EXECUTIVE SUMMARY

ES-1 Introduction

M/s Shogun Organics Limited is operating their Manufacturing setup successfully at Plot no - D-18, MIDC Kurkumbh, Taluka Daund, District Pune, Maharashtra (Fig: ES-1). MIDC Kurkumbh is notified by Government of Maharashtra. The Kurkumbh manufacturing facility of M/s. Shogun Organics Limited was established in 1995 for producing household insecticides and formulations.

Figure No : **ES-1** Google Earth Image: M/s Shogun Organics Ltd.

ES-2 History of the project

Table no – ES-1 Chronology of events

Date	Event / Activity
03-02-1995	Obtained Consent to Establish from MPCB with NO conditions to obtain Environment Clearance.
13-06-2008	Obtained first Consent to Operate from MPCB with NO conditions to obtain Environment Clearance.
17-02-2009	Renewed Consent to Operate for 1 year with NO conditions to obtain Environment Clearance.
31-12-2009	Renewed Consent to Operate for 3 years with NO conditions to obtain Environment Clearance.
20-12-2012	Our voluntary application for Terms of Reference (TOR) with MoEF.
30-04-2013	We received TOR approval from MoEF.
10-11-2013	Renewed Consent to Operate for 3 years with NO conditions to obtain

	Environment Clearance.
02-02-2014	We have submitted final EIA (Environment Impact Assessment) Report.
02-04-2014	We have received MoEF letter asking for details of EIA / EMP by Accredited Environmental Consultant
21-04-2014	We have re-submitted EIA Report with details and disclosure of Accredited consultant.
08-05-2014	Our EC application was considered complete and listed in Agenda for presentation in 19th Reconstituted Expert Appraisal Committee on 29th May 2014).
16-05-2014	Our case was removed from Agenda for 29th May meeting, only for requirement of Public hearing at our factory site.
21-07-2014	We received MoEF letter for conducting Public Hearing.
18-08-2014	We made complete submission of documents with MPCB, Pune, Maharashtra to conduct Public Hearing.
10-12-2014	Office memorandum of MoEF, stating Public Hearing is not required. Our factory being in industrial zone was exempted from Public hearing.
04-03-2015	Re-submitted our application for EC online
07-04-2015	Once again MoEF asked for Accredited Environmental Consultant details dated 10/03/2015
14-04-2015	Once again we submitted EIA/EMP with details of Accredited Environmental Consultant
23-04-2015	Renewed Consent to Operate for the period 2 years. Valid Till 31/07/2017 with NO conditions to obtain Environment Clearance.
01-7-2015	EDS received from MoEF asking for Compliance report of our factory from Regional office of MoEF&CC
13-08-2015	Our reply letter given for this EDS
23-09-2015	Email from Joint Director(S) of MoEF, asking to appear and present our case before Joint Secretary, IA Division, MoEF on 28-09-2015.
26-09-2015	We sent email reply requesting another date for hearing with Joint Secretary
05-10-2015	Email from Joint Director(s) of MoEF, asking us to appear for hearing with Joint Secretary on 19-10-2015
20-10-2015	Hearing was held in chamber of Joint Secretary, IA Division, MoEF
29-10-2015	We sent email to Joint Secretary, copy to Additional Director and Joint Director, containing details of our EC application and summary of the hearing.

27-11-2015	Our EC application was considered complete and listed in Agenda for presentation in the 1st Expert Appraisal Committee meeting dated 30-11-2015 to 01-12-2015.
12-01-2016	Received email from Joint Director(s) of MoEF, asking us to appear for hearing with Joint Secretary, IA Division, MoEF on 25-01-2016
25-01-2016	Hearing was held in chamber of Joint Secretary, IA Division, MoEF
25-01-2016	We submitted application for TOR amendment w.r.t. quantity amendment.
15-03-2016	Our EC application was once again considered complete and listed in Agenda for presentation in the 6th Expert Appraisal Committee meeting dated 30-03-2016
21-03-2016	We sent email to Joint Secretary, copy to Additional Director and Joint Director, asking about information w.r.t. hearing dated 25-01-2016.
30-03-2016	In the 6th Expert Appraisal Committee Meeting dated 30th March 2016. The committee was of the view that proposal shall be considered on merit of the case after finalization of procedure registered for violation.
29-03-2017	We sent letter to JS, MoEF for grant our Environment Clearance by considering important information mentioned in the letter.
13-05-2017	We have uploaded NEW proposal for grant of ToR based on Gazette dated 14/03/2017 (Proposal No. IA/MH/IND2/62652/2017)
20-05-2017	Our proposal is verified by MS
06-06-2017	We have received letter by email for submission of signed hard copy of the documents in the Ministry along with email alert.
09-06-2017	We have submitted hard copy of the application along with the email alert.
16-06-2017	Meeting with Joint Secretary, IA Division, and Shri SK Srivastav, member secretary of new EAC (Expert Appraisal Committee) formed to hear our application. We were asked to present our case in 1st EAC (new Expert Appraisal Committee) meeting dated 22-06-2017.
22-06-2017	We present to the EAC. EAC directs us during the meeting that based on our already approved TOR, we can proceed to submit EIA report for grant of EC.
06-07-2017	Minutes of the 1st EAC meeting appear online on website of MoEF&CC. The minutes of the meeting are incorrect and not as per EAC direction given to us on 22-06-2017.
13-07-2017	Meeting with Joint Secretary, IA Division, and Shri SK Srivastav, member secretary of new EAC. They accept the error in minutes, ask us to submit letter.
18-07-2017	We submit our letter with corrections in the minutes, as directed
27-07-2017	Order of National Green Tribunal

21-11-2017	Writ Petition filed in the High Court of Judicature at Bombay
13-12-2017	Order received from the High Court Bombay .
09-01-2018	Letter sent to Secretary - MoEF&CC and copies to JS, SK Srivastava, Addl. Director and MPCB Chairman through Regd. AD and by email.
12-01-2018	Letter sent to Secretary – MoEF&CC and copies to JS, SK Srivastava, Addl. Director and MPCB Chairman through Regd. AD and by email for exemption of Public Hearing
24.01.2018	ToR letter received from MoEF dated 23.01.2018

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Table No. ES-2: Salient Features of the Project

Sr. No	Component	Status		
1	Name	M/s Shogun Organics Ltd.		
2	Location	Plot No.D-18, MIDC Kurkumbh, Taluka-Daund, District-Pune, Maharashtra, India.		
3	Product Type	Pesticide Manufacturing & Formulation Unit		
4	Project Type	Expansion Project		
5	Schedule as per EIA Notification,2006	5 (b)		
6	Category of Project	'A' Category		
7	**Area Details (in Sq. m.)**			
		Existing	**Proposed**	**Total**
i.	Total Plot Area	1,06,384	--	106384
ii.	Built-up Area	9048.82	3375	12423.82
iii.	Parking area	3802.82	6835.58	10638.40
iv.	Greenbelt Area	7164.5	11825	18989.5
8	**Production Details)**			
i.	Technical Product	5.7 MT/M	38.8 MT/M	44.5 MT/M
ii.	Intermediate	22.25 MT/M	10 MT/M	12.25 MT/M*
	By – Product	--	13.8 MT/M	13.8 MT/M
iii	Formulation	--	113.6 MT/M	113.6 MT/M

	Heater Machine	--	25,000 Nos./M	25,000 Nos./M
	Note : *1) Two existing intermediate Allethlone Alcohol & Prallethrolone Alcohol each of capacity 10MT/M will be stopped.			
9	**Budgetary Allocation (in lakhs)**			
i.	Project Cost	8.85 Cr.	5.65 Cr.	14.5 Cr.
ii.	EMP Cost	90 Lakh	24.15 Lakh	114.15 Lakh
iii	Cost for Remediation plan & Natural and community resource augmentation plan	--	90 thousand	90 thousand
10	Manpower	27	41	68
11	**Power Requirement**			
	Connected Load (KW)	95	130	225
	Source: MSEDCL (Maharashtra State Electricity Distribution Co. Ltd.)			
12	**Fuel Requirement**			
i	Boiler : LDO (Ltr/day)	62.5	548.5	611
ii.	D.G. set: HSD (L/hr)	75	--	75
13	**Utility Capacity**			
i.	Boiler (kg/hr)	Steam Boiler: 1250 Kg/Hr Thermic Fluid Heater: 4 Lakh Kcal/hr capacity (Back-up)	-	Steam Boiler: 1250 Kg/Hr Thermic Fluid Heater: 4 Lakh Kcal/hr capacity (Back up)
ii	D.G. Set (KVA)	320	--	320
		Existing	**Proposed**	**Total**
iii	Water Requirement (CMD)	13.8 CMD 9.3 (Fresh water) + 4.5 (Recycled water)	48.63 CMD 28.25 (Fresh water) + 20.38 (Recycled water)	62.43 CMD 37.55 (Fresh water) + 24.88 (Recycled water)
	Source: MIDC Kurkumbh			
14	**Scrubber Details**			

	Scrubber Capacity	1500 CFM	--	1500 CFM
15	**Stack Details**			
i.	Boiler Stack (m, from ground level)	20m	Stack height will be increased to 30 m	30 m
ii.	Process scrubber (m)	9 m	Stack height will be increased to 12 m	12 m
iii.	D.G. Set (m)	3m above the roof	--	3m above the roof
16	**Effluent Details**			
i	Sewage (CMD)	0.9	4.4	5.3
ii	Process effluent (CMD)	4.5	12.28	16.78
17	**ETP Details**			
i.	Sewage treatment Details	The Domestic wastewater will be treated in the STP of capacity: 6 CMD. Treated water after treatment in STP will be reused for gardening purpose. The sludge from the STP will be used as manure for green belt development.		
ii	ETP Details	It is a Zero Liquid Discharge Project. Process Wastewater will be treated in the ETP of capacity 18 CMD. Water obtained after treatment will be reused as cooling tower makeup water.		

18	**Details of Hazardous Waste**					
	Particulars	**HW Category***	**Existing TPA**	**Proposed TPA**	**Total, TPA**	**Method of Disposal**
i.	Chemical sludge containing residue Pesticides	29.2	1.25	0.625	1.875	CHWTSDF, Ranjangaon
ii.	ETP Sludge (Chemical Sludge from Waste	35.3	0.3	13.9	14.2	CHWTSDF, Ranjangaon

	Treatment Plant)					
19	**Details of Solid Non-Hazardous Waste**					
i.	**Particulars**	**Existing**	**Proposed**	**Total**	**Method of Disposal**	
	STP Sludge	-	68 kg/d	68 kg/d	Used as Manure for Gardening.	
	Scrap & Paper	20 Kg/ kg/d	20 kg/d	40 kg/d	Sold To Authorized Vendors	

ES-3 Justification of project

The main products of the company are mosquito repellents and household insecticides. With the increasing cases in India of Dengue, Malaria, and other mosquito borne diseases, need for high quality, safe cost effective mosquito control products has become a necessity. Exports are a key focus area to support the vision of Hon'ble Prime Minister "Make In India" program. Some of the products will help reduce imports and develop indigenous production. Company aims to become the "one-stop" product & service provider to the global home insecticide industry by providing cost effective solutions for customer's diverse requirement & by reducing the demand and supply gap in the nation as well as international market.

ES-4 Process Description: The process of the company is depicted in Figure. ES - 2.

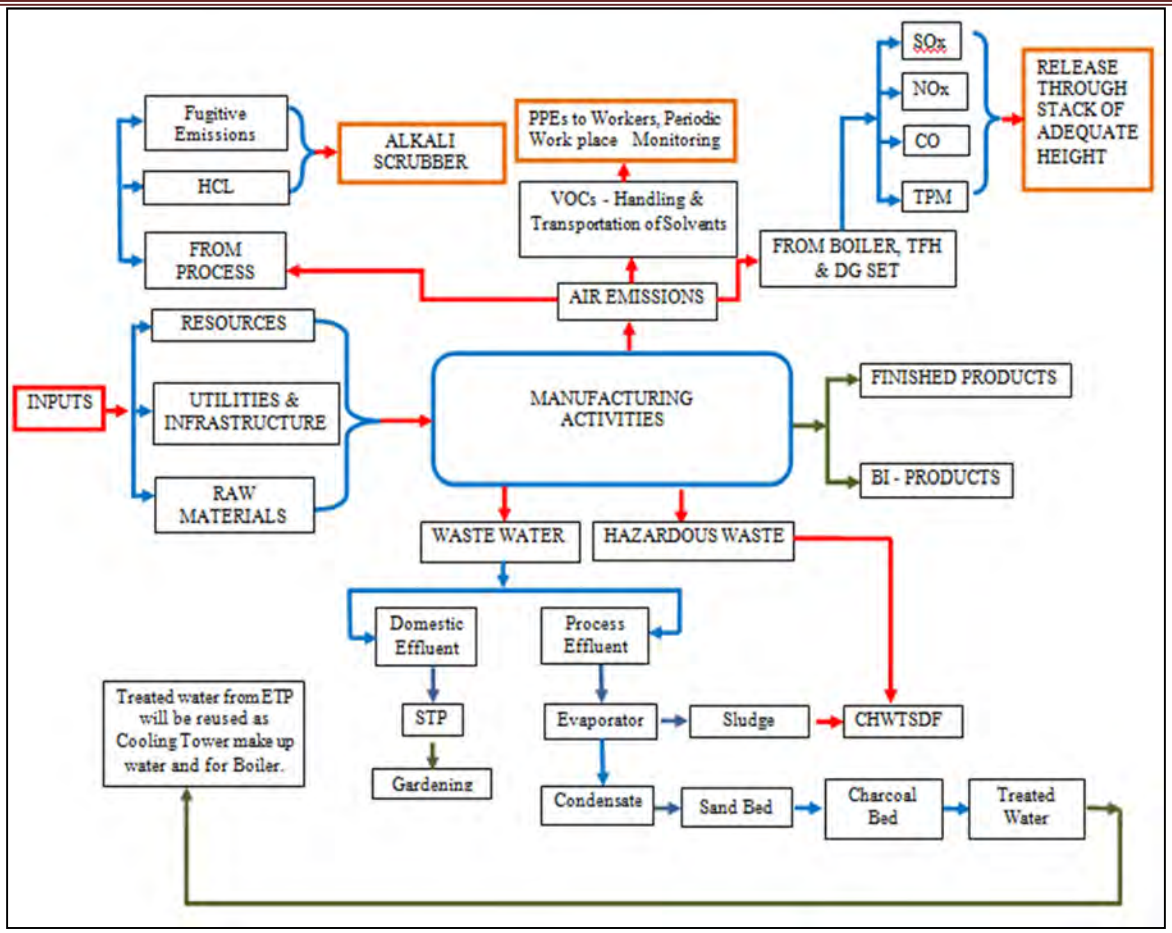

Figure No. ES-2: Process Description Diagram

ES-5 Baseline Environmental Status

The study area is 10 km radial distance from centre of existing plant site. All the monitoring has been completed in various locations within the study area during the period of March 2017 - May 2017. The findings of the baseline environmental status on Land (Topography, Soil Quality, Land Use Pattern), Micrometeorology (Temperature, Humidity, Rainfall, Wind Speed), Air (Ambient Air Quality - PM_{10}, $PM_{2.5}$, SO_2, NOx, CO), Noise Level, Biotic Environment (flora, fauna & assessment of conservation aspects), Socio Economic conditions are presented in the report and interpreted with reference to Standards.

ES-5.1 Air Environment

PM_{10}

The maximum & minimum concentrations recorded for PM_{10} was 89.1 and 63.2 $\mu g/m^3$ respectively. The maximum concentration was recorded at sampling location (A1) which is located within the factory premises and the minimum concentration was recorded at location at A8 near Kharade Wadi. The minimum & maximum average concentrations of PM_{10} during the study ranged between 70.7 $\mu g/m^3$ to 82.8 $\mu g/m^3$. The maximum concentration of particulate matter recorded at project site may be due to transportation activity on NH-9 (Pune - Solapur) highway which lies at a distance of 0.11 km from the project site & stone quarries located in the upwind direction near Dhangarwadi.

$PM_{2.5}$

The maximum concentration of $PM_{2.5}$, 46.1 $\mu g/m^3$ during the study period was recorded at location A1, whereas the minimum concentration 29.1 $\mu g/m^3$ was recorded at A8 location (Near Khardewadi Village) which is a remote rural area. The minimum concentration recorded at location A8 is an indicative of minimal combustion and vehicular activity around Khardewadi rural area and on the other hand the high concentration recorded at A1 location can be attributed to the heavy vehicular movement on the nearby Highway and the movement of trucks related to the quarrying activities in the upwind direction. The average 24hourly concentrations of $PM_{2.5}$ during the study period were in the range of 35.3 to 40.5 $\mu g/m^3$.

Sulphur dioxide (SO_2)

High levels of SO_2 in the ambient air are generally an indicative of combustion of fossil fuels in the vicinity. The ambient air monitoring results indicate that the highest average concentration of SO_2 was recorded at the project site, i.e. location A1. The regular movement of heavy vehicles in and around the MIDC area surrounding to the project site can be considered as principle source of SO_2 emission.

The minimum & maximum concentrations of SO_2 recorded at all the monitoring locations during the study period were in the range of 16.2 to 35.8 µg/m^3 respectively. The highest and lowest concentrations of SO_2 viz. 35.8 µg/m^3 & 16.2 µg/m^3 were recorded at locations A1 & A5 respectively. The average concentration of SO_2 at all the monitoring locations varied in the range of 20.2 to 31.7 µg/m^3.

Oxides of Nitrogen (NO_X)

The various forms of Nitrogen in NO, NO_2 and N_2O are collectively called as Oxides of Nitrogen (NOx). During the study period amongst all the monitoring locations the maximum value 53.1 µg/m^3 of NOx was recorded at location A1 and the minimum value 25.7 µg/m^3 was recorded at location A8 and the average concentrations of NOx were in the range of 34.3 to 44.5 µg/m^3.

Carbon monoxide (CO)

The source of CO in the ambient air for the study area in consideration can be attributed to vehicular movement in the study area. The maximum concentrations of CO at all the locations recorded during the study period were in the range of 1.4 to 2.4 mg/m^3 whereas the minimum concentrations ranged between 0.4 to 1.5 mg/m^3. The highest average value for CO was recorded at location A1 and the lowest was recorded at A8.

HCl

The results revealed that the values of HCl were detected to be below the minimum detection limit at all the locations monitored.

VOC.

Based on the above results it can be stated that the values of VOC were found to be below detection limit at all the location monitored.

The monitoring for additional parameters in ambient air namely Ozone, Lead, Ammonia, Arsenic, Benzene, Nickel & Benzo(a)pyrene was conducted within the project premises (A1 location) and the concentration of Benzene, Benzo(a)pyrene & Ammonia was found to be below the detection limit.

The values of Ground level ozone were estimated to be below the detectable limits and thus their presence can be said to be negligible. The presence of heavy metals such as Lead, Arsenic and Nickel were estimated to be below the detectable limits and thus their presence can be said to be negligible.

The concentration of VOCs was also monitored at the project site. The results revealed that the concentration was found to be below the detection limit as presently. The analysis of additional parameters monitored for ambient air quality at the location A1 reveals that the values did not exceed the limits prescribed by CPCB, during the sampling period.

ES-5.2 Noise Environment

Noise monitoring was conducted as per the standard operating procedures.

Industrial Zone:

The day time noise level at the project premises was observed to be 68.4 dB (A) Leq while during night time the noise level was recorded to be 61.9 dB (A) Leq. It should be noted that the noise levels during the day time as well as night time were observed to be within the prescribed standards by Central Pollution Control Board.

Residential Zone:

The noise monitoring was conducted at representative sites at seven locations for 24hr. As prescribed the sampling was carried out once in a week and average hourly readings were

recorded. The minimum noise level recorded during the daytime was 49.0 dB(A) which was observed at location N5, where as the maximum noise levels recorded during the daytime was 53.9dB(A) which was observed at location N4. The minimum noise level recorded during the night time was 39.4 dB(A) which was observed at location N5, where as the maximum noise levels recorded during the night time was 45.2dB(A) which was observed at location N4. The high values of noise are due to the presence of major road, which connects Pune to Solapur and also has high traffic density of heavy vehicles entering the Kurkumbh MIDC in the vicinity of the sampling location. It should be noted that the permissible limits for noise did not exceed at any of the locations selected for sampling.

ES-5.3 Water Environment

Surface Water Study

Based on the analysis results of water samples it can be stated that the pH of all the samples was found to vary between 7.1 –8.0. This is to infer that the values obtained were within the desirable limit for pH as prescribed by CPCB. The total hardness was observed to be ranging between 166.8 to 256 mg/l. The maximum value of hardness was recorded at SW4 and the minimum value was recorded at SW2. The concentration of Total Dissolved Solids was in the range of 255.7 mg/l to 380 mg/l. The maximum concentration of Total Dissolved Solids (TDS) was observed at SW4 whereas the minimum TDS concentration was observed at SW2. The large variation observed in the concentration of TDS can be said to be present since the locations are varied ranging from river water body to stagnant reservoirs. The Chemical Oxygen Demand (COD) & Biochemical Oxygen Demand (BOD) values were calculated to be in the range of 12 mg/l to 56 mg/l & 4.1 mg/l to 10.2 mg/l respectively. It is important to note the nitrate concentration in the surface water ranges from 7.4 to 12.6 mg/l. The values of nitrate and phosphates also indicate that domestic sewage can be a major source of pollution in the selected water bodies. Moreover, the surrounding area is known to be engaged in agricultural activity in majority, which utilizes chemical fertilizers. It is possible that these fertilizers have been leached into the water bodies.

The concentration of heavy metals such as Arsenic, Mercury, Chromium, Nickel and Lead was observed to be below the detection limit. The concentration of Zinc was observed to present in trace quantity at all the locations.

Based on the above information the locations of representing respective water bodies can be categorized in the category "E"

It should be noted that in case of the selected water bodies (sampling locations) classified under category "E the parameters were found to be within the prescribed limits at all the locations

The analysis of microbiological parameters reveals that total coliforms & E-coli are present at all the locations in the selected water bodies. It is possible that the water bodies are experiencing contamination due to discharge of uncontrolled and untreated domestic waste in the form of sewage and storm water drainages.

Based on the above results and inferences it can be stated that the water from the above water bodies can be said to be fit for their designated purpose under the "E" category as compared to the permissible limits provided therein for the Inland Surface Water Standards.

Ground Water Study

The above results indicate that the pH of all the ground water samples was within the prescribed standards following in the range of 7.48 - 8.20.

The concentration of heavy metals like arsenic, chromium, lead, mercury, nickel & cadmium were below the detection limit. Iron was not detected in any of the ground water samples. Zinc was observed in the range of <0.1-1.2 mg/lit which well below the acceptable standards of IS: 10500:2012.

The hardness of all the ground water samples was found to be ranging between 195-845 mg/lit. The value of hardness was exceeding the acceptable limit for all the locations except for GW2, although none of the samples were exceeding the permissible limit of drinking water. It should be noted that high values of calcium and chlorides in Ground Water are experienced in the area. The same is also reported by few studies conducted by Indian Council of Agricultural Research in their annual report of 2011-2012 titled: "All India Coordinated Research Project on Ground Water Utilization".

It can be observed that the values for total dissolved solids in all the sampling locations were estimated to be under the permissible standards for drinking water. The concentration of total

dissolved solids ranged between 312-1435 mg/lit. The maximum concentration was observed at location GW 6 whereas the minimum concentration was observed at GW7.

It should be noted that the microbiological analysis of all the samples indicate that e-coli was absent in all the ground water samples except for GW3 & GW6. The total coliforms were present in all the sample indicating that the anthropogenic activity in the surrounding area can be a possible source of contamination.

The fluoride concentrations are ranging between 0.26 - 0.4 mg/l. The presence of the fluoride in all the water samples is mostly due to geogenic in nature. The nitrates concentrations were ranging between 2.1 -7.5 mg/l well below the acceptable limits of drinking water. The probable sources of nitrates in the ground water could be the use of fertilizers in the nearby agricultural activity.

The COD and BOD values of all the ground water samples were found to be below the detection limit.

Thus based on the above results it can be stated that the water from the said samples can be considered fit for domestic purpose with primary treatment.

ES-5.4 Soil Environment

The findings of the study reveal that pH of the soil in the study area ranged between 6.49 to 7.93 This is indicative of the slightly acidic to moderately nature of soil. The values for Nitrogen at all locations varied between 102.6 to 342.0 Kg/ha. Maximum concentration of nitrogen was observed at location S3.

The concentration of phosphate was estimated to be between 21.9 to 78.0 Kg/ha. The highest concentration can be observed at location S3, while the lowest concentration can be observed at location S1. Present analysis indicates that concentration of potassium is estimated to be ranging between 126.0 to 252.0 Kg/ha. The presence of heavy metals like arsenic, cadmium, lead & chromium in all the soil samples were below the detection limit.

Based on the above findings it can be concluded that the soil samples can be classified as per soil classification given by *Hand Book of Agriculture, ICAR, New Delhi* and Tondon H.L.S. (2005). The samples can be said to contain nutrients from medium to sufficient amount at all the sampling locations (Table 3.20).

Based on the above results it can be inferred that the soil at location S1 contains least amount of nutrients while that location S3 contains the maximum quantity of nutrients. It is important to note that the location S3 lies in the area which has maximum agricultural activity whereas the location S1 lies in the MIDC and has heavy anthropogenic activity.

ES-5.5 Biological Environment

The proposed expansion project activity does not pose any threat to any species of conservation importance also does not involve any sort of liquid or solid discharge/disposal on the ground or in the water bodies within the study area & project plot being located well within the precincts of the Kurkumbh MIDC industrial estate which is exclusively meant for industrial developmental activities no adverse impacts are anticipated on the surrounding biotic environment.

ES-5.6 Socio Environment

The data collected by the assessment tool had three variables namely; accessibility of public resources and its satisfaction, impact of expansion activity and attitude towards expansion project of SOL. The data of 50 participants was put for correlation analysis. The data was found to be normally distributed hence; the data fulfils the assumptions of parametric statistics. Based on this information Pearson product-moment correlation was conducted.

It is found that accessibility of public resources and its satisfaction is significantly correlated in positive direction with impact of SOL's industry activity ($r = .77$; $p = .01$). This indicates that accessibility of public resources will lead to low impact of industry activities and vice versa. Accessibility of public resources and its satisfaction is also found to be significantly correlated with attitude towards SOL's industry activity ($r = -.68$; $p = .05$) but in negative direction. This indicates that accessibility to public resources there is positive inclination for SOL's industry activity in the study area. Further, it is also found that impact of expansion project activity is significantly correlated with attitude towards industrial activity ($r = -.48$; $p = .01$). This indicates that due to low impact there is positive attitude towards among the participants in the study area (Table 3.39).

Table No. ES -3 Indicating Pearson's correlation among variables (N=50)[1]

	Accessibility & satisfaction	Impact	Attitude towards project of Shogun Organics Ltd.
Accessibility & Satisfaction	1.1	-	-
Impact	0.77**	1	-
Attitude towards project of SOL	-.68*	-.48	1.2

* Correlation is significant at the 0.05 level. ** Correlation is significant at the 0.01 level.

ES-6 Prediction of Impacts & Mitigation Measures

The summary of mitigation measures is presented in tabulated format in Table ES-3

Table No. ES-4: Summary of Impacts & Mitigation Measures

A) Minor Construction Phase				
Sr. No.	**Environmental Parameters**	**Aspect Attributes**	**Impact**	**Proposed Mitigation Measures**
1	Air Quality	Minor dust emissions from handling & transportation of cement/concrete /stone aggregates.	The emission would be around 0.6696 tons/month of the construction activity. Workers getting exposed to the dust pollution generated due to the construction activity can suffer from respiratory problems and prolonged exposure can lead to malfunctioning of lungs.	Traffic management for loading and unloading of the materials. Regular sprinkling of water on the working site, Avoiding Cement dust emission, Managing stockpiles. Creating wind barrier for controlling the dust emissions.
2	Noise Quality	Noise generated from construction equipments/machinery like spade, shovel, dabber, drill,	The impacts of high noise level would be Temporary/Permanent hearing loss, Mental disturbance, Increase in heart rate, Affecting worker's	Appropriate PPEs will be provided to the workers. Implementation of Traffic management. Development of Green belt.

		hammer, concrete mixer etc. Transportation of construction materials.	performance.	
3	Water Quality	Water used for construction activity mainly for concrete mixing, sprinkling etc.	Contamination of the soil and nearby water bodies due to the surface runoff.	Proper surface water runoff management would be implemented. Storm water drain should be provided.
4	Solid Waste Management	Construction wastes such as left off concrete, stone, aggregates, wooden piles, excavated material etc.	Unhealthy Work Conditions at project site.	The solid waste generated in the construction phase would be disposed off through local Municipal Body. The excavated soil will be used for green belt development activities within the premises.

B) Operational Phase

Sr. No.	Environmental Parameters	Aspect Attributes	Impact	Proposed Mitigation Measures
1.	Air Quality	Operation of Boilers, D.G Set & Gaseous emission from manufacturing process, Non spontaneous emissions from transportation of raw materials & finished goods. VOC emission generated due to the handling and storage of the solvents & other raw materials.	The Maximum Incremental concentration of PM_{10} – 0.00314 ug/m^3 $PM_{2.5}$ - 0.0008 ug/m^3 SO_2 - 0.81652ug/m^3 NOx - 0.06386 ugm^3 CO - 0.01597 ug/m^3 The Health effects related to particulate matter are majorly respiratory, pulmonary injury & lung cancer etc. Exposure to SO_2 and NOx majorly leads to	1. Up gradation of Boiler stack height to 30 m Up gradation of Process scrubber stack Height to 12 m. 2. D.G Set is provided with a stack height of 3 m above roof level. 3. One Alkali scrubber is provided to mitigate the process emissions. 4. The roads within the premises is concreted / paved to avoid the dust generation from vehicular

			respiratory problems. Carbon monoxide decreases the oxygen carrying capacity of the blood by reducing the hemoglobin. The health effects related to VOC emission are eye, nose and throat irritation headaches, loss of coordination and nausea, damage to liver, kidney and central nervous system etc. The air emissions in long course of time may affect the immediate surrounding vegetation stature physically (leaf senescence, hampered growth etc.) & biologically thus may affect the overall surrounding ecology.	activity. 5. It will be ensured that all the vehicles used for transportation activity have a valid PUC (Pollution under Control) Certificate. 6. Proper servicing & maintenance of vehicles is carried out. Same practice will be continued in future. 7. Regular sweeping of all the roads & floors is being /will be done. 8. Development of the green belt along the plant boundary will help to capture the fugitive emission. 9. To control VOC emission carbon adsorption system can be implemented. 10. Industry to ensure that at no point of time the air emission concentrations does not exceed the prescribe standards.
2.	Noise Quality	Operation of D.G set, Boiler, Reactors, ancillary utilities & transportation activity.	The impacts of high noise level would be Temporary/Permanent hearing loss, Mental disturbance Increase in heart rate Decreasing in workers performance due to psychiatric disorder Workers developing Tinnitus due to high level of noise exposure on regular basis.	1. Acoustic enclosure will be provided to D.G set for attenuation of noise level during operation. 2. Boilers will be placed in a confined space viz. boiler house where the surrounding walls acts as a barrier for noise propagation. 3. Isolation of high intensity noise generating equipments. 4. Appropriate traffic management to be

			The increased noise level may induce locale level disturbances/ temporary migration of fauna in the immediate vicinity of the project area.	implemented. 5. Green belt developed around the company premises will acts a noise barrier. 6. Appropriate PPE should be provided to workers.
3.	Water Quality	1. Effluent from manufacturing process. 2. Effluent from Scrubber operations 3. Blow down water from Boiler and Cooling Tower. 4.Domestic wastewater	Indiscriminate release/discharge of effluents may contaminate the surrounding surface and groundwater & there by affecting the overall ecology & agricultural productivity.	1. The sewage effluent generated from the domestic activities will be treated in the STP. The treated water obtained after treatment in the STP will be further reused for gardening. 2. The effluent generated from manufacturing process, boiler & cooling tower blow down will be sent to ETP comprising of aeration followed by Evaporator, the condensate is further sent to Sand Bed filter followed by Charcoal Bed filter. The treated water obtained after treatment in ETP will be reused as Cooling Tower makeup water. 3. Maximum quantity of treated waste water will be recycled and reused within the plant premises. The proposed expansion project will be Zero Liquid Discharge project.
4.	Solid Waste Management - Hazardous Waste	1. Hazardous waste generated from the manufacturing process.	Unscientific handling & disposal may lead to contamination of surrounding soil, water sources & there	1. Hazardous waste generated from the manufacturing process is disposed to CHWTSDF, Ranjangaon.

		2. Sludge generated from the ETP operation. .	by affecting the ecology & health of the workers coming in direct contact with the hazardous waste like skin allergies/rashes/ burns etc.	2. Sludge generated from the ETP operations are disposed to CHWTSDF, Ranjangaon.
5	Solid Waste Management - Non Hazardous waste	1. STP Sludge 2. Scrap & Paper	1.Hap-Hazard handling & storage may lead to inadequate open space in plant premises & it may lead to rodent breeding.	1.STP Sludge is used as manure for gardening purpose 2. Designated area for Scrap materials is provided in the plant. Scrap materials will be recycled through registered scrap vendors. Daily housekeeping waste and food waste is disposed through municipal waste management facility.

ES -7 Risk Assessment

Risks likely to pose harm to man, environment or property associated with various activities are addressed in this report. Such activities include transport, storage; handling and usage of hazardous raw materials & fuels etc. DOW index was performed for four different chemicals namely EDC, n – Hexane, toluene, monochlorobenzene the degree of hazard was found to be moderate for EDC, toluene and monochlorobenzene whereas it was found light for n-Hexane respectively. Fire & explosive Index for Pivaloyl chloride was higher than the other materials i.e. 84.04. Therefore the radius and area of exposure was calculated for Pivaloyl chloride drum storage. The radius of exposure for toluene is determined to be 18.4 m & area of exposure is around 1072.34 sq. m. The impact would be confined within the factory boundaries. It will lead to an onsite emergency situation which could be handled through appropriate mitigation measures

According to the Mond's Index the highest toxicity is calculated for the storage of Thionyl Chloride i.e. 8.5 indicating high degree of hazard. Thionyl Chloride is a corrosive liquid &

classified as class 8 Corrosive materials under UN DOT classification of Hazardous chemicals. Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over- exposure can result in death. To reduce the intensity of the hazard following recommendation and suggestion should be followed.

ES-8 Disaster management plan

In view of the insecticide and formulation industry, Onsite and Offsite Emergency Plans are important hence, has been prepared for the industry. During operational phase, surrounding population shall be made aware of safety precautions to be taken in case of any emergency situation due to the overall project activity. On-site disaster management plan and Off-site emergency management plan, commands communication and controls will be established and maintained. Adequate provisions like emergency response, response organization, response plan, Material Safety Data Sheets (MSDs), command and control, capabilities, transportation, medical facilities, mitigation measures, training, education, public awareness emergency plan review etc. to control any disaster situation will be made available.

ES-9 CSR Activity

In order to carry out the CSR activity it was decided that the proponent would provide basic facilities in the area of safe drinking water, sanitation and educational aid for the nearby ZP Schools of Firangai Devi Nagar and Patas village.

Facilities for cleaning and hygienic maintenance of the toilets and provision of clean drinking by providing water filters. Facilities for students mainly eye checkup, dental checkup, overall checkup, blood check up, urine checkup will be provided.

Along with the above inspection it was noted that the kitchen used for providing food under the Mid-day Meal program was also maintained under standard. Under the CSR, the proponent would like to upgrade the existing kitchen providing it with proper ventilation and exhaust system, new gas stove and improving the illumination facilities of the room. After

renovation it is decided that new set of cooking utensils, dishes and other miscellaneous products shall be provided.

Table No.ES-5 : List of CSR Activity

<table>
<tr><th>Cost of Project expansion</th><th>Cost for the CSR Activity</th><th>Year of Implementation</th><th>Amount in Lakhs</th><th>Activity</th><th>Cost Estimate</th></tr>
<tr><td>5.65 Cr. is the Project Cost.</td><td>28,25,000/-</td><td>2018</td><td>5,65,000/-</td><td>Providing basic amenities to two nearby ZP school present in Firangai Devi Nagar and Patas are as under:
1. Safe Drinking water System.
2. Renovation of Toilets</td><td>
<table>
<tr><th>Particulars</th><th>Amount (Approx.)</th></tr>
<tr><td colspan="2">For Water Purification</td></tr>
<tr><td>R.O. + UV purification System (1 no. x 2 Schools)</td><td>90,000/- (each)
= 1,80,000/-</td></tr>
<tr><td>Storage Tank (2no.each x 2 Schools)</td><td>20,000/- (each)
=40,0000/-</td></tr>
<tr><td>Fitting charges</td><td>32,500/- (each)
=70,000/-</td></tr>
<tr><td colspan="2">For Toilets</td></tr>
<tr><td>Re-Plastering of existing Toilets</td><td>55,000/- (each)
=1,10,000/-</td></tr>
<tr><td>Construction of Urinals</td><td>50,000/- (each)
=1,00,000/-</td></tr>
<tr><td>Over head water Storage Tanks and labour charges</td><td>35,000/- (each)
70,000/-</td></tr>
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<tr>
<td></td>
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<td>2019</td>
<td>5,65,000/-</td>
<td>Providing modern teaching facilities to two ZP schools present in Firangai Devi Nagar and Patas, such as Projector, Computer and Projector Screen</td>
<td>
<table>
<tr><th>Particulars</th><th>Amount (Approx.)</th></tr>
<tr><td>Computer (5 nos x 2 Schools)</td><td>2,12,500/- (each) = 4,25,000/-</td></tr>
<tr><td>Projector (1 no. x 2 Schools)</td><td>45,000/- (each) = 90,000/-</td></tr>
<tr><td>Projector Screen (1 no..x 2 Schools)</td><td>25,000/- (each) = 50,000/-</td></tr>
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<td></td>
<td></td>
<td>2020</td>
<td>5,65,000/-</td>
<td>Organizing Health Check-up camp for the students of Firangai Devi Nagar ZP School and Locals of Firangai Devi Nagar.</td>
<td>
<table>
<tr><th>Particulars</th><th>Amount (Approx.)</th></tr>
<tr><td>Normal Health Checkup</td><td>1,13,000/-</td></tr>
<tr><td>Checkup by Eye-Specialist</td><td>1,13,000/</td></tr>
<tr><td>Checkup by ENT Specialist</td><td>1,13,000/</td></tr>
<tr><td>Checkup by Dentist</td><td>1,13,000/</td></tr>
<tr><td>Blood Tests for Blood group, WBC Count, ESR, Platelet Count, etc.</td><td>1,13,000/</td></tr>
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<td rowspan="2"></td>
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<td>2021</td>
<td>5,65,000/-</td>
<td>Improving Kitchen Facilities</td>
<td>
<table>
<tr><th>Particulars</th><th>Amount (Approx.)</th></tr>
<tr><td>New Exhaust and Chimney</td><td>1,20,000/-</td></tr>
<tr><td>Renovation of Kitchen</td><td>2,50,000/-</td></tr>
<tr><td>New set of cooking utensils, dishes</td><td>1,50,000/-</td></tr>
<tr><td>Grocery supplier for cooking for one year</td><td>45,000/-</td></tr>
</table>
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<tr>
<td>2022</td>
<td>5,65,000/-</td>
<td>Providing basic amenities to the Primary health Care Center located at Kurkumbh Village.</td>
<td>
<table>
<tr><th>Particulars</th><th>Amount (Approx.)</th></tr>
<tr><td>Sterilizing Equipment (Auto Clave) (2 No)</td><td>80,000/-</td></tr>
<tr><td>Hot Air Owen (2 No)</td><td>62,500/-</td></tr>
<tr><td>Examination Bed (4 No)</td><td>1,20,000/-</td></tr>
<tr><td>Power Back-up System 2 KW (Inverter) (1 no)</td><td>1,02,500/-</td></tr>
<tr><td>Doctor’s Desk and table (4 no)</td><td>40,000/-</td></tr>
<tr><td>Air Conditioner (4 no)</td><td>1,60,000/-</td></tr>
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ES-10 Occupational Health Measures

The company will strictly adhere to the rules of Factories Act 1948 & the Maharashtra Factories Rules, 1963 regarding the occupational health facilities to be provided to the workers of the company. The industry has provided decontamination facilities for the workers. The health records of the workers would be maintained. For the continuous and continual development, the company will train & educate the operators and workers with the environment, health & safety rules & regulation, procedure and measures.

ES -11 Post Project Monitoring Plan

Monitoring of environmental parameters shall be done as per the guidelines provide by MoEF&CC/CPCB/MPCB. The method followed shall be recommended / standard method approved/recommended by MoEF&CC/CPCB. The Table ES-5 explains the approach for environmental monitoring program.

Table No. ES-6: Environmental Monitoring Program

Sr. no	Activity/Area	Pollutant	Pollutant Characteristics	Frequency	Period
OPERATION PHASE					
1.	Vehicular Movement	Dust Emission	CO, SO_2, NO_X, SPM in Ambient Air	Intermittent / Periodic	Quarterly
2.	Diesel Power Generator, Boiler.	Air emissions	CO, SO_2, NO_X, SPM from boiler	Intermittent / Periodic	Quarterly
3.	Scrubbers	Air emissions	Acid fumes	Intermittent / Periodic	Quarterly
3.	Boiler Area, ETP, Work Place Area	Sound	Noise Level dB (A)	Intermittent / Periodic	Quarterly
4.	Effluent treatment plant	All parameters	pH, O & G, TDS, TSS, COD, BOD. Heavy Metals & Organic Compounds	Intermittent / Periodic	Weekly

			specific to project		
5.	Hazardous Wastes	Chemical sludge containing residue Pesticides, E.T.P sludge residue.	H.W. characteristics	As per the requirement of CHWTSDF providers	Once in a Year
6.	Work Place	Air pollutants, Heavy metals	Volatile Organic Compounds & Heavy Metals in ambient air specific to project.	Intermittent / Periodic	Quarterly

ES - 12 EMP Cost & Budgetary Allocation

The proposed capital investment of the company is envisaged to be 5.65 Cr. and the proposed capital investment for Environmental Pollution Control Measures is around 24.15 lakh.

The cost details for Environmental Management are as below

Table No.ES-7 : Cost details for environmental management

Sr. No.	Parameters	Capital Cost (Rs.)	Recurring Cost per Annum (Rs.)
1	Air Pollution Control	7 lakh	50,000
2	Water Pollution Control	7.9 Lakh	5.63 Lakh
3	Noise Pollution Control	1 Lakh	50,000/-
4	Environment Monitoring and Management	2.5 Lakh	50,000/-
5	Occupational Health	1 Lakh	1 Lakh
6	Green Belt	2.6 Lakh	6.37 Lakh
7	Solid Waste Management	1.15 Lakh	2.5 Lakh
8	Water conservation	1 Lakh	20,000/-
Total EMP Cost		**24.15 Lakh**	**17.2 Lakh**