Sri Krishna
PHARMACEUTICALS

11th February , 2014

To
The Chairman / Member Secretary,
Expert Appraisal Committee,
Industrial Projects, EIA division
Ministry of Environment & Forests
Paryavaran Bhawan, CGO Complex,
Lodi Road, New Delhi – 110 003.

Dear Sir,

Sub: **Application for Environmental Clearance for our proposed new project for manufacturing of API (Bulk Drug & Intermediates) for a capacity of 4095 MT/month (2545 MT API products and 1550 MT of by-product Acetic acid) at Plot No. F- 1 MIDC Chincholi, Tehsil- Mohol, Dist. Solapur, State -Maharashtra-413 255.**

We, **M/s. Sri Krishna Pharmaceuticals Limited (SKPL)** would like to propose a manufacturing unit which will be producing 4095 MT/month (2545 MT API products and 1550 MT by-product Acetic acid). We have procured a plot measuring 101250 sq. meters (Plot no.F-1) in a notified industrial area in MIDC, Chincholi, Taluka Mohol, Dist. Solapur- 413 255, State – Maharashtra.

The existing manufacturing facilities of the SKPL in Andhra Pradesh have been certified by USFDA & WHOGMP. Besides this, the company has also been accredited by various other regulatory authorities with a Certificate of Suitability (COS) from European Directorate of Quality Medicines (EDQM) and TGA-Australia. The organization has been recognized as an "Export House" by Ministry of Commerce, Government of India for the meritorious contribution in the field of Export of API's. In addition to above, we are also certified for ISO 14001& OHSAS 18001.

Contd....

Sri Krishna Pharmaceuticals Ltd.
CORPORATE OFFICE: C4 Industrial Area Uppal Hyderabad - 500 039 AP India
T: +91 40 2720 1101 - 02 / 2720 0103 - 04 / 2720 4471 - 72
F: +91 40 2720 4470 E: skg@srikrishnapharma.com
(ISO 9001:2008 Company) srikrishnapharma.com
Factory : Unit - V, Plot No. B-14, MIDC, Chincholi,
Taluk Mohal, Solapur - 413 255, M.H. INDIA.
T: 91 0217 2357038/39, F: 91 0217 2357038

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This proposed project under consideration would be located at Chincholi MIDC, a Notified Industrial Estate. We already have an API manufacturing unit in the same MIDC area which gives us an edge for managing the proposed expansion. As a part of growth policy and due to continuously changing market scenario we wish to expand our bulk drugs & intermediates production activity to remain in business and retain our leadership. The proposed manufacturing capabilities and product range is as detailed below:

List of Products for Environmental Clearance:

Sr. No.	Name of the Product	Remark	Proposed production Quantity for Environmental Clearance (MT/Month)
1A	Partacetamol -4 Stages	(Starting from PNCB)	400
1B	Partacetamol -2 Stages	(Starting from Penultimate stage)	1100
2	Ibuprofen	--	500
3	Metformin	--	500
4	Domperidone	--	15
5	Dextromethorphan Hydrobromide	--	20
6	Omega -3	--	10
	By Product		
7.	Acetic Acid	(Generates in the process and sold to consumers)	1550

Details of the project, process reactions, chemicals used and environmental implications are described in attached pre-feasibility report.

Contd.....

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For the proposed project we request you to take a note of following facts:

- As per the MoEF notification SO 1533 issued on 14th September 2006, our industry is classified under 5(f) of the Schedule.
- The project site is located in MIDC Industrial area at Chincholi and comes under category B
- Wildlife sanctuary " Great Indian Bustard" at Nanaj within 10 km of the project site,

In line with MoEF notification, we wish to get prior environmental clearance for this proposed activity. We are pleased to submit the project proposal with Form-I & pre-feasibility report in new format for your consideration.

Thanking you,

Yours Faithfully

For Sri Krishna Pharmaceuticals Limited

V.V. Krishna Reddy

V.V. Krisha Reddy
Managing Director

Encl: i) Pre- feasibility report
ii) Form -I

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APPENDIX I

(see paragraph—6)

FORM 1

(I) Basic Information

S. No.	Item	Details
1.	Name of the project-	Sri Krishna Pharmaceuticals Limited F-I, MIDC Chincholi, Tal- Mohal, Dist: Solapur- 413 255
2.	Sr. No. in the Schedule	5 (f)
3.	Proposed capacity / area/ tonnage	4095 MT/ Month
4.	New / Expansion / Modernization	New
5.	Existing Capacity/Area etc.	It is a new unit
6.	Category of project ie A or B	B
7.	Does it attract the general condition? if yes, please specify	No
8.	Does it attract the specific condition? If yes, please specify	No
9.	Location	MIDC, Chincholi
	Plot/Survey/ Khasra No.	Plot No. F-1
	Village	Chincholi
	Taluka	Mohol
	District	Solapur
	State	Maharashtra
10.	Nearest Railway station/ Airport along with distance in kms.	Nearest Railway station : Solapur – 15 Kms away from site Nearest Airport : Solapur Nearest City: Solapur – 5 kms. Away from site
11.	Nearest Town, City, District Headquarters along with distance in kms.	Nearest City : Solapur- 5 kms. Away from site
12.	Village Panchayat, Zilla Parishad, Municipal Corporation,Local Body (Complete postal address with telephone nos. to be given)	Village Panchayat : Chincholi Taluka- Mohol District : Solapur
13.	Name of the applicant	Mr. V.V. Krishna Reddy- (Managing Director)

14.	Registered address	Sri Krishna Pharmaceuticals Limited Plot No. C-4 Industrial Area, Uppal, Hyderabad- 500 039, A.P. India.
15.	Address for correspondence:	Sri Krishna Pharmaceuticals Limited Plot No. C-4 Industrial Area, Uppal, Hyderabad- 500 039, A.P. India
	Name	Mr. V.V. Krishna Reddy
	Designation(Owner/ Partner/ CEO)	Managing Director
	Address	Regd Off:Sri Krishna Pharmaceuticals Limited :Plot No. C-4 Industrial Area, Uppal, Hyderabad- 500 039, A.P.
	Pin code	500 039
	Email	vvk@srikrishnapharma.com gchandrasekhar@srikrishnapharma.com
	Telephone No.	040-27204471-72 Site: 0217 2357039
	Fax No.	0217 2357038
16.	Details of alternative sites examined, if any. Location of these sites should be shown on a topo sheet.	Refer Attached toposheet in prefeasibility report.
17.	Interlinked projects	None
18.	Whether separate application of interlinked project has been submitted	Not Applicable
19.	If yes, date of submission	Not Applicable
20.	If No, Reason	Not Applicable
21.	Whether the proposal involves approval/clearance under: If yes, data (a)The Forest (Conversation) Act, 1980 (b)The wildlife (protection) Act, 1972 (c) The CRZ Notification, 1991	No
22.	Whether there is any Government order/policy relevant/relating to the site?	No
23.	Forest land involved (Hectares)	No
24.	Whether there is any litigation pending against the project and or land in which the project is propose to be set up a) Name of the court b) Case No. Orders/ Directions of the court if any and its relevance with the proposed project.	No Not Applicable

(II) Activity

1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)	No	Already an existing notified (MIDC) industrial area. Same status continues.
1.2	Clearance of existing land, vegetation and buildings?	No	Already an existing notified (MIDC) industrial area. Same status continues.
1.3	Creation of new land uses?	No	Already an existing notified industrial area. Same status continues.
1.4	Pre-construction investigations e.g. bore houses, soil testing?	No	Land is plain developed land. Normal Soil testing required for checking load bearing capacity.
1.5	Construction works?	No	No, land cutting or filling required. No explosives shall be used
1.6	Demolition works?	No	Not Applicable
1.7	Temporary sites used for construction works or housing of construction workers?	No	No Housing for Workers proposed. Workers will come from nearby area.
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	No	Not Applicable
1.9	Underground works including mining or tunneling?	No	Not Applicable
1.10	Reclamation works?	No	Not Applicable
1.11	Dredging?	No	Not Applicable
1.12	Offshore structures?	No	Not Applicable
1.13	Production and manufacturing processes?	No	Please refer prefeasibility report.
1.14	Facilities for storage of goods or materials?	No	Separate storage yard will be provided for the storage of materials and goods.
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	No	Liquid Waste: Shall be treated in separate Effluent Treatment Plant. Solid Waste: Management system followed based on category of waste as per MPCB standards.
1.16	Facilities for long term housing of operational workers?	No	There will not be any housing facility proposed. Workers will come from nearby area.

1.17	New road, rail or sea traffic during construction or operation?	No	Existing approach road is available.
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	No	Existing approach Road is available
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No	Not Applicable/ Not Required
1.20	New or diverted transmission lines or pipelines?	No	Not Applicable/ Not required
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	Not Applicable/ Not required
1.22	Stream crossings?	No	Not Applicable/ Not required
1.23	Abstraction or transfers of water form ground or surface waters?	No	Not required, as the water supply is of MIDC
1.24	Changes in water bodies or the land surface affecting drainage or run-off?	No	Roof rain water harvesting, pavement rainwater recharging of groundwater will be done
1.25	Transport of personnel or materials for construction, operation or decommissioning?	No	This will be in small extent and for limited period of Time.
1.26	Long-term dismantling or decommissioning or restoration works?	No	Not Applicable
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	Not Applicable
1.28	Influx of people to an area in either temporarily or permanently?	No	Not Applicable
1.29	Introduction of alien species?	No	Not Applicable
1.30	Loss of native species or genetic diversity?	No	Not Applicable
1.31	Any other actions?	No	Not Applicable

2. Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):

Sr. No.	**Information/checklist confirmation**	**Yes/ No**	**Details thereof (with approximate quantities /rates, wherever possible) with source of information data**
2.1	Land especially undeveloped or agricultural land (ha)	No	The land is a part of notified industrial area of govt. of Maharashtra. There will be no change in the existing land use.

<table>
<tr><td>2.2</td><td>Water (expected source & competing users) unit: KLD</td><td>No</td><td>Source of water supply : MIDC

Quantity during construction – Process & others including for civil works :50 KLD

Adequate quantity will be available from MIDC.
Qty. During Operational Phase -
.
<table><tr><td>Sr. No.</td><td>Source of use</td><td>Quantity in KLD</td></tr><tr><td>1</td><td>Domestic</td><td>50.00</td></tr><tr><td>2</td><td>Industrial Processing/washings
Cooling water make up/ Boiler feed</td><td>678.23</td></tr><tr><td>3.</td><td>Cooling water make up & Boiler Feed</td><td>711.60</td></tr><tr><td>4.</td><td>MEE & ATFD</td><td>210.00</td></tr><tr><td>5.</td><td>Agricultural/ Gardening</td><td>39.00</td></tr><tr><td></td><td>Total</td><td>1688.83</td></tr></table></td></tr>
<tr><td>2.3</td><td>Minerals (MT)</td><td>No</td><td>Not Applicable</td></tr>
<tr><td>2.4</td><td>Construction material – stone, aggregates, sand / soil (expected source – MT)</td><td>Yes</td><td>New Factory and office building is proposed.

Construction material is available locally.</td></tr>
<tr><td>2.5</td><td>Forests and timber (source – MT)</td><td>No</td><td>No tree cutting is involved. Minimum use of timber will be used as per requirement.</td></tr>
<tr><td>2.6</td><td>Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)</td><td>Yes</td><td>Electricity available from State Electricity Board.

D.G. Sets capacity 1000 KVAx3 Nos shall be proposed.</td></tr>
<tr><td>2.7</td><td>Any other natural resources (use appropriate standard units)</td><td>Yes</td><td>Boiler- 2 nos. of capacity 15 TPH each and One 10 TPH will be stand by.
Type of Fuel : Coal
Qty.: 2800 T/Month</td></tr>
</table>

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

S. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)	No	Refer Prefeasibility report for list of hazardous chemicals used. Adequate precautions / safety measures will be exercised. Quantity below threshold limits.
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	Nothing above threshold quantity.
3.3	Affect the welfare of people e.g. by changing living conditions?	No	Shall be favorable
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	No	
3.5	Any other causes	No	

4. Production of solid wastes during construction or operation or decommissioning (MT/month)

S. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes	No	Not applicable
4.2	Municipal waste (domestic and or commercial wastes)	Yes	Office trash, garden waste, bio sludge etc.
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	Yes	Pl. refer prefeasibility report. Disposal through CHWTSDF.
4.4	Other industrial process wastes	No	NIL
4.5	Surplus product	No	--
4.6	Sewage sludge or other sludge from effluent treatment	Yes	Sewage Sludge, garden waste: shall be used as manure for gardening. ETP Sludge: Shall be disposed through CHWTSDF.
4.7	Construction or demolition wastes	Yes	No demolition. Construction wastes if any Metallic Waste: will be sold to scrap dealers.
4.8	Redundant machinery or equipment	No	Not Applicable
4.9	Contaminated soils or other materials	No	Not Applicable

4.10	Agricultural wastes	No	Not Applicable
4.11	Other solid wastes	No	Garden leaves and road sweeping used as manure for gardening.

5.0 Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr)

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	Yes	Boiler- 2nos. of capacity 15 TPH each One No 10 TPH as stand by Type of Fuel : Coal Qty.: 2800 T/Month Boiler Emissions : SPM, SO_2, CO_2, NO_X D.G. Set with Capacity-1000 KVA x 3 No shall be proposed with acoustic enclosure.
5.2	Emissions from production processes	No	Process emissions existing: SOx, NOx, Acid mist
5.3	Emissions from materials handling including storage or transport	Low	Fugitive emissions due to transport. Precautions shall be taken. Mostly closed containers shall be used.
5.4	Emissions from construction activities including plant and equipment	No	Insignificant due to limited transport only.
5.5	Dust or odours from handling of materials including construction materials, sewage and waste	No	Not Applicable
5.6	Emissions from incineration of waste	No	Not Applicable
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	Not Applicable
5.8	Emissions from any other sources	Nil	Not Applicable

6.0 Generation of Noise and Vibration, and Emissions of Light and Heat:

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data with source of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	Precautions will be taken to reduce noise. Acoustic enclosures and covers / guards shall be provided to equipments & machineries. Please refer details in prefeasibility report.

6.2	From industrial or similar processes	Yes	Precautions will be taken to reduce noise. Acoustic enclosures and covers will be provided. In plant emission control devices such as scrubbers, dust collectors will be provided
6.3	From construction or demolition	Yes	No demolition involved. During construction precautions will be taken. Acoustic enclosures and covers / guards shall be provided to equipments & machinaries.
6.4	From blasting or piling	No	Land is already developed by MIDC
6.5	From construction or operational traffic	Low	Limited
6.6	From lighting or cooling systems	No	Very low and limited
6.7	From any other sources	Nil	Not Applicable

7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	No	Precautions will be taken during transportation, loading/ unloading etc. MSDS will be followed.
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	No	For treatment of sewage well designed septic tank followed by soak pit shall be provided. For treatment of trade effluent full fledged Effluent Treatment Plant shall be provided. Treated effluent shall be recycled and reused for cooling water make up and for gardening.
7.3	By deposition of pollutants emitted to air into the land or into water	No	Not Applicable
7.4	From any other sources	No	Not Applicable
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?	No	Not Applicable

8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment

S.No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data.
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances	No	No use of explosives. Fire fighting precautions as per CIF and Insurance co.
8.2	From any other causes	No	Physical hazard like injury
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc)?	No	Site is in existing notified industrial estate/ not a flood / earthquake prone or hilly area. Risk is minimum. DMP in place

9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality.

S. No.	Information/Checklist confirmation	Yes/No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
9.1	Lead to development of supporting. ancillary development or development stimulated by the project which could have impact on the environment e.g.: • Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.) • housing development • extractive industries • supply industries • other	No	• Infrastructure already available in MIDC. • No Housing in Premises is proposed. • Few industries downstream • No Additional / sudden load
9.2	Lead to after-use of the site, which could have an impact on the environment	No	Not Applicable
9.3	Set a precedent for later developments	No	Not Applicable
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	No	Not Applicable

(III) Environmental Sensitivity

S.No.	Areas	Name/ Identity	Aerial distance (within 10 km.) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	Yes	The Great Indian Bustard Sanctuary of Nannaj located in Solapur comes under 10 Km radius circle of study area. It is about 9 Km from the proposed project site.
2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	None	Not Applicable
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	Yes	The Great Indian Bustard Sanctuary of Nannaj located in Solapur comes under 10 Km radius circle of study area. It is about 9 Km from the proposed project site.
4	Inland, coastal, marine or underground waters	None	Not Applicable
5	State, National boundaries	No	Not Applicable
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	No	Not Applicable
7	Defense installations	No	Not Applicable
8	Densely populated or built-up area	No	---
9	Areas occupied by sensitive man-made land uses *(hospitals, schools, places of worship, community facilities)*	No	---
10	Areas containing important, high quality or scarce resources *(ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)*	No	Not Applicable
11	Areas already subjected to pollution or environmental damage. *(those where existing legal environmental standards are exceeded)*	No	Not Applicable
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (*earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions*)	No	Not Applicable

(IV). Proposed Terms of Reference for EIA studies :

- The proposed project is new project in production of Pharmaceuticals at Plot No. F-1, MIDC Chincholi, Taluka Mohol, Dist -Solapur.
- The project location is in notified industrial Estate
- Land use does not change
- Water supply from MIDC
- Adequate full fledged Effluent Treatment Plant shall be provided with 100% recycle.
- Unit will have the membership of CHWTSDF, MEPL, which is in the vicinity, for scientific disposal of Hazardous Waste.
- Effective waste minimization, maximum utilization of raw material, recycling, scrubbing of stack emissions.

This new proposal is for the pharmaceutical products. We have previous experience for handling the raw materials and manufacture of such types of products in our other factory in the same area.

We have already started preparation of EIA report through consultant organizationbased on the MoEF guidelines for field monitoring and model TOR by SEAC for Pharmaceutical units.

We have consents from Maharashtra Pollution Control Board for our existing manufacturing unit.

Based on the above, the project be considered as category B-1 schedule I under activity 5 (f) and the proposal is requested to be appraised based on Form-1, Pre-feasibility report submitted and draft EIA report .

"We hereby give an undertaking that the data and information given in the application and enclosures are true to the best of our knowledge and belief and we are aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance given, if any to the project will be revoked at our risk and cost ".

Thanking You,

Yours Truly,
For Sri Krishna Pharmaceuticals Limited

V.V. Krishna Reddy

V.V. Krishna Reddy-
Managing Director

Stamp :
Date:

Place: MIDC, Chincholi

PREFEASIBILITY REPORT

New Project for

Manufacturing of Bulk Drugs & Intermediates

Category – 5(f) B

by

M/s. Sri Krishna Pharmaceuticals Limited

Plot No. F-1, MIDC Chincholi, Taluka Mohol,

Dist. Solapur - 413 255

Prepared by

Goldfinch Engineering Systems Pvt. Ltd., Thane

Formerly Waste Encare (India) Pvt. Ltd.

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CHAPTER 01

EXECUTIVE SUMMARY

M/s. Sri Krishna Pharmaceuticals Limited (SKPL) would like to propose to establish a new unit at Plot no. F-1, MIDC, Chincholi, Taluka Mohol, Dist. Solapur- 413 255, State – Maharashtra to manufacture 4095 MT/month of API (Bulk Drug & Intermediates) products (2545 MT API products and 1550 MT by product acetic acid). SKPL already has an existing operating API unit in the same MIDC area. Hence no alternate site was considered.

As mentioned in the EIA Notification No. S. O. 1533 dated 14th September 2006, these types of industries are covered as category 5 (f) in the Schedule. It is also stated that Synthetic Organic Chemical Industry (Bulk Drugs & Intermediates) located in a notified industrial area/estate comes under category B and No public hearing is required.

The proposed project will be located on Plot No. F-1 having area of 101,250 sq. meters. The proposed Layout Plan is attached as **Annexure–II**. This plot is not a prime agricultural land. The land use is Industrial as plot is in MIDC area. Thus there is no change in the land use status. This is a plain developed land and there will be No cutting or filling of land required. This plot is allotted by notified industrial Estate (MIDC). The city of Sholapur, Railway line, State Highway is sufficiently at a safe distance. Govt. and MIDC has provided all basic infrastructure like assured Electrical Power, continuous & adequate purified water supply from water works having RSF (Rapid Sand Filtration) and disinfection facility, internal road network, external approach road and networking with CHWSTDF (Common Hazardous Waste Storage Treatment and Disposal Facility). There is no sensitive area in the vicinity (with in 10 km radius) such as tourist / health resort, hospital, archaeological monuments, sanctuaries, etc. All nearby villages are provided with drinking water from wells or Government Water Supply Schemes RWS. Hence we do not encroach upon their supply.

There will be no noise nuisance from DG set which will have acoustic enclosure and will be run occasionally in emergencies only. There is no crushing, pulverizing noise generating operations. Labor strength will also be limited in this unit. There will not be any odor nuisance from this unit. SKPL has proposed to establish their proposed manufacturing activity of API (Bulk Drug & Intermediates) as required by market scenario.

Source of water is from MIDC. Water input requirement will be around 1690 CMD, however there is a proposal of recover and reuse almost all the treated effluent that will be generated and hence the requirement of fresh water will be very less. Coal based boiler will be proposed with proper in-built coal handling and pollution control equipment. Coal consumption will be 2800 TPM. 500 nos. of workers & staff will be employed.

In SKPL, Safety and occupational Health will be given prime importance right from the project inception stage. A disciplined approach is natural to this industry. EHS policy will be in place. This unit shall be registered under Factories Act and follow State Factories Rules & Regulations. Thus, Trained Staff having knowledge of First Aid and Fire Fighting will be available in every shift. A competent person will be appointed as Safety Officer. Wherever necessary, provisions of other Acts, like Environment Act, Petroleum Act, and Explosive Act etc. will be obeyed. Firefighting system will be installed as per norms of Insurance Company and CIF.

On-site emergency control plan (OECP) will be in place. Brief of HARA & OECP is enclosed as **Annexure V**. Accordingly, Personal protective equipment will be given and their proper use will be insisted. Consulting physician will be appointed for the factory as per the rules.

This proposed API Bulk Drug & Intermediates facility is located at MIDC of Chincholi, in Solapur District, in Maharashtra. The Site is 5.00 km from Solapur city and 15.00 km from the Railway Station. The land and infrastructure is made available by MIDC and the raw material is easily available through the easy transport via road. The city has Railway station. Nearest Airport is Solapur. The site is at a distance of 2.00 km. from Pune- Solapur Road State-Highway With all these considerations and as the project proponent has another existing unit in the same MIDC area, this site was selected. **.** The total cost of the project will be 125 Crores. Cost for the Environment Management Plan will be 10.00 Crores**.**

The industry will manufacture Bulk Drug & Intermediate which is in good demand for growing Medical facilities in India. This will not disturb the environmental setting because SKPL have proposed all preventive and mitigative measures required for pollution prevention and control and the area occupied by the proposed unit will be only small % of influence zone of 10 km. This land is in notified Industrial estate. Trees will be planted and not cut down. No Rehabilitation issue is involved. There will not be problematic waste materials as all will be utilized/safely disposed.

CHAPTER 02

INTRODUCTION OF THE PROJECT/ BACKGROUND INFORMATION

2.1 Identification of the Project and Project Proponent

Sri Krishna Pharmaceuticals Limited (SKPL), a company engaged in manufacturing of Active Pharmaceutical Ingredients (API's), was established in the year 1976 in Andhra Pradesh state and started its operations in Maharashtra in 2007 under the leadership of Mr. V.V. Krishna Reddy- Managing Director with a strong vision for the future. In the past 5 years, SKPL has emerged as a leader in the International market as a reputed manufacturer of Active Pharmaceutical Ingredients (API's) for Global Pharmaceutical Industry.

The company has Headquarter in Hyderabad, India, and is catering to the ever growing demand of Active Pharmaceutical Ingredients (API's) from single state-of-the-art manufacturing facility already established in Chincholi MIDC (Maharashtra) and has built up a reputation for excellence on the foundations of consistent high quality, a constantly expanding product portfolio and timely launches of new API's.

The in-house QC Laboratories are equipped with sophisticated instruments to assure the quality of the raw materials, intermediates and API's. The company believes in quality by design and continuous improvement in all aspects of its operations. By this endeavor, Sri Krishna Pharma has become a force to recognize in the global market of Pharmaceuticals as an important partner for API's.

The manufacturing facilities of the company have been inspected by USFDA & WHO-GMP. Besides this, the company has also been accredited by various other regulatory authorities such as certificate of suitability (COS) from European Directorate of Quality Medicines (EDQM), Pharmaceutical Inspection Convention (PIC) member countries, TGA–Australia, HPB Canada, Japanese Ministry of Health & Labor Welfare etc., The Organization has been recognized as an "Export House" by Ministry of Commerce, Government of India for the meritorious contribution in the field of Export of API's.

Quality, Safety & Environmental protection is of paramount importance to the success & growth of company's business and SKFL has a defined corporate policy.

The policy of Srikrishana Pharma is to ensure that customers worldwide are delighted by receiving API's which are safe, efficient and are of highest quality. SKPL adhere to principles of GMP and everyone at all levels is committed to achieving the corporate quality goal.

Srikrishna Pharma considers that well trained human resources are the key for servicing of the clients. SKPL is proud of their personnel in all areas from R&D, Manufacturing, Quality Management, Marketing, and Finance to Supply Chain. We believe in respect and welfare of employees at all levels in the organization.

To support the manufacturing activity, R&D activity has been stepped up for identification & Development of new & non-infringing process, optimization of manufacturing process addressing all environmental issues & making it more eco-friendly, technology transfer from lab to plant etc. The technologies of the proposed drugs have been developed in our R & D located in the same manufacturing facility.

SKPL will provide a full-fledged Effluent Treatment Plant of capacity 1000 CMD in the facility including MEE & RO to treat and recycle / reuse the effluents discharged from the manufacturing processes and also for treatment of sewage generated from the toilets in well-designed septic tank followed by soak pit. The treated water from the ETP shall be recycled and reused for cooling water make up, process use wherever feasible and gardening purpose inside the premises. The SKPL has an ambitious plan and clear vision for achieving Global Market taking into consideration, the safety of the drugs as well as its personnel.

The Project Proponent has an existing unit in Chincholi MIDC area, Sholapur for manufacturing of Bulk drugs & intermediates located on Plot No. B-14 and a consent to operate has been issued by Maharashtra Pollution Control Board vide Consent No. BO/RO-Pune/RO (P&P)/EIC-PN-5869-10/O/CC-228 dated 23.11.2011 valid up to 31.03.2013. SKPL has now proposed a new project for manufacture of APIs on Plot no. F-1 in the same area for company's growth in this sector.

2.2 Nature of the proposed Project

The Project Proponent M/s. Sri Krishna Pharmaceuticals Ltd. (SKPL) is a well-established API manufacturing company in India. SKPL is already operating one API unit in Chincholi MIDC area. Now, considering the market

demand and growth policy of the company, PP has proposed some new Bulk Drug & intermediate products on a new industrial plot in the same MIDC area with an area of about 25 acres. It is proposed to manufacture 2545 MT/month of APIs and 1550 MT/month of by-product Acetic acid. This is an optimum size as per the requirements of market and capital because it is manageable both from production, pollution control and quality assurance point of view also. All necessary infrastructures for this capacity are conveniently available.

The capital cost of the project is estimated to be around Rs. 125 crores.

2.3 Need of project and its importance for region and country

The Public health is one of the prime considerations of the Government. Large funds are generally allocated to this account head in every annual budget of the State and Centre. By these Governmental efforts India has found an excellent outcome of lowering the death rate at birth and increasing the general length of life. At the time of Independence, in 1947 the expectancy of life was merely 47 years and in 1993, it has increased to 70 years.

Though many traditional diseases and disorders are controlled or even eradicated, we are finding that due to change in way of life, newer ailments are prevailing. Lot of R&D efforts are being made to produce new and more effective drugs to control and cure the diseases which were not known till now. The life style changes and stress related diseases have surfaced and drug therapy is required apart from better way of life.

Drugs manufacture is an important aid and there are only a few producers worldwide. SKPL has developed these products by in-house R&D and trials, and are desirous to serve the nation by producing it here, albeit in a small scale compared to world requirement.

Thus such units have a justification. SKPL already has exposure to such activities both at national and international market and the support needed for controlling human diseases and disorders mentioned. These will be an import substitute and is also useful for defense services. Expertise of SKPL is established in these products and similar conversions to obtain molecules. The proponents have received recognition from University, National laboratories and Administrations of developed nations especially USFDA, German Health

Authority, EDQM France etc. This region – Sholapur district's location is strategic in the sense that it can cater to the needs of South –Central region of the country covering Maharashtra, Karnataka and Andhra Pradesh.

2.4 Demand and Supply gap

The population of India as well as internationally is increasing at an alarming rate. This has created a huge gap between demand & supply of API & finally the finished dosage form globally. To fulfill this gap, SKPL are proposing to increase the range and production capacity to meet the market requirement.

The products manufactured will be sold both in domestic & Export markets. The major thrust in Export market will earn foreign currency for the country.

The foreign currency earned will be utilized to import Raw materials used to manufacture these products and save valuable foreign exchange for the country.

2.5 Imports vs. Indigenous production

The medicines which are essential for Indian market are on demand; such medicines get produced at Indian level to fulfill the need of medicine of nation and reduce their import from international market. It will help in reducing the flow of currency to other nations; and also will help in availability of medicines at affordable prices.

2.6 Export Possibility

Marketing will be done at international level as well as finished goods will be exported to the Regulated International Market.

2.7 Domestic/ Export Markets

The finished goods will be sold in domestic market and will be exported to the Regulated International Market as per demand.

2.8 Employment Generation due to Project

Employment will get generated for administration and production purposes; that will be recruited locally without any difficulty.

Employment will get generated in market by sales and service for providing medicine to social community.

CHAPTER 03

PROJECT DISCRIPTION

3.1 Type of Project:

M/s. Srikrishna Pharmaceuticals Limited (SKPL) would like to establish the new manufacturing of pharmaceutical products at proposed Plot no. F-1 at MIDC, Chincholi, Dist. Solapur State – Maharashtra- 413 255. The total magnitude of the proposed 7 nos. of products & one by-product will be 4095 MT/ month in this large size industrial (LSI) sector at the above plot.

The EIA notification No. S.O.1533 dated 14th September 2006 covers these types of Bulk Drug and Pharmaceutical industries (API units) under 5(f) in its schedule. It is stated that synthetic organic chemical industry (Bulk Drug and Pharmaceutical industries (API units) located in a notified industrial area/estate is classified under Category B.

SKPL is an Independent Project Proponent producing Active Pharmaceutical Ingredients (API). Based on the screening, it is necessary for SKPL to approach SEAC & SEIAA - the duly constituted committees as per EIA notification 2006 and Maharashtra Pollution Control Board for Environment Clearance and Consent for Establishment & Operation guidance respectively for this unit. This Pre-feasibility report is prepared for initial application for prior environmental clearance along with Form-I as per MoEF guidelines. Draft EIA study report based on model TOR by SEAC will be submitted as may be required at the time of consideration of the proposal by SEAC.

The government with an intention to improve the status of this District and has encouraged notified MIDC Industrial Estate at Chincholi. In order to have a sustainable development, the pollution generation from this industry is finally made insignificant having taken all the precautions right from raw material selection up to low or no waste generation and maximum recycle/reuse.

3.2 Location of Project:

The proposed project is located at plot no. F-1 at MIDC, Chincholi, Dist. Solapur, State – Maharashtra- 413 255. The Geographical Location of the proposed site for this Industry is 17^0 76' N Latitude and 75^0 78' E Longitude with an elevation of 1975 ft. (500 m) above mean sea level (MSL). These candidate sites are in premises of MIDC- notified industrial Estate which is meant for these types of Industries. Government / MIDC has provided all infrastructure like assured Electrical power, continuous water supply with purification from water works having RSF (Rapid Sand Filtration) and disinfection, the internal road network, external approach road, and networking with CHWSTDF (Common Hazardous Waste Storage Treatment and Disposal Facility) in vicinity established with support of MIDC and MPCB.

GPS Location on Google Imagery of the proposed site is attached as **(Annexure- I)**.

Location can be thus justified. A relevant portion of MIDC Map is enclosed **(Annexure- III)**. The proposed site is plot no. F-1, MIDC, Chincholi, Taluka Mohol, Dist. Solapur- 413 255, State - Maharashtra. The plot area is admeasuring 101205 sq. meters.

Land Form: Land is on plain contour, it is a flat terrain.

Land Ownership: Land ownership is with project proponent on 99 years lease from MIDC.

Other Infrastructure like, hospital, school, housing, entertainment, daily needs are available easily at Solapur Town (Which is at distance of 5.00 kms.)

Transport infrastructure like Airport, Railway, and Bus Station is also easily available. Nearest Airport is at Solapur and Railway Station is at Solapur at a distance of 15 kms. Bus Stand Chincholi is at a distance of 2.00 Kms from proposed site.

3.3 Details of Alternate sites:

The proposed project is at plot No. F-1, MIDC, Chincholi, Taluka Mohol, Dist. Solapur- 413 255, State - Maharashtra.

This proposed Bulk Drug facility is located at MIDC of Chincholi, in Sholapur district, Maharashtra. The land and infrastructure is made available by MIDC and the raw material is easily available through the easy transport via road connectivity. The Town has Railway station and Airport. The site is by the side of State Highway at a distance of 2.00 km. This site is inside the campus of the MIDC and means safe transportation, less need of Utilities, less constructing buildings and roads, less fuel and water with optimization of infrastructure.

No alternate site was considered as the PP already has an existing API unit in the same MIDC and it will be easier for administrative and technical management of the project, product manufacturing & distribution.

The location justification for the project is as under

- ✓ Availability of required land for locating the Bulk Drug Plant.
- ✓ Suitability of land from topography & geological aspects.
- ✓ Proximity to rail / road to facilitate transport of equipment / materials.
- ✓ Availability of adequate quantity of fuel and fuel transport facility.
- ✓ Facility for interconnection with transmission and distribution system for evacuation of power.
- ✓ Availability of adequate quantity of water to meet cooling and DM water requirements.

The details are given below:
Land use Pattern: The Land is reserved for Industrial use & presently project site is running facility for API. Infrastructure like water, electricity, telephone facility, roads already available as this is an existing Industrial area.

MIDC Chincholi is an integral part of the family of MIDC estate. They provide many basic facilities like uninterrupted Water supply, Power, Road Network & Solid waste disposal facility. When various sites were seen, this site appeared to be environmentally best as also from the business angle and therefore this option was

finally adopted. Nearest village is Chincholi at a distance of 2.0 km in West direction away, surrounded by industries only and no nuisance is spread neither in the past nor shall be in future. Government MIDC has provided all infrastructure like assured Electrical power, Continuous water supply with purification from water works having RSF (Rapid Sand Filtration) and disinfection, the internal road network, external approach road, and networking with CHWSTDF (Common Hazardous Waste Storage Treatment and Disposal Facility) at MEPL Ranjangaon in vicinity established with support of MIDC and MPCB.

All nearby villages are provided with drinking water from wells or Government Water Supply Schemes RWS. Hence we do not encroach upon their supply.

Lay-Out

Layout is designed properly. It is proposed to make construction to house shops for finished products, ware houses, utility building, pilot plant and administrative offices. The capital investment is provided for purchase of land, building construction, plant and machinery, utility as also for piping insulation, fire protection and environmental protection. The total cost of the project will be 125 Crores. Cost for the Environment Management Planning will be 5.00 Crores. In addition to this plan, attendant waste minimization or solvent recovery unit, sophisticated laboratory will be required and provided. Proposed Layout Plan is given as **(Annexure II).**

This is not a prime Agricultural Land. The land-use is already as “Industrial”. Thus there is no change in the status. This is flat land whereby Cutting-filling balances and there will be No/Low Borrowing from nature. Topography Map of the proposed site is attached as **(Annexure IV)**.

Within 10 km Influence Zone, there is no Forest, Biosphere Reserve, National Park, Wild Life Sanctuary and Coral Formation Reserve. The River, City Solapur, Railway line, National Highway are sufficiently at a safe distance. The Clearance is obtained from local body and hence will have a public acceptability.

3.4 Size or Magnitude of Operation:

The total magnitude of Bulk Drugs & intermediates including by-product manufacturing operation will be 4095 MT/ month.

It is proposed to manufacture 2545 MT/month of APIs and 1550 MT/month of by-product Acetic acid. This is an optimum size as per the requirements of market and capital because it is manageable both from production, pollution control and quality assurance point of view also. All necessary infrastructures for this capacity are conveniently available.

The capital cost of the project is estimated to be around Rs. 125 crores.

3.5 Project Description with Processes Details:

List of Products for Environmental Clearance:

Sr. No.	Name of the Product	Remark	Proposed production Quantity for Environmental Clearance (MT/Month)
1A	Partacetamol -4 Stages	(Starting from PNCB)	400
1B	Partacetamol -2 Stages	(Starting from Penultimate stage)	1100
2	Ibuprofen	--	500
3	Metformin	--	500
4	Domperidone	--	15
5	Dextromethorphan Hydrobromide	--	20
6	Omega -3	--	10
	By Product		
6.	Acetic Acid	(Generates in the process and sold to consumers)	1550

Manufacturing Process of the products is given:

Any kind of product or intermediate shall follow all or some of the steps as mentioned in the flow diagram. These reactions may occur at different temperature & pressure. As per the requirement of the product raw materials, solvents, catalysts etc. shall be used.

Brief manufacturing process including chemical reactions is as below:

1. PARACETAMOL

Brief manufacturing process
Stage-1 (Hydrolysis)

Para Nitro Chloro Benzene is treated with aqueous sodium hydroxide at a temperature of 135 – 140^{O}C in an autoclave and neutralized with Sulphuric Acid to get Para Nitro phenol.
Stage –2 (Reduction)

Para nitro phenol is reduced in boiling water under mild acidic condition with iron powder and acetic acid to get Para Amino Phenol.

Stage-3 (Acetylation)

Para Amino Phenol is condensed with Acetic Anhydride in aqueous medium to get paracetamol and acetic acid.

Stage-4 (Purification)

Paracetamol technical is dissolved in hot water, treated with carbon, crystallized to get Paracetamol which is dried, milled and packed in LDPE lined HDPE bags.

PARACETAMOL MATERIAL BALANCE -for 1000 kgs out put

STAGE- I

S.No	Inputs	Kg/Ton	Output	Kg/ton	Remarks
1	PNCB	1178.267	PNP	1082.638	Stage I Product 1028.48, product,54.13 moisture
2	Caustic Lye (48%)	1246.841	Total waste water		3235.44
			reactants/unreacted		
3	Sulphuric Acid	371.271	Sodium Chloride	432.859	To waste water
4	Water	2000.000	Sodium Sulphate	525.352	To waste water
			Sulphuric Acid	8.705	To waste water
			Waste water	1840.000	To waste water
			Evaporation loss	160.000	
			water formation	79.055	
			Unreacted PNCB	12.874	
			Excess Lye	6.538	
			Water from Lye	648.358	
	Total Input	**4796.378**	**Total Output**	**4796.378**	

Waste water	kgs	3553.741

PARACETAMOL MATERIAL BALANCE
STAGE-II

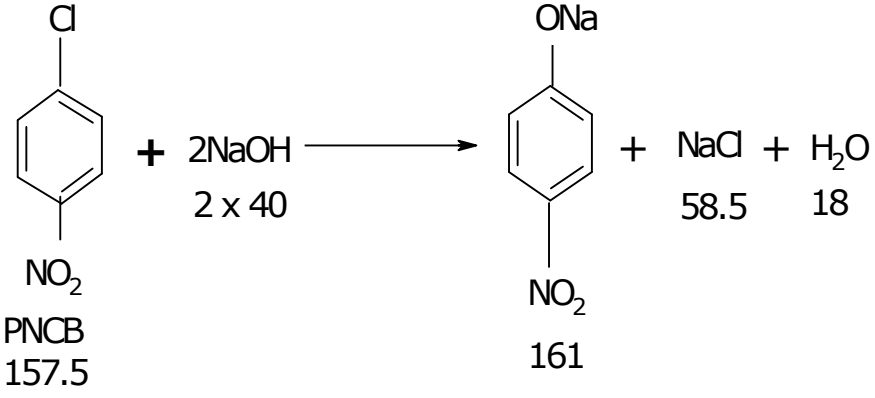
S.No.	Inputs	Kg/ton	Output	Kg/ton	Remarks
1	PNP(Lod 2.5%)Dry 1028.42	1054.798	PAP	786.070	Stage II Product 778.20 , 7.87moisture in product
	dry 1002.05				
	moisture52.74				
2	Iron Powder	1035.129	Byproducts		
3	Acetic Acid (32.5%)	57.811	Iron Sludge	1368.671	To cement Industries
			Unreacted PNP/with iron sludge	9.032	
			Excess Iron	9.390	
			Total Iron		To cement Industries
4	Caustic Lye (48%)	26.087	Sodium acetate	25.675	With ML which is sent to waste water after recycled for 45 cycles .
5	Water from previous ML	20713.000	Water formation	5.633	
			Water from Acid	39.022	
			Water from Lye	13.570	
			Waste water	20584.428	To waste water
			Moisture Loss	32.775	LOD 5%-2.5%
			Moisture with product	12.558	Product shall have 2.5% moisture
	Total Input		Total Output		
		22886.825		22886.824	

waste water 20668.328

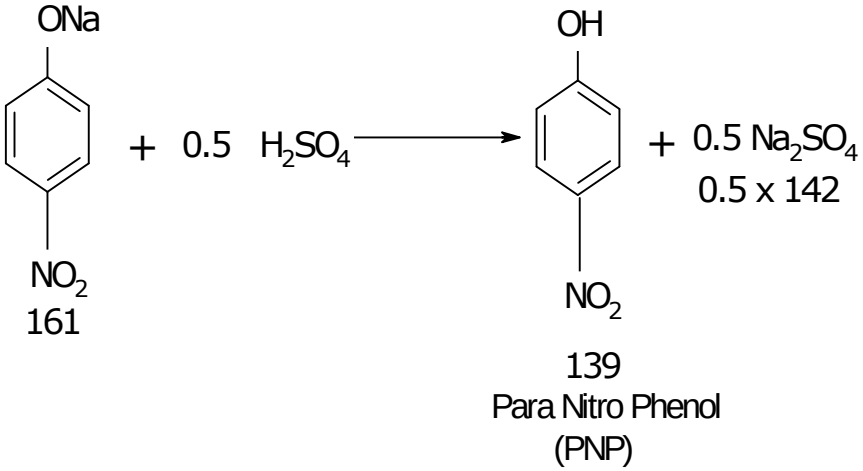
CHEMICAL PATHWAY OF PARACETAMOL SYSNTHESIS

Stage I -P-Nitro Phenol:

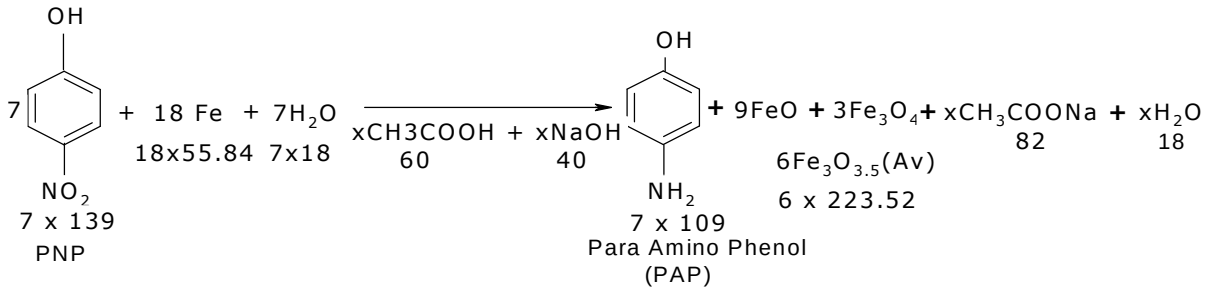
Step 1.



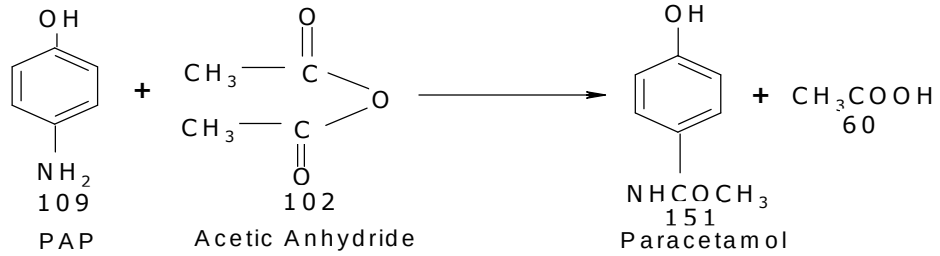
Step 2.



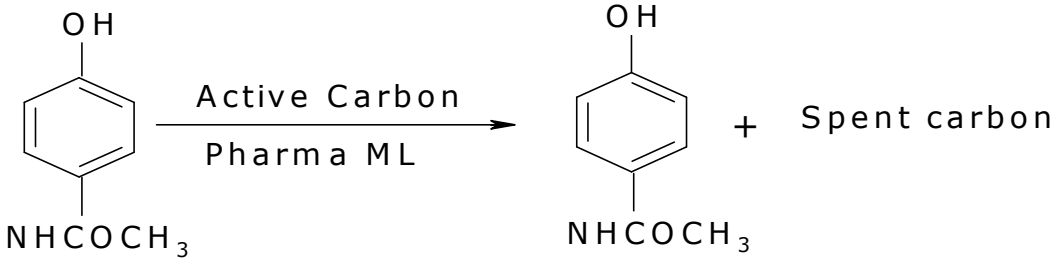
Stage -II - P-Amino phenol:



STAGE III - Paracetamol Technical



Stage - IV- Paracetamol Pharma



2. IBUPROFEN

BRIEF DESCRIPTION OF PROCESS

Stage-I: Isopropyl chloro acetate
Monochloro aceticacid is ester with isopropyl alcohol and sulphuric acid which on work up with soda ash & sodium bi carbonate gave the title compound

Stage-II: p-isobutyl aceto phenone
Acetyl chloride is reacts with 4-isobutyl benzene in presence of aluminium chloride at 0-5Deg C and decomposed with ice water. Separation of layer and work up given the title product.

Stage-III: p-Isobutyl propanaldehyde
Sodium isopropxide is made by dissolves sodium in isopropanol. A mix of p-isobutyl acetophenone & isopropyl chloro acetate is added. Isopropanol is distilled off and the reaction mass in subjected to hydrolyser with aqueous alkali and worked up to get the title compound.

Stage-IV: Ibuprofen
P-Iso Butyl Phenyl Propanaldehyde is oxidized in Acetone with sodium dichromate in Acetone and water in the presence of sulphuric acid to get Ibuprofen tech which is further recrystalized from n-hexane to get the title compound.

Stage II – Isobutyl Aceto Phenone (IBAP)

S.No.	Inputs	Kg/day		Output	Kg/day	Remarks
1	Isobutyl Benzene	773.056		IBAP	995.038	Stage I Product
2	Acetyl chloride	511.806		Aluminum chloride	878.471	To waste water
3	Aluminum chloride	878.471		HCl	219.883	Emission, scrubbed & reused
4	Conc. HCl 30%	76.389		Acetic acid	51.971	To waste water
5	Liquor ammonia 25%	76.389		Ammonium chloride	60.099	To waste water
6	Water	5847.953		Unreacted		
				Isobutyl benzene	15.348	Present in stage I product
				Water	5943.253	To waste water
	Total Input	8164.063		Total Output	8164.063	

Waste water	6933.79
Emision -HCl	219.88

Stage-III

S.No.	Inputs	Kg/day		Output	Kg/day	Remarks
1	Sodium Metal	189.827		Isobutyl Phenyl Propanaldehyde (Aldehyde)	966.754	Stage II Product taken for next step
2	Isopropyl alcohol	2507.576		Isopropanol	0.000	
3	Isobutyl Acetophenone	995.038		a) Recovered from direct distillation	2085.868	Recycled
				b) Recovered as azetrope with water 80% pure	746.162	Rectified and reused
				c) Balance	231.763	Fugitive loss
4	Isopropyl Chloro acetate	926.045		Unreacted		
5	C.S.Lye 48%	880.848		a) Isobutyl benzene	15.348	Recover during fractionating and recycled
6	Water	4385.965		b) Unreacted IBAP	84.231	Recover during fractionating and recycled
				Inorganic bye products		
				a) Sodium chloride	396.867	To waste water
				b) Sodium glycollate	166.199	To waste water
				c) Sodium carbonate	539.344	To waste water
				d) Sodium hydroxide	6.725	To waste water
				Water	4637.792	To waste water
				H2 evolved	8.251	Emission
	Total Input	9885.300		Total Output	9885.300	

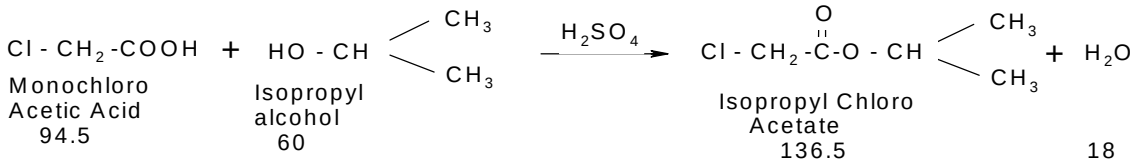
waste water	5746.93
Emission H2	8.25

Stage IV: Ibuprofen

S.No.	Inputs	Kg/day	Output	Kg/day	Remarks
1	Aldehyde	966.754	Ibuprofen	1000.000	Pharma Product
2	Sodium dichromate dehydrate	527.778	Acetone		
3	Sulphuric acid	972.222	Recovered	2194.444	Directly reused
4	Acetone	2444.444	Balance	250.000	Fugitive loss
5	N-hexane	1361.111	Hexane		
6	DM water	3611.111	Recovered	1156.940	
			Balance	204.160	136-Present in solid waste
					68.16 Fugitive loss
			Solid waste	48.546	Solid waste
			Sodium sulphate	251.474	To waste water
			Sulphuric acid	297.222	To waste water
			Chromic sulphate	668.863	To waste water
			Chromic acid	15.406	To waste water
			Water	3796.366	To waste water
	Total Input	9883.421	Total Output	9883.421	

Waste water 5029.33

STAGE I ISOPROPYL CHLORO ACETATE



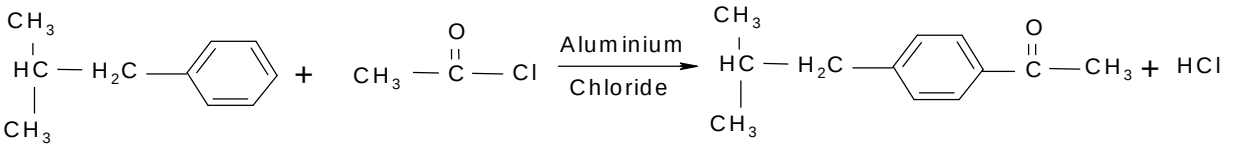
Monochloro Acetic Acid 94.5

Isopropyl alcohol 60

Isopropyl Chloro Acetate 136.5

18

STAGE II: P-ISOBUTYL ACETOPHENONE



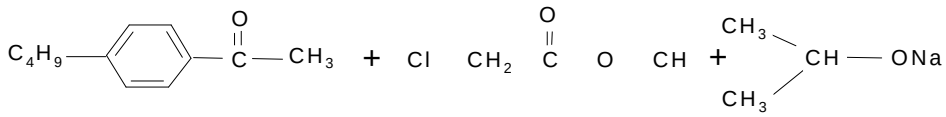
Isobutyl Benzene 134

Acetyl Chloride 78.5

P-Isobutyl Aceto Phenone

36.5

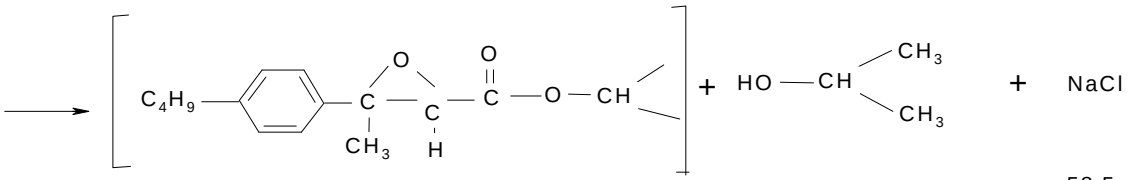
STAGE III P-ISOBUTYL PHENYL PROPANE-2-ALDEHYDE



Isobutyl Aceto Phenone
176

ISOPROPYL CHLOROACETATE

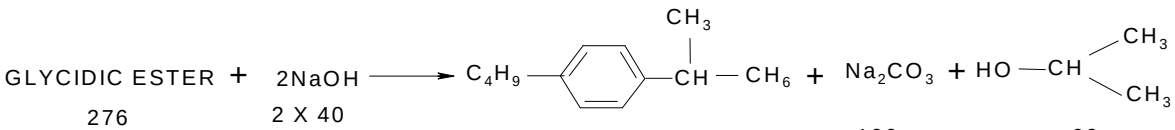
SODIUM ISOPROPOXIDE
82



GLYCIDIC ESTER
276

ISOPROPYL ALCOHOL
60

NaCl
58.5



GLYCIDIC ESTER
276

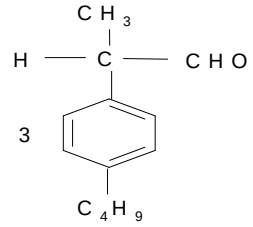
2NaOH
2 X 40

P-ISOBUTYL PHENYL PROPANALDEHYDE
190

106

60

STAGE IV

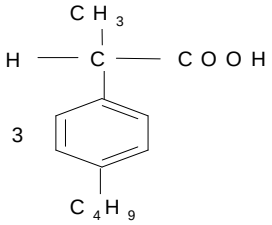


3

+ $Na_2Cr_2O_7.2H_2O$ + $4H_2SO_4$ ⟶

298 4 x 98

3 X 190
P-Isobutyl Phenyl
Propanaldehyde



3

+ $Cr_2(SO_4)_3$ + Na_2SO_4 + $6H_2O$

CHROMIC SULPHATE
392.18 142 6 x18

3.

METFORMIN HYDROCHLORIDE

BRIEF MANUFACTURING PROCESS

Stage-I

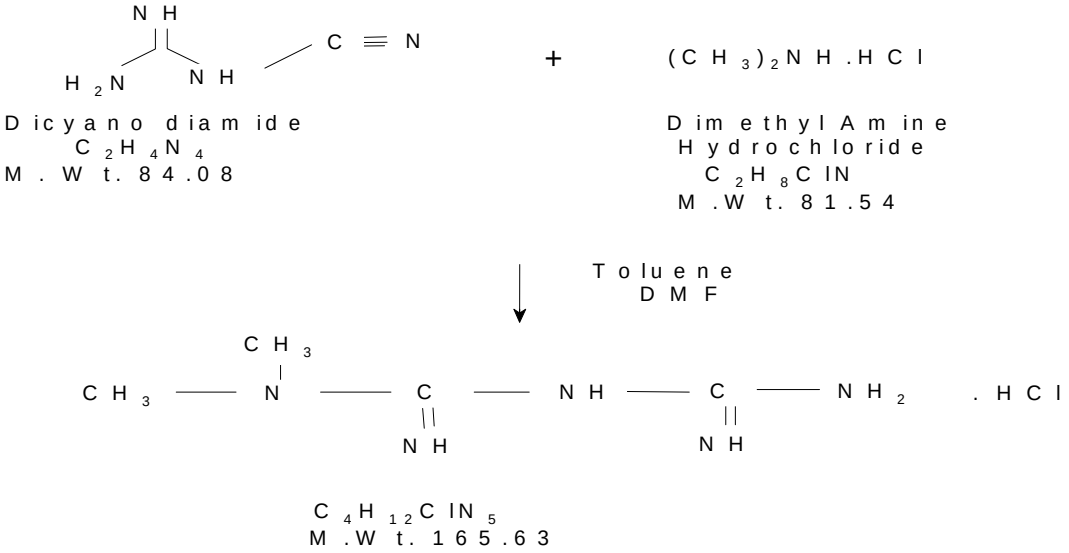
Process: Dicyanodiamide is reacted with dimethylamine hydrochloride using dimethyl formamide and toluene as solvent. Toluene is distilled off. The crystallized metformin hydrochloride is filtered to obtain technical metformin hydrochloride.

Stage-II:

Process: Technical metformin hydrochloride is dissolved in aqueous Methanol, decolourised with activated carbon and crystallized to form metformin hydrochloride pharma.

METFORMIN HYDROCHLORIDE

Synthesis



4. DOMPERIDONE

BRIEF MANUFACTURING PROCESS
Stage-I :

Process: Orthophenylene diamine is condensed with Methyl Aceto acetate in Xylene . Xylene is distilled off and the mass is filtered to get crude Stage I which is further purified by dissolving in Lye solution and reprecipitating with hydrochloric acid.

Stage-II: (3- Chloro Propyl) – 1,3 – Dihydro -2H Benzimidazole -2- one

Process: The Stage–I compound obtained above is reacted with 1-Bromo-3- chloro- propane in acetone in presence of anhydrous potassium carbonate. After the completion of the reaction acetone is distilled off and the reaction mass is taken in toluene and water , the toluene layer is separated and washed with dilute alkali to remove unreacted Stage I compound. The toluene layer is hydrolyzed in dilute hydrochloric acid and the toluene layer is separated and distilled off to get the title compound.

Stage –III - Domperidone Technical :

Process: The stage II compound is taken along with 5- Chloro -2,3- dihydro -1-(Piperidine -4 yl)-1-H-Benzimidazole -2-one (Stage-VII compound which is made in-house started from N-Methyl piperidinone)) in methyl Isobutyl Ketone in the presence of Soda ash. The contents are refluxed cooled, filtered and washed with water to get the technical domperidone which is further dried.

Stage- IV

Process: The Technical Domperidone is dissolved in methanol and Acetic acid mixture, carbon treatment is given and filtered. The filtrate is basified with gaseous Ammonia and the precipitate is filtered & washed and dried to get Domperidone pharma.

Material Balance for Production of
DOMPERIDONE per KG out put

Production Capacity TPM
Batch size: kgs
No. of batches per month:

Stage I

S.No.	Inputs	Kg	Output		Kg	Remarks
1	OPDA	0.558	Stage I Product		0.7440	Stage I Product
2	MAA	0.599	Byproduct		0.0000	
3	Xylene	2.392	Methanol		0.1367	
		0.000	Xylene		0.0000	
		0.000	Recovery		2.2728	Recovery and Reuse
4	Caustic Lye (48%)	0.495	Loss		0.1196	
5	Carbon	0.037	Waste water		6.8902	To ETP
6	Conc. HCl (30%)	0.737	Waste water	6.461		
		0.000	Water formed	0.078		
7	Water	5.580		0.000		
			Sodium Chloride	0.348		
			HCl	0.004		
			Solid waste (unreacted)	0.000	0.236	
			MAA	0.103		Solid Waste
			OPDA	0.096		Solid Waste
			Spent Carbon	0.038		Solid Waste
	Total Input	10.399	Total Output		10.399	

TDS 51088 mg/lit

Stage II

S.No.	Inputs	Kg	Output		Kg	Remarks
1	Stage I	0.74	D2		0.67	Stage II Product
2	BCP	0.67			0	
3	Potassium Iodide	0	Acetone		0.2	Recovery
4	Toluene	2.39	Balance		0.03	Fugitive loss.
5	Potassium carbonate	0.63	Toluene			
6	Conc.HCl (30%)	0.64	Recovery		2.16	Recovery and Reuse
7	Caustic Lye (48%)	0.04	Balance		0.23	Loss
8	Water	20.91	Waste water		22.34	To waste water
			Water+formed	21.44		
			Unreacted			
			K2CO3	0.13		
			HCl	0.05		
			KBr	0.42		To waste water
			Potasium Chloride	0.26		
			Potassium Iodide	0.01		
			lye	0.02		To waste water
				0		To waste water
			Solid waste		0.23	
			Stage Ia. Product	0.13		To solid waste
			BCP	0.11		To solid waste
			Carbon dioxide		0.15	Gas Emission
	Total Input	26.02	Total Output		26.02	

TDS 40192 mg/lit

STAGE III

S.No.	Input	Kg	Output		Kgs	Remarks
1	NMP	0.72	N-Carbethoxy		0.86	
2	Ethyl chloro formate	0.96	Toluene		0	
		0	a) Recovery		2.39	Recycled
		0	b) Balance		0.2	Fugitive loss
3	C.S.Flakes	0.58	Methyl chloride		0.27	Emmision & scrubbed in alkali
4	Toulene	2.59	Unreacted		0	
			Waste Water		11.14	To waster water treatment
			a) NMP	0.12		Present in waste water
5	DM water	10.06	Sodium chloride	0.21		Present in waste water
			Sodium bicarbonate	0.29		Present in waste water
			Ethyl alcohol	0.16		Present in waste water
			Water	10.06		
			Water from Lye	0.3		
			Solid Waste		0.04	decomposed product
	Total	14.9			14.9	

TDS-mg/Lit 55520

STAGE IV

S.No.	Input	KGS	Output		Kgs	Remarks
1	Stage – III	0.86	Stage –IV		0.86	Stage –IV product
2	Methanol	1.01	Methanol		0	
		0	a) Recovery		0.91	Recycled after rectification
		0	b) Balance		0.1	Fugitive loss
		0	Ammonia		0.07	Scrubbed and reused
3	Rany nickel	0.02	Solid Waste Spent nickel	0.02	0.02	TSDF
4	Ammonia gas	0.15	Unreacted	0.01		Solvent residue to be incinerated
5	Hydrogen	0.01	Water		0.09	Present in the recovered methanol
	Total	2.05			2.05	

STAGE V

S.No.	Input	kg	Output		Kg	Remarks
1	Stage –IV	0.86	Stage – V		1.42	Stage –V product
2	DCNB	1.03	Toulene		0	
		0	a) Recovery		1.58	Recovered & recycled
		0	b) Balance		0.14	Fugitive loss
		0	Waste water		11.01	
		0	Water	10.39		
3	K2CO3	0.6	Potassium carbonate	0.3		Present in waste water
4	Toluene	1.72	Potassium chloride	0.32		Present in waste water
5	Water	10.35	Carbondioxide		0.1	Emission
			Solid Waste		0.31	Solvent residue to be incinerated
	Total	14.57	Total		14.57	

TDS-Mg/Li 56463

Potassium carbonate	0.3
Potassium chloride	0.32
Total	0.62
TDS-mg/lit	56463

STAGE VI

S.No.	Input	Kgs	Output		Kgs	Remarks
1	Stage – V	1.42	Stage – VI		1.02	StageVI product
2	Toluene	2.87	Toluene			
		0	a) Recovery		2.44	Recycled partly as a mixture with methanol and partly as pure toluene after distillation
		0	b) Balance		0.43	fugitive loss
3	Methanol	1.72	Methanol			
			a) Recovery		1.55	Recycled as mixture with toluene after distillation
			b) Balance		0.17	fugitive loss
			Solid waste		0.36	Solid waste
4	Rainy nickel	0.07	Spent nickel	0.07		Solid waste
5	Hydrogen	0.03	Unreacted	0.3		Solvent residue solid waste to be incinerated
			Hydrogen		0.01	Emission
			Water		0.12	Present in recovered solvents
	Total	6.12			6.12	

No effluent generation

STAGE VII

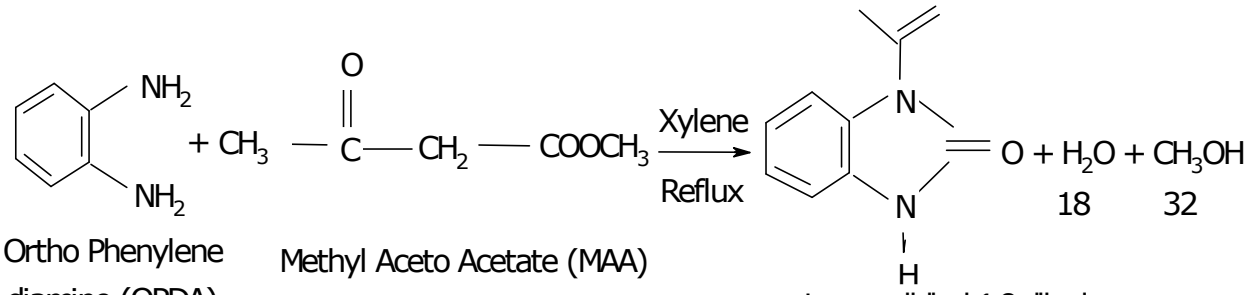
S.No.	Input	Kgs	Output		Kgs	Remarks
1	Stage – VI	1.02	Stage VII		0.74	StageVII product
2	Urea	0.51	Ammonia		0.83	EmissionScrubbed
3	Caustic lye 47%	1.64	Carbondioxide		0.38	Emission
		0	Waste water		39.29	
		0	Water	37.59		
4	Ammonium chloride	1.15	Ethyl alcohol	0.16		Present in waste water ML I
5	Carbon	0.1	Sodium chloride	1.13		Present in waste water ML I
6	Conc. HCl. 30%	0.42	Ammonium chloride	0.28		Waste water
		0	Hydrochloride of	0.09		Waste water
7	Ammonia 30%	0.86				Waste water
8	Water	35.63	DOM – 8			
			Hydrochloride of N-Piperidinyl O-Phenlenediamine	0.04		Waste water
			Solid waste			
			Spent Carbon		0.1	Solid waste
	Total	41.34			41.34	
				TDS	43299 mg/lit	

STAGE VIII

S.No.	Inputs	Kg	Output		Kg	Remarks
1	Stage VII	0.74	Domperidone		1	Final Pharma
2	Stage II	0.67				
3	Soda ash	0.37	MIBK			
4	MIBK	3.57	Recovery		3.22	Recovery and Reuse
5	Methanol	9.53	Balance		0.36	Loss
6	Carbon	0.04	Methanol			
7	Acetic acid	0.35	Recovery		9.05	Recovery and Reuse
8	Ammonia	0.1	Balance		0.48	
9	Water	20.44	Waste water		21.62	To waste water
			Waste	20.46		
			Unreacted Organics			
			Stage VII	0.12		Solid waste
			Stage II	0.14		Solid waste
			Domperidone	0.06		Solid waste
			Unreacted Inorganics			
			Sodium Chloride	0.15		To waste water
			Sodium carbonate	0.24		To waste water
			Ammonium acetate	0.45		To waste water
			Ammonia	0		To waste water
			Gases			
			Carbondioxide		0.05	Gas Emission
			Spent Carbon		0.04	Solid waste
	Total Input	35.81	Total Output		35.81	

CHEMICAL PATHWAY OF DOMPERIDONE SYNTHESIS

STAGE I - DOMPERIDONE

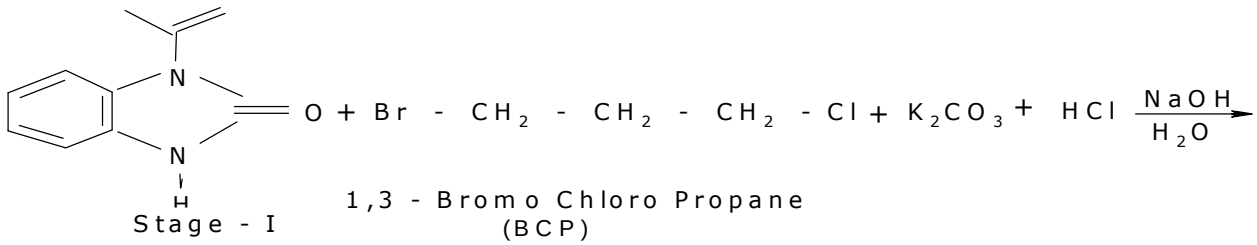


Ortho Phenylene diamine (OPDA)
108

Methyl Aceto Acetate (MAA)
116

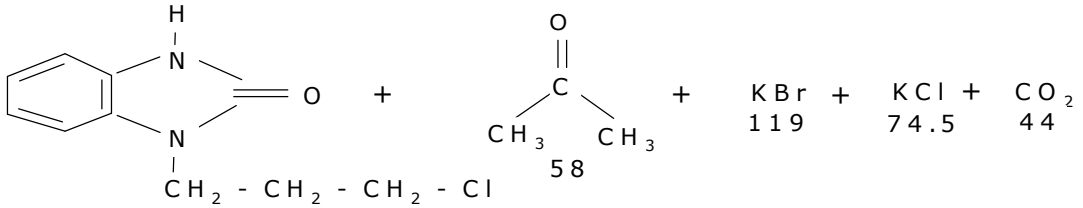
Isopropylidinyl-1,3-dihydro benzimidazole-2-one (Stage - I)
174

STAGE II - DOMPERIDONE



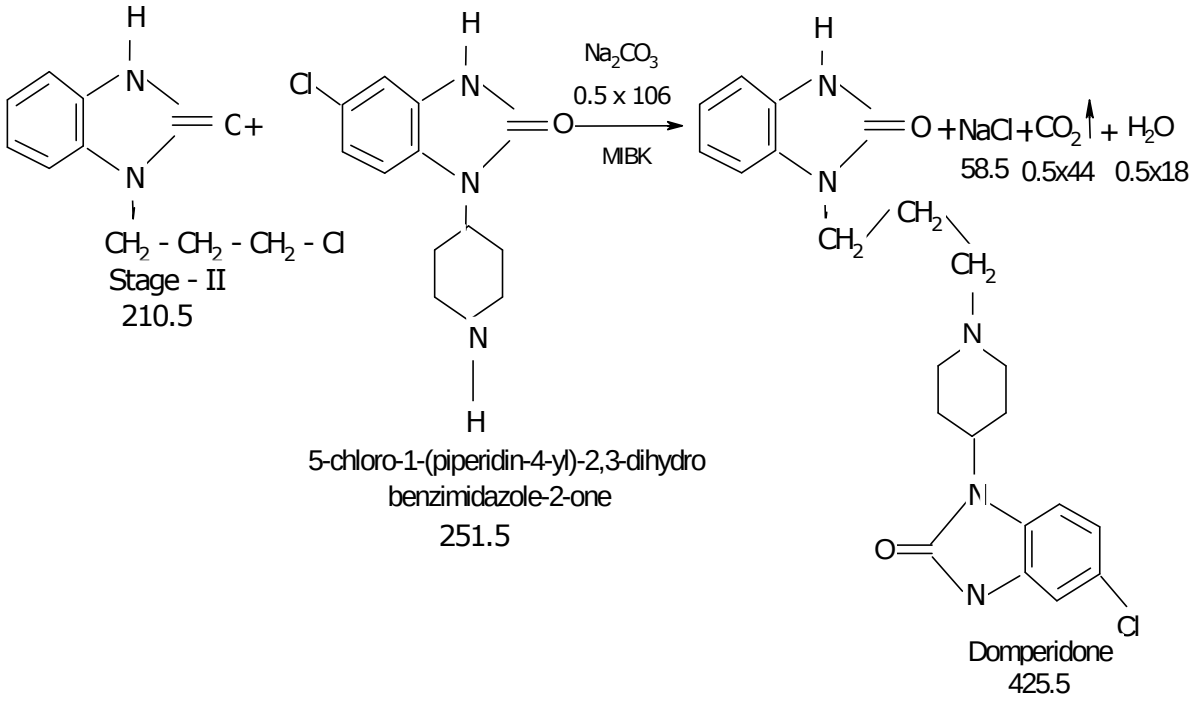
Stage - I
174

1,3 - Bromo Chloro Propane (BCP)
157.5



N-(3-Chloropropyl)-1,3-dihydro benzimidazole-2-one (Stage - II)
210.5

STAGE III – DOMPERIDONE



STAGE IV – DOMPERIDONE PHARMA

Carbon Treatment
& Crystallization
from Methanol

DOMPERIDONE TECH ⟶ **DOMPERIDONE PHARMA**

5. DEXTROMETHORPHAN HYDROBROMIDE

Brief Manufacturing Process

Stage I :-
Preparation of N[2-(cyclohexe-1-en-yl)ethyl]2-(4-Methoxyphenyl acetamide
4-Methoxy phenyl acetic acid was reacted with 2-[1-Cyclohexenyl] Ethylamine using o-Xylene as solvent. Formed water was azeotropically distilled off to get amide compound.
Amide compound was cyclised with Phosphorous oxy chloride in the presence o-Xylene as solvent to get 1-(4-Methoxybenzyl)3,4,5,6,7,8,-hexahydroisoquinoline.
The 1-(4-Methoxybenzyl)3,4,5,6,7,8,-hexahydroisoquinoline was reduced with sodium borohydride to get 1(4- methoxybenzyl) 1,2,3,4,5,6,7,8,octahydroisoquinoline (RS-Octabase)

Stage II:- Preparation of (S)-1(4- methoxybenzyl) 1,2,3,4,5,6,7,8,octahydroisoquinoline mandalate salt.

1(4- methoxybenzyl) 1,2,3,4,5,6,7,8,octahydroisoquinoline was resolved with (-) Mandelic acid using acetone as solvent to crystallize S-1(4- methoxybenzyl)
1,2,3,4,5,6,7,8,octahydroisoquinoline mandelate (S- Octabse mandelate) salt.

Stage III:- Preparation of S-1(4- methoxybenzyl) 1,2,3,4,5,6,7,8,octahydroisoquinoline.

S-1(4- methoxybenzyl) 1,2,3,4,5,6,7,8,octahydroisoquinoline mandelate was basified with caustic soda lye to get S -1(4- methoxybenzyl) 1,2,3,4,5,6,7,8,octahydroisoquinoline
Stage IV:- Preparation of N-Formyl-1(4- methoxybenzyl) 1,2,3,4,5,6,7,8,octahydroisoquinoline.
S -1(4- methoxybenzyl) 1,2,3,4,5,6,7,8,octahydroisoquinoline was formulated with methyl formate using methanol as solvent to obtain N-Formyl -1(4- methoxybenzyl)
1,2,3,4,5,6,7,8,octahydroisoquinoline (Formyl compound)**.**

Stage V:- Preparation of N-Formyl-3- Methoxymorphinan

Formyl compound was cyclised using phosphoric acid to get N-Formyl-3- Methoxymorphinan

Stage VI:- Preparation of 3-Methoxy morphinan

N-Formyl-3- Methoxymorphinan was deformulated with potassium hydroxide using isopropanol as solvent to obtain 3-Methoxymorphinan.

Stage VII: - Preparation of Dextromethorphan base.

3-Methoxymorphinan was methylated with formic acid and formaldehyde using toluene as solvent media to form Dextromethorphan base.

Stage VIII:- Preparation of Dextromethorphan Hydrobromide
Dextromethorphan base was reacted with 48% Hydrobromic acid to get Dextromethorphan hydrobromide.

DEXTROMETHORPHAN HYDROBROMIDE MATERIAL BALANCE PER KG

DEXTROMETHORPHAN HYDROBROMIDE					
Stage I					
SL.No.	MATERIAL NAME	INPUT-KGS	MATERIAL NAME	OUT PUT IN KGS	
1	2-[1-Cyclohexyl]ethylamine	1.176	Stage-I		2.300
2	4-Methoxy phenyl acetic acid	1.294	o-Xylene	Recoveryto stage II	4.704
3	o-Xylene	4.704	Waste -Water FORMATION		0.169
	Total	7.174			7.174

DEXTROMETHORPHAN HYDROBROMIDE

Stage II

SL.No.	MATERIAL NAME	INPUT-KGS		MATERIAL NAME	OUT PUT IN KGS	
1	Stage-I	2.300		Stage II in water		1.944
2	Phosphorous oxychloride	1.541		o-Xylene recovered	Rec	4.468
					Loss	0.235
3	DM Water	21.168		Water	to stage-iii	21.168
4	o-Xylene(From Stage-I)	4.704		Phosphoric acid	to stage-iii	0.823
				Water from reaction	to stage-iii	0.153
				HCl gas	to scrubber	0.922
	Total	29.713		Total		29.713
				no effluent		

DEXTROMETHORPHAN HYDROBROMIDE

Stage III

SL.No.	MATERIAL NAME	INPUT-KGS		MATERIAL NAME	OUT PUT IN KGS	
1	Stage II	1.944		Stage III crude		1.764
2	Aq. Layer	8.031		waste water		35.973
3	Sodium Borohydride	0.289		Un reacted	0.49	
4	DM Water	26.814		Sodium bicarbonate	0.64	
5	C.S Lye (48%)	0.706		water+ Aq layer	34.85	
6	Toluene	2.940		Toluene recovered		2.793
				Vapour loss		0.148
				Hydrogen -		0.046
	Total	**40.724**				**40.724**

Stage IV

SL.No.	MATERIAL NAME	INPUT-KGS		MATERIAL NAME	OUT PUT IN KGS	
1	Stage III crude	1.764		Stage IV (s)salt wet in		1.258
2	(-) Mandelic acid	1.031		Acetone-with product		0.135
3	Acetone	2.646		Stage IV (R)salt wet in	to stage VA	1.537
				Acetone-Recovery		2.352
				Filtration loss		0.159
	Total	5.441				5.441
				No effluent		
Stage V						
SL.No.	MATERIAL NAME	INPUT-KGS		MATERIAL NAME	OUT PUT IN KGS	
1	Stage IV (s)salt in	1.258		Stage IV(S) base		0.776
2	Toluene	3.128		Waste water		15.842
3	Acetone	1.881		Sodium Mandalate	0.607	
4	C.S Lye	0.266		Water	15.000	
5	DM Water	15.000		Unreacted	0.24	
				Acetone Recovered		1.599
				Vapour loss		0.240
				Toluene recovered		2.811
				Vapour loss		0.265
	Total	21.533				21.533

DEXTROMETHORPHAN HYDROBROMIDE

Stage VA

SL.No.	MATERIAL NAME	INPUT-KGS	MATERIAL NAME	OUT PUT IN KGS	
1	Stage IV (R)salt in	1.537	Stage IV(R) base	byproduct -sale	1.012
			Sodium Mandalate in water	to recovery	9.840
2	Tolune	1.436	Sodium Mandalate	0.717	
3	Caustic	0.315	Water	9.123	
4	DM Water	9.000	Tolune Recovered		1.292
			Vapour loss		0.144
	Total	**12.288**			**12.288**

DEXTROMETHORPHAN HYDROBROMIDE

Stage VI

SL.No.	MATERIAL NAME	INPUT-KGS	MATERIAL NAME	OUT PUT IN KGS	
1	Stage IV(S) Base	0.776	Stage V crude		0.858
2	Methyl formate	0.694	Methanol from reaction-recovery		0.506
3	Methanol	0.764	Methanol recovered		0.741
			Methanol Vaporous loss		0.129
	Total	2.234			2.234
			No effluent		

DEXTROMETHORPHAN HYDROBROMIDE

Stage VII

SL.No.	MATERIAL NAME	INPUT-KGS	MATERIAL NAME	OUT PUT IN KGS	
1	Stage VI	0.858	Stage VII		0.811
2	Ice Water	18.981	Toluene		1.139
3	Toluene	1.225	Toluene loss		0.086
4	Phosphoric acid	2.211	Waste water		21.24
			Water	18.98	
			Phosphoric acid	2.22	
			Unreacted	0.04	
	Total	**23.275**			**23.275**

DEXTROMETHORPHAN HYDROBROMIDE

Stage VIII

SL.No.	MATERIAL NAME	INPUT-KGS	MATERIAL NAME	OUT PUT IN KGS	
1	Stage VII	0.811	Stage VIII		0.753
2	Potassium Hydroxide	0.600			
3					
4	Water	10.000	Waste water		10.659
5	Toluene	2.905	Water	10	
			Unreacted	0.4	
			Potassium formate	0.26	
			Toluene recovered		2.705
			Toluene vapour loss		0.200
	Total	**14.316**			**14.316**

DEXTROMETHORPHAN HYDROBROMIDE

Stage IX

SL. NO.	**MATERIAL NAME**	**INPUT-KGS**	**MATERIAL NAME**	**OUT PUT IN KGS**	
1	Stage VIII crude	0.753	Stage IX		0.788
2	Formaldehyde (40% Solution)	0.094	Carbon dioxide		0.082
3	Formic acid	0.118	Waste Water	Fugitive loss	0.094
4	Toluene	1.129	Toluene		1.023
			Tolune vapour loss		0.106
	Total	2.093			2.093

DEXTROMETHORPHAN HYDROBROMIDE

Stage X

SL. NO.	MATERIAL NAME	INPUT-KGS	MATERIAL NAME	OUT PUT IN KGS	
1	Stage IX	0.788	Stage X		1.000
2	40% Hyrdoboric acid	0.647	Waste Water		10.436
3	Activated Carbon	0.005	Water	10	
4	Water	10.000	water from acid	0.39	
5	Toluene	1.320	Unreacted	0.048	
			Toluene		1.246
			Solid WasteCarbon cake		0.005
			Tolune vapour loss		0.072
	Total	12.759			12.759

DEXTROMETHORPHAN HYDROBROMIDE

MANDALIC ACID RECOVERY

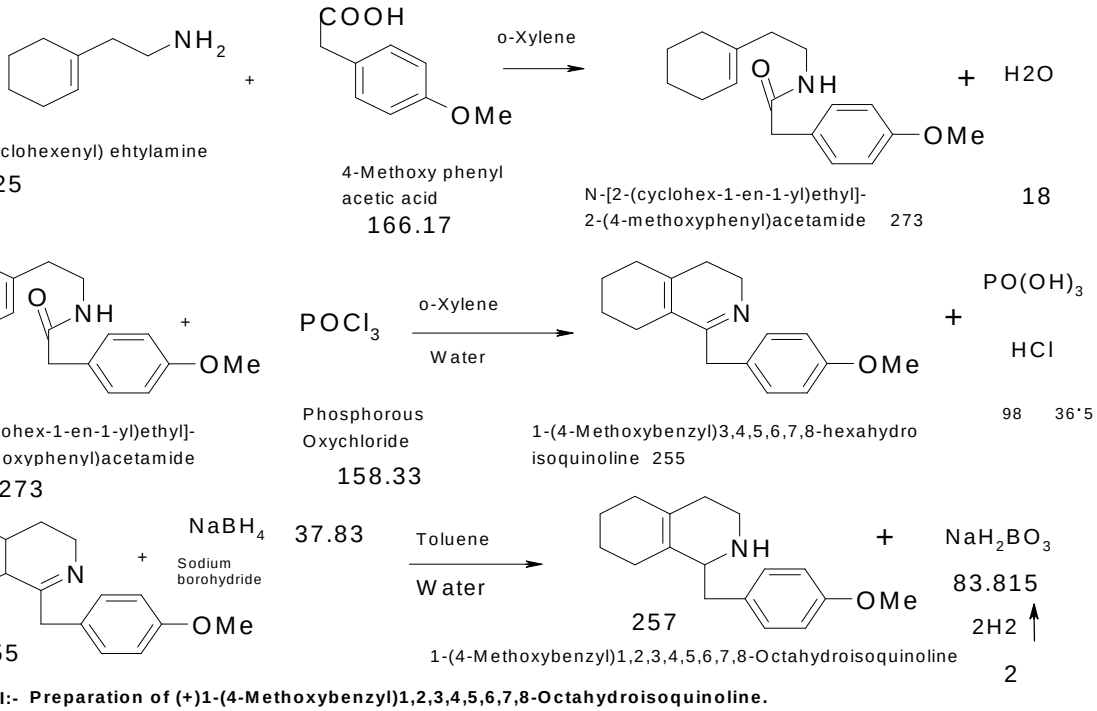
SL.No.	MATERIAL NAME	INPUT-KGS		OUT PUT IN KGS	
1	waste water stage V	15.842	Mandalic acid		0.975
2	waste water stage VA	9.840	Waste water		**25.369**
	Sodium Mandalate		Sodium chloride	1.146	
	0.717+0.607=1.324		water	24.123	
	Water-24.223			0.100	
3	Conc HCl	0.662			

‘

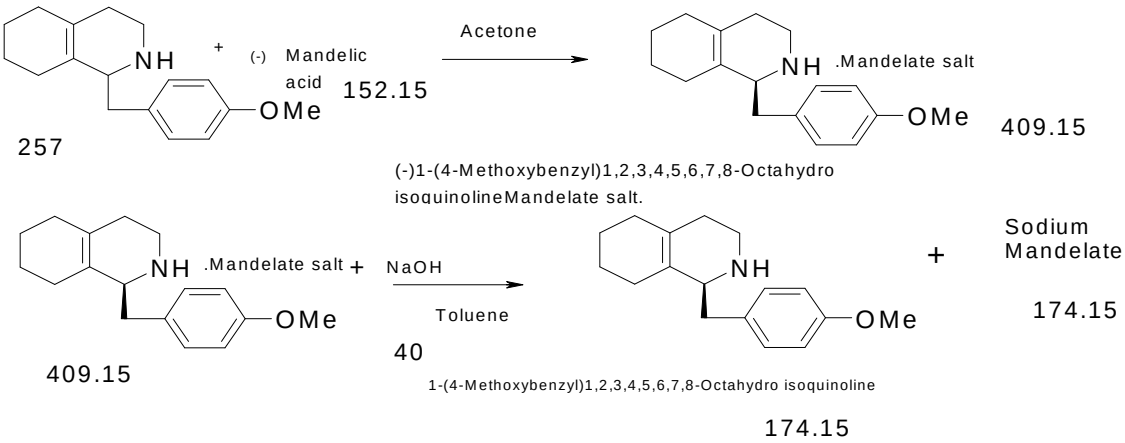
DEXTROMETHORPHAN HYDROBROMIDE

Route of Synthesis

STAGE I:- Preparation of 1-(4-Methoxybenzyl)1,2,3,4,5,6,7,8-Octahydro isoquinoline

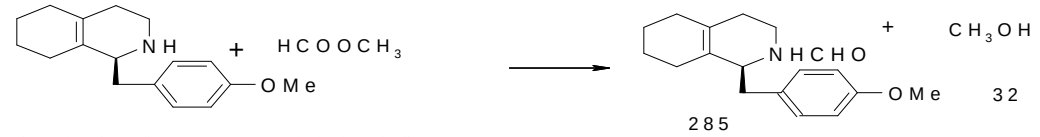


STAGE II:- Preparation of (+)1-(4-Methoxybenzyl)1,2,3,4,5,6,7,8-Octahydroisoquinoline.



Dextromethorphan Hydrobromide
Route of synthesis

Stage III: preparation of N-Formyl-1-(phenylethyl)1,2,3,4,5,6,7,8,-Octahydroisoquinoline



1-(4-Methoxybenzyl)1,2,3,4,5,6,7,8-Octahydro isoquinoline
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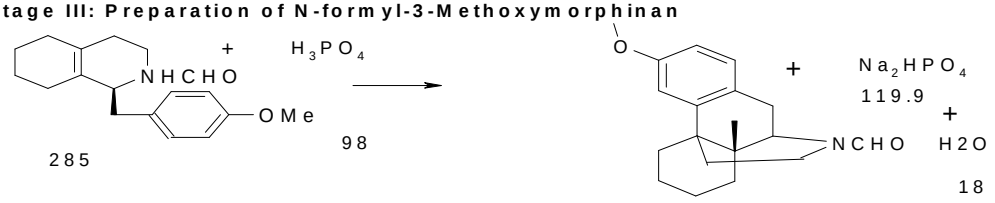
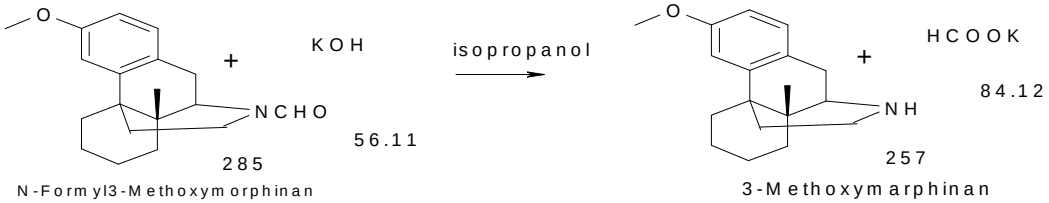
1-(4-Methoxybenzyl)1,2,3,4,5,6,7,8-Octahydro isoquinoline

Stage III: Preparation of N-formyl-3-Methoxymorphinan



N-Formyl3-Methoxymorphinan
285

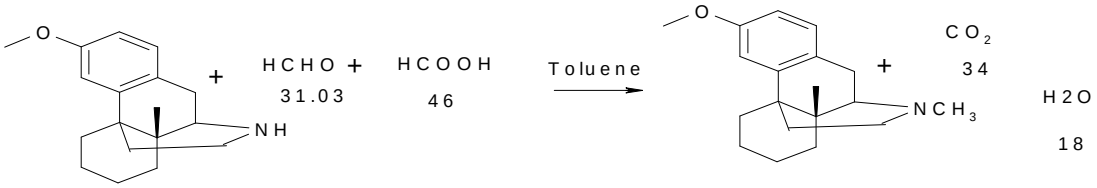
Stage IV: Preartion of 3-Methoxymorpinan



N-Formyl3-Methoxymorphinan

3-Methoxymarphinan

Stage VI:Preparation of Dextromethorphan



3-Methoxymarphinan
257

Dextromethorphan
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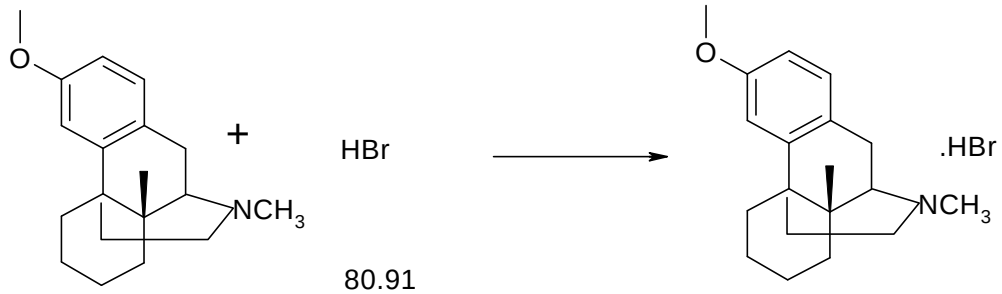
Stage VII:- Preparation of Dextromethorphan hydrobromide



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Dextromethorphan

352.32

Dextromethorphan Hydrobromide

Omega-3 Manufacturing process

INOCULUM OF MARINE ALGAE INOCULATED--------> SEED TANK -------->FERMENTER

--------> SEPARATION OF BIOMASS----------> EXTRACTION WITH ORGANIC SOLVENT(TOLUENE /ETHYL ACETATE)

ORGANIC LAYER SEPARATION-------->CONCENTRATION OF ORGANIC SOLVENT TO GET CRUDE OIL---------> CRUDE OIL PURIFICATION ----------> PURE OIL CONTAINING NLT 32% DHA

Material Balance for Production of
OMEGA-3 FOR 1000 KGS OUT PUT

Production Capacity 10 TPM
Batch size: 1000 kgs
No. of batches per month: 10

Stage I

S.No.	Inputs	Kg		Output		Kg	Remarks
1	Sea water	48000		Bio Mass		20000	
2	Dextrose	26000		waste water		54000	
3	water for was	60000				60000	
	Total	**134000**				**134000**	

Stage II

S.No.	Inputs	Kg		Output		Kg	Remarks
1	Bio Mass	20000		Crude oil		4000	
2	Water	10000		solid waste		16000	
3	Solvent Tolune	10000		Waste water		10000	
				solvent recovery		9000	
					LOss	1000	
	Total	**40000**		**Total**		**40000**	

Stage III

S.No.	Inputs	Kg		Output		Kg	Remarks
1	Crude oil	4000		Product	Omega-3	1000	
2	Alkali soln	2000		waste oil		1000	
3				Soap	By product	4000	
					for sale		
	Total	**6000**		**Total**		**6000**	

List of proposed Plant and Machinery :

PARACETOMAL1500 MT/MONTH

S.No	Name of the Equipment	Cap	MOC	Qty Nos
1.	Reactors	7 KL	SS	22
		8 KL	SS	8
		4 KL	SS	4
		10 KL	FRP	1
		9 KL	SS	16
2.	Pumps	15 M^3	SS	16
		15 M^3	SUITABLE	8
3.	Vacuum pumps	300 M^3	SS	12
4.	Scrubber	(Suitable)	PP-FRP	10
5.	Agitated Nutsche filter	8 KL	SS	4
		4 KL	SS	2
6.	Spin Flash Dryer	1000 KG/H	SS	1
7.	Sifter	Suitable	SS	2
8.	Octagonal Blender	12 Kl	SS	2
9.	DM Plant	Suitable	SS	01
10.	Air Handling Unit	SUITABLE		4 SETS
11.	Fluid Bed Dryer	1500 KG/H	SS	1
12.	Storage Tanks	25 KL	SS	2
		3 KL	SS	1

		70 KL	Aluminum	1
		20 KL	MS	1
		70 KL	SS	3
		50 KL	SS	4
		25 KL	SS	2
13.	Receiver	4 KL	SS	2
		0.5 KL	SS	3
		2 KL	SS	2
		7KL	SS	4
14.	Vacuum transfer	Suitable	SS	1
15.	Triple Effect forced evaporator	3 Kl/H	SS	2
16.	Quadruple effect forced circulation evaporator with stripper and ATFD	5 Kl/H	SS	2
17.	Trance former	2000		1
18.	Reactors	12 KL	MS	4
		12 KL	SS	3
		4 KL	MS	1
		15 KL	SS	5
		16 KL	SS	10
19.	Centrifuges	48 "	SS	1
20.	Pumps	15 M^3	SS	17
21.	Vacuum pumps	300 M^3	SS	6

22.	Scrubber		SUITABLE	1
23.	Nutsche Filter	1.5 KL	SS	1
		3 KL	SS	6
24.	Vessels (Holding)	4 KL	SS	1
		10 KL	SS	2
		3 KL	MS	2
		1.02KL	MS	1
		2 KL	SS	2
		6 KL	SS	1
25.	Heat exchangers	50 M^2	SS	5
26.	Pusher centrifuge	1500 kg/h	SS	1
27.	Storage Tanks	5 KL	MS	2
		70 KL	MS	1
		30 KL	MS	1
		2 KL	MS	1
		25 KL	SS	2
		1.5 KL	SS	2
		10 KL	SS	1
28.	Crusher	Suitable		1
29.	Bucket Elevator	Suitable		1
30.	Receiver	1.5 KL	SS	5

DOMPERIDONE

S.No	Name of the Equipment	Cap	MOC	Qty Nos
1.	Reactors with Heat Exchanger	4 KL	SS	5
		3 KL	SS	19
		5 KL	GLR	1
		5KL	SS	3
		3.5 KL	SS	2
		4 KL	SS	4
		8 KL	SS	3
		1 KL	SS	1
		2.5	SS	7
		3 KL	GLR	2
		2 KL	GLR	1
		2 KL	SS	6
		1.5 KL	SS	2
2.	Centrifuges	48”	SS	14
		36”	SS	2
3.	Pumps	3 HP		4
4.	Holding taks	0.5 KL	SS	1
		0.5 KL	FRP	1
5.	Nutsche Filter	2 KL	SS	1
		3 KL	SS	2

6.	Tray drier	48 Trays	SS	7
		96 Trays	GMP MODEL	4
7.	Octagonal Blender	1.5 KL	SS	1
8.	Fluid Bed Dryer	50 KG/h	SS	1
9.	Leaf Filter	150 lit	SS	5
		100 LIT	SS	1
10.	Storage Tanks	10	SS	5
		10	PP-FRP	1
11.	Receiver	2 KL	SS	12
		3 KL	SS	6
		7 KL	SS	2
		0.5 KL	SS	2
12.	MILLER	100 KG/H	SS	2
13.	WEIGHING MACHINES	300 KG	SS	4
14.	CROSS OVER BENCHES		SS	4

IBUPROFIN

S.No	Name of the Equipment	Cap	MOC	Qty Nos
1.	Reactors With Heat Exchanger	5 KL	SS	29
		4 KL	SS	16
		12 KL	PP-FRP	8
		3.5 KL	PP-FRP	6
		8 KL	MS	10

		8 KL	SS	16
		12 KL	MS	10
		2.5	SS	6
		2 KL	GLR/LEAD	4
		1.6 KL	SS	10
		2 KL	SS	14
		2 KL	MS	4
		6 KL	GLR	4
		4 KL	PP-FRP	4
		3 KL	SS	4
2.	CENTRIFUGE	48”	SS	8
3.	Pumps		PP	4
			CI	25
			SS	6
4.	Vacuum pumps	300 M^3	MS	6
5.	Scrubber		PP-FRP	1
6.	Nutsche filter	2 KL	MS	5
		1.5KL	MS	5
7.	Sifter	500 KG/H	SS	2
8.	Ribbon Blender	6 KL	SS	2
9.	Fluid Bed Dryer	500 KG/H	SS	5
10.	LEAF FILTER	50 LIT	SS	8
11.	TERMIC FLUID Boiler	2 LAKH CALORIES		6

12.	Storage Tanks	50 KL	PP-FRP	4
		8 KL	MS	2
		50 KL	MS	6
		5 KL	MS	4
		2 KL	PP-FRP	7
		30 KL	MS	1
13.	Receiver	1.2 KL	SS	10
		2 KL	MS	26
		0.8 KL	PP-FRP	10
		2 KL	PP-FRP	2
		1 KL	MS	23
		3 KL	MS	12
		2 KL	SS	6
		0.5 KL	SS	10
		0.5 KL	MS	6
		1 KL	SS	21
		0.5 KL	PP-FRP	4
		5 KL	GLASS	8
		1 KL	SINTEX	4
		1.2 KL	MS	4

METFORMIN

S.NO	DESCRIPTION	CAPACITY KL	MOC	QTY
1.	REACTOR	10	GLASSLINED	5
		6	GLASSLINED	8
		6	GLASSLINED	3
		5	SS 316	5
2.	HEAT EXCHANGER	20 M^2	SS 316	5
		10 M^2	SS 316	8
		6 M^2	SS 316	16
3.	CENTRIFUGE	48"	SS 316	5
4.	CATCHPOTS	2	SS 316	5
5.	FBD,(bowls and chamber PTFE coated)	500	SS 316	2
6.	SPARKLER FILTER	48"	SS 316	3
7.	RECEIVER VERTICLE	2	SS 316	4
8.	STORAGE TANK,HORIZ	5	SS 316	4
9.	LINE FILTER	50 LTR	SS 316	4
10.	LEAF FILTER	150 LTR	SS 316	2
11.	MULTIMILL	240 KGS	SS 316	3
12.	RIBBON BLENDER	6 KL	SS 316	1
13.	SHIFTER	240 KGS	SS 316	3
14.	WATERJET VAC.EJECTOR	40 MT	SS 316	6

15.	CENTRIFUGAL PUMP WITH MOTOR FOR EJECTOR	24"	SS 316	6
16.	PROCESS PUMPS FLP	5 HP	SS 316	2
17.	DM PLANT(24KL/DAY)	1 SET		1
18.	Cooling Tower,	1500Trx2		2
19.	Boiler	15 TPH		2
20.	Stand by Boiler	10 TPH		1
21.	DG sets	1000 KVA		2
22.	Trance former	3500 KVA		1

3.6 Raw Material for finished Product:

Raw Materials:

The basic raw material for above key product capacity are submitted herein below and for the details are given for all reactants, solvents and work up support chemicals, collectively for the year.

Source for Raw Material Procurement: Raw Material is easily available in the local market; some of the raw materials will be procured from the International Market.

Mode of Transport of Raw Materials: Few of the raw materials will be transported locally and few will be imported from the International Market.

Storage at the site: Raw materials will be stored in Storage Yard at the project site.

List of Product wise raw materials with consumption quantity :

Sr. No.	Name of Raw material	Qty. in TPM
PARACETAMOL - 1500 TPM		
1.	Para nitro chloro benzene	471
2.	Para amino phenol	1179
3.	Iron powder	414
4.	Acetic anhydride	1119
5.	Caustic soda lye (48%)	499
6.	Sulphuric acid	149
7.	Carbon	26
IBUPROFEN 500 TPM		
1	Mono chloro acetic acid	412.5
2	Iso butyl benzene	390
3	Acetyl chloride	262.5
4	Aluminium chloride	450
5	Sodium	97.25
6	Sodium dichromate	270
7	Sodium carbonate	7.5
8	Sodium Bicarbonate	30
9	Caustic soda lye (48%)	450

10	Sulphuric acid	645
11	Ammonia 25%	37.5
12	Isopropyl alcohol	475
13	Acetone	130
14	n-hexane	200
METFORMIN 500 TPM		
1	Dicyano diamine	255
2	Dimethyl amino hydrochloride	270
3	Dimethyl formamide	10.5
4	Toluene	10
5	Methanol	135
6	Active carbon	15.25
DOMPERIDONE -15 TPM		
1	Ortho Phenylene Diamine	8.4
2	Methyl Aceto Acetate	9
3	1-Bromo-3-Chloro Propane	9.9
4	Potassium carbonate	9
5	Ethyl acrylate	32.1
6	Mono methyl amine 30%	21
7	Sodium methoxide	9.6
8	Ethyl chloro formate	14.4
9	Rainy nickel	1.2
10	2,5-dichlro Nitro benzene	15.6

11	Urea	7.74
12	Ammonium chloride	17.4
13	C.S.Lye 48%	34.95
14	Conc. HCl	27
15	Hydrogen	23.1
16	Ammonia gas	2.25
17	Carbon	1.11
18	Chloroform	6
19	Toluene	15
20	Methanol	12
21	Methyl Isobutyl Ketone	5.4
22	Xylene	1.8
OMEGA-3 (10 PPM)		
1	Sea Water	480
2	Dextrose	260
3	solvent	100
4	Alkali solution	20

DEXTROMETHORPHAN HYDROBROMIDE 20 TPM

S.No.	Raw material	Qty. in TPM
Stage-I		
	2-[1-Cyclohexyl]ethylamine	23.520
	4-Methoxy phenyl acetic acid	25.872
	o-Xylene	94.080
Stage-II		
	Phosphorous oxychloride	30.811
	O-Xylene	94.080
Stage-III		
	Sodium Borohydride	5.786
	C.S Lye (48%)	14.112
	Toluene	58.800
Stage-IV		
	(-) Mandelic acid	20.627
	Acetone	52.920
Stage-V		
	Toluene	62.560
	Acetone	37.620
	C.S Lye	5.315
Stage-VA		
	Toluene	28.720
	Caustic	6.303
Stage-VI		
	Methyl formate	13.877
	Methanol	15.288
Stage-VII		
	Toluene	24.500
	Phosphoric acid	44.218
Stage-VIII		
	Potassium Hydroxide	11.995
	Toluene	58.094
Stage-IX		
	Formaldehyde (40% Solution)	1.881
	Formic acid	2.352
	Toluene	22.579

stage-X		
	40% Hyrdoboric acid	12.936
	Activated Carbon	0.094
	Toluene	26.400

List of Products for Environmental Clearance:

Sr. No.	Name of the Product	Remark	Proposed production Quantity for Environmental Clearance (MT/Month)
1A	Partacetamol -4 Stages	(Starting from PNCB)	400
1B	Partacetamol -2 Stages	(Starting from Penultimate stage)	1100
2	Ibuprofen	--	500
3	Metformin	--	500
4	Domperidone	--	15
5	Dextromethorphan Hydrobromide	--	20
6	Omega -3	--	10
	By Product		
6.	Acetic Acid	(Generates in the process and sold to consumers)	1550

3.7 Resource Optimization:

SKPL is desirous to produce their proposed total 7 nos. of products including By product (4095 MT/ month) in this large size industrial (LSI) sector at Plot no. F-1, MIDC, Chincholi, Taluka - Mohol, Dist. Solapur- 413 255, State - Maharashtra.

The industry will manufacture Bulk Drug & Intermediate which is in good demand for growing Medical facilities in India.

3.8 Availability of Resources (Water, Energy/Power Requirement):

Power: SKPL already has sanctioned connected load of 4500 KW and sanctioned Demand of 2000 KVA available through supply from MSEDCL (MSEB) grid.

Water: The water requirement is about 1690 CMD for domestic, greenery, and process, boiler feed & for cooling water make up. The source of water is already available from existing water works of MIDC and the same is adequate and satisfactory. A water purification work is already operational with settling, coagulation and Disinfection. The source is dependable and reliable. It does not encroach on anybody else's water source.

Manpower: The manpower required for administration and production purposes will be recruited locally without any difficulty. There will be requirement of 500 nos. of new manpower.

Steam Requirement: 21 TPH will be the steam requirement for the unit; can be met by using 2 nos. of Boilers of capacity of 15 TPH & 1 no. stand by boiler with capacity of 10 TPH.

Fuel for Boiler: 2800 MT/ Month of coal will be used.

DG Set: 3 nos. of DG Set of capacity 1000 KVA shall be required for backup power supply. Proposed for emergency backup. Required Quantity of HSD shall be 500 lit/hr.

Material Storage: The R & D will keep its efforts to see if any other mode of process comes up or if outsourcing can be done to minimize the load. Measures may be adopted as

1. Procuring pure raw material and analyzing them before accepting
2. To reduce inventory by adopting JIT (just in time) procurement.
3. Designing the tank roofs to avoid VOC (Volatile Organic Contents)
4. To go by predictive maintenance rather than preventive or emergency maintenance.
5. Good housekeeping and machine keeping for enhancing the efficiency.

Water Balance

Sr. No.	Product	Process Water Consumption (KL/d)	Water loss (-) / Reaction water add (+)(KL /d)	Density kg/m3 /TDS in mg/l	Waste Water in KL/d
1A	Paracetamol – 4 Stages	83.114	+ 0.24	1128 / 166485	83.36
1B	Paracetamol – 2 Stages	138.21	- 31.19	1040 / 57276	107.02
2	Ibuprofen	241.018	+ 33.32	1140 / 180281	274.34
3	Metformin	6.19	-0.001	1000 / Nil	6.19
4	Domperidone	51.48	+ 2.97	1031 / 37653	54.45
5	Dextromethorphan Hydrobromide	73.89	+ 4.72	1014 / 2227.5	78.61
6	Omega-3	23.31	+18.61	1000 / Nil	41.920
7	Scrubber Water	50.0	Nil	1040 / 48076	50
8	Floor Washings	10.0	Nil	1000 / 1000	10
9	Laboratory Washings	1.0	Nil	1000/ 100	1
	Sub- Total	**678.23**	**+ 28.61**	**1080 / 111668.9**	**706.86**
10	**Domestic**	50.0	-20.00	1000 / 500	30.00
11	**Boiler Feed**	201.60	-181.60 (Condensate recovery back to feed water)	1000 / 1000	20.00
12	**Cooling water make up**	510.0	- 459.00 (evaporation, windage, drift)	1000 / 1000	51.00
13	**Gardening**	39.0	-39.00		0
14	**Steam for MEE & ATFD**	120.0+ 90.0	0	1000 / 150.0	210.00
	Total	**1688.842**	**- 670.99**		**1017.86**
	Water recycle after effluent Treatment	960			
	Net Requirement	728.842			

3.9 Quantity of waste to be generated:

Water & Waste water

SKPL wish to produce 4095 MT/month of bulk drug intermediates. As there will be total seven products including a bi-product, pollution control work can be much streamlined. The details regarding pollution control of water, waste water, air and solid wastes are as follows:

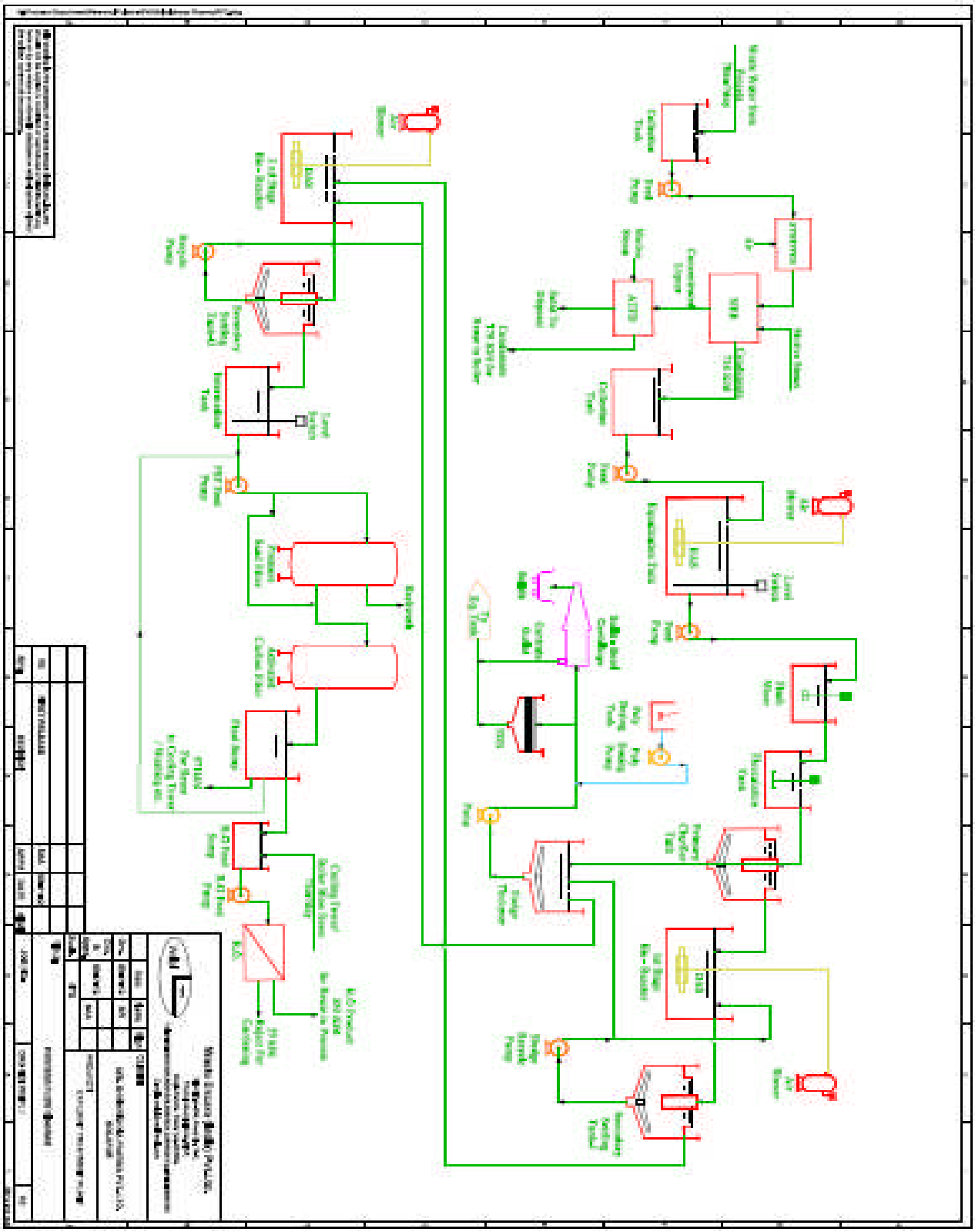
Water & waste water

The water supply will be through the MIDC. Their source is from Dam on river basin Godavari, and hence extremely dependable source. MIDC has provided full water works including filtration and disinfection. We are not encroaching on anybody's water source.

The water & waste water generated in the factory will be as follows.

Water recovery from ETP:

Waste water fed to MEE	706.86 KL / d
MEE Distillate to ETP (A)	714 KL / d
ATFD Condensate directly available for reuse (B)	175 KL / d
Total water (A) + (B) = (C)	889 KL / d
Treated water (C) will be reused for	
Cooling Tower (D)	510 KL / d
Scrubber (E)	50 KL / d
Floor Washings (F)	10 KL / d
Laboratory washings (G)	1 KL / d
Water balance = C – D – E – F – G = (H)	318 KL / d
Boiler & cooling tower blow down (I)	71 KL / d
Total water for R.O Treatment = H + I = (J)	389 KL / d
Product from R.O for Process wash /Boiler feed	350 KL / d
Reject from R.O for gardening	39 KL / d



SOLID WASTE

The main solid waste from this factory will be (a) non-hazardous from office, garden leaves and sewage septic tank and (b) hazardous from process.

Non-hazardous will be segregated as recyclable/salable. This will be so done.

SKPL has in place the following mitigation policy future:

- Waste minimization at all levels for discarded products, empty containers, packing surplus, unloading spillages and fugitives.
- The plant will produce very less amount of scrap material. All these will, however be stored carefully on raised platform, with dwarf toe-walls all around and an overhead roof. The contents will not be stored in the factory for more than a fortnight.
- The main solid waste from factory will be in form of process waste and residues form solvent recovery. This waste will be transported to CHWTDSF for proper treatment and ultimate disposal.
- The empty drums will be recycled or given back to the original vendors for utilization.
- The non-hazardous waste will be disposed by scientifically designed composting plant.

(a) Non Hazardous Solid Waste:

Based on above canteen facilities and ETP will be proposed. The canteen waste & bio-sludge of ETP shall be disposed as manure in landscaping.

Proposed quantities of Solid waste generation are:

a) From Process Manufacture:
The quantity of generation of non-hazardous solid waste from the process of manufacture is **Nil.**

b) From the waste treatment:
The generated solid waste from the Effluent Treatment Plant is mostly containing dried Biomass. This Biomass will be mixed with Domestic Bio waste (dry leaves, roots & hey) & composting with the help of worms will be carried out for producing bio-compost & will be used for Green Belt Development.
Additionally considerable contaminated inorganic solids will generated from ATFD. This waste will have to be disposed of to CHWTSDF.

c) Treatment: By land fill as compost.

S. No.	Type of waste	Quantity	Treatment	Disposal
	Biodegradable Waste			
1	ETP Bio-sludge	12.90 MT/ Month	composting	Gardening
	Non-Biodegradable Waste			
1.	Waste Paper	100 Kgs/ Month	Nil	Sale
2.	Corrugated Boxes	500 Kgs/ Month	Nil	Sale
3.	Broken glass	100 Kgs/ Month	Packed in HDPE bags	Sale
4.	Decontaminated used drums	100 Kgs/ Month	Decontamination	Sale
5.	Decontaminated HDPE bags	100 Kgs/ Month	Decontamination	Sale
6.	Coal Ash	280 MT/ Month		Sale

(b) Hazardous Waste: (For Proposed Product)

The quantification of solid waste generated from the factory can be presented as follows:

Sr. No.	Type of waste	Category No.	Qty(TPM)	Disposal
1.	ETP Sludge	34.3	30	CHWTSDF
2.	MEE / ATFD salts	34.3	2679	CHWTSDF
3.	Spent Carbon	28.2	63.36	CHWTSDF
4	Distillation Residue/ Process Sludge	20.3	85.53	Send to cement industry/ CHWTSDF/
5	Spent Solvents	28.5	52	CHWTSDF
6	Iron Sludge	28.1	555.21	Send to cement Industry
7.	Waste Oil	5.1	0.2	Sale to Recycler/ CHWTSDF
8.	E- Waste		0.240	E- Waste Recycler
9.	Used Lead Acid Batteries		2 Nos.	Returned to supplier for replacement in exchange

All the above waste will be transported to the CHWTDSF for proper treatment and ultimate disposal:

Sr. No.	Type of waste generated	Type of waste generated	Collection	Reception	Storage	Transport	Treatment	Disposal
1.	Purification process for water	Chemical sludge from waste water treatment	With the help of scoop in the polythene bags	In polythene bags	In hazardous waste storage area	Through container provided by CHWTSDF	Will be treated by CHWTSDF	Will be disposed by CHWTSDF
2.	Purification process for water	Inorganic salts from ATFD MEE Salts	With the help of hopper in the polythene bags	In polythene bags	In hazardous waste storage area	Through container provided by CHWTSDF	Will be treated by CHWTSDF	Will be disposed by CHWTSDF
3.	Production / formulation of drugs/ pharmaceuticals & health care product	Spent carbon	With the help of scoop in the polythene bags	In polythene bags	In hazardous waste storage area	Through container provided by CHWTSDF	Will be treated by CHWTSDF	Will be disposed by CHWTSDF
4.	Production and Industrial use of solvents	Distillation residue/ Process Sludge	In HDPE / MS drums or polythene bags	In HDPE / MS drums or polythene bags	In hazardous waste storage area	Through container provided by CHWTSDF	Will be treated by CHWTSDF	Will be disposed by CHWTSDF
5.	Production and Industrial use of solvents	Spent Solvents	In HDPE / MS drums	In HDPE / MS drums	In hazardous waste storage area	Through container provided by authorized recycler / CHWTSDF	Will be treated by authorized recycler / CHWTSDF .	Will be disposed by authorized recycler / CHWTSDF
6.	Production and Industrial use	Iron Sludge	In HDPE / MS drums or polythene bags	In HDPE / MS drums or polythene bags	In hazardous waste storage area	Through container provided by CHWTSDF	Will be treated by CHWTSDF	Will be disposed by CHWTSDF
7.	Industrial operations using mineral/synthetic oil as lubricant in hydraulic system or other applications	Waste Oil	In HDPE / MS drums	In HDPE/ MS drums	In hazardous waste storage area	Through container provided by authorized recycler / CHWTSDF	Will be treated by authorized recycler / CHWTSDF	Will be disposed by authorized recycler / CHWTSDF
8.	Industrial operations / office use	E- Waste	Loose Packing	Loose Packing	In E- Waste storage area	Loose Packing	Will be treated by authorized E-Waste recycler	Will be disposed by authorized E- Waste recycler /

9.	Industrial operations / office use	Used Lead/ Acid batteries	Loose Packing	Loose Packing	In E- Waste storage area	Loose Packing	Will be treated by authorized E-Waste recycler	Will be disposed by authorized E- Waste recycler /

It may be seen that though the hazardous waste chemical containers are cleaned and dried. Theses cleaned containers / Barrels are stored in separate area and after visual inspection of Quality Control Department and after accumulation these waste is sent for disposal through Waste Management facility

Asthetics:

There will be no nuisance from noise. DG set will be provided with acoustic enclosures and run only occasionally for backup power supply. There are no crushing, pulverizing operations. Labour strength is also limited in this MSI unit. Odor however can be of some sensitivity in chemical industries. However, in this case majority input is odorless and only few with mild or characteristics odour. This will be handled carefully. No nuisance will go to surrounding industries.

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CHAPTER 04

SITE ANALYSIS

4.1 Connectivity:

This proposed Bulk Drug facility is located at notified MIDC of Chincholi, in Solapur district, Maharashtra. The Site is 5.00 km from Solapur city and 15.00 km from railway Station. The land and infrastructure is made available by MIDC and the raw materials are easily available through easy transport via road connectivity. The Solapur city has Railway station and nearest Airport is at Solapur. The site is by the State Highway is 2.00 km. away from site

4.2 Land form, Land use and Land ownership:

The proposed project is on the location at plot no. F-1 in notified MIDC Industrial Estate, Chincholi, Dist. Solapur, Maharashtra. This proposed site is in premises of MIDC Estate which is meant for this type of Industries. The Geographical Location of this Industry is 17^0 76' N Latitude and 75^0 78' E Longitude with an elevation of 1975 ft (500 m.) above sea level MSL. GPS Location on Google Imagery of the proposed site is attached for as **Annexure I**.

The proposed land is on plot no. F-1 which has area of 101250 m2.

Land Form: Land is on plain contour, it is flat terrain.

Land Ownership: Land ownership is with project proponents.

Existing Land use Pattern The Land is reserved for Industrial use. Small new tree plantations are present at the site, which are retained at the site for Landscape Development.

Existing Infrastructure: Presently land is with existing infrastructure facility.

4.3 Topography:

SKPL is located almost in the central part of state of Maharashtra at an altitude of approximately 1975 ft (500 meters) above the sea level. It is bounded by the Solapur hills. The exact location of the project site is 17^0 76' N Latitude and 75^0 78' E Longitude **(Annexure I).**

4.4 Existing land use pattern:

Proposed site falls under the notified Industrial estate. The land is reserved for Industrial use. There is no water body passing near the proposed site.

4.5 Existing Infrastructure:

Existing Infrastructure: Presently there is existing Infrastructure at the site.

This Project will improve the physical infrastructure of this area.

- It will not disturb the existing pattern of drainage, because the building construction is not massive. It is more a steel structure not preventing the natural flow of rain water. There will neither be any inundation nor any erosion. As roof rain harvesting is proposed, there will not be any incremental run-off causing floods downstream. The nearby nalla is trenched by good civil engineering practice and hence physical infrastructure will improve.

- Rain harvesting will improve the groundwater table. On the other hand no groundwater is consumed by PP. PP are either dependent on authorized surface water source or on recycled waste water after full treatment. The enhanced groundwater will be indeed useful to the surrounding farmers who are down gradient. The green crops in their fields on such groundwater will improve the physical infrastructure.

- The industry is dependent on raw materials and helping chemicals, which arrives by road. The finished goods too is dispatched by roads. All the labor force will come by road. Thus authorities shall have to maintain the roads in good conditions. Road connectivity thus will improve. This improved physical infrastructure will be an added facility to the community for surface transport.

- While developing tree plantation, concept of bio-diversity will be kept in mind. This will need many local mixed species. These will be made available to us only through nursery. Nursery once so established will be useful in turn for others too who need. The nursery so developed may inspire others to plant more trees in this area in their compounds. This physical infrastructure will available to them.

4.6 Soil Classification:

The soils of the district are derived from the Deccan trap which is predominant rock formation of the district. The soil of the district can be classified as light, medium and heavy according to the depth, texture and location. The best black soils are found in a narrow strip of land on the banks of the Godawari and its tributaries. There is sandy loam to loamy in texture, brownish black in colour and under laid with murum derived from the basic rock basalt. Because the murum sub soil is quickly reached, they are also called murmad.

4.7 Climate data from secondary sources:

The climate of the district is characterized by a hot summer and general dryness throughout the year except during the south-west monsoon season. The year may be divided in to four seasons. The winter or cold season is from December to February, summer or hot season from March to May. The south-west monsoon season is from June to September, while October and November constitute the post monsoon season. The average rainfall of the district is 725 mm and month of May is generally the hottest month of the year with the mean daily maximum temperature at about 40.7 ^{0}C and temperature sometimes raises to 45^{0}C to 46^{0}C. In the cold season the district is sometimes affected by the cold waves over north India and the minimum temperature may drop to about 7.1 ^{0}C to 10.1 ^{0}C The air is generally dry except during the south west monsoon season when the relative humidity is high.

Climate Classification: Project site features a semiarid climate under the Koppen climate Classification

Temperature: Annual temperatures in Chincholi range from 12°C to 40 °C, with the most comfortable time to visit in the winter - October to February. The highest maximum temperature ever recorded was

46 °C (114 °F) on 25 May 1905. The lowest recorded temperature was 2 °C (36 °F) on 2 February 1911. In the cold season, the district is sometimes affected by cold waves in association with the eastward passage of western disturbances across north India, when the minimum temperature may drop down to about 2 °C to 4 °C (35.6 °F to 39.2 °F).

Rainfall: Most of the rainfall occurs in the monsoon season from June to September. Average Annual rainfall is 725 mm.

4.8 Social Infrastructure available:

This proposed Bulk Drug facility is located at notified MIDC of Chincholi, in Solapur district, Maharashtra. The Site is 5.00 km from Solapur city and 15.00 km from railway Station. The land and infrastructure is made available by MIDC and the raw materials are easily available through easy transport via road connectivity. The Solapur city has Railway station and nearest Air port is at Solapur. The site is by the State Highway is 2.00 km. away from site

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CHAPTER 05

PLANNING BRIEF

5.1 Planning Concept:

MIDC Chincholi is an old part of the family of MIDC estate. They provide many basic facilities like uninterrupted water supply, power and Road Network & solids disposal facility if feasible. When various sites were seen, this site appeared to be environmentally best as also from the business angle and therefore this option was finally adopted. This site is inside the campus of the MIDC and means safe transportation, less need of Utilities, less constructing buildings and roads, less fuel, less water with optimization of infrastructure.

Government MIDC has provided all infrastructure like assured Electrical power, continuous water supply with purification from water works having RSF (Rapid Sand Filtration) and disinfection, the internal road network, external approach road, and networking with CHWSTDF (Common Hazardous Waste Storage Treatment and Disposal Facility) at MIDC Ranjangaon in vicinity established with support of MIDC and MPCB.

All nearby villages are provided with drinking water from wells or Government Water Supply Schemes RWS. Hence we do not encroach upon their supply.

5.2 Population Projection:

Comparative study of important aspects of population projection status of the people of the Solapur district vis-à-vis the state.

Sr. No.	State	District	Sub District	Cat.	Location	No. of households	Persons	Male	Female
1.	Maharashtra	Solapur	Mohol	Village	Angar	1999	6407	3374	3033
2.	Maharashtra	Solapur	Solapur North	Village	Hiraj	576	2793	1417	1376
3.	Maharashtra	Solapur	Solapur North	Village	Khed	187	1019	528	491

4.	Maharashtra	Solapur	Mohol	Village	Kurul	1583	8208	4241	3967
5.	Maharashtra	Solapur	Solapur North	Village	Pakani	548	3164	1707	1457
6.	Maharashtra	Solapur	Mohol	Village	Mohol	4844	25023	12951	12072
7.	Maharashtra	Solapur	Mohol	Village	Chincholikati	507	2354	1256	1098
8.	Maharashtra	Solapur	Mohol	Village	Penur	1578	7993	4184	3809
9.	Maharashtra	Solapur	Mohol	Village	Sawaleshwar	711	3479	1829	1650
10.	Maharashtra	Solapur	Mohol	Village	Takali (Shikander)	1920	8468	4480	3988
11.	Maharashtra	Solapur	Solapur North	Village	Akolrkati	891	4069	2094	1975
12.	Maharashtra	Solapur	Solapur North	Village	Kondi	818	4148	2146	2002
13.	Maharashtra	Solapur	Solapur North	Village	Shivani	234	1095	569	526
14.	Maharashtra	Solapur	Solapur North	Village	Narkhed	1017	5008	2553	2455

Day by day population going to increase in similar way there requirement of one of the basic need Medicine which is very essential for every one so to fulfill their future basic need of Medicine for social community there is need to promote R & D center in each industrial sector. There will be in ratio of population increases in similar way their need also increases so to fulfill their need we have to set up a proposed production capacity which again generates employment.

5.3 Land use planning:

The proposed project is on notified MIDC Industrial area, this is not a prime Agricultural Land. The land-use is already as “Industrial”. Thus there is no change in the status. This is flat land whereby Cutting-filling balances and there will be No/Low Borrowing from nature. Proposed site was initially open land. Topography Map of the proposed site is attached as **(Annexure IV)**.

Proposed site will house the Facilities, some part will remain untouched for the Future Expansion and 33% area will be demarcated for Green belt development.

5.4 Assessment of Infrastructure Demand (Physical and Social):

In SKPL, proposed new project will be having production of Bulk drug & intermediates at large scale, which require a full-fledged infrastructure, so there will be demand of physical infrastructure and social infrastructure.

5.5 Amenities/ Facilities:

SKPL is proposing bulk drugs and intermediates in Chincholi MIDC. MIDC provides many basic facilities like uninterrupted water supply, power and Road Network & solids disposal facility if feasible. This site is inside the campus of the MIDC and means safe transportation, less need of Utilities, less constructing buildings and roads, less fuel, less water with optimization of infrastructure and networking with CHWSTDF (Common Hazardous Waste Storage Treatment and Disposal Facility) at MIDC Ranjangaon in vicinity established with support of MIDC and MPCB.

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CHAPTER 06

PROPOSED INFRASTRUCURE

6.1 Industrial area:

SKPL propose to set up the new manufacturing of API (Bulk Drug & Intermediates) products at Plot no. F-1, MIDC, Chincholi, Taluka- Mohol, Dist. Solapur- 413 255, State - Maharashtra. The total magnitude of the product will be 4095 MT/ month.

6.2 Residential Area:

In SKPL, there will NO residential activity.

6.3 Green Belt:

In and around the Industry of green plantation has already started. The area for green belt development within the factory premises is approximately 14,000 sq. mtrs. Following are the status of green belt development. Number of species of trees & shrubs to be planted- 700 Nos.

List of Trees (Common Name) are as under

- ✓ Neem
- ✓ Shirish
- ✓ Kala Shirish
- ✓ Dhavada
- ✓ Palas
- ✓ Phanshi
- ✓ Ashoka
- ✓ Arjun
- ✓ Cadamba
- ✓ Taman
- ✓ Katesawar
- ✓ Bahava
- ✓ Nandruk
- ✓ Dhaman
- ✓ Bibba

6.4 Social Infrastructure:

M/s. Sri Krishna Pharmaceuticals Limited is a new project in API Bulk Drug & Intermediates facility. There is need of providing Social infrastructure as the proposed project is required additional man power.

6.5 Connectivity:

This proposed API Bulk Drug & Intermediates facility is located at MIDC (17^0 76' N Latitude and 75^0 78' E Longitude) of Chincholi, in Solapur District, in Maharashtra. The Site is 5.00 km from Solapur city and 15.00 km from railway Station. The land and infrastructure is made available by MIDC and the raw material is easily available through the easy transport via road . The city has Railway station. Nearest Air port is Solapur. The site is by the side of Solapur Road State-Highway at a distance of 2.00 km. With all this consideration, this site was ranked first and adopted.

6.6 Drinking Water Management:

The source of water supply is MIDC.

6.7 Sewage System:

To treat the sewage, well designed septic tank followed by soak pit is available.

6.8 Industrial Waste Management:

Trade Effluent treatment process:

M/s. Sri Krishna Pharmaceuticals Limited, will be providing Full-fledged Effluent Treatment Plant of Multiple Effect Evaporator system followed by conventional aerobic & RO system to cater to the pollution load of effluent. Treated effluent shall be recycled and reused for process & for cooling water make up, gardening etc.

Proposed Effluent Treatment Scheme:

The waste water generated 706 cmd from the process/manufacturing will be collected & neutralized. This waste water has high TDS. So it will be directly pumped to the Multi Effect Evaporator. The concentrated salts in last effect of the evaporator would be pumped to the Agitated thin Film dryer (ATFD) to obtain pure solids / salts (approximately 85 tons / day). The condensate of the ATFD (175 KL / day) can be reused. The condensate of the evaporator (714 Kl / day) which would be having a TDS of less than 250 ppm will be pumped to the conventional aerobic Effluent Treatment Plant to remove the volatile organic COD / BOD. For the purpose the waste water will be equalized and then pumped to the Primary system, followed by the aerobic secondary system and tertiary treatment system for polishing. The final outlet of the ETP would be having a COD of less than 50 ppm and TDS < 350 ppm. This treated water will be mixed with condensate of ATFD and the total treated water will be 889 KL / day. Of the 889 KL / day 571 Kl / day will be put for reuse to the cooling tower, floor washings, scrubbers and laboratory washings.

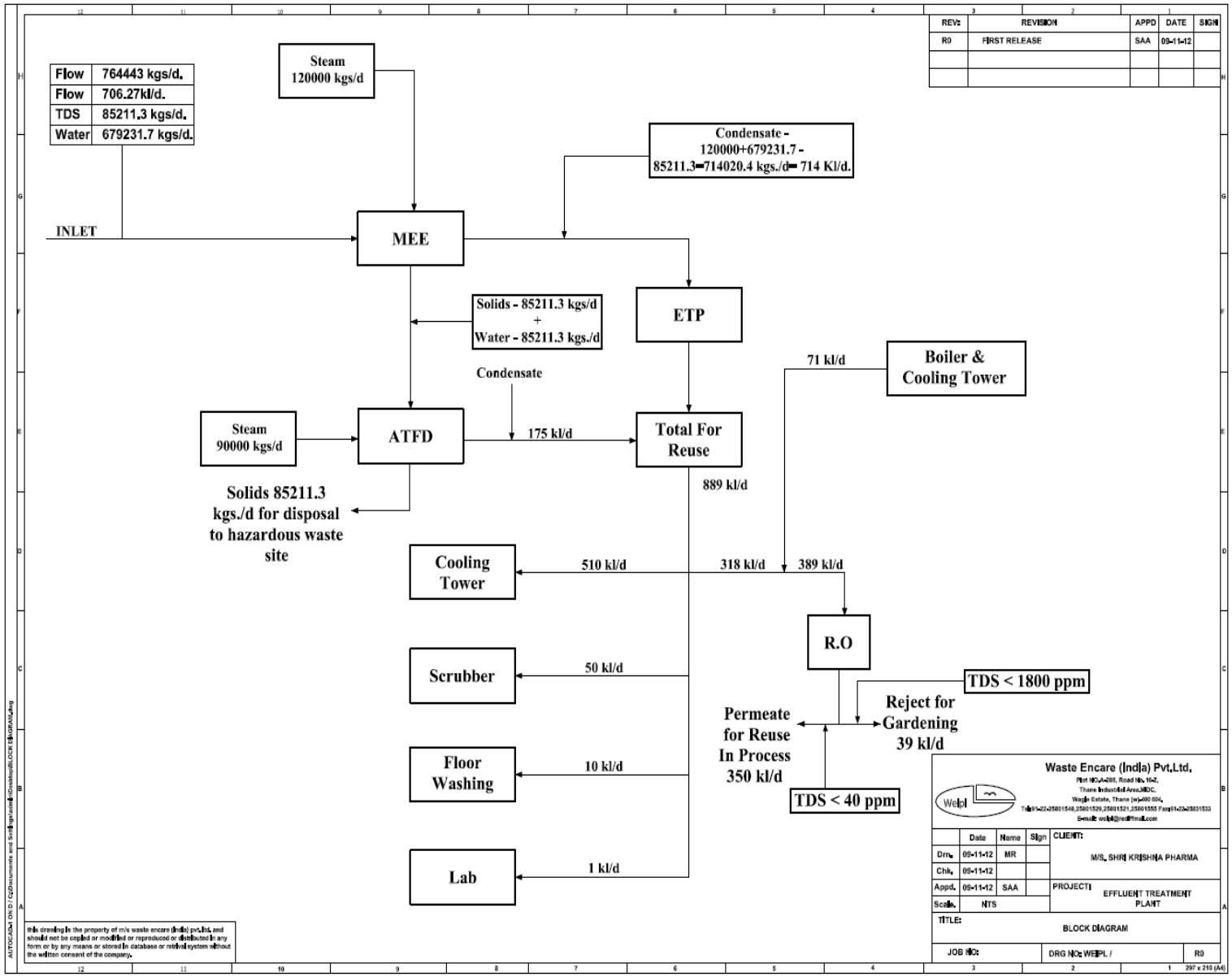
The remaining 318 Kl / day will be mixed with boiler and cooling tower blowdown water (71 Kl / day). This water (389 Kl / day) will be pumped to the R.O system, where 350 Kl water will be recovered as permeate. The permeate water will have TDS less than 40 ppm and can be reused in the process. The reject of the R.O system 39 Kl / day will have TDS less than 1800 ppm and can be used for gardening.

Water requirement in CMD during Dry Season:

Source	Consumption	Loss	Effluent
Domestic	50	-20	30
Cooling water make up & boiler feed	711.60	-640.60	71
MEE & ATFD (Steam Consumption)	+210	0	210.00
Industrial Processing/ washing	678.23	+ 28.61	706.84
Gardening	39	39	0
Total	**1688.83**	**-670.99**	**1017.84**
Water recycle	**960**		
Net Water requirement	**728.83**		

Water requirement in CMD during Wet Season:

Source	Consumption	Loss	Effluent
Domestic	50	-20	30
Cooling water make up & boiler feed	711.60	-640.60	71
MEE & ATFD (Steam Consumption)	+210	0	210.00
Industrial Processing/ washing	678.23	+ 28.61	706.84
Gardening	0	0	-0
Total	**1649.83**	**-631.99**	**1017.84**
Water recycle	**960**		
Net Water requirement	**689.83**		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Flow 706.27kl/d.
TDS 85211.3 kgs/d.
Water 679231.7 kgs/d.
Steam 120000 kgs/d
Condensate - 120000+679231.7 - 85211.3=714020.4 kgs./d= 714 Kl/d.
INLET
MEE
Solids - 85211.3 kgs/d + Water - 85211.3 kgs./d
ETP
71 kl/d
Boiler & Cooling Tower
Condensate
Steam 90000 kgs/d
ATFD
175 kl/d
Total For Reuse
889 kl/d
Solids 85211.3 kgs./d for disposal to hazardous waste site
Cooling Tower
510 kl/d
318 kl/d
389 kl/d
R.O
Scrubber
50 kl/d
TDS < 1800 ppm
Reject for Gardening 39 kl/d
Permeate for Reuse In Process 350 kl/d
Floor Washing
10 kl/d
TDS < 40 ppm
Lab
1 kl/d
this drawing is the property of m/s waste encare (india) pvt.ltd. and should not be copied or modified or reproduced or distributed in any form or by any means or stored in database or retrival system without the written consent of the company.
Waste Encare (India) Pvt.Ltd.
Plot NO.A-288, Road No. 16-Z, Thane Industrial Area,MIDC, Wagle Estate, Thane (w)-400 604.
Date Name Sign
Drn. 09-11-12 MR
Chk. 09-11-12
Appd. 09-11-12 SAA
Scale. NTS
CLIENT: M/S. SHRI KRISHNA PHARMA
PROJECT: EFFLUENT TREATMENT PLANT
TITLE: BLOCK DIAGRAM
JOB NO: DRG NO: WEPL / R0
297 x 210 (A4)

6.9 Solid / Hazardous Waste Management:

The main solid waste from this factory will be (a) Domestic (Sanitary waste) & garden waste is disposed through corporation and used as manure for gardening respectively.

Non bio degradable waste is segregated & sold.

Disposal of The ETP/ MEE sludge: ETP / MEE Sludge shall be dispose through Common Hazardous Waste treatment storage disposal facility.

Hazardous waste:

Sr. No.	Type of waste	Category No.	Qty. (TPM)	Disposal
1.	ETP Sludge	34.3	30	CHWTSDF
2.	MEE salts	34.3	2679	CHWTSDF
3.	Spent Carbon	28.2	63.36	CHWTSDF
4	Distillation Residue/ Process Sludge	20.3	85.53	Send to cement industry/ CHWTSDF/
5	Spent Solvents	28.5	52	CHWTSDF
6	Iron Sludge	28.1	555.21	Send to cement Industry
7.	Waste Oil	5.1	0.2	Sale to Recycler/ CHWTSDF
8.	E- Waste		0.240	E- Waste Recycler
9.	Used Lead Acid Batteries		2 Nos.	E- Waste Recycler

Non Hazardous Waste: -

Sr. No.	Type of waste	Quantity	Treatment	Disposal
	Biodegradable Waste			
1	ETP Bio-sludge	12.90 MT/ Month	composting	Gardening
	Non-Biodegradable Waste			
1.	Waste Paper	100 Kgs/ Month	Nil	Sale
2.	Corrugated Boxes	500 Kgs/ Month	Nil	Sale
3.	Broken glass	100 Kgs/ Month	Packed in HDPE bags	Sale
4.	Decontaminated used drums	1000 Kgs/ Month	Decontamination	Sale
5.	Decontaminated HDPE bags	1000 Kgs/ Month	Decontamination	Sale
6.	Coal Ash	280 MT/ Month		Sale

6.10 Power Requirement & Supply/ Source:

Power: The total power requirement for this proposed project will be 6000 HP . The required power connection is available from MSEDCL who will fulfill the need for additional production quantity.

Connected load- : 4500 KW

Max. demand : 2000 KVA

Transformer capacity : 3500 KVA

Total power requirement – 6000 HP

Power Supply: (From MSEDCL)

1. Total Power requirement : 6000 HP

In case of emergency backup 3 nos. of DG sets of capacity 1000 KVA each shall be proposed with acoustic enclosure.

DG sets:

Number and capacity DG sets to be used

Details of provided D.G. Sets with acoustic enclosure		
Capacity	**Qty.**	**Fuel Used**
1000 KVA	3 Nos.	HSD

Details of the non-conventional renewable energy used:

1) Design & construction of building considering maximum use of natural light and ventilation.

2) In future we are planning to use solar power for toilet and street lights.

6.11 Solvent Recovery System

There will be recovery of solvents. The use and recovery of solvents is explained here:
Major solvents which will be used in the process will be

1. Dimethyl Formamide

2. Isopropyl Alcohol

3. Methanol

4. Formamide

Solvent Recovery Plant is installed for the recovery of solvents

1) For Dimethyl Formamide

Distillation column is installed for the recovery of Dimethyl Formamide, which is mainly used in the reaction of Metformin Hydrochloride. The unit is equipped with stainless steel reactors, S.S. packed column, S.S. condensers, S.S. receivers, S.S. collection tanks etc. The generated spent solvent – DMF is collected as a ML from Production & is sent for distillation. The distilled DMF is reused for the reaction. The remaining spent residue will be send to disposal through CHWTSDF. The distillation activity is carried out for minimizing the raw material cost & use of fresh solvent in the process.

Technical Details:

- **S.S. Reactor** –

  Capacity- 5 KL
  Quantity - 2 Nos.
  Equipment I.D. – 122 & 132
  Capacity - 3 KL / day

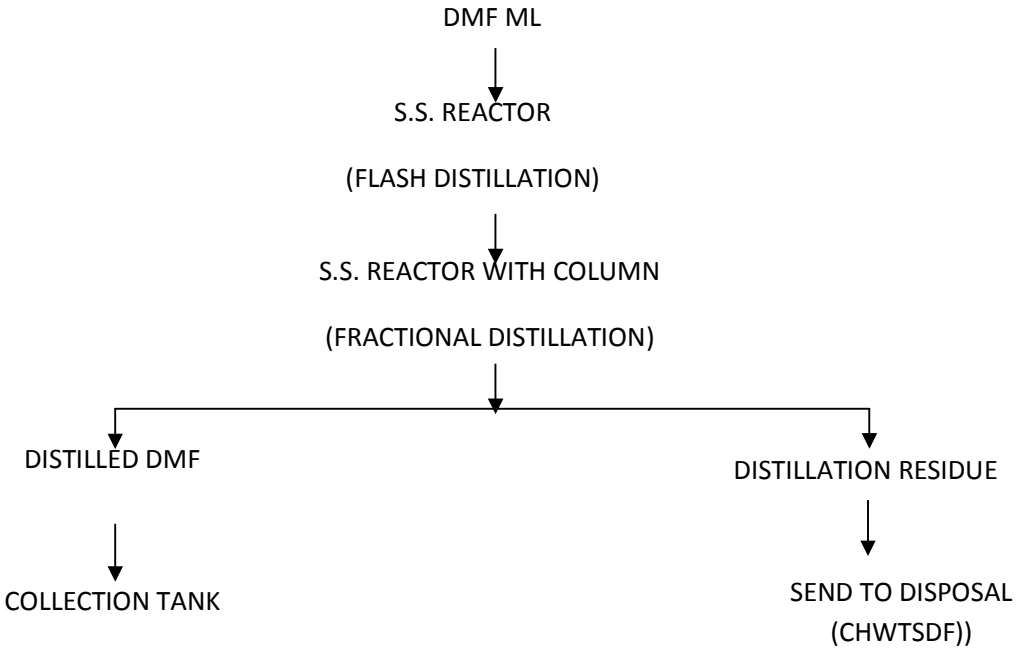
- **S.S. Column** –

  Height – 12.00 m, 11.5 m and 11.5 m
  Dia. - 390mm, 500mm and 600mm
  Quantity – 3 Nos.
  Equipment I.D. – 101,102 and 103

- **S.S. Condenser** –

  Area – 25 m^2 + 15 m2

FLOW SHEET DIAGRAM OF SOLVENT RECOVERY PLANT



2) For Isopropyl Alcohol

Distillation column is installed for the recovery of Isopropyl alcohol, which is mainly used in the reaction of Metformin Hydrochloride. The unit is equipped with stainless steel reactors, S.S. packed column, S.S. condensers, S.S. receivers, S.S. collection tanks etc. The generated residual DMF is send to DMF recovery column for further distillation. The distilled IPA is reused for the reaction. The distillation activity is carried out for minimizing the raw material cost & use of fresh solvent in the process.

1. **S.S. Reactor** –

   Capacity- 5 KL
   Quantity - 2 Nos.
   Equipment I.D. – 122 & 132
   Capacity - 3 KL / day

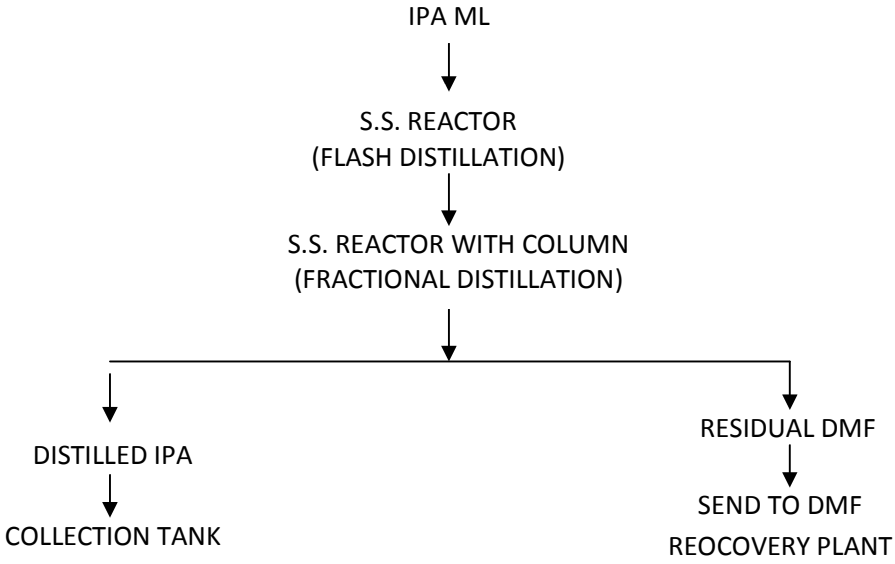
2. **S.S. Column** –

   Height – 12.00 m, 11.5 m and 11.5 m
   Dia. - 390mm, 500mm and 600mm
   Quantity – 3 Nos.
   Equipment I.D. – 101,102 and 103

3. **S.S. Condenser** –

   Area – 25 m^2 + 15 m2

FLOW SHEET DIAGRAM OF SOLVENT RECOVERY PLANT



3) For Methanol

Distillation column is installed for the recovery of Methanol, which is mainly used in the reaction. The unit is equipped with stainless steel reactors, S.S. packed column, S.S. condensers, S.S. receivers, S.S. collection tanks etc. The generated Water is send to ETP for further treatment .The distilled Methanol is reused for the reaction. The distillation residue will be send to CHWTSDF for disposal. The distillation activity is carried out for minimizing the raw material cost & use of fresh solvent in the process. It is our Policy to 'recycle & reuse' for Environmental aspect.

- **S.S. Reactor** –

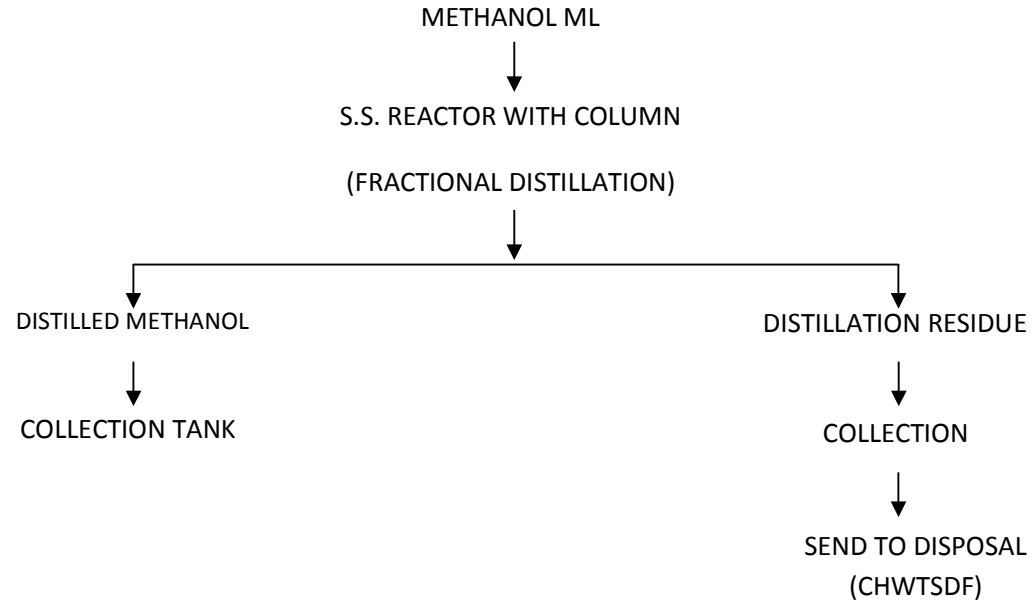
  Capacity- 5 KL
  Quantity - 2 No
  Equipment I.D. – 122 & 132
  Capacity - 3 KL / day

- **S.S. Column** –

  Height – 12.00 m, 11.5 m and 11.5 m
  Dia. - 390mm, 500mm and 600mm
  Quantity – 3 Nos.
  Equipment I.D. – 101,102 and 103

- **S.S. Condenser** – Area – 25 m^2 + 15 m2

FLOW SHEET DIAGRAM OF SOLVENT RECOVERY PLANT



4) For Formamide

Distillation column is installed for the recovery of Formamide, which is mainly used in the reaction. The unit is equipped with stainless steel reactors, S.S. packed column, S.S. condensers, S.S. receivers, S.S. collection tanks etc. The generated Water is send to ETP for further treatment .The distilled Formamide is reused for the reaction. The distillation residue will be send to CHWTSDF for disposal. The distillation activity is carried out for minimizing the raw material cost & use of fresh solvent in the process. It is our Policy to 'recycle & reuse' for Environmental aspect.

a) **S.S. Reactor** –

Capacity- 5 KL
Quantity - 2 Nos.
Equipment I.D. – 122 & 132
Capacity - 3 KL / day

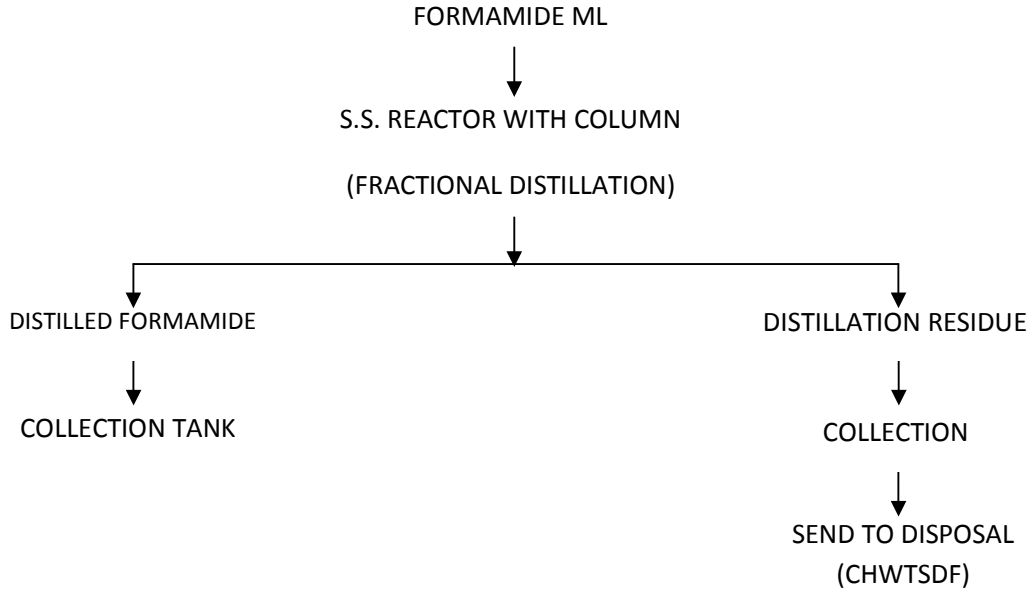
b) **S.S. Column** –

Height – 12.00 m, 11.5 m and 11.5 m
Dia. - 390mm, 500mm and 600mm
Quantity – 3 Nos.
Equipment I.D. – 101,102 and 103

c) **S.S. Condenser** –

Area – 25 m^2 + 15 m2

FLOW SHEET DIAGRAM OF SOLVENT RECOVERY PLANT



B) Fire Hydrant system:

Fire hydrant system will be provided to cover the entire sites which will include existing and proposed facilities. The system will be equipped with hydrant.

PROPOSED EXPANSIONS:

A) Solvent recovery plant:

- **S.S. Reactor** –
  Quantity - 3 Nos.

- **S.S. Column** –
  Height – 17.00 m
  Dia. – 1000mm, 750mm, & 600mm respectively
  Quantity – 3 Nos.
  Equipment I.D. – 104, 105, 106

Proposed columns will be used to recovery solvents like DFM and IPA. Procedure will be adopted as per given above.

B) Fire Hydrant system:

Fire hydrant system will be provided to cover the entire sites which will include existing and proposed facilities. The system will be equipped with hydrant points, Fire boxes, Water monitors, sprinkler systems etc.

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CHAPTER 07

REHABILATION AND RESETTLEMENT (R & R PLAN)

7.1 Policy to be adopt

This project does not requires acquisition of Land and the Infrastructure so there is no any kind of activity of Rehabilitation and Resettlement carried out over it.

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CHAPTER 08

PROJECT SHEDULE & COST ESTIMATES

8.1 Time schedule of the Project

SKPL have ability to complete their construction within 7 to 8 Months and likely to be completion the project for operation purposes

8.2 Proposed project cost analysis (Economic Viability of the Project)

Estimated Proposed project cost will be approximately 127.50 crores. Environmental Cost benefit Analysis produces more efficient decision by increasing monetary values of the life, health and natural resources. In order to assess the pros and cons of any particular regulatory standard for proposed activity, cost- benefit analysis seeks to translate all relevant considerations into monetary terms.

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CHAPTER 09

ANALYSIS OF PROPOSAL

9.1 Financial and Social Benefits

SKPL will be develop Medicinal API product which are used for curing of different diseases in social community and help to maintain healthy life. It supports the need to control human diseases and disorders this will be an important substitute for local market and also useful for defense services.

Medicines which are very costly at international market and are not available for national community for to avoid such market policy, SKPL manufacture medicines which Help to purchase in cheap rate and easily available in Market for Indian social community. This helps financially for nation and social community also.

Emergency Preparedness Plan

An emergency could be defined as any situation which presents a threat to safety of persons and or property, or environment. It may require outside help to bring the situation under control.

Major Emergency

A major emergency occurring at work is one that may affect several departments within it and or may cause serious injuries, loss of life, extensive damage to property or serious disruption outside the work. It will require the use of outside resources to handle it effectively.

Usually the result of a malfunction of the normal operating procedures, which may also be precipitated by the intervention of an outside agency, such as a severe storm, flooding, crashed aircraft.

Emergency due to operating conditions such as uncontrolled reaction, spark leading to small fire, slow gas leak, spill, failure of power, water, air, steam, cooling media, scrubbing media etc. These can be locally handled by plant personnel alone without outside help is not considered as major emergency.

Operating instructions in the Safety Manual shall cover this area, though the on-site emergency plan is also helpful.

Hazard

Hazard is a physical situation which may cause human injury, damage to property or the environment or some combination of these criteria.

Risk

Risk is the likelihood of an undesired event i.e. accident, injury or Death occurring within a specified period or under specified circumstances. It may be either a frequency or a probability depending on the circumstances.

The On-Site Emergency Plan

The On-site Emergency Plan deals with measures to prevent and control emergencies affecting persons, property & the environment inside the premises**.**
It is mandatory for the manufacturer to provide the necessary information on the nature, extent & likely effects of such incidents.

The Off-Site Emergency Plan

The Off-Site Emergency Plan deals with measures to prevent and control emergencies affecting general public and the environment outside the premises.
The manufacturer has to provide the necessary information on the nature, extent and likely effects of such incidents.

Objectives of the Emergency Plan

An emergency may not always be prevented but it can be controlled within limits and its effect can be minimized by using the best resources available at the time.

Emergency planning is a management function and it is not be considered in isolation. Management must evaluate the activities, operations and processes carried out within the works before starting to plan an emergency operation.

A check is made to ensure that all required steps have already been taken which are included in emergency planning.

Considering our number of employees, materials and processes, availability of resources, location of site, size and complexity of the works, we have prepared this emergency plan.
In the text of our emergency plan, we have included the clear instructions as to what role is to be played and by whom, without overlap or confusion for all concerned staff member.

The objectives of the Emergency Planning are as under:

(a) To define and to assess emergencies, including risk and environmental impact assessment.

(b) To prevent the emergency turning into a disaster.

(c) To safeguard employees and people in vicinity.

(d) To minimize damage to property or/and the environment.

(e) To inform employees, the general public & the authorities about the hazards/risks assessed, safeguards provided, residual risk if any and the role to be played by them in the event of emergency.

(f) To be ready for 'Mutual Aid' if need is arises to help neighboring unit. Normal jurisdiction of an OEP is the own premises only, but looking to the time factory in arriving the external help of off-site plan agency, the jurisdiction must be extended outside to the extent possible in case of emergency occurring outside.

(g) To inform authorities and mutual aid centers to come for help.

(h) To effect rescue and treatment of casualties.

(i) Identify and list in case of any deaths.

(j) To inform and help relatives.

(k) To secure the safe rehabilitation of affected areas and to restore normalcy at the earliest.

(l) To provide authoritative information to the news media.

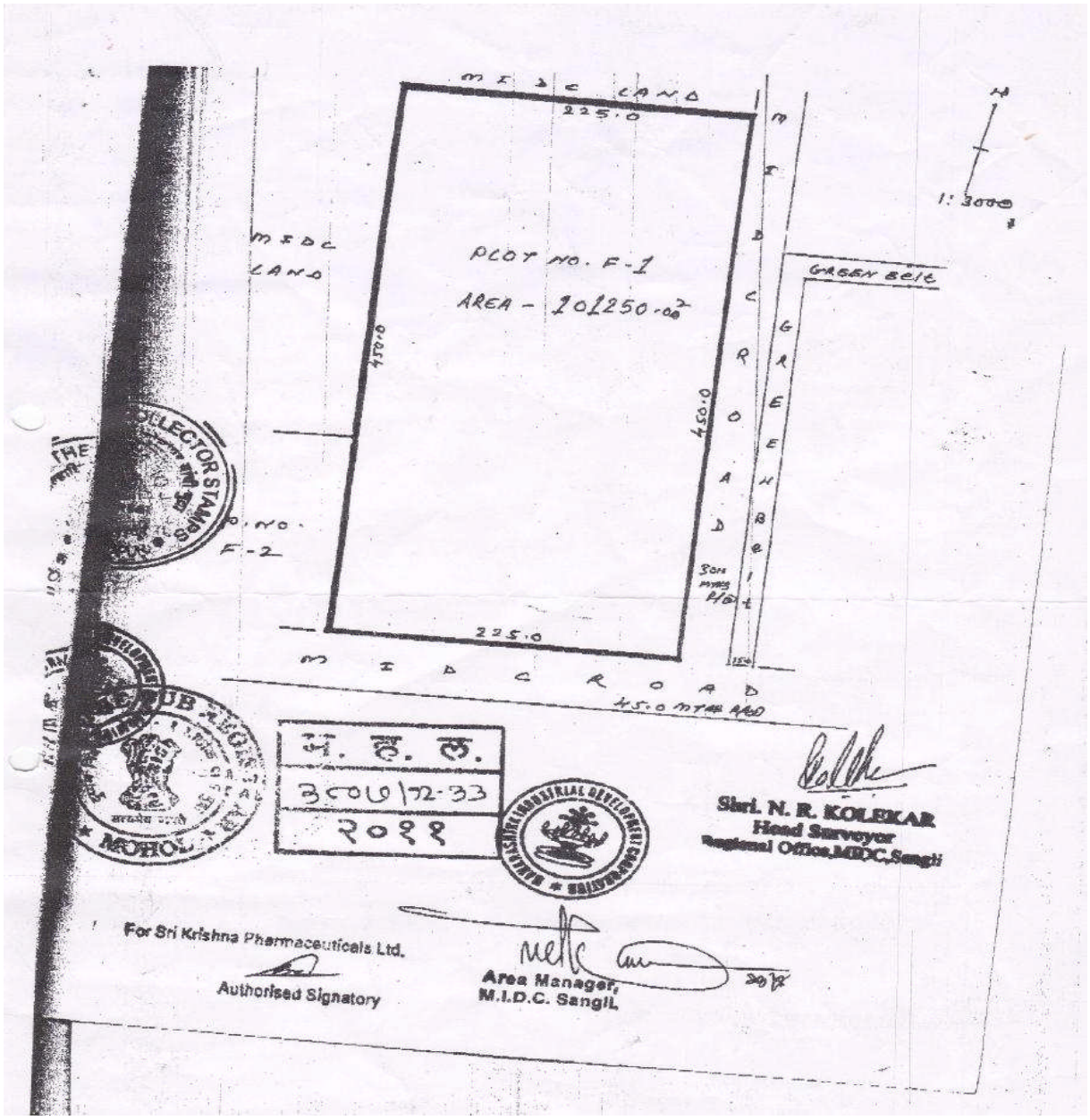
(m) To preserve records, equipments etc. and to organize investigation into the cause of the emergency and preventive measures to stop its recurrences.

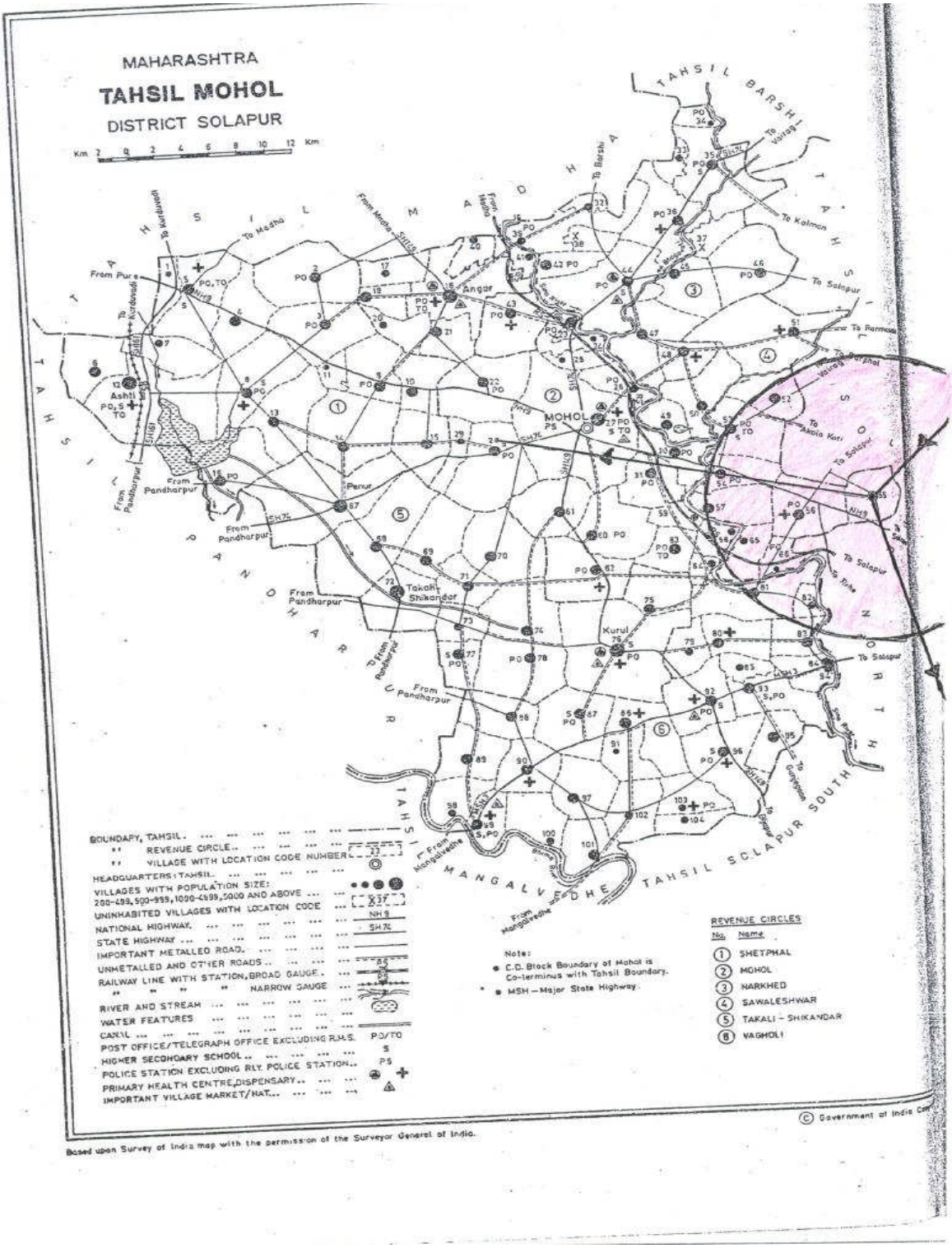
(n) To ensure safety of the works before personnel re-enter and resume work.

(o) To work out a plan with all provisions to handle emergencies and to provide for emergency preparedness and the periodical rehearsal of the plan.

Annexure -I Google Image

Annexure -II : Site Survey Plan




MAHARASHTRA
TAHSIL MOHOL
DISTRICT SOLAPUR
Km 2 0 2 4 6 8 10 12 Km
TAHSIL BARSHI
TAHSIL MADHA
TAHSIL KARMALA
TAHSIL PANDHARPUR
TAHSIL MANGALVEDHE
TAHSIL SOLAPUR SOUTH
TAHSIL SOLAPUR NORTH
MOHOL
Angar
Ashti
Pandharpur
Takali Shikandar
Kurul
Perur
To Barshi
To Vairag
To Kalman
To Solapur
To Pamree
To Akola Kati
To Tuljapur
To Gurgaon
From Pune
From Madha
From Mangalvedha
Note:
C.D. Block Boundary of Mohol is Co-terminus with Tahsil Boundary.
MSH – Major State Highway.
REVENUE CIRCLES
No. Name
1 SHETPHAL
2 MOHOL
3 NARKHED
4 SAWALESHWAR
5 TAKALI – SHIKANDAR
6 VAGHOLI
BOUNDARY, TAHSIL
REVENUE CIRCLE
VILLAGE WITH LOCATION CODE NUMBER
HEADQUARTERS: TAHSIL
VILLAGES WITH POPULATION SIZE: 200-499, 500-999, 1000-4999, 5000 AND ABOVE
UNINHABITED VILLAGES WITH LOCATION CODE
NATIONAL HIGHWAY
STATE HIGHWAY
IMPORTANT METALLED ROAD
UNMETALLED AND OTHER ROADS
RAILWAY LINE WITH STATION, BROAD GAUGE
" " " " NARROW GAUGE
RIVER AND STREAM
WATER FEATURES
CANAL
POST OFFICE/TELEGRAPH OFFICE EXCLUDING R.M.S.
HIGHER SECONDARY SCHOOL
POLICE STATION EXCLUDING RLY. POLICE STATION
PRIMARY HEALTH CENTRE, DISPENSARY
IMPORTANT VILLAGE MARKET/HAT
NH 9
SH 76
PO/TO
S
PS
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Annexure IV : MIDC Chincholi Layout Plan