Standard Operating Procedure and Checklist of Minimal Requisite Facilities for utilization of hazardous waste under Rule 9 of the Hazardous and Other Wastes (Management and Transboundary movement) Rules, 2016

Utilization of Spent Sulphuric Acid generated from dye & dye intermediates industries and chemical manufacturing industries as neutralizing agent in Effluent Treatment Plant (ETP)/Common Effluent Treatment Plant (CETP)

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Central Pollution Control Board

(Ministry of Environment, Forest & Climate Change, Government of India)

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Procedure for grant of authorization by SPCBs/PCCs for utilization of Hazardous waste

1) While granting authorisation for utilization of hazardous wastes, SPCBs/PCCs shall ensure that authorisation is given only to those wastes for which SoPs on utilisation have been circulated by CPCB ensuring the following:
   a. The waste (intended for utilization) belongs to similar source of generation as specified in SoP.
   b. The utilization shall be similar to as described in SoP.
   c. End-use/ product produced from the waste shall be same as specified in SoP.
   d. Authorisation shall be granted only after verification of details and minimum requisite facilities as given in SoP.
   e. Issuance of passbooks for maintaining records of receipt of spent acid for utilization.
2) After issuance of authorization, SPCB shall verify the complaisance of checklist and SoP on quarterly basis for initial 2 years; followed by random checks in the subsequent period for atleast once a year.

   In-case of lack of requisite infrastructures with the SPCBs/PCCs, they may engage 3rd party institutions or laboratories having EPA/NABL/ISO17025 accreditation/ recognition for monitoring and analysis of prescribed parameters in SoPs for verification purpose.
3) SPCBs shall provide half yearly updated list of units permitted under Rule 9 of Hazardous & Other Wastes (Management & Transboundary Movement) Rules, 2016 (HOWM Rules, 2016) to CPCB and also upload the same on SPCB website, periodically. Such updated list shall be sent to CPCB on a half yearly basis i.e by July and January respectively.
4) Authorisation for utilisation shall not be given to the units located in the State/UT where there is no Common TSDF, unless the unit ensures authorised captive disposal of the hazardous waste (generated during utilisation) or its complete utilisation or arrangement of sharing with any other authorised disposal facility.
5) In case of the utilization proposal is not similar with respect to source of generation or utilization process or end-use as outlined in this SoP, the same may be referred to CPCB for clarification /conducting trial utilization studies and developing SoPs.
6) The source and work zone standards suggested in the SoP are based on the E(P)A notified and OSHA standard respectively, however, SPCB/PCC may impose more stringent standards based on the location or process specific conditions.

49.0 Utilization of spent sulphuric acid:

Type of HW	Source of generation	Recovery/Product
Spent sulphuric acid (Category: 26.3 of Schedule I of HOWM Rules, 2016 and Inorganic Acids mentioned at S. No 15 in the foot note of Schedule II of HOWM Rules, 2016)	Generated from: (i). Dyes & dyes intermediates industries, and (ii). Chemical manufacturing industries	As a neutralizing agent in ETP/ CETP

49.1 Source of Waste

The spent sulphuric acid is generated from manufacturing of dyes and dyes intermediate industries and chemical manufacturing industries and is categorized as Hazardous waste at S.No. 26.3 of Schedule I of HOWM Rules, 2016 and Inorganic Acids mentioned at S. No 15 in the foot note of Schedule II of HOWM Rules, 2016, which are required to be disposed in authorized disposal facility in accordance with authorization condition, when not utilized as resource recovery.

49.2 Utilization Process

The spent sulphuric acid is used in wastewater treatment plant (Effluent Treatment Plant/Common Effluent Treatment Plant) as a neutralizing agent (by replacing use of fresh sulphuric acid). In neutralizing process pH of alkaline wastewater is reduced by using neutralizing agent. The dosing of neutralizing agent (i.e. spent sulphuric acid) is done in ETP/CETP in equalization tank/ before flash mixer. The effluent goes through screen chamber, collection tank, equalization tank, flash mixer, flocculation tank, primary clarifier, aeration tank, secondary clarifier and treated effluent storage tank. After treatment, the treated effluent may be discharged in accordance with the conditions stipulated in the Consent to Operate issued by respective SPCB/PCC. Typical flow diagram for utilization of spent sulphuric acid in ETP/CETP is shown in Figure 1.

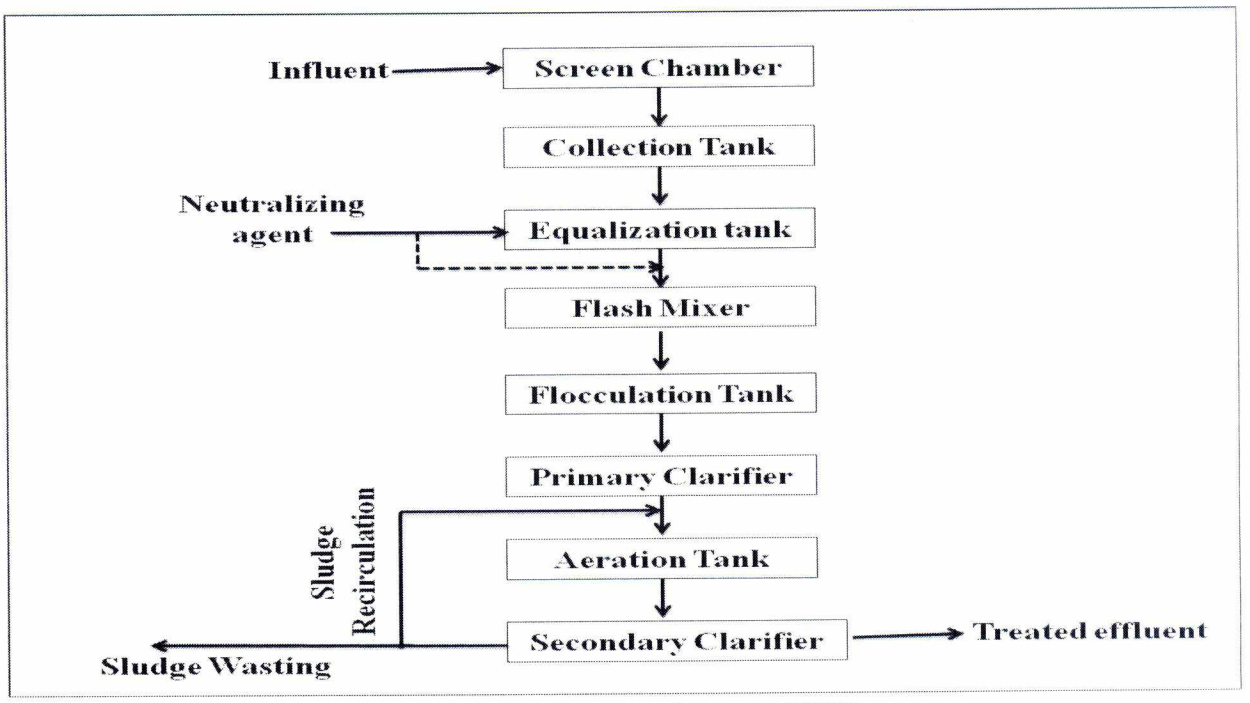

Figure 1: Typical Flow diagram for ETP/CETP

49.3 Product Usage / Utilization

The spent sulphuric acid shall be utilised in wastewater treatment plant (i.e. ETP/CETP) as a neutralizing agent in equalization tank/ before flash mixer.

4.9.4 Methodology for finalization of quantity and quality of Spent Sulphuric Acid for utilisation in CETP/ ETP as neutralizing agent

1) MOEF&CC vide Office Memorandum No: SO 3518(E) dated 23/11/2016 notified the procedure to issue permission for the "Change in product mix without increase in pollution load". As per this notification, all SPCBs shall have to frame Technical Committee to implement the notification.

2) It is envisaged that wherever scrutiny and assessment are required in this SoP, implementation of this SoP is done through the above committee and in case the said committee has not been constituted then implementation be done through committee constituted for implementation of HOWM Rule, 2016, by the SPCBs/PCCs. Further, the following shall be the responsibilities of Technical Committee while reviewing the application for utilisation of spent sulphuric acid:

   a) Technical committee shall check characteristics of spent acid i.e. COD/TOC, Acidity, Heavy Metals and Toxicity generated from the source industry.
   b) The quality of industrial wastewater shall be reviewed so as to evaluate the feasibility of utilization of spent acid.
   c) The committee shall permit the quantity for utilization of spent acid for neutralization into CETP/ETP based on mass balance, water balance, inlet/outlet standards, results of Jar test, design criteria of CETP/ETP,
   d) In no case, the spent acid having parameters (except pH) exceeding the inlet or design norms of CETP/ETP, whichever is stringent, shall be permitted for utilization. Further, the norms for the heavy metals and pesticides shall not exceed following:

No.	Parameters	CETP Inlets Norms
1	Arsenic	0.2 mg/l
2	Total Chromium	2 mg/l
3	Hexavalent Chromium	0.1 mg/l
4	Copper	3 mg/l
5	Lead	0.1 mg/l
6	Mercury	0.01 mg/l
7	Nickel	3 mg/l
8	Zinc	5 mg/l
9	Cadmium	2 mg/l
10	Pesticides	Absent
11	Cyanide	0.2 mg/l

   e) In case if parameters are exceeding the inlet or design norms of CETP/ETP, such cases may be referred to CPCB to prepare specific SoP.
   f) The spent acid generated from dyes & dyes intermediate industries and chemical manufacturing industries having high COD and toxicants shall not be utilised in neutralization.
   g) The adequacy certificate/ treatability report of final treated effluent complying prescribed standards in Consent to Operate issued under Water Act shall also be assessed prior to granting authorization for such spent sulphuric acid for neutralization into CETP/ETP.
   h) The general conditions shall be complied as mentioned in this SoP.
   i) Based on the recommendation of the Technical Committee, SPCB shall grant authorization to unit under Rule 9 to utilize Spent Acid for neutralization of industrial waste water in CETP/ ETP.

99.5 Standard Operating Procedure for utilization

This SoP is applicable only for utilization of spent sulphuric acid generated during manufacturing of dyes and dyes intermediate industries and chemical manufacturing industries as neutralizing agent in ETP/ CETP.

1) The spent sulphuric acid shall be transported in SPCB/PCC authorized tankers mounted on vehicles fitted with requisite safeguards ensuring no spillage of the same.

2) There shall be a designed space for unloading of spent sulphuric acid into the storage tank. The receiving storage tank shall be placed above the ground and contained with low raise parapet/bund wall with slope to collect spillages, if any, into collection pit. Alternatively, storage tanks for spent sulphuric acid may be kept below the ground provided it has HDPE liner system beneath the tank and leachate collection system below HDPE liner. In the event of leachate detection in the leachate collection system, corrective measures shall be taken immediately.

3) The unit shall install storage tank under cool, dry, well ventilated covered storage shed(s) within premises, as authorized by the concerned SPCB/ PCC under Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016, so as to eliminate rain water intrusion.

   Further, the storage area shall have leak-proof floor tiles with adequate slope to collect spillage, if any, into a collection pit. The spillage from collection pit shall be transferred to ETP/CETP, as the cases may be, through chemical process pump.

4) There shall be no manual handling of the hazardous wastes (spent sulphuric acid). Acid proof pump shall be used for transfer of spent sulphuric acid through pipelines to the spent sulphuric acid dosing tank.

5) The treated effluent shall be discharged in accordance with the conditions stipulated in the Consent to Operate issued by respective SPCB/PCC under the Water (Prevention and Control of Pollution) Act, 1974.

6) The unit shall maintain proper ventilation in the work zone and process areas. All personnel involved in the plant operation shall wear proper personal protective equipment (PPE) specific to the process operations involved and type of chemicals handled as per Material Safety Data Sheet (MSDS). The safety precautions of the worker shall be in accordance with the Factory Act, 1948, as amended from time to time.

7) It shall be ensured that the aforesaid hazardous waste is procured from the industries who have valid authorization for the same from the concerned State Pollution Control Board as required under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

8) The hazardous wastes generated (such as ETP sludge) shall be collected and temporarily stored in non reactive drums / bags under a dedicated hazardous waste storage area and be sent to authorized common TSDF or other authorized facility within 90 days from generation of the waste in accordance with the authorization issued by the concerned SPCB/PCC. Such storage area shall be covered with proper ventilation.

9) SPCBs/PCCs shall ensure synchronization of generation and utilization of spent sulphuric acid and the same shall be reflected in respective authorization specifying name and quantity.

10) Transportation of spent sulphuric acid shall be carried out by sender or receiver (utilizer) only after obtaining authorisation from the concerned SPCB under the Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016.

11) Prior to utilization of spent sulphuric acid, the unit shall obtain authorization for generation, storage, and utilization of spent sulphuric acid solution from the concerned State Pollution Control Board under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016.

12) In case of environmental damages arising due to improper handling of hazardous wastes including accidental spillage during generation, storage, processing, transportation and disposal, the unit shall be liable to implement immediate response measures, environmental site assessment and remediation of contaminated soil/groundwater/sediment etc. as per the *"Guidelines on Implementing Liabilities for Environmental Damages due to Handling & Disposal of Hazardous Wastes and Penalty"* published by CPCB.

13) During the process of utilization and handling of hazardous waste, the unit shall comply with the requirements in accordance with the Public Liability Insurance Act, 1991 as amended, wherever applicable.

9.6 Record/Returns Filing

1) The unit shall maintain a passbook issued by concern SPCB wherein the following details of each procurement of spent sulphuric acid shall be entered:
   - Address of the sender
   - Date of dispatch
   - Quantity procured
   - Seal and signature of the sender
   - Date of Receipt in the premises

2) A log book with information on source and date of procurement of spent sulphuric acid, quantity, date wise utilisation of the same, hazardous waste generation and its disposal, etc. shall be maintained including analysis report of fugitive emission monitoring & effluent discharged, as applicable.

3) The unit shall maintain record of hazardous waste utilised, hazardous waste generated and disposed as per Form 3 & shall file annual returns in Form 4 as per Rule 20 (1) and (2) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, to concerned SPCB/PCC.

4) The unit shall submit quarterly and annual information on hazardous wastes consumed, its source, products generated or resources conserved (specifying the details like, type and quantity of resources conserved) to the concerned SPCB.

49.7 Standards

1) Fugitive emission in the storage area shall comply with the following standards:

Acid Mist (H_2SO_4)	:	1.0 mg/m^3 TWA* (PEL)
	:	3.0 mg/m^3 TWA* (STEL)

**PEL: Permissible Exposure Limit*
**time-weighted average (TWA): measured over a period of 8 hours of operation of process.*
**short term exposure limit (STEL): measured for 15 minutes duration of exposure*

2) Treated effluent shall comply with prescribed CETP standards notified under the Environment (Protection) Act, 1986, vide notification no. S.O. 4(E) dated 01/01/2016 or standards prescribed in Consent to Operate issued under the Water (Prevention and Control of Pollution) Act, 1974 by the respective SPCB/PCC, whichever is stringent.

3) Fugitive and effluent monitoring for specified parameters shall be carried out quarterly. The monitoring shall be carried out by NABL accredited or ISO17025 /EPA approved laboratories and the results shall be submitted to the concerned SPCB/PCC on a quarterly basis.

49.8 Siting of Industry

Facilities for utilization of spent sulphuric acid shall be located in a notified industrial area or industrial park/estate/cluster and in accordance with Consent to Establish issued by the concerned SPCB/PCC.

49.9 Checklist of Minimal Requisite Facilities

Sl. No	Particulars
1	Storage tank(s) of adequate capacity to store spent sulphuric acid of at least two weeks requirement. Storage tank(s) shall be placed above the ground and contained with low raise parapet/bund wall with slope to collect spillages, if any, into collection pit. Alternatively, storage tanks may be below the ground provided it has HDPE liner system beneath the tank and leachate collection system below HDPE liner.
2	Cool, dry well-ventilated covered storage shed(s) for spent sulphuric acid storage tanks within premises.
3	Mechanized system for transfer of spent sulphuric acid from tanker to storage tank and storage tank to spent sulphuric acid dosing tank.
4	Adequate ETP/CETP so as to comply with standards/conditions prescribed by the concerned SPCB/PCC.
5	Dedicated hazardous waste storage area for temporary storage of hazardous waste (i.e. primary sludge and secondary sludge) generated during utilization process.

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