

**EXECUTIVE SUMMARY**  
**OF**  
**ENVIRONMENTAL IMPACT ASSESSMENT REPORT**  
**FOR PUBLIC HEARING**  
**OF**  
**NEW & EXPANSION PROJECT**

**PROPOSED BY**



**M/S INVENTYS RESEARCH COMPANY PVT. LTD.**

**PLOT. NO.K-38**

**MDC INDUSTRIAL AREA, BUTIBORI  
DIST: NAGPUR, MAHARASHTRA**

**FOR**  
**MANUFACTURING OF AGROCHEMICALS /API & API INTERMEDIATES,  
ADVANCED AND BULK INTERMEDIATES PRODUCTS,  
PERFUMERY AND COSMETICS, SPECIALITY CHEMICALS  
& EXISTING ADVANCED INTERMEDIATE PRODUCTS**

**PREPARED BY**



**GOLDFINCH ENGINEERING SYSTEMS PVT. LTD.**

**NABET ACCREDITED EIA CONSULTANT  
THANE, MAHARASHTRA**

**AUGUST 2014**

## **Executive Summary**

**M/s. Inventys Research Company Pvt. Ltd. (IRC)** proposes to expand the manufacturing of products in segments of Agrochemicals/pesticides, Pharmaceuticals, Advanced Intermediates, Perfumery & Cosmetics and Speciality products for Pharma Industry, for current as well as proposed future specialty chemicals in order to meet the increasing demand. The total magnitude of operation will be 11,400 MT/Year apart from by-products to the tune of 2105 MT/Year. Out of this, existing capacity is 420 MT/Year in operation, whereas proposed additional capacity of expansion is about 10,980 MT/Year.

Currently Inventys Research Company is producing Specialty Chemicals products sMPGM ((s)-(+)-Methyl Phenyl Glycine Methyl Ester) and 5-Methyl 5- Phenyl Imidazolidine 2, 4-dione. These products are used in various pharmaceutical and agro application.

The proposal by M/s Inventys falls under category 5(b), 5(f) of schedule. It falls under category "A" as Pesticides 5(b) is in "A" category and 5(f) Synthetic Organic Chemicals is in "B" category and will be appraised by EAC of MoEF.

This Environmental Impact Assessment (EIA) is to provide information on the potential positive and negative environmental and social impact of the project. It also aims to make recommendations for the mitigation of the potential negative impacts and enhancement of the positive one. A field survey of the project site was conducted and potential environmental impact of project activities were identified, assessed, and documented. The EIA team carried out consultation with local authorities and the affected people.

Environmental Protection Act (1986) policies have been considered during the assessment. The EIA has been proposed according to the EIA format regarding the requirement of the Indian Ministry of Environment and Forestry. This project meets the requirement of Indian Ministry of Environment and Forestry. This EIA study has been conducted by Goldfinch Engineering Systems Pvt. Ltd.

### **1.1 PROJECT DESCRIPTION**

Inventys is a contract manufacturing company in segments of Agrochemicals/ pesticides, Pharmaceutical, Advanced Intermediates for Pharma Industry. The intended expansion of the current facility would comprise current as well as proposed future products in order to meet the increasing demand of bulk drugs and chemicals.

The Total magnitude of operation will be 11,400 MT/Year apart from by-products to the tune of 2105 MT/year. Out of this existing capacity is of 420 MT/Year in operation, whereas proposed additional capacity of expansion is about 10,980 MT/Year. The plant will be constructed in notified Industrial area in Butibori, district Nagpur. The plant will cover a land of 28,327 m<sup>2</sup>.

## **1.2 PROJECT IMPACT**

No potential ecological impacts were identified in the operation of the plant. All those wastes with potential impacts on the environment will be treated with most recent technology available in accordance with the relevant national legal framework. The positive impact that will be benefited from the project will be increased employment opportunities to the youth in the area and hence help to improve the social well-being also with improved life standard.

## **1.3 EXTENT OF STUDY & STUDY COVERED**

Environmental Impact Assessment report is prepared based on the studies carried out during April 2013, May 2013 & June 2013. The Environmental parameters such as ambient air, water, soil, noise selected for study are those which are likely to be affected by the project. The study area is defined as an area within 10kms radius around site.

## **1.4 METHOD OF STUDY**

Based on the MoEF guidelines study were carried out and identified the nature of activities involved and their impacts caused on various environmental parameters. It subsequently suggests mitigation measures to be executed for safeguarding against any environmental degradation. Finally it suggests methods of implementing the environmental management plan.

## **2. PROJECT DETAIL**

Inventys is a contract manufacturing company in the specialty and Intermediates chemicals fields, and serves the big global multinational customers. Manufacturing will be done as per the requirement on contract basis. Therefore the list of anticipated products proposed is large. At any particular time maximum of 10 products will be manufactured.

It is proposed to increase the production capacity from 420 MT/Yr to 11,400 MT/Yr by enhancing the manufacturing capacity by addition of 10,980 MT/yr of new and existing products apart from by-products to the tune of 2,105 MT/Yr. Inventys has proposed to manufacture the following products and byproducts.

**Table [1.1]: List of proposed Products**

S. No.		Product Name	Capacity (Existing) MT/Yr	Capacity (Proposed) MT/Yr
		Advanced Intermediates	420	2550
	A	s Methyl Phenyl Glycine Methyl Ester(sMPGM)	180	600
	B	Methyl 5 Phenyl Imidazolidine 2,4-dione(rMPID)	240	900
1	1.1	Dichloro Phenyl Methyl Hydantoin		1050
	1.2	Dibromo Phenyl Methyl Hydantoin		
	1.3	Dilodo Phenyl Methyl Hydantoin		
	1.4	Chloro Bromo Phenyl Methyl Hydantoin		
	1.5	DiChloro DiMethyl Hydantoin		
	1.6	Dilodo DiMethyl Hydantoin		
	1.7	Chloro Bromo DiMethyl Hydantoin		
	1.8	Bromo Hydantoin		
	1.9	Dimethyl Aminoacrylic Acid EthylEster		
	1.10	Methoxyacrylic acid methyl ester		
	1.11	Propionic Acid methyl ester		
	1.12	Methoxyacrylic acid ethyl ester		
	1.13	Glycide ethers		
	1.14	9-H-Carbazole-4-ol		
	1.15	2, 4-DiHydroxy-Benzonitrile		
	1.16	Isophthalonitrile		
	1.17	1-Cyano Acetate OR Propaenitrile, 2-(Acetyloxy)		
	1.18	Benzonitrile		
	1.19	Malononitrile		
	1.20	Propionitrile		
	1.21	2 Hydroxybenzonitrile		
	1.22	4 Hydroxybenzonitrile		
	1.23	Phthalodinitrile		

1.24	Phthalonitrile		
1.25	Lilial		
1.26	6-Hydroxy Quinoline		
1.27	6-Bromo Quinoline		
1.28	6-Methoxy Quinoline		
1.29	Methyl Isobutyl Ketone		
1.30	4- Ethoxy -1,1,1- Trifluorobut-3-ene-2-one		
1.31	4-Methoxy -3N-Amino Sulfonyl phenyl acetone		
1.32	2-Allyl-4-Hydroxy-3-Methyl-2-Cyclopenten-1-One		
1.33	2,4 DiChloro Velerophenone		
1.34	4-Methoxy Acetophenone		
1.35	Furan-2,5-Dicarboxylic Acid		
1.36	2-Isopropyl-2-PhenylAcetic Acid		
1.37	1,6-DiHydro-6-Oxo-Pyridazine-4-Carboxylic Acid		
1.38	P- Nonylphenoxyacetic Acid		
1.39	Cyano Acetic Acid		
1.40	Tiglic Acid		
1.41	Beta Benzoyl acetic acid		
1.42	4- Amino-2-Hydroxy -Benzoic Acid		
1.43	2-Chloro-5-Methoxy Aniline HCl		
1.44	Suberic Acid		
1.45	Mesalazine (5 Amino Salicyclic Acid)		
1.46	Chloro diMethoxy triazine		
1.47	N-(4 Hydroxy Benzyl)3,4 dimethoxy benzamide		
1.48	N,N-Bis (Chloroethyl) phenyl Sulphonamide		
1.49	Dichlorobenzylidene		
1.50	Imidazopyridine		
1.51	Piperazine		
1.52	2-Chloro-4,6-dimethoxy-1,3,5-triazine		
1.53	4-Hydroxy -2-methyl 2H-1,2 Benzothiazine		
1.54	Cyclopentanol		

	1.55	Chloroacetoxylidide		
	1.56	1-Bromo-1-tert-ButylBenzene		
	1.57	3-Phenoxy Benzaldehyde		
	1.58	2-Nitrolmino Imidazolidine		
	1.59	2-Amino-4-Chloro-6-Methoxy Pyrimidine		
	1.60	2-Amino-4,6-Dimethoxy Pyrimidine		
	1.61	2-Amino-4,6-Dihydroxy Pyrimidine		
	1.62	2-Amino-4,6-Dichloro Pyrimidine		
	1.63	Ethyl 3-(dimethylamino)acrylate		
	1.64	Chloromethyl Dimethyl Dioxalane		
	1.65	Ethyl Chrysanthemumate		
	1.66	(S)-tert-Leucino		
	1.67	DimethylFuran-2,5-Dicarboxylate		
	1.68	Ninhyrin Hydrate		
	1.69	1-Methyl Pyrazole		
	1.70	Ethyl Cyano Acetate		
	1.71	2,2-Dichloro -3,3-Dimethyl Butane		
	1.72	Tert-Butyl Acetylene		
	1.73	Ethyl3-dimethylaminoacrylate, beta -(beta-DAASE)		
	1.74	4 Chloromethyl2,2 dimethyl 1,3 dioxalane		
	1.75	Isophorene		
	1.76	Amino ethoxy Anisole		
	1.77	N-Pentyl Chloroformate		
	1.78	1-Cyanoethyl Acetate		
	1.79	Propargyl Chloride		
	1.80	1-Phenyl-3-Hydroxy-1-2,4-Triazole		
	1.81	1,8-Octanediol		
	1.82	1-Hydroxy Benzotriazole (HOBT) Hydrate		
	1.83	Benzethonium Chloride		
2		Bulk Intermediates	Nil	6000

	2.1	Meta Phenoxy Benzaldehyde		
	2.2	Di N Propyl Amine		
	2.3	Styrene Oxide		
	2.4	Acetonitrile		
	2.5	4 Cyanophenol		
	2.6	2 Cyanophenol		
3		Perfumery & Cosmetics	Nil	450
	3.1	Cyclo Pentanone		
	3.2	Cyclo Pentanol		
	3.3	Astroglide		
	3.4	Sandalica		
	3.5	Phenyl Ethyl Alcohol		
	3.3	Propiophenone		
	3.4	Methyl Propyl Ketone		
	3.5	Heptanone		
	3.6	Zinc Pyrithione		
	3.7	Styrallyl Acetate		
	3.8	Styrallyl Propionate		
	3.9	Benzethonium Chloride		
	3.10	Oxybenzone		
	3.11	Delta Deca Lactone		
	3.12	Ethyl Phenyl Glycidate		
	3.13	Phenyl Acetaldehyde Dimethyl Acetal		
	3.14	Phenyl Ethyl Acetate		
	3.15	Phenyl Ethyl Methyl Ether		
3.16	Raspberry Ketone			
3.17	Dihydroxy Methyl lasmonate			
3.18	Phenyl Acetaldehyde			
4		Pesticides	Nil	800
	4.1	Azoxystrobin		
	4.2	Fenamidone		

	4.3	Carbendazim		
	4.4	Simazine		
	4.5	Napropamide		
5		APIs	Nil	1200
	5.1	Montelukast		
	5.2	Fexofenadine hydrochloride		
	5.3	Levocetirizine dihydrochloride		
	5.4	Cetirizine		
	5.5	Chlorpheniramine		
	5.6	Fexofenadine		
	5.7	Hydroxyzine		
	5.8	Aripiprazole		
	5.9	Imatinib		
	5.10	Fludarabin		
	5.11	Itopride Hcl		
	5.12	Famotidine plus calcium		
	5.13	Omeprazol		
	5.14	Fenofibrate		
	5.15	Fenofibrate(Tricor)		
	5.16	Ezetimibe (Zetia)		
	5.17	Ambroxol		
	5.18	Metformin HCl		
	5.19	Nateglinide (Starlix)		
	5.20	Oxybutynin Chloride		
	5.21	Pioglitazone HCl		
	5.22	Amaryl- Glimepiride		
	5.23	Glimepiride		
	5.24	Glipizide		
5.25	Divalprox Sodium			
5.26	Gabapentin			
5.27	Phenytoin			



5.28	Pregabalin		
5.29	Tamsulosin Hcl		
5.30	Valporic Acid		
5.31	Zonisamide		
5.32	Zolpidem tartrate		
5.33	Carbamazepine		
5.34	Hydantoins		
5.35	Bupranoll		
5.36	Felodipine		
5.37	Nisoldipine		
5.38	Ranolazine		
5.39	Lopressor (metoprolol tartrate)		
5.40	Norvasc(amlodipine besylate)		
5.41	Atenolol		
5.42	Diltiazem		
5.43	Nicardipine		
5.44	Propanolol		
5.45	Capecitabine		
5.46	Irbesartan		
5.47	Tamoxifen Citrate		
5.48	Miradon		
5.49	Clopidogrel		
5.50	Dabigatran		
5.51	Sintrom		
5.52	Ticlopidine		
5.53	Warfarin		
5.54	Bupropion		
5.55	Citalopram		
5.56	Duloxetine		
5.57	Pramipexole		
5.58	Venlafaxine		

5.59	Moclobemide		
5.60	Sertraline		
5.61	Tofranil		
5.62	Terbinafine Hcl		
5.63	Fluconazole		
5.64	Itraconazole		
5.65	Miconazole (trade name Micatin or Daktarin)		
5.66	Nifedipine		
5.67	Epinephrine		
5.68	Captopril		
5.69	Nicardipine Hcl		
5.70	Guafacine Hcl		
5.71	Chlorothiazide		
5.72	Guaifenesin		
5.73	Ramipril		
5.74	Nebivolol Hcl		
5.75	Carvedilol		
5.76	Guanfacine		
5.77	Losartan/hctz		
5.78	Metoprolol		
5.79	Propranolol		
5.80	Sildenafil		
5.81	Telmisartan		
5.82	Valacyclovir HCl' Isonicotinyl Hydrazide		
5.83	Ciprofloxacin		
5.84	Clarithromycin		
5.85	Azithromycin		
5.86	Metronidazole		
5.87	Nitrofurantoin Macrocrystals		
5.88	Ketoconazole		
5.89	Ephedrine (Rynatuss*)		

	5.90	Ibutilide (Corvert*)		
	5.91	Itraconazole (Sporanox*)		
	5.92	Ketoconazole (Nizoral*)		
	5.93	Ketoprofen Mefenamic Acid		
	5.94	Piroxicam		
	5.95	Celecoxib		
	5.96	Diclofenac		
	5.97	Allytestrenol		
	5.98	Chlomiphene Citrate		
	5.99	Clopidogrel Hcl		
	5.100	Olanzapine		
	5.101	Eszopiclone		
	5.102	Aripiprazole		
	5.103	Quetiapine		
	5.104	Prochloroperazine		
	5.105	Tolterodine		
	5.106	Zidovudine		
	5.107	Donepezil Hcl		
	5.108	Ropinirole		
	5.109	Domperidone		
	5.110	Quatianine fumerate		
	5.111	Clomiphene Citrate		
	5.112	Epinephrine		
	5.113	Tamoxifen		
	5.114	Zoledronic acid		
	5.115	Alendronate sodium		
	5.115	Rivastigmine tartrate		
	5.116	Entacapone		
	5.117	Dexlansoprazole		
	5.118	Lidocaine		
6		API Intermediate	Nil	400

6.1	3-Cyano Quinoline		
6.2	2-EthoxyBenzamide		
6.3	4-Amino Salicylic acid		
6.4	2-Phenyl Butyric Acid		
6.5	Mucic Acid		
6.6	6- DiMethoxy-1-Indanone		
6.7	7-Chloro Quinaldehyde		
6.8	DiBenzo[b,f][1,4]Thiazepin-11(10H)-One		
6.9	5-Chloro Indanone		
6.10	Methyl-5-Chloro-1-Oxoindane-2-carboxylate		
6.11	5-Chloro-2-Hydroxy-2-Methoxy Carbonyl Indanone		
6.12	1-Indanone		
6.13	2-Chloro-5-Nitrotoluene		
6.14	Pyrazole		
6.15	CycloOctanone		
6.16	Methyl 5-Acetyl Salicylate		
6.17	N,N-Di-N-Propyl-2-methyl-3-nitro-phenyl ethyl amine		
6.18	6-Methoxy-8-Nitroquinoline		
6.19	Sodium Valporate Indene-2-Carboxylic Acid-5-chloro-1-Hydrazinylidene-2,3-Dihydroxy-2-		
6.20	Hydroxy Methyl Ester		
6.21	3,5-Dinitro-4-Chlorobenzene Sulfonic Acid		
6.22	3,4,5-Trimethoxy Toluene		
6.23	1,2,4-Triazole Sodium		
6.24	Vilsmeier Reagent		
6.25	3,4-Dihydroxy-Benzaldehyde		
6.26	Benzyl Chloroformate		
6.27	S-methyl isothiourea hemisulphate		
6.28	Pivaloyl Chloride		

**List of By-products:**

Sodium Sulfate = 1600 MT/year,(This is part of the existing product sMPGM)

Potassium Bromide = 480 MT/year

Sodium Bromide = 25 MT/year

**Maximum 10 Nos. of products will be simultaneously produced at any given time in this Multi-purpose facility. The total production volume will not exceed 11,400 MT/year. The total By-products will not exceed 2105 MT/year**

**2.1 Power/ Energy Requirement**

Inventys Research Company Pvt Ltd already has a sanctioned connected load of 750 KVA available through supply from MSEB and a proposed demand for 3000 KVA  
Existing power supply shall be utilized for proposed expansion.

**D.G. Sets**

<b>Capacity</b>	<b>Qty.</b>	<b>Fuel Type</b>	<b>Qty.</b>
500 KVA	2	HSD	100 Ltr/Hr

**2.2 Water Requirement**

The proposed water requirement is about 1115 CMD for domestic, gardening, process, cooling water make up and boiler feed purpose. The source of water is MIDC and the same is adequate and satisfactory. Treated effluent will be recycled to reduce the fresh water consumption.

### WATER BALANCE (Dry Season)

Particulars	Consumption (CMD)		Loss (CMD)		Effluent (CMD)	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
Water Requirement						
Process	15	300	Nil	40	15	260
Boiler feed	120 (60+60)	400	5 steam 50 (cond. Rec.)	175 (cond. Rec.)	5	225
Cooling tower make up		500	60 evap.	485 evap.		15
Domestic	10	50	2.5	10	7.5	40
Gardening	5	40	5	40	0	0
<b>Total</b>	<b>150</b>	<b>1290</b>	<b>122.5</b>	<b>750</b>	<b>27.5</b>	<b>540</b>
Condensate Recycle	50	175				
<b>Fresh Water Requirement</b>	100	<b>1115</b>				

### WATER BALANCE (Wet Season)

Particulars	Consumption (CMD)		Loss (CMD)		Effluent (CMD)	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
Water Requirement						
Process	15	300	Nil	40	15	260
Boiler feed	120 (60+60)	400	5 steam 50 (cond. Rec.)	175 (cond. Rec.)	5	225
Cooling tower make up		500	60 evap.	485 evap.		15
Domestic	10	50	2.5	10	7.5	40
Gardening	5	40	5	40	0	0
<b>Total</b>	<b>150</b>	<b>1290</b>	<b>122.5</b>	<b>750</b>	<b>27.5</b>	<b>540</b>
Condensate Recycle	50	175				
RWH		126.05				
<b>Fresh Water Requirement</b>	100	<b>988.95</b>				

### 3. Baseline Environment

Baseline environment incorporates the description of the various existing environmental settings within the area encompassed by a circle of 10 km radius around the proposed project site.

### 3.1 Ambient Air Quality

Ambient air was sampled at nine locations selected and each station was sampled for continuously 24 hrs. in each month. Parameters monitored were Particulate matter, NO<sub>x</sub>, SO<sub>2</sub>, Ambient air was found to be within the prescribed regulatory limits. Within study area the average Ambient air quality is shown below:

	March, 2013	April, 2013	May, 2013	CPCB Standards
PM <sub>10</sub> (µg/m <sup>3</sup> )	27.78-33.8	23.94-38.94	23.94-41.99	100
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	6.38-14.05	8.33-17.67	5.02-17.02	60
SO <sub>2</sub> (µg/m <sup>3</sup> )	11.5-44.5	7.92-40.83	10.42-42.08	80
NO <sub>x</sub> (µg/m <sup>3</sup> )	5.46-29.04	8.54-21.87	4.44-17.43	80

### 3.2 Water & Hydrology

Surface and ground water (bore well water) were sampled at 6 & 8 stations respectively. 15 Parameters were monitored and found to be within the prescribed regulatory limits.

### 3.3 Noise

Ambient Noise levels in the study area were recorded to be within the limits stipulated by regulatory limits. The equivalent Noise levels during day and night time within study area are shown below:

Leq	March, 2013	April, 2013	May, 2013	Air Quality Standards with respect to Noise (Industrial/ Residential)
During Day time	50.21-69.74	48.93-71.45	47.33-59.28	75 / 55 dB(A)
During Night time	42.5-54.3	38.3-55.0	37.1-57.0	70 / 45 dB(A)

### 3.4 Flora & Fauna

Field survey was planned and undertaken by the M/s Ecobasics Ecology Consultancy and Services Pvt. Ltd. after making a preliminary visit to the proposed site. Data were collected on flora (Herbs, Shrubs and Trees) and fauna (Birds, Insects, Spiders, Reptiles, and Mammals).

As the area falls in MIDC, the project site has very limited vegetation. Adjacent to the project site there are some individual trees and others are planted along the road side. The core area of the plot is having good number of plant species, however, most of plantation at project site comprises of garden species. The member from Fabaceae family is the dominant at project site.

Vegetation diversity status of the site: Vegetation at proposed site is very poor.

Fauna Ecological and Biodiversity status of the site: Very low.

Ecological richness and value of the core site: Very low.

Ecological significance and richness of areas within 1 km range: Low.

Ecological significance and richness of areas within 5 km range: Moderate low.

Ecological significance and richness of areas within 10 km range: Moderate with some ecological significant habitats.

National Parks and Sanctuaries within 10 km: None.

Nearby Forest areas: Lakhmapur, Salaidabha, Wadgaon Dam.

### **3.5 Demographic & Socio-economic Profile**

#### **3.5.1 Population**

Nagpur has a population 4,653,171 as per census data and projection of which 51% are Males and 49% females.

#### **3.5.2 Literacy**

Nagpur has an average literacy rate with 89.13% of the males and 76.09% of females literate in rural area, 95.89 % of the males and 89.16 % of females literate in Urban Area.

### **3.6 Public Amenities**

#### **i. Transportation**

There is full-fledged Airway, railway and local transportation facilities available

#### **ii. Banks**

There are branches of most of the nationalized as well as co-operative banks in the city.

#### **iii. Education Centers**

Skilled manpower and labors are easily available. There are a number of secondary and higher secondary, technical engineering, management, and computer training institutes in the city.

#### **iv. Connectivity**

Fax, telex, email and internet facilities are available.



## 4. ENVIRONMENTAL IMPACTS

### 4.1 Ambient Air

The source of Air emission would be from the industrial Boiler stack and Process emissions from various plant. The flue gas emission from boiler will be controlled by multi-cyclones / dust collectors and released through stack with adequate height and process emissions through scrubbers. GLC for  $PM_{10}$ ,  $PM_{2.5}$ , &  $SO_2$ ,  $NO_2$  conc. from the emissions of the two Boilers and DG sets working, following conclusion are drawn :

Air pollution estimation is done for worst condition of APC not working and no plume rise existing. GLC of  $PM_{10}$  for villages in 10 km radius: It is concluded that under worst case of APC not existing and plume rise is absent the total concentration of  $PM_{10}$  from the Plant emission is in the range of 41.44 to 69.89  $\mu\text{g}/\text{m}^3$ . All these values are less than the AAQS for  $PM_{10}$  of 100 $\mu\text{g}/\text{m}^3$

GLC of  $PM_{2.5}$  for villages in 10 km radius : It is concluded that under worst case of APC not working and plume rise is absent the total concentration of  $PM_{2.5}$  from the Plant emission is in the range of 16.81 to 59.00  $\mu\text{g}/\text{m}^3$ . All these values are less than the AAQS for  $PM_{2.5}$  of 60  $\mu\text{g}/\text{m}^3$ .

GLC of  $SO_2$  for villages in 10 km radius: It is concluded that under worst case of APC not working and plume rise is absent the total concentration of  $SO_2$  from the Plant emission is in the range of 12.72 to 44.66  $\mu\text{g}/\text{m}^3$ . All these values are less than the AAQS for  $SO_2$  of 80 $\mu\text{g}/\text{m}^3$ .

GLC of  $NO_2$  for villages in 10 km radius: It is concluded that under worst case of APC not working and plume rise is absent the total concentration of  $NO_2$  from the Plant emission is in the range of 16.06 to 57.08  $\mu\text{g}/\text{m}^3$ . All these values are less than the AAQS for  $NO_2$  of 80  $\mu\text{g}/\text{m}^3$

From the operation of two DG Sets during emergency, GLC of  $SO_2$  for villages in 10 km radius: It is concluded that the under worst case of APC not working and plume rise is absent the total concentration of  $SO_2$  from the DG sets emission is in the range of 13.50 to 77.42  $\mu\text{g}/\text{m}^3$ . All these values are less than the AAQS for  $SO_2$  of 80  $\mu\text{g}/\text{m}^3$

From the operation of two DG Sets during emergency, GLC of  $NO_2$  for villages in 10 km radius: It is concluded that under worst case of APC not working and plume rise is absent the total concentration of  $SO_2$  from the DG sets emission is in the range of 11.00 to 77.10  $\mu\text{g}/\text{m}^3$ . All these values are less than the AAQS for  $NO_2$  of 80  $\mu\text{g}/\text{m}^3$

In addition air pollution control equipment in the form of Bag House Filters with particulate matter removal efficiency of 97 % shall be installed to bring down the PM emission levels well below the AAQS for two boilers.

For all the scrubbers have good efficiency and emissions are less and hence not contributing to Pollution load on air environment.

Therefore there shall not be any adverse impact on air environment due to the emissions from the industry. The maximum values of the air emission in the area are within the NAAQS standards.

#### **4.2 Water**

Water requirement will be met from MIDC, Butibori. The proposed water requirement is about 1115 CMD for domestic, gardening, process, cooling water make up and boiler feed purpose. The domestic wastewater will be treated in a separate Sewage Treatment Plant (STP) and utilized for gardening or will be sent to CETP.

A full-fledged ETP consisting of primary, secondary and tertiary treatment for 500 m<sup>3</sup>/day industrial effluent including MEE for high TDS effluent will be provided to meet the standards for CETP discharge. There will not be any adverse impact envisaged but in fact will provide dilution to inlet of CETP effluent.

#### **4.3 Noise**

The noise levels will be below MPCB prescribed limits. All operating personnel are well acquainted with their respective operations and personnel protection equipment's will be provided to the operators in utility area.

- In house monitoring will be done regularly inside and outside the factory. The noise levels will always be within Maharashtra Pollution Control Board limits for industrial activity and Inventys will ensure 100% compliance record.
- Proper noise barriers, acoustic enclosures will be provided on noise generating equipment's like D G sets and cooling towers to minimize noise.

#### 4.4 Soil/Land Quality

The project proponents will take all the precautions to make its solid waste areas impervious to water and leachate migration. This will avoid soil contamination. It follows that soil quality will not be adversely impacted by proposed production activity. The unit set up is in industrial area hence no change in land use.

#### Investigated environmental impacts

<b>Construction phase</b>			
1.	Ambient air quality	Particulate emissions from construction activities	<b>Insignificant impact</b> as ready-mix concrete will be used, during excavation; the dust suppression measures will be implemented.
2.	Noise	Noise from D G sets	<b>Insignificant impact</b> as DG Set will be utilized only during power failure. DG Set will be provided with proper acoustic enclosure. All personnel will be provided with ear muffs and other protective devices.
3.	Water quality	Water supply by MIDC for Construction	Water will be used /consumed in construction and curing operations only. No untreated water/partially treated water will be disposed off straight onto the land and hence <b>no impact on the soil.</b>
4.	Water usage	Water supplied by MIDC	<b>No impact on ground water</b> as no water will be taken from the ground to meet the requirements
5.	Soils	Fuel and material spills	There could be minor impacts. There will be standard operating procedures for handling of spillages.
6.	Ecology Flora and fauna	No change in land use	No negative impact as the surrounding flora and fauna will be in no way disturbed due to the proposed project.
7.	Traffic pattern	Not much change in the traffic	No negative impact.
<b>Operation phase</b>			
1.	Ambient air quality	Particulate emissions from process stacks, DG sets, boiler and vents	Insignificant impact as all boilers and DG set are provided with stacks/chimneys of adequate height and all process vents are provided with scrubbers to control the release of pollutants into the atmosphere.

2.	Noise	Noise from D G sets	Insignificant impact as DG sets will be provided with proper acoustic enclosure. All personnel will be provided with ear Safety muffs and other protective devices.
3.	Water quality	Fuel/Oil, solvent spills Waste water from the plant	All solvents and fuel/oil will be stored in appropriate storage tanks in the area reserved for chemicals storage. Insignificant impact. No untreated water/partially treated water will be disposed off straight onto the land and hence the impact on the soil is NIL
4.	Water usage	Water supplied by MIDC	No impact on ground water as no water will be taken from the ground to meet the daily water requirements
5.	Soils	Fuel and material spills	Insignificant impact as fuel will be stored in separate area reserved for storage and care will be taken so as to prevent the fuel spillage. Fuel leak from tanker vehicles will be moderate and will be taken care of immediately to prevent percolation into the ground.
6.	Ecology Flora and fauna	No change in land use	Insignificant impact as the surrounding flora and fauna will be in no way disturbed due to the proposed project.
7.	Traffic pattern	Not much change in the traffic	Insignificant impact
8.	Socio-economic Impacts	socio-economic development activities in the villages around the MIDC area	Positive impact as the work expands the company intends to increase the scope of CSR activities in near future and creation of job opportunities.

## 5. ENVIRONMENTAL MANAGEMENT PLAN

An environmental management plan has been proposed to implement the mitigation measures. The plan will ensure that the adverse environmental impacts are minimized and the beneficial impacts area maximized.

### 5.1 Domestic Sewage

The sewage will be treated in the Septic tanks. The overflow of the septic tanks will be pumped in the bioreactor of STP. The treated sewage will be used for gardening and green belt that will be developed with in the factory premises or will be sent to CETP.

## 5.2 Industrial Effluent

To treat the industrial effluent IRC will provide Effluent treatment plant. As per the need of the day to minimize the effluent generation and recycle the treated effluent, treatment systems are designed to comply standards for discharge of treated industrial waste water to CETP.

## 5.3 Air Pollution Management

The source of emission i.e. Flue Gas Emission is from industrial Boiler. The Flue gas emission will be taken to Multi cyclones / Bag Filters and released through stack having adequate stack height. The process emission from the reaction vessel of the main tanks will be taken to the scrubber before releasing it to the atmosphere.

## 5.4 Solid & Hazardous Waste Management

The Hazardous Wastes generated will be sent for further treatment and disposal to CHWSTDF (Common Hazardous Waste Storage Treatment and Disposal Facility), membership from Vidharbha Enviro Protection Limited, Butibori.

## 5.5 Green Belt Development

Green Belt development within the project premises is planned on 7,685 sq. m area. About 1680 trees and shrubs of local variety have been planted. This will reduce noise levels and dust levels by acting as a barrier between the outside environment and the inside environment of the premises.

## 5.6 Project Cost and Expenditure for environmental activities (EMP cost)

Estimated project cost is approximately 3,26,10 Lakhs which is economically viable.

Sr. no	Fixed Assets	Amount in Lakhs
1.	Land	---
2.	Building/ Premises	52,53
3.	Plant & Machinery and Equipment	2,71,15
4	Furniture & Fixtures	200
5	Any other Immovable / Fixed Assets (Road and other infrastructure improvement)	
	<b>Total Assets deployed at original cost</b>	<b>3,26,10</b>

## EMP Cost estimate

Sr No.	Particulars	Capital cost (In lacs)	Recurring cost (lacs) per annum
<b>1</b>	<b>Air pollution control</b>		
	Boiler chimney 53m each	5.0	
	Multicyclone	3.0	
	Dust collector	10.0	
	Scrubber		
	1 HCl Absorber	20.0	
	2. Caustic scrubber, VGS	10.0	36.0
	3. Circulation pumps, incl. blowers, stack, instrumentation etc.	20.0	
<b>2</b>	<b>Water Pollution control</b>		
	Process drains to ETP	10.0	
	ETP	1200.0	750.00
	RWH	20.0	5.0
<b>3</b>	<b>Noise pollution control</b>		
	Acoustic encl.	10.0	
	Env. Monitoring and management	--	10.0
<b>4</b>	<b>Occupational health</b>		
	Medical checkup		
	Health insurance policy		
	Medical staff charges		
	First aid facilities consumables	5.0	8.0
	In-house first aid room		
	Other infrastructure and Equipment		
<b>5</b>	<b>Green belt</b>	2.0	1.0
<b>6</b>	<b>Hazardous waste</b>		
	storage & Disposal	5.0	320
	<b>Grand Total</b>	<b>1320.0</b>	<b>1130</b>

## 6. ENVIRONMENTAL MONITORING PROGRAM

Following program schedule has been suggested for effective monitoring of the environmental parameters:

Sr. No.	Type	Locations	Parameters	Period and Frequency
1.	Ambient air Quality	Project site 2 locations	Criteria Pollutants: • SO <sub>2</sub> , NO <sub>x</sub> , RSPM, NH <sub>3</sub>	24-hr average samples every quarter during operation
2.	Stack emission Monitoring	Stack of Boilers and DG sets 6 nos.(3 Existing + 3 Proposed)	• SO <sub>2</sub> , NO <sub>x</sub> , RSPM, NH <sub>3</sub> and hydrocarbons	24 hr average every quarter.
3.	Ambient noise	Project site 2 locations	• dB(A) levels	Hourly Day and Night time Leq levels every quarter during Operation phase.
4.	Treated effluent quality	Influent, bio reactor, final treated water before disposal.	• General parameters like pH, COD, TSS, BOD, MLSS, MLVSS	Once every day. Twice a week.
5.	Surface water quality	3 stations around project Site	• Physical and Chemical Parameters.	Once a month.
			• Bacteriological parameters.	Once in 3 months
			• Heavy metals and toxic constituents.	Once in 3 months
6	Ground water quality and depth of water table	3 piezometer stations around the factory site for ground water monitoring to ensure no contamination	• Physical and chemical parameters: Total Organic matter Concentration	Once a month.
			• Bacteriological Parameters.	Once in 3 months
			• Heavy metals and toxic Constituents.	Once in 3 months
7.	Terrestrial ecology	Flora and fauna in and around the site	• The health and the density of the vegetation, forest cover	Once a year
8.	Aquatic ecology	Aquatic organisms in the nearby water body	• Ensure no fish kill in the nearby water body.	Once a year
9.	Waste characterization	Storage area	Physical and chemical composition	Annual by CHWTSDF

## **7. ADDITIONAL STUDIES**

A detailed Quantitative Risk Analysis has been done by an expert considering the various hazardous chemicals and solvents being handled and stored. The report on the same is available separately.

## **8. CONCLUSION**

It can be concluded that proposed project activity of Inventys Research Company is in the interest of common man, the society, the state and the country as a whole.

1. Socio-economic benefits due to creation of direct/indirect employment. Moreover due to project other direct and indirect business will be benefited.
2. Country will save valuable foreign exchange as import of these chemicals will reduce by corresponding amount.
3. These chemicals also have export potential. Hence possibility of earning foreign exchange.
4. The Flue gas emission from boiler will be left out through stack. The stack with adequate height as per CPCB norms will be provided.
5. Industrial waste water will be treated by ETP within the premises.
6. The domestic wastewater generated will be treated in a separate Sewage Treatment Plant (STP) and utilized for gardening or will be sent to CETP.
7. The noise generation will be reduced due to the measures provided in Environmental Management Plan.
8. The risk associated is identified by conducting risk assessment, HAZOP and recommendations of the same will be implemented. Moreover on site emergency plan will be prepared to tackle the emergency when it arises.

Thus it can be concluded on a positive note that after the implementation of the mitigation measures and Environmental Management Plan the normal operation of M/s Inventys Research Company Pvt. Ltd. will have negligible impact on environment and will benefit the local people and the country as a whole.