



**STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY
ENVIRONMENTAL CLEARANCE**

From DR. S. KALYANASUNDARAM, I.F.S.(Retd.) CHAIRMAN 3rd Floor, Panagal Maaligal, No.1, Jeenis Road, Saidapet, Chennai-600 015. e.mail-cmantnseiaa@yahoo.co.in	To THIRU S.SAHA General Manager Heavy Water Plant-Solvent production Plant Division,(Department of Atomic Energy, GOI) P.O.HWP Housing Colony, Tuticorin- 628007. e.mail-gm@tut.hwb.gov.in
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Lr. No. SEIAA-TN/F.No.3730/2016/EC-43/5(f)/TTN/2016/dated 06.07.2016

Sir,

Sub: SEIAA-TN – Proposal seeking Environmental Clearance for the Proposed Solvent Production Plant, S.F.No. 432/2B, 433/2, 439/2, Mullakadu Village, Thoothukudi Taluk and District under category-B 1, schedule No.5(f)- For Solvent Production plant of 180 TPA by Heavy Water Plant (Department of Atomic Energy, GOI)--Issue of Environmental Clearance--Regarding

Ref: 1.Your application dated 29.08.2015



This has reference to your application and further communication on the above mentioned subject. The Solvent Production plant is reported to be a separate facility to be established within existing premises of Heavy Water Plant, Tuticorin and is a constituent of the Heavy Water Board (HWB) under the Department of Atomic Energy (DAE) for manufacturing of 180MTPA of solvents (any two solvents at a time) and estimated project cost of Rs. 38 crores. The proposal was considered as per the EIA Notification, 2006, by the State Level Expert Appraisal Committee, Tamilnadu in its 72nd meeting and decided to recommend the project for issue prior environment clearance by SEIAA and SEIAA after obtaining additional details and careful consideration decided to issue Environmental Clearance in its 177th meeting held on 06.07.2016 vide Item No 03 based on the Information submitted by you which are extracted below.

1	(i) Name of the Project: (ii) Date of Application:	Solvent Production Plant (Heavy Water Plant, Tuticorin.) 29.08.2015
2.	Name of Sector: Schedule No (in the EIA Notification,2006):	5(f) - Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)
3.	New Project/ Expansion	New Project

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4	Name of the Applicant/Project Proponent	Thiru. S. Saha, General Manager, M/s. Heavy Water Plant, Tuticorin Solvent Production Plant Division, Dept. of Atomic Energy (GOI), PO. HWP Housing colony, Tuticorin-628007.		
5.	Name of the Consultancy Company	ABC Techno Labs India Private Limited, No.2, Second street, Thangam colony, Anna Nagar West, Chennai-40.		
6(i).	Project Location	SF No.:432/2B,433/2,439/2 Village: Mullakkadu Taluk: Tuticorin District: Tuticorin		
6(ii).	Geographical Coordinates of Site	Latitude	Longitude	Direction
		8°44'19.15"N	78° 8'35.21"E	NW
		8°44'18.90"N	78° 8'36.60"E	NE
		8°44'11.0"N	78° 8'35.7"E	SE
		8°44'11.1"N	78° 8'34.0"E	SW
6(iii)	Whether GO attracted	No. Does not attract G.O.Ms. No. 213		
7.	Area of the Site(in Hectares)	Solvent Production Plant - Total Area : 1.375 Hectares (13750 Sq.mt)		
8.	Built up area (in Sq. Metres)	4611 Sq.mt (4185+426)		
9.	Land Use Break Up Details	Particular	Area (in Sq.m)	Percentage of total area
		Solvent Production Plant Area	4185	30.43%
		Storage Area	426	3.10%
		Roads & Pathways	1100	8%
		Open Area	2539	18.47%
		Green Belt	5500	40%
	Total	13750	100%	
10.	Land use Classification as per Record	Industrial Use Zone as per DTCP		
11.	TOR given by SEAC? (If yes then specify the meeting)	67 th SEAC meeting held on 25.09.2015 (TOR Letter No. SEIAA-TN/F.No-3730/2014/TOR- 225/2015 dated 09.10.2015)		
12.	Project Cost	Rs. 38 Crores		
13.	Distance from Protected areas Areas/Critically Polluted	There are no Protected Areas/Critically Polluted areas/Eco- Sensitive areas / Inter - State Boundaries		



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	areas/Eco-Sensitive areas/Inter-State Boundaries.	within 10 Km radius of the project site .		
14.	Production Details	SL	Name of Product	Quantity (T/yr)
		1.	Tri butyl phosphate (TBP)	150
		2.	Tri - Iso Amyl Phospate (TiAP)	35
		3.	Di-2 Ethyl Hexyl Phosphonic Acid (D2EHPA-II)	12
		4.	Di - Hexyl Octanamide (DHOA)	30
		5.	Tri Octyl Phosphine Oxide (TOPO)	15
15.	Raw materials(Including Process Chemicals, catalysts & additives etc)	Enclosed as Annexure I		
16.	Manufacturing Process	<p>S Complete synthesis operation (for production) of all the solvents. Consists of chemical reactions followed by unit operations for recovery of reaction medium & intermediates and purification by water washing, atmospheric & vacuum distillation. .</p> <p>All the reactions are carried out in Glass lined / Nickel lined reactors associated with graphite / SS condensers. The reactions are carried out at atmospheric pressure, temperature and final purification by distillation is under vacuum.</p> <p>Synthesis operation of the respective solvents shall be carried out in batch manner (campaign mode). Any two solvents at a time shall be synthesized in two separate reactor loops.</p>		
17.	Man-Power Requirement	During Construction Phase - 60 No's During Operation Phase - 48 No's		
18(i).	Total Water Requirement (Operation Phase)	20.0 KLD		
	Source	TWAD Board		
	(a) Domestic Purpose	3.0 KLD		
	(b) Industrial Purpose	17.0 KLD (Process - 7 + Cooling water - 8 KLD + Boiler feed - 2 KLD)		
18(ii).	Domestic water during construction phase	3.0 KLD of water will be required for domestic purpose during construction phase it will be met from the existing Heavy Water Plant Source.		
19(i).	Sewage Generation, Treatment &	2.4 KLD of sewage generated will be settled in settling tank		



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	Disposal Details during Operation Phase	and further to be treated in Bio-Filter unit. After treatment same shall be used for green belt. Settling Tank Dimensions : 11.31 x 3.37 x 2.25 (m) – 1 No Bio- Filter unit : 3.35 x 3.35 x 1.9 (m) – 1 No			
19(ii).	Effluent Generation/Treatment & Disposal Details	7 KLD (Process – 6KLD + R.O reject -1KLD) Enclosed as Annexure II			
20.	Solid Waste Management				
20 (i).	Non-Hazardous Waste Management	Sl.No.	Particular	Quantity	Disposal
		1.	Municipal Solid Waste	10.0 Kg/day	Bio-degradable waste and inert waste will be disposed through local body.
		2.	Non-hazardous Industrial waste	5 kg/day (packing materials, plastic containers etc)	Disposed to recyclers and processors.
20 (ii)	Hazardous Waste Management	Sl No.	Particular	Quantity (Tons/Annum)	Disposal
		1.	Used Oil	1.0	Disposed off through vendors authorized by TNPCB
		2.	Discarded Containers	210 Nos	
		3.	Sludge from ETP	125.0	
		4.	Salt from Solar evaporation Pond	175.0	TSDF
21.	Stack emission Details: (All the stacks attached to process units, Boilers, captive power plant, D.G. Sets, (kg/hr)	Stack No.	Stack Attached To	Height From Ground Level (m)	Internal Diameter (Top)(m)
		01.	DG Set – 400 KVA – 1 No	4.0	0.125
		02.	Scrubber – 1 No	15.0	0.4
22.	Details of Fuel to be used	Sl No.	Fuel	Consumption	
		1.	HSD	30 Litres/hr	
		High Speed Diesel will be used only for DG Set during TNEB GRID power failure			
23.	Power Requirement	TNEB		1.5 MW	
		DG Set (Back-Up)		400 KVA	


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24.	EIA Study –Baseline studies Period	21 st July 2014 to 10 th October 2014 (As permitted by SEAC in 67 th SEAC Meeting)
25.	Public Hearing .	Public Hearing Exempted as per Section 7(i) (III) stage (3), Para (i) (b) of EIA notification, 2006 as the site is located in a notified Industrial area.
26.	Storm Water Management	Storm water drains will be provided along the project boundary for discharging surplus storm water to nearby drains.
27.	Rain Water Harvesting	Rain water harvesting pits will be provided for harvesting rainwater from roof top, paved areas and landscaped areas. 4 Nos. of 2m x 1m will be provided.
28.	Green Belt Development	5500 Sq.mt - 40 % of total Solvent Production Plant area.
29.	CSR details	<p>i) Solvent Production Plant, located at Heavy Water Plant Tuticorin will carry out such activities as admissible for Central Government Organization.</p> <p>ii) Rs. 10 Lakhs fund was provided for the construction of shed for Fish cleaning / segregating activities at Vellapatti village, Ottapidaram Block.</p>
30.	Environment Management plan Budgetary Allocation	Capital Cost : Rs. 265 Lakhs Recurring Cost/Annum :Rs. 136 Lakhs
31.	Project Benefits	<p>1) Assigned by Department of Atomic Energy to Heavy water Board for production of Novel solvents.</p> <p>2) Solvents are of importance to in house applications of Department of Atomic Energy in the back end of Nuclear cycle, particularly for high burn up fuels and also for hydrometallurgical extraction of metals like Nickel, Cobalt etc.</p>

VALIDITY - THE SEIAA-TN HEREBY ACCORDS ENVIRONMENTAL CLEARANCE TO THIS PROJECT UNDER THE PROVISIONS OF THE EIA NOTIFICATION 2006 AS AMENDED, WITH VALIDITY FOR SEVEN YEARS FROM DATE OF ISSUE SUBJECT TO THE CONDITIONS

(A) Conditions for Pre Construction Phase:-

1. The project authorities should advertise with basic details at least in two local newspaper widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at website of SEIAA, TN and a copy of the same should be forwarded to the Regional Office of the Ministry


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of Environment and Forests located at Chennai.

2. In the case of any change(s) in the scope of the project, a fresh appraisal by the SEAC/SEIAA shall be obtained.
3. A copy of the clearance letter shall be sent by the proponent to the Block development officers of Panchayat union and the Local NGO, if any, from whom suggestions /representations, if any, have been received while processing the proposal. The clearance letter shall also be put on the website of the Proponent.
4. "Consent for Establishment" shall be obtained from the Tamil Nadu Pollution Control Board and a copy of the same shall be submitted to the SEIAA, Tamil Nadu before start of construction activity at the site.
5. Any appeal against this environmental clearance shall lie with the Hon'ble National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.
6. The approval of the competent authority shall be obtained for structural safety of the buildings during earthquake, adequacy of fire fighting equipments, etc as per National Building Code including protection measures from lightning etc.
7. All required sanitary and hygienic measures should be in place before starting construction activities and they have to be maintained throughout the construction phase.
8. All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire and Rescue Services Department, Civil Aviation Department, Forest Conservation Act, 1980 and Wild Life (Protection) Act, 1972, State / Central Ground Water Authority, Coastal Regulatory Zone Authority, other statutory and other authorities as applicable to the project shall be obtained by project proponent from the concerned competent authorities.
9. A separate environment and safety management cell with qualified staff shall be set up before establishment of the facility and shall be retained throughout the lifetime of the industry, for implementation of the stipulated environmental safeguards.
10. Ambient Air Quality Monitoring Stations shall be set up in the down wind direction as well as where maximum ground level concentration of VOC, Co, SO₂, NO_x &


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Particulate Matter is anticipated. At least four ambient air quality monitoring stations should be established in the core zone as well as buffer zone for monitoring above parameters & Particulate Matter. Location of the monitoring stations should be decided in consultation with State Pollution Control Board based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring etc.

11. a) This Environmental Clearance shall not be cited to relax any other rules applicable to this project.
- b) The Land use classification shall be meeting the requirement for this type of project, before commencement of establishment.

(B). Construction Phase

12. a) The ETP as proposed shall be installed after obtaining consent from the TNPCB for the treatment of the trade effluent to achieve prescribed standard.
- b) Sewage shall be treated as proposed to prescribed standards before disposal.
13. a) APC measures for reactors, such as Wet scrubbers/stack of adequate height at emission source areas shall be provided, to achieve prescribed standards. Scrubbing liquid shall be sent to ETP.
- b) The gaseous emission from DG set shall be dispersed through adequate stack height as per CPCB standards.
14. The land area of 5500 Sq.mt earmarked within the project area shall be developed for green belt development.
15. It shall be ensured that necessary trenches for openings shall be provided at periodic intervals along the compound wall, so as to let out the storm water during rainy season, without stagnation/ ponding.
16. It shall be ensured that roof top run-off collected from the covered roof of the buildings, etc shall be scientifically harvested so as to ensure the maximum beneficiation of rain water harvesting.
17. The natural drainage pattern in the project area shall be maintained and storm water drain along the boundary and appropriate places shall be provided considering the Catchment area and maximum intensity of rainfall to collect runoff water/rain water for proper disposal to avoid flooding around the premises.



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18. All the environmental protection measures and safeguards as recommended in the EIA report shall be complied with.
19. Entire plant where solvents are used shall be flame proof.

(C) Conditions for Operation Phase / Post Construction Phase:

20. The industry shall conduct air sampling at least twice in a week (104 times in a year), as stipulated under the EP Act 1986.
21. Analysis of Process hazards pertaining to the type of industry shall be constantly carried out as per guidelines.
22. Regular monitoring on the air quality, water quality and noise on the selected locations in and around the project site as mentioned in the EMP report for creating base line data shall be continued and records shall be maintained.
23. a) The hazardous wastes generated shall be disposed of as per the provision of latest Rules for Hazardous Wastes Management.
b) The proponent shall comply with Manufacture, Storage & Import of Hazardous Chemicals (MSIHC) Rule, 1988.
24. All the recommendation in the Risk Assessment Report shall be satisfactorily implemented. Recommendations of HAZOP Study, Fire hazard analysis study and MSDS for all chemicals shall be followed.
25. Raw material storage shall be ensuring all safety aspects. Hexane and other solvents shall be stored with approval from PESO.
26. Scheduled Flora and Fauna found in the study area of the core zone around the project site shall be monitored closely and a plan shall be prepared and implemented for their conservation.
27. Data on ambient air, stack and fugitive emissions shall be regularly submitted online to the Regional office of MoEF&CC,GOI, at Chennai, TNPCB and Central Pollution



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Control Board as well as hard copy once in six months and display data on RSPM, SO₂ and NO_x outside the premises at the appropriate place for the general public.

28. a) The fugitive emissions during loading and unloading shall be suitably controlled, by providing closed storage, closed handling & conveyance of chemicals/materials. Fugitive emissions in the work zone environment and raw materials storage & handling areas shall be regularly monitored. The emissions shall conform to the limits prescribed by the TNPCC/CPCB.

b) For further control of fugitive emissions following steps shall be followed:

- i) Closed handling system shall be provided for chemicals.
- ii) Reflux condenser shall be provided over reactor.
- iii) System of leak detection and repair of pump/pipeline based on preventive maintenance.
- iv) The acids shall be taken from storage tanks to reactors through closed pipeline. Storage tanks shall be vented through trap receiver and condenser operated on chilled water.
- v) Cathodic protection shall be prevented to the underground solvent storage tanks.

29. Vehicular emissions should be kept under control and each vehicle shall carry valid Emission certificate issued by competent Authority.

30. It shall be ensured that storm water drain provided at the project site shall be maintained without choking or without causing stagnation and should also ensure that the storm water shall be properly disposed off in the natural drainage/channels without disrupting the adjacent public. Adequate harvestion of storm water should be ensured.

31. The implementation of the project vis-à-vis environmental action plans shall be monitored by the Regional office of MoEF& CC at Chennai, TNPCC and CPCB. A six monthly compliance status report shall be submitted to monitoring agencies regularly.



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32. CSR activity shall be implemented by drawing a scheme for social up-liftment in the surrounding villages with reference to contribution in road construction, providing sanitation facilities, drinking water supply in the government schools nearby, community awareness, establishment of health centres, water supply to nearby villages.
33. The requisite amount earmarked towards capital cost and recurring cost/annum for implementing pollution control measures shall be used judiciously to implement the Environment Management Plan as furnished in the EIA report. The funds so provided shall not be diverted for any other purposes.

(D) Entire Life:

34. National Emission Standards for Organic Chemicals manufacturing industry issued by the Ministry vide G.S.R. 608 (E) dated 21st July, 2010 and amended from time to time shall be adhered to.
35. Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.
36. Occupational health surveillance programme shall be undertaken as regular exercise for all the employees, especially for those engaged in handling hazardous substances. The first aid facilities in the occupational health centre shall be strengthened and the medical records of each employee should be maintained separately.
37. Usage of Personnel Protection Equipment (PPEs) by all employees workers shall be ensured.
38. The overall noise levels in and around the plant area shall be kept well within the standards prescribed for by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 55 dBA (day time) and 45 dBA (night time).
39. Hydro geological study of the area shall be reviewed annually and report submitted to the Authority. No water bodies including natural drainage system in the area shall be


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disturbed due to activities associated with the setting up / operation of the power plant.

40. The project proponent shall upload the status of compliance of the stipulated environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF&CC, GOI at Chennai, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; VOC, PM, SO₂, NO_x, CO (ambient levels as well as stack emissions) or critical sector parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.
41. The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Offices of the MOEF by e-mail.
42. The SEIAA, TN may alter/modify the above conditions or stipulate any further condition in the interest of environment protection.
43. The SEIAA, TN may cancel the environmental clearance granted to this project under the provisions of EIA Notification, 2006, if, at any stage of the validity of this environmental clearance, if it is found or if it comes to the knowledge of this SEIAA, TN that the project proponent has deliberately concealed and/or submitted false or misleading information or inadequate data for obtaining the environmental clearance.
44. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of the Environment (Protection) Act, 1986.



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45. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability Insurance Act, 1991, along with their amendments.
46. The Environmental Clearance is issued without prejudice to any order that may be passed by the Hon'ble NGT/ Hon'ble High Court of Madras.



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Copy to:-

1. The Principal Secretary to Government,
Environment & Forests Department,
Govt. of Tamil Nadu, Fort St. George,
Chennai - 600 009.
2. The Chairman,
Central Pollution Control Board, Parivesh Bhavan,
CBD Cum-Office Complex, East Arjun Nagar,
New Delhi 110032.
3. The Member Secretary,
Tamil Nadu Pollution Control Board,
76, Mount Salai, Guindy,
Chennai - 600 032.
4. The ACCF(C), Regional Office of MoEF,
34, hepc Building, 1 & 2 nd Floors,
Cathedral Garden Road, Nungambakkam,
Chennai - 600 034.
5. Monitoring Cell, I A Division,

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Ministry of Environment & Forests,
Paryavaran Bhavan, CGO Complex,
New Delhi 110003.


6. The District Collector, Tuticorin district.
7. Stock File.



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Annexure – I

Feed Rawmaterials (chemicals) for synthesis process of all five solvents

SLNo	Chemicals	Quantity, in kg
 TIAP : 950 Kg/batch ; No of batches /annum : 37 ; Prodn./annum : 35 MT		
1	Iso Amyl Alcohol	1109.0 (actual consumption) 3159.6 (actual feed per batch - remaining is recycled from prev. batch)
2	Phosphorous Oxy Chloride	556.8
3	Sodium carbonate	576.8
SEIAA IN D2EHPA-II : 280 Kg/batch ; No. of batches /annum : 43 ; Prodn./annum : 12 MT		
1	2-Ethyl Hexanol (ROH)	807.7
2	Phosphorous Tri Chloride	258.8
3	Hexane	307.84
4	2-Ethyl Hexyl Chloride/2-ethyl hexanol	249.57
5	Xylene	327.6
6	Sodium	34.64
7	KOH	251.06
8	HCl	140.59
9	Sodium carbonate	2.97



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DHOA : 350 Kg/batch ; No of batchs /annum : 86 ; Prodn./annum : 30 MT		
1	Octonoyl Chloride	213.36
2	Di-Hexyl Amine	231.33
3	Hexane	790.41
4	Tri-Ethyl Amine	139.06
5	HCl	76.78
6	NaOH	136.07
TOPO : 150 Kg/batch ; No of batch/annum : 100 ; Prodn./annum : 15 MT		
1	Magnesium	35.41
2	Iodine	0.14
3	Tetra Hydro Furan	408.14
4	Bromo Octane	295.5
5	Phosphorous Oxy Chloride	74.56
6	Hexane	253.13
7	HCl	40.13
8	Sodium carbonate	38.34
TBP : 1200Kg/batch ; No of batch/annum : 125 ; Prodn./annum : 150 MT		
1	Phosphorous Oxy Chloride	728.0
2	Butanol	1052.87 (actual consumption) 3000.00 (actual feed per batch - remaining is recycled from prev. batch)
3	Sodium carbonate	740.0



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Annexure – II

Effluent Generation & Disposal Details

S.No.	Description	Waste water generation	Treatment and disposal method
1.	Process	6.0	Removal of organics by FeCl ₃ precipitation process. Organic free aq. effluent, containing only inorganic salt, shall be evaporated in solar pond and solid salt shall be disposed through TNPCB authorized agency.
2	Cooling Tower Make up	2.0	2.0 KLD of waste water shall be treated in RO unit. 1.0 KLD of permeate will be used for green belt. 1.0 KLD of Reject will be sent to Solar pond.
3	Boiler feed water make-up	2.0 (Condensate)	2.0 KLD to recycle to process /boiler

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Green Belt - 3,4 KLD

1.0 KLD from RO unit + 2.4 KLD treated Sewage water

Effluent Treatment Plant Details

Sl.No..	Treatment Unit	Dimensions
1.	Effluent collection Tank [Reinforced Cement Concrete (RCC) – Impervious Layer of Poly Propylene lined]-1 no.	4m X 3m X 2.5m 30 m ³ Capacity
2.	Stirrer tank Mild Steel(MS) – [Fiber Reinforced Plastic (FRP) – High Density Polyethylene (HDPE) Reactor] – 2 Nos.	Diameter: 1.52 m Height 3.8 m Each having capacity of 7 m ³
3.	Chemical dosing Vessels (HDPE&MS) – 3Nos.	Diameter:0.94m Height :1.41m Capacity: 1 m ³ (1 Nos.) Diameter:1.15m Height:2.8m Capacity: 3 m ³ (2 Nos.)
4.	Rotary Vacuum Drum Filter (RVDF) system – 2 Nos.	Each of 4 M ³ /Hr capacity
5.	Filtrate buffer Vessel (MS & HDPE)	Diameter :1.85m Length:3.70m Capacity – 10 m ³
6.	Solar Evaporation Pan [Impervious Layer of Propylene Lined]	Dimensions : 55 m X 30m X 0.9m Active Area of Evaporation:1600 Sq.M