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|  | <p><i>Environmental Impact Assessment for the Proposed Capacity Enhancement of Coal Washery from 1.60 MTPA to 4.10 MTPA with an Extension of Land Use from 16.45 Ha to 20.64 Ha within the Existing Plant Premises at Dhatura Village, Pali Tehsil, Korba District, Chhattisgarh State</i></p> <p style="text-align: right;"><i>Executive Summary</i></p> |
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1.0 Introduction

M/s. KJSL Coal & Power Private Ltd [KJSL] plans to expand the existing capacity of its coal washery (for beneficiation of coal) at Dhatura village in Pali tehsil of Korba district, Chhattisgarh state. KJSL proposes to increase the capacity of its existing coal washery operating at 1.60 MTPA capacity up to 4.10 MTPA with an extension of land use from 16.45 ha to 20.64 ha to meet the increase in demand of beneficiated coal in the local Indian market place / industries.

2.0 Purpose of the Report

As per the Environment Impact Assessment (EIA) Notification dated 14th September, 2006 as well as its subsequent amendment, new projects or activities or the expansion or modernization of existing projects proposed in any part of India will obtain prior environmental clearance from the Ministry of Environment Forests and Climate Change (MoEF&CC). The proposed coal washery expansion project falls under "Category-A" of activity type 2(a) as per the EIA Notification dated 14th September, 2006 issued by the Ministry of Environment, Forest and Climate Change, New Delhi.


In response to the proposal submitted by M/s.KJSL Coal and Power Private Ltd in the Ministry of Environment, Forest and Climate Change to prescribe the Terms of Reference (TOR) for undertaking detailed EIA study for the purpose of obtaining Environmental Clearance in accordance with the provisions of the EIA Notification, 2006; and submission of online information in the prescribed format (Form-1) along with a Pre-feasibility Report to Impact Assessment Division of MoEF&CC, the Standard Terms of Reference (TOR) were issued vide MoEF&CC letter No. IA-J-11015/9/2020-IA-II(M) dated 16th March 2020. EIA/EMP has been prepared in line with the above letter (approved standard TOR dated 16/03/2020) and will be made available to public for comments and concerns. A copy of TOR letter and its compliance are given in Annexure-I.

Vimta Labs Limited, Hyderabad, has been assigned to undertake an Environmental Impact Assessment (EIA) study and preparation of Environment Management Plan (EMP) for various environmental components, which may be affected due to the impacts arising out of the proposed expansion project.

2.0 Identification of the Project and Project Proponent

M/s. KJSL Coal & Power Private Ltd is a well-established name in coal handling, washing & transportation with a capacity of 1.6 MTPA at Dhatura village, tehsil Pali, Korba district, Chhattisgarh state.

It is a brown field project acquired from the previous owner in the year 2013-2014 through share transfer mode whose CTE was obtained in the year 2005. The existing project does not have Environmental clearance as it was established in the year 2005 (before 2006 EIA Notification).

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3.0 Environmental Setting

This site is located at Dhatura village, Pali tehsil, Korba district, Chhattisgarh State.

- General slope of the site is towards south-east and the average contour elevation near to the site is 280 to 300 m MSL;
- The project area is encompassed between the Geographical coordinates $22^{\circ}15'23.17''N$, $82^{\circ}31'55.49''E$ and $22^{\circ}15'38.82''N$, $82^{\circ}32'21.05''E$;
- Nearest city/town is Korba and is located at 18.8 km in NE direction and the nearest village is Dhatura at about 1.2 km from the project site;
- Nearest highway: NH-149 B, which is at a distance of 19 km in E direction;
- Nearest railway station is Gevra Road railway station at a distance of 19.0 km in E direction;
- Major water bodies: Lilagar nadi (0.4 km, w), Hasdo right bank canal (9.7 km, SE) and Hasdo River (13.2 km, E);
- 6 reserve forests exist within 10 km i.e. Burgahan PF (1.5 km, S), Khisora PF (4.8 km, S), Chhata RF (5.0 km, SE), Chhind Pani RF (7.9 km, W), RF near Pantora (8.6 km, SE) and Bituli RF (8.8 km, SW);
- No national parks, wildlife sanctuaries and biosphere reserves within 15 km; and
- Seismic zone-II (As per IS 1893 Part 1:2002).

The study area of the project is shown in **Figure-1**.

4.0 Size of the Project

The existing plant was constructed to wash about 1.60 MTPA. Now, the present proposal is to enhance the production capacity of coal washery from 1.60 MTPA to 4.10 MTPA. The estimated cost of the proposed expansion project is about Rs.30 crores. The cost of existing project is about Rs.34 crores. Total cost after expansion will be about Rs. 64 crores.



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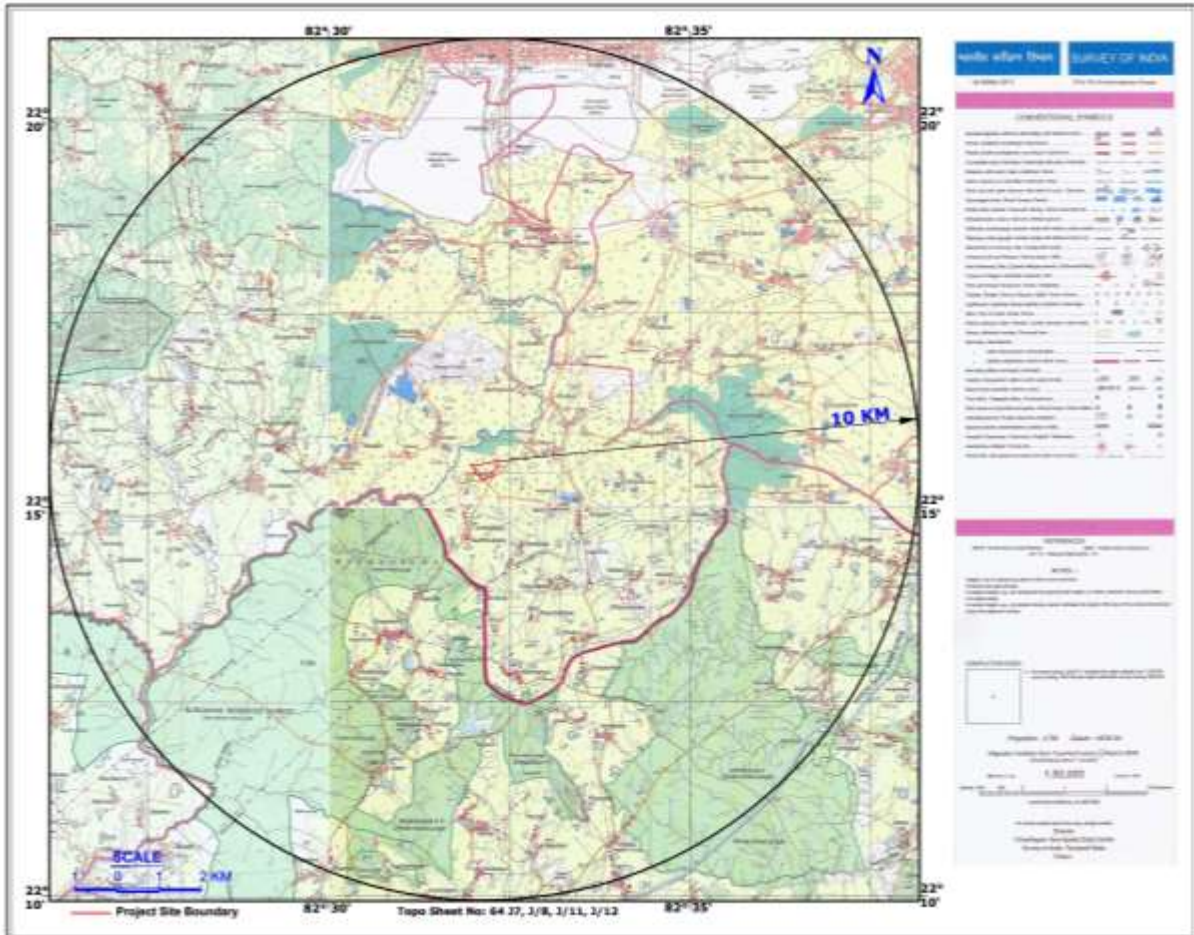



FIGURE-1
STUDY AREA MAP (10 KM RADIUS)

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5.0 Resource Requirement

- **Land Requirement**

The existing unit of 1.60 MTPA was installed in an area of 16.45 ha and the land requirement for proposed 2.50 MTPA is about 4.19 ha. The total area is about 20.64 ha. The entire land is under possession of M/s. KJSL. Out of proposed capacity enhancement, 1.60 MTPA will be within the existing plant premises and 2.50 MTPA will be on the extra land which is appurtenant to the existing plant premises. No additional land acquisition is involved for the expansion project. The existing plant has all the amenities and auxiliaries well developed for the coal washery while minimum requirement in changes or capacity enhancement is required with respect to the capacity enhancement related aspects.

- **Water Requirement**

Water consumption of operating 1.60 MTPA is about 105 KLD. The water requirement for the proposed 2.50 MTPA additional coal washery will be about 420 KLD. The total water requirement of 525 KLD after the expansion will be met from the nearby Lilagar nadi.

Wastewater generated will be treated and will be 100% recycled back to the process in a closed-circuit module. The plant will operate on the principle of zero liquid discharge.

- **Power Requirement**

The existing contract demand is 900 KVA supplied by CSEB. Action has already been initiated for obtaining approval from concerned authorities for enhancing the contract demand up to 3000 kVA. The enhanced contract demand will also meet requirement of the proposed expansion.


- **Coal Requirement**

Annual Throughput of Coal

The proposed coal washery will have an installed capacity to wash 4.10 MTPA of coal (RoM). The output washed coal will be of such nature i.e. ash content - 32-34%, moist content 10-12%, GCV - 3600-4200 Kcal / kg and yield of 65-75%. Remaining will be the rejects.

Sources and Transport of Raw Coal

Currently, KJSL procures the raw coal from Dipka coal mine (5.6 km, N), Gevra mines (7.4 km, NNE) & Kusmunda mines (10 km, NE) of SECL in Raigarh. And, raw coal for proposed new coal washery of 2.50 MTPA will be coming up in an area of 4.19 ha will be sourced from mines of Korba area, Raigarh area and CIC Field of SECL. It was found that in average raw coal, ash content varies from 42 - 50%.

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- **Manpower Requirement**

The existing manpower is about 70 persons. The proposed manpower is about 150 persons. The total manpower after expansion will be about 220 persons.

6.0 Process Technology

The operating coal washery of 1.60 MTPA is operating with heavy media bath technology. The proposed enhancement of capacity will be with a throughput of 2.50 MTPA and proposed to be operated on heavy media cyclone based coal processing unit.

7.0 Description of the Environment

The baseline data was monitored for three months from 1st December, 2019 to 29th February, 2020 representing winter season. Secondary data was collected from various government and semi-government organizations.

7.1 Drainage Pattern

Drainage of the study area is mainly drained by Lilagar Nadi which is about 0.4 km, W, Hasdo River which is about 13.2 km, E and one Hasdo Right Bank canal which is about 9.7 km, SE.


The drainage of the project area, there is no first order or second order streams flowing in the project site. Therefore, drainage of surface run-off is not likely to be affected either during construction or during operational phase.

7.2 Land Use of Study Area

As per satellite imagery (Year 2020), the built-up land is 8.5 %, forest land occupies 15.6 %, agricultural land is about 46.6 %, water body is 7.2 % and remaining land is waste land comprising of land utilized for mining and related activities or scrub lands, cultivable/non-cultivable wastelands, etc.

7.3 Climatology and Meteorology

The climate of Korba district is observed to be dry tropical in nature. The maximum and minimum temperatures recorded at site during study period were 34.0 °C and 9.0 °C. The relative humidity was observed to range from 61% RH to 67% RH during daytime and 28% RH to 36% RH during night time. Mean of heaviest rainfall in 24 hours is observed to be in the range of 262.1 mm, while the highest rainfall in a month was observed to be 47.9 mm (February, 2020) in the study period. The predominant wind pattern of the study area is mostly winds blowing from north direction except in monsoon season.

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7.4 Ambient Air Quality

Ambient Air Quality Monitoring (AAQM) stations were set up at nine locations. The minimum and maximum concentrations for PM₁₀ were recorded as 42.1 µg/m³ and 62.7 µg/m³ respectively. The minimum and maximum concentrations for PM_{2.5} were recorded as 11.6 µg/m³ and 36.2 µg/m³ respectively. The minimum and maximum SO₂ concentrations were recorded as 10.1 µg/m³ and 23.4 µg/m³ respectively. The minimum and maximum NO₂ concentrations were recorded as 11.7 µg/m³ and 27.6 µg/m³ respectively.

The concentrations of PM_{2.5}, PM₁₀, SO₂, NO₂, O₃, CO, NH₃, Pb, BaP, As, Ni and C₆H₆ are observed to be well within the NAAQ standards prescribed by Central Pollution Control Board (CPCB) for industrial and rural /residential zone.

7.5 Water Quality

Four surface water and eight ground water sources in the study area were examined for physico-chemical, heavy metals and bacteriological parameters in order to assess the effect of industrial activities and other activities on surface and ground water.

Ground Water Quality

The pH and conductivity vary from 6.65 to 7.36 and 487 µS/cm to 965 µS/cm respectively. Total dissolved solids range between 291 to 615 mg/l.

Sodium and potassium contents are in the range of 46.6 to 131.4 mg/l and 0.65 to 2.4 mg/l respectively. Calcium and magnesium content vary between 39.4 to 72.4 mg/l and 18.8 to 46.3 mg/l respectively.


Total hardness expressed as CaCO₃ and alkalinity ranges between 175.6 to 314.2 mg/l and 151 to 245 mg/l respectively. Chlorides and sulphates are in the range between 63.4 to 165.2 mg/l and 26.7 to 83.4 mg/l respectively. Nitrates and fluorides vary from 1.6 to 4.3 mg/l and 0.4 to 0.9 mg/l respectively.

The heavy metal contents were found to be well within the limit. The physico-chemical and biological analysis revealed that most of the parameters are well within the prescribed limits of IS: 10500.

Surface Water Quality

The pH and conductivity vary from 7.13 to 7.87 and 176 to 321 µS/cm respectively. The dissolved oxygen levels range from 5.2 to 5.8 mg/l and the total dissolved solids range from 98 to 198 mg/l.

Sodium and potassium content are in the range of 9.3 to 24.5 mg/l and 1.16 to 3.9 mg/l respectively. Calcium and magnesium contents vary in between 14.6 to 36.4 mg/l and 9.3 to 23.7 mg/l respectively.

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Total hardness expressed as CaCO₃ and alkalinity ranges between 73.5 to 156.3 mg/l and 45 to 135 mg/l respectively. Chlorides and sulphates are in the range of 29.6 to 51.3 mg/l and 9.7 to 16.7 mg/l respectively. Nitrates and fluorides are in the range of 1.1 to 3.4 mg/l and 0.5 to 1 mg/l respectively.

The heavy metal contents were found to be well within the limit. Total coliforms were found to be in the range of 1080 to 1640 MPN/100. The physico-chemical and biological analysis revealed that all the parameters are well within the prescribed limits of IS: 10500 limits.

7.6 Noise Level Survey

a) Day Time Noise Levels (L_{day})

The equivalent day time (L_{day}) noise levels at all the locations are observed to be in the range of 42 dB (A) to 50.2 dB (A). The maximum noise level of 50.2 dB (A) and minimum noise level of 42 dB (A) was observed. It is observed that the day time noise levels are in accordance to the prescribed limit of 55 dB (A) for residential areas.


b) Night Time Noise Levels (L_{night})

The equivalent night time (L_{night}) noise levels at all the locations were observed to be in the range of 38 dB (A) to 46.1 dB (A). The maximum noise level of 46.1 dB (A) and minimum noise level of 38 dB (A) was observed. It has been found that the night time noise levels are in accordance with prescribed limit of 45 dB (A) for residential areas.

7.7 Soil Characteristics

Eight locations within 10 km radius of the proposed expansion project site were selected for soil sampling. The baseline status of the soil quality is as below:

- It has been observed that the texture of soil is mostly sandy clay in the study area. The pH (5.38 to 6.86) of the soil indicating that is Very strongly acidic to Slightly acidic in nature;
- The electrical conductivity was recorded as 108.6-314.60 µS/cm;
- The organic carbon content in the study area observed as 0.29 % to 0.82 %, which the soil falls under sufficient category;
- Available potassium was observed as 256.9 kg/ha to 342.6 kg/ha in the study region indicating that the soil falls under average to better category;
- Available nitrogen was observed as 86.9 kg/ha to 182.6 kg/ha. Based on the above values the soil falls under less to better category of nitrogen; and
- Available phosphorous was observed as 104.7 kg/ha to 159.6 kg/ha in the study region. It shows the soil falls under more than sufficient category.

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7.8 Flora and Fauna

The proposal involves expansion of the core area from 16.5 to 20.64 Ha and Coal washing capacity from 1.6 to 4.1 MTPA. No forest land is involved in the proposal. Neither the project site of 20.64 Ha nor the buffer zone of 10km radius is eco-sensitive. There are no wildlife sanctuaries or National Parks or Biosphere Reserves or Migratory corridors of wildlife or Ramsar Wetlands.

On account of the expansion, the vegetation and flora present in 4.19 Ha of the land that is proposed to be brought under the Coal washery are going to be lost but there no rare or endangered or endemic or threatened species in the area that gets impacts directly on account of change in land use.


7.9 Demography and Socio-Economics

The configuration of male and female indicates that the males constitute to about 50.59% and females to 49.41% of the total population as per 2011 census records. The study area on an average has 977 females per 1000 males as per 2011 census reports. In comparison to the state rural sex ratio (Chhattisgarh: 1001) the study area has recorded low sex ratio.

In the study area, as per 2011 census, 23.27% of the population belongs to Scheduled Castes (SC) and 30.06% to Scheduled Tribes (ST). Overall the data of social stratification reveals that the SC and ST % to population is more than 53%, The SC and ST community are marginalized and they are at considered at low level of social strata and calls for a special attention in corporate social responsibility plan and corporate environment responsibility plan for improving their socio-economic status apart from preservation and protection of their art, culture and traditional rights of livelihood.

The percentage of male literates to the total literates of the study area works out to be 56.97%. The percentage of female literates to the total literates, which is an important indicator for social change, is observed to be 43.03% in the study area as per 2011 census records.

As per 2011 census data, total work participation in the project study area is 47.78% and the non-workers constitute 52.22% of the total population respectively. The distribution of workers by occupation indicates that the non-workers are the predominant population. The female non-workers to the total non-workers are 56.89% and male non-workers are 38.16%. The main workers to the total workers are 62.22% and the marginal workers constitute to 37.78% to the total workers.

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8.0 Anticipated Environmental Impacts and Mitigation Measures

8.1 Impact on Land Use

The land required for the proposed expansion activity is about 4.19 ha. The additional land required for the proposed expansion is already in possession of M/s. KJSL. The land is already under industrial land use category.

The topography of the site is fairly flat and requires minimum filling. No filling material from outside is envisaged for the plant construction.

8.2 Impact on Soil

The construction activities will result in loss of vegetation cover and topsoil to some extent in the plant area. Apart from localized construction impacts at the plant site, no adverse impact on soil in the surrounding area is anticipated.

8.3 Impact on Air Quality

The source of emissions from the operations will be from proposed expansion of washery and its activities covering stock pile, crushing, screening, unloading / loading, and vehicles movement. The emissions are mainly particulate matter (PM).

Prediction of impacts on air environment has been carried out employing mathematical model based on a steady state Gaussian plume dispersion model. The resultant concentrations after the implementation of the proposed expansion project are observed to be within the permissible limits.

The following are the mitigation measures being adopted in the existing plant and the same will be implemented after the proposed expansion also


- Dust extraction / bag filters dust suppression system to control dust from the material transfer points;
- Regular water sprinkling on roads; and
- Greenbelt development.

8.4 Water Environment

Plant with close circuit water circulation system so that no effluent is discharged in the open outside the plant boundary. All the process effluent will be collected in the thickener. Settled slurry of the thickener will be dewatered in a multi roll belt press. The dewatered filter cake will be mixed with the rejects. The clarified water from thickener overflow will be re-circulated to the plant for use as process water. Only make-up water requirement will be added in the clarified water tank.

8.5 Noise Environment

The most common noise generating sources are screens, crushers and vehicular movement. These noise sources are generating noise continuously as well as

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intermittently. Noise attenuation measures will be taken up to control the noise levels.

8.6 Impact on Soil vis-à-vis Solid Waste

Final rejects (consisting of coal fines mixed with shales etc.) will be the main solid waste generated from coal washery. Shales and stones etc. will be utilized for road formation and levelling of low-lying areas while the reject coal shall be gainfully utilized by the nearby power plants and other prospective buyers. Spent oil and lubricants will be collected in leak proof drums and stored in earmarked area, which will be sold to authorised vendors.

Solid waste in the form of sludge is generated from existing septic tank/ soak pits. This waste will be used as manure for greenbelt development.

8.7 Greenbelt development

Greenbelt is developed in the area of 2.65 ha within the existing premises and further will be strengthened for the proposed expansion up to an additional area of 1.19 ha.

8.8 Impacts on Socio-Economics

The requirement of skilled, unskilled and semi-skilled manpower will be met from nearby villages during construction phase. The project will also help in generation of the indirect employment apart from direct employment. This will be a positive socio-economic development for the region. There will be a general upliftment of standard of living in the region.

9.0 Environmental Monitoring Program


Post project environmental monitoring is important in terms of evaluating the performance of pollution control equipment installed in the project. The sampling and analysis of the environmental attributes will be as per the guidelines of CPCB/ Chhattisgarh Environment Conservation Board (CECB). The frequency of air, noise, surface water and ground water sampling and location of sampling being as per the directives of CECB.

10.0 Environmental Cost

The expenditure for environmental controls is earmarked at Rs 43 lakhs as recurring budget every year with a recurring cost of Rs.10 lakhs per annum.

11.0 Risk Assessment and Disaster Management Plan

Risk assessment has been carried out to quantify the extent of damage and suggest recommendations for safety improvement for the proposed expansion project. Risk mitigation measures based on consequence analysis and engineering judgments are incorporated in order to improve overall system safety and mitigate the effects of major accidents.

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An effective Disaster Management Plan (DMP) to mitigate the risks involved is in place for proposed expansion of project. This plan defines the responsibilities and resources available to respond to the different types of emergencies envisaged. Training exercises will be held to ensure that all personnel are familiar with their responsibilities and that communication links are functioning effectively.

12.0 Project Benefits

The beneficial impact of proposed expansion project on the civic amenities will be substantial after the commencement of project activities. The basic requirement of the community needs will be strengthened by extending healthcare, educational facilities to the community, building/strengthening of existing roads in the area. The proposed CER budget break-up on total project cost for 2020-21 to 22-2023 is about Rs. 64 lakhs.

13.0 Conclusion


The proposed expansion of the KJSL project is conceptualized to supply for the increasing washed coal demand in the Indian market. Further, abundant availability of raw coal from nearby SECL mines in the locality of the KJSL plant is beneficial for the project and projected demand of washed coal in the market.

The proposed expansion project will mostly have localized and marginal impact on the land use as additional land use is free from any form of litigations and no land acquisition, displacement of communities or R&R measures are required as the project is planned to come up on a vacant land within the premises of the land already acquired by the project proponent.

The project area is free from any form of sensitivities or ecological habitats and reserve forests thereby reducing impact on the flora and fauna of the Dhatura village.

The water required for the project will be sourced from the nearby Lilagar nadi and no groundwater extraction is envisaged. Further the project area is not drained by any water bodies thereby eliminating any impact on existing water bodies in the study area of the project. The KJSL plant is designed to re-utilize the process water effluent by further treating it within a closed-circuit system hence zero discharge of wastewater is anticipated.

Appropriate pollution control technologies like water sparkling, installation bag filters etc. are already implemented in the process area of the existing plant and planned to be augmented for the new plant in order to mitigate the negative impact on the air environment. Through modelling, it has been observed that increase in air and noise levels will be mostly within the project boundary with little impact on the nearby areas although appropriate mitigation measures along with increase of greenbelt area is planned to reduce the impact due to air noise and pollution during plant construction or operation phases after expansion. In addition to this, appropriate measures are implemented and are further recommended for solid and liquid waste management.

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The project will generate employment for additional 150 people mostly planned to be recruited from the locality, while the expansion project will also generate new business opportunities for small business owners in the nearby locality.

Therefore, it can be concluded that the project is deemed environmentally sound for expansion of the existing plant with judicious implementation of control and mitigation measures, while it might be socio-economically beneficial for the local communities. The project is deemed environmentally sustainable if environmental management plan recommended in this report is well implemented during construction and operation phases of the project.