

**BEFORE THE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI.
(Through Video Conferencing)**

Original Application No. 16 of 2019(SZ)

K. Gemini,
Son of Kannupaiyan
Aged about 53 years
5/1-34, Rettaipulliyamaram
Raman Nagar Post, Mettur Dam
Salem District – 636 403.

...Applicant

Vs

Union of India & others

...Respondents

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**Filed by
Thiru. C. Kasirajan,
Advocate,
Chennai.**

Report of the Joint Committee on M/s. ChemplastSanmar Limited, Plant-I, M/s. ChemplastSanmar Limited, Plant-II, on M/s. ChemplastSanmar Limited, Plant-III, M/s. ChemplastSanmar Limited, Plant-IV, M/s. Cabot Sanmar Limited, Plant-V, M/s. ChemplastSanmar Limited (Power) Plant, Mettur, Salem District as per the direction of the Hon'ble National Green Tribunal order dated: 06/10/2020.

1. Back Ground

The Hon'ble National Green Tribunal (NGT), Principal Bench in the matter of original application No. 16/2019 & Shri.K.Gemini Vs Union of India & others passed an order dated 06/10/2020 (Annexure – I) and directed that (as in point 4);

4. “ So under these circumstances, since it is a general study to be conducted to assess the water quality in that area for the benefit of the local people, we direct the Pollution Control Board to appropriate this amount from the environmental compensation lying with them and thereafter when they are assessing the environmental compensation from the persons to be recovered in proportion to the level of pollution contributed by the units, including the fourth respondent, if any and recover this portion of the amount also from those persons, as part of the environmental compensation fixed or assessed, so that the necessary study to be conducted for the benefit of the people can be proceeded with. The committee is also directed to consider the reply/objection filed by the fourth respondent and compliance of the recommendations made by the committee which the fourth respondent is expected to carry out and if there is any deficiency, they are directed to mention the same also in the further report to be filed”.

2. Meeting of the Joint Committee

In compliance with the Hon'ble NGT order dated 06/10/2020 a meeting was conducted by the joint committee on 21/12/2020 in the unit of M/s. ChemplastSanmar Limited Unit-II, Mettur Dam, Salem District.

The unit authorities made power point presentation regarding compliance of the Hon'ble NGT Committee recommendation and also explained about the compliance status of earlier field observations of the joint committee and compliance status w.r.t recommendations of the joint committee on SLFs.



3. Inspection of the Joint Committee

a) STP installation in Plant - I

The joint committee inspected plant-I and observed the construction activities of the STP. The civil works were under progress.



STP Work in Progress at Plant-1

b) Storm water management

The committee inspected the Plant-II, III, IV, V and Coal Power Plant to check the storm water management systems. In plant-II, the unit has proposed 5 roof top water collection schemes out of which 3 schemes were completed and remaining two schemes were under progress. In plant-III out of 5 schemes, 4 schemes were completed and one was in progress. In plant-IV all 4 schemes were completed. In Cabot plant, all the 2 schemes were completed. In coal power plant all 4 schemes were completed. The said units have also made arrangements to collect the surface run off water collection from the non process area & process area.



Storage Tank -25000 KL – Plant-III



Surface run-off water (non-process area) collection Tank – 600 KL – Plant-II



Plant-III Sparestorage tank – Capacity: 2517 KL

c) Online monitoring in Storm water

The unit has installed online monitoring system for pH, TDS and COD at the outlet of the storm water runoff of plant-II & plant -III. It was observed that the unit has not provided online monitoring for storm water outlet in plant-IV.



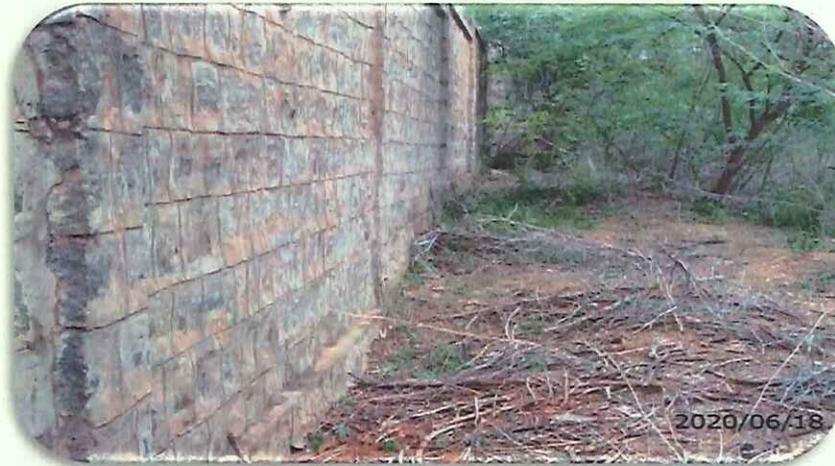
Storm Water Analyzers- Plant-II



Storm Water Analyzers- Plant-III

d) Oozing of water

Oozing of water from outside of the plant-II was found during committee's earlier visit. The same area was inspected and found that there was no oozing of water. That area was dry during inspection.



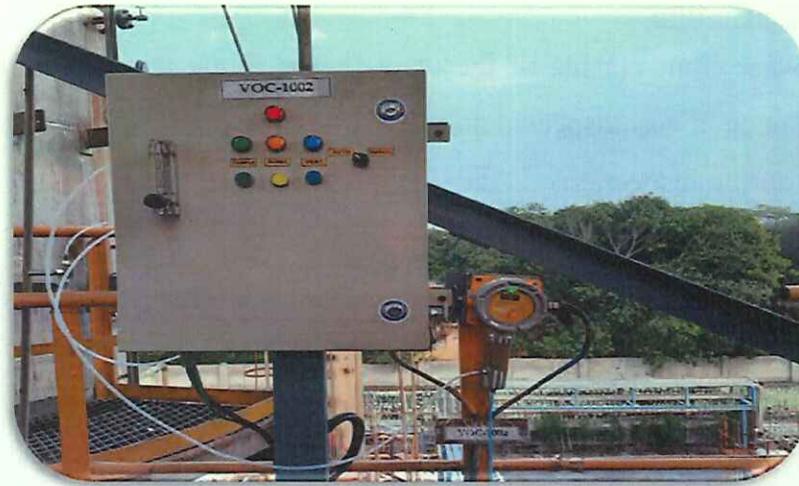
Environmental Inspection at Plant-II boundary wall side

e) Piezometric Borewells

The piezometric bore wells located in plant-I, II, III and Cabot SLFs were inspected by the committee and found that all the SLFs were provided with the required numbers of the upstream and downstream piezometric wells as per the guidelines of CPCB. The details of the piezometric wells are furnished vide **Annexure-II**.

f) Inspection of Plant-IV

The committee noticed that the unit has provided stack emission monitoring system (VOC) with suction motor and also it has installed alarm system for caution in case of exceedance of VOC limit in the stack. The unit has provided interlocking system in the production line with respect to the VOC concentration at the outlet of the absorbent bed. Further, the unit has provided siren system coupled with ambient VOC level to issue caution to the public.



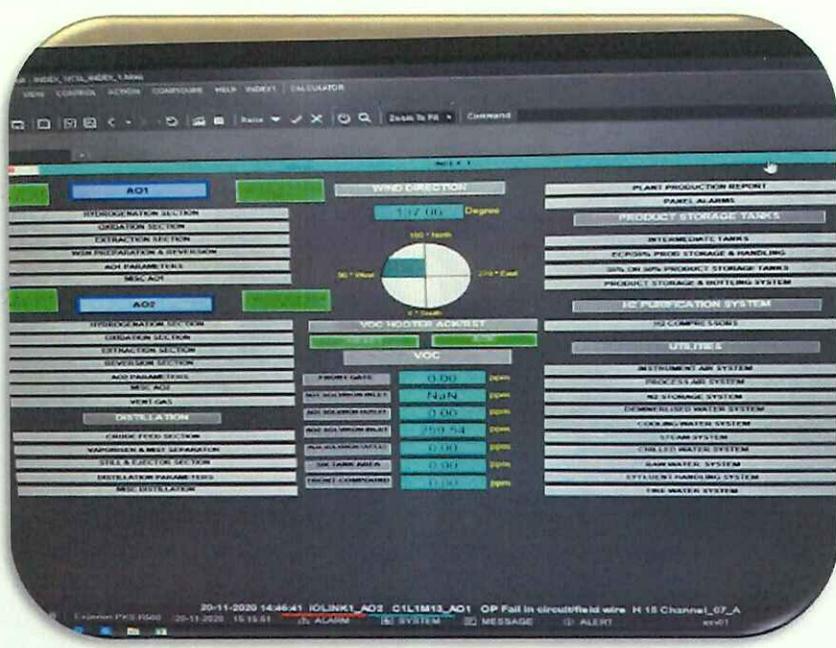
VOC Analyzers at Plant-4



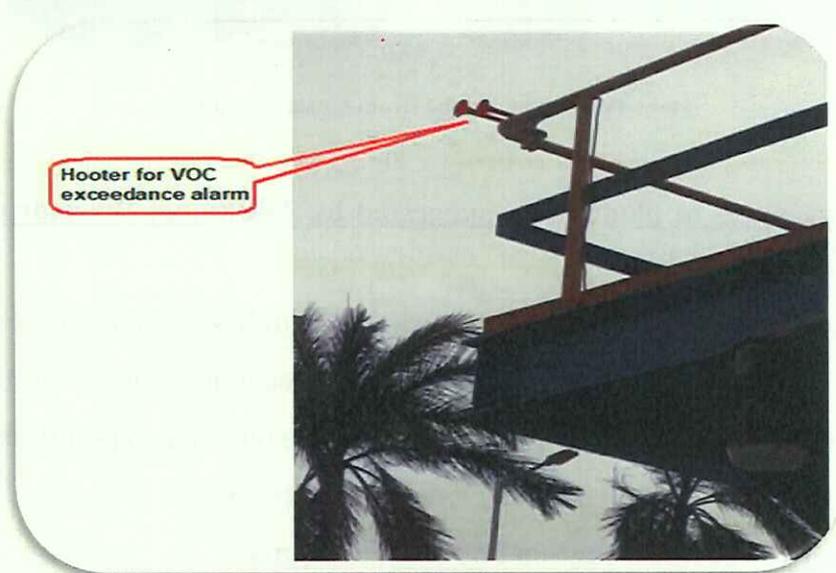
Ambient VOC Analyzers at Plant-4



Inlet VOC Analyzers of Adsorption beds -Plant-4



VOC level monitoring in DCS including adsorption bed inlet



Siren System at Plant-4

g) Rain water entry into Plant-IV

The origin of the storm water is from outside of the plant-IV and it was entering the plant through anodai(nullah). Earlier the committee recommended to close the rain water inlet to avoid rain water entry into plant-IV and to take action to reuse the storm water from seepage of plant. But, the unit has provided 2 Nos. of 8inch PVC line for transporting the water coming from northern side of the plant to the outside of the plant.

The unit has not made provision to collect the ground water seepage at plant-IV.



Plant-IV Water Channel (from outside boundary)

h) Safety measures in plant IV as suggested by Additional Director of Industrial Safety & Health.

The Additional Director of Industrial Safety & Health has recommended to implement 35 safety measures. The unit has implemented 30 recommendation and the remaining 5 recommendations are yet to be implemented by the unit. The report of the Director of Industrial Safety & Health is enclosed vide **Annexure-IV**.

4. The committee recommendation and its compliance.

Sl. No	Committee Recommendation	Unit's Reply	Joint Committee remarks.
1.	The unit has already provided STP for domestic effluent arising from Plant II & III. Now the Unit has installed one new STP w.r.t Plant IV & V and it is in operation. The Unit has not provided STP for domestic effluent w.r.t. Plant I & its colony and still sending domestic	Company is in the process of establishing a sewage treatment plant (STP) for Plant-I. All mechanical equipments arrived to the site. Civil work is in the advanced stage. STP will be in operation by end Jan 2021.	STP civil works are in progress(photo attached) Partially complied

	effluent into soak pit/septic tank.		
2.	The unit has installed adequate number of flow meter and web camera for monitoring at ZLD but no water auditing report made available to committee to verify the adequacy	A comprehensive water audit has been carried out by M/s Chennai Testing Laboratory Private limited (NABL and NABET accredited agency) for all Sanmar units of Mettur . The report covers the water balance & usage for the last 5 years period. It has been submitted the report in August 2020.	The unit submitted a third party report filed "Assessment of Water Management". The report comprises and highlights the water data of chemplast Mettur for a period of 5 years (2014-2019) and gauges the adequacy of the ZLD, however does not show the water balance.
3.	To stop disposing their hazardous waste in captive SLFs and to direct to sent to Common TSDF or Co-processing depending on the quality of Hazardous waste. The hazardous waste generated from Plant I, II & III is being disposed in captive SLF itself. Only the hazardous waste from Plant V is being sent to TSDF	<ul style="list-style-type: none"> ➤ Among the Sanmar plants of Mettur, Plant-III generates around 70% of the total waste generated from Mettur plants ➤ Plant-III has already disposing its waste to TSDF facility at Virudhunagar since March 2019 ➤ Currently all Sanmar plants of Mettur have obtained authorization from TNPCB to dispose their wastes to TSDF/ co-processing <p>All our plants currently disposing the waste to TSDF /co-processing instead of disposing in captive landfill. Annual expense is around Rs.184 Lacs.</p>	<p>The unit has stopped disposal of hazardous waste into the SLF's in all the plants in Mettur and they are disposing the same to the TSDF or co-processing.</p> <p>The unit require to provide detailed analytical report of Alumina waste to decide suitable disposal path way.</p> <p>Partially complied</p>

4.	<p>To take immediate steps to provide proper storm water management system to collect - roof top water separately, surface runoff from plant area separately and Surface run off from vacant land separately in all plants and to construct separate storage system so that these waters shall be utilized for industrial purpose with suitable treatment if required. No Storm water shall be let it out in public drains/Odai</p>	<p><u>a. Rain water collection from the roof top & reuse:</u></p> <p>Plant-II : 12000 SqM → 25000KL storage & reuse Out of 5 Schemes - 3 Schemes completed & 2 are in progress (Target date: Dec 2020)</p> <p>Plant-III: 3600 Sq.M → 25000KL storage (Tank-1) & reuse Out of 5 Schemes - 4 Schemes completed & one in progress (Dec 2020)</p> <p>Plant-IV :2000 Sq.M.- → 160KL tank - reuse for make up for Cooling Tower All 4 schemes completed</p> <p>Cabot :1230 Sq.M → 25000 KL Raw water storage tank & reuse. All 2 Schemes- Completed</p> <p>Coal Power: 5400 Sq.M → 4000 KL -Raw water storage tanks & reuse - All 4 Schemes- Completed</p> <p>Investment for these schemes: Rs.142 Lacs.</p>	<p>The origin of the storm water is from outside of the plant-IV and it was entering the plant through an odai (nullah). Earlier the committee recommended to close the rain water inlet to avoid rain water entry into plant-IV and to take action to reuse the storm water from seepage of plant. But, the unit has provided 8inch PVC line for the water coming from northern side of the plant.</p> <p>The unit has not made provision to collect the ground water seepage at plant-IV.</p> <p>The committee inspected the Plant-II, III, IV, V and Coal Power Plant to verify the storm water management systems.</p> <ul style="list-style-type: none"> • In plant-II, the unit has proposed 5 roof top water collection schemes and 3 schemes were completed and works for the remaining two schemes were in progress. • In plant-III out of 5 schemes, 4 schemes have been completed and the remaining one was in progress. • In plant-IV all the 4 schemes were completed. • In Cabot plant, all 2 schemes were completed. • In coal power plant all 4 schemes were completed. • The said units have also
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			<p>made certain arrangements to collect surface run off water collection from the non process area & process area. Though the unit has taken several steps to collect the roof water and surface run off, the unit shall explore the possibility to provide earthen reservoir / seepage pond to collect surface runoff from non-process area and to collect surface runoff from non process area and to recharge the ground water (as all the storage tanks are above ground level) and to reduce the water intake from the reservoir. By this means, there is a possibility for reduction of TDS levels present in the ground water.</p>
		<p><u>b. Surface run off -Plant Process Area:</u></p> <ul style="list-style-type: none"> ✓ The rain water in the uncovered process area & raw material storage area/ utilities of each Plant diverted to their respective ETP ✓ Only during the heavy rains (around 45 days spread over 3 months/year), the water is routed to ETP. Surplus water will be stored in the spare storage tank for treatment and subsequently gets 	<p>Diverted to the ETP.</p> <p>Though the unit has taken several steps to collect the roof water and surface run off, the unit shall explore the possibility to provide earthen reservoir / seepage pond to recharge the ground water (as all the storage tanks are above ground level) and to reduce the water intake from the reservoir.</p>

		<p>processed at ETP/ZLD(Capacity at Plant-II: 5824 KL and Plant-III: 2517 KL)</p> <p><u>c. Surface Runoff water collection- Non-process & other areas:</u></p> <ul style="list-style-type: none"> ✓ Rain water from the non-process areas , green belt, roads & housing colonyflowsthrough the storm water channel into a collection tank of 600 KL at Plant-II and 200KL at Plant-III ✓ This water will be pumped to the 25000 KL storage tank of the respective Plants ✓ During the heavy rains, the excess rain water will flow through the designated public drain supported by the on-line storm water analyzers installed at Plant-II & III channels for pH, TDS, COD and BOD monitoring on continuous basis. 	<p>Provided.</p> <p>On-line monitors installed.</p> <p>Partially Complied</p>
5.	<p>The industry shall explore the possibility of diversion of storm water drains which are passing inside the premises in consultation with local administration. In extreme circumstances of</p>	<ul style="list-style-type: none"> ➤ Storm water channel is a natural one. ➤ Only Government authorities can divert the channel & diversion of storm water outside the plant premises is beyond company's control. ➤ As suggested by the Joint 	<p>The unit has installed online monitoring system for pH,TDS,BOD and COD in two places of storm water drains passing through plant II &III</p> <p>However, the origin of the storm water is from outside</p>

	<p>non diversion of existing storm water drains (Odai), the unit required to install online monitoring system for pH, TDS, BOD and COD to ensure the natural quality of storm water/ surface water runoff.</p>	<p>Committee, the company has installed 2 sets of online monitoring system for pH, TDS, BOD and COD at the outlet of the storm water runoff at Plant-II & Plant-III with an</p>	<p>of the plant-IV and it was entering the plant through an odai (nullah). Earlier the committee recommended to close the rain water inlet to avoid rain water entry into plant-IV and to take action to reuse the storm water from seepage of plant. But, the unit has provided 2 Nos. of 8inch PVC line for the water coming from northern side of the plant.</p> <p>The unit has not made provision to collect the ground water seepage at plant-IV.</p> <p>Partially Complied</p>
6.	<p>To take steps to find out root causes for oozing of water from outside boundary wall of Plant – II (South west side) and sources of stagnant water in the area</p>	<ul style="list-style-type: none"> ➤ Oozing of water from outside Plant-II boundary wall side and stagnant water is a very rare phenomenon due to very heavy rain in Nov 2019 just before the visit of the Joint Committee. ➤ It seems to be one off occurrence. ➤ The oozing of water has not been seen after Nov 19 including during the recent rains. The area is being inspected on regular basis. 	<p>Oozing of water from outside of the plant-II was found during committee's earlier visit. The same area was inspected and found that there was no oozing water. That area was found dry during inspection.</p> <p>Complied</p>

<p>7.</p>	<p><i>To provide Continuous Ambient Air Quality monitoring stations (CAAQM) in four directions around the Plant-II, III, IV, V and Power Plant. The Plant shall monitor PM10, SOx, NOx, Chlorine and VOC</i></p>	<p>➤ List of online ambient air monitors already installed at the respective Sanmar plants of Mettur based on the relevancy to the operation of each Plant is detailed in “Online monitors- Mettur”.</p> <p><i>All continuous monitoring of ambient air quality parameters namely Particulate matter, Chlorine, VOC, SO2 and NOx in Mettur plants as detailed below:</i></p> <p>➤ Continuously operated VOC monitors (AAQ) at Plant-II (2 Nos), Plant -III (2Nos) and Plant-IV (2 Nos) and to CAC – No deviation.</p> <p>➤ Continuously operated AAQ Chlorine monitors, at Plant-II (8Nos) and III (12 Nos) - including monitors at periphery –No Deviation</p> <p>➤ Only areas concerned with particulate matter - Plant-II PVC driers, boilers of coal Power Plant and Coal yard were provided with continuously operated Particulate monitors and PM10 &PM2.5 (Coal yard)- No Deviation</p> <p>➤ SO2 & NOx also monitors continuously operated at the Coal Power Plant boiler stack as it is the only prime source for emission- No Deviation</p> <p>➤ Monthly AAQ survey</p>	<p>The unit reported that the unit has provided continuous VOC, chlorine monitors and also continuous stack monitors with respect to particulate matter SO_x, & NO_x.</p> <p>But, Continuous monitoring is required to measure the pollutant ground level concentration at a particular distance. Since many hazardous chemicals are being handled in the unit-II, III, IV & V, it is essential to provide online continuous Ambient Air Quality monitoring station outside of the unit.</p> <p>During the meeting on 21/12/2020 the authorities of the unit agreed to provide two continuous AAQ monitoring stations in the upstream and downstream directions outside the unit. The committee recommends the same.</p> <p>Not Complied</p>
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		<p>(PM10, SOx, NOx, Chlorine and VOC) as well as stack monitoring through a third party agency having QCI/NABL accreditation</p> <ul style="list-style-type: none"> ➤ Advanced Environmental Lab of TNPCB is also carrying out the AAQ/Stack monitoring survey either bi-annually or annually based on the category of Industry. The results obtained from the above surveys reveal that there is no deviation in any of the parameters stipulated in the regulations ➤ TNPCB is monitoring Air Quality Monitoring station at Mettur under National Air Quality Monitoring Program (NAMPP) from 2013. The results are in terms of AAQ Index - no time recorded with any deviation ➤ Hence , providing of continuous ambient air quality monitoring stations (CAAQM) in four directions around the Plant-II, III, IV, Cabot Sanmar and Power Plant is redundant, given the fact that there already exists adequate monitoring system in place 	
8.	The Plant shall provide more effective chiller to the solvent recovery Plant for better recovery	<p>Compliance initiated.</p> <ul style="list-style-type: none"> ❖ Company has ordered for a new chiller which operates at 5 Deg C instead of the 	The unit has reported that purchase order has been issued to provide chiller for better recovery of the

	<p>of the solvent</p>	<p>existing chiller at 10 Deg C with an investment of Rs 70 Lakhs.</p> <ul style="list-style-type: none"> ❖ TVOC at off gas chiller inlet : 36.33 kg/hr (3166 ppm) ❖ The carbon beds are designed for 75 kg/hr organic load with an Operating load of 45 kg/hr. ❖ However the plant is operated at an TVOC load around 3.2 kg/hr ❖ With new chiller, this is expected to drop from the present 3.2 kg/hr (280ppm) to 2.7 Kg/hr (236 ppm). ie 16 % reduction of load. ❖ Even though the existing chiller itself is adequate , the introduction of new chiller (5 Deg C) and with sufficiently over designed adsorber capacity will acts as additional protection & if any abnormal process excursions <p>The existing water-cooled condenser has been provided with chiller at its outlet. This outlet is connected with a water seal. This ensures containment of VOC within the condenser itself.</p>	<p>solvent. Copy of the purchase order is attached vide Annexure-III. Also, it was reported that it will be provided before January-2021.</p> <p>Partially Complied</p>
9.	<p>The unit shall provide adequate number of additional adsorbent beds for better control of VOC emission further.</p>	<p>✓ Company has ordered a new Chiller with lower operating temperature of 5 Deg C, which makes a significant reduction of organic load to</p>	<p>The unit reported that additional absorbent is not required since proposed chiller will reduce the organic load to the adsorber.</p>

		<p>the adsorber. Thereby the TVOC load to the Solvicon adsorption bed is expected to drop from the present 3.2kg/hr to 2.7 Kg/hr.</p> <ul style="list-style-type: none"> ✓ Company has installed the steam + solvent vent condensing chiller system at the vent of the solvent condenser in each Plant ✓ Under the current circumstances, the additional adsorbent bed installation will not be required in Plant-IV 	<p>It is submitted that the emission level of the adsorber will be monitored by the committee through a NABL approved third party auditing continuously for two days with the consented quantity of production rate. Thereafter, the committee will report on the requirement of the additional Air pollution control system to control VOC emission.</p> <p>Partially Complied</p>
<p>10.</p>	<p>In addition to adsorbent beds, the unit shall be directed to install Regenerative Thermal Oxidizer (RTO) system to achieve the VOC emissions below 5 microgram /Nm³</p>	<ul style="list-style-type: none"> ✓ The operating Solvent Recovering Unit is adequately designed to achieve the VOC emission level of less than 5 mg/nm³ ✓ Company has validated the adequacy of the existing chiller & adsorber efficiency through third party study ✓ Technologically, RTO's function with exit threshold limits similar to SRUs ✓ i.e., RTO is an alternative technology to SRU's and not for use sequentially. ✓ Point source of emission is prescribed in milligram /NM³. ✓ Ambient air quality standard is expressed in microgram/nm³. ✓ Under the prevailing circumstance, RTO is not 	<p>The unit reported that RTO is not required since the proposed chiller will reduce organic load to the adsorber. The committee recommends the emission level of the adsorber will be monitored by the committee through an approved third party auditing continuously for two days with the consented quantity of production rate. Thereafter, the committee will report on the requirement of the additional control measures to control VOC emission.</p> <p>Partially Complied</p>

		required	
11.	The concentration of VOC at outlet of adsorbent should be interlocked with production line. The Plant shall provide proper stack emission monitoring system (VOC monitoring) with suction motor. The Plant shall install alarm system to give caution in case of exceedance of VOC limit in the stack	<p>Complied with.</p> <ul style="list-style-type: none"> ✓ Company has already introduced an interlock to stop production in case VOC exceeds 15 ppm at the outlet of the adsorbent vent. ✓ VOC emission monitoring system has been installed with suction motor at the inlet & outlet of the SRU ✓ This system is in operation since Sep-2020 ✓ An alarm system is introduced in the monitoring system to caution in case of VOC emission level exceeds 10 ppm. 	<p>The unit has provided inter lock system; and the same will be demonstrated through mock drill during subsequent inspection by the committee.</p> <p>Complied</p>
12.	The Plant shall provide Siren system coupled with ambient VOC monitoring system to give alert to public in case of exceedance of TVOC in ambient air	<p>Complied with.</p> <ul style="list-style-type: none"> ❖ Company has already installed an "Alert" siren system which is coupled with the threshold VOC value of 5 ppm measured by VOC monitors installed at the periphery of Plants .(northern & southern directions). <p>6 VOC monitors & samplers : Rs.10.5 Lacs</p>	<p>The unit has provided siren system and it is in operable condition.</p> <p>Complied</p>
13.	The Plant shall carry out automation in the adsorbent section to control emission	<p>Complied with.</p> <ul style="list-style-type: none"> ✓ Three activated carbon adsorption beds operate on "Merry-go- round" sequence automatically in each SRU ✓ During the operation, there are two beds in the 	<p>The unit has done automation in the adsorber section and operation will be confirmed during subsequent inspection by the committee.</p>

		adsorption mode & one is in regeneration mode in sequence and every half an hour, the changeover of the adsorption beds is taking place.	Complied
14.	The unit shall regularly calibrate all the VOC monitors installed at the stacks attached to adsorbent beds and provide proper data to Care Air Centre of TNPCB, Guindy at all times	<p>Complied with.</p> <ul style="list-style-type: none"> ➤ VOC monitors installed at the SRU stacks and the ambient air quality monitoring stations are periodically calibrated by the competent agency. ➤ Calibration Certificate dated 24 11 20-attached ➤ VOC Monitors are also connected with Care Air Centre of TNPCB. 	<p>VOC monitors have been calibrated and the unit authorities furnished documents in this regard.</p> <p>Complied</p>
15.	The unit shall be directed to implement all safety measures in Plant IV as suggested by Additional Director of Industrial Safety & Health	<p>Complied with.</p> <ul style="list-style-type: none"> ✓ All the 35 safety related recommendations pointed out by Additional Director of Industrial Safety & Health were implemented, which includes a safety audit by an external agency. <p>Compliance status attached.</p>	<p>The report of the Director of Industrial Safety & Health is enclosed vide Annexure-IV.</p> <p>Partially complied</p>
16.	To take action to reuse the storm water collected from seepage of the Plant during rainy time. The Plant shall take necessary steps to close the rain water inlet line to avoid the rain water entry into Plant IV	<ul style="list-style-type: none"> ➤ The origin of the storm water is from outside of Plant-IV & it is entering the Plant through a nullah due to geographical inclination and going outside ➤ There is no change in the characteristic of storm water entering inside the plant and the water going out of the plant. The water flow is 	<p>The origin of the storm water is from outside of the plant-IV and it was entering the plant through an odai (nullah). Earlier the committee recommended to close the rain water inlet to avoid rain water entry into plant-IV and to take action to reuse the storm water from seepage of plant. But, the unit</p>

		<p>continuous only during rainy season for about 3-4 months in a year</p> <ul style="list-style-type: none"> ➤ If the inlet provision to the plant is closed, it may lead to collapsing of the wall at the northern side due to water stagnation ➤ Establishment of 8 inch PVC line for the total diversion of water coming from northern side of the plant through the pipeline for the entire length of 370 m till the outside to remove any doubt of pickup in the stream from our plant area (Amount spent: Rs.12.6 Lacs) ➤ Additionally, company is discussion with the land owner of the shallow portion of the land at the northern side of Plant-IV to sort out the issue on permanent basis. 	<p>has provided 2 Nos. of 8 inch PVC line for transporting the water coming from northern side of the plant to the outside of the plant.</p> <p>The unit has not made provision to collect the ground water seepage at plant-IV.</p> <p>Partially complied</p>
17.	No investigation has been carried out with respect to Type of Soil/ Permeability of Soil.	<ul style="list-style-type: none"> ✓ The investigation on soil type/quality and its permeability aspects have been done and covered in the Impact study carried out by Dr. Swaminathan, Ex NEERI Scientist in 2003. Pl refer page # 24-26 of the Dr Swaminathan report. 	Committee recommends that this part is to be covered in the proposed NGRI study since NGRI study can provide information whether there is any seepage from the SLF
18.	Single liner of 1.5 mm thickness is provided. Liner system was not provided as per CPCB criteria	<ul style="list-style-type: none"> ✓ Based on the State Ground and Surface Water Resources Data Centre, Chennai, the data obtained for the ground water level in the nearest area 	Committee recommends that this part is to be covered in the proposed NGRI study since NGRI study can

		<p>to ChemplastSanmar Plants indicate that the ground water level is in the range of 18.2 - 22.6 meters.</p> <ul style="list-style-type: none"> ✓ As per the CPCB guidelines, if the ground water table is between 2 to 6 m, then the liner system shall be double composite liner. ✓ However, as per the above stated data, the ground water level is much deeper than the prescribed criteria. If the ground water level is more than 6 m from the base of the SLF, then a single liner would suffice. ✓ In addition to above, the SLF area is in highly impermeable rocky in nature and hence is adequate to have a single liner system for the SLFs at CSL plants. <p>This is further corroborated with the findings made in the Impact Study carried out by Dr. Swaminathan, Ex NEERI Scientist in 2003 (at page #28).</p>	<p>provide information whether there is any seepage from the SLF</p>
19.	<p>The trench network is not provided and no Leachate collection system exists in any closed SLF.</p>	<ul style="list-style-type: none"> ✓ Company's Secured landfill areas are located in hilly terrain. All SLFs are below ground level. (ie., not stored above ground level). Hence the garland trench is not applicable to CSL captive SLFs. ✓ ChemplastSanmar Plants SLFs are dedicated to each plant, thus the heterogeneity 	<p>Committee recommends that this part is to be covered in the proposed NGRI study since NGRI study can provide information whether there is any seepage from the SLF</p>

factor with respect to the material disposed is totally eliminated.

- ✓ In addition to above, SLFs which are in operation, are being covered with Tarpaulin to minimize the rain water entry/impact during monsoon. Thus the generation of Leachate is minimized as low as possible.
- ✓ Company has provided leachate collection system for all the active SLFs mainly to enable collection of the leachate during rainfall, which is pumped to ETP to complete the treatment & disposal.
- ✓ There is no collection of leachate water in any of the SLFs, which has been observed over a period of time, proves that leachate is collected only during the rains in the active SLFs.
- ✓ *There is no need for leachate collection from any of the capped / closed SLFs as these SLFs due to the following reasons:*
- ✓ capped/closed as per our closure plan involving the combination of 75mm of clay and 50 mm sand on both sides of 1.5 mm thickness of HDPE liner and finally a concrete capping (75mm) on

		<p>top of it</p> <ul style="list-style-type: none"> ✓ no stagnation of rain water on the top of the landfill because of its higher slope nature of the top concrete cover ✓ no scope for entry of rain water into the closed SLFs ✓ SLFs in each Plant are significantly very small in size and the quantity disposed in each cell is very minimal, which will not develop any self-weight to squeeze the hazardous waste to generate any leachate ✓ lower inherent moisture content in the sludge ✓ No organic content in the sludge resulting no possibility of water generation due to biodegradation. 	
<p>20.</p>	<p>No phased operation of SLF.</p>	<ul style="list-style-type: none"> ✓ Medium and large size SLFs. Any SLFs less than 5 Hectares is considered as small SLF. (Medium = 5 -20 Hec; Large: above 20 Hec) ✓ Phased operation is applicable for the landfill of much higher size as this allows the <i>progressive use of the landfill area</i> such that at any given time , a part of the site may have a final cover, a part being actively filled, a part being <i>prepared to receive waste</i>, and a part 	<p>These are the deviation of operational procedures- practised by the unit, However, cumulative impact may be assessed based on the NGRI study in case of any environmental damages reported.</p>

		<p><i>undisturbed, non-conforming waste storage</i> – the typical phases of operation of TSDF</p> <p>✓ In case of Mettur plant landfills, the area of Plant-1 SLF (1-No) only 0.06 Hectares, in plant-2 (15 SLFs) - 0.921 Hectare, in Plant-3 (14 SLFs) - 2.3 Hectare and in CabotSanMar (4 SLFs) - 0.36 Hectares. (Total: 3.641 Hec)</p> <p>✓ Therefore, it is clear that the <i>SLFs in each plant are significantly very small</i> in size .Also these landfills were constructed one by one</p> <p>After total establishment of each of the SLF, the SLF was put into operation</p> <p>During the operation, the waste is being dumped from one side and moved further till it the SLF gets filled. The filled area is covered with Tarpaulin.</p>	
21.	Record Keeping and Waste inspection not maintained	<p>Following record of planning and execution of waste disposal is being maintained at site of individual plants:</p> <ul style="list-style-type: none"> ➤ Impact Study carried out using external expert during 2003 covering various details like site criteria, geological/hydro-geological features of the area, topography, design aspects, landfill components etc., ➤ Drawings of the landfill 	<p>Presently, the unit is monitoring and maintaining records regarding sludge generation and disposal details to the TSDF.</p> <p>Complied</p>

		<p>construction</p> <ul style="list-style-type: none"> ➤ Standard Operating Procedure (SOP) for operation, maintenance, inspection & monitoring ➤ Operational records like quantity of waste disposed date wise ➤ Waste Loading inspection, vehicle inspection, Spreading & compaction activity, landfill cover inspection, leachate collection / pumping, spillage etc., ➤ Monitoring reports of Piezometric wells ➤ Visitor entry record etc., ➤ Monthly waste disposal data (Form-3) ➤ Annual return on Waste disposal (Form4) <p>Records with respect to SLFs was reviewed by various agencies including TNPCB, MOEF and CPCB periodically and no deficiency observed in the maintenance of such records as on date</p>	
<p>22.</p>	<p>The monitoring wells not meeting the criteria of CPCB</p>	<ul style="list-style-type: none"> ➤ As per the CPCB guidelines minimum of 4 Piezometer / ground monitoring wells (one in up gradient and three in down gradient) shall be provided. ➤ Plant-III is totally complying with this requirement. ie., each SLF is provided with at least one upstream & three 	<p>The piezometric bore wells of the SLFs located in plant-I, II, III and Cabot plant were inspected by the committee.</p> <p>The group units have now provided the required numbers of the upstream and downstream piezometric wells for all the SLFs as per</p>

		<p>downstream monitoring wells.</p> <p>➤ Additional Piezometric wells have been installed for the other Plants, namely Plant-I (3 Nos), Plant-II (5 Nos) and CabotSanmar (4 Nos) to comply with this criterion.</p> <p>(Amount spent : Rs.7 Lacs)</p> <p>Annexure- Plant-I, Plant-II , Plant-III, Cabot Sanmar – Piezometer wells</p>	<p>the guidelines of the CPCB.</p> <p>The details of the piezometric wells are furnished vide Annexure II</p> <p>Complied</p>
23.	No closure plan was observed in all 30 closed SLFs.	<p>As per clause 7.2 of CPCB criteria for Secured Landfills, the cover system shall be designed, constructed and installed to satisfy the following:</p> <ul style="list-style-type: none"> ✓ Prevent infiltration of precipitation into the closed landfill ✓ Promote drainage of surface water accumulated on the cover ✓ Minimize erosion of the cover ✓ Withstand or accommodate settlement of the cover to maintain its integrity ✓ Have permeability less than or equal to the liner system ✓ Function with minimum maintenance of the post-closure period of 30 years. <p>Hence All SLFs are capped with six layers of protection as follows to prevent any infiltration of precipitation into the closed landfill and to avoid</p>	<p>Committee recommends that this part is to be covered in the proposed NGRI study since NGRI study can provide information whether there is any seepage from the SLF.</p>

		<p>erosion of the top soil cover.</p> <ul style="list-style-type: none"> ✓ 75 mm thickness clay layer ✓ 50 mm thickness sand layer ✓ 1.5 mm thickness HDPE liner (Geomembrane) ✓ 75 mm thickness clay layer ✓ 50 mm thickness sand layer ✓ 75 mm thickness concrete layer. ✓ Since the plants at Mettur and its SLFs are located at higher elevation (approx. 250m from mean sea level) in a hilly terrain, the chance of soil erosion is very high. Hence establishing vegetative top soil cover may lead to soil erosion/sliding. <p>The capping system is in compliance with the CPCB criteria for capping SLFs except the vegetative top soil cover. Instead of soil cover, Sanmar units are provided with a concrete cover with sloping at all sides (to prevent water stagnation at the top), which is more efficient and costlier than the soil cover.</p> <p>In order to fulfill all of the above criteria, we have designed and installed a more suitable concrete capping system instead of vegetative soil cover</p>	
24.	No gas collection system provided to extract gas if any from SLF	❖ The waste stored in all the Mettur plants contain 100% inorganic constituents. No bio-degradable organic	Committee recommends that this part is to be covered in the proposed NGRI study since NGRI study can

		<p>material is disposed in any of the SLFs.</p> <ul style="list-style-type: none"> ❖ The comprehensive analysis report of these samples reveals that there is no organic matter present in any of these wastes, hence there is no possibility of generation of any gas, including CO₂, from the SLF. ❖ Hence, gas collection system is not applicable at all for ChemplastSanmar units' landfills. 	<p>provide information whether there is any seepage from the SLF.</p>
25.	<p>No monitoring carried out as per the post closure criteria</p>	<p>Monitoring of secured landfills after closure, is being carried out in the following ways:</p> <ol style="list-style-type: none"> 1) Monitoring of Piezometric Wells through third party lab (QCI/NABL accredited) as well as through TNPCB for any deviation or sudden raise in active ingredient migration to the wells. 2) Inspection of the secured landfills for any breakage/ defects for rectification and abnormality around the landfills including wild growth. The closed SLFs are being inspected as per the checklist once in 2 weeks. <p>Annexure – Well analysis Inspection of SLF Checklist used.</p>	<p>Committee recommends that this part is to be covered in the proposed NGRI study since NGRI study can provide information whether there is any seepage from the SLF.</p>

6 Conclusions of the Joint Committee based on the field observations and compliance verifications as on 21.12.2020:

i. Status of compliance w.r.t recommendations of first Committee

- The unit has taken steps to install STP in Plant – I, during inspection civil work was found under progress
- The unit has completed the water auditing. A comprehensive water audit has been carried out by M/s Chennai Testing Laboratory Private limited (NABL and NABET accredited agency) for all Sanmar units in Mettur. The report comprises and highlights water data of chemplast mettur for period of 5 years (2014-2019) and gauges the adequacy of the ZLD however does not show the water balance of the units in the present, based on the real time study.
- The data in the total industrial water consumption was 4759 KLD during 2014 and it has been reduced to 4337 KLD during 2019.
- The unit has stopped disposal of hazardous waste into their SLF and taken steps to send the same to TSDF, however the unit is yet to obtain the authorisation from TNPCB to send the Alumina waste for co-processing as per the CPCB guideline.
- The unit has taken steps to segregate and collect storm water plant area and vacant area, however, it was observed that 80 % of segregation and collection work found completed and balance work found under progress. It was informed that around Rs.142 lakhs was spent for implementation of segregation and collection of storm water schemes.
- The unit has installed online monitoring system at two places of storm water drains passing through Plan II & III for monitoring of pH, TDS, COD and BOD. The unit has not taken any steps to collect the ground water seepage at plant –IV.
- No Oozing of water from outside of the plant – II was found, the area was found dry during the inspection which indicates that the same has been arrested.
- The unit has not installed recommended CAAQM station. However, the authorities of the unit agreed to provide the two CAAQM stations but no target time is committed.

ii. Status of compliance w.r.t implementation of pollution control measures in Plant IV

- ❖ The unit has been issued purchase order for procurement of new chiller which operates at 5°C to improve solvent recovery.
- ❖ The unit claims that addition of new chiller reduces 16 % of TVOC load on absorber and no additional requirement of adsorbent beds.

- ❖ The unit has installed additional water cooled condenser at outlet with water seal to ensure containment of VOC.
- ❖ The unit claims that new chiller along with existing adsorbent is adequate to meet the VOC of 5 microgram/ Nm³. However the committee expressed that decision on requirement of additional adsorbent and Regenerative Thermal Oxidiser (TRO) will be taken after assessment of detailed emission level after installation of new chiller.
- ❖ The unit has completed the automation system in adsorbent section to control emission.
- ❖ The unit has provided the interlock system as a safety measures to avoid any accidental failure of pollution control measures.
- ❖ The unit also installed siren system coupled with ambient VOC monitoring system to give alert to public in case of exceedance of TVOC in ambient air.

iii. Status of Compliance made in SLFs of Plant I, II, III & V

- ✓ The unit has installed additional 3 Nos of piezometers in plant I, 5 Nos of piezometers in Plant II and 4 Nos of Piezometers in Plant V.
- ✓ The unit has stopped disposal of Hazardous waste into SLFs, the Committee felt that the decision on continuation of SLFs will be taken based on the outcome of study conducted by NGRI.

iv. Status compliance made w.r.t safety measures taken in Plant IV

- ✓ The unit has implemented 30 safety measures against the 35 safety measures suggested by the Industrial Safety & Health.
- ✓ Status of balance measures are incorporated in Sl.No.6 in the committee recommendations.

6. Recommendation of the Committee.

1. The plant-I shall complete the STP works before January-2021 as reported.
2. The plant-IV shall require to provide detailed analytical report of Alumina waste to decide suitable disposal path way.
3. The unit shall make provision to collect ground water seepage at plant-IV and to treat the same if required.
4. The unit shall take effective steps to avoid oozing of high TDS water in the southern side of plant-II in future as it is done at present.

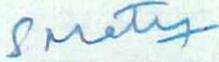
5. The unit shall collect the runoff water during heavy monsoon and store the same in the eastern reservoir/seepage pond to reduce the TDS level in the ground water in that area.
6. The unit shall provide online continuous monitoring in the upstream and downstream side as agreed during the meeting with committee in consultation with TNPCB. The remaining two directions shall be covered in due course of time.
7. The unit shall provide chiller to control the VOC emission as reported.
8. The additional adsorbent bed requirement for VOC emission control and also additional safety measures will be decided by conducting emission audit by the committee for two days through a suitable accredited agency after installation of chiller since residences are located in the nearby area. During audit time, the unit shall operate the plant with the consented quantity.
9. The additional safety measure such as RTO requirement for VOC emission control for VOC emission control and also additional safety measures will be decided by conducting emission audit by the committee for two days through a suitable accredited agency after installation of chiller since residences are located in the nearby area.
10. Effective steps to conduct NGRI study needs to be undertaken for the allegation of ground water pollution in the vicinity of the M/s. ChemplastSanmar group of units and safety of the SLF located in the plant-I, II, III & V.
11. The Director of Industrial Safety and Health (OSD), Directorate of Industrial Safety and Health, Chennai recommended to carryout the following measures.
 - (i) For Hydrogenator, temperature and pressure gauges shall be fixed at upper middle and lower level for physical measurement and maximum permissible level marking in colour is necessary. Hence, temperature and pressure gauges shall be fixed at upper, middle and lower level for physical measurement and maximum permissible level marking in colour.
 - (ii) The Electrical cable tray and hydrogen storage tank shall be separated by a fire resistance barrier.
 - (iii) The purity of hydrogen before entering Hydrogenator shall be checked for impurities (i.e.,) to avoid carbon steel waste particles.
 - (iv) VOC (Volatile Organic Compounds) monitor shall be provided near the final product outlet or process completion area.
 - (v) As the compatible raw materials are stored in the ground floor in case of fire/explosion the buildings, its structures including the roof sheet will collapse. Hence, such storages shall be shifted to safe place. Also, Electrical

connections shall be removed (or) made flame proof. Smoke detectors shall be provided.

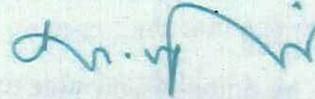
The committee recommends for carrying out the above measures.



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