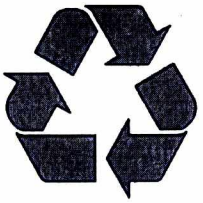
Standard Operating Procedure and Checklist of Minimal Requisite Facilities for utilization of hazardous waste under Rule 9 of the Hazardous and Other Wastes (Management and Transboundary movement) Rules, 2016

Utilization of Tarry Residue generated from Coal Gasifier Units (excluding operating in Morbi-Wankaner area in Gujarat) for production of Creosote Oils and Coal Tar Pitch



February, 2019

Central Pollution Control Board
(Ministry of Environment, Forest & Climate Change, Government of India)
Parivesh Bhawan, East Arjun Nagar,
Shahdara, Delhi – 110032

Procedure for grant of authorisation by SPCBs/PCCs for utilization of Hazardous Waste

(i) Utilization of Tarry Residue generated from Coal Gasifier Units for production of Creosote Oils and Coal Tar Pitch is provisionally released by CPCB.

(ii) This SoP shall not be applicable for utilization of tarry residue generated from coal gasifier plants located in Morbi-Wakaner Area in Gujarat.

(iii) Gujarat SPCB shall not permit fresh authorizations for utilization of tarry residue generated from Morbi- Wakaner area till the matter is decided by the Hon'ble National Green Tribunal, Western Zone Bench, Pune.

(iv) This SoP may be withdrawn by CPCB at any point of time as per the direction of the Hon'ble Tribunal/Courts or in the interest of environment protection, if considered necessary.

(v) While granting authorisation for utilization of hazardous wastes, SPCBs/PCCs shall ensure the following:

a. The waste (intended for utilization) belongs to similar source of generation as specified in SoP.

b. The utilization process is similar to the process of utilization described in this SoP.

c. End-use / product produced from the waste shall be same as specified in this SoP.

d. Authorisation be granted only after verification of utilization process and minimum requisite facilities as given in this SoP and in accordance with provisions under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

e. Issuance of passbooks (similar to the passbooks issued for recycling of used oil, waste oil, non-ferrous scrap, etc.) for maintaining records of receipt of hazardous wastes for utilization.

(vi) After issuance of authorization, SPCB/PCC shall verify the utilization process, 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 SPCB/PCC, they may engage 3rd party institutions or laboratories having EPA/NABL/ISO17025 accreditation/recognition for monitoring and analysis of prescribed parameters in this SoP for verification purpose.

(vii) SPCBs/PCCs shall provide half yearly updated list of units permitted under Rule 9 of HOWM Rule, 2016to CPCB and also upload the same on SPCB website, periodically. Such updated list shall be sent to CPCB half yearly by July and January respectively.

(viii) 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.

(ix) The source and work zone standards suggested in the SoP are based on the E(P)A notified and OSHA standards respectively, however, SPCB/PCC may impose more stringent standards based on the location or process specific conditions.

(x) In case the utilization proposal is not similar with respect to source of generation or utilization process or product recovered as outlined in this SoP, the same may be referred to CPCB for clarification/ conducting trial utilization studies and developing SoP thereof.

52.0 Utilization of Tarry Residue Waste:

Type of HW	Source of generation	Recovery/Product
Tarry residue waste (category no. 35.1 as per Schedule I of the HOWM Rules, 2016)	Coal gasifier units	For production of Creosote Oils and Coal Tar Pitch

52.1Source of Waste

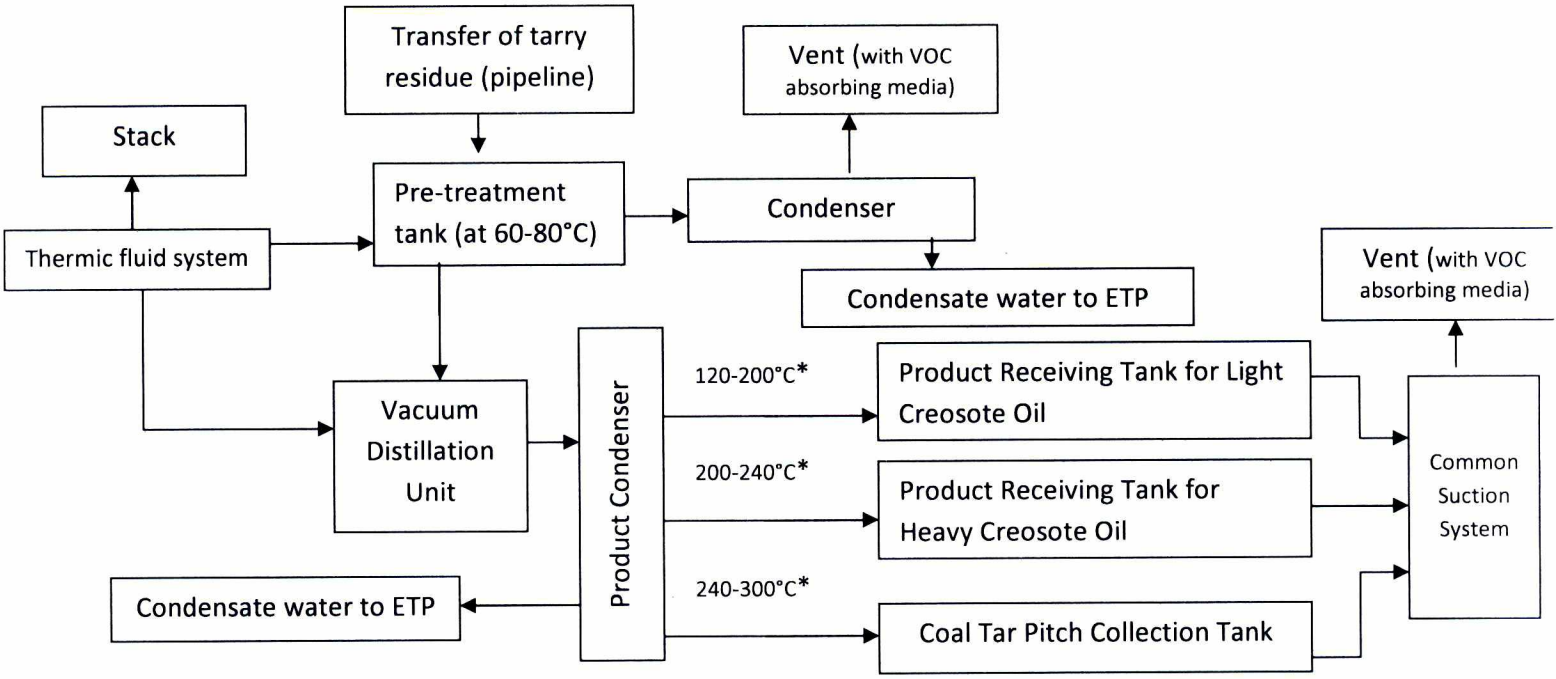
The Tarry Residue waste is generated from gas cleaning unit (wet ESP) of coal gasifier plants where coal is gasified to produce coal gas categorised as hazardous waste at S. No. 35.1 of schedule-I of HOWM Rules, 2016 which are required to be disposed in authorized disposal facility in accordance with authorization condition, when not utilized as energy/resource recovery.

Characteristics of Tarry Residue

S. No.	Parameters	Unit	Range
1.	Moisture	%	19-22
2.	Colour		Black
3.	Physical State		Semisolid/thick viscous liquid
4.	Calorific Value(CV)	Kcal/Kg	> 6000
5.	Poly Aromatic Hydrocarbon (PAH)	%	0.24-0.27
6.	TCLP-CN	mg/l	0.002-0.0001
7.	Ammonia as NH_3	mg/kg	960-1291
8.	Carbon	%	64-67
9.	Hydrogen	%	6.60-7.00
10.	Nitrogen	%	0.12-0.28
11.	Sulphate	%	0.73-0.97

52.2 Utilization Process

Utilisation process involves pre-treatment of tarry residue for removal of moisture followed by vacuum distillation at different temperature for the production of creosote oils and coal tar pitch. In pre-treatment tank the tarry residue is heated at 60-80°C using thermic fluid heater. The de-watered coal tar from pre-treatment tank is transferred to vacuum distillation unit where tarry residue is further heated to produce Light Creosote Oil (at temperature range of 120-200°C), Heavy Creosote (at temperature range of 200-240°C) and Coal Tar Pitch (at the temperature range of 240-300°C).



* Typical temperature range, which may vary depending upon distillation technology.

52.3 Product Usage / Utilization

Tarry Residue shall be used for the production of Creosote Oils and Coal Tar Pitch for industrial purpose.

52.4 Standard Operating Procedure (SoP) for utilization

This SoP is applicable only for the utilization of tarry residue for the production of creosote oils and coal tar pitch by adhering the following;

(1) The Tarry Residue shall be procured only in tanker mounted over vehicles fitted with requisite safeguards ensuring no spillage, as authorised by SPCB/PCC.

(2) The Tarry Residue shall be received into storage tank and a transfer pump shall be used to transfer the tarry residue. All the tanks and transfer pump shall be under covered shed to eliminate any contact with rain water. The storage tanks shall be provided with water seals to all probable leaking points so as to minimise the VOCs emissions.

(3) There should be designated space for unloading of Tarry Residue into storage tank.

(4) The storage tank shall be preferably placed above the ground with low raise bund wall & cemented floor with slope to collect spillages, if any, to collection pit. The collected seepage

shall be reused in the process. The vent of storage tank shall be connected through condenser In case of underground storage of tarry residue, storage tanks may be 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.

(5) During loading and unloading of Tarry residue from Tanker to Storage Tank or Storage Tank to Tanker, vent (of both Storage Tank/Tanker) shall be connected to each other so as to minimize VOC emissions.

(6) The entire process area shall have cemented floor with adequate slope to collect spillages, if any, into a collection pit. The spillages from collection pit shall be transferred to ETP or reaction tank, as the cases may be, through pump.

(7) The Tarry Residue shall be transferred to pre-treatment/vacuum distillation unit by using transfer pumps/pipeline system only. There shall be no manual handling of tarry residue.

(8) The Tarry Residue shall be heated in pre-treatment tank at the temperature range of 60-80°C (using thermic fluid heater with automatic cut-off system) to remove moisture content. The pre-treatment tank shall be connected to condenser through vent of minimum height of 06 meters above the roof top or as prescribed by the concerned SPCB/PCC, whichever is higher.

(9) The vent of condenser shall be passed through VOC absorption media like activated carbon.

(10) The de-watered coal tar from pre-treatment tank shall be transferred to vacuum distillation unit, where tarry residue is distilled at various temperatures and maintaining pressure below 600 mm Hg to produce Light Creosote Oil (at temperature range of 120-200°C), Heavy Creosote (at temperature range of 200-240°C) and Coal Tar Pitch (at the temperature range of 240-300°C).

(11) The above products from the product condenser shall be collected in the separate covered product receiving tanks with safety valves provision. The product receiving tanks shall be connected with common suction system (having vacuum trap pot and water circulating system for creating vacuum in the suction line and scrubbing of vapours) and vent with VOC absorbing media like activated carbon.

(12) The vent height shall be minimum 06 meters above the roof top or as prescribed by SPCB/PCC, whichever is higher.

(13) Treatment and disposal of wastewater: Sources of waste water generation are –condensate water, cooling tower blow down and floor washing. The wastewater from cooling tower blow down and condensate water shall be treated Physico-Chemical by neutralization, settling and filtration and treated effluent shall be evaporated in single or multi effect evaporator so as to meet zero discharge. The waste water generated from floor washing shall be sent to authorized common hazardous waste incinerator for disposal. Alternate to ETP and single or multi effect

evaporator, the condensate water may also be sent to authorized common hazardous waste incinerator for disposal.

(14) The spent carbon and ETP residue and/or residue of single or multi effect evaporator, as applicable, 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.

(15) 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) such as Chemical goggles, full-face shield, or a full-face respirator, Impervious gloves of chemically resistant material (rubber or neoprene), safety shoes etc.

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

(17) It shall be ensured that Tarry Residue is procured from the industries who have valid authorization for generation/storage of the same from the concerned SPCB/PCC as required under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

(18) Transportation of hazardous wastes such as tarry residue shall be carried out by the sender or receiver (utilizer/TSDF operator) as per the authorization issued by concerned SPCB/PCC under the Hazardous and Other Wastes (Management &Transboundary Movement) Rules, 2016.

(19) Prior to utilization of Tarry Residue, the unit shall obtain authorization for generation, storage and utilisation of Tarry Residue from the concerned State Pollution Control Board under the Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016.

(20) 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.

(21) 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.

52.5 Records/Return Filing

(1) The unit shall maintain a passbook issued by concerned SPCB wherein the following details of each procurement of tarry reside 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 shall be maintained with information on source and date of procurement of tarry reside, quantity, date wise utilization of the same, hazardous waste generation and its disposal, etc.

(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/PCC.

(4) The unit shall maintain record of hazardous waste utilised, residues 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 SPCB/PCC.

52.6 Standards

(1) Fugitive emissions in the work zone shall comply with following:

- Respirable dust (PM_{10}) – 5.0 mg/m^3 TWA*
- Coal tar pitch volatiles -0.2 mg/m^3 TWA*

(i.e *benzene-soluble fraction viz. anthracene, Benzo (a) Pyrene, phenanthrene, Dibenzo[b,e]pyridine, chrysene &pyrene)*

*Time –weighted average (TWA)-measured over a period of 8 hours of operation of process.

(2) Emissions from vent attached with condenser and product receiving tank shall comply with standard of Total Organic Carbon (TOC) i.e. 20mg/Nm^3.

(3) Fugitive emission for specified parameters shall be carried out quarterly. The monitoring shall be carried out by NABL accredited or EPA approved laboratories results shall be submitted to the concerned SPCB/PCC quarterly.

52.7 Siting of Industry

Facilities for processing of tarry residue shall preferably 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. Further, such facilities shall be located atleast 500 meters away from the residential area.

52.8 Size of Plant & Efficiency of utilisation

13.05 MT of Coal Tar Pitch, 0.75 MT of Light Creosote Oil and 0.75 MT of Heavy Creosote Oil are produced from 15 MT of Tarry Residue. Therefore, requisite facilities of adequate size of storage shed and other plant & machineries as given in para 52.10 below shall be installed accordingly.

52.9 On-line detectors / Alarms / Analysers

Online emission monitoring system for TOC emission should be installed in vent and online emission data be connected to server of the concerned SPCB/PCC within the time line stipulated by the concerned SPCB/PCC. Smoke detector and fire alarm system shall be installed at tarry residue storage and handling area.

52.10 Checklist of Minimal Requisite Facilities

S.No	Minimal Requisite Facilities
1.	MS tanks for receiving and storage of Tarry waste.
2.	Connection of vent to the tanker with Tarry Residue storage tanks during loading and unloading
3.	Cover over tarry waste storage tank, transfer pump, etc. so as to eliminate any contact with rain water.
4.	Vent of the Tarry Storage tank connected to Product Condenser
5.	Fire fighting systems (i.e. fire extinguisher and water hydrant) in storage area, pre-treatment tank, vacuum distillation unit and product receiving tank.
6.	Smoke detector and fire alarm system
7.	Closed pre-treatment tank connected to condenser through vent of minimum height of 06 meters above the roof top
8.	Thermic fluid heating system with automatic cut-off system for heating of Tarry Residue
9.	Vacuum distillation unit attached with Product condenser and product receiving tanks
10	Product receiving tanks with safety valves connected with common suction system attached to Vent.
11	Vent with VOC adsorption media like activated carbon

12	Height of the vent be atleast 06 metres above the roof top or as prescribed by SPCB/PCC, whichever is higher
13	Common suction system with vacuum trap pot and water circulating arrangement
14	Cooling Tower
15	Effluent Treatment Plant (ETP) and single or multi effect evaporator Or Arrangement for disposal of waste water to authorized common hazardous waste incinerator.
16	Dedicated covered shed for storage of hazardous waste generated (leaks/spills/debris containing tarry wastes, used oils, ETP sludge/residue, spent carbon and condensate water etc.)

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