EXECUTIVE SUMMARY

1.0 INTRODUCTION

Steel is essential to our society. As a permanent material which can be recycled over and over again without losing its properties, steel is also fundamental to a successful circular economy. The quantum of steel consumption is considered as an index of industrial prosperity. Since the independence there has been a substantial growth in the steel sector in India, due to an increasing demand for steel in industrial, housing and construction sector.

For the production of steel, the basic raw material required is iron ore and the state of Karnataka is having abundant quantity of iron ore fines, which almost contribute to 60-70% of the total iron ore reserves of the state. The good quality iron ore (more than 63% Fe Content) is being mined, for the past 15-20 years and the availability of this, is becoming scarce. To make effective utilization of the lower grade iron ores (i.e. with less than 60% Fe Content), which is abundantly available, it is necessary to process the same from lower grade to higher grade, by using suitable and proven techniques

Manganese Ore is also abundantly available in Karnataka Region. Similar to iron ore, high grade Manganese Ore reserves are also depleted over the years. Now-a-days, low grade manganese ore is available at a throw-away price. By way of suitable processing, it can be made as a marketable product. Beneficiation, is one such process, which converts the lower grade ore into a higher grade, thereby increasing its market value. Establishment of these units, will generate employment for the local youth and helps in augmenting the overall economy of the state/ country.

Considering these aspects, M/s. Sri Channakeshava Industries, a Registered Partnership Firm, under Indian Partnership Act 1932, is proposing to establish a 100 Tons per Hour (TPH) Capacity Mineral Beneficiation Plant, to beneficiate of 4,80,000 Tons per Annum (TPA) of low grade Iron ore and 15,000 TPA of low grade Manganese ore, in an industrially converted land bearing Sy. No. 116P1 (P), 117 & 106 of Dharmapura Village, in Sandur Taluk of Ballari District.

M/s Sri Channakeshava Industries, has been promoted by well-known mining company viz. M/s HRG Group, initiated by veteran in iron ore mining industry, Shri. H G Rangan Goud, whose family has been into mining business since 1950. The promoter has vast business experience of steel industry owing to his exposure to mining business. The HRG Group owns mining lease of Iron Ore, Quartz and other minerals in the State of Karnataka and Telengana.

As per EIA Notification 2006 (incl. various amendments from time to time) issued by the Ministry of Environment, Forests & Climate Change (MoEFCC), Govt. of India, the Proponents (M/s Sri. Channakeshava Industries) have applied for Environmental Clearance and have obtained the Terms of Reference (ToR) from State level Environment Impact Assessment Authority (SEIAA), Karnataka, vide No. SEIAA 05

IND 2021, dated 01st July 2021 and have prepared Draft Environmental Impact Assessment (EIA) report for the proposed Project.

Present summary is of the EIA report as per TOR and has been prepared as per generic structure given in Appendix III of EIA notification 2006 by MOEF & CC. The summary of the report is presented below:

2.0 PROJECT SITE DETAILS

- M/s Sri Channakeshava Industries, has identified an extent of 10.90 Acres of Patta Land, for the proposed Iron Ore/ Manganese Ore Beneficiation Plant Project.
- The proposed project site is located in Dharmapura village, and is about 4-5 km towards SE side of Sandur Town, in Bellary District, Karnataka
- The site is approachable from Bellary-Kudligi Bypass Road, at a distance of about 0.30 km.
- Nearest habitation from the proposed project site is Dharmapura, at a distance of 1.50 km from the project site.
- The nearest urban area to the project site is Sandur Town, at about 4-5 km, which has all necessary social infrastructural facilities like railway station, bus station, hospitals, educational institutions, banks, post office, police station, fire station, hotels and, restaurants, etc. The nearest railway facility is at Bannihatti, about 12 km and the nearest airport is at Vidyanagar (Toranagallu), which is about 25 km to the proposed project site
- Presently, the land is a barren land, with jungle trees and bushes. It will be transformed into industrial land. The proposed land is having some operating industrial units, iron ore mines etc., within close proximity.

3.0 DETAILS ABOUT THE PROJECT

3.1 Cost of the Project:

The total cost of the proposed Iron Ore/ Manganese Ore Beneficiation Plant project is estimated as Rs. 14.25 Crores, of which approx. 1.50 crores is towards the pollution control.

3.2 Raw Materials Requirement

The following will be the raw material requirement in the proposed plant

Raw materials	Quantity	Source
Low Grade Iron Ore	4,80,000 TPA	Through E-Auction
Low Grade Mn Ore	15,000 TPA	Through E-Auction

The material balance is furnished below:

Input		**Output**	
Material	Quantity, t/yr	Material	Quantity, t/yr
Iron Ore Beneficiation			
Low grade iron ore	4,00,000	Beneficiated Ore	3,36,000
		Tailings	1,44,000
Total	**600,000**	**Total**	**4,80,000**

Manganese Ore Beneficiation			
Low Grade Mn Ore	15,000	Beneficiated Ore	10,500
		Tailings	4,500
Total	**15,000**	**Total**	**15,000**

3.3 Description of Mineral Beneficiation Process:

The main plant facilities proposed to be established in the project include raw material receipt and storage, weigh-bridge, crushing of the ore in the crusher(s) followed by screening, washing of iron ore fines in a wet scrubber & wet screening, followed by grinding in a ball mill, hydro-cyclones, Spiral Classifiers, thickeners, filter press and storage of concentrate/ tailings. To utilize the tailings, it is proposed to convert them into bricks or will be sold to cement plants, in the region.

Raw Material Handling: The low-grade iron ore/ manganese ore/ BHQ etc, will be procured through E- Auction and will be brought to the plant site, by road, in tipper trucks. The trucks will be weighed on a weighbridge, located within the premise. It is proposed to provide 10 days stock of low grade ore fines and 20 days stock of produced concentrate. The low grade iron ore will be reclaimed by a pay loader and will be dumped into a ground hopper. From there, a covered conveyor carries the low grade ore into the primary crusher, for crushing to the required size.

Ore Crushing & Screening: The low grade ore will be fed into the Primary Crusher followed by Secondary Crusher, wherein the ore will be crushed to the size below 10mm. After crushing, the crushed ore will be sent to segregating screen, where +10mm ore will be separated and sent back to the secondary crusher. The smaller size (-10mm) will be sent to an intermediate bunker, for further processing.

Vertical Wet Scrubber: The Vertical Wet Scrubber, offers several tangible benefits including primary attrition to liberate bonded clay and fines. There is a Wet Screen, which has spray jets to improve overall screening efficiency. The unit works as a Rinser, removing the liberated fines from -10 to +5mm efficiency. This stage gives us our first product on to the stockpile, with an average Fe Content of 60%+. If incase the grade is lower than 60% Fe, provision for jigging of the material grade improvement is proposed. The jig tails are crushed to -5 mm and fed to ball mill for grinding.

Ball Mill: The -5mm size material will be fed to a ball mill, wherein the ore gets ground to approximately 200 microns size with maximum 1 mm size. The ground material will be sent to the series of Hydro-Cyclones, comprising 5" Hydro-Cyclone and 10" Hydro-Cyclone.

Hydro-Cyclones: The ground (grinded) material will be subjected to gravity concentration at moderately low % solids, called de-sliming using hydro-cyclones, producing a high grade concentrate. In this process, the material passes through a 10" primary hydrocyclone and the concentrate collected at the bottom will be sent to the next process. The lighter material collected at the top, called intermediate tailings or 10" cyclone overflow will be sent to a 5" secondary hydrocyclone, where further

recovery of the concentrate is possible from its underflow. The tailings collected at the top of the 5" hydrocyclone, called final tailings, will be sent to a thickener, for water recovery. The ground (grinded) material will be subjected to gravity concentration at moderately low % solids, called de-sliming using hydro-cyclones, producing a high grade concentrate. In this process, the material passes through a 10" primary hydrocyclone and the concentrate collected at the bottom will be sent to the next process. The lighter material collected at the top, called intermediate tailings or 10" cyclone overflow will be sent to a5" secondary hydrocyclone, where further recovery of the concentrate is possible from its underflow. The tailings collected atthe top of the 5" hydrocyclone, called final tailings, will be sent to a thickener, for water recovery.

Spiral concentrators: After de-sliming in the hydro-cyclones, the upper materials will be sent to a battery of spiral concentrtors for further recovery of any concentrate. The heavier material, i.e. concentrate recovered after spiral concentrators will be sent to a concentrate thickener.

Thickening and Filtration Units: The concentrate will be pumped into a concentrate thickener where the solid content will be increased to 65%. The thickened slurry will be pumped into a slurry storage tank and from the tank to distributors ranging above the filtrate. Excess slurry from distributors will flow back to thickener. The slurry is dewatered to a moisture content of 9-9.5%. Each filter is equipped with the vacuum pump for producing a necessary vacuum. The pump sucks moisture of air and filter water from the filters via a double stage vacuum receiver system where air and filter water are separated. The filter cake from disc filters is blown out by compressed air. The tailing from the de-sliming screen, hydro-cyclone and bins is taken into tailing thickener where the solid contents are increased to 50%.

Disposal of Tailings: From the quality of the iron ore available in the region and based on the recovery pattern of similar plants working in the area, it is expected to recover 70-75% of the feed material, as a concentrate. The balance I.e. 25-30%, will be disposed of, in the form of tailings with a plan for their filtration. It is proposed to utilize these tailings for brick manufacture, at a later stage of the project. Also, it is proposed to sell these tailings, to nearby cement plants, in the region. However, a space provision has been made in the Plant Layout, to store the tailings in the designated tailing ponds, within the plant area only. In dewatering, the water recovery is ~ 90%. Similar results are expected while treating sub grade manganese ores of the region.

3.4 Water requirement

500 KLD water will be required for the proposed plant and is proposed to draw from the Bore wells proposed within the identified project site. The water will be drawn and stored in a Tank and Pumped to the relevant units. In the unlikely event of a power failure an overhead tank of sufficient height & capacity has been proposed to ensure non– stop water supply to the system. The water from the thickener, de-sliming screen, cooling towers etc., will be collected in the settling tank and the overflow flows into the next tank, from where it will be pumped back, for recycling. Also, there will be a requirement of 4.5-5.0 KLD of water to meet the drinking & sanitation needs of

employees and for gardening. The wastewater from the toilets will be diverted into a septic tank, followed by soak pit. Good hygienic conditions will be maintained. Considering the availability of ground water, the topography of the project site, amount of annual rainfall, etc. it is proposed to undertake rain water harvesting and recharge ground water by way of building check dams, percolation pits, etc. to ensure a perennial source of water.

3.5 Power

The estimated power load for the plant is found to be around 700 Kw. Capacitors will be installed to improve the Power factor to 0.9 as per statutory requirements. To ensure continuous & uninterrupted power supply to the beneficiation plant, a provision has been made for the installation of the electricity power line from the nearest substation of Gulbarga Electricity Supply Company Limited (GESCOM), and also provision has been made for 2 D.G Sets of 250 kVA capacity, to meet the emergency power requirements

3.6 Manpower

The total manpower requirement during plant operation will be 46 personnel including personnel at all levels. Local people will be employed to the maximum extent possible for skilled and unskilled categories.

3.8 Land requirement

The project proponents have already identified a land of 10.90 Acres in Dharmapura village in Sandur Taluk of Bellary District. The land has already been converted as Industrial Land. The land utilization plan is given in the Table below:

#	Description	Area (Acres)	Percentage
1	Water Storage Area	0.65	6.25%
2	Raw Material Storage Area	1.25	12.02%
3	Actual Plant Area	1.50	14.42%
4	Tailings Storage Area	1.50	14.42%
5	Concentrate Storage Area	1.00	9.62%
6	Auxiliary Buildings	0.50	4.81%
7	Roads & Drains	0.50	4.81%
8	Greenery Area	3.50	33.65%
TOTAL AREA		10.40	100 %

4.0 Baseline data

Baseline data has been collected during the period January 2021 to March 2021, on meteorology, ambient air quality, water quality, noise levels, soil analysis, flora & fauna and socio-economic details of the people within 10 km. radius of the proposed project site.

4.1 Meteorology

Meteorological parameters measured are wind speed and direction, temperature and relative humidity, continuously at one hour interval, during the study period. The observations are:

- Predominant Wind Direction: From East (28.70%), followed by ESE (27.04%) and ENE (15.74%)
- Wind Speed : ranging from 0.6 to 6.7 m/sec
- Temperature : 15.50 – 36.8°C
- Relative Humidity : Mean was found to be 54.57 %

4.2 Ambient Air Quality

Ambient air quality was monitored for PM 2.5, PM10, SO_2 & NO_x at 9 stations for one season as per MOEF guidelines. The following are the concentrations of various parameters at all the monitoring stations:

PM2.5	-	28.8 to 42.0 μg/m^3
PM10	-	46.8 to 61.4 μg/m^3
SO_2	-	9.5 to 13.4 μg/m^3
NO_X	-	8.4 to 11.4 μg/m^3

4.3 Water Quality

Eight (08) ground water samples and one (01) surface water sample were collected and analysed for various physico -chemical parameters. The water samples show that, in general are acceptable as per IS:10500.

4.4 Noise levels

Noise levels were measured at 9 stations during day time & night time. The noise levels at the monitoring stations are ranging from 42.1 dB(A) to 68.9 dB(A), during day time and were 34.8 dB(A) to 49.6 dB(A) during night time.

4.5 Land use pattern

The landuse pattern within 10 km. radius of the proposed site is given below:

Sl. No.	Type of Land	Area in Ha.	% age
1	Agricultural Land (all types)	9,039.17	28.64 %
2	Built-up Area (Rural)	857.37	2.72 %
3	Built-up Area (Industrial)	22.16	0.07 %
4	Mining Areas	829.46	2.63 %
5	Waste Land – Dense Scrub	20,240.24	64.11 %
6	Waste Land – Open Scrub	412.94	1.31 %
7	Water Body	165.23	0.52 %
TOTAL		31,566.57	100.00 %

5.0 IMPACTS & MITIGATING MEASURES

5.1 Air Environment

The emissions from the proposed project is mainly particulate matter, in the form of dust. There will be some minor emissions of SO_2 & NO_x, due to usage of diesel operated machineries for loading, transport vehicles etc. The predictions of Ground Level Concentrations have been carried out using meteorological data such as wind direction, wind speed, temperature etc. collected at the site, as input data to run the model.

It is observed from the computation results that the maximum predicted incremental rise in 24 hourly ground level concentrations of PM2.5 was about 10.5 $\mu g/m^3$, that of PM 10.0 was about 18.4 $\mu g/m^3$ and SO_2 & NO_x are 4.5 $\mu g/m^3$ and 3.7 $\mu g/m^3$ respectively in the down wind direction.

The predicted results show that the net resultant concentrations (Max. Baseline conc. + Max. incremental rise in conc.) of PM2.5, PM 10, SO_2 & NO_x will be well within the National Ambient Air Quality Standards after commissioning of the proposed Plant. Hence there will not be any adverse impact on air environment due to the proposed Project.

The chosen beneficiation process, being a wet process, arrests the generation of dust. However, at the material transfer points for the raw ore, there may be some dust generation. The major sources of air pollution shall be provided with air pollution control systems (like dust extraction systems, dust suppression using water sprinkling, bag filters etc.) to limit air pollutant emissions within the permissible norms. The other source of air pollution, i.e. the emergency DG Sets, will be procured, which comply with CPCB norms.

5.2 Noise Environment

The major sources of noise generation in the proposed Project will be Crushers, screens, Ball Mill, etc. The ambient noise levels will be within the standards prescribed by MOEFCC i.e. the noise levels will be less than 75 dBA Leq during day time and 70 dBA Leq during night time, at the plant boundary. The extensive greenbelt proposed to be developed in the Plant premises will 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 Project.

5.3 Water Environment

The process effluents that get generated in the proposed plant, will have suitable treatment systems to reuse the water, to maximum extent. The domestic sewage that gets generated from the toilets, canteen etc. will be disposed into septic tank followed by soak pit. Hence there will not be any adverse impact in water quality in the study area due to the proposed project. Rain Water Harvesting pits will be constructed to recharge the groundwater.

5.4 Solid Waste Management

The major solid waste that will be generated from the proposed plant will be the iron ore tailings, which will be utilized for brick/ tiles manufacturing or will be sold to cement manufacturers in the region.

5.5 Land environment

There is no discharge of any effluent(s) generated from the plant, outside its premises. All the required air pollution control systems such as bag filters, dust suppression systems etc. will be provided in the proposed plant. Hence there will not be any adverse impact on land environment due to the proposed project. With the

establishment of this industry, the land rates in the area may increase, which contributes to the upliftment of economic status of people in the area.

5.6 Flora & Fauna

There are no National Parks or any Ecologically Sensitive Areas within the study area. Also, there are no endangered species of any plant or animal species. As all the required Air pollution control systems such as dust extraction systems, bag filters, etc., are proposed to meet the KSPCB norms, there will not be any adverse impact on flora & fauna due to the proposed project.

5.7 Socio-economic Environment

With the establishment of the proposed plant, employment potential will increase along with medical facilities. The economic status of the people will improve with this project. Land prices in the area will increase, thereby causing the general upliftment in the area.

6.0 ENVIRONMENTAL IMPACT STATEMENTS (EIS)

6.1 Air Environment

Impact scenario of air component due to the proposed project is marginal. The predicted concentrations are well within the National Ambient Air Quality Standards. The meteorological data collected confirmed that climatic status of the study area is consistent with the regional meteorology. With this proposed project there will not be any adverse impact on the meteorology of the region. Hence the same meteorological pattern is expected to continue.

6.2 Water Environment

All the process effluents will have proper treatment systems for maximum recovery of precious water for reuse in the process. The domestic sewage will be let into a septic tank – soak pit system. The plant is designed on zero discharge concept. Hence there will not be any adverse impact on water quality in the study area due to the proposed project.

6.3 Land and Biological Environment

There are no National Parks or Ecologically Sensitive Areas within the study area. The extensive greenbelt proposed to be developed will have a positive impact on flora, which will have long term beneficial effects in changing the environmental quality of the surrounding area.

6.4 Socio-economic Environment

About 45-50 persons will find direct employment once the Plant is commissioned and about 80-100 persons will get indirect employment during construction stage. Semi skilled and unskilled workers will be selected from the local areas only. Local economy will certainly improve through increase in employment potential in the commercial activity. This proposed project will soon attract industrial growth in the region. Proper precautionary measures would be taken for adopting occupational

safety and health standards and the life style of the local people will certainly improve with this proposed project.

7.0 ENVIRONMENTAL MANAGEMENT PLAN

7.1 During Construction Phase

1. After construction, all the excavated materials will be suitably disposed with proper back filling and levelling of excavated areas.
2. Dust suppressant spraying will be undertaken to minimise the fugitive dust emission. Slopes shall be well stabilised before the onset of monsoon.
3. The workers at site during construction will be provided with proper drinking water and sanitation facilities.
4. All labourers to be engaged in the construction activity will be examined by medical personnel before employment. Medical facilities will be provided to the labourers during construction period.

7.2 During Operation Phase

7.2.1 Land Environment

There is no discharge of any effluents from the plant premises. Extensive greenbelt will be developed in the proposed plant premises. Desirable beautification and landscaping practices will be followed.

7.2.2 Water Environment

The process effluents will be suitably treated to recover maximum water for reuse in the process. The domestic sewage (from toilets, canteen etc.) will be let into a septic tank – soak pit system. There will not be any discharge from the plant premises, into the environment.

7.2.3 Air Environment

All material transfer points, dust generating areas in the plant will be provided with dust extraction system consisting of Bag filters and dust suppression system. Air pollution control measures will be strictly implemented so that the ambient air quality will be well below the National Ambient Air Quality standards. Extensive greenbelt proposed to be developed in the proposed plant premises will help in further mitigating the air emissions.

7.2.4 Noise Environment

The major sources of noise in the proposed plant will be Crusher, Ball Mill, Screens etc. The equipment will be of reputed make which are designed to meet the latest National / International Standards on noise levels. The employees working near the noise generating sources will be provided with earplugs. Noise absorbing materials will be used in the construction of roofs, walls and floors. The extensive greenbelt development proposed within the plant premises will help in attenuating the noise levels further. Training would be imparted to plant personnel to generate awareness about the health effects of noise.

7.2.5 Green Belt development

Thick greenbelt of 3.50 acres will be developed within the plant premises of the proposed project to further enhance environmental quality through limitation of air emissions, attenuation of noise levels, balancing eco environment, prevention of soil erosion and creation of aesthetic environment. The greenbelt will be developed simultaneously with the plant construction. A detailed greenbelt plan will be developed in consultation with local DFO.

7.2.6 Environmental Monitoring

The following schedule will be implemented during the operational phase of the project, for monitoring of various environmental parameters:

Env. Segment	Parameter	Frequency
Water quality	IS 10500	Quarterly
G.W. table	Fluctuation in monsoon & post monsoon period	May & October
AAQ	PM 10, PM 2.5, SO2 and NOx	Monthly
Noise	Equi. noise levels	Monthly
Health	Pulmonary function, eye sight, audiometry, B.P., etc.	Annual record
Plantation	Survival	annual survival rate
Data analyses	Efficiency of mitigation measures	Half-Yearly

8.0 Conclusions & Recommendation:

Considering the growing demand for iron/ manganese ore and the depleting sources of the rich grade ores, it is becoming inevitable to evolve suitable techniques for the upgradation of the cheaply available low grade ore reserves. Due to the location of the proposed mineral beneficiation plant and considering the experience & expertise of the project proponents, along with their dynamism coupled with the familiarity to the project region, it is felt that the proposed project is highly viable. Hence, the proposed mineral beneficiation plant, to process about 4,80,000 Tons/Annum of low grade iron ore and 15,000 Tons/ Annum of low grade manganese ore, is strongly recommended for implementation, in the proposed project location.