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 ETP sludge generated from Textile Industries to use as a Supplementary fuel along with Coal in Thermic Fluid Heater (TFH) / Boiler

September, 2020

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 (similar to the passbooks issued for recycling of used oils, waste oil, non-ferrous scraps, etc.) for maintaining records of receipt of hazardous waste for utilization.
2. After issuance of authorization, SPCB shall verify the compliance of checklist and SoP on quarterly basis for initial 2 years; followed by random checks in the subsequent period for atleast once a year.
3. 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.
4. 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.
5. 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.
6. 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 thereof.
7. 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.

57.0 Utilization of ETP sludge:

Type of HW	Source of generation	Recovery/Product
ETP Sludge generated from secondary treatment of waste water generated from Textile Industry ETP (Category 35.3 of Schedule I of HOWM Rules, 2016)	Effluent Treatment Plant of Textile Industry	For energy recovery in Captive Thermic Fluid Heater (TFH) / Boiler

57.1 Source of Waste

Sludge generated during secondary treatment of wastewater generated from textile industries is categorized as Hazardous waste as per Schedule – I Category – 35.3 of HOWM Rules, 2016 which are required to be disposed in authorized disposal facility in accordance with authorization condition, when not utilized as resource/energy recovery. The said waste can be utilized as energy resource in Thermic Fluid Heater / Boiler.

Table 1- *Typical Characteristics of Textile Industries ETP Sludge*

Sl. No.	Properties/Parameters	Unit	Typical Characteristics
1	pH	--	7.36
2	Moisture	%	17.1
3	Gross Calorific Value (GCV)	Kcal/Kg	4442
4	Sulphur	%	0.66
5	Halogenated Aromatic Compounds	mg/kg	Absent
6	Total Halogens (Cl + Br + I)	mg/kg	98.2
7	Heavy Metals	mg/kg	BDL

57.2 Utilization Process

The utilization process involves the mixing of ETP sludge (dry weight) with coal (in the ratio of 20:80) and feeding this mixture in Thermic Fluid Heater / Boiler as energy resource. The flue gas from TFH/ Boiler after passing through heat economiser followed by Electro Static Precipitator (ESP) or Bag filters and dispersed through stack to the atmosphere.

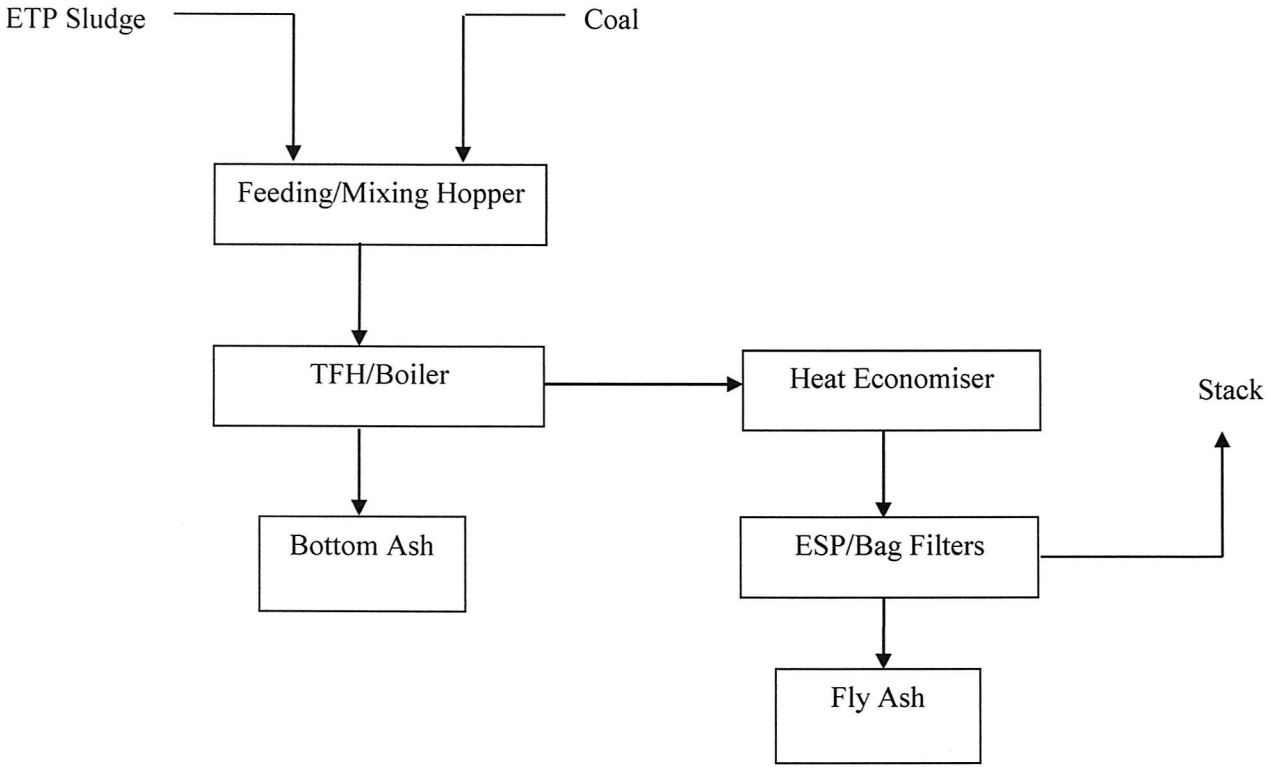

Figure 1- *Process flow diagram for utilization of ETP Sludge.*

57.3 Product Usage / Utilization

The dried ETP sludge mixed with coal is used as a supplementary energy resource in TFH/ Boiler which will conserve the natural resource i.e. coal or other conventional fuels (permitted by concerned SPCB under the Air Act, 1981).

57.4 Standard Operating Procedure for utilization

This SoP is applicable only for the utilization of ETP sludge generated from the secondary clarifier unit of Effluent Treatment Plant (ETP) in Textile Industry, as a supplementary energy resource in TFH/Boiler.

1) The dewatered Secondary ETP Sludge (with moisture not more than 20 %) generated from its own Effluent treatment Plant of textile industries shall be collected and stored under covered storage shed(s) within premises, so as to eliminate rain water intrusion. Further, the storage sheds shall have proper slope and seepage collection pit so as collect seepage/floor washings. The collected seepage/floor washings shall be channelized to Effluent Treatment Plant for further treatment.
2) Utilisation of Secondary ETP Sludge shall not exceed 20 % of the coal consumed in TFH/ Boiler.
3) Transfer of ETP Sludge from the storage shed shall be carried out through mechanical conveyor system to storage hopper/mixing unit.
4) Uniform mixing of coal and ETP sludge in the ratio of 20: 80 (ETP Sludge: Coal) shall be achieved using appropriate mechanized mixing units.
5) The uniformed mixture shall be transfer to the TFH/ Boiler through mechanised system.
6) The TFH/ boiler shall maintain the temperature not less than 1000°C.
7) Utilization of ETP Sludge shall not be carried out during un-stable/breakdown conditions in the TFH/ boiler.
8) The hot flue gases shall be passed through heat economiser and treated in Electrostatic Precipitator (ESP) or bag filters (dust collectors) connected to stack with height as prescribed by SPCB.
9) The treated gases shall comply with emission norms and prior to dispersion into atmosphere through stack. The height of stack shall be a minimum of 6 m above the roof top or as prescribed by the concerned SPCB/PCC, whichever is higher.
10) The unit shall obtain authorization from the concerned State Pollution Control Board under the Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016, for generation, storage and utilisation of ETP Sludge.
11) The unit shall submit quarterly and annual information on ETP Sludge generated, consumed, quantity utilised or resources conserved (specifying the details like type and quantity of resources conserved) to the concerned SPCB. Further, the unit shall also submit quarterly analysis report of fly ash generated during utilisation of ETP sludge for initial one year.

12) A log book with information on source, quantity, quality, date wise utilization of ETP Sludge shall be maintained including analysis report of emission monitoring & effluent discharged, as applicable.

13) The unit shall maintain record of hazardous waste utilised 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 SPCB.

14) Temporary storage of the ash should be done inside closed shed/ on HDPE lined platform.

15) Utilization/disposal of ash should be carried out as per HOWM Rules, 2016.

16) Treatment and disposal of wastewater:

    Wastewater generated from floor-washings, spillages, reactor washing, including the wastewater from filtration shall be treated Physico-Chemically in an ETP or may be sent to CETP for final disposal or be treated further in a captive facility to comply with surface water discharge standards.

    In case of zero discharge condition by SPCB/PCC, the treated waste water from ETP may be managed as per conditions stipulated by the SPCB/PCC.

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

18) In case of environmental damages arising due to improper handling of hazardous wastes including accidental spillage during generation, storage, processing, transportation and disposal, the occupier (sender or receiver, as the case may be) 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.

19) 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. The safety precautions of the worker shall be in accordance with the Factory Act, 1948, as amended from time to time.

20) The unit shall provide suitable fire safety arrangements and flame proof electrical fittings.

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

57.5 Record/Returns Filing

The unit shall maintain a passbook issued by concern SPCB wherein the following details of each generation of ETP Sludge shall be entered:

- Date of ETP sludge generation
- Quantity produced
- Date of Receipt in the storage area for utilization
- Quantity utilised per day

1) A log book with information on date of generation of ETP Sludge along with 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.

2) 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.

3) 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.

57.6 Standards

1) Source emissions from the stack connected to reactors/process stack shall comply with the following standards or as prescribed by the concerned SPCB/PCC, whichever is stringent;

PM SO_2 NO_x	As per the standards notified vide notification no. S.O.3305 (E) dated 07/12/2015

CO	: 100 mg/Nm^3	Or the stringent standard as prescribed by SPCB
TOC	: 20 mg/Nm^3	
HCL Mist	: 50 mg/Nm^3	

2) Monitoring of the above specified parameters for source emission shall be carried out quarterly for first year followed by at least annually in the subsequent year of utilization. Fugitive emissions for specified parameters shall be carried out quarterly. The monitoring shall be carried out by ISO17025 accredited or EPA approved laboratories and the results shall be submitted to the concerned SPCB/PCC on a quarterly basis.

57.7 Siting of the industry

This SOP is applicable only for captive utilization of ETP sludge in a TFH/ boiler of same textile industry already in operation, hence siting is not applicable.

57.8 Size of plant & Efficiency of utilization

This SOP is applicable to TFH/ boiler irrespective of size of plant. The unit shall utilise ETP sludge in the ratio of 20 : 80 along-with coal (i.e. ETP Sludge : Coal in ratio 20 : 80) Hence, requisite facilities of adequate size shall be installed accordingly.

57.9 On-line detectors/ Alarms/ Analysers

Online emission analysers for PM, SO_2 and NO_X in the stack shall be installed and the online data be connected to the server of the concerned SPCB/PCC and CPCB Server.

57.10 Checklist of Minimal Requisite Facilities

Sl. No	Particulars
1.	Covered Hazardous Waste Storage shed (s) for dewatered Secondary sludge of adequate size.
2.	Mechanised systems for handling & transfer of ETP sludge & Coal
3.	Appropriate mechanised systems for mixing of ETP sludge & Coal
4.	Thermic fluid heater/ Boiler
5.	Flue gas heat economizer.
6.	Electro static precipitators/ Bag filters
7.	Stack of height prescribed by SPCB with easy access to porthole, for conducting stack monitoring
8.	Stack to have sampling port, platform, access to the platform etc. as per the guidelines on methodologies for source emission monitoring published by CPCB under Laboratory Analysis Techniques LATS/80/2013-14.
9.	Online analysers for PM, SO_x & NO_x emission monitoring in the stack

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