of water of the drain.

iii. Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road transport or conveyor-cum-rail transport shall be examined.

iv. A note on treatment of wastewater from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) Rules.

v. Details of stack emission and action plan for control of emissions to meet standards.

vi. Measures for fugitive emission control

vii. Details of hazardous waste generation and their storage, utilization and disposal. Copies of MOU regarding utilization of solid and hazardous waste shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation.

viii. Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.

ix. Action plan for the green belt development plan in 33 % area i.e. land with not less than 1,500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be incorporated.

x. Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources.

xi. Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.

xii. Action plan for post-project environmental monitoring shall be submitted.

xiii. Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan.

8. Occupational health

i. Details of existing Occupational & Safety Hazards. What are the exposure levels of above mentioned hazards and whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved.

ii. Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during pre placement and periodical examinations give the details of the same. Details regarding last month analyzed data of abovementioned parameters as per age, sex, duration of exposure and department wise.

iii. Annual report of heath status of workers with special reference to Occupational Health and Safety.

iv. Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers.

9. Corporate Environment Policy

i. Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.

ii. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.

iii. What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.

iv. Does the company have system of reporting of non compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report

10. Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase.

11. Enterprise Social Commitment (ESC)

    i. Adequate funds (atleast 2.5 % of the project cost) shall be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan shall be included. Socio-economic development activities need to be elaborated upon.

12. Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and present status of the case.

13. 'A tabular chart with index for point wise compliance of above TORs.

14. The TORs prescribed shall be valid for a period of three years for submission of the EIA-EMP reports along with Public Hearing Proceedings (wherever stipulated).

<u>The following general points shall be noted:</u>

i. All documents shall be properly indexed, page numbered.
ii. Period/date of data collection shall be clearly indicated.
iii. Authenticated English translation of all material in Regional languages shall be provided.
iv. The letter/application for environmental clearance shall quote the MOEF file No. and also attach a copy of the letter.
v. The copy of the letter received from the Ministry shall be also attached as an annexure to the final EIA-EMP Report.
vi. The index of the final EIA-EMP report must indicate the specific chapter and page no. of the EIA-EMP Report
vii. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MOEF vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry shall also be followed.
viii. The consultants involved in the preparation of EIA-EMP report after accreditation with Quality Council of India (QCI) /National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA-EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. Name of the Consultant and the Accreditation details shall be posted on the EIA-EMP Report as well as on the cover of the Hard Copy of the Presentation material for EC presentation.
ix. TORs' prescribed by the Expert Appraisal Committee (Industry) shall be considered for preparation of EIA-EMP report for the project in addition to all the relevant information as per the 'Generic Structure of EIA' given in Appendix III and IIIA in the EIA Notification, 2006. Where the documents provided are in a language other than English, an English translation shall be provided. The draft EIA-EMP report shall be submitted to the State Pollution Control Board of the concerned State for conduct of Public Hearing. The SPCB shall conduct the Public Hearing/public consultation, district-wise, as per the provisions of EIA notification, 2006. The Public

XXX

Hearing shall be chaired by an Officer not below the rank of Additional District Magistrate. The issues raised in the Public Hearing and during the consultation process and the commitments made by the project proponent on the same shall be included separately in EIA-EMP Report in a separate chapter and summarised in a tabular chart with financial budget (capital and revenue) along with time-schedule of implementation for complying with the commitments made. The final EIA report shall be submitted to the Ministry for obtaining environmental clearance.

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ANNEXURE-2

INDUCTION/ARC FURNACES/CUPOLA FURNACES 5TPH OR MORE

1. Details of proposed layout clearly demarcating various units within the plant.
2. Complete process flow diagram describing each unit, its processes and operations, along with material and energy inputs and outputs (material and energy balance).
3. Details on design and manufacturing process for all the units.
4. Details on environmentally sound technologies for recycling of hazardous materials, as per CPCB Guidelines, may be mentioned in case of handling scrap and other recycled materials.
5. Details on requirement of raw materials, its source and storage at the plant.
6. Details on requirement of energy and water along with its source and authorization from the concerned department. Location of water intake and outfall points (with coordinates).
7. Details on toxic metal content in the waste material and its composition and end use (particularly of slag).
8. Details on toxic content (TCLP), composition and end use of chrome slag. Details on the recovery of the Ferro chrome from the slag and its proper disposal.

ANNEXURE-3

Plant /Unit	Pollutants	Qty generated	Method used to Control/ and specifications/attach Separate Sheet to furnish Details	Number of units planned & Capacity	Budget	Estimated Post Control Qty of Pollutant	
						Per Unit	Per Day

Executive Summary

Executive summary of the report in about 8-10 pages incorporating the following:

i. Project name and location (Village, Dist, State, Industrial Estate (if applicable)
ii. Products and capacities. If expansion proposal then existing products with capacities and reference to earlier EC.
iii. Requirement of land, raw material, water, power, fuel, with source of supply (Quantitative)
iv. Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
v. Measures for mitigating the impact on the environment and mode of discharge or disposal.
vi. Capital cost of the project, estimated time of completion
vii. Site selected for the project – Nature of land – Agricultural (single/double crop), barren, Govt/private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest , eco-sensitive zones, accessibility, (note – in case of industrial estate this information may not be necessary)
viii. Baseline environmental data – air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
ix. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
x. Likely impact of the project on air, water, land, flora-fauna and nearby population
xi. Emergency preparedness plan in case of natural or in plant emergencies
xii. Issues raised during public hearing (if applicable) and response given
xiii. CSR plan with proposed expenditure.
xiv. Occupational Health Measures
xv. Post project monitoring plan

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F. No. J-11011/192/2013 – IA.II(I),
BMA STAINLESS LIMITED, BURDWAN,WESTBENGAL
TERMS OF REFERENCE – STATUS OF COMPLIANCE

S. No	TOR Point	Reply	Citation
A.	**Specific ToR**		
i.	Public hearing to be conducted by the West Bengal Pollution Control Board.	Public Hearing was conducted by West Bengal Pollution Control Board on 21.07.2017.Public Hearing Proceeding and Minutes of Meeting are incorporated in the EIA report.	**Chapter 7, Item No. 7.3, Page No. 162-175.**
ii.	The issues raised during public hearing and commitment of the project proponent on the same along with time bound action plan to implement the commitment and financial allocation thereto should be clearly provided.	The action planfor the issues raised during public hearing and commitment made by the project proponent included in the EIA report. Action Plan of Public of Public Hearing with commitment of PP, time bound action plan along with fund provision is attached as **Annexure.**	**Chapter 7, Table No. 7.2, Page No. 174-175.**
iii.	The Project proponent should carry out social impact assessment of the project as per the office Memorandum No. J-11013/25/2014-IA.I dated 11.08.2014 issued by the Ministry regarding guidelines on Environment Sustainability and CSR related issues. The social impact assessment study so carried out should form part of EIA and EMP report.	Social impact assessment survey was conducted by Functional Area Expert Mrs. Shilpa Mishra (Socio-economic) with M/s VardanEnvironet. TheSIA reportisincorporated in the EIA Report and questionnaire is enclosed as Annexure.	**Chapter 7, Item No. 7.2, Page No. 157-161.** **Annexure XIV, Page No. 245**
iv	Compliance report for the early EC	Latest Compliance Report for the period of (March to September, 2017)	**Annexure XV, Page**

S. No	TOR Point	Reply	Citation
	should be submitted	submitted to Regional Office, MoEF&CC, Bhubaneswar on 18.11.2017 and compliance report is incorporated with EIA Report.	**No. 346.**
	Generic ToR		
1.	**Executive Summary**		
	Executive summary (maximum 8-10 sheets in A4 size paper) of the project covering project description, description of the environment, anticipated environmental impacts & its mitigation measures, environmental management plan, environmental monitoring program, public consultation, project benefits, Social impacts including R&R.	Executive Summary is enclosed as Annexure-Iwith EIA report.	**Annexure I, Page No. 227**
2.	**Introduction**		
i	Details of the EIA Consultant including NABET accreditation	**VardanEnviroNet,** is an accredited organization by Quality Council of India/NABET, Certificate no**.** **NABET/EIA/1619/RA0037.**NABET accreditation certificate is enclosed with the EIA Report.	**Page No. ii**
ii	Information about the project proponent	BMA Stainless Limited is a Limited company in the business of production of MS Billets and Rolled products. The company has been promoted by a Group of experience businessmen who are presently engaged in manufacturing and trading of various products. BMA Steel Limited is headed by Mr. Avinash Agarwalla, Director. Mr. Agrawalla has more than 30 years of experience in the field of production of MS Billets and Rolled product.	**Chapter 1, Item No. 1.3 at Page No. 1.**

S. No	TOR Point	Reply	Citation
iii	Importance and benefits of the project	**Importance of Project:** In India, a major part of steel is consumed in engineering applications, followed by automobiles and construction. As the growth of steel, as is well known, is dependent upon the growth of economy, industrial production and infrastructure sectors, demand of steel is day by day increasing. India has been a net importer of steel but in recent years, we might become a net exporter. Therefore production of steel at the regional level will be highly beneficial & help in reduction of imports. **Benefits of Projects:** This project will benefit the local people by way of direct & indirect employment which would improve the living conditions of the people and infrastructure development through socioeconomic measures taken up by proponent.	**Chapter 1, Item No. 1.5 at Page No. 5** **Chapter 8 at Page No. 213.**
3.	**Project Description**		
I.	Cost of project and time of completion.	Cost of the project is Rs. 9.94 Crores. Completion schedule of the project is 24 months. "Zero date" for a project is reckoned as the date on which the all statutory clearance to start the project are received.	**Project Costs**: **Chapter 2, Item No. 2.7.6 at Page No. 37** **Project Completion: Chapter 2**, **Item No. 2.5.1 at Page No. 23.**

<table>
<tr><th>S. No</th><th>TOR Point</th><th>Reply</th><th>Citation</th></tr>
<tr><td>II.</td><td>Product with capacities for the proposed project.</td><td>
<table>
<tr><th rowspan="2">Plant</th><th colspan="2">Existing
As per the Present Environment Clearance</th><th colspan="2">As per the proposed expansion project (Additional)</th><th colspan="2">Total (after the proposed expansion)</th></tr>
<tr><th>Unit</th><th>Capacity</th><th>Unit</th><th>Capacity</th><th>Unit</th><th>Capacity</th></tr>
<tr><td>Induction Furnace</td><td>4x8 Tons</td><td>1,20,000 TPA</td><td>4x12Tons (replacement of exiting 4x8T IFs)</td><td></td><td>4x12Tons</td><td>2,07,360 TPA</td></tr>
<tr><td>Continuous Casting Machine (CCM)</td><td>2 Strand, 6/7 m radius</td><td>1,20,000 TPA</td><td>-</td><td>87,360 TPA</td><td>2 Strand, 6/7 m radius</td><td>2,07,360 TPA</td></tr>
<tr><td>Producer Gas plant</td><td>1</td><td>27,00,000 Nm^3/month</td><td>-</td><td>-</td><td>-</td><td>27,00,000 Nm^3/month</td></tr>
<tr><td>Rolling Mill</td><td>1</td><td>1,20,000</td><td>-</td><td>87,360 TPA</td><td>-</td><td>2,07,360 TPA</td></tr>
</table>
</td><td>Chapter 2, Item No.- 2.4, Table 2.2 in Page No. 22.</td></tr>
<tr><td>III.</td><td>If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.</td><td>Capacity expansion of BMW Stainless Limited from existing production of 1,20,000 TPA Billet/Rolled product to 2,07,360 TPA Billet/Rolled product by replacement of existing 4x8Ton capacity Induction Furnaces with 4x12 Ton capacity furnaces.

There is no additional land requirement for the project as the project is for replacement of existing Induction Furnaces with higher capacity Induction Furnaces.
Earlier EC for 4x8T Induction Furnace for production of 1,20,000 TPA</td><td>Chapter 2, Item No.- 2.4, Table 2.1 at Page No. 22.

Land documents are attached as Annexure II, Page No. 236.
Earlier EC letter is</td></tr>
</table>

S. No	TOR Point	Reply	Citation
		Billet/Rolled product was obtained from MoEF&CC vide F.No. J-11011/192/2013-IA.II(I) dated 29.09.2014	**attached as Annexure III, Page No.- 239**
IV.	List of raw materials required and their source along with mode of transportation.	The Major raw materials are required for proposed project are Sponge iron, Pig Iron and alloys.It will be mainly transported by road. Details of raw material required with their source and mode of transportation are incorporated in EIA report.	**Chapter 2, Item No.- 2.7.2, Table 2.3, Page No. 31.**
V.	Other chemicals and materials required with quantities and storage capacities.	There are no chemicals used in process. Only Lab chemical used for laboratory testing. Lab chemical used such as Mercuric Chloride, Ammonium Molybdate, Potassium Permanganate, Hydrochloric Acid, Nitric Acid, Sulfuric Acid.	-----
VI.	Details of Emission, effluents, hazardous waste generation and their management.	During charging of sponge iron and pig iron, during tapping of liquid steel and during melting there will be fugitive emissions. Will be taken care of by Pulse Jet bag filters with theInduction Furnaces to keep fugitive emissions <2000 µg/Nm^3 and stack emissions <50 mg/Nm^3. Waste water discharge from the process will be approx. 1.6 m^3/h (19 KLD) from Cooling Tower blow down and DM plant waste water after the proposed expansion. The utilization of waste water for re-use and re-cycling will be carried out for slag cooling, dust suppression and horticulture. After the proposed expansion only used oil will be generated as hazardous waste and the same shall be sold to the registered recyclers.	**Chapter 2, Item No.- 2.8 at Page No. 37-38.** **Chapter 4, Item No.- 4.9 at Page No. 133.**
VII.	Requirement of water, power, with source of supply, status of approval, water balance diagram, manpower requirement (regular and contract)	Total Make-up water requirement after the proposed expansion will be 202 KLD which will be sourced from DVC and rain water harvesting. Water permission from DVC for drawl of 0.80 MGD from Maithon Reservoir was issued vide letter No. MRO/Tariff Cell/- 151 dated	**Chapter 2 Item No.- 2.7.3 at Page No. 34 Water Permission from DVC is enclosed**

S. No	TOR Point	Reply	Citation
		22.03.2018. Water Balance diagram is given in Chapter 2 of EIA. Water for domestic use approx. 10 KLD will be sourced from Bore well. Total power requirement is 20 MVA after proposed expansionand power assurance for expansion proposal is obtained from Damodar Valley Corporation (DVC). Power Assurance is enclosed as Annexure in EIA Report. Direct manpower requirement for the project will be 30 and indirect will be approx. 150.	**as Annexure IV at Page No.245** **Chapter 2 Item No.- 2.7.4 at Page No. 36. Annexure V, Page No. 249.** **Chapter 2 Item No.- 2.7.5 at Page No. 37.**
VIII.	Process description along with major equipment and machineries, process flow sheet (quantitative) from raw material to product to provided.	Process description of Induction furnace, Continuous Casting Machine given with schematic process flow diagram.	**Chapter 2, Item No.- 2.6 at Page No. 22-31.**
IX.	Hazard identification and details of proposed safety systems.	Details of Hazard identificationwith the process, Risk Analysis and Mitigation measuresis incorporated in the EIA report.	**Chapter7, Item No.- 7.5, Table no. 7.5 at Page No. 178-185.**
X.	**Expansion/modernization proposals:**		
	a. Copy of all the Environmental Clearance(s) including Amendments there to be obtained for the project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the	Copy of Earlier EC for 4x8T Induction Furnace for production of 1,20,000 TPA Billet/Rolled product was obtained from MoEF&CC vide F.No. J-11011/192/2013-IA.II(I) dated 29.09.2014. Copy of CTE and valid CTO of plant is attached as annexure.	**Earlier EC Copy attached as Annexure-III, Page No. 239** **CTE/ CTO copy attached as**

S. No	TOR Point	Reply	Citation
	Regional Office of the Ministry of Environment and Forest as per circular dated 30th May, 2012 on the status of compliances of conditions stipulated in all the existing environmental clearance including Amendments shall be provide. In addition, status of compliance of Consent to Operate for the ongoing existing operation of the project from SPCB shall be attached with the EIA-EMP report.		**Annexure-VI Page No. 254.**
	b) In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or Notification 2006 shall be provided. Copies of Consent of Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted.	Earlier EC attached. Regularly submitted Half Yearly Compliance Report of the EC conditions, time to time. Last compliance report submitted to Regional Office, MOEF&CC, Bhubaneswarwas on 18.11.2017.	**Annexure III at Page No. 239** **Annexure XV, Page No.346**

<table>
<tr><th>S. No</th><th>TOR Point</th><th>Reply</th><th>Citation</th></tr>
<tr><td>4.</td><td>Site Details</td><td></td><td></td></tr>
<tr><td>I.</td><td>Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered.</td><td>Project site is situated at village Debipur, PO: Kalyaneshwari, District Burdwan, West Bengal. As this is an expansion project and no alternative site has been considered. Expansion includes no additional land requirement.
Proposed expansion done in existing premises hence, no other sites were considered for the project.</td><td>Chapter 1 inItem No. 1.4.2 Page No. 3-4.</td></tr>
<tr><td>II.</td><td>A topo-sheet of the study area of radius of 10km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet. (including all eco-sensitive areas and environmentally sensitive places)</td><td>Topo-sheet (Topo-sheet No: 73/9,73/10,73/13,73/14) of the study area is included in EIA report.</td><td>Chapter 1 at Figure 1.1 at Page No. 6.</td></tr>
<tr><td>III.</td><td>Co-ordinates (lat-long) of all four corners of the site</td><td><table><tr><th>Pillar No.</th><th>Latitudes</th><th>Longitudes</th></tr><tr><td>A</td><td>23°46'59.64"N</td><td>86°49'55.42"E</td></tr><tr><td>B</td><td>23°46'57.62"N</td><td>86°50'5.44"E</td></tr><tr><td>C</td><td>23°46'58.57"N</td><td>86°50'9.70"E</td></tr><tr><td>D</td><td>23°46'52.16"N</td><td>86°50'8.45"E</td></tr><tr><td>E</td><td>23°46'53.15"N</td><td>86°49'59.77"E</td></tr><tr><td>F</td><td>23°46'57.17"N</td><td>86°49'53.13"E</td></tr></table></td><td>Chapter 2in Figure 2.2 at Page No. 16.</td></tr>
<tr><td>IV.</td><td>Google map-Earth downloaded of the project site.</td><td>Google imaginary of project site downloaded from Google earth is given in EIA report.</td><td>Chapter 2 as Figures 2.2, 2.3 at Page No. 16 & 17.</td></tr>
<tr><td>V.</td><td>Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/Estate/Complex,</td><td>Layout map of proposed project site is given in EIA report.</td><td>Chapter 2 as Figure 2.4 at Page No. 18.</td></tr>
</table>

<table>
<tr><th>S. No</th><th>TOR Point</th><th>Reply</th><th>Citation</th></tr>
<tr><td></td><td>layout of Industrial Area indicating location of unit within the Industrial area/Estate.</td><td></td><td></td></tr>
<tr><td>VI.</td><td>Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular</td><td>Photographs of the existing and proposed site along with green belt are given in EIA report.</td><td>Chapter 2 as Figure 2.5 Page No. 19-20.</td></tr>
<tr><td>VII.</td><td>Land use break-up of total land of the project site (identified and acquired), government/private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (not required for industrial area).</td><td>The expansion will be done in existing industry premises.
Land-use breakup of the project site is given in Plant Layout incorporated in chapter 2.</td><td>Chapter 2, as Figure 2.4 Page No. 18</td></tr>
<tr><td>VIII.</td><td>A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area.</td><td>A list of major industries with name and type within study area (10km radius) is attached as Annexure in the EIA Report.
Land Use of the study area is as follows:
<table>
<tr><th>Land use</th><th>Area (in Hectares)</th><th>% Area</th></tr>
<tr><td>Water body</td><td>6278.58</td><td>19</td></tr>
<tr><td>Forest land</td><td>5515.74</td><td>17</td></tr>
<tr><td>Barren land</td><td>321.39</td><td>1</td></tr>
<tr><td>Sandy area</td><td>958.14</td><td>3</td></tr>
<tr><td>Settlement</td><td>5499.26</td><td>17</td></tr>
<tr><td>Open scrub</td><td>684.18</td><td>2</td></tr>
<tr><td>Fallow land</td><td>3890.52</td><td>11</td></tr>
<tr><td>Agricultural land</td><td>9423.93</td><td>29</td></tr>
<tr><td>Total area</td><td>32571.74</td><td>100</td></tr>
</table></td><td>List of Major Industries attached as Annexure VII, Page No. 263.

Land Use details given in Chapter 3, as Figure 3.13, Page No. 65.</td></tr>
</table>

S. No	TOR Point	Reply	Citation
IX.	Geological features and Geo-hydrological status of the study area shall be included.	Burdwan district has total geographical area of 7024 sq.m. The district falls in the lower part of the Ganga Basin. The Ganag/Bhagirathi, with tributaries like Damodar, Ajoy, Barakar etc. from the main drainage system of the district.	**Chapter 3 as Item No.-3.10 & 3.11 at Page No. 68-70.**
X.	Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided. (mega green field projects)	Drainage Pattern in the study area from South to North site. Drainage and counter map is given in the EIA Report. There is no major river in 1 km radius of the project site.	**Chapter 3 as Figure 3.18 at Page No. 70.**
XI.	Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.	The proposed expansion is proposed at the existing land area and there is no additional land required for the expansion. The land is purchased by project proponent and land documents are attached as Annexure.	**Attached as Annexure II, Page No. 236.**
XII.	R&R details in respect of land in line with state Government policy.	There is no displacement of any person due to the project and hence the R&R Plan is not required.	**Chapter 7, Item No. 7.4.1, Page No. 178**
5.	**Forest and wildlife related issues (if applicable):**		**--**
I.	Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the	Not Applicable	-----

S. No	TOR Point	Reply	Citation
	State Forest Department. (if applicable).		
II.	Land-use map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland (*in case of projects involving forest land more than 40 ha).*	The detailed land use study has been carried out and the details are incorporated in EIA report.	**Chapter 3, Figure 3.13 Page No. 65.**
III.	Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.	Not applicable as no forest land involve in the projectsite.	
IV.	The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing thesefeatures vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden-thereon.	There is no National Park, Sanctuaries, Bio-sphere Reserves and Migratory Corridors of Wild Life Animals within 10 km from the project site. Forest NOC has been obtained on 28.09.2017.	**Forest NOC is enclosed as Annexure VIII, Page No. 264.**
V.	Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area.	There is no Schedule-1 species in the study area	

S. No	TOR Point	Reply	Citation
VI.	Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife	Not applicable.	
6.	**Environmental Status**		
I.	Determination of atmospheric inversion level at the project site and site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall.	-------	**Chapter 3 as Table 3.1 in Page No. 42.**
II.	AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO2, NOX, CO and other parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests.	The monitoring stations are selected based on the the pre-dominant wind direction, population zone and sensitive receptors including reserved forests.	**Chapter 3 as Table 3.5 in Page No. 42-43. Details of monitoring station in Table 3.4 & 3.5 at Page No. 41-43 and Figure 3.4 at Page No. 49.**
III.	Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM	Raw data of PM_{10}, $PM_{2.5}$, SO_2, NO_2 for 12 weeks of all stations measured twice a week are attached with EIA report. Min., max., average and 98% values for each of the AAQ parameters from	**Details in Table 3.5 and Figure 3.3 at Page No. 45-48.**

S. No	TOR Point	Reply	Citation
	Notification of Nov. 2009 along with – min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.	data of all AAQ stations are also given.	**Report is attached as Annexure X at Page No. 280.**
IV.	Surface water quality of nearby River (60m upstream and downstream) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines.	Surface water is taken from Barakar River and other water sources near the project site.	**Chapter 3, Table 3.12 at Page No. 60 Report attached as Annexure X at Page No.280.**
V.	Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC.	No	---
VI.	Ground water monitoring at minimum at 8 locations shall be included.	About 8 ground water samples were collected from the study area to assess the water quality during the study period.	**Chapter 3 Table 3.11 at Page No. 58-59. Report attached as Annexure X at Page No. 280.**
VII.	Noise levels monitoring at 8 locations within the study area.	Ambient noise levels were measured using integrated sound level meter at 8 locations.	**Chapter 3 as Table 3.7 at Page No. 50 and monitoring report is attached as Annexure X at Page No. 280.**
VIII.	Soil Characteristic as per CPCB guidelines.	For studying the soil types and soil characteristics, 8 sampling locations were selected to assess the existing soil conditions representing various land use conditions and geological features.	**Chapter 3 as Table 3.9 Page No. 54 and monitoring report is attached as Annexure**

S. No	TOR Point	Reply	Citation
			X at Page No. 280.
IX.	Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc.	Detailed traffic study of the area along with type & frequency of the heavy vehicles and additional traffic due to proposed project has been carried out and incorporated in EIA report.	**Chapter 3 as Item No. 3.15 Page No. 73-74 and Figure 3.21, Page No. 75.**
X.	Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule-I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished.	An ecological survey was conducted by Functional area expert Dr. Vivek N Singh (Ecology and biology) of M/s VardanEnvironet The study was carried out during December, 2016. The details are incorporated in EIA Report.	**Chapter 3, Item No. 3.17, Page 95-105.**
XI.	Socio-economic status of the study area.	Socio-economic survey was conducted by Functional area expert Mrs. Shilpa Mishra (Socio-economic) of M/s VardanEnvironet.The details are incorporated in EIA report.	**Chapter 3, Item No. 3.16 at Page No. 75-95.**
7.	**Impact Assessment and Environment Management Plan**		
I.	Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modeling shall be done using inputs of the specific terrain characteristics for determining the	The project is not located on a hilly terrain. Air quality Modeling has been done for determining cumulative impact of all sources of emission. ISCST3 (US-EPA approved). Dispersion Model was used to predict the air quality. The details are incorporated in EIA report.	**Chapter 4, Item No. 4.5.2, Page No. 120-126.**

S. No	TOR Point	Reply	Citation
	potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be well assessed. Details of the model used and the input data used for modeling shall also be provided. The air quality contours shall beplotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.		
II.	Water Quality modelling – in case, if the effluent is proposed to be discharged in to the local drain, then Water Quality Modelling study should be conducted for the drain water taking into consideration the upstream and downstream quality of water of the drain.	Not applicable as the proposed project has adopted "Zero liquid effluent Discharge (ZLD)". There is no effluent will be discharged out of the plant boundary.	**Chapter 4, Item No. 4.6 Page No. 129.**
III.	Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail cum road transport or conveyor-	The detailed traffic study has been carried out to determine impact due to transportation of raw material. The LOS value from the proposed project is "Very Good" (same as earlier value)for all National and State highway. So the additional load is not likely to have any significant effect on the carrying capacity.	**Chapter 3 as Item No. 3.15 Page No. 73-74 and Figure 3.21, Page No. 75.**

S. No	TOR Point	Reply	Citation
	cum-rail transport shall be examined.		
IV.	A note on treatment of wastewater from different plant operations, extent of recycling and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) Rules.	Treatment of waste water from different plant operations, extent of recycling and reused, characteristics of treated effluent discussed in Chapter-4 of the EIA report.	**Chapter 4, Item No. 4.6.1 Page No. 130.**
V.	Details of stack emission and action plan for control of emissions to meet standards.	4 nos. of Pulsejet Bag Filters are provided with 4 nos. of Induction Furnaces, connected with two stacks. Pulse jet Bag Filters shall be augmented to keep stack emissions below 50 mg/Nm^3.	**Chapter 4, Item No. 4.5.7 Page No. 127-128.**
VI.	Measures for fugitive emission control	Fugitive emissions during charging and tapping shall be controlled using Pulse Jet Bag Filters. Additional measures are as follows: •Haulage roads will be sprinkled with water at regular intervals for which water tankers with sprinkler arrangement are deployed. •Trucks carrying coal and other raw material are covered with tarpaulin to prevent spillage dust during transportation. •Green belt and greenery development around storage yards, both side of the roads and around the periphery of the industry. •Water spraying arrangement at loading unloading points of raw materials. •The conveyors shall be suitably covered to control fugitive emissions. •All internal roads in the premise are paved /tarred.	**Chapter 4, Item No. 4.5.7.1, Page No. 128-129.**
VII.	Details of hazardous waste generation and their storage,	After the proposed expansion only Used oil will be generated as hazardous waste and the same shall be sold to the registered recyclers.	**Chapter 4, Item No. 4.9, Page No. 133.**

S. No	TOR Point	Reply	Citation
	utilization and disposal. Copies of MOU regarding utilization of solid and hazardous waste shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation.		
VIII.	Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.	Cinder from Bottom Ash is being given at no cost to the nearby Brick Manufacturing Unitsto be used as fuel due to presence of unburnt carbon in it.	**Chapter 4, Item No. 4.8.3(a), page no. 133.**
IX.	Action plan for the green belt development plan in 33 % area i.e. land with not less than 1,500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be incorporated.	Green belt will be developed over 33% area of the total plant area. Out of the 6.92 ha. (17.1 Acres) of the plant area, about 2.3 ha. (5.7 Acres) will be developed as greenbelt.Indigenous trees with tree density of 1500 trees per hectare (600nos. of plant per acre) with local board leaf species. A budget of Rs. 5 Lakhs has been kept for Green belt development. Total **2.30 ha**. i.e. 33% of total plot area is earmarkedfor greenbelt development out of which**1.5 ha.**has already been developed andremaining area which will be completed within six months from May, 2018 onwards. In this regard an undertaking is given by project proponent to complete the greenbelt development and enclosed as Annexure in EIA Report.	**Chapter 4, Item No. 4.12, Page No. 137-142.** **Undertaking for Plantation is enclosed as Annexure XI at Page No. 335.**
X.	Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains	Detailed plan for Rain Water Harvesting is included in the EIA report. Approx. 12,707 m^3 of runoff-rain water will be harvested every year.	**Chapter 4, Item No. 4.13, Page No. 142-143.**

<table>
<tr><th>S. No</th><th>TOR Point</th><th>Reply</th><th>Citation</th></tr>
<tr><td></td><td>to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources.</td><td></td><td></td></tr>
<tr><td>XI.</td><td>Total capital cost and recurring cost/annum for environmental pollution control measures shall be included</td><td>
<table>
<tr><th>S.No.</th><th>Environmental Protection Measures</th><th>Capital Cost Rs. In lakhs</th><th>Recurring Cost Rs. In Lakhs / Yr.</th></tr>
<tr><td>1</td><td>Air Pollution Control Measures</td><td>50.00</td><td>6.00</td></tr>
<tr><td>2</td><td>Water Pollution Control Measures</td><td>3.00</td><td>1.00</td></tr>
<tr><td>3.</td><td>Noise Pollution Control Measures</td><td>1.00</td><td>0.10</td></tr>
<tr><td>4</td><td>Greenbelt Development</td><td>5.00</td><td>2.00</td></tr>
<tr><td>5</td><td>Rain Water Harvesting</td><td>3.50</td><td>0.30</td></tr>
<tr><td>6</td><td>Occupational health and safety</td><td>1.50</td><td>1.00</td></tr>
<tr><td colspan="2">TOTAL</td><td>64.00</td><td>10.40</td></tr>
</table>
</td><td>Chapter 10, Item No. 10.1 Page No. 221.</td></tr>
<tr><td>XII.</td><td>Action plan for post-project environmental monitoring shall be submitted.</td><td>A detailed monitoring of emissions and effluent sources for different environmental parameters will be carried out as per the present norms and any further notification/direction from West Bengal Pollution Control Board (WBPCB), Central Pollution Control Board (CPCB) and MoEF.Monitoring methodologies will follow standard methods prescribed by Central Pollution Control Board (CPCB), Bureau of Indian Standards (BIS) etc.</td><td>Chapter 6, Item No. 6.2.1-6.2.5 Page No. 150-152.</td></tr>
<tr><td>XIII.</td><td>Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster</td><td>Onsite and Offsite Disaster (natural and Man-made) Management Plan, and Emergency Preparedness & Response Plan including Risk Assessment and damage control has been prepared and given in Chapter-7.</td><td>Chapter 7, Item No. 7.8 & 7.9 Page No. 158-199.</td></tr>
</table>

<table>
<tr><th>S. No</th><th>TOR Point</th><th>Reply</th><th>Citation</th></tr>
<tr><td></td><td>management plan should be linked with District Disaster Management Plan.</td><td></td><td></td></tr>
<tr><td>8.</td><td>Occupational health</td><td></td><td></td></tr>
<tr><td>I.</td><td>Details of existing Occupational & Safety Hazards. What are the exposure levels of above mentioned hazards and whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved,</td><td>
<table>
<tr><th rowspan="2">S. No.</th><th rowspan="2">Chemical Name</th><th>OSHA PEL</th><th>Cal/OSHA PEL</th><th>NIOSH REL</th><th>ACGIH</th></tr>
<tr><th>Mg/m3</th><th>8-hour TWA (ST) STEL(C) Ceiling Mg/m3</th><th>Up to 10-hour TWA(ST) STEL(C) Ceiling Mg/m3</th><th>TLV</th></tr>
<tr><td>1.</td><td colspan="2">Coal Dust</td><td rowspan="3">1</td><td rowspan="3">0.9 (resp.) bituminous or lignite; 0.4 (resp.) anthracite (coal dust to be monitored for crystalline silica</td></tr>
<tr><td rowspan="2">2.</td><td>a)Respirable fraction less than 5% SiO2</td><td>2.4Mg/m^3</td><td>0.9(bituminous)</td></tr>
<tr><td>b)Respirable fraction greater than 5% SiO2</td><td>10/(%SiO_2+2)</td><td>0.1(bituminous)</td></tr>
<tr><td>3</td><td>Iron oxide</td><td>10 (fume)</td><td>5 fume)</td><td>5(dust and fume)</td><td>5 mg/m^3</td></tr>
<tr><td>4</td><td>Silica Dust</td><td></td><td>50 µg/m^3</td><td></td><td></td></tr>
<tr><td>5</td><td>Carbon Monooxide</td><td>55 Mg/m^3</td><td>25 ppm</td><td>35 ppm</td><td>25 ppm</td></tr>
<tr><td colspan="6">Reference- OSHA/PEL exposure limit Guide</td></tr>
</table>
</td><td>Chapter 7, Item No. 7.10.10 Page No. 209-210.</td></tr>
<tr><td>II.</td><td>Details of exposure specific health status evaluation of worker. If the workers’ health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during pre-placement and periodical examinations give the</td><td>Workers' health shall be evaluated by pre designed formats for chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision,colour vision and any other ocular defect), ECG, during pre-placement andperiodical.</td><td>Chapter 7, Item No. 7.10.10 Page No. 211</td></tr>
</table>

S. No	TOR Point	Reply	Citation
	details ofthe same. Details regarding last month analyzed data of abovementioned parameters as per age, sex, duration of exposure and department wise.		
III.	Annual report of health status of workers with special reference to Occupational Health and Safety	Annual report of health will be reviewed for BMA Stainless Limited, once the facility for the proposed activity is operational as per the formats given in EIA report. Safety Policy is attached as Annexure-XII in EIA EMP Report	**Chapter 7, Item No. 7.10.10 Page No. 212. Annexure XII at Page No. 336.**
IV.	Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers	A budget of Rs.1.5 Lakhs has been kept for occupational health & safety.	**Chapter 6, Table 6.4 at Page No. 154.**
9.	**Corporate Environment Policy**		
i.	Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.	Environment Policy is attached with EIA report.	**Annexure XIII at Page No. 337.**
ii.	Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.	Environment Policy have been commitment to comply with the legal other requirement. Company have the system of reporting of Non-conformances/violation of any Environmental Law/Policy to their Board of Directors as per their management system.	**Chapter 10, Item No. 10.3 Page No. 218-219. Annexure-XIII at Page No. 337.**
iii.	What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance	Hierarchical system of the company is mentioned in EIA report.	**Chapter 10, Figure No 10.1 at Page No. 219.**

S. No	TOR Point	Reply	Citation
	with the environmental clearance conditions? Details of this system may be given		
iv.	Does the company have system of reporting of non-compliances/ violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report	Yes the company haswell laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders.	**Chapter 10, Item No. 10.3 at Page No. 218-219.**
10.	Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase.	As this is operational plant, these facilities exists. No additional facilities shall be required	---
11.	**Enterprise Social Commitment (ESC)**		
i.	Adequate funds (at least 2.5 % of the project cost) shall be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan shall be included. Socio-economic development activities need to be elaborated upon	Rs. 40 lakhs (5% of the project cost) has been earmarked for the Corporate Environment Responsibility (CER) includes the activities based on the need and priorities of the villagers identified during the **Social Impact Assessment** study and issues raised in **Public hearing**.	**Chapter 7, Item 7.4, Table No. 7.3 at Page No.- 176-177**

S. No	TOR Point	Reply	Citation
12.	Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and present status of the case	No	---
13.	'A tabular chart with index for point wise compliance of above TORs.	Complied	
14.	The TORs prescribed shall be valid for a period of three years for submission of the EIA/EMP reports along with Public Hearing Proceedings (wherever stipulated).	The MoEF&CC vide its letter F. No. J-11011/192/2013-IA.II (I), dated 17th November 2016 has issued TOR for preparation of EIA/EMP Report for obtaining Environmental Clearance for the proposed project. It is valid till 16th November, 2019.	**ToR Letter at Page No**
The following general points shall be noted:			
i.	All documents shall be properly indexed, page numbered.	Complied	---
ii.	Period/date of data collection shall be clearly indicated.	Complied	---
iii.	Authenticated English translation of all material in Regional languages shall be provided	Complied	---
iv.	The letter/application for	Complied	---

S. No	TOR Point	Reply	Citation
	environmental clearance shall quote the MOEF file No. and also attach a copy of the letter.		
v.	The copy of the letter received from the Ministry shall be also attached as an annexure to the final EIA-EMP Report.	Complied	---
vi.	The index of the final EIA-EMP report must indicate the specific chapter and page no. of the EIA-EMP Report	Complied	---
vii.	While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MOEF vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry shall also be followed.	Complied	---
viii.	The consultants involved in the preparation of EIA-EMP report after accreditation with Quality Council of India (QCI) /National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA-EMP reportsprepared by them and data provided by other	Complied	---

S. No	TOR Point	Reply	Citation
	organization/ Laboratories including their status of approvals etc. Name of the Consultant and the Accreditation details shall beposted on the EIA-EMP Report as well as on the cover of the Hard Copy of the Presentation material for EC presentation.		
ix.	TORs' prescribed by the Expert Appraisal Committee (Industry) shall be considered for preparation of EIA-EMP report for the project in addition to all the relevant information as per the 'Generic Structure of EIA' given in Appendix III and IIIA in the EIA Notification, 2006. Where the documents provided are in a language other than English, an English translation shall be provided. The draft EIA-EMP report shall be submitted to the State Pollution Control Board of the concerned State for conduct of Public Hearing. The SPCB shall conduct the Public Hearing/public consultation, district-wise, as per the provisions	Complied	---

S. No	TOR Point	Reply	Citation
	of EIA notification, 2006. The Public Hearing shall be chaired by an Officer not below the rank of Additional District Magistrate. The issues raised in the Public Hearing and during the consultation process and the commitments made by the projectproponent on the same shall be included separately in EIA-EMP Report in a s eparate chapter and summarized in a tabular chart with financial budget (capital and revenue) along with time-schedule of implementation for complying with the commitments made. The final EIA report shall be submitted to the Ministry for obtaining environmental clearance.		
C. ADDITIONAL TORS			
1	Details of proposed layout clearly demarcating various units within the plant	Compiled in EIA	**Chapter 2, Figure no. 2.4 at Page No. 18.**
2	Complete process flow diagram describing each unit, its processes and operations, along with material and energy inputs and outputs(material and energy balance)	Complete process flow diagram describing each unit, its processes and operations, along with material and energy balance diagrams given in Chapter-2 of EIA Report.	**Chapter 2, Item No.-2.6 at Page No. 22-31.**

S. No	TOR Point	Reply	Citation
3	Details of design and manufacturing process for all units	Detailed process description is included in EIA	**Chapter 2, Item No.- 2.6 at Page No. 22-31.**
4	Details of environmentally sound technologies for recycling of hazardous materials as per CPCB guidelines may be mentioned in case of handling scrap and other recycled materials.	Hazardous waste generated in the project site will be in the form of 'UsedOil' shall be sold to the registered recyclers. Utilization of other management of Solid Wastes generated during the process is given in Chapter-4 of EIA Report. For Proper management of Solid wastes generated from plant, a MoUhas been executed by the Project proponent with on 27th September, 2017 with Maithan Alloys Ltd. in this regard.	**Chapter 4, Item No. 4.9 at Page No. 133.** **MoU is enclosed as Annexure XVI at Page No. 358.**
5	Details on requirement of raw material, its source and storage at the plant.	Details is included in chapter 2	**Chapter 2, Item No. 2.7.1 at Page No. 29-31.**
6	Details on requirement of energy and water along with the source and authorization from the concerned department,Location of water intake and outfall points(with coordinates)	Total power requirement is 20 MVA after proposed expansionand power assurance for expansion proposal is obtained from Damodar Valley Corporation (DVC). Power Assurance is enclosed as Annexure in EIA Report. Total Make-up water requirement after the proposed expansion will be 202 KLD which will be sourced from DVC and rain water harvesting. Water permission from DVC for drawl of 0.80 MGD from Maithon Reservoir was issued vide letter No. MRO/Tariff Cell/- 151 dated 22.03.2018. Water Balance diagram is given in Chapter 2 of EIA. Water for domestic use approx. 10 KLD will be sourced from Bore well.	**Chapter 2 Item No.- 2.7.4 at Page No. 36. Annexure V, Page No.249.** **Chapter 2 Item No.- 2.7.3 at Page No. 34 Water Permission from DVC is enclosed as Annexure IV at Page No. 245.**
7	Details of toxic metals content in the waste material and its composition and end use (particularly of slag)	Not applicable. There is no toxic metal content in theslag. Chemical composition of slag is given in Table 4.9 of the EIA Report	**Chapter 4 as Table 4.9 at Page No. 132.**

S. No	TOR Point	Reply	Citation
8	Details of toxic content (TCLP),composition and end use of chrome slag.Details on the recovery of Ferro Chrome from the Slag and its proper disposal	Not applicable	----

ADDITIONAL TOR

Plant/Unit	Pollutants	Qty. Generated	Methods used to control/and specification /attach separate sheet to furnish details	Number of units planned & capacity	Budget	Estimated post control Qty. of Pollutants	
						Per Unit	Per day
Induction furnace	PM,SO_2,NO_x	PM - 5 g/Nm^3	Pulse Jet Bag filters	4	Rs. 50 Lakhs	< 50 mg/NM^3	Approx. 4 kg/day

CHAPTER-1
INTRODUCTION

1.1 INTRODUCTION

BMA Stainless Limited is an existing plant for production of M S Billet/Rolled products (TMT Bars) through Induction Furnace – CCM – Rolling Mill route for production of 1,20,000 TPA MS Billets/Rolled product.

To make end product economically viable in present fluctuating market, M/s BMA Stainless Limited have decided to go for expansion by replacement of the existing 8 Tons Induction Furnaces with 12 Ton capacity Induction Furnaces and increasing the output (speed) of existing Rolling Mill through modernization to enhance the annual production capacity from existing 120,000 TPA to 207,360 TPA MS Billets/Rolled product (TMT Bar).

Capacity expansion by replacing the existing Induction Furnaces will essentially meet the increasing steel demand. Expansion shall take place within the existing plant area of 6.92 hectares (17.1 Acres). No additional land shall be required for the project.

1.2 PURPOSE OF THE REPORT

In pursuance of Government of India National Environmental Policy as approved by the Union Cabinet on 18th May, 2006, new projects or expansion of any existing plant necessitates statutory prior environmental clearance in accordance with the MOEF&CC EIA Notification dated 14.09.06, by preparing Environmental Impact Assessment (EIA) report. In view of the above, this EIA/EMP report is prepared for obtaining the environmental clearance for the proposed expansion of BMA Stainless Limited. The EIA report has been prepared taking into consideration the requirement and guidelines of statutory bodies and also requirement of BMA Stainless limited.

The project activity is listed at S.No. 3(a),Secondary Metallurgical Industry, under Category 'B', as per the EIA Notification, 2006. However, as the project site is located within 10 km from the interstate boundary (West Bengal and Jharkhand Boarder), the General Condition of the notification is applicable and hence the project falls under Category 'A' and will be appraised by the Expert Appraisal Committee (Industry-1). Accordingly, ToR was prescribed by Expert Appraisal Committee (Industry-1), MOEF&CC, GoI for undertaking detailed EIA Study vide file no. J-11011/192/2013-IA.II (I) dated 17th Nov, 2016.The purpose of this report is to assess the environmental impacts due to the proposed expansion of the Plant at Village – Debipur, P.O.-Kalyaneshwari, District – Burdwan, West Bengal.

1.3 IDENTIFICATION OF PROJECT&PROJECT PROPONENT

The company has been promoted by a Group of experience businessmen who are presently engaged in manufacturing and trading of various products. BMA Steel Limited is headed by Mr. Avinash Agarwalla, Director.

BMA Group–BMA Group has made foray into the energy industry in the year 1920 with a mission to assume eminence in the Coal mining business. The Group has scaled many heights venturing into Refractory, Smelting, Ferrous Alloys, Coke and IT. The Company Directors have long experience in mineral mining and metal trade.

The company has sound financial background and good market base which they will use to replace existing Induction Furnace with higher capacity to become economic steel producer of the region.

National Refractories (Prop. Snowtex Udyog Ltd.)	Refractories Unit	West Bengal
The Behar Potteries Limited	Refractories Unit	West Bengal
Anjaney Ferro Alloys Ltd.	Ferro Alloys Unit	Jharkhand
Maithan Alloys Ltd.	Ferro Alloys Unit	West Bengal
Maithan Smelters Ltd.	Ferro Alloys Unit	Meghalaya
Premium Fuels	Metallurgical Coke Unit	West Bengal

1.4 BRIEF DESCRIPTION OF NATURE, SIZE, LOCATION OF THE PROJECT AND ITS IMPORTANT TO THE COUNTRY AND REGION

1.4.1 Nature and Size of the Project

BMA Stainless Limited has an existing steel plant for production of M S Billet/Rolled products (TMT Bars)through Induction Furnace – CCM – Rolling Mill route. The company has proposed an expansion by replacement of existing 4 nos. of 8 Ton Induction Furnace with 4 nos. of 12 Ton Furnaces. Rolling mill capacity shall be increased from 1×20 TPH to 1×30 TPH by increasing speed of rollers. No additional facility will be installed.

Table 1.1: Detail of the existing and proposed capacities

Plant	Existing		Proposed		Total (after the proposed expansion)	
	Unit	Capacity	Unit	Capacity	Unit	Capacity
Induction Furnace	4x8 Tons	1,20,000 TPA	4×12 Tons (replacement of existing IFs)	4x12 Tons	4x12Tons	2,07,360 TPA
Continuous Casting (CCM)	2 Strand, 6/7 m radius	1,20,000 TPA	-	87,360 TPA	2 Strand, 6/7 m radius	2,07,360 TPA
Producer Gas plant	1	27,00,000 Nm^3/month	-	-	-	27,00,000 Nm^3/month
Rolling Mill	1	1,20,000 TPA	Modernization	87,360 TPA	-	2,07,360 TPA

Downstream facilities like Continuous Casting Machine, Rolling Mill, Producer Gas plant doesn't require any change/modification as they have adequate capacity to meet the proposed production. In Rolling Mill motors with the Rollers shall be replaced with high speed motors to meet the annual production of 207,360 Tons of rolled product.

The project activity is listed at S. No. 3(a) Secondary Metallurgical Industry, under Category 'B' as per the EIA Notification, 2006. However, the project site is located within 5 Km from the interstate boundary (West Bengal and Jharkhand Boarder) and hence the General Condition of the notification is applicable and the project is treated and appraised by the Expert Appraisal Committee (Industry-1) for prescribing TOR for undertaking detailed EIA Study.

1.4.2 Location of the project

The proposed expansion project is located at village Debipur, P.O.Kalyaneshwari, District Burdwan, West Bengal. Total land area is 17.1 Acres. No additional land is required for proposed expansion.

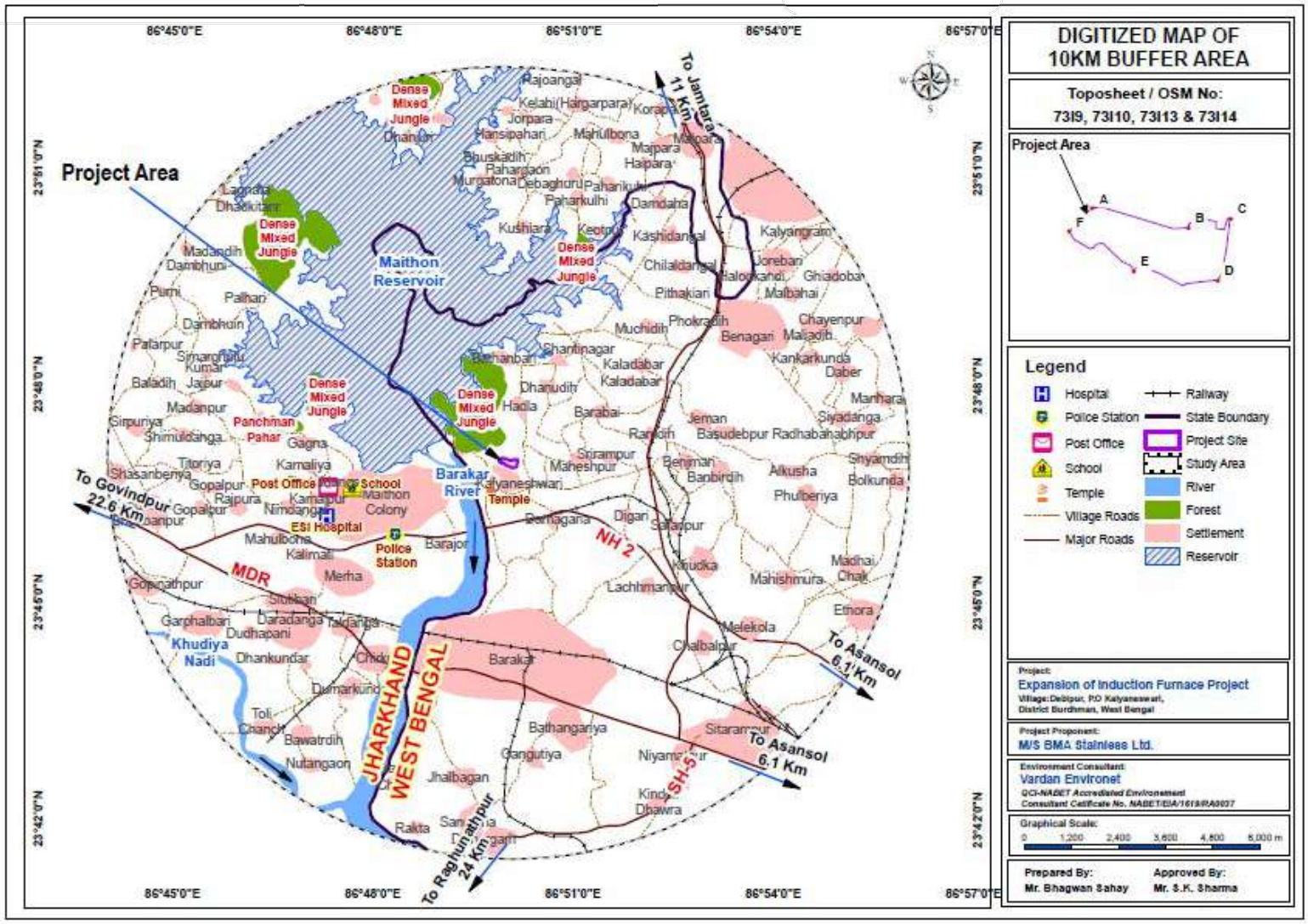


Fig 1.1: Digitized Key Plan of Project site

1.5 IMPORTANCE OF THE PROJECT TO THE COUNTRY AND REGION

Steel is crucial to the development of any modern economy and is considered to be the backbone of the human civilization. The level of per capita consumption of steel is treated as one of the important indicators of socio-economic development and living standard of the people in any country. All major industrial economies are characterized by the existence of a strong steel industry and the growth of many of these economies has been largely shaped by the strength of their steel industries in their initial stages of development.

According to Ministry of Steel reports, the total production of Crude Steel in India has been 89.32 million tons in 2015-16 as compared to 46.46 million tons in 2005-06 indicating an increase of 48% in the last 10 years (i.e. annual growth rate of above 4.8%).

Global Steel Production

Global Crude steel production has recorded an annual growth of 2.9% during last 10 years (2005 to 2015). World crude steel production stands at 1623 million tons during 2015, down by 2.6% compared to 2014. During 2015, crude steel production was decreased for most of the countries in comparison to 2014 (China down by 2.3%, Japan down by 5%, Germany down by 0.6%, Italy by 7.1%, France 7.2%, Spain, US 10.5% etc.). However, India's Crude Steel production was up by 2.6% in comparison to 2014.

World Steel Association has projected Indian steel demand to grow by 6.2% in 2015 and by 7.3% in 2016 as compared to global steel use growth of 0.5% and 1.4% respectively.

Demand-Supply Gap

The per capita steel consumption in India continues to remain at a level 60 kg in comparison to World average of about 222 kg and 350 kg in developed countries.

Though, India is the largest producer of Sponge Iron and 3rd largest producer of Crude steel in the World, however, with nearly 20% of the world population, India's contribution is only of the order of 5.4% of the world steel production. Hence long term and short term strategies are necessary in planning the development of the steel industry in the country to improve the level of per capita steel consumption.

Despite the current concerns over growth, there is a strong view within the industry and the government that due to the intrinsic potential of steel demand growth in India, the longer term opportunities for the sector continue to be strong. Steel consumption significantly depends on the overall performance of the economy (GDP) and more specifically on investments made in fixed assets such as housing, infrastructure like railways, ports, roads, airports, etc. While there is no absolutely reliable information on the share of steel consumption in these areas in India, most

of the estimates put the figure at about 65 per cent. This is in line with global experiences. In addition, steel is consumed significantly in the production of capital goods, automobiles, etc.

Considering the prospects for the development for Infrastructure, construction and Industrial activity in India in the years to come, large scope exists for increased consumption of long steel products. The projections made by the Ministry of Steel in its Vision-2020 document, there is a significant domestic demand for steel in the Country.

In order to meet the increasing steel demand, new steel plants shall be established. It has been observed that a combination of small, medium and large capacity steel plants can contribute in big way in achieving the national interest of self-reliance.

The demand for Rebars which is about 30% of the total Steel Consumption in the country is expected to grow from 22.0 Million Tonnes per annum to about 44.0 Million Tonnes per annum by 2020.

TMT Rebars are used as Steel Reinforcement Bars in the construction sector for building the houses, industrial buildings, bridges for highways, roads & railways, schools, airports, recreation centers, power plants & electrical distribution, civil works etc.

Importance of the Project

Considering the demand for steel in these sectors M/s. BMA Stainless Ltd. has planned to expand the production capacity of its existing plant at Village: Debipur, P.O: Kalyaneshwari, Dist: Burdwan, West Bengal.

The State can be benefited from the project as there will be direct employment of large people in the Steel plant. Preference will be given to the people of the state possessing requisite skill and qualification criteria. Also there will be lot of scope for indirect employment of the people of the state in and around the project site.

Domestic/Export Market

The finished product produced will be sold in the Steel Markets of Major cities in Bengal, Jharkhand, Bihar, Sikkim, Uttar Pradesh and North Eastern States. The products will be produced indigenously and will be consumed in the country itself.

Employment Generation (Direct and Indirect) due to the Project

The estimated additional direct manpower required after the proposed expansion shall be 30 in addition to the existing manpower of 210, comprising administrative, technical, non-technical, skilled and unskilled workforce.

The total requirement of manpower in the plant will be available without much difficulty as the area has industrial exposure in Iron & steel sector. However, specialized training for operation and maintenance will have to be given to selected

candidates well in advance before commissioning of the plant.

In addition to this there shall be indirect requirement of manpower in transportation sector for transportation of raw material. Development of nearby industries also envisaged for supply of additional requirement of Sponge Iron and Pig Iron.

1.6 SCOPE OF THE STUDY- DETAILS OF SCOPING (AS PER TOR)

BMA Stainless Limited has entrusted the EIA studies to M/s VardanEnvironet, Gurgaon to carry out Environmental Impact Assessment (EIA) study and preparation of EIA/EMP report in order to obtain Environmental clearance.

1.6.1 Terms of Reference issued by MOEF&CC

The aim of the study is to establish the existing baseline environmental conditions, predict impacts of the project, suggest Environmental Management Plan and develop a post-study monitoring program. Subsequently the MOEF&CC vide its letter F. No. J-11011/192/2013-IA II (I), dated 17thNovember 2016 has issued TOR for preparing the EIA/EMP Report for obtaining Environmental Clearance for the proposed project.

The project which is located in Village – Debipur, P.O.-Kalyaneshwari, District – Burdwan, West Bengal State is listed in S. No. 3 (a) of the Schedule, under EIA Notification,2006 and its amendments thereof under Category 'A' as Metallurgical Industries.

1.6.2 PREPARATION OF EIA

The identification of impacts requires one to first describe and understand the conditions of the environment prior to the proposed activity. The fresh baseline data has been collected for the period October 2016 to December 2016.

The scope of the study includes a detailed characterization of the environment in an area of 10 km. radius of the Mine Lease Area for various environmental parameters like, Air, Water, Soil and Noise, Ecological and Socio-economic aspects.

The EIA includes the following details:

This EIA Report is prepared in accordance with has been divided into twelve chapters (in addition to Executive Summary) as briefed here under:

Chapter 1 – Introduction

The chapter provides description of project background, site and surroundings, objectives, scope and organization of the study and format of this report.

Chapter 2 – Project Description

This chapter provides information on project and capacity; need for the project; location; size ormagnitude of operation; technology and process description; maps showing project layout, component of projects etc.

Chapter 3 – Description of the Environment

This chapter deals with the methodology and findings of field studies undertaken with respect to ambient air, meteorology, water, soils, noise levels, ecology to define the various existing environmental status in the area of the project. This also deals with the infrastructural development as a part of project and sources of pollution from the proposed Steel project.

Chapter 4 – Anticipated Environmental Impacts and Mitigation Measures

In this chapter, the potential impacts of the proposed expansion project, which could cause significant environmental concerns, are identified and discussed. This discussion will form the basis for environmental management activities.

Chapter 5 – Analysis of Alternatives (Technology and Site)

This chapter will include a comparison of alternatives in this chapter to determine the best method of achieving the project objectives with minimum environmental impacts or indicates the most environmentally friendly and cost effective options, if any.

Chapter 6 – Environmental Monitoring Program

This chapter will include ascertaining the environmental impacts; state of pollution within the mine lease and in its vicinity; planning for predictive or corrective actions in respect of pollution to keep it within permissible limits.

Chapter 7 – Additional Studies

This chapter will include outcomes of public consultation, risk assessment, social impact assessment, R&R action plan, biodiversity conservation plan, watershed management etc.

Chapter 8 – Project Benefits

This chapter deals with improvements in the physical infrastructure, social infrastructure, employment potential and other tangible benefits due to proposed project activity.

Chapter 9 – Environmental Cost Benefit Analysis

This chapter includes Project Cost, cost of pollution control facilities and project implementation schedule.

Chapter 10 – Environmental Management Plan

This chapter will include the description of administrative aspects of ensuring that the mitigation measures suggested are implemented and their effectiveness is monitored, after approval of the EIA.

Chapter 11 – Summary& Conclusion

This will constitute the summary of EIA Report.

Chapter 12 – Disclosure of Consultant

This will includes the names of the consultants engaged in preparation of EIA and nature of consultancy rendered.

1.6.3 LAWS APPLICABLE TO THIS PROJECT

The Acts, Notifications, Rules and Amendments applicable for setting up a new Metallurgical industry or its expansion project of an existing industry and for its operation include the following:

Applicable Environmental Acts & Rules	Roles & Responsibilities of the Project Proponent
The Water (Prevention & Control of Pollution) Acts1974/ Rules1975	• Not to discharge any effluent, not confirming to standards, prescribed by WBPCB into any stream, well, sewers or land • Not to discharge air pollutant(s) in excess of standards, prescribed by the State PCB • Obtain 'Consent to Establish' prior to establish any process, operation or treatment system • Obtain 'Consent to Operate' prior to operation of system which is likely to discharge effluent • Apply for renewal of the 'Consent to Operate' before the expiry • Comply with conditions as prescribed under consents
The Air (Prevention & Control of Pollution) Acts1981/ Rules1982	
The Water (Prevention & Control of Pollution) Cess Acts 1977/ Rules 1977	• Pay Water Cess within specified time • To install Water meters • Provide access to WBPCB for implementing the provisions of the Act
The Environment (Protection) Acts1986/Rules 1986 The Environmental Impact Assessment (EIA) Notification, 2006	• Prevent discharge or emission of environment pollutants in excess of the prescribed standards • Submit 'Environmental Statement' every year • Obtain prior "Environmental Clearance' from MoEF&CC in case of new project or for Modernisation / Expansion
Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016	• It is the responsibility of the occupier to identify the hazardous wastes in their units and ensure proper handling and disposal • BMA Stainless Limited to take all steps to contain contamination, prevent accident and limit consequences on human being and environment

Applicable Environmental Acts & Rules	Roles & Responsibilities of the Project Proponent
	• Obtain authorization from WBPCB and comply with the conditions. • Maintain records of Hazardous Waste generated in Form-3 and submit yearly return for generation, treatment, recycling, disposal etc., to SPCB in Form-4 • Used Oil to be send / sold to the registered recycler, re-processor, registered authorized facility • Shall be transported in accordance with the rule. • Site storage is allowed for 90 days only
Batteries (Management & Handling) Rules, 2001	• It is the responsibility of the generator to ensure, used batteries are not disposed of in any manner other than depositing with dealer, manufacturer, importer, re-conditioner registered recycler or at designated collection centre • Submit half yearly return for disposal of used batteries to State PCB by 30th June & 31st December, every year • In case of auction, ensure batteries are auctioned to the registered recycler only • File half yearly return for the auction • Maintain record for such auction
Bio-Medical Waste Management Rules, 2016	Not applicable. No Bio-medical waste is generated.
Fly Ash Notification, 1999 as amended in 2016	• At least 20% of dry ESP fly ash shall be made available free of charge to units manufacturing fly ash or clay-fly ash bricks, blocks and tiles on a priority basis over other users and if the demand from such agencies falls short of 20% of quantity, the balance quantity can be sold or disposed of by the power station as may be possible' • Ensure 100% utilisation of Fly-ash
E-Waste (Management) Rules, 2016.	• Shall make provisions for collection of e-waste generated from 'end of life' of their products and shall ensure that such e-wastes are channelized to registered dismantler or recycler, In line with the principle of 'Extended Producer Responsibility'. • Set-up collection centre or take back systems either individually or collectively. • Finance and organize a system to meet costs involved in the environmentally sound management of e-waste

Applicable Environmental Acts & Rules	Roles & Responsibilities of the Project Proponent
	generated from the 'end of life' of its own products. • Create Awareness
The Manufacture, Storage & Import of Hazardous Chemical Rules, 1989 (Including amendment rules till date)	• Identify major accident hazards and take adequate steps to prevent or limit such major accidents • Prepare on-site emergency plan and off-site emergency plan for certain chemicals • Information to person liability to be affected • Develop Material Safety Data Sheets (MSDS) • Inform major accidents
Ozone Depleting Substance (Regulation & Control) Rules, 2000	Not applicable to M/s BMA Stainless Limited. No ODS substance is being used by BMA. For cleaning of motor winding or electrical parts Non-ODS solvent is being used.
The Factory Act 1948 (as amended till 1987)	• Obtain and renew factory license and obtain permission for the site from State Government or the Chief Inspector of Factories in case of new or extension of any Factory. • Ensure health, safety and welfare of all workers while they are at work in the Factory as far as reasonably practicable. • Ensure effective and adequate ventilation of work place and adequate measures to be taken to protect workers particularly in the processes involving excessive temperature. • Ensure effective and adequate ventilation of work place and adequate measures to be taken to protect workers particularly in the processes involving excessive temperature.
The Central Motor Vehicle Rules 1989(Under Motor Vehicle Act 1988)	• Ensure compliance to safety provisions in the transport vehicle carrying dangerous and hazardous substances inside works • Display of emergency information panels at front, back and both side of vehicle • Every transporter to ensure safe transportation of dangerous/ hazardous goods. • Earthing chain for grounding, any prevalent static charge. • All motor vehicle entering the works shall have properly maintained brakes, lights, signal system for brakes,

Applicable Environmental Acts & Rules	Roles & Responsibilities of the Project Proponent
	blinkers and registration number displayed, and valid Pollution under Control Certificate.
The Boiler Acts 1923 & Rules 1950	• Ensure availability and effective functioning of steam vents, safety valve, drain valve, monitoring instruments of critical parameter through regular checks and maintain records for the same. • Obtain authorization for boilers and their renewal prior to due date and / or when an accident occurs to the boiler / when any structural alteration / addition / renewal is made. • Ensure mandatory registration of boilers. • Ensure to obtain prior approval before taking any alteration and renewals to steam pipes after submitting plan and report. • Ensure to obtain prior approval before taking structural alteration, addition and renewal to boilers from Chief Boiler Inspectors. • Ensure prior examination of boiler by Inspector during & after any repair/shut down and maintain record for the same. • Report accident / incident or any severe damage to property, human life within 24 hours giving details of occurrence.

CHAPTER – 2
PROJECT DESCRIPTION

2.1 THE PROJECT

M/s BMA Stainless Limited is expanding the capacity of the existing plant at Village-Debipur, by replacement of existing 4 nos. of 8 Ton capacity Induction Furnaces to 4 nos. of 12 Tons I nduction Furnaces and increasing the output (speed) of existing Rolling Mill through modernization.

After the proposed expansion, the production capacity of the plant shall be 207,360 TPA of M S Billet/Rolled Product from the existing production of 120,000 TPA. Other facilities like Continuous Casting Machine (CCM), Producer Gas Plant and Rolling Mill have adequate capacities to meet the enhance production. Rolling Mill capacity shall be enhance to 30 TPH from the 20 TPH (existing) by replacing the existing motors with higher speed motors to increase the rolling speed.

Expansion shall take place within the existing plant area of 6.92 Hectares (17.10 Acres). No additional land shall be required for the project. The existing plant is located at village Debipur, P.O.:Kalyaneshwari, District: Burdwan, West Bengal.

2.2 NEED OF THE PROJECT

Over the last few years, there has been a great change in the Indian Economic Scenario due to Global slowdown which affected the whole world including India. The major sector which took the toll was Steel & Power Sector.

M/s BMA Stainless Limited is presently operating four numbers Induction Furnace of capacity 8 Tons capacity with annual production of 1,20,000 TPA MS Billets/Rolled products.

To make end product economically viable in present fluctuating market, M/s BMA Stainless Limited have decided to go for expansion by replacement of the existing Induction Furnaces to 12 Ton capacity from the existing 8 Tons to enhance the annual production capacity to 207,360 TPA MS Billets/Rolled product (TMT Bar), to make its end product more economically viable to withstand the present market situations. Capacity expansion by replacement of existing Induction Furnaces will essentially meet the increasing steel demand in India.

The technology involved in expansion project is well proven and reliable. Many plants are operating all over the country in this pattern are successful. All equipment purchased shall be brand new & latest in model and will be purchased from reputed suppliers. For O&M of the plant, experienced Engineers/Technicians are available in the region.

The region shall also be benefited from the project as there will be direct employment of people in the Steel plant. Preference will be given to the people of the state possessing requisite skill and qualification criteria. Also there will be lot of scope for indirect employment of the people of the state in and around the project site like in transportation sector.

2.3 LOCATION OF PROJECT (MAPS SHOWING GENERAL LOCATION, SPECIFIC LOCATIONS, PROJECT BOUNDARY AND PROJECT SITE LAYOUT)

The proposed Expansion will be carried out within the existing premises. There will be no additional land requirement. The project is located at Village – Debipur, P.O.-Kalyaneshwari, District – Burdwan, West Bengal. Alternate site has not been examined as the project is for the replacement of the existing units with the new units of higher capacity within the existing premises.

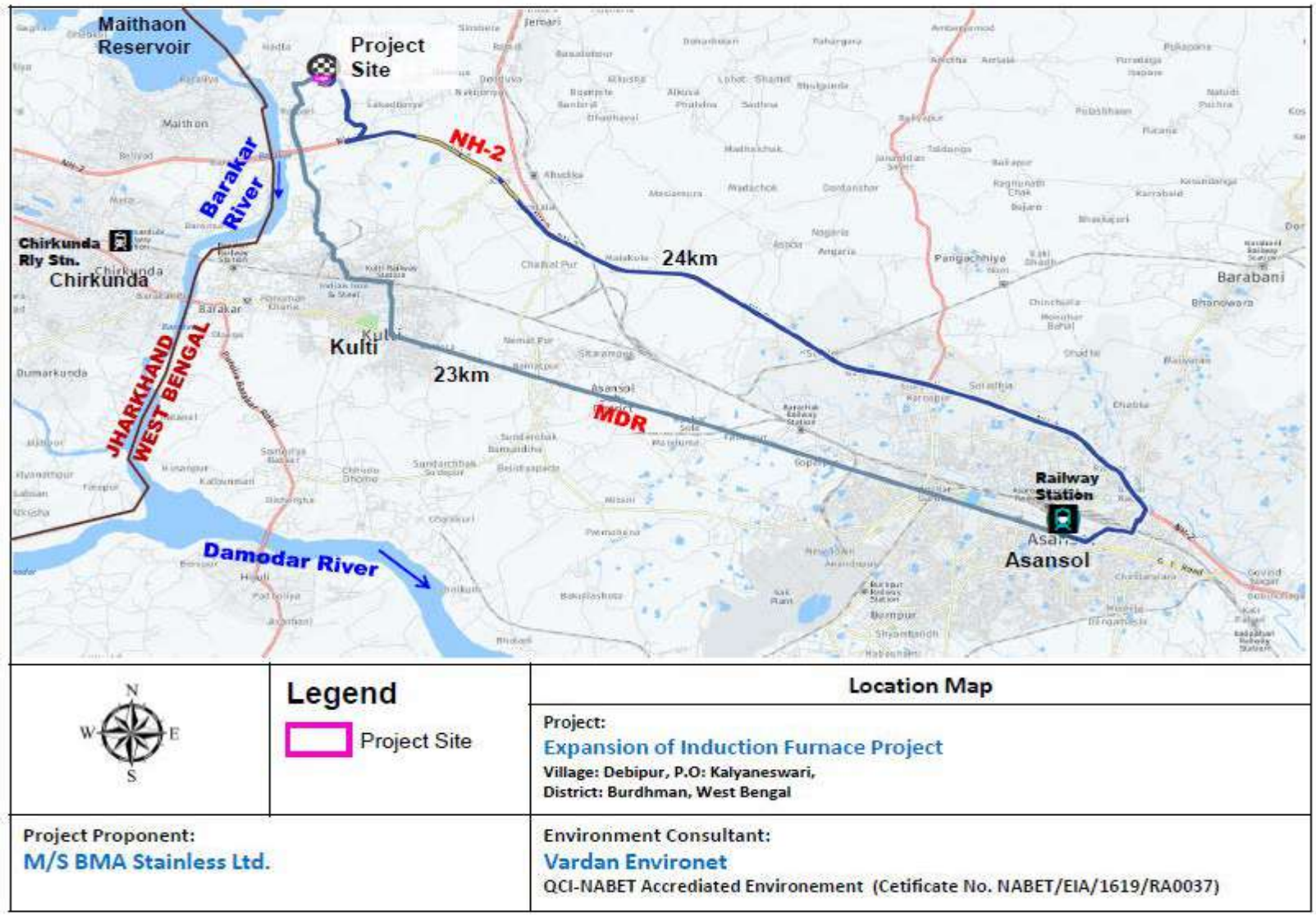


Fig 2.1: Map showing location of project site

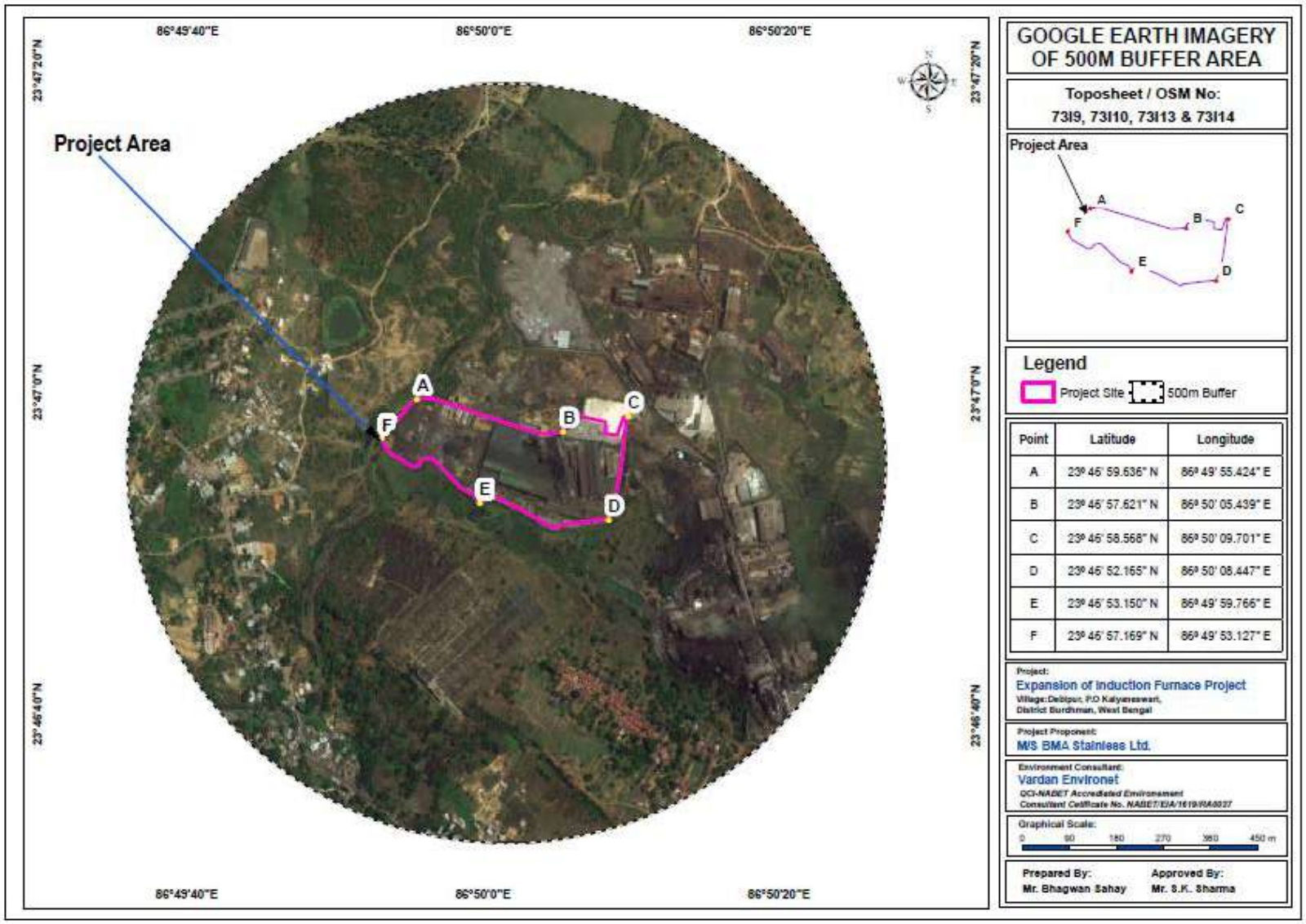


Fig 2.2: 500 m Google image of project site

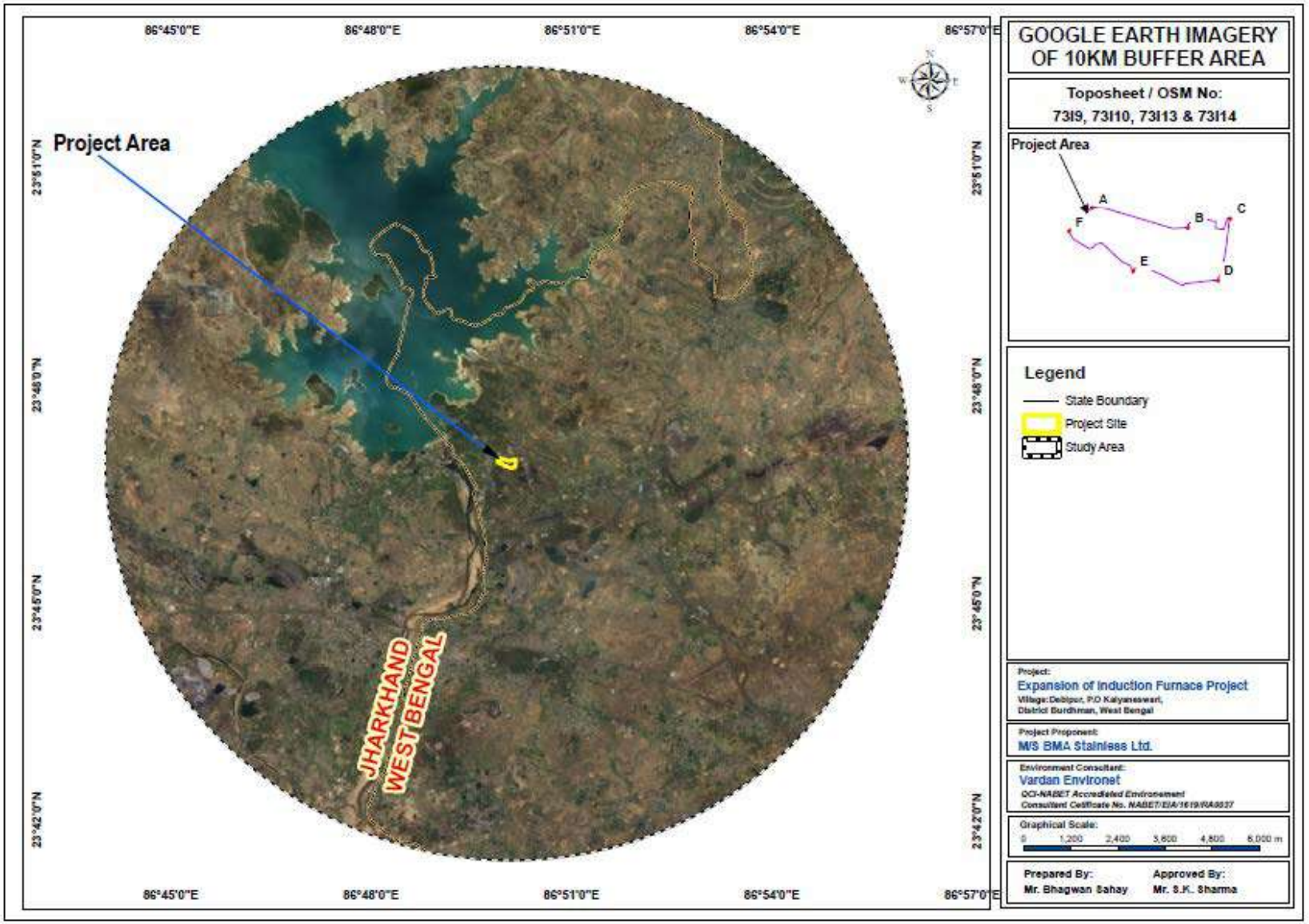


Fig 2.3: 10 Km Google image of project site

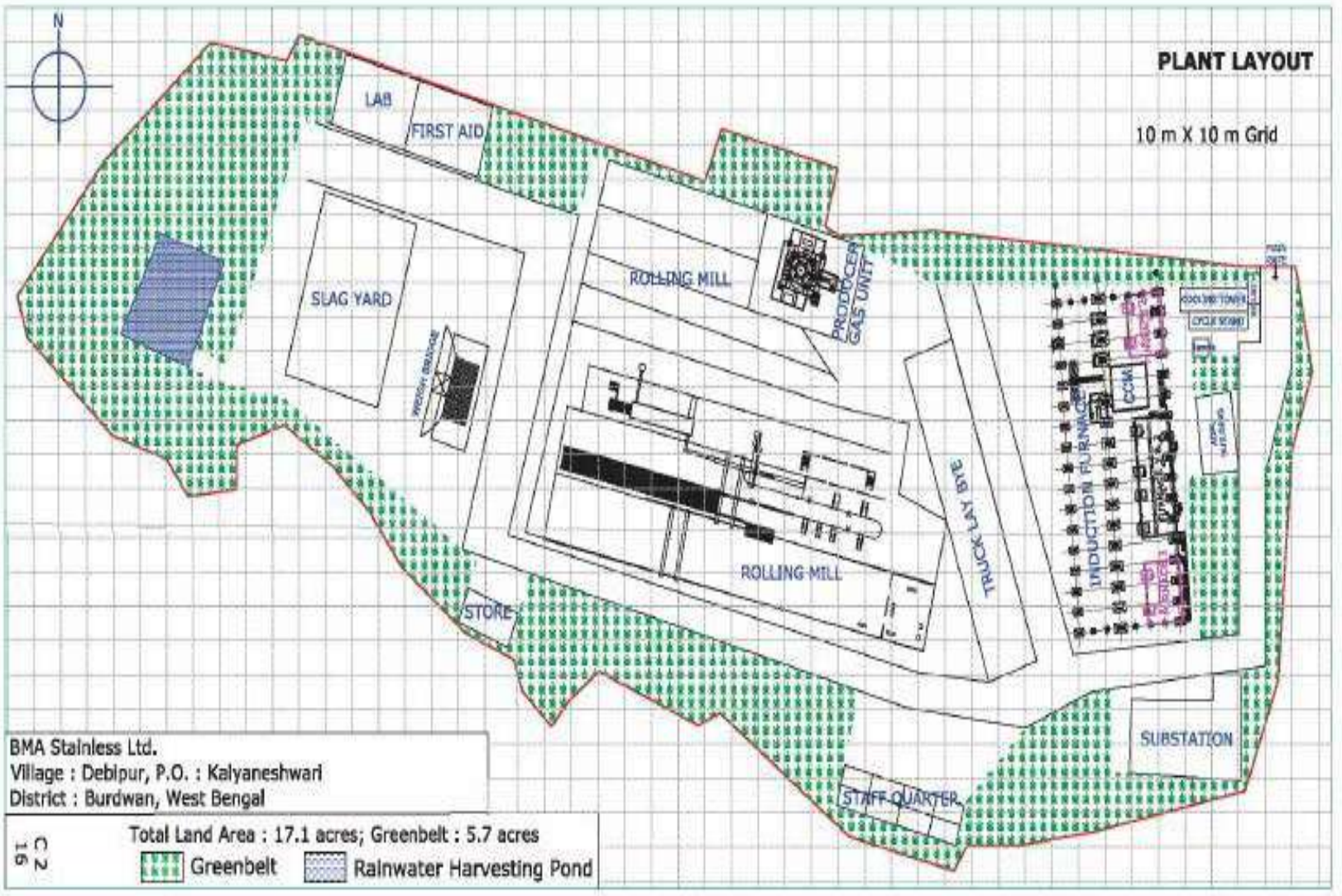


Fig 2.4: Plant Layout


25.11.2016


25.11.2016


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25.11.2016



Fig 2.5: Site Photographs

Table 2.1: Salient Features of the Project

S.No.	Features	Details
1	Village, District and State	Village: Debipur, P.O.: Kalyaneshwari, District – Burdwan, West Bengal
2	Survey of India Topo sheet covering the plant and surroundings	73 I/9, 73 I/10, 73 I/13/73 I/14
3	Latitude	23°46'59.63"N, 23°46'57.16"N
4	Longitude	86°49'55.42"E, 86°50'5.43"E
5	Land use of the project site	Within existing industrial premises
6	Total Area	6.92 Hectares
7	Nearest Highway/State High Way	NH-2,1.37 Km (S),SH-2,3.3 Km (E)
8	Nearest Railway Station	Barakar 4.5 Kms (S),Kulti Railway Station 4.96 Km(S), Salanpur Railway Station,4.72 Km (SE), Rupnarayanpur ,6.5 Km (NE)
9	Nearest Airport	NetajiSubhash Chandra Bose International Air Port -234 km
10	Nearest River	Barakar 1.3 Km (W)
11	Forest	None within 15 KM Radius
12	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	Deshbandhu College 8.5 Km Boy's High School 8.1 Km NazrulCentenary Polytechnic 7.5 Km Kulti college 8.5 Km RPF Training Centre 1.0 Km
13	State, National boundaries	Jharkhand boarder 1.3 km Inter State Boundary (West Bengal & Jharkhand): 1.3 Km
14	Densely populated or built-up area	Kulti 5.8 Km(S) Barakar 5.2 Km (SW)
15	Defense Installation	Nil within 10 Km radius
16	National Park/Wild life Sanctuary	Nil within 10 Km radius
17	Religious Place	Kalanashwari temple 0.59 Km (SW)
18	Nearest dam	Maithon dam 1.4 Km (NW)
19	Nearest Power Station	DVC HydalPower Plant 0.43 Km(W)
20	Nearest Village	Kalyaneshwari 0.07 Km (S)
21	Existing Units and capacities as per the exiting Environmental Clearance	1. Induction Furnace 4x8 Tons 2. Continuous Casting Machines 2 Strand 6/7 m radius 3. Producer Gas Plant 27,00,000 Nm^3/month 4. Rolling Mill 1,20,000 TPA
22	Production as per the existing capacity	1,20,000 TPA Billets/Rolled Product
23	Proposed Expansion	Replacement of existing 4x8 Tons Induction Furnace with 4x12 Tons and modernization of

S.No.	Features	Details	
		Rolling Mill	
24	Proposed Production Capacity after Expansion	2,07,360 TPA Billets /Rolled Products	
25	Cost of the Project	Rs.8.0 Crores	
26	Manpower Requirement	Existing: 210 Additional 30 nos. Total -240	
27	Requirement of Water (in KLD) and Source	Existing-52 Additional– 150 Total – 202	**Source:**Damodar Valley Corporation, Borewell and Rain Water Harvesting Pond
28	Requirement of Power (in MW) and Source	Existing-20 Additional– 10 Total – 30	**Source:**Damodar Valley Corporation

2.4 SIZE OR MAGNITUDE OF OPERATION

The present proposal is for replacement of existing 4 nos. of 8 Ton Induction Furnaces with 12 Ton Furnaces. Downstream facilities like Continuous Casting Machine, Producer Gas plant doesn't require any change/modification as they have adequate capacity to meet the proposed production. In Rolling Mill motors with the Rollers shall be replaced with high speed motors to meet the annual production of 207,360 Tons of rolled product. Details of existing and proposed capacities are as follows:

Table 2.2: Detail of the Proposed Plant

Plant	Existing		Proposed		Total (after the proposed expansion)	
	Unit	Capacity	Unit	Capacity	Unit	Capacity
Induction Furnace	4x8 Tons	1,20,000 TPA	4×12Tons (replacement of existing 4x8 Ton IFs)	4x12 Tons	4x12Tons	2,07,360 TPA
Continuous Casting Machine (CCM)	2 Strand, 6/7 m radius	1,20,000 TPA	-	87,360 TPA	2 Strand, 6/7 m radius	2,07,360 TPA
Producer Gas plant	1	27,00,000 Nm3/month	-	-	-	27,00,000 Nm^3/month
Rolling Mill	1x20 TPH	1,20,000 TPA	Modernization (increased speed)	87,360 TPA	1x30 TPH	2,07,360 TPA

2.5 SCHEDULE FOR APPROVAL AND IMPLEMENTATION

O8.08.2016	Submission of Form-1/PFR
17.11.2016	TOR issued from MOEF
25.05.2017	Draft EIA submission for Public Hearing
21.07.2017	Public Hearing
08.12.2017	Submission of Final EIA to MOEF for EC
06.02.2018	Consideration of Project by EAC (Industry-1)
June, 2018	Submission of Revised EIA to MoEF&CC for Re-Consideration

The tentative schedule is given below:

July, 2018	Re-Consideration of Project by EAC (Industry-1)

The implementation of the project will be taken up after receipt of Consent to Establish from West Bengal State Pollution Control Board and Environmental Clearance from the Ministry of Environment, Forests and Climate Change, Government of India.

2.5.1 Schedule for implementation of the Project

Implementation schedule of the project is 24 months. “Zero date” for a project is generally reckoned as the date on which the contract for “main machinery” becomes effective. For implementation of the project “SPLIT PACKAGE BASIS” mode of procurement for project execution is proposed. The proposed solution shall help in optimizing project investment and minimizing entrepreneur risk due to unknown circumstances.

Based on the consideration that pre-project activities are accomplished prior to the award of the main machinery order, implementation schedule is given below for various units to be installed. M/s BMA Stainless Limited has initiated to get clearance from the statutory bodies. The site selected and land for the project is industrial land to establish the project. The consent required under Air, Water Acts will be obtained from WBPCB

Completion schedule of the project is 24 months. “Zero date” for a project is reckoned as the date on which the all statutory clearance to start the project are received.

Table 2.3: Project Implementation Schedule

Sl.No.	Activity	Schedule in Months
1	Consent to Establish	Zero date
2	Placement of Order	1 months
3.	Civil & Structural work	5 months
4.	Procurement, Installation & Commissioning	18 months
Total		**24 months**

2.6TECHNOLOGY AND PROCESS DISCRIPTION

Technology for production of TMT Bar is through Induction Furnace – Continuous Casting – Rolling in the existing plant as well as for proposedexpansion.

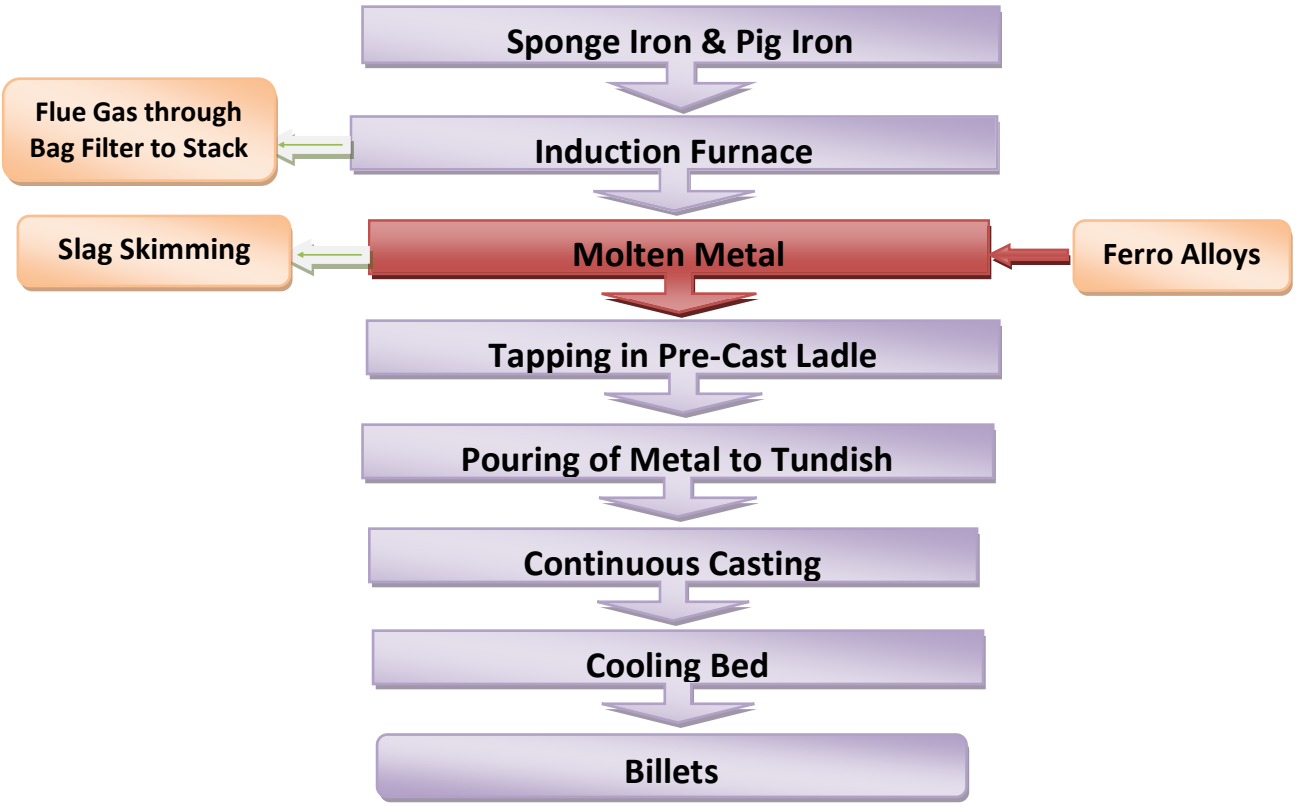


Fig 2.6: Process Flow Diagram

The Raw Material likes Sponge Iron, Pig Iron & Ferro-Alloys are being melted in Induction Furnace and the refined liquid metal is cast into billets through continuous casting machine. Billets are rolled into rolled products in Rolling Mill. Reheating Furnace has been provided to reheat the billets, if required for rolling. Producer gas is used as fuel in the Reheating Furnace. In addition to the above, the plant have numbers of cranes (for material handling), water treatment plant (to soften the water), dust extraction systems (to remove dust from hot air), fire protection system, air compressors, air conditioning and ventilation system and electrical system.

2.6.1Process Description

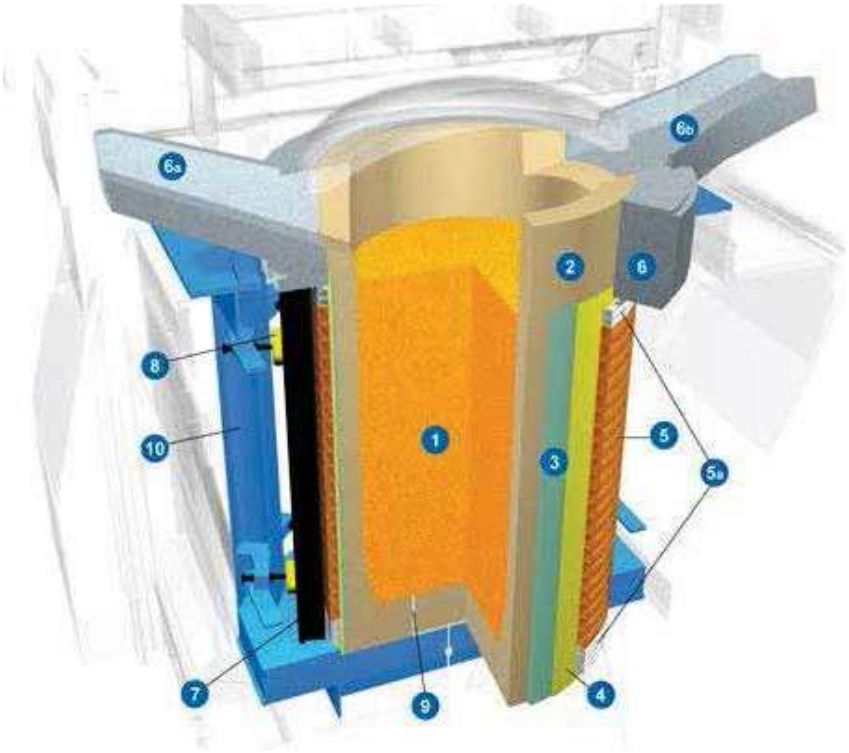
Steel Melting Shop

a) Induction Furnace

Induction furnace is basically furnaces meant for use of Sponge iron as major raw material to produce mild steel. These furnaces work on the principal of electromagnetic induction. After

the furnace is switched on, producing an induced magnetic field inside the central space of the coils where the crucible is located. The induced magnetic field thus generated cut through the packed charge in the crucible. As the magnetic flux cut through the scrap and complete the circuit, they generate an induced current in the scrap. The induced current as it flows the highly resistive path of scrap mix, generate tremendous amount of heat and melting the scrap. When these additives have melted completely, the power input may be increased to bring the temperature of metal up to the point most desirable for pouring. The current is then turned off and the furnace is tilted for pouring into the ladle. As soon as pouring has ceased, the crucible is cleaned completely from any slag or metal droplets adhering to the wall of the crucible and the furnace is now ready for charging again.

The slagging & pouring usually takes 15 – 20 minutes and one cycle/heat is completed in about 2 hrs. During charging of sponge iron and pig iron and also during pouring, some hot gases and small amountof smoke (resulting from burning of carbon & gangue materials in the charge) comes out from the mouth(top opening) of the furnace. These gases & smoke are taken care of. For 12 t on furnace where up to 12heats can be obtained by using 70% sponge iron and 30% melting grade pig iron.



1	Melting
2	Ceramic Crucible
3	Thermal Insulation
4	Lining with Sensor
5	Cable
5a	Current Spool
6	Cooling Coil
6a	Furnace Head
6b	Snout
7	Tee Snout
8	Yoke
9	Vibration Dampers
10	Antenna for Ground Fault Monitoring

Figure 2.7: Induction Furnace

Molten metal in an induction furnace is caused to circulate automatically by electromagnetic action. Whenalloy additions are made to molten metal, the stirring action results in creating a homogenous product at aminimum time. For making medium carbon steel in electric induction

furnace, the foremost consideration is the optimum utilization of the furnace with emphasis on elimination of delays so as to save power i.e. the most effective cost.

However, time between tap and charge, charging time, power delays etc. are items of utmost importance for meeting the objective of maximum output with lower operational cost. First of all the crucible/furnace is brought to a vertical position and after checking all safety conditions, power is switched on immediately; a molten heel is formed at the bottom of the crucible. Now sponge iron is charged in buckets by the crane and pig iron is charged either by electromagnet or buckets by overhead crane. The charging usually takes 15minutes. Thereafter, the furnace lid is closed and melting continues for about an hour. Alloy additions and de-oxidants are added as from the top into the molten metal.

Once the furnace contains the full capacity of molten steel (1600 – 1650°C); slag is manually skimmed off from the top. The slag is skimmed into a slag pot kept near the mouth of the furnace on the furnace platform. Next the hydraulic tilting device is actuated and liquid metal from the ladle is discharged in there linedladle.

The most advantageous aspect of Induction Furnace is that they are relatively low in capital cost as compared to other types of melting units. Its installation is comparatively easier and its operation is also simpler. Among other advantages, there is very little heat loss due to radiation from the furnace as the bathis constantly covered and there is practically no noise in attending their operation.However, time between tap and charge, charging time, power delays etc. are items of utmost importance for meeting the objective of maximum output with lower operational cost. At the ladle treatment station, liquid steel is ringed with nitrogen to homogenize its temperature and composition.

b) Continuous Casting Machine: The ladle containing liquid steel is placed on the turret and brought over the tundish. The tundish act as a buffer and enable the liquid steel to move homogeneously down through the six nozzles, provided at the bottom of the tundish into moulds. The automatic mould level controller controls the steel level in the mould. The subsequent primary and secondary cooling transform the liquid steel into billets of the required dimensions and is drawn out with the help of a withdrawal and straightener unit and cut into required length by the shear provided in each strand. Once a ladle is emptied another ladle is brought into the casting position and the casting continues. The billets are gradually shifted to the cooling beds and then stacked orderly at the dispatch end for outside dispatch. The details about the cast number and quality of billets are marked on the billet stack.

c) Plant Water System: Water required in Cooling Tower as make up. Water is also required to produce treated water to maintain its ppm or hardness or conductivity, increased due to contamination in cooling line. Raw water requirement for CT, DM plant, area cleaning system etc. shall be met through bore-wells, water stream and Rain water harvesting. Water tank of

adequate capacity (depending upon equipment requirement & workforce) has been constructed within the premises.

d) Compressed Air System: Compresses air is required primarily at three locations in the plant viz. in Induction Furnace, in CCM & in Dust Extraction System (bag filter).

e) Fire Protection System: Adequate fire-fighting equipment has been provided for each production unit. Following systems of fire protection has been provided in the steel plant:

- Water hydrants network around all the shops.
- Smoke detectors in critical areas such as control rooms
- CO2 type portable fire extinguishers for electrical rooms flooding system and
- Foam type fire extinguishers near lubrication, hydraulic and fuel oil installation.

Adequate number of portable fire extinguishers will be provided at various locations in the plant shed, LT panel room & DG set room.

f) Plant Electrical System: Plant Electrical System will have a 33/22 kV outdoor type sub-station. The power supply through furnace transformers will be supplied to furnace whereas power supply through auxiliary transformer which will be used for EOT crane operations, CCM operations, furnace auxiliaries, pumps for cooling water, lighting etc.

g) Emergency Back-up Power: 1 no. of 380 KVA silent type DG set has been provided for power to the auxiliaries of plant when DVC power is not available. This will also be useful for emergency power to take care of safe shut down of important auxiliaries of plant. During total power failure, above DG set will also support for Emergency lighting for personnel movement in some main location of steel plant.

h) Storage Yard: Raw material shall be brought to the yard in trucks are unloaded and stacked in different piles by pay loaders.

i) Bag Filter System i.e. a compartment type bag house having 8 to 10 compartments with polyester felt filter bags has been installed & commissioned to comply with the emission norm from the Induction Furnace. The flue gases from furnace will be sucked through an interconnecting ductwork by induced draft fan & exhaust to the chimney. The system will meet the emission standards during operation of the plant and ensure clean plant operation. The fume exhaust hood with duct will be provided around the furnace circumference to capture the fumes generated during tapping operation. The cleaning will be off line & will take place after tapping operation is over. Emission level at the outlet of Bag House for Induction Furnace is less than 50 mg/ Nm^3.

Reheating Furnace

Reheating furnace is used for heating of billets before hot rolling in Rolling Mill. Producer Gas is used as fuel in reheating furnace. The billets manufactured as described above are cut into

required sizes and then fed into a reheating furnace where it is reheated to temperatures up to of 1050°C; the rate at which heat is absorbed by the billet has to be controlled to avoid partial rolling. At present Billets are directly fed from CCM to the Rolling Mill bypassing the Reheating Furnace. Reheating Furnace is used only when there is no feed from CCM and for the purchased billets.

Producer Gas Plant

Producer gas plant of capacity to produce 270,0000 m^3/month flammable gas is produced by the gasification of coal at relatively low temperatures (700°Cto 1000°C). Producer gas is composed of carbon monoxide (CO), hydrogen (H_2), carbon dioxide (CO_2) and typically a range of hydrocarbons such as methane (CH_4) with nitrogen from the air. Producer gas is burned as a fuel gas in the Reheating Furnace for heating of billets to attain the required temperature of ≈1020°C before rolling.At present, Billets are directly from CCM to Rolling Mill. Billets from RH Furnace are fed to the Rolling Mill when there is no feed from CCM.

Rolling Mill

The billets produced in CCM (Size-100x100/125x125 mm) will be fed directly to Rolling Mill of the steel plant. There will be One Hi speed rolling mill for of capacity 1x20 TPH for production of TMT bars varying from 12mm to 25mm in size.

2.7 PROJECT DESCRIPTION

2.7.1 Facilities Proposed under the Expansion

The present proposal is for replacement of existing 4x8 Tons Induction Furnaces with 4x12 Tons Furnaces and increasing the output (speed) of existing Rolling Mill through modernization. Downstream facilities like Continuous Casting Machine, Rolling Mill, Producer Gas plant doesn't require any change/modification as they have adequate capacity to meet the proposed production. In Rolling Mill motors with the Rollers shall be replaced with high speed motors to meet the annual production of 207,360 Tons of rolled product.

(a) Steel Melting Shop

The present proposal is for replacement of existing 4x8 Tons Induction Furnaces with 4x12 Tons. Steel Melting Shop is having complete facilities right from Receiving and Processing Yard for Raw Material, Charging Bays, Furnace Transformer, cooling towers, DM Plant, water softening plant, EOT Cranes, Storage Yards, Conveyor Systems for feeding, Bin weighing system, Ladle heater, compressor, pumps, Electrical Power and Control System, etc.

Additional facilities like Softening Plant, Cooling Towers and cranes shall be installed in Steel Melting Shop. The proposed shop shall also adopt IF-CC route as per the existing facility. The production plan of the steel melt shop shall be 207,360 tons of liquid steel and 197,486 tons of Cast Billets.

The installed capacity and number of heats can be calculated as below for 70:30 (sponge/ pig iron) charge:

Table 2.4: Induction Furnace Capacity after the proposed Expansion

Parameters	Existing	After Expansion
Furnace capacity	4x8 Tons /heat = 32 Tons / heat	4 x12Tons / heat = 48Tons / heat
Tap-to-tap cycle time/min	120	120
Number of heat/day	48	48
No. of operating days	330	360
Equivalent liquid steel,	1,26,720	2,07,360
Production of Cast billet, tons /year	1,20,000	1,97,486

It may be seen from Table above that tap to tap time has been aimed at approx. 120 minutes enabling production of 12 heats per day from each Induction Furnace. The Induction Furnace lining will require repair/replacement after about 15-16 heats. Lining repair will be done in-situ. In order to ensure uninterrupted operations a second crucible, lined and ready should be available. Thus, each furnace station will consist of two crucibles complete with all fitting and auxiliaries installed adjacent to each other.

High Tension power supply is transferred to the converter through step down transformers where power is converted from AC to DC. 5000 KVA Furnace Transformer has been provided with each furnace and 1000 KVA Auxiliary Transformer.

Furnace Transformer

Parameters	Existing	Proposed
Maximum Rating (20% overload)	4000 KVA	6000 KVA
Normal Rating	3500 KVA	5000 KVA
Primary Voltage	33 KV	33 KV
Secondary voltage	2x900 V	2x1000 V
No. of Secondary taps	+1-7.5%	±1-7.5%
Method of Tap changing	<1& at full load	<1 & at full load

The three phases Oil Immersed Transformer is rugged designed to meet the requirement of ladle refining operation. It will be of continuous duty. The selection of secondary voltage is effected by means of triple pole remote operated on load, tap changer. The transformer is designed for forced cooling and the oil is circulated in the heat exchanger (mounted on tank) by means of an oil pump, and is cooled by water. In the water circuit, a flow meter with electrical contacts is provided which gives an alarm in case the cooling water rate falls below the set

value. The primary terminals of the transformer are terminated on top of the tank into HV bushings and the secondary terminals in heavy sectional copper bars.

DM Plant: Electrical control panel of Induction furnace needs to be cooled by De-mineralized water primarily to avoid any electrical conduction through cooling water. To achieve this2 nos. of DM Plant of capacity 12,000 LPM, each of Metcon make have been provided. Additionally 1 nos. of DM Plant of capacity 12,000 LPM and 2 nos. of Softening Plant, each of capacity 12,000 LPM shall be provided under the proposed expansion.

Cooling Water System-1**:** The system will take care of cooling water requirement of Induction Coil, magnetic yokes, and water cooled cables. 2 nos. of Cooling Towers of capacity of Paharpur and Hind makes have been provided. Under the expansion 2 (two) additional cooling towers of 550 Cubic meters shall be provided

Cooling Water System-2**:** Cooling water System-2 is for Deionised water. One Cooling Tower of capacity 175 Cubic meters has been provided.

Cranes: 2x25/10 MT and 2x10/5 MT and 1x15MT double girders, EOT cranes to handle the raw material and finished product have been provided. All cranes will comply IS 3177 – Code of practice for electric overhead travelling cranes and IS-807 – Code of practice for electric overhead traveling cranes, which is meant for EOT cranes in steel plants.

Ventilation Plant: Ventilation system for Air cooling of the electrical room and the electrical equipment comprising of blower fan and exhaust fan, fan motor and filters are housed in the same building. Air from the blower leads to the electrical room through ducts.

There will be no change in the existing Continuous Casting Machine, Producer Gas Plant and Reheating Furnace. Rolling Mill shall be modified to meet the increased production.

(b) Continuous Casting Machine

CCM is used to produce billets of cross sections 100mm x 100mm and 125mm x 125mm directly from molten metal by passing the same through mould tubes designed to produce specific sections. Molten metal passes through the mould tubes by gravity where solidification of outer layer of the metal occurs due to Mould tube cooling by cooling water. As the metal moves out of the tube &progresses along a curve from vertical to horizontal direction, water through nozzles is sprayed over the metal shell which results in thickening of the shell. This thickness continuously increases with cooling as the metal (section produced after passing through mould tube) progresses & the section finally becomes solid. As the section becomes horizontal, it is passed through straightening & withdrawal unit where it is straightened. The section (billet) is then gas cut into pieces of desired length.

Rolling Mill

The billets produced in CCM (Size-100x100/125x125 mm) will be fed directly to Rolling Mill of the steel plant. The capacity of the Rolling Mill shall be increased to 30 TPH from the present capacity of 20 TPH for production of TMT bars varying from 12mm to 25mm in size by replacing the motors and controllers.

2.7.2 Raw material requirement

The basic raw materials required for producing liquid steel are Sponge Iron, Pig Iron, Ferro-Alloys etc. The main raw materials and their annual requirement along with the source of the raw materials for the proposed Project are given below:

Table 2.5: Raw Material Requirement after the Proposed Expansion

S. No.	Item	Per MT of Product	Requirement MT per day	Requirement MT per year	Source	Mode of Transport Distance from plant
SMS – Induction Furnace (576 TPD – 207360 TPA)						
1	Sponge Iron	0.808	465	1,67,547	Odisha, Jharkhand, Durgapur &Bankura, WB	By Rail up to Asansol Railway siding then by road 25 kms.
2	Purchased pig iron / Revert scrap	0.286	164.7	59,305	Aitibir Industries, Electro Steel, Neo Metallicks, KIC Metallics	By road 50 – 100 kms.
3	Ferro-Alloy	0.006	3.46	1,244	Maithan Ferro Alloys	By road 50 kms.
	TOTAL	**1.1**	**633.16**	**228,096**		
Continuous Casting (548 TPD – 197,486 TPA)						
1	Liquid Steel	1.05	576	207,360	In-house	
	TOTAL	**1.05**	**576**	**207,360**		
Rolling Mill Plant (576 TPD – 207360 TPA)						
1	Steel Billets	1.05	548	197,486	In-house	
2	Steel Billets	1.05	240	20,242	Purchased. ChhabraIspat, Burdwan	By road 100 kms.
	TOTAL	**1.05**	**788**	**217,728**		
Producer Gas Plant (27,000 Nm^3/hr)						

S. No.	Item	Per MT of Product	Requirement MT per day	Requirement MT per year	Source	Mode of Transport Distance from plant
1	Coal	-	38	13,680	Chitra colliery (BCCL), Jharkhand ECL, Raniganj	By road 50 – 100 kms.
2	Water	-	26 KLD	9,360 KL		

2.7.2.1 Mass Balance

Table 2.6: Mass Balance

Input		Output	
Raw Material	**Percentage**	**Product & Waste**	**Percentage**
Sponge Iron	73.45	MS Billets	91.0
Pig iron	26.0	Slag	8.6
Alloys	0.55	Bag Filter Dust	0.3
		Waste Gas	0.1
Total	**100.00**	**Total**	**100.00**

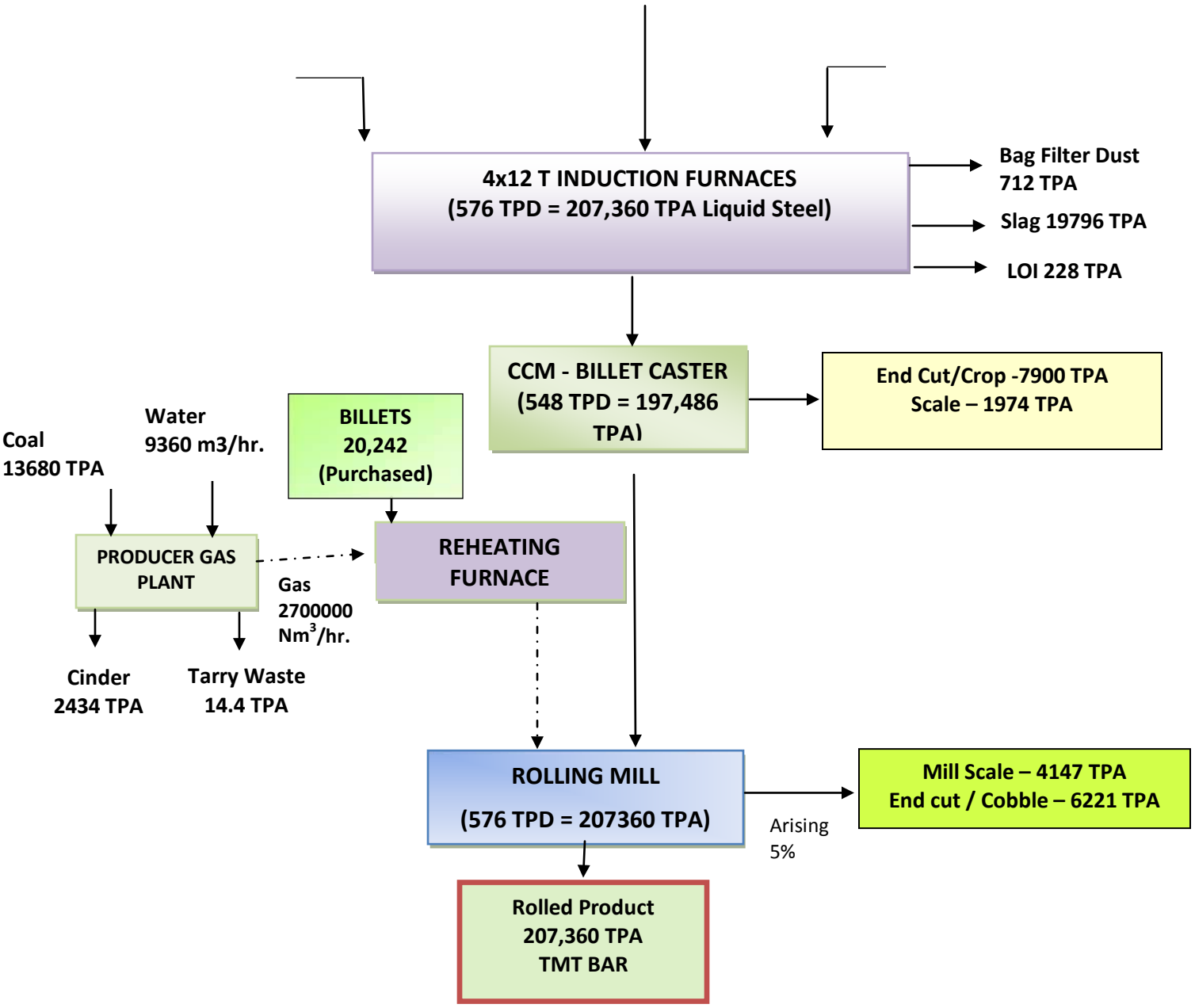


Fig 2.8: Material flow diagram

2.7.3 Water Requirement

In order to conserve fresh water, water economy has been an underlying criterion for selection of plant and equipment. Water recirculation systems have been planned to cater extensive recycling and reuse of return water from plant processes. Industrial quality water will be used in the secondary side of plate heat exchangers for cooling of process water in the primary side and also for direct cooling circuits. For the primary side, soft water will be re-circulated in closed circuits. Evaporative cooling towers will be provided for cooling industrial water in open circuit recirculation systems. Process water losses in various circuits will be compensated by adding make-up water of required quantity. Estimated make-up water for operation of the proposed Project including requirement of water for domestic uses is approximately.

The requirement of makeup water excluding domestic & other purposes will be 202 m^3/day. Water requirement for domestic purpose shall be 10 KLD. The water requirement will be met from DVC, Borewell and Rain Water harvesting pond.

DVC vide letter dated 22.03.18 has asked BMA to execute the agreement for drawl of 0.8 MGD of raw water from Maithan Reservoir.

Table 2.7: Total water requirement in the Plant

Existing	Additional	Total
52 KLD	150 KLD	202 KLD

Waste Water Discharge

Blow down water approx. 14.5 KLD (which include 0.5 KLD domestic waste) will be used for slag cooling and greenbelt development, gardening purpose, etc. after treatment in ETP. Domestic wastewater from the service units of plant premises will be collected in an individual septic tank and then soak pits. Water balance diagram is given at **Figure 2.10.**

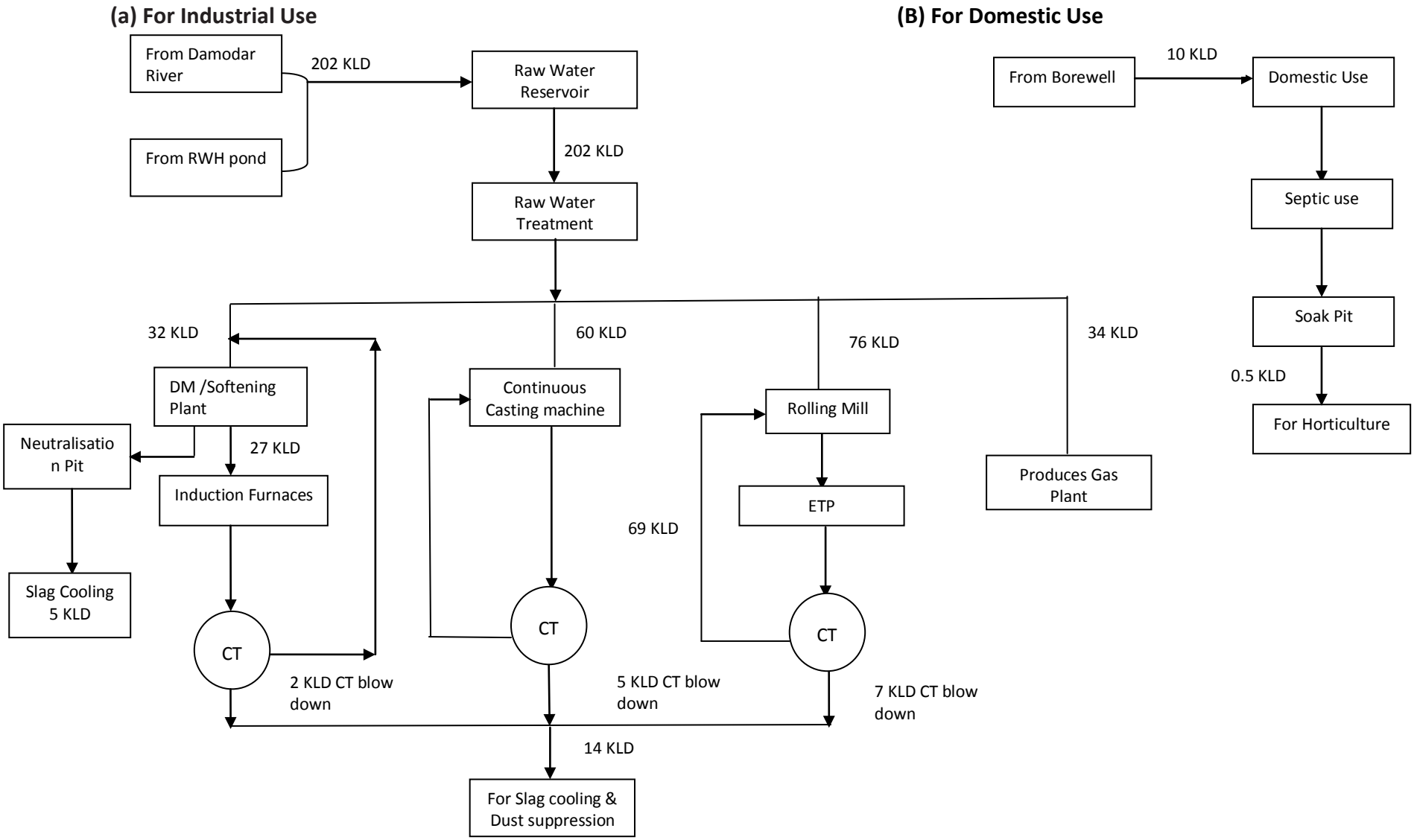


Fig 2.9: Water Balance Diagram

2.7.4 Power Requirement

The power to the plant shall be brought from the Damodar Valley Corporation substation located near the plant. A separate bay will be extended at a potential of 132 KV at grid substation by providing 132 KV breakers, Isolators, CTs, CVTs, LA, Structures, Conductors, CR Panel and earthing system.

Based on estimated power consumption per ton of production of Billets, the company would require 20 M VA of power including the auxiliary power requirements. Substation with adequate capacity to supply of power is proposed for the project. DVC vide letter no. Coml/CD/17-18/Kalyaneswari/BMA/608 dated 12.02.2018, permitted for enhancement of power from DVC.

Table 2.8: Total Power in the Plant

Existing	Additional	Total
15.75 MVA	4.25 MVA	20.0 MVA

2.7.4.1 Energy Balance

Table 2.9: Energy Balance

Energy Balance	Energy(KWH/tons)	Percentage%
Input Energy	660.0	100
Useful Heat	380.0	58.5
Coil I^2R	130.0	20.0
Radiation Losses	97.5	15.0
Conduction Losses	34.0	5.2
Other unaccounted losses	18.5	1.3

2.7.5 Man Power Requirement

The estimated additional direct manpower required after the proposed expansion shall be 30 in addition to the existing manpower of 210, comprising administrative, technical, non-technical, skilled and unskilled workforce.

The total requirement of manpower in the plant will be available without much difficulty as the area has industrial exposure in Iron & steel sector. However, specialized training for operation and maintenance will have to be given to selected candidates well in advance before commissioning of the plant.

In addition to this there shall be indirect requirement of manpower in transportation sector for transportation of raw material. Development of nearby industries also envisaged for supply of additional requirement of Sponge Iron and Pig Iron.

Table 2.10: Manpower Requirement in the Plant

Existing	Additional	Total
210	30	240

2.7.6 Cost Estimate of the Project

Estimated cost of the proposed project for replacement of the existing 4 nos. of Induction Furnace from 8 Ton to 12 Ton shall be Rs. 9.94 Cr.

Table 2.11: Total cost of the project

S. No.	Item	Cost (Rs. In lakhs)
1	Civil & Structural Cost	100.00
2	Plant & Machinery	600.00
3.	Electrical installation	75.00
4.	Escalation	20.00
5.	Preliminary Expenses	5.00
5.	Cost of EMPs	64.00
6.	CER cost for the activities proposed	40.00
7.	Interest during construction (IDC)	90.00
Total		**994.00**

2.7.7 Green Belt Development

Out of total 17.1 Acres, 5.7 Acres of area is already developed as green belt for the existing project. At present 2000 nos. of trees have already been planted in 1.5 Ha. Additionally, 1500 trees shall be planted covering area more than 2.3 Ha.The Fruit bearing/ Medicinal plants and local species will be planted for greenbelt development.

2.8 DESCRIPTION OF MITIGATION MEASURE INCORPORATED IN TO THE PROJECT TO MEET ENVIRONMENTAL STANDARD, ENVIRONMENTAL OPERATING CONDITIONS OR OTHER EIA REQUIREMENTS-

As the Detailed Project Report (DPR) for the expansion project is not available at this stage, mitigation measures suggested here and in Chapter-4 are consultant's view for keeping emissions below the prescribed environmental standards and in most of the cases to keep below the prescribed standards.

Mitigation measures

To control the primary & secondary emissions from Induction Furnaces, Pulse jet type **Bag Filter System with** bag house having 8 to 10 compartments with polyester felt filter bags has been installed to keep the emission below 50 mg/Nm^3 from stack and less than 2000 µg/m3 in ambient, near to Induction Furnace as per GSR 277(E) dated 31st March, 2012. These Bag Filter systems shall be augmented by installing additional 8 to 10 compartments with polyester felt filter bags to meet to emission levels below 50mg/Nm3, even after increased inlet load due to increased production.

Table 2.12: Details of the Air Pollution Control facilities

S. No.	Unit	Type of Pollution Control System	No. of Stacks
1	4x12 T Induction Furnace (replaced with 4x8 T)	4 nos. Pulsejet type Bag Filter (one Unit with each Induction Furnace) Two Units, i.e. 2 Bag Filter Units will be connected with one stack	2
Total		**4 Bag Filters (Augmentation)**	

Waste water discharge from the process will be approx. 1.6 m^3/h (19 KLD) from Cooling Tower blow down and DM plant waste water after the proposed expansion. The utilization of waste water for re-use and re-cycling will be carried out for slag cooling, dust suppression and horticulture.

Table 2.13: Details of the Water Pollution Control facilities

S. No.	Unit	Type of Pollution Control System	No.	Quantity (m^3/day)	Usages
1	DM Plant reject	Neutralization Pit	1	5	Slag cooling
2	Cooling Tower Discharge	-	7	14	Slag cooling & Dust suppression
3	ETP Rolling Mill	Scale Pit	1	-	Recycled
4	Domestic waste water	Septic tank with Soak Pit	-	0.5	
Total				**19.5 KLD**	

CHAPTER – 3
DESCRIPTION OF THE ENVIRONMENT

3.1 INTRODUCTION

This chapter illustrates the description of the existing environmental status of the study area with reference to the major environmental attributes. The existing environmental setting is considered to establish the baseline conditions which are described with respect to physical environment, air environment, water environment, noise environment, traffic pattern and density, land environment, biological environment and socio economic environment.

The monitoring of environmental parameters has been conducted within the core zone and buffer zone (10 km radial distance) from project site at Village: Debipur P.O: Kalyaneshwari, District: Burdwan, West Bengal, in accordance with the guidelines issued by the Ministry of Environment, Forests and Climate Change, CPCB, and SPCBduring the study period (October 2016 to December 2016).

Baseline Environmental status in and around the BMA Stainless Limited project depicts the existing quality of Air, Noise, Water, Soil, Ecology & Biodiversity and Socio-economic environment. Based on the baseline data, environmental impact assessment is carried out and Environmental Management Plan is prepared.

This baseline environmental study reveals information on existing environmental scenario.

- Delineation of project site and study area.
- Delineation of the environmental components and methodology
- Delineation of study period.
- Delineation of the location of the Plant and description of its surroundings based on secondary data.

Baseline data generation/establishment of baseline for different environmental components

- Baseline status of the existing plant site operating facilities.
- Traffic density at the inter-phase of project site and study area.

3.2 STUDY AREA AND PERIOD

Studies of various environmental parameters have been done within 10 Km radius area of the proposed project site. The study area map is given in Figure 1.1 in Chapter 1. The impact identification always commences with the collection of baseline data such as Ambient Air Quality, Micro-Meteorology, Ground and Surface Water Quality, Noise levels, Soil Quality, Land use pattern, Biological Environment and Socio-economic aspects, Solid and Hazardous waste, Risk Assessment, Geology and Hydrology within the study zone of 10 Km. radius.The air, noise, soil and water sampling locations have

been presented in **Figure 3.4, 3.7, 3.9 and3.11 respectively.**

3.3 STUDY PERIOD

The baseline environmental study has been done for the period of October to December 2016 byM/s. Vardan Envirolab, Gurgaon, NABL Accredited Lab, Certificate No. T-2629 (Certificate enclosed as **Annexure IX**)} in accordance with the Guidelines for EIA issued by the Ministry of Environment Forests and Climate Change, Govt. of India and CPCB, New Delhi. Secondary data also collected from different sources.

3.3.1 Components &Methodology

The data was collected from both primary and secondary sources. The baseline information on micro-meteorology, ambient air quality, water quality, noise levels, soil quality and floristic descriptions are largely drawn from the data generated by M/s Vardan EnviroLab, Gurgaon (NABL Accredited Lab). Climatological data recorded at the nearest IMD station, Ranchi (180 km from project site) was also collected. Micrometeorological data at site was recorded using automatic weather station. Apart from these, secondary data have been collected from Census Handbook, Revenue Records, Statistical Department, Soil Survey and Land use Organization, District Industries Centre, Forest Department, Central Ground Water Authority, etc.

The studies involved conducting field studies and analyzing various parameters that might be affected due to the industry and conducting socio-economic survey among the people. During reconnaissance survey the sampling locations were identified based on:

- Existing topography and meteorological conditions
- Locations of water intake and waste disposal points.
- Location of human habilitation and other sensitive areas present in the vicinity of the proposed project site.
- Representative areas for baseline conditions.
- Accessibility for sampling

The scoping and the extent of data were formulated based on interdisciplinary team discussions, and professional judgment keeping in view of ToR assigned by MOEF&CC. The base line studies started with reconnaissance survey and the site visits in the study area for fixing the monitoring locations for collection of the primary data. Various Government and other organizations were approached for getting information for the secondary data. The various parameters surveyed and studied for the baseline study are discussed in the following components:

- Physical environment
- Air environment
- Noise environment
- Traffic pattern and density

- Water environment
- Land environment
- Biological environment
- Socio economic environment

3.4 ESTABLISHMENT OF BASELINE FOR VALUED ENVIRONMENTAL COMPONENTS, AS IDENTIFIED IN THE SCOPE

The scope of the study is as per discussion in EAC meeting dated 29.08.2016 andToR letter issued by MoEF&CC vide its File no. J-1011/192/2013-IA.II(I) dated 1 7th November, 2016.

3.4.1 METEOROLOGICAL DATA

Assessment of the micro and macro meteorology is important from the point of view of understanding the nature of environment in the study area. Climate has an important role in the build-up of pollution levels. The climatic condition of the study area may be classified as moderately or seasonally dry, tropical or temperate savanna climate with four seasons in a year. Winter is critical for air pollution build-up because of frequent calm conditions with temperature inversions resulting in poor atmospheric mixing, natural ventilation and high emission loads.

The metrological station was set-up at the project site and data were collected which are reproduced as under:

3.4.2Wind

Regional meteorological scenario helps to understand the trends of the climatic conditions. It also helps in determining the sampling locations and in predicting the post project environmental scenario. Meteorological scenario exerts a critical influence on Air Quality as the pollution arises from the interaction of atmospheric contaminants with adverse meteorological conditions such as temperature inversions, atmospheric stability and topographical features like hills, and valleys.

The critical weather elements that influence air pollution are wind speed, wind direction, temperature, which together determines atmosphere stability. Hence it is an indispensable part of any air pollution studies and required for interpretation of base line information. Wind speed and direction data recorded during the study period is useful in identifying the influence of meteorology on the air quality of the area.

3.4.3 Wind Rose

The meteorological data was collected at the site by installing an automatic weather station during winter season, 2016.Wind Speed, Wind Direction, Temperature and Relative Humidity were recorded for the study period. Wind roses on sixteen-sector basis (N,NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW, and NNW) have been drawn for 24 hours. The data on wind patterns are pictorially represented by

means of windrows diagrams for study period 1st October, 2016 to 31st December, 2016 as Figure- 3.1.The meteorological data reflecting minimum, maximum temperature in ^{0}C, relative humidity in %, rainfall in mm/hr, wind speed in m/s, was collected for winter season, 2016.

Table-3.1: Onsite Meteorological Data (Period: 1st October, 2016 to 31st December, 2016)

Months	Temp (°C)		Relative Humidity (%)		Average Mixing Height (m)	Average wind velocity (m/s)	Total Rainfall (mm)
	Max	Min	Max	Min			
October-2016	30	23	88	53	554	0.98	132.2
November-2016	29	16	72	50	517	0.7	15
December-2016	26	14	73	51	394	0.7	4.8

During the study period, wind speed measured on site varied between 0.8 m/s to 4.1 m/s. The wind rose diagram indicates predominant wind direction NE.

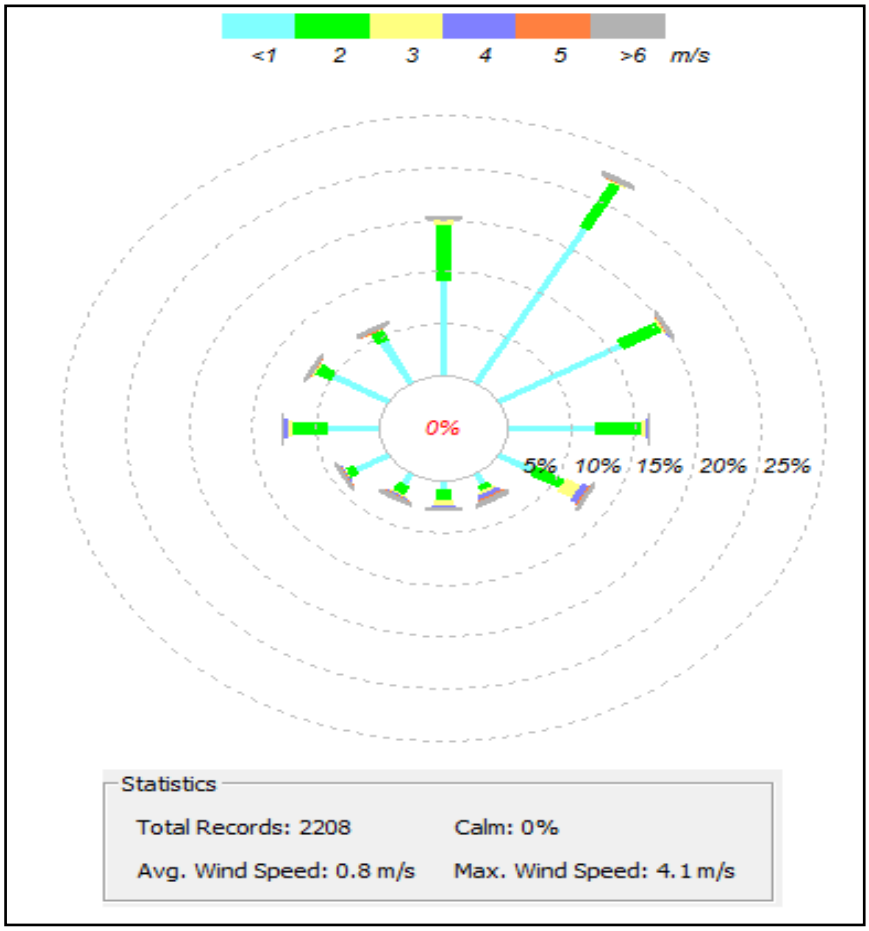


Figure 3.1: Wind Rose Diagram of Study Period (October to December 2016)

3.5AIR QUALITY

3.5.1 Analytical Techniques for Air Quality Monitoring

PM_{10} and $PM_{2.5}$ have been estimated by gravimetric method. Modified West and Gaeke

Method (IS: 5182 Part – II, 1969) has been adopted for estimation of SO_2. Jacobs – Hochheiser Method (IS: 5182 Part-VI, 1975) has been adopted for the estimation of NO_x. NDIRS (Non-Dispersive Infra-Red Spectroscopic) Method (IS:5182 Part-X, 1999) has been adopted for the estimation of Carbon monoxide. Summary of the analytical techniques and their references are as given in Table-3.2.

Table 3.2: Monitoring Methods

S. No	Parameters	Methods	Technical Protocol	Minimum detectable limits as provided by lab
1	SulphurDioxide(SO_2)	West&Gaeke	IS:5182(P2)	4 mcg
2	Nitrogen Dioxide(NO_2)	Jacob&Hochheiser	IS:5182(P6)	1 mcg
3	ParticulateMatterPM$_{10}$	Gravimetric	IS:5182(P15)	5 mcg
4	ParticulateMatterPM$_{2.5}$	Gravimetric	-	5 mcg
5	CarbonmonoxideasCO	NDIR	IS:5182(P-10)	10mcg

3.5.2Air Quality Monitoring

The baseline air quality was established by monitoring of major air pollutants like suspended particulate matters, sulfur dioxide, nitrogen dioxide and carbon monoxide at various locations near the project site. Reparable dust samplers and fine particulate matter samplers were used for ambient air sampling. Samples were collected continuously from all the stations for 24 hours. Samples thus collected were analyzed for various pollutants.

Baseline data for ambient air quality were collected at 8 locations within the study area during the period of 1st October, 2016 to 31st December 2016. The sampling stations along with their distance and direction from the project site, ambient air quality monitoring stations, windrows diagram showing the direction of the blowing wind during the analysis period, are detailed in Table 3.4 and Figure 3.4. Ambient air quality analysis data for various parameters are given in Table 3.5.

To study the existing ambient air quality, monitoring was done by Vardan Envirolab NABL Accredited lab. The observations made during the study period are presented under the forthcoming sub-sections.

3.5.3 Methodology Adopted for the Study

The baseline status of the ambient air has been established through a scientifically designed ambient air quality monitoring network. The following criteria were taken into account during selection of the sampling stations:

- Topography of the area
- Human settlements within the study area
- Safety, accessibility and non-interference with general routine of the people residing near the station
- Prediction of maximum concentration of the air pollutants through dispersion

modeling for the proposed source details using prevailing meteorological conditions in the region.

Table3.3: Procedures for Determining Various Air Quality Parameters

Parameters	Testing Procedure
PM_{10}& $PM_{2.5}$	Gravimetric Method by using Respirable Dust Sampler" (RDS) and Repairable fine Particulate Matter sampler
NO_2	Absorption in diluted NaOH and then estimated calorimetrically with sulphanilamide and N (I-Nepthyle) Ethylene diamine Di-hydrochloride and Hydrogen Peroxide (IS: 5182 1975, Part-VI).
SO_2	Absorption in Sodium Tetra Chloromercurate followed by Colorimetric estimation using P-Rosaniline hydrochloride and Formaldehyde (IS: 5182 Part – II, 2001).
CO	Each constituent gas in a sample will absorb some infrared at a particular frequency. By shining an infra-red beam through a sample cell (containing CO), and measuring the amount of infra-red absorbed by the sample at the necessary wavelength, a NDIR detector is able to measure the volumetric concentration of CO in the sample.

Table 3.4 Ambient Air Quality Monitoring Stations

Station	Sampling Location	Distance from project site(Km)	Direction	Direction of Wind from the plant site	Justification
A1	Project Site	-	-	-	-
A2	Village Kalyaneswari	0.5	S	Down wind	Nearest to project site
A3	Village Barakar	4.5	S	Down Wind	Densely populated and near to river site
A4	VillageNarayan Chak	8.4	S	Down Wind	Less populated and near to river site
A5	Village Banshkatiya	2.6	N	Up Wind	Less Populated
A6	Village Haipara	8.2	N	Up Wind	Less Populated
A7	Village Khudka	5.4	SE	Cross Wind	Less Populated and near to railway track
A8	Village Palhari	7.5	NW	Cross Wind	Near to water source and dense mixed jungle



Figure 3.2: Photographs of Air quality Monitoring

Table 3.5 Ambient Air Quality Monitoring Results

Parameters	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
AAQ Norms	**100**	**60**	**80**	**80**	**2**
Project Site (A1)					
MIN	53.80	31.70	17.60	8.60	0.77
MAX	90.80	54.70	31.70	13.40	1.87
MEAN	75.60	43.99	24.09	10.26	1.20
98 TILE	87.37	53.56	31.39	12.62	1.84
Village Kalyaneswari (A2)					
MIN	59.30	35.80	14.20	6.90	0.62
MAX	88.40	52.70	31.50	11.50	1.86
MEAN	73.57	41.34	24.21	9.09	0.95
98 TILE	88.04	49.11	30.88	11.45	1.80
Village Barakar (A3)					
MIN	72.80	39.50	19.80	8.30	0.78
MAX	95.30	55.40	34.50	14.70	1.90
MEAN	83.20	47.88	26.86	10.89	1.22
98 TILE	94.78	54.52	33.41	14.08	1.85
VillageNarayan Chak(A4)					
MIN	64.20	32.60	19.30	8.10	0.69
MAX	88.60	52.60	32.50	14.50	1.64
MEAN	74.77	42.24	25.80	10.28	0.96
98 TILE	87.50	51.78	32.12	13.59	1.58
Village Banshkatiya (A5)					
MIN	55.80	30.50	17.30	6.80	0.64

Parameters	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
AAQ Norms	**100**	**60**	**80**	**80**	**2**
MAX	86.20	49.80	25.80	11.50	1.80
MEAN	70.85	39.10	21.30	8.25	0.89
98 TILE	84.55	49.05	25.70	11.20	1.72
Village Haipara (A6)					
MIN	58.90	32.50	18.60	6.80	0.58
MAX	84.50	51.80	28.60	10.20	1.22
MEAN	71.20	40.42	22.46	8.53	0.84
98 TILE	82.95	49.50	28.10	10.20	1.21
Village Khudka (A7)					
MIN	64.50	32.60	15.20	6.60	0.55
MAX	79.30	42.40	26.70	10.90	1.72
MEAN	73.07	38.42	19.64	8.66	0.90
98 TILE	78.90	42.30	26.05	10.85	1.63
Village Palhari(A8)					
MIN	63.50	37.60	17.90	6.90	0.55
MAX	93.00	54.90	32.70	13.00	1.81
MEAN	76.38	44.42	24.25	9.14	0.96
98 TILE	91.20	54.75	31.95	12.80	1.77

(Source: Vardan EnviroLab)

3.5.3.1 Observations

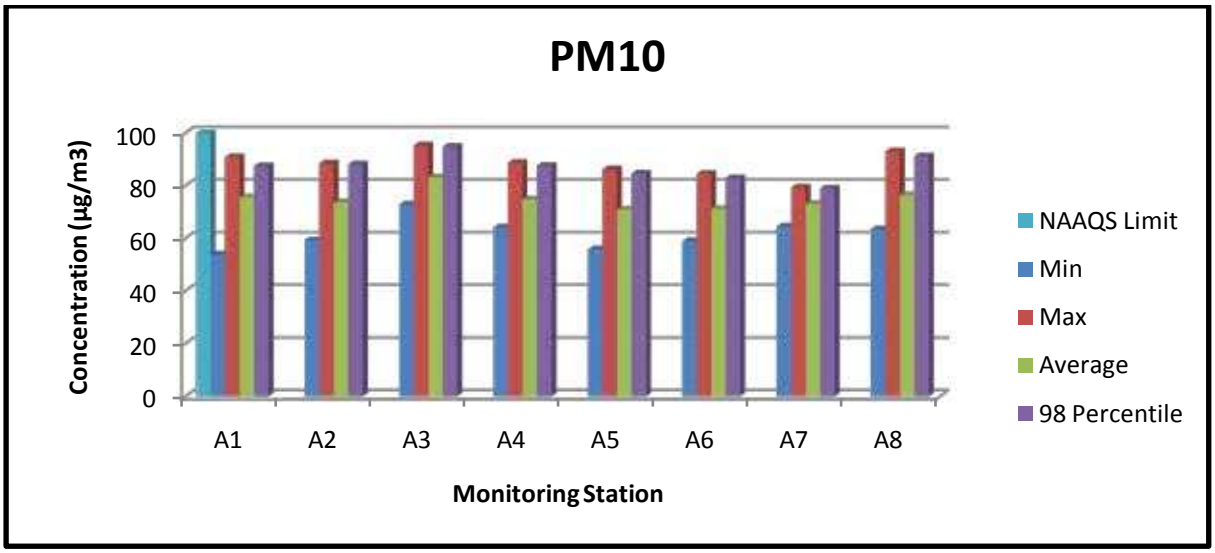
Ambient Air Quality Monitoring reveals that the minimum and maximum concentrations of PM_{10} for all the eight (8) Air Quality monitoring stations were found to be 53.3$\mu g/m^3$ and 95.3$\mu g/m^3$ respectively, while for $PM_{2.5}$varies between 30.50 $\mu g/m^3$ and 55.40 $\mu g/m^{3.}$. As far as the gaseous pollutants SO_2, NO_2, CO are concerned, the prescribed limits under NAAQ Standards for Industrial, residential and rural areas has never surpassed at any station. The minimum and maximum concentrations of NO_2 were found to be 14.20 $\mu g/m^3$ and 34.50 $\mu g/m^3$ respectively. The minimum and maximum concentrations of SO_2 were found to be 6.60 $\mu g/m^3$ and 14.70 $\mu g/m^3$ respectively. The minimum and maximum concentrations of CO were found to be 0.55 mg/m^3 and 1.90 mg/m^3 respectively.The prescribed limits of SO_2 and NO_2 is 80 $\mu g/m^3$ and CO is 2mg/m^3 for Industrial, residential and rural areas has never surpassed at any monitoring station. Detailed Air Monitoring Lab report is attached as **Annexure-X.** The standards of Ambient Air Quality in India are available online at *http://cpcb.nic.in/National_Ambient_Air_Quality_Standards.php*.

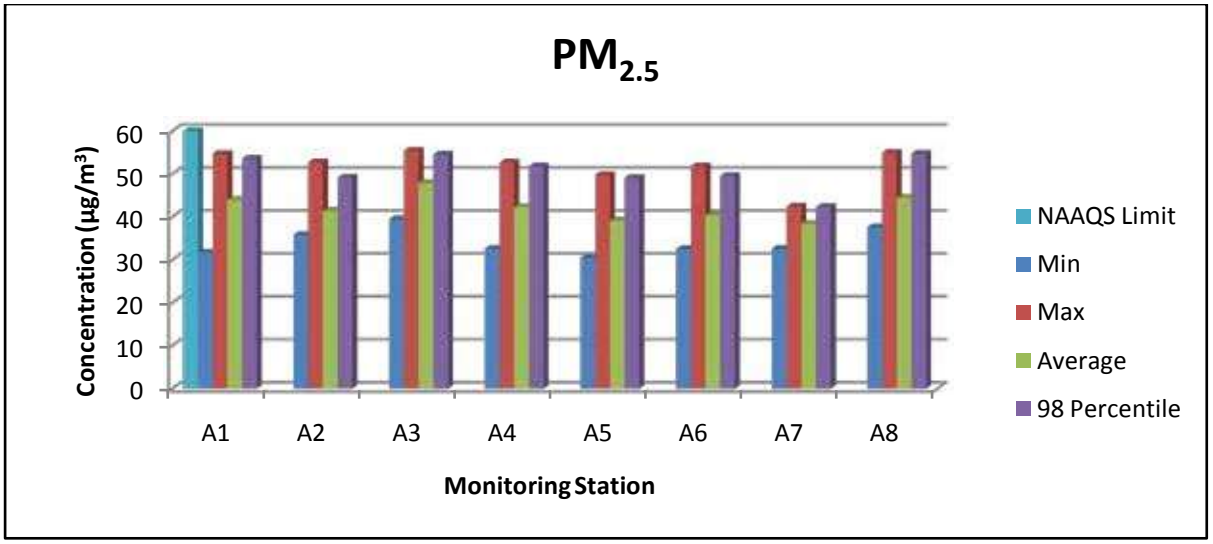
3.5.3.2 Interpretation of Air Quality:

Following inferences may be made from the ambient air quality monitoring and the results thus reported:

1. The maximum98th percentile value of $PM_{10,}$ 94.78 µg/m^3 at Barakar. The area is densely populated and high value is mainly due to traffic.
2. The maximum 98th percentile value of $PM_{2.5}$, 54.75 µg/m^3 was found at village Palhari, is mainly due to presence of power plant, though below the NAAQ standards.
3. A suitable green belt is planned along the periphery of the plant for abatement of air pollutants.

Air quality predictions have been carried out and are presented in **Chapter-4** of this report.





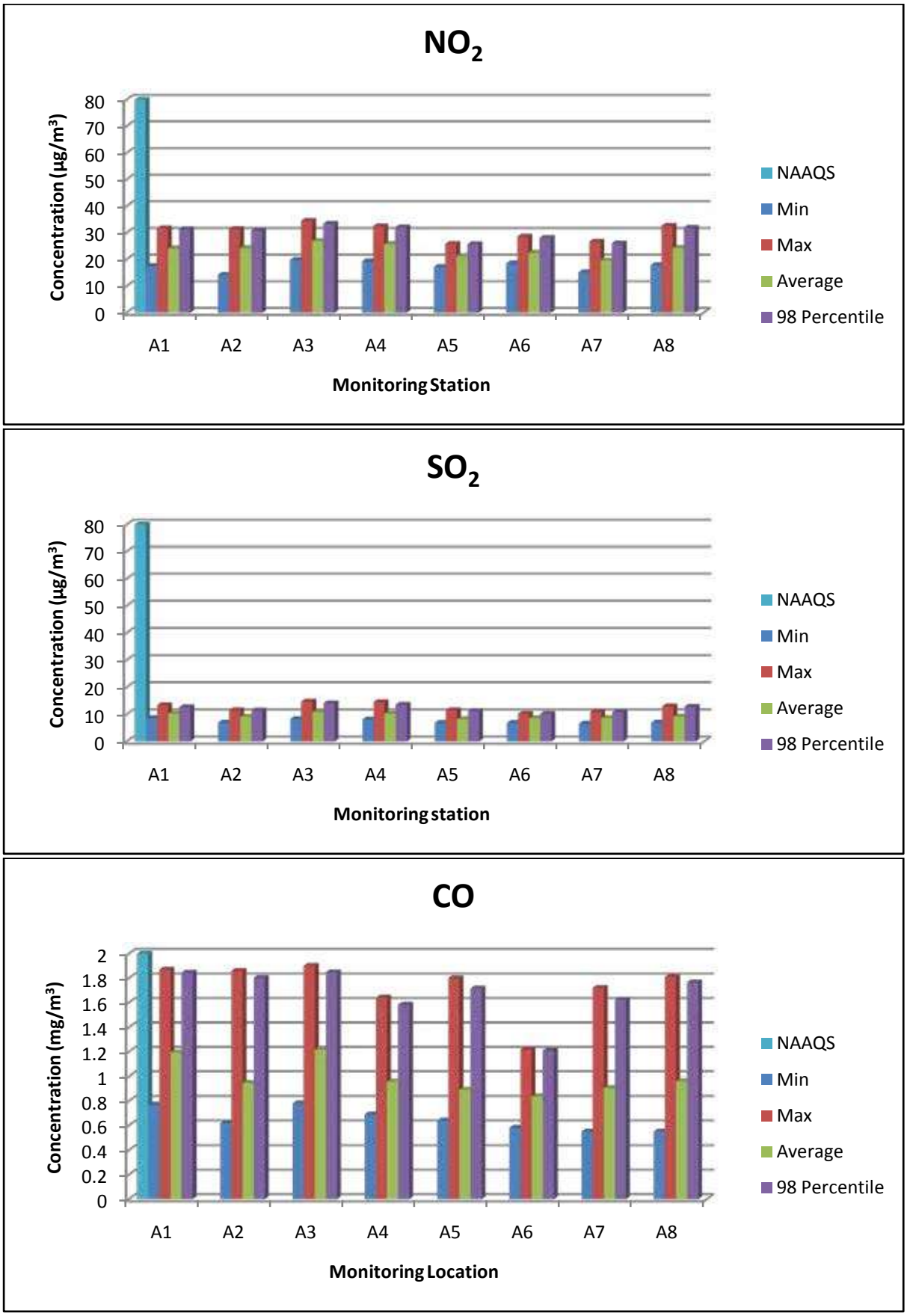


Figure 3.3: Graphs showing Pollutants concentration of the study area

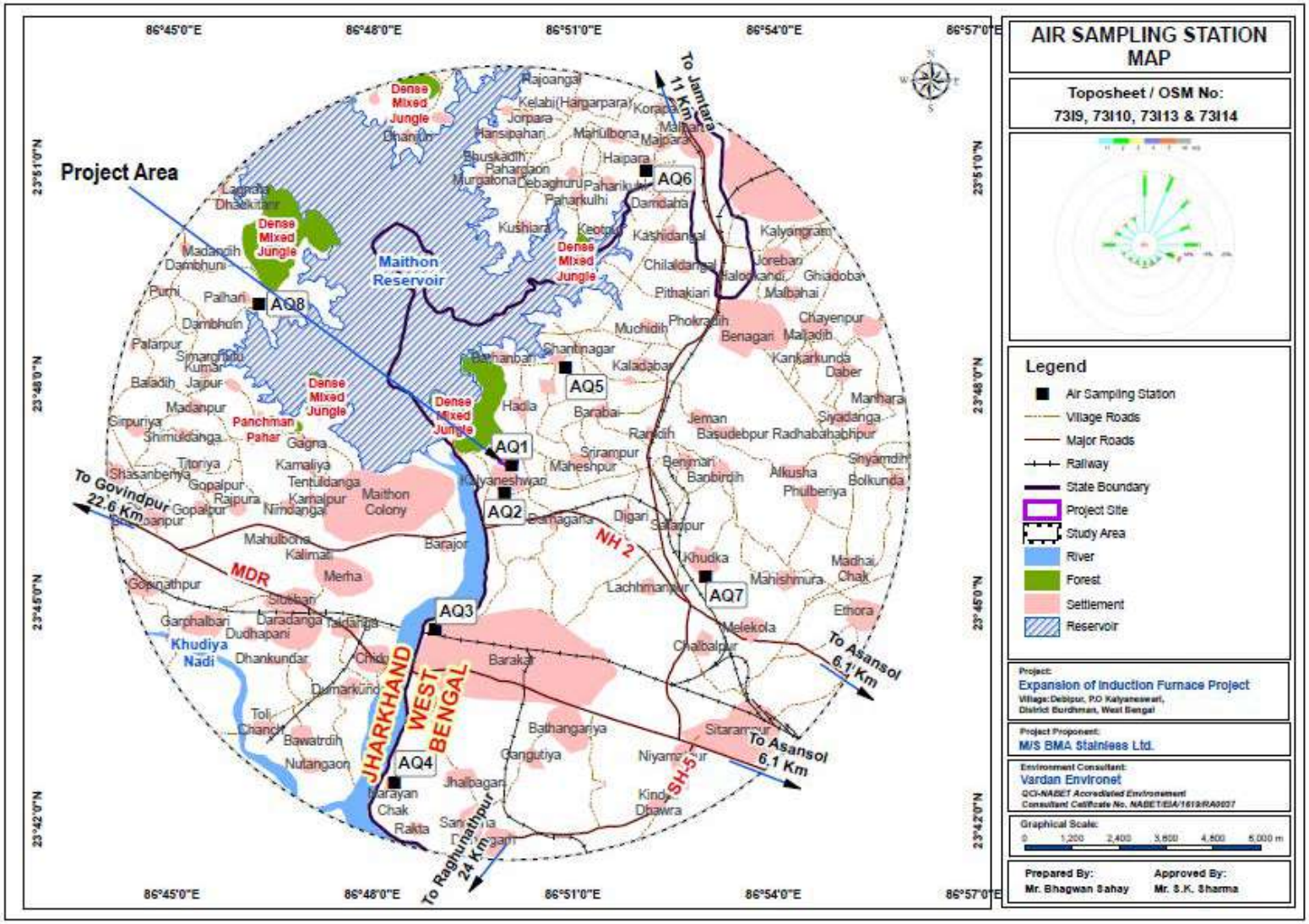


Figure 3.4: Map showing Air Monitoring Stations

3.6 NOISE ENVIRONMENT

A total of eight (8) locations within the study area have been selected for measurement of ambient noise levels. The results of such monitoring have been gathered in **Table 3.7.** Noise level monitoring has been carried out once during November 2016. Day and night time Leq values have then been computed from the hourly Leq values. Day time & Night time Leq have been computed from the hourly Leq values between 6 a.m.- 10 p.m. & between 10 p.m. - 6 a.m. respectively. Ambient noise levels were measured using integrated sound level meter at 8 locations located within the study area (Figure 3.7).

Table 3.6 Noise Level Sampling Stations

Station	Sampling Location	Direction	Distance from project site(Km)	Direction of Wind from the plant site	Type of Area
N1	Project Site	-	-	-	Industrial
N2	Village Kalyaneswari	S	0.5	Down wind	Residential
N3	Village Barakar	S	4.5	Down Wind	Residential
N4	VillageNarayan Chak	S	8.4	Down Wind	Residential
N5	Village Banshkatiya	N	2.6	Up Wind	Residential
N6	Village Haipara	N	8.2	Up Wind	Residential
N7	VillageKhudka	SE	5.4	Cross Wind	Residential
N8	VillagePalhari	NW	7.5	Cross Wind	Residential

Table 3.7 Noise Levels during Monitoring

S. No	Locations	Average Day Time Noise Level $L_{eq.}$ dB (A)	Average Night Time Noise Level $L_{eq.}$ dB (A)
		Day Time (10:00 a.m. to 12:00)	Night Time (10:00 p.m. to 12:00 Midnight)
1.	N1	62.30	57.40
2.	N2	54.36	43.18
3.	N3	52.75	43.07
4	N4	51.40	42.66
5	N5	51.30	42.65
6	N6	53.58	42.86
7	N7	50.75	40.45
8	N8	54.10	43.52

(Source: Vardan EnviroLab)

3.6.1 Observations

Ambient noise levels were measured at 8 locations around the proposed project site. Minimum and maximum noise levels recorded during the day time were from 50.75 Leq dB(A) and 62.30 Leq dB(A) respectively and minimum and maximum level of noise during night time were 40.45 Leq dB(A) and 57.40 Leq dB(A) respectively. At none of the place noise levels have exceeded the respective permissible limits. Maximum Leq. noise levels during daytime and night time were found at Location N1 (Plant Site) and mainly due to noise from plant, however within the permissible limit of 75 dB(A) during daytime and 70 dB(A) during night time. Lab result is attached as **Annexure-X** and noise levels at all locations were observed to be within the prescribed limits of Ambient Noise Quality Standards, available online at

http://cpcb.nic.in/divisionsofheadoffice/pci2/noise_rules_2000.pdf. From the above study and discussions it can be concluded that noise levels in the study area are well within the prescribed limits as prescribed by the CPCB and State Pollution Control Board.

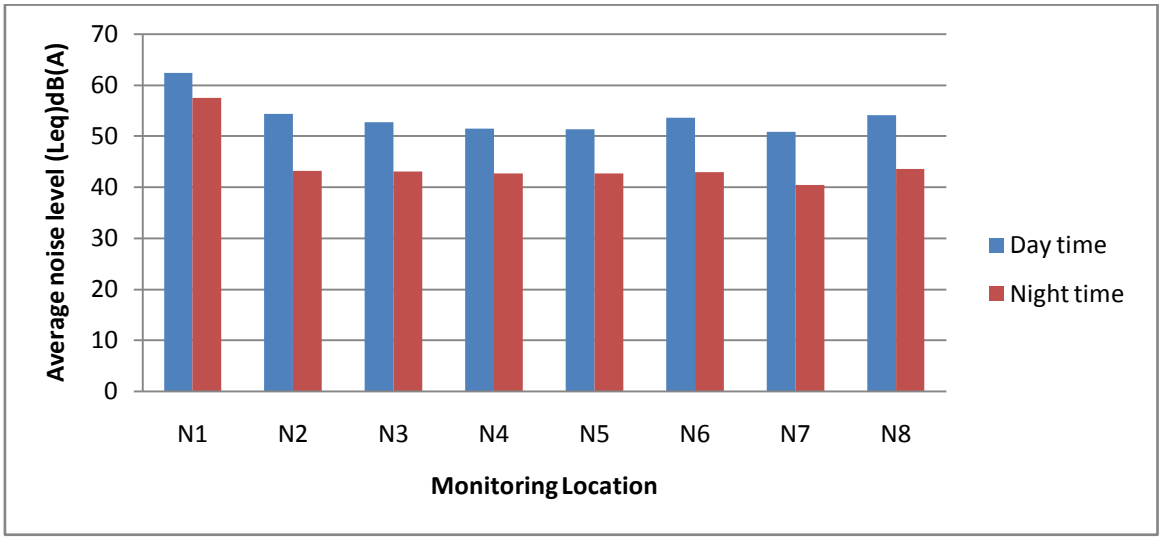


Figure 3.5: The graphical representation of Noise level survey

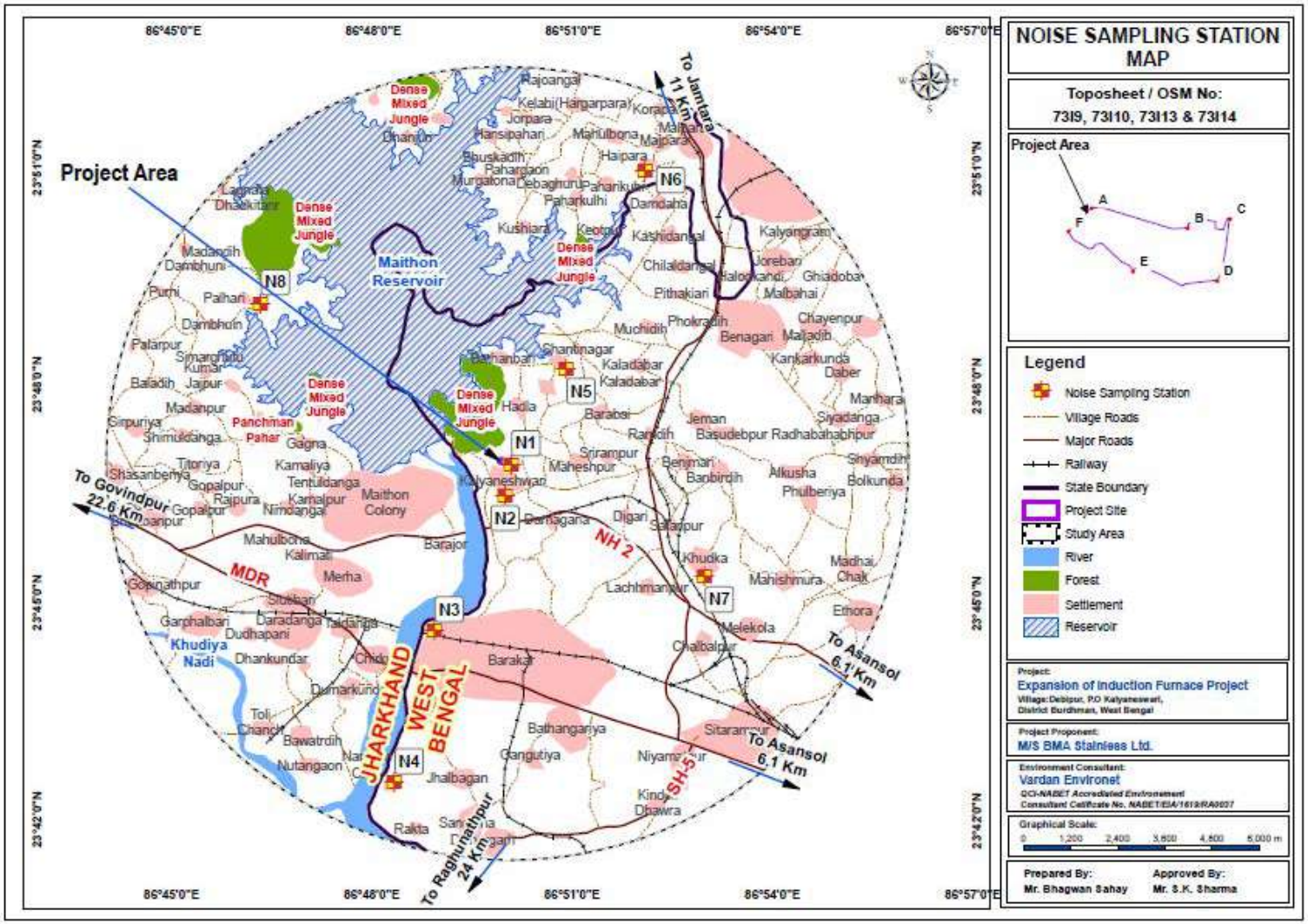


Figure 3.6: Map showing Location of Noise Level Monitoring Station

3.7 SOIL ENVIRONMENT

The soils of district are mainly two types: Silty and Sandy loam.

3.7.1 Soil Quality

The information on soils has been collected from various secondary sources and also through primary soil sampling analysis of which is described in this section.

For studying the soil profile of the region, soil samples were collected from 8 locations to assess the existing soil conditions within the study area representing various land uses. The sampling locations have been finalized with the following objectives:

- To determine the base line characteristics
- To determine the soil characteristics of proposed project site.
- To determine the impact of industrialization/urbanization on soil characteristics
- To determine the impacts on soils from agricultural productivity point of view.

3.7.2 Criteria Adopted for Selection of Sampling Locations

For studying the soil types and soil characteristics, 8 sampling locations were selected to assess the existing soil conditions representing various land use conditions and geological features.

3.7.3 Methodology and Sampling

The homogenized soil samples collected at different locations were packed in a polyethylene plastic bag and sealed. The sealed samples were sent to laboratory for analysis. The important physical, chemical parameter concentrations were determined from all samples.

3.7.4 Soil Sampling Locations

Details of the soil sampling locations are given in Table 3.8.

Table 3.8 Soil Sample Monitoring Station

Station	Sampling Location	Direction	Distance from project site (Km)	Direction of Wind from the plant site	Type of Land
S1	Project Site	-	-	-	Industrial
S2	Village Kalyaneswari	S	0.5	Down wind	Scrub Land
S3	Village Barakar	S	4.5	Down Wind	Settlemen
S4	Village Narayan Chak	S	8.4	Down Wind	Agriculture land
S5	Village Banshkatiya	N	2.6	Up Wind	Agriculture land
S6	Village Haipara	N	8.2	Up Wind	Agriculture land
S7	VillageKhudka	SE	5.4	Cross Wind	Agriculture land
S8	VillagePalhari	NW	7.5	Cross Wind	Forest land

Table 3.9 Physico-chemical Properties of Soil

S.No	Parameters	Unit	S1	S2	S3	S4	S5	S6	S7	S8
1.	pH (at 25 ^{0}C)	--	6.68	6.75	6.49	6.55	6.79	6.80	6.39	6.86
2.	Color	--	Reddish Brown	Reddish Brown	Brownish	Brownish	Reddish Brown	Reddish Brown	Brownish	Brownish
3.	Soil Texture	--	Silty	Silty	Sandy Loam	Silty	Sandy loam	Silty	Silty	Sandy Loam
4.	Potassium as K	kg/hec.	174.30	142.00	168.63	205.00	166.00	235.00	187.00	253.00
5.	Organic Matter	%	0.68	0.70	0.62	0.69	0.59	0.76	0.74	0.64
6.	Available Nitrogen as N	kg./hec.	214.00	248.00	207.00	228.20	234.00	263.00	218.00	198.00
7.	Available Phosphorus	kg./hec.	18.00	23.30	17.63	15.47	12.65	20.00	13.50	19.12
8.	ElectricalConductivity	mS/cm	0.367	0.423	0.440	0.487	0.508	0.474	0.367	0.440
9.	Water holding capacity	%	32.30	29.53	27.42	28.42	25.63	29.47	28.79	30.42
10.	Bulk density	gm/cc	1.26	1.30	1.31	1.41	1.23	1.42	1.42	1.22
11.	Chloride as Cl	mg/100gm	42.32	35.47	38.42	34.25	38.20	41.24	38.68	45.78
12.	Calcium as Ca	mg/100gm	32.63	39.53	42.36	27.53	36.36	36.20	30.23	41.36
13.	Sodium as Na	mg/100gm	30.21	27.20	36.53	25.24	22.16	27.48	15.05	36.53
14.	Magnesium as Mg	mg/100gm	10.23	14.21	10.25	13.40	11.53	13.53	9.62	16.53
15.	Zinc as Zn	mg/kg	2.89	3.42	3.12	2.90	3.70	4.10	3.55	3.62
16.	Manganese as Mn	mg/kg	17.00	18.21	20.35	18.00	21.00	19.67	1.19	18.32
17.	Chromium as Cr	mg/kg	1.75	1.80	0.63	0.72	0.73	0.69	0.45	1.06
18.	Lead as Pb	mg/kg	0.25	0.45	0.38	0.56	0.48	0.30	0.57	0.39
19.	Cadmium as Cd	mg/kg	0.79	0.86	0.81	1.20	0.69	0.76	0.16	0.45
20.	Copper as Cu	mg/kg	2.23	2.50	2.42	2.32	1.53	1.53	2.17	2.52

(Source: Vardan enviroLab)

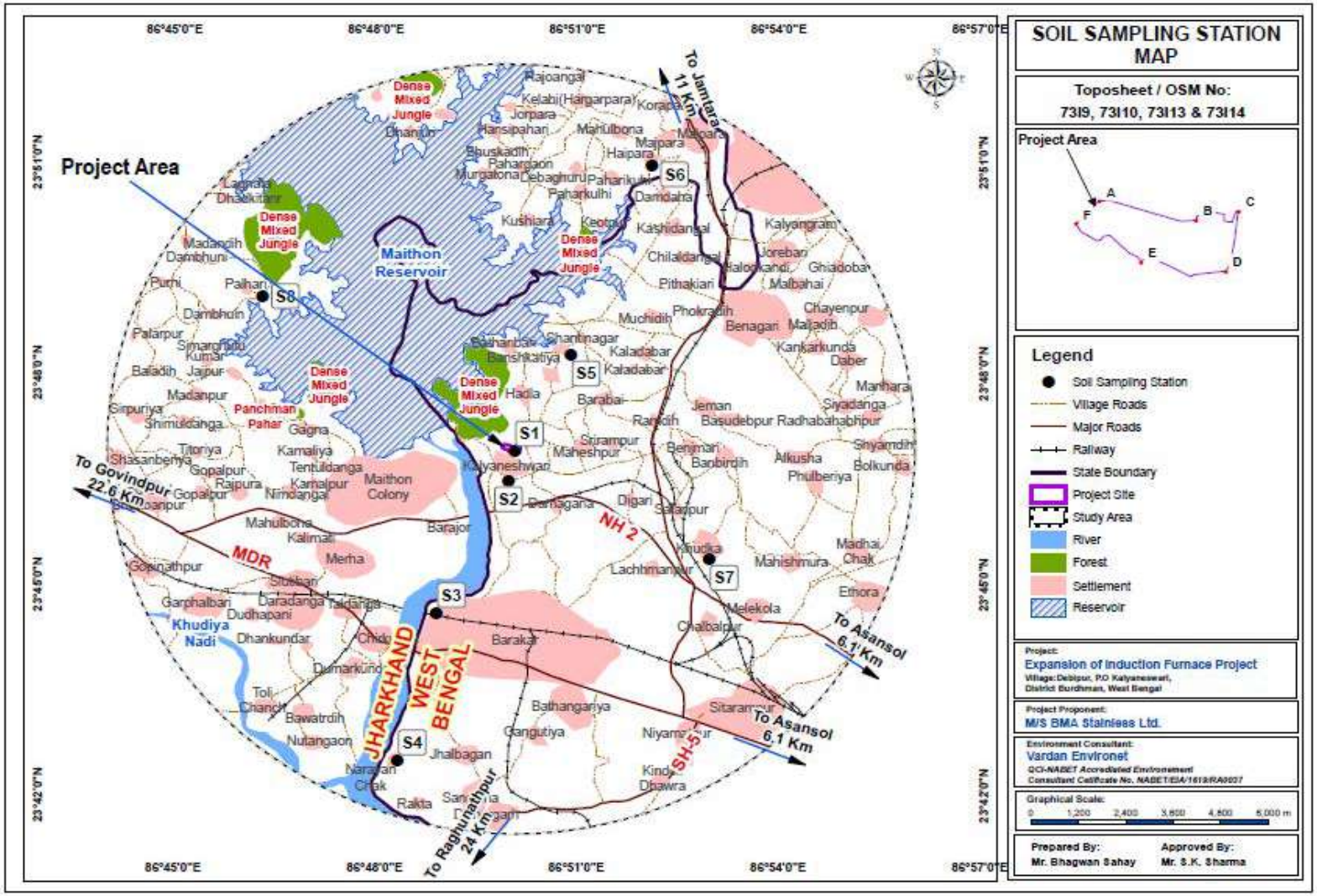


Figure 3.7: Location of Soil sampling Monitoring Stations

3.7.5 Interpretation of Soil Quality

The analysis results show that soil is acidic in nature as pH value ranges from 6.39 to 6.86 with organic matter 0.59 %-0.76%. The concentration of Nitrogen (198.00 Kg/ha. to 3263.00Kg/ha.) Phosphorus (12.65 Kg/ha. to 23.30 Kg/ha.) and Potassium (142.00 Kg/ha. to 253.00Kg/ha.) has been found to be in good amount in the soil samples. The NPK (Compound fertilizer containing N, P_2O_5 and K_2O) ratio is 8:1:3. The consumption of fertilizers is as important factor as their production. There should be appropriate balance in the consumption of different fertilizer nutrients. The appropriate NPK ratio under Indian soil conditions is stated to be 4:2:1 (National Academy of Agricultural Sciences, 2009).Soil Quality data attached as **Annexure-X.**

3.8WATER ENVIRONMENT

The impact has been assessed on randomly selected surface and ground water sources falling within the study area. In order to assess the existing water quality, the Ground water samples were collected from 8 different locations and Surface Water quality from 3 locations within the study area and analyzed it as per the procedure specified in standard methods for examination of water and wastewater published by American Public Health Association and Bureau of Indian Standards (APHA/BIS).

Monitored values have been used for describing the water environment and assessing the impacts on it. To assess the water quality impacts, water resources in the impact area have been grouped into 2 classes.

- Ground water resources in the deeper strata of the ground
- Surface water resources

About 8 ground water and 3 surface water samples were collected from the study area to assess the water quality during the study period. The ground water samples were drawn from the hand pumps and open wells being used by the villagers for their domestic needs. Surface water sampling was carried out from Rivers present within 10 Km of the project site. The details of the locations are given in Table 3.10.

Table 3.10: Ground and surface water Monitoring Station Details

Code	Name of the Station	W.R.T. Site Remarks		Justification	Remarks
		Direction	Distance in Km		
GW1	(Project Site)	-		Project site	Ground waters
GW2	Village Kalyaneswari	S	0.5	Nearest to project site	
GW3	Village Barakar	S	4.5	Densely populated and near to river site	

Code	Name of the Station	W.R.T. Site Remarks		Justification	Remarks
		Direction	Distance in Km		
GW4	VillageNarayan Chak	S	8.4	Less populated and near to river site	
GW5	Village Banshkatiya	N	2.6	Less Populated	
GW6	Village Haipara	N	8.2	Less Populated	
GW7	Village Khudka	SE	5.4	Less Populated and near to railway track	
GW8	Village Palhari	NW	7.5	Near to water resource and dense mixed jungle	
SW1	Near Maithon Colony	NW	1.7	Less Populated	Surface waters
SW2	Near Rakta	S	9.9	Less Populated	
SW3	Near Toli Chanch	SW	9.4	Less Populated	

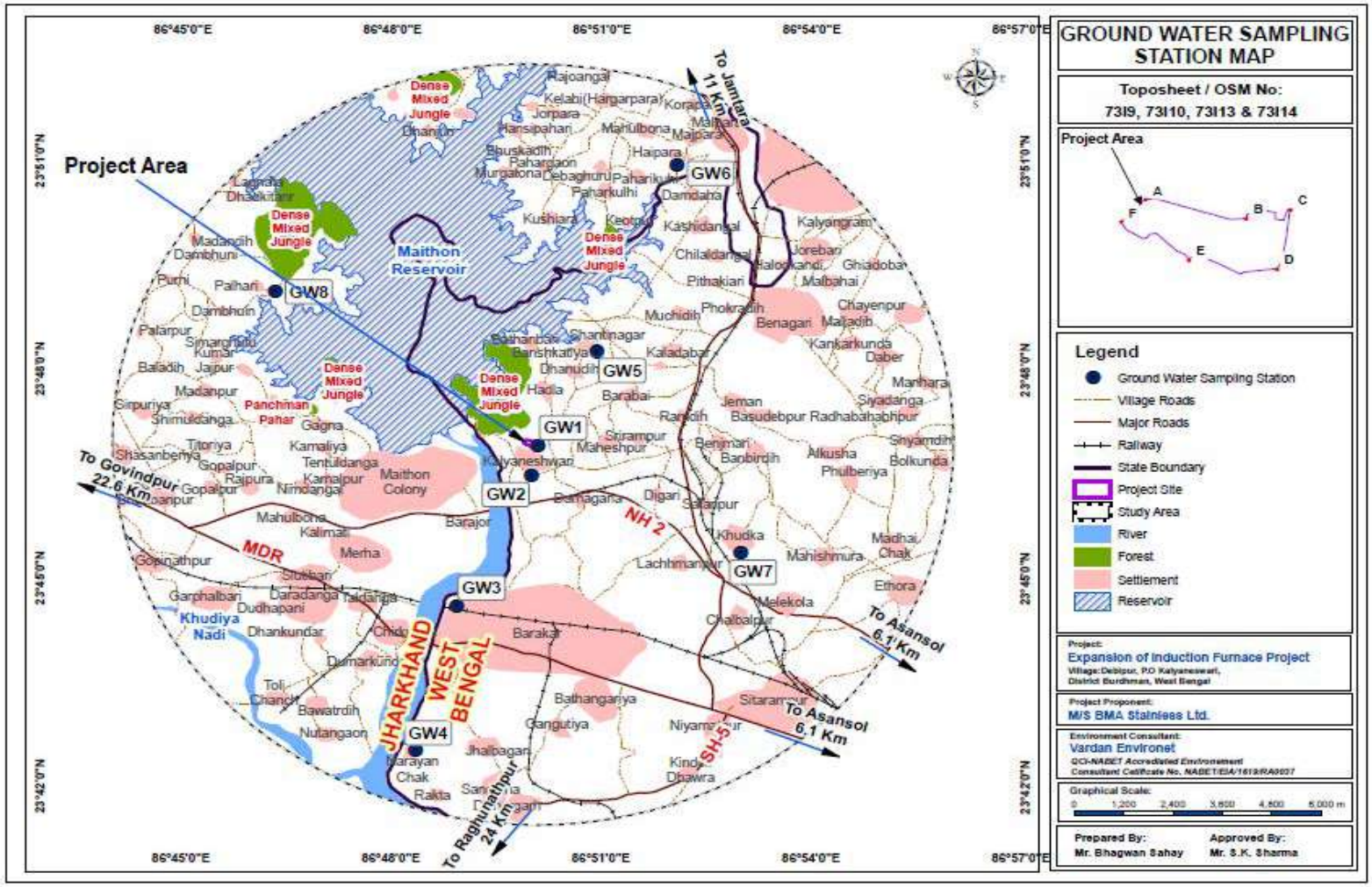
Table 3.11: Water Analysis Result (Ground Water)

S.No	Parameter	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8	Desirable Limit	Permissible Limit
1.	pH (at 25 ^{0}C)	6.89	6.86	7.57	7.56	7.98	8.13	7.45	7.60	6.5 to 8.5	No Relaxation
2.	Colour (Hazen)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	5	15
3.	Turbidity (NTU)	<1	<1	<1	<1	<1	<1	<1	<1	1	5
4.	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5.	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$ (mg/L)	278.50	270.09	308.60	210.07	247.16	317.83	326.53	239.08	200	600
7.	Calcium as Ca (mg/L)	74.08	83.50	92.50	48.70	59.03	84.10	86.03	46.55	75	200
8.	Alkalinity as $CaCO_3$ (mg/L)	288.00	276.00	327.00	198.00	235.00	359.00	238.00	208.00	200	600
9.	Chloride as Cl (mg/L)	68.50	63.04	87.08	71.40	112.06	87.26	92.55	59.80	250	1000
10	Cyanide as CN (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	No Relaxation
11.	Magnesium as Mg (mg/L)	22.76	15.01	18.91	21.52	24.27	26.24	27.19	29.87	30	100
12.	Total Dissolved Solids(mg/L)	448.00	456.00	542.00	408.00	469.00	553.00	452.00	387.00	500	2000
13.	Sulphate as SO_4 (mg/L)	36.8	43.11	54.00	51.22	57.10	60.50	39.05	29.55	200	400
14.	Fluoride as F (mg/L)	0.67	0.70	0.84	0.59	0.89	0.69	0.77	0.86	1.0	1.5
15.	Nitrate as NO_3(mg/L)	12.88	23.90	13.70	10.60	23.03	15.28	20.28	31.05	45	No Relaxation
16.	Iron as Fe (mg/L)	0.34	0.29	0.34	0.27	0.24	0.26	0.29	0.24	0.3	No Relaxation
17.	Aluminium as Al (mg/L)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.03	0.2
18.	Boron (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.5	1.0
19	Hexa Chromium as Cr^{+6}(mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	No Relaxation
20.	Electrical Conductivity(mS/cm)	0.748	0.765	0.906	0.685	0.784	0.926	0.756	0.648		

21.	Phenolic Compounds (mg/L)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	0.002
22.	Mineral Oil (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.5	No Relaxation
23.	Anionic Detergents as MBAS (mg/L)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.2	1.0
24.	Zinc as Zn (mg/L)	1.87	1.80	1.06	1.07	1.60	2.01	1.07	1.11	5	15
25.	Copper as Cu (mg/L)	0.37	0.28	0.27	0.22	0.09	0.76	0.11	0.70	0.05	1.5
26.	Manganese as Mn (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.1	0.3
27.	Cadmium as Cd (mg/L)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.003	No Relaxation
28.	Lead as Pb (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	No Relaxation
29.	Selenium as Se (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	No Relaxation
30.	Arsenic as As (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	No Relaxation
31.	Mercury as Hg (mg/L)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	No Relaxation
32.	Total Coliform(MPN/100ml)	<2/100ml	<2/100ml	<2/100ml	<2/100ml	<2/100ml	<2/100ml	<2/100ml	<2/100ml	-	10.00
33.	*E.coli*(MPN/100ml)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent

Table 3.12: Surface Water Quality

S. No.	Parameter	SW1	SW2	SW3
1.	pH (at 25^0C)	7.90	7.80	7.91
2.	Color	< 5	< 5	< 5
3.	Turbidity(NTU)	4.0	17.0	15.0
4.	Odour	Agreeable	Agreeable	Agreeable
5.	Total hardness as $CaCO_3$ (mg/l)	132.48	142.02	129.53
6.	Calcium as Ca (mg/l)	38.70	28.70	42.10
7.	Alkalinity as $CaCO_3$ (mg/l)	165.00	175.00	155.00
8.	Chloride as Cl (mg/l)	23.98	42.70	38.11
9.	Residual free Chlorine	< 0.20	< 0.20	< 0.20
10.	Cyanide as CN (mg/l)	<0.02	<0.02	<0.02
11.	Magnesium as Mg (mg/l)	8.73	17.11	5.95
12.	Total Dissolved Solids (mg/l)	217.00	265.00	257.00
13.	Total Suspended Solids (mg/l)	25.00	38.00	42.00
14.	Dissolved Oxygen	7.8	6.9	6.8
15.	Sulphate as SO_4 (mg/l)	9.55	18.08	21.34
16.	Fluoride as F (mg/l)	0.35	0.39	0.44
17.	BOD (3 Days at 27 0C) (mg/L)	5.00	5.20	5.80
18.	COD (mg/L)	14.75	16.90	18.22
19.	Conductivity (mS/cm)	0.364	0.445	0.431
20.	Nitrate as NO3 (mg/L)	1.26	1.08	1.79
21.	Sodium as Na (mg/L)	24	33	35
22.	Potassium as K (mg/L)	<1.0	6	4
23.	Iron as Fe (mg/L)	0.16	0.20	0.18
24.	Aluminium as Al (mg/L)	< 0.03	< 0.03	< 0.03
25.	Boron (mg/L)	<0.05	<0.05	<0.05
26.	Hexa Chromium as Cr+6 (mg/L)	<0.01	<0.01	<0.01
27.	Phenolic Compounds (mg/L)	<0.001	<0.001	<0.001
28.	Mineral Oil (mg/L)	<0.01	<0.01	<0.01
29.	Anionic Detergents as MBAS (mg/L)	<0.02	<0.02	<0.02
30.	Zinc as Zn (mg/L)	0.87	0.70	0.85
31.	Copper as Cu (mg/L)	0.09	0.19	0.08
32.	Manganeseas Mn (mg/L)	<0.10	<0.10	<0.10
33.	Cadmium as Cd (mg/L)	< 0.001	< 0.001	< 0.001
34.	Total Coliform (MPN/100 ml)	480	500	580
35.	Fecal Coliform (MPN/100 ml)	340	390	410


GROUND WATER SAMPLING STATION MAP
Toposheet / OSM No:
73I9, 73I10, 73I13 & 73I14
Project Area
Legend
Ground Water Sampling Station
Village Roads
Major Roads
Railway
State Boundary
Project Site
Study Area
River
Forest
Settlement
Reservoir
Project:
Expansion of Induction Furnace Project
Village:Debipur, P.O Kalyaneswari, District Burdhman, West Bengal
Project Proponent:
M/S BMA Stainless Ltd.
Environment Consultant:
Vardan Environet
Graphical Scale:
Prepared By:
Mr. Bhagwan Sahay
Approved By:
Mr. S.K. Sharma
Project Area
Maithon Reservoir
GW1
GW2
GW3
GW4
GW5
GW6
GW7
GW8
Dense Mixed Jungle
To Jamtara 11 Km
To Govindpur 22.6 Km
To Asansol 6.1 Km
To Asansol 6.1 Km
To Raghunathpur 24 Km
NH 2
MDR
SH5
JHARKHAND
WEST BENGAL
Khudiya Nadi
Kalyaneshwari
Maithon Colony
Barajor
Barakar
Lachhmanpur
Chalbalpur
Mahishmura
Melekola
Ethora
Madhai Chak
Khudka
Digari
Sahapur
Barhagora
Maheshpur
Srirampur
Ramdih
Jeman
Basudebpur
Radhaballabhpur
Siyadanga
Manhara
Kankarkunda
Daber
Chayenpur
Majadih
Benagari
Phokradih
Muchidih
Pithakiari
Malbahal
Ghiadoba
Jorebari
Kalyangram
Kashidangal
Damdaha
Haipara
Majpara
Mahulbona
Hansipahari
Jorpara
Kelahi(Hargarpara)
Rajoangal
Koradih
Malhara
Bhuskadih
Pahargaon
Murgabona
Debaghuru
Paharkulhi
Kushiara
Keotpur
Chilaldangal
Halokandi
Dambhuni
Madanpur
Panchmahan
Pahar
Gagna
Shimuldanga
Titoriya
Kamaliya
Tentuldanga
Karnalpur
Nimdanga
Rajpura
Gopalpur
Shasanbeniya
Sinpuriya
Baladih
Jaipur
Palarpur
Simarghutu
Kumar
Purni
Palhari
Lagnadih
Dhaskatanr
Barabai
Hadia
Dhanudih
Kaladaha
Shantinagar
Barishkatya
Sahanbak
Bolkunda
Phulberiya
Alkusha
Benimari
Banbirdih
Sinyamdih
Dhanjuri
Dhankundar
Chido
Damarkunda
Toli
Chanch
Bawatrdih
Nutangaon
Narayan Chak
Rakta
Sanchala
Dhagani
Jhalbagan
Gangutiya
Bathangariya
Niyamatpur
Sitarampur
Kindi
Dhawra
Garphalbari
Dudhapani
Daradanga
Haldanga
Merha
Sobnathpur
Mahulbona
Kalimati
Barajor
Sitalpur
Bhuskan
Chandrapur
Kanpur
Gopalpur
Dambhuni
Purni
Palhari
Madanpur
Shimuldanga
Titoriya
Shasanbeniya
Gopalpur
Rajpura
Karnalpur
Nimdanga
Maithon Colony
Kalyaneshwari

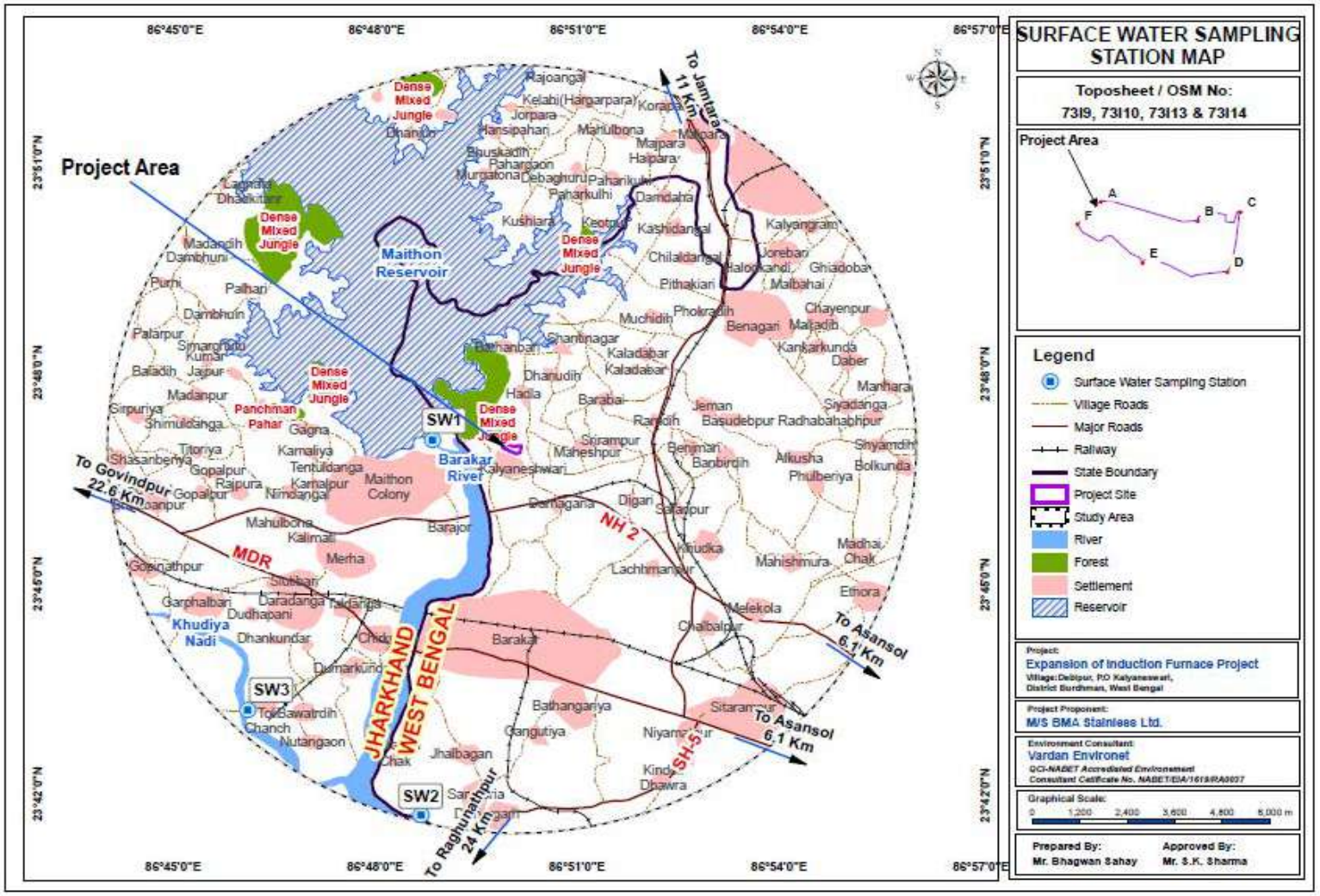


Fig 3.9: Map showing Surface Water Monitoring Locations

3.8.1 Observations

Analysis results of ground water reveal the following:

- pH varies from to 6.86 to 8.13
- Total Hardness varies from 210 to 326.53 mg/L.
- Total Dissolved Solids varies from 387 to 553 mg/L.

Analysis results of surface water reveal the following:

- pH varies from to 7.80 to 7.91
- Total Hardness varies from 129.53 to 142.02 mg/L.
- Total Dissolved Solids varies from 217 to 265 mg/L.

Interpretation on water Quality

In study area, water quality has been observed to vary considerably between the sampling locations. Mostly the parameters fall within the permissible limits of drinking water standards. Existing and proposed water requirement for the plant is met from DVC. Rain Water Harvesting Scheme shall be adopted to supplement the ground water recharge.

3.9LAND USE

3.9.1 Data Used

United States Geological Survey (USGS) Satellite Data: Landsat 8 cloud free data has been used for Land use /Land cover analysis, Satellite Sensor–OLITIRS multi-spectral digital data has been used for the preparation of land use/ land cover map of present study. Survey of India reference map on 1:50,000 scales have been used for the preparation of base map and geometric correction of satellite data. Ground truthing has been carried out to validate the interpretation accuracy and reliability of remotely sensed data, by enabling verification of the interpreted details and by supplementing with the information, which cannot be obtained directly on satellite imagery.

Methodology: The methodology used for the study consists of following components.

3.9.2 Methodology Adopted for Thematic Data Extraction from the Satellite Imageries

ERDAS image processing 10.0 software and ARC/GIS 10.0 software were used for the project. ERDAS 10.0 image processing software was used for digital processing of the spatial data. Digital image processing techniques were applied for the mapping of the land use land cover classes of the provided area from the satellite data. Methodology Used for Land use Classification and Mapping is presented in **Figure 3.12.**

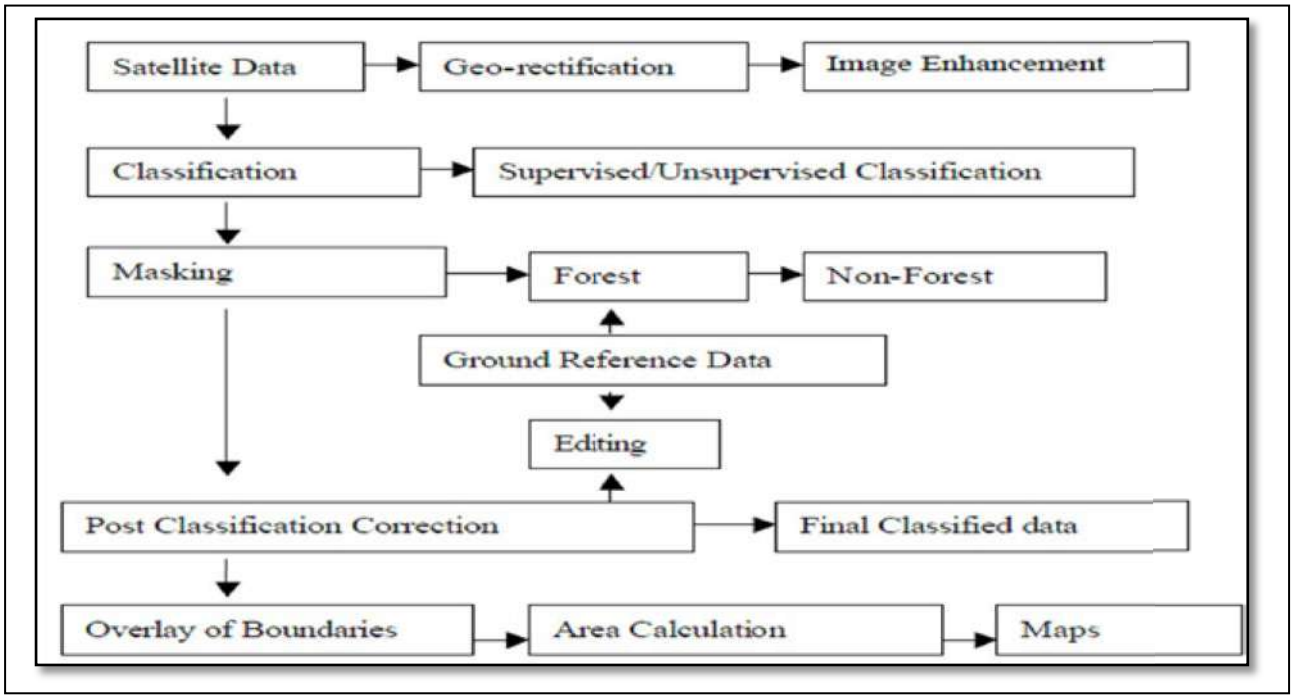


Figure 3.10: Methodology Used for Land use Classification and Mapping

Results: A standard False Color Composite (FCC) image has also been generated on the same scale (Figure 3.14).The proposed project site is located on land with scrub land use class. Results are given in Table 3.13.

Table 3.13: Land Use

Land use	Area (in Hectares)	% Area
Water body	6278.58	19
Forest land	5515.74	17
Barren land	321.39	1
Sandy area	958.14	3
Settlement	5499.26	17
Open scrub	684.18	2
Fallow land	3890.52	11
Agricultural land	9423.93	29
Total area	**32571.74**	**100**

The study area consisting 19%(6278.58Ha) water body, 17%(5515.74 Ha) forest land,1%(321.39 Ha) barren land,3%(958.14 Ha) Sandy area,17%(5499.26 Ha) Settlement,2%(684.18 Ha) Open scrub,11%(3890.52 Ha) Fallow Land,29% (9432.93 Ha) Agricultural land.

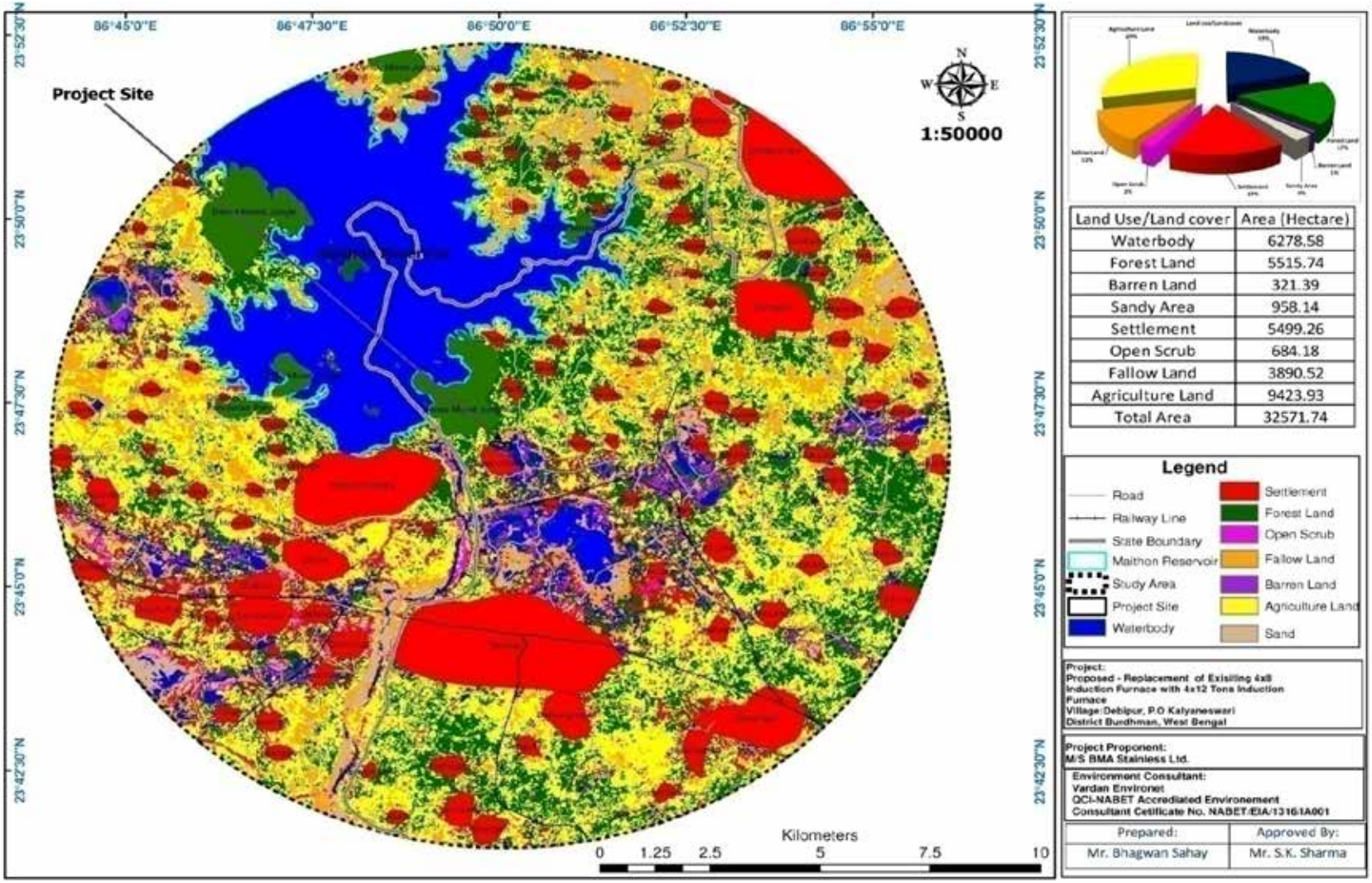


Fig 3.11: Land Use Pattern of Study area

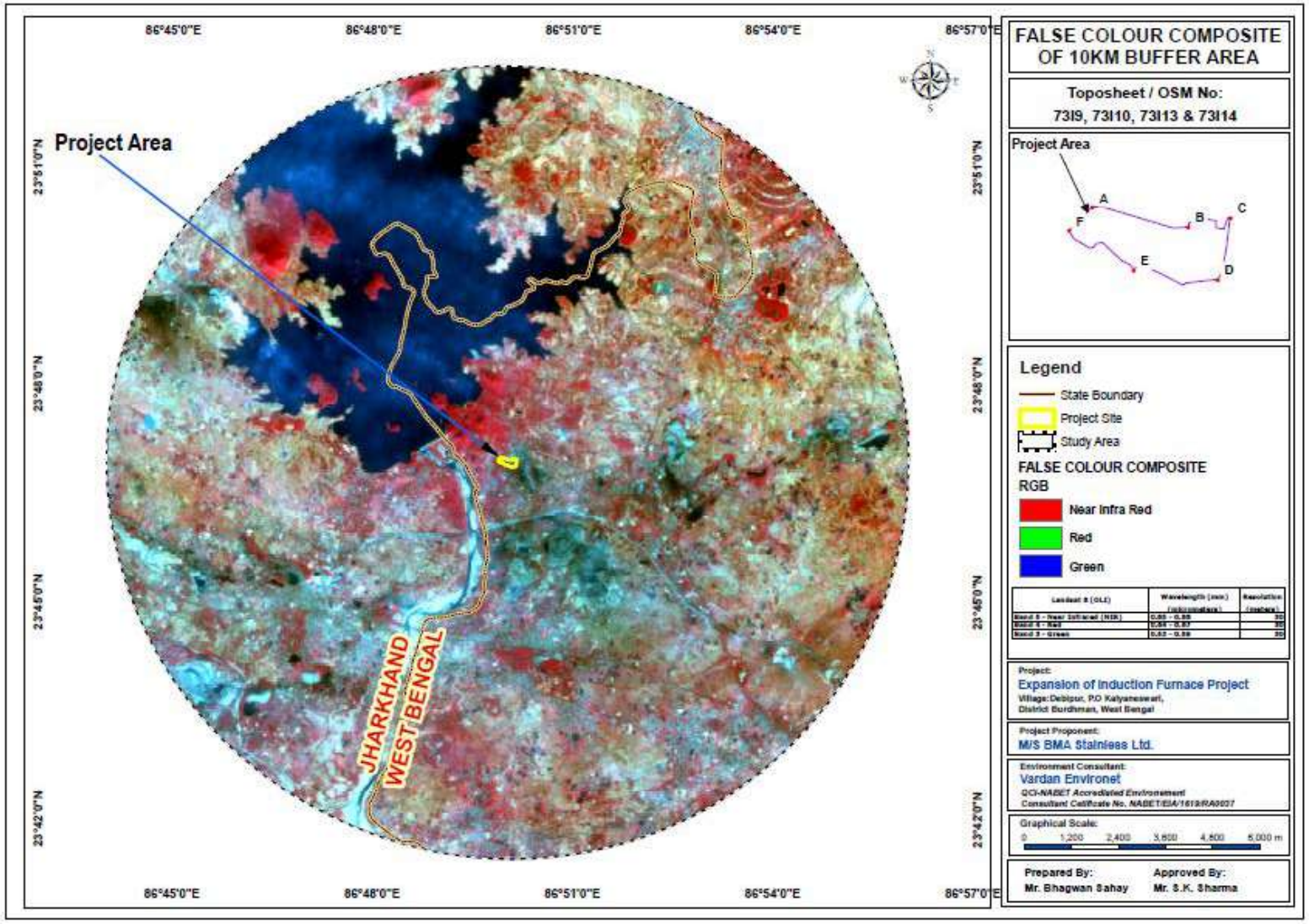


Fig 3.12: False color composite (FCC) image of study area

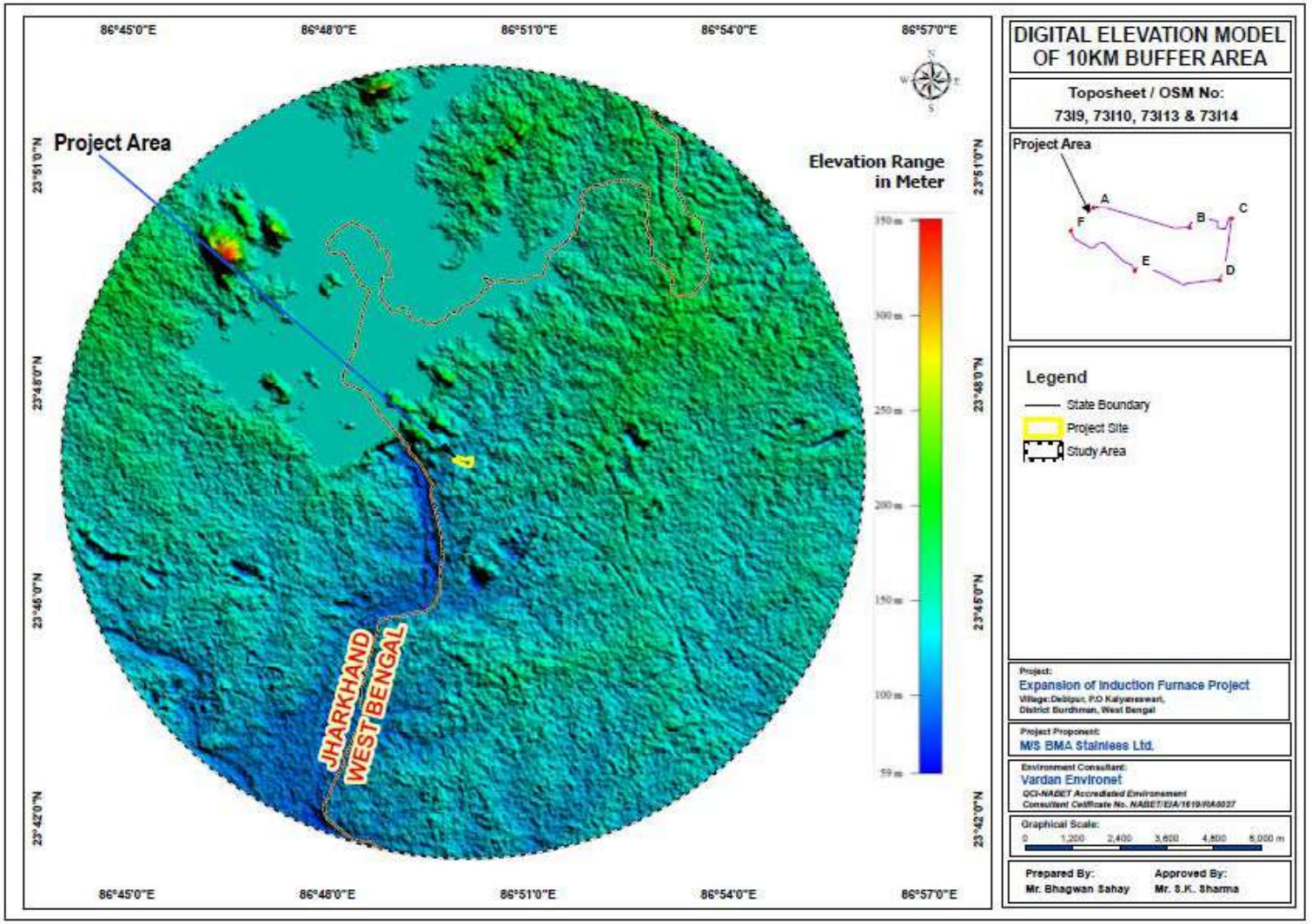


Fig 3.13: DEM map of Study area

3.10GEOLOGY

The district is covered by alluvium except in the Asansol subdivision where Gondwana rocks are exposed. The deposits which cover the immense alluvial plain of the Ganges and the Brahmaputra and there tributaries belong in part to an older alluvial formation, which is usually composed of massive argillaceous beds of a rather pale reddish-brown hue often weathering yellowish, disseminated throughout which occur kankar and pisolitic ferruginous concretions . The soil is partially laterite clay more or lessaltered and partly a red-colored course grained sand characteristic of the eastern ranges of the Vindhya formation large surfaces composed of which are to be found in the beds of Damodar and Ajay rivers.

The Gondwana system is represented in the Rajmahal hills, the Damodar valley several of the chota Nagpur district, and in Orissa,the system is divisible into an upper and lower series, characterized by marked straitigraphical discordance and an utter change in the type of the fossil,flora, cycads and conifers prevailing in the upper and equisetaceous plant in the lower subdivision, ferns being found commonly in both.

The Talcher group ,which forms the basis of the Gondwana system, consists of silty shales usually of greenish, grey and olive color weathering into minutes, thin angular fragments and of fine ,soft sandstone composed chiefly of quartz and of under decomposed pink feldspar. The most strinking features in connection with these rocks in the occurrence amongst them of usually well rounded pebbles and conglomerates ,the transport of which to their present position is ascribed to the agency of ice .the rocks of the Karharbari group consist almost solely of sandstone ,grits and conglomerates with seams of coal.

(Source:http://bardhaman.gov.in/distgazet/ch1.pdf)

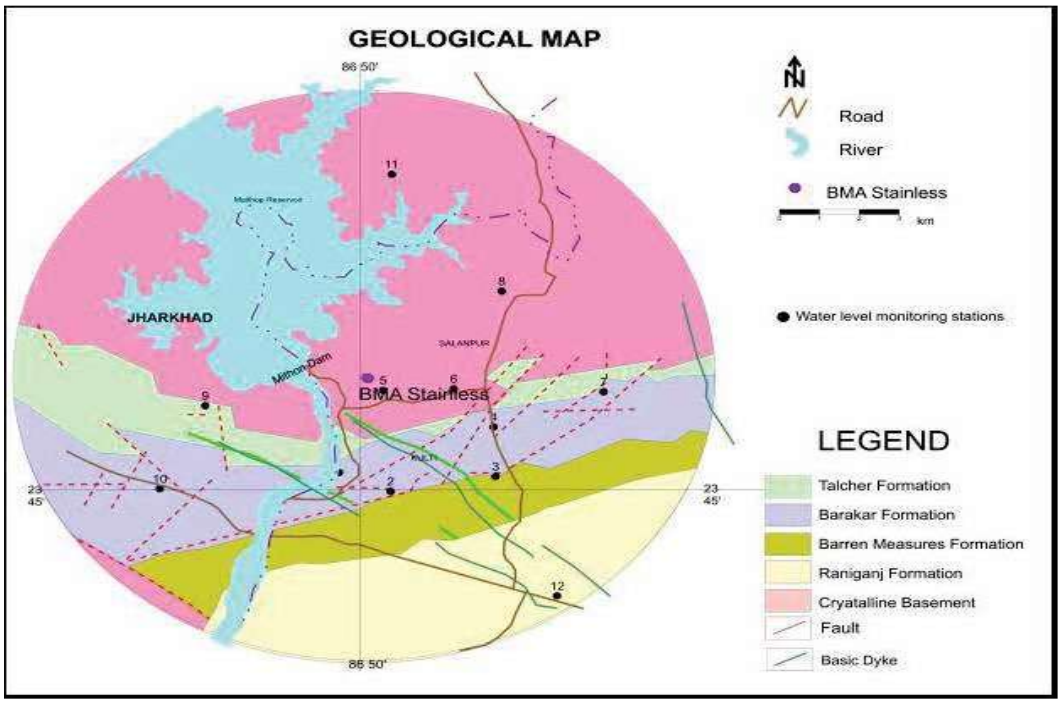


Fig.3.14: Geological Map of Burdwan District

3.11HYDROGEOLOGY

In the major part of the district ground water occurs in thick unconsolidated Quaternaries & Tertiaries deposited under fluviatile environment, the sand and/or gravel in different propositions of this formation constitute the main aquifers and they occur down to 295m bgl in the central and eastern part of the district. Deeper aquifers occur under semi-confined to confined condition. Groundwater in the western Up. Palaezoic – Mesozoic-Tertiary sequence of Gondwana Supergroup of sedimentary occurs under both unconfined and confined conditions down to 150.35mbgl.

Ground water in the extreme northwestern small part of Salanpur Block occupied by the archaeon metamorphic occurs down to a depth of about 82mbgl under both unconfined and confined condition down to 150.35m bgl. It may occur under unconfined condition in the dugwell zone and under semi confined to confined condition in the deeper horizons. Depth of water level in pre-monsoon period varies from 1.43 to 19.03 mbgl whereas that to post monsoon it is from 1.03 to 11.63 mbgl.

Aquifer Characteristic: Tube wells in the central & eastern part constructed tapping both semi confined and confined aquifers are characterized generally medium duty(50-150 m^3/hr) yield with nominal drawdown of 4-5 m Transmissivity (T) values ranges from 30.77-1700 m^2/day and the storativity ranges from $2.0x10^{-4}$ to $188x10^{-4}$. The aquifers of Gondwana sedimentaries and archaeon metamorphic show T values ranging from 40 to 50 m^2/day and Storativity value is about $14x10^{-4}$.

Source:http://www.cgwb.gov.in/District_Profile/WestBangal/Barddhaman.pdf)

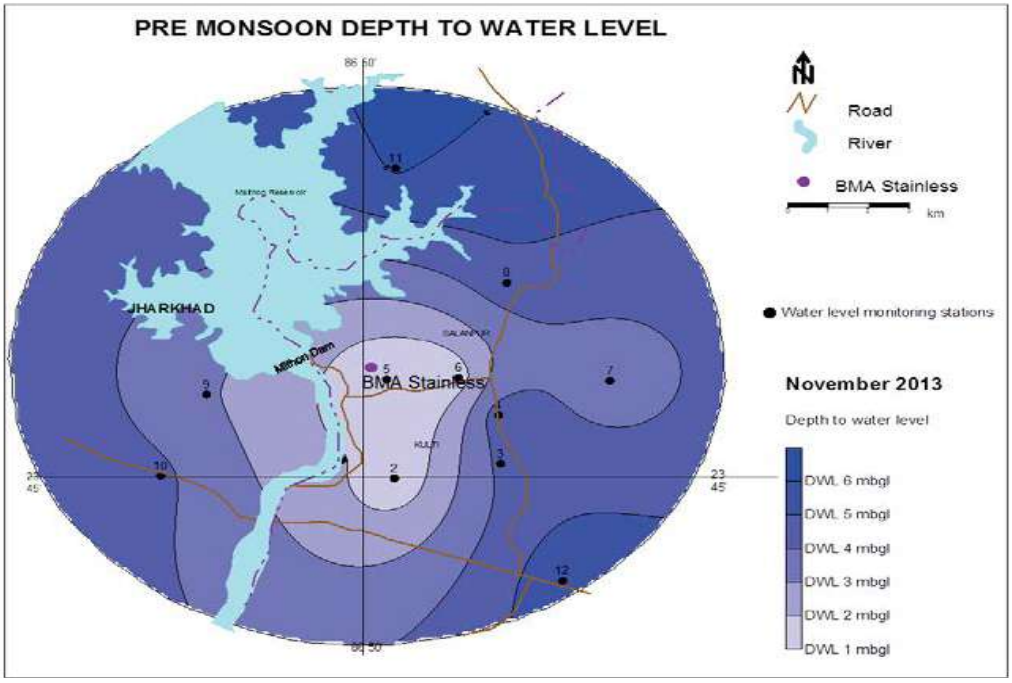


Fig 3.15: Hydrogeological map of Burdwan District

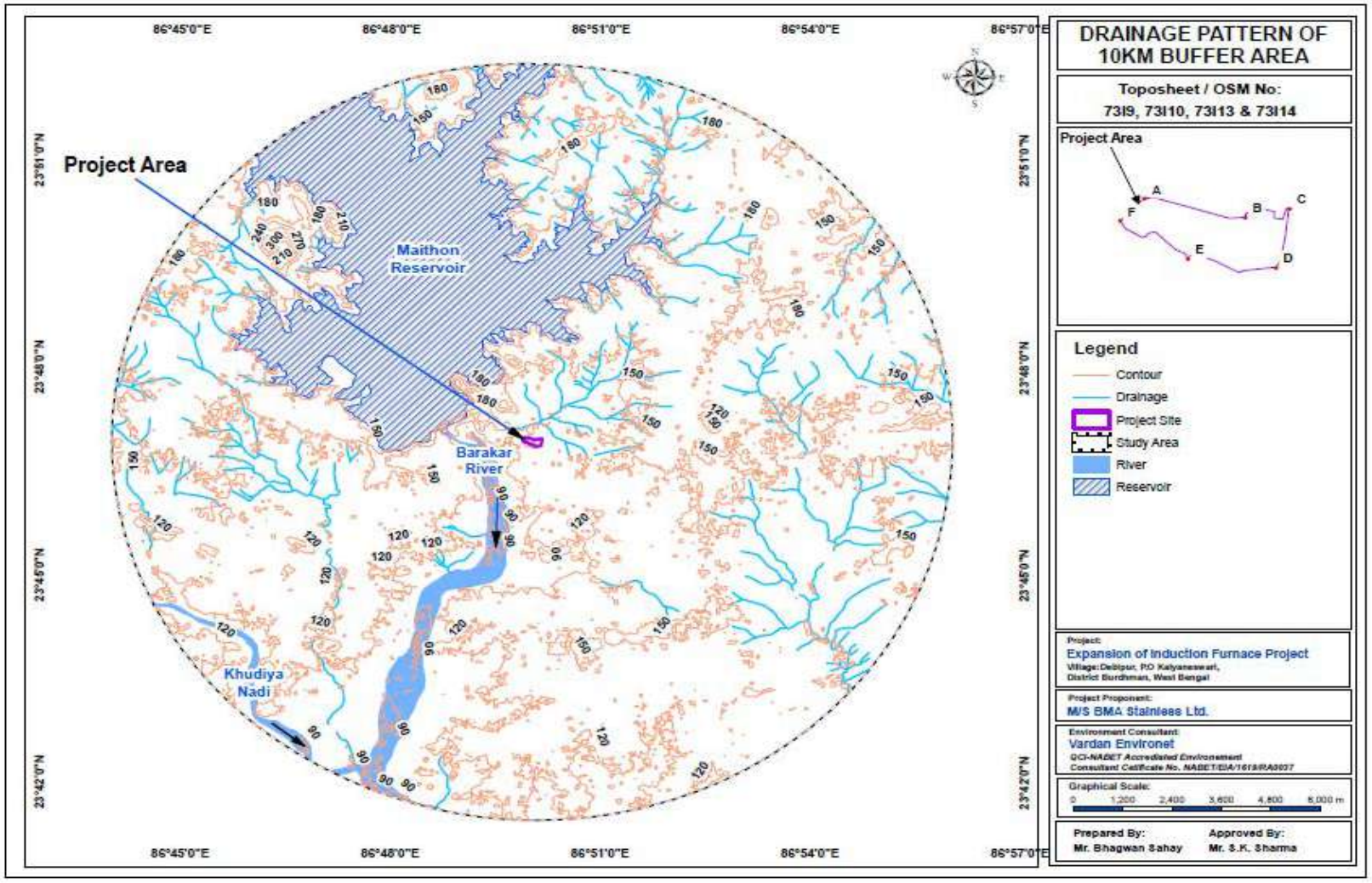


Fig 3.16: Drainage and Contour map of Study area

3.12TOPOGRAPHY

Barddhaman district with its varied tectonic elements and riverine features is a transitional zone between the Jharkhand plateau which constitutes a portion of peninsular shield in the west and Ganga-Brahamaputra alluvial plain in the north and east. In general the Jharkhand plateau consists of the metasedimentary rocks of precambrian age, Gondwana sedimentary rocks, Rajmahal basalts and upper tertiary sediments. Laterite has developed on these older rocks as well as on early Quaternary sediments. Towards south, the alluvial plain merges with Damodar-kasain-Subarnarekha deltaic plains.

The western half of the district resembles a promontory jutting out from the hill ranges of Chotonagpur plateau and consists of barren, rocky and rolling country with a laterite soil rising into rocky hillocks, the highest being 227 m. These diversify the otherwise monotonous landscape and lend a special charm to the skyline arround Asansol subdivision.

Ajoy-barakar divide is a convex plateau, the average altitude being 150 m. The gradient is westerly to the west and to the east it is northerly towards Ajay and southerly towards Damodar below the latitude. The Ajoy- Damodar inter-stream tract is made up of several stows consisting of vales and low convex spurs which run in almost all directions except north-east and thus lends a very complicated character to local relief.

(Source:http://bardhaman.gov.in/geography.html)

3.13 CLIMATE

The climate of the district is generally dry, mild and healthy. The hot weather usually last from the middle of March to the middle of the June, the rainy season from the middle of June to the middle of September, and the cold weather from middle of October to the middle of February. They do not always correspond to this limit. As a rule, the wind is from south-east in summer and from the north-west in winter.

The area is characterized by hot and humid climate. It receives adequate rainfall from southwest monsoon which sets in the latter half of June and withdraws in mid of October. The average maximum and minimum temperature is 44 and 07degree respectively.

The average rainfall of the area

Month	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	**Total**
Rainfall(mm)	23.1	13.3	21.3	37.3	115.2	250.5	371.1	297.9	268.3	44.0	0	0	**1442**

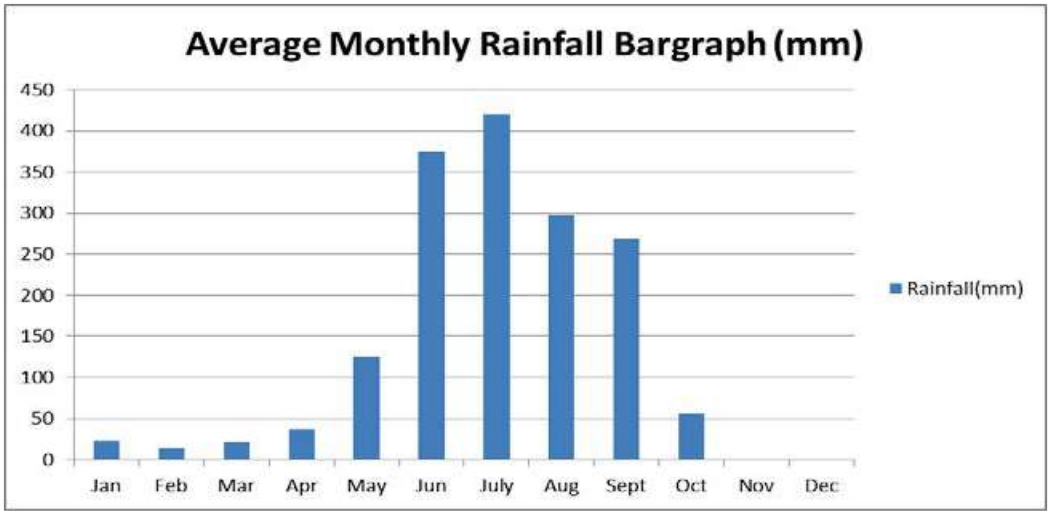


Fig 3.17: Average monthly Rainfall Bar-graph

3.14SEISMICITY

According to IS : 1893 – 1984, the study area falls in Zone-III (which can be considered as calm zone)which means that the earthquake shock in the area is expected to be of intensity of VI as per The Modified Mercalli Scale. As per this scale, intensity VI is described as "felt by all, many frightened and run outdoors; some heavy furniture moved a few instances of fallen plaster or damaged chimneys &damaged slight" but no major earthquake episode has been recorded in the study area.

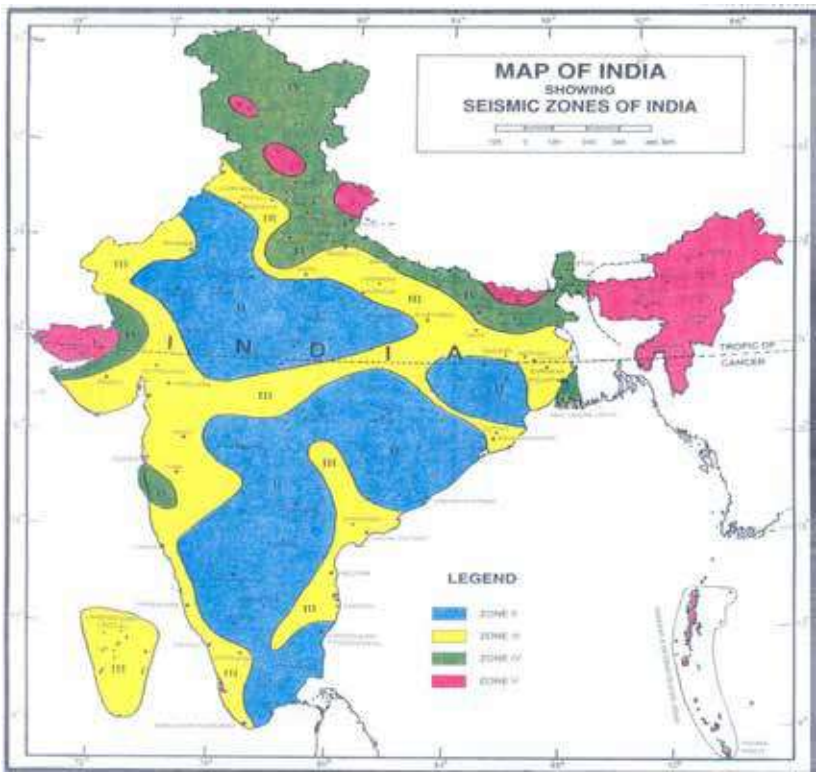


Fig 3.18: Map showing seismic zones of India

(source:http://imd.gov.in)

3.15 TRAFFIC STUDY

Traffic study measurements were performed at National Highway-2 and State Highway to assess impact on local transport infrastructure due to this proposed project. Road and highway studies are given in Table 3.14.

Table 3.14: Highway in the Study Area

Name of National/State Highway	Direction		Ratio in Percentage (%)
	Up	Down	
NH-2	Govindpur	Asaansol	60
SH-5	Jamtara	Raghunathpur	40
Total			100%

Traffic data collected continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two skilled persons were deployed simultaneously at each station during each shift- one person on each of the two directions for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Total numbers of vehicles per hour under the three categories were determined and given in Table 3.15. Existing traffic scenario is given in Table 3.16. Modified traffic scenario given in Table 3.18.

Table 3.15: No. of Vehicles per Day

S.No.	Vehicles Distribution	Number of Vehicles Distribution/Day		PCU	Total Number of Vehicle in PCU		Total Number of Vehicle(PCU)/Hour	
		NH-2	SH-5		NH-2	SH-5	NH-2	SH-5
1	**Cars**	4275	1566	1	4275	1566	178.125	65.25
2	**Buses**	1374	630	3	4122	1890	171.75	78.75
3	**Trucks**	1860	846	3	5580	2010	232.5	83.75
4	**Two wheelers**	1956	878	0.5	982.5	439	40.94	18.292
5	**Three wheelers**	992	642	0.75	744	481.5	41.33	20.062
Total		**10457**	**4562**		**15703.5**	**6386.5**	**664.645**	**266.104**

Table 3.16: Existing Traffic Scenario and LOS

Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
NH-2	665	3000	0.221	B
SH-5	266	1250	0.212	B

Note: The existing level may be “Very Good” for **NH-2 and SH-5**

V/C	LOS	Performance
0.0-0.2	A	Excellent
0.2-0.4	B	Very Good
0.4-0.6	C	Good/ Average/ Fair
0.6-0.8	D	Poor
0.8-1.0	E	Very Poor

Note: Capacity as per IRC: 64-1990

Table 3.17: During Plant Operation

S. No.	Type of Vehicle	Additional Vehicle Per day	PCU	Total Number of Vehicle in PCU/day	PCU/Hr
1	**Truck**	298	3	894	37.25
2	**2 Wheeler**	50	0.5	25	1
3	**Bus**	6	3	18	0.75
4	**Car**	30	1	30	1.25
Total				**182**	**40.25 or 40**

Basis No. of vehicle x 2 (Up and Down)

Table 3.18: Modified Traffic Scenarios and LOS

Road	Increased PCU's- State/National Highway	V	C	Modified V/C Ratio	LOS
NH-2	40x 60%= 24	665+24=689	3000	0.23	B
SH-5	40 x 40%= 16	266+16=282	1250	0.23	B

3.15.1Conclusion

The LOS value from the proposed project may be same as earlier value "Very Good" for all National and State highway. So the additional load on the carrying capacity of the concern roads is not likely to have any significant adverse effect.

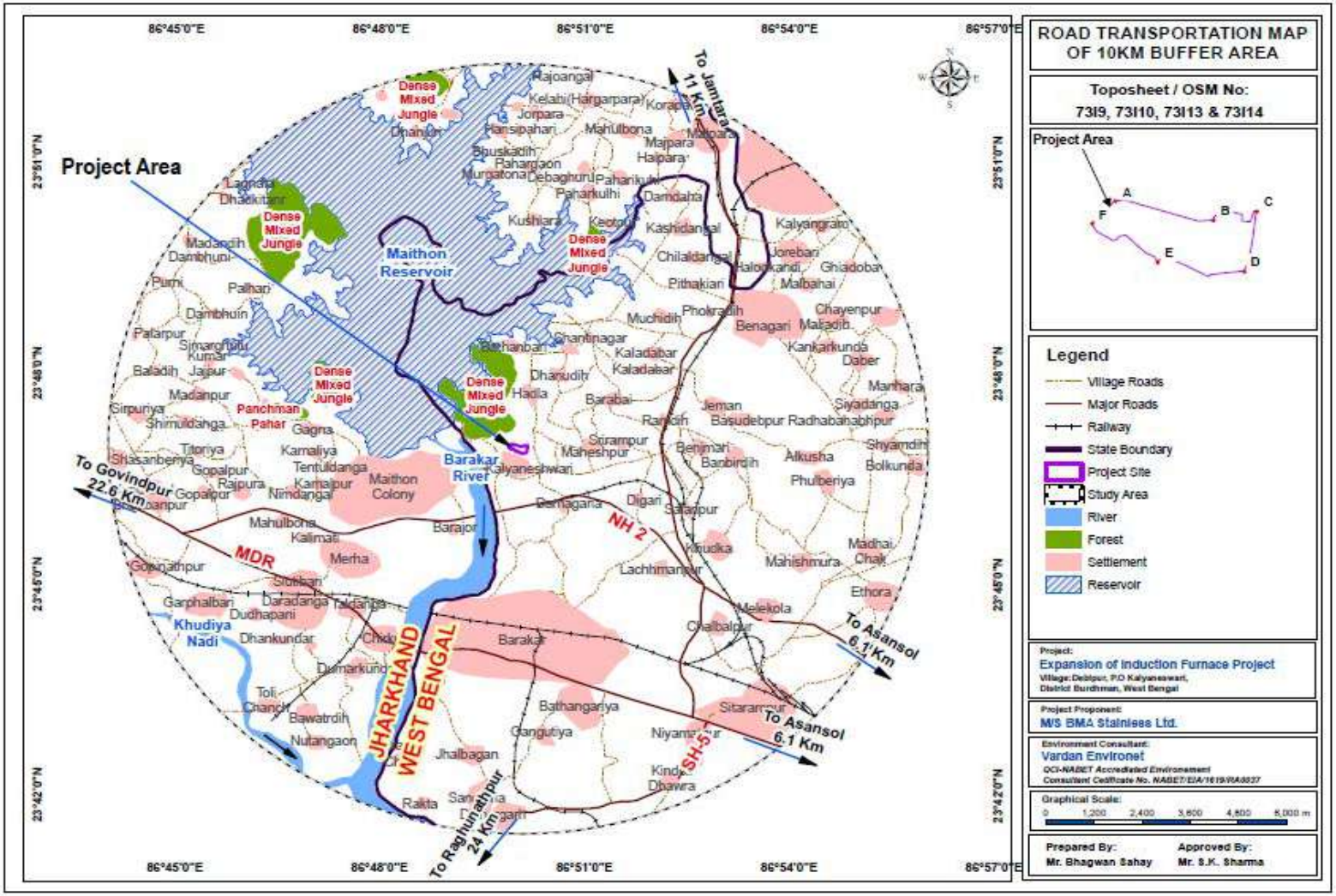


Fig 3.19: Road Transportation Map of the Project Site

3.16SOCIO-ECONOMIC ENVIRONMENT

Any developmental activity exerts a direct impact on the socio-economic environment of the region. Usually, the beneficial impacts such as better job opportunities, improved education, communication, energy, housing, health, transportation facilities etc. outweighs the adverse impacts, if any.

The study of socio-economic component of environment is incorporating various facets, viz. demographic structure, availability of basic amenities such as housing, education, health and medical services, occupation, water supply, sanitation, communication and power supply, prevailing diseases in the region as well as features such as places of tourist attraction and monuments of archaeological importance. The study of these parameters helps in identifying predicting and evaluating the likely impacts due to project activity in the surrounding region. The proposal is of M/s BMA Stainless Limited has decided to expand the capacity of the existing plant at village- Debipur, by replacement of existing 4 nos. of 8 Ton heat capacity Induction Furnaces to 4 nos. of 12 Tons / heat Induction Furnaces.

After the proposed expansion, the production capacity of the plant shall be 207,360 TPA of M S Billet / Rolled Product from the existing production of 1,20,000 TPA (as per the existing Environmental Clearance). Expansion shall take place within the existing plant area of 17.1 Acres. No additional land shall be required for the project. Baseline data such as demographic pattern, occupational status, educational, health and other amenities as existing in the study area have been studied.

3.16.1 Baseline Status

The latest available data has been complied to generate the existing socio-economic scenario of the study area. Information on socio-economic profile was collected from the Primary Census Abstract CD 2011 including the population details of the region.

a) District Profile

Barddhaman district is geographically a transition zone between the Jharkhand plateau which forms a shield in the west and the Ganga-Brahmaputra alluvial plains in the north and the east. Towards south the alluvial plains merge with Damodar-Kasain- Subarnarekha deltaic plains. Owing to its position and natural advantages the region is believed to be the seat of settled civilization from prehistoric times. As noted in the Burdwan district Gazetteer by C.K. Patterson, the country with its ever changing courses of the rivers Damodar, Ajay and Ganga, is recorded in British chronicles as the richest tract in Bengal and the area of its oldest and most settled cultivation. Burdwan is the anglicised form of Bardhaman.

Bardhaman District has an area of 7,024 km² and a population of 7717563.It is bounded on the north by Birbhum and Murshidabad districts, on the east by Nadia District, on the southeast by Hooghly District, on the southwest by Bankura and Purulia districts, and on the northwest by Dhanbad district of Jharkhand. The district has six sub-divisions: Asansol, Sadar (North), Sadar (South), Durgapur, Kalna, and Katwa.

Bardhaman is the most advanced district in West Bengal industrially and agriculturally. The eastern part is enriched by the alluvial soil of Bhagirathi River (minor stream of river Ganges) and is one of the most productive agricultural regions in West Bengal. The western part of the district, chiefly Asansol, is rich in coal and other mineral resources. This part is highly industrialized and factories based on iron and steel processing, as well as many cement factories. Durgapur, Burnpur and Kulti are in the western part of the district. It also have contains power plants at Durgapur and Dishergarh.

The Socio-Economic Status of the study areas is mentioned below and the villages surveyed are enlisted in Table3.20

b) Village

The basic unit for rural areas is the revenue village which has definite surveyed boundaries. The revenue village may comprise of one or more hamlets but the entire village is treated as one unit for presentation of data.

c) Study Area

The study area was defined as an area within 10 km radius around the proposed project site. Total 86 villages are coming within the 10 km radius of the study area. The villages are from Salanpur, Kalna–II and Galsi I of Burdhamman district of West Bengal and Nirsa-Cum-Chirkunda of Dhanbad District of Jharkhand State.

3.16.2 Demographic Structure

Demographic structure of the study area was estimated for the selected parameters as households, population, sex ratio, scheduled caste, scheduled tribes, literacy from primary census abstract, CD 2011 of West Bengal and Jharkhand State. The summarized demographic structure of the study area is presented in Table3.20, while the details of the parameters of demographic structure of the villages within 10 kms are shown in Table 3.21. The population details with the distribution of Scheduled Caste and Scheduled Tribes are shown in Fig. 3.22

a) Demographic Profile of the District

According to the 2011 census Bardhaman district has a population of 7,717,563.This gives it a ranking of 7th in India (out of a total of 640). The district has a population density of 1,100 inhabitants per square kilometre (2,800/sq mi) and Muslim population of 19.78%. Its population growth rate over the decade 2001-2011 was 12.01%.Barddhaman has a sex ratio of 943 females for every 1000 males and a literacy rate of 76.2%.

b) Demographic Profile of the Study Area

- Total number of households are about 26123
- The total area of the rural region covered in the study area is about 22669.7 hectares
- Total population of villages under the study area is 132,458 out of which having males are 68,368 (51.61%) and females are 64,090 (48.38%)
- The average family size is about 5 persons per family
- Density of population i.e the number of people living per unit of an area (e.g. per square mile); is about 501 persons per square mile in the rural area of the study area.
- Sex ratio (No. of females per 1000 males) is 943.
- Out of the total population, the population of children within the age of 0-6 age-group is about 17358 (13.10%)
- Child Sex ratio is 931 i.e number of female child per 1000 male child
- Scheduled caste population is 32383 (24.44%) and Scheduled tribes population is about 18027 i.e 13.60 %.
- Out of the total population in the region 81264 i.e 61.35 % are literates with 58.72 male literates and 41.27% female literates

It can be inferred from the data obtained that the rural area is densely populated while it is observed that the child sex ratio in both the rural is low as compared to adult female population of the study area and the district child sex ratio. The literacy level of the study area is low as compared to the district. Scheduled caste population is higher than the scheduled tribe population in the area.

3.16.3 Occupational Pattern/ Economic Resource Base

'Work' has been defined as participation in any economically productive activity. Such participation may be physical or mental. Persons on leave and under training are also treated as workers. However, rent receivers and pensioners are not treated as workers.

a) Total Workers

Occupational pattern of the villages within 10 km is presented in Table 3.22. Occupational pattern of any region mainly depends upon its economically active group i.e. the working

populations involved in different economically productive activities. The total workers further categorized as main worker, marginal and the non-working population.

The workers coming under the main and marginal workers category are cultivators, agricultural labors and those engaged in livestock, forestry, fishing, hunting, and plantations, orchards and allied activities, mining and quarrying, manufacturing, processing, servicing and repairs in household industry, construction trade and commerce, transport, storage & communication, and other services

Different types of workers in total worker population may be classified and described below while presented in Fig 3.24

b) Main Workers

Main workers are those who have worked for a major part of the year (i.e. at least six months or 183 days). Main activity of a person who was engaged in more than one activity was reckoned in terms of time disposition. 29636 (22.37%) of the total population comes under the main workers category from the villages coming in the project site.Main workers are further classified into 4 categories viz., cultivators, agricultural laborers and household workers and other main workers

c) Cultivators

For purposes of the Census a person is classified as cultivator if he or she is engaged in cultivation on land owned or held from government or held from private persons or for payment in money, kind or share. The person who is engaged either as employer, single worker or family worker in cultivation of land is recognized as a cultivator. Cultivation involves ploughing, sowing, harvesting and production of cereals and millet crops such as wheat, paddy, jowar, bajra, ragi, etc., and other crops such as sugarcane, tobacco, ground-nuts, tapioca, etc., and pulses, raw jute and kindred fiber crop, cotton, cinchona and other medicinal plants, fruit growing, vegetable growing or keeping orchards or groves, etc. Cultivation does not include the following plantation crops–tea, coffee, rubber, coconut and betel-nuts (areca).

Maximum populations in the study area are engaged as Cultivators i.e depended on agriculture. The cultivator population within the rural area is 2009 i.e 6.77%. It can be concluded from the data that the population in the villages engaged in agriculture activity is quite low.

d) Agricultural Laborers

Persons working on land owned by others for wages or share in the yield have been treated as agricultural laborers. Out of the total main worker category agricultural laborers

population in rural are about 2059 (6.94%)

e) Laborers in Household Industry

The laborers engaged in household activity are quite low in all the study area. Among the total main workers very few population are engaged in household activity i.e 448 (1.51%) in rural area

f) Other Workers

All main workers i.e. those who have been engaged in some economic activity during the last one year and who are neither cultivators nor agricultural laborers or household industry workers are classified as other main workers. The type of workers that come under this category includes factory workers, plantation workers, those in trade, commerce, business, transport, construction, political or social works, all government servants, municipal employees, teachers, priests, entertainers, artists etc. Maximum populations in the study area are engaged in other activity 25120 (84.76%)

It can be concluded that maximum population from the villages are engaged in other activities which means either in service or business activity.

g) Marginal Workers

Marginal workers are those who have worked any time in the year for less than six months or 183 days but have not worked for a major part of the year. The population of marginal workers within the rural area comprises of about 9.46%

h) Non-Workers

Non-Workers are those who have not worked any time at all in the year. Non-workers constitute householders, students, dependents, retired persons etc. The economy of the study area is primarily based on agriculture. The agriculture sector has thus absorbed a major portion of the working force.

The categories of main workers, marginal workers & non workers are complementary to each other. Therefore, in areas where the proportion of main workers & marginal workers are high, the proportion of non-workers would be naturally low. At present main workers category outweighs the marginal and non-workers in the study area.

The proportion of female main worker population is high as compared to their male worker counterpart because in general rural areas offer more opportunities for men & women to work in agriculture & animal husbandry etc. In view of the labor intensive nature of agricultural economy, a large number of women are required to participate in work especially during the peak seasons ofagricultural operations like sowing & harvesting

which are to be carried out in a short span of time covering large areas in each village. It is being observed that the 68.15% population is Non-worker.

3.16.4 Infrastructure Resource Base

The details of infrastructure resources base of the study area with reference to education, medical facility, water supply, post and telegraph, communication facility,power supply, existence of nearest town etc. are presented in Table 3.23. The significant features of these important parameters for each study area are discussed as below:

a) Educational Facility

The numbers of educational institution in the study area are primary schools (74), middle school (22), and Secondary schools (7) and 3 senior secondary schools. In some villages it is extended to high schools. For further studies people have to avail the facility from the nearest town i.e. Alladi or Asansol town place.

b) Drinking Water Facility

The numbers of major sources of drinking water in the study area are treated Tap water in 40 villages, Covered Wells (7), uncovered wells (73), 80 villages have Hand Pump facility in the study area.

c) Medical Facility

Medical institutions in rural parts of the region are inadequate, as per the data recorded in the village amenities CD there is Primary health Centre only in Kendua Tikka, Pithakiari and Ramchandrapur village of Burdhamman district. Primary health sub-centre in 13 villages, Maternal Child Welfare Centre in 1 village and Dispensaries in 12 village and mobile health clinics in 5 villages. People generally prefer private hospitals because of the inadequate and poor facilities at government hospitals.

d) Sanitation & Drainage Facility

Sanitation facility is poor in the villages of the study area. Villages only have the open drainage system available in 17 villages while the closed drainage system is available in only Harwe village

e) Communication Facility

Communication facility is available in the form of Post office is available in 4 villages and telephone connections are available in most of the villages. At the present time most of the villagers have mobile phones for communication.

f) Transportation Facility

Public Bus Service is the main mode of transportation available.

g) Approach Road

Pucca roads are available in 86 villages while Kuccha road is available in 41 villages. This shows that the approach roads are available in all the villages which makes easier to travel to long distances.

h) Power Supply

Electricity is available for domestic in 43 villages of the study area but is available for only 10-12 hours a day. Electricity is not available for agriculture and commercial purpose.

3.16.5 Economic Resource Base

Forest Cover: The forest areas of the district are chiefly in the lateritic and red soil highlands in the Aushgram PS of Sadar subdivision and in the Asansol subdivision.

In Ausgram P.S. the forest areas are interspersed with paddy fields. The Durgapur forests are continued in the Birbhum district beyond the Ajay while the forest area in the Asansol subdivision forms a part of the forest area of Dumka District of Jharkhand.

a) Soil & Cropping Pattern

Cropping pattern is defined as the combination of agricultural crops that are grown in a particular geographical area. The selection of crops and their varieties is made depending on the soil and rainfall situation in the rained area and/or irrigation facilities therein. Apart from agro-climatic conditions the selection of crop depends on institutional reasons like Governmental policy like providing incentives, supporting prices etc. Own consideration is the third most important factor. Cropping Pattern can be viewed either in terms of the area allocated for each crop, or, by the production composition in value terms for any specific area. The cropping pattern gradually changes over time with the development of agriculture. A comparative study of the proportion of area allocated to the major crops in the years 1991-92 and 2010-11 shows that rice was and remains the predominant crop in the region although there has been a shift in its variety from *Aman* and *Aus* to *Boro*.

b) Health Status

Health of the people is not only a desirable goal, but it is also an essential investment in human resources. As per the National Health Policy (1983), Primary Health Care has been accepted as main instrument for achieving this goal of development and strengthening rural health infrastructure through a three-tier system, viz., Primary Health Center (PHCs), Primary Health Subcentres (PHS) and Community Health Centers have been established to

provide health care facility not only to the resident population of the concerned villages but also to the neighboring villages.

c) Primary Health Centers

PHC is the first contact point between village community and the Medical Officer. The PHCs were envisaged to provide an integrated curative and preventive health care to the rural population with emphasis on preventive and promotive aspects of health care.

d) Primary Health Sub-Centers

Sub-Centers are assigned tasks relating to interpersonal communication in order to bring about behavioral change and provide services in relation to maternal and child health, family welfare, nutrition, immunization, diarrhea control and control of communicable diseases programmes.

e) Community Health Centre

Community Health Centre (CHCs) are being established and maintained by the State Government under MNP/BMS programme. As per minimum norms, a CHC is required to be manned by four medical specialists i.e. Surgeon, Physician, Gynecologist and Pediatrician supported by 21 paramedical and other staff.

Lack of building, shortage of manpower and inadequate provision of drug supplies are hampering the operation of these units. The standards to be met according to National Rural Health Care System are given below:

Population	Medical Facility & Infrastructure	Personnel
3000-5000	1 Sub centre (Contact Unit of PHC and Community)	1 Health Worker (Female)/Auxiliary Nurse Midwives & 1 Health Worker (Male)
20,000-30,000	1 PHC (Unit of 6 Sub-Centers)- 6 beds	Medical officers & 14 Paramedical Staff
80,000-1,20,000	Community Health Centre (Referral Unit-4 PHCs)- 30 Bedded Hospital	Medical superintendent

(*Source: National Rural Health Care System in India (2005-12)*)

During the study it was revealed that within the study area of 10 km radius there is Medical institutions in rural parts of the region are inadequate, as per the data recorded in the village amenities CD there is Primary health Centre only in Kendua Tikka, Pithakiari and Ramchandrapur village of Burdhaman district. Primary health sub-centre in 13 villages, Maternal Child Welfare Centre in 1 village and Dispensaries in 12 village and mobile health clinics in 5 villages. People generally prefer private hospitals because of the inadequate and poor facilities at government hospitals. It is attributed from the data that different

health problems are reported which could be attributed to improper sanitation, lack of health awareness among the people and lack of health related infrastructure facilities.

3.16.6 Cultural and Aesthetic Attributes

As such no culturally and aesthetically important places are located within the 10 kms radius of the study area.

3.16.6.1 Socio-economic Survey

In order to access and evaluate likely impacts arising out of any development projects on socio economic environment, it is necessary to gauge the apprehensions of the people in the study areas.

3.16.6.2 Methodology applied for selection of sample & data collection

The methodology which is applied for primary source of data collection i.e. gathering data through field survey for socio-economic environment is depicted below:

a) Sampling Method

A judgmental and purposive sampling method was used for choosing respondents of various sections of the society i.e. Sarpanch, adult males and females, teachers, medical practitioners, businessmen, agriculture laborers, unemployed group etc. Judgmental and purposive sampling method includes the right cases from the total population that helps to fulfill the purpose of research needs.

b) Data Collection Method

For the process of data collection through primary source certain methods are used among that are:

3.16.6.3 Field Survey and Observations

Field survey and observations is made at each sampling village and the socioeconomic status of that region is studied. Visits are made at hospitals, primary health centers and sub-centers to know the health status of the region. Various governmental organizations such as statistical department, department of census operations are visited to collect the population details of that region.

a) Interview Method

Structured interview method is used to collect data regarding the awareness and opinion from the samples selected of the various socio- economic sections of the community. Structured interviews involve the use of a set of predicted project questions that includes fixed and alternative questions. The questionnaire mainly highlights the parameters such

as income, employment and working conditions, housing, food, water supply, sanitation, health, energy, transportation and communication, education, environment and pollution to assess the standard of living of that particular region and general awareness, opinion and expectation of the respondents about the proposed project. Interview method helps to collect more correct and accurate information as the interviewer is present during the field survey. Socio-economic survey was conducted in the villages within the study areas located in all directions with reference to the clusters. 7 villages were surveyed from study area. The respondents were asked for their awareness / opinion about the existing masonary stone quarry and also of their opinion about the impacts of the masonary stone quarry which are an important aspect of socio-economic environment, viz. job opportunities, education, health care, housing, transportation facility and economic status.

The salient observations recorded during socio economic survey in the study areas are depicted below

- Livelihood of the villagers is primarily based on agriculture sector. Majority of main workforce are engaged as cultivators or agriculture laborers in others agricultural land.
- Majority of workers are practicing farming activities without any irrigation source, it means that area under irrigation is very low and maximum area is covered by unirrigated land
- Most of the villages have Primary School (PS) while in some villages it is extended up to Middle School (MS). While for further education villagers go to the town places that is to Alladi and asansol city which is about 10 kms from the project site
- The main source of drinking water supply is through hand pumps and uncovered wells while few village have treated tap water facility. But majority of respondents expressed unsatisfactory opinion regarding the availability of drinking water facility as the villages mainly have open wells which are not portable for drinking
- No Government medical facilities in the form of primary health sub- center and private medical representatives are available in the surveyed villages. Villagers expressed satisfactory opinion regarding the facilities available at the center. and health checkup camps are organized by the health center
- The nearest Railway Station is Barakar on Kolkata – Delhi route, 6.9 kms from the project site
- Two wheelers, auto rickshaws & bus facility are the main mode of transportation used by natives in the study area

- Power supply is available in mostly all the sampling villages. Street lights are also available in all villages but frequent power cut/ load shedding problem is experienced by the people in the area
- Wood, kerosene and LPG gas is a major fuel used for cooking purpose
- No Post office is available in the survey villages few have sub post offices and banking facilities is available within the villages
- Majority of surveyed population opted positive response regarding the proposed project activities as most of the local population will be given preference in employment and the activity will help in development of auxiliary as well as ancillary jobs in the region.

The following facilities are already available at the project site as it is an operational plant:

- Administration Building
- Stores
- Time and security offices
- First aid and firefighting station
- Canteen and welfare center
- Toilets and Rest rooms
- Car parks and cycle / scooter stands
- No other additional facilities are proposed

3.16.7Employment Generation due to the Project

The estimated additional direct manpower required after the proposed expansion shall be 30 in addition to the existing manpower of 210, comprising administrative, technical, non-technical, skilled and unskilled workforce. The total requirement of manpower in the plant will be available without much difficulty as the area has industrial exposure in Iron & steel sector. However, specialized training for operation and maintenance will have to be given to selected candidates well in advance before commissioning of the plant. In addition to this there shall be indirect requirement of manpower in transportation sector for transportation of raw material. Development of nearby industries also envisaged for supply of additional requirement of Sponge Iron and Pig Iron.

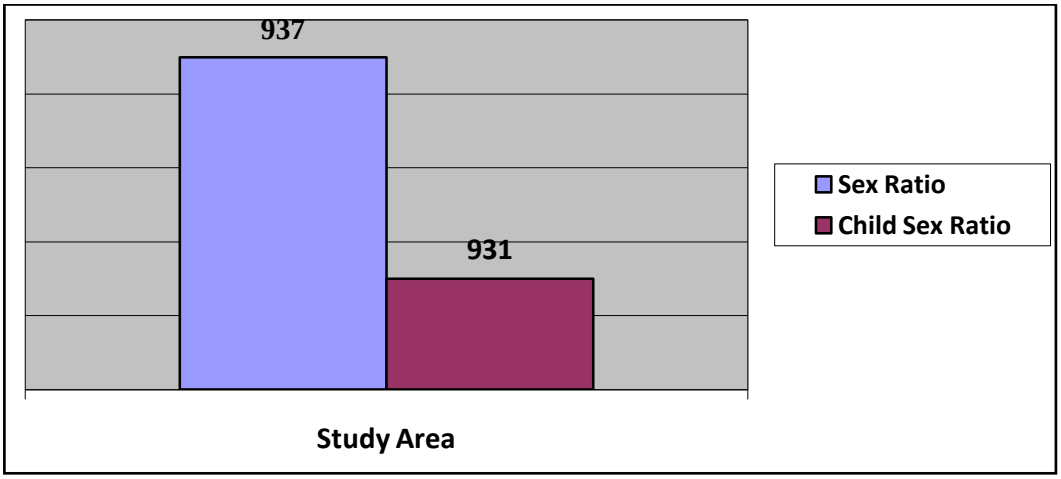


Fig 3.20: Bar diagram representing the ratio of population in the study area

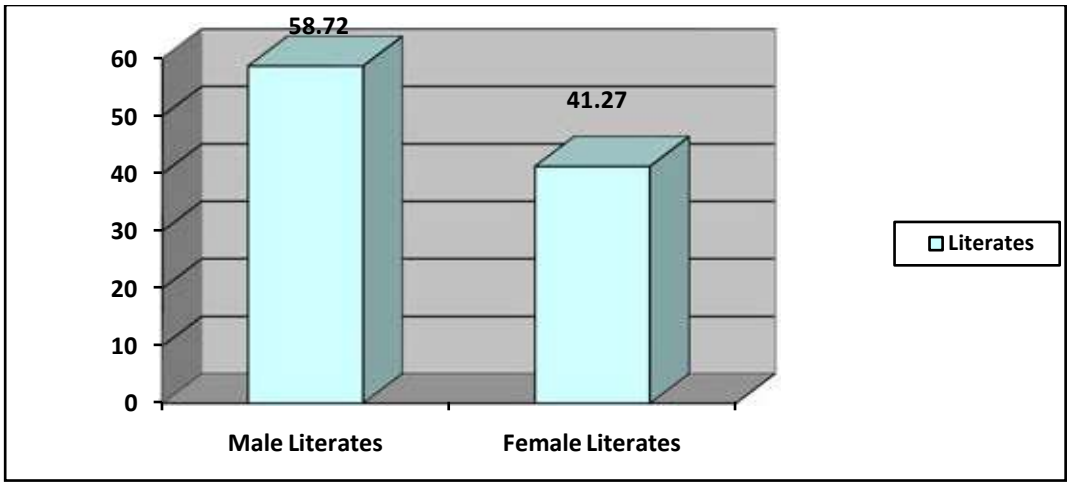


Fig 3.21. Literacy rate of the study are

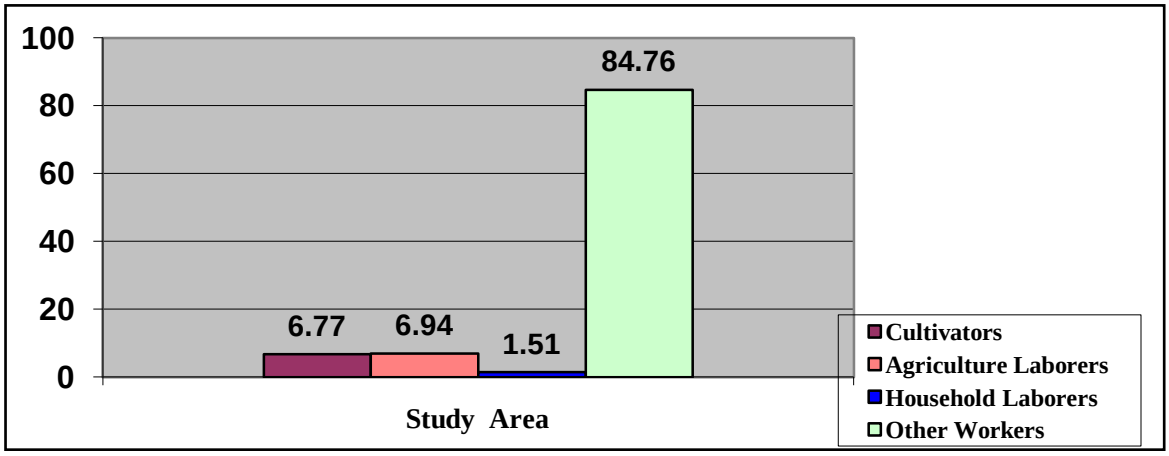


Fig.3.22: Occupational pattern of the study area

Table 3.19: List of the villages for field survey of socio-economic environment

S. No.	Villages	Direction from the Project Site
1.	Maithon	W
2.	Hadla	N
3.	Dendua	E
4.	Kulti	S
5.	Milikhola	SE
6.	Gagna	W
7.	Chirkunda	SW

Table 3.20: Summarized demographic structure of the study area

S. No.	Parameter	Study Area
1.	No. of Villages	86
2.	Area in Hectares	11885.29
3.	Household	26123
4.	Household Ratio	5.0
5.	Total Population	132458
6.	Male Population %	68368(51.61)
7.	Female Population %	64090(48.38)
8.	Population (0-6 Years)%	17358(13.10)
9.	Sex Ratio	937
10.	Child Sex Ratio	931
11.	Scheduled Caste %	32383(24.44)
12.	Scheduled Tribes %	18027(13.60)
13.	Literates %	81264(61.35)
14.	Main Workers %	29636(22.37)
15.	Marginal Workers %	12539(9.46)
16.	Non-Workers %	90283(68.15)

(Source: PCA Census 2011, Burdhamman District, West Bengal State & Dhanbad District, Jharkhand State)

Table 3.21: Demographic structure of the study area

S. No.	Villages	Households	Total Population	Population (0-6 Years)	Scheduled Caste	Scheduled Tribes	Literates
West Bengal State							
Burdhamman District							
Salanpur Tehsil							
1.	Sarkuri	3	25	0	8	0	22
2.	Bathanbari	139	941	110	0	345	577
3.	Sidhabari	148	745	113	244	147	357
4.	Banskatia	108	553	54	0	550	275
5.	Ramchandrapur	220	1111	129	272	192	627
6.	Kalipathar	307	1513	221	0	237	933
7.	Brindabani	154	761	116	126	84	304
8.	Damdaha	191	952	121	210	243	553
9.	Dhanguri	274	1318	148	1156	82	926
10.	Pithakiari	557	2782	250	782	288	1843
11.	Majhladi	106	518	78	0	0	343
12.	Muchidi	215	1048	130	77	701	510
13.	Pratappur	147	697	73	7	346	437
14.	Alladi	473	2384	302	34	21	1604
15.	Kaladabar	244	1206	160	121	0	717
16.	Sinsbera	139	749	114	122	0	307
17.	Ramdi	309	1712	219	235	45	1198
18.	Dendua	441	2297	272	338	16	1606
19.	Barabai	228	1259	177	0	1072	659
20.	Dhanudi	65	417	70	0	0	234
21.	Hadla	524	2479	328	182	300	1696
22.	Maheshpur	195	1184	170	268	784	644
23.	Srirampur	84	505	79	0	0	189
24.	Nakrajuria	509	2746	417	912	515	1522
25.	Salanpur	885	4739	658	1711	194	2909
26.	Khudika	725	3630	385	1467	0	2376
27.	Dhundabad	220	1002	85	452	0	665
28.	Banbirdi	283	1312	151	464	0	949
29.	Basudebpur	587	3098	392	1204	17	2057
30.	Jemari	795	4321	683	2007	104	2255

S. No.	Villages	Households	Total Population	Population (0-6 Years)	Scheduled Caste	Scheduled Tribes	Literates
31.	Dhaminberia	48	261	42	261	0	65
32.	Amjharia	58	271	49	271	0	80
33.	Harishadi	507	2328	229	242	11	1840
34.	Rupnarayanpur	523	2242	179	572	20	1791
35.	Benagarya	837	3434	253	297	25	3021
36.	Kusumdanali	240	1095	114	58	146	816
37.	Ghiadoba	738	3388	289	252	1050	2417
38.	Bolkunda	326	1351	136	557	10	971
39.	Barbakpur	0	0	0	0	0	0
40.	Madhaichak	93	521	52	0	513	249
41.	Patal	187	908	100	366	0	601
42.	Mahishmura	167	941	132	0	0	577
43.	Bara Pattabara	0	0	0	0	0	0
44.	Miliakhola	323	1532	170	802	0	927
45.	Talberia	0	0	0	0	0	0
46.	Ethora	904	4547	513	1922	288	2731
Total		14226	70823	8463	17999	8346	45380
Kalna – II Tehsil							
47.	Kulti	501	2110	217	446	527	1488
48.	Galsi – I Tehsil						
49.	Kendua Tikuri	214	864	87	107	194	520
50.	Sodepur	245	1087	130	328	129	580
51.	Komarband	5	30	5	0	0	13
Total		464	1981	222	435	323	1113
Nirsa-Cum-Chirkunda							
52.	Panchmahali (CT)	913	4832	664	1145	1	2996
53.	Dumarkunda (CT)	2146	11434	1574	4083	686	6401
54.	Kalimati	369	1832	250	578	572	1022
55.	Kesharkural	239	1376	200	220	464	830
56.	Kamaliya	278	1538	249	595	389	916
57.	Puyaladi	195	977	179	0	210	518
58.	Gagna	299	1682	200	106	1146	945
59.	Bankata	0	0	0	0	0	0
60.	Dhabkol	0	0	0	0	0	0

S. No.	Villages	Households	Total Population	Population (0-6 Years)	Scheduled Caste	Scheduled Tribes	Literates
61.	Laghata	159	785	101	90	60	443
62.	Madandi	315	1374	226	0	741	743
63.	Dambhuni	244	1274	253	116	1038	649
64.	Kenjapahar Second Part	0	0	0	0	0	0
65.	Kenja Pahar Alias Butbera 1S	0	0	0	0	0	0
66.	Raghunathpur	25	157	16	0	156	68
67.	Durgapur	45	278	49	0	272	156
68.	Majhiladi	38	168	31	0	168	88
69.	Chelyagi	0	0	0	0	0	0
70.	Dulalsol	208	1118	224	288	251	334
71.	Jaspur	282	1399	206	397	223	584
72.	Madanpur	437	2739	508	260	0	1434
73.	Mahatadi	101	591	97	297	155	299
74.	Simuldanga	116	669	118	129	130	344
75.	Sasanberia	259	1335	162	86	12	929
76.	Tiltoria	313	1659	262	880	3	847
77.	Gopalpur	523	2430	217	488	212	1940
78.	Rajpura	262	1445	184	518	400	829
79.	Satkanali	32	182	32	7	12	98
80.	Hirbandh	118	570	111	0	0	210
81.	Kapasara	789	4138	559	628	164	2855
82.	Brindabanpur	816	4345	624	496	247	2719
83.	Gopinathpur	872	4609	817	1487	545	2607
84.	Morkara	370	1744	253	394	510	870
85.	Josnadi	43	212	20	99	20	128
86.	Junkudar	126	652	70	116	44	481
Total		**10932**	**57544**	**8456**	**13503**	**8831**	**33283**
Grand Total		**26123**	**132458**	**17358**	**32383**	**18027**	**81264**

Source: PCA Census 2011, Burdhamman District, West Bengal State & Dhanbad District, Jharkhand State

Table 3.22: Occupational Structure of the Study Area

S.No.	Villages	Total Main Workers	Main Workers				Marginal Workers	Non-Workers
			Cultivators	Agricultural Laborers	Household Laborers	Other Workers		
Burdhamman District								
Salanpur Tehsil								
1.	Sarkuri	5	0	0	0	5	4	16
2.	Bathanbari	185	2	1	5	177	95	661
3.	Sidhabari	186	17	1	8	160	17	542
4.	Banskatia	2	2	0	0	0	66	485
5.	Ramchandrapur	166	5	0	5	156	143	802
6.	Kalipathar	282	6	3	2	271	174	1057
7.	Brindabani	239	1	0	13	225	5	517
8.	Damdaha	206	13	1	3	189	126	620
9.	Dhanguri	367	15	46	1	305	66	885
10.	Pithakiari	587	25	38	5	519	187	2008
11.	Majhladi	145	8	106	0	31	4	369
12.	Muchidi	285	23	4	11	247	69	694
13.	Pratappur	193	2	5	5	181	11	493
14.	Alladi	633	43	10	15	565	99	1652
15.	Kaladabar	286	14	1	19	252	102	818
16.	Sinsbera	206	5	2	0	199	2	541
17.	Ramdi	250	9	1	4	236	283	1179
18.	Dendua	686	5	47	0	634	35	1576
19.	Barabai	378	141	11	5	221	225	656
20.	Dhanudi	10	0	0	0	10	100	307
21.	Hadla	461	4	2	3	452	281	1737
22.	Maheshpur	329	4	158	1	166	92	763
23.	Srirampur	51	1	0	1	49	94	360
24.	Nakrajuria	472	2	0	5	465	383	1891
25.	Salanpur	1147	30	16	16	1085	320	3272
26.	Khudika	984	71	43	10	860	238	2408
27.	Dhundabad	217	1	2	2	212	94	691
28.	Banbirdi	397	29	4	8	356	85	830
29.	Basudebpur	503	40	37	15	411	356	2239
30.	Jemari	1024	14	12	5	993	205	3092
31.	Dhaminberia	61	0	0	0	61	14	186
32.	Amjharia	74	0	0	0	74	18	179
33.	Harishadi	708	23	0	1	684	59	1561
34.	Rupnarayanpur	635	5	1	5	624	56	1551
35.	Benagarya	1019	12	0	8	999	39	2376

S.No.	Villages	Total Main Workers	Main Workers				Marginal Workers	Non-Workers
			Cultivators	Agricultural Laborers	Household Laborers	Other Workers		
36.	Kusumdanali	159	7	0	5	147	201	735
37.	Ghiadoba	651	23	5	103	520	530	2207
38.	Bolkunda	318	7	0	1	310	132	901
39.	Barbakpur	0	0	0	0	0	0	0
40.	Madhaichak	192	46	1	0	145	10	319
41.	Patal	167	43	9	3	112	138	603
42.	Mahishmura	37	1	0	0	36	265	639
43.	Bara Pattabara	0	0	0	0	0	0	0
44.	Miliakhola	246	9	11	6	220	215	1071
45.	Talberia	0	0	0	0	0	0	0
46.	Ethora	851	107	126	18	600	697	2999
Total		**16000**	**815**	**704**	**317**	**14164**	**6335**	**48488**
Kalna-II Tehsil								
47.	Kulti	799	60	391	9	339	88	1223
48.	Galsi – I							
49.	Kendua Tikuri	174	63	73	3	35	190	500
50.	Sodepur	72	48	6	0	18	514	501
51.	Komarband	0	0	0	0	0	13	17
Total		**246**	**111**	**79**	**3**	**53**	**717**	**1018**
Nirsa-Cum-Chirkunda								
52.	Panchmahali (CT)	1421	6	21	5	1389	51	3360
53.	Dumarkunda (CT)	2749	350	145	8	2246	494	8191
54.	Kalimati	514	26	3	4	481	20	1298
55.	Kesharkural	310	11	144	7	148	245	821
56.	Kamaliya	312	40	5	5	262	194	1032
57.	Puyaladi	171	2	13	2	154	124	682
58.	Gagna	489	2	10	2	475	168	1025
59.	Bankata	0	0	0	0	0	0	0
60.	Dhabkol	0	0	0	0	0	0	0
61.	Laghata	151	38	3	3	107	142	492
62.	Madandi	363	6	78	1	278	28	983
63.	Dambhuni	319	28	1	6	284	137	818
64.	Kenjapahar Second Part	0	0	0	0	0	0	0
65.	Kenja Pahar Alias Butbera 1S	0	0	0	0	0	0	0
66.	Raghunathpur	86	26	15	0	45	6	65

S.No.	Villages	Total Main Workers	Main Workers				Marginal Workers	Non-Workers
			Cultivators	Agricultural Laborers	Household Laborers	Other Workers		
67.	Durgapur	147	18	53	3	73	14	117
68.	Majhiladi	97	4	41	0	52	3	68
69.	Chelyagi	0	0	0	0	0	0	0
70.	Dulalsol	344	136	114	0	94	61	713
71.	Jaspur	210	37	26	2	145	414	775
72.	Madanpur	498	75	77	8	338	443	1798
73.	Mahatadi	21	0	1	0	20	176	394
74.	Simuldanga	51	13	8	0	30	151	467
75.	Sasanberia	326	116	10	5	195	81	928
76.	Tiltoria	216	0	0	0	216	337	1106
77.	Gopalpur	486	6	4	12	464	195	1749
78.	Rajpura	101	5	23	2	71	344	1000
79.	Satkanali	51	0	1	0	50	6	125
80.	Hirbandh	5	0	0	0	5	144	421
81.	Kapasara	714	24	3	9	678	412	3012
82.	Brindabanpur	1067	7	6	14	1040	197	3081
83.	Gopinathpur	1005	42	77	20	866	476	3128
84.	Morkara	253	4	2	1	246	261	1230
85.	Josnadi	30	0	0	0	30	15	167
86.	Junkudar	84	1	1	0	82	60	508
Total		**12591**	**1023**	**885**	**119**	**10564**	**5399**	**39554**
Grand Total		**29636**	**2009**	**2059**	**448**	**25120**	**12539**	**90283**

Source: PCA Census 2011, Burdhamman District, West Bengal State & Dhanbad District, Jharkhand State

Table 3.23:Infrastructure resource base of the study area

Sl.No.	Amenities	Availability in Number
1.	Education Facility	P(74),M(22), S(7), Ssc(3)
2.	Medical Facility	PHC(3), PHS(13),MCW(1), D(12).MHC(5)
3.	Drinking Water Facility	T (40) , CW(7),UCW(73) HP(60)
4.	Drainage Facility	OD(41)
5.	Communication Facility	PO(4)

(Source: Village amenities 2011, West Bengal and Jharkhand State)

Table 3.24:Abbreviations

Educational Institutions			Medical Facilities			Drinking Water Supply			Communication		
P	:	Primary School	PHC	:	Primary health Centre	T	:	Tap Water	PO	:	Post Office
M	:	Middle School	PHS	:	Primary health sub centre	CW	:	Covered Well Water	PH	:	Phone connections
S	:	Secondary School	D	:	Dispensary	UCW	:	Uncovered Well Water	Drainage Facility		
						HP	:	Hand pump	OD	:	Open Drainage
									CD	:	Covered Drainage
Power Supply			Approach Road			Transportation					
ED	:	Electricity for domestic purpose	PR	:	Pucca Road	BS	:	Bus			
			KR	:	Kuccha road	RS	:	Railway Station			

3.17 ECOLOGY AND BIODIVERSITY

Study of biological environment is one of the important aspects for the Environmental Impact Assessment, in view of the need for conservation of Environmental quality and biodiversity of particular geographical area. Ecological systems show complex interrelationship between biotic and abiotic components including dependence, competition and mutualism. Biotic components comprises of plant (Flora) and animal (Fauna) communities which interact not only within and between themselves but also with the Abiotic components viz. Physical and Chemical; components of the surrounding environment.

The animal and plant communities exist in their natural habitats in well-organized manner. Their natural settings can be disturbed by any externally induced anthropological activities or by naturally induced calamities or disaster. So, once this setting is disturbed, it becomes practically impossible or takes a longer time to come to its original state. Plants and animals are more susceptible to environmental stress. Change in the composition of biotic

communities reflected by changing in the distribution pattern of natural species of existing flora and fauna of an ecosystem. The sensitivity of animal and plant species to the changes occurring in their existing ecosystem can therefore, be used for monitoring Environmental Impact Assessment studies of any project

3.17.1 Objectives of Biological Studies:

The main objectives of biological study were:

- To collect the baseline data for the study along with a description of the existing terrestrial and aquatic biodiversity.
- To assess the scheduled species in the proposed site (rare, endangered, critically endangered, endemic and vulnerable).
- To identify the locations and features of ecological significance.
- To identify the Impacts of proposed project before, after and during development phase.

Table: 3.25: Mode of data collection and parameters considered during the Survey

S. No.	Aspect	Data	Mode of Data collection	Parameters monitored	Remarks
1.	Terrestrial Biodiversity	Primary data collection	By field survey	Floral and Faunal diversity	**For Floral Diversity:** Random survey, sapling survey/forest inventory, walking transect, collection and identification with the help of relevant literature. **For Faunal Diversity:** direct and indirect sampling, walking transect, point sampling and nest sampling etc.
2.		Secondary data collection	From authentic sources like Forests department of Haryana and available published literatures from ZSI, BSI etc.	Floral and Faunal diversity and study of vegetation, forest type, importance etc.	Data collected from the working plan of the region, forest types from the authentic literature of Champion & Seth.
3.	Aquatic Biodiversity	Primary data	By field survey	Floral and Faunal diversity	**For Plankton Study-** Lackey's drops method and light microscope **For other aquatic-**Random survey, opportunistic

S. No.	Aspect	Data	Mode of Data collection	Parameters monitored	Remarks
					observations
4.		Secondary data collection	From authentic sources like Forests department of Haryana.	Floral and Faunal diversity and study of vegetation, forest type, importance etc.	Desktop literature review to identify the representative spectrum of threatened species, population and ecological communities.

3.17.2 Methodology for Floral Diversity

The present study on the floral assessment for the project activity is based on field survey of the area. By the following forest inventory methodology; the survey of biological parameters has been conducted within the core zone and buffer zone (10 km radial distance) from project site at Village: Debipur P.O: Kalyaneshwari, District: Burdwan, West Bengal, in accordance with the guidelines issued by the Ministry of Environment, Forests and Climate Change, CPCB, and SPCB during the study period (October 2016 to December 2016).

A preliminary survey of the study area has been performed to get a general picture of the landscapes in vegetation. Traverses have been taken within different zone of the study area to note major vegetation patterns and plant communities including their growth form and dominant species. A forest inventory is **"an attempt to describe the quantity and quality of forest trees and many of the characteristics of the land area upon which the trees are grown."** The objective this floral inventory of the study area, is to provide complete checklist of floristic structure within the core zone and buffer zone (10 km radial distance) from project site for formulating effective management and conservation measures.

3.17.3 Floristic Composition of Study Area:

The terrestrial flora of the study area i.e. core zone and buffer zone (10 km radial distance) from the project site could be categorized as agriculture vegetation, social forestry plantation, Agro-forestry plantation, greenbelts developed by existing industries and natural/forest vegetation.

A. Agricultural Crops:

To a certain extent most of the agriculture activity is confined to southwest monsoon period of July to October. Agriculture crops of the study area consist mainly: Rice (*Oryza sativa*) and Maize (*Zea mays*) were grown during rainy season. The vegetables such as Brinjal (*Solanum melongena*), Bhindi (*Abelmoschus esculentus*) and Karela (*Momordica*

charantia) were cultivated in backyards and farmlands during post rainy season.

Table 3.26: Agricultural Crops of the Study Area

Crop Variety	Family	Botanical Name	Trade Name
Vegetable	Malvaceae	*Abelmoschus esculentus*	Bhindi
	Cucurbitaceae	*Coccinia indica*	Kundru
	Cucurbitaceae	*Cucurbita pepo*	Kaddu
	Cucurbitaceae	*Momordica charantia*	Karela
	Solanaceae	*Capsicum annuum*	Mirchi
	Solanaceae	*Solanum melongena*	Brinjal
	Solanaceae	*Solanum tuberosum*	Potato
	Solanaceae	*Lycopersicon lycopersicum*	Tomato
Cereals	Poaceae	*Oryza sativa*	Rice
	Poaceae	*Zea mays*	Maize
Fruits	Myrtaceae	*Psidium gujava*	Guava
	Musaceae	*Musa paradisiacal*	Banana
	Caricaceae	*Carica papaya*	Papaya
Spices	Apiaceae	*Coriandrum sativu*	Dhaniya
	Zingiberaceae	*Zingiber officinale*	Adrak

B. Plantations/Agro-forestry Species:

The plantations raised by BMA Stainless Limited and forest department in vacant lands consist Agro Forestry Species: *Mangifera indica, Madhuca longifolia, Butea monosperma, Dalbergia sissoo, Dendrocalamus strictus* etc.

Table 3.27: Agro Forestry Species of the Study Area (Core and Buffer Zone)

Botanical Name	Trade Name	Family
Delonix regia	Gulmohar	Caesalpiniaceae
Phyllanthus emblica	Awla	Euphorbiaceae
Dalbergia sisso	Shisham	Fabaceae
Azadirachta indica	Neem	Meliaceae
Artocarpus heterophyllus	Kathal	Moraceae
Bambusa arundinacea	Bamboo	Poaceae
Mangifera indica	Aam	Anacardiaceae
Annona squamosa	Sitafal	Annonaceae
Pongamia pinnata	Karanj	Euphorbiaceae
Musa paradisiacal	Banana	Musaceae
Ficus religiosa	Papal	Moraceae
Moringa oleifera	Munga	Moringaceae
Eucalyptus globules	Nilgiri	Myrtaceae
Pisidium guava	Guava	Myrtaceae
Tectona grandis	Sagwan	Verbenaceae

Botanical Name	Trade Name	Family
Dendrocalamus strictus	Lathi bans	Poaceae
Butea monosperma	Kachnar	Fabaceae
Cassia fistula	Amaltas	Fabaceae
Saraca asoca	Asok	Fabaceae

C. Grasslands:

No prominent grass land ecosystem has been found in core and buffer zone of the project. However the grass lands were mixed with natural vegetation in low lands and cultivable waste lands are now being utilized as grazing grounds to the livestock species: Sheep, Goat, Cow, Ox and Buffalo. The grass species and sedges of core and buffer zone are listed below with the natural vegetation of buffer zone.

D. Endangered Flora:

No endangered flora was recorded from core and buffer zone of the project area.

E. Endemic Flora:

No endemic plant species of trees, shrubs and herbs have been identified in the project area.

F. Natural/Forest Vegetation:

Upper layer is stratified by dominant tree species: *Aegel marmalos* (Bel); *Dalbergia sisso* (Shisham); *Azadirachta indica* (Neem); *Bauhinia racemosa* (Apta); *Bombax cieba* (Semel); *Butea monosperma* (Nut tree); *Madhuca longifolia* (Mahua tree); *Lagerstromia parviflora* (Nandi); *Tectona grandis* (Teak wood); *Zizyphus Mauritiana* (Jujube tree); and *Artrocarpus heterophylla* (Kathal).

Lower strata of shrubs occupied at ground level: *Cassia alata* (Wild Senna); *Cocculus hirsutus* (Jamiti-ki-bel); *Tinospora cordifolia* (Gulancha); *Barleria cristata* (Crested purple); *Vitex negundo* (Chaste tree); *Coccinia grandis* (Ivy gour); *Lantana camara* (Wild sage); *Ricinus communis* (Arandi); and *Hyptis suaveolens* (Wilaiyati tulasi).

The herbaceous species: *Cynodon dactylon* (Dubh); *Achyranthes aspera* (Chirchira); *Saccharum spontaneum* (Kansh); *Parthenium hysterophorus* (Congress weed); *Cassia tora* (Tarota); *Cassia fistula* (Amaltas); *Tridax procumbens* (Kamarmodi); *Panicum indicum* (Fox tail grass); *Croton bonplandianus* (Mirchini); and *Hemidesmus indicus* (Abnantmul). The status of forest flora of buffer zone is presented below:

Table 3.28: Checklist of Natural Vegetation (Buffer Zone)

Family Name	Botanical Name	Trade Name
I. UPPER LAYER-TREE FLORA		

Family Name	Botanical Name	Trade Name
Aeracaceae	*Phoenix sylvestris*	Khajur
Anacardiaceae	*Buchanania lanzan*	Chironji
Anacardiaceae	*Mangifera indica*	Aam/Mango
Anacardiaceae	*Semecarpus anacardium*	Bhelua
Anacardiaceae	*Spondias pinnata*	Wild Mango
Annonaceae	*Annona squamosa*	Sitafal
Caesalpiniaceae	*Bauhinia racemosa*	Apta
Caesalpiniaceae	*Bauhinia verigata*	Kachnar
Caesalpiniaceae	*Cassia fistula*	Amaltas
Combretaceae	*Anogeissus latifolia*	Dhaura
Combretaceae	*Terminalia arjuna*	Arjun
Combretaceae	*Terminalia tomentosa*	Asan
Loranthaceae	*Dendrophthoe falcate*	Banda
Sapotaceae	*Madhuca longifolia*	Mahua
Simaroubaceae	*Ailanthus excelsa*	Adusa
Ebenaceae	*Diospyros melanoxylon*	Tendu
Euphorbiaceae	*Cleistanthus collinus*	Garari
Euphorbiaceae	*Phyllanthus emblica*	Awla
Fabaceae	*Butea monosperma*	Palash
Fabaceae	*Dalbergia sissoo*	Shisham
Fabaceae	*Dalbergia paniculata*	Dhoban
Fabaceae	*Delonix regia*	Gulmohar
Fabaceae	*Pongamia pinnata*	Karanj
Fabaceae	*Saraca asoca*	Ashok
Poaceae	*Bambusa arundinacea*	Baans
Poaceae	*Dendrocalamus strictus*	Lathi Baans
Meliaceae	*Azadirachta indica*	Neem
Meliaceae	*Melia azedarach*	Bakain
Mimosaceae	*Acacia auriculiformis*	Babul
Mimosaceae	*Acacia nilotica*	Desi Babul
Mimosaceae	*Albizzia lebbeck*	Siris
Mimosaceae	*Albizzia procera*	Kala Siris
Moraceae	*Ficus benghalensis*	Bargad
Moraceae	*Ficus religiosa*	Papal
Moraceae	*Ficus racemosa*	Gular
Moraceae	*Ficus elastica*	Rubber Plant
Myrtaceae	*Aegle marmelos*	Bel
Myrtaceae	*Syzygium cumini*	Jamun
Rubiaceae	*Haldina cordifolia*	Haldu
Lytheraceae	*Lagerstroemia parviflora*	Lendia

Family Name	Botanical Name	Trade Name
Malvaceae	*Bombax ceiba*	Semal
Sapindaceae	*Schleichera oleosa*	Kusum
Bignoniaceae	*Stereospermum suaveolens*	Padeli
II. LOWER LAYER-SHRUB & HERBS		
Moraceae	*Ficus religiosa*	Pipal
Primulaceae	*Embelica ribes*	Vidang
Aeracaceae	*Phoenix sylvestris*	Khajur
Rubiaceae	*Catunaregam spinosa*	Mainphal
Myrtaceae	*Syzygium cumini*	Jamun
Combretaceae	*Terminalia chebula*	Bahera
Ebenaceae	*Diospyros melanoxylon*	Tendu
Poaceae	*Denderocalamus strictus*	Lathi Baans
Verbenaceae	*Calotropis procera*	Aak
Urticaceae	*Cannabis sativa*	Bhang
Achanthacea	*Adhatoda vasica*	Bansa
Amarantaceae	*Achyranthes aspera*	Chirehitta
Apocynaceae	*Carrissa occidentalis*	Karaunda
Cyperaceae	*Eriophorum Comosum*	Nakli Bhabbar
Verbenaceae	*Lantana camara*	Raimuniya
Cyperaceae	*Cyperus rotundus*	Nut grass
Rutaceae	*Murraya koenigii*	Gandhela
Apocynaceae	*Nerium indicum*	Kaner
Solanceae	*Withania somnifera*	Asgandh
Amaranthaceae	*Chinopodium album*	Bathuwa
Solanceae	*Solonum erianthum*	Aradu, Ban
Rhacnaceae	*Zizyphus nummularia*	Maltha
Gramineae	*Dendrocalamus strictus*	Bans
Apocynaceae	*Cryptolepis buchanani*	Dudhi
Leguminose	*Acacia pennata*	Agla
Sapindaceae	*Caesalpinia sepiaria*	Kainju Bel
Leguminosae	*Bauhinia vahlii*	Maljhan
Leguminosae	*Pueraria truberosa*	Sural
Araceae	*Scindapsus officianlis*	Gajpipper
Ranuculaceae	*Clematis gouriana*	Balkangu
Apocunaceae	*Vallaris solancea*	Buddhi Bel
Typhaceae	*Typha angustifolia*	Patera
Asteraceae	*Parthenium hysterophorus*	Gajar Ghas
Papaveraceae	*Argemmone maxicana*	Satyanashi
Amaranthaceae	*Amaranthus spinosa*	Kate Chawli
Euphorbiaceae	*Euphobia hirta*	Dudhi

Family Name	Botanical Name	Trade Name
Convonvulaceae	*Evolvulus alsinoides*	--
Convonvulaceae	*Ipomoea carnea*	Besharam
Fabaceae	*Tephrosia purpurea*	Nili
Asteraceae	*Tridax procumbens*	Kamarmodi
Lamiaceae	*Ocimum sanctum*	Tulsi
Malvaceae	*Sida acuta*	--
Nyctaginaceae	*Boerhavia diffusa*	Punarnawa
Caesalpiniaceae	*Cassia tora*	Panwar
III. LOWER LAYER-GRASSES		
Poaceae	*Apluda mutica*	Banjura grass
Poaceae	*Aristida hystrix*	
Poaceae	*Chloris barbata*	
Poaceae	*Cymbopogon martinii*	Tikhadi
Poaceae	*Cynodon dactylon*	Doob
Poaceae	*Dactyloctenum aegyptium*	Crow foot grass
Poaceae	*Digitaria ternata*	
Poaceae	*Eragrostiella bifaria*	
Poaceae	*Eragrostis ciliaris*	
Poaceae	*Panicum tripheron*	
Poaceae	*Sacharrum spontanium*	
Poaceae	*Apluda mutica*	Banjura grass

G. Location of National Parks / Sanctuaries

There is no Bio-sphere Reserve, National Parks, Wildlife Sanctuary, Tiger Reserve or Elephant Reserve within 10 km radius of the project site.

3.17.4 Faunal Diversity

To prepare a detailed report on the status of wildlife biodiversity within 10 km radial area around the BMA Stainless Limited at village –Debipur, P.O: Kalyaneshwari, District-Burdwan, West Bengal, to assess the impacts due to the mining activity and evolve suitable mitigation measures to protect and conserve wildlife biodiversity following components were studied:

a) Wildlife Survey (Diversity)
b) Habitat Study (Feeding, Breeding and Roosting areas)
c) Distribution/Status of Birds
d) Rare & Endangered species of Fauna
e) Specific local characteristics of biodiversity in the study area.

3.17.5 Methodology for Faunal Diversity:

A linear transect of 1.0 km each was chosen for sampling at each site. Each transect was trekked for 1.5 hr. for the sampling of faunal diversity through following methods for different categories. For the sampling of butterflies, the standard 'Pollard Walk' method was employed and all the species recorded daily. Voucher specimens of the species that could not be identified in the field were collected using a butterfly net besides photographing them.

For bird's sampling, 'Point Sampling' along the fixed transect (Foot trails) was carried out. All the species of birds were observed through a binocular and identified with the help of field guide book and photographs.

For the sampling of mammals, direct count on open width (20m) transect was used. In addition, information on recent sightings/records of mammals by the villagers/locals was also collected. For carnivores, indirect sampling was carried out and the mammals were identified by foot marks, faeces and other marks/sign created by them. In case of reptiles mainly lizards were sampled by direct count on open width transects.

The study of fauna takes substantial amount of time to understand the specific faunal characteristic of area. The assessment of fauna has been done by extensive field survey of the area. During survey, the presence of wildlife was also inhabitants depending on animal sightings and the frequency of their visits in the project area which was later confirmed from forest department, Wildlife Department etc.

Table 3.29: Checklist of Faunal Diversity (Core & Buffer Zone)

S. No.	English Name	Scientific Name	Status/Schedule
Mammals			
1.	Jackal	*Canis aureus*	Schedule-II
2.	Indian Hare	*Lepus nigricollis*	Schedule-IV
3.	Little Indian field mouse	*Mus booduga*	Schedule-V
4.	Nilgai	*Boselaphus tragocamelus*	Schedule-III
5.	Jungle Cat	*Felis catus*	Schedule-II
6.	Monkey	*Maccaca mulata*	Schedule-II
7.	Black Rat	*Rattus rattus*	Schedule-V
8.	Bat	*Rousettus leschenaultia*	Schedule-V
9.	Common Langur	*Semnopithecus entellus*	Schedule-II
10.	Common Mangoose	*Herpestes edwerdsii*	Schedule-II
11.	Five Striped Palm Squirrel	*Funambulus pennanii*	Schedule-IV
12.	Hare	*Lepus nigrigolis*	Schedule-IV
Amphibians			
1.	Indian pond frog	*Rana hexadactyla*	Schedule-IV

S. No.	English Name	Scientific Name	Status/Schedule
2.	Common Indian Toad	*Duttaphrynus melanostictus*	Not Listed
3.	Indian Bull Frog	*Hoplobatrachus tigerinus*	Schedule-IV
4.	Indian Skipper Frog	*Euphlyctis cyanophlyctis*	Schedule-IV
5.	Marble Toad	*Bufo stomaticus*	Not Listed
Reptiles			
1.	House gecko	*Hemidactylus flavivridis*	Common
2.	Common garden lizard	*Calotes versicolor*	Common
3.	Brahminy skink	*Mabuya carinata*	Common
4.	Indian Cobra	*Naja naja*	Schedule-II
5.	Rat Snake	*Ptyas mucosa*	Schedule-IV
6.	Famn Throated Lizard	*Sitana ponticeriana*	Not Listed
Butterflies			
1.	White orange tip	*Ixias marianne*	Common
2.	Lime butterfly	*Papilio demoleus*	Common
3.	Common crow	*Euploea core*	Common
4.	Common map	*Cyrestis thyodamas*	Common
5.	Common mormon	*Papilio polytes*	Common
6.	Common Grass Yellow	*Eurema hecabe*	Fairly Common
7.	Stripped Tiger	*Danaus genutia*	Common
8.	Danaid Egg Fly	*Hypolimanas misippus*	Common
9.	Common Bush Brown	*Mycalesis perseus*	Common
Aves			
1.	House Crow	*Corvus splendens*	Schedule-V
2.	Rock Pigeon	*Columba livia*	Common
3.	Gery francolin	*Francolinus pondicerianus*	Least Concern
4.	Jungle babbler	*Turoides striatus*	Schedule-IV
5.	Common Myna	*Acridotheres tristis*	Schedule-IV
6.	Green bee-eater	*Merops orientalis*	Least Concern
7.	Indian roller	*Coracias benshalensis*	Schedule-IV
8.	Black Drongo	*Dicrirus macrocercus*	Schedule-IV
9.	Little cormorant	*Microcarbo niger*	Schedule-IV
10.	Common swift	*Apus apus*	Schedule-IV
11.	House swift	*Apus affinis*	Schedule-IV
12.	Shikra	*Accipiter badius*	Schedule-IV
13.	Cattle Egret	*Bubulcus ibis*	Schedule-IV
14.	Little Egret	*Egretta garzetta*	Schedule-IV
15.	Pond heron	*Ardeola grayii*	Schedule-IV
16.	Red wattled lapwing	*Vanellus indicus*	Schedule-IV
17.	Black Ibis	*Pseudibis papillosa*	Schedule-IV
18.	Ring dove	*Streptopelia decaocto*	Schedule-IV

S. No.	English Name	Scientific Name	Status/Schedule
19.	Spotted Dove	*Streptopelia chinensis*	Schedule-IV
20.	White Breasted Kingfisher	*Halcyon smyrnensis*	Schedule-IV
21.	Blue Cheeked Bee Eater	*Merops persicus*	Schedule-IV
22.	Asian Koel	*Eudynamys scolopacea*	Schedule-IV
23.	Drongo Cuckoo	*Srniculus lugubris*	Schedule-IV
24.	Red Jungle Fowl	*Gallus sallus*	Schedule-IV
25.	White breasted water hen	*Amaurornis phoenicurus*	Schedule-IV
26.	Common Moorhen	*Gallinule chloropus*	Schedule-IV
27.	Raven	*Corvus corax*	Schedule-IV
28.	Tree Pie	*Dendrocitta vagabunda*	Schedule-IV
29.	Indian Robin	*Saxicoloides fulicata*	Schedule-IV
30.	Pied Bush Chat	*Saxicola caprata*	Schedule-IV
31.	Purple Sun Bird	*Nectarinia asiatica*	Schedule-IV
32.	Small Sun Bird	*Nectarinia minima*	Schedule-IV
33.	House Sparrow	*Passer domesticus*	Schedule-IV
34.	Grey Tit	*Parus major*	Schedule-IV
35.	Red Vented Bulbul	*Pycnonotus cafer*	Schedule-IV
36.	Bank Myna	*Acridotheres ginginianus*	Schedule-IV
37.	Common Babbler	*Turdoides caudatus*	Schedule-IV
38.	Tailor Bird	*Orthotomus sutorius*	Schedule-IV
39.	Rose Ringed Parakeet	*Psittacula krameri*	Schedule-IV
40.	Baya	*Ploceus philippinus*	Schedule-IV
41.	Owl	*Bubo bubo*	Schedule-IV
Pisces			
1.	Rohu	*Labeo rohita*	Least Concern
2.	Katla	*Catla catla*	Least Concern
3.	Calbasu	*Labeo calbasu*	Least Concern
4.	Black Fish	*Barbus chilinadea*	Least Concern
5.	Singi	*Clarias batrachus*	Least Concern
6.	hilsa	*Tenualosa ilisha*	Not Listed
7.	Chelluah	*Aspidoparia morar*	Least Concern
8.	Barna Baril	*Barilius barna*	Least Concern
9.	Chaguni	*Chagunius chagunio*	Least Concern
10.	Common Carp	*Cyprinus carpio*	Least Concern

3.17.6 Methodology for Inland Water Sampling:

The samples for qualitative and quantitative analysis of planktons were collected from the sub surface layer at knee depth. Water samples were filtered through plankton net of 20µ mesh size (APHA, 1971). The filtered samples were concentrated by using the centrifuge. By using Lackey's drops method and light microscope (Lackey, 1938), the

qualitative analysis was carried out for phytoplankton and zooplankton (Table 3.30). The standard flora and other literature were followed for the qualitative evaluation of Plankton.

Table 3.30: Phytoplankton and Zooplanktons Recorded in the Study Area

S. NO.	NAME OF THE GENUS	CLASS	CORE AREA	BUFFER AREA
(A)PHYTOPLANKTON				
1	Amphora	Bacillariophyceae	-	+
2	Cymbella	Bacillariophyceae	-	+
3	Fragillaria	Bacillariophyceae	-	+
4	Gomphonema	Bacillariophyceae	-	+
5	Gyrosigma	Bacillariophyceae	-	+
6	Navicula	Bacillariophyceae	-	+
7	Ankistrodesmus	Chlorophyceae	-	+
8	Microspora	Chlorophyceae	-	+
(B)ZOOPLANKTON				
1	Alona	Branchiopoda	-	+
2	Nauplins	Crustacean	-	+
3	Euglypha	Imbricatea	-	+
4	Centropyxis	Lobosea	-	+
5	Tichocera	Monogononta	-	+
6	Epiphanes	Rotifera	-	+
7	Euglypha	Imbricatea	-	+

3.18 CONCLUSION

i. Plant species diversity is low in core zones and moderate in buffer zones.
ii. Evenness is almost similar in tree flora and shrub community.
iii. Species richness is varied from core zones to buffer zones of the all clusters.

CHAPTER 4
ANTICIPATED ENVIRONMENTAL IMPACTS &MITIGATION MEASURES

4.1 INTRODUCTION

Environmental impact in the study area is any alteration of environmental conditions or creation of new set of environmental conditions, adverse or beneficial, caused or induced by the impacts of project. Prediction involving identification and assessment of potential impacts of the project on surrounding environment is a significant component of EIA studies. The likely Impacts of various activities of the proposed project on the environment were identified. These impacts were assessed for their significance based on the background environmental quality in the area and the magnitude of the impact. All components of the environment were considered and wherever possible impacts were evaluated in quantitative/qualitative terms. Several scientific methods are available to predict the impact of project on environmental factors such as water, air, noise, land environment, socio-economic. Such predictions are superimposed over base line environmental status to derive post projected scenario of the environmental conditions. The resultant (post-project) quality of environmental parameters is reviewed with respect to the permissible limits. Based on the impacts thus predicted preventive mitigation measures were formulated and incorporated in the environmental management plan to minimize adverse impacts on environmental quality during and after project execution.

The environmental impacts can be categorized as primary and secondary. Primary are those which are directly attributed to the project and secondary impacts are those which are indirectly induced due to primary impacts and include those associated with investment & socio-economic status. The impact may be broadly divided into two phases.

- During construction phase: These may be regarded as temporary or short term and ceases with implementation of the project.
- During operation phase: These impacts are continuous warranting built in permanent measures for mitigation and monitoring.

Construction and operation phase of the project various activities comprises of, each of which will have an impact on some or other environmental parameters. Impacts on environmental parameters during construction and operational phase have been studied to estimate the impacts on environment. The impacts have been predicted for the proposed industrial project assuming that the pollution due to the existing activities has already been covered under baseline environmental monitoring.

4.2. IDENTIFICATION & CHARACTERIZATION OF IMPACTS

The wastes and pollutants generated due to various activities of the project cause impacts on different environmental attributes. The major project activities and the anticipated environmental impacts of the proposed expansion are discussed below under the following categories:

- Impacts and mitigation measures due to project location
- Impacts and mitigation measures due to project design
- Impacts and mitigation measures during construction
- Impacts and mitigation measures during operation.

4.2.1. Impacts and Mitigation Measures Due to Project Location

The proposed expansion shall be carried out within the existing plant premises. The proposed expansion is for replacement of existing Induction Furnaces and no additional land is required for the proposed expansion. Hence no impact due to the project location is envisaged.

4.2.2Impacts and Mitigation Measures Due to Project Design

The impacts on air quality from any project depends on various factors like design capacity, configuration, process technology, raw material, fuel to be used, air pollution control measures, operation and maintenance. The proposed expansion plan envisaged state of art technology, presently available in the country and thus no anticipated impacts are envisaged due to project design.

- The new Induction Furnace will have higher productivity and less pollution per ton of liquid steel produced.
- State of art pollution control technologies have been considered to keep the impact due to the proposed expansion low.

4.2.3. CONSTRUCTION PHASE

Infrastructure facilities like roads, fencing, boundary, drainage system etc. already exists. The land, where the proposed expansion will be carried out is already leveled and graded. There is no additional land requirement. Construction activity includes foundation works, dismantling, fabrication and erection of new Induction Furnace. The major activities during construction phase are given below.

Project Activities

1. Dismantling
2. Civil work
3. Loading and unloading civil items and equipment
4. On-site storage of civil items &equipment
5. Erection of plant and civil structures

6. Power supply
7. Maintenance of construction machinery
8. Vehicular movements
9. Disposal of solid wastes

Particulate matter would be the predominant pollutant affecting the air quality during the construction phase. Dust will be generated mainly during excavation, back filling and hauling operations along with transformational activities. The plantation developed in the project area will help a long way to attenuate the dust in the area. The vehicular exhausts and other related activities will result in air pollution. However, the incremental values are expected to be insignificant.

During construction phase of the proposed project, construction debris and will be stacked separately will be used for filling of low laying area. Used oil will be sold to CPCB authorized vendor. During construction activity various risk involved, hence, detailed study has been done and given in Chapter 7.

4.2.4 OPERATION PHASE

The operation of 4x12 Tons Induction Furnace may result in higher particulate matter and gaseous emissions in surroundings. Higher production of liquid steel, Billets and Rolled products may affect the environment in varying degrees through natural resources depletion viz. water consumption, release of particulates and gaseous emissions, contamination of water body, run-off from waste storage area etc. During operational phase air, water and noise may be affected due to material usage and processing for liquid steel and associated activities in general. Associated activities e.g. transportation of materials, operations of workshop and garage, canteen etc., may also affect air, water and noise environment. Green belt development will have a positive impact not only on flora and fauna but also on air quality, noise and soil characteristics. Positive impacts on socio- economic environment are expected due to employment, further infrastructure development and also due to socio-economic welfare developmental activities to be taken up. The major project activities and the affected environmental parameters are given below.

4.3 IMPACT MATRIX

Environmental impacts could be positive or negative, direct or indirect, local or regional and also reversible or irreversible. The primary function of an environment impact assessment study is to predict and quantify the magnitude of these impacts, evaluate and assess the importance of the identified changes, present information and monitor actual changes. The activities of the proposed project are studied. The impacts of various activities of the proposed project are identified and presented as matrix in Table-4.1. Further the characteristics of these impacts have been evaluated and they are presented as matrix in Table- 4.2A, 4.2B.

Table 4.1: Impact Identification Matrix

No.	Activities	Environmental Attribute						
		Air	Noise	Water	Land & Soil	Ecology	Socio Eco	Aesthetics
Construction phase								
1.	Dismantling							
2.	Storage of Raw materials							
3.	Ready-mix concrete preparation							
4.	Transportation of materials and equipment							
5.	Fabrication activities							
6.	Civil Work							
7.	Erection of equipment							
Operational phase								
1.	Operation of Induction Furnace							
2.	Operation of Billet Caster							
3	Operation of Producer Gas Plant							
4	Operation of Reheating Furnace							
5.	Operation of Rolling Mill							
6.	Handling of Sponge Iron, pig iron and alloys							
7.	Operation of Domestic utilities							
8.	Operation of the DG Sets							
9.	Transportation of Raw material/ products							
10.	Development of greenbelt							
11.	Employment generation							

Table-4.2A: Environmental Impacts from Construction Phase

Activity	Environmental attributes	Cause	Impact characteristics			
			Nature	Duration	Reversibility	Significance, Mitigative measures
Dismantling of Existing Induction Furnace	Air Pollution (Dust)	Excavation of the area, Gas cutting etc.	Direct Negative	Short Term	Reversible	Significant. Personnel Protective Equipment (PPE) shall be used.
	Noise Pollution	Noise generation from hammering / dismantling activities	Direct Negative	Short Term	Reversible	Significant. Personnel Protective Equipment (PPE) shall be used.
	Land use	Storing of scrap, waste refractory bricks	Direct Negative	Short Term	Reversible	Insignificant, as storage is temporary
	Water Pollution	Potential for seepage from the waste storage area.	Direct Negative	Short Term	Reversible	Significant, Proper care of the storage area shall be taken. Temporary check dam along temporary storage area shall be made, if required.
Transportation of scrap/spares/ waste material/ construction material	Air Pollution (Dust & Gases))	Transportation of scrap / waste material by trucks	Direct Negative	Short Term	Reversible	Medium, Regular emission checks shall be performed. Raw materials will be transported, covered with tarpaulin.
	Noise Pollution	Noise generated from loading / unloading and movement of vehicles	Direct Negative	Short Term	Reversible	Insignificant, Regular vehicle maintenance shall be done. PPE shall be provided.
Construction activities	Air Pollution (Dust & Gases)	Operation of construction machinery, welding & others	Direct Negative	Short Term	Reversible	Insignificant. PPE shall be provided to workers
	Noise Pollution	Generation from construction activities	Direct Negative	Short Term	Reversible	Significant. PPE shall be provided to workers

Activity	Environmental attributes	Cause	Impact characteristics			
			Nature	Duration	Reversibility	Significance, Mitigative measures
	Land use	Storage of spares, Refractory	Direct Negative	Short Term	Reversible	Insignificant. Storage is temporary and during construction period only
Disposal of scrap / waste material (including refractory)	Air Pollution (Dust & Gases)	Due to movement of Vehicles	Direct Negative	Short Term	Reversible	Significant. PPE shall be provided to workers
	Noise Pollution	Due to loading / unloading	Direct Negative	Short Term	Reversible	Insignificant. Regular vehicle maintenance and pollution check shall be done.PPE shall be provided to workers

Table-4.2B. Environmental Impacts from Operational Phase

Activity	Environmental attributes	Cause	Impact characteristics			
			Nature	Duration	Reversibility	Significance, Mitigative measures
Induction Furnace						
Transportation of the Sponge Iron, Pig Iron & Alloys to the site	Air Pollution (Dust & Gases)	Haul road dust emission. Gaseous emissions due to Vehicle exhaust	Direct Negative	Short Term	Reversible	• **Water sprinkling** shall be done where material will be unloaded in bins. • Regular vehicle maintenance and pollution check shall be done. • Raw material will be covered with tarpaulin during transportation • Besides, the management will ensure proper usage of the personal protective equipment by the workers to avoid any exposure to dust.

Activity	Environmental attributes	Cause	Impact characteristics			
			Nature	Duration	Reversibility	Significance, Mitigative measures
	Noise Pollution	Noise pollution due to unloading of raw material and vehicle movement	Direct Negative	Short Term	Reversible	• Low, theunloading will be done in covered area from low height. • PPE shall be provided to the workers working in the area.
Operation of Induction Furnace	Air Pollution, Thermal Pollution	In induction furnace the melting of scrap, pig iron and alloys will take place. During melting there may be some fugitive emission.	Direct Negative	Long Term	Reversible	Dust extraction system with Bag filter system shall be augmented to reduce particulate matter emissions from stack to keep the level below 50 mg/Nm^3 and fugitive emissions in the surrounding areas.
	Water Pollution	Backwash water from DM Plant	Direct Negative	Long Term	Reversible	Significant. Neutralization Pit shall be installed to treat the waste water and shall be used for slag quenching.
	Noise Pollution	Due to furnace operations	Direct Negative	Long Term	Reversible	Management will ensure proper usage of the personal protective equipment by the workers to avoid any exposure to dust.
	Solid waste generation	During liquid steel making process slag will be generated	Direct Negative	Long Term	Irreversible	Slag generated during the process shall be used for road / area and land development.
Billet Caster						

Activity	Environmental attributes	Cause	Impact characteristics			
			Nature	Duration	Reversibility	Significance, Mitigative measures
Casting of Billets	Consumption of water	Cooling of mould and billets	Direct Negative	Long Term	Reversible	Insignificant. Water recycled back after cooling in Cooling Towers. Only make-up water is required
	Solid waste generation	Generation of Scales	Direct	Long Term	Reversible	Scale shall be recovered in **Settling Tank** and will be sold to the Sinter Plant.
		Generation of scrap (end cuts)	Direct	Long Term	Reversible	Reused in IF
	Noise pollution	Caster rollers (rolling noise)	Direct	Short Term	Reversible	Ear plug/muff shall be provided to the employees working in that area
Rolling Mill						
Rolling of Billets	Water pollution	Cooling of rollers and flushing of scales	Direct Negative	Short Term	Reversible	Water for cooling of rollers along with mill scale generated during rolling process shall be taken to ETP where oil and mill scale shall be separated out and treated water shall be recycled
	Solid Waste Generation	Used Oil	Direct Negative	Long Term	Irreversible	Shall be removed from the effluent in ETP by oil skimmer. Hazardous wastes and shall be sold to the registered recycler only

Activity	Environmental attributes	Cause	Impact characteristics			
			Nature	Duration	Reversibility	Significance, Mitigative measures
		Mill scale	Direct Negative	Short Term	Reversible	Mill scale shall be removed from the ETP by Grab Bucket and shall be recycled to Sinter plant
		Cobbles, end cuts (Scrap)	Direct	Short Term	Reversible	Shall be used in IF
DG Set						
Operation of theDG Set	Air Pollution	Flue gas emission, used oil generation	Direct Negative	Short Term	Reversible	The DG will be operated in case of power failure only. Green DG sets shall be installed
	Noise Pollution	Generation of noise during DG Set operation	Direct Negative	Short Term	Reversible	The DG Sets will have acoustic enclosure to minimize the noise.
Domestic Waste						
Operation and of Domestic utilities	Water Pollution	Operation of Washroom, toilets – Wastewater generation	Direct Negative	Long Term	Reversible	The sewage will be disposed into septic tank and soak pits. No discharge from Soaking Pits
Green Belt Development						

Activity	Environmental attributes	Cause	Impact characteristics			
			Nature	Duration	Reversibility	Significance, Mitigative measures
Development and maintenance of Green Belt	Reduction in Air Pollution and Noise Pollution	Plantation of trees within premises. to cover 33% of the area	Direct Positive	Long Term	Reversible	Positive Impact due to development of a proper green belt along the periphery of the premises. This will act as barrier for air emission and noise
Socio-economic Development						
Employment Generation			Direct Positive			Positive Impact due to direct employment of persons from the nearby area.
						Substantial benefits in the form of contracts to local agencies for different services.
						Employment generation in transport sector for transportation of raw material and finished goods..

4.4 IMPACTS DURING CONSTRUCTION PHASE

4.4.1. Impact on Land Environment

There will be no change in land use pattern as no land is required for the proposed expansion. Construction waste shall be temporarily placed, contain no hazardous or toxic substance.

4.4.2.Impact on Water Environment

Construction activities for the proposed development can have minor impact on hydrology and ground water quality of the area if the construction waste leaches into the ground water source. Potential sources of impacts on the hydrology and ground water quality during the construction phase are as follows:

- Soil runoff from the site leading to off-site contamination (particularly during rainy season).
- Improper disposal of construction debris/refractories leading to off-site contamination of water resources.
- Spillage of oil and grease from the vehicles and waste water generated on site activities such as vehicles washing, workshop etc.

Following precautions and preventive measure will be taken at the site during construction to avoid any ground and surface water contamination.

- Not allowing water to leave the construction site.
- Disposal of construction debris in approved areas.
- Construction of storm water diversion channels to divert storm runoff from flowing over the construction areas.
- Due to civil construction activities, during rainy season the surface run off may contain more of eroded soil and other loose matter. Construction activities will be avoided during rainy days to mitigate the small impacts on soil quality caused due to construction activity.
- With segregation of construction area and proper drainages provided prevents the contamination of water due to soil erosion.

4.4.3. Impact on Air Environment

The construction & erection of proposed 4 X 12 T Induction Furnace in place of existing 4 x 8 T will generate dust resulting in higher PM levels in surrounding area. The impact on the air quality during construction phase will be localized, temporary and reversible in nature. The dust generation during construction will be suppressed through intensive water spraying. Proper maintenance of equipment and transport vehicles will reduce generation of gases. It will be ensured that all vehicles are properly maintained to comply with exhaust emission requirements.

Particulate matter would be the predominant pollutant affecting the air quality during the construction phase. Dust will be generated mainly during excavation, back filling and hauling operations along with transformational activities. In this case, pollution emission sources are distributed throughout the project site and shall fall under the category of area source. The project site is slightly undulated, so extensive formation work is not expected during this phase. Surplus excavated material shall be used for road construction and for land leveling and landscaping activities besides for backfilling. Concentration of SO_2, NO_X and CO may slightly increase due to increased vehicular traffic. The approach roads are paved and tarred and vehicles will be kept in good order to minimize the pollution due to vehicular traffic. The impact of such activities would be temporary and restricted to the constructed phase. The impact will be confined within the project boundary and is expected to be negligible outside the plant boundaries. Proper upkeep and maintenance of vehicles, sprinkling of water on roads and construction site, providing sufficient plantation all-around are some of the measure that would greatly reduce the impacts during the construction phase. With the emission factor and the phased manner in which construction activity is to be carried out, it is likely that increase in SPM levels due to construction would mainly be confined to the project site. Thus, it is inferred that minor negative impact within a few 100 meters from the source within the site would occur on the ambient air quality under the worst conditions, which are mitigated by implementing environmental management plan. However, no significant impacts are expected on the overall ambient air quality due to construction activities, at the sensitive receptors outside the project premises.

4.4.4. Impact on Noise level

During the construction phase, some of the activities would temporarily enhance the ambient noise levels.

The major source of noise generation during the construction phase are due to dismantling of existing Induction Furnaces, vehicular traffic, construction equipment like scrapers, concrete mixer, cranes, generators, compressors, vibrators etc. is given below. The operation of these equipment will generate noise ranging between 70-85 dB(A). The noise produced during the construction will have significant impact on the existing ambient noise levels. The construction equipment has high noise levels which can affect the personnel, operating the machines. Major construction work will be carried during the daytime. Use of protective equipment like mufflers will reduce noise generated by such equipment. Personnel protective such as earplugs shall be used by the operators of these machineries.

4.4.5. Impact on Biological Environment

Construction activities at the site involving human and vehicular movement will disturb aril and wild animals in the area. Terrestrial micro flora and fauna at the site are also affected. However, as the project is for replacement of Induction Furnaces within the same area, no additional land is used in the project and no removal of any plantation or shrub. The adverse effect will further reduced by shortening the construction phase period and development of greenery in the site. Further, there are no sensitive locations within the study area. Hence, no significant adverse impacts are expected on biological environment.

4.4.6 Impact on Socio-Economic status

The construction phase induces employment opportunities for the local people. Approx. 240 persons will be employed during peak construction phase. In addition to the opportunity of getting employment in construction work, the local population would also have employment opportunities in related activities like petty commercial establishments, small contracts and supply of construction materials etc. The dwelling of construction workers at the site may cause sanitation and other problems. As the villages are nearby and staying facilities are readily available in these villages. The construction and other workers will not be permitted to reside at the project site. Safety and health care of workers is also an important factor to be considered during construction phase. Hazards expected are electrocution, vehicular accident, fall of personnel from overhead works, high level noise due to construction machinery, centering failure and exposure of eyes to dust and welding rays. Constructional and occupational safety measures will be adopted during construction phase of the industry.

4.5 IMPACT DURING OPERATIONAL PHASE

4.5.1 Impact on Air

4.5.1.1. Emission from Point Source (Stack Emissions)

Dust and gaseous emission shall be from the Flue gases generated at Induction Furnace.

4.5.1.2. Emission from Area Source (Fugitive Emissions)

Fugitive emissions are expected from Induction Furnace during melting operations, during unloading and transportation of raw materials. The vehicular exhausts and other related activities will result in air pollution.

4.5.2. Air Pollution Dispersion Modeling Studies

ISCST3 Dispersion Model

The Industrial Source Complex (ISC) Short Term model provides options to model emissions from a wide range of sources that might be present at a typical industrial source complex. ISCST3 is US-EPA approved model to predict the air quality. The model uses urban dispersion and regulatory defaults options as per guidelines on air quality models (PROBES/70/1997-1998). Emission sources are categorized into four basic types of sources, i.e., point sources, volume sources, area sources, and open pit sources. The volume source option and the area source option may also be used to simulate line sources. The model assumes receptors on flat terrain. The ISC short term area source model is based on a numerical integration over the area in the upwind and cross wind directions of Gaussian plume formula. This can be applied to the Point, Area, Line or Volume sources simultaneously and their resultant incremental concentration of the pollutant can be predicted.

Model Options Used For Computations

The options used for short-term computations are:

- The plume rise is estimated by Briggs formulae, but the final rise is always limited to that of the mixing layer;
- Stack tip down-wash is not considered;
- Buoyancy Induced Dispersion is used to describe the increase in plume dispersion during the ascension phase;
- Calms processing routine is used by default;
- It is assumed that the pollutants do not undergo any physio-chemical transformation and that there is no pollutant removal by dry deposition;
- Washout by rain is not considered;
- Flat terrain is assumed / used for computations;
- Cartesian co-ordinate system has been used for computations; and
- The model computations have been done for 10 km with 100 m grid interval.

4.5.3 Gaussian Plume Model

Ground Level Concentration (χ) (GLC) from a point source at any receptor is given by -

$$\chi = \frac{Qg_1g_2}{(2\pi\sigma_y\sigma_z u)}$$ - (USEPA ISCST3, 1987)

where,

$g_1 = \exp(-y2/2\sigma y2)$

$g_2 = \exp[-(z-H)2/2\sigma z2] + \exp[-(z+H)2/2\sigma z2]$

Q = source strength

Z = receptor height above the ground

H_e = effective stack height (Plume rise + Physical stack height)

u = wind speed at stack level

σ_y &σ_z = dispersion parameters

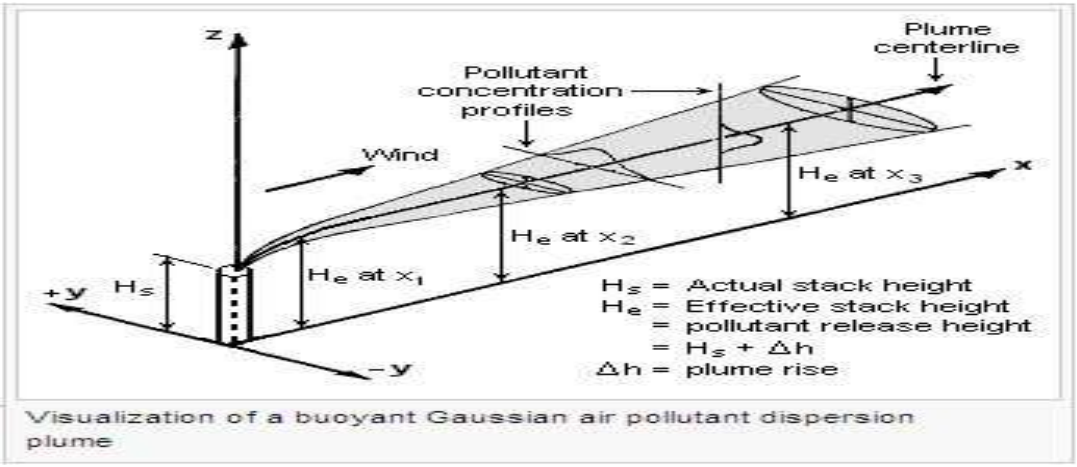


Figure 4.1 – Gaussian Plume Model

Dispersion Parameters

Dispersion parameters σ_y and σ_z for open country conditions (Briggs, 1974) are used, as the project is located on in a rural area. Atmospheric dispersion coefficients vary with downwind distance (x) from emission sources for different atmospheric stability conditions. (CPCB – PROBES/70/1997-98).

Table 4.3 - Dispersion parameters as per stability class

Stability Class	σ_y	σ_z
A	$0.22x(1+0.0001x)^{-.5}$	0.20x
B	$0.16x(1+0.0001x)^{-.5}$	0.12x
C	$0.11x(1+0.0001x)^{-.5}$	$0.08x(1+0.0002x)^{.5}$
D	$0.08x(1+0.0001x)^{-.5}$	$0.06(1+0.0015x)^{.5}$
E	$0.06x(1+0.0001x)^{-.5}$	$0.03x(1+0.0003x)^{-1}$
F	$0.04x(1+0.0001x)^{-.5}$	$0.16x(1+0.0003x)^{-1}$

4.5.4Plume Rise

Plume rise Δh has been determined according to Brigg's formula (CPCB guideline)

$$\Delta h = 21.425 \frac{F^{3\,4}}{U_s} \quad \text{for } F<55$$

$$\Delta h = 38.71 \frac{F^{3\,5}}{U_s} \quad \text{for } F>55$$

F = g VsD2(Ts-Ta)/4Ts

Where

Us = wind speed at stack level (m/s)
Vs = stack gas velocity (m/s)
Ts = stack gas temperature (0K)
Ta = ambient temperature (0K)
F = Buoyancy flux parameter (m^4/s^3)
Δh = Plume rise (m)
D = Diameter of the stack (m)
g = acceleration due to gravity, 9.807 (m/s^2)

4.5.5Stack details:

Table 4.4: Stack details

Stack Attached to	No. of stack	Stack Temp (K)	Velocity (m/s)	Stack Height(m)	Dia. of Stack (mm)
Steel Melting Shop 4x12 T Induction Furnace (augmentation)	2	553 - 573	15	30	700

4.5.6 Meteorological Data

The meteorology of the project area plays very important role in dispersion of pollutants and buildup of pollution within the atmosphere. In the present study, one season (October 2016 – December 2016) meteorological data has been taken to find the dispersion of pollutant concentration. The mixing height for study period, which is an important parameter to express the dispersive potential of atmosphere, has been taken from the atlas of hourly mixing height and assimilative capacity of atmosphere in India (S.D. Attri et al., 2008). Windrosediagram of one season meteorological data used for modeling is shown given below in **Figure 4.2**.

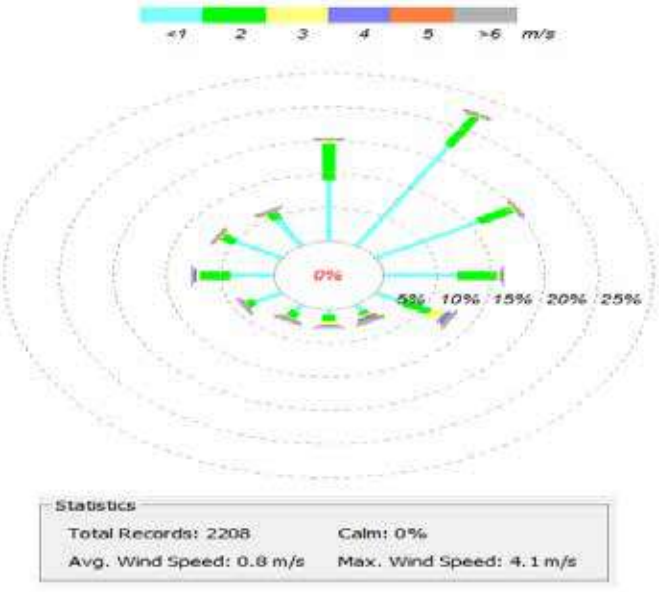


Figure 4.2 –Windrose Diagram

Results

- The maximum cumulative GLC concentration of PM10 wiz. 95.3ug/m3 was predicted inside the study area. As the distance from source increases, the incremental concentration of PM10 drops drastically due to settling of PM10 particles under gravity.
- The maximum cumulative GLC concentration of SO2 wiz. 14.7ug/m3 was predicted inside the study area.
- The maximum cumulative GLC concentration of NOxwiz. 34.5ug/m3 was predicted inside the study area.

Table 4.5 – Predicted GLC of PM10 at Ambient Air Quality Monitoring Stations

Location Code	Location Name	Parameter	Max Baseline Conc. ($\mu g/m^3$)	Predicted GLC ($\mu g/m^3$) – ISCST3 Model	Cumulative GLC ($\mu g/m^3$)
A1	Project Site	PM_{10}	90.80	0.298	91.098
		SO_2	11.90	0.576	12.476
		NO_X	31.70	0.810	32.510
A2	Near Village-Kalyaneswari	PM_{10}	88.40	0.079	88.479
		SO_2	11.50	0.197	11.697
		NO_X	31.50	0.274	31.774
A3	Near Village-Barakar	PM_{10}	95.30	0.001	95.301
		SO_2	14.70	0.002	14.702
		NO_X	34.50	0.005	34.505
A4	Near Village-Narayan Chak	PM_{10}	88.60	0.000	88.600
		SO_2	12.60	0.001	12.601
		NO_X	32.50	0.001	32.501
A5	Near Village-Banshkatiya	PM_{10}	86.20	0.003	86.203
		SO_2	10.90	0.005	10.905
		NO_X	25.80	0.009	25.809
A6	Near Village-Haipara	PM_{10}	84.50	0.001	84.501
		SO_2	10.20	0.001	10.201
		NO_X	28.60	0.002	28.602
A7	Near Village-Khudka	PM_{10}	78.50	0.002	78.502
		SO_2	10.90	0.004	10.904
		NO_X	26.70	0.006	26.706
A8	Near Village-Palhari	PM_{10}	93.00	0.001	93.001
		SO_2	13.00	0.002	13.002
		NO_X	32.70	0.005	32.705

The contour maps showing the predicted concentration levels of PM10, SO2, NOx are presented in **Figure4.3, Figure 4.4** and **Figure 4.5**.

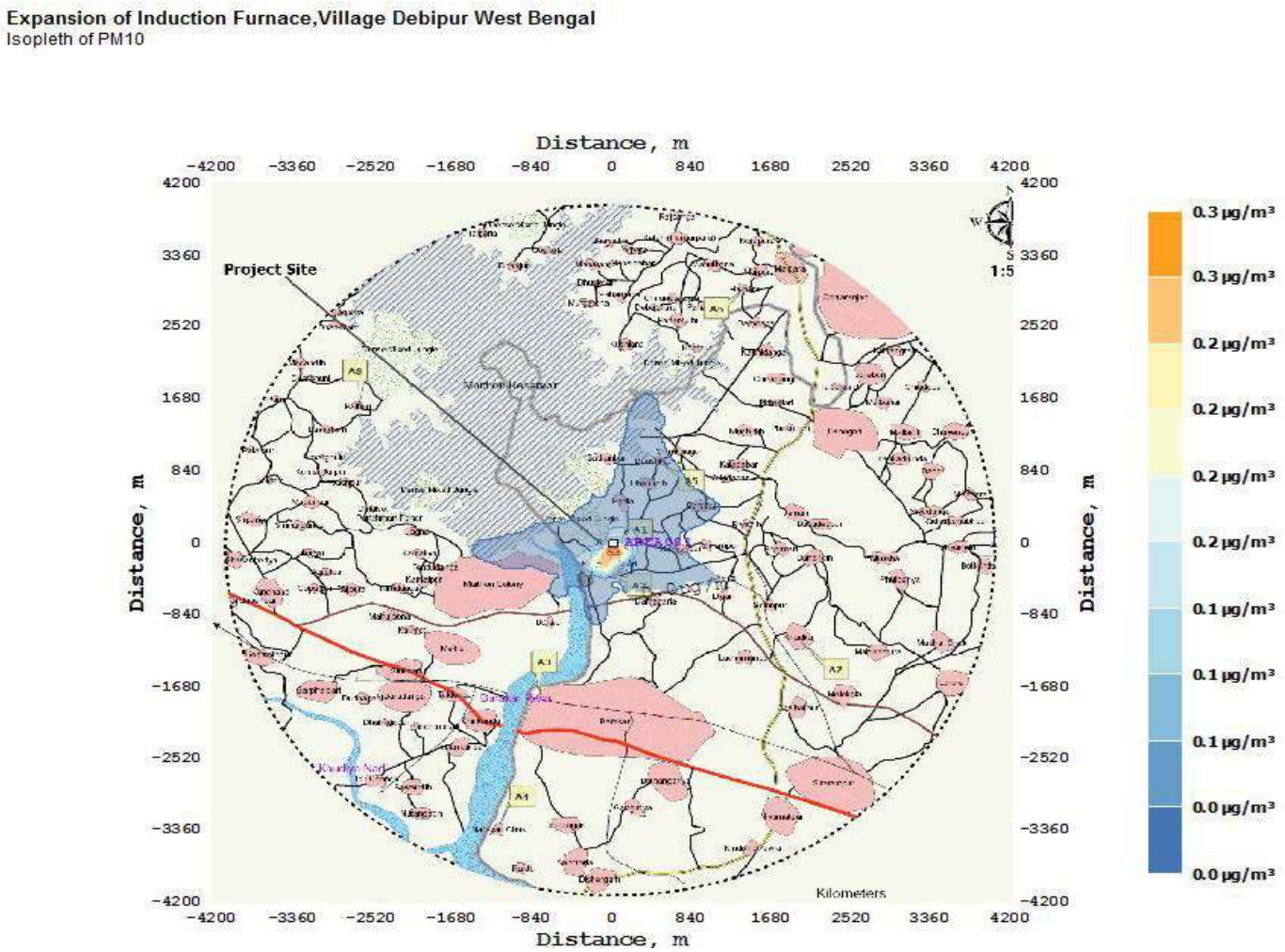


Figure4.3 – Spatial distribution of predicted GLCs of PM10

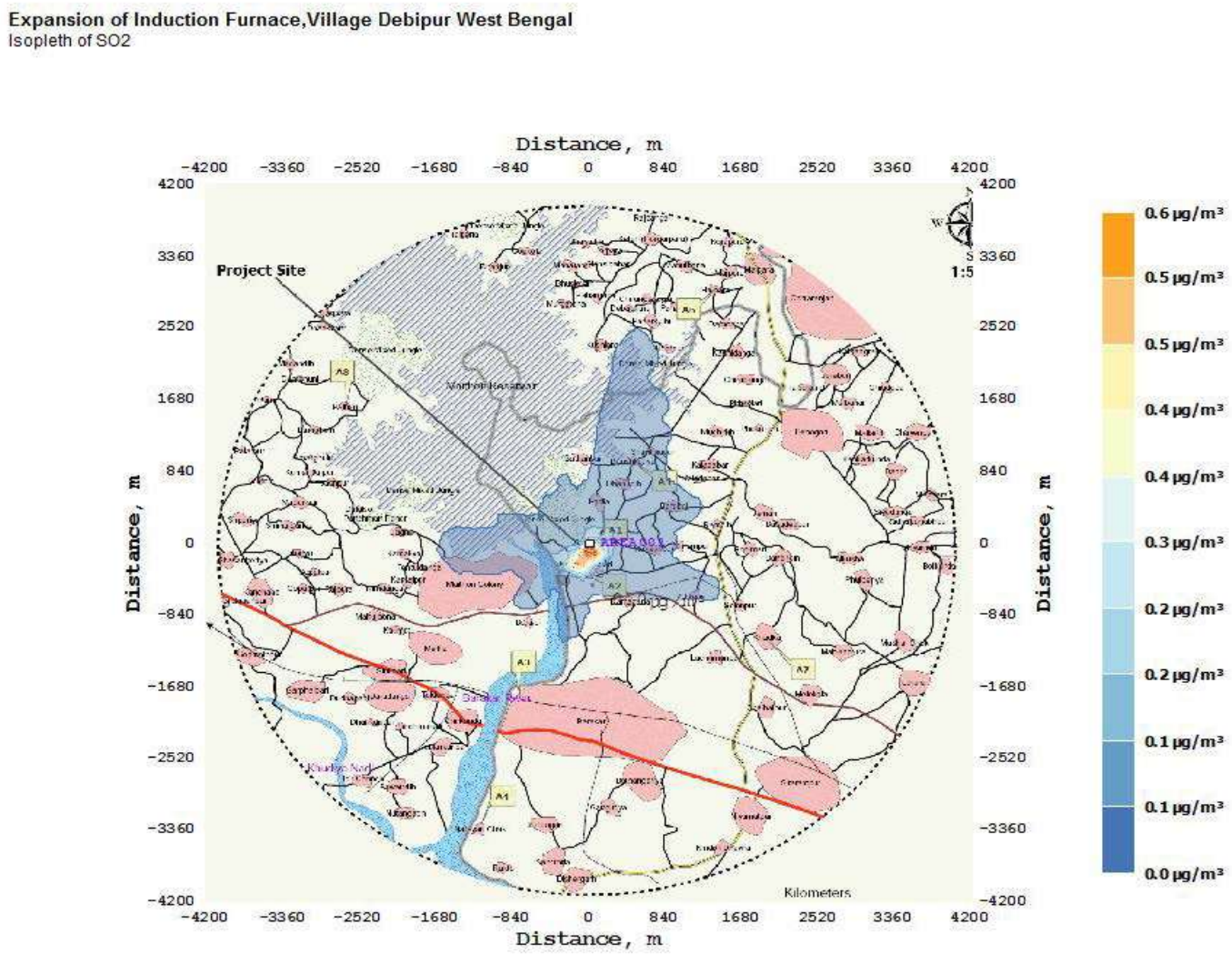


Figure 4.4– Spatial distribution of predicted GLCs of SO_2

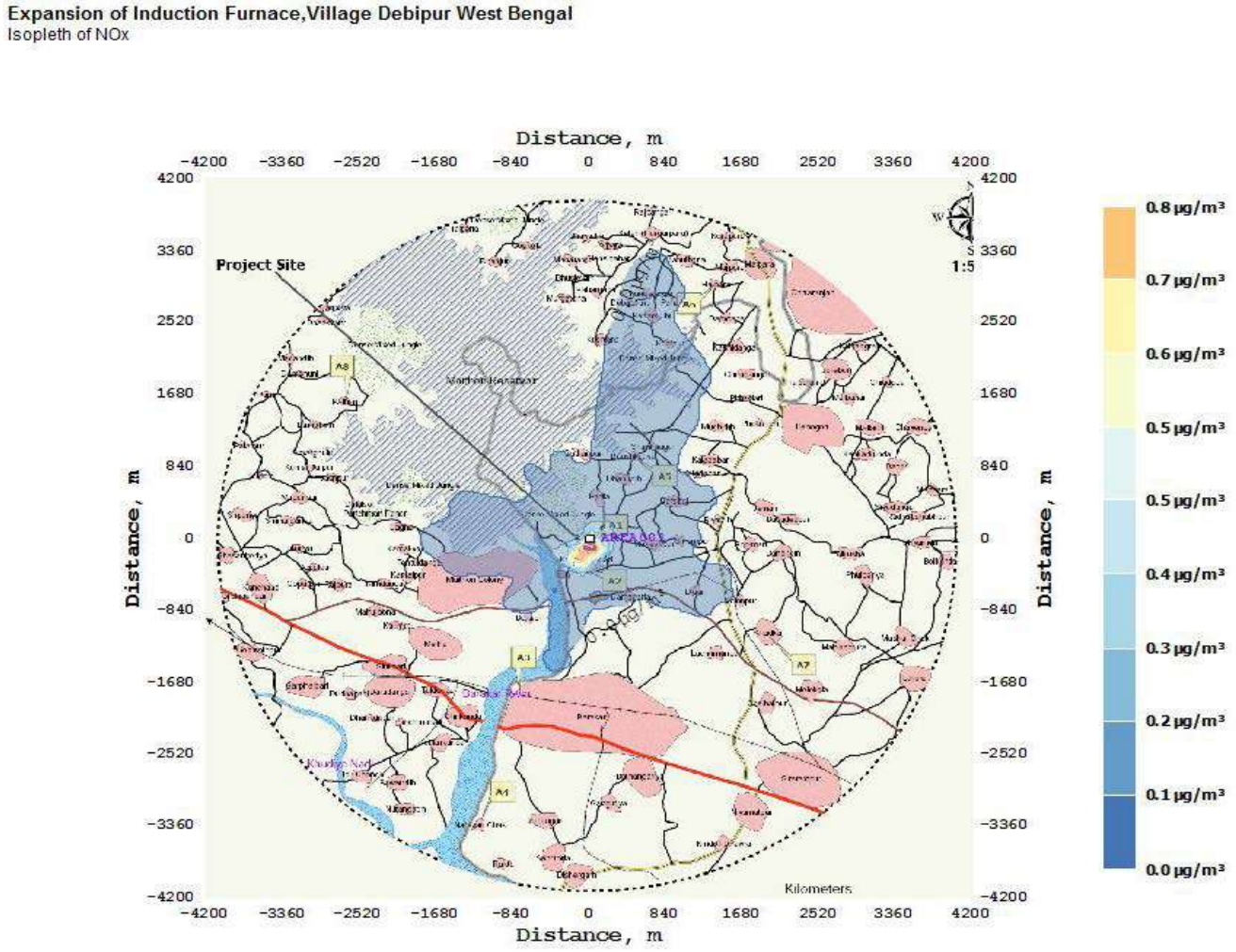


Figure4.5 – Spatial distribution of predicted GLCs of NOx

4.5.7. Air Pollution - Mitigative Measures

The major sources of air pollution will be fugitive emissions from the Induction Furnace and stack emissions from the Gas Cleaning Plant stack, provided to limit the air pollutant emissions within 50 mg/Nm^3. Fugitive emissions in and around the furnaces is being removed by adequate flue gas cleaning system for primary and secondary emission control. For adequate dispersion of gases, stack of adequate height has been provided that conforms to statutory requirements. For heat dissipation inthe work zones arising from furnaces adequate ventilation systems has been provided.

Effective pollution control system, i.e., Bag Filter, I.D. Fan & stack of adequate height has been installed for controlling the emissions from Induction Furnace.

Bag Filter System: A compartment type bag house having 8 to 10 compartments with polyester felt filter bags has been installed with the existing Induction Furnaces to keep the emission from the Induction Furnace, below 50 mg/Nm^3.The flue gases from furnace is being sucked through an interconnecting ductwork by induced draft fan &exhaust to the chimney.

The gases first enter to Heat Exchanger at @ 250 to 300 ^{0}C, where it will be cooled down to 120^{0}C. It will also remove / extinguish the sparks if any. Cooled flue gases then go to the next equipment i.e. Bag House to remove dust from the flue gases before discharge from the stack. The collected dust is discharged from bottom hopper through a Rotary Airlock valve. Two Screw Conveyors have been provided below all the Bag house compartments with Rotary Airlocks. The Dust from all compartments are being discharged in screw conveyor through Rotary Airlock and collected in trolley.

Four bag filter units provided one with each Induction Furnace shall be augmented to keep emission level at the outlet of Bag house for furnace fumes less than 50 mg / Nm3. 2 nos. of stacks have been provided with these four bag filter units (2 Induction Furnaces shall be connected with one stack).

Each compartment will be provided with manual inlet & automatic outlet dampers for isolation purpose during maintenance / trouble shooting if any.

Under expansion, the Bag house system will be augmented by construction of additional 8 to 10 equal compartments having equal number of bags as per the design. It will be provided with inlet & outlet manifold duct for proper distribution of the gas. The gas will pass through the filter bags depositing the dust on the outside of the filter bags. The dust will be removed by pulse jet.

The clean gas will exit through outlet manifold to exhaust fan and then to atmosphere through chimney. The cleaning of filter bags will be 'Off Line', i.e. the compartment under the cleaning cycle is an isolated using outlet pneumatic damper. Thus at any time one compartment will be under cleaning and the rest are in operation. Pilot operated diaphragm valves will be controlled by solid-state sequential times to perform this operation. A master in turn will operate the timer controller. The cleaning sequence will be On Demand. If the pressure drop across the compartment exceeds a preset limit, it will automatically isolate the compartment by closing outlet pneumatic damper, trigger the cleaning cycle and bring down the pressure drop. When pressure drop reaches lower set point, the cleaning cycle will stop. This method On Demand cleaning ensures optimum cleaning and results into higher bag life and high filtration efficiencies.

The bag house will have inlet manual dampers and outlet pneumatic dampers for, isolation purpose. If any compartment is down for routine check-up, maintenance or for any other reason, the bag house can be still operated with other compartments. The duct to inlet of the bag house will be fitted with RTD probes and monitor the temperature of flue gases. If the measured temperature at any point exceeds a set point (i.e. beyond operating limit of the filter bag fabric), there is likely hood of damage to the filter fabric. To avoid this situation, by pass pneumatic dampers will be provided with this system. When higher temperature is sensed, it will immediately bypass the system by automatically closing the damper in the inlet duct to Heat Exchanger. Simultaneously it will open the damper in the bypass duct, thereby bypassing the gases to the atmosphere. The system will meet with the emission standards during operation of the plant and ensure clean plant operation.

Table 4.6: Details of the Air Pollution Control facilities

S. No.	Unit	Type of Pollution Control System	No. of Stacks
1	4x12 T Induction Furnace (replaced with 4x8 T)	4 nos. Pulsejet type Bag Filter (one Unit with each Induction Furnace) Two Units, i.e. 2 Bag Filter Units will be connected with one stack	2
Total		**4 Bag Filters (Augmentation)**	

4.5.7.1 General Mitigation Measures

The impacts of fugitive emissions in the industry are controlled by following measures:

- Haulage roads are sprinkled with water at regular intervals for which water tankers with sprinkler arrangement are deployed.

- Trucks carrying raw material are covered with tarpaulin to prevent spreading of dust during transportation.
- Green belt and greenery development around storage yards, around plants, either side of roads and around the periphery of the industry.
- Water spray and sprinkling is practiced at unloading locations.
- The conveyors of fuel are suitably covered with hood or enclosures to control fugitive emissions.
- Dust respirators are provided for the people working dust generating locations.
- All internal roads in the premise are paved /tarred.
- Speed limit of 10 km/h is enforced for vehicles in the plant premises to prevent road dust emission.
- Regular sweeping of roads is practiced with vacuum sweeping machine or water flushing to minimize dust.
- The air pollution control measures will ensure the ambient air quality to be within the NAAQ standards for industrial areas as indicated below.

Sl. No	Pollutants	Concentration µg/m^3 (Annual)
1	PM_{10}	100
2	$PM_{2.5}$	60
3	Sulphur Dioxide	80
4	Nitrogen Dioxides	80

4.6 IMPACT ON WATER RESOURCES / WATER POLLUTION

Water shall be drawn from Damodar River and Rain Water Harvesting Pond for Industrial use and ground water for domestic use. Proposed water intake point at Damodar River is falling under Polluted River Stretch, notified by CPCB where BOD value remains between 3 to 6 mg/l. (listed at sl.no.36, Barakar, where BOD is 3.8 mg/l). Area comes under 'Priority-5' as per CPCB notified site status i.e. least priority under degree of violation. Zero water discharge from the plant is proposed and hence there will not be any impact on the water course due to BMA expansion project. All discharges from Neutralisation Pit, Cooling Towers, Rolling Mill ETP and Domestic waste water shall be used for either slag cooling, dust suppression and / or horticulture after treatment.

Total fresh water requirement of the expansion project is estimated to be **202 KLD (existing: 52 KLD & additional: 150 KLD)**. Major portion of this water is utilized as make up to the cooling water systems. Waste water generation from the proposed operations will be due to blow downs from cooling towers, DM unit regeneration wastewater, waste water from water pre-treatment and effluent from service water

uses like plant washings, leakages, run off from raw material handling areas, run off from solid waste storage and handling areas and sewage from buildings. Wastewater streams comprising cooling tower blow down, DM plant wastewater and service water effluents, will be collected in Neutralization Pit and utilized quantitatively for slag cooling. Wastewater streams comprising pre-treatment wastewater will be collected and utilized quantitatively for green belt development. The sewage & sanitary wastewater from toilets, washrooms and canteen shall be treated in septic tank.

The rainwater within the entire project area will be routed to the raw water reservoirs through storm water drains. The runoff will be guided through drains into the reservoir, via settling chambers & will be utilized in the plant. Appropriate drainage facilities will be developed within the proposed plant site including proper disposal to drains in line with the existing plant. The water requirement of the project will be met by water supply from DVC, Bore well and Rainwater Harvesting Pond. The plant has been designed based on maximum recycling and zero liquid effluent discharge plant have less impact on ground water as well as surface water hydrology in this region. Rain water harvesting will be taken up as a measure to reduce make up water consumption of the plant.

4.6.1 Mitigation Measures – Water Pollution

Waste water discharge from the process will be approx. 1.6 m^3/h (19 KLD) from Cooling Tower blowdown and DM plant waste water. The utilization of waste water for re-use and re-cycling will be carried out. Other effluent streams such as cooling tower blow down and miscellaneous intermittent water such as DM Plant rejects etc. will be used for slag cooling.

Table 4.7: Details of the Water Pollution Control facilities

S. No.	Unit	Type of Pollution Control System	No.	Quantity (m^3/day)	Usages
1	DM Plant reject	Neutralization Pit	1	5	Slag cooling
2	Cooling Tower Discharge	-	7	14	Slag cooling &Dust suppression
3	ETP Rolling Mill	Scale Pit	1	-	Recycled
4	Domestic waste water	Septic tank with Soak Pit	-	0.5	
Total				**19.5 KLD**	

4.7. IMPACT ON NOISE

The noise levels near the sources such as raw material handling yard, Induction Furnace etc. will be higher during the operation phase.

The noise levels at sources like Induction Furnace are anticipated to go upto85dB(A). However, the noise levels will attenuate to the background values beyond the plant boundary. The damage risk criteria as enforced by OSHA and CPCB to reduce hearing loss, stipulates the noise levels up to 85dB(A) as acceptable limits for 8 hour working shift per day. Noise levels may, however, exceed the prescribed limits in certain work places. At these work places, workers will be posted for shorter durations only. During visits to the areas of high noise levels, the personnel will be provided with ear muffs/plugs to prevent adverse impact on the hearing.

4.7.1 Mitigation Measures - Noise

All the workers engaged at and around high noise generating sources shall be provided with ear protection devices like ear mufflers/plugs. Their place of attending the work will be changed regularly so as to reduce their exposure duration to high levels. They will be regularly subjected to medical check-up for detecting any adverse impact on hearing. The existing & proposed green belt will also help to prevent noise generated within the plant from spreading beyond the plant boundary. Greenbelt in 2.3 hectares (5.7 acres) will also be developed to reduce ambient noise level.

4.8 SOLID WASTE MANAGEMENT

During operation phase, land environment is affected by disposal of solid wastes. Depending on the type of the industry, the problem of handling waste varies accordingly. Solid wastes generation and utilization at BMA Stainless Limited for the proposed expansion is given below at Table 4.8. Induction Furnace Slag will be utilized in road / area / land development. Some scrap material (waste) will also be generated in the CCM and Rolling Mill. Proper solid waste management plan has to be devised for the management of all these solid wastes to prevent any impact on the environment. The anticipated amount of waste generation is given as follows:

Table 4.8: Solid Waste Generations &Utilization

Solid Wastes	Generation (TPA)	Utilisation (TPA)		Remark
		Recycle / Reuse	Sold	
Steel Melting Shop (IF + CCM)				
Bag Filter Dust	712	---	712	Will be sold to the nearby Sinter Plant
IF Slag	19,796	1,980	17,816	Approx. 1,980 TPA shall be used in IF and 17,816 TPA shall be used as aggregates

				for construction, road making and filling of low lying area
Rolling Mill				
Mill Scale	6,121	---	6,121	Will be sold to the nearby Sinter Plants
Producer Gas Plant				
Bottom Ash (Clinker)	2,434	---	2,434	Cinder is being given at no cost to the nearby Brick Manufacturing Units.
Tarry Wastes	14.4	14.4	----	Being used internally for road construction

4.8.1 Steel Melting Shop

a. Bag Filter Dust

Generation of Bag Filter dust is approx. 712 Tons per year, shall be sold to the nearby Sinter Plant.

Bag Filter dust shall be given to Maithan Alloys Ltd.. A MoU has been executed by the Project proponent with on 27th September, 2017 with Maithan Alloys Ltd. in this regard (MoU is attached as Annexure XVI).

b. Slag

Slag generation from the steel melting process shall be approx. 19,796 Tons per year. After metal recovery which is approx. 10%, remaining approx. 17,816 Tons of slag will be crushed and used as aggregates in construction materials, road making and filling-up of low lying area.

Table 4.9: Chemical composition of Induction Furnace Slag

Oxides	%
MnO	8 – 10
SiO2	30 – 35
Al2O3	18 – 20
CaO	2 – 3
MgO	1 – 2
Fe2O3	32 – 35
S	<1

4.8.2 Rolling Mill

Mill scale generation will be approx. 6,121 Tons per year. Mill scale shall be given to Maithan Alloys Ltd. A MoU has been executed by the Project proponent with on 27th

September, 2017 with Maithan Alloys Ltd. in this regard. (MoU is attached as **Annexure XVI)**.

4.8.3 Producer Gas Plant

a. Cinder

Cinder is being given at no cost to the nearby brick kilns to be used as fuel due to presence of unburnt carbon in it.

b. Tarry Waste

Being used internally for road construction.

4.9 Hazardous Waste Management

No hazardous waste shall be generated from the process except the 'Used Oil'. Approximate quantity of 'Used Oil' generation will be approx. 35 KL per year.

'Used Oil' will be sold to the register recycler, In this regard.

4.10. IMPACT OF BIOLOGICAL ENVIRONMENT

During construction phase, there will hardly be any negative impacts on terrestrial eco-system. On the contrary, with progressive growth of greenery, terrestrial eco-system will improve in course of time.

Though the site is located in fallow land, the impact zone is part of landscape involving rural areas. There is scarce growth of vegetation and meager presence of fauna. Impacts on biological environment will be negligible during the operational phase. The dust emission will affect the effective photosynthesis and biological processes by covering the plant/tree leaves, however installation and effective operation of air pollution control facility will keep the effect minimum. Thin dust layer during dry months which however will be washed away in rainy months.

There are no forests and eco sensitive sites in the vicinity of the site except the rivers near to project site. There are no endangered flora and fauna species in the region.

4.10.1 Mitigation Measures-Biological Environment

Vehicular movement during night will be restricted to avoid adverse consequence to wildlife in the region. The project activities are restricted to the factory site except the transportation of raw material and products. There is no discharge of solid or liquid wastes to the environment.

Green belt and greenery will be developed in the premise covering more than 33% of area. Special care has to be taken while planting trees, as regards the type and the number, within the plant premises in order to confine the pollutants to the area and prevent their dispersal. Trees will be planted as apart of the plantation program for

green belt as well as along roads. The selection of trees to be planted has to be done judiciously keeping in mind the adaptability of trees to the climate of the region. As mentioned in Chapter 3, the trees which are found in relative abundance as compared to the other species& species with proven survival rate will be preferred. In view of the effective greenbelt development to reduce pollution load in ambient air, consultation with the forest officers and experts in the field will be considered to identify the exact species to be planted and these can be obtained from the nurseries/forest department in the nearby areas. The social aspects of requirements of fodder and fuel needs of the community will require to be appropriately addressed.

The plantation will be mixed i.e. all the species prescribed are to be planted intermingled and there will be no mono specific plantation or plantation of a single species in a patch. In the initial years of plantation irrigation will be done and in the later years canopy management will be done to enable the shrub and herb species to colonize the floor of the greenbelt.

The area under study is in the process of rapid industrialization. There is no doubt of the fact that accumulative impact of the operating industries on the ecosystem in future is inevitable. But as the area at present does have any species under endemic or rare or endangered categories there will be least impact of the industry on the biosphere of the region. Maintenance of 33% of the plant area under plantation and management of the vegetation cover will ensure absorption of some gasses and particulate matter due to industrial activities.

Time to time monitoring of the plantation activities and proper management advice for maintenance of green cover is required from the regulating bodies in order to ensure least harm to the surrounding ecosystems. Out of 17.10 acres of total land area, 5.7 acres is being developed as greenbelt.

4.11 IMPACT ON SOCIO-ECONOMIC ENVIRONMENT

Critically analysing the existing environmental status of the socio-economic profile and visualizing the scenario with the project, the impacts of the project would be varied and may generate both positive and negative impacts of the proposed project in the region that are stated below.

4.11.1. Positive Impacts

a) No Rehabilitation

As per the details provided by the proponent during the baseline study the proposed expansion is for replacement of the existing Induction Furnaces and no land is required for the proposed expansion. Expansion shall take place within the existing plant area of 6.92hectares (17.1 Acres). No additional land shall be required for the

project. Hence, Resettlement & Rehabilitation is not required as there is no land acquisition or displacement of any houses, habitation or livestock.

b) Increase in Job Opportunities

As per the survey it has been observed that the population in general do not have opportunities of earning from employment and the non-worker population is higher which covers 68.15 % of the total population in the region so the project in general will help to reduce the unemployment level as it may provide direct and indirect job opportunities for auxiliary and ancillary works etc. The proposed project will provide direct employment to 30 skilled and unskilled personnel and with the ratio of about 1:5 indirect employments will be given to 150 personnel.

c) Minimal burden in the existing Infrastructure Facilities

As the labour will mostly be employed from Local work force and first preference will be given to them, the activity will reduce the influx of the outsiders. Thus, there will not be the necessity of provision of housing facility for the local workers

d) Improvement in Infrastructure

As the project authority is working towards the welfare of village community it will definitely benefit the local people by providing more infrastructural facilities such as developments of approach routes within the village area of Salanpur village, street light, health facilities etc.

e) Agriculture

The project is not going to cause any damage to the existing agricultural situation. Instead, it is likely to provide the farmers with non-farm activities as maximum population among the main worker are getting engaged in other activity.

There is a possibility to increase in industrialization in the vicinity of the project area. This is likely to bring more skill diversification among local people.

4.11.2. Adverse Impacts:

a) Impacts on Human Health

The project may have impact due to air pollution on the villages in Core zone near to the Project site. The impact from the air emissions are controlled efficiently using air pollution control equipment and designed in such a manner that after implementation of the project, the air emissions will be well within the prescribed ambient air quality limits set forth by CPCB. The proponents of this facility will adopt effective control systems at all the identified sources of emission.

b) Impacts on Public Health and Safety

The discharge of waste materials (stack emission, wastewater and solid wastes) from process operations can have potential impact on public safety and health. The impact from the discharge of waste products is not expected to be significant since, the adverse impacts on ambient air, water and soil quality are predicted to be low. It is predicted that the impacts on public safety will be very low, due to the effective safety system and safety management available in the plant.

The Prediction of qualitative impacts on socio-economic environment has been made according to field observations by the expert in purview with the existing condition of the study area and critically analyzing the socio-economic baseline conditions in context of the proposed project, the impacts of the project could be variable in nature and may have Local, Regional, direct and indirect impact on the different parameters which is shown in Table below:

Table 4.10: Qualitative Effects on Socio-economic Environment

Parameter	Local	Regional	Direct	Indirect	Reversible	Irreversible
Employment	+	●	+	+	●	+
Income	+	●	+	+	●	+
Transport	+	+	+	+	●	+
Education	+	●	+	●	●	+
Medical facilities	+	●	+	●	●	+
Communication	+	+	+	●	●	+
Sanitation	-	●	-	●	●	-
Housing	+	●	+	●	●	+
Health	-	●	-	-	●	-
Recreation	+	+	●	+	●	+
Agriculture	-	●	-	-	●	-
Cost of living	+	●	●	-	●	+
Business	+	+	+	●	●	+
Per Capita Income	+	+	+	●	●	+
Pollution	-	●	-	●	●	●

+ : Positive; - : Negative ; ● : Insignificant

4.11.3 Mitigation Measures of Socio Economic Environment

- Adequate measures have been envisaged in the project design to control air & noise pollution. Proposed adequate & effective control measures will be provided which include dust suppression
- Awareness programs shall be arranged on health, hygiene and sanitation
- Periodic health checkup camps, distribution of medical aid and medicines shall be organized by project authority for villagers, contract laborers, employees and their family

- Apart from the normal health check-up, emphasis shall also be given to prevent specific diseases originating due to emission of different pollutants such as respiratory ailments, skin problems, water borne diseases, hearing abilities etc.
- Job oriented training courses must be organized through industrial / technical training institutions for educated youth like electrical, tailoring, plumbing, type writing, shorthand and machine repairing, welding fabrication, and other skill developing trades
- Whenever necessary, collaboration between project authority and local bodies will be done on regular basis with an objective to build and maintain a good relationship which is necessary for smooth functioning of the project as well as progress and welfare of the people in the study area
- Awareness programs will be taken to make people aware about the environmental protection, need of water conservation etc.
- At the work place, first aid facilities shall be maintained at a readily accessible place with Necessary appliances including sterilized cotton wool etc. Ambulance facility shall also be provided during emergency
- Sufficient supply of water fit for drinking shall be provided at suitable places.
- Sanitary facilities shall be provided at accessible place within the work zone and kept in a good condition.

4.12 Green Belt Development

Green belt will be developed over 33% area of the total plant area. Out of the 6.92 ha. (17.1 Acres) of the plant area, about 2.3 ha. (5.7 Acres) will be developed as green belt. Indigenous trees with tree density of 1500 trees per hectare (600 nos. of plant per acre) with local board leaf species shall be planted. Out of 2.30 ha. area earmarked for greenbelt development, at present 2000 nos. of trees have already been planted in 1.5 Ha. area. Additionally, 1500 trees shall be planted covering area more than 2.3 Ha. in this monsoon.

Total 3500 saplings shall be planted in 2.3 Ha. area which will be completed within six months. In this regard an undertaking is given by project proponent (undertaking attached as **Annexure XI)**. 3 tier plantations along the plant boundary shall be done. A budget of Rs. 5.00 lakhs has been kept for Green belt development

Calculation of Cost for Green belt Development

Expenditure per plant: Rs. 500

Total Numbers of additional Plants to cover 2.3 ha.(additional 0.8 ha.): 1,000

Total Expenditure=1,000*500=/-

Total Expenditure = Rs. 5.00 lakhs

Table 4.11: Budgetary outlets of greenbelt development to cover in Six Months

S. No.	Year	No. of plants	Budget (Rs. in Lakhs)
1.	May, 2018	200	1.00
2.	June, 2018	200	1.00
3.	July, 2018	200	1.00
4.	August. 2018	200	1.00
5.	September, 2018	100	0.50
7.	October, 2018	100	0.50
Total			**5.0**

Tree plantation is one of the effective remedial measures, which controls the Air Pollution. It also causes aesthetic and climatological improvements of an area as well as sustains and supports the biosphere. It is a well- established fact that trees and vegetation act as a vast natural sink for the gaseous as well as particulate air pollutants due to enormous surface area of leaves. Plantation around the air pollution sources control the air pollution by filtering particulate matter and interacting with gaseous pollutants before it reaches the earth. Trees also act as buffers and absorbers against accidental release of pollutants.

Green Belts with properly selected plant species serve as a useful buffer to contain the menace of pollution from the different sources. As a control measures of atmospheric pollution, as a barriers noise generated in the plant premises and to utilize the treated sewage wastewater, it is recommended to develop vast green belt around the periphery of the plant, along the road side and other area available for the plantation.

For the development of the Green Belt at the project site, guidelines for developing green belts as well as the outcome of the biological survey conducted around the project site is shall be followed.

Roadside Plantation

Roadside plantation plays a very important role for greening the area, increasing the shady area, increasing aesthetic value and for eco-development of the area. The approach roads to project site, colony, etc. can be planted with flowering trees. Trees can be planted to increase aesthetic value as well as shady area along the roads.

The trees and shrubs selected, based on its availability shall be, planted as greenbelt of 9 m width around the plant boundary. The plantation will be in this recommended pattern:

Tier	Habit	Height (m)	Rows
1st Tier (Towards boundary)	Trees	10-20 m	4
2nd Tier (Middle Layer)	Small Trees	5-10 m	6
3rd Tier (Towards Plant)	Small Trees	1-2 m	Thick Pattern

Recommended Plants for Green Belt Development

Greenbelts are an effective mode of control of air pollution, where green plants form a surface capable of absorbing air pollutants and forming a sink of pollutants. Leaves with their vast area in a tree crown, sorbs pollutants on their surface, thus effectively reduce pollutant concentration in the ambient air. Often the adsorbed pollutants are incorporated in the metabolic pathway and the air is purified. Plants grown to function as pollution sink are collectively referred as greenbelts. An important aspect of a greenbelt is that the plants are living organism with their varied tolerance limit towards the air pollutants. A green belt is effective as a pollutant sink only within the tolerance limit of constituent plants. Planting few, known pollutant sensitive species along with the tolerant species within a green belt however, do carry out an important function of indicator species. Apart from function as pollution sink, greenbelt would provide other benefit like aesthetic improvement of the area and providing suitable habitats for birds and animals.

Selection of Plants for Greenbelts

The main limitation for plants to function as scavenger of pollutants are, plant's interaction to air pollutants, sensitivity to pollutants, climatic conditions and soil characteristics. While making choice of plants species for cultivation in green belts, due consideration has to be given to the natural factor of bio-climate. Xerophytes plants are not necessarily good for greenbelts; they with their sunken stomata can withstand pollution by avoidance but are poor absorber of pollutants. Character of plants mainly considered for affecting absorption of pollutant gases and removal of dust particle are as follows.

For absorption of gases:

- Tolerance towards pollutants in question, at concentration, that are not too high to be instantaneously lethal
- Longer duration of foliage
- Freely exposed foliage
- Adequate height of crown
- Openness of foliage in canopy

- Big leaves (long and broad laminar surface)
- Large number of stomatal apertures

For Removal of Suspended Particular matter:

- Height and spread of crown.
- Leaves supported on firm petiole
- Abundance of surface on bark and foliage
- Roughness of bark
- Abundance of axillary hairs
- Hairs or scales on laminar surface
- Protected Stomata

- **Table: Recommended plant Species for Green Belt Development**

Plantspecies	*Habit*	*Tolerance limit*	*Stomatal index*	*Mode of regeneration*
Acacia auriculiformis	*Tree*	*Tolerant*	*10.9*	*Seeds*
Acacia leucophloea	*Shrub*	*T*	*12.01*	*Seeds*
Acacia farnesiana	*Tree*	*T*	*--*	*Seeds*
Achrassapota	*Tree*	*T*	*25.78*	*spreading*
Ailanthus excels	*Tree*	*T*	*13.01*	*Seeds, Shoot, Root*
Albiziaamara	*Tree*	*T*	*--*	*Seeds*
Albiziachinensis	*Tree*	*T*	*--*	*Seeds*
Albizialebbeck	*Tree*	*T*	*19.72*	*Seeds*
Albiziaprocera	*Tree*	*T*	*20.21*	*Seeds*
Alstonascholairs	*Tree*	*T*	*15.23*	*Seeds*
Azadirachtaindica	*Tree*	*T*	*29.2*	*Seeds*

- T:TolerantS- sensitive,(--) =Notavailable
- Sources:CPCB (March,2000) Guidelines for developing greenbelts PROBES/75/1999-2000

Table 4.12: Species Selected for Plantation along the Roadside

S. NO.	*Based on color*	*S. NO.*	*Based on color*
Yellow Flowered Trees			
1	*Acacia Auriculaeformis*	*10*	*Erythrinaparcelli*
2	*Acacia Baileyana*	*11*	*Laburnum anagyroides*
3	*Acacia Dealbata*	*12*	*Micheliachampaca*
4	*Acacia Decurrens*	*13*	*Parkinsoniaaculeata*
5	*Acacia Implexa*	*14*	*Peltophorumptreocarpum*
6	*Anthocephalus Chinensis*	*15*	*Pterocarpusdalbergioides*
7	*Bauthinia Tomentosa*	*16*	*Schizolobiumexcelsum*
8	*Cassia Calliantha*	*17*	*Tabebuiaspectabillis*
9	*Cassia Fistula*	*18*	*Thespesiapopulnea*
Red Flowered Trees			

S. NO.	Based on color	S. NO.	Based on color
1	BombaxCeiba	5	Erythrinavariegate
2	Brownea Grandiceps	6	Saracaasoca
3	ErythrinaBlakei	7	Spathodecampanulata
4	ErythrinaLaurifolia	8	Wrightiacoccinea
Scarlet Flowered Trees			
1	BarringtoniaAcutangula	5	Callistemon Lanceolatus
2	BrassiaActinophylla	6	Delonixregia
3	BrowneaCoccinea	7	Stenocarpussinuatua
4	ButeaMonosperma	8	Sterculiaacerifolia
Pink Flowered Trees			
1	BauhiniaPurpurea	5	Hibiscuscollinus
2	CassiaJavanica	6	Kleinhovia hospital
3	CassiaNodosa (Red)	7	Lagerstroemia speciosa
4	CassiaRenigera	8	Samaneasaman
Blue Flowered Trees			
1	BolusanthusSpeciosus	3	Solanumgrandiflorum
2	Jacaranda Acutifolia	4	Solanum macranthum
White Flowered Trees			
1	AlbiziaLebbeck	8	Mesuaferrea
2	BauhiniaAcuminate	9	Millingtoniahortensis
3	Calophyllumlnophyllum	10	Mimusopseslengi
4	KydiaCalycina	11	Morningaoleifera
5	Madhucalndica	12	Oncobaspinosa
6	Magnolia Grandiflora	13	Plumeria alba
7	Magnolia Pterocarpa		

Plant species	Habit	Tolerance limit	*Stomatal index*	*Mode of regeneration*
Bauniniarecemosa	Tree	T	25.68	Seeds
Bauhinia acuminata	Tree	T	22.31	Seeds
Bauhinia purpurea	Tree	T	23.58	Seeds
Bambusa vulgaris	Tree/ Shrub	T		Cutting
Bougainvillea spectabilis	Shrub	T	32.53	Cutting
Caesalpiniapulcherrima	Tree	T	29.09	Seeds and Cutting
Callistemon citrinus	Small tree	T	127.49	Seeds
Cassia javanica	Tree	T		Seeds
Cassia siamea	Tree	T	21.2	Seeds
Clerodendruminerme	Shrub	T	18.02	Seeds / Cutting
Dalbergiasisoo	Tree	T	18.72	Seeds / Cutting
Dalbergialatifoloa	Tree	T	10.12	Seeds / Cutting
Delonixregia (Gulmonhur)	Tree	Sensitive	14.38	Seeds / stem cutting
Dendrocalamusstrictus	Shrub/ tall grass	T	-	Seeds / stem cutting
Hibiscus rosa-sinensis	Small tree	T	23.32	Stem cutting
Ixoraaborea	Small tree	T	17.3	Stem cutting
Ixorarosea	Small tree	T	20.3	Stem cutting

Plant species	Habit	Tolerance limit	*Stomatal index*	*Mode of regeneration*
Kegilia Africana	Small tree	T	12.9	Seeds
Lantana camara	Shrub	T	12.13	Seeds / Cutting
Lowsoniaintermis	Shrub	T	17	Seeds / Cutting
Mangiferaindica	Tree	T	30.77	Seeds/ budding/ grafting
Melia azadirachta	Tree	T		Seeds/ stem cutting
Neriumindicum	Shrub	T	15.7	Cutting
Peltophorumpterocarpum	Tree	T	16.78	Seeds
Pithecellobiumducle	Tree	T	11.78	Seeds / Cutting
Polyathialongaifolia	Tree	Sensitive	22.27	Seeds
Prosopis cineraria	Tree	T	18.1	Seeds/ root suckers
Syzygiumcumini	Tree	T	20.6	Seeds
Tecomasatans	Shrub	T	23.08	Seeds / Cutting
Termindia catapppa	Tree	T	20.9	Seeds
Thespesiapopulneoides	Tree	T	29.81	Seeds / Cutting
Thevetiaperuviana	Shrub	T	27.8	Seeds

4.13 Rain Water Harvesting

Depending upon the available contours at detailed engineering stage, the number of drainage outfall and extent of open drains etc. will be designed so as to discharge the water to the rainwater harvesting pond for reuse in dust suppression & greenbelt development. A rainwater harvesting pond of capacity 6000 Cubic meters will be made to collect rainwater. Groundwater recharge is not allowed by West Bengal Pollution Control Board for industries. The calculation of rainwater endowment is presented here which shows the total rain water harvesting potential of the plant.

Rain Water Harvesting Potential of the Area

Average Annual Rainfall of the area	1442 mm
Roof top (corrugated) area	6614 sq. meters
Roof top (concrete) area	2281 sq. meters
Paved area	10,877 sq. meters
Open land	5,650 sq. meters

Considerations

1	Run-off coefficient for Roof top (corrugated)	0.7
2	Run-off coefficient for Roof top (concrete)	0.8
3	Run-off coefficient for Paved area	0.6
4	Run-off coefficient for Open land	0.3

5	Collection of the rain water harvested due to evaporation and other losses (Recharge is not permitted by WBPCB at Industrial Site)	60%

Quantity of Water Harvested

S.No.	Details	Calculation	Rainfall Endowment (m^3)	Rainfall Harvesting Potential
1	Roof top (corrugated)	1.442 x 6614	9537	-
		9537 x 0.7 x 0.6	-	4006
2	Paved Area	1.442 x 10877	15685	-
		15685x 0.6 x 0.6	-	5656
3	Roof top (concrete)	1.442 x 2281	3289	-
		3289 x 0.8 x 0.6	-	1579
4	Open land	1.442 x 5650	8147	-
		8147 x 0.3 x 0.6	-	1,466
Total effectively harvested water quantity / annum				**12,707**

Rain Water Harvesting Plan

This existing rainwater harvesting pond size length – 150' length x 50' wide x 8' depth = 1700 KL (capacity). The size of the existing Rain Water harvesting Pit shall be increased to length – 60 m, width – 25 m and depth - 4m = 6000 K L (capacity), to store the rain water at any point of time.

4.14ACTION PLAN FOR COMPLIANCE WITH CHARTER ON CORPORATE RESPONSIBILITIES FOR ENVIRONMENTAL PROTECTION (CREP)

The Charter on Corporate Responsibility (CREP) as laid down by Central Pollution Control Board (CPCB) for Integrated Iron and Steel Plants. Action plan drawn by BMA Stainless Limited to meet compliance with CREP is summarized below:

Table 4.13: Action Plan for Compliance with CREP

S. No.	Unit	CREP Requirement	Action Plan
1	Coke Ovens	To meet PLD, PLL, PLO of notified standard under EP (Act)	Not applicable
2	Steel Melting Shop	Fugitive emissions – to reduce 100% (including installation of Secondary de-dusting facility)	Pulse jet type Bag Filters units (4 nos.) shall be augmented to reduce fugitive emissions from Induction Furnaces at SMS.

S. No.	Unit	CREP Requirement	Action Plan
3	Blast Furnace	Direct injection of reducing agent	Not Applicable
4.	Solid Waste /Hazardous Waste Management	100% utilization of Steel/Melting shop (SMS)/ Blast Furnace (BF) Slag	100 % utilization of SMS Slag has been proposed.
		Charge of tar sludge/ETP sludge to Coke Oven	Not applicable
5.	Water Conservation/ Water Pollution	To reduce specific water consumption to 5 m^3/t for long products and 8 m^3/t for flat products notified effluent discharge standard	Sp. Water consumption after the proposed expansion is envisaged as 0.35 m^3/hr. of liquid steel
		To operate the Co-BP effluent treatment plant efficiently to achieve the norm	Not applicable
6.	All major stacks	Installation of online stack monitoring & online ambient air quality monitoring stations	Online stack monitoring & online ambient air quality monitoring equipment shall be installed.
7.		To operate the existing pollution control equipment efficiently and to keep proper record of run hours, failure time and efficiency	Shall be complied. Existing pollution control equipment shall be operated efficiently and proper record shall be kept for run hours, failure time and efficiency
8.		Implement the recommendations of Life Cycle Assessment (LCA)	Not Applicable
9.		Industry will initiate the steps to adopt the following clean technologies measures to improve the performance of industry towards production, energy, land environment: • Energy recovery of top Blast Furnace (BF) gas	Not Applicable.
		• Use of Tar- free runner linings.	Not feasible
		• De- dusting of Cast house at tap holes, runners, skimmers ladle and charging points.	Not feasible
		• Suppression of fugitive emissions using nitrogen gas or other inert	Not feasible

S. No.	Unit	CREP Requirement	Action Plan
		gas	
		• To study the possibility of slag and fly ash transportation back to the abandoned mines, to the abandoned mines, to fill up the cavities through empty railway wagons while they return back to the mines and its implementation.	Not feasible
		• Processing of the waste containing flux & ferrous wastes through waste recycling plant.	Not Applicable
		• To implement rainwater harvesting	Shall be implemented
		• Reduction Green House Gases by : - Reduction in power consumption - Use of by –products gases for power generation Promotion of Energy Optimization technology including energy/ audit	Shall be complied
		• To set targets for Resource Conservation such as Raw material, energy and water consumption to match International Standards.	Shall be complied
		• Up- gradation in the monitoring and analysis facilities for air and water pollution. Also to impart elaborate training to the manpower so that realistic data is obtained in the environmental monitoring laboratories	Shall be complied
		• To Improve overall house-keeping	Shall be complied

CHAPTER - 5
ANALYSIS OF ALTERNATIVES TECHNOLOGIES

5.1 PREAMBLE

The BMA Stainless Limited has proposed to expand its existing capacity from 1,20,000 TPA to 2,07,360 TPA Billet/Rolled product by replacement of existing 4x8 Tons Induction Furnaces with 4x12 Tons Induction Furnaces. Prior to arriving at a conclusion regarding establishment of proposed project, a number of alternatives were examined and reviewed. The options considered were:

- Project location
- Raw material availability.
- Technology
- Environment

5.2 SELECTION OF LOCATION

Selection of location in this case is not required as the project is for replacement of existing Induction Furnace with the higher capacity Induction Furnace in the same area. Other facilities like Continuous Casting, Reheating Furnace and Rolling Mill are available within the plant premises and shall be used for the expansion project also.

However, the site is located close to National Highway 2. It is commonly referred as Delhi-Kolkata Road is a busyIndian National Highway that runs through the states of Delhi, Haryana, Uttar Pradesh, Bihar, Jharkhand and West Bengal. The road is the part of National Highway network of India, and it is officially listed asrunning over 1465 km from Delhi to Kolkata. The kilometers in each of the states are Delhi (12), Haryana (74), Uttar Pradesh (752), Bihar (202), Jharkhand (190) and West Bengal (235). The nearest railway station isSalanpur. The nearest airport is Kolkata airport at a distance of about 220 km. The location of the plantenjoys the following benefits:

- Proximity to the electricity grid.
- Sub soil water is available at reasonable depth.
- Access to Northern, Southern & Western markets easily.
- Both skilled and unskilled labour is available at the site.
- Good connectivity for transportation of inward and outward materials.
- Already established industrial environment and necessary infrastructure.

The power to the plant shall be brought from the Damodar Valley Corporation substation located near theplant. A separate bay will be extended at a potential of 132

KV at grid substation by providing 132 KVbreakers, Isolators, CTs, CVTs, LA, Structures, Conductors, CR Panel and earthing system exists.

Based on the above observations and expected project scenario, the following has been concluded:

- The project at Burdwan district will have location advantage for its proximity to the raw materials required for production of liquid steel through Induction Furnaces. The basic raw materials required are Sponge Iron, Pig Iron, Ferro-Alloys etc.
- There are many tanks, wells, canals, swamps and bills all over the district. In the Damodar Valley region, there are around 17,000 tanks. The Durgapur barrage and Maithan dam have formed two large reservoirs at the southwestern and western periphery of the district.
- Man power is available in local area in plenty. Also being a number of steel and allied plants established in this area, all kinds of technical man power is also available.
- There is no wild life sanctuary / national park or any ecological sensitive zone within 10 Km radius of the proposed site.
- The State can be benefited from the project in the following ways:

There will be direct employment of large people in the Steel plant. Preference will be given to the people of the state possessing requisite skill and qualification criteria. Also there will be lot of scope for indirect employment of the people of the state in and around the project site.Based on the above guidelines the plant site on Village – Debipur, P.O.-Kalyaneshwari, District – Burdwan, West Bengal State has been chosen for the Mini Intergraded Steel Plant.

5.3 SELECTION OF TECHNOLOGY

The technological facilities required at each processing step to achieve good quantity rolled products are described briefly in the following sections. The technology facilities most commonly followed in the processes is given in Table.

Sl. No.	Processing step	Technological facility
1.	Steel Making	BOF/Electric Arc Furnace/Induction Melting Furnace
2.	Billet Casting	Continuous casting Machine
3.	Rolling	Rolling Mill

Steel Making through Induction Furnace with Billet Caster

Electric Steel Making through Melting in an Electric Induction Furnace (IF) and Billet Casting in a Continuous Casting Machine (CCM) is the only and well established technology for meeting the objectives. During the last four decades, there has been tremendous development in Electric Steel Melting. This technology today is widely used not only for recycling of scrap (which was the original objective) but also for manufacture of steel from the primary raw materials (in the form of DRI, HBI, SI, IC etc.)

5.4 ENVIRONMENT SENSIVITY OF THE LOCATION

1. There is no Wildlife Sanctuary / National Park / Bio-sphere Reserve / Habitat of Migratory birds within 10 km radius from the project site.
2. There is no Tiger Reserve / Elephant Reserve / Turtle Nesting Ground within 10 km radius from the project site.
3. There is no Archeological Monument / Defense installation within 10 km radius from the project site.
4. There is no Forest land in project site

M/s BMA Stainless Limited is committed to use best technology available for controlling, treating and disposing of all type of waste to be generated during the operation of proposed plant. The details of air emission, waste water and solid wastes proposed to be generated and their disposal during operation phase are discussed in Chapter-2 and Chapter-4. Environment sensitivities present in the study area of 10 km around the proposed project site are given in Chapter 3.0. The anticipated adverse impacts shall be less due to the following:

- All statutory requirements, guidelines and recommendations of WBPCB/CPCB/MOEF&CC shall be complied, including CREP.
- Waste water to be generated shall be treated and used within the plant premises. No waste water shall be discharged outside the premises.
- Solid waste to be generated shall either be utilized or disposed-off in environment friendly manner.
- Air emission shall be controlled by providing adequate pollution control equipment.
- Continuous efforts shall be made for improvement of the socio-economic status of the surrounding area.

CHAPTER 6
ENVIRONMENTAL MONITORING PROGRAM

6.1 INTRODUCTION

Environmental Monitoring is an essential tool for sustainable development and ensuring effective most implementation and monitoring of Environmental management plan and mitigation measures. The monitoring and evaluation of the management measures envisaged are critical activities in implementation of the Project. Monitoring involves periodic checking to ascertain whether activities are going according to the plans. It provides the necessary feedback for project management to keep the program on schedule. The purpose of the environmental monitoring plan is to ensure that the envisaged purpose of the project is achieved and results in desired benefits.

To ensure the effective implementation of the proposed mitigation measures, the broad objectives of monitoring plan are:

- To evaluate the performance of mitigation measures proposed in the EMP.
- To evaluate the adequacy of Environmental Impact Assessment
- To suggest improvements in management plan, if required
- To enhance environmental quality.
- To implement and manage the mitigative measures defined in EMP.
- To undertake compliance monitoring of the proposed project operation and evaluation of mitigative measures.

A detailed monitoring of emissions and effluent sources for different environmental parameters will be carried out as per the present norms and any further notification / direction from West Bengal Pollution Control Board (WBPCB), Central Pollution Control Board (CPCB) and MoEF&CC. Monitoring methodologies will follow standard methods prescribed by Central Pollution Control Board (CPCB), Bureau of Indian Standards (BIS), USEPA, AWWA etc.

6.2 PARAMETERS TO BE MONITORED

- Ambient Air Quality,
- Stack Emission
- Work zone Air quality,
- Surface water and Ground Water Quality
- Noise Level
- Performance of pollution control equipment.

6.2.1 Ambient Air Quality

Presently ambient air quality is being monitored regularly in accordance with CPCB/WBPCB guidelines. On line Ambient Air Quality monitoring station shall be installed. It is necessary the monitor the air quality at the boundary of the steel works specifically with respect to particulate matters. It is proposed that continuous particulate matter monitoring stations be established at one location on the downwind of the annual predominant wind direction of the steel works. The equipment shall have facilities to monitor PM_{10}, $PM_{2.5}$,SO_2&NOx.

Ambient air quality monitoring stations in and around the premises will be done as per direction by West Bengal Pollution Control Board (WBPCB). The parameters monitored include the parameters as per National Ambient Air Quality Standard, 2009.

Table 6.1: Ambient Air Quality – Frequency and Parameters

Description	Number of Monitoring Stations	Frequency
Ambient Air Quality	4	quarterly
Parameters – PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO, NH_3, O_3, C_6H_6, B(a)P, Pb, As, Ni		

6.2.2 Stack Emissions

Periodical monitoring of stack for SPM, SO2, NOx& CO in case of process stacks of Induction Furnace and Reheating Furnace shall be done to assess the performance of pollution control facilities installed at the unit. Incase emissions are found to exceed the norms, the 'on duty' personnel shall check the relevant process parameters and take appropriate corrective action. Emissions from all the stacks shall be monitored once in a quarter using the manuallyoperated stacks emissions monitoring equipment. However the frequency of monitoring may be increased if required in accordance with the stipulations of WBPCB or other statutory authorities.

Table 6.2: Stacks to be monitored after the Implementation of the Expansion Plan

Shop / Unit	No. of Stacks	Monitoring Frequency
Process Stacks		
Induction Furnaces (Bag Filter Stack)	2	quarterly
Re Heating Furnace (Rolling Mill)	1	quarterly
Total nos. of stacks to be monitored	**3**	

6.2.3 Effluent Quality

There will be no effluent generation as the proposed plant has adopted zero liquid discharge (ZLD). Domestic water generated will be treated in septic tank/soak pit.

Blow-down water from Cooling Tower and DM Plant regeneration water after the 'Neutralization Pit's shall be used for slag quenching and horticulture after treatment.

Water quality shall be monitored at following locations after the treatment facilities to check their conformance with Effluent Discharge Quality norms under Schedule – VI of Environmental (Protection) Rules, 1986 for the relevant parameters and will be maintained so as to meet the requirements of West Bengal Pollution Control Board.

Table 6.3: Monitoring of Effluent Quality

Unit	Point of Measurement of Effluent quality	Use after the Treatment
Neutralization Pit	At the outlet of Neutralization Pit	Use for slag cooling and dust suppression
Settling Pit	At the outlet	Recycled
Parameters to be monitored –Wastewater shall be monitored quarterly or as directed by WBPCB.		

6.2.4 Ground Water Quality

Ground water shall be sampled from up gradient and down gradient of the proposed slag bank to check for possible contamination and to ascertain the trend of variation in the water quality, if any. In case any adverse trend is noticed, immediate remedial measures shall be taken.

A total of two samples shall be collected from nearby slag dump yard and will be compared with IS: 10500 drinking water standard.

6.2.5 Noise Monitoring

Noise monitoring shall be carried at near to the high noise generating areas once in a quarter. Monitoring of Ambient noise levels will be monitored once every quarter during day time (6 AM to 10 PM) and night time (10 PM to 6 AM) as per S.O. 123(E) Noise Pollution (Regulation & Control) Rules at Industrial, Commercial, Residential and Silence Zone.

6.2.6 Plantation

Plant growth, its maintenance and survival rate will be monitored.

6.2.7 Occupational Health & Safety Monitoring

Occupational health and safety monitoring programs shall verify the effectiveness of prevention and control strategies. The selected indicators shall be representative of the most significant occupational, health, and safety hazards, and the implementation of prevention and control strategies. The performance and achievements of the OHSMS responsible for all management of all environments, Health & Safety aspects

shall be re-assessed on annual basis. The occupational health and safety monitoring program shall include:

- Safety inspection, testing and calibration: BMA shall carryout inspection and testing of all safety features and hazard control measures for plant operation. This shall include regular inspection and testing of all safety features and hazard control measures focusing on engineering and personal protective features, work procedures, places of work, installations, equipment, and tools used. The inspection shall verify that issued personal protective equipment (PPE) continues to provide adequate protection and is being worn as required.
- All instruments installed or used for monitoring and recording of working environment parameters shall be regularly tested and calibrated, and the respective records maintained;
- Surveillance of the working environment shall be carried out.
- Surveillance of workers health: When extraordinary protective measures are required, workers shall be provided appropriate and relevant health surveillance prior to first exposure and at regular intervals thereafter. BMA is already providing and shall continue to provide appropriate and relevant health surveillance to workers with special emphasis to the dust prior to first exposure and at regular intervals thereafter.

6.2.8 Socio-Economic Development Monitoring of ESC Programs

The setting up of the steel plant has improved the socio economic conditions in the surrounding area. The expansion plan will further improve the infrastructure, economic conditions further. The communities, benefited by the steel plant, are the key stakeholders of the steel plant.

It is suggested that BMA Stainless Limited should monitor the ESC programs and should have structured interactions with the community to elicit suggestions for overall improvement for the development of the area.

6.2.9 Training

Training activities for employees and visitors shall be adequately monitored and documented (curriculum, duration, and participants). Emergency exercises, including fire drills, shall be documented adequately. Service providers and contractors shall be contractually required to submit to the BMA Stainless Steel Limited adequate training documentation before start of their assignment.

6.2.10 House keeping

There should be different stockyard for the raw materials, so that the shop floor area can be kept clean. Proper maintenance and cleaning of the Bag house would be done as per requirement. Any generated solid waste will be kept in specific area and if possible it would be reused in the process or sold.

6.2.11 Monitoring of Pollution Control Equipment

It should be ensured that pollution monitoring equipment are effectively working. A detailed maintenance schedule shall be drawn for all pollution control systems. The maintenance shall be done strictly as per schedule and guidelines furnished by plant manufacturer. All pollution control, monitoring and safety equipment shall be periodically checked and calibrated.

6.2.12 Accidents and Diseases Monitoring

BMA stainless Steel Limited has established procedures and systems for reporting and recording of Occupational accidents and diseases and dangerous occurrences and incidents.

These systems enable workers to report immediately to their immediate supervisor any situation they believe presents a serious danger to life or health. The systems and the employer shall further enable and encourage workers to report to management all:

- Occupational injuries and near misses;
- Suspected cases of occupational disease; and
- Dangerous occurrences and incidents.

All reported occupational accidents, occupational diseases, dangerous occurrences, and incidents together with near misses are being duly investigated with the assistance of a person knowledgeable/competent in occupational safety and will continue doing the same for the proposed expansion project. The investigation shall:

- Establish what happened;
- Determine the cause of what happened
- Identify measures necessary to prevent a recurrence.

6.3 BUDGET ALLOCATION FOR MONITORING

On regular basis, Environment Management Cell will inspect the necessity and availability of the materials, technologies, services and maintenance works. The Cell will make appropriate budget for the purpose. Regular record review for any change in financial requirement of environment management will be done and appropriate budgetary provisions will be made. Along with other budgets, Budget for environmental management will be prepared and revised regularly as per requirement. The budget will include provisions for:

- Environmental Monitoring Program
- Laboratory works for Environmental management activities
- Emergency Purchase of necessary material, equipment, tools, services
- Greenbelt development

- Social and Environmental Welfare and Awareness programs / training (CSR)
- Annual Environmental Audit.

Table 6.4: Cost of Environmental Monitoring Program

S.No.	Item	Cost (in Lakhs) Per year
1.	Cost of monitoring of environmental parameters for Air, Water and Noise	8.50
2.	Occupational Health & Safety (Monitoring)	1.50
3.	Plantation	1.00
4.	Socio-economic (Monitoring of ESC Programs)	1.00
5.	Monitoring of Performance of Pollution Control Equipment	1.50
TOTAL		**13.50**

6.4 ENVIRONMENTAL MANAGEMENT CELL

BMA Stainless Limited is responsible for implementation Environmental Monitoring Program. A s eparate department "Environmental Management Cell" (EMC) shall be established to look after all environmental related matters of the plant. The EMC will supervise the reported activity from time to time for smooth implementation of Environmental Monitoring Program and Mitigation and Management measures and will take necessary actions if required. The cell will act to ensure the suitability, adequacy and effectiveness of the Environment Management Program. It will also ensure to meet all the Statutory Requirements.

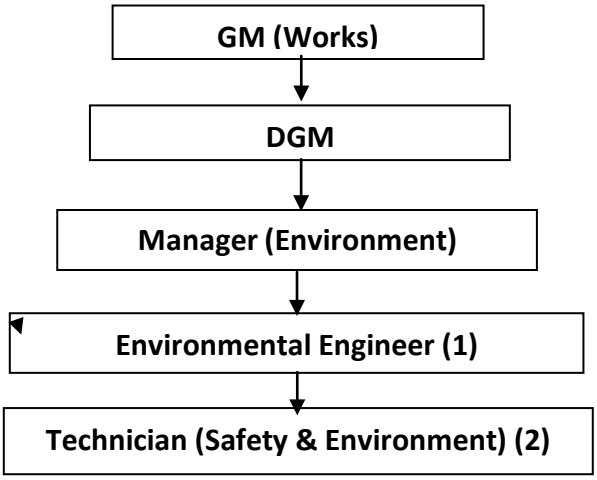


Fig 6.1: Organization Chart of Environmental Monitoring Cell

6.4.1 Monitoring & responsibility

The cell will responsible for monitoring of the plant environment related requirements which include**:**

Interaction with the State pollution Control Board

EMC shall be in regular touch with WBPCB and shall send them environmental monitoring reports regularly in the prescribed format, as per the prevailing practice. Any new regulations considered by State/Central Pollution Control Board for the Industry shall be taken care of by EMC

Provide Training

EMC would be responsible for the implementation of the EMP, needs to be trained on the effective implementation of the environmental issues. To ensure the success of the implementation set up proposed, there is a high requirement of training and skill up-gradation. For the proposed expansion project, additional training facilities will be developed for environmental control. For proper implementation of the EMP, the officials responsible for EMP implementation will be trained accordingly.

To achieve the overall objective of pollution control it is essential not only to provide latest pollution control and monitoring systems but also to provide trained man power resources to operate and maintain the same. So far, the practice with many plants is to utilize the plant operations and maintenance crew for operation of systems. This has shown adverse results due to lack of specialized knowledge in addition to priority selection. Therefore apart from the ECD, specific training will be provided to personnel handling the operation and maintenance of different pollution control equipment.

In-plant training facilities will be developed for environmental control. Specialized courses at various Research / Educational institutes will be organized. The training will be given to employees to cover the following fields:

- Awareness of pollution control and environmental protection to all.
- Operation and maintenance of specialized pollution control equipment.
- Organize field monitoring, maintenance and calibration of pollution monitoring instruments.
- Laboratory testing of pollutants.
- Repair of pollution monitoring instruments.
- Occupational health/safety.
- Disaster management.
- Environmental management.
- Afforestation / plantation and post care of plants.
- Knowledge of norms, regulations and procedures.
- Risk assessment and Disaster Management.

Other responsibilities of the cell will include:

- A WBPCB registered agency will be retained to generate the environment quality data in respect of air, water, noise, soil and meteorology and prepare the Environmental report.
- Timely renewal of Consents & Authorization will be taken care of.
- Submitting environmental monitoring report to WBPCB. The cell will also take mitigative or corrective measures as required or suggested by the Board.
- Conduct and submit annual Environmental Statement to WBPCB.
- Prepare and submit six monthly report on the compliance with the conditions of the environmental clearance
- Keeping the management updated on regular basis about the findings / results of monitoring activities and proposes measures to improve environmental performance.
- Conducting regular safety drills and training programs to educate employees on safety practices. A qualified and experienced safety officer will be responsible for the identification of the hazardous conditions and unsafe acts of workers and advise on corrective actions, organize training programs and provide professional expert advice on various issues related to occupational safety and health.
- Conducting safety and health audits to ensure that recommended safety and health measures are followed.

6.5 SUMMARY

The environment monitoring plan enables environmental management system with early sign of need for additional action and modification of ongoing actions for environment management, improvement and conservation. The environmental monitoring points will be decided considering the environmental impacts likely to occur due to the operation of proposed project as the main scope of monitoring program is to track, timely and regularly, the change in environmental conditions and to take timely action for protection of environment Monitoring of environmental samples will be done as per the guidelines provided by MoEF&CC/CPCB/WBPCB. Separate records for water, wastewater, solid wastes, air emission, soil and manure/ compost will be prepared and preserved regularly. Along with other budgets, Budget for environmental management will be prepared and revised regularly as per requirement.

CHAPTER - 7
ADDITIONAL STUDIES

7.1PREAMBLE

This chapter covers the followings:

- Social Impact Assessment Study
- Public consultation / Public Hearing
- Hazard Identification &Risk Assessment (HIRA)

7.2 SOCIAL IMPACT ASSESSMENT

7.2.1 Introduction

The term "Social Impact" means all social and cultural consequences, including changes of people's life, production, social relations and organization pattern, brought about by any private or public activity, as well as cultural impacts, including changes of people's behavior, the view of value and religion.

The objective of a Social Impact Assessment (SIA) is to assess the possible social impacts that may be brought about by a development project, to understand, manage and control changes, to formulate, implement mitigation measures to minimize adverse social impacts or prevent from extension. In the assessment, the most important key is to carry out social intervention to settle, mitigate and eliminate the adverse impacts and manage the social impacts rationally.

Social Impact Assessment is carried out, based on impacts to all the properties and assets identified along the project site. The socio-economic survey in the project area was carried out and the detailed relevant information.

7.2.2 Objectives of Social Impact Assessment Study

The main objective of conducting social survey is to provide inputs of social concerns and to avoid or minimize the adverse social impacts with the best possible solutions at minimum cost. The social reconnaissance exercise is intended to assess the negative impacts (direct, indirect or cumulative) and to suggest mitigating measures to avoid or at least minimize the adverse impacts on nearby communities and people. To minimize and or avoid the adverse impacts through suggested appropriate measures that can be adopted during the operation of the project.

The above objectives can be summarized as follows:

- To identify Socio economic status of the study area;
- To collect base line demographic and socio-economic characteristics of the study area
- To gather from the villagers information on the awareness and opinion about of the project

- To know the perceptions and expectations of the respondents from the project authority
- To suggest an appropriate action plan for improving/ restoring the living standards of people in the study area

7.2.3 Rehabilitation & Resettlement Plan

The proposed expansion project does not involve any displacement of persons and no rehabilitation or resettlement is necessary.

7.2.4 Reconnaissance Survey of the Project Area

The study team carried out extensive visits to collect social features within the study area. Other primary data has been collected by using structured and semi-structured questionnaires. Socio Economic survey was been carried out in all the directions within the 10 km radius of the study area to know their socio economic status that includes the basic amenities like education, health, communication and transportation, drinking water facility, sanitation facility and their views, expectation and perceptions about the project.
The consultations were carried out with both individuals and groups during the reconnaissance survey involving local people, directly and indirectly affected persons, public consultation involved information dissemination i.e. informing the people about the details of the project and to invite their suggestions and comments.

7.2.5 Analysis of Data and Reconnaissance Exercise

The data collected through the above steps were compiled to develop the social scenario of the project area and the sensitive components within that. The collected data was analyzed, tabulated, summarized and accordingly socio-economic features of the project area were assessed. The analysis will indicate the feasibility of the project and will help in suggesting various socially viable options and suggested mitigation measures to make the project socio-economically acceptable.

7.2.6 Details of Project Area

Study Area

The study area was defined as an area within 10 km radius around the proposed project site. Total 86 villages are coming within the 10 km radius of the study area. The villages are from Salanpur, Kalna – II and Galsi-I of Burdhamman district of West Bengal and Nirsa-Cum-Chirkunda of Dhanbad District of Jharkhand state. Socio economic survey was conducted in 7 villages of the study area. The questionnaire for the socio economic survey is attached in **Annexure XIV.**

Table 7.1: Summarized Details of the Socio Economic Survey

S. No.	Name of the Villages	Education Facility	Health Facility	Drinking Water Facility	Sanitation Facility
1	Hadla	Primary(2), Middle (1), Secondary school(1), High school(1)	No Medical Facility	Tap, Uncovered Well	Closed drainage system available in the village but unsatisfactory. No Garbage disposal system.
2	Dendua	Primary(1), No middle and High school facility, prefer to go to Salanpur village	No Medical Facility	Tap water, Uncovered well, Hand Pump and Tube well	No Sewage and Drainage System
3	Kulti	Primary (1), Middle(1)	No Government Medical Facility	Untreated tap water, Hand Pump	Lack of sanitation and Garbage System
4	Milikhola	Primary(1), Middle school, Secondary school(--) at Belrui	No Medical Facility	Tap water and Hand Pump	No sanitation and toilet facility
5	Salanpur	Primary(3), Middle (1), High school(1) and Senior secondary school (1)	Primary Health Sub-centre with staff of 3 medical staff	Hand Pump, Covered well and Tap water facility	Open drainage system, community toilet available
6	Nakarjuria	Primary(1), Middle(1), High School (-)	No Medical Facility	Tap water, Uncovered well, Hand Pump	Lack of sanitation and Garbage System
7	Mahespur	Primary(1), Middle(--), High School (-)	No Medical Facility	Uncovered well and Tube Well	Open drainage system

Source: Socio Economic survey

7.2.7 Public Consultation

As part of the participatory approach, the project has been designed in due consultation with all the stakeholders. Public consultation is mandatory for any investment in infrastructural development program. The aim of the public consultation is to make the stakeholders aware about the developmental activities being undertaken and to incorporate their views for making sustainable plan during the design and to have successful completion of the project.

Methods of Public Consultation

Informal and formal consultations in the project area were conducted which adopted the following methodology:

(i) Walk over survey and informal discussion with people
(ii) Individual interviews with villagers.

As per the data generated through the survey it is observed that the quality of life of the surveyed village is on an average with lack of basic amenities such as medical facility, sanitation condition is very poor which leads to the unhealthy environment and cause for various health problems. Drinking water facility is also very poor and unsatisfactory. Project proponent should work in certain area for improvement in the quality of life of the region.

Key Findings of the Consultation

The key findings of the consultation on various issues such as, general perception, expectation from the project and suggestions to mitigate any damage are given below:

Points Discussed in consultation	Opinion and Expectations
Issues Discussed: • The Project Background, Environmental, Social issue and benefit from the project were explained to the Stakeholders. • The Main issue of villagers during public consultation was discussed. • Perceptions of the villagers were discussed • Expectations of the respondent from the project proponent were discussed to know their priority needs and requirements	• Most of the respondents are aware about the project but they are not aware about the expansion project. • Villagers from Hadla village opined that toilet shall be constructed in schools of the village • Most of the respondents from Salanpur village are expecting that the job opportunities may be increase due to project work mainly during construction work. • As the main problem faced by most of the villagers is scarcity of water, they are expecting that water facility should be provided to them; also proponent must help in repairing and maintenance of hand pump. • Villagers of Salanpur village responded that the condition of the approach road to the village is very poor, so the proponent should construct village road adjacent to the plant, also the bore wells in the village are not working properly so project authority must assist for its maintenance • Villagers from Salanpur and Dendua village are expecting that project authority should organize health check-up camp once in a month and Ambulance facility for the villagers • Villagers opined that the proposed expansion project may increase the pollution level in the region so project proponent must adapt necessary measures to mitigate the environmental impacts

Source: Socio Economic Survey

7.2.8Following Activities can be proposed In the Study Area

As per the socio economic survey in the study area, following activities can be proposed in the surrounding areas of the plant in association with the Gram Panchayats and by identifying the priorities needs of the villagers:

S. No.	Proposed Planned Activities under CSR	
1.	**Health Facility**	• Organizing medical check-up camps at least once in a month in the villages like Hadla, Dendua, Miliakhola and Nakarjuria were no medical facility is available • Malaria eradication camps (collection of blood sample & detection of virus & free medicine to the Primary Health sub- Centre of Salanpur village • Eye-checkup camps in the villages • Providing facilities for blood test for the villagers of the adjacent area • Providing infrastructure facilities such as beds, medical instruments etc. to the Primary Health S ub-centre at Salanpur village
2.	**Infrastructural Development**	• Installation/ Repair of Hand Pumps/ Bore wells in the project area • Construction and maintenance of roads
3.	**Educational Facility**	• Distribution of educational books, stationary, uniforms etc. to the schools at Miliakhola, Salanpur and Hadla villages • Providing utensils to schools and anganwadi for Mid-Day Meal preparation • Repairing and maintenance of school building and construction of toilets. • Provide water facility such as installation of water cooler in the schools • Supports for sports & cultural events in schools
4.	**Community Welfare Activities**	• Provide sanitation facilities to villagers along with provision for garbage disposal system • Development & beautification of Worship places in the core area.
5.	**Community Water Conservation**	• Landscaping and greenbelt development in and around the project site. • Rain water harvesting ponds and ground water recharge pits in villages of project site
6.	**Community Capacity Building**	• Vocational training for technical skills to the educated youth population of the local villages • Self-employment training for women such as stitching, embroidery, tailoring, handicrafts

7.3 PUBLIC CONSULTATION

Public hearing is a very significant part of the process of public participation envisaged under guidelines issued by MoEF&CC, Government of India. It facilitates involvement of all the stake holders of the project which is essential for ensuring smooth running of project and benefitting all section of society in the process of economic development of the region. Expansion Proposal- Capacity expansion from 1,20,000 TPA to 2,07,360 TPA Billet/Rolled product by Replacement of existing 4x8 Tons induction Furnace with 4x12 Tons Induction Furnace and modernization of Rolling Mill by M/s BMA Stainless Limited located at village –Debipur, P.O: Kalyaneshwari, District-Burdwan,West Bengal was conducted on 21.07.2017 at 12.00 noon at Nandanik Hall of Salanpur PanchayetSamity, P.S- Salanpur, District- Paschim Bardhaman, West Bengal by West Bengal Pollution Control Board.

7.3.1 Advertisement forPublic Hearing



NOTICE

West Bengal Pollution Control Board

In compliance with Notification No. S.O. 1533 (E) dated 14.09.2006 of Ministry of Environment, Forest & Climate Change, Govt. of India, it is hereby notified that, the Public Hearing for the proposed expansion of Steel Plant for production of Billets/ rolled products (TMT) bars (120000 TPA to 207360 TPA) by replacement of existing 4x8 Tons Induction Furnaces with 4x12 Tons Induction Furnaces at Vill - Debipur, P.O. - Kalyaneshwari, Dist. Paschim Bardhaman, West Bengal by M/s. BMA Stainless Ltd. is hereby scheduled on 21.07.2017 at 12.00 noon at Nandanik Hall of Salanpur Panchayat Samity, Dist. - Paschim Bardhaman, West Bengal.

Any person or associaEon of persons, who feel that he/it might be affected by the said authority involved, may consult the copies of Executive Summary of project (English and Bengali) and draft EIA/EMP report would be available at the (1) Office of the District Magistrate, Paschim Bardhaman (2) Office of the Additional District Magistrate (Gen.), Dist. - Paschim Bardhaman (3) Office of the Sub-Divisional Officer, Asansol Paschim Bardhaman (4) Office of the Block Development Officer, Salanpur Development Block, Dist. Paschim Bardhaman (5) Office of the General Manager (O.C.) Paschim Bardhaman (6) Office of the Assansol Municipality, Dist. Paschim Bardhaman (7) Office of the Sabhadhipati, Paschim Bardhaman Zilla Parishad (8) Office of the Salanpur Panchayat Samity, Dist. Paschim Bardhaman (9) Office of the Senior Environmental Engineer, Kendriya Corona Vihar, Panpur, P.O. - Narayanpur, Dist. 24 Parganas (10) the Office of the Environmental Engineer, Asansol Regional Office, ADDA Commercial Market, 2nd Floor, Opp. Asansol Fire Station, G.T. Road, Asansol, Dist. Paschim Bardhaman (11) Department of Environment, Govt. of West Bengal, Paribesh Bhawan, 5th Floor, LB-2, Sector - III, Salt Lake, Kolkata - 700098 (12) Addl. Principal Chief Conservator of Forests & Climate Change, Eastern Zone, Office of the Principal Chief Conservator of West Bengal Pollution Control Board, Paribesh Bhawan, 10A, Block - LA, Sector III, Salt Lake, Kolkata 700106. Executive Summary and the application form of the project would also be available on their website of the Board : www.wbpcb.gov.in

Any person or groups who might be locally affected from the proposed project or activity may participate in the public hearing to be held on 21.07.2017 at 12.00 noon at Nandanik Hall of Salanpur Panchayat Samity, Dist. - Paschim Bardhaman, West Bengal. They may make verbal or written suggestions / objections in the matter in the public hearing meeting. Any other concerned persons having a plausible stake in the environmental aspects of the project may make suggestions /objections in writing to the Senior Environmental Engineer (EIA Cell), Paribesh Bhawan, 10A, Block - LA, Sector - III, Salt Lake, Kolkata - 700 106 before the date of public hearing.



The Times of India dated 21.06.2017EiSamay dated 21.06.2017

Photographs of Public hearing



7.3.2 Minutes of Public Hearing

Annexure-I

Chronology of events leading to Public Hearing

1) Copy of the letter from the District Magistrate, Dist – Paschim Bardhaman dated 19.06.2017 (copy enclosed).
2) Letter of circulation of copies of Executive Summary and EIA / EMP of the project on 21.06.2017 (copy enclosed).
3) Notification of Public Hearing in two local dailies published on 21.06.2017 (copy enclosed).
4) Holding Public Hearing at the Nandanik Hall of Salanpur Panchayat Samity, P.S.: Salanpur, Dist – Paschim Bardhaman, West Bengal on 21.07.2017.

Copies of Executive Summary with EIA/EMP report were available for public scrutiny in the offices of:

1. Office of the District Magistrate, Paschim Bardhaman, Govt. of West Bengal.
2. Office of the Additional District Magistrate (General), Dist – Paschim Bardhaman, Govt. of West Bengal.
3. Office of the Sub-Divisional Officer, Asansol Sub-Division, Dist – Paschim Bardhaman.
4. Office of the Block Development Officer, Salanpur Development Block, Dist – Paschim Bardhaman
5. Office of the General Manager, D.I.C., Paschim Bardhaman.
6. Office of the Asansol Municipality, Dist – Paschim Bardhaman.
7. Office of the Sabhadhipati, Paschim Bardhaman Zilla Parishad.
8. Office of the Salanpur Panchayat Samity, Dist – Paschim Bardhaman.
9. Office of the Chief Engineer (O & E), Paribesh Bhawan, 10A, Block-LA, Sector-III, Salt Lake City, Kolkata – 700 106.
10. Office of the Senior Environmental Engineer, Kankinara Circle Office, Panpur More, Kalyani Expressway, PO – Narayanpur, Dist: 24 Parganas(N).
11. Office of the Environmental Engineer, Asansol Regional Office, ADDA, Commercial Market, 2nd Floor, Opp.– Asansol Fire Station, G. T. Road, Asansol, Dist – Paschim Bardhaman.
12. Department of Environment, Govt. of West Bengal, Pranisampad Bhavan, 5th Floor, LB-2, Sector – III, Salt Lake, Kolkata 700 098.
13. Ministry of Environment, Forests & Climate Change, Eastern Zonal Office, Bhubaneswar.
14. Head Office of West Bengal Pollution Control Board, Paribesh Bhawan, 10A, Block-LA, Sector-III, Salt Lake City, Kolkata – 700 106.

PROCEEDINGS OF THE PUBLIC HEARING FOR THE PROPOSED EXPANSION OF M/S. BMA STAINLESS LIMITED; CAPACITY ENHANCEMENT FROM 1,20,000 TPA TO 2,07,360 TPA BILLET/ROLLED PRODUCTS BY REPLACEMENT OF EXISTING 4X8 TONS INDUCTION FURNACES WITH 4X12TONS INDUCTION FURNACES AND MODIFICTION OF ROLLING MILL AT VILLAGE: DEBIPUR, P.O.: KALYANESHWARI, DISTRICT: PASCHIM BARDHAMAN, WEST BENGAL. PUBLIC HEARING CONDUCTED ON 21.07.2017 AT 12.00 NOON AT NANDANIK HALL OF SALANPUR PANCHAYET SAMITY, P.S.: SALANPUR, DISTRICT: PASCHIM BARDHAMAN, WEST BENGAL.

M/s. BMA Stainless Limited submitted an application to the West Bengal Pollution Control Board for conducting a public hearing for the proposed capacity enhancement from 1,20,000 TPA to 2,07,360 TPA billet/rolled products by replacement of existing 4x8 tons induction furnaces with 4x8 tons induction furnaces and modification of rolling mill at Village: Debipur, P.O.: Kalyaneshwari, District: Paschim Bardhaman, West Bengal.

As per the EIA Notification S.O. 1533 dated 14th September, 2006 of the MoEF & CC, Govt. of India, Environmental Clearance (EC) of the said project is required to be obtained from the MoEF, Govt. of India after conducting the public hearing.

Accordingly, the West Bengal Pollution Control Board (WBPCB) after observing all formalities conducted the public hearing on 21.07.2017 at 12.00 Noon at Nandanik Hall of Salanpur Panchayet Samity, P.S.: Salanpur, District: Paschim Bardhaman, West Bengal. Sri Kaushik Mukherjee, W.B.C.S. (Exe.), Dy. Magistrate & Dy. Collector, and O.C., Judicial Munshi Khana, Paschim Bardhaman presided over the hearing, having been duly authorized by the District Magistrate, Paschim Bardhaman. List of the panel members and the others present in the public hearing is enclosed.

The hearing started with a welcome note from Sri Mukherjee, DMDC &OC, JM. He informed the audience about the proposal of M/s. BMA Stainless Limited for the expansion project and explained about the need setting up of new industries which would lead to socio-economic development of the area. He however stressed upon the need for implementation of pollution control measures so as to minimize the effect of pollution in the surrounding area. He also highlighted the rules & objectives of conducting public hearing.

Sri S.Ganguly, Environmental Engineer, WBPCB, explained the provisions of the above stated MoEF Notification and also informed the audience about the proposal of M/s. BMA Stainless Limited for the proposed project and the measures to be adopted for control of pollution. Sri S.Ganguly further informed the gathering that the entire public hearing procedure will be recorded and unedited videography will be sent to the MoEF & CC, Govt. of India for their consideration. He requested the project proponent to present the details of the project in local language.

Sri Niranjan Lal Agarwalla, of M/s. BMA Stainless Limited, presented the details of the proposed project in local language through a power point presentation. The presentation as given by Sri Niranjan Lal Agarwalla is depicted as under –

Project Summary							
Proposed Project	Capacity expansion of BMA Stainless Limited from 1,20,000 TPA to 2,07,360 TPA Billet/Rolled product by Replacement of existing 4 X 8 Tons induction Furnace with 4 X 12 Tons Induction Furnace.						
Project Proponent	BMA Stainless Limited. 10A, Shakespeare Court, 21 A, Shakespeare Sarani, Kolkata – 700071.						
Project Location	Village : Debipur, P.O : Kalyaneshwari, District : Burdwan, West Bengal. Latitude : 23°21'1.72" N ; Longitude : 86°22'58.30" E.						
Main Plant	Plant	Existing		Proposed expansion (Additional)		Total (after the proposed expansion)	
		Unit	Capacity	Unit	Capacity	Unit	Capacity

	1. Induction Furnace	4 X 8 Tons	1,20,000 TPA	Replacement of exiting 4X8 T IF with 4X12	-	4 X 12 Tons	2,07,360 TPA
	2. Continuous Casting Machine(CCM	2 Strand, 4/7m radius	1,20,000 TPA	-	87,360 TPA	2 Strand, 4/7m radius	2,07,360 TPA
	3. Producer Gas Plant	1	27,00,000 Nm^3/month	-	-	-	27,00,000 Nm^3/month
	4. Rolling Mill	1	1,20,000 TPA	-	87,360 TPA	-	2,07,360 TPA

Product	Billets / Rolled Products : 2,07,360 TPA					
Raw Materials	Sl. No.	Raw Materials	Quantity (TPA)			Source of Supply
			Existing	Additional	Total	
	1.	Sponge iron	96,960	70,587	1,67,547	Durgapur &Bankura, West Bengal.
	2.	Pig iron	34,320	24,985	59,305	Nearby Industries in West Bengal.
	3.	Alloys	720	524	1,244	In-house.
		Total	1,32,000	96,096	2,28,096	-
Land Area	Expansion shall be within 6.92 Hectares of land in possession of the project proponent.					
Project Cost	Rs. 8.0 Crores.					
Make-up Water Consumption	Existing : 150 KLD ; Additional : 52 KLD ; Total : 202 KLD. Source : Damodar Valley Corporation (DVC) & Rainwater Harvesting.					
Power Requirement	Existing : 20 MW ; Additional : 10 MW ; Total : 30 MW. Source : Damodar Valley Corporation (DVC).					
Manpower	Existing : 210 ; Additional : 30 ; Total : 240.					
Air Pollution Control System	Source	Pollution Control System				
	Induction Furnace	Bag Filter. Stack emissions <50 mg/Nm^3 and Fugitive emissions <2000 µg/Nm^3.				
Solid Waste	Type of Waste	Existing	Additional	Total	Mode of Disposal	
	Slag	10,308 TPA	7,504 TPA	17,812 TPA	Utilized in road / area / land development.	
	Bag Filter Dust	360 TPA	262 TPA	622 TPA	Recycled in the process.	
Applicability of EIA Notification 2006	*Category A [3(a) : Metallurgical Industry (Ferrous & Non Ferrous)]* *Environmental Clearance is to be accorded from Expert Appraisal Committee (Industrial Projects –1), Ministry of Environment, Forest and Climate Change, Government of India, New Delhi.*					

During the discussion the panel members and the others present in the public hearing made queries/suggestions with respect to the proposed project, which are noted below:

Sri Manoj Tewari of Kalyaneswari, welcomed the proposed project and requested that job opportunity be provided for the local people in the upcoming project. He also mentioned that the unit should adopt effective pollution control measures.

Sri Barun Kr. Malakar of Sababanpur, also welcomed the proposed project and requested the project proponent to take measures taken to minimize the effect of pollution, both air and water, to be generated from the project.

Sri Akshay Kr. Layek of Hodla, questioned the project proponent regarding the source of water and the treatment of the effluent discharged from the project. He also requested for the renovation of the toilets in local schools.

Sri Tarakeshwar Saitiya of Salanpur, requested the project proponent for development of local roads in the area and to provide employment to the local people.

Sri Manick Malakar of Salanpur, also stressed upon the need for local employment generation and developmental work in the area.

Mr. Mobin Khan of Salanpur requested the. project proponent to provide employment to the local people and to provide an ambulance as a part of CSR program. He also mentioned about the need for plantation of more trees and development of the infrastructure in local schools.

Sri Naba Kr. Garai of Salanpur, Sri Bharat Chandra Mondal of Sitaramarhi and Sri Niladri Karmakar of Neamatpur, all welcomed the proposed project.

Sri Arun Kar, AGM, Business Development, of M/s. BMA Stainless Limited, welcomed the audience for their queries / suggestions. He mentioned that no process effluent will be discharged from the project. For emission control, proper emission control system comprising of bag filters of adequate design will be installed for each individual induction furnace. Sri Kar further stated that preference will be given to local employment generation which will lead to improvement in the livelihood of the local people. He mentioned that they will try to work for the betterment of the local people. Proper pollution control measures are in place and the norms/ stipulated standards will be adhered to in future. Community development measures and local development work will be continued. All points raised during the hearing will be duly taken care of.

Sri Tapan Sarkar, BDO, Salanpur, welcomed the proposed project. He expressed the hope that local employment opportunities will be generated as a result of the upcoming project which will lead to the socio-economic development of the area. He also requested the project proponent to take necessary steps for abatement of pollution resulting from the project.

Sri Mukherjee, DMDC &OC, JM, welcomed the proposal of M/s. BMA Stainless Limited, especially regarding community outreach programs conducted by the industry as also the mitigative measures taken for minimization of the impact of pollution. He requested the project proponent to plant more trees both inside and outside the plant premises and also to distribute tree saplings among the people in the locality. He requested the project proponent to create employment generation for the benefit of the local people. He thanked the audience for their active participation in the public hearing and voicing their opinion regarding the proposed project. He then finally concluded the session.

S. Ganguly 21.07.17

Sri S. Ganguly
Environmental Engineer
West Bengal Pollution Control Board

21/7/17

Sri Kaushik Mukherjee, W.B.C.S. (Exe.)
DMDC & OC, JM
Dist – Paschim Bardhaman

EIM-B658
18/07/17

Government of West Bengal
Office of the District Magistrate
Paschim Bardhaman
(J.M. Section)

Memo No:- 101/JM

Date:-19/6/2017

To
The Senior Environmental Engineer (EIM Cell)
West Bengal Pollution Control Board,
Department of Environment, Govt. of West Bengal
Paribesh Bhawan, 10A Block L.A Sector-III
Bidhan Nagar, Kolkata-700098

18.07.17

Sub. : Public Hearing for the proposed expansion of Steel Plant for production of MS Billets / rolled products (TMT) bars (120000 TPA to 207360 TPA) by replacement of existing 4x8 Tons Induction Furnaces with 4x12 Tons Induction Furnaces at Vill – Debipur, PO – Kalyaneshwari, Dist – Paschim Bardhaman, West Bengal, by M/s. BMA Stainless Ltd.

Ref : Your letter bearing Memo No.- 245-2N-43/2013(E) Dated – 30/05/2017

Sir,

In reference to your above referred letter, this is to inform you that the public hearing will be held on 21/07/2017 at 12.00 noon at Nandanik Hall of Salanpur Panchayet Samity, P.S – Salanpur, Dist – Paschim Bardhaman, West Bengal

In this context you are requested to make wide publicity from your end to ensure participation in the hearing of the people who may be affected.

18.07.2017

Yours faithfully

19/06/17

For District Magistrate
Paschim Bardhaman

Memo No:- 101(17)/JM

Date:- 19/6/2017

Copy forwarded for information & with the request to make it convenient to remain present at the hearing and also kindly ensure participation by affected families at the hearing to:-

1) The Commissioner of Police, Asansol-Durgapur Police Commissionerate, Asansol.
2) The Mayor, Asansol Municipal Corporation, Asansol.
3) The Officer-in-charge, M/s. BMA Stainless Ltd. Vill – Debipur, PO – Kalyaneshwari, Dist – Paschim Bardhaman, West Bengal.
4) The Block Development Officer and Executive Officer, Salanpur Panchayet Samity.
5) The Sabhapati, Salanpur Panchayet Samity
6) The Officer-in-charge, Salanpur P.S.
7) The Block Land & Land Reforms Officer, Salanpur.

19/06/17

For District Magistrate
Paschim Bardhaman

WEST BENGAL POLLUTION CONTROL BOARD
(Department of Environment, Govt. of West Bengal)
Parivesh Bhawan, 10A, Block - LA, Sector III
Bidhannagar, Kolkata-700 098, India
Tel : 2335 - 9888 / 7428 / 8211 / 6731 / 0261 8861 / 5868 / 1625
Fax : 2335 - 5868 / 9813
City Code : 33, Country Code : 91
Website: www.wbpcb.gov.in

Memo No. 296(1-11)-2N-43/2013(E) Dated: 21.06.2017

CIRCULAR

It is hereby informed that a Public Hearing will be held on 21.07.2017 at 12:00 noon at Nandanik Hall of Salanpur Panchayat Samity, Dist – Paschim Bardhaman, West Bengal for the proposed expansion of Steel Plant for production of MS Billets / rolled products (TMT) bars (120000 TPA to 207360 TPA) by replacement of existing 4x8 Tons Induction Furnaces with 4x12 Tons Induction Furnaces at Vill – Debipur, PO – Kalyaneshwari, Dist – Paschim Bardhaman, West Bengal, by M/s. BMA Stainless Ltd. Paper notification in this respect may kindly be seen in "Times of India" and "Ei-Samay".

In this regard copies of the draft EIA / EMP report and Executive Summary of the project along with soft copies are sent herewith for record and for access to the general public for their information and participation of locally affected persons in the Public Hearing on 21.07.2017. Special care against any damage or pilferage of the draft EIA / EMP report and Executive Summary copies should be taken as these are very much limited in number.

21.6.17.

Senior Environmental Engineer (E.M Cell)
West Bengal Pollution Control Board

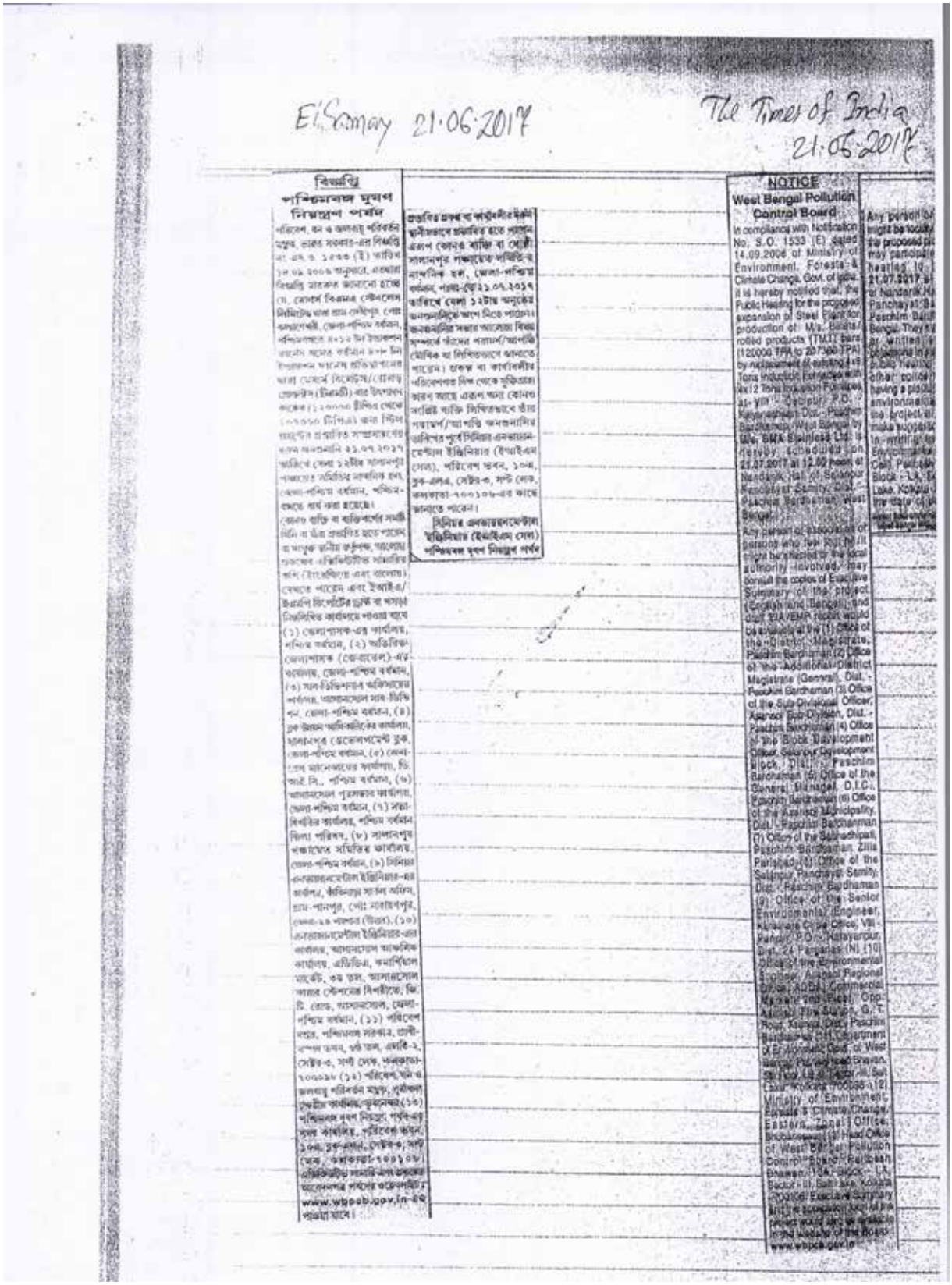
Memo No. 286(14)-2N-42/2013(E) Dated: 2 .06.2017

...with copies of draft EIA / EMP report, Executive Summary (English and Bengali) along with ...

...District Magistrate, Paschim Bardhaman, ... West Bengal	1 Set of Executive summary in English & Bengali and one draft EIA / EMP report
... Additional District Magistrate (General), ... Govt. of West Bengal	- Do -
... Sub Divisional Officer, Asansol Sub-... – Bardhaman	- Do -
... Development Officer, Salanpur ... – Paschim Bardhaman	- Do -
... General Manager, D.I.C., Paschim	- Do -
... Municipality, Dist – Paschim	- Do -
... Panchayat Samity, Dist – Paschim	- Do -
... Chief Engineer (O & E), Paribesh Bhawan, ... Block-LA, Sector-III, Salt Lake City, Kolkata – 700 098	- Do -
... Senior Environmental Engineer, Kankinara ... More, Kalyani Expressway, PO – ... 24 Parganas(N)	- Do -
... Environmental Engineer, Asansol Regional ... A.I.A, Commercial Market, 2nd Floor, Opp.– ... Road, Asansol, Dist – Paschim	- Do -
... Govt. of West Bengal, ... Floor, LB-2, Sector – III, Salt ... 098	- Do -
... Environment, Forests & Climate Change, ... Office, Bhubaneswar	- Do -
... West Bengal Pollution Control Board, ... Block-LA, Sector-III, Salt Lake ... – 700 098	- Do -

4.06.17

Senior Environmental Engineer (EIM Cell)
West Bengal Pollution Control Board



Ei Samay 21.06.2017

The Times of India
21.06.2017

বিজ্ঞপ্তি

পশ্চিমবঙ্গ দূষণ নিয়ন্ত্রণ পর্ষদ

পরিবেশ, বন ও জলবায়ু পরিবর্তন মন্ত্রক, ভারত সরকার-এর বিজ্ঞপ্তি নং এস ও ১৪৩৩ (ই) তারিখ ১৪.০৯.২০০৬ অনুযায়ী, এতদ্বারা বিজ্ঞপ্তি জারিকল্পে জানানো হচ্ছে যে, বোলপুর বিএমএ স্টেনলেস লিমিটেড থানা গড় সেইদপুর, পোঃ কল্যাণেশ্বরী, জেলা-পশ্চিম বর্ধমান, পশ্চিমবঙ্গের ৪×৮ টন ইন্ডাকশন ফার্নেস স্থানে বর্তমান ৪×১২ টন ইন্ডাকশন ফার্নেস দ্বারা মেসার্স বিএমএ স্টেনলেস লিমিটেড/রোলড্ড প্রোডাক্টস (লিমিটেড) এর উৎপাদন ক্ষমতা ১,২০,০০০ টিলেট থেকে ২,০৭,৩৬০ টিলেট/রোলড্ড প্রডাক্ট বৃদ্ধির প্রস্তাবিত সম্প্রসারণ বিষয় গত ২৩.০৭.২০১৭ তারিখে বেলা ১২টায় সালানপুর পঞ্চায়েত সমিতির দফতর, জেলা-পশ্চিম বর্ধমান, পশ্চিমবঙ্গে গণ শুনানি করা হচ্ছে।

কোনও ব্যক্তি বা ব্যক্তিবর্গের সম্ভাব্য লিখিত বা তাঁর প্রতিনিধি মারফত পাঠানো বা মাতৃভাষায় জনশুনানি, আলোচ্য প্রস্তাবিত প্রকল্প এনভিরনমেন্টাল সার্ভিসের খসড়া (ইংরাজিতে এবং বাংলায়) দেখতে পাবেন এবং ইআইএ/ইএমপি রিপোর্টের কপি বা খসড়া নিম্নলিখিত কার্যালয়ে পাওয়া যাবে (১) জেলা শাসক-এর কার্যালয়, পশ্চিম বর্ধমান, (২) অতিরিক্ত জেলা শাসক (জে-ডেভেল)-এর দফতর, জেলা-পশ্চিম বর্ধমান, (৩) মহকুমা ডিভিশনাল অফিসারের কার্যালয়, আসানসোল সাব-ডিভিশন, জেলা-পশ্চিম বর্ধমান, (৪) ব্লক ডেভলপমেন্ট অফিসারের কার্যালয়, হলদাপুর ব্লক ডেভেলপমেন্ট ব্লক, জেলা-পশ্চিম বর্ধমান, (৫) জেলা ম্যাজিস্ট্রেটের কার্যালয়, ডি. জি. পি., পশ্চিম বর্ধমান, (৬) আসানসোল পুরসভার কার্যালয়, জেলা-পশ্চিম বর্ধমান, (৭) সকাবিধীর কার্যালয়, পশ্চিম বর্ধমান জিলা পরিষদ, (৮) সালানপুর পঞ্চায়েত সমিতির কার্যালয়, জেলা-পশ্চিম বর্ধমান, (৯) সিনিয়র এনভায়রনমেন্টাল ইঞ্জিনিয়ার-এর কার্যালয়, ঐতিহ্যপুর সাব-রিজিওনাল অফিস, গ্রাম-পানপুর, পো: নারায়ণপুর, জেলা-২৪ পরগনা (উত্তর), (১০) এনভায়রনমেন্টাল ইঞ্জিনিয়ার-এর কার্যালয়, আসানসোল আঞ্চলিক কার্যালয়, এডিডিএ, কমার্শিয়াল কমপ্লেক্স, ৩য় তল, আসানসোল পাওয়ার স্টেশনের বিপরীতে, ডি. টি. রোড, আসানসোল, জেলা-পশ্চিম বর্ধমান, (১১) পরিবেশ ভবন, পশ্চিমবঙ্গ সরকার, তানী-দুগ্ধ ভবন, ৭ম তল, এরিয়া-২, সেক্টর-৫, সল্ট লেক, কলকাতা-৭০০০৯১ (১২) পরিবেশ, বন ও জলবায়ু পরিবর্তন মন্ত্রক, পূর্বাঞ্চল দেবীটার কার্যালয়, ভুবনেশ্বর (১৩) পশ্চিমবঙ্গ দূষণ নিয়ন্ত্রণ পর্ষদ-এর মূল কার্যালয়, পরিবেশ ভবন, ১০ম, ব্লক-এলএ, সেক্টর-৩, সল্ট লেক, কলকাতা-৭০০১০৬। এক্সিকিউটিভ সামারি-এর প্রকাশ অনুরোধপত্র পর্ষদের ওয়েবসাইট www.wbpcb.gov.in-এও পাওয়া যাবে।

প্রস্তাবিত প্রকল্প বা কার্যাবলীর ব্যাপারে কোনও ব্যক্তি বা সেচ্ছা সালানপুর পঞ্চায়েত সমিতি-র নাগরিক হল, জেলা-পশ্চিম বর্ধমান, পরামর্শ-তারিখ ২১.০৭.২০১৭ তারিখে বেলা ১২টায় অনুষ্ঠেয় জনশুনানিতে অংশ নিতে পারেন। জনশুনানির সময় আলোচ্য বিষয় সম্পর্কে পরামর্শ/আপত্তি মৌখিক বা লিখিতভাবে জানাতে পারেন। প্রকল্প বা কার্যাবলীর পরিবেশগত দিক থেকে গুরুত্বপূর্ণ হলে অন্য কোনও ব্যক্তি লিখিতভাবে তাঁর পরামর্শ/আপত্তি জনশুনানির তারিখের পূর্বে সিনিয়র এনভায়রনমেন্টাল ইঞ্জিনিয়ার (ইআইএ সেল), পরিবেশ ভবন, ১০ম, ব্লক-এলএ, সেক্টর-৩, সল্ট লেক, কলকাতা-৭০০১০৬-এর কাছে জানাতে পারেন।

সিনিয়র এনভায়রনমেন্টাল ইঞ্জিনিয়ার (ইআইএ সেল)
পশ্চিমবঙ্গ দূষণ নিয়ন্ত্রণ পর্ষদ

NOTICE

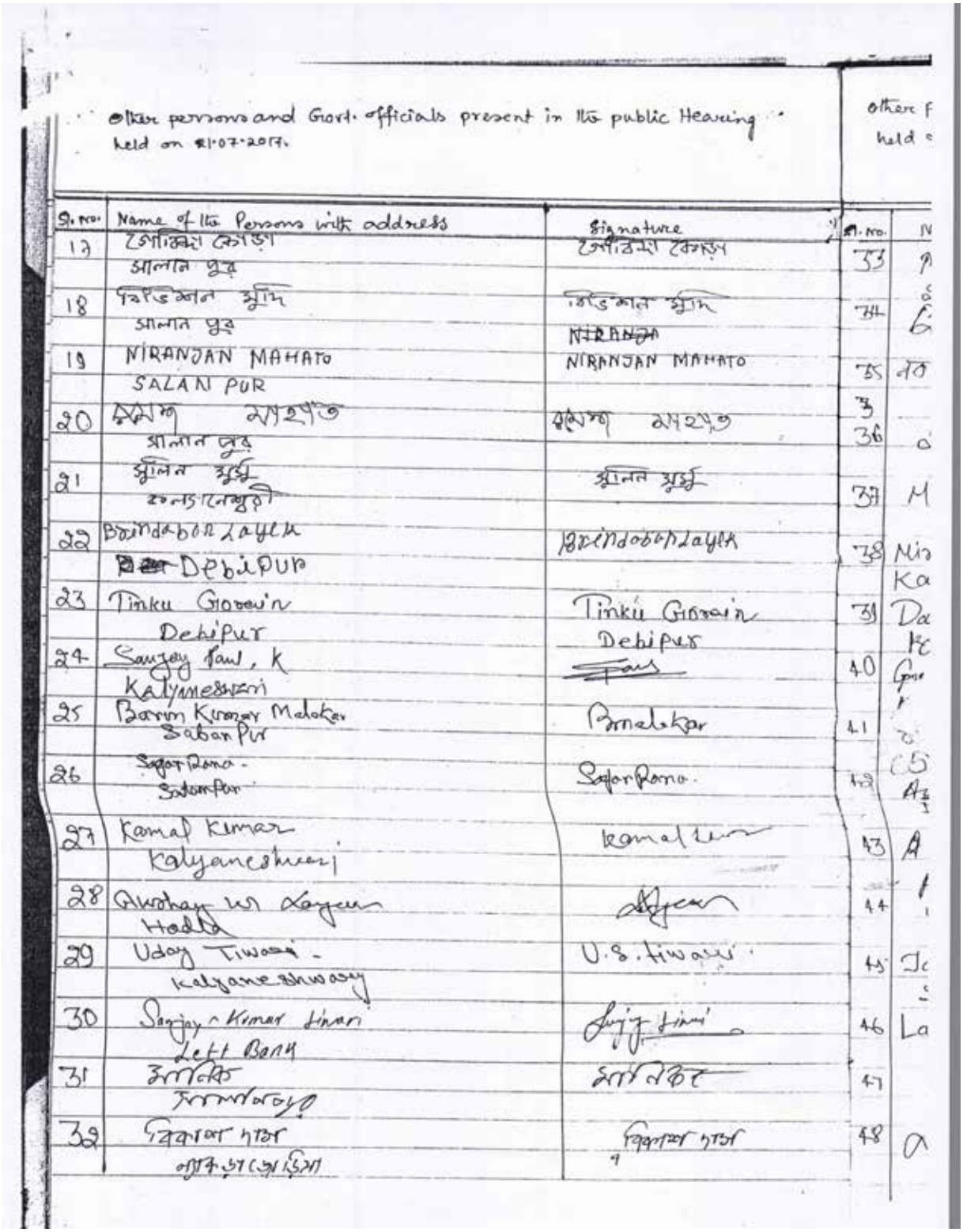
West Bengal Pollution Control Board

In compliance with Notification No. S.O. 1533 (E) dated 14.09.2006 of Ministry of Environment, Forests & Climate Change, Govt. of India it is hereby notified that, the Public Hearing for the proposed expansion of Steel Plant for production of M/s. Billets/rolled products (TMT bars) (120000 TPA to 207360 TPA) by replacement of existing 4x8 Tons Induction Furnaces with 4x12 Tons Induction Furnaces at- vill - Debipur, P.O.- Kalyaneshwari, Dist.- Paschim Bardhaman, West Bengal by M/s. BMA Stainless Ltd. is hereby scheduled on 21.07.2017 at 12.00 noon at Nandanik Hall of Salanpur Panchayat Samity, Dist.- Paschim Bardhaman, West Bengal.

Any person or associations of persons who feel his/her/its interest may be affected by the local authority involved, may consult the copies of Exaclive Summary of the project (English and Bengali) and draft EIA/EMP report would be available at the (1) Office of the District Magistrate, Paschim Bardhaman (2) Office of the Additional District Magistrate (General), Dist.- Paschim Bardhaman (3) Office of the Sub-Divisional Officer, Asansol Sub-Division, Dist.- Paschim Bardhaman (4) Office of the Block Development Officer, Sesarpur Development Block, Dist.- Paschim Bardhaman (5) Office of the General Manager, D.I.C., Paschim Bardhaman (6) Office of the Asansol Municipality, Dist.- Paschim Bardhaman (7) Office of the Sabhadhipati, Paschim Bardhaman Zilla Parishad (8) Office of the Salanpur Panchayat Samity, Dist.- Paschim Bardhaman (9) Office of the Senior Environmental Engineer, Kalyaneshwari Circle Office, Vill- Panpur, P.O.- Narayanpur, Dist.-24 Parganas (N) (10) Office of the Environmental Engineer, Asansol Regional Office, ADDA Commercial Complex 3rd Floor, Opp.- Asansol Fire Station, G.T. Road, Kajora, Dist.- Paschim Bardhaman (11) Department of Environment, Govt. of West Bengal, Paribesh Bhawan, 3rd Floor, 10 A, Block - III, Salt Lake, Kolkata-700098 (12) Ministry of Environment, Forests & Climate Change, Eastern Zonal Office, Bhubaneswar (13) Head Office of West Bengal Pollution Control Board, Paribesh Bhawan, 10A, Block - LA, Sector - III, Salt Lake, Kolkata - 700106. Executive Summary and the application form in the prescribed proforma are also available in the website of the Board www.wbpcb.gov.in

Statement of attendance of Panel Members of the Public Hearing for the proposed expansion of Steel Plant for production of MS Billets/ rolled products (TMT) bars (120000 to 207360 TPA) by replacement of existing 4X8 Tons Induction Furnaces with 4X12 Tons Induction Furnaces at Vill- Debipur, PO- Kalyeneshwari, Dist- Paschim Burdhaman, West Bengal by M/s. BMA Stainless Ltd. Public Hearing held on 21.07.2017 at 12:00 noon at Nandanik, Hall of Salanpur Panchayat Samity, Dist- Paschim Burdhaman, WB.

Sl. No.	Name of the Panel Members	Signature
1.	K. M. Khare, EIA cordinator Vardan Environet	
2.	Narayan Lal Agarwala BMA Stainless Ltd.	
3.	Sandipan Majumdar BMA Stainless Ltd.	
4.	Subir Kumar Ganguly BMA Stainless Ltd	
5.	Kaushik Mukherjee DMDC & Officer-in-charge, Judicial Hazat Khana. Paschim Burdhaman	21/7/17
6.	Shourik Ganguly EE, WBPCB	21.07.17.
7.	Samit Jr. Engr., ACE, WBPCB	21/07/2017
8.	Tapan Sarkar, BDO, Salanpur	21.07.17.
9	Shyamal Mahanta (Sevashri, Salanpur P.S)	
10	Arun Kumar Kar (BMA Stainless Ltd)	21/07/17



Other persons and Govt. officials present in the public Hearing held on 21.07.2017.

Sl. no.	Name of the Persons with address	Signature
17	[illegible]	[illegible]
18	[illegible]	[illegible]
19	NIRANJAN MAHATO SALANPUR	NIRANJAN MAHATO
20	[illegible]	[illegible]
21	[illegible]	[illegible]
22	Brindaban Layek Debipur	Brindaban Layek
23	Tinku Goswin Debipur	Tinku Goswin Debipur
24	Sanjay Paul, K Kalyaneshwari	[illegible]
25	Barun Kumar Malakar Saban Pur	Barun Malakar
26	Safar Rana - Sabanpur	Safar Rana.
27	Kamal Kumar Kalyaneshwari	kamal kumar
28	Awdhay [illegible] Hadia	[illegible]
29	Uday Tiwari - Kalyaneshwary	U.S. Tiwari
30	Sanjay Kumar Hari Left Bank	Sanjay Hari
31	[illegible]	[illegible]
32	[illegible]	[illegible]

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Table 7.2: Summary of the issues raised during Public Hearing and Action Plan

Sl. No.	Name & Village of Participant	Issues Raised	Action Plan		
			Commitment	Time Frame	Budget
1	Manoj Tiwari, Kalyaneshwari, Barun Kumar Malakar, Sababanpur, Naba Kr. Garai, Salanpur, Nilandrikarmakar, Neamatpur, Bharat Chandra Mondal, Sitaramarhi,	Welcomed the proposal			
2	Manoj Tiwari, Kalyaneshwari, Tarakeshwar, Saitiya, ManickMalakar, Salanpur, Mobin Khan, Salanpur,	Job for the local people in the upcoming project	The company will frame policy for recruitment in which preference will be given to the local people on the basis of their merit and qualification. **Vocational Training Center** for providing training to youths on self-employment.	6 months	Rs 8.0 Lakhs for Vocational Training centre
3	Manoj Tiwari, Kalyaneshwari, Barun Kumar Malakar, Sababanpur, Akshay Kr. Layek, Hadla	• Unit should adopt effective pollution control measures. • Project proponent to adopt suitable pollution control measures for both air & water • Proponent regarding the source of water and the	• Existing Bag Filter units shall be augmented to keep stack emission below 50 mg/Nm^3 from Induction Furnace. • Utilization of waste water for re-use and re-cycling will be carried out. Other effluent streams such as cooling tower blow down and DM Plant waste water will be used for	18 months	Capital cost for installation of pollution control facilities and other Environment Management Plan will be Rs.

Sl. No.	Name & Village of Participant	Issues Raised	Action Plan		
			Commitment	Time Frame	Budget
		treatment of effluent discharged from the project.	slag cooling after treatment. • Water for industrial use will be sourced from Damodar River. • Rain Water harvesting System in Kalyaneshwari, Salanpur, Hadla, Sababanpur village		64 lakhs RWH at four villages Rs. 4.0 lakhs .
4	Mobin Khan, Salanpur, Akshay Kr. Layek, Hadla,	• Renovation of the toilets in the local school. • Development of the infrastructure in local schools.	Construction of Toilets at primary school of village Hadla, Old Debipur&Salanpur will be taken up under CER	6 months	Rs. 5 lakhs
5	Tarakeshwar, Saitiya, ManickMalakar, Salanpur,	• Development of roads in the area. • Developmental work in the area.	Maintenance and repairing of road at village Hadla&Salanpur under CER Program.	18 months	Rs. 8 lakhs
6	Mobin Khan, Salanpur,	Provide Ambulance	Under Health Care Program ambulance facility will be provided in village Salanpur&Hadla under ESC Program.	8 months	Rs. 10.00 lakhs.

7.4 CORPORATE ENVIRONMENT RESPONSIBILITY

The proposed Corporate Environment Responsibility includes the activities based on the need and priorities of the villagers identified during the **Social Impact Assessment** study and issues raised in **Public hearing**. The list of activities includes:

1. Employment Opportunity

Employment to the local people from Kalyaneshwari, Salanpur and Hadla villagesduring construction and Operation of the plant on the basis of their skills.

Construction of Vocational Training Institute to provide training for self-employment.

2. Health Care

- 24x7 Ambulance facility forSalanpur and Hadla villages
- Health Check-up Camps in Salanpur, Hadla, Dendua, Kalyaneshwari villages of project site by hiring Doctor, Nurse and Assistant

3. Education Development

- Construction of Toilets in Primary and Higher Secondary schools for maintaining health and Hygiene of students at Salanpur&Debipur villages
- Infrastructure development in school like providing drinking water facility, Tables, Chairs etc.

4. Infrastructure Development

- Construction of approach road in Salanpur village and in Halda village

5. Community Development

- As water scarcity is the major problem faced by the villagers, to reduce the problem rain water storage units shall be constructed in Kalyaneshwari, Hadla, and Salanpur.

Rs. 40 Lakhs (5% of the project cost) has been earmarked for the Corporate Environment Responsibility (CER) to meet expenditures for the commitments made to the stakeholders during the Public Hearing.

The details of activities to be undertaken and the budget allocated are given in Table below

Table 7.3: Proposed Corporate Environment Responsibility Activities (Based on Public Hearing &Need Based Assessment) & Budget

S. No.	Area of Concern	Name of the Village Represented in Public Hearing	Action Plan	Budget Allocated (in Lakhs)	Time Frame for Implementation from the date of EC
1)	**Employment**	1. Kalyaneshwari 2. Salanpur 3. Hadla	**Vocational Training Center** for Skill development for self-employment like Sewing, for youth of Kalyaneshwari, Salanpur and Hadla village	8	6 months
2)	**Health Care**	1. Salanpur 2. Hadla 3. Dendua, 4. Kalyaneshwari	• Ambulance 24x7 made available in villages Salanpur, Hadla, **Cost of an Ambulance-** **5 lakhs x 2 villages = 10 lakhs** • Health Checkup Camps in Salanpur, Hadla, Dendua, Kalyaneshwari village=**5 lakhs**	15	10 months
3)	**Educational Development**	1. Hadla 2. Salanpur	1. Construction of Toilets in Primary Schools of Hadla, Old Debipur, SishuSikshyaKendra, Salanpur **Cost of Toilet construction - 1.0 lakh x 3 villages= aprox. 3 lakhs** 2. Infrastructure development in schools (school furniture, drinking water facility etc.) - **2 lakhs**	5	6 months
4)	**Infrastructure Facility**	1. Hadla 2. Salanpur	• Construction of road at Hadla&Salanpur Village **Cost of Repair of road = 8 lakhs**	8	18 months
5)	**Community Development**	1. Kalyaneshwari 2. Salanpur 3. Hadla 4. Sababanpur	• Rain Water harvesting System in Kalyaneshwari, Salanpur, Hadla, Sababanpur village **Estimated cost = 4 villages x 1 lakhs = approximately 4 lakhs**	4	18 months
	Total			**Rs. 40 Lacs**	

7.4.1 Rehabilitation & Resettlement Plan

The expansion project shall be carried out within the existing plant boundary. No land shall be acquired for the proposed expansion. Hence the proposed expansion project does not involve any displacement of persons and no rehabilitation and resettlement is required.

7.5 HAZARD IDENTIFICATION AND RISK ASSESSMENT

7.5.1 Risk Assessment & Damage Control

Risk assessment is the determination of quantitative and qualitative value of risk related to a concrete situation and a recognized threat. Activities requiring assessment of risk due to occurrence of most probable instances of hazard and accident are both onsite and off-site.

7.5.2 Maximum Credible Accident Analysis (MCA)

Increasing fatal accidents that have occurred during transportation, Handling, operation, Process have to be taken into consideration and, therefore have prompted the Ministry of Environment and Forests & Climate Change (MoEF&CC), Government of India, to make Risk Assessment a mandatory requirement for all Industry sector.

MCA stands for Maximum Credible Accident or in other words, an accident with maximum damage distance, which is believed to be probable. M CA analysis does not include quantification of the probability of occurrence of an accident. In practice the selection of accident scenarios for MCA analysis is carried out on the basis of engineering judgment and expertise in the field of risk analysis especially in accident analysis.

7.5.3 Methodology of MCA Analysis

The MCA analysis involves ordering and ranking of various sections in terms of potential vulnerability. The data requirements for MCA analysis are:

- Operating manual
- Flow diagram and P&I diagrams
- Detailed design parameters
- Physical and chemical properties of all the chemicals
- Detailed plant layout
- Detailed area layout
- Past accident data

7.5.4 Following steps are involved in the MCA analysis:

- Identification of potential hazardous sections and representative failure cases.
- Visualization of release scenarios considering type and the quantity of the hazardous material.

- Damage distance computations for the released cases at different wind velocities and atmospheric stability classes for heat radiations and pressure waves.

7.5.5 Hazard Identification & Risk Assessment (HAZID-HIRA) for project

The steel manufacturing industry is labor intensive and uses large scale and potentially hazardous manufacturing processes. The industry experiences accident rates that are high compared with some other manufacturing industries. Some examples of such hazards likely to occur in proposed Induction Furnace, Continuous casting machine (CCM), Billet Caster and Rolling Mill, at M/s BMA Stainless Ltd are given below:

Frequent causes of accidents

A. Fire and explosion: explosives, flammable material
B. Being struck by falling objects
C. Snapping of cables, ropes, chains, slings
D. Handling heavy objects
E. Electricity (electrocution)
F. Poor illumination
G. Falls from height inside industrial units or on the ground
H. Struck by moving objects
I. Slipping on wet surfaces
J. Sharp objects
K. Oxygen deficiency in confined spaces
L. Lack of personal protective equipment (PPE), housekeeping practices, safety signs,
M. Hackles, hooks, chains
N. Cranes, winches, hoisting and hauling equipment;

Physical hazards

A. Noise
B. Extreme temperatures
C. Vibration

Mechanical Hazards

A. Trucks and transport vehicles
B. Scaffolding, fixed and portable ladders
C. Impact by tools, sharp-edged tools
D. Power-driven hand tools, saws, grinders and abrasive cutting wheels
E. Failure of machinery and equipment
F. Poor maintenance of machinery and equipment

G. Lack of safety guards in machines
H. Structural failure

General concerns

A. Lack of safety and health training
B. Poor work organization
C. Inadequate housing and sanitation
D. Inadequate accident prevention and inspection
E. Inadequate emergency, first-aid and rescue facilities
F. Lack of medical facilities and social protection

These mainly impact on those working within the industry, although health hazards can also impact on local communities.

- Fire at Lubrication, Hydraulic & fuel oil installations
- Physical Hazards due conveyor system, material handling
- Fugitive Dust of Raw Material Handling at charging bay, storage yard,
- Collapse of Structures/Fall of Material, stacking failure
- Loading/ Unloading failures
- Electrocution/ Electrical Hazards
- Accidental Spillage of hot molten metal

7.5.5.1Identification of source of Ignition at M/s. BMA Stainless Ltd

1. Self-ignition of hot material
2. The electrical Discharge(thunderbolt, electrostatic charges, short circuits), Static charge

7.5.5.2 Identification of sources of Fire & Explosion at M/s. BMA Stainless Ltd

1. Oil and Lubricant Room (spillage)
2. Fine Coal Hoppers
3. Coal Storage area
4. Electrical Substations (Short circuit)
5. Induction Furnace

7.5.5.3 Site specific Physical Hazards onsite

- Dust Exposure at coal crushing area
- Fall of Sling rope of EOT Crane during material handling
- Accident due to Conveyor feeding system
- Slip/Trip/ Fall due to improper stacking of material
- Contact with Hot molten Mild steel

7.5.5.4 Site Specific Loading/Unloading operation/ Storage

- Approach of heavy good vehicles for unloading material
- Excessive Dust during Loading/unloading operation
- Conveyor moving parts
- Cleaning of overflows
- Unauthorized passages ,travelling over transportation system
- Motor overloading
- Unclean platforms causing staggering and falls

7.5.5.5Site Specific Hazards in Induction Furnace

- Heat Radiation
- Exposure to molten metal Fumes
- Electrical hazards.

Thermal radiation

Table 7.4 Enlists damage consequences due to different Heat Loads are given below:

Table 7.4: List of Damages Envisaged at Various Heat Loads

S. No.	Heat loads (kW/m^2)	Type of Damage Intensity	
		Damage to Equipment	Damage to People
1	37.5	Damage to process equipment	100% lethality in 1 min. 1% lethality in 10 sec
2	25.0	Minimum energy required to ignite wood	50% Lethality in 1 min. Significant injury in 10 sec
3	19.0	Maximum thermal radiation intensity allowed on thermally unprotected equipment	--
4	12.5	Minimum energy required to melt plastic tubing	1% lethality in 1 min
5	4.0	--	First degree burns, causes pain for exposure longer than 10 sec
6	1.6	--	Causes no discomfort on long exposures
***Source**: World Bank (1988). Technical Report No. 55: Techniques for Assessing Industrial Hazards. , Washington, D.C: The World Bank.*			

7.5.5.6 Site specific Hazards at Steel Melting Shop

The main hazards arise out of the use of hot metal and oxygen at the spillage of hot metal cause serious burn injuries and fires. Severe explosions are also caused due to hot metal falling over a pool of water, resulting in injuries to persons, fire and damage to equipment due to flying of hot splinters & splashing of liquid metal/slag.

Sudden break out of molten metal result in heavy explosions, due to their coming in contact with water, thereby causing serious burn injuries to persons and damage to equipment.

7.5.5.7 Site specific Hazards at Producer Gas Plant

Producer gas, the mixture of carbon monoxide, hydrogen, methane and other gases, is hazardous, if it is not handled and used properly. Poisonous component of producer gas is carbon monoxide.

- Fire Hazard
- Explosion(Air leakage into the gas system,- Air penetration during refueling, Air leakage into cold gasifier still containing gas which can ignite)
- High Surface temperature
- Spark During Refueling
- Toxic Hazard

7.5.5.8 Site Specific Electrical Hazard due to Dust

Electrical equipment such as motors, circuit breakers, transformers, and switchgear can produce sparks and ignite dust clouds and hybrid dust/air mixtures in the vicinity.

- Ingress of dust into enclosures with subsequent ignition causes smoldering or burning (fires)
- Dust that enters an enclosure will settle out as layers on internal surfaces and become heated
- Electrically conductive dusts causes short-circuiting when deposited on exposed electrical components and circuits
- Abrasive and/or corrosive dusts damages components of electrical equipment
- Electric shock

7.6 RISK ASSESSMENT

Risk assessment is the determination of quantitative and qualitative value of risk related to a concrete situation and a recognized threat. Activities requiring assessment of risk due to occurrence of most probable instances of hazard and accident are both onsite and off-site.



The risk management measures for the proposed project activities will beadopted as required for bestsafety practice within the worksboundary. In addition, thedesign and engineering of theproposed activities will take intoconsideration of the proposedprotection measures towardsmaintaining environmentalnorms.

5 x 5 Matrix for Risk Assessment

Likelihood

5. Almost Certain
4. Probable
3. Possible
2. Possible (under unfortunate circumstances)
1. Rare

Severity

5. Fatality
4. Major Injury, resulting in disability
3. Injury Requires, Doctor's or Hospital attendance
2. Minor Injury, 1st Aid required
1. Minor Injury, 1st Aid not required

Risk Rating

Risk Rating is calculated by multiplying the likelihood against the consequences, e.g. taking a likelihood of 4, which isclassified as Probable, and multiplying this against a consequence of 2, which is classified as a Minor Injury1st aid required, would give you and overall risk rating of 8, which would be risk rated as a low risk.



High Risk (16 – 25)	High Risks activities should cease immediately until further control measures to mitigate the risk are introduced
Medium Risk (9 – 15)	Medium Risks should only be tolerated for the short-term and then only whilst further control measures to mitigate the risk are being planned and introduced, within a defined time period. Note: Medium risks can be an organizations greatest risk, its184chilles heel, this due to the fact that they can be tolerated in the short-term.
Low Risk (1 – 8)	Low Risks are largely acceptable, subject to reviews periodically, or after significant change etc.

Table 7.5: Site Specific HIRA

S. No.	Activity	Hazard	Risk	Proposed Safety system
1	**Raw material Handling**			1. Preparation of SOP and SMP and Training manuals 2. Provide adequate training to operators 3. Conduct regular safety audits and rectify safety issue and monitor safety compliance reports 4. Ensure personnel wear PPE
1.1	Unloading of material from trucks	Dust, collision of trucks	Respiratory problems and injury to personnel	
1.2	Shifting of material by mobile equipment's	Dust , collision, overloading	Injury to personnel	
1.3	Transportation of material in conveyors	Dust, overloading,	Respiratory problem and injury to personnel	
2	**Induction furnace**			1. Hot protection suit to be worn by personnel working with hot metal 2. Follow work permit, SOP and SMP. 3. On line gas monitoring system for gas leakage. 4. Wear gas masks during working in gas line 5. Fire fighting system in operation 6. Reliable and selective digital or microprocessor based electromagnetic protective relays would be incorporated in the electrical system
2.1	Tapping of hot metal	Spillage of hot metal	Burn injury	
2.2	Working in gas pipeline	Gas leakage	Gas poison , gas explosion	
2.3	Operation Area	Electrical Hazard	Body injury	
3	**Rolling mill**			1. Preparation of SOP and SMP and Training manuals 2. Provide adequate training to operators 3. Conduct regular safety audits and rectify safety issue and monitor safety compliance reports 4. Ensure personnel wear PPE
3.1	Roll mill operation	Hot object	Burn injury	
3.2	Cutting of re bars in shear machine	Flying off sharp metals	Body injury	
4.	**Producer Gas Plant**			
4.1	Explosion during start of the plant due to presence of air leakage into the gas system	Explosion	Risk of life and machinery	Preparation of SOP and SMP regarding purging of system with nitrogen or any other inert gas
4.2	CO Gas leakage	Affinity to absorb Hemoglobin	Fire & Risk on life	To follow SOP and SMP. Install CO Alarm at all predominant locations

7.7 DISASTER MANAGEMENT PLAN

7.7.1 Introduction to the term "Disaster"

Disaster management plan are prepared with an aim of taking precautionary step to control the hazard propagation, avert disaster, take action after the disaster which limits the damage to the minimum and follow the on-site emergency planning.

The term "Disaster" refer to extensive damage of property and serious disruption both inside, outside the work system and its surrounding that can be natural or human interfered. Emergency may be caused by a number of different factors, e.g. plant failure it will normally manifest itself in three basic forms viz fire, explosion or toxic release and requires the assistance of emergency control services to handle mass devastation effectively.

7.7.2 Need of Disaster Management

The aim of Disaster management plan is concerned with preventing accidents through following guidelines of good design practice, operation, maintenance and inspection, by which it is possible to reduce the risk of an accident. Since it is known to all it is not possible to eliminate entire risk since, absolute safety is not achievable.

After Assessing and quantifying the possible scenarios, consequence analysis approach to emergency preparedness and emergency planning delineates Disaster Management Plan for both on-site and off-site. These plans are needed to be implemented in the event of a disaster.

7.7.3 Objective of Disaster Management Plan

The objective of Disaster Management plan is to give a broad framed layout to tackle emergency situation that may lead to a hazardous situation. It defines detail organizational responsibilities, actions, reporting requirements, broad and specific key roles and responsibilities of personal with Organograms and organisation charts. The overall objectives of the emergency plan will be:

- Ensure safety of people, protect the environment
- To ensure localization of risk
- To minimize and reduce the effects of the accident on people and property.
- Immediate response to emergency scene with effective communication network and organized procedures
- To obtain and mitigate early warning of emergency conditions so as to prevent impact on personnel, assets and environment
- To prevent injuries by following proper onsite, offsite emergency plans that can protect personnel from the hazard

7.7.4 Phases of Disaster

There are various phases of Disaster including pre and Post Management of Hazardous Event that may or has occurred.

a) Warning Phase

Emergencies /disasters are generally preceded by warnings during which preventive measures may be initiated. For example uncontrollable build-up of pressure in process equipment, weather forecast give warning about formation of vapour cloud, equipment failure etc.

Period of Impact Phase

This is the phase when emergency /disaster actually strike and preventive measures may hardly be taken. However, control measures to minimise the effects may be taken through a well-planned and ready-to-act disaster management plan already prepared by organization. The duration may be from seconds to days.

b) Rescue Phase

This is the phase when impact is almost over and efforts are concentrated on rescue and relief measures.

c) Relief Phase

In this phase, apart from organization and relief measures internally, depending on severity of the disaster, external help are also to be summoned to provide relief measures (like evacuations to a safe place and providing medical help, food clothing etc.). This phase will continue till normalcy is restored.3

d) Rehabilitation Phase

This is the final and longest phase. During which measures required to put the situation back to normal as far as possible are taken. Checking the systems, estimating the damages, repair of equipment and putting them again into service are taken up. Help from revenue/insurance authorities need to be obtained to assess the damage, quantum of compensation to be paid etc.

7.7.5 Key Elements

a) Basis of Plan

Hazard Identification necessitates preparation and planning the prevention and methods by which accidental failure can be tackled without much damage to life. HAZID-HIRA and consequence analysis combines and requires planning for the following:

- Hazards from spread of fire or release of flammable from storage and process units
- Hazards due to formation of pressure waves due to vapour cloud explosion of flammable gases

b) Emergency planning and Response procedure

The Emergency Response Plan is plan for dealing with emergencies are implemented immediately whenever there is a fire, explosion, or release of a hazardous substance that threatens human health or the environment. The emergency response plan is reviewed and immediately amended whenever:

- The list of emergency contacts change
- The list of emergency equipment changes
- The facility changes in its design, construction, operation, maintenance, or other circumstances in a way that increases the potential for fire, explosions, or release of a hazardous substance

c) Incident Response Plan

It is the Frame work of addressing the emergency situation arose due to failure scenario.

- Incident Response Plan(IRP) and Emergency Preparedness Plan
- Incident Response Team (IRT)
- Emergency Response Team (ERT)
- Crisis Management Team (CMT)

7.8 ON-SITE EMERGENCY PLAN

The onsite emergency is an unpleasant situation that causes extensive damage to plant personnel and surrounding area and its environment due to in operation, maintenance, design and human error. Onsite plan will be applied in case of proposed expansion. Following point are taken into consideration:

- To identify, assess, foresee and work out various kinds of possible hazards, their places, potential and damaging capacity and area in case of above happenings.
- Review, revise, redesign, replace or reconstruct the process, plant, vessels and control measures if so assessed.
- Measures to protect persons and property of processing equipment in case of all kinds of accidents, emergencies and disasters
- To inform people and surroundings about emergency if it is likely to adversely affect them

7.8.1Disaster control Management system at M/s. BMA Stainless Ltd

Disaster Management group plays an important role in combating emergency in a systematic manner. Schematic representation Emergency Control Management system for M/s. BMA Stainless Ltd is shown in **Fig.7.1.**

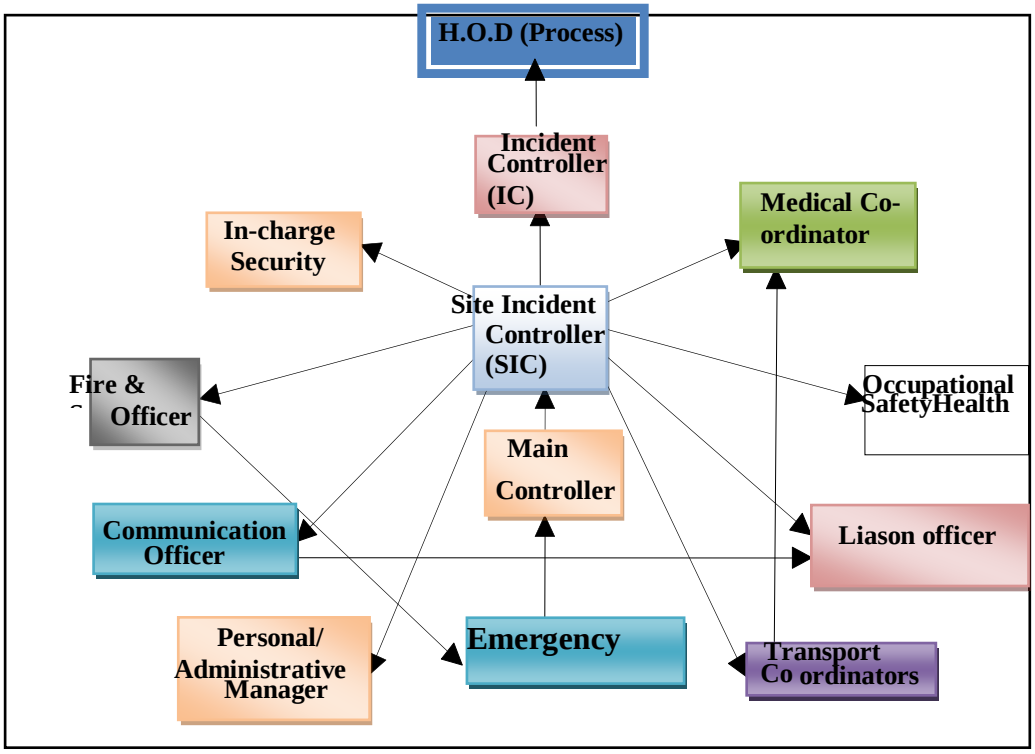


Fig.7.1: Onsite DMP - Disaster Control / Management System

7.8.2 Emergency Control Centre (ECC)

An Emergency Control Centre (ECC) is established from which emergency operations are directed and co-ordinated. Centre will be activated as soon as on-site emergency is declared. The ECC will consist of one room, located in an area that offers minimal risk being directly exposed to possible accidents. During an emergency, the Emergency Management Staff, including the main controller will gather in the ECC. Therefore, the ECC will be equipped with adequate communication systems in the form of telephones and other equipment to allow unhampered organization and other nearby facility personnel.

The ECC will provide shelter to its occupants against the most common accidents; in addition, the ECC's communication systems will be protected from possible shutdown. The ECC will have its own emergency lighting arrangement and electric communication systems operation. The ECC will always be ready for operation and provided with the equipment and supplies necessary during the emergency such as:

- Hazard identification chart, All Emergency response plans

- Population around factory
- Internal telephone connections and External telephone connections
- A list of key personnel, with addresses, telephone numbers, etc.
- Hotline connection to district collector, police control room, fire brigade, Hospital etc.
- Public address system (PAS)
- MSDS of all the materials used in Plant site
- List of dispensaries and registered medical practitioners around factory
- Area map of surrounding villages
- Note pads and ball pens to record message received and instructions
- The blown up copy of Layout plan showing areas where accident has Occurred
- Updated copies of the On-site Disaster Management Plan
- Emergency telephone numbers
- The names, phone number, and address of external agencies, response organizations and neighboring facilities
- The adequate number of telephone
- Emergency lights
- List of fire extinguishers with their type no. and location, capacity, etc
- Personal protective equipment(PPE)
- Safety helmets
- Clock
- Several maps of the facility including drainage system for surrounding area showing:
- Areas where hazardous materials are stored
- Plant layout
- Plot plans of storage tanks, routes of pipelines, all water permanent lines etc.
- The locations where personal protective equipment are stored
- The position of pumping stations and other water sources
- Roads and plant entrances
- Assembly areas
- Lay out of Hydrant lines

7.8.3 Roles and Responsibility

A team of following Essential persons shall be taking necessary action in case of emergency. The roles and responsibilities of these personnel are defined subsequently:

- Main Controller
- Site Incident Controller(SIC)
- Incident Controller (IC)

- Liaison Officer
- Communication Officer
- Observer
- In-charge (Security)
- In-charge (Medical)
- Shift In-charge (Security)

a) Main Controller

The Primary Controller is the employee who gives the first information about the incident/accident. He will be responsible for:

- To inform the Security office (Main Gate), & Engineers/Sr. Engineers / Shift In-Charges/HOD of Section of the aforesaid Department/Section from the nearest available telephone about the location and nature of incident.
- To assist rescue operation as well as clear obstruction, if any, in the same.
- To carry out all instructions from IncidentController.

b) Site Incident controller (SIC)

The Unit Head shall have overall responsibility for the factory and its personnel. In absence of Unit Head, Chairman OHS Committee shall assume the responsibility of Site Controller. His duties during emergency shall be:

- To assess the magnitude of the situation and decide if employees need to be evacuated from assembly points.
- To give necessary instructions to Liaison Officer, HOD(HR&A) regarding the help to be obtained from outside agencies like Fire Brigade, Police and Medical
- To advise Liaison Officer to pass on necessary information about the incident to News Media and ensure that the evidences are preserved for enquiry to be conducted by statutory authorities.

c)Incident Controller(IC)

The HOD of affected department shall have overall responsibility for controlling the incident and directing the personnel. Section In charge of the affected department shall assume the responsibility of Incident Controller(IC) in the absence of HOD of affected department. His duties during emergency shall be:

- To inform Communication Officer about the emergency, Control Centre& Assembly point.
- To direct all operations` within the affected area with priorities for safety of personnel, to minimize damage to the Plant and environment and to minimize loss of material.
- To act as Site Controller till the later arrives.

- To advise and provide information to Fire Squad, Security Officer and Local Fire Services when they arrive.
- To ensure that all non-essential persons are sent to the assembly point.

d) Liaison Officer

HOD (HR&A) shall be the Liaison officer. He shall be responsible for: -

- To contact Fire Brigade, Police, and Medical facilities on intimation from Site Controller & arrange for the rescue operation.
- To ensure that the casualties receive attention.
- To inform relatives of the affected employee at the earliest.
- To arrange for additional transport if required.
- To arrange for relief of personnel & organize refreshment/catering facility, in case the duration of emergency is prolonged.
- To issue authorized statements to news media and ensure that evidence is preserved for enquiry to be conducted.

e) In-charge (Medical)

On receiving the information he will reach hospital immediately and take following actions:

- He will keep necessary first aid medicines and artificial respiration equipment ready.
- Inform doctors at other places to be ready, for attending serious injury, burn cases and food poisoning

f) Observer

During Mock Drill for Emergency Situations they shall be placed at different locations in plant to note down the movement and action taken by people and give feed back to the Site Controller.

g) Communication Officer

In-Charge (Safety) shall act as Communication officer. He shall work from Control Centre and maintain communication between relevant personnel. He shall be responsible for: -

- To apprise the site controller of the situation, based on the information received, suggest the evacuation of personnel from assembly points, if needed.
- To arrange for suitable persons to act as runners/messengers in case of failure of communication system.
- To carry out any other works as assigned by Site Controller/Incident Controller

h) In-charge - Security

The In-charge (Security) shall guide the crew, according to the condition of emergency site, for the actions required to handle the emergency i.e. for fire-fighting, removal of debris, arresting of dust, removal of oil soaked earth etc. He shall give instructions to Security Guards to cordon off areas as required by Incident Controller. He shall render all help to incident controller to handle the emergency and carry out the work as assigned to him.

He shall be responsible for ensuring the discipline at control points and for preventing the entry of unauthorized persons inside the affected area as well as inside the factory during emergency.

i) Shift In-charge – Security

He shall be responsible for;

- To arrange the necessary help as requested by Primary Controller.
- To inform In-charge (Security).
- To blow emergency siren, if instructed by the HOD (HR&A)/Incident Controller.
- To send Ambulance near accident area.
- To rush to the accident site with fire brigade along with available trained security persons

7.8.4Automatic Fire Detection System

Unattended vulnerable premises like electrical control rooms, cable tunnels, MCC, oil cellars, etc. will be provided with automatic fire detection and alarm systems.

7.8.5Manual Call Point Systems

All major units and welfare/administrative building will be provide with manual call points for summoning the fire-fighting crew from the fire station for necessary assistance.

7.8.6Fire Station

The following equipment will be provided in the fire posts:

- Water tender
- Foam tender
- Portable pump
- Wireless set
- Hoses
- Hot line telephone

7.8.7Alarm System

A hooter installed at the Security Office shall be blown alternately with high and low pitch for 2 minutes to indicate major emergency in the plant. In such case, all non-essential

employees are expected to gather at assembly point i.e. Company's Main Gate/Time Office. Signal for the clearance of emergency shall be given by blowing the hooter continuously for one minute.

7.8.8First Aid

Fully equipped Hospital with Ambulance Van is available. Doctors and nurse are available round the clock to handle any emergency in the plant. The Ambulance shall be periodically checked through preventive maintenance programme .To ensure that the system is strictly followed, In-charge (Safety) shall cross check randomly once in a fortnight the preparedness of Ambulance as per the check list and counter sign.

- The injured shall be shifted to nearby hospital, as per the opinion of the Medical Officer.
- A list of First Aid boxes is available in every department as mentioned in ECC
- Medical Officer shall ensure that refilling is done on monthly basis and he shall maintain a record of refilling.
- The names & contact numbers of trained First Aiders are provided the same is displayed at all the prominent locations in the premises.
- In case of Injury caused due to Hazardous Chemicals, Material Safety Data Sheet (MSDS) available with the user department / Hospital shall be referred.

7.8.9Mock Drill

For reviewing and assessing the level of preparedness, In-charge (Safety) shall conduct Mock trials twice in a year (one in each half) simulating the covered emergencies and will maintain records of the trials. The team of Prime & Deputy Responsible persons will review the records and events of the emergency preparedness trials along with the observations taken by the observer and report shall be put forward to the Site Controller. Corrective and Preventive measures, if suggested/directed, will be initiated and relevant records of the same are maintained. Fire drills will be exercised once in every six months under the leadership of Incharge (Security). The records of Fire drill will be recorded & maintained.

The findings of the mock drills shall be used for improvements in preparedness and response. All team leaders shall be responsible for implementing the suggestions based on mock drill findings within reasonable time frame.

7.8.10Training

On a yearly basis class room training for fire fighting and mitigating measures to be adopted to reduce environmental impact & OHS risks, will be imparted covering at least 20% employee by the In-charge (Safety) and In-charge (Security). The records of the same are maintained.

7.8.11Evacuation Plan

To establish method of systematic, safe and orderly evacuation of all the occupants in case of fire or any emergency, in the least possible time, to a safe assembly point through nearest safe means of escape. Additionally to use available fire appliances provided for controlling or extinguishing fire and safeguarding of human life.

Facility staff will be notified of evacuation by one or more of the following method(s): Verbal, Intercom, Portable Radio, Alarm, Other

Notification to emergency services to ECC

Staff will follow predetermined evacuation routes and assemble at designated areas. Evacuation maps must be displayed throughout the facility.

Individuals responsible for coordinating evacuations must confirm the process

7.9 OFF-SITE EMERGENCY PLANNING

The off-site emergency plan is an integral part of any hazard control system. It is based on those accidents identified by the works management, which could affect people and the environment outside the works. Thus, the off-site plan follows logically from the analysis that took place to provide the basis for the on-site plan and the two plans therefore complement each other. The roles of the various parties that may be involved in the implementation of an off-site plan are described below. The responsibility for the off-site plan will be likely to rest either with the works management or with the local authority. Schematic representation of various organisation involved during emergency is shown below in Fig.7.5.

Either way, the plan must identify an emergency coordinating officer who would take overall command of the off-site activities. Consideration of evacuation may include the following factors:

- In the case of a major fire but without explosion risk (e.g. an oil storage tank), only houses close to the fire are likely to need evacuation
- If fire is escalating very fast it is necessary to evacuate people nearby as soon as possible
- In acute emergency people are advised to stay indoors and shield themselves from the fire.

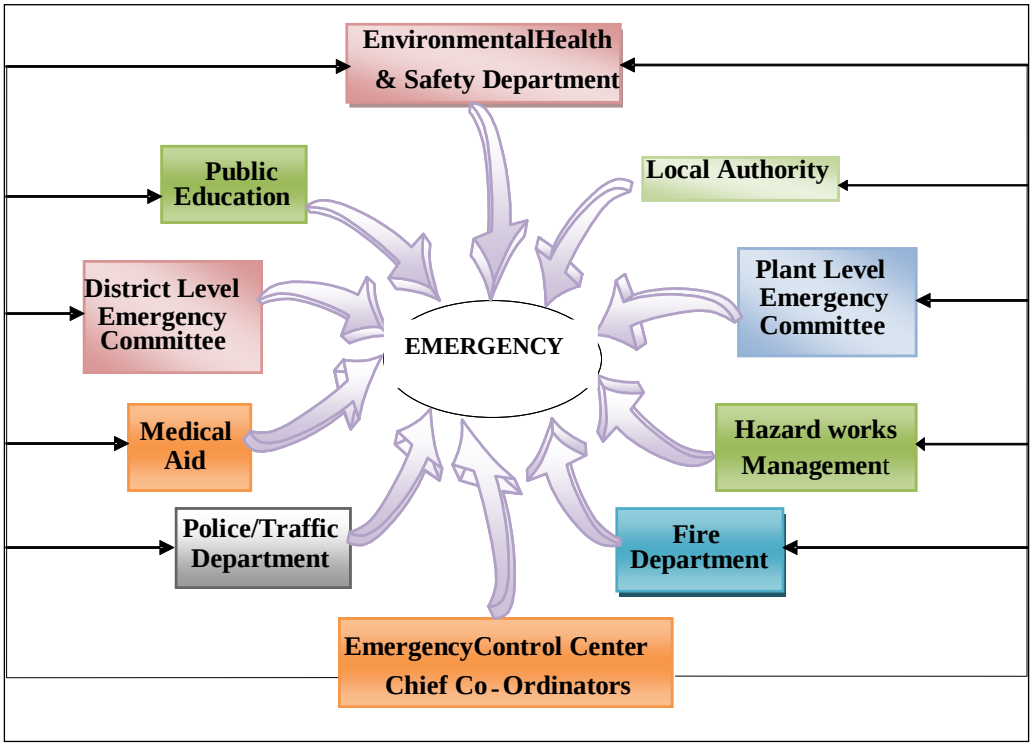


Fig. 7.2: Various Organizations Involved During Emergency

7.9.1 Organization

Organizational details of command structure, warning systems, implementation procedures, emergency control centres include name and appointments of incident controller, site main controller, their deputies and other key personnel involved during emergency.

7.9.2 Communications

Identification of personnel involved, communication centre, call signs, network, list of telephone numbers.

7.9.3 Special Emergency Equipment

Details of availability and location of heavy lifting gear, specified fire-fighting equipment, fireboats etc.

7.9.4 Voluntary Organizations

Details of Voluntary organizations, telephone numbers nearby of hospitals, Emergency helpline, resources etc. are to be available with chief authorities.

7.9.5 Non-governmental Organizations (NGO)

- NGO's could provide a valuable source of expertise and information to support emergency response efforts. Members of NGOs could assist response personnel by performing specified tasks, as planned during the emergency planning process.
- Evacuation of personnel from the affected area
- Arrangements at rallying posts and parking yards
- Rehabilitation of evacuated persons

7.9.6 Chemical information

Details of the hazardous substances (MSDS information) and a summary of the risks associated with them will be made available at respective site.

7.9.7Meteorological information

There is to be arrangements for obtaining details of weather conditions prevailing at r before the time of accident and weather forecasts updates.

7.9.8 Humanitarian Arrangements

Transport, evacuation centres, emergency feeding, treatment of injured, first aid, ambulances, temporary mortuaries.

7.9.10 Public Information

- Dealing with the media-press office
- Informing relatives, etc.

7.9.11Assessment

- Collecting information on the causes of the emergency
- Reviewing the efficiency and effectiveness of all aspects of the emergency plan.

7.9.12Role of local authority

Local Authorities like Panchayat, Sabha, Samity, municipalities can help in combating emergency situation after assessing the impact scenario in rescue phase.

7.9.13 Role of police

- The police are to assist in controlling of the accident site, organizing evacuation and removing of any seriously injured people to hospitals.
- Co-ordination with the transport authorities, civil defence and home guards
- Co-ordination with army, navy, air force and state fire services
- Arrange for post mortem of dead bodies
- Establish communication centre with easy contact with ECC

7.9.14 Role of Fire Brigade

The fire brigade shall be organized to put out fires and provide assistance as required during emergency.

7.9.15 Media

The media is to have ready and continuous access to designated officials with relevant information, as well as to other sources in order to provide essential and accurate information to public throughout the emergency and to avoid commotion and confusion

- Efforts are made to check the clarity and reliability of information as it becomes available, and before it is communicated to public
- Public health authorities are consulted when issuing statements to the media concerning health aspects of chemical accidents
- Members of the media are to facilitate response efforts by providing means for informing the public with credible information about accidents involving hazardous substances

7.9.16 Role of health care authorities

- Hospitals and doctors shall be ready to treat all type of injuries to causalities during emergency.
- Co-ordinate the activities of Primary Health Centres and Municipal Dispensaries to ensure required quantities of drugs and equipment
- Securing assistance of medical and paramedical personnel from nearby hospitals/institutions
- Temporary mortuary and identification of dead bodies

7.9.17 District Disaster Management Authority, Burdwan District, West Bengal

1. District Magistrate, Burdwan –Chairperson
2. Sabhadhipati, Burdwan Zilla Parishad – Co –Chairperson
3. Superintendent of Police, Burdwan –Member,
4. Additional District Magistrate (Disaster Management) –Member Secretary
5. Chief Medical Officer of Health , Burdwan –Member
6. Superintendent of Engineer, Irrigation Burdwan-Member
7. Sub- Divisional Officer, BurdwanSadar (North) -Member
8. Sub- Divisional Officer, BurdwanSadar (South) -Member
9. Sub- Divisional Officer, Katwa -Member
10. Sub- Divisional Officer, Kalna -Member
11. Sub- Divisional Officer, Asansol -Member
12. Sub- Divisional Officer, Durgapur – Member
13. District Disaster Management Officer, Burdwan Co-opt Member

Table 7.6: District Disaster Management Committee of Burdwan district, West Bengal

S. No	Name	Designation	Address	Phone Number	
				Office	Residence
1.	Savadhipati, BurdwanZillaParishad	Chairman	P.O & DistBurdwan	0342-2662401	0342-260208
2.	District Magistrate, Burdwan	Vice- Chairman	Do	0342-2662428 0342-2561510	0342-2625700 0342-2625702
3.	Superintendent of Police Burdwan	Member	Do	0342-2662495	0342-2624400
4.	Additional District Magistrate (DM)	Member Convenor	Do	0342-2663335	0342-2625220
5.	Chief Medical Officer of Health, Burdwan	Member	Do	0342-2563973 0342-2565817	0342-2520901 9434214204
6.	Karmadhyakshya, Tran-S-S, BurdwanZillaParishad	Member	Do	0342-2662578	0342-2323297 9434189311
7.	SDO Sadar (North)	Member	Do	0342-2662353	0342-2625644
8.	SDO, Sadar (South)	Member	Do	0342-2663322	0342-2625689
9.	SDO, Kalna	Member	Kalna	03454-255028	03454-255024
10.	SDO, Katwa	Member	Katwa	03453-255550	03453-255551
11.	SDO, Durgapur	Member	Durgapur	0343-2545141 0343-2546105	0343-2562851 0343-2563869
12.	SDO, Asansol	Member	Asansol	0341-2252222	0341-2252276
13.	Exe. Eng. PWD, Div. – I, Burdwan	Member	Burdwan	0342-2562497	
14.	Exe. Eng. PWD, Div. – II, Asansol	Member	Asansol	0341-2252526	
15.	Exe. Eng. PWD, Div. - III, Bhatar	Member	Bhatar	0342-2322262	
16.	Exe. Eng. PHE, Burdwan Div. Burdwan	Member	Burdwan	0342-2544416	
17.	Exe. Eng. PHE, Mech Div., Burdwan	Member	Do	0342-2544048	

7.10NATURAL AND MANMADE CALAMITIES WHICH CAN LEAD TO EMERGENCY

7.10.1 Earthquake

The Burdwan District area falls under the seismic zone-III, which is the Moderate risk earthquake upto magnitude 5.0 and may trigger into a technological disaster, includes collapse of structures, buildings leading to fire and explosion. Earthquake cannot usually be forecasted and therefore precautions immediately prior to such event are not usually possible. Earthquake zonation map is given below in Fig No: 7.3.

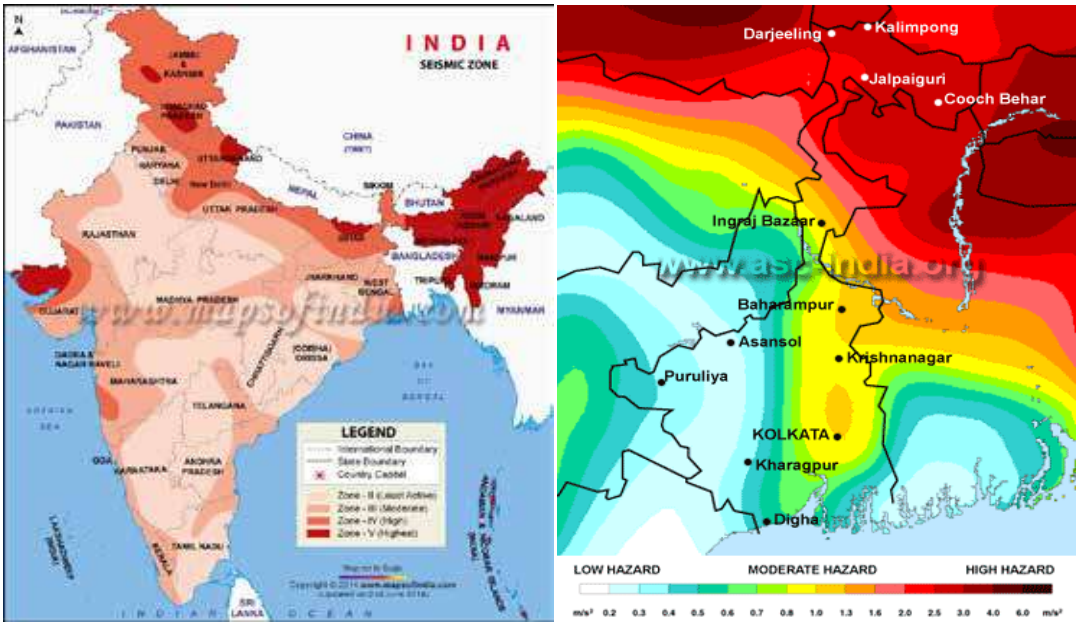


Fig no: 7.3 Earthquake Zonation Map

7.10.2 Storm

The contingency actions during storm shall be based on the weather forecasts obtained from meteorological stations and the local meteorological department. Some of the important actions to be carried out are as follows:

Prior to Storm

- Communication with the local meteorological department.
- Maintain distances from storm in order to execute preparatory actions in a shorter time.
- Considering the consequences about the emergency might have on operations and personnel.
- Review all operations carefully to ensure that systems in jeopardy are taken care of or shut down.
- Ensure the readiness of first aiders, emergency vehicles, medical centre, medicines etc.

- Metallic sheets, loose materials, empty drums and other light objects shall be properly secured.
- Flush the drainage systems.

During Storm

- Remain calm.
- Avoid going outdoors.
- Do not seal the office completely as the suction created by the difference in atmospheric pressure inside and outside can rip open a window or door by breaking window glass panes.

After the Storm

- Do not touch electric lines.
- Stay away from the disaster area.
- Take special precautions in driving vehicles since the under-pavement could cave in due to the weight of automobile.

7.10.3 Flood

River and Excessive Rain water flooding are the most frequently occurring natural disaster and are increasing in occurrence more rapidly than any other disaster in Burdwan, West Bengal. Urbanization and deforestation reduce the capability of the earth to hold excess water. As asphalt- and concrete-covered surfaces expand and open spaces disappear at the edges of metropolitan areas, it takes less rain to flood communities as water running over the pavement collects quickly and easily disrupts storm drain systems. West Bengal Flood prone area map is shown in Fig 7.4.

Causes of Flood

i. Excessive rainfall in river catchments or concentration of runoff from the tributaries and river carrying flows in excess of their capacities.
ii. Backing of water in tributaries at their confluence with the main river.
iii. Synchronization of flood peaks of the main rivers and tributaries.
iv. Landslides causing obstruction to flow and change in the river course.
v. Poor natural drainage.
vi. Cyclone and very intense rainfall.
vii. Intense rainfall when river is flowing full.



Fig 7.4 West Bengal Flood Zone Map

Table 7.7: Blue Areas depict Flood Affected Area		
Flood	**North Bengal**	**South Bengal**
Districts Affected by Flood	Cooch Behar, Jalpaiguri, Uttar Dinajpur, DakshinDinajpur, Malda;	Nadia, Howrah, Murshidabad, North 24 Parganas, South 24 Parganas, Hooghly, Burdwan, Birbhum, PaschimMedinipur, PurbaMedinipur
Relatively scare Districts affected by Flood	Darjeeling	Puruliya&Bankura
Source: wbdmd.gov.in		

Burdwan, Howrah and Hoogly districts are mainly drained by Damodar and Bhagirathi-Hoogly Rivers. In the Damodar-Barakar basin system, the rivers originate at Chotanagpur plateau and flow down the plains of West Bengal to meet Bhagirathi. The Ajoy forms the border between Birbhum and Burdwan. Flood History of Burdwan District, West Bengal is given below in Table no: 7.4

Table 7.8: Flood History of Burdwan District

S. No.	Year	Flood in Burdwan District, West Bengal
1.	**1999**	Tropical cyclones caused destruction of an estimated number of 1500 villages. Floods due to brief torrential rains affected areas of Kolkata, Burdwan and Birbhum
2.	**2006**	The regions of Birbhum, Burdwan and Murshidabad were affected mainly from continuous monsoonal downpour Monsoonal rains and tropical cyclone-driven storms in the Bay of Bengal hit India and

S. No.	Year	Flood in Burdwan District, West Bengal
		Bangladesh. West Bengal recorded 50 deaths, 300 were injured and 30,000 mud houses destroyed. Heavy rains left large parts of Kolkata city under water; subsequently 2000 people were evacuated from the city.

7.10.4 Heat Wave

Heat wave is taking its toll across the West Bengal and is set to break all records. Other areas of West Bengal are into High Risk zone as per Heat Wave zonation Map of India showed in **Fig 7.5.** Coupled with frequent power cuts, the situation doesn't guarantee any relief.

In West Bengal, the Sunderbans area has been hit hard by heatwaves. The rise in temperature in the forest region is harmful for the flora and the fauna. One may experience rapid climate and associated changes in various eco-regions. It will affect wildlife in Sunderbans and Gorumara forest.

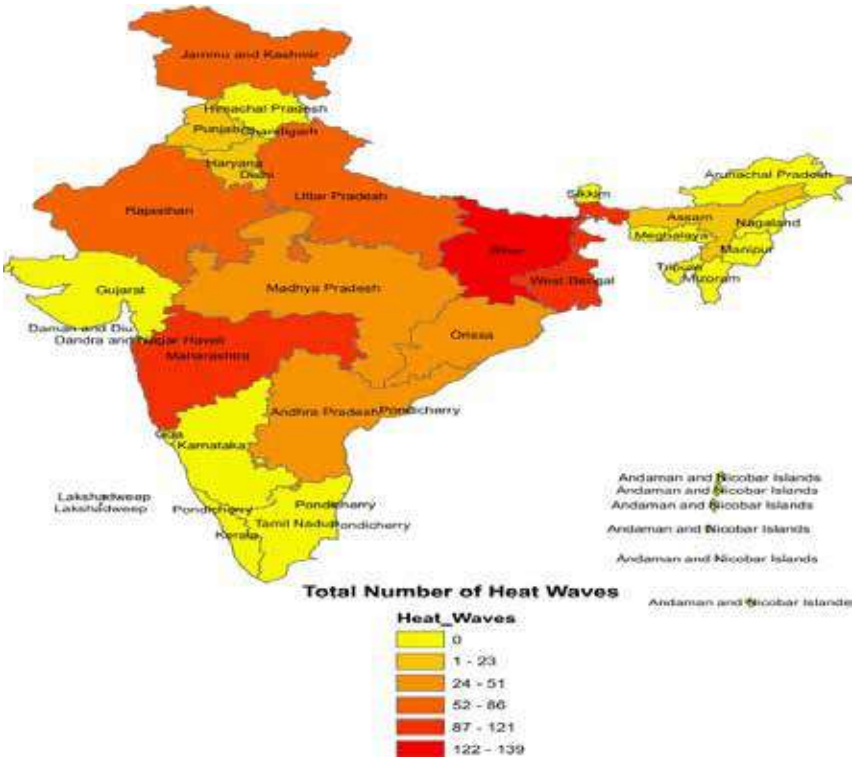


Fig 7.5: Heat Wave Zonation Map

7.10.5 Air Raid

Air raid warning is obtained from the District Emergency Authority or Defence Authorities, during which total blackout of the entire complex should be considered. Some of the contingency actions to be considered during an air raid are as follows:

- The Aviation Lights installed on highest point inside the factory shall be switched off.

- All the lighting on the Streets shall be put off.
- All the plant lighting shall be put off.
- Brown curtains shall be provided for all windows inside the building.
- Other emergency actions shall be followed in addition as per the general procedure.

7.10.6 Food and Water Poisoning

Food and water poisoning to a no. of persons, due to canteen food or other means, is another scenario which can leads to major emergency. In this case Medical Officer would be informed immediately by the Main Controller at site and then to incident Controller(IC) and Site Controller (SC). In such situation doctors will act and if situation demands additional help such as ambulances, doctors and medicine would be arranged from nearby factories and hospitals.

7.10.7 Fire & Explosion Index

Fire and Explosion Index (FEI) is useful in identification of areas in which the potential risk reaches a certain level. It estimates the global risk associated with a process unit and classifies the units according to their general level of risk. FEI covers aspects related to the intrinsic hazard of materials, the quantities handled and operating conditions. This factor gives index value for the area which could be affected by an accident, the damage to property within the area and the working days lost due to accidents.

Fire and explosion index is then calculated as the product of Material Factor (MF) and Unit Hazard Factor. Degree of hazards based on F& EI given in the following Tables 7.9 and Table 7.10 respectively.

Table 7.9: Degree of Hazards Based on F& EI

FEI Range	Degree of Hazard
0 – 60	Light
61 – 96	Moderate
97 – 127	Intermediate
128 - 158	Heavy
159 and Above	Severe

Table 7.10: Calculated Degree of Hazards Based for M/s. BMA Stainless Ltd

S.No.	Unit	Parameter	Hazard F&EI Potential	Remarks
1.	Raw materials & Products	Iron ore	Light	Physical Hazard
		Coal	Moderate	Fire
		Product steel	Light	Physical Hazard
2.	Rolling Mills	Hot metal	Intermediate	Fire

S.No.	Unit	Parameter	Hazard F&EI Potential	Remarks
3.	Fuel gas Distribution	Fuel leaks	Intermediate	Fire and CO pollution
4.	Reheating Furnace	Hot Molten metal spill/Heat Radiation	Intermediate	Physical Hazard
5.	Producer Gas Plant	Producer Gas composition	Intermediate	Fire, Explosion, Toxic
6.	Electric power supply	Short circuit	Intermediate	Fire
7.	Transformer	Electrical Fire	Light	Explosion & fire
8.	Coal Handling plant	Storage shed	Moderate	Fire or dust explosion
9.	Coal Storage	Storage shed	Moderate	Spontaneous Combustion

7.10.8MITIGATION MEASURES

Risk Mitigation measures for the proposed Expansion and new Installation activities require adoption of best safety practice at the respective construction zones as well as operational phase within the works boundary. In addition, the design and engineering of the proposed facilities will take into consideration of the proposed protection measures for air and water environmental as outlined in earlier Chapter.

a) Coal Handling Plant

Coal handling unit shall be minimum 500 meters away from the residential area, school/colleges, Historical Monuments, Religious Places, Ecological sensitive area as well as forests area. Also from Railway line, Express ways, National Highways, State ways and District Roads and from water bodies like River, Nala, Canal, Pond etc.

- Coal storage unit shall provide paved approach with adequate traffic carrying capacity.
- Compound wall with adequate height should be constructed around the coal storage area
- The unit should have adequate water supply through pipe/ surface water before selection of the site.
- Coal storage unit should ensure that stacking of coal in heaps does not get higher than the compound wall of premises of unit
- Adequate dust suppression measures should be provided to prevent fugitive emission and also risk of fire. Similar measures should be adopted for loading/unloading operations. Coal ash should be transported in tankers, which are covered and closed and there is no chance of spillage during transportation.
- Fire fighting measures should be provided to avoid any fire and ensure that there is no explosive or chemical reaction in storage yard.

- Coal unit should take measures to control the air pollution while loading/handling coal. Specific measures should be under-taken to avoid fugitive emission at the time of loading/unloading of coal by individual coal yard unit.

b) Induction Furnace

Gas safety man would accompany the team and would test the atmosphere for the presence of CO, before starting the work. If CO, concentration is found exceeding the sage limit, the job would be undertaken using necessary safety appliances viz., Oxygen Breathing Apparatus/Blower type Gas mask.

Any gas cutting /welding job would be undertaken with the clearance from Gas safety man.

c) Control Rooms

- Control rooms shall be blast proof and shock proof
- The building shall be located upwind of the process storage and handling facilities. The building shall not be at a lower level than the tank farm.
- Adequate number of doors shall be provided in the control room for safe exit
- Smoke detectors system shall be provided for control rooms at suitable locations
- One hydrant (minimum) for every 45m per wall of the building shall be positioned all around the building

d) Gas Explosion, Prevention & Preventive Measure

The following actions would be taken to prevent any gas explosions in case of gas leakage:

- For works on gas lines/equipment, non-sparkling copper tools will used. If such tools are not available, grease coated steel tools would be used.
- Electrical drill & other electrical equipment will not be used as these can give rise to sparks.
- The gas line would be thoroughly purged with steam before undertaking the job on the same.
- Naked lights will not be used near any de-pressurized gas main or equipment unless the same has been thoroughly purged.
- In case of profuse leakage of gas, action would be taken for water sealing and isolating that portion.
- The approach road to the gas line complex would be kept free from any obstructions.
- If gas catches fire due to some leakage, it will be extinguished with plastic clay, steam or water.

- The portion of gas main affected would be cooled down with water. The valve will not be closed when fire is still there and the pressure in the main will be maintained at minimum 100mm (WC).
- Gas tapping points of flow or pressure measurement will be cleaned with wooden stick or grease coated wire.
- If lighting is necessary near gas line, portable spark, proof electrical lamps of low voltage or explosion proof torchlight will be used for enclosed areas.

e) Mitigation measure for Hot Metal spillage

Any accumulation of water will be prevented in such vulnerable areas.

- In case of minor leakages, the flow of molten metal will be controlled.
- If there is major breakout, the area would be cut off and cordoned.
- Vital connections e.g. water, gas, compressed air, oxygen etc., would be cut off or regulated as per requirement.

f) Electrical safety

- Adequately rated and quick response circuit breakers, aided by reliable and selective digital or microprocessor based electromagnetic protective relays would be incorporated in the electrical system design for the proposed activities.
- The metering and instruments would be of proper accuracy class and scale dimensions.

g) Fire Fighting Facilities

All the fire extinguisher system will be controlled by the Security Department. Safety department will consist of qualified safety manager, safety officer and supporting staff.

- Portable fire extinguishers
- Smoke Detectors
- Fire Hydrant system
- Fire Buckets

Table 7.11: Details of Fire Fighting Facilities onsite

S. No.	Name of site	Type of Extinguisher
1	Cable galleries	CO_2 Type
2	High voltage panel	CO_2& Foam type, Dry chemical powder
3	Control rooms	CO_2& Foam type, Dry chemical powder
4	MCC rooms	CO_2& Foam type, Dry chemical powder
5	Pump Houses	CO_2& Foam type, Dry chemical powder

S. No.	Name of site	Type of Extinguisher
6	Guest houses and offices	Dry chemical powder, foam type
7	Godowns, Lubrication rooms, Hyraulic & fuel oil Installation	Foam type
8	Bunkers, Silo, enclosed dust collector	CO_2 type, N_2 type, automatic sprinkler, fixed spray nozzle (unless water reactive)

7.10.9 Personal Protective Equipment (PPE)

Personal Protective equipment kept onsite are made readily available to plant personnel. **Table7.12** shows the lists of recommended Personal Protective equipment (PPE) onsite.

Table 7.12: Recommended Personal Protective Equipment According to Hazard

	Workplace Hazards	Suggested PPE
Eye and face protection	Flying particles, molten metal, gases or vapors, light radiation	Safety glasses with side-shields, protective shades, etc.
Head protection	Falling objects, inadequate height clearance, and overhead power cords	Plastic helmets for top and side impact protection
Hearing protection	Noise	Hearing protectors (ear plugs or ear muffs)
Foot protection	Failing or rolling objects, points objects. Corrosive or hot liquids	Safety shoes and boots for protection against moving and failing objects, liquids and chemicals
Hand protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures	Gloves made of rubber or synthetic material (Neoprene), leather, steel, insulation materials, etc.
Respiratory protection	Dust, fogs, fumes, mists, gases, smokes, vapors	➢ Facemasks with appropriate filters for dust removal and air purification (chemical, mists, vapors and gases). ➢ Single or multi-gas personal monitors, if available
	Oxygen deficiency	Portable or supplied air (fixed lines). Onsite rescue equipment
Body / leg protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration	Insulating clothing, body suits, aprons etc. of appropriate materials

7.10.10 Occupational Health & Safety Onsite as per T.o.R Point (8i-iv):

Details of existing Occupational & Safety Hazards. What are the exposure levels of above mentioned hazards and whether they are within Permissible Exposure level (PEL).If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved,

Occupational Health Hazards at M/s. BMA Stainless Ltd, West Bengal

1. Occupational Overuse syndrome(OOS)
2. Cancer
3. Dermatitis
4. Stress
5. Fatigue
6. Metal fumefever
7. Vibration whitefinger
8. Burns
9. Soft tissue injuries
10. Leadpoisoning
11. Respiratorydisease
12. Sprains and strains
13. Eyeinjuries
14. Silicosis
15. Noise-induced hearing loss
16. Severeinjury
17. Carbon monoxide poisoning

a) Silica dust

The lung disease silicosis can result from prolonged exposure to excessive concentrations of Respirable, free crystalline silica dust. This dust is generated during mixing, moulding, shakeout and dressing operations, and during sand conditioning for re-use.

The amount of Respirable dust is increased by such re-use. Formation of scar tissue, due to dust inhalation, interferes with lung function. Conditions such as tuberculosis and bronchitis may be complications of silicosis.

b) Airborne contaminants:

Gases, vapors and other contaminants In addition to dusts, these contaminants may irritate the eyes and the respiratory tract.

c) Carbon monoxide gas

It is produced in substantial amounts by a variety of furnaces & Producer Gas Plant. It may also be released during the pouring of molten metal. Inhaled carbon monoxide prevents the blood from carrying a normal supply of oxygen. Exposure to concentrations of 500 to 1000 parts per million (ppm) for approximately 30 minutes may precipitate headache, accelerated breathing, nausea, dizziness and mental confusion. Thus a possible secondary effect of exposure is an increased risk of accident and injury to the worker. Exposure to higher concentrations (several 1000 ppm) may result in the appearance of symptoms after several minutes, or unconsciousness may occur rapidly without any warning symptoms.

d) Iron oxide

It is the major fume generated in iron and steel operations. 'Metal fume fever' may result from exposure to these contaminants. This is an acute illness of short duration which commences some hours after inhalation of the metallic fumes. The initial symptoms are flu-like: nausea, headache, dry throat and coughing, and muscular pains. Chills and sweating may occur later. Recovery is usual within 24 hours after removal from exposure

M/s. BMA Stainless Ltd will adopt suitable measures for the proper occupational health safety of workers complying with OSHA standards. Permissible Exposure Level(PEL) of various Chemical Handled onsite are listed below in table no 7.11:

- Dust Exposure level of shop floor workers shall be appropriately monitored.
- Check of the effectiveness of preventive and control measures on regular basis.
- Adequate supplies of potable drinking water is to be provided .Water supplied to areas of Plant food preparation or for the purpose of personal hygiene (washing or bathing) are according to drinking water quality standards
- Where there is potential for exposure to harmful dusts by ingestion arrangements are to be made for clean eating areas, where workers are not exposed to the hazardous or noxious substances
- Periodic medical hearing checks are to be performed on workers exposed to high noise levels
- Provisions are to be made to provide OHS orientation training to all new employees to ensure they are apprised of the basic site rules of work at / on the site and of personal protection and preventing injury to fellow employees
- Contractors that have the technical capability to manage the occupational health and safety issues of their employees are to be hired, extending the application of the hazard management activities through formal procurement agreements

- Ambulances and First aid treatment facilities are made available for any emergency situation.

Table 7.13: PEL Level Summary as per OSHA

S. No.	Chemical Name	OSHA PEL	Cal/OSHA PEL	NIOSH REL	ACGIH
		Mg/m3	8-hour TWA (ST) STEL(C) Ceiling Mg/m3	Up to 10-hour TWA(ST) STEL(C) Ceiling Mg/m3	TLV
1.	Coal Dust			1	0.9 (resp.) bituminous or lignite; 0.4 (resp.) anthracite (coal dust to be monitored for crystalline silica
2.	a) Respirable fraction less than 5% SiO2	2.4Mg/m3	0.9(bituminous)		
	b) Respirable fraction greater than 5% SiO2	10/(%SiO2+2)	0.1(bituminous)		
3	Iron oxide	10 (fume)	5 fume)	5 (dust and fume)	5 mg/m3
4	Silica Dust		50 microgram/m3		
5	Carbon Monooxide	55 Mg/m3	25 ppm	35 ppm	25 ppm
Reference- OSHA/PEL exposure limit Guide					

Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry. Vision testing (Far & near vision. color vision and any other ocular defect) ECG, during pre-placement and periodical examinations give the details of the same. Details regarding last month analyzed data of abovementioned parameters as per age, sex, duration of exposure and department wise.

Workers' health shall be evaluated by pre designed format, given below for chest X rays, Audiometry, Spirometer, Vision testing (Far & Near vision, colour vision and any other ocular defect), ECG, during pre-placement and periodical animations that will give the details of the same.

Spirometery Tests						
Year	***Total Manpower***	***FVC (litres)***	***FEV 1***	***FEV 1/ FVC %***	***PEFR***	***Conclusion***

Physical Examination Tests

YEAR	*Total Manpower*	*Pulse*	*ECG*	*BP*	*Right Eye*	*Left Eye*	*Color Blindness*	*Squint*

Investigations Tests					
YEAR	*Total Manpower*	*Blood (CBC)*	*Blood Sugar (F& PP)*	*Lipid profile*	*URINE (R&M)*

Audiometry Tests					
YEAR	*Total Manpower*	*Audiometry done*	*Normal*	*Abnormal*	*Conclusion*

Annual report of heath-status of workers with special reference to Occupational Health and Safety.

Annual report of health will be reviewed for M/s. BMA Stainless Ltd, manpower once the facility the proposed activity is operational as per above given formats.

Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers.

Necessary required budgetary allocation will be kept for to ensure safety of all Employees including contract & casual workers. Safety policy is attached as an Annexure XII in EIA report

7.10 CONCLUSION

As discussed in above sections, adequate risk Control measures for process needs to be considered for to say that the proposed expansion Project Activity is not likely to cause major significant risk to onsite, offsite & environment. Suitable Mitigation Measures will be taken by M/s. BMA Stainless Ltd, Dist-Burdwan, West Bengal to ensure complete workplace safety. In the event of disaster onsite, offsite and all the emergency planning procedures will be followed so as to minimise the impact on working personnel, plant surrounding and environment.

CHAPTER - 8
PROJECT BENEFITS

8.1 INTRODUCTION

The development of industrial projects plays a key role in the economic growth of any country. Iron is the most important metal to the mankind, which is widely used for domestic, agricultural, industrial and defense purposes. Per capita steel consumption is a major indicator of economic status of any country. The growth of the steel industry significantly contributes to economic growth as it generates employment both directly and also indirectly due to development of downstream industries. Peripheral development takes place and due to more influx of money through the area, overall importance of the area increases and overall the infrastructure improves.

8.2 EMPLOYMENT POTENTIAL

8.2.1 Direct Employment

Employment scenario of the study area is largely dependent on the agriculture and Industrialization of the area. The present expansion project has employment generation potential by way of recruiting local people directly for different activities of the project.

Estimated manpower requirement after the proposed expansion shall be 240. Both skilled & un-skilled workers will be employed by the company. At present workforce of more than 210 are working directly in the existing facility. These persons will be on Company payroll. Others will be arranged through contractors. From unloading of raw materials to loading of finished goods one or more labor contracts will be awarded to local contractors.

Local people will be given the opportunity in employment as per their capability and expertise. Priority will be given to scheduled tribe families and women. This will enhance the present socio economic status of the local people.

8.2.2 Indirect Employment

Indirect employment and income effects of any steel plant are non-marginal and usually remain widespread across a long region. Over the years BMA Stainless Limited has caused generation of income and employment opportunities the ancillaries and service unit switch came in the vicinity of the steel plant, specifically, in mining, ancillary, transport and manufacturing sectors. Employment generation potential by way of recruiting local people directly for different activities of the project, specifically at the construction phase. It is expected that substantial portion of the investment in this project will trickle down to the local people in the form of employment and income.

A part of this increase in employment potential may be attributed to the existing plant and other industries in the vicinity. As the expansion will takes place, indirect employment is likely to grow further. The project is expected to generate substantial indirect employment in other sectors such as service units etc. employment and income effects indicates that the project has strong positive direct as well as indirect impact on employment and income generation of the area. Since the infrastructure for maintenance of the specialized plant and machinery may not be readily near site, adequate maintenance facilities for day-to-day and minor plant maintenance including a well-equipped workshop and trained technicians shall be developed for the project. Major maintenance and annual overall will be contracted out to manufactures or reputed agencies. Odd jobs, plant cleaning, hiring of vehicles, road and maintenance, plant security, gardening/green belt development etc. will be locally contracted out

Some earlier studies pointed out that "direct to indirect employment ratio" as 1: 8 for a typical Integrated Steel Plant (ISP). Improvement in technology certainly brought this ratio down. Attempt is made to estimate the indirect employment effect of the project. The exercises are done on the basis of the following assumption:

"Direct to indirect employment ratio" as 1: 5 with the distribution in mining (1:1), Ancillary (1:1), Transport (1:1) and Manufacturing (1:2).Present manpower of BMA Stainless Ltd. after the proposed expansion shall be 240. Only 4 sectors are considered based on backward and forward linkage to the BMA expansion programme.

Table 8.1 depicts the total indirect employment. It is observed that about 150 people may get indirect employment only in these sectors.

Table 8.1: Impact of the Project on Indirect Employment

Area	Ratio	Employment (Nos.)
Mining	1.0	30
Ancillary	1.0	30
Transport	0.8	30
Manufacturing	1.6	60
TOTAL	**4.0**	**150**

Employment generation potential from the proposed project will be 30 direct employment comprising Technical, Managerial & Supervisory Staff and indirect employment generation is expected to be more than 150 persons. Local people will be given the opportunity of employment as per their capability and expertise. Priority will be given to scheduled tribe families and women. This will enhance the present socio economic status of the local people.

8.3 IMPOVEMENT IN INFRASTRUCTURE

M/s BMA Stainless Ltd. intended to provide the following infrastructure in the study area of 10 km radius:

a) Road Transport: There will be improved road communication due to the proposed project and maintenance will also be done time to time.

b) Market: Need for the proposed products are based on the demand and supply gap in the current market. With increasing utilization of the current products, in future, to cater the requirement of all the products, it is essential to have the proposed manufacturing unit.

c) Infrastructure: Creation of community assets (infrastructure) like Installation/ Repair of Hand Pumps/ Bore wells, Gram Panchayat dug well de-siltation and deepening, as a part of corporate social responsibility.

d) Increasing other business opportunities for local people- There will be scope of hiring vehicle like tractors & trolleys, bulldozers, JCB, excavators during construction and operation phase of the project.

8.4 EDUCATION

The local peoples' interest towards education will increase due to the expectation of getting jobs, especially from non-agricultural sources such as the industries in the vicinity of BMA Stainless. The project is expected to increase such aspirations by bringing opportunities of some direct and indirect employment for the local people. The general awareness towards the importance of education is expected to increase as a result of the proposed expansion. The project will have positive impact on the level of education of the people.

8.5 CORPORATE SOCIAL RESPONSIBILITY (CSR) ACTIVITIES

Company is responsible for social activities and encourages a positive impact on the stakeholders through these activities. Plant authorities have provided support for local schools and local groups, for health care, sports, water supply, job opportunity, and so on. Action is also being taken for arranging for rain water harvesting. This reveals the interest of the plant authority towards CSR. The detail Corporate Social Responsibility (CSR) activities undertaken by M/s BMA Stainless Ltd. is given in chapter 7**.**

The CSR budget for the welfare activities to be undertaken by M/s BMA Stainless Ltd. in next 3 years shall be Rs.20 Lakhs

8.6OTHER TANGIBLE BENEFITS

Steel plants by nature serve as the nuclei for development of small-scale industries in the areas around them. These small-scale units usually have input-output linkages with

the steel plants. The demand for spares, assemblies and sub-assemblies by steel plants are generally met through the supply (of these items) from small-scale units located nearby.

The present project is likely to accelerate such industrialization through "Bubble Effects" in the study area. It is important to note that the small-scale units are usually labour-intensive and high-priority industries from social point of view. This is expected to play a major role in the future economic and social development of this area.

The proposed project is expected to serve as Centre of significant small-scale industrial economy around it complemented by the services sector. This is expected to play a major role in the future economic and social development of this area. Project will encourage industrial growth of this sector specifically in formulation units in the region.

CHAPTER 9
ENVIRONMENTAL COST BENEFIT ANALYSIS

9.1 ENVIRONMENTAL COST BENEFIT ANALYSIS

As per EIA Notification dated 14th September, 2006 as amended from time to time; the chapter on "Environmental Cost Benefit Analysis" is applicable only, if the same is recommended at the Scoping Stage.

As per the ToR issued by MoEF&CC for the project, vide letter no. J-11011/192/2013-IA II (I) dated 17th November, 2016, the Environmental Cost Benefit Analysis is not required.

CHAPTER - 10
EMP IMPLEMENTATIONPROGRAM

10.1 INTRODUCTION

Any industrial development is associated with certain positive impacts as well as some negative impacts on the environment. However, the negative or adverse impacts cannot possibly rule out scientific development. At the same time adverse impacts cannot be neglected. An Environmental Management Plan shall be formulated for mitigation of the adverse impacts and is based on the present environmental conditions and the environmental impact appraisal. This plan helps informulation, implementation and monitoring of the environmental parameters during and after commissioning of the project. The Environmental Management Plan describes in brief, the management plan for proper and adequate implementation of treatment and control system for air and water and noise pollution and for maintaining the environment. It also includes the development of green belts in and around the plant, proper safety of the workers, noise control, fire protection systems and measures.

10.2 PURPOSE OF ENVIRONMENTAL MANAGEMENT PLAN

The environment management plan is prepared with a view to facilitate effective environment management of the project, in general and implementation of the mitigation measures in particular. The EMP provides a delivery mechanism to address potential adverse impacts and to introduce standards of good practice to be adopted for all project works. For each stage of the program, the EMP lists all the requirements to ensure effective mitigation of every potential biophysical and socio-economic impact identified in the EIA. For each operation, which could otherwise give rise to impact, the following information is presented:

- To treat and dispose-off all the pollutants *viz.* liquid, gaseous and solid waste so as to meet statutory requirements (Relevant Pollution Control Acts) with appropriate technology.
- To support and implement work to achieve environmental standards and to improve the methods of environmental management.
- To promote green-belt development.
- To encourage good working conditions for employees.
- To reduce fire and accident hazards.
- Budgeting and allocation of funds for environment management system.
- To adopt cleaner production technology and waste minimization program.

10.3 ENVIRONMENT MANAGEMENT POLICY& ENVIRONMENT COMMITTEE

The Company is very much oblivious of its responsibility in protecting the Environment.

Thus various mitigation measures as given in the report shall be taken-up and effort will be made to nullify the effect of the Project, on the Environment, if any. Any action or effort remains incomplete, if it is not monitored properly at regular intervals and corrective measures taken, wherever necessary. Regular monitoring has thus, been provided. The Company has a well-defined policy to keep the Environment clean. The management has decided that all effective steps shall be taken to prevent deterioration of the existing Environment. They have formed an Environment Committee committed for this cause. The Committee will consist of following persons as given in Figure 10.1.

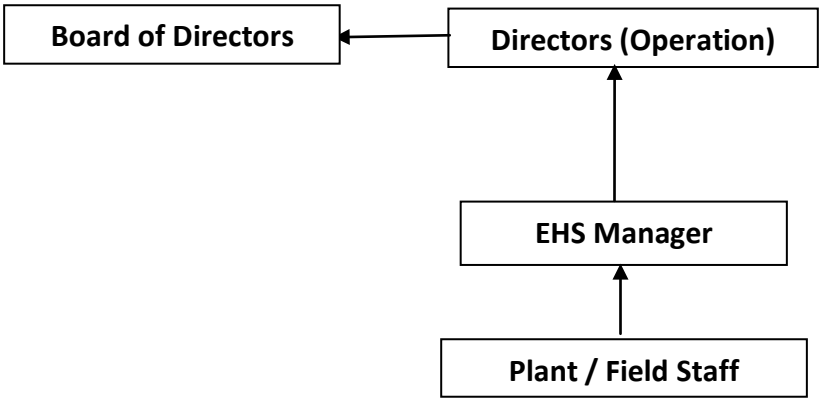


Figure 10.1: Organization of Environment Management Cell

SOP in case of any Violation is observed

- The cases of violations/non-compliances of Environment or Forest Laws, if any, shall be reported to the Board of Directors through EHS Manager and shall identify designate responsible person for ensuring compliance with the Environmental Laws and Regulations.
- Conduct reviews of our operations to monitor environmental performance.
- Comply with all relevant environmental laws and regulations to minimize risks to health, safety and the environment.
- Work with local government, regulatory authorities and communities to ensure safe handling, use and disposal of all materials, resources and products.

The main aims under the said Policy are to:

- Effectively manage, monitor, improve and communicate the environmental performance.
- Take all reasonable steps to prevent pollution.
- Set realistic and measurable objectives and targets for continual improvement of the environmental performance.

- Ensure that all employees and contractors are trained to understand their environmental responsibilities and create an environment that adheres to the Company's Policies, procedures and applicable regulations.
- Minimize waste and increase recycling within the framework of waste management procedures.
- Comply fully with all relevant legal requirements, codes of practice and regulations.
- Identify and manage environmental risks and hazards.
- Hold leadership accountable for good environment performance of our operations and projects. Inherent in that accountability will be the commitment of management to provide resources and successfully create an appropriate environment.
- Reduce, recycle and reuse natural resources.
- The project proponent shall regularly review this policy and ensure that corrective and preventative actions are taken in order to ensure continual improvement.
- To treat all the pollutants viz. liquid and gaseous, which contribute to the degradation of the environment, with appropriate technologies.
- To comply with all regulations stipulated by the Central / State Pollution Control Boards related to air emissions and liquid effluent discharge as per air and water pollution control laws, to handle hazardous wastes as per the Hazardous & Other Wastes (Management and Transboundary Movement) Rules, 2016 of the Environment (Protection) Act, 1986.
- To encourage support and conduct developmental work for the purpose of achieving environmental standards and to improve the methods of environmental management.
- To make continuous efforts to improve environment.
- The system of reporting of Non-conformances/ violation of any Environmental Law/Policy will be as per the management system.

Environmental Policy is attached as **Annexure XIII.**

10.4 IMPLEMENTATION OF ENVIRONMENT MANAGEMENT PLAN

BMA Stainless Limited is responsible for implementation of all the mitigation and management measures. A separate department "Environmental Management Cell" (EMC) shall be established to look after all environmental related matters of the plant. The EMC will supervise the reported activity from time to time for smooth implementation of Environmental Mitigation and Management measures and will take necessary actions if required. The cell will act to ensure the suitability, adequacy and effectiveness of the Environment Management Program. It will also ensure to meet all the Statutory Requirements.

10.5 BUDGETARY PROVISION FOR EMP IMPLEMENTATION

Table 10.1: Cost of EMP in the Plant

S.No.	Environmental Protection Measures	Capital Cost Rs. In lakhs	Recurring Cost Rs. In Lakhs / Yr.
1	Air Pollution Control Measures	50.00	6.00
2	Water Pollution Control Measures	3.00	1.00
3.	Noise Pollution Control Measures	1.00	0.10
4	Greenbelt Development	5.00	2.00
5	Rain Water Harvesting	3.50	0.30
6	Occupational health and safety	1.50	1.00
TOTAL		**64.00**	**10.40**

CHAPTER 11
SUMMARY AND CONCLUSIONS

11.1 OVERALL JUSTIFICATION FOR IMPLEMENTATION OF THE PROJECT

M/s BMA Stainless Limited present proposal is for replacement of existing 4x8 Tons Induction Furnaces with 4x12 Tons Furnaces and modification of the existing Rolling Mill by increasing the output (speed) from 20 TPH to 30 TP H. Downstream facilities like Continuous Casting Machine, Producer Gas plant doesn't require any change / modification as they have adequate capacity to meet the proposed production. In Rolling Mill motors with the Rollers shall be replaced with high speed motors to meet the annual production of 207,360 Tons of rolled product. The steel industries in general are on priority list as they contribute in overall development of the country and in particular will produce steel and steel products at economic cost and also have export potential to earn/save foreign exchange.

11.1.1 The proposal is essential for the sustainable development due to following reasons:

- This project is essential for economic viability of the company where downstream facilities have adequate capacities to meet this increased production.
- The local people desire the setting up of the industry to create additional direct & indirect job opportunities as well as business opportunities.
- Water, power, raw materials are available nearby.
- This is cost effective proposal and aims at sustainable development.
- The project is proposed in economically and industrially backward / rural area of West Bengal and Jharkhand State.

11.1.2 Salient features of the project are as follows:

- The proposal is for addition of capacity. This will reduced per capita cost of production and will result into overall economy and viability of the industry.
- The product is TMT bars from rolling mill, based on market demand. Product has market in West Bengal, Jharkhand and North East States
- The industry has taken all the necessary preventive measures to mitigate the negative impact caused by the industrial activities. This industry does not produce any toxic products and does not have significant adverse effect on the quality of water, air and land.
- Gaseous emissions will be generated from furnaces; fume exhaust will be treated in suitable APC system and vented through the stacks of adequate height.
- For optimum utilization of solid waste, the concept of Reduce, Reuse and Recycle shall be adopted.

- Wastewater generated in the industry will be treated and re used for industrial purpose and greenery development in the factory premise. There will be zero discharge from the plant.
- The industry will adopt an effective environment management system and environment management plan to protect the environment.
- Priority will be given for greenery development and rain water harvesting at the factory premises.
- The site is well connected through national & state high ways and railway lines for transportation of raw materials.
- The technology involved in expansion project is well proven and reliable. Many plants are operating all over the country in this pattern are successful.
- All equipment purchased shall be brand new & latest in model and will be purchased from reputed suppliers. For O&M of the plant, experienced Engineers /Technicians are available in the region.

11.2 CONCLUSION

Environmental Impact Assessment study reveals that, M/s. BMA Stainless Limited will successfully implement a well – designed Environmental Management Plan and it will comply with Environmental Norms / Guidelines issued by WBPCB/CPCB/MoEFCC.

The region shall also be benefited from the project as there will be direct employment of people in the Steel plant. Preference will be given to the people of the state possessing requisite skill and qualification criteria. Also there will be lot of scope for indirect employment of the people of the state in and around the project site like in transportation sector.

In view of the above the Expansion Project of M/s. BMA Stainless Limited is technically feasible and financially viable thus, we request EAC to recommend Environmental Clearance for the project.

CHAPTER 12
DISCLOSURE OF CONSULTANT ENGAGED

Vardan EnviroNet, established on 16th August 2012, is an accredited organization by Quality Council of India/NABET (National Accreditation Board for Education and Training) certificate no. **NABET/EIA/1619/RA0037** issued on **March 28, 2017**. The updated list of accredited consultant is also available online at http://nabet.qci.org.in/environment/pop.asp?file=documents/Annexure7.pdf&heading=Accredited%20EIA%20Consultant%20Organizations%20with%20accredited%20sectors.

NABET Accredited Sectors:

S. No.	Sector Description	Sector as per		Cat.
		NABET	MoEFCC	
1.	Mining of Minerals including Opencast/Underground mining	1	1 (a)(i)	A
2.	Mineral Beneficiation	7	2 (b)	A
3.	Metallurgical Industries (Ferrous and Non-Ferrous)	8	3 (a)	A
4.	Cement Plants	9	3 (b)	B
5.	Coke Oven Plants	11	4 (b)	B
6.	Petrochemical based processing (process other than cracking & reformation and not covered under the complexes)	20	5 (e)	B
7.	Synthetic Organic Chemicals Industry	21	5 (f)	A
8.	Distilleries	22	5 (g)	A
9.	Sugar Industry	25	5 (j)	B
10.	Oil & Gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/sanctuaries/ coral reefs/ ecologically sensitive areas including LNG terminal	27	6 (a)	A
11.	Isolated Storage & handling of hazardous chemicals	28	6 (b)	B
12.	Highways	34	7 (f)	A
13.	Common Effluent Treat Plants (CETPs)	36	7 (h)	B
14.	Common Municipal Solid Waste Management Facility	37	7 (i)	B
15.	Building & Construction Projects	38	8 (a)	B
16.	Townships and Area development projects	39	8 (b)	B

It is an organization of senior retired officers of state and central government departments like Pollution Control Board, Mines & Geology Department, Town & Country Planning Department, Coal India Ltd, Steel Authority of India, NEERI, State Level Environment Impact Assessment Authority and various research institutes.

We have a Pan-India presence; Vardan has successfully executed many major diverse range of projects from mining, large building construction, township and area development, chemical plants, highways, distilleries, Steel & sugar manufacturing facilities and other sectors.

We have our in-house Environmental Laboratory named "**Vardan EnviroLab**" at Village Samaspur, Opposite Amity International School, Sector 51, Gurgaon (Haryana) approved by National Accreditation Board for Testing and Calibration Laboratories, Govt. of India (NABL ACCREDITATION No. T-2629), Ministry of Environment, Climate Change & Forest (MOEF&CC No.- S.O. 1783 (E)), Haryana State Pollution Control Board (HSPCB) and Rajasthan State Pollution Control Board (RSPCB), ISO 9001 : 2008 and OHSAS 18001 : 2007.

The details of experts involved in the project are given as NABET Annexure VII at page No. ii.

Core Business Services: -

We offer a diverse range of services in the field of environment like: -

- Environmental Impact Assessment and Environmental Management Plan.
- Rehabilitation and Resettlement Plan and Social Impact Assessment (SIA).
- Hydro-geological study, Rain Water Harvesting Scheme & Approval from Central Ground Water Authority.
- Mining plan for open cast & underground mining projects from Ministry of Coal/Indian Bureau of Mine.
- Forest and Wild Life Clearances.
- Ecology & Bio-Diversity Studies and Preparation of Conservation Plans.
- Remote Sensing and GIS work.
- Environment Auditing & preparation of ESR/CTE/CTO/EMP/CGWA Compliance report.
- Annual compliance/monitoring as per Environmental Clearance/ NOC/ Consents by MOEF/ SEIAA/ SPCB/ IBM/CGWA.
- Ambient Air and Indoor Air Quality Monitoring/ Source Emission stack Monitoring/ Fugitive Emission Studies, Personal Dust Monitoring as Per CPCB Guidelines/Under EPA Act.
- Ambient Noise & Work Zone Noise Monitoring as per CPCB Guidelines/Under EPA Act.
- Complete Testing of Ground and Surface Water, Drinking Water, Domestic Effluent and Industrial Effluent (STP/ETP) as CPCB Guidelines/Indian Standard.
- Adequacy & Performance Evaluation of Water & Air Pollution Control Devices.
- Soil & sediments testing, characterization, fertility tests.
- Meteorological monitoring of temperature, wind, relative humidity, cloud cover etc.
- Installation and O&M of STP and ETP.

Accreditations and Certifications:

Vardan EnviroNet ***Address:*** *D-142, Ground Floor, Sushant Lok III, Golf Course Extension Road, Sector 57, Gurgaon 122001*
• *NABET* Accredited EIA Consultants Organization from Quality Council of India (QCI) **(Certificate from NABET for accreditation has been enclosed in NABET Annexure VII)**
• *ISO 9001:2008* Certified

Vardan EnviroLab ***Address:*** *Village Samaspur, Opposite Amity International School, Sector 51, Gurgaon*
• *National Accreditation Board for Testing and Calibration Laboratories (NABL) as per ISO/IEC 17025:2005*
• *Recognized from MoEF&CC*
• *Haryana Pollution Control Board (RPCB)* approved
• *OHSAS 18001:2007* Certified
• *ISO 9001 : 2008*

Annexure I

EXECUTIVE SUMMARY

1) Project name and location

Project Name: M/s. BMA Stainless Limited

Capacity expansion of BMA Stainless Limited from 1,20,000 TPA to 2,07,360 TPA Billet/Rolled product by Replacement of existing 4x8 Tons induction Furnace with 4x12 Tons Induction Furnace

Location: Village –Debipur, P.O: Kalyaneshwari, District-Burdwan, West Bengal

2) Persons to be employed

The estimated direct manpower required after the proposed expansion shall be 240, comprising administrative, technical, non-technical, skilled and unskilled workforce.

In addition to this there shall be indirect requirement of manpower in transportation sector for transportation of raw material. Development of nearby industries also envisaged for supply of additional requirement of Sponge Iron and Pig Iron.

3) Address for Correspondence (Name, Designation and complete address)

Mr. Avinash Agrawalla
BMA Stainless Limited
10A, Shakespeare Court,
21 A, Shakespeare Sarani,
Kolkata-700071
Phn: 9163391214,Fax:+913412524300
Mail id: bmastainlessltd@gmail.com

4) Products and Capacities.

Plant	Existing		Proposed		Total (after the proposed expansion)	
	Unit	Capacity	Unit	Capacity	Unit	Capacity
Induction Furnace	4x8 Tons	1,20,000 TPA	4×12Tons (replacement of existing 4x8 Ton IFs)	4x12 Tons	4x12Tons	2,07,360 TPA
Continuous Casting Machine (CCM)	2 Strand, 4/7 m radius	1,20,000 TPA	-	87,360 TPA	2 Strand, 4/7 m radius	2,07,360 TPA
Producer Gas plant	1	27,00,000 Nm3/month	-	-	-	27,00,000 Nm^3/month
Rolling Mill	1	1,20,000 TPA	Modernization (increased speed)	87,360 TPA	-	2,07,360 TPA

Product – Billets / Rolled Products – 2,07,360 TPA

5) Requirement of land, raw material, water, power, fuel with source of supply (Quantitative)

Land Requirement: There is no additional land requirement for the project as the project is replacement of existing Induction Furnaces. Expansion shall be within 6.92hectares of land in possession of the project proponent.

Raw material

Annual Requirement of Raw Material for production of 2,07,360 MT of liquid steel shall be as follows:

S. No.	Raw Materials	Ratio	Quantity (Tons)			Source of Supply
			Existing	Additional	Total	
1.	Sponge iron	0.808	96,960	70,587	1,67,547	Durgapur &Bankura, West Bengal
2.	Pig iron	0.286	34,320	24,985	59,305	Nearby Industries in West Bengal
3.	Alloys	0.006	720	524	1,244	In-house
TOTAL		**1.1**	**1,32,000**	**96,096**	**2,28,096**	

Water requirement: The requirement of makeup water including domestic & other purposes will be 202 m^3/day. The requirement will be met from DVC, water stream and Rain Water harvesting pond. Permission for the same will be obtained from concerned authority.

Existing	Additional	Total
52 KLD	150 KLD	202 KLD

Power requirement: Based on estimated power consumption per ton of production of M.S. Ingots / Billets, the company would require 30 MW [Existing: 20 MW & Additional: 10 MW] of power including the auxiliary power requirements Substation with adequate capacity to supply of power is proposed for the project.

Existing	**Additional**	Total
20 MW	10.0 MW	30.0 MW

6) Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes

Induction furnaces basically furnaces meant for use of Sponge Iron as major raw material to produce mild steel. These furnaces work on the principal of electromagnetic induction. After

the furnace is switched on, current start flowing at a high rate and comparatively low voltage through the induction coil of the furnace, producing an induced magnetic field inside the central space of the coils where the crucible is located. The induced magnetic field thus generated cut through the packed charge in the crucible. As the magnetic flux cut through the scrap and complete the circuit, they generate an induced current in the scrap. The induced current as it flows the highly resistive path of scrap mix, generate tremendous amount of heat and melting the scrap. When these additives have melted completely, the power input may be increased to bring the temperature of metal up to the point most desirable for pouring. The current is then turned off and the furnace is tilted for pouring into the ladle. As soon as pouring has ceased, the crucible is cleaned completely from any slag or metal droplets adhering to the wall of the crucible and the furnace is now ready for charging again. The slagging & pouring usually takes 15 – 20 minutes and one cycle/ heat is completed in about 2 hrs.

Gaseous Emissions

During charging of sponge iron and pig iron and also during pouring, some hot gases and small amount of smoke (resulting from burning of carbon & gangue materials in the charge) comes out from the mouth(top opening) of the furnace. These gases & smoke are taken care of.

To control dust and gaseous emission existing Pulse Jet bag filters with 4x8 Ton Induction Furnaces shall be augmented to keep fugitive emissions <2000 µg/Nm3 and stack emissions <50 mg/Nm3.

Liquid Effluent:

The electrical control panel of Induction furnace needs to be cooled by De-mineralized water primarily to avoid any electrical conduction through cooling water. To achieve this, 2 nos. of DM Plants have been provided.

Cooling Water System-1**:** The system will take care of Cooling water requirement of Induction Coil, magnetic yokes, and water cooled cables. 2 nos. of Cooling Towers of capacity 550 Cubic meters of Paharpur and Hind makes have been provided.

Cooling Water System-2**:** Cooling water System-2 is for Deionized water. One Cooling Tower of capacity 175 Cubic meters has been provided.

Water is required to be treated to maintain its ppm, hardness and conductivity, increased due to contamination in cooling line. Blow down water shall be treated to meet discharge quality norm under Schedule-VI of Environmental (Protection) Rules, 1986 before using it for slag cooling or horticulture

It is proposed to adopt fully re-circulating systems in all areas of the plant. As a result the net water requirement will get limited to the losses in the system only. The water system shall be designed for 'Zero discharge' outside the plant.

Solid Waste:

Solid wastes arising during the process are Slag and Bag Filter dust. Their quantity of generation and mode of utilization is given in table, below:

Type of Waste	Quantity in Tons			Mode of Disposal
	Existing	Additional	Total	
Slag	10,308	7,504	17,812	Utilized in road / area / land development
Bag Filter Dust	360	262	622	Recycled in the process
Total	**10,668**	**7,766**	**18,434**	

Hazardous Waste:

In the proposed plant Use of substances / materials, which are hazardous (as per MSIHC Rules) are mainly HSD/FO used in initial start-up of Induction furnace.

From the proposed project hazardous waste will be generated in the form of waste oil grease, lubricating and insulating oils from Turbo generator and Transformer. Waste oil will be collected in dedicated drums and stored on impervious concrete floor. The same will be sold to the vendors authorized by MOEF/ SPCB for recycling.

7) Measures for mitigating the impact on the environment and mode of discharge or disposal

EMPs have been developed to mitigate / reduce the impact on the environment. An Environmental Management Plan shall be formulated for mitigation of the adverse impacts and is based on the present environmental conditions and the environmental impact appraisal. This plan helps in formulation, implementation and monitoring of the environmental parameters during and after commissioning of the project. The Environmental Management Plan describes in brief, the management plan for proper and adequate implementation of treatment and control system for air and liquid pollutants and for maintaining the environment. It also includes the development of green belts in and around the plant, proper safety of the workers, noise control, fire protection systems and measures.

EMP Monitoring Program has been prepared to ensure effective implementation of Environmental Management Plan and mitigation measures.

8) In case of hazardous operation, safety systems incorporate:

Hazardous operations of BMA Stainless Limited have been identified and safety systems are in place. Fire extinguisher of proper type have been provided in all areas, potential for fire. Moving parts have been properly guarded. Pressure vessels are regularly being tested as per norms of the Factory's Act.

Workers have been trained to deal with any emergency situations and have been given training on use of fire extinguishers also. Mock drills are being conducted to deal with the emergency situation. Workers health are regularly being checked and occupational health related problem if any, is being properly addressed.

9) Capital cost of the project, estimated time of completion:

Cost Estimate of the Project - Estimated cost of the proposed project for modification of the existing 4 nos. of Induction Furnace from 8 Ton to 12 Ton shall be Rs. 8.00 Cr.

Schedule for implementation of the Project - Completion schedule of the project is 24 months. "Zero date" for a project is reckoned as the date on which the all statutory clearance to start the project are received.

10) Descriptions of Environmental sensitivity in 10 km radius form the site. Selection of the project – Nature of land – Agricultural (single/double crop), barren, Govt/private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest, eco-sensitive zones, accessibility.

S. No.	Features	Details
1	Village, District and State	Village: Debipur, P.O.: Kalyaneshwari, District – Burdwan, West Bengal
2	Survey of India Topo sheet covering the plant and surroundings	73 I/9, 73 I/10, 73 I/13/73 I/14
3	Latitude	23°46'59.636"N, 23°46'57.169"N
4	Longitude	86°49'55.424"E, 86°50'5.439"E
5	Land use of the project site	Within existing industrial premises
6	Total Area	6.920124 Hectares
7	Nearest Highway/State High Way	NH_2-1.37 Km (S),SH_2-3.3 Km (E)
8	Nearest Railway Station	Barakar 4.5 Kms (S),Kulti Railway Station 4.96 Km(S), Salanpur Railway Station,4.72 Km (SE), Rupnarayanpur ,6.5 Km (NE)
9	Nearest Airport	Netaji Subhash Chandra Bose International Air Port -234 km
10	Nearest River	Barakar 1.3 Km (W)
11	Forest	None within 15 KM Radius

12	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	Deshbandhu College 8.5 Km Hindustan Cables 8.1 Km Boy,s High School 8.1 Km NazrulCentanary Polytechnic 7.5 Km Kulti college 8.5 Km RPF Training Centre 1.0 Km
13	State, National boundaries	Jharkhand boarder 1.3 km
14	Densely populated or built-up area	Kulti 5.8 Km(S) Barakar 5.2 Km (SW)
15	Defense Installation	Nil within 10 Km radius
16	National Park/Wild life Sanctuary	Nil within 10 Km radius
17	Religious Place	Kalanashwari temple 0.59 Km (SW)
18	Nearest dam	Maithon dam 1.4Km (NW)
19	Nearest Power Station	DVC hydal power plant 0.43 Km(W) Maa Kaleshwari Substation 220 KV
20	Nearest Village	Kalyaneshwari 0.07 Km (S)
21	Existing Units and capacities as per the exiting Environmental Clearance	1. Induction Furnace 4x8 Tons Continuous Casting Machines 2 Strand 4/7 m radius 3. Producer Gas Plant 27,00,000 Nm^3/month 4. Rolling Mill 1,20,000 TPA
22	Production as per the existing capacity	1,20,000 TPA Billets /Rolled Product
23	Proposed Expansion	Replacement of existing 4x8 Tons Induction Furnace with 4x12 Tons
24	Proposed Production Capacity	2,07,360 TPA Billets /Rolled Products
25	Cost of the Project	Rs. 8.0 Crores
26	Manpower Requirement	Additional 30 nos. Total -240
27	Requirement of Water and Source	Additional – 150 KLD Total – 202 KLD Source - DVC
28	Requirement of Power and Source	Additional – 10 MW Total – 30 MW Source - DVC

11) Baseline environmental data– air quality, surface and ground water quality, soil Characteristic, flora and fauna, socio-economic condition of the nearby population

Baseline Environmental Study

To predict the impact of the proposed activities on the surrounding environment, the current

baseline environmental status was studied by collecting the data and carrying out monitoring for the period of **October, 2016 to December, 2016.** The baseline data for ambient air quality, surface and ground water quality, noise and soil quality were measured and analyzed for various parameters are as per norms.

Parameter	Total Sites	Description	Permissible limit
AMBIENT AIR QUALITY	8	$PM_{2.5}$ - 30.50 μg/m^3 and 55.40 μg/m^3 PM_{10} - 53 μg/m^3 and 95 μg/m^3 SO_2 - 6.60 μg/m^3 and 14.70 μg/m^3 NO_2 - 14.20 μg/m^3 and 34.50 μg/m^3 CO -0.55 mg/m^3 and 1.90 mg/m^3	60 μg/ m^3 100 μg/ m^3 80 μg/ m^3 80 μg/ m^3 4mg/ m^3
GROUND WATER	8	pH - 6.86 to 8.13 EC-0.648 to 0.926(mS/cm) Total Hardness-210 to 326.53 mg/L. Total dissolved Solid-387 to 553 mg/L. Fluoride-0.59 to 0.89(mg/L) Chloride-59.80 to 112.06(mg/L)	6.5-8.5 200-600 mg/l 500-2000mg/l 1.0-1.5 mg/l 250-1000 mg/l
SURFACE WATER	3	pH(at 25^0C)-7.80 to 7.91 EC- 0.364 to 0.445 (mS/cm) Total Hardness 129.53 to 142.02 mg/L Total dissolved Solid 217 to 265 mg/L. Fluoride 0.35 to 0.44(mg/L) Chloride 23.98 to 42.70(mg/L) COD 14.75 to 18.22(mg/L) BOD 5 to 5.80 (mg/L) DO 6.8 to 8 (mg/L)	
SOIL ENVIRONMENT	8	pH 6.39 to 6.86 EC- 0.367 to 0.508(mS/cm) Potassium ,K -142 to 253(Kg/hec) Available nitrogen N – 198 to 263(Kg/hec) Organic matter 0.59 to 0.76	
NOISE ENVIRONMENT	8	Noise Level (Day) - 51.30 Leq dB and 62.30Leq dB Noise Level (Night) –40.45 Leq dB and 57.40Leq dB	75 Leq dB (A) 70 Leq dB (A)

12) Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk:

Hazards with the operations of BMA Stainless Limited have been identified and Risk assessment has been made. Risk management plan has been discussed in details in Chapter-7 of the EIA Report.

13) Likely impact of the project on air, water, land, flora-fauna and near by population:

Likely impacts in the study area on Air, Water, Land, flora-fauna and nearby population have been predicted during construction phase and during operation. Air quality dispersion model ISCSTS-3, US-EPA and MoEFCC recommended has been has been used for prediction of impact on Air quality.

As this is a project for replacement of the existing Induction Furnaces with higher capacity Furnaces, no significant impact will be on land and flora and fauna. Zero discharge from the plant has been proposed and hence there will be no significant impact on water quality also.

Mitigation measures have been proposed in the EIA Report wherever there will be any impact on the surroundings by state of art treatment and control facilities for maintaining the environment. It also includes the development of greenbelts in and around the plant and Rain Water Harvesting.

14) Emergency preparedness plan in case of natural or in plant emergencies:

On-site and Of-site Emergency Plan and Emergency Preparedness & Response Plan have been prepared and discussed in the Chapter-7 of the EIA Report.
The emergency control room shall be set up at a safe location and marked on the site plan and will be manned round the clock. The control room will be activated in case of an emergency to direct and co-ordinate the operations to handle the emergency.

15) Issues raised during public hearing (if applicable) and response given:

The Public hearing for Capacity expansion from 1,20,000 TPA to 2,07,360 TPA Billet/Rolled product by Replacement of existing 4x8 Tons induction Furnace with 4x12 Tons Induction Furnace and modernization of Rolling Mill b y M/s BMA Stainless Limited located at village –Debipur, P.O: Kalyaneshwari, District-Burdwan,West Bengal was conducted on **21.07.2017** at **12.00 noon** at Nandanik Hall of Salanpur Panchayet Samity, P.S- Salanpur, District- Paschim Bardhaman, West Bengal and the same have been approved by Deputy Collector & Deputy Magistrate, Paschim Bardhaman and Environmental Engineer, West Bengal Pollution Control Board. The point wise reply of all issues with action plan is incorporated in the EIA Report.

16) CSR plan:

The company proposes a budget of Rs. 20 lakhs for activities under CSR and creates a corpus for the same. Sustainable livelihood creation, Education, Healthcare awareness camps, Providing free treatment to poor patients, Community initiative – Need based services, project/programs for illiterate adults, Rural development –Water management, housing, sheds, village development with all basic amenities. Infrastructure developments are some of the activities undertaken / proposed under CSR.

17) Occupational Health Measures:

The project proponent strongly believes in the safety and health of the workers. The company will conduct regular medical checkup of the worker and for the safer side there will always be a rotation of the worker where the exposure to dust is high. A budget of Rs 1.5 Lakhs per year has been proposed in the EIA report for Occupational Health & safety.

Form No. 1077 L&LR SBP M

খাজনার দাখিলা এবং বিবিধ তলব

6583948

প্রজার অংশ

১। জেলার নাম	২। থানার নাম ও তৌজি নং	৩। সার্কেলের নাম ও গুরুত্বপূর্ণ ব্লক নং	৪। ভূমিসহায়কের রসিদ নং
হবিগঞ্জ	সদর	হবিগঞ্জ	৪৮/২৭

৫। মৌজার নাম ও জে.এল. নং	৬। জমাবন্দী নং	৭। খতিয়ান নং	৮। দাগ নং	৯। জমির পরিমাণ
৩৫/৭০	-	৪৫৮	৪০, ৮১, ৪২	৭.৬৪

১০। প্রজার নাম ও পিতা/স্বামীর নাম ও সাকিন	১১। কাহার দ্বারা (খাজনা) দাখিল হইয়াছে
[illegible]	[illegible]

প্রজার উপর সালিয়ানা তলব

নগদ খাজনা	সার চার্জ	পথ কর	পূর্ত কর	শিক্ষা কর	বিবিধ		গ্রামীণ কর্মসংস্থান আইনে দেয়		মোট
					খাস জমি বাবদ লাইসেন্স ফি	অন্যান্য	সার চার্জ	সেস	
১২	১৩	১৪	১৫	১৬	১৭ (ক)	১৭ (খ)	১৮ (ক)	১৮ (খ)	১৯

ওয়াশীল ২৪২৩

১৭২৭৩৩ 24/8/15

	তিন সনের পূর্বেকার ২০	তৃতীয় সনের বাকি ২১	দ্বিতীয় সনের বাকি ২২	হাল সনের পূর্ববর্তী ২৩	হাল ২৪	সূদ ২৫	*অগ্রিম ২৬
খাজনা					২৭১৫৩.১০		
সার চার্জ							
পথ কর							
পূর্ত কর							
শিক্ষা কর							
খাস জমি বাবদ লাইসেন্স ফি							
অন্যান্য					২৭৬৪০.৯		
গ্রামীণ কর্মসংস্থান আইনে দেয়							
(ক) সার চার্জ							
(খ) সেস					১৩৫২৪৫.৯		
মোট							
বাদ মিনাহ							

*যে সনের বাবদ ওয়াশীল তাহা লিখুন।
ব্রষ্টব্য : চেকের দ্বারা খাজনা দেওয়া হইলে এইখানে তাহার সবিশেষ বিবরণ লিখিতে হইবে।

মোট আদায় [illegible] (কথায়)

আদায়কারী কর্মচারীর সহি ও তারিখ
22/12/17

SBP [illegible] 700 Bks

West Bengal Form No. 1072

L&LR
SBP
M

খাজনার দাখিলা এবং হিসাব তলব

6583049

প্রকার ঘরশ

১। মৌজার নাম	২। পরগনার নাম ও জেএল নং	৩। সার্কেলের নাম ও তহশীল কোড নং	৪। ভূমিসংস্কার দপ্তর তারিখ নং
ঘরিবাসান	১৩	৫৩৮৭ ৬	৪৩১/২৭

৫। খতিয়ান নং	৬। দাগ নং	৭। জমির পরিমাণ
১২৮	৭৮ ৫৮ ৫৮	২১৩০

৮। প্রকৃত নাম ও পিতা/স্বামীর নাম ও ঠিকানা — ৯। কারণ দর্শান (খাজনা) দাখিল হইবার

প্রকৃতি উপর খালিয়ানা তলব

খাজনা ১২	সার চার্জ ১৩	পথ কর ১৪	পূর্ত কর ১৫	শিক্ষা কর ১৬	বিবিধ: বাঁধ আদি বাবদ সাইলেস টি ১৭ (ক)	বিবিধ: অন্যান্য ১৭ (খ)	প্রস্তাবিত অতিরিক্ত আইনে দেয়: সার চার্জ ১৮ (ক)	প্রস্তাবিত অতিরিক্ত আইনে দেয়: সেস ১৮ (খ)	মোট ১৯

ওয়াশীল ১৪২০২

	তিন সনের পূর্ববর্তীর ২০	তৃতীয় সনের বাকি ২১	দ্বিতীয় সনের বাকি ২২	গত সনের পূর্ববর্তী ২৩	হাল ২৪	মূল ২৫	*অতিরিক্ত ২৬
খাজনা					২৮৩৯০		
সার চার্জ							
পথ কর							
পূর্ত কর							
শিক্ষা কর							
বাঁধ আদি বাবদ লাইসেস টি							
অন্যান্য					২৪৩০		
৫ বীধ কর্মসংস্থান আইনে দেয়							
(ক) সার চার্জ							
(খ) সেস					২১৭৩০		
মোট							
বাদ মিনাহা							

*এই সনের বকেয়া হইলে তাহা লিখুন।
মন্তব্য : [illegible] দেওয়া হইলে এইখানে তাহার সংশোধিত পরিমাণ লিখিতে হইবে।

মোট আদায় (কথায়)

আদায়কারী কর্মচারীর সহি ও তারিখ

SBP, Kolkata-700 013

Anneuxre II

LAND DETAILS OF BMA STAINLESS , DEBIPUR

	Date of Purchase	Deed No.	Mouza	Plot No.	Area (acres)	Remarks
5)	31.10.2003	6414/03	Debipur	70	3.75	
				654	0.33	
					4.08	Lease deed
2)	31.10.2003	6415/03	Debipur	70	5.25	Lease deed
3)	16.12.2004	4209/05	Debipur	93	3.02	Lease deed
4)	06.04.2005	2281/05	Debipur	92	1.27	
				107	0.69	
				89	0.32	
					2.28	Sale Deed
5)	07.04.2005	2285/05	Debipur	84	0.36	
				85	0.04	
				86	0.15	
				87	0.06	
				88	0.07	
				90	0.06	
				91	0.07	
					0.81	Sale Deed
6)	05.06.2005	3147/05	Debipur	80	0.2	
				81	0.22	
				82	0.17	
				83	0.63	
				1252	0.12	
				1253	0.27	
					1.61	Sale Deed
7)	28.04.2006	3928/06	Debipur	70	0.25	Sale Deed
8)	28.04.2006	3927/06	Debipur	71	0.3	
				72	0.23	
				73	0.1	
				74	0.11	
				75	0.12	
				76	0.1	
				77	0.2	
				78	0.06	
				79	1.45	
				80	0.27	
				82	0.12	
				1252	0.08	
					3.14	Sale Deed
9)	01.08.2006	P4814/06	Debipur	1224	0.11	Sale Deed

17.05

17.30

Lease Deed Total **12.35**

Sale Deed Total **8.2**

Grand Total : 20.55

Government of India
Ministry of Environment, Forests and Climate Change
F. No. J-11011/192/2013-IA II (I)

Indira Paryavaran Bhawan
Jor Bagh Road, Ali Ganj,
New Delhi - 110003
E-mail: tchand2003@yahoo.co.uk
Tel: 011: 24695313

Dated: 29th September 2014

To
Shri Avinash Agarwalla
Director,
M/s BMA Stainless Ltd.
10A, Shakespeare Court,
21A, Shakespeare Sarani, Kolkata-700 071.
Email: bmastainlessltd@gmail.com Fax: 033 – 40112505

Subject: Proposed 2x8T Induction Furnace (Expansion) Project of **M/s BMA Stainless Ltd.** at village Debipur, P.O.Kalyaneshwari, District Burdwan, West Bengal -**Environmental Clearance-reg.**

Sir,

This is with reference to your letter dated 20.3.2014 along with EIA-EMP report seeking environmental clearance (EC) from this Ministry for the aforesaid project, under the provisions of the EIA Notification, 2006. The Terms of Reference (ToR) was awarded by MoEF&CC vide letter of even no. dated 13.11.2013 for preparation of EIA-EMP report.

2. The Ministry of Environment, Forests and Climate Change (MoEF&CC) has examined your application for EC for the aforesaid project. It is noted that M/s BMA Stainless Limited has proposed to set up 2 X 8 T Induction Furnace (Expansion Project) at village Debipur, P.O. Kalyaneshwari, district Burdwan, West Bengal. The project will be set up within the existing plant premises of 17.1 acres. The existing plant got Consent To Establish was obtained from the West Bengal Pollution Control Board on 19.1.2005 (2x8 T Induction Furnace), 30.6.2005 (20 TPH Rolling Mill), 4.9.2006 (5000 TPM Steel Billets) and 22.11.2007 (Producer Gas Plant – 2700000 Nm^3/Month) respectively. The capital investment for the existing project is Rs.10.8225 crores and not covered under the purview of the EIA Notification 1994. Further, the unit has obtained CTEs for the induction furnace, rolling mill and billet manufacturing unit prior to the EIA Notification 2006 dated 14.9.2006, hence the project is not covered under the purview of EIA Notification 2006. The latitude and longitude of the project site is 23°46'54.15"N and 86°50'4.40"E respectively. No Forest land is involved. No Defense Installation, Biosphere Reserve, National Park/Wild Life Sanctuary, Ecologically Sensitive Area is located within 10 km radius of the project site. No court case/litigation is pending against the proposed project. Total cost of the project is Rs.5.06 crores. Rs. 50 Lakhs and Rs. 6 lakhs is earmarked for the capital cost and recurring cost per annum towards the environmental pollution control measures. Rs. 25.3 lakhs is earmarked towards the Enterprise Social Commitment based on Public Hearing issues over a period of five years.

For BMA Stainless Limited
Director.

3. The details of the existing and proposed product details are as given below:-

	Plant	Existing	Additional	Total
Existing Plant Facilities	Induction Furnace	2 x 8 T	2x8 T	4x8 T
	Continuous Casting Machine	2 strand 4/7 m radius	--	2 strand 4/7 m radius
	Rolling Mill	1,20,000 TPA	--	1,20,000 TPA
	Producer Gas	27,00,000 Nm^3/month	--	27,00,000 Nm^3/month
Products	MS Billets	60,000 TPA	60,000 TPA	1,20,000 TPA
	Rolled Products	1,20,000 TPA	--	1,20,000 TPA

4. The basic raw materials required for manufacturing M.S. Billets are Sponge Iron (48,450 TPA), Pig Iron (17,100 TPA), Ferro Alloys (360 TPA) etc. The raw materials will be transported by road in covered trucks. The power requirement after the proposed expansion would be 20 MW [Existing: 12 MW; Additional: 8 MW] which will be met from Damodar Valley Corporation.

5. It is noted that the Induction Furnace will be equipped with bag filter arrangement with 99.9% efficiency. Good housekeeping practices will be adopted to control the fugitive emissions.

6. The water requirement for the project would be 52 KLD [Existing: 40 KLD; Additional:12 KLD]and it will be met from existing bore wells and rain water harvesting pond. Application for permission for the drawl of 52 KLD water has been submitted to State Water Investigation Directorate, West Bengal. No industrial waste water will be generated in the plant. Domestic waste water generated from the project will be sent to the septic tank. Rainwater harvesting will be practiced within the plant premises.

7. It is also noted that the fines collected at Bag Filter from Induction Furnace (200 TPA) will be recycled in the process. Induction Furnace Slag (5,662 TPA) will be utilized in road / area / land development. Out of the total plant area (i.e. 17.1 acres), 33% of total plant area will be developed under green belt / plantation in a scientific manner around the plant boundary, roadside, office buildings and stretches of open land.

8. The proposed project activity is listed at S.No. 3(a) Secondary Metallurgical Industry under category 'B'. As the project site is located within 10 km radius of inter-State boundary (West Bengal – Jharkhand Border), due to the applicability of the general condition the project has been treated as Category 'A' of the Schedule of EIA notification 2006 and appraised by the Expert Appraisal Committee (Industry) of MoEF.

9. The proposal was considered by the Reconstituted Expert Appraisal Committee (Industry) in its 20th meeting held during 23-24th June 2014. After detailed deliberations, the Committee recommended the project for environmental clearance.Public Hearing / Public Consultation meeting was conducted by the West Bengal Pollution Control Board on 28.2.2014.

10. Based on the information submitted by you, presentation made by you and your consultant M/s Environ India - Kolkata, the Ministry of Environment, Forests and Climate Change (MoEF&CC)

For PMA Stainless Limited

Director

hereby accords environmental clearance to the above project under the provisions of EIA Notification dated 14th September 2006 subject to strict compliance of the following Specific and General conditions:

A. **SPECIFIC CONDITIONS :**

i. Measures shall be taken to reduce PM levels in the ambient air. Continuous stack monitoring facilities for all the stacks shall be provided and sufficient air pollution control devices viz. Electrostatic precipitator (ESP), bag house, bag filters etc. shall be provided to keep the emission levels below 50 mg/Nm^3 and installing energy efficient technology.

ii. Steps/Measures shall be taken for keeping emissions from project activities within prescribed limits in the context of the National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009.

iii. Gaseous emission levels including secondary fugitive emissions from all the sources shall be controlled within the latest permissible limits issued by the Ministry vide G.S.R. 414(E) dated 30th May, 2008 and regularly monitored. Guidelines / Code of Practice issued by the CPCB shall be followed.

iv. Vehicular pollution due to transportation of raw material and finished product shall be controlled. Proper arrangements shall also be made to control dust emissions during loading and unloading of the raw material and finished product.

v. Total fresh water requirement from ground water source shall not exceed 52 KLD which will be met from bore wells and rain water harvesting pond. Prior permission shall be obtained from the Competent Authority for water drawl from bore well. 'Zero' effluent discharge shall be strictly followed and no wastewater shall be discharged outside the premises.

vi. Regular monitoring of influent and effluent surface, sub-surface and ground water shall be ensured and treated wastewater shall meet the norms prescribed by the State Pollution Control Board or described under the E(P) Act whichever are more stringent.

vii. Proper handling, storage, utilization and disposal of all the solid waste shall be ensured and regular report regarding toxic metal content in the waste material and its composition, end use of solid/hazardous waste shall be submitted to the Ministry's Regional Office at Bhubaneshwar, SPCB and CPCB.

viii. A time bound action plan shall be submitted to reduce solid waste, its proper utilization and disposal.

ix. Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 1999 and subsequent amendment in 2003 and 2009. All the fly ash shall be provided to cement and brick manufacturers for further utilization and Memorandum of Understanding shall be submitted to the Ministry's Regional Office at Bhubaneshwar.

x. A Risk and Disaster Management Plan (including Earth quake and Seismic hazard) shall be prepared and a copy submitted to the Ministry's Regional Office at Bhubaneshwar, SPCB and CPCB within 3 months of issue of environment clearance letter.

For BMA Stainless Limited

Director

xi. As proposed, green belt shall be developed in at least 33 % of the project area. Selection of plant species shall be as per the CPCB guidelines in consultation with the DFO.

xii. All the commitments made to the public during Public Hearing/public consultation meeting held on 28.2.2014 shall be satisfactorily implemented and adequate budget provision shall be made accordingly.

xiii. At least 5 % of the total cost of the project shall be earmarked towards the Enterprise Social Commitment based on earlier Public Hearing issues, locals need and item-wise details along with time bound action plan shall be prepared and submitted to the Ministry's Regional Office at Bhubaneshwar. Implementation of such program shall be ensured by constituting a Committee comprising of the proponent, representatives of village Panchayat and District Administration. Action taken report in this regard shall be submitted to the Ministry's Regional Office at Bhubaneshwar.

xiv. The Company shall submit within three months their policy towards Corporate Environment Responsibility which shall inter-alia address (i) Standard operating process/procedure to being into focus any infringement/deviation/ violation of environmental or forest norms/conditions, (ii) Hierarchical system or Administrative order of the Company to deal with environmental issues and ensuring compliance to the environmental clearance conditions and (iii) System of reporting of non-compliance/violation environmental norms to the Board of Directors of the company and/or stakeholders or shareholders.

xv. Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, Safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

B. GENERAL CONDITIONS:

i. The project authorities must strictly adhere to the stipulations made by the West Bengal Pollution Control Board and the State Government.

ii. No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC).

iii. At least four ambient air quality monitoring stations should be established in the downward direction as well as where maximum ground level concentration of PM_{10}, $PM_{2.5}$, SO_2 and NO_x are anticipated in consultation with the SPCB. Data on ambient air quality and stack emission shall be regularly submitted to this Ministry including its Regional Office at Bhubaneshwar and the SPCB/CPCB once in six months.

iv. Industrial wastewater shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended form time to time. The treated wastewater shall be utilized for plantation purpose.

v. The overall noise levels in and around the plant area shall be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels

For BMA Stainless Limited

Director

should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime).

vi. Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

vii. The company shall develop rain water harvesting structures to harvest the rain water for utilization in the lean season besides recharging the ground water table.

viii. The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programmes, educational programmes, drinking water supply and health care etc.

ix. Requisite funds shall be earmarked towards capital cost and recurring cost/annum for environment pollution control measures to implement the conditions stipulated by the Ministry of Environment, Forests and Climate Change (MoEF&CC) as well as the State Government. An implementation schedule for implementing all the conditions stipulated herein shall be submitted to the Regional Office of the Ministry at Bhubaneshwar. The funds so provided shall not be diverted for any other purpose.

x. A copy of clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad/Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent.

xi. The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF&CC at Bhubaneshwar. The respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; PM_{10}, SO_2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.

xii. The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF&CC, the respective Zonal Office of CPCB and the SPCB. The Regional Office of this Ministry at Bhubaneshwar / CPCB / SPCB shall monitor the stipulated conditions.

xiii. The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Office of the MOEF&CC at Bhubaneshwar by e-mail.

xiv. The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available

For BMA Stainless Limited

Director

with the SPCB and may also be seen at Website of the Ministry of Environment, Forests and Climate Change (MoEF&CC) at http://envfor.nic.in . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional office at Bhubaneshwar.

xv. Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.

10. The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

11. The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

12. The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 and the Public (Insurance) Liability Act, 1991 along with their amendments and rules.

(Dr. T. Chandini)
Scientist F

Copy to:

1. The Secretary, Department of Environment, Govt. of West Bengal.
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, New Delhi, 110 032.
3. The Chairman, West Bengal Pollution Control Board, Paribesh Bhawan, Bldg. No. 10-A, Block- LA, Sector 3, Salt Lake City, Kolkata – 700 091
4. The Additional Principal Chief Conservator of Forests, Regional Office (EZ), Ministry of Environment, Forests and Climate Change (MoEF&CC), A/3, Chandesekharpur, Bhubaneswar – 751023.
5. Guard File / Record File/Monitoring file.

For BMA Stainless Limited

Director.

Damodar Valley Corporation
Office of the Manager Reservoir Operations
Maithan Dam, Dhanbad
Jharkhand-828 207
Phone: 06540- 279445

Annexure IV

No.: MRO/Tariff Cell/ -151

Dated: 22.3.18

To
The Director
BMA Stainless Limited
21-A,Shakespeare Sarani,
10th Floor,Kolkata-700017

Sub: **Execution of Agreement with M/s BMA Stainless Limited regarding drawl of 0 .80 MGD from Maithon Reservoir.**

Ref:- (1) letter of Member Secretary, DVRRC No-MD/DVRR/W-6-116//2008 /602-608 Dated:- 11.09.2008.

Dear Sir,

This is to inform you that, as requested by your company, the competent authority of DVC leasing out 12,962 sq ft of land in favour of M/s BMA Stainless Limited for period 12.03.18 to 11.02.19 for proposed intake well, approached road and pump house etc for drawal of 0.8 MGD of raw water from Maithon reservoir.

In view of the above, you are also requested to take necessary action on urgent basis in respect of execution of agreement with DVC against the drawl of 0.80 MGD from Maithon reservoir and also deposit **Rs.26,22,962/-** (Rs.17,67,470/- as a security deposit for three months + Rs. 8,55,492/- as a land leasing charge for 11 months).

The details of Security deposit and leasing charge of land are given below:

SL. NO	Allocated Quantity (MGD)	Allocated Quantity (KLD)	Total Quantity (in KL per Month)	Rate (in Rs./KL)	Amount(in Per Month)	Total Amount For 3(Three) Month	Remarks
1.	0.80	3636.768	109103.04	5.40	Rs.589156.41	Rs.17,67,470.00	As a S.D
2	Lease of Land= 12962x@Rs 6 per sq ft					Rs 8,55,492.00	As a Lease out
	TOTAL					**Rs.26,22,962.00**	

You are also requested to submit the following documents in three sets to this office for execution of agreement with DVC for withdrawal 0.80 MGD from Maithon reservoir.

1 DVRRC allocation letter.
2 Filled Annexure – B.
3 Layout plan of intake well and inter structure for drawal of raw water.
4 Mouza Map for showing pump house location and inter structure.
5 Intake well structure design.
6 Schematic diagram of pipe line.

Bank details:
Details for payment through RTGS/NEFT-
Bank: United Bank of India.
Branch: New Manicktala, VIP Road,Kolkata-54
MICR Code: 700027099
Branch Code: NMT-147
DVC's Account No-0082250010682
RTGS Code: UTBI0NMT147.(''0'' STANDS FOR ZERO)

For (Demand Draft) in favour of Damodar Valley Corporation, Payable at Kolkata.

Yours faithfully

22/3/18

(Ajay Kumar)
SDE(C), Tariff Cell,
MRO's Office,DVC,Maithon

Copy to:
1. The Executive Director(C), DVC, Maithon
2. The Deputy Engineer(C), WR, DVC, Maithon.
3. The Executive Research, MRO's Office, DVC, Maithon.
4. Office Copy.

Annexure IV

066751

FORM 4

[See Rules 9(3) and 10(5)]

(EMBLEM OR HOLOGRAM OF THE CONCERNED AUTHORITY)

PERMIT FOR SINKING OF NEW WELL

[U/S 7(3)(b) / 7(4)(b) / 7(5)(a) of the West Bengal Ground Water Resources (Management, Control and Regulation) Act 2005.]

Burdwan

P- 1362

PERMIT NO P022202401252000000 1TSE

Name of the applicant (user)	:	Shri/Smt. BMA STAINLESS LIMITED.
Son / Daughter of	:	
Address of the applicant	:	P.O : KALYANESWARI, PIN : 713369, BURDWAN
Category of farmer (Please tick) (in case of irrigation well)	:	Small Farmer / Marginal Farmer / Others
Serial No. of application Form and date of submission	:	BP/A 0148,SL.NO: 73; DT. 06.11.2013
Specimen signature of the user	:	Chanchal Bose
ation particulars---		
District		BURDWAN
Block, Mouza, J. L. No. , Plot No.	:	KULTI, DEBIPUR, 001, 1252
Municipality / Corporation Ward No. / Borough No., Holding No.	:	
ticulars of the proposed well and pumping device---		
Type of the well	:	TUBEWELL
Approx. depth of the well (m)	:	100 m
Purpose of the well	:	INDUSTRIAL
Assembly size (for tube well)	:	mm. X mm.
Approx. strainer length (for tube well)	:	100 m. 150
Diameter (for dug well)	:	12 m.
Type of pump to be used	:	SUBMERSIBLE
H. P. of the pump	:	3.5 H.P
Operational device	:	Electric Motor
Rate of withdrawal (m3 / hr.)	:	7 m^3/hr
Maximum allowable running hours per day	:	2 Hours Per Day

s permit authorizes the owner applicant (user) to sink a well in the location specified at S1. (2) for extraction of ground er at a rate not exceeding that as shown at S1. (3) (J) and for running hours / day as shown at S1. (3) (K), and is valid subject he observance of the conditions stated overleaf.

OFFICE OF THE GEOLOGIST * GEOLOGICAL SUB-DIVISION NO.IIA, BURDWAN * OFFICE SEAL GOVT. OF W.B

Burdwan

07.02.2017

07/02/2017

Geologist, SWID &
Member Secretary, District Level
Ground Water Resources Development Authority
Burdwan-713101

Signature of the Issuing Authority and Designation.

se of any change of ownership of the proposed well, fresh registration has to be obtained.

hange of location, design, rate of withdrawal and pumping device in respect of the proposed well as indicated at S1. (2) and (3) of this certificate shall ade without prior permission of the Competent Authority. Any deviation in this regard shall lead to cancellation of this permit.

ase, any of the particulars / information furnished by the applicant in his application for issuance of this permit is found to be incorrect during fication at any subsequent stage, this permit is liable for cancellation.

other condition imposed by the concerned Authority.

SWID GOVT. OF W.B * GEOLOGICAL SUB-DIVISION NO.IIA, BURDWAN * OFFICE SEAL

0/'06

DITIONALITIES FOR PACKAGE DRINKING WATER PROJECTS AND INDUSTRIES/ RASTRUCTURES:

1. Roof Top Rain Water harvesting for Surface Storage.
2. Excavation of pond of size 150 ft. x 50ft. with 2 m. depth.
3. Chemical Quality Test Report from BIS approved Laboratory in each year to be submitted to the Geologist & Member Secretary, DLA.
4. Arrangement of Water Meter at the outlet of Tube Well discharge to be monitored by Govt. Officials as assigned by DLA.
5. The enhanced rate if any in future (including the rates revised retrospectively) of fees/ charges/ taxes for drawls of ground water on annual basis, should be borne by applications for operating their tube wells in a continuous manner.

02/02/2017.

Geologist, SWID &
Member Secretary, District Level
Ground Water Resources Development Authority
Burdwan-713101

Annexure V

स्पीड पोस्ट द्वारा
BY SPEED POST

DAMODAR VALLEY CORPORATION
COMMERCIAL DEPARTMENT
DVC TOWERS, V I P ROAD, KOLKATA- 700 054.

Tel. No: 033-2355-1172/7931 FAX: 033-2355-2129

No.- Coml/CD/17-18/Kalyaneshwari/BMA/601 Date: 12.02.2018

To
The Director,
BMA Stainless Limited,
P.O. Kalyaneswari,
Dist-Burdwan, West Bengal.

Sub: Enhancement of Contract Demand (CD) from existing 15.75 MVA to 20 MVA in respect of M/s. BMA Stainless Limited fed at 33 KV level from Kalyaneshwari Substation. (Consumer No. 440212)

Ref:- 1) Your Letter No. BMA/DVC/17-18/04 dtd. 02.11.2017

Dear Sir,

The enhancement of Contract Demand from 15.75 MVA to 20.0 MVA i.r.o M/s. BMA Stainless Limited fed at 33KV level from Kalyaneshwari S/s of DVC, is under consideration subject to compliance of the following commercial terms from your end:

1) Current outstanding dues, if any, at the time of enhancement of CD shall be cleared prior to the enhancement of CD.

2) Payment of the Security Deposit (SD) amount of Rs. 17,94,78,000 /- in the form of Demand Draft in favour of Chief Accounts Officer, Damodar Valley Corporation or in the form of Bank Guarantee(BG) commensurate with your CD of 20 MVA. The BG should be valid for the period of 02 (two) years with a claim period of 03 (three) months. BG format is enclosed herewith.

3) Alternate to Sl. No. (2) above, you shall have to comply (A) as given below:

(A)You are requested to open a new Confirmed, Irrevocable, Revolving, Non-Recourse LC for an amount of Rs. 5,98,26,000/- (monthly) commensurate with enhanced CD of 20 MVA and should be valid for not less than 12 (twelve) months. LC format is enclosed herewith.

Yours faithfully,

12/02/2018

Chief Engineer (Commercial)

Encl: as above

AGREEMENT NO.:COML/2006-07/EC-.....

AGREEMENT

EXECUTED ON 29TH JUNE.....2006

BETWEEN

DAMODAR VALLEY CORPORATION

AND

BMA STAINLESS LIMITED

FOR

33 KV POWER SUPPLY

AT

DEBIPUR, KULTI, KALYANESWARI

FOR

OTHER STEEL LOAD

WITH

CONTRACT DEMAND OF 12000 KVA IN PHASES

THE AGREEMENT WILL COME INTO EFFECT ON AND FROM THE DATE OF COMMENCEMENT OF SUPPLY

स्पीड पोस्ट द्वारा
BY SPEED POST

DAMODAR VALLEY CORPORATION
COMMERCIAL DEPARTMENT
DVC TOWERS: VI P ROAD
KOLKATA- 700 054.

No. Coml. /CD/BMASL/Kalyaneshwari/- 1148 Date: 30 JUN 2015

To
The Director,
M/s. BMA Stainless Ltd.,
10A, Shakespeare Court,
21A, Shakespeare Sarani,
Kolkata – 700 017.

Sub: Enhancement of Contract Demand in respect of M/s. BMA Stainless Ltd. from existing 12 MVA to 16.25 MVA at 33 KV fed from Kalyaneshwari S/s. of DVC.

Ref: Your letter No. Nil dtd. 07.10.2014.

Dear Sir,

The subject enhancement of your Contract Demand (CD) from the existing 12 MVA to 16.25 MVA at 33 KV fed from Kalyaneswari S/s. of DVC as requested by you vide your letter under reference above, is revised as detailed below:

Existing CD	Revised CD
12 MVA Upto 24:00 Hrs of 30.06.2015	16.25 MVA W.e.f. 00:00 Hrs of 01.07.2015

This letter modifying the Contract Demand will form an integral part of Power Supply Agreement signed between DVC and M/s. BMA Stainless Ltd. (Consumer No.440212)

Yours faithfully,

Chief Engineer (Commercial)

DAMODAR VALLEY CORPORATION

Commercial Department,DVC Towers,VIP Road,Kolkata-700054

Monthly Bill for the month of 11,2016

Meter No. 0212		Old Consumer No. : 44212	
New Consumer No.	440212	Bill No.	MFN/201611/440212
Previous Meter Reading Date	01/11/2016	Bill Date	08/12/2016
Present Meter Reading Date	30/11/2016	Due Date of Payment	23/12/2016
BMA Stainless Limited BMA Stainless Ltd., P.O.- Kalyaneswari, Dist - Burdwan, West Bengal. Pin-713 369.		Contract Demand(KVA)	15750
		Supply Voltage(Volt)	33000
		SupplyPoint	Debipur,Kulti
		Consumption Month	11,2016

Peak		OffPeak		Normal	
Previous Meter Reading	139546300	Previous Meter Reading	46865600	Previous Meter Reading	272851700
Present Meter Reading	142046300	Present Meter Reading	49792600	Present Meter Reading	277329500
Gross Energy(Kwh)	2500000	Gross Energy(Kwh)	2927000	Gross Energy(Kwh)	4477800
				LT Adjustment(Kwh)	0
Other Kwh Adjustment	0	Other Kwh Adjustment	0	Other Kwh Adjustment	0
Net Energy(Kwh)	2500000	Net Energy(Kwh)	2927000	Net Energy(Kwh)	4477800
Max Demand(KVA)	15222	Max Demand(KVA)	15266	Max Demand(KVA)	15225
KVAH	2516900	KVAH	2948100	KVAH	4508100
Power Factor	0.993	Power Factor	0.993	Power Factor	0.993

		Total Supply Hours	720	Maximum Demand(KVA)	15266
Gross Total Energy(Kwh)	9904800	Total L.S. Hours	0.06	Total KVAH	9973100
Net Total Adjustment(Kwh)	0	Net Restricted Hours	0	Power Factor	0.993
Net Total Energy(Kwh)	9904800	Balance Hours	719.94	Load Factor(%)	91.87

Details of Bill(All figures in rupees)					
Energy Charge Peak@499P/kwh	12475000	Energy Charge OffPeak@354P/kwh	10361580	Energy Charge Normal@416P/kwh	18627648
Peak P.F. Rebate(-)	1122750	OffPeak P.F. Rebate(-)	725311	Normal P.F. Rebate(-)	1490212
Peak P.F. Surcharge	0	OffPeak P.F. Surcharge	0	Normal P.F. Surcharge	0
Demand Charge@320 Rs./KVA/month	4884713	Addl. Energy Charge For Restricted Period	0	Rental Charge	0
Addl. Demand Charge	0	L.F. Rebate(-)	1584768	Other Charges	0
Net Demand Charge	4884713	L.F. Surcharge	0	Gross Amount	41425900

DPS	0	Adjustment(in Rs.)	0	WB Electricity Duty(@5%)	1690323
MVCA	0	Advance Paid	0	WB Electricity Duty(@15%)	1018989
Arrear Installment (Apr'14-May'15)	0	1% Addl. Rebate for e-payment	413091	WB Electricity Duty Adj.	0
Arrear Installment (Apr'13-Mar'14)	0	Final Rebate	413091	Rebate for E-Billing(-)	0
				Net Amount	43309030

Rs.Four Crore Thirty-Three Lakh Nine Thousand Thirty only.

Message to Customer	Authorized Signatory
The present bill is being claimed as per tariff order issued by Hon'ble WBERC on 25.5.15. This bill is computer generated does not require any signature. Bank Detail for Payment: United Bank Of India, Branch-New Manicktala, VIP Road,Kolkata-700054, A/C Title- DAMODAR VALLEY CORPORATION, A/C No.-0082250010682,Branch Code-NMT147,MICR Code-700027099, RTGS(IFSC)Code-UTBI0NMT147. ['0' stands for zero]. Please share your mobile no and Whatsapp no so that the billing information can be sent directly to your mobile no. Send the details at rajib.goswami@dvc.gov.in & pratik.biswas@dvc.gov.in	

Copy to :Engineer In Charge,Kalyaneswari Sub/Stn,GOMD-II,DVC. Please verify and inform us if there is any error in meter and restriction data.

DAMODAR VALLEY CORPORATION

Outstanding Dues and DPS Statement

Consumer	BMA Stainless Limited			Supply	Debipur,Kulti
Consumer No. :	440212	Biling Month	11	Billing Year	2016

Total Dues as on 28.11.2016 for the consumption month from May 2010 to October 2016. Error, if any will be rectified subsequently.	86541259
DPS due since May 2010.The actual DPS bill will be raised only after receipt of the actual payment and will be reflected in subsequent monthly bill.	0

WEST BENGAL POLLUTION CONTROL BOARD

'Paribesh Bhawan',
Bldg. No. – 10A, Block-LA, Sector-III,
Salt Lake City, Kolkata-700 098

Consent Letter Number : CO107785

Memo Number : 302-WPBA/Red(Bwn)/Cont(521)/06

apply for renewal of consent 60 (Sixty) days before expiry

Date : 17-3-17

Consent to Operate

under

Section 25 & 26 of the **Water (Prevention and Control of Pollution) Act, 1974** and
Section 21 of the **Air (Prevention and Control of Pollution) Act, 1981.**

The West Bengal Pollution Control Board (hereinafter referred to as State Board) under the provisions of Section 25 & 26 of the Water (Prevention and Control of Pollution) Act, 1974, as amended and Section 21 of the Air (Prevention and Control of Pollution) Act, 1981, as amended, and Rules and Orders made thereunder, hereby grants its consent to :

M/s. BMA Stainless Ltd.

WEST BENGAL

(Address of Regd. office/Head/Office/City Office)

(hereinafter referred to as Applicant) for its unit located at Vill- Debipur, P.O.- Kalyaneswari, P.S. Kulti, Dist-Burdwan

(Detailed address of the manufacturing unit)

for a period from 01-05-2017 to 30-04-2022

to operate the industrial unit and to discharge liquid effluent and to emit gaseous effluent from the premises/land of the industrial unit, in accordance with the conditions as mentioned in the Annexure to this consent leter provided on any day at any instance the quantity and quality of liquid discharge and gaseous emission shall not exceed the permissible limit as specified in the Table I & II of this consent letter and in the Environmental (Protection) Act, 1986.

Breach of the conditions and / or failure to comply with the directions as set out in the Annexure shall render the applicant liable for prosecution under the provisions of the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981.

The State Board reserve the right to revoke, withdraw or make any reasonable variation / change / alter the conditions of this consent letter giving one month's notice to the applicant.

Pollution Control Board
Asansol
Regional
Office
Seal

For and on behalf of the State Board

17/3/17

(Member Secretary/Chief Engr./Sr. Env. Engr./Env. Engr./Asst.Env.E

ANNEXURE

nsent to M/s. BMA Stainless Ltd.

its unit at Vill -Debipur, P.O. Kalyaneswari, P.S. Kulti, Dist-Burdwan

nditions :

This Consent is valid for the manufacture of :–

Sl. No.	Name of major products and by–products	Quantity manufactured per month
01	Producer Gas	2700000 NM^3
02	Steel Bars & Rods	10000 MT
03	Steel Billet / Ingot	7500 MT
04		
05		
06		
07		
08		
09		
10		
11		
12		

WEST BENGAL

The *Applicant* shall remain responsible for quantity and quality of liquid effluent and air emissions.

Daily discharge of industrial liquid effluent shall not exceed – KL.

Daily discharge of domestic liquid effluent shall not exceed 4 KL.

Daily discharge of mixed (industrial & domestic) liquid effluent shall not exceed – KL.

The *Applicant* shall discharge liquid effluent to Soak Pit (place of discharge) through 01 nos. outlets/outfalls.

To bring into any altered or new outlet/outfall or to change the place of discharge, the Applicant shall have to inform the Board and obtain prior permission of the Board in this effect.

The *Applicant* shall provide comprehensive facility for treatment of industrial liquid waste and domestic liquid waste (sewage, sullage and liquid effluent generated from canteen), and operate and maintain the same continuously so that the quality of final effluent conforms to the *Standard* as given in Table-I in page 03.

19/9/17

(Member Secretary/Chief Engr./Sr. Env. Engr./Env. Engr./Asst.Env.Engr.)

Continued.....

Consent to M/s. BMA Stainless Ltd.

for its unit at Vill- Debipur, P.O. Kalyaneswari, P.S. Kulti, Dist-Burdwan

Table–I

Outlet No.	Nature of effluent	Parameters	Standard	Frequency of effluent sampling
01	Domestic	pH	Between : 5.5 to 9.0	Yearly
		Total Suspended Solids	Not to exceed : 100 mg/l.	
		Biochemical Oxygen Demand (3day at 27°C)	Not to exceed : 30 mg/l.	
		Chemical Oxygen Demand	Not to exceed : 250 mg/l.	
		Oil & Grease	Not to exceed : 10 mg/l.	

WEST BENGAL

09. The *Applicant* falls in the ..... Category of the Water (Prevention and Control of Pollution) Cess Act, 1977 and Rules made thereunder and the Applicant shall comply with the provisions of the said Act and Rules made thereunder.

10. Daily water consumption for the following purposes should not exceed :–

- Industrial cooling, spraying in mine pits and boiler feed water → 10 KL
  (Water used for gardening should be included in this category of use)
- Domestic purpose → 10 KL
- Processing whereby water gets polluted and the pollutants are easily biodegradable → – KL
- Processing whereby water gets polluted and the pollutants are not easily biodegradable → – KL

The *Applicant* shall regularly submit to the Board the Returns of Water Consumption in the prescribed form and pay the Cess as specified under Section 3 of the said Act.

17/03/17

(Member Secretary/Chief Engr./Sr. Env. Engr./Env. Engr./Asst.Env.Engr.)

Continued.....

...sent to M/s. BMA Stainless Ltd.
Vill- Debipur, P.O. Kalyaneswari, P.s. Kulti, Dist-Burdwan
...r its unit at .....

1. The *Applicant* shall install suitable device for measuring the volume of water consumed for different purposes as mentioned above giving correct result to the satisfaction of the *State Board.*

2. All the stacks connected to various sources of emissions must be designated by numbers such as S-1, S-2, S-3, etc., and this must be painted/displayed to facilitate identification.

3. The *Applicant* shall install comprehensive control system consisting of pollution control equipment as is warranted with reference to generation of air emissions and operate and maintain the same continuously so as to achieve the level of pollutants to the *Standard* as given in Table-II below.

Table–II

Stack No.	Stack height from G.I., (in mts.)	Stack attached to (sources and control system, if any):	Volume Nm^3/hr	Velocity of gas emission m/sec	Concentrations of parameters not to exceed					Frequency of emission sampling
					SPM (mg/Nm^3)	CO (% v/v)				
S-1	30	Producer Gas Plant	–	–	–	–	–	–	–	–
S-2	30	Reheating Furnace	–	–	–	–	–	–	–	–
S-3	30	Induction Furnace (1 X 2 MT)	–	–	150	–	–	–	–	Yearly
S-4	30	Induction Furnace (2 X 8 MT)	–	–	150	–	–	–	–	-do-
S-5	10	D.G. Set (2 X 380 KVA)	–	–	150	–	–	–	–	-do-
S-6										
S-7										
S-8										
S-9										
S-10										

WEST BENGAL

18/9/17

(Member Secretary/Chief Engr./Sr. Env. Engr./Env. Engr./Asst.Env.Engr.)

Continued.....

onsent to M/s. BMA Stainless Ltd.

for its unit at Vill- Debipur, P.O. Kalyaneswari, P.S. Kulti, Dist-Burdwan

14. The *Applicant* shall provide ports in the stack(s) and other necessary permanent facilities such as ladder, platform, etc. for monitoring/sampling the air emissions and the same shall be made available for inspection and use by the *State Board's* staff as well as *State Board's* authorised agencies.

15. The *Applicant* shall observe the following fuel consumption pattern :–

Sl. No.	Type of fuel	Quantity consumed per day	Fuel burning operation where the fuel is used
01	CBM	11000 M^3 /day	Reheating Furnace
02	Coal	960 MT/ month	Producer Gas Plant
03	F.O.	300 KL /month	Reheating Furnace
04			
05			

6. The *Applicant* shall maintain the generation and treatment/disposal of non-hazardous solid waste as specified below :

Type of waste	Quantity	Treatment	Disposal
Ash	6 MT/day		Low Land Filling
Slag	960 MT / month		Low Land Filling

7. The *Applicant* shall take adequate measures for control of noise levels from its own sources within the premises within the limit given below :

Time	Limit in dB(A) L_{eq}
Day Time (06 a.m. to 10 p.m.)	65
Night Time (10 p.m. to 06 a.m.)	55

8. The *Applicant* shall at all times maintain good house-keeping, proper working order, and operate efficiently for control of pollution from all sources so as not to cause nuisance to surrounding areas/inhabitants and to achieve compliance with the terms and conditions of the consent.

9. The *Applicant* shall bring about at least 33% of the available open land under the green coverage / plantation.

10. The *Applicant* shall provide for an alternate electric power source sufficient to operate all pollution control facilities installed by the *Applicant* to maintain compliance with the terms and conditions of the consent. In absence of such an alternate electric power source, the *Applicant* shall stop, reduce or otherwise control production to abide by the terms and conditions of the Consent regarding pollution level.

11. The *Applicant* shall install a separate energy meter showing the consumption of energy for operation of pollution control devices.

12. The *Applicant* shall ensure that fugitive emissions from the activity are controlled so as to maintain clean and safe environment in and around the factory premises.

13. The *Applicant* shall provide drainage system for conveying industrial and domestic liquid waste. Storm-water drain shall be kept separate from the drainage system meant for industrial and domestic liquid waste.

17/3/17

(Member Secretary/Chief Engr./Sr. Env. Engr./Env. Engr./Asst.Env.Engr.)

Continued.....

Consent to M/s. BMA Stainless Ltd.

for its unit at Vill- Debipur, P.O. Kalyaneswari, P.S. Kulti, Dist-Burdwan.

24. The *Applicant* shall maintain a separate register showing consumption of chemicals used in pollution control systems.

25. The *Applicant* shall get the samples of hazardous wastes/leachates analysed at least once in ..... from the laboratory recognised of the West Bengal Pollution Control Board and ensure that they conform to the limits stipulated. Test reports shall be sent to the Board.

26. The *Applicant* shall provide adequate and safe facility for collection of air, wastewater and solid waste samples by the *State Board's* staff as well as *State Board's* authorised agencies.

27. The *Applicant* shall submit to the *State Board* by the 30th September of every year the Environmental Statement Report for the financial year ending 31st March of the current year in the prescribed form (Form-V) as required under the provisions of rule 14 of the Environment (Protection) [Second Amendment] Rules. 1992.

28. The *Applicant* shall allow the Officers of the *State Board* to enter into the applicant's premises at any reasonable time to inspect the pollution control systems as well as monitoring and measuring devices in connection with prevention & control of pollution.

29. The *Applicant* shall maintain an Inspection Book in the factory premises which shall be made available to Officers & employees of the *State Board* for inspection, review and to write down any direction or observation as is deemed necessary during the inspection from time to time.

30. The *Applicant* shall furnish to the *State Board* all information in respect of quality, quantity, rate of discharge, place of discharge of liquid effluent and air emissions.

31. The *Applicant* shall maintain adequate number of qualified and trained personnel among his staff for proper maintenance and operation of the effluent treatment and/or emission control devices and for overall environment management of the industry.

32. The *Applicant* shall have to make registration for the use of groundwater, if any, with Central Ground Water Authority.

33. The *Applicant* shall intimate to the *State Board* immediately of any occurrence or apprehension of occurrence of discharge of any poisonous, noxious or pollutants in excess of quality as well as quantity as mentioned earlier to any receiving water body/receiving system or to atmosphere owing to accident or other unforeseen incident / event including natural disaster. The *Applicant* shall (i) take all steps adequate to prevent such accidental discharge / release of poisonous, noxious or pollutants and to limit their consequences to persons and the environment. (ii) provide to the persons working on the site with the information, training and equipment including antidotes necessary to ensure their safety and mitigate the accidental release of poisonous, noxious or pollutants to the environment.

4. The *Applicant* shall make an application to the *State Board* in the prescribed form for renewal of the consent at least 60 (sixty) days before the date of expiry of this Consent.

5. The *Applicant* shall not make any alternation/modification/expansion in the existing manufacturing process and equipment as well as the pollution control system without prior approval of the Board.

6. The Applicant shall comply with the conditions as laid down in the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and Hazardous Wastes (Management & Handling) Rules, 1989.

Additional Conditions

(Member Secretary/Chief Engr./Sr. Env. Engr./Env. Engr./Asst.Env.Engr.)

SPEED POST

NOC NO124867

WEST BENGAL POLLUTION CONTROL BOARD

Paribesh Bhawan
10A, Block-LA, Sector-III
Bidhannagar, Kolkata-700 098

Memo No. 865-2N-43/2013(E) Dated 05/11/2014

From :
Member Secretary,
West Bengal Pollution Control Board

To : M/s. BMA STAINLESS LTD.,
10A, Shakespeare Court,
21A, Shakespeare Sarani, Kolkata-700 071.

Sub : Consent to Establish (NOC) from Environmental Point of View

Ref : Your letter No. ..... Dated 14.10.2014

Dear Sirs,

In response to the application for Consent to Establish (NOC) for proposed expansion Unit of M/s BMA Stainless Ltd.,
for manufacturing/storage/installation MS Billets - 5000 T/month.
at existing unit premises at Vill-Debipur, PO-Kalyaneshwari, Dist.- Burdwan.
this is to inform you that this Board hereby grants the Consent to Establish (NOC) from the environmental point of the above subject to the following conditions and special conditions annexed.

1. The quality of sewage and trade effluent to be discharged from your factory shall satisfy the permissible limits as prescribed in IS : 2490 (Pt. I) of 1974, and/or its subsequent amendment and Environment (Protection) Rules 1986.

2. Suitable measures to treat your effluent shall be adopted by you in order to reduce the pollutional load so that the quality of the effluent satisfies the standards mentioned above.

3. You shall have to apply to this Board for its consent to operate and discharge of sewage and trade effluent according to the provisions of the water (Prevention & Control of Pollution) Act, 1974. No sewage or trade effluent shall be discharged by you without prior consent of this Board.

4. All emission from your factory shall conform to the standards as laid down by this Board.

5. No. emission shall be permitted without prior approval of this Board and you shall apply to this Board for its consent to operate and atmospheric emission as per provision of the Air (Prevention & Control Pollution) act, 1981.

6. No industrial plant, furnace, flues, chimneys, control equipment, etc. shall be constructed/reconstructed/

NOC NO124867

7. You shall comply with
   (i) Water (Prevention and Control of Pollution) Cess Act, 1977, if applicable.
   (ii) Water (Prevention and Control of Pollution) Cess Act, 1978, if applicable.
   (iii) Environment (Protection) Act, 1986
   (iv) Environment (Protection) Rules, 1986
   (v) Hazardous Wastes (Management and Handling) Rules, 1989 and Amended Rules, 2000
   (vi) Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and Amended Rules, 2000
   (vii) Manufacture, Use, Import and Storage and Hazardous Micro-Organisms, Genetically Engineered Organisms or Cell Rules, 1989
   (viii) The Public Liability Insurance Act, 1991 and Amended Act, 1992
   (ix) The Public Liability Insurance Rules, 1991 and Amended Rules 1993
   (x) Biomedical Wastes (Management & Handling) Rules, 1998 and Amended Rules 2000 if applicable.
   (xi) Recycled Plastics Manufacture and Usage Rules 1999, if applicable and
   (xii) Ozone Depleting Substances (Regulation & Control) Rules, 2000, if applicable

8. You will have to abide by any other stipulations as may be prescribed by any authority/local bodies/Government Departments etc.

SPECIAL CONDITION :

See Annexure.
Gross Capital investment of Rs.4.56 Crores (excluding investment on Pollution Control System).

Any violation of the aforesaid conditions shall entail cancellation of this Consent to Establish (NOC)

Yours faithfully,

05/11/14.
Member Secretary/ SR. ENV. ENGR.
West Bengal Pollution Control Board (EIM CELL)

Memo No. 865-2N-43/2013(E) dtd. 05.11.2014 Dated:

Environmental Engineer
W B Pollution Control Board
Dept. of Environment, GoWB

Copy forwarded for information to :

1. Chief Inspector of Factories, Government of West Bengal, N. S. Building, Kolkata-700 001
2. Director of Industries/Director of Cottage & Small Scale Industries, Government of West Bengal, N. S. Building, Kolkata-700 001
3. Guard file, West Bengal Pollution Control Board.
4. Environmental Engineer, I/II/Alipur R.O./Howrah R.O./Hooghly R.O./B.R.O./D.R.O./Haldia R.O./S.R.O./ Asansol/ Sub-R.O./WBPC Board

Himalaya Bhawan Delhi Road, Dankuni Dist. Hooghly	Vill, Panpur Kalyani Expressway P.O. Narayanpur Dist. 24 Pgs. (N)	Sahid Khudiram Sarani City Centre, Durgapur-16 Dist. Burdwan	10, Camac Street 2nd Floor Kolkata-700 017
Paribesh Bhawan 10A, LA-Block, Sector-III Salt Lake City, Kolkata - 700 098	Block-05 at 40 Flats Complex Adjacent to Priyambada Housing Estate P.O. : Khanjanchak, P.S. Durgachak Haldia-721602 Dist. : Purba Medinipur	Paribahan Nagar Matigara, Siliguri Dist.-Darjeeling	
Satya Chowdhury Indoor Stadium Balurchar Bandh Road Malda-732101	Asansol Sub-Regional Office ADDA Commercial Market (2nd Floor) Opposite Asansol Fire Station G.T. Road, Asansol-713 301		

05/11/14.
Member Secretary. / SR. E. E.
West Bengal Pollution Control Board
(EIM CELL

Annexure to NOC Sl. No. – **NO124867**

Special Conditions issued to - M/s. BMA Stainless Ltd. (Expansion), Vill – Debipur, PO – Kalyanesshwari, Dist - Burdwan

Emission :-

1) Induction Furnace – 2 (two) nos., Capacity (each) - 8 T per heat.

Stack -

For Induction Furnaces 30 m from G.L. common stack to be provided with individual Air Pollution Control Systems (swiveling hood, cyclone cum spark arrestor, Bag Filter & I.D. Fan).

Stacks should have sampling arrangement with port, platform and ladder as per the Emission Regulation Part –III of CPCB.

Effluent :-

1) Process – Nil.
2) Cooling water to be recycled after settling.
3) Domestic – to be discharged through septic tank to panchayat drain.

Solid Waste : -

Slag - to be used for land filling.
Bag Filter dust – to be reused in process.

General :-

1) Noise Control – Ambient noise level not to exceed the permissible limit.
2) No additional machineries / equipment can be installed without prior permission from the State Board.
3) No change in raw materials, products and production capacity should be made without prior permission from the State Board.
4) Use of galvanized iron scrap as raw material is not permitted.
5) Sponge iron and/or Pig iron to be used as major raw material.
6) Proper lighting and proper pathway inside the factory premises should be constructed.
7) Adequate measures to be adopted for control of fugitive emission.
8) The unit should not start operation without obtaining 'Consent to Operate' from the State Board after complete installation of pollution control devices.
9) The unit should obtain permission from the District level authority for ground water abstraction, if any, as per The West Bengal Ground Water Resources (Management, Control and Regulation) Act, 2005; before applying for 'Consent to Operate' to this Board.
10) The unit should obtain Land Conversion Certificate from the competent authority, if applicable, before starting construction activities.
11) At least 33% of the project area should be under green belt.
12) Rain water harvesting must be done however recharging of harvested rain water is not allowed under any circumstances.
13) Conditions laid down in the Environmental Clearance obtained for the project from MoEF, GoI must be strictly followed.
14) Good house-keeping to be maintained.
15) This NOC is valid up to **31.10.2019** for setting up the expansion of the unit.

25/11/14

Member Secretary /Sr. Environmental Engineer (EIM Cell)
West Bengal Pollution Control Board

List of Industries within 10 km radius

Sl. No.	Name of the Industries	Sl. No.	Name of the Industries
1	Amar Coke Industries	31	Maa Laxmi Fuel Products
2	Arpan Industries	32	Maa Shakambari Ceramics
3	Arun Coke Industries	33	Maa Tara Industries
4	Asansol Aqua Pvt. Ltd.	34	Maa Vaishnav Devi Industries
5	Balaji Glass Factory	35	Mahavir Fuel Industries
6	Burnpur Iron Foundary	36	Maithan Alloys Ltd.
7	Chandrama Hard Coke Mfg.	37	Manju Cement Co. Pvt. Ltd.
8	Chinmoy Fuel Coke	38	Mega Mould India Ltd.
9	City Alloys Pvt. Ltd.	39	Mongal Chand Rolling Mill Pvt. Ltd.
10	City Cement Pvt. Ltd.	40	Mugma Coke Oven (P) Ltd.
11	Damodar Valley Corporation (DVC)	41	Nav Bharat Briquette
12	Das & Deogharia Enterprise	42	Nikita Metals Pvt. Ltd.
13	G.N. Coke Industries (P) Ltd.	43	Nirmal Arc
14	Ganpati Industries	44	Nutan Refractories
15	Gee Tee Hard Coke Industries	45	Power Briquette
16	Gopal Coke Industries	46	Premium Fuels
17	Gupta Udyog	47	Premium Hard Coke (P) Ltd.
18	Hindusthan Cables	48	Pure Minerals & Engineers Syndicate (P) Ltd.
19	Hira Concast Ltd.	49	R.K. Industries
20	Hiramoti Cement Pvt. Ltd.	50	Rajpura Collieries
21	IISCo Works Ltd., SAIL	51	Royal Coke Corporation
22	Impex Ferro Tech Ltd.	52	S G Pulp & Paper (P) Ltd.
23	Impex Steel Ltd.	53	Sanjay Kr.& Co. (P) Ltd.
24	Jagdamba Ispat Pvt. Ltd.	54	Sathyam Industries
25	Jai Maa Durga Ceramics	55	Shanti Industries
26	Joy Guru Briquette	56	Shivam Industries
27	Karmakar Enterprise	57	Shyam Tar Products
28	Kumardhubi Collieries	58	Swadeshi Soap Industries
29	Ma Suvadra Fuel Coke	59	Tractors India Pvt. Ltd.
30	Maa Durga Coal Briquette Industries	60	Vamshi Chemical Ltd.

সত্যমেব জয়তে

Government of West Bengal
Directorate of Forests,
Office of the Divisional Forest Officer, Durgapur Division.
Aranyapally, Shashtri Avenue, Durgapur-12.
E-mail- dfodurgapur@yahoo.in
Office Tel. / FAX- 0343-2537229

Memo No. 2359 / 8-

Dated, Durgapur, The 25/09/2017

To :: The General Manager
BMA Stainless Limited
P.O.- Kalyaneshwari
Dist.- Paschim Bardhaman
PIN- 713360.

Sub. :: N.O.C. in connection with expansion of Steel Plant.

Ref. :: Your letter No. BMA/P&A/2017-18/004, Dt. 10.07.2017.

Apropos to the communication mentioned above, I am to apprise you that the proposed, expansion area is not a forest land. It is not a National Park/Sanctuary/Buffer Zone of forest or any ecologically sensitive area.

Divisional Forest Officer
Durgapur Division

NABL

National Accreditation Board for Testing and Calibration Laboratories

(An Autonomous Body under Department of Science & Technology, Govt. of India)

CERTIFICATE OF ACCREDITATION

VARDAN ENVIRO LAB

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2005

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

Village-Samaspur, Sector-51, Gurgaon, Haryana

in the discipline of

CHEMICAL TESTING

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Certificate Number T-2629

Issue Date 05/08/2015

Valid Until 04/08/2017

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the additional requirements of NABL.

Signed for and on behalf of NABL

N. Venkateswaran	Anil Relia	Prof. S. K. Joshi
Program Manager	Director	Chairman

रा.प्र.प्र.बो.

राष्ट्रीय परीक्षण और अंशशोधन प्रयोगशाला प्रत्यायन बोर्ड

(विज्ञान एवं प्रौद्योगिकी विभाग, भारत सरकार के अधीन स्वायत्तशासी निकाय)

प्रत्यायन प्रमाण–पत्र

वरदान एन्वायरो लैब

का मूल्यांकन और प्रत्यायन निम्न मानक के अनुसार

आई.एस.ओ./आई.ई.सी. 17025:2005

"परीक्षण एवं अंशशोधन प्रयोगशालाओं की सक्षमता की सामान्य अपेक्षाएँ"

गुड़गाँव, हरियाणा

में स्थित इसकी सुविधाओं के लिए

रासायनिक परीक्षण

के विषय क्षेत्र में किया गया।

(इस प्रयोगशाला के प्रत्यायन के विषय क्षेत्र की जानकारी एन ए बी एल वेबसाइट www.nabl-india.org से भी प्राप्त कर सकते हैं)

प्रमाण-पत्र संख्या प-2629

जारी करने की तिथि 05/08/2015

[redacted]

वैधता की तिथि 04/08/2017

यह प्रमाण-पत्र उपर्युक्त मानक तथा राष्ट्रीय परीक्षण और अंशशोधन प्रयोगशाला प्रत्यायन बोर्ड की अतिरिक्त अपेक्षाओं का निरंतर संतोषप्रद अनुपालन किए जाने पर अनुबंध में निर्दिष्टानुसार प्रत्यायन के क्षेत्र के लिए वैध रहेगा।

रा.प्र.प्र.बो. की ओर से हस्ताक्षरित

एन. वेंकटेश्वरन
एन. वेंकटेश्वरन
कार्यक्रम प्रबन्धक

अनिल रेलिया
अनिल रेलिया
निदेशक

श्रीकृष्ण जोशी
प्रो. श्रीकृष्ण जोशी
अध्यक्ष

NABL

SCOPE OF ACCREDITATION

Laboratory	**Vardan Enviro Lab, Village-Samaspur, Sector-51, Gurgaon, Haryana**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Discipline	**Chemical Testing**	**Issue Date**	**05.08.2015**
Certificate Number	**T-2629**	**Valid Until**	**04.08.2017**
Last Amended on	**07.08.2015**	**Page**	**1 of 10**

S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
AT LABORATORY				
I.	**WATER**			
1.	**Surface Water/ Ground Water**	pH	APHA (22nd Edition) 4500H^+ B: 2012 Electrometric Method	1 to 14
		Odour	APHA (22nd Edition) 2150 B: 2012 Threshold Odour Method	Qualitative
		Taste	APHA (22nd Edition) 2160 B: 2012 Flavor Threshold Test Method	Qualitative
		Turbidity	APHA (22nd Edition) 2130 B: 2012 Nephelometric Method	1NTU to 1000 NTU
		Total Dissolved Solid	APHA (22nd Edition) 2540 C: 2012 Gravimetric Method	5 mg/L to 10000 mg/L
		Total Suspended Solid	APHA (22nd Edition) 2540 D: 2012 Gravimetric Method	5 mg/L to 10000 mg/L
		Anionic Surfactant	APHA (22nd Edition) 5540 C:2012 MBAS Method	0.20 mg/L to 5 mg/L
		Boron	APHA (22nd Edition) 4500 BC:.2012 Carmine Method	0.50 mg/L to 100 mg/L
		Calcium as Ca	APHA (22nd Edition) 3500 Ca B: 2012 EDTA Titrimetric Method	1.0 mg/L to 1000 mg/L
		Chloride as Cl	APHA (22nd Edition) 4500 Cl^- B: 2012 Argentometric Method	2.0 mg/L to 5000 mg/L
		Copper	APHA (22nd Edition) 3111 B: 2012 Direct Air Acetylene Flame Method	0.20 mg/L to 50 mg/L

Deepak Kumar Sharma
Convenor

N. Venkateswaran
Program Manager

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S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Surface Water/ Ground Water	Fluoride as F	APHA (22nd Edition) 4500 FD: 2012 SPADNS Method	0.20 mg/L to 10 mg/L
		Residual Free Chlorine	APHA (22nd Edition) 3500 Cl B: 2012 Iodometric Method	0.02 mg/L to 5.0 mg/L
		Iron as Fe	APHA (22nd Edition) 3500 Fe B: 2012 1, 10 Phenophthroline Method	0.10 mg/L to 10.0 mg/L
		Magnesium as Mg	APHA (22nd Edition) 3500 MgB: 2012 By Calculation	0.5 mg/L to 250 mg/L
		Nitrate	IS 3025 (Part 34) (RA 2003) Chromotropic Method	0.20 mg/L to 100 mg/L
		Phenolic Compound	APHA (22nd Edition) 5530 C: 2012 Chloroform Extraction Method	0.10 mg/L to 5.0 mg/L
		Sulphate as SO_4	APHA (22nd Edition) 4500 SO_4^{2-}E: 2012 Turbidmetric Method	1.0 mg/L to 500 mg/L
		Alkalinity	APHA (22nd Edition) 2320 B: 2012 Titrimetric Method	1.0 mg/L to 10000 mg/L
		Total Hardness as $CaCO_3$	APHA (22nd Edition) 2340 C: 2012 EDTA Titrimetric Method	1.0 mg/L to 10000 mg/L
		Zinc	APHA (22nd Edition) 3111 B: 2012 Direct Air Acetylene Flame Method	0.20 mg/L to 50 mg/L
		Lead	APHA (22nd Edition) 3111 B: 2012 Direct Air Acetylene Flame Method	0.20 mg/L to 50 mg/L
		Nickel	APHA (22nd Edition) 3111 B: 2012 Direct Air Acetylene Flame Method	0.20 mg/L to 10 mg/L

Deepak Kumar Sharma
Convenor

N. Venkateswaran
Program Manager

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S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Surface Water/ Ground Water	Hexavalent Chromium as Cr^{6+}	APHA (22nd Edition) 3500 Cr B: 2012 Colorimetric Method	0.20 mg/L to 10 mg/L
		Conductivity	APHA (22nd Edition) 2510 B: 2012 By Conductivity meter	1 µS/cm to 200 mS/cm
		Acidity	APHA (22nd Edition) 2310 B: 2012 Titrimetric Method	1 mg/L to 500 mg/L
		Temperature	APHA (22nd Edition) 2550 B: 2012 By Thermometer	0.1 °C to 50°C
		Phosphate as PO_4	APHA (22nd Edition) 4500 PD: 2012 Stannous Chloride Method	0.20 mg/L to 100 mg/L
		Silica as SiO_2	APHA (22nd Edition) 4500 SiO_2 C: 2012 Molybdosilicate Method	0.01 mg/L to 10 mg/L
		Ammonical Nitrogen as NH_3	IS 3025 (Part 34): 1988 (RA 2009) Titrimetric Method	1 mg/L to 50 mg/L
		Sodium as Na	APHA (22nd Edition) 3500 Na B: 2012 Flame-photometer Method	1 mg/L to 500 mg/L
		Potassium as K	APHA (22nd Edition) 3500 K B: 2012 Flame-photometer Method	1 mg/L to 500 mg/L
		Total Nitrogen as N	IS 3025 (Part 34): 1988 (RA 2009) Kjeldhal Method	1 mg/L to 50 mg/L
2.	**Waste Water**	pH	APHA (22nd Edition) 4500H^+ B: 2012 Electrometric Method	1 to 14
		Color	APHA (22nd Edition) 2120 B: 2012 Visual Comparison Method	1 Hazen to1000 Hazen

Deepak Kumar Sharma
Convenor

N. Venkateswaran
Program Manager

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S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Waste Water	Turbidity	APHA (22nd Edition) 2130 B:2012 Nephelometric Method	0.1 NTU to 500 NTU
		Total Dissolved Solid	APHA (22nd Edition) 2540 C: 2012 Gravimetric Method	5 mg/L to 5000 mg/L
		Total Suspended Solid	APHA (22nd Edition) 2540 D: 2012 Gravimetric Method	5 mg/L to 1000 mg/L
		Ammonical Nitrogen	IS 3025 (Part 34): 1988 (RA 2009) Titrimetric Method	1 mg/L to 50 mg/L
		Fluoride as F	APHA (22nd Edition) 4500 FD: 2012 SPADNS Method	0.20 mg/L to 10 mg/L
		Chemical Oxygen Demand (COD)	APHA (22nd Edition) 5220 B: 2012 Open Reflux Method	5 mg/L to 10000 mg/L
		Biochemical Oxygen Demand (BOD) (3 Days at 27°C)	IS 3025 (Part 44) (RA 2004)	5 mg/L to 10000 mg/L
		Oil & grease	APHA (22nd Edition) 5520B: 2012 Gravimetric method	0.2 mg/L to 200 mg/L
		Specific Conductivity	APHA (22nd Edition) 2510 B: 2012 By Conductivity meter	1 µS/cm to 20 mS/cm
		Dissolved Oxygen	APHA (22nd Edition) 4500 OB: 2012 Iodometric method	0.5 mg/L to 15 mg/L
		Sodium as Na	APHA (22nd Edition) 3500 NaB: 2012 Flame-photometer Method	1 mg/L to 2000 mg/L

Deepak Kumar Sharma
Convenor

N. Venkateswaran
Program Manager

NABL

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S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Waste Water	Potassium as K	APHA (22nd Edition) 3500 KB: 2012 Flame-photometer Method	1 mg/L to 2000 mg/L
		Temperature	APHA (22nd Edition) 2550 B: 2012 By Thermometer	0.1°C to 50 °C
		Total Residue Chlorine	APHA (22nd Edition) 3500 Cl B: 2012 Iodometric Method	0.20 mg/L to 5 mg/L
		Total Khjeldal Nitrogen	IS 3025 (Part 34): 1988 (RA 2009) Kjeldhal Method	1 mg/L to 500 mg/L
		Lead	APHA (22nd Edition) 3111 B: 2012 Direct Air Acetylene Flame Method	0.20 mg/L to 50 mg/L
		Hexavalent Chromium as Cr^{6+}	APHA (22nd Edition) 3500 Cr B: 2012 Colorimetric Method	0.20 mg/L to 50 mg/L
II.	**AIR, GASES AND ATMOSPHERE**			
1.	**Ambient Air Monitoring**	Suspended Particulate Matter	IS 5182 (Part 4): (RA 2005) Gravimetric Method	5 $\mu g/m^3$ to 10000 $\mu g/m^3$
		$PM_{2.5}$	VEL/SOP/01 Issue No.: 01 Issue Date: 25.01.2013	5 $\mu g/m^3$ to 500 $\mu g/m^3$
		PM_{10}	IS 5182 (Part 23) (RA 2006) Gravimetric Method	5 $\mu g/m^3$ to 1000 $\mu g/m^3$
		Sulphur Dioxide	IS 5182 (Part 2) (RA 2012) Modified West and Gaeke Method	5 $\mu g/m^3$ to 500 $\mu g/m^3$
		Nitrogen Dioxide	IS 5182 (Part 6) (RA 2006) Jacob & Hochheiser Method	5 $\mu g/m^3$ to 500 $\mu g/m^3$

Deepak Kumar Sharma
Convenor

N. Venkateswaran
Program Manager

NABL

SCOPE OF ACCREDITATION

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Certificate Number	**T-2629**	**Valid Until**	**04.08.2017**
Last Amended on	**07.08.2015**	**Page**	**6 of 10**

S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Ambient Air Monitoring	Carbon Monoxide	IS 5182 (Part 10) (RA 2003) By Gas Chromatography	0.5 mg/m^3 to 50 mg/m^3
		Ozone	IS 5182 (Part 9) (RA 2003) Colorimetric Method	0.5 $\mu g/m^3$ to 500 $\mu g/m^3$
		Ammonia	IS 11255 (Part 6) (RA 2009) Indo Phenol Blue Method	1 $\mu g/m^3$ to 500 $\mu g/m^3$
		Fluoride	IS 5182 (Part 13) (RA 2009) SPADNS method	0.20 $\mu g/m^3$ to 20 $\mu g/m^3$
		Lead	IS 5182 (Part 22) (RA 2009) Air Acetylene Method	0.20 $\mu g/m^3$ to 50 $\mu g/m^3$
		Nickel	IS 5182 (Part 22) (RA 2009) Air Acetylene Method	0.20 $\mu g/m^3$ to 50 $\mu g/m^3$
		Hydrogen Sulphide	IS 5182 (Part 7) (RA 2009) Colorimetric Method	0.20 $\mu g/m^3$ to 20 $\mu g/m^3$
		Chlorine	IS 5182 (Part 19) (RA 2009) Colorimetric Method	0.20 $\mu g/m^3$ to 100 $\mu g/m^3$
2.	**Stack/ Source Emission**	Particulate matter	IS 11255 (Part 1) (RA 2003) Gravimetric Method	5 mg/Nm^3 to 5000 mg/Nm^3
		Sulphur Dioxide	IS 11255 (Part 2) (RA 2003) Titrimetric Method	5 mg/Nm^3 to 1000 mg/Nm^3
		Nitrogen Dioxide	IS 11255 (Part 7) (RA 2012) Colorimetric Method	5 mg/Nm^3 to 1000 mg/Nm^3
		Total Fluoride	IS 11255 (Part 5) (RA 1999) SPADNS Method	0.20 mg/Nm^3 to 50 mg/Nm^3

Deepak

Deepak Kumar Sharma
Convenor

N. Venkateswaran
Program Manager

NABL

SCOPE OF ACCREDITATION

Laboratory	**Vardan Enviro Lab, Village-Samaspur, Sector-51, Gurgaon, Haryana**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Discipline	**Chemical Testing**	**Issue Date**	**05.08.2015**
Certificate Number	**T-2629**	**Valid Until**	**04.08.2017**
Last Amended on	**07.08.2015**	**Page**	**7 of 10**

S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Stack/ Source Emission	Ammonia as NH_3	IS 11255 (Part 6) (RA 2009) Titrimetric Method	1 mg/Nm^3 to 500 mg/Nm^3
III.	**SOIL**			
1.	**Soil**	pH value	IS 2720 (Part 26) (RA 2011) Electrometric Method	2 to 12
		Conductivity	IS 14767: 2000 (RA 2006) By Conductivity meter	1 µS/cm to 20 mS/cm
		Bulk Density	SOP, SP- 80 Issue No.: 01 Issue Date: 14/02/2013 Gravimetric Method	0.5 g/cc to 50 g/cc
		Chloride	SOP, SP- 85 Issue No.: 01 Issue Date: 14/02/2013 Titrimetric Method	2.0 mg/100g to 1000 mg/100g
		Water Holding Capacity	SOP, SP- 81 Issue No.: 01 Issue Date: 14/02/2013 Gravimetric Method	10 % to 50 %
		Colour	SOP, SP- 78 Issue No.: 01 Issue Date: 14/02/2013 Visual Comparison Method	Qualitative
		Soil texture	IS 2720 (Part 22): (RA 2003) Gravimetric Method	Qualitative

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SCOPE OF ACCREDITATION

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Accreditation Standard	**ISO/IEC 17025: 2005**		
Discipline	**Chemical Testing**	**Issue Date**	**05.08.2015**
Certificate Number	**T-2629**	**Valid Until**	**04.08.2017**
Last Amended on	**07.08.2015**	**Page**	**8 of 10**

S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Soil	Moisture	SOP, SP- 79 Issue No.: 01 Issue Date: 14/02/2013 Gravimetric Method	0.50 % to 80 %
		Calcium	SOP, SP- 82 Issue No.: 01 Issue Date: 14/02/2013 Titrimetric Method	2.0 mg/100g to 1000 mg/100g
		Magnesium	SOP, SP- 83 Issue No.: 01 Issue Date: 14/02/2013 Titrimetric Method	0.5 mg/100g to 1000 mg/100g
		Phosphorus	SOP, SP- 86 Issue No.: 01 Issue Date: 14/02/2013 Colorimetric Method	0.2 kg/hec. to 200 kg/hec.
		Organic Matter	IS 2720 (Part 22) (RA 2009) Titrimetric Method	0.05 % to 20 %
		Nitrogen	IS 14648 (RA 2006) Distillation Method	1 kg/hec. to 1000 kg/hec.
		Organic Carbon	IS 2720 (Part 22) (RA 1972) Titrimetric Method	0.1 % to 20 %
		Sodium	SOP, SP- 84 Issue No.: 01 Issue Date: 14/02/2013 By Flame Photometer	1 mg/100g to 500 mg/100g
		Potassium	SOP, SP- 84 Issue No.: 01 Issue Date: 14/02/2013 By Flame Photometer	1 kg/hec. to 500 kg/hec.

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NABL

SCOPE OF ACCREDITATION

Laboratory	Vardan Enviro Lab, Village-Samaspur, Sector-51, Gurgaon, Haryana		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Chemical Testing	Issue Date	05.08.2015
Certificate Number	T-2629	Valid Until	04.08.2017
Last Amended on	07.08.2015	Page	9 of 10

S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
IV.	BUILDING MATERIALS			
1.	Limestone & Dolomite	Calcium Oxide	IS 1760 (Part 3) (RA 1992) Gravimetric Method	0.5 % to 60 %
		Loss of Ignition	IS 1760 (Part 1) (RA 1991) Gravimetric Method	0.6 % to 60 %
		Silica	IS 1760 (Part 6) (RA 2001) Gravimetric Method	0.1 % to 40 %
		Magnesium oxide	IS 1760 (Part 3) (RA 1992) Gravimetric Method	0.1 % to 50 %
		Alumina	IS 1760 (Part 3) (RA 1992) Gravimetric Method	0.5 % to 50 %
		Chloride	IS 1760 (Part 5) (RA 1991) Gravimetric Method	0.5 % to 15 %
		Iron Oxide	IS 1760 (Part 3) (RA 1992) Gravimetric Method	0.1 % to 30 %

Deepak Kumar Sharma
Convenor

N. Venkateswaran
Program Manager

NABL

SCOPE OF ACCREDITATION

Laboratory	**Vardan Enviro Lab, Village-Samaspur, Sector-51, Gurgaon, Haryana**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Discipline	**Chemical Testing**	**Issue Date**	**05.08.2015**
Certificate Number	**T-2629**	**Valid Until**	**04.08.2017**
Last Amended on	**07.08.2015**	**Page**	**10 of 10**

S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
AT SITE				
I.	**NOISE**			
1.	**Ambient Noise**	L_{max}	IS 9989: 1981 (RA 2003) By Calculation	30 dB(A) to 200 dB(A)
		L_{min}	IS 9989: 1981 (RA 2003) By Calculation	25 dB(A) to 150 dB(A)
		Leq	IS 9989: 1981 (RA 2003) By Calculation	30 dB(A) to 200 dB(A)
		L_{dn}	IS 9989: 1981 (RA 2003) By Calculation	30 dB(A) to 150 dB(A)

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Deepak

Deepak Kumar Sharma
Convenor

N. Venkateswaran
Program Manager

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भारत का राजपत्र
The Gazette of India

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अधिसूचना

नई दिल्ली, 30 जून, 2015

का.आ. 1783(अ).— केन्द्रीय सरकार, पर्यावरण (संरक्षण) नियम, 1986 के नियम 10 के साथ पठित पर्यावरण (संरक्षण)अधिनियम, 1986 (1986 का 29) की धारा 12 की उपधारा (1)के खंड (ख)और धारा 13 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, भारत सरकार के तत्कालीन पर्यावरण और वन मंत्रालय की अधिसूचना संख्यांक का.आ. 1174(अ) तारीख 18 जुलाई, 2007 का निम्नलिखित और संशोधन करती है, अर्थात् :--

उक्त अधिसूचना की सारणी में क्रम सं. 126 और उससे संबंधित प्रविष्टियों के पश्चात् निम्नलिखित क्रम संख्यांक और प्रविष्टियां अंत:स्थापित की जाएंगी, अर्थात् :--

(1)	(2)	(3)	(4)
"127	मैसर्स वरदान इन्वायरोलेब, सेक्टर-51, समसपुर, एमेटी स्कूल के सामने, गुड़गांव–122001 (हरियाणा)	(1) श्री एस.के. शर्मा (2) श्री राजेन्द्र सिंह यादव (3) श्री गौरव प्रताप सिंह	30.06.2015 से 29.06.2020" ;

[फा. सं. क्यू-15018/23/2013-सीपीडब्ल्यू]

डा. राशिद हसन,सलाहकार

टिप्पण: मूल अधिसूचना भारत के राजपत्र, असाधारण, में संख्यांक. का.आ. 1174(अ), तारीख 18 जुलाई, 2007 द्वारा प्रकाशित की गई थी और तत्पश्चात् अधिसूचना सं0 का.आ. 1539(अ), तारीख 13 सितंबर, 2007, का.आ. 1811(अ), तारीख 24 अक्तूबर, 2007, का.आ. 55(अ), तारीख 9 जनवरी, 2008, का.आ. 428(अ), तारीख 4 मार्च, 2008, का.आ. 865(अ), तारीख 11 अप्रैल, 2008, का.आ. 1894(अ), तारीख 31 जुलाई, 2008, का.आ. 2728(अ), तारीख 25 नवंबर, 2008, का.आ. 1356(अ), तारीख 27 मई, 2009, का.आ.1802(अ)तारीख 22 जुलाई, 2009, का.आ.2399(अ)तारीख 18 सितंबर, 2009,का.आ. 3122(अ), तारीख 7 दिसंबर, 2009, का.आ. 3123(अ), तारीख 7 दिसंबर, 2009, का.आ. 142(अ), तारीख 21 जनवरी, 2010, का.आ. 619(अ), तारीख 19 मार्च, 2010, का.आ. 1662(अ), तारीख 13 जुलाई, 2010, का.आ. 2390(अ), तारीख 30 सितंबर, 2010, का.आ. 2904 (अ), तारीख 8 दिसंबर, 2010, का.आ. 181(अ), तारीख 28 जनवरी, 2011, का.आ. 692(अ), तारीख 5 अप्रैल, 2011, का.आ. 1537(अ), तारीख 6 जुलाई, 2011, का.आ. 1754(अ), तारीख 28 जुलाई, 2011, का.आ. 2609(अ), तारीख 22 नवंबर, 2011, का.आ. 264(अ), तारीख 13 फरवरी, 2012, का.आ. 1150(अ), तारीख 22 मई, 2012, का.आ. 2039(अ), तारीख 5 सितंबर, 2012, का.आ. 2802(अ), तारीख 27 नवंबर, 2012 और का.आ. 2850(अ), तारीख 7 दिंसबर, 2012 तथा का.आ. 592(अ), तारीख 8 मार्च, 2013, का.आ. 945(अ), तारीख 8 अप्रैल, 2013, का.आ.2287(अ),तारीख 27 जुलाई, 2013, का.आ.2288(अ),तारीख 27 जुलाई, 2013,का.आ.3489(अ),तारीख 26 नवंबर, 2013, का.आ.21(अ),तारीख 3 जनवरी, 2014, का.आ.561(अ),तारीख 26 फरवरी, 2014, का.आ.1205(अ),तारीख 5 मई, 2014, का.आ.1190(अ),तारीख 2 मई, 2014, का.आ.2003(अ),तारीख 6 अगस्त, 2014 और का.आ.137(अ),तारीख 12 जनवरी, 2015 द्वारा उसका संशोधन किया गया था

MINISTRY OF ENVIRONMENT, FORESTS AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 30th June, 2015

S.O. 1783(E).—In exercise of the powers conferred by clause (b) of sub-section (1) of section 12 and section 13 of the Environment (Protection) Act, 1986 (29 of 1986) read with rule 10 of the Environment (Protection) Rules, 1986, the Central Government hereby makes the following further amendments in the notification of the Government of India in the erstwhile Ministry of Environment and Forests, number S.O. 1174(E), dated the 18th July, 2007, namely :-

In the said notification, in the Table after serial number 126 and the entries relating thereto, the following serial number and entries shall be inserted, namely :-

(1)	(2)	(3)	(4)
"127	M/s Vardan Enviro Lab, Sector-51, Samaspur, Opposite Amity School, Gurgaon - 122001 (Haryana)	(1) Mr.S. K. Sharma (2) Mr.Rajinder Singh Yadav (3) Mr. Gaurav Pratap Singh	30.06.2015 to 29.06.2020"

[F. No. Q. 15018/23/2013-CPW]
Dr. RASHID HASAN, Advisor

Note.- The principal notification was published in the Gazette of India, Extraordinary *vide* number S.O. 1174(E), dated the 18th July, 2007 and subsequently amended *vide* notification numbers S.O. 1539(E), dated the 13th September, 2007, S.O. 1811(E), dated the 24th October, 2007, S.O. 55(E), dated 9th January, 2008, S.O. 428(E), dated the 4th March, 2008, S.O. 865(E) dated the 11th April, 2008, S.O. 1894(E) dated the 31st July, 2008, S.O. 2728(E) dated the 25th November, 2008, S.O. 1356(E) dated the 27th May, 2009, S.O. 1802(E) dated the 22nd July, 2009, S.O. 2399(E), dated the 18th September, 2009, S.O. 3122(E), dated the 7th December, 2009, S.O. 3123(E), dated the 7th December, 2009, S.O. No. 142(E), dated the 21st January, 2010, S.O. 619(E), 19th March, 2010, S.O. 1662(E) dated the 13rd July, 2010, S.O. 2390(E), dated the 30th September, 2010, S.O. 2904(E), dated the 8th December, 2010, S.O. 181(E), dated the 28th January, 2011, S.O. 692(E), dated the 5th April, 2011, S.O.1537(E), dated the 6th July,2011 , S.O.1754(E), dated the 28th July, 2011 S.O. 2609 (E) dated the 22nd November, 2011, S.O. 264 (E), dated the 13 February, 2012, S.O. 1150(E), dated the 22nd May, 2012, S.O. 2039(E), dated the 5th September, 2012, S.O. 2802(E) dated the 27th November, 2012, S.O. 2850(E), dated the 7th December, 2012, S.O. 592(E), dated the 8th March, 2013, S.O. 945(E), dated the 8th April, 2013, S.O. 2287(E), dated the 27th July, 2013, S.O. 2288(E), dated the 27th July, 2013, S.O. 3489(E) dated the 26th November, 2013, S.O.21(E), dated 3rd January, 2014 and S.O. 561(E), the 26th February, 2014, S.O. 1205(E), the 5th May, 2014, S.O. 1190(E), the 2nd May, 2014, S.O. 2003(E), the 6th August, 2014 and S.O. 137(E), the 12th January, 2015.

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Vardan EnviroLab

Regd. Off: D-142, Sushant Lok-III, Sector-57, Gurgaon - 122003 (Haryana) Tel: 0124-4291036
Laboratory: Samaspur, Opposite Amity International School, Sector-51, Gurgaon - 122001 (Haryana)
Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035 (Rajasthan) Tel: 0141-2983404
(ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

Test Certificate

Name & Address of the Project:	M/s BMA Stainless Ltd. Expansion of Induction Furnace Village-Debipur, P.O. Kalyaneswari District-Burdhman, West Bengal	Report No.:	VEL/A/ BMASL/1610/1621-1647
		Reporting Date:	05/01/2017
		Ref. No:	NIL
		Monitoring Period:	October -December 2016
Sample Description:	Ambient Air Quality Monitoring	Equipment Used:	RDS & FPS with all accessories
Sample Collected by:	Vardan Envirolab Team	Protocol Used:	CPCB Guidelines/IS-5182
Location:	Near Project Site (A1)	Parameter Required	As Per TOR Letter

RESULT

Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
01.10.2016	71.6	42.4	17.6	9.6	0.85
02.10.2016	69.8	39.8	21.6	10.2	0.95
08.10.2016	70.5	44.7	23.4	9.8	1.01
09.10.2016	81.4	48.4	24.5	10.3	0.86
15.10.2016	53.8	35.1	18.4	8.9	1.23
16.10.2016	72.1	43.4	30.8	11.7	1.57
22.10.2016	68.9	37.9	20.7	9.7	0.98
23.10.2016	81.4	42.8	19.7	10.8	1.54
29.10.2016	79.6	47.7	24.1	10.6	1.06
30.10.2016	75.4	44.0	31.7	8.8	1.63
05.11.2016	80.6	52.5	27.4	10.2	1.82
06.11.2016	79.4	50.2	25.8	11.9	0.89
12.11.2016	70.5	36.3	23.7	10.9	1.55
13.11.2016	65.3	38.8	25.6	9.8	0.84
19.11.2016	74.5	44.9	24.7	8.6	0.77
20.11.2016	70.0	41.4	19.7	10.9	0.91
26.11.2016	84.2	49.7	18.4	11.4	0.89
27.11.2016	75.6	44.6	21.7	8.8	0.94
03.12.2016	83.6	45.2	27.4	9.7	1.62
04.12.2016	84.2	48.4	29.2	13.4	1.58
10.12.2016	77.4	31.7	31.1	10.9	1.44

Mr. MOHAMMAD ANAS
M.Sc. Env. Science

VARDAN ENVIRO LAB (GURGAON) GAURAV CHAUHAN AUTHORISED SIGNATORY

NOTE: a)The results listed refer only to the tested samples & applicable parameters
b) Total liabilities of our lab will be restricted to the invoice amount only
c) The sample will be destroyed after retention time unless otherwise specified
d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

Vardan EnviroLab

Regd. Off: D-142, Sushant Lok-III, Sector-57, Gurgaon - 122003 (Haryana) Tel: 0124-4291036
Laboratory: Samaspur, Opposite Amity International School, Sector-51, Gurgaon - 122001 (Haryana)
Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035 (Rajasthan) Tel: 0141-2983404
(ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

Test Certificate

Report No.:	VEL/A/ BMASL/1610/1621-1647				
Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
11.12.2016	90.8	54.7	24.4	10.3	1.87
17.12.2016	81.4	46.9	25.7	8.7	0.98
18.12.2016	73.7	48.4	18.3	9.5	0.82
24.12.2016	77.4	42.4	21.4	10.7	1.09
25.12.2016	68.7	35.8	28.7	9.9	1.51
31.12.2016	79.5	49.7	24.6	10.9	1.09

Mr. MOHAMMAD ANAS
M.Sc. Env. Science

GAURAV CHADHAN

NOTE: a)The results listed refer only to the tested samples & applicable parameters
b) Total liabilities of our lab will be restricted to the invoice amount only
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Laboratory: Samaspur, Opposite Amity International School, Sector-51, Gurgaon - 122001 (Haryana)
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(ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

Test Certificate

Name & Address of the Project:	M/s BMA Stainless Ltd. Expansion of Induction Furnace Village-Debipur, P.O. Kalyaneswari District-Burdhman, West Bengal	Report No.:	VEL/A/ BMASL/1610/1648-1674
		Reporting Date:	05/01/2017
		Ref. No:	NIL
		Monitoring Period:	October -December 2016
Sample Description:	Ambient Air Quality Monitoring	Equipment Used:	RDS & FPS with all accessories
Sample Collected by :	Vardan Envirolab Team	Protocol Used:	CPCB Guidelines/IS-5182
Location:	Near Village- Kalyaneswari (A2)	Parameter Required	As Per TOR Letter

RESULT

Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
01.10.2016	62.3	38.4	25.3	8.4	0.82
02.10.2016	68.3	40.5	28.1	7.3	1.75
08.10.2016	79.4	37.3	19.7	6.9	0.79
09.10.2016	70.6	35.8	22.8	8.2	0.62
15.10.2016	68.0	38.6	26.4	9.1	0.74
16.10.2016	84.8	37.4	20.6	8.8	1.09
22.10.2016	72.6	43.8	27.3	9.6	0.73
23.10.2016	68.9	41.9	26.4	7.7	0.95
29.10.2016	59.3	39.2	16.4	8.5	0.66
30.10.2016	69.8	40.0	30.3	9.4	0.95
05.11.2016	74.5	42.3	31.5	11.0	1.01
06.11.2016	87.7	38.4	22.8	10.4	0.84
12.11.2016	63.7	39.6	28.4	9.2	1.23
13.11.2016	67.4	41.5	14.2	8.6	0.73
19.11.2016	85.4	52.7	24.7	8.2	0.71
20.11.2016	66.3	39.1	19.9	7.9	0.64
26.11.2016	70.1	38.7	22.4	10.3	0.88
27.11.2016	70.9	40.8	29.7	7.6	0.83
03.12.2016	76.8	43.5	19.2	8.4	0.94
04.12.2016	75.2	45.8	28.6	9.2	1.86
10.12.2016	81.6	44.1	25.4	10.2	0.72

Mr. MOHAMMAD ANAS
M.Sc. Env. Science

VARDAN ENVIRO LAB (GURGAON) GAURAV CHAUHAN AUTHORISED SIGNATORY

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Vardan EnviroLab

Regd. Off: D-142, Sushant Lok-III, Sector-57, Gurgaon - 122003 (Haryana) Tel: 0124-4291036
Laboratory: Samaspur, Opposite Amity International School, Sector-51, Gurgaon - 122001 (Haryana)
Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035 (Rajasthan) Tel: 0141-2983404
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Test Certificate

Report No.:	VEL/A/ BMASL/1610/1648-1674				
Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
11.12.2016	71.4	40.4	22.4	11.5	0.68
17.12.2016	78.3	45.3	23.7	9.6	0.93
18.12.2016	88.4	39.7	24.2	7.8	1.70
24.12.2016	69.7	41.7	28.4	9.4	0.84
25.12.2016	75.6	44.6	18.8	11.4	0.63
31.12.2016	79.4	45.2	26.1	10.9	1.32

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Test Certificate

Name & Address of the Project:	M/s BMA Stainless Ltd. Expansion of Induction Furnace Village- Debipur, P.O. Kalyaneswari District- Burdhman, West Bengal	Report No.:	VEL/A/ BMASL/1610/1675-1701
		Reporting Date:	05/01/2017
		Ref. No:	NIL
		Monitoring Period:	October -December 2016
Sample Description:	Ambient Air Quality Monitoring	Equipment Used:	RDS & FPS with all accessories
Sample Collected by:	Vardan Envirolab Team	Protocol Used:	CPCB Guidelines/IS-5182
Location:	Near Village-Barakar (A3)	Parameter Required	As Per TOR Letter

RESULT

Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
01.10.2016	75.6	44.3	22.3	10.2	1.34
02.10.2016	78.2	45.2	28.5	11.5	1.45
08.10.2016	81.3	50.4	27.4	9.8	1.20
09.10.2016	79.1	46.5	29.3	10.3	1.22
15.10.2016	83.4	47.2	24.2	12.4	1.67
16.10.2016	85.8	49.2	26.8	11.7	1.80
22.10.2016	90.1	52.4	28.2	11.0	1.76
23.10.2016	81.4	46.1	22.5	10.8	1.90
29.10.2016	78.2	40.8	30.2	10.4	0.98
30.10.2016	89.6	48.7	31.6	13.5	1.04
05.11.2016	95.3	53.6	32.4	14.7	0.87
06.11.2016	90.5	52.1	34.5	12.4	1.27
12.11.2016	77.4	44.9	26.7	11.3	1.11
13.11.2016	83.6	49.6	29.4	10.2	0.90
19.11.2016	72.8	42.8	30.5	9.9	1.29
20.11.2016	81.4	53.3	25.7	10.4	0.78
26.11.2016	81.6	45.7	27.4	10.2	1.04
27.11.2016	83.7	46.2	21.5	8.6	1.33
03.12.2016	74.2	39.5	26.3	12.5	1.65
04.12.2016	94.3	53.7	30.4	9.7	0.89
10.12.2016	80.0	42.8	31.2	9.3	1.21

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Vardan EnviroLab

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Laboratory: Samaspur, Opposite Amity International School, Sector-51, Gurgaon - 122001 (Haryana)
Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035 (Rajasthan) Tel: 0141-2983404
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Test Certificate

Report No.:	VEL/A/ BMASL/1610/1675-1701				
Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
11.12.2016	83.6	48.8	19.8	8.3	1.07
17.12.2016	75.1	45.3	25.6	10.2	1.23
18.12.2016	88.4	50.1	22.4	11.3	1.08
24.12.2016	86.3	49.5	20.7	9.6	0.98
25.12.2016	84.2	48.6	24.1	13.0	0.78
31.12.2016	91.2	55.4	25.6	10.7	1.04

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Test Certificate

Name & Address of the Project:	M/s BMA Stainless Ltd. Expansion of Induction Furnace Village-Debipur, P.O. Kalyaneswari District-Burdhman, West Bengal	Report No.:	VEL/A/ BMASL/1610/1702-1727
		Reporting Date:	05/01/2017
		Ref. No:	NIL
		Monitoring Period:	October -December 2016
Sample Description:	Ambient Air Quality Monitoring	Equipment Used:	RDS & FPS with all accessories
Sample Collected by :	Vardan Envirolab Team	Protocol Used:	CPCB Guidelines/IS-5182
Location:	Near Village-Narayan Chak (A4)	Parameter Required	As Per TOR Letter

RESULT

Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
03.10.2016	78.3	37.5	21.6	11.3	0.84
04.10.2016	64.2	32.6	29.3	9.0	0.86
10.10.2016	81.6	45.5	31.7	10.9	1.20
11.10.2016	70.4	43.4	25.7	8.7	0.77
17.10.2016	69.3	35.8	26.4	10.8	0.72
18.10.2016	70.6	39.8	28.3	12.4	0.83
24.10.2016	69.8	38.7	22.7	14.5	1.02
25.10.2016	88.6	50.9	19.4	10.9	1.49
31.10.2016	64.6	47.1	32.5	9.7	1.52
01.11.2016	86.3	52.6	30.3	11.6	1.64
07.11.2016	70.4	40.5	28.4	9.8	0.98
08.11.2016	68.4	39.6	23.3	10.5	1.11
14.11.2016	74.2	40.9	30.6	8.2	0.76
15.11.2016	76.4	41.8	29.7	8.6	0.72
21.11.2016	82.6	49.7	20.5	9.4	0.82
22.11.2016	70.7	38.6	26.4	8.5	0.91
28.11.2016	71.5	42.8	19.3	8.1	1.06
29.11.2016	79.8	36.5	20.2	12.6	0.78
05.12.2016	73.7	42.0	24.8	10.2	1.01
06.12.2016	80.7	46.3	28.2	11.8	0.86
12.12.2016	69.8	37.0	19.3	9.9	0.91

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Laboratory: Samaspur, Opposite Amity International School, Sector-51, Gurgaon - 122001 (Haryana)
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Test Certificate

Report No.:	VEL/A/ BMASL/1610/1702-1727				
Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
13.12.2016	74.3	39.7	22.7	10.4	0.75
19.12.2016	78.5	43.6	28.4	9.0	0.88
20.12.2016	80.4	50.8	31.0	10.9	0.69
26.12.2016	74.2	42.2	24.3	9.4	0.82
27.12.2016	75.9	44.9	20.4	11.7	1.04

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GAURAV CHAUHAN
AUTHORISED SIGNATORY

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Test Certificate

Name & Address of the Project:	**M/s BMA Stainless Ltd. Expansion of Induction Furnace Village-Debipur, P.O. Kalyaneswari District-Burdhman, West Bengal**	Report No.:	**VEL/A/ BMASL/1610/1728-1753**
		Reporting Date:	**05/01/2017**
		Ref. No:	**NIL**
		Monitoring Period:	**October -December 2016**
Sample Description:	**Ambient Air Quality Monitoring**	Equipment Used:	**RDS & FPS with all accessories**
Sample Collected by :	**Vardan Envirolab Team**	Protocol Used:	**CPCB Guidelines/IS-5182**
Location:	**Near Village-Banshkatiya (A5)**	Parameter Required	**As Per TOR Letter**

RESULT

Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
03.10.2016	68.3	39.5	22.3	7.6	0.76
04.10.2016	75.8	40.6	18.6	6.9	0.69
10.10.2016	70.6	39.2	19.5	7.2	1.23
11.10.2016	68.6	32.4	20.1	7.4	0.72
17.10.2016	72.4	39.9	23.5	10.9	0.68
18.10.2016	72.1	40.1	24.6	8.5	0.79
24.10.2016	63.9	37.9	20.8	7.8	0.82
25.10.2016	59.2	32.6	25.6	8.4	1.50
31.10.2016	74.5	42.8	17.3	7.9	0.65
01.11.2016	81.3	47.4	20.4	8.0	0.79
07.11.2016	82.9	48.3	22.8	8.8	1.80
08.11.2016	77.4	41.2	21.3	11.5	0.72
14.11.2016	68.7	38.4	18.9	6.9	0.74
15.11.2016	70.9	39.7	19.7	7.4	0.78
21.11.2016	66.3	36.2	18.3	6.8	0.66
22.11.2016	55.8	31.7	22.5	10.0	0.70
28.11.2016	74.3	30.5	21.8	8.3	1.16
29.11.2016	69.8	41.8	24.7	7.4	0.81
05.12.2016	78.7	31.4	23.1	8.6	1.63
06.12.2016	68.3	34.9	22.8	7.8	0.76
12.12.2016	86.2	49.8	20.0	8.5	0.64

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Test Certificate

Report No.:	VEL/A/ BMASL/1610/1728-1753				
Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
13.12.2016	59.6	36.4	23.4	7.7	0.72
19.12.2016	62.3	39.7	25.8	6.9	0.66
20.12.2016	71.5	42.5	19.8	9.8	0.73
26.12.2016	74.1	44.8	18.4	7.4	1.20
27.12.2016	68.7	36.9	17.9	10.1	0.85

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Test Certificate

Name & Address of the Project:	**M/s BMA Stainless Ltd. Expansion of Induction Furnace Village-Debipur, P.O. Kalyaneswari District-Burdhman, West Bengal**	Report No.:	**VEL/A/ BMASL/1610/1754-1779**
		Reporting Date:	**05/01/2017**
		Ref. No:	**NIL**
		Monitoring Period:	**October -December 2016**
Sample Description:	**Ambient Air Quality Monitoring**	Equipment Used:	**RDS & FPS with all accessories**
Sample Collected by :	**Vardan Envirolab Team**	Protocol Used:	**CPCB Guidelines/IS-5182**
Location:	**Near Village-Haipara (A6)**	Parameter Required	**As Per TOR Letter**

RESULT

Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
03.10.2016	72.3	37.4	24.6	9.6	1.20
04.10.2016	76.9	38.2	22.8	10.2	0.72
10.10.2016	59.8	32.5	28.6	8.4	0.82
11.10.2016	77.7	39.4	19.3	8.3	0.75
17.10.2016	68.3	40.6	18.8	8.2	1.22
18.10.2016	79.4	47.2	22.4	9.6	0.81
24.10.2016	68.7	32.6	26.3	8.7	0.87
25.10.2016	70.2	45.4	23.7	7.5	0.93
31.10.2016	79.8	40.8	20.8	8.3	0.88
01.11.2016	72.5	44.4	18.6	10.2	0.83
07.11.2016	70.3	41.0	18.9	9.8	0.75
08.11.2016	84.5	51.8	21.4	6.8	1.09
14.11.2016	78.9	45.3	22.3	7.4	0.62
15.11.2016	76.3	34.1	24.8	10.1	0.65
21.11.2016	74.8	37.8	19.4	8.3	0.68
22.11.2016	66.3	38.3	24.7	8.4	0.75
28.11.2016	60.2	41.3	23.5	7.7	0.72
29.11.2016	58.9	34.6	22.4	7.8	0.71
05.12.2016	62.4	40.5	27.6	8.4	0.69
06.12.2016	65.8	41.4	25.4	9.2	0.58
12.12.2016	59.7	38.1	24.3	8.5	1.11

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Laboratory: Samaspur, Opposite Amity International School, Sector-51, Gurgaon - 122001 (Haryana)
Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035 (Rajasthan) Tel: 0141-2983404
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Test Certificate

Report No.:	VEL/A/ BMASL/1610/1754-1779				
Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
13.12.2016	81.4	42.5	18.7	9.1	0.89
19.12.2016	69.3	38.4	22.0	10.2	0.68
20.12.2016	70.6	41.9	19.3	7.2	0.95
26.12.2016	72.8	44.6	22.4	7.0	1.03
27.12.2016	73.5	40.8	20.9	6.9	0.82

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Test Certificate

Name & Address of the Project:	**M/s BMA Stainless Ltd. Expansion of Induction Furnace Village-Debipur, P.O. Kalyaneswari District-Burdhman, West Bengal**	Report No.:	**VEL/A/ BMASL/1610/1780-1805**
		Reporting Date:	**05/01/2017**
		Ref. No:	**NIL**
		Monitoring Period:	**October -December 2016**
Sample Description:	**Ambient Air Quality Monitoring**	Equipment Used:	**RDS & FPS with all accessories**
Sample Collected by :	**Vardan Envirolab Team**	Protocol Used:	**CPCB Guidelines/IS-5182**
Location:	**Near Village- Khudka (A7)**	Parameter Required	**As Per TOR Letter**

RESULT

Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
05.10.2016	66.5	35.3	19.3	7.8	0.82
06.10.2016	70.9	38.4	20.6	9.0	0.86
12.10.2016	70.3	39.3	18.5	8.7	0.55
13.10.2016	64.8	40.5	19.6	6.8	0.92
19.10.2016	77.5	37.7	17.4	7.9	0.90
20.10.2016	71.3	40.8	21.8	9.0	0.87
26.10.2016	73.6	37.4	26.7	8.7	0.84
27.10.2016	78.4	37.8	18.4	6.9	0.76
02.11.2016	69.3	32.6	21.6	8.6	1.53
03.11.2016	74.6	40.2	20.5	9.0	1.72
09.11.2016	69.5	35.8	19.3	6.6	0.84
10.11.2016	78.4	39.6	18.8	10.0	0.95
16.11.2016	77.6	40.3	17.9	8.7	0.82
17.11.2016	75.3	37.3	20.8	7.8	0.85
23.11.2016	78.5	40.9	16.7	9.3	0.91
24.11.2016	77.9	37.7	20.7	8.5	1.06
30.11.2016	68.5	38.5	21.3	9.4	0.83
01.12.2016	76.4	40.3	19.2	9.3	0.94
07.12.2016	75.4	37.8	21.8	8.6	0.85
08.12.2016	74.9	42.2	20.3	9.4	0.72
14.12.2016	69.5	34.8	25.4	10.8	0.78

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Test Certificate

Report No.:	VEL/A/ BMASL/1610/1780-1805				
Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
15.12.2016	70.8	36.9	18.7	9.3	0.80
21.12.2016	79.3	42.4	17.3	8.7	0.92
22.12.2016	64.5	38.5	15.2	6.6	0.87
28.12.2016	76.3	40.2	16.0	8.8	0.73
29.12.2016	69.8	35.6	16.8	10.9	0.88

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Test Certificate

Name & Address of the Project:	M/s BMA Stainless Ltd. Expansion of Induction Furnace Village-Debipur, P.O. Kalyaneswari District-Burdhman, West Bengal	Report No.:	VEL/A/ BMASL/1610/1806-1831
		Reporting Date:	05/01/2017
		Ref. No:	NIL
		Monitoring Period:	October -December 2016
Sample Description:	Ambient Air Quality Monitoring	Equipment Used:	RDS & FPS with all accessories
Sample Collected by :	Vardan Envirolab Team	Protocol Used:	CPCB Guidelines/IS-5182
Location:	Near Village- Palhari (A8)	Parameter Required	As Per TOR Letter

RESULT

Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
05.10.2016	68.3	39.9	18.3	7.6	1.55
06.10.2016	72.3	42.4	27.6	8.2	0.71
12.10.2016	74.6	44.2	21.3	7.2	1.63
13.10.2016	66.4	40.6	19.4	6.9	0.58
19.10.2016	73.2	41.4	22.5	10.8	0.77
20.10.2016	85.3	50.7	29.8	9.3	0.69
26.10.2016	72.4	45.8	25.7	8.0	0.72
27.10.2016	89.3	46.2	21.4	10.1	0.75
02.11.2016	76.4	39.9	27.9	9.7	1.81
03.11.2016	69.3	40.4	31.2	9.4	0.83
09.11.2016	77.6	48.2	25.1	12.6	0.79
10.11.2016	68.3	40.0	28.9	7.9	0.74
16.11.2016	87.2	53.6	22.8	10.8	1.69
17.11.2016	63.5	38.5	28.4	7.4	0.71
23.11.2016	89.4	48.5	21.6	8.3	0.72
24.11.2016	84.8	37.6	19.3	7.7	0.74
30.11.2016	73.2	42.8	25.9	11.0	0.68
01.12.2016	84.6	49.2	32.7	9.2	0.69
07.12.2016	68.7	38.8	22.6	7.3	0.63
08.12.2016	72.8	42.2	20.8	8.4	1.72
14.12.2016	93.0	54.6	23.7	13.0	0.70

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Test Certificate

Report No.:	VEL/A/ BMASL/1610/1806-1831				
Date	PM10 ($\mu g/m^3$)	PM 2.5 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (mg/m^3)
15.12.2016	70.3	42.7	18.3	11.6	0.55
21.12.2016	78.2	39.4	25.4	8.8	1.67
22.12.2016	67.1	46.8	17.9	8.3	0.74
28.12.2016	75.8	45.7	29.3	10.7	1.63
29.12.2016	83.9	54.9	22.7	7.4	0.58

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Test Certificate

Sample Number:	VEL/BMA/AN/01	Report No.:	VEL/ BMA /N/1610/41
Name & Address of the Project:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman ,West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	18/10/2016
		Receipt Date:	12/10/2016

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	:	Vardan Enviro Lab Team
Sampling Location	:	Project Site (N1)
Instrument Used	:	Sound Level Meter
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	10/10/2016 to11/10/2016
Time of Monitoring	:	06:00 AM to 06:00AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	CPCB Guidelines & IS-9989
Sampling Duration	:	24 Hours
Parameter Required	:	As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	CPCB Guidelines/ IS 9989	69.30	58.20	dB(A)
2.	L_{min}	CPCB Guidelines/ IS 9989	56.10	49.30	dB(A)
3.	L_{eq}	CPCB Guidelines/ IS 9989	62.30	57.40	dB(A)
4.	CPCB Limits in dB(A) Leq (Industrial Area)	-	75.00	70.00	dB(A)

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Test Certificate

Sample Number:	**VEL/ BMA /AN/02**	Report No.:	**VEL/ BMA /N/1610/42**
Name & Address of the Project:	**M/s BMA Stainless Ltd.** **Village-Debipur , P.O Kalyaneswari** **District- Burdhman , West Bengal**	Format No.:	**5.10 F-01**
		Party Reference No.:	**NIL**
		Reporting Date:	**18/10/2016**
		Receipt Date:	**12/10/2016**

Sample Description: **AMBIENT NOISE LEVEL MONITORING**

General Information:-

Sample collected by	:	Vardan Enviro Lab Team
Sampling Location	:	Near Village-Kalyanesswari (N2)
Instrument Used	:	Sound Level Meter
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	10/10/2016 to 11/10/2016
Time of Monitoring	:	06:00 AM to 06:00AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	CPCB Guidelines & IS-9989
Sampling Duration	:	24 Hours
Parameter Required	:	As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	CPCB Guidelines/ IS 9989	64.20	55.30	dB(A)
2.	L_{min}	CPCB Guidelines/ IS 9989	48.20	42.10	dB(A)
3.	L_{eq}	CPCB Guidelines/ IS 9989	54.36	43.18	dB(A)
4.	**CPCB Limits in dB(A) Leq (Residential Area)**	-	55.00	45.00	dB(A)

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Test Certificate

Sample Number:	VEL/ BMA /AN/03	Report No.:	VEL/BMA /N/1610/43
Name & Address of the Project:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman , West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	18/10/2016
		Receipt Date:	12/10/2016

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	:	Vardan Enviro Lab Team
Sampling Location	:	Near Village- Barakar (N3)
Instrument Used	:	Sound Level Meter
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	10/10/2016 to 11/10/2016
Time of Monitoring	:	06:00 AM to 06:00AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	CPCB Guidelines & IS-9989
Sampling Duration	:	24 Hours
Parameter Required	:	As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	CPCB Guidelines/ IS 9989	66.20	56.30	dB(A)
2.	L_{min}	CPCB Guidelines/ IS 9989	43.40	39.10	dB(A)
3.	L_{eq}	CPCB Guidelines/ IS 9989	52.75	43.07	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

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Test Certificate

Sample Number:	**VEL/ BMA /AN/04**	Report No.:	**VEL/ BMA /N/1610/44**
Name & Address of the Project:	**M/s BMA Stainless Ltd.** **Village-Debipur , P.O Kalyaneswari** **District- Burdhman , West Bengal**	Format No.:	**5.10 F-01**
		Party Reference No.:	**NIL**
		Reporting Date:	**18/10/2016**
		Receipt Date:	**12/10/2016**

Sample Description: **AMBIENT NOISE LEVEL MONITORING**

General Information:-

Sample collected by	:	Vardan Enviro Lab Team
Sampling Location	:	Near Village- Narayan Chak (N4)
Instrument Used	:	Sound Level Meter
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	10/10/2016 to 11/10/2016
Time of Monitoring	:	06:00 AM to 06:00AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	CPCB Guidelines & IS-9989
Sampling Duration	:	24 Hours
Parameter Required	:	As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	CPCB Guidelines/ IS 9989	58.10	53.30	dB(A)
2.	L_{min}	CPCB Guidelines/ IS 9989	43.20	38.50	dB(A)
3.	L_{eq}	CPCB Guidelines/ IS 9989	51.40	42.66	dB(A)
4.	**CPCB Limits in dB(A) Leq (Residential Area)**	-	55.00	45.00	dB(A)

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Sample Number:	VEL/ BMA /AN/05	Report No.:	VEL/ BMA /N/1610/45
Name & Address of the Project:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman , West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	18/10/2016
		Receipt Date:	12/10/2016

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	:	Vardan Enviro Lab Team
Sampling Location	:	Near Village-Banshkatiya (N5)
Instrument Used	:	Sound Level Meter
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	10/10/2016 to 11/10/2016
Time of Monitoring	:	06:00 AM to 06:00AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	CPCB Guidelines & IS-9989
Sampling Duration	:	24 Hours
Parameter Required	:	As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	CPCB Guidelines/ IS 9989	60.10	49.30	dB(A)
2.	L_{min}	CPCB Guidelines/ IS 9989	40.20	37.50	dB(A)
3.	L_{eq}	CPCB Guidelines/ IS 9989	51.30	42.65	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

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Test Certificate

Sample Number:	VEL/ BMA /AN/06	Report No.:	VEL/ BMA /N/1610/46
Name & Address of the Project:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman , West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	18/10/2016
		Receipt Date:	12/10/2016

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	:	Vardan Enviro Lab Team
Sampling Location	:	Near Village-Haipara (N6)
Instrument Used	:	Sound Level Meter
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	10/10/2016 to 11/10/2016
Time of Monitoring	:	06:00 AM to 06:00AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	CPCB Guidelines & IS-9989
Sampling Duration	:	24 Hours
Parameter Required	:	As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	CPCB Guidelines/ IS 9989	59.60	50.30	dB(A)
2.	L_{min}	CPCB Guidelines/ IS 9989	45.20	37.40	dB(A)
3.	L_{eq}	CPCB Guidelines/ IS 9989	53.58	42.86	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

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Test Certificate

Sample Number:	VEL/ BMA/AN/07	Report No.:	VEL/ BMA /N/1610/47
Name & Address of the Project:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman , West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	18/10/2016
		Receipt Date:	12/10/2016

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	:	Vardan Enviro Lab Team
Sampling Location	:	Near Village- Khudka (N7)
Instrument Used	:	Sound Level Meter
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	10/10/2016 to 11/10/2016
Time of Monitoring	:	06:00 AM to 06:00AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	CPCB Guidelines & IS-9989
Sampling Duration	:	24 Hours
Parameter Required	:	As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	CPCB Guidelines/ IS 9989	57.20	49.40	dB(A)
2.	L_{min}	CPCB Guidelines/ IS 9989	42.40	39.30	dB(A)
3.	L_{eq}	CPCB Guidelines/ IS 9989	50.75	40.45	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

Mr. MOHAMMAD ANAS
M.Sc. Env. Science

VARDAN ENVIRO LAB (GURGAON) GAURAV CHAUHAN AUTHORISED SIGNATORY

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Vardan EnviroLab

Regd. Off: D-142, Sushant Lok-III, Sector-57, Gurgaon - 122003 (Haryana) Tel: 0124-4291036
Laboratory: Samaspur, Opposite Amity International School, Sector-51, Gurgaon - 122001 (Haryana)
Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035 (Rajasthan) Tel: 0141-2983404
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Test Certificate

Sample Number:	VEL/ BMA /AN/08	Report No.:	VEL/ BMA /N/1610/48
Name & Address of the Project:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman , West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	18/10/2016
		Receipt Date:	12/10/2016

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	:	Vardan Enviro Lab Team
Sampling Location	:	Near Village- Palhari (N8)
Instrument Used	:	Sound Level Meter
Instrument Calibration Status	:	Calibrated
Meteorological condition during monitoring	:	Clear Sky
Date of Monitoring	:	10/10/2016 to 11/10/2016
Time of Monitoring	:	06:00 AM to 06:00AM
Surrounding Activity	:	Human & Vehicular Activities
Scope of Monitoring	:	Regulatory Requirement
Sampling & Analysis Protocol	:	CPCB Guidelines & IS-9989
Sampling Duration	:	24 Hours
Parameter Required	:	As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L_{max}	CPCB Guidelines/ IS 9989	66.20	50.60	dB(A)
2.	L_{min}	CPCB Guidelines/ IS 9989	48.50	38.10	dB(A)
3.	L_{eq}	CPCB Guidelines/ IS 9989	54.10	43.52	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

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Test Certificate

Sample Number:	VEL/BMA/01	Report No.:	VEL/BMA/S/1610/41
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman ,West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	18/10/2016
		Receipt Date:	12/10/2016
Sample Description:	Soil	Sampling Date:	11/10/2016
Sampling Location:	Project Site Area	Type of Sampling:	Composite
Sample Collected by:	Vardan Enviro Lab Team	Sampling Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 & USDA	Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Protocol	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26,1987)	6.68	--
2.	Color	USDA Method, 1968	Reddish Brown	--
3.	Soil Texture	USDA Method, 1968	Silty	--
4.	Potassium as K	USDA Method, 1968	174.30	kg/hec.
5.	Organic Matter	IS:2720 (P-22, 1972)	0.68	%
6.	Available Nitrogen as N	IS:14684, 1999	214.00	kg./hec.
7.	Available Phosphorus	USDA, APHA-4500PC	18.00	kg./hec.
8.	Conductivity	IS:14767-2000 Reaffirmed 2006	0.367	mS/cm
9.	Water holding capacity	USDA Method, 1968	32.30	%
10.	Bulk density	USDA Method, 1968	1.26	gm/cc
11.	Chloride as Cl	USDA Method, 1968	42.32	mg/100gm
12.	Calcium as Ca	USDA Method, 1968	32.63	mg/100gm
13.	Sodium as Na	USDA Method, 1968	30.21	mg/100gm
14.	Magnesium as Mg	USDA Method, 1968	10.23	mg/100gm
15.	Zinc as Zn	APHA-3030D, APHA-3111B	2.89	mg/kg
16.	Manganese as Mn	APHA-3030D, APHA-3111B	17.00	mg/kg
17.	Chromium as Cr	APHA-3030D, APHA-3111B	1.75	mg/kg
18.	Lead as Pb	APHA-3030D, APHA-3111B	0.25	mg/kg
19.	Cadmium as Cd	APHA-3030D, APHA-3111B	0.79	mg/kg
20.	Copper as Cu	APHA-3030D, APHA-3111B	2.23	mg/kg

Mr. DAYA SHANKAR MISHRA
M.Sc. Env. Science

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Test Certificate

Sample Number:	VEL/ ASIPL /02	Report No.:	VEL/ ASIPL /S/1610/42
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman , West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	18/10/2016
		Receipt Date:	12/10/2016
Sample Description:	SOIL	Sampling Date:	11/10/2016
Sampling Location:	Near Village- Kalyanesswari	Type of Sampling:	Composite
Sample Collected by:	Vardan Enviro Lab Team	Sampling Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 & USDA	Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Protocol	Result	Unit
1.	pH (at 25 ^{0}C)	IS : 2720 (P-26,1987)	6.75	--
2.	Color	USDA Method, 1968	Reddish Brown	--
3.	Soil Texture	USDA Method, 1968	Silty	--
4.	Potassium as K	USDA Method, 1968	142.00	kg/hec.
5.	Organic Matter	IS:2720 (P-22, 1972)	0.70	%
6.	Available Nitrogen as N	IS:14684, 1999	248.00	kg./hec.
7.	Available Phosphorus	USDA, APHA-4500PC	23.30	kg./hec.
8.	Conductivity	IS:14767-2000 Reaffirmed 2006	0.423	mS/cm
9.	Water holding capacity	USDA Method, 1968	29.53	%
10.	Bulk density	USDA Method, 1968	1.30	gm/cc
11.	Chloride as Cl	USDA Method, 1968	35.47	mg/100gm
12.	Calcium as Ca	USDA Method, 1968	39.53	mg/100gm
13.	Sodium as Na	USDA Method, 1968	27.20	mg/100gm
14.	Magnesium as Mg	USDA Method, 1968	14.21	mg/100gm
15.	Zinc as Zn	APHA-3030D, APHA-3111B	3.42	mg/kg
16.	Manganese as Mn	APHA-3030D, APHA-3111B	18.21	mg/kg
17.	Chromium as Cr	APHA-3030D, APHA-3111B	1.80	mg/kg
18.	Lead as Pb	APHA-3030D, APHA-3111B	0.45	mg/kg
19.	Cadmium as Cd	APHA-3030D, APHA-3111B	0.86	mg/kg
20.	Copper as Cu	APHA-3030D, APHA-3111B	2.50	mg/kg

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Test Certificate

Sample Number:	VEL/ BMA /03	Report No.:	VEL/ BMA /S/1610/43
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman , West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	18/10/2016
		Receipt Date:	12/10/2016
Sample Description:	SOIL	Sampling Date:	11/10/2016
Sampling Location:	Near Village- Barakar	Type of Sampling:	Composite
Sample Collected by:	Vardan Enviro Lab Team	Sampling Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 & USDA	Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Protocol	Result	Unit
1.	pH (at 25 ^{0}C)	IS : 2720 (P-26,1987)	6.49	--
2.	Color	USDA Method, 1968	Brownish	--
3.	Soil Texture	USDA Method, 1968	Sandy Loam	--
4.	Potassium as K	USDA Method, 1968	168.63	kg/hec.
5.	Organic Matter	IS:2720 (P-22, 1972)	0.62	%
6.	Available Nitrogen as N	IS:14684, 1999	207.00	kg./hec.
7.	Available Phosphorus	USDA, APHA-4500PC	17.63	kg./hec.
8.	Conductivity	IS:14767-2000 Reaffirmed 2006	0.440	mS/cm
9.	Water holding capacity	USDA Method, 1968	27.42	%
10.	Bulk density	USDA Method, 1968	1.31	gm/cc
11.	Chloride as Cl	USDA Method, 1968	38.42	mg/100gm
12	Calcium as Ca	USDA Method, 1968	42.36	mg/100gm
13.	Sodium as Na	USDA Method, 1968	36.53	mg/100gm
14.	Magnesium as Mg	USDA Method, 1968	10.25	mg/100gm
15.	Zinc as Zn	APHA-3030D, APHA-3111B	3.12	mg/kg
16.	Manganese as Mn	APHA-3030D, APHA-3111B	20.35	mg/kg
17.	Chromium as Cr	APHA-3030D, APHA-3111B	0.63	mg/kg
18.	Lead as Pb	APHA-3030D, APHA-3111B	0.38	mg/kg
19.	Cadmium as Cd	APHA-3030D, APHA-3111B	0.81	mg/kg
20.	Copper as Cu	APHA-3030D, APHA-3111B	2.42	mg/kg

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Test Certificate

Sample Number:	VEL/ BMA /04	Report No.:	VEL/ BMA /S/1610/44
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman , West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	18/10/2016
		Receipt Date:	12/10/2016
Sample Description:	Soil	Sampling Date:	11/10/2016
Sampling Location:	Near Village-Narayan Chak	Type of Sampling:	Composite
Sample Collected by:	Vardan Enviro Lab Team	Sampling Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 & USDA	Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Protocol	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26,1987)	6.55	--
2.	Color	USDA Method, 1968	Brownish	--
3.	Soil Texture	USDA Method, 1968	Silty	--
4.	Potassium as K	USDA Method, 1968	205.00	kg/hec.
5.	Organic Matter	IS:2720 (P-22, 1972)	0.69	%
6.	Available Nitrogen as N	IS:14684, 1999	228.20	kg./hec.
7.	Available Phosphorus	USDA, APHA-4500PC	15.47	kg./hec.
8.	Conductivity	IS:14767-2000 Reaffirmed 2006	0.487	mS/cm
9.	Water holding capacity	USDA Method, 1968	28.42	%
10.	Bulk density	USDA Method, 1968	1.41	gm/cc
11.	Chloride as Cl	USDA Method, 1968	34.25	mg/100gm
12.	Calcium as Ca	USDA Method, 1968	27.53	mg/100gm
13.	Sodium as Na	USDA Method, 1968	25.24	mg/100gm
14.	Magnesium as Mg	USDA Method, 1968	13.40	mg/100gm
15.	Zinc as Zn	APHA-3030D, APHA-3111B	2.90	mg/kg
16.	Manganese as Mn	APHA-3030D, APHA-3111B	18.00	mg/kg
17.	Chromium as Cr	APHA-3030D, APHA-3111B	0.72	mg/kg
18.	Lead as Pb	APHA-3030D, APHA-3111B	0.56	mg/kg
19.	Cadmium as Cd	APHA-3030D, APHA-3111B	1.20	mg/kg
20.	Copper as Cu	APHA-3030D, APHA-3111B	2.32	mg/kg

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Test Certificate

Sample Number:	VEL/ BMA /05	Report No.:	VEL/ BMA /S/1610/45
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman , West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	18/10/2016
		Receipt Date:	12/10/2016
Sample Description:	SOIL	Sampling Date:	11/10/2016
Sampling Location:	Near Village –Banshkatiya	Type of Sampling:	Composite
Sample Collected by:	Vardan Enviro Lab Team	Sampling Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 & USDA	Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Protocol	Result	Unit
1.	pH (at 25 ^{0}C)	IS : 2720 (P-26,1987)	6.79	--
2.	Color	USDA Method, 1968	Reddish Brown	--
3.	Soil Texture	USDA Method, 1968	Sandy loam	--
4.	Potassium as K	USDA Method, 1968	166.00	kg/hec.
5.	Organic Matter	IS:2720 (P-22, 1972)	0.59	%
6.	Available Nitrogen as N	IS:14684, 1999	234.00	kg./hec.
7.	Available Phosphorus	USDA, APHA-4500PC	12.65	kg./hec.
8.	Conductivity	IS:14767-2000 Reaffirmed 2006	0.508	mS/cm
9.	Water holding capacity	USDA Method, 1968	25.63	%
10.	Bulk density	USDA Method, 1968	1.23	gm/cc
11.	Chloride as Cl	USDA Method, 1968	38.20	mg/100gm
12.	Calcium as Ca	USDA Method, 1968	36.36	mg/100gm
13.	Sodium as Na	USDA Method, 1968	22.16	mg/100gm
14.	Magnesium as Mg	USDA Method, 1968	11.53	mg/100gm
15.	Zinc as Zn	APHA-3030D, APHA-3111B	3.70	mg/kg
16.	Manganese as Mn	APHA-3030D, APHA-3111B	21.00	mg/kg
17.	Chromium as Cr	APHA-3030D, APHA-3111B	0.73	mg/kg
18.	Lead as Pb	APHA-3030D, APHA-3111B	0.48	mg/kg
19.	Cadmium as Cd	APHA-3030D, APHA-3111B	0.69	mg/kg
20.	Copper as Cu	APHA-3030D, APHA-3111B	1.53	mg/kg

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Test Certificate

Sample Number:	VEL/ BMA /06	Report No.:	VEL/ BMA /S/1610/46
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman , West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	18/10/2016
		Receipt Date:	12/10/2016
Sample Description:	SOIL	Sampling Date:	11/10/2016
Sampling Location:	Near Village- Haipara	Type of Sampling:	Composite
Sample Collected by:	Vardan Enviro Lab Team	Sampling Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 & USDA	Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Protocol	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26,1987)	6.80	--
2.	Color	USDA Method, 1968	Reddish Brown	--
3.	Soil Texture	USDA Method, 1968	Silty	--
4.	Potassium as K	USDA Method, 1968	235.00	kg/hec.
5.	Organic Matter	IS:2720 (P-22, 1972)	0.76	%
6.	Available Nitrogen as N	IS:14684, 1999	263.00	kg./hec.
7.	Available Phosphorus	USDA, APHA-4500PC	20.00	kg./hec.
8.	Conductivity	IS:14767-2000 Reaffirmed 2006	0.474	mS/cm
9.	Water holding capacity	USDA Method, 1968	29.47	%
10.	Bulk density	USDA Method, 1968	1.42	gm/cc
11.	Chloride as Cl	USDA Method, 1968	41.24	mg/100gm
12	Calcium as Ca	USDA Method, 1968	36.20	mg/100gm
13.	Sodium as Na	USDA Method, 1968	27.48	mg/100gm
14.	Magnesium as Mg	USDA Method, 1968	13.53	mg/100gm
15.	Zinc as Zn	APHA-3030D, APHA-3111B	4.10	mg/kg
16.	Manganese as Mn	APHA-3030D, APHA-3111B	19.67	mg/kg
17.	Chromium as Cr	APHA-3030D, APHA-3111B	0.69	mg/kg
18.	Lead as Pb	APHA-3030D, APHA-3111B	0.30	mg/kg
19.	Cadmium as Cd	APHA-3030D, APHA-3111B	0.76	mg/kg
20.	Copper as Cu	APHA-3030D, APHA-3111B	1.50	mg/kg

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Test Certificate

Sample Number:	VEL/ BMA /07	Report No.:	VEL/BMA /S/1610/47
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman , West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	18/10/2016
		Receipt Date:	12/10/2016
Sample Description:	SOIL	Sampling Date:	11/10/2016
Sampling Location:	Near Village- Khudka	Type of Sampling:	Composite
Sample Collected by:	Vardan Enviro Lab Team	Sampling Quantity:	2.0 Kg
Sampling & Analysis Protocol:	IS 2720 & USDA	Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Protocol	Result	Unit
1.	pH (at 25 ^{0}C)	IS : 2720 (P-26,1987)	6.39	--
2.	Color	USDA Method, 1968	Brownish	--
3.	Soil Texture	USDA Method, 1968	Silty	--
4.	Potassium as K	USDA Method, 1968	187.00	kg/hec.
5.	Organic Carbon	IS:2720 (P-22, 1972)	0.74	%
6.	Available Nitrogen as N	IS:14684, 1999	218.00	kg./hec.
7.	Available Phosphorus	USDA, APHA-4500PC	13.50	kg./hec.
8.	Conductivity	IS:14767-2000 Reaffirmed 2006	0.367	mS/cm
9.	Water holding capacity	USDA Method, 1968	28.79	%
10.	Bulk density	USDA Method, 1968	1.42	gm/cc
11.	Chloride as Cl	USDA Method, 1968	38.68	mg/100gm
12.	Calcium as Ca	USDA Method, 1968	30.23	mg/100gm
13.	Sodium as Na	USDA Method, 1968	15.05	mg/100gm
14.	Magnesium as Mg	USDA Method, 1968	9.62	mg/100gm
15.	Zinc as Zn	APHA-3030D, APHA-3111B	3.55	mg/kg
16.	Manganese as Mn	APHA-3030D, APHA-3111B	1.19	mg/kg
17.	Chromium as Cr	APHA-3030D, APHA-3111B	0.45	mg/kg
18.	Lead as Pb	APHA-3030D, APHA-3111B	0.57	mg/kg
19.	Cadmium as Cd	APHA-3030D, APHA-3111B	0.16	mg/kg
20.	Copper as Cu	APHA-3030D, APHA-3111B	2.17	mg/kg

Mr. DAYA SHANKAR MISHRA
M.Sc. Env. Science

VARDAN ENVIRO LAB (GURGAON) GAURAV CHAUHAN AUTHORISED SIGNATORY

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Laboratory: Samaspur, Opposite Amity International School, Sector-51, Gurgaon - 122001 (Haryana)
Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035 (Rajasthan) Tel: 0141-2983404
(ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

Test Certificate

Sample Number:	**VEL/ BMA /08**	Report No.:	**VEL/ BMA /S/1610/48**
Issued to:	**M/s BMA Stainless Ltd.** **Village-Debipur , P.O Kalyaneswari** **District- Burdhman , West Bengal**	Format No.:	**5.10 F-01**
		Party Reference No.:	**NIL**
		Reporting Date:	**18/10/2016**
		Receipt Date:	**12/10/2016**
Sample Description:	**SOIL**	Sampling Date:	**11/10/2016**
Sampling Location:	**Near Village- Palhari**	Type of Sampling:	**Composite**
Sample Collected by:	**Vardan Enviro Lab Team**	Sampling Quantity:	**2.0 Kg**
Sampling & Analysis Protocol:	**IS 2720 & USDA**	Depth of Sampling:	**30 cm**
		Packing Status:	**Temp Sealed**

S. No.	Parameter	Protocol	Result	Unit
1.	pH (at 25 ^{0}C)	IS : 2720 (P-26,1987)	6.86	--
2.	Color	USDA Method, 1968	Brownish	--
3.	Soil Texture	USDA Method, 1968	Sandy Loam	--
4.	Potassium as K	USDA Method, 1968	253.00	kg/hec.
5.	Organic Matter	IS:2720 (P-22, 1972)	0.64	%
6.	Available Nitrogen as N	IS:14684, 1999	198.00	kg./hec.
7.	Available Phosphorus	USDA, APHA-4500PC	19.12	kg./hec.
8.	Conductivity	IS:14767-2000 Reaffirmed 2006	0.440	mS/cm
9.	Water holding capacity	USDA Method, 1968	30.42	%
10.	Bulk density	USDA Method, 1968	1.22	gm/cc
11.	Chloride as Cl	USDA Method, 1968	45.78	mg/100gm
12	Calcium as Ca	USDA Method, 1968	41.36	mg/100gm
13.	Sodium as Na	USDA Method, 1968	36.53	mg/100gm
14.	Magnesium as Mg	USDA Method, 1968	16.53	mg/100gm
15.	Zinc as Zn	APHA-3030D, APHA-3111B	3.62	mg/kg
16.	Manganese as Mn	APHA-3030D, APHA-3111B	18.32	mg/kg
17.	Chromium as Cr	APHA-3030D, APHA-3111B	1.06	mg/kg
18.	Lead as Pb	APHA-3030D, APHA-3111B	0.39	mg/kg
19.	Cadmium as Cd	APHA-3030D, APHA-3111B	0.45	mg/kg
20.	Copper as Cu	APHA-3030D, APHA-3111B	2.52	mg/kg

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Test Certificate

Sample Number:	VEL/BMA/W/01	Report No.:	VEL/ BMA/W/1610/80
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman, West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	21/12/2016
		Receipt Date:	16/12/2016
Sample Description:	Groundwater Sample	Sampling Date:	15/12/2016
Sampling Location:	Near Project Site (GW1)	Sampling Type:	Grab
Sample Collected by:	Vardan EnviroLab Team	Preservation:	Refrigerated
Sampling & Analysis Protocol:	IS-10500-2012, APHA 22nd Edition 2012	Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 °C)	APHA 22nd Edition, 4500-H+ B	6.89	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 22nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA 22nd Edition, 2130 B	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	APHA 22nd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 22nd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA 22nd Edition, 2340 C	278.50	mg/l	200	600
7.	Calcium as Ca	APHA 22nd Edition, 3500 Ca B	74.08	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA 22nd Edition, 2320 B	288.00	mg/l	200	600
9.	Chloride as Cl	APHA 22nd Edition, 4500-Cl- B	68.50	mg/l	250	1000
10.	Cyanide as CN	APHA 22nd Edition, 4500 CN- D	BDL(DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA 22nd Edition, 2340 B	22.76	mg/l	30	100
12.	Total Dissolved Solids	APHA 22nd Edition, 2540 C	448.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA 22nd Edition, 4500 E	36.8	mg/l	200	400
14.	Fluoride as F	APHA 22nd Edition, 4500-F- D	0.67	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) 1988	12.88	mg/l	45	No Relaxation
16.	Iron as Fe	APHA 22nd Edition, 3500-Fe B	0.34	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA 22nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA 22nd Edition, 4500B C	BDL(DL 0.1 mg/l)	mg/l	0.5	1
19.	Chromium as Cr	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.05	No Relaxation

Ms. NIDHI SHARMA
M.Sc. Env. Science

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Test Certificate

Sample No.: **VEL/ BMA /W/01**				Report No.: **VEL/ BMA /W/1610/80**		
S. No.	**Parameter**	**Test-Method**	**Result**	**Unit**	**Limits of IS:10500 -2012**	
					Requirement (Acceptable) Limit	**Permissible limit in the Absence of Alternate Source**
20.	Conductivity	APHA 22nd Edition, 2120 B	0.748	mS/cm	--	--
21.	Phenolic Compounds	APHA 22nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l	0.5	No Relaxation
23.	Anionic Detergents as MBAS	APHA 22nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA 22nd Edition, 3111 B	1.87	mg/l	5	15
25.	Copper as Cu	APHA 22nd Edition, 3111 B	0.37	mg/l	0.05	1.5
26.	Manganese as Mn	APHA 22nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA 22nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA 22nd Edition, 3111 B	BDL(DL 0.01mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	0.05
31.	Mercury as Hg	APHA 22nd Edition, 3111 B	BDL (DL 0.001 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	<2/100ml	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, *DL- Detection Limit

MS. NUPUR SHARMA
M.Sc. Env. Science

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Test Certificate

Sample Number:	VEL/ BMA /W/02	Report No.:	VEL/ BMA /W/1610/81
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman, West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	21/12/2016
		Receipt Date:	16/12/2016
Sample Description:	Groundwater Sample	Sampling Date:	15/12/2016
Sampling Location:	Near Village- Kalyanesswari (GW2)	Sampling Type:	Grab
Sample Collected by:	Vardan EnviroLab Team	Preservation:	Refrigerated
Sampling & Analysis Protocol:	IS-10500-2012, APHA 22nd Edition 2012	Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 ^{0}C)	APHA 22nd Edition, 4500-H^+ B	6.86	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 22nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA 22nd Edition, 2130 B	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	APHA 22nd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 22nd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA 22nd Edition, 2340 C	270.09	mg/l	200	600
7.	Calcium as Ca	APHA 22nd Edition, 3500 Ca B	83.50	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA 22nd Edition, 2320 B	276.00	mg/l	200	600
9.	Chloride as Cl	APHA 22nd Edition, 4500-Cl^- B	63.04	mg/l	250	1000
10.	Cyanide as CN	APHA 22nd Edition, 4500 CN^- D	BDL(DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA 22nd Edition, 2340 B	15.01	mg/l	30	100
12.	Total Dissolved Solids	APHA 22nd Edition, 2540 C	456.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA 22nd Edition, 4500 E	43.11	mg/l	200	400
14.	Fluoride as F	APHA 22nd Edition, 4500-F^- D	0.70	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) 1988	23.90	mg/l	45	No Relaxation
16.	Iron as Fe	APHA 22nd Edition, 3500-Fe B	0.29	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA 22nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA 22nd Edition, 4500B C	BDL(DL 0.1 mg/l)	mg/l	0.5	1
19.	Chromium as Cr	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.05	No Relaxation

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Test Certificate

Sample No.: **VEL/ BMA /W/02**				Report No.: **VEL/ BMA /W/1610/81**		
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity	APHA 22nd Edition, 2120 B	0.765	mS/cm	--	--
21.	Phenolic Compounds	APHA 22nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l	0.5	No Relaxation
23.	Anionic Detergents as MBAS	APHA 22nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA 22nd Edition, 3111 B	1.80	mg/l	5	15
25.	Copper as Cu	APHA 22nd Edition, 3111 B	0.28	mg/l	0.05	1.5
26.	Manganese as Mn	APHA 22nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA 22nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA 22nd Edition, 3111 B	BDL(DL 0.01mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	0.05
31.	Mercury as Hg	APHA 22nd Edition, 3111 B	BDL (DL 0.001 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	<2/100ml	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, *DL- Detection Limit

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Test Certificate

Sample Number:	VEL/ BMA /W/03	Report No.:	VEL/ BMA /W/1610/82
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman, West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	21/12/2016
		Receipt Date:	16/12/2016
Sample Description:	Groundwater Sample	Sampling Date:	15/12/2016
Sampling Location:	Near Village-Barakar (GW3)	Sampling Type:	Grab
Sample Collected by:	Vardan Enviro Lab Team	Preservation:	Refrigerated
Sampling & Analysis Protocol:	IS-10500-2012, APHA 22nd Edition 2012	Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 ^{0}C)	APHA 22nd Edition, 4500-H+ B	7.57	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 22nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA 22nd Edition, 2130 B	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	APHA 22nd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 22nd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA 22nd Edition, 2340 C	308.60	mg/l	200	600
7.	Calcium as Ca	APHA 22nd Edition, 3500 Ca B	92.50	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA 22nd Edition, 2320 B	327.00	mg/l	200	600
9.	Chloride as Cl	APHA 22nd Edition, 4500-Cl- B	87.08	mg/l	250	1000
10.	Cyanide as CN	APHA 22nd Edition, 4500 CN- D	BDL(DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA 22nd Edition, 2340 B	18.91	mg/l	30	100
12.	Total Dissolved Solids	APHA 22nd Edition, 2540 C	542.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA 22nd Edition, 4500 E	54.00	mg/l	200	400
14.	Fluoride as F	APHA 22nd Edition, 4500-F- D	0.84	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) 1988	13.70	mg/l	45	No Relaxation
16.	Iron as Fe	APHA 22nd Edition, 3500-Fe B	0.34	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA 22nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA 22nd Edition, 4500B C	BDL(DL 0.1 mg/l)	mg/l	0.5	1
19.	Chromium as Cr	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.05	No Relaxation

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Test Certificate

Sample No.: **VEL/ BMA /W/03**				Report No.: **VEL/ BMA /W/1610/82**		
					Limits of IS:10500 -2012	
S. No.	**Parameter**	**Test-Method**	**Result**	**Unit**	**Requirement (Acceptable) Limit**	**Permissible limit in the Absence of Alternate Source**
20.	Conductivity	APHA 22nd Edition, 2120 B	0.906	mS/cm	--	--
21.	Phenolic Compounds	APHA 22nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l	0.5	No Relaxation
23.	Anionic Detergents as MBAS	APHA 22nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA 22nd Edition, 3111 B	1.06	mg/l	5	15
25.	Copper as Cu	APHA 22nd Edition, 3111 B	0.27	mg/l	0.05	1.5
26.	Manganese as Mn	APHA 22nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA 22nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA 22nd Edition, 3111 B	BDL(DL 0.01mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	0.05
31.	Mercury as Hg	APHA 22nd Edition, 3111 B	BDL (DL 0.001 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	<2/100ml	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, *DL- Detection Limit

Ms. NUPUR SHARMA
M.Sc. Env. Science

GAURAV CHAUHAN
AUTHORISED SIGNATORY (GURGAON)

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Vardan EnviroLab

Regd. Off: D-142, Sushant Lok-III, Sector-57, Gurgaon - 122003 (Haryana) Tel: 0124-4291036
Laboratory: Samaspur, Opposite Amity International School, Sector-51, Gurgaon - 122001 (Haryana)
Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035 (Rajasthan) Tel: 0141-2983404
(ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

Test Certificate

Sample Number:	VEL/ BMA /W/04	Report No.:	VEL/ BMA /W/1610/83
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman, West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	21/12/2016
		Receipt Date:	16/12/2016
Sample Description:	Groundwater Sample	Sampling Date:	15/12/2016
Sampling Location:	Near Village-Narayan Chak (GW4)	Sampling Type:	Grab
Sample Collected by:	Vardan Enviro Lab Team	Preservation:	Refrigerated
Sampling & Analysis Protocol:	IS-10500-2012, APHA 22nd Edition 2012	Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 ^{0}C)	APHA 22nd Edition, 4500-H+ B	7.56	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 22nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA 22nd Edition, 2130 B	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	APHA 22nd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 22nd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA 22nd Edition, 2340 C	210.07	mg/l	200	600
7.	Calcium as Ca	APHA 22nd Edition, 3500 Ca B	48.70	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA 22nd Edition, 2320 B	198.00	mg/l	200	600
9.	Chloride as Cl	APHA 22nd Edition, 4500-Cl^- B	71.40	mg/l	250	1000
10.	Cyanide as CN	APHA 22nd Edition, 4500 CN^- D	BDL(DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA 22nd Edition, 2340 B	21.52	mg/l	30	100
12.	Total Dissolved Solids	APHA 22nd Edition, 2540 C	408.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA 22nd Edition, 4500 E	51.22	mg/l	200	400
14.	Fluoride as F	APHA 22nd Edition, 4500-F^- D	0.59	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) 1988	10.60	mg/l	45	No Relaxation
16.	Iron as Fe	APHA 22nd Edition, 3500-Fe B	0.27	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA 22nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA 22nd Edition, 4500B C	BDL(DL 0.1 mg/l)	mg/l	0.5	1
19.	Chromium as Cr	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.05	No Relaxation

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Laboratory: Samaspur, Opposite Amity International School, Sector-51, Gurgaon - 122001 (Haryana)
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(ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

Test Certificate

Sample No.: **VEL/ BMA /W/04** | Report No.: **VEL/ BMA /W/1610/83**

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity	APHA 22nd Edition, 2120 B	0.685	mS/cm	--	--
21.	Phenolic Compounds	APHA 22nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l	0.5	No Relaxation
23.	Anionic Detergents as MBAS	APHA 22nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA 22nd Edition, 3111 B	1.07	mg/l	5	15
25.	Copper as Cu	APHA 22nd Edition, 3111 B	0.22	mg/l	0.05	1.5
26.	Manganese as Mn	APHA 22nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA 22nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA 22nd Edition, 3111 B	BDL(DL 0.01mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	0.05
31.	Mercury as Hg	APHA 22nd Edition, 3111 B	BDL (DL 0.001 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	<2/100ml	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, *DL- Detection Limit

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Test Certificate

Sample Number:	VEL/ BMA /W/05	Report No.:	VEL/ BMA /W/1610/84
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman, West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	21/12/2016
		Receipt Date:	16/12/2016
Sample Description:	Groundwater Sample	Sampling Date:	15/12/2016
Sampling Location:	Near Village- Banshkatiya (GW5)	Sampling Type:	Grab
Sample Collected by:	Vardan EnviroLab Team	Preservation:	Refrigerated
Sampling & Analysis Protocol:	IS-10500-2012, APHA 22nd Edition 2012	Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 ^{0}C)	APHA 22nd Edition, 4500-H$^+$ B	7.98	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 22nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA 22nd Edition, 2130 B	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	APHA 22nd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 22nd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA 22nd Edition, 2340 C	247.16	mg/l	200	600
7.	Calcium as Ca	APHA 22nd Edition, 3500 Ca B	59.03	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA 22nd Edition, 2320 B	235.00	mg/l	200	600
9.	Chloride as Cl	APHA 22nd Edition, 4500-Cl$^-$ B	112.06	mg/l	250	1000
10.	Cyanide as CN	APHA 22nd Edition, 4500 CN$^-$ D	BDL(DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA 22nd Edition, 2340 B	24.27	mg/l	30	100
12.	Total Dissolved Solids	APHA 22nd Edition, 2540 C	469.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA 22nd Edition, 4500 E	78.22	mg/l	200	400
14.	Fluoride as F	APHA 22nd Edition, 4500-F$^-$ D	0.91	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) 1988	32.11	mg/l	45	No Relaxation
16.	Iron as Fe	APHA 22nd Edition, 3500-Fe B	0.30	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA 22nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA 22nd Edition, 4500B C	BDL(DL 0.1 mg/l)	mg/l	0.5	1
19.	Chromium as Cr	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.05	No Relaxation

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Test Certificate

Sample No.: **VEL/ BMA /W/05**				Report No.: **VEL/ BMA /W/1610/84**		
S. No.	**Parameter**	**Test-Method**	**Result**	**Unit**	**Limits of IS:10500 -2012**	
					Requirement (Acceptable) Limit	**Permissible limit in the Absence of Alternate Source**
20.	Conductivity	APHA 22nd Edition, 2120 B	0.784	mS/cm	--	--
21.	Phenolic Compounds	APHA 22nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l	0.5	No Relaxation
23.	Anionic Detergents as MBAS	APHA 22nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA 22nd Edition, 3111 B	1.60	mg/l	5	15
25.	Copper as Cu	APHA 22nd Edition, 3111 B	0.09	mg/l	0.05	1.5
26.	Manganese as Mn	APHA 22nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA 22nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA 22nd Edition, 3111 B	BDL(DL 0.01mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	0.05
30.	Arsenic as As	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	APHA 22nd Edition, 3111 B	BDL (DL 0.001 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	<2/100ml	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, *DL- Detection Limit

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Test Certificate

Sample Number:	VEL/ BMA /W/06	Report No.:	VEL/ BMA /W/1610/85
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman, West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	21/12/2016
		Receipt Date:	16/12/2016
Sample Description:	Groundwater Sample	Sampling Date:	15/12/2016
Sampling Location:	Near Village-Haipara (GW6)	Sampling Type:	Grab
Sample Collected by:	Vardan Enviro Lab Team	Preservation:	Refrigerated
Sampling & Analysis Protocol:	IS-10500-2012, APHA 22nd Edition 2012	Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 ^{0}C)	APHA 22nd Edition, 4500-H$^+$ B	6.65	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 22nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA 22nd Edition, 2130 B	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	APHA 22nd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 22nd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA 22nd Edition, 2340 C	296.60	mg/l	200	600
7.	Calcium as Ca	APHA 22nd Edition, 3500 Ca B	64.32	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA 22nd Edition, 2320 B	255.00	mg/l	200	600
9.	Chloride as Cl	APHA 22nd Edition, 4500-Cl$^-$ B	133.00	mg/l	250	1000
10.	Cyanide as CN	APHA 22nd Edition, 4500 CN$^-$ D	BDL(DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA 22nd Edition, 2340 B	33.08	mg/l	30	100
12.	Total Dissolved Solids	APHA 22nd Edition, 2540 C	553.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA 22nd Edition, 4500 E	60.50	mg/l	200	400
14.	Fluoride as F	APHA 22nd Edition, 4500-F$^-$ D	0.69	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) 1988	15.28	mg/l	45	No Relaxation
16.	Iron as Fe	APHA 22nd Edition, 3500-Fe B	0.26	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA 22nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA 22nd Edition, 4500B C	BDL(DL 0.1 mg/l)	mg/l	0.5	1
19.	Chromium as Cr	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.05	No Relaxation

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Test Certificate

Sample No.: **VEL/ BMA /W/06**					Report No.: **VEL/ BMA /W/1610/85**	
S. No.	**Parameter**	**Test-Method**	**Result**	**Unit**	**Limits of IS:10500 -2012**	
					Requirement (Acceptable) Limit	**Permissible limit in the Absence of Alternate Source**
20.	Conductivity	APHA 22nd Edition, 2120 B	0.926	mS/cm	--	--
21.	Phenolic Compounds	APHA 22nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l	0.5	No Relaxation
23.	Anionic Detergents as MBAS	APHA 22nd Edition, 5540 C	BDL(DL 0.02 mg/l) -	mg/l	0.2	1.0
24.	Zinc as Zn	APHA 22nd Edition, 3111 B	2.01	mg/l	5	15
25.	Copper as Cu	APHA 22nd Edition, 3111 B	0.76	mg/l	0.05	1.5
26.	Manganese as Mn	APHA 22nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA 22nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA 22nd Edition, 3111 B	BDL(DL 0.01mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	0.05
31.	Mercury as Hg	APHA 22nd Edition, 3111 B	BDL (DL 0.001 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	<2/100ml	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, *DL- Detection Limit

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Test Certificate

Sample Number:	VEL/ BMA /W/07	Report No.:	VEL/ BMA /W/1610/86
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman, West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	21/12/2016
		Receipt Date:	16/12/2016
Sample Description:	Groundwater Sample	Sampling Date:	15/12/2016
Sampling Location:	Near Village-Khudka (GW7)	Sampling Type:	Grab
Sample Collected by:	Vardan Enviro Lab Team	Preservation:	Refrigerated
Sampling & Analysis Protocol:	IS-10500-2012, APHA 22nd Edition 2012	Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 ^{0}C)	APHA 22nd Edition, 4500-H$^+$ B	7.45	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 22nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA 22nd Edition, 2130 B	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	APHA 22nd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 22nd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA 22nd Edition, 2340 C	326.53	mg/l	200	600
7.	Calcium as Ca	APHA 22nd Edition, 3500 Ca B	86.03	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA 22nd Edition, 2320 B	238.00	mg/l	200	600
9.	Chloride as Cl	APHA 22nd Edition, 4500-Cl$^-$ B	92.55	mg/l	250	1000
10.	Cyanide as CN	APHA 22nd Edition, 4500 CN$^-$ D	BDL(DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA 22nd Edition, 2340 B	27.19	mg/l	30	100
12.	Total Dissolved Solids	APHA 22nd Edition, 2540 C	452.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA 22nd Edition, 4500 E	39.05	mg/l	200	400
14.	Fluoride as F	APHA 22nd Edition, 4500-F$^-$ D	0.77	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) 1988	20.28	mg/l	45	No Relaxation
16.	Iron as Fe	APHA 22nd Edition, 3500-Fe B	0.29	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA 22nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA 22nd Edition, 4500B C	BDL(DL 0.1 mg/l)	mg/l	0.5	1
19.	Chromium as Cr	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.05	No Relaxation

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Vardan EnviroLab

Regd. Off: D-142, Sushant Lok-III, Sector-57, Gurgaon - 122003 (Haryana) Tel: 0124-4291036
Laboratory: Samaspur, Opposite Amity International School, Sector-51, Gurgaon - 122001 (Haryana)
Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035 (Rajasthan) Tel: 0141-2983404
(ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

Test Certificate

Sample No.: **VEL/ BMA /W/07** Report No.: **VEL/ BMA /W/1610/86**

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
20.	Conductivity	APHA 22nd Edition, 2120 B	0.756	mS/cm	--	--
21.	Phenolic Compounds	APHA 22nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l	0.5	No Relaxation
23.	Anionic Detergents as MBAS	APHA 22nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA 22nd Edition, 3111 B	1.07	mg/l	5	15
25.	Copper as Cu	APHA 22nd Edition, 3111 B	0.11	mg/l	0.05	1.5
26.	Manganese as Mn	APHA 22nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA 22nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA 22nd Edition, 3111 B	BDL(DL 0.01mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	0.05
31.	Mercury as Hg	APHA 22nd Edition, 3111 B	BDL (DL 0.001 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	<2/100ml	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, *DL- Detection Limit

Ms. NUPUR SHARMA
M.Sc. Env. Science

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Test Certificate

Sample Number:	**VEL/ BMA /W/08**	Report No.:	**VEL/ BMA /W/1610/87**
Issued to:	**M/s BMA Stainless Ltd.** **Village-Debipur , P.O Kalyaneswari** **District- Burdhman, West Bengal**	Format No.:	**5.10 F-01**
		Party Reference No.:	**NIL**
		Reporting Date:	**21/12/2016**
		Receipt Date:	**16/12/2016**
Sample Description:	**Groundwater Sample**	Sampling Date:	**15/12/2016**
Sampling Location:	**Near Village- Palhari (GW8)**	Sampling Type:	**Grab**
Sample Collected by:	**Vardan EnviroLab Team**	Preservation:	**Refrigerated**
Sampling & Analysis Protocol:	**IS-10500-2012, APHA 22nd Edition 2012**	Sampling Quantity:	**2.0 Ltr**
		Parameter Required:	**As per Work Order**

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Requirement (Acceptable) Limit	Permissible limit in the Absence of Alternate Source
1.	pH (at 25 ^{0}C)	APHA 22nd Edition, 4500-H^+ B	7.60	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 22nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA 22nd Edition, 2130 B	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	APHA 22nd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 22nd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$	APHA 22nd Edition, 2340 C	239.08	mg/l	200	600
7.	Calcium as Ca	APHA 22nd Edition, 3500 Ca B	46.55	mg/l	75	200
8.	Alkalinity as $CaCO_3$	APHA 22nd Edition, 2320 B	208.00	mg/l	200	600
9.	Chloride as Cl	APHA 22nd Edition, 4500-Cl^- B	59.80	mg/l	250	1000
10.	Cyanide as CN	APHA 22nd Edition, 4500 CN^- D	BDL(DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA 22nd Edition, 2340 B	29.87	mg/l	30	100
12.	Total Dissolved Solids	APHA 22nd Edition, 2540 C	387.00	mg/l	500	2000
13.	Sulphate as SO_4	APHA 22nd Edition, 4500 E	29.55	mg/l	200	400
14.	Fluoride as F	APHA 22nd Edition, 4500-F^- D	0.86	mg/l	1.0	1.5
15.	Nitrate as NO_3	IS 3025 (P-34) 1988	31.05	mg/l	45	No Relaxation
16.	Iron as Fe	APHA 22nd Edition, 3500-Fe B	0.24	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA 22nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA 22nd Edition, 4500B C	BDL(DL 0.1 mg/l)	mg/l	0.5	1
19.	Chromium as Cr	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.05	No Relaxation

Ms. NIDHI SHARMA
M.Sc. Env. Science

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Test Certificate

Sample No.: **VEL/ BMA /W/08**					Report No.: **VEL/ BMA /W/1610/87**	
S. No.	**Parameter**	**Test-Method**	**Result**	**Unit**	**Limits of IS:10500 -2012**	
					Requirement (Acceptable) Limit	**Permissible limit in the Absence of Alternate Source**
20.	Conductivity	APHA 22nd Edition, 2120 B	0.648	mS/cm	--	--
21.	Phenolic Compounds	APHA 22nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l	0.5	No Relaxation
23.	Anionic Detergents as MBAS	APHA 22nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA 22nd Edition, 3111 B	1.11	mg/l	5	15
25.	Copper as Cu	APHA 22nd Edition, 3111 B	0.70	mg/l	0.05	1.5
26.	Manganese as Mn	APHA 22nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA 22nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA 22nd Edition, 3111 B	BDL(DL 0.01mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	0.05
31.	Mercury as Hg	APHA 22nd Edition, 3111 B	BDL (DL 0.001 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	<2/100ml	MPN/100ml	Shall not be detectable in any 100 ml sample	
33.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Shall not be detectable in any 100 ml sample	

Note: - *BDL-Below Detection Limit, *DL- Detection Limit

Ms. NUPUR SHARMA
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Test Certificate

Sample Number:	VEL/BMA/W/09	Report No.:	VEL/ BMA /W/1610/88
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman, West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	21/12/2016
		Receipt Date:	16/12/2016
Sample Description:	Surface Water	Sampling Date:	15/12/2016
Sampling Location:	Nearby Maithon Colony (SW 1)	Sampling Type:	Composite
Sample Collected by:	Vardan EnviroLab Team	Preservation:	Refrigerated
Sampling & Analysis Protocol:	IS-10500-2012,APHA 22nd Edition 2012	Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 22nd Edition, 4500-H+B	7.90	--
2.	Colour	APHA 22nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen
3.	Turbidity	APHA 22nd Edition, 2130 B	4.0	NTU
4.	Odour	APHA 22nd Edition, 2150 B	Agreeable	--
5.	Total Hardness as $CaCO_3$	APHA 22nd Edition, 2340 C	132.48	mg/l
6.	Calcium as Ca	APHA 22nd Edition, 3500 Ca B	38.70	mg/l
7.	Alkalinity as $CaCO_3$	APHA 22nd Edition, 2320 B	165.00	mg/l
8.	Chloride as Cl	APHA 22nd Edition, 4500-Cl- B	23.98	mg/l
9.	Residual free Chlorine	APHA 22nd Edition, 4500 Cl-B	BDL(DL 0.20mg/l)	mg/l
10.	Cyanide as CN	APHA 22nd Edition, 4500 CN-D	BDL(DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA 22nd Edition, 2340 B	8.73	mg/l
12.	Total Dissolved Solids	APHA 22nd Edition, 2540 C	217.00	mg/l
13.	Total Suspended solids	APHA 22nd Edition,2540 D	25.00	mg/l
14.	Dissolved Oxygen	APHA 22nd Edition,4500	7.8	mg/l
15.	Sulphate as SO^4	APHA 22nd Edition, 4500 E	9.55	mg/l
16.	Fluoride as F	APHA 22nd Edition, 4500-F- D	0.35	mg/l
17.	BOD (3 Days at 27°C)	IS 3025,P-44,1999 (R- 2003)	<5.00	mg/l
18.	COD	APHA 22nd Edition, 5220 B	14.75	mg/l

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Test Certificate

Sample No.: **VEL/BMA/W/09**			Report No.: **VEL/ BMA /W/1610/88**	
S. No.	**Parameter**	**Test-Method**	**Result**	**Unit**
19.	Conductivity	APHA 22nd Edition, 2120 B	0.364	mS/cm
20.	Nitrate as NO_3	IS 3025 (P-34) 1988	1.26	mg/l
21.	Sodium as Na	APHA 22nd Edition,3500 Na B	24	mg/l
22.	Potassium as K	APHA 22nd Edition, 3500 K B	<1.0	mg/l
23.	Iron as Fe	APHA 22nd Edition, 3500-Fe B	0.16	mg/l
24.	Aluminium as Al	APHA 22nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l
25.	Boron	APHA 22nd Edition, 4500B C	BDL(DL 0.05 mg/l)	mg/l
26.	Chromium as Cr	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l
27.	Phenolic Compounds	APHA 22nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l
28.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l
29.	Anionic Detergents as MBAS	APHA 22nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l
30.	Zinc as Zn	APHA 22nd Edition, 3111 B	0.87	mg/l
31.	Copper as Cu	APHA 22nd Edition, 3111 B	0.09	mg/l
32.	Manganese as Mn	APHA 22nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l
33.	Cadmium as Cd	APHA 22nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l
34.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	480	MPN/100ml
35.	Fecal Coliform	IS 1622,1981(Reaffirmed 2003)	340	MPN/100ml

Note: -*BDL-Below Detection Limit, *DL- Detection Limit

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Test Certificate

Sample Number:	VEL/BMA/W/10	Report No.:	VEL/ BMA /W/1610/89
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman, West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	21/12/2016
		Receipt Date:	16/12/2016
Sample Description:	Surface Water	Sampling Date:	15/12/2016
Sampling Location:	Nearby Rakta (SW 2)	Sampling Type:	Composite
Sample Collected by:	Vardan EnviroLab Team	Preservation:	Refrigerated
Sampling & Analysis Protocol:	IS-10500-2012,APHA 22nd Edition 2012	Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 ^{0}C)	APHA 22nd Edition, 4500-H$^+$B	7.80	--
2.	Colour	APHA 22nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen
3.	Turbidity	APHA 22nd Edition, 2130 B	17.0	NTU
4.	Odour	APHA 22nd Edition, 2150 B	Agreeable	--
5.	Total Hardness as $CaCO_3$	APHA 22nd Edition, 2340 C	142.02	mg/l
6.	Calcium as Ca	APHA 22nd Edition, 3500 Ca B	28.70	mg/l
7.	Alkalinity as $CaCO_3$	APHA 22nd Edition, 2320 B	175.00	mg/l
8.	Chloride as Cl	APHA 22nd Edition, 4500-Cl$^-$ B	42.70	mg/l
9.	Residual free Chlorine	APHA 22nd Edition, 4500 Cl-B	BDL(DL 0.20mg/l)	mg/l
10.	Cyanide as CN	APHA 22nd Edition, 4500 CN-D	BDL(DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA 22nd Edition, 2340 B	17.11	mg/l
12.	Total Dissolved Solids	APHA 22nd Edition, 2540 C	265.00	mg/l
13.	Total Suspended solids	APHA 22nd Edition,2540 D	38.00	mg/l
14.	Dissolved Oxygen	APHA 22nd Edition,4500	6.9	mg/l
15.	Sulphate as SO^4	APHA 22nd Edition, 4500 E	18.08	mg/l
16.	Fluoride as F	APHA 22nd Edition, 4500-F$^-$ D	0.39	mg/l
17.	BOD (3 Days at 27^{0}C)	IS 3025,P-44,1999 (R- 2003)	5.20	mg/l
18.	COD	APHA 22nd Edition, 5220 B	16.90	mg/l

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Test Certificate

Sample No.: **VEL/BMA/W/10**			Report No.: **VEL/ BMA /W/1610/89**	
S. No.	**Parameter**	**Test-Method**	**Result**	**Unit**
19.	Conductivity	APHA 22nd Edition, 2120 B	0.445	mS/cm
20.	Nitrate as NO_3	IS 3025 (P-34) 1988	1.08	mg/l
21.	Sodium as Na	APHA 22nd Edition,3500 Na B	33	mg/l
22.	Potassium as K	APHA 22nd Edition, 3500 K B	6	mg/l
23.	Iron as Fe	APHA 22nd Edition, 3500-Fe B	0.20	mg/l
24.	Aluminium as Al	APHA 22nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l
25.	Boron	APHA 22nd Edition, 4500B C	BDL(DL 0.05 mg/l)	mg/l
26.	Chromium as Cr	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l
27.	Phenolic Compounds	APHA 22nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l
28.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l
29.	Anionic Detergents as MBAS	APHA 22nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l
30.	Zinc as Zn	APHA 22nd Edition, 3111 B	0.70	mg/l
31.	Copper as Cu	APHA 22nd Edition, 3111 B	0.19	mg/l
32.	Manganese as Mn	APHA 22nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l
33.	Cadmium as Cd	APHA 22nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l
34.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	500	MPN/100ml
35.	Fecal Coliform	IS 1622,1981(Reaffirmed 2003)	390	MPN/100ml

Note: -*BDL-Below Detection Limit, *DL- Detection Limit

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M.Sc. Env. Science

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(ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

Test Certificate

Sample Number:	VEL/BMA/W/11	Report No.:	VEL/ BMA /W/1610/90
Issued to:	M/s BMA Stainless Ltd. Village-Debipur , P.O Kalyaneswari District- Burdhman, West Bengal	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	21/12/2016
		Receipt Date:	16/12/2016
Sample Description:	Surface Water	Sampling Date:	15/12/2016
Sampling Location:	Nearby Toli Chanch (SW3)	Sampling Type:	Composite
Sample Collected by:	Vardan EnviroLab Team	Preservation:	Refrigerated
Sampling & Analysis Protocol:	IS-10500-2012,APHA 22nd Edition 2012	Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 °C)	APHA 22nd Edition, 4500-H+B	7.91	--
2.	Colour	APHA 22nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen
3.	Turbidity	APHA 22nd Edition, 2130 B	15.0	NTU
4.	Odour	APHA 22nd Edition, 2150 B	Agreeable	--
5.	Total Hardness as $CaCO_3$	APHA 22nd Edition, 2340 C	129.53	mg/l
6.	Calcium as Ca	APHA 22nd Edition, 3500 Ca B	42.10	mg/l
7.	Alkalinity as $CaCO_3$	APHA 22nd Edition, 2320 B	155.00	mg/l
8.	Chloride as Cl	APHA 22nd Edition, 4500-Cl- B	38.11	mg/l
9.	Residual free Chlorine	APHA 22nd Edition, 4500 Cl-B	BDL(DL 0.20mg/l)	mg/l
10.	Cyanide as CN	APHA 22nd Edition, 4500 CN-D	BDL(DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA 22nd Edition, 2340 B	5.95	mg/l
12.	Total Dissolved Solids	APHA 22nd Edition, 2540 C	257.00	mg/l
13.	Total Suspended solids	APHA 22nd Edition,2540 D	42.00	mg/l
14.	Dissolved Oxygen	APHA 22nd Edition,4500	6.8	mg/l
15.	Sulphate as SO^4	APHA 22nd Edition, 4500 E	21.34	mg/l
16.	Fluoride as F	APHA 22nd Edition, 4500-F- D	0.44	mg/l
17.	BOD (3 Days at 27°C)	IS 3025,P-44,1999 (R- 2003)	5.80	mg/l
18.	COD	APHA 22nd Edition, 5220 B	18.22	mg/l

Ms. NUPUR SHARMA
M.Sc. Env. Science

GAURAV
AUTHORISED SIGNATORY

NOTE: a)The results listed refer only to the tested samples & applicable parameters
b) Total liabilities of our lab will be restricted to the invoice amount only
c) The sample will be destroyed after retention time unless otherwise specified
d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

Vardan EnviroLab

Regd. Off: D-142, Sushant Lok-III, Sector-57, Gurgaon - 122003 (Haryana) Tel: 0124-4291036
Laboratory: Samaspur, Opposite Amity International School, Sector-51, Gurgaon - 122001 (Haryana)
Branch Off: Plot No. 24 & 25, Narayan Vihar, B-Block, Jaipur - 302035 (Rajasthan) Tel: 0141-2983404
(ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

Test Certificate

Sample No.: **VEL/BMA/W/11**			Report No.: **VEL/ BMA /W/1610/90**	
S. No.	**Parameter**	**Test-Method**	**Result**	**Unit**
19.	Conductivity	APHA 22nd Edition, 2120 B	0.431	mS/cm
20.	Nitrate as NO_3	IS 3025 (P-34) 1988	1.79	mg/l
21.	Sodium as Na	APHA 22nd Edition,3500 Na B	35	mg/l
22.	Potassium as K	APHA 22nd Edition, 3500 K B	4	mg/l
23.	Iron as Fe	APHA 22nd Edition, 3500-Fe B	0.18	mg/l
24.	Aluminium as Al	APHA 22nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l
25.	Boron	APHA 22nd Edition, 4500B C	0.29	mg/l
26.	Chromium as Cr	APHA 22nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l
27.	Phenolic Compounds	APHA 22nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l
28.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l
29.	Anionic Detergents as MBAS	APHA 22nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l
30.	Zinc as Zn	APHA 22nd Edition, 3111 B	0.85	mg/l
31.	Copper as Cu	APHA 22nd Edition, 3111 B	0.08	mg/l
32.	Manganese as Mn	APHA 22nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l
33.	Cadmium as Cd	APHA 22nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l
34.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	580	MPN/100ml
35.	Fecal Coliform	IS 1622,1981(Reaffirmed 2003)	410	MPN/100ml

Note: -*BDL-Below Detection Limit, *DL- Detection Limit

Ms. NUPUR SHARMA
M.Sc. Env. Science

VARDAN ENVIRO LAB (GURGAON) GAURAV CHAUHAN AUTHORISED SIGNATORY

NOTE: a)The results listed refer only to the tested samples & applicable parameters
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BMA Stainless Ltd.

Date - 02.04.2018

UNDERTAKING

I Avinash Agarwalla, Director of BMA Stainless LTD. at village – Debipur, P.O: Kalyaneshwari, District- Paschim Bardhaman, West Bengal do hereby undertake the following:

1. Our plot area for plant is 6.92 ha. Out of which 2.30 ha. i.e. 33% of total plot area is earmarked for greenbelt development as per EC grant vide letter No. f. No. j- 11011/ 192/ 2013-IA II (I) dated 29th September 2014.
2. Out of which 1.5 ha. Has already been developed by planting around 2000 saplings and remaining area is also under development.
3. Total 3500 saplings shall be planted in 2.3 Ha. area which will be completed within six months as earlier environmental clearance.

Mr. Avinash Agrawalla
DIRECTOR
BMA STAINLESS LTD.

Regd. Office : 10A, Shakespeare Court, 21A Shakespeare Sarani, Kolkata-700 017, Tel: +91 33 40112525
Fax: +91 33 40112505, E-mail: captain@bmaind.com, Website: www.captaintmt.com
Works : P.O.: Kalyaneshwari-713 369, Dist: Burdwan, West Bengal, Tel: +91 341 2524301/02
Fax: +91 341 2524300
CIN No. : U27109WB2003PLC097108

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BMA Stainless Limited

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SAFETY POLICY

We at BMA STAINLESS LIMITED, are committed to provide Safe Working Conditions to all our Employees.

* TO ACHIEVE ZERO ACCIDENT TARGET.
* TO PROVIDE & ENSURE USE OF PERSONAL. PROTECTIVE EQUIPMENT TO ALL EMPLOYEES AS PER JOB REQUIREMENT.
* TO PROVIDE FIRE SAFETY EQUIPMENT FOR FIRE HAZARDS & ARRANGE REGULAR TRAINING FOR PROPER USE.
* TO PROVIDE FIRST AID FACILITIES & ARRANGE TRAINING & PROVIDE MEDICAL CHECKUP & MEDICAL HELP AS REQUIRED.
* TO PROVIDE SAFE, HYGENIC & CLEAN ENVIRONMENT IN & AROUND WORKING AREAS.

TO IMPLEMENT ALL RULES & REGULATIONS AS PER THE WEST BENGAL FACTORIES ACT.

Avinash Agarwalla
Director

BMA Stainless Ltd.

ENVIRONMENT POLICY

BMA Stainless Ltd.

BMA Stainless Ltd. is engaged in production of TMT Bars is committed towards clean and sustainable environment . The mission of BMA Stainless Limited is to produce TMT Bars in an environment friendly manner and is strive to.

- Integrate sound environmental management practices in all our activities
- Conduct our operations in environmentally responsible manner to minimize pollution and its' impact on environment.
- Comply with applicable legal and other requirements related to environmental aspects of our operations and strive to go beyond.
- BMA Stainless Limited shall ensure that deviations from this policy and cases of violations, if any, shall be reported to the Board of Directors and shall identify designate responsible person for ensuring compliance with the environmental Laws and Regulations.
- Conserve energy, and other natural resources, minimize waste generation and promote recovery, recycle and reuse.
- Increase greenery in and around the plant.
- Ensure continual improvement in environmental performance by setting & reviewing objectives & targets.
- Encourage environmental awareness amongst employees working for and on behalf of BMA Stainless Limited and the general populace around the plant.

DATE:15.03.18

DIRECTOR

Regd. Office : 10A, Shakespeare Court, 21A Shakespeare Sarani, Kolkata-700 017, Tel: +91 33 40112525
Fax: +91 33 40112505, E-mail: captain@bmaind.com, Website: www.captaintmt.com
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Fax: +91 341 2524300
CIN No. : U27109WB2003PLC097108

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BMA Stainless Ltd.

Reference No.:

Date: 23rd February, 2018

BOARD RESOLUTION

EXTRACT OF THE MINUTE OF THE MEETING OF BOARD OFDIRECTORS OF M/S BMA STAINLESS LIMITED HELD ON FRIDAY 23rd DAY OFFEBRUARY 2018 AT 2.30 P.M. AT REGISTERED OFFICE OF THE COMPANY.

Based on the principle of managing environment for the benefit & enjoyment of both current &future generation, the board decided to frame and adopt an EnvironmentalPolicy. After due deliberation, following resolutions was passed in this regard:-

"RESOLVED THAT" the board hereby adopts the Environmental Policy (as discussed below) and is strive to;

- Integrate sound environmental management practices in all our activities
- Conduct our operations in environmentally responsible manner to minimize pollution and its' impact on environment.
- Comply with applicable legal and other requirements related to environmental aspects of our operations and strive to go beyond.
- BMA Stainless Limited shall ensure that deviations from this policy and cases of violations, if any, shall be reported to the Board of Directors and shall identify designate responsible person for ensuring compliance with the Environmental Laws and Regulations.
- Conserve energy, and other natural resources, minimize waste generation and promote recovery, recycle and reuse.
- Increase greenery in and around the mines.
- Ensure continual improvement in environmental performance by setting & reviewing objectives & targets.
- Encourage environmental awareness amongst employees working for and on behalf of BMA Stainless Limitedand the general populace around the plant.

Date:

BMA Stainless Ltd. Kolkata 700 017

DIRECTOR

Regd. Office : 10A, Shakespeare Court, 21A Shakespeare Sarani, Kolkata-700 017, Tel: +91 33 40112525
Fax: +91 33 40112505, E-mail: captain@bmaind.com, Website: www.captaintmt.com
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CIN No. : U27109WB2003PLC097108

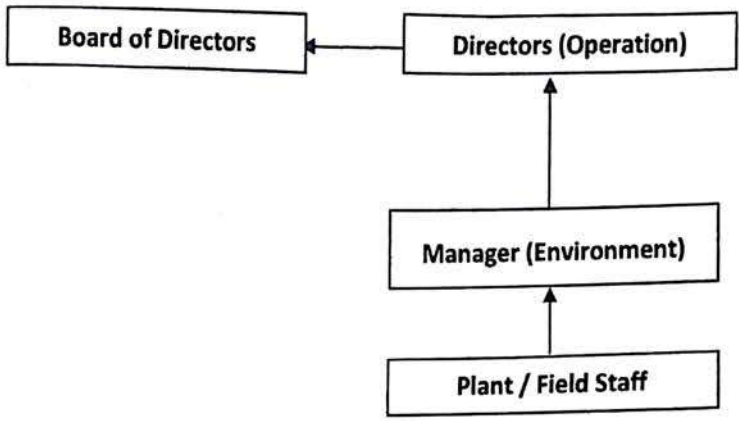
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BMA Stainless Ltd.
(ISO 9001 : 2008 Company)

Hierarchical systems - environmental issues and for ensuring compliance

Company EHS cell is responsible for the compliance of the environmental conditions.The Environmental Manager will functionally report to Director (Operation), and the environmental matters are placed to the Board of Directorsthrough Director (Operation).



Date: 23.02.2018

BMA Stainless Ltd. Kolkata 700 017

DIRECTOR

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Questionnaire for Village Sarpanch /Town Development Officer

(Existing Infrastructure Facilities – Indicate No. of Facilities Available)

1	Name of Village /Town	Hadla
2	Population	About 500 Houses.
3	Name of Sarpanch	Approx. 2500
4	Sex	Male / Female
5	Road Pucca / Kuchha	
6	Bus service /Road./Waterway/ Railway Station	— Salanpur
7	Are you satisfied with the existing transport facilities	Yes / No
8	Anganwadi	— 1
9	Primary School	— 1
10	Middle School	No middle school — Salanpur village
11	High School	
12	Technical School/College	
	• Art /Commerce /Science	
	• Medical College	
	• Polytechnic /Engineering College	
13	Clinic/Nursing Home	—
14	Library theatre/sport ground community hall	
15	Tourist attraction	Historical Monuments/Zoo/ Museum
16	Health centre	No medical facility
17	Drug store	—
18	Fair price shop	
19	Petrol Pump	
20	Post office	— Salanpur.
21	Telegraph office	
22	Telephone	
23	Are you satisfied with the existing communication	— Yes / No

	facilities	
24	Police station	– Kulti police station
25	Market	–
26	Ration shop	
27	Bank	
28	Cooperative society	
29	Drinking water system	a) House Connection – Tap water b) Hand pump c) Spring water Scarcity during summer.
30	Are you satisfied	Yes / No
31	Sewage system	Yes / No
32	Fuel used	Wood / Kerosene/Coal / LPG
33	Electric connections	(a) Domestic (b) Agricultural
34	Street Lights	
35	Worship Places	– Kalyaneshwari Temple
36	Cremation and Burial grounds	
37	Any industry near village	Yes / No
38	Type of industry if present	Major/ Minor
39	**Environmental pollution**	
40	Main difficulties faced	Air / Water / Noise Pollution

Expectations of the Respondent (from Project Proponent)

Perceptions of the Respondent

(1. Urgenly required 2. Required in future 3. Not Required 4. Do Not know)

1) Priorities actives for agricultural development
   - (i) Better irrigation facilities
   - (ii) Development of social forestry
2) Priorities activities for industrial growth
   - (i) Loans to develop cottage industries
3) Priorities the activities for growth of employment
   - (i) Development of agriculture based programmes
   - (ii) Development of trading and commerce
   - (iii) Adequate water supply
   - (iv) Sanitation facilities

main employment is business such as shops hotels etc. Labour work engaged in maximum use villagers.

(v) Better health services
(vi) Grazing lands / fodder
(vii) Availability of fuel
(viii) Better education facilities /school buildings / adequate technical staff
(ix) Better transportation facilities

Awareness and Opinion about the Project

A Project Awareness

1. Are you aware of the project — Yes / No
2. Is your land aquisited for the project — Yes / No
3. Are you willing to give your land for the project — Yes / No
4. What are your expectation in return
   - Money in cash
   - Employment
   - Both employment and cash
   - Alternate land at the other place

B Opinion about the project

Positive Impacts		
1	Improvement in job opportunities /transport facilities /health facilities/ educational facilities / trade / life style	
Negative Impacts		
1	Increase in air pollution/water pollution /housing problems / cost of commodities	
2	Adverse impact on cottage industry	Yes / No
3	Deterioration in texture of soil	Yes / No

Signature of the Expert: Sudhu

Questionnaire for Village Sarpanch /Town Development Officer

(Existing Infrastructure Facilities – Indicate No. of Facilities Available)

1	Name of Village /Town	Dendua
2	Population	441 Household with about 2500 Population
3	Name of Sarpanch	
4	Sex	Male / Female
5	Road Pucca / Kuchha	
6	Bus service /Road./Waterway/ Railway Station	
7	Are you satisfied with the existing transport facilities	Yes / No (1st auto / Jeep
8	Anganwadi	1
9	Primary School	1
10	Middle School	go to Salanpur village (2 kms)
11	High School	
12	Technical School/College • Art /Commerce /Science • Medical College • Polytechnic /Engineering College	
13	Clinic/Nursing Home	
14	Library theatre/sport ground community hall	
15	Tourist attraction	Historical Monuments/Zoo/ Museum
16	Health centre	PHS (in salanpur village
17	Drug store	
18	Fair price shop	
19	Petrol Pump	
20	Post office	
21	Telegraph office	
22	Telephone	
23	Are you satisfied with the existing communication	Yes / No

	facilities	
24	Police station	
25	Market	once in week market
26	Ration shop	
27	Bank	UCO Bank, Dendua.
28	Cooperative society	
29	Drinking water system	a) House Connection b) Hand pump uncovered well c) Spring water
30	Are you satisfied	Yes / No not portable to drink.
31	Sewage system	Yes / No
32	Fuel used	Wood / Kerosene/Coal / LPG
33	Electric connections	(a) Domestic (b) Agricultural
34	Street Lights	
35	Worship Places	Durga Temple, Shiv Mandir
36	Cremation and Burial grounds	
37	Any industry near village	Yes / No
38	Type of industry if present	Major/ Minor
39	**Environmental pollution**	
40	Main difficulties faced	Air / Water / Noise Pollution

Expectations of the Respondent (from Project Proponent)

Perceptions of the Respondent

(1. Urgenly required 2. Required in future 3. Not Required 4. Do Not know)

1) Priorities actives for agricultural development
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   - (ii) Development of social forestry

2) Priorities activities for industrial growth
   - (i) Loans to develop cottage industries

3) Priorities the activities for growth of employment
   - (i) Development of agriculture based programmes
   - (ii) Development of trading and commerce
   - (iii) Adequate water supply
   - (iv) Sanitation facilities

(v) Better health services
(vi) Grazing lands / fodder
(vii) Availability of fuel
(viii) Better education facilities /school buildings / adequate technical staff
(ix) Better transportation facilities

Awareness and Opinion about the Project

A Project Awareness

1. Are you aware of the project — Yes / No
2. Is your land aquisited for the project — Yes / No
3. Are you willing to give your land for the project — Yes / No
4. What are your expectation in return
   - Money in cash
   - Employment
   - Both employment and cash
   - Alternate land at the other place

B Opinion about the project

Positive Impacts		
1	Improvement in job opportunities /transport facilities /health facilities/ educational facilities / trade / life style	
Negative Impacts		
1	Increase in air pollution/water pollution /housing problems / cost of commodities	
2	Adverse impact on cottage industry	Yes / No
3	Deterioration in texture of soil	Yes / No

Major population engaged as laborers in Industries.

Signature of the Expert : Sushir

BMA Stainless Ltd.

Ref. No. MOEF/02/2017 Date : 18 .11.2017

To
The Director (S)
Ministry of Environment, Forest and Climate Change
Government of India
Eastern Regional Office
A/3, Chandrasekharpur
Bhubaneswar – 751023
Orissa.

Subject	Six Monthly Compliance Report (April, 2017 – September, 2017).
Reference	Environmental Clearance accorded by Ministry of Environment, Forests and Climate Change, New Delhi for the proposed 2 X 8T Induction Furnace (Expansion) Project of M/s BMA Stainless Ltd. at Village : Debipur, P.O. : Kalyaneshwari, District : Burdwan, West Bengal. [F. No. J-11011/192/2013-IA II (I) Dated: 29th September 2014].

Dear Sir,

Enclosed please find the Six Monthly Compliance Report (April, 2017 – September, 2017) w.r.t. the above mentioned Environmental Clearance for the existing Plant at Village : Debipur, P.O. : Kalyaneshwari, District : Burdwan, West Bengal for your ready reference.

Thanking you.

Yours faithfully,

for BMA Stainless Ltd.

(Avinash Agarwalla)
Director

Encl. as stated above

Copy to :

Environmental Engineer
Asansol Regional Office
West Bengal Pollution Control Board
ADDA Commercial Market (2nd Floor)
Opposite Asansol Fire Station, G. T. Road
Asansol, Pin : 713301
Dist. Paschim Bardhaman

Regd. Office : 10A, Shakespeare Court, 21A Shakespeare Sarani, Kolkata-700 017, Tel: +91 33 40112525
Fax: +91 33 40112505, E-mail: captain@bmaind.com, Website: www.captaintmt.com
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Fax: +91 341 2524300
CIN No. : U27109WB2003PLC097108

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Six Monthly Compliance Report
(April, 2017 - September, 2017)

BMA Stainless Ltd.

Subject	Six Monthly (April, 2017 - September, 2017) Compliance Report.
Reference	Environmental Clearance accorded by Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi for the proposed 2 X 8 T Induction Furnace (Expansion) Project of M/s BMA Stainless Ltd. at Village : Debipur, P.O. : Kalyaneshwari, District : Burdwan, West Bengal. [F. No. J-11011/192/2013-IA II (I) Dated: 29th September 2014]

Plant

Village : Debipur
P.O. : Kalyaneshwari
Pin : 713369
District : Burdwan
West Bengal.

Corporate Office

10 A, Shakespeare Court
21 A, Shakespeare Sarani
Kolkata-700 071
West Bengal.
Tel. : 033 40112525
Email : bmastainlessltd@gmail.com

November, 2017

BMA Stainless Ltd.

Subject	Six Monthly Compliance Report (April, 2017 - September, 2017).
Plant	BMA Stainless Ltd.
	Village : Debipur, P.O. : Kalyaneshwari, District : Burdwan, West Bengal.
Reference	Environment Clearance accorded by Ministry of Environment, Forest and Climate Change, Government of India, New Delhi. F. No. J-11011/192/2013-IA II (I) Dated: 29th September 2014.

Environmental Clearance		**Remarks**
Sl. No.	**Description**	
A.	**SPECIFIC CONDITIONS :**	
i.	Measures shall be taken to reduce PM levels in the ambient air. Continuous stack monitoring facilities for all the stacks shall be provided and sufficient air pollution control devices viz. Electrostatic precipitator (ESP), bag house, bag filters etc. shall be provided to keep the emission levels below 50 mg/Nm^3 and installing energy efficient technology.	Fume Extraction System with Bag Filter and Stack have been provided in order to control source emissions to comply with statutory norms. The pollution control equipment is being periodically maintained for efficient functioning and utilization of the facilities provided.
ii.	Steps/Measures shall be taken for keeping emissions from project activities within prescribed limits in the context of the National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009.	Is being complied with.
iii.	Gaseous emission levels including secondary fugitive emissions from all the sources shall be controlled within the latest permissible limits issued by the Ministry vide G.S.R. 414(E) dated 30th May, 2008 and regularly monitored. Guidelines / Code of Practice issued by the CPCB shall be followed.	Bag filter system has been provided for Induction Furnaces to control source emissions as well as fugitive emissions.
iv.	Vehicular pollution due to transportation of raw material and finished product shall be controlled. Proper arrangements shall also be made to control dust emissions during loading and unloading of the raw material and finished product.	Water sprinkling is being done to control dust emissions during loading and unloading of the raw materials and finished product. It is ensured that vehicles coming inside the plant are having valid PUC.
v.	Total fresh water requirement from ground water source shall not exceed 52 KLD which will be met from bore wells and rain water harvesting pond. Prior	The total make-up water requirement for the project is being met by supply water from Maithon Dam. Permission has been

Environmental Clearance		Remarks
Sl. No.	Description	
	permission shall be obtained from the Competent Authority for water drawl from bore well. 'Zero' effluent discharge shall be strictly followed and no wastewater shall be discharged outside the premises.	obtained from Damodar Valley Corporation for that. To maximize recycle and reuse of treated wastewater, closed circuit cooling system has been adopted. The treated wastewater is reused in the dust suppression and greenbelt development. The plant is designed on the basis of zero liquid effluent discharge. No effluent is let out of the plant premises. Domestic wastewater is treated in septic tank followed by soak pit.
vi.	Regular monitoring of influent and effluent surface, sub-surface and ground water shall be ensured and treated wastewater shall meet the norms prescribed by the State Pollution Control Board or described under the E(P) Act whichever are more stringent.	The total make-up water required for the project is for cooling and domestic purposes. To maximize recycle and reuse of treated wastewater, closed circuit cooling system has been adopted. The bleed off from cooling tower is reused in the dust suppression and greenbelt development. The plant is designed on the basis of zero liquid effluent discharge. No effluent is let out of the plant. Domestic wastewater is treated in septic tank followed by soak pit.
vii.	Proper handling, storage, utilization and disposal of all the solid waste shall be ensured and regular report regarding toxic metal content in the waste material and its composition, end use of solid/hazardous waste shall be submitted to the Ministry's Regional Office at Bhubaneswar, SPCB and CPCB.	Proper handling, storage, utilization & disposal of solid waste are being ensured in the plant. The solid waste, i.e., slag generated during operation of Induction Furnace is being utilized for road / land / area development.
viii.	A time bound action plan shall be submitted to reduce solid waste, its proper utilization and disposal.	Slag is being utilized in road / land / area development and fly ash is being utilized in brick manufacturing.
ix.	Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 1999 and subsequent amendment in 2003 and 2009. All the fly ash shall be provided to cement and brick manufacturers for further utilization and Memorandum of Understanding shall be submitted to the Ministry's Regional Office at Bhubaneswar.	Fly ash is being utilized in brick manufacturing. The MOU in this regard will be submitted to MoEF&CC.
x.	A Risk and Disaster Management Plan (including Earth	On-site emergency plan was included in

BMA Stainless Ltd.

Environmental Clearance		Remarks
Sl. No.	Description	
	quake and Seismic hazard) shall be prepared and a copy submitted to the Ministry's Regional Office at Bhubaneswar, SPCB and CPCB within 3 months of issue of environment clearance letter.	the EIA / EMP Report.
xi.	As proposed, green belt shall be developed in at least 33 % of the project area. Selection of plant species shall be as per the CPCB guidelines in consultation with the DFO.	Efforts for greenbelt development have already been initiated and will continue to be developed and maintained.
xii.	All the commitments made to the public during Public Hearing/public consultation meeting held on 28.2.2014 shall be satisfactorily implemented and adequate budget provision shall be made accordingly.	Is being complied with.
xiii.	At least 5 % of the total cast of the project should be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and Item-wise details along with time bound action plan should be prepared and submitted to the Ministry's Regional Office at Bhubaneswar. Implementation of such program shall be ensured accordingly in a time bound manner.	The item-wise details of the action plan for Enterprise Social Commitment will be prepared and submitted in the next Six Monthly Compliance Report.
xiv.	The Company shall submit within three months their policy towards Corporate Environment Responsibility which shall inter-alia address (i) Standard operating process/procedure to being into focus any infringement/deviation/ violation of environmental or forest norms/conditions, (ii) Hierarchical system or Administrative order of the Company to deal with environmental issues and ensuring compliance to the environmental clearance conditions and (iii) System of reporting of non-compliance/violation environmental norms to the Board of Directors of the company and/or stakeholders or shareholders.	The policy towards Corporate Environment Responsibility will be submitted in the next Six Monthly Compliance Report.
xv.	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, Safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	The construction labours are from the nearby locality. However, necessary facilities are being provided in line with the existing contractual workers.

As per Environmental Clearance		Remarks
Sl. No.	Description	
B.	**GENERAL CONDITIONS :**	
i.	The project authorities must strictly adhere to the stipulations made by the West Bengal Pollution Control Board and the State Government.	Is being complied with.
ii.	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC).	Prior approval will be obtained as per environment laws before any further expansion or modification of the plant.
iii.	At least four ambient air quality monitoring stations should be established in the downward direction as well as where maximum ground level concentration of PM_{10}, $PM_{2.5}$, SO_2 and NO_X are anticipated in consultation with the SPCB. Data on ambient air quality and stack emission shall be regularly submitted to this Ministry including its Regional Office at Bhubaneswar and the SPCB/CPCB once in six months.	Ambient air quality is being monitored at Main gate, Plant boundary and Labour colony and the value are within the permissible limits. Please refer Monitoring Results.
iv.	Industrial wastewater shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended form time to time. The treated wastewater shall be utilized for plantation purpose.	The total make-up water required for the project is for cooling and domestic purposes. The plant is designed on the basis of zero liquid effluent discharge. No effluent is let out of the plant.
v.	The overall noise levels in and around the plant area shall be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime).	Acoustic enclosures have been provided to control work-zone noise levels and through adoption of adequate protective measures, i.e., use of personal protective equipment (ear plugs, ear muffs). Ambient noise level is being monitored and is within the permissible limits.Please refer Monitoring Results.
vi.	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	All the regulations as per Factories Act, w.r.t., personal protective equipment and sanitation facilities, occupational health surveillance of the workers are being maintained on a regular basis for compliance.
vii.	The company shall develop rain water harvesting	Effort has been initiated for the rainwater

As per Environmental Clearance		Remarks
Sl. No.	Description	
	structures to harvest the rain water for utilization in the lean season besides recharging the ground water table.	harvesting.
viii.	The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programmes, educational programmes, drinking water supply and health care etc.	Will be complied with.
ix.	Requisite funds shall be earmarked towards capital cost and recurring cost/annum for environment pollution control measures to implement the conditions stipulated by the Ministry of Environment, Forests and Climate Change (MoEF&CC) as well as the State Government. An implementation schedule for implementing all the conditions stipulated herein shall be submitted to the Regional Office of the Ministry at Bhubaneswar. The funds so provided shall not be diverted for any other purpose.	Regular maintenance of pollution control equipment is being done for effective operation of the pollution control measures to comply with statutory norms.
x.	A copy of clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad/Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent.	Copy of Environmental Clearance had been sent to local authorities.
xi.	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF&CC at Bhubaneswar. The respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; PM10, SO2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a	Will be complied with.

As per Environmental Clearance		Remarks
Sl. No.	Description	
	convenient location near the main gate of the company in the public domain.	
xii.	The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF&CC, the respective Zonal Office of CPCB and the SPCB. The Regional Office of this Ministry at Bhubaneswar / CPCB / SPCB shall monitor the stipulated conditions.	Will be complied with.
xiii.	The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Office of the MOEF&CC at Bhubaneswar by e-mail.	Will be complied with.
xiv.	The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment, Forests and Climate Change (MoEF&CC) at http://envfor.nic.in . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional office at Bhubaneswar.	Environmental Clearance was advertised in two local newspapers and copy was sent to Eastern Regional office of Ministry of Environment and Forests, Bhubaneswar and West Bengal Pollution Control Board.
xv.	Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.	Out of two, one 8T Induction furnace has been commissioned. Financial closure with approval will be submitted once the project will be completed.

Eco Care
Specialised House on Environmental Monitoring, Analysis, Assessment & Management
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Manoj Talkies Basement, Kumarpur
ASANSOL-713304 (W.B.)
ISO 9001 : 2015 Certified, OHSAS 18001:2007 Certified

TEST REPORT

Report Release Date	: 20.09.2017	Sample Ref. No.(ARF)	: EC/ARF/29/170917
Test Report No	: EC/TR-42/09016	Source of Sample	: Steel Plant
Type of Sample	: Dust & Gaseous Emission	Sampling Date	: 15.09.2017
Sample Collected by	: Mr. Sumit Sarkar & Team	Period of Analysis	: 16.09.2017
Sample Details	: Stack Emission	Sampling Location	: Bag Filter Stack
Name & Address	: BMA Stainless Ltd Vill. – Debipur P.O. – Kalyaneshwari Dist. – Paschim Barddhaman West Bengal, Pin No. 713369	Sample Condition	: Preserved & Sealed
		Sample Stamped as	: TH – 124
		Sample Drawn By	: ECO CARE
		Remarks	: ---
		Deviation if any.	: None

GENERAL INFORMATION

1	Particular of the Plant	: Steel Plant
2	Emission Due to	: Process Activity
3	Stack Connected to	: Bag Filter at Induction Furnace
4	Material of Construction	: M.S
5	Stack Height from G.L.	: 30.0 m
6	Height of Sampling Port from G.L.	: 9.0 m
7	Height of Sampling Port from L.D.Z.	: 5.18 m
8	Dimension of Stack at Sampling Port	: 0.71 m
9	Shape of the Stack	: Circular
10	Working Load	: 8 MT/heat (1 heat = 3 hrs)

FUEL CHARACTERISTIC REPORT

1	Source of Energy	: Electricity
2	Energy Consumption	: ----
3	Calorific Value (K-Cal/Kg)	: ----

RESULTS OF SAMPLING GASEOUS EMISSION ANALYSIS

			Method
1	Flue Gas Temperature	45 ^{0}C	IS 11255 : Part 3
2	Barometric Pressure	755 mm Hg	IS 11255 : Part 3
3	Velocity of Flue Gas	7.07 m/sec	IS 11255 : Part 3
4	Flue Gas Quantity	9386 NM^3/hr	IS 11255 : Part 3
5	Concentration of Particulate Matter	43.67 mg/NM^3	IS 11255 : Part 1
6	Concentration of Carbon Dioxide	3.0 %	IS 13270
7	Concentration of SO_2	----	IS 11255 : Part 2
8	Concentration of NO_x	----	IS 11255 : Part 7

1. Test values are reported based on the samples received.
2. Sample(s) will be destroyed after 7 days from date of issues of the Test Report subject to nature of Preservation. Sample will be preserved as per the standard method.
3. The Test report shall not be reproduced, without the written approval of laboratory

Authorised Signatory
Nupur Chatterjee
B. Sc. M. Sc. (Env. Sc.)
Dy Technical Manager

Eco Care
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TEST REPORT

Report Release Date	: 20.09.2017	Sample Ref. No.(ARF)	: EC/ARF/29/170917
Test Report No	: EC/TR/42/09047	Source of Sample	: Steel Plant
Type of Sample	: Dust & Gaseous Emission	Sampling Date	: 15.09.2017
Sample Collected by	: Mr. Sunil Sarkar & Team	Period of Analysis	: 16.09.2017
Sample Details	: Stack Emission	Sampling Location	: Bag Filter Stack
Name & Address	: BMA Stainless Ltd Vill. – Debipur P.O. – Kalyaneshwari Dist. – Paschim Barddhaman West Bengal, Pin No. 713369	Sample Condition	: Preserved & Sealed
		Sample Stamped as	: TH – 125
		Sample Drawn By	: ECO CARE
		Remarks	: —
		Deviation if any	: None

GENERAL INFORMATION -

1	Particular of the Plant	: Steel Plant
2	Emission Due to	: Process Activity
3	Stack Connected to	: Bag Filter at Re Heating Furnace
4	Material of Construction	: M.S.
5	Stack Height from G.L.	: 30.0 m
6	Height of Sampling Port from G.L.	: 10.5 m
7	Height of Sampling Port from L.D.Z.	: ----
8	Dimension of Stack at Sampling Port	: 2.80 m
9	Shape of the Stack	: Circular
10	Working Load	: 15 MT/heat

FUEL CHARACTERISTIC REPORT

1	Source of Energy	: Coal Bed Methane Gas
2	Energy Consumption	: 3000 MT/hr
3	Calorific Value (K-Cal/Kg)	: ----

RESULTS OF SAMPLING GASEOUS EMISSION ANALYSIS

			Method
1	Flue Gas Temperature	216 ^{0}C	IS 11255 : Part 3
2	Barometric Pressure	755 mm Hg	IS 11255 : Part 3
3	Velocity of Flue Gas	5.42 m/sec	IS 11255 : Part 3
4	Flue Gas Quantity	72794 NM^3/hr	IS 11255 : Part 3
5	Concentration of Particulate Matter	37.38 mg/NM^3	IS 11255 : Part 1
6	Concentration of Carbon Dioxide	7.8 %	IS 13270
7	Concentration of SO_2	----	IS 11255 : Part 2
8	Concentration of NO_x	----	IS 11255 : Part 7

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TEST REPORT

Report Release Date	: 20.09.2017	Sample Ref. No.(ARF)	: EC/ARF/29/170917
Test Report No	: EC/TR/42/09048	Source of Sample	: Steel Plant
Type of Sample	: Suspended Dust & Gases	Sampling Date	: 15.09.2017
Sample Collected by	: Mr. Sumit Sarkar & Team	Period of Analysis	: 16.09.17 to 18.09.17
Sample Details	: Ambient Air	Sample Condition	: Sealed & Preserved
Name & Address	: **BMA Stainless Ltd** Vill. – Debipur, P.O.– Kalyaneshwari Dist. – Paschim Barddhaman West Bengal, Pin No. 713369	Remarks Sample Drawn By Deviation if any	: ---- : ECO CARE : None

METEOROLOGICAL INFORMATION

1	Average Temperature	30.0 °C	2	Barometric Pressure	755 mm Hg
3	Average Relative Humidity	64.0 %	4	Weather Condition	Clear Day

1. Sampling Location: Rear End of the Plant (South Side)

SL NO	TESTS	PROTOCOL	RESULT
1	PM < 10 micron ($\mu g/M^3$)	IS : 5182 (Part – 23) : 2006	89.23
2	Particulate Matter $PM_{2.5}$ $\mu g/m^3$	EPA CFR- 40 (pt 50), Appendix 1	35.48
3	Sulphur Dioxide (SO_2), $\mu g/m^3$	IS : 5182 (Part – 2) : 2001	22.83
4	Nitrogen Dioxide (NO_x), $\mu g/m^3$	IS : 5182 (Part – 6) : 2006	38.30

2. Sampling Location: Near Main Gate

SL NO	TESTS	PROTOCOL	RESULT
1	PM < 10 micron ($\mu g/M^3$)	IS : 5182 (Part – 23) : 2006	72.15
2	Particulate Matter $PM_{2.5}$ $\mu g/m^3$	EPA CFR- 40 (pt 50), Appendix 1	37.91
3	Sulphur Dioxide (SO_2), $\mu g/m^3$	IS : 5182 (Part – 2) : 2001	20.08
4	Nitrogen Dioxide (NO_x), $\mu g/m^3$	IS : 5182 (Part – 6) : 2006	37.02

3. Sampling Location: Workers Colony

SL NO	TESTS	PROTOCOL	RESULT
1	PM < 10 micron ($\mu g/M^3$)	IS : 5182 (Part – 23) : 2006	76.91
2	Particulate Matter $PM_{2.5}$ $\mu g/m^3$	EPA CFR- 40 (pt 50), Appendix 1	36.33
3	Sulphur Dioxide (SO_2), $\mu g/m^3$	IS : 5182 (Part – 2) : 2001	19.17
4	Nitrogen Dioxide (NO_x), $\mu g/m^3$	IS : 5182 (Part – 6) : 2006	39.58

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Authorised Signatory

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Technical Manager

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ASANSOL-713304 (W.B.)

TEST REPORT

Report Release Date	: 20.09.2017	Sample Ref. No.(ARF)	: EC/ARF/29/170917
Test Report No	: EC/TR/42/09049	Source of Sample	: Steel Plant
Type of Sample	: Noise	Sampling Date	: 15.09.2017
Sample Collected by	: Mr. Sumit Sarkar & Team	Period of Analysis	: ----
Sample Details	: Ambient Noise	Sample Condition	: ----
Name & Address	: **BMA Stainless Ltd** Vill. – Debipur, P.O.– Kalyaneshwari Dist. – Paschim Barddhaman West Bengal, Pin No. 713369	Remarks Sample Drawn By Deviation if any	: ---- : ECO CARE : None

METEOROLOGICAL INFORMATION

1	Average Temperature (°C)	30.0
2	Average Relative Humidity (%)	64.0
3	Barometric Pressure (mm of Hg)	755
4	Weather Condition	Clear Day

AMBIENT NOISE QUALITY REPORT

Sampling Location	NOISE LEVEL		
	Minimum	Leq – Mean	Maximum
Near Main Gate	53.70 dB(A)	69.77 dB(A)	76.10 dB(A)
Near Workers Colony	47.90 dB(A)	61.84 dB(A)	67.40 dB(A)
Near End of the Plant (South Side)	64.70 dB(A)	73.38 dB(A)	77.90 dB(A)

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Authorised Signatory
Nupur Chatterjee
B. Sc. M. Sc. (Env. Sc.)
Dy. Technical Manager

BMA Stainless Ltd.

MEMORANDUM OF UNDERSTANDING FOR DISPOSAL OF MILL SCALE & BAG FILTER DUST

Memorandum of Understanding for Disposal of Mill Scale & Bag Filter Dust made on this 22nd day of September, 2017, between BMA Stainless Limited , a company incorporated under the Companies Act, 1956 and having its registered office at 21A, Shakespeare Sarani, 10th floor, Kolkata – 700017 and having manufacturing unit at P.O. Kalyaneswari, Dist. Pachim Bardhaman, West Bengal; represented by Company's authorized representative, AND M/s MAITHON ALLOY LTD. , a Company incorporated under the Companies Act, 1956 and having its Registered Office at 9, AJC BOSE ROAD, IDEAL CENTRE, 4th FLOOR, KOL -17; Represenetted by its authorized representative engaged in manufacturing Ferro Alloys product .

BMA Stainless Limited is enaged in manufacturing of TMT bars/Billets in production of such Items, also generates 'MILL SCALE & BAG FILTER DUST' as its by – product from Rolling Mill /SMS Section .

M/S MAITHAN ALLOYS LTD is engaged for manufacture Ferro Alloy products.

1. That M/s BMA Stainless Limited has approached and expressed its desire to dispose the entire quantity of Mill Scale & Bag Filter Dust for free of cost on a mutual understanding and M/s MAITHAN ALLOYS LTD. Has consented to lift the entire quantity of Mill Scale & Bag Filter Dust received from M/s BMA Stailess Limited for a period of 03 (Three years) from the date of commencement of the proposed plant.

For BMA Stainless Ltd

Authorised Signatory

For Maithan Alloys Ltd

Authorised Signatory

WITNESSES

Name : R. GANESH.

Signature:

WITNESSES

Name : R. G. Das Adhikari

Signature:

भारत सरकार/ Government of India
पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय/ Ministry of Environment, Forest & Climate Change
पूर्वी क्षेत्रीय कार्यालय/ Eastern Regional Office
ए/3 चन्द्रशेखरपुर/A/3 Chandrasekharpur,
भुवनेश्वर – 751 023/ Bhubaneswar – 751 023
Ph : 0674-2301213, 2301248, 2302452, 2302453, Fax : 2302432, E mail : roez.bsr-mef@nic.in

सत्यमेव जयते

No.102-507/EPE /813 **SPEED POST** 03-04-2018

To

Shri Sharath Kumar Pallerla, Director (S),
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan,
Jor Bagh, Aiganj,
New Delhi -110003
E mail: sharath.kr@gov.in

Sub: Examination of the reply submitted by Proposed 2x8 T Induction Furnace (Expansion Project) at Debipur PO: Kalyanshwari, Burdwan, West Bengal by M/s BMA Stainless Limited.

Ref: Ministry's EC No. J-11011/192/2013-IA II (I), dated 29.09.2014.

Sir,

I am directed to state that above project was monitored on 19.09.2017 by the undersigned. During monitoring several non-compliances have been observed. Subsequently, letter has been sent to the project proponent for taking necessary action on the non compliances observed during monitoring.

In reply of the non-compliance letter issued by this office, PAs have submitted action taken report vide letter No. MOEF/02/2017 dated 18.11.2017 which was received to this Office on dated 29.11.2017. As per action taken report, which may require to be verified in the next round of monitoring, the condition wise reply is furnished below:

SN	Conditions Stipulated
	Specific Conditions:
	As proposed, green belt shall be developed in at least 33 % of the project area. Selection of plant species shall be as per the CPCB guidelines in consultation with the DFO. **Observe made during Monitoring on 19.09.2017:** It has been found that PAs have developed partially significant green belt with indigenous species of the plants. It is required to increase green belt area up to satisfactory level i.e., 33% of the total land area. It is also requested to carry out plantation in light of the CPCB gridlines. **Reply made by Project Proponent:** Our plot area is 6.92 ha out of which 2.30 ha. *i.e.* 33% of total plot area is earmarked for greenbelt development out of which 1.5 ha has already been developed and remaining area is also under development. **Comment by Regional Office:** It has been found that PAs are in process to increase the green belt area.
vii.	**The company shall develop rain water harvesting structures to harvest the rain water for utilization in the lean season besides recharging the ground water table.**

Observe made during Monitoring on 19.09.2017:
It has been noticed that PAs have not yet developed the rain water harvesting pit on the project site. It is requested to take immediate action on the above points.

Reply made by Project Proponent:
We are harvesting Rain water at our plant. The dimension of Storage tank is 150' x 50' and 8 feet deep. We have installed this storage tank at the northern area of our land and it is also catchment area as well. (Photographs enclosed).

Comment by Regional Office:
It has been found that PAs have constructed rain water harvesting pit with a size of 150' x 50' and 8 feet deep.

ix. **At least 5 % of the total cost of the project shall be earmarked towards the Enterprise Social Commitment based on earlier Public Hearing Issues, locals need and item-wise details along with time bound action plan shall be prepared and submitted to the Ministry's Regional Office at Bhubaneswar. Implementation of such program shall be ensured by constituting a Committee comprising of the proponent, representatives of village Panchayat and District Administration. Action taken report in this regard shall be submitted to the Ministry's Regional Office at Bhubaneswar.**

&

Requisite funds shall be earmarked towards capital cost and recurring cost/annum for environment pollution control measures to implement the conditions stipulated by the Ministry of Environment, Forests and Climate Change (MoEF&CC) as well as the State Government. An implementation schedule for implementing all the conditions stipulated herein shall be submitted to the Regional Office of the Ministry at Bhubaneswar. The funds so provided shall not be diverted for any other purpose.

Observe made during Monitoring on 19.09.2017:
As stated earlier that the PAs have installed various pollution control equipments which is also found working during visit. Significant expenditure required for their maintenance. As stated they have made expenditure of Rs 16 lakh in year. Detailed information in this regard is yet to be submitted.

Reply made by Project Proponent:
An amount of Rs. 23.50 Lakhs *i.e.* 5% of Project cost has earmarked for CSR activities to be spend in 5 years (2015-2020). Till date Rs. 16 lakh has been spent for sport activities sponsored, Unprivileged Children, Blood Donation Camp, distribution of Medical Chair & Hearing Equipment and Ambulance Donated to Kulti Municipality. (CSR details with expenditure is enclosed).

Comment by Regional Office:
As per the information submitted by the Project Proponent. Expenditure incurred under CSR for year 2015-16, 2016-17 & 2017-18 which are as follows:

Project Cost: Rs. 5.06 Cr.
ESC Budget: 5% of the Project Cost = Rs. 25.3 Lakhs.

Sl. No.	Description	2015-16		2016-17		2017-18		2018-19	
		P	I	P	I	P	I	P	I
1	Road development	3.0	4.2	3.0	4.4	2.0	3.0	2.0	-
2.	Drinking water supply	0.8	1.0	0.8	0.8	0.8	0.8	8.0	-
3.	Medical facilities for local people	0.5	0.6	0.5	4.9*	0.5	0.6	0.3	-
4.	Donation in cultural activities & sports	0.1	0.3	0.1	0.4	0.1	0.2	0.1	-
5.	Development of schools	0.5	0.8	0.5	0.6	0.5	0.4	0.5	-

6.	Green Belt Development in locality	0.8	0.4	0.6	0.4	0.4	0.3	0.2	
7.	ESC Total	5.7	7.3	5.5	11.5	4.3	5.5	4.1	
* Ambulance was provided for the local people. P: Proposed; I: Incurred									

Item-wise Breakup of Management Plan

Sl. No.	Description	Capital Cost (Rs.)	
		Proposed	Incurred
1	Air pollution control system	45,00,000	46,00,000
2.	Water pollution control system	1,00,000	3,00,000
3.	Noise pollution control system	1,00,000	1,20,000
4.	Environmental Management	1,00,000	80,000
5.	Occupational health	1,00,000	1,30,000
6.	Greenbelt development	50,000	30,000
7.	Rainwater harvesting	50,000	40,000
	Total	**50,00,000**	**53,00,000**

As per the preamble of the EC Rs. 25.3 lakh is earmarked towards the entireprice social commitment based on Public Hearing issues over a period of 5 years. However, Rs. 50 lakh and Rs 53 lakh is earmarked for the capital cost and recurring cost per annum towards the environmental pollution control measures.

xi. **The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF&CC at Bhubaneshwar. The respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; PM10, SO2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.**

Observe made during Monitoring on 19.09.2017:
It has been found that PAs have not yet uploaded the EC and its compliance related information on the company website http://www.bmaind.com/steelproducts.html. It is requested to upload the EC related information on priority basis.

Reply made by Project Proponent:
We are displaying copy of the existing EC letter, six-monthly compliance and analysis reports on our company website, i.e. http://captaintmt.com/news&event.php.

Comment by Regional Office:
It has been found that PAs are uploading six monthly compliance reports along with analytical reports on the Company's website i.e. http://captaintmt.com/news&event.php.

xii. **The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF&CC, the respective Zonal Office of CPCB and the SPCB. The Regional Office of this Ministry at Bhubaneswar / CPCB / SPCB shall monitor the stipulated conditions.**

Observe made during Monitoring on 19.09.2017:
It has been found that PAs are irregular in submitting the six monthly compliance report both hard as well as in soft copy to this office. It requires immediate attention.

Reply made by Project Proponent:

	We are regularly submitting six monthly compliance reports to your office and will ensure to do so in future as well. Submission receipts of compliance reports are attached herewith as Annexure 1. **Comment by Regional Office:** It has been found that PAs have submitted half yearly compliance report for the period of April, 2017 to September, 2017 on dated 29.11.2017 to this Office.

Yours faithfully,

3/4/18

(Dr. A.K. Gupta)
Joint Director (S)

Copy to: The Director, M/s BMA Stainless Ltd., 10A, Shakespeare Court, 21A, Shakespeare Sarani, Kolkata – 700 017, for information and necessary action.

3/4/18

Joint Director (S)

Action Plan of the Public Hearing of BMA Stainless Steel

S.No.	Name and Address of Respondent	Question	Reply	Proposed Action Plan	Proposed Budget and implement period
1	ShriManojTiwari Village: kalyaneshwari	He welcomed the proposed project and requested that job opportunity be provided for the local people in the upcoming project. He also mentioned that the unit should adopt effective pollution control measures.	ShriKar stated that preference will be given to the locals in employment which will lead to improvement in the livelihood of the local people. He said he will try to work for the betterment of the localpeople.	• The company will frame policy for recruitment in which preference will be given to the local people on the basis of their merit and qualification. • Existing Bag Filter units shall be augmented to keep stack emission below 50 m g/$Nm^3$from Induction Furnace details are incorporated in Chapter 4 of EIA. • The utilization of waste water for re-use and re-cycling will be carried out. Other effluent streams such as cooling tower blow down and DM P lant regeneration will be used for slag cooling. • Rain water harvesting will be taken up as a me asure to reduce make up water requirement.	Capital Cost of EMP: Rs. 64 lakhs; Recurring Cost: 10.40 Lakhs/year. Completed within 18 months during construction of project.
2	ShriBarun Kr. Malakar Village: Sababanpur	He welcomed the proposed project and requested the project proponent to take measures taken to minimize the effect of pollution, both air and water, to be generated from the Project.	ShriArunKar,AGM, Business Development of the BMA mentioned that no process effluent will be discharged from the project.Foremission control proper emission control system comprising of bag filters of adequate design will be installed with each	• Proposed Action P lan for pollution control already discussed in **S.No.1**	Details given at **S.No.1**

S.No.	Name and Address of Respondent	Question	Reply	Proposed Action Plan	Proposed Budget and implement period
			individual induction furnace.		
3	Shri. Akshay Kr. Layek Village: Hadla	He questioned the Project Proponent regarding the source of water and the treatment of effluent discharged from the project. He also requested for the renovation of the toilets in the local school.	ShriKar Stated that no process effluent will be discharged from the project. Foremission control proper emission control system comprising of bag filters of adequate design will be installed with each individual induction furnace.Community Development measures and all local area development work will be continued and all the points raised during the public hearing will be taken care of.	• Proposed action plan for control of water pollution given in **S.No.1.** • Renovation of toilets wills we carried out.	Details given at **S.No.1** Construction of Toilets at primary school of village Hadla, Old Debipur&Salanpurwithin 6 months under ESC Program. **Budget = Rs. 3.00 Lakhs**
4	ShriTarakeshwarSaitiya Village: Salanpur	He requested the project Proponent for the development of roads in the area and to provide employment to the local people.	ShriKar stated that preference will be given to employment to the local peoplewhich will lead to improvement in the livelihood of the local people. He said he will try to work for the betterment of the people.	• Maintenance and Repairing of roads will be done under the ESC program. • The company will frame policy for recruitment in which preference will be given to local people on the basis of merit and qualification. In this regard,	Maintenance and repairing of road at village Hadla&Salanpur within 1 year under ESC Program. **Budget = Rs. 8.00 Lakhs** Organize Vocational Training center for educated youth at village Kalyaneshwari,

S.No.	Name and Address of Respondent	Question	Reply	Proposed Action Plan	Proposed Budget and implement period
				Vocational Training centre for educated youth of Kalyaneshwari, Salanpur and Hadla village as per the skill and requirement will be organized under ESC program.	Salanpur and Hadla within 6 months under ESC Program. Budget= **Rs. 8.00 Lakhs**
5	ShriManickMalakar Village: Salanpur	He stressed upon the need for employment for the local people and developmental work in the area.	ShriKar stated that preference will be in theemployment to local people. He also stated that development work in the local area will be continued and all the points raised during the public hearing will be taken care of.	• Proposed action plan for providing employment given at **S. No. 4.** • Education development in which construction of toilets in primary school of Hadla, Old Debipur&Salanpur under ESC Program. • Community development in which construction of Rain Water Harvesting System in village Kalyaneshwari, Salanpur&Hadla under ESC Program. • Infrastructure Facility in which Maintenance & Repairing of road at VillageHadla&Salanpurunder ESC Program.	Detail givens at **S. No. 4.** Construction of toilets within 6 months with Budget of **Rs. 3.00 Lakhs.** Construction of **RWH** within $1^1/_2$year with budget of **Rs. 3.00 lakhs.** Repairing of **roads** within $1^1/_2$ years with budget of **Rs. 8.00 Lakhs**
6	Mr. Mobin Khan Village: Salanpur	He requested the project Proponent to provide the employment to the local people and to provide	ShriKar stated that preference will be given to the locals in employment He said he will try to work for the betterment of the people. He	• Proposed action plan for providing employment given at **S. No. 4** • Health Check- up camp will be organize in village Salanpur, Hadla,	Detail givens at **S. No. 4.** Under Health Care Program ambulance

S.No.	Name and Address of Respondent	Question	Reply	Proposed Action Plan	Proposed Budget and implement period
		ambulance as a p art of CSR program. He also mentioned about the need for plantation and development of the infrastructure in local schools.	also stated that local area development work will be continued and all the points raised during the public hearing will be taken care of.	Dendua&Kalyaneshwari and ambulance facility provide in village Salanpur&Hadla under ESC Program. • Green Belt will be developed over 33% of the plant area. Indigenous trees will be planted in three tire plantation system	facility provided within 8 months in village Salanpur&Hadlaunder ESC Program with Budget of **Rs. 10.00 lakhs.** Greenbelt development completed within 6 months under EMP with budget of Rs. 5.00 Lakhs
7	Sri N aba Kr. Garai Village: Salanpur	He welcomed the proposed project	Management team thanked for supporting the expansion of the plant.	NIL	
8	Shri Bharat Chandra Mondal Village: Sitaramarhi	He welcomed the proposed project	Management team thanked for supporting the expansion of the plant.	NIL	
9	ShriNilandrikar makar Village: Neamatpur	He welcomed the proposed project	Management team thanked for supporting the expansion of the plant.	**NIL**	
10	ShriTapanSark ar, BDO, Salanpur	He welcomed the proposed project. He expressed the hope that local employment	ShriKar stated that preference will be given to local employment generation which will lead to	• Proposed action plan for providing employment given at **Sl. No. 4.**	Detail givens at **S. No. 4**

S.No.	Name and Address of Respondent	Question	Reply	Proposed Action Plan	Proposed Budget and implement period
		opportunity will be generated as a result of the upcoming project which will lead to socio economic development of the area. He also requested the project proponent to take necessary steps for abatement of pollution resulting from the project.	improvement in the livelihood of the local people. He said he will try to work for the betterment of the people. He also stated that local area development work will be continued and all the points raised during the public hearing will be taken care of. ShriArunKar, AGM, Business Development of the BMA welcomed the audience, He mentioned that no process effluent will be discharged from the project for emission control proper emission control system comprising of bag filters of adequate design will be installed for each individual induction furnace.	• Proper action plan for development work is given at **S.No.5.** • Proposed Action P lan for pollution control already discussed in **S.No.1**	Detail givens at **S. No. 5** Detail givens at **S. No. 1**
11	ShriKaushikMukherjee, DMDC & OC, JM,	He welcomed the proposal,especially regarding community outreach programs conducted by the industry as also the mitigative measures taken for minimization	ShriArunKar, AGM, Business Development of the BMA welcomed the audience; he mentioned that no process effluent will be discharged from the project. For emission control proper emission control system	• Proposed Action P lan for pollution control already discussed in **S.No.1**	Detail givens at **S. No. 1**

S.No.	Name and Address of Respondent	Question	Reply	Proposed Action Plan	Proposed Budget and implement period
		of the impact of the pollution. He requested the project proponent to plant more trees both inside and outside the plant premises and also to distribute tree sampling among the people in the locality. He requested the project proponent to create employment generation for the benefit of the local people. He thanked the audience for their active participation in the public hearing and voicing theiropinion regarding the proposed project. He then finally concluded the meeting.	comprising of bag filters of adequate design will be installed for each individual induction furnace. ShriKar stated that preference will be given to locals in employment which will lead to improvement in the livelihood of the local people. He said he will try to work for the betterment of the people. He also stated that local area development work will be continued and all the points raised during the public hearing will be taken care of.	• Proposed action plan for providing employment given at **S. No. 4.** • Proper action plan for development work is given at **S.No.5.**	Detail givens at **S. No. 4** Detail givens at **S. No. 5**