

EXECUTIVE SUMMARY

for

INSTALLATION OF NEW NANO UREA-FERTILIZER PLANT AT RCF, TROMBAY, CHEMBUR, SUBURBAN MUMBAI, MAHARASHTRA-400074



Type of Project	New
Category as per EIA notification 2006 and its amendments:	Activity 5(a) , Chemical Fertilizers Category A
Total Plot Area	216.41 Hectares (Land allocated for proposed plant: 1.19 Ha)
Proposed Production Capacity	27,375 KL/annum of Nano Urea
Total Cost of Project	₹ 150 Crore
TOR Letter	Letter No. No.IA-J-11011/216/2021-IA-II(I) dated 13 th July,2022
Monitoring Laboratory	J. P Test House & Research Centre Shahibabad Industrial Area Shahibabad Ghaziabad (UP); NABL Accredited-Certificate No. TC-8047
NABET Acc. No.	NABET/EIA/1922/RA0197 valid till 03.05.2023

PROJECT PROPONENT



M/s RASHTRIYA CHEMICALS AND FERTILIZERS LIMITED
(Government of India Undertaking)

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UID No.: EQMS/EIA/RCF/5(a)A/PR-670/24112022

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ENVIRONMENTAL CONSULTANT:



(Approved Consultant)



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Disclaimer: This document has been prepared with all reasonable skills, knowledge, care and diligence by M/s. EQMS India Pvt. Ltd., Karkardooma, Delhi, the NABET accredited and national level leading Environmental Consultancy Organization within the terms of the contract with the client (Project Proponent), incorporating their General Terms and Conditions of Business and taking account of the resources devoted to it by Business Agreement. The report was discussed with the project proponent in details before releasing. This report has been prepared using information received from Client, collecting primary data and compilation of secondary data from available resources. We are not responsible for the origin and authenticity of the information, drawings or design details provided by the Client.



EXECUTIVE SUMMARY

1.1. Introduction

M/s Rashtriya Chemicals and Fertilizers Limited has proposed for **“Installation of New Nano-Urea Plant”** within existing premises of RCF Trombay Unit. The total production capacity of proposed Nano-Urea plant will be **27,375 kL/annum**. Proposed nano-urea fertilizer plant shall also comprise of bottle manufacturing and bottling unit besides auxiliary facilities. Provision for the same has been included in the proposed plant layout. The project will be developed within plot area of 11900 m² (1.19 Ha.) within Trombay Unit of 216.41 Ha.

Existing RCF Trombay Unit is involved in manufacturing of various fertilizers like Urea & complex fertilizers, Bio-fertilizers like Biola, micronutrient like Microla & Water-soluble fertilizers like Sujala and and synthetic organic/inorganic chemicals like Ammonia, Conc. Nitric Acid, Phosphoric Acid, Ammonium Bicarbonate, Sodium Nitrate/Nitrite, Sulphuric Acid, Argon, Ammonium Nitrate Melt. RCF also produces range of specialty fertilizers. The unit also has facility for Solar Power Generation Plant, Heat Recovery Steam Generation, Gas Turbine Generation Unit. At Trombay Unit, RCF operates two no. of Sewage Treatment Plants (STPs) to meet its water requirement by processing sewage and generating water of raw water quality.

Consolidated details of RCF Trombay Unit have been provided in **Table 1.1** below:

Table 1.1 : Consolidated Details of RCF Trombay Unit

S. No.	Particulars	Unit	Details			Remarks
			Existing	For Nano Urea Plant	Total after Nano Urea Plant	
A.	AREA DETAILS					
1	Total Factory Area	Ha.	216.41			No Change
2	Area of Proposed Nano-Urea Plant	m ²	0	11900 (1.19 Ha)	11900 (1.19 Ha)	Proposed Area for new Nano Urea fertilizer Plant
3	GREEN BELT AREA					
a.	Green Area (In Trombay Unit)	m ²	344300 (34.43 Ha.)			No Change
b.	Green Area (In RCF Trombay Township)	m ²	235000 (23.5 Ha)			No Change
B.	EMPLOYMENT DETAILS					
1.	Total Employment	No.	As on 01.10.2022 permanent employee at Trombay Unit	Existing manpower of RCF will be utilized for the proposed	1455	--

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M/s Rashtriya Chemicals and Fertilizers Limited



S. No.	Particulars	Unit	Details			Remarks
			Existing	For Nano Urea Plant	Total after Nano Urea Plant	
			1455	new Nano Urea fertilizer plant.		
C.	Trombay Unit (GENERAL & SERVICE) DETAILS					
1	Total Water Requirement	KLD	34165	90	34255	Increase
2	PERMITTED DISCHARGE OF EFFLUENT					
i	Domestic Sewage	KLD	2700	4	2704	Increase
ii	Industrial Effluent	KLD	13088.8	5.25	130894.05	Increase
iii	Total Wastewater	KLD	15788.80	9.25	15798.05	Increase
3	Wastewater Treatment Unit	KLD	ETP- 2880 KLD; STP- 2 x 22.75 MLD			No Change
4	Power Requirement	kVA	42000	1300	43300	Increase
5	Power Backup	kVA	1x250 kVA, 1x625 kVA, 2x750 kVA, 1x690 kVA, 1x600 kVA, 1x320 kVA, 1x312 kVA & 1x160 kVA	1x80 kVA	1x250 kVA, 1x625 kVA, 2x750 kVA, 1x690 kVA, 1x600 kVA, 1x320 kVA, 1x312 kVA, 1x160 kVA & 1x80 kVA	Increase
6	Project cost including Environmental controlling equipment	Rs. (Crore)	-	150	-	Estimated cost of Proposed Nano Urea Plant

1.2. Terms of Reference

The application for scoping of the said project was submitted to Expert Appraisal Committee (EAC), New Delhi and Terms of Reference was granted to the project vide File No. IA-J-11011/216/2021-IA-II(I) dated 13th July,2022.

1.3. Project Categorization

As per the Government of India, Ministry of Environment, Forests & Climate Change (MoEF&CC) EIA Notification,2006 and further amendments, the proposed Nano Urea Fertilizer Plant will be covered under **Activity 5(a); Category A** and hence requires environmental clearance from MoEF&CC, New Delhi.



1.4. Project Location

RCF Trombay Unit is located at Chembur Suburban Mumbai, Maharashtra-400074. The proposed Nano Urea Fertilizer Plant will be installed within the existing premises of RCF Trombay Unit. Bottle manufacturing plant shall be set-up of as part of future plan. Provision for the same has been included in the proposed plant layout. The center co-ordinates of the RCF Trombay Unit are Latitude:19° 2'24.21"N; Longitude: 72°53'6.85"E and center co-ordinates of proposed Nano Urea fertilizer plant are Latitude: 19° 2'11.35"N; Longitude: 72°53'4.70"E.

The project is well connected to Eastern Express Highway from both north and south directions. The nearest railway station to the project is Chunabhatti Railway Station located 1.17 km, W. Nearest Airport located to the project is Chhatrapati Shivaji Maharaj International Airport (Mumbai Airport) located at 5.20 km, NW. Mahim/Mithi River is nearest river flowing at 1.52 km (NW) from the site. There are no environmentally sensitive components within study.

1.5. Description of Environment

1.5.1. Topography

Topographically the area is undulating, and the elevation of the project site is between 3-11 amsl. Mumbai District is situated on the West coast of India between 18° 52' and 19° 04' North latitudes and 72°47' and 72°54' East longitudes. It is surrounded on three sides by water, the open Arabian Sea to the West and South and Thane creek to the East. To the North it is bordered by Mumbai (Suburban) District.

1.5.2. Geology and Hydrogeology

GEOLOGY: The soils of the district are essentially derived from Deccan Trap, which is the predominant rock formation in the district. A substantial area of the district has been reclaimed from sea. Most of the geological exposures are now covered by buildings and rarely exposed in some road cuttings. The trap rocks, which are now extinctive, are still found in places like elevated Mazgaon, Bhoiwada, Koliwada, Antop Hill and Sion.

HYDROGEOLOGY: *The entire district is underlain by basaltic lava flows of upper Cretaceous to lower Eocene age. The shallow Alluvium formation of Recent age also occurs as narrow stretch along the major rivers flowing in the area. The premonsoon depth to water levels monitored during May 2011 ranges between 2.67 m bgl and 4.25 m bgl. The depth to water levels during pre-monsoon occurs in 2.0 to 5.0 m depth range. The depth to water levels during post-monsoon (Nov. 2011) in major part of the district ranges between 2 and 5 m bgl. The Shallow water levels of < 2 m bgl are observed in small area in southern part of the district.*



1.5.3. Meteorology

Temperature–The Annual mean minimum temperature of around 12.7°C and annual mean maximum temperature of around 38.9°C. March is the hottest month with daily mean maximum temperature at 38°C and January is the coldest month with daily mean minimum temperature of 13.2°C.

Relative Humidity– Most humid conditions are found maximum no. of times in the monsoon months, followed by summer, post-monsoons, and winter in that order. Mornings are more humid than evenings; highest relative humidity is recorded as 86 % in August.

Rainfall– Total annual rainfall was observed to be 2373.4 mm. Mostly rainfall occurs in the months of June to Sep. The maximum total monthly rainfall is 840.7 mm during the month of July and minimum monthly rainfall during monsoon is 0 mm during the month of March.

Wind Speed– Mean wind speed was observed from 12.2 kmph (July) to 5.1 kmph (December).

Wind Direction–The wind pattern of the region shows that the predominant wind direction is NW, W.

1.5.4. Ambient Air Quality

Nine locations were monitored and assessed for ambient air quality in 10 km radius study area. The monitoring results of ambient air quality were compared with the National Ambient Air Quality Standards (NAAQS) prescribed by MoEF&CC; GoI Notification dated 16.11.2009. The maximum concentration of PM₁₀, PM_{2.5}, SO₂, NO_x & CO was 176 µg/m³, 77 µg/ m³, 24 µg/ m³, 38 µg/ m³, 1.3 mg/ m³ respectively. The 98%tile observed to be within the limits of standards prescribed by NAAQS, 2009 only for NO_x & SO₂. However, PM₁₀ & PM_{2.5} levels during the season were found to be exceeding than the permissible limits of 100 µg/m³ & 60 µg/m³ respectively. The results have also been validated by live ambient air data located at Mumbai Airport collected by Central Pollution Control Board (CPCB). On the criteria of AQI, the AQI Category for each of monitoring station has been found to be moderate.

1.5.5. Noise Environment

Eleven locations were monitored and assessed for ambient air quality in 10 km radius study area. Noise levels ranged from 50.9 dB(A) to 69.4 dB(A) at daytime and 41.6 dB(A) to 62.3 dB(A) during night-time. The noise levels observed in the project site and study area are within prescribed limits except at N-8 i.e., Dadar located 3.81 km, in WSW direction of the project due community noise and vehicular movement at residential area. As per the results, it has been observed that noise levels are higher at residential



areas than industrial areas. Vehicular traffic in the area also contribute to the increased noise levels in the area.

1.5.6. Water Environment

GROUNDWATER QUALITY: Eight locations were monitored and assessed for ground water quality. The analysis results indicate that the pH ranged between 6.35 to 7.24 which are well within the specified standard of 6.5 to 8.5 limit. Total hardness levels were recorded in the range between 28 to 478 mg/l that is within permissible limits of 600 mg/l. Total dissolved solids were recorded in the range of 45 to 1034 mg/l that falls within permissible limits of 2000 mg/l. Chloride levels were recorded between 12 to 226 mg/l that falls within the range of permissible limit i.e., 1000 mg/l. Sulphate levels were observed in the range of 2 to 78 mg/l and were within the acceptable limit i.e. 400 mg/l. Bacteriological studies reveal that no coliform bacterial are present in the samples. The heavy metal contents were observed to be in below detectable limits. Parameters for toxic substances were recorded within the permissible limits. All physical and general parameters were observed within the permissible limit as per IS10500:2012 (Second Revision). Thus, it is recommended that water be filtered and disinfected prior to be given for drinking water requirements. Groundwater Quality Index ranged from Poor water to Excellent in sampling locations.

SURFACE WATER QUALITY: Seven locations were monitored and assessed for surface water quality in 10 km study area. Since there are only 1 river (Mithi River), creeks (Mahim Bay, Mahul Creek, Vashi Creek) and Arabian Sea, only seven locations have been identified for baseline monitoring of surface water in the area. The pH values of all analysed samples ranged between 6.25 – 7.35. TDS levels were observed to be in range from 660 to 65268 mg/l. Total hardness levels were observed to be in the range of 212 to 4846 mg/l. Dissolved Oxygen values ranged between 0.9 to 6.3 mg/l. The chlorides level was observed to be in range of 195 to 35490 mg/l. Sulphate level were found to be ranging from 10 to 558 mg/l. Nitrate levels were found to be observed within the range of 11.2 to 31 mg/l. Total Coliform levels were found to be in the range of 4.9×10^3 to 4.8×10^7 MPN/100 ml. Biochemical Oxygen Demand (BOD) was observed to be in range of 3.9 to 32 mg/l. Comparing the values as per classification for designated best use water quality criteria by CPCB, 5 surface water locations (SW-1 to SW-5) were classified under "Below E Category as the parameters were found to be exceeding the permissible limits as per CPCB while SW-6 & SW-7 were classified under "Class-D i.e., suitable for propagation of wildlife and fisheries." Surface Water Quality Index ranged from non-polluted to Heavily polluted.

1.5.7. Soil Environment

Eight sampling locations were monitored and assessed for Soil quality in 10 km study area. As per the grain size distribution the percentage of Sand in all sampled soil was found varied from 30.4% to 63.7%. Silt varied from 16.8% to 51.3 % and Clay from 15.5% to 22.5% during study season. The soil texture is Sandy Clay loam. The soil pH ranges



were observed from 6.38 to 7.62 during study season, thereby indicating the soil is "Slightly Acidic to Slightly alkaline" in nature. Organic Carbon content of sampled soil during study seasons varied from 0.28% to 0.91%, thereby implying that soils are low to high with organic carbon content. Available nitrogen content in the surface soils ranges between 86 kg/ha to 208 kg/ha thereby indicating that soils are low in available nitrogen content. Available phosphorus content ranges between 3.11 kg/ha to 11.7 kg/ha thereby indicating that soils are low to medium in available phosphorus content. Available potassium content in these soil ranges between 154 kg/ha to 356 kg/ha thereby indicating that the soils are medium to high in potassium. Based on Nutrient Index Value for N, P and K, the soils of study area fall into Low to Medium Fertility Status.

1.5.8. Ecology and Biodiversity

FLORA: The site is in urban area. The vegetation in core zone and its immediate surrounding is present in the form of existing greenbelt and vegetation present along the roadside and parks. The common trees present in the core zone are *Acacia arabica*, *Albizia lebbeck*, *Azadirachta indica*, *Bambusa vulgaris*, *Ficus benghalensis*, *Ficus religiosa*, *Mangifera indica*, *Peltophorum pterocarpum*, *Samanea saman*, *Schefflera actinophylla*. The vegetation is present in form of roadside plantation, gardens and park. Coastal area includes mangrove vegetation. The Mahul creek, Mahim River and Thane creek is located within the 10 km study area and mangroves vegetation is present in creeks. Mangrove can be seen in creeks as well. The most commonly and dominant species seen is *Avicennia marina*. Urban vegetation comprises of gardens, avenue tree, ornamental plants, which grow along the road dividers and traffic island at junctions of crossroads. General urban trees are *Acacia arabica*, *Albizia lebbeck*, *Azadirachta indica*, *Bambusa vulgaris*, *Ficus benghalensis*, *Ficus religiosa*, *Mangifera indica*, *Peltophorum pterocarpum*, *Samanea saman*, *Schefflera actinophylla*. The commonly found shrubs are *Carissa carandas*, *Gnidia eriocephala* etc. There is no endangered or critical plant species present in the study area.

MANGROVES: Along the seacoast and creeks there is a mangrove swamps present in the study area. *Avicennia marina* is the main dominant mangrove species reported near to tidal waves followed by *Rhizophora mucronate*. Progressing landward, the next zone was that of *Bruguiera cylindrica*, whereas *Acanthus ilicifolius* formed the fringe layer near to the land. Shrubs of *Ceriops tagal* and *Aegiceras corniculatum* were scattered intermittently among the other mangroves species. However, in the Thane creek, an *Avicennia marina* and *Sonneratia apetala* association was found evident.

PHYTOPLANKTONS: A total of 42 species of phytoplankton were recorded from the study areas and adjoining areas of Mumbai Coast. The total cell count of phytoplankton was encountered as high, 40.40×10^2 L⁻¹. The low phytoplankton productivity might be due to high turbidity of seawater. Diatoms (*Bacillariophyceae*)



are the dominant component of phytoplankton in all the samples collected from the study area. Total number of species recorded was 41 belongs to 20 genera. The species diversity was found 1.25.

ZOOPLANKTONS: Copepods have the great percentage among all other groups of zooplankton. There are about 22 species of zooplanktons observed in the study area.

FAUNA: A total of 7 species of mammal reported in the study area. As per Indian Wildlife (Protection) Act, 1972 (Amendment 2002) none of mammal species belongs to schedule -I species. The list of herpetofauna includes 13 species of amphibians and reptiles. The all-recorded species are categorized as Lower Risk Least Concerned species of IUCN.

AVIFAUNA: Due to presence of water bodies and Sanjay Gandhi national park there is huge diversity of avifaunal species in the study area. List of the terrestrial fauna has been cross checked and as per wildlife protection act 1972, No schedule-I species reported from the study area.

FISH SPECIES: Approx. 32 no. of fish species were recorded in the study area.

1.5.9. Socio-economic Environment

As per the census records 2011, the total population was recorded as 33,10,657 persons of 23 Wards in Mumbai Suburban districts in Maharashtra. Total number of 'Households' was observed as 732931 in the study area. Male-Female wise total population in the study area was recorded as 1794715 males and 1515942 females respectively. The 'Sex Ratio' was observed as 869 females per 1000 males in the study area. Scheduled Castes' population was observed as 176923 persons consisting of 90802 males and 86121 females respectively in the study area which accounts as 5.34% to the total population of the study area. 'Scheduled Tribes' population was observed as 26377 persons, accounting as 0.80% to the total population of the study area consisting of 14161 males and 12216 females. 'Literacy Rate' is recorded as 58.11% with male-female wise percentages being 45% & 35.68% respectively. The 'Main Workers' were observed as 1266588 (38.2%) persons to the total population of the study area.

1.5.10. Traffic Study

The project site is connected to Eastern Express Highway which is located adjacent to site in North & South direction of the project site. Under proposed nano-fertilizer project, approx. 10 no. of trucks will be utilized for raw material and 10 no. of trucks will be used for transportation of products daily. The results indicate that all three roads have ample capacity to cater additional load of trucks for raw materials and product transportation for the proposed nano-fertilizer fertilizer project and no impact will be observed from the same.



1.6. Anticipated Environmental Impacts and Mitigation Measures

1.6.1. Air Environment

Impacts: During Construction Phase, the proposed project includes development of pre-engineered building shed with commissioning of machineries that would lead to low/minimal dust generation. Construction of pre-engineered shed and related machineries will lead to low/minimal dust generation. Existing expressway shall be used for transportation and present road conditions are reasonably good. Minimal impact is being anticipated with respect to proposed facility to nearby habitation. During Operation Phase, Due to endothermic nature of formulation reaction of Nano-Urea and production of stable nanocluster of nano Urea fertilizer, there are no such air emissions being generated from nano Urea fertilizer plant. Hence, the Nano Urea Fertilizer plant does not emit air pollutants. However, due to increment in transportation and handling of product, minimal impact can be foreseen for which appropriate measures will be taken.

Mitigation Measures: During Construction Phase, regular water sprinkling, site barricading, covering of trucks for construction materials, conduction of construction activities only at daytime will be done to negate the impacts. The proposed project does not pose impact in terms of air pollution. However, the industry complies with all compliance measures w.r.t. air environment protection. However, measures like periodic monitoring, provision of PPE's to workers, ample green belt plantation will be done.

1.6.2. Noise Environment

Impacts: The main causes of noise during construction phase will be operation of construction machineries & equipments like compressors, mixers, cranes, generators. There will be minimal construction activities in proposed project involves development of pre-engineered shed, machines and equipments involved in nano-urea plant. Chances of noise generation are anticipated for short duration of time. However, all preventive measures like maintenance of noise generating vehicles, provision of machinery & equipment with mufflers, adequate parking space, noise monitoring will be executed to avoid noise pollution. During Operation Phase, main sources of noise generation are ID Fans, pumps, compressors etc.

Mitigation Measures: The equipments will be designed with enclosures and mufflers which ultimately reduce the noise level around the machinery. Wide tree belts and higher relative height of trees are in the plant that will result in more diffraction effect, longer noise pathway and greater noise reduction. The height of trees planted in the existing site is ranges from 5-20 m, which results in reduction of noise decibels. Acoustic enclosures will be made. All engineering control practice shall be undertaken during installation of machinery to maintain noise level. During Operation Phase, low noise generation can be foreseen due to operation of machinery in proposed nano-urea plant. However, appropriate green area around the proposed plant has also been proposed that will mitigate such minimal impacts effectively.



1.6.3. Water Environment

Impacts: All existing facilities like drinking, sanitation shall be used during the installation/construction purpose. No additional facility will be required for additional work force. Existing supply of water shall be used for meeting requirement of labour. Wastewater generated from toilets shall be disposed as same as existing practice i.e., treatment in existing STP. No wastewater will be discharged to surface or ground. For proposed Nano Urea Fertilizer plant, approx. 90 KLD of water will be required. There will be no abstraction of groundwater or surface water for proposed project. Wastewater generation from proposed Nano-Urea fertilizer plant will be 9.25 KLD (Domestic Sewage-4 KLD; Industrial Effluent-5.25 KLD). Wastewater will be treated in existing ETP for reuse within the premises. There will be no discharge of wastewater into land/sea from proposed project and thereby shall no impact the water quality.

Mitigation Measures: Online monitoring instruments for measurement of pH, flow and ammoniacal nitrogen at the discharge line of existing ETP have been installed and connectivity has been established with MPCB & CPCB Servers. No ground water abstraction or disposal of water in ground and surface water will be done. All probable leakage areas such as pipelines, joints, pumps and structure of reactor/ storage vessel will be inspected and maintained proactively.

1.6.4. Soil & Land Environment

Impacts: The proposed project is "Setting-up of Nano Urea Fertilizer Plant" within existing premises of RCF Trombay Unit. The land is already in possession of RCF. Hence, there will be no impact on land-acquisition status. There will be no land use / land cover change as it is development of new nano urea fertilizer plant within existing premises of RCF Trombay Unit. The proposed project shall be undertaken within the existing site of the project and the present land use of the existing site is industrial. Soil erosion may happen if open areas are left without paving or plantation. Thus, it is required to either pave or green the open areas. Soil may get contaminated, if sewage is disposed of on the soil, littering of municipal waste, e-waste and spillage of HSD, oil and fuel.

Mitigation Measures: Municipal Waste (domestic and or commercial waste) will be disposed as per existing practices i.e., disposal to BMC approved vendors. All precautions will be taken to avoid spillage from storage during existing phase and shall be taken during further phase. Paved area will be provided near the process area to avoid soil contamination. All underground tanks will be provided with extra prevention to avoid leakage. Used oil shall be stored drums and shall be sold to registered recycler.



1.6.5. Impact on Ecology and Biodiversity

Impacts: Under construction/installation of proposed unit, no additional land is proposed to be acquired for proposed development. No tree cutting shall be required for the proposed project hence the direct impact on terrestrial ecology (loss of flora and fauna) is likely to be insignificant. The proposed project is neither generating any air emissions or hazardous wastes. Additionally, minimal quantities of wastewater generated from the project will be reused within the plant after its appropriate treatment. Thus, no major impact is anticipated due to the proposed project.

Mitigation Measures: Dust generation due to construction activities be confined mostly to the initial period of the construction phase and would be minimized through paving of roads, surface treatment, regular water sprinkling in dust generating areas and green area. Construction activities will be limited to only daytime. Greenbelt development works for proposed plant will be initiated during construction phase. The project will be planned with most efficient air pollution control systems for achieving air emissions norms, so that the impact on nearby ecosystem is minimized.

1.6.6. Socio-economic Environment

Impacts: Approximately 150 no. of labour shall be required for installation/commissioning of machinery for the proposed project. Most of the unskilled and semi-skilled labour will be hired from nearby areas. The project construction activity will have positive impact on the social environment. Through nano-urea plant, farmers as well as environment will be able to achieve sustainable farming practices. With Nano technology-based products, better nutrient assimilation inside the plant system will not only address nutrient losses prevalent in conventional farming practices but also will let the farmers achieve twin benefit of higher crop yields at lower cost and better environment. Overall, the project will have positive impacts on socio-economic environment. However, due to operation & maintenance there may be various risks for the staff and other nearby people.

Mitigation Measures: All basic facility like sanitation, toilets, canteen, camps shall be provided within the plant area. PPEs shall be given to all labour working in noise-prone area. All the staff will be given training for carrying out the work assigned keeping the safety as priority. Workers medical tests will be undertaken periodically. Proper guards/safety provision will be made. Entry without entry pass will be restricted. Trainings will be conducted on regular basis to train about the safety procedures and strictly following the rules.

1.7. Environment Monitoring Programme

Environment Monitoring Programme will be implemented as per regulatory requirement to comply with necessary compliances.



1.8. Additional Studies

Based on the QRA study results, following major recommendations have been made for Plant to improve the overall safety.

Recommendations for Frequency Reduction

1. Ensure that all protection, interlocks are Tested periodically as per OEM recommendations.
2. Ensure that dyke's integrity is maintained, and dyke drain valves is operated through administrative controls only to prevent loss of containment through dyke drain valve.
3. Ensure that all electrical and instruments are provided as per Hazardous Area Classification and Maintained well to prevent probable ignition of leaked flammable chemical.

Recommendations for Consequence mitigation to avoid disastrous effect on societal risk

1. Recommended to Ensure that proper firefighting facilities are provided, and workers are trained to tackle fire and to prevent it from spreading to other area.
2. Ensure adequate inventory of SCBA sets is available in respective use area for emergency response.
3. Train emergency responders and management team on consequence and damage distance of various emergency scenarios covered in this QRA and ideal emergency response in case of onsite and off-site emergency.

1.9. Project Benefits

1. The proposed project would generate direct and indirect employment opportunities, which will benefit the local people during construction period.
2. Employment will be generated for Workers in skilled or unskilled category.
3. Business opportunities to the local people shall be available during the construction phase.
4. It will improve the economy of the local nearby vendors.
5. Reduction in shortfall of fertilizers and therefore fertilizer import will be reduced.
6. The Project shall contribute towards local training and employment programs.
7. There will be some boost to the state's business sector, including manufacturing, construction, transport, engineering, and related consultancies.
8. It will ease the availability of chemical fertilizers to farmers.
9. Nano Urea fertilizer is an alternate and improved solution for restricting/reducing the use of chemical fertilizer and are highly cost effective. These products shall provide nutrients required for healthy crops and better yields.
10. The company has contributed in socio-economic development via Corporate Social Responsibility Expenditure and shall continue to do the same in future.

1.10. Environment Management Plan

OH&S policy and EHS policy is adopted by the plant for sustainability. A separate Environment Management Cell, Fire & Safety cell and Occupational Health Centre is

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provided in the plant for compliance of Environmental Management Plan and OHSAS guideline RCF has implemented all guidelines laid down by CPCB and MoEF&CC for CREP (Corporate Responsibility for Environmental Protection) and submitting the annual compliance of the same to the MPCB.

The estimated cost for proposed project is **Rs.150 Crores**. RCF has spent approx. Rs. 8560.11 Lakhs on environment management plan for compliance of standards, norms laid down by GOI and environmental sustainability. Proposed Budget planned on environment management plan for next year (2022-23) will be **Rs. 129 Lakhs**.

1.11. Conclusion

Thus, it can be concluded on a positive note that after implementation of the mitigation measures and Environment Management Plan, the operation of the project will have no major impact on environment.
