

Executive Summary

of

Draft EIA Report prepared for proposed greenfield fertilizer
manufacturing unit of SSP (300 MTPD);
GSSP (200 MTPD) and other Sulphates

by

M/s Shree Agro Crop Sciences Pvt. Ltd

Project Site

Gat No. 792, At Takewadi, Tq. Man, Dist.
Satara - 415509 (MH)

Report Prepared by

Gaurang Environmental Solutions Pvt. Ltd

(NABET Accreditation No-NABET/EIA/1720/IA0026)

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EXECUTIVE SUMMARY

1.1. Project Description

1.1.1. Introduction and Background Project Highlight

Shree Agro crop science Pvt. Ltd. propose to establish and operate facilities for manufacturing Single super phosphate (SSP) and Granulated Single super phosphate (GSSP) and other sulphates in a plot of land located at Gat No. 792, At Takewadi, Tq. Man, Dist. Satara - 415509 (MH). The total cost of the project will be Rs19.07 Crore.

Total land area acquired for the proposed project is 3.70 Ha. At present the land use of the plot is agricultural and land conversion is already processed for industrial land use. The project site is located at a distance of ~ 4.24 km from SH-10 (Dahiwadi – Phaltan road).

Out of the total plot area, Approx. 33% i.e 1.23 Ha of the total land will be kept for greenbelt and plantation. The new plant will be designed with the basic concept of green chemistry with modifications to optimize energy utilization and with significant reduction of manual interface.

1.1.2. Project Categorization

As per the Environmental Impact Assessment Notification, 2006 and amendments thereof, all Chemical fertilizer plants are designated as category “A” except SSP and GSSP which falls under category “B” and Section 5(a) of the schedule. Project proponent shall apply consent for GSSP and its associated products (200 MTPD).

1.1.3. Project Location

The proposed project will be coming up at Gat No. 792, At Takewadi, Tq. Man, Dist. Satara - 415509 (MH). Kaccha road is located outside the project site in north direction connecting main Tar road at 200 mt which is further connecting SH-10 and NH 160 (Dahiwadi-Phaltan road) at 4.24 km in east direction. Nearest railway station is Koregaon railway station located about 40 km from site in south-west direction. Nearest airport is at Phaltan located about 21 km north from site.

1.1.4. Project Description

Shree Agro crop science Pvt. Ltd. propose to establish and operate facilities for manufacturing Single super phosphate (SSP) and Granulated Single super phosphate (GSSP) and other sulphates. List of products to be manufactured at the site are mentioned below:

List of products with capacities

EC Products

S. No	Product	Quantity - MTPD
1.	SSP/Boronated SSP/ Zincated SSP/ Boronated + Zincated SSP	300

Non-EC Products

**Greenfield Project of SSP (300 MTPD); GSSP (200 MTPD) and other Sulphates
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S. No	Product	Quantity - MTPD
1.	GSSP/ Boronated GSSP/ Zincated GSSP/ Boronated + Zincated GSSP	200
2.	Di-Calcium Phosphate	30
3.	Magnesium Sulphate	30
4.	Zinc Sulphate	25
5.	PROM (Phosphate Rich Organic Manure Powder/ Granulated)	200

1.1.5. Resources Requirement

**Greenfield Project of SSP (300 MTPD); GSSP (200 MTPD) and other Sulphates
at Gat No. 792, At Takewadi, Tq. Man, Dist. Satara - 415509 (MH)**

S. No.	Particular	Details												
1.	Plot/Survey/Khasra No	Gat No. 792												
2.	Village	Takewadi												
3.	Tehsil	Man												
4.	District	Satara												
5.	State	Maharashtra												
6.	Latitude	17°47'42.65"N to 17°47'39.47"N												
7.	Longitude	74°30'46.19"E to 74°30'38.03"E												
8.	Products	<table border="1"> <tr> <td>SSP/Boronated SSP/ Zincated SSP/ Boronated + Zincated SSP</td> <td>300</td> </tr> <tr> <td>GSSP/ Boronated GSSP/ Zincated GSSP/ Boronated + Zincated GSSP</td> <td>200</td> </tr> <tr> <td>Di-Calcium Phosphate</td> <td>30</td> </tr> <tr> <td>Magnesium Sulphate</td> <td>30</td> </tr> <tr> <td>Zinc Sulphate</td> <td>25</td> </tr> <tr> <td>PROM (Phosphate Rich Organic Manure Powder/ Granulated)</td> <td>200</td> </tr> </table>	SSP/Boronated SSP/ Zincated SSP/ Boronated + Zincated SSP	300	GSSP/ Boronated GSSP/ Zincated GSSP/ Boronated + Zincated GSSP	200	Di-Calcium Phosphate	30	Magnesium Sulphate	30	Zinc Sulphate	25	PROM (Phosphate Rich Organic Manure Powder/ Granulated)	200
SSP/Boronated SSP/ Zincated SSP/ Boronated + Zincated SSP	300													
GSSP/ Boronated GSSP/ Zincated GSSP/ Boronated + Zincated GSSP	200													
Di-Calcium Phosphate	30													
Magnesium Sulphate	30													
Zinc Sulphate	25													
PROM (Phosphate Rich Organic Manure Powder/ Granulated)	200													
9.	Land Area	Total plot area is 3.70 Ha. Approx. 33% i.e 1.23 Ha of the total land will be kept for greenbelt and plantation.												
10.	Project cost	The total cost of the project including Environmental controlling equipment shall be Rs 19.07 Cr												
11.	Water Requirement	Total fresh water requirement- 245 KLD												
12.	Source of water	Water requirement will be sourced from ground water through borewell.												
13.	Status of permission	The permission of abstracting groundwater from the Central ground water authority (CGWA) is in process.												
14.	Waste Water Generation	<p>Waste water generation from industrial use will be 229 kLD out of which 142.5 kld will be recycled in process as mixed liquor and consumed in process directly and rest 86.5 kld will be evaporated.</p> <p>Domestic waste water generation will be 10 kLD.</p>												
15.	Treatment Facility	<p>Domestic waste water will be sent to septic tanks via soak pits.</p> <p>All the waste water generated in the process will be recycled back in process again following zero liquid discharge. ETP is the inbuilt facility in process involved in project.</p>												
16.	Employment Generation	<p>During construction phase: Temporary employees: 40 Permanent employee:10</p> <p>Operation Phase: Temporary employees: 120 Permanent employee:100</p>												

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17.	Defense Installations	None
18.	Ecological Sensitive Areas/ Protected Areas as per Wildlife Protection Act 1972 (National Parks / Wild life sanctuaries / bio-sphere reserves / tiger reserves)	Not within 15 km distance
19.	Reserved / Protected Forest	Not within 15 km distance
20.	Water Bodies	Following water bodies present within the study area: 1. Andhali Dam (4.5 Km, South) 2. Manganga River (4.9 Km, South)
21.	Nearest National Highway/ Other Road	SH-10 (Dahiwadi – Phaltan road) 4.24 km in East Direction
22.	Nearest Rail Head	Koregaon Railway Station: ~40 Km, SW
23.	Nearest Airport	Phalton – 21 Km, N
24.	Nearest Town/ Tourist Place	Nearest Town - Phalton, 20 Kms
25.	Nearest Village	Jadhavwadi :0.9 km NE Takewadi : 2.3 km SW

1.2. Environmental Aspects

Air Pollution

The major gaseous emissions which will generate inside the plant are usually from manufacturing processes and DG set.

The impact on air quality due to the operation of the proposed SSP/GSSP project will be mainly due to the following sources:

- Combustion of coal.
- Grinding/ milling of rock phosphate.
- Emission of hydrogen fluoride and particulate matter from the granulator & den conveyor.
- Fugitive emissions.

The control measures employed for controlling air pollution are

- Use of APCM equipments i.e. Cyclone, Closed conveyers, Venturi scrubbers
- Adequate stack for venting of gases from the scrubbers to atmosphere
- Reuse of dust separated from cyclone from cyclone separator and from duct collector in process
- HF gas generated from the SSP process will be conveyed in rubber lined ducts to the scrubbers and scrubber liquor will be reutilized in the process.
- In granular SSP plant the air pollution control system will have:
 - Twin cyclones
 - Dust separation chamber
 - 30 m stack for venting of gases
 - Blower

Water Pollution

In this project, water would be required for industrial use, domestic & greenbelt development purposes. There will be some wastewater generation from the industrial process, the waste water generated from the processes, floor washing, will be treated in ETP and recycled back in the process and the domestic waste water will be treated in STP and Zero liquid discharge system will be maintained.

Table 1.1 : Influent Generation Source and Quantity

**Greenfield Project of SSP (300 MTPD); GSSP (200 MTPD) and other Sulphates
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Water sources/ activities	Output (kLD)
Water for acid dilution from SSP	45
Evaporation losses from SSP	10
Evaporation losses from GSSP	23
Evaporation losses from Di calcium Phosphate	9.9
Mixed liquor from Di calcium phosphate	53.5
Evaporation losses from Mg/Zn sulphate	23.63
Mixed liquor from Mg/Zn sulphate	11.003
Evaporation losses from PROM	20
Soak pit	10
Green belt	-
	206.03

Source: Shree Agro

Effluent Treatment Procedure

The wastewater generated from SSP; GSSP and other sulphate plant will be reused in process. Waste water from SSP scrubber will be reused for acid dilution; mixed liquor from Di calcium phosphate and magnesium sulphate will be reused in process and rest will be evaporation losses from GSSP and other sulphate plant. Similarly, waste water generated from GSSP plant will be evaporation losses and no other source of industrial wastewater generation at the plant. So, the project will follow zero liquid discharge scheme. ETP is the inbuilt facility in process involved in project. The water from scrubbing will be reused in process which will reduce the fresh water consumption. The domestic waste water will be discharge to septic tank followed by soak pit.

Noise Pollution

The plant will have various rotating machines including rock grinders, crushers, dryers, blowers, vacuum pumps, process pumps, compressers, etc. along with DG sets, which will generate noise. These machines will be provided with appropriate control measures to maintain the noise levels within limits.

Waste Generation

There will be no major source of hazardous waste generation due to the proposed project that would be causing harm to the environment, as major substances that are hazardous are Silica Sludge, Hydrofloro silicic acid and spent oil. Industrial hazardous wastes will be sent to TSDF site and will be disposed as per Hazardous and other waste (Management & Transboundary Movement) amendment Rules, 2016 and further amendments, while other solid wastes will be segregated in salable and non-salable waste. Salable waste will be sold off, will be handled as per solid waste management rules, 2016.

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The spent hydrofluorosilicic acid generating from scrubbers waste will be utilized. Filtered cake around 500 kg will be used in product as filler. Filtrate around 40 kL will be used to dilute the 98% concentrated acid to 69%. Phospho gypsum generated from Di-calcium phosphate plant will be reused as filler in SSP plant. In the GSSP, unburnt carbon & coal ash will be sold to brick manufacturer as a fuel and filler.

1.3. Description of the Environment

Site Characteristics

M/s Shree Agro Crop Science Pvt. Ltd. is planning to propose a Greenfield project of SSP; GSSP chemical fertilizer and other sulphates on a vacant plot located at Gat No. 792, At Takewadi, Tq. Man, Dist. Satara - 415509 (MH) spreaded in 3.70 Ha area.

Kaccha road is located outside the project site in north direction connecting main Tar road at 200 mt which is further connecting SH-10 and NH 160 (Dahiwadi-Phaltan road) at 4.24 km in east direction. Nearest railway station is Koregaon railway station located about 40 km from site in south-west direction. Nearest airport is at Phalton located about 21 km north from site.

The proposed project site is privately owned by M/s Shree Agro and present landuse of the site is agriculture and application for change in landuse for industrial use is already applied for. The nearest settlement to the site is Jadhavadi village located about 0.9 km NE and Takewadi about 2.32 km SW of the site.

Andhali Dam at 4.5 km, S and Manganga River flowing at 4.9 km, S are the main surface water bodies located within the study area.

There are no environmentally sensitive components such as National Park, Wildlife Sanctuary, Elephant / Tiger Reserve, migratory routes of fauna and wet land present within 10 Km radius of plant site.

Topography and Meteorology:

The topography of the proposed site is almost flat terrain and the elevation of the site ranges between 824 to 835 m above the mean sea level.

Temperature – During the study period minimum temperature was 13.80C and maximum temperature was 31.40C.

Relative Humidity – During the study period observed minimum humidity was 22% and maximum humidity was 99%.

Wind Speed– The wind speed ranges between 1.1 to 1.6 km/hr during study period except calm conditions.

Wind Direction – The predominant wind direction at site is from E and W direction.

Seismicity:

Satara area is moderately vulnerable to earthquake disasters. According to the seismic-zoning map of India, the project area falls in Zone-III (Moderate Damage Risk Zone) of seismicity. The IS code assigns a zone factor of 0.16 for Zone 3. The water holding capacity varies from 29.10 to 34.66 %.

Soil:

Brown colour soils are observed in the study area. Texturally the soils of study area are observed as Clay Loam Soils. The Bulk Density of the soils was found in the range of 1.45 to 1.55 gm/cm³. Sodium Absorption ratio 12 -14 and porosity is 32 to 36 %.

The soil pH ranges from 7.54 to 8.38, thereby indicating the soils are slightly alkaline to moderately alkaline. The Organic matter is 0.6 to 0.7 % there by implying that soils are sufficient in organic content. Available nitrogen content in the surface soils ranges between 281 & 286 kg/ha, thereby indicating that soils are medium in available nitrogen content. Available phosphorus content ranges between 11 & 14 kg/ha, thereby indicating that soils are low to medium in available phosphorus content. Available potassium content in these soils ranges between 132 & 138 kg/ha, thereby is indicating that the soils are medium in potassium content.

Water: Eight ground water samples and four surface water samples were collected from different locations around the site during study period. The water samples were examined for physicochemical parameters and bacteriological parameters.

Observations on Ground Water Quality:

- The pH value of drinking water is an important index of acidity or alkalinity. PH value of the sample varies from 7.14 to 8.37 in all locations, which is well within the specified standard of 6.5 to 8.5. The pH of the entire sampling site is slightly basic in nature.
- Electric Conductivity levels in Ground water vary from 0.38 to 1.52 µmho/cm.
- Total dissolved solids range in Ground water from 245 to 472 mg/l which is within permissible limit.
- The total hardness is an important parameter of water quality. The hardness values in ground water of the study area ranges between 68 to 184 mg/l which is well within the permissible limit.
- The calcium values in ground water vary between 22.06-32.06 mg/l. The calcium values in ground water of the study area are well within the specified permissible limit of Indian drinking water standard.
- The magnesium values in ground water vary between 5.34-21.38 mg/l. The magnesium values in ground water of the study area are well within the specified permissible limit of Indian drinking water standard
- The chloride values in ground water of the study area ranges between 17.60 to 91.30 mg/l which is well within the permissible limit.
- No biological and metallic contamination has been found in any of the ground water sample of the study area.
- Overall the parameters in ground water sample were well within the permissible limit of Indian Standard IS: 10500-2012.

Observations on Surface water Quality:

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Surface water quality was analysed against the Designate Best Use Criteria by CPCB. The quality of water matches with the category C of Manganga river and category B for Andhali Dam and thus the Manganga river is fit for drinking water source after conventional treatment and disinfection and Andhali dam water is good for outdoor bathing.

Air Quality: AAQ monitoring was done at eight locations within the study area considering dominant wind direction, populated area and sensitive receptors.

Particulate Matter (PM₁₀): The highest PM₁₀ level were found near project site (85 µg/m³) and lowest PM₁₀ level was found at Jadhavadi (62 µg/m³). While the mean conc. of all location ranges between 67-81 µg/m³. The PM₁₀ level near project site is slightly higher due to dust resuspension, plot being vacant land. However, PM₁₀ concentration is within limit. Rest overall location, the values are well is within permissible limit i.e. NAAQS level 100 µg/m³

Particulate Matter (PM_{2.5}): The highest PM_{2.5} level was found near project site (45 µg/m³) and lowest PM_{2.5} level was observed at Jadhavadi (28 µg/m³) while the mean conc. of all location ranges between 32-41 µg/m³. Concentration were observed within limit at all location i.e. NAAQS level 60µg/m³

Sulphur Dioxide (SO₂): The highest SO₂ level were found near project site (16.82 µg/m³) and lowest SO₂ level were found at Vadgaon (8.26 µg/m³) while the mean conc. of all location ranges between 11.77-13.03 µg/m³. The SO₂ level in all the monitoring locations is within permissible limit i.e. NAAQMS level 80µg/m³

Oxides of Nitrogen (NO_x): The highest NO_x level was found at Jadhavadi (35.46 µg/m³) and lowest NO_x level were observed at Vadgaon (23.64 µg/m³) while the mean conc. of all location ranges between 28.21-31.34 µg/m³. The NO_x levels in all monitoring location are under permissible limit i.e. NAAQS level 80µg/m³

Ammonia: The NH₃ level was found below detection limit at all the location under permissible limit i.e. NAAQS level 400µg/m³.

CO: The levels of CO observed in the study area to be in the range of 0.10 -0.18 mg/m³. The CO level in all monitoring location are under permissible limit i.e. NAAQS level 4 mg/m³.

Noise:

Ambient noise level was found slightly higher at Bodake and Yelewadi in day and night which may be due to presence of heavy vehicular traffic in Malvad road located south of Bodake village and SH 10 highway located east of Yelegaon village. In other residential and commercial areas, the ambient noise quality was found within the prescribed National Ambient Noise Quality Standards.

Traffic

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Proposed site is well connected with SH 10 (Dahiwadi- Phaltan road). Kaccha road is located outside the project site in north direction connecting main Tar road at 200 mt, is privately owned by the project proponent so, at the time of operation of the project, the road will be constructed and maintained by the project proponent. Traffic count study was undertaken near the SH-10 (Dahiwadi- Phaltan road) because most of the material movement will be performed through this road.

It is estimated that movement of ~405 PCUs (including Trucks, tanks, passenger cars, two-wheeler, and cycle) is done per day in and out from the project site. And due to this upcoming project, movement of ~200 PCUs is expected in and out from the project site. The NH-160/ SH 10 is two lane of very good design (carriage width 12 m) and its capacity is 1500 PCU per hour as per IRC specification (IRC106-1990).

Biological Environment

The study area is primarily comprises of rural environment. There is no national park, wildlife sanctuary, biosphere reserve, reserve or protected forest is present in the study area (10 km area). The ecology of 10 km radius zone around the project site included open scrub vegetation and crop land ecosystem only. The vegetation type in core zone is mostly agrarian ecosystem.

The common tree species observed in the core zone area are Acacia arabica, Cassia fistula, Aegle marmelos, Tamarindus indica, Albizzia lebbek and Dalbergia latijolia. Herb & shrubby species Xanthium strumarium, Nerium indicum, Parthenium spp. Calotropis procera, Lantana camara, Casia tora, Vitex negundo, Zizyphus mauritiana, Cannabis sativa, Argemone maxicana, Sida spp. and few grasses species.

Due to lack of any forest area at present, there is hardly any wildlife left in the area. Mammals, rarely sighted in the area the other fauna that can rarely see are Mongoose and reptiles. However, avifauna diversity is good due to presence of water bodied in the area.

Demography:

The District has an area of 10,480.0 sq.kms and a population of 30,03,741 persons as per 2011 Census. While the area of the District accounts for 3.41 percent of the total area of the State, the District population constitutes 2.67 percent of the total population of the State.

As per Census of India 2011, the total population of the study area is 41287 in which 20747 (50.25%) are males and 20550 (49.75%) are females, the entire population of the study area has been grouped into 9124 households and the average size of the household is approx. 4.53 person/ household; an average SC and ST population constitute 9.58% and 0.002% respectively, an average literacy rate of the study area is 65.13% out of which male literacy is 71.87% with respect to the male population and female literacy is 58.29% with respect to the female population, creating a gender gap of 13.58%; the total number of workers in the study is 21743 and the WPR is 52.66%, in which male's WPR is 57.65% with respect to male population and female's WPR is 47.60% with respect to the female population, creating a gender gap of 10.05%.

Infrastructure Facilities

Roads: The proposed project is connected with state highway - 10 (Dahiwadi – Phaltan road) 4.24 km in East Direction and further village road is also well connected with SH – 10 and is in good condition.

Education: There is one Zila Parishad Primary School available in Takewadi Village. In respect to the study area it was observed that almost every village have availability of Z.P. school Communities have to travel 10-15km for further education in Mhaswad and Dahiwadi from the villages. State government is facilitating, in Govt. Primary and Upper Primary School, with scholarship, mid-day meal, free text-book and uniform to every student to encourage the students and improve the educational quality of the region. The average literacy rate of the study area is approximately 65.13% whether as male literacy is 71.87% and female literacy rate is 58.29% with creating a gender gap of 13.57%.

Health: There is no Sub-Primary Health Centre is available in in the core zone. Further, it was noticed that communities have to travel 10-15km to get medical facilities in Dahiwadi and Mahaswad, as there is no any CHC/PHC available in the 10km of the study area. It was also envisaged that Anganwadi and ASHA workers are available in most of the villages of the study area. There has been no chronic or epidemic diseases has been reported/or observed during the course of site visit of the study area except general cases of fever and cough.

Drinking Water Facility: Well, Tap water and Hand pump are the main source of water for drinking and other domestic use in the study area and these are reportedly sufficient to cater the drinking as well as other domestic water requirement of all the villagers.

Communication: The people of the study area is well connected via mobile, telephone and internet. Means of communications such as internet, telephone and television has made a vital role in changing the conservative thoughts of the people of the study area and brought awareness for development in both men and women.

Electricity Facility: The study area is good in terms of electricity supply. Power supply in the study area is “20 hours for domestic use and 9 hour for agricultural use” electricity is available in most of the villages of the study area.

1.4. Anticipated Environmental impacts and mitigation measures

Land Environment

Construction Phase

- The plot of land identified for establishing the project is private agricultural land, and has been purchased by the project proponent from individual owners for the purpose of establishing the SSP project. Thus, the proposed project will result into change of land use from agricultural to industrial.

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- The land fill and excavation activities during the construction phase will be limited to the areas identified for locating the plants and facilities. There is no drain passing through this land. Storm water drains, leading to the rain Water Harvesting tank, will be provided around the elevated areas. Thus, impact on drainage pattern is ruled out.
- During construction phase some waste construction material will be generated. However, it will be used for landfill and will have no impact on the land environment.
- There will be no change in Land use\Land cover outside the plant area. There are no labour colonies proposed outside the plant area Majority of the labour will be hired from nearby villages, so no housing or shelter facilities required for construction workers. However temporary camp sites shall be provided with minimum requirement of drinking water and sanitation facilities for workers during working hours
- Debris, Scraps, excavated soil, used bags and steel waste should be generated and disposed as per Construction and Demolition Waste Management Rules 2016.
- The excavated soil will be used for levelling the premises and care should be taken for using the soil for greenbelt development
- Construction activities (grinding, movement of vehicles and other machinery) will lead to dust emission. Proper upkeep and maintenance of vehicles and machineries should be done; sprinkling of water on roads at construction site etc. will reduce the impact.
- Presently, the project area is either barren or covered with agricultural crops. During construction of the project, more than one-third of the project area will be covered by green belt and plantation. Thus, significant positive impact on land use is envisaged.

Operation Phase

- Rock phosphate and elemental sulphur will be transported in covered truck. Thus, their spillage and subsequent adverse impact on soil quality, is not foreseen. Sulphuric acid will be stored in tanks, surrounded by lined containment dykes. Similarly, rock phosphate, green SSP and the granulated product will be stored in covered sheds. Adequate control measures (bag filters and cyclones, enclosed housings, etc.) are proposed for control of dust emissions. Therefore, impact on land environment during handling of raw materials and products will be insignificant.
- The project proposal does not involve disposal of toxic wastes (liquid and solid wastes) on land. Wastewater from scrubbers and precipitated silica will be recycled quantitatively to the process. Spent oil and used containers will be disposed through approved vendors. Spent catalyst will be disposed through approved recyclers. Thus, impact due to disposal of liquid and solid wastes is not envisaged.
- The plant will be operated on zero effluent basis. Thus, disposal of trade effluents is not involved. Sewage from toilets will be treated in septic tanks and disposed in soak pits.
- The process does not involve handling of materials resulting into generation of garbage.
- The entire quantity of solids collected in dust collection systems shall be recycled to the process.
- Municipal Waste (domestic and or commercial waste) during operational phase shall be disposed as per Solid waste management (amendment) rules 2020.

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- Hazardous waste generated in the Plant will be Spent Acids, discarded containers, scrubber sludge and other Hazardous waste which will be managed as per Hazardous and other waste (Management and Transboundary movement) amendment rules, 2020.
- Industrial effluent should be treated and reused in process. Domestic effluent shall be disposed to septic tank followed by soak pit. Zero liquid Discharge (ZLD) will be followed.
- Spillage will be managed by detection of leaks in the first place from structures or vessels. Spillage during loading unloading shall be channelized properly to drains and all PPE will be worn during this time.
- Paved area will be provided near the process area to avoid soil contamination
- The loading unloading activity shall be done with a safe zone defined and in a marked safe area.

It is, therefore, concluded that the proposed facilities will have insignificant adverse impact on land environment, neither during construction nor during operation phase. Provision of green cover approx. 33% of the land will have positive impact on the land environment.

Land Use

The present project is a greenfield project where land is vacant and owned by M/s Shree Agro Crop Science Pvt. Ltd. Land Acquisition is not involved in this project. The client has applied for land conversion of the plot for industrial land use. CRZ clearance is not applicable for this project.

Air Quality

During the construction phase, land preparation and civil construction activities will lead to generation of dust. However, the construction activities will be limited within the project area, and for a limited period. It is, therefore, concluded that the construction phase impact on air quality will be short-lived, reversible, and restricted within vicinity of the project area.

The main sources of air pollution due to the operation of the plant are the process stack, and Hot air generator stack. The DG set stacks were not taken as the emissions from the DG sets will be intermittent. For the proposed project, computations of 24-hour average ground level concentrations were carried out using AERMOD model version 9.8.1, which is a recommended model by USEPA for prediction of air quality from point area.

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Parameter	Max Conc ($\mu\text{g}/\text{m}^3$)	Distance and Direction from the project center
PM10	2.26	2 km in SW
PM2.5	1.80	
NOx	0.9853	
SO2	1.97	
F	0.129	

Noise : The major noise generating sources during the construction phase are vehicular traffic, and construction equipment like, concrete mixers, cranes, generators, pumps, compressors, vibrators, etc. The predicted noise level due to operation of such equipments at a distance of 900 m (where the nearest settlement is located) is 46.45 dB(A). The day time ambient noise level (24 hour Leq) recorded during field studied in the nearest settlement, located at a distance of 0.9 km from the project site is 50.6 dB(A). As the existing ambient noise levels is slightly higher than the predicted additional noise levels, due to masking effect, no significant increase in the ambient noise levels during construction phase is envisaged.

The main sources of noise generation in the proposed project are various types of ID fans, pumps & compressors, grinders, DG sets, etc. Nearest village Jadhavadi is 0.9 km, NE away from the project site. The noise generated from the project activities will not be attenuated significantly due to atmospheric attenuation. The control of noise within the plant is through the provision of silencers, hoods, and acoustic walls to the noise generating equipment. Suppliers of DG Sets, pumps, and fans shall ensure that the noise levels from these equipment do not exceed 90 dB at 1 m from the equipment.

Water Resources and Water Quality

The likely impacts on water quality during the construction phase may arise from inappropriate disposal of construction waste, and wastewater generated from the construction sites. Likely waste generation from the site will be of domestic waste. The domestic sewage will be sent to soak pit.

During Operation Phase, in the proposed project of SSP; GSSP and other sulphates manufacturing project, water will be required for industrial use as well as for domestic & gardening purposes 245 kLD which will be met by Ground water through Borewell.

The wastewater generated from SSP & GSSP and other sulphate plant will be reused in process. Waste water from SSP scrubber will be reused for acid dilution; mixed liquor from Di calcium phosphate and magnesium sulphate will be reused in process and rest will be evaporation losses from GSSP and other sulphate plant. And no other source of industrial wastewater generation at the plant. So, the project will follow zero liquid discharge scheme. ETP is the inbuilt facility in process involved in project.

The domestic waste water will be discharge to septic tank followed by soak pit.

Biological Environment

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The impact of construction activities on ecology will be short term and localized to project site only hence it will be negligible.

Particulate emission and other gaseous emissions from the proposed plant are the major pollutant that may affect the ecology of the area. □ The incremental emission of air pollutants is not likely to induce any significant changes in the ecology because the national ambient air quality standards will remain within the limits. The incremental MGLC of PM, and HF generated from the proposed plant will be very less and overall incremental GLC will remain within the NAAQS.

The study area does not have any identified endangered species, Forest, National Park, Sanctuaries and hence there is no question of any adverse impact on the same.

Proposed plant is zero liquid discharge based so no waste water will be discharged. Thus, no impact on the aquatic ecology is envisaged.

Demographic and Socio-economic

The socio-economic impacts are intrinsically linked with the economic, environmental and health impacts. The proposed project will affect positively the welfare of local people through direct & indirect employment which will improve the Socio-economic status of the area. Use of fertilizer affects farmers agricultural production patterns through increase in agricultural crop yields in the surrounding areas. The project will be beneficial to local people as the company progress and expands its activity gradually. The greenbelt area development and tree plantation will help in enhancing the aesthetics of the plant. Increase in industrialization in the area can increase the main workers sub-category of other workers.

The Proposed project will be installed on agricultural land therefore, proposed construction and operation will cause physical changes (of topography, land use and water bodies) in the locality. The proposed plant may contribute pollutants in the form of dust, gaseous. However, they can be kept below the prescribed environment with proper control mechanism. Due to Noise generation during the construction and operation phase of the proposed project, local people may be adversely affected. All the workers will be equipped with PPE"s and the D.G with facility of acoustic enclosures has been provided to reduce the noise levels.

1.5. Environmental Monitoring Program

Environmental monitoring plan will be implemented as per regulatory requirement to comply the necessary compliances.

1.6. Project Cost & Environmental Protection cost

Total estimated Project cost is Rs 19.07 Crores for proposed greenfield project. The cost on environmental system will be Rs 98.2 and recurring cost will be 21.12 lakhs.

1.7. Additional Studies

Quantitative Risk assessment, Work safety analysis is performed for the proposed project and accordingly Disaster Management plan and on-site emergency plan is prepared for the proposed project site.

1.8. Project Benefits

Corporate Environmental Responsibility

The proposed project shall further strengthen its commitment on CER investment for overall upliftment of socio-economic index of the communities around the project site by way of financial and administrative support. The project will open large employment opportunities, directly and indirectly. There shall be opportunities for entrepreneurs to engage in many service sectors directly or indirectly associated with the project.

As the proposed project is new so as per OM released by MoEF&CC towards Corporate Environment Responsibility dated 1st May 2018, it will dedicate 2% of the project cost towards CER.

1.9. Environment Management Plan

Air Environment

In order to mitigate the adverse environmental impacts due to the construction and operation of the proposed project following measures will be taken:

Construction Phase:

- Wind breaks i.e barricading around construction site.
- Water sprinkling shall be done at regular interval in dust generating areas.
- Providing suitable surface treatment to ease the traffic flow and regular sprinkling of water will reduce the dust generation.
- Aggregates and sand will be stockpiled at suitable places (after stabilizing the surface), near the boundary wall so that the wall acts as windshield.
- Necessary water sprinkling arrangement will be provided around the stockpiles and used whenever necessary to make them moist.
- Cement and steel will be stocked inside covered sheds.
- Construction equipment having 'Pollution Under Control Certificate' will be deployed during the activity to restrict the exhaust emissions.
- Stack height shall be provided to DG set as per CPCB norm

Operation Phase (Fugitive Dust):

- Cyclone Separators, Ventury Scrubbers and Multi Stage Scrubbing Towers shall be installed to control the particulate and other gaseous emissions.
- The entire Hot Air system will be fluidized there will be complete combustion of fuel. Ash collection system will be provided to control particulate matter.
- The rock phosphate is proposed to be transported under cover truck only.
- Covered conveyer system with dust collection system at transfer points
- Water spraying shall be done for dust suppression in dust generating areas/ roads.
- Adequate stack height is provided in DG as per CPCB guideline.

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- Greenbelt will be maintained to attenuate the air pollution.
- Proper personal protective equipment will be provided to the workers.
- All the trucks being used for transportation of raw material and final product shall be checked for "Pollution under Control" certificate prior to their entry to the plant premises

Noise Environment

Construction Phase:

- The construction activity will be carried out mostly during daytime.
- The construction equipment will undergo preventive maintenance test at routine intervals.
- Any machinery or equipment generating excessive noise levels (above 90 dBA) will be taken out of service and replaced by new ones.
- The noise generation will be confined within the plant premises.
- Workers exposed to noise will be given personnel protective equipment like nose masks, face shields and ear plugs. Job rotation schemes will be practiced for over-exposed persons
- Temporary noise shields shall be provided all around the heavy noise making activities.
- Noise monitoring shall be carried out to ensure the effectiveness of mitigation measures and develop a mechanism to record and respond to complaints on noise.
- Job rotations will be practiced for workers, working in noisy environment.
- Protection devices (earplugs or earmuffs) shall be provided to those workers who cannot be isolated from the source of noise and reducing the exposure time of workers to the higher noise levels by rotation.

Operation Phase

- Procurement of equipment meeting prescribed noise standards will be done.
- Sufficient engineering control during installation of equipment and machineries is to be ensured to reduce noise levels at source.
- Acoustical Enclosures with Very high transmission loss rating are strongly recommended for Gas turbines. Minimum Transmission Loss rating should be at least 30 dB for Gas turbine Acoustical Enclosures;
- Room Acoustical Treatment can be done to the Compressor-House walls from the inside;
- Removable acoustical blankets can be effective and economical in reducing the noise level of the pumps;
- All Safety valves in the steam lines should be installed with In-Line silencers with insertion loss rating of 25 dB or more, in order to reduce the noise generated due to the operation of Safety valve;
- Personnel Protective Equipment (PPE) like ear plugs/muffs is to be given to all the workers at site and it will be ensured that the same are wore by everybody during their shift;
- Ducts to be treated with Acoustical lining from the inside, with Duct silencers incorporated in-line to reduce the duct and vent noise;
- Temporary new approach road can be constructed, if required, for smooth and hassle-free movement of personnel;

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- Proper and timely maintenance of machineries and preventive maintenance of vehicles is to be adopted.

Water Environment

Construction Phase:

- Wastewater arising from site offices, and other washing facilities shall be disposed in septic tank and soak pit.
- Oil separator / interceptor will be provided near vehicle parking site, workshop and canteen to prevent the release of oil and grease into drainage system.
- The oil and grease separators will be cleaned on regular basis.
- Storm water drains will be made which will collect rain water during rainy season at construction stage.
- The drains are properly aligned in conformity with the site drainage pattern so that the alteration is kept to the minimum and flooding or soil erosion does not occur.

Operation Phase:

- Ground water will be used at the site as there is no other source of water supply in the area.
- ~206.03 kLD wastewater from process and other industrial utilities and 10 KLD domestic waste shall be generated from proposed plant.
- All the process waste water generated from the scrubber will be either recycled in process or evaporated.
- The domestic wastewater generated from the toilets, washrooms and canteen of the plant shall be treated in septic tank via soak pit and reused in greenbelt.
- No process effluent will be discharged outside the plant premises during non-monsoon and under normal operating conditions.
- The network of storm water drains and wastewater drains inside the plant will be made separate.
- Plant should ensure that the treated effluent quality shall comply with norms set by MPCB.

Biological Environment

Construction Phase:

- Water sprinkling shall be done at regular interval in dust generating areas.
- Providing suitable surface treatment to ease the traffic flow and regular sprinkling of water will reduce the dust generation.
- Temporary greenbelt development shall be started in and around the plant wherever possible

Operation Phase:

- The incremental emission of air pollutants is not likely to induce any significant changes in the ecology because the national ambient air quality standards will remain within the limits. The incremental MGLC of PM, and acid mist generated from the proposed plant will be very less and overall incremental GLC will remain within the NAAQS.
- Proposed plant will be zero liquid discharge based so no waste water will be discharged.

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- All solid waste and hazardous waste shall be disposed as per norm. Therefore, impact of emission on the surrounding vegetation will be insignificant.
- Greenbelt development along the plant boundary, further development of gardens and lawns near admin building will mitigate the residual impact on natural resources.

Socio-economic Environment

Construction Phase:

- To control the fugitive emission during construction phase adequate water sprinkling system will be developed in dust generating area.
- All trucks/machineries used for construction should have PUC.
- All the loose construction material will be transported in covered trucks/dumpers.
- Regular maintenance of all the construction equipment including dumpers/trucks to prevent leakage and Noise and dust emissions.
- Barricade the area for safety and minimization of dust spread. Barricade shall be provided with LED lights.
- However, the project will create employment opportunity for 20-30 temporary and 10-15 no. of permanent employees.
- Shree Agro is also committed to employ local people, depending upon their skill and experience.

Operation Phase:

- The project will create employment opportunity to people of the area.
- Shree Agro will recruit 100 permanent employees and 120 temporary employees in proposed project.
- It is anticipated that this project will improve the socio-economic status in the study area by creating better paying job opportunities.
- Shree Agro is also committed to employ local people, and depending upon their skill and experience they will be trained and allotted suitable jobs.
- Proposed plant will be zero liquid discharge based so no waste water will be discharged.

All solid waste and hazardous waste shall be disposed as per norm. Therefore, the impact of emission on social environment will be insignificant.