SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

OF

Hanumant Alloys (India) Pvt. Ltd.

[Expansion of Sponge Iron Plant - Additional Increase in existing 50 TPD DRI Kiln Sponge Iron production from 15,000 TPA to 16,500 TPA by Increase in the no. of days from 300 to 330 days and establishment of new DRI Kiln (1 x 125 TPD = 41,250 TPA) for total production of 57,750 TPA Sponge Iron]

at

Plot No. 657, Silpahari Industrial Area, Village Hardikala,
Tehsil Bilha, District Bilaspur, Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD
Raipur [C.G.]

1.0 PROJECT DESCRIPTION

Hanumant Alloys (India) Pvt. Ltd. is an existing plant site is located at Plot No. 657, Silpahari Industrial Area, Village Hardikala, Tehsil Bilha, District Bilaspur, Chhattisgarh. Existing plant is operating with Consent to Operate (CTO) issued by CECB vide no. 8105 / TS / CECB / 2020 valid till 30-11-2021.

Now it is proposed to increase existing 50 TPD DRI Kiln Sponge Iron production from 15,000 TPA to 16,500 TPA by Increase in the no. of days from 300 to 330 days and establishment of new DRI Kiln (1 x 125 TPD) for production of 41,250 TPA Sponge Iron in the existing plant premises at Plot No. 657, Silpahari Industrial Area, Village Hardikala, Tehsil Bilha, District Bilaspur, Chhattisgarh.

Existing plant is located in 3.95 Ha. / 9.76 acres of land and proposed expansion will be taken up in the existing plant premises only.

As per the Ministry of Environment, Forest & Climate Change, New Delhi, EIA notification dated 14thSeptember, 2006 & its subsequent amendments, all the Sponge Iron units (< 200 TPD) &non –toxic secondary metallurgical processing industries are falling under Sl. No. 3 (a), classified as Category 'B' for the grant of Environmental Clearance at State Level.The State Expert Appraisal Committee (SEAC), Chhattisgarh has accorded Terms of Reference (TOR) for the proposed project vide letterNo. 1072 / SEACCG / Plant / 881 dated 19th November, 2019.

Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad, which is accredited by NABET, Quality Council of India, for preparing EIA report for Metallurgical Unit, have prepared Environmental Impact Assessment (EIA) report for the proposed projectby incorporating the TOR approved by Ministry of Environment, Forests& Climate Change, New Delhi. The report contains detailed description of the following:

- Characterization of status of environment with in an area of 10 km radius from the plant for major environmental components including air, water, noise, soil, flora, fauna and socio-economic environment.
- Assessment of air emissions, liquid waste and solid waste from the proposed project along with the noise level assessment.

- Environmental Management Plan comprising of emission control measures proposed to be adopted in the proposed project, solid waste management, Greenbelt development.
- Post Project Environmental Monitoring& Budget for Environmental Protection Measures.

1.1 Environmental Setting Within 10 Km. Radius of the Plant Site

Table No. 11.1.2: Environment setting within 10 Kms. radius of the plant site

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Industrial Land
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Industrial Area-3.6 %, Tank / River – 8.9 %, Single crop – 47.3 %, Double crop – 11.3%, Plantation – 3.9 %, Settlements / Aero Drome – 14.7%, Land with scrub – 5.7%, Land without scrub – 2.2 %, Sheet rock area – 1.1%, Stone quarry – 1.3%
3.	National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	Nil
4.	Historical places / Places of Tourist importance / Archeological sites	Nil
5.	Industrial areas / cluster (MoEF&CC Office Memorandum dated 13thJanuary 2010) &its subsequent amendments and NGT order vide dt. 10th July 2019	Nil
6.	Defence Installations	Nil
7.	Nearest village	Kormi Village – 0.8 Kms.
8.	No. of Villages in the Study Area	48
9.	Nearest Hospital	Silpahari – 1.4 Kms. (SE)
10.	Nearest School	Silpahari – 1.4 kms. (SE)
11.	Forests	No reserve forests within 10 Km radius
12.	Water body	Arpa river (4.8 Kms.) & Gokenah nallah (0.5 Kms.) are present with in 10 Km. radius of the plant site.
13.	Nearest Highway	NH # 200 is passing at distance of 3.6 Kms. (by aerial) of the plant site
14.	Nearest Railway Station	Nearest Railway Station is Bilaspur, at a distance of 4.4 Kms. (by aerial) from the plant site
15.	Nearest Port facility	Nil

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
16.	Nearest Airport	Nil
17.	Nearest Interstate Boundary	Nil
18.	Seismic zoneas per IS-1893	Seismic zone – II
19.	R & R	There is no rehabilitation and resettlement issue, as the proposed expansion project will be taken up in the existing plant premises only.
20.	Litigation / court case is pending against the proposed project / proposed site and or any direction passed by the court of law against the project	Nil

1.2 Plant Configuration and Production Capacity

The following are the existing &proposed products & their production capacities.

Table No. 11.1.3: Plant Configuration and Production Capacity

S.No.	Unit (Product)	Existing Plant	Proposed Expansion	Total (After proposed expansion)
1.	DRI Kiln (Sponge Iron)	1 x 50 TPD (15,000 TPA)	1 x 50 TPD (15,000 TPA to 16,500 TPA by increase in the no. of days from 300 to 330 days)	1 x 50 TPD (15,000 TPA to 16,500 TPA by increase in the no. of days from 300 to 330 days)
			1 x 125 TPD (41,250 TPA)	1 x 125 TPD (41,250 TPA)
			Total Production = 57,750 TPA	Total Production = 57,750 TPA

1.3 Raw MaterialsRequirement

The following will be the raw material requirement for the proposed expansion project:

Table No. 11.1.4: Raw Material Requirement [for Expansion Project]

S.No.	Raw Material		Quantity (TPA)	Source	Mode of Transport
For DRI Kiln (Sponge Iron) – 41,250 TPA					
1.	Iron Ore		66,000	NMDC, Bailadila/ Bachheli	By rail & road (through covered trucks)
2.	Coal	Indian Coal	53,625	SECL, Chhattisgarh /MCL Odisha	By rail & road (through covered trucks)
		Imported Coal	37,125	Indonesia / South Africa / Australia	Through sea route, rail route & by road
3.	Dolomite		2,000	Local Area	By road (through covered trucks)

S.No.	Raw Material		Quantity (TPA)	Source	Mode of Transport
For DRI Kiln (Sponge Iron) – 16,500 TPA					
1.	Iron Ore		26,400	NMDC, Bailadila/ Bachheli	By rail & road (through covered trucks)
2.	Coal	Indian Coal	21,450	SECL, Chhattisgarh /MCL Odisha	By rail & road (through covered trucks)
		Imported Coal	14,850	Indonesia / South Africa / Australia	Through sea route, rail route & by road
3.	Dolomite		825	Local Area	By road (through covered trucks)

1.4 Manufacturing Process

1.4.1 Sponge Iron (DRI)

Refractory lined rotary kilns will be used for reduction of iron ore in solid state. A central Burner located at the discharge end will be used for initial heating of the kiln.

Iron ore will be continuously fed into the kiln along with coal which has dual role of fuel as well as reductant. Dolomite will be added to scavenge the sulphur from the coal. A number of air tubes will be provided along the length of the kiln. The desired temperature profile will be maintained by controlling the volume of the combustion air through these tubes. The Carbon monoxide generated due to the combustion of coal, reduces the iron ore and converts it into sponge iron. The rotary kiln is primarily divided into two zones viz. the pre heating zone and the reduction zone. The preheating zone extends over 30 to 50 % of the length of the kiln and in this the moisture in the charge will be driven off and the volatile matter in the coal will be burnt with the combustion air supplied through the air tubes. Heat from the combustion raises the temperature of the lining and the bed surface. As the kiln rotates, the lining transfers the heat to the charge. Charge material, pre-heated to about 1000^0C enters the reduction zone. Temperature of the order of 1050^0C will be maintained in the reduction zone, which is the appropriate temperature for solid state reduction of iron oxide to metallic iron.

This hot material will be transferred to Heat exchanger. In Heat exchanger the material will be cooled to 160^0C. The cooler discharge material consists of sponge iron lumps, sponge iron fines and char. Magnetic and non-magnetic material will be separated through magnetic separators and stored in separate bins. The hot flue gases will be taken to a Waste

Heat Recovery Boilers and after heat recovery they will be treated in high efficiency ESP and discharged into the atmosphere through stack whose height will be in accordance with CPCB norms.

1.5 Water Requirement

Water required in the existing plant is 20 KLD and same is being sourced from Ground Water. Water required for the proposed expansion project will be 40 KLD and same will be supplied by CSIDC Limited. Letter from CSIDC is issued confirming supply of water for proposed expansion proposal vide letter No. CSIDC/ Division – 1/ 2020 – 21/ 18521 dated: 19.03.2021 and same is enclosed as **Annexure - 2**. This includes make up water for DRI Kilns and for domestic consumption. Total water requirement after the proposed expansion will be 60 KLD.

Table No. 11.1.5:Water Requirement (entire plant)

S.No.	Water requirement	Quantity in KLD		
		Existing	Proposed	Total after Expansion
1.	DRI Kilns	15	35	50
2.	Domestic	5	5	10
	Total	**20**	**40**	**60**

1.6 Waste Water Generation& its management

Existing

- There is no effluent discharge from the Existing DRI plant as closed-circuit cooling system is being adopted.
- Only wastewater is sanitary wastewater, which is being treated in Septic tank followed by Soak pit.
- Zero Discharge is being maintained in the existing plant.

Proposed

- There will be no effluent discharge from the proposed DRI plant as closed-circuit cooling system will be adopted.
- Sanitary waste water will be treated in proposed STP.
- Zero Liquid effluent Discharge will be maintained in the in the proposed expansion also.

Table No.11.1.6: Wastewater Generation breakup

S.No.	Wastewater generation from	Quantity in KLD		
		Existing	Proposed	Total after Expansion
1.	Sanitary Wastewater	4	4	8
	Total	**4**	**4**	**8**

1.7 Wastewater Characteristics

The following are the characteristics of effluent

Table No. 11.1.7: Characteristics of Effluent

PARAMETER	CONCENTRATION
	Sanitary waste water
pH	7.0 – 8.5
BOD (mg/l)	200 – 250
COD (mg/l)	300 – 400
TDS (mg/l)	800 – 900
Oil & Grease (mg/l)	--

2.0 DESCRIPTION OF ENVIRONMENT

Base line data has been collected on ambient air quality, water quality, noise levels, flora and fauna and socio-economic details of people within 10 km radius of the plant.

2.1 Ambient air quality

Ambient air quality was monitored for $PM_{2.5}$, PM_{10}, SO_2, NOx& CO at 8 stations including project site duringOctober, 2020 to December, 2020. The following are the concentrations of various parameters at the monitoring stations:

Table No.11.2.1 : AAQ Data Summary

S.No.	Parameter		Concentration
1.	$PM_{2.5}$	:	22.1 to 38.9 $\mu g/m^3$
2.	PM_{10}	:	36.5 to 64.8 $\mu g/m^3$
3.	SO_2	:	10.1 to 16.2 $\mu g/m^3$
4.	NO_X	:	12.6 to 21.2 $\mu g/m^3$
5.	CO	:	515 to 1105 $\mu g/m^3$

2.2 Water Quality

2.2.1 Surface Water Quality

Arpa River and Gokena Nallah are flowing at 4.7 Kms. & 0.4 Kms. respectively from the plant site. 2 nos. of samples has been collected from 60m Upstream & 60 m Downstream of Gokena nallah & Arpa River and analyzed for various parameters. The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

2.2.2 Ground Water Quality

8No. of ground water samples from open wells / bore wells were collected from the nearby villages to assess ground water quality impactsand analyzed for various Physico-Chemical parameters. The analysis of samples shows that all the parameters are in accordance withBIS: 10500specifications.

2.3 Noise Levels

Noise levels were measured at 8 locations during day time & Night time. The noise levels at the monitoring stations are ranging from 47.00 dBA to 68.57 dBA**.**

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

3.1 Prediction of impacts on air quality

The likely emissions from the proposed expansion project are PM_{10}, SO_2, NOx& CO. The predictions of Ground level concentrations have been carried out using Industrial Source Complex (ISC-3) model. Meteorological data such as wind direction, wind speed, max. and min. temperatures collected at the site have been used as input data to run the model.

The predicted max. Incremental PM_{10} concentrations (24 hourly) due to the emissions from operation of proposed expansion projectwill be **0.23 μg/m^3**at a distance of 1120 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in PM concentration due to the Vehicular emission will be **0.05 μg/m^3**.

Hence the total predicted incremental rise due to the emissions from operation of proposed expansionproject and due the vehicular emission will be **0.23 μg/m^3 + 0.05 μg/m^3 = 0.28 μg/m^3.**

The predicted max incremental SO_2 concentrations (24 hourly) due to the emissions from operation of proposed expansion projectwill be **8.04 µg/m^3** at a distance of 1120 m from the stack in the down wind direction over the baseline concentrations.

The predicted max incremental NOx concentrations (24 hourly) due to the emissions from operation of proposed expansion project will be **1.23µg/m^3** at a distance of 1120 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in NOx concentration due to the Vehicular emission will be **0.52 µg/m^3**.

Hence the total predicted incremental rise due to the emissions from operation of proposed expansion projectand due the vehicular emission will be**1.23 µg/m^3 + 0.52µg/m^3 = 1.75 µg/m^3**

The predicted incremental rise in CO concentration due to the Vehicular emission will be **0.37 µg/m^3**.

Table No. 11.3.1 Net Resultant maximum concentrations due to the proposedexpansion project

Item	PM_{10} (µg/m^3)	SO_2 (µg/m^3)	NO_x (µg/m^3)	CO (µg/m^3)
Maximum baseline conc. in the study area	64.8	16.2	21.2	1105
Maximum predicted incremental rise in concentration due to **the proposed expansion Project**	0.23	8.04	1.23	Nil
Maximum predicted incremental rise in concentration due to **Vehicular Emissions from the proposed expansion project**	0.05	Nil	0.52	0.37
Net resultant concentrations during operation of the proposed expansion project	**65.08**	**24.24**	**22.95**	**1105.37**
National Ambient Air Quality Standards	**100**	**80**	**80**	**2000**

The predicted results show that the net resultant concentration (max. baseline conc. + max. incremental rise in conc.) of PM_{10}, SO_2, NOx& CO will be well within the National Ambient Air Quality Standards after commissioning of proposed expansion project. Hence there will not be any adverse impact on air environment due to the proposed expansionproject.

3.2 Prediction of impacts on Noise quality

The major sources of noise generation in the proposed expansion project will be Rotary Kilns, compressors, DG set, etc. Acoustic enclosures will be provided. The ambient noise levels will be within the standards prescribed by MoEF vide notification dated 14-02-2000 under the Noise Pollution (Regulation & Control), Rules 2000 i.e. the noise levels will be less than 75 dBA during day time and less than 70 dBA during night time. 3.25 Acresof extensive greenbelt will be developed to further attenuate the noise levels. Hence there will not be any adverse impact due to noise on population in surrounding areas due to the proposed expansion project.

3.3 Prediction of impacts on Water Environment

Existing

- There is no effluent discharge from the Existing DRI plant as closed-circuit cooling system is being adopted.
- Only wastewater is sanitary wastewater, which is being treated in Septic tank followed by Soak pit.
- Zero Discharge is being maintained in the existing plant.

Proposed

- There will be no effluent discharge from the proposed DRI plant as closed-circuit cooling system will be adopted.
- Sanitary waste water will be treated in proposed STP.

3.4 Prediction of Impacts on Land Environment

Zero effluent discharge will be adopted. All the required air pollution control systems will be provided to comply with CPCB/SPCB norms. All solid wastes will be disposed / utilized as per CPCB/SPCB norms.3.25 Acresof greenbelt is maintained as per guidelines. Hence there will not be any adverse impact on land environment due to the proposed expansion project.

3.5 Prediction of Impacts on Biological Environment

- There are no National Parks, Wild life Sanctuaries and Bird Sanctuaries within 10 Km. radius of the plant site.

- All the required Air emissions control systems in the expansion project will be installed and operated to comply with MoEF&CC/CPCB/CECB norms.
- Zero liquid effluent discharge is being maintained in the existing plant and similar practice will be maintained after expansion also.
- All solid waste disposal will be in accordance with the norms.
- 3.25 Acresof greenbelt is maintained in the plant premises.

When all norms are complied and with proper implementation of Environment ManagementPlan, there will not be any adverse impact on flora & Fauna due to the proposed expansion.

3.6 Socio - Economic Environment

There will be lot of opportunities in employment to local people during construction as well as in operation phase. There will be further upliftment in Socio Economic status of the people in the area. Hence there will be further development of the area due to the proposed expansion project.

4.0 ENVIRONMENTAL MONITORING PROGRAMME

Post project monitoring will be conducted as per the guidelines of SPCB and MoEF&CC are tabulated below:

Table No. 11.4.1: MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
1. Water &Waste water quality				
A.	Water quality in the area	Quarterly basis	Composite sampling (24 hourly)	As per IS: 10500
B.	Sanitary waste water	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules1996
2. Air Quality				
A.	Stack Monitoring	Online monitors CEMS	Continuous	PM
		Once in a month		PM, SO_2 & NOx
B.	Ambient Air quality	Once in a month	24 hours continuously	$PM_{2.5}$, PM_{10}, SO_2& NOx
C.	Fugitive emissions	Quarterly basis	8 hours	PM
3. Meteorological Data				

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
4. Noise level monitoring				
	Ambient Noise levels	Twice in a year	Continuous for 24 hours with 1-hour interval	Noise levels

5.0 ADDITIONAL STUDIES

There will not be any additional land procurement for the proposed expansion project. The expansion project will be taken up in the existing plant premises only. Hence no R & R study has been carried out.

6.0 PROJECT BENEFITS

With the establishment of the proposed expansion project employment potential will increase. Land prices in the area will increase. The economic status of the people in the area will improve due to the proposed project. Top priority will be given to locals in employment. A separate budget will be allocated for socio economic activities which will be implemented in the nearby villages.These activities will help in contributing to the development of villages in the nearby areas.

7.0 ENVIRONMENT MANAGEMENT PLAN

7.1 Air Environment

The following are air emission control systems proposed in the proposed expansion project:

Table No.11.7.1: Air Emission Control Systems Proposed (Proposed)

S.No.	Source	Control Equipment	Particulate emission at the outlet
1.	DRI kiln	Electro Static Precipitators (ESP)	<30 mg/Nm^3

Note : Apart from the above Fume extraction system with bagfilters, dust suppression system, covered conveyers etc. will also be installed

The following air pollution control systems/ measures are proposed in the Plant:

- All conveyors will be completely covered with G.I. sheets to control fugitive dust.

- All bins will be totally packed and covered so that there will not be any chance for dust leakage.
- All the dust prone points material handling systems will be connected with de-dusting system with bag filters.
- All discharge points and feed points, wherever the possibility of dust generation is there a de-dusting suction point will be provided to collect the dust.
- The flue gases from the DRI kiln will be treated in High efficiency ESP to bring down the particulate emission in the exhaust gases to below 30 mg/Nm^3 and then discharged into the atmosphere througha stackof 70 m height.

7.2 Water Environment

Existing

- There is no effluent discharge from the Existing DRI plant as closed-circuit cooling system is being adopted.
- Only wastewater is sanitary wastewater, which is being treated in Septic tank followed by Soak pit.
- Zero Discharge is being maintained in the existing plant.

Proposed

- There will be no effluent discharge from the proposed DRI plant as closed-circuit cooling system will be adopted.
- Sanitary waste water will be treated in proposed STP.

7.3 Noise Environment

The major sources of noise generation in the proposed expansion project will be Rotary Kiln, compressors, DG set, etc. Acoustic enclosure will be provided.All the machinery will be manufactured in accordance with MoEF&CC norms on Noise levels. The employees working near the noise generating sources will be provided with earplugs. The extensive greenbelt development proposed within the plant premises will help in attenuating the noise levels further. Noise barriers in the form of trees are recommended to be grown around administrative block and other utility units.

7.4 Land Environment

Proposed expansionproject will maintain Zero effluent discharge and closed-circuit cooling system will be implemented. All the required Air emission control systems will be installed and operated to comply with SPCB norms. Solid wastes will be disposed off as per norms. Extensive greenbelt will be developed in the plant premises. Desirable beautification and landscaping practices will be followed. Hence there will not be any impact due to the proposedexpansion project.

Table No.11.7.2: Solid Waste Generation & Method of Disposal

S.No.	Waste	Quantity (TPD)		Method of disposal
		Existing	Proposed	
1	Ash from DRI	9.0	23.0	Is being given to Brick manufacturers [i.e. M/s. Chhabra Marble & Tiles Industries] and the same practice will be continued after expansion also.
2	Dolochar	15.0	38.0	Is being given to M/s Nutan Ispat & Power Pvt. Ltd. for power generation and after expansion same practice will be continued.
3	Kiln Accretion Slag	0.45	1.1	Is being used in road / civil construction & being given to Road contractor [i.e. M/s. Khetan Buildcon Pvt. Ltd.) and same practice will be continued after the proposed expansion also.
4	Wet scrapper sludge	2.3	6.0	Is being used in road / civil construction & being given to Road contractor [i.e. M/s. Khetan Buildcon Pvt. Ltd.) and same practice will be continued after the proposed expansion also.

7.5 Greenbelt Development

3.25 Acres of Greenbelt inclusive of existing greenbelt will be developed in the plant premises. 15 to 42 m wide greenbelt is being developed all around the plant.

7.6 Cost for Environmental Protection

Capital cost for environment protection : Rs. 3.60 Crores

Recurring Cost per annum for Environmental protection : Rs.75.0 Lakhs/annum