

Waste Management - II Division
Central Pollution Control Board, Delhi

Sub: Minutes of the 35th meeting of the Technical Expert Committee (TEC) for "Evaluation of proposals for utilization of hazardous wastes under Hazardous and Other Wastes (Management and Transboundary Movement) (HOWM) Rules, 2016".

1. The 35th meeting of TEC for "Evaluation of proposals received from various industries for utilization of hazardous wastes under Rule 9 of HOWM Rules, 2016" was held during 24 – 25, July 2023 by CPCB, Delhi through hybrid mode.
2. Ms. Deepti Kapil, Sc. D & Member Convener (TEC), Waste Management-II Division, CPCB, Delhi, welcomed the Chairman and members of the committee and apprised the agenda of the meeting to TEC. The list of the participants is enclosed at ***Annexure A***.
3. Based on the trial study reports, the draft Standard Operating Procedures (SoPs) & Checklist of Minimal Requisite facilities for utilization of hazardous waste were discussed by the committee. Recommendations of the committee are tabulated below:

S.no.	SoP	Recommendations
1.	SoP for utilization of ETP Sludge (generated from pickling activity) in manufacturing of Ferrous Sulphate	<p>Gujarat PCB along with the unit presented the findings of trial run conducted at M/s Prakriya Metals and Chemicals, Mehsana, Gujarat for utilization of ETP Sludge (generated from pickling activity) as supplementary material (alongwith iron scrap) in manufacturing of Ferrous Sulphate.</p> <p>The committee observed the following:</p> <ol style="list-style-type: none"> i. The trial study was conducted for utilization of ETP sludge generated from the pickling activity of Mild steel (M.S.) and Stainless Steel (S.S.) products respectively. ii. During the utilization process ETP sludge is utilized along with iron scrap. The oxidation state of iron in the ETP Sludge is reduced from +3 to +2 by addition of Iron scrap (0-oxidation state). iii. High chromium & nickel content was observed in ETP Sludge during the trial run specifically in sludge from SS products. iv. The analysis report of hazardous waste, mother liquor, and the product does not reflect complete mass balance of chromium (Cr) and nickel (Ni). Further, analysis of the sludge generated from the filter press has also not been carried out.



		<p>v. The mother liquor produced after centrifugation is proposed to be recycled. However, the details on saturation level of mother liquor for recycle or disposal was not provided.</p> <p>The committee suggested for following:</p> <ol style="list-style-type: none"> Unit shall submit the reactions involved in said utilization process alongwith mass balance of all heavy metals present to GPCB. Unit to work upon the number of cycles that can be allowed prior to final disposal in view of the building up of the contaminants in the mother liquor. Also the unit shall propose adequate treatment of exhausted mother liquor to maximize the possible number of recycling of the mother liquor and final exhausted mother liquor to be disposed of as per the consent condition. The final proposal of unit shall be verified by GPCB and shall also carry out sampling and monitoring to establish unit's proposal. The report shall then be put forth before the committee. Sludge from the filter press during the utilization process shall be handled as per the authorization. <p>The committee recommended for deliberation of the matter in subsequent TEC, upon receipt of above information from GPCB.</p>
2.	SoP for Utilization of process residue (generated during the production of Glufosinate Technical Pesticide) for recovering 93% Ethanol (C_2H_5OH) and 30% Sodium Acetate (CH_3COONa)	<p>Gujarat PCB along with the unit presented the findings of trial run conducted at M/s UPL Limited, Unit-5, Ankleshwar, Gujarat for utilization of process residue generated during the production of Glufosinate Technical Pesticide for recovering 93% Ethanol (C_2H_5OH) and 30% Sodium Acetate.</p> <p>The committee observed the following:</p> <ol style="list-style-type: none"> Hazardous waste (process residue) utilized during the trial run is the process residue containing ethanol > 30%, which is generated from the distillation units during the manufacturing of Glufosinate (Technical Pesticide). The above said process residue is highly acidic in nature and thus requires safe handling. The utilization process further generates 03 different

		<p>hazardous wastes i.e., Salt Sludge, Carbon sludge, and Organic liquid waste.</p> <p>iv. The recovered Ethanol and Sodium Acetate are of purity 92.86 % and 31.63 % respectively.</p> <p>v. As per the BIS standards (IS 323:2009 and IS 15464:2004) the purity requirements of Ethanol is 95% for Rectified spirit for industrial use and 99.5 % for Anhydrous Ethanol for use in Automotive fuel respectively.</p> <p>The committee suggested for following:</p> <p>i. SoP shall be prepared for Utilization of the Process residue containing ethanol >30 % [generated during the manufacturing of Glufosinate (Technical Pesticide)], prescribing the category of hazardous waste as Process residue - 29.1 of Schedule-I under HOWM Rules, 2016.</p> <p>ii. Alkali scrubber shall be provided to the reactors and the vacuum pump of the distillation column in the said utilization process.</p> <p>iii. Hazardous wastes generated during the utilization process shall be handled as below:</p> <p>a) Salt sludge generated from the agitated nutsche filter attached to the acid reactor – To be disposed of in the TSDF.</p> <p>b) Carbon sludge generated from the filtration of Sodium acetate – To be disposed of in Common Hazardous Waste Incineration Facility (CHWIF) or for Co-processing.</p> <p>c) Organic liquid waste generated as 1st cut in the distillation unit – To be disposed of in the CHWIF or for Co-processing.</p> <p>iv. Recovered Ethanol shall be reused back into the manufacturing of Glufosinate (Technical pesticide) and the recovered Sodium acetate shall be used for industrial purposes.</p> <p>v. The recovered sodium acetate shall NOT be utilized in food & beverages, pharma, healthcare industries or as additive in automobile fuel.</p>
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3.	SoP for utilization of Spent Magnesium Chloride Solution (generated from Glufosinate Technical Pesticide) in Recovery of Magnesium Chloride Flake	<p>Gujarat PCB along with the unit presented the findings of trial run conducted at M/s UPL Limited Unit-5, Ankleshwar, Gujarat, for utilization of Spent Magnesium Chloride Solution (generated from Glufosinate-Technical Pesticide) in recovery of Magnesium Chloride Flakes.</p> <p>The committee observed the following:</p> <ol style="list-style-type: none"> The spent MgCl₂ is formed during Diethyl methyl Phosphite (DEMP) preparation which is the first step of manufacturing Glufosinate. The category of spent MgCl₂ was prescribed as B10 of Schedule II in the authorization of the unit. High concentration of TOC was observed in the spent MgCl₂ which was reduced by treating with Hydrogen peroxide during utilization process. Wastewater generated from reactor & drum flaker is proposed for using as scrubbing media and then in low boiler distillation before treatment in ETP. GPCB suggested the possible option of utilizing recovered MgCl₂ in industrial wastewater treatment – such as Magnesium Ammonium Phosphate (MAP) process of CETP for treatment of ammonical nitrogen. During the utilization process, aqueous solution of magnesium oxide reacts with free chloride and increases the concentration of MgCl₂. <p>The committee suggested for following:</p> <ol style="list-style-type: none"> Caustic scrubber shall be provided to the vent of reactors & storage tanks. The category of spent MgCl₂ shall be mentioned as B-10, Note 7 of Schedule II of HOWM rules, 2016 in the SoP. The unit shall use hydrogen peroxide during the utilization process to reduce TOC in hazardous waste i.e.



		<p>spent $MgCl_2$ to improve the product quality.</p> <p>iv. The first cut of wastewater generated from the distillation column is sent for co-processing or incineration and second cut of wastewater is sent to ETP.</p> <p>v. The scrubbing bleed liquor shall be sent to ETP for treatment before final disposal.</p> <p>vi. Organic waste/reactor residues generated during the utilization process shall be disposed of in CHWIF.</p> <p>vii. The end usage of final product i.e. recovered $MgCl_2$ may be permitted in pulp and paper industry, textile industry, in cementing material and in refrigeration subject to meeting the quality criteria as defined in IS: 254-1973 and in industrial wastewater treatment pertaining to Magnesium Ammonium Phosphate (MAP) process of CETP.</p> <p>The committee recommended finalization of SoP by CPCB upon incorporating the above suggestions.</p>
4.	SoP for Utilization of ETP sludge (generated during manufacturing of Phenolic compound) along with coal in boiler	<p>CPCB, Regional Directorate-Vadodara presented the findings of a trial run conducted at M/s Deepak Phenolics, Gujarat for utilization of ETP sludge (generated from waste water treatment of Phenolic manufacturing industry) along with coal in boiler.</p> <p>The committee observed the following:</p> <p>i. The trial study was conducted for captive utilization of ETP sludge in boiler.</p> <p>ii. ETP sludge and coal are utilized in the proportion of 0.5:99.5 during the trial study and treated with lime for feeding into the boiler.</p> <p>iii. Trial study was carried out in fluidized bed combustion chamber boilers of 100 and 150 tones per hour of capacity.</p> <p>iv. The boiler temperature was maintained $>800^{\circ}C$.</p> <p>v. The unit has provided ESP as APCD.</p> <p>vi. During the trial, SO_2 exceeded the prescribed standard in case of both with and without utilization of ETP sludge.</p>

		<p>The committee suggested for following:</p> <ol style="list-style-type: none"> i. Any hazardous waste proposed to be used as supplementary resource along with conventional fuel in the boiler for energy recovery, the facility may have following minimal requisites: <ol style="list-style-type: none"> a. The minimum capacity of boiler to be 100 TPH of steam generation which shall be used in industrial operation including Captive Power generation. b. The boiler should be Fluidized bed combustion. c. The temperature of flue gases in boiler shall be maintained at not less than 850°C for at least 1 second duration. d. The facility should have pulverization unit for hazardous waste and coal mixing. e. The source of ETP sludge is from the treatment of the wastewater generated from phenol manufacturing plant which comprises of Dephenolization process. f. Alkali Scrubber in addition to ESP/Bag filters shall be provided for control of gaseous emissions. g. Dioxin-Furan in emissions shall not exceed the HW incinerator standards i.e. 0.1 ng TEQ/Nm³, for which the unit shall install flue gas treatment unit for adsorption with activated carbon. h. The TOC in boiler emissions shall not exceed 20 mg/Nm³. i. Apart from PCDDs and TOC, the boiler unit shall comply with standards stipulated by SPCBs/PCCs for PM, SO₂ and NO_x. ii. Utilization of ETP sludge shall not exceed 0.5% of the coal consumed in the boiler. <p>The committee recommended finalization of SoP by CPCB upon incorporating the above suggestions.</p>
5.	SoP for Utilization of Spent Hydrochloric Acid (generated during Chlorination of	<p>CPCB, Regional Directorate-Vadodara presented the findings of the trial run conducted at M/s Chemifs Chemicals Pvt. Ltd., Gujarat for utilization of Spent Hydrochloric Acid (generated during Chlorination of Phenol) for Manufacturing</p>

	Phenol) for manufacturing of Poly Aluminium Chloride	<p>of Poly Aluminum Chloride</p> <p>The committee observed the following:</p> <ol style="list-style-type: none"> Hazardous waste i.e., Spent HCl was generated during the scrubbing of the process gas liberated from the chlorination of Phenol. The trial study was conducted for utilization of Spent HCl in solution form only (10-12%), since the spray dryer plant was under maintenance during trail run. The intended utilization of recovered PAC is as coagulant in Effluent Treatment Plant or as sizing material in Pulp & paper industry. Process sludge generated during the filtration of the reacted mass is highly acidic in nature and the same is proposed to be reused in the process. <p>The committee suggested for following:</p> <ol style="list-style-type: none"> A dedicated storage area along with dyke wall, acid proof brick lined flooring with proper slope and collection pit shall be provided for the storage of process sludge generated from the filter press before reutilized in the process. SoP may be prepared for utilization of Spent HCl (generated during the scrubbing of the process gas liberated from the chlorination of Phenol) for Manufacturing of Poly Aluminium Chloride. The PAC produced may be utilized as coagulant in Effluent Treatment Plant or as sizing material in Pulp & paper industry. The process sludge shall handle as per the conditions of authorization. <p>The committee recommended finalization of SoP by CPCB upon incorporating the above suggestions.</p>
6.	Utilization of Sulpholane & KF solution in manufacturing of isomers of Fluoronitro benzene and tech	<p>CPCB, Regional Directorate- Pune presented the findings of inspection conducted at M/s Aarti Industries Ltd., Plot no. L-5, L-8, L-9/1, MIDC Tarapur (hereby referred as Unit-A) and M/s Aarti Industries Ltd., Plot no. L-10, MIDC Tarapur (hereby referred as Unit-B); as per the recommendation of TEC (28th meeting) to verify the hazardous waste source of generation, utilization process with monitoring.</p>

	salt (KCl)	<p>The committee observed the following:</p> <ol style="list-style-type: none"> Crude KCl (a by-product) is generated during manufacturing of Isomers of fluoro nitro benzenes {para fluoro nitrobenzene (PFNB) & difluoro nitro benzene (DFNB)} at Unit-A. This crude KCl is refined at Unit-B. During the refining process, 02 hazardous wastes (KF Solution and Sulfolane) get generated. These 02 hazardous wastes streams were proposed to be utilized in the manufacturing of Isomers of fluoro nitrobenzene at Unit-A. RD-Pune along with Maharashtra PCB have jointly inspected both above said units and conducted monitoring of Work zone emission (at both the units); Source emission (during drying of KF solution at Unit-A); Effluent (from sulfolane recovery system, inlet and outlet of ETP at Unit-A). Further carried out analysis of Crude KCl, refined KCl, and both hazardous wastes (KF Solution and Sulfolane). Analysis of the final product (Isomers of fluoro nitrobenzene {para fluoro nitrobenzene) derived using hazardous waste was not carried out. Analysis of the Spent KF solution indicates the content of KCl (32%) is more than that of KF (4%). <p>The committee suggested that analysis of final products i.e., Isomers of fluoro nitrobenzene {PFNB & DFNB} manufactured from utilization of hazardous wastes (KF Solution and Sulfolane) needs to be analysed. The amount of KCl present in the spent KF solution should also be examined</p> <p>Accordingly, the committee recommended for analysis of residues and products generated during the pre-treatment and final utilization of hazardous wastes, in line with the parameters as in the earlier inspection, by RD-Pune and MPCB.</p> <p>The facility may be permitted to operate for 2 weeks to carry-out sampling and upon receipt of the inspection report, the matter will be placed for further deliberation in the subsequent TEC meeting.</p>
7.	SoP for Utilization of Spent Acetic	Gujarat PCB alongwith the unit presented the findings of trial run conducted at M/s Hubergroup India Pvt. Limited,

	<p>Acid (generated from pharmaceutical sector) in manufacturing of Pigments to be used in production of Printing Ink</p>	<p>Vapi, for utilization of Spent Acetic Acid (generated from pharmaceutical sector) in manufacturing of Pigments to be used in production of Printing Ink.</p> <p>The committee observed the following:</p> <ol style="list-style-type: none"> The trial study was conducted on Spent acetic acid (14%) generated during manufacturing of 7-ADCA & spent acetic acid (30%) generated during manufacturing of paracetamol. The analysis results of spent acetic acids (i.e., 14% & 30%) and the final product (Pigment yellow) indicates variation in sulphate content, TOC, COD & heavy metals for both the laboratories. Also sulphate content in the waste water from filter press & Equalization tank shows variation. <p>The committee suggested for following:</p> <ol style="list-style-type: none"> It is required to characterize the spent acetic acid for the parameters conducted during trial study in accordance with HOWM Rules, 2016 from NABL accredited laboratory. The utilizer shall also characterize the final product (Pigment yellow) and waste water generated during utilization of spent acetic acid, for the parameters conducted during trial study in accordance with HOWM Rules, 2016 from NABL accredited laboratory. The utilizer shall submit a process flow diagram of complete utilization process with mass balance incorporating input & output of chlorides and sulphates from generation to disposal end. The utilizer shall submit BIS standards of the final product for determining the end usages of printing ink manufactured using pigment derived from hazardous waste utilization. GPCB may collect and consolidate the above information from both generators and utilizer. SPCB may permit the facility to operate temporarily for a period about 2 weeks for the proposed sampling activity for characterization. <p>The committee recommended further deliberation of the</p>
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		matter in subsequent TEC meetings upon receipt of above said information from GPCB.
8.	SoP for Utilization of process/ distillation residue [generated during manufacturing of Diphenol (Hydroquinone & Catechol)] as energy recovery in Boiler which will be used as Supplementary Source with Coal	<p>Gujarat PCB along with the unit presented the findings of trial run conducted at M/s Camlin Fine Science Limited, Bharuch, for utilization of process/ distillation residue [generated during manufacturing of Diphenol (Hydroquinone & Catechol)] as energy recovery in Boiler which will be used as Supplementary Source with Coal.</p> <p>The committee observed the following:</p> <ol style="list-style-type: none"> The spent process/distillation residue is generated during separation of hydroquinone & Catechol. The trial study was conducted by utilizing 5% of spent process/distillation residue as supplementary resource along with coal in the boiler for energy recovery. The capacity of boiler at the unit is 20 TPH. There is no blending or mixing mechanism provided by unit to ensure uniform mixture/blending of coal (95%) and HW (5%) before feeding. The proportionate/approximate quantity (about 5%) of HW is feed directly in the boiler from the residue bunker (3MT) manually by using Variable Frequency Drive. The analysis results carried out for emission monitoring, wastewater and fly ash conducted by 3rd party lab and GPCB indicates variation in heavy metal concentration. The fly ash contains 5% TOC however as per hazardous waste incinerator standard the maximum allowed TOC in fly ash is 3%. Unit has installed flaker for drying hazardous waste in place of earlier practice of collecting hazardous waste in open trays and subsequent open cooling and drying. Unit needs to take adequate measures to control fugitive emission near coal storage, crushing and boiler area and also take adequate measures to control SO₂ and NO_x in the flue gas. <p>The committee suggested for following:</p> <ol style="list-style-type: none"> The proposals for utilization of hazardous waste, such as process residue as a supplementary resource for energy in the boiler for energy recovery, the facility shall have



		<p>following minimal requisites:</p> <ol style="list-style-type: none"> The minimum capacity of boiler shall be 100 TPH of steam generation which shall be used in industrial operation including Captive Power generation. Shall use fluidized bed combustion boiler. The temperature of boiler shall maintain not less than 850°C for not less than 1 second. Provide pulverisation unit for the mixing of flaked hazardous waste and coal. Alkali Scrubber in addition to ESP/ Bag filters shall be provided for control of gaseous emissions. Dioxin-Furan in emissions shall not exceed the HW incinerator standards i.e. 0.1 ng TEQ/Nm³, for which the unit shall install flue gas treatment unit for adsorption with activated carbon. The TOC in boiler emissions shall not exceed 20 mg/Nm³. Apart from PCDDs and TOC, the boiler unit shall comply with standards stipulated by SPCBs/PCCs for PM, SO₂ and NO_x. <p>ii. Utilization of ETP sludge shall not exceed 5% of the coal consumed in the boiler.</p> <p>The committee recommended finalization of SoP by CPCB upon incorporating the above suggestions.</p>
9.	SoP for Utilization of Spent Hydro Fluoro Silicic acid (generated during manufacturing of Hydrofluoric acid) in production of Sodium/ Potassium/ Calcium/ Magnesium Silicofluoride	<p>CPCB presented the findings of a trial run conducted at M/s S.B. Chemicals, Gujarat for utilization of Spent Hydro Fluoro Silicic acid (generated during the manufacturing of Hydrofluoric acid) in the manufacturing of Sodium Silico Fluoride, Potassium Silicofluoride, Calcium Silico Fluoride & Magnesium Silicofluoride Hexahydrate.</p> <p>The committee observed the following:</p> <ol style="list-style-type: none"> During the trial run, mother liquor was generated in the said utilization process was treated by neutralization and filtration. The final filtrate (treated effluent) was discharged to CETP. The unit mentioned that the cakes generated from treating the mother liquor were reused in the said utilization

		<p>process.</p> <ul style="list-style-type: none"> ii. Unit informed that scrubber bleed and the cake generated from the i.) alkali scrubber attached to the reactor and ii.) wet scrubber attached to the dryer respectively, were reused back in the utilization process. iii. Fluoride content in the Mother liquor is reduced from ~2000 mg/L to 2 mg/L in the final treated effluent, which may not be feasible with settling and neutralizing treatment alone. iv. The products derived from the said utilization process have the end usage in glass industry, ceramic industry and metallurgy industries. <p>The committee suggested for following:</p> <ul style="list-style-type: none"> i. All the cakes and residues (scrubber bleed) proposed to be reused in the above said utilization process may be analyzed in line with the parameters analyzed in the final product and final treated effluent during the trial study. ii. Fluoride content shall be analyzed in the mother liquor, final treated effluent, and intermediate samples during the treatment of the mother liquor. iii. CPCB RD-Vadodara and GPCB may carry out the above said monitoring at the applicant facility - M/s S.B. Chemicals, Gujarat and submit the report. iv. The facility may be permitted by SPCB to operate utilization process temporarily for about 2 weeks for the purpose of sampling / characterization <p>The committee recommended further deliberation of the matter in subsequent TEC, upon receipt of the report as suggested above.</p>
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4. In addition to the above, following representations were considered:

S. no	Agenda	Details about the proposal	Recommendations
i.	Representation on utilization of ETP sludge generated from	GPCB has presented the joint representation by	<p>The committee observed the following:</p> <ul style="list-style-type: none"> i. Due to topographical conditions in the Greater Kutch area, large area



S. no	Agenda	Details about the proposal	Recommendations
	neutralization facility of Bromine manufacturing unit) in bund construction	<p>(1) M/s. Agrocel Industries Pvt. Ltd,</p> <p>(2) M/s. Archean Chemical Industries Pvt. Ltd,</p> <p>(3) M/s. Satyesh Brine chem Pvt. Ltd and</p> <p>(4) M/s. Solaris Chemtech Industries Ltd</p> <p>on utilization of Gypsum sludge generated from Neutralization facility of Bromine Manufacturing Unit for the bund construction around the bittern ponds in the area leased to above industries.</p>	<p>of brine ponds undergoes progressive evaporation by natural phenomenon and converts the brine water into bittern. This bittern is used for extracting the Bromine. The process of recovery of bromine generates de-brominated acidic bittern.</p> <p>ii. The acidic bittern is neutralized in the ETP with lime thus generating Gypsum (Calcium sulphate) as waste. This Gypsum has been generated in large quantities (1-1.5 MT of gypsum per MT of bromine) by the units.</p> <p>iii. The units have leased large areas of bittern ponds and these areas need large quantity of construction materials for development of intermediate dyke/ bunds for dividing the pond area.</p> <p>The committee suggested the following:</p> <p>i. Allowing unlimited quantities of foreign substances (i.e., Gypsum) into natural environment of brine ponds could lead to deterioration of natural quality of bittern, further unlimited use of gypsum in bunds may gradually reduce effective volume of bittern ponds, and it may also affect bittern quality and the yield of bromine. However such impacts needs to be studied.</p> <p>ii. Construction of bunds/ dykes by using Gypsum generated from aforementioned units in Brine</p>



S. no	Agenda	Details about the proposal	Recommendations
			<p>fields of a limited portion of leased area may be monitored for 1-2 years to study adverse effects and a report in this regard should be submitted to GPCB. In this regard the unit shall engage a reputed government institution like CSIR as may be identified by GPCB. This study may provide guidance on the quantity of gypsum that can be used (in bunds) for unit area of bittern ponds, and the desired quality of gypsum for making such bunds.</p> <p>iii. Further, GPCB may also opt for using a dedicated portion of pond area isolated and contained for storage of Gypsum alone.</p> <p>iv. The option of using a dedicated portion of pond area contained for storage of Gypsum needs to be explored based on the studies.</p> <p>v. The other options for utilization of waste gypsum outside the bittern ponds may be explored.</p> <p>Accordingly, the committee recommended that GPCB may provide necessary permission to the units as outlined above.</p>
ii.	Proposal regarding Amendment in existing SoPs #85 for utilization of Spent Hydrochloric acid for	In the said SoP Spent Hydrochloric acid sources of generation are (i) dye & dye intermediates (vinyl sulphone) & (ii) synthetic organic chemical sector (chlorobenzene)] for	<p>The committee observed the following:</p> <p>i. GPCB has submitted compiled analysis data of spent HCl generated from various organic chemical manufacturing industries.</p> <p>ii. In order to clarify the source of generation, GPCB submitted that main source of spent HCl is scrubbing of process gas liberated during the chlorination of various organic</p>



S. no	Agenda	Details about the proposal	Recommendations
	manufacturing of Calcium chloride	<p>manufacturing of Calcium chloride.</p> <p>The request is made by GPCB to generalize the industrial sector as source of generation instead of specific vinyl sulphone & chlorobenzene</p>	<p>compounds.</p> <p>The committee suggested the following:</p> <p>i. As the standards (limits) have already been prescribed in the existing SoP for major contaminants (TOC & COD), Spent HCl (from scrubbing of process gas liberated during the chlorination process of various organic compounds) meeting those prescribed standards may be considered for utilization.</p> <p>Accordingly, committee recommends that source of generation may be amended as "spent HCl generated from scrubbing of process gas liberated during the chlorination process of various organic compounds" instead of specific source such as vinyl sulphone or chlorobenzene.</p> <p>Further, the committee recommends revision of existing SoP #85 for utilization of Spent Hydrochloric acid for manufacturing of Calcium chloride, upon incorporating above suggestions.</p>
iii.	Representation regarding the provision of boiler temperature during utilization of ETP sludge	<p>CPCB has prepared SoPs for recovery of energy utilizing hazardous waste specially ETP sludge as supplementary fuel.</p> <p>The proposal is regarding to define a minimum temperature for operation of boilers with safe utilization of hazardous waste.</p>	<p>The committee observed that two proposals (S.No. 3.4 & 3.8) have already been discussed in this meeting regarding utilization of ETP sludge & process/distillation residue in the boiler for energy recovery.</p> <p>In view of decisions recommended above, the committee suggested that proposals for utilization of hazardous waste in boilers shall be maintained at</p> <p>(i) a minimum temperature of 850°C with residence time of 1 second.</p> <p>(ii) Only fluidized bed combustion boiler shall be used for utilization.</p> <p>Accordingly, CPCB may amend existing SoPs as required and define the minimum temperature condition in the boilers.</p>
iv.	Amendment in draft SoP for	GPCB requested to consider the sources	The proposal was deferred for



S. no	Agenda	Details about the proposal	Recommendations
	utilization of Spent Hydrochloric acid [generated from organic chemical sector] in pickling process of galvanized wire	of generation of spent HCl for organic chemical sectors as submitted in matter of revision of SoP #85 above. Also it is requested to consider the end use of spent HCl in the pickling process for all metal and not for only galvanized wire.	deliberation in subsequent TEC meeting.
v.	Representation regarding Utilization of Spent acetic acid for recovery of Acetic acid	<p>GPCB in receipt of applications for utilization of Spent acetic acid (generated from pharmaceutical sector) for recovery of Acetic acid by azeotropic distillation method i.e., for manufacturing glacial acetic acid from Spent acetic acid.</p> <p>In this regard, a SoP#63 is already available for the for manufacturing Acetic anhydride from Spent acetic acid with defined process and checklists for minimal requisites.</p> <p>However, the unit claimed that the process may not require suction hood/Alkali scrubber with process units, Spare vessel to transfer the reaction mass, Furnace, Absorption column,</p>	<p>GPCB detailed that the process of recovery of Acetic acid from Spent Acetic acid is similar to the process of recovery of Spent Solvent, since the distillation process for solvents and acids is similar in nature with boiling points ranging from 100 to 150°C and thus suggested for consideration of Spent acetic acid as Spent Solvent for which SoP#1 is already available.</p> <p>The committee opined that matter need to be deliberate in detail with regard to Source of generation of Spent acetic acid, its constituents from the source of generation, typical characteristics, complete utilization proposal and deviation with existing SoP, if any.</p> <p>The committee recommended to deliberate the matter in subsequent TEC meeting upon receipt of detailed proposal from GPCB/ unit.</p>



S. no	Agenda	Details about the proposal	Recommendations
		recovery column and chiller and Connection of vent of all the dilute acetic acid storage tanks to be connected to condenser which were prescribed in the said SoP.	

5. The following applicants were requested to make a technical presentation:

- i. M/s Vedanta Limited, (Smelter & CPP) At- Bhurkamunda, Sripura, Jharsuguda-768202, Odisha.
- ii. M/s Atul Limited, Atul Village and Haria village, Taluka and District Valsad, Gujarat
- iii. M/s Aspee Chemicals Plot No: 328/A, Phase-II, GIDC- Naroda, Ahmedabad, Gujarat-382330.

The details of the proposals along with the recommendations of the committee on the above proposals are given in **Annexure-B**.

M/s Atul Limited, Valsad, Gujarat has withdrawn its proposal hence, the Rule 9 application is disposed of.

6. The meeting ended with a vote of thanks to the chair.



Annexure A**List of Participants**

Sl. No	Name	Designation and Organization	Member of the Committee / Invitee
1.	Dr. Anil K Saxena	Former Director, National Productivity Council, Delhi	Chairman
2.	Sh. D. M. Thakker	Member Secretary, GPCB	Invitee
3.	Sh. P. C Rauta	Additional Chief Environment Engineer, State Pollution Control Board, Odisha	Member
4.	Sh. N. A. Shah	Unit Head, Hazardous Waste Cell, Gujarat Pollution Control Board	Member
5.	Sh. Rajan	Additional Chief Environment Engineer, Tamil Nadu Pollution Control Board	Member
6.	Sh. R K Gupta	Superintending Engineer, Madhya Pradesh Pollution Control Board	Member
7.	Dr. S.K. Goyal	Chief Scientist & Head, CSIR-NEERI, Delhi	Member
8.	Dr. Sandeep Kumar Dixit	Assistant Professor, Department of Chemistry, S.S. (PG) College, Shahjahanpur, UP	Member
9.	Sh. B. Vinod Babu	Division Head, WM-II, CPCB, Delhi	Member
10.	Ms. Deepti Kapil	Scientist D, WM-II Division, CPCB, Delhi	Member Convener
11.	Sh. Nishchal C	Sc. D, CPCB, Regional Directorate- Pune	Invitee
12.	Ms. Kavita B.V.	Sc. D, CPCB, Regional Directorate- Vadodara	Invitee
13.	Sh. Manoj Kumar Sharma	Sc. B, CPCB, Regional Directorate- Vadodara	Invitee
14.	Ms. Sarah M. Syed	Assistant Environmental Engineer, Gujarat Pollution Control Board	Invitee
15.	Ms. Medha Sharma	Scientist C, WM-II Division, CPCB, Delhi	Invitee
16.	Sh. M. V. Srinivas	SRF, WM-II Division, CPCB, Delhi	Invitee
17.	Sh. Mohd Salik	SRF, WM-II Division, CPCB, Delhi	Invitee



Annexure B**Recommendation of TEC for proposals under Rule 9 of HOWM Rules, 2016.**

S. no.	Name of the unit	Hazardous Waste details	Product	Brief Process	Recommendations
1.	M/s Vedanta Limited, (Smelter & CPP) At-Bhurkamunda, Sripura, Jharsuguda-768202, Odisha	Spent pot liner (generated from Aluminium Smelters) falls under hazardous waste category 11.2, Schedule I of HOWM Rules, 2016)	As supplementary fuel along with coal for energy production in captive power plant	The crushed SPL Carbon will be fed directly in the conveying line that is feeding crushed coal in the grinding equipment feeding the ground coal & SPL to the boiler.	<p>The unit has presented the proposal. Upon deliberation the committee observed that the unit intended to directly feed the SPL alongwith coal in the boilers of the existing captive power plant of capacity 135MW. The unit currently has 09 boilers ready for trial purpose but the unit has requested for considering only one boiler.</p> <p>All boilers of the unit are Pulverised fuel boilers with operational temperature 1150°C & residence time 1.25 sec.</p> <p>The committee also observed that the unit is not treating the SPL before utilization for cyanide & fluoride. As per the comments of the unit, the thermal treatment process of boilers, Fluorine reacts with Metal Oxide and Cyanide undergoes thermal destruction. Cyanide decomposes into CO₂, water and NO at temperature >300°C. The Fluorine reacts with the available Calcium oxide to become CaF₂.</p> <p>Upon deliberation, the TEC is of the view that the operations such as handling of SPL including pulverization and blending would</p>



S. no.	Name of the unit	Hazardous Waste details	Product	Brief Process	Recommendations
					<p>require special attention as there is a risk of exposure to dust containing fluoride and cyanide. Committee recommended for trial run to utilize hazardous waste (i.e., Spent Pot Liner) for 3 days (Day 1: with 100% fuel quantity as coal; and Day 2: 0.5% amount of fuel as SPL, treated with lime, & 99.5% of Coal;) with the following monitoring parameters & conditions:</p> <ul style="list-style-type: none"> i. Hazardous waste (i.e Spent Pot Liner) to be analyzed for CNHS, Calorific value, ash content, LoI, SiO₂, Al₂O₃, Fe₂O₃, Na, F, CN Heavy metals (Zn, Pb, Hg) as per schedule-II of HOWM Rules, 2016. ii. The unit shall install adequate systems to eliminate dust during handling, pulverizing, blending and firing. iii. Bottom and fly ash to be analyzed for Ash content, CNHS, Calorific Value, CN Heavy Metals (Zn, Pb, Hg) as per schedule-II of HOWM Rules, 2016. iv. Emission from the stack of boilers to be monitored for parameters: SO_x, NO_x, PM, TOC, Total fluoride, HF, NH₃, HCN.

S. no.	Name of the unit	Hazardous Waste details	Product	Brief Process	Recommendations
2.	M/s Aspee Chemicals Plot No: 328/A, Phase-II, GIDC-Naroda, Ahmedabad, Gujarat-382330	Spent sodium acetate [generated during manufacturing of specialty chemicals (aromatic compounds)] falls under HW category under category – 26.1 at Schedule I and B-36 (Salts of pre-acids) under Note-7 at Schedule II of HOWM Rules, 2016	Sodium acetate	<p>Sodium acetate crystal: Solution of sodium acetate is concentrated upto 45% by heating into closed tawada. After completion of heating, the material shall be cooled naturally to form sodium acetate crystal.</p> <p>Sodium acetate (anhydrous): Two mole of acetic acid and one mole of soda ash are slowly added into closed tawada with manual stirring. This reaction started $\text{CH}_3\text{COONa} \cdot 3\text{H}_2\text{O}$ is obtained. Due to the heating of water molecules are decomposed and anhydrous lumps of sodium acetate are formed.</p>	<p>The unit has presented the details of proposals.</p> <p>Upon deliberation, the committee observed that the unit is only performing physical change through the tawada process i.e. open evaporation. Thus the proposal may not fall into the ambit of Rule 9.</p> <p>However, it is further acknowledged that GPCB had earlier conducted a trial study for recovery of sodium acetate from spent sodium acetate (generated during manufacturing of pharma products) and draft SoP in this regard has been discussed in the 34th TEC meeting. It is important to note that trial study was performed with different processes including neutralization, purification method and use of cationic surfactant, etc. Also, a trial run has been granted to M/s Shree Shubh Industries after discussing the proposal in 32nd TEC for conducting trial study to recover sodium acetate from spent sodium acetate (generated during manufacturing of dye & dye intermediates).</p> <p>In this regard, the committee suggested that such proposals being received for recovery of sodium acetate utilization shall require a</p>



S. no.	Name of the unit	Hazardous Waste details	Product	Brief Process	Recommendations
					<p>comprehensive purification system for removal of impurities instead of heating/ evaporation technique alone. It was also suggested that actual users of sodium acetate may be encouraged to recover the same from spent sodium acetate by applying under Rule 9 for eliminating the traders.</p> <p>The committee recommended that the GPCB may submit a technical proposal on purification mechanism for removal of impurities from spent sodium acetate based on current industrial practices and available technologies in the State. Further consideration of the matter for trial study may be taken-up in subsequent TEC meeting.</p>

