	Setting up new manufacturing unit of Pesticides At Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin code – 441 122	Doc No.: EIA
		Rev No. 0
		Issue Date: 08.02.2018
		Page 1 of 15

EXECUTIVE SUMMARY

Introduction and Project Proponent

“**M/s Crystal Crop Protection Private Limited**” was earlier known as “M/s Cytec India Specialty Chemicals Materials Private Limited”, a company incorporated under the provisions of the Companies Act, 1956, having its registered office at G-54, MIDC Industrial Estate, Butibori, Nagpur, Maharashtra (India)

Crystal Group is a 34-year-old company established by the visionary industrialist Mr. Nand Kishore Aggarwal. Crystal engages in the technical manufacturing, formulation and marketing of agrochemical products – Insecticides, Fungicides, Herbicides, Plant Growth Regulators / Micro Nutrients.

M/s Crystal Crop Protection Pvt. Ltd (henceforth Crystal) plans to manufacturing pesticides at Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin Code – 441 122.

The pesticides are integrated part of agriculture development. The problems of pest resurgence and secondary pest out-breaks crop up with the indiscriminate use of pesticides. These associated problems offer a great scope for revolutionizing the use of pesticides. However, in India though the overall pesticide growth figures may appear impressive, the rate of consumption per hectare of cultivated is very low in comparison to other countries. Crystal proposed new greenfield project is one step in this direction.

Project Categorization

As per the EIA Notification 2006 of Ministry of Environment & Forests (MoEF), Government of India and lastly amended on December 1, 2009, the proposed project comes under “project and activity-5 (b) of schedule.” Considering the products portfolio, the proposed greenfield project falls in “Category A” of Schedule of the EIA notification which requires Environmental Clearance (EC) from MOEFCC, New Delhi.

Project Location

Crystal proposed project will be set up at Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin Code – 441 122. The proposed project is occupying an area of about 40500 Sq. Meters. Site is well connected with National Highway 7 is 4.7 km in East direction. Nearest Railway station Butibori Railway Station (5.9-km; SE). The proposed project site is located in MIDC, Butibori notified Industrial area.

Proposed Project

The present EIA study is for the manufacturing of total 42 No's of products which includes 16-Fungicides, 12-Herbicides and 14-Insecticides. The list of products and byproducts are shown in below:



**Setting up new manufacturing unit of Pesticides At Plot No: G-54,
MIDC Butibori, Nagpur, Maharashtra, Pin code – 441 122**

Doc No.: EIA

Rev No. 0

**Issue Date:
08.02.2018**

Page 2 of 15

S. No	Name of Technical	Qty MT	S. No	Name of Technical	Qty MT
Fungicide					
1	METIRAM TECHNICAL	850	9	PICOXYSTROBIN TECHNICAL	105
2	CYMOXANIL TECHNICAL	105	10	MANDIPROPAMID TECHNICAL	100
3	PROPICONAZOLE TECHNICAL	50	11	EPOXYCONAZOLE TECHNICAL	330
4	HEXACONAZOLE TECHNICAL	315	12	BENZOVINDIFLUPYR TECHNICAL	30
5	TRICYCLAZOLE TECHNICAL	420	13	BIXAFEN TECHNICAL	30
6	TEBUCONAZOLE TECHNICAL	300	14	FLUOPYRAM TECHNICAL	50
7	AZOXYSTROBIN TECHNICAL	125	15	FLUOXASTROBIN TECHNICAL	30
8	PYRACLOSTROBIN TECHNICAL	5	16	FLUXAPYROXAD TECHNICAL	50
Insecticide					
17	CLOTHIANIDINE	50	24	SPIROTETRAMAT TECHNICAL	30
18	FLONICAMIDE TECHNICAL	105	25	SULFOXAFLOLOR TECHNICAL	50
19	IMIDACLOPRID TECHNICAL	400	26	DINETOFURON	100
20	THIAMETHOXAM TECHNICAL	480	27	FLUBENDAMIDE	100
21	ACETAMIPRID TECHNICAL	180	28	LAMBDA CYHALOTHRIN TECHNICAL	400
22	PYRIDABEN TECHNICAL	50	29	CYPERMETHRIN TECHNICAL	250
23	CHLORANTRANILIPROLE TECHNICAL	100	30	BIFENTHRIN TECHNICAL	250
Herbicide					
31	PYRAZOSULFURON TECHNICAL	20	37	METAMIFOP TECHNICAL	50
32	TEMBOTRIONE TECHNICAL	50	38	SAFLUFENACIL TECHNICAL	30
33	PENOX SULAM TECHNICAL	30	39	BENTAZONE TECHNICAL	360
34	QUIZALOFOP ETHYL TECHNICAL	80	40	CLOMAZONE TECHNICAL	450
35	OXADIAZON TECHNICAL	25	41	SULFENTRAZONE TECHNICAL	135
36	CLODINOFOP PROPARGYL TECHNICAL	100	42	PROPAQUIZAFOP TECHNICAL	100
		6870			


Resources Requirement

Land: The project is located in MIDC notified Industrial area. The overall area of the project site is 40500 Sq. Meter. 13365 Sq. Meter (~33%) has been earmarked for green belt development.

Raw Material: There is large number of raw materials required for the proposed products.

Water: The source of water for the proposed project will be from MIDC.

- Fresh water requirement-120 KLD
- Recycled Water- 107.5 KLD

	Setting up new manufacturing unit of Pesticides At Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin code – 441 122	Doc No.: EIA
		Rev No. 0
		Issue Date: 08.02.2018
		Page 3 of 15

- Total water- 227.5 KLD

Power: Proposed plant will require 1000 KW (Estimated Sanctioned Load) and will be sourced from Maharashtra State Electricity Board. To meet the emergency power requirement for critical operations for ensuring safety, 02 No's DG sets having capacity 750 KVA and 180 KVA each will be as standby power back up.

Fuel: Rice husk/wood/ LDO/HSD will be used as fuel.

Manpower: During construction phase 25 manpower will be required per day. During Operation stage around 100 manpower will be required at various levels.

Environmental Aspects

Air Pollution

The main sources of existing air pollution due to the operation of the plant are the Stacks of process and utility sections (one Boiler, incinerator, Process vent scrubber, DG sets (during power failure only).


The control measures employed for controlling air pollution are

- Gaseous emission from fuel burning, consist of common pollutants like SO₂, NO₂, and PM would be discharged into atmosphere through Stack of suitable height.
- Green belt will be developed covering >33% of the total project area, around the plant boundary as dust preventive barrier.
- Odour Control System: All the vents of the batch tanks and solvents are connected to scrubber to absorb any pollutant / odour producing gases and chemicals. Green belt around the plant boundary will absorb the odour to some extent.
- The operation of process system will be done in closed equipment to avoid any vapours coming out in the local atmosphere. The vents of centrifuges / filters will be connected to scrubbers.
- The drying of the product is done in a closed type continuous Fluidized Bed dryer/ Nudge filter to avoid the exposure of any chemicals to human being.
- Volatile organic solvents are carefully handled in a closed system, thereby preventing any discharge of these chemicals into the air.

Water Pollution

In this project, water would be required for industrial use, domestic & gardening purposes. Although, there will be wastewater generation due to industrial process, the water generated from washing and scrubbing will be recycled back in the process.

Wastewater of the site is segregated based on COD, TDS and BOD/COD ratio and treated in the Effluent Treatment Plant (ETP) followed activated carbon filter. Treated effluents are recycled in the Cooling Tower / process etc. RO reject goes to ETP.

	Setting up new manufacturing unit of Pesticides At Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin code – 441 122	Doc No.: EIA
		Rev No. 0
		Issue Date: 08.02.2018
		Page 4 of 15

Domestic effluents goes to Sewage Treatment Plant and then used for Green Belt Development.

The proposed project is “Zero Discharge project”.

Noise Pollution

The plant will have various rotating machines including blowers, vacuum pumps, process pumps, etc. along with DG sets, which will generate noise and noise levels are within limits.

During operation/construction phase minor noise is envisaged. The statutory national standards for noise levels at the plant boundary and at residential areas near the plant are being monitored and shall be met. The green belt developed helps in reducing noise levels generated due to plant operations.

Waste Generation

The plant will generate various category of hazardous wastes. ETP sludge, waste oily sludge and other hazardous wastes will be sent to authorized TSDF site. Waste from Solvent Recovery system and some hazardous wastes will be incinerated in the in-house incinerator. Incinerator ash will go to TSDF Site.


Environmental Status of Plant Site and Study Area

Site Characteristics

The proposed green field project is being set up at Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin Code – 441 122.. Site is located in Notified industrial area developed by MIDC. The study area has been defined as an area covering the buffer study zone of 10-km radius around project site. The coordinates of the project site are 20° 56’ 38.60” N & 78° 57’ 42.10” E. map showing corner coordinates of the Project site is provided in Figure 3.1. Proposed site is well connected to national highway-7 (Mancherial-Chandrapur-Nagpur Road) through Salaidhaba-Gumgaon road which is passing close to eastern boundary of the proposed site. National Highway-7 is passing about 4.7 km east of the proposed site. Nagpur -wardha rail line is passing about 5.7 km east of the project site. Nearest railway station is Buti Bori railway station located about 5.9 km from site in southeast direction.

Topography and Geology:

Topography of site and surrounding 10 Km area: The study area falls in Nagapur district. The study area forms part of Deccan Plateau having flat topped and terraced features. It is a plain area with the general topography some areas and its vicinity have higher elevation. Lineaments are also observed in the study area. the elevation of the study area (10 Km area) ranges between 250 amsl to 414 amsl. The topography of the proposed site is plain and the elevation of the site ranges between 284 to 286 amsl. The Digital elevation model of the study area area is presented in Figure 3.7.

	Setting up new manufacturing unit of Pesticides At Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin code – 441 122	Doc No.: EIA
		Rev No. 0
		Issue Date: 08.02.2018
		Page 5 of 15

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. However there are few patches of reserve forests are present within the study area. Nearest forest is Bir Sukli RF located about 3.45 km NW of the site other forests are JunaPani RF located about 7.25 km SW and Degma Reserve Forest located about 9.5 km NW of the proposed plant site. Santra Nala is 1.83 km in South. Kanholibara river 3.2 km S, Vena river 3.2 km E, Vadgaon Lake 9.5 km SE. Location map, showing site and surrounding environment features within the 10 km area is provided in **Figure 3.3**

Climate:

During the summer months i.e., April-June, the daily mean minimum temperature are around 24.0°C and daily mean maximum temperature around 42.3°C. During winter months i.e. December – January the daily mean maximum temperature remains around 28.7°C and daily mean minimum temperature remains around 12.4°C..

The total annual mean rainfall received at Nagpur (Sonogaon) IMD is about 1097.7 mm. Rainfall peaks during the month of July and August (mean monthly being about 286.5 mm and 284.1 mm). The maximum rainfall for monsoon months (June to September) contributing about 84.5% (about 928.0 mm) of the total annual rainfall.

Seismicity:

Based on tectonic features and records of past earthquakes, a seismic zoning map of India has been prepared by a committee of experts under the auspices of Bureau of Indian Standard (BIS Code: IS: 1893: Part I 2002. According to the seismic-zoning map of India, the project area falls in **Zone-II (Low Damage Risk Zone)** of seismicity. Thus lies among the moderate-risk earthquake areas.


Micro-meteorology:

An automatic met station was established at site to collect the site specific data (from 1st October to 31st December 2017.). The predominant wind direction was from North and North-West direction. The mean wind speed was 0.88 m/s. Calm was observed for 31.66%. Utmost care was taken to ensure that the stations were free from obstructions to free flow of winds. Wind speed, wind direction, temperature and relative humidity data was collected daily on an hourly basis during the study period.

Soil:

The soil samples collected from six locations. The physical characteristics examined include color, texture, bulk density, porosity and water holding capacity. As of texture as per 'USDA' Triangular Classification System, Texturally the soils of study area are observed as clay and Clay Loam Soils.

Bulk density of soils in the study area varied between 1.16 to 1.38 gm/cm³. The results show Permeability values were found to vary from 0.15 to 0.33-cm/hr under Clay and

	Setting up new manufacturing unit of Pesticides At Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin code – 441 122	Doc No.: EIA
		Rev No. 0
		Issue Date: 08.02.2018
		Page 6 of 15

Clay Loam textured soil in the study area. Water Holding Capacity of study area soils was observed as 29.9 to 32.8 %.

Landuse:

Land use analysis was carried out using remote Sensing Data. Interpretation approach based on systematic digital imaging was used for delineating the land use classes. The demarcation of boundaries falling under different land use/land cover units is done using different colours assigned to different land use/land cover units of satellite imagery¹.

Land use of project site is industrial land. Most of the land within the 10 km area of the project site is under agriculture. As per the land use based on satellite image, about 62% of the land is under cultivation. Open Shrub land consist 25.9% of the total area. 3.16% land is under vegetation, 6.61% of the land is under settlement and about 2.30% land is under water bodies.


Water:

Eight ground water samples and two surface water sample were collected from different locations around the site during study period. The water samples were examined for physico-chemical parameters and bacteriological parameters. The samples were collected and analysed as per the procedures specified in Standard Methods.

The pH value of drinking water is an important index of acidity or alkalinity. pH value was found within desired and permissible limit, neutral to alkaline in nature. Total dissolve solids was found within permissible range for all the location but at location 1,6,7, and 8, the TDS value was higher than the desired range which states that water can be used for drinking if any other source of water is not available at those areas. Similarly, total hardness at Ground water locations 1,2,6,7 and 8 is higher than the desired limit but within the permissible range. Total alkalinity at Ground water locations 1,2,6,7 and 8 is higher than the desired limit but within the permissible range. Rest all the alkaline and heavy metal is found within desired and permissible range which states that ground water is not contaminated and is safe for drinking.

Kanholibara river, Vena River and Vadgaon Lake are the source of surface water in the study area. Four (04) surface water samples were collected and examined for major physico-chemical parameters and bacteriological parameters. It is concluded from the observed parameters that Kanholibara River Down Stream River near Patanbori fall under class of water C i.e (Drinking water source after conventional treatment and disinfection, DO-4.7 mg/l; BOD-3 mg/l;pH-7.99;Total coliform-1230) and rest all the surface water locations falls under class of water D i.e (Propagation of Wild life and Fisheries) as BOD is more than 3 mg/l at all these locations. Also at river Vena DO is less than 4 mg/l

Air Quality:

	Setting up new manufacturing unit of Pesticides At Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin code – 441 122	Doc No.: EIA
		Rev No. 0
		Issue Date: 08.02.2018
		Page 7 of 15

The highest PM_{2.5} level was found at Patan Bori as 56-µg/m³ and lowest PM_{2.5} level was observed at Sailadabad as 21-µg/m³, while the mean concentration of all monitoring locations ranges between 29 to 43-µg/m³. The PM_{2.5} level at all the monitoring locations is observed within permissible limit i.e. NAAQMS level 60-µg/m³. SO₂ and NO_x levels in all monitoring locations were found within the NAAQS (80 µg/m³). Ammonia level in all monitoring location are under permissible limit i.e. NAAQMS level 400µg/m³. The 8 hour concentration of CO was detected in the range of 0.3 to 0.8 mg/m³. VOC, HBr was not detected in the study area. Over all The ambient air quality of the study area is meeting the prescribed National Ambient Air Quality Standard at all locations. No abnormal values have been found in the dust of ambient air.

Noise

The ambient noise quality of the study area is within the prescribed National Ambient Noise Quality Standards prescribed for industrial (Standards - 75 dBA during day time and 65 dBA during night time) residential area (Standards - 55 dBA during day time and 45 dBA during night time) and commercial area (Standards - 65 dBA during day time and 55 dBA during night time).

Flora & Fauna:


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. However there are few patches of degraded reserve forests are present within the study area. Nearest forest is Bir sukli RF located about 3.45 km NW of the site other forests are JunaPani RF located about 7.25 km SW and Degma Reserve Forest located about 9.5 km NW of the proposed plant site.

Except forest areas the vegetation is restricted along the open areas, along fields and road sides. The most common trees observed in the study area are *Mangifera indica*, *Madhuca longifolia*, *Syzygium cumini*, *Tamarindus indica*, *Terminalia bellerica*, *Ficus bengalensis*, *Ficus religiosa*, *Psidium guajava*, *Azadirachta indica*, etc. Among the dominant shrubs species *Abutilon indicum*, *Cassia auriculata*, *Datura metal*, *Holarrhena antidysentrica*, *Cassia pumila*, *Cassia tora*, *Calotropis gigantea*, *Lantana camera*, *Zizyphus sp.* and *Zizyphus mauritiana* and *Carissa spinarum* are the common in study area.

No significant carnivorous and herbivorous wild animals are found in the area. Langurs (*Semnopithecus entellus*), Blue bull (*Boselaphus tragocamelus*), Mongoose (*Herpestes edwards*) and Jungle Cat (*Felis chaus*) are the common mammals observed in the area. However, the presence of fox and hare has also been reported in the area by the villager during public consultation

Demography:

The greenfield project site is located in MIDC Butibori Industrial area. The study area is falling mainly in Nagpur District of Maharashtra. According to Census 2011, the District Nagpur has total population of 46, 53,570 comprising of 23, 84,975 males and 22, 68,595 females. The decadal variation in the population of the District was observed as

	Setting up new manufacturing unit of Pesticides At Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin code – 441 122	Doc No.: EIA
		Rev No. 0
		Issue Date: 08.02.2018
		Page 8 of 15

14.4% during 2001-11. The District shows a density of population of 470 persons /sq. km, whereas it is 157 for rural and 6582 for urban respectively. Sex Ratio was observed as 951 females per 1000 males comprising of 945 & 954 females per 1000 males for rural and urban part of the district.

Literacy Level

The literacy rate of the District was observed as 88.4% while it is 81.9% for rural and 91.4% for urban area in the district.

As per the Census records 2011, about 75% of the District population are Hindus and Buddhists constitute about 14.4%. Remaining population consists of Muslims (8.4%), Christian (0.7%), Jains (0.5%) and Sikhs (0.4%).

Medical facilities


The medical facilities are provided by different agencies like Govt. & Private individuals and voluntary organizations in the study area. As per the district census handbook information of 2011, no community health centre (CHC) exists in the study area and only one primary health center (PHC) also exists in the Borkhedi revenue village of the rural part of the study area; most of the study area villages depend upon the towns / district HQ of the study area having such facility. Seven (07) Primary Health Sub-Centers (PHSC) are exists in the rural part of the study area. Mother & Child Welfare Centre (MCWC) facility are available in one revenue village of the study area. Family welfare centre (FWC) exists in 01 village named Borkhedi revenue village of the study area. Overall study area villages are served by average medical facilities. Specialized medical facilities are available in towns and District Headquarter (HQ) only.

Drinking Water facilities

Potable water facility is available in most of the villages/towns of the study area. The entire study area has plenty of good potable water facilities. Hand Pump water facility is commonly observed in about 80% villages in the study area. Out of total 50 revenue villages/towns only 15 villages are served with River/Canal water as drinking water in the study area. As per the census records of 2011, about 07 villages (14.0%) are being served with Tank/Pond/Lake in the study area. In the majority of the villages, hand pumps are commonly observed in the study area. Good potable water facilities are available in the study area.

Communication Facilities

Apart from Post & Telegraph (P & T) services, transport is the main communication linkage in the study area. Out of 50 villages /towns of the study area, only 05 villages are served with Post Office facilities in the study area, remaining villages are depending upon these five (05) villages and towns of the study area. The study area has average rail and road network, passes from the area. Railway Station facility is available only in one revenue village named Borkhedi at 7.0km away from the project site and remaining villages are depending upon this village for railway station facility. Nearest town/city is

	Setting up new manufacturing unit of Pesticides At Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin code – 441 122	Doc No.: EIA
		Rev No. 0
		Issue Date: 08.02.2018
		Page 9 of 15

Nagpur city at about 26.8-km away from the project site. 'Dr. Baba Saheb Ambedkar International Airport' is about 28.0-kms away from the proposed site. Most of the villages (about 80%) are served with Pucca road facility in the study area. The villages in the study area which do not have such facility can reach within 5 to 10-km range. Mainly one town named Nagpur is available within the distance range of 15 to 45-kms from the villages of the study area. Approach by Pucca road facility is available for 80% villages of the study area. The study area has almost all the schedule commercial banks with ATM facility in urban areas and the district HQ. Majority of the villages have banking facility at a distance of 5-10 km.

Power Supply:

It is revealed from the compiled information on amenities availability as per the census record of 2011; most of the villages and towns (about 98%) are electrified for all purpose in the study area.

Environmental Impact Assessment

The activities involved in site preparation will be site clearance of the project site, cutting and uprooting of shrubs, earthwork excavation (limited only) etc. The development of site will also involve the removal of topsoil, removal of shrubs, soils, etc. As the topography of the land (Being greenfield project in the notified industrial area) is almost flat, there will be very minimum cutting and filling required for setting up of the plant and no filling material from outside is required. Hence, there will be very limited impact on the land environment due to the proposed project.


Air Quality

The main sources of additional air pollution due to the operation of proposed project will be new plant and utility stacks emitting (within norms) PM, SO_x, NO_x and HCl, NH₃ and HC..

For the proposed project, computations of 24-hour average ground level concentrations were carried out using ISCST3 model, which is a recommended model by USEPA for prediction of air quality from point area and line sources.

Summary of Maximum 24-hour Incremental GLC due to the Proposed Greenfield Project Stacks

S.No.	Parameters	Max Observed Value (µg/m³)	Distance & Direction
1	SO _x	0.4	1000m SSW
2	NO _x	0.9	1000m SSW
3	HCL	0.0	--

	Setting up new manufacturing unit of Pesticides At Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin code – 441 122	Doc No.: EIA
		Rev No. 0
		Issue Date: 08.02.2018
		Page 10 of 15

4	PM	4.4	900m SSW
5	CO	0.4	1000m SW

Summary of Maximum GLC at Monitoring Locations due to the Proposed Project

S. No	Location	Distance Direction	Mean Value of Baseline ($\mu\text{g}/\text{m}^3$)					Incremental GLS of Pollutant ($\mu\text{g}/\text{m}^3$)				
			PM10	SO2	NOX	HCL	CO	PM10	SO2	NOX	HCL	CO
1	Project Site	Site	72	8.4	16.8	0.1	0.75	0.9	0.09	0.4		0.08
2	Salaidabad	2.02 km, N	67	7.5	14.7	0.1	0.65	1.2	0.2	0.2		0.18
3	Tembhari	2.82 km, NE	81	11.6	18.6	0.1	0.4	1.8	0.2	0.6		0.25
4	Develipeth	1.0 km, S	58	7.1	13.1	0.1	0.68	3.1	0.1	0.4		0.2
5	Wateghat	2.1 km, SW	68	9	16.4	0.1	0.7	2.8	0.2	0.7		2.8
6	Kohla	5.2 km, SW	64	9.2	14.0	0.1	0.3	1.9	0.1	0.5		1.9
7	Patan Bori	4.31 km, SE	83	15.5	20.1	0.1	0.8	1.7	0.1	0.3		1.7
8	Bid Ganeshpur	3.51 km, S	80	15.8	20.6	0.1	0.72	0.6	0.09	0.2		0.6

As is evident from the table and discussion above, there will be no adverse impacts on the surrounding area (all pollutants post project GLC will be well within NAAQ norms. Highly efficient air pollution control systems have been adopted to mitigate particulate matter as well as gaseous emissions in the ambient environment.

Noise


The noise level norms in villages of study area are being met with respect to the norms of 'Ambient Air quality Standards in Respect of Noise'.

The operation of Crystal proposed project will have the noise level not exceeding the present noise level and as such will not have any adverse impact on the human settlement around it. The noise will not be audible beyond its boundary limit, particularly due to natural green belt and other attenuators.

Water Resources and Water Quality

Fresh water requirement will be around limited (120 KLD). The total water requirement 227.5 KLD and 107.5 KLD water will be recycled treated effluents. The water balance for the proposed project is given in the Chapter 2.

Effluent conveyed to effluent treatment plant will be segregated as "High TDS effluent" and "Low TDS effluent". The separate treatment train provided for both types of effluent.

	Setting up new manufacturing unit of Pesticides At Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin code – 441 122	Doc No.: EIA
		Rev No. 0
		Issue Date: 08.02.2018
		Page 11 of 15

The effluent generated in the process shall be separated, will be treated in three stage ETP followed by activated carbon filter and RO.

There will not be any discharge of effluent outside due to proposed project.

Land Use

CRYSTAL greenfield project is being located in the MIDC notified industrial area and as such no diversion of land from other uses is involved.

The hazardous waste is generated at various stages of the manufacturing activity. The mode of disposal is mentioned for each category of waste as per hazardous wastes (management, handling and transboundary movement) rules, 2008.

All above waste are will be collected and stored at separate identified place and suitably disposed off to authorized agencies –TSDf site.

Biological Environment

The CRYSTAL greenfield project is small and will have limited highly controlled emission (through high stacks/ scrubbers). The emission (if any) will not adversely affect the flora in the study area. The limited treated effluents generated will be meeting prescribed norms and will also not going to adversely affect the flora.

CRYSTAL is going to develop green belt in and around the plant. The development of green belt provides habitat, food and breeding areas to birds. The green belt will attenuate the little emission and noise from the plant.


Demographic and Socio-economic

CRYSTAL greenfield project will generate employment opportunities some through direct employment and more so indirectly through services for the plant. Pesticides manufactured by CRYSTAL proposed plant are indirectly going to contribute food grain availability by preventing loss due to insects (to crop) and rodents (during storage) etc.

- CRYSTAL greenfield project will have some impacts also on socio – economic environment of the study area- some are as given below:
- CRYSTAL project would increase requirement from ancillary and auxiliary industries in the vicinity.
- Some more load on infrastructure facilities – roads and rails; these facilities have sufficient capacity to take the traffic load.

Infrastructure

The raw material (solid, liquid and gaseous etc.) will be transported from suppliers / ports located in various places in the country. Approximately 25 to 30 trucks (different sizes)/ day will come or leave to the plant. The final product (active pesticides) will be dispatched from plant to various parts of the country through the State and National high

	Setting up new manufacturing unit of Pesticides At Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin code – 441 122	Doc No.: EIA
		Rev No. 0
		Issue Date: 08.02.2018
		Page 12 of 15

way and railways. Hence, this marginal increase in the traffic, will not affect the road infrastructure of the study area.

Environmental Management Plan

Air Environment

In order to mitigate the adverse environmental impact due to the construction and operation of the proposed project following measures are recommended:

Construction Phase: Limited work only

Construction activity is limited only to the project site and for limited period only and hence unlikely to cause any change in the ambient air quality around the proposed project. The main air pollutants during construction stages are:

- Dust due to powdery construction materials, movement of vehicles/ personnel on un-metalled roads etc.
 - Emission from construction machinery / vehicles/DG sets etc.
- Key steps to control / limit the air pollution are:
- Dust Pollution: Sprinkling water on roads, covering the solid / powder material heaps during transportation and storage etc. should be followed.
 - All automotive machineries (vehicles and other equipment) should be regularly checked for limits. If exhaust going beyond limits, the machine is to be attended.


Operation Phase (Fugitive Dust):

Following measures are recommended:

- Fugitive dust emissions: Keep check while handling solid / liquid raw materials/products
- All solvents /volatile raw materials should be carefully handled; Vessels storing these should always be covered.
- The control measures (through proper up keep / maintenance) and good housekeeping will considerably reduce the fugitive emission.
- Powdery Materials and ash should be transported in covered trucks,
- Leakages {of gases / liquids/ dust} should be checked and promptly attended.
- Material handling in the plant will be done in closed conveyors.
- 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

- The statutory national standards for noise levels at the plant boundary and at industrial areas near the plant are being and are to be met. The following mitigation measures are proposed to meet the objectives:

	Setting up new manufacturing unit of Pesticides At Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin code – 441 122	Doc No.: EIA
		Rev No. 0
		Issue Date: 08.02.2018
		Page 13 of 15

- The selection of any new plant equipment is to be made with specification of low noise levels. Noise suppression measures such as acoustic enclosures / cabins, buffers and / or protective measures are to be provided if necessary.
- Earplug shall be provided to all workers where exposure level is > 85 dB (A). The exposure of employees working in the noisy area should be monitored regularly to ensure compliance with the regulatory requirements.

Water Environment

CRYSTAL plant has taken ample precautions to tackle effluents problem. The philosophy of segregation of effluent streams and treatment near the source and ETP will reduce the effluent problem considerably:

Following measures are proposed for controlling water pollution and resource conservation:


- Keep checks on all process parameters to prevent abnormal conditions resulting in sudden process release. Any sudden process liquid release due to disturbance should be collected and stored. The process liquid should be recycled (if possible). In worst case (if not possible to recycle) it should be released to ETP in control manner not to disturb the treated effluent quality.
- Keep check on all process parameters to maintain process effluent quality to ETP.
- CRYSTAL should install three or more piezo metric wells at selected places (one near treated effluent pond) to see and check the ground water contamination.
- Water is a precious commodity and it should be conserved.
- Rainwater harvesting should be taken up at different places (not in the plant).

Biological Environment

An action plan to develop green belt in ~33 % area. The green belt and other horticulture program will start along with plant construction. However these activities will take momentum only after the construction activities are over and plant commissioning starts. The plant construction, vehicle movement and other activities may damage the young trees. All the open area will have green cover. The total area under green cover will not be less than 33%.

The development of green belt provides habitat, food and breeding areas to birds, small animals and insects. No rare or endangered species of fauna are reported to exist in the area. Thus, no impacts on rare or endangered species are envisaged due to normal operations. Indigenous tree plantation will be preferred in greenbelt development. Hence, no impact on biological environment is envisaged.

Corporate Social Responsibility

	Setting up new manufacturing unit of Pesticides At Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin code – 441 122	Doc No.: EIA
		Rev No. 0
		Issue Date: 08.02.2018
		Page 14 of 15

Crystal has allocated Rs.35 Lakhs per year towards CSR plan. The above amount will be spent in next 5 years for infrastructure development of surrounding area. Need based study have been conducted in surrounding villages of the study area. Based on the analysis, the fund will be proportioned.

Occupational Exposure Mitigation Planning

CRYSTAL is using, producing and storing a number of hazardous chemicals. There is possibility of various hazardous incidents.

- Incidents involving thermal hazards are mainly due to raw material fire (due to spillage). The impact (1st degree burn) is limited to ~49 m (Hexane spillages) only (i.e. within plant boundary). However the consequences can go to worse if the incidents lead to domino effect to other tanks.
- Toxic hazards are mainly due to Chlorine, Ammonia and other toxic chemicals leakages. The impact is can go up to 1.2 km i.e., outside the plant boundary..

A detailed mitigation plan would be planned, where-in the identification of the anticipated occupational health and safety impact and its control by employing a detailed mitigation planning by comparing the already anticipated impacts during the design stage of the project and providing a separate plan to cater in case if it differs from original. Apart from the occupational exposure, mitigation plans for various activities and work areas of hazards, following administrative control measures will be followed.


All the employees will be trained for EHS policies.

- Periodical medical examination is being carried out twice in a year for all operation workers included contractor workers and once in year for non-operation workers.
- All the employees have been trained for Basic life support, first aid, Basic fire safety and emergency preparedness.
- Ambient air quality monitoring in every month at 4 locations
- Monthly monitoring of environmental parameters.
- Safety display boards provided throughout the plant.
- Fire extinguisher audit at regularly interval.
- Work permit system
- PPE adherence
- Waste management and hazardous waste handling
- Safe lifting operation
- Industrial hygiene

Environment Monitoring Plan

A detailed environmental monitoring plan for the proposed project during construction and operation phases of the project has been outlined. The same will be adhered during the project execution. In addition to that all the conditions being imposed in the consent to establish/ operate and environmental clearance shall be adhered.

Project Cost & Cost towards Environmental Protection

	<p align="center">Setting up new manufacturing unit of Pesticides At Plot No: G-54, MIDC Butibori, Nagpur, Maharashtra, Pin code – 441 122</p>	Doc No.: EIA
		Rev No. 0
		Issue Date: 08.02.2018
		Page 15 of 15

CRYSTAL proposed project cost is Rs. 35 Crores. Total capital cost of about INR 246 Lakh has been kept in the project cost towards the environmental protection, control and mitigation measures and implementation of the EMP.