Protocol for assessing proposals of Development Projects in buffer zone of closed TSDF

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1.0 Background

There are 45 Common Hazardous Waste Treatment, Storage and Disposal Facilities (TSDFs) in 18 States/UT across the country. 17 are integrated TSDFs (having both Secured Landfills and Incinerators); 12 are standalone incinerators, and 16 are Secured Landfills only.

The Buffer zone is an area of restricted activities, around the TSDF, with dimensions depending on the activity and adjacent land uses. It also supports long-term suitability of disposal sites by avoiding potential conflicts between disposal sites and adjacent land use. However, laying down physical dimensions of Buffer Zone is a critical issue. The provision laid down for buffer zone near habitation in CPCB "Criteria for Hazardous Waste Landfills" in 2001, is given below:

"…A landfill site shall be at least 500 m from a notified habitated area. A zone of 500 m around a landfill boundary should be declared a no-development buffer zone after the landfill location is finalised…"

Representations have been received regarding consideration of granting permissions for development of projects in buffer zone of TSDF. This protocol has developed to address the issue of development in the buffer zone of closed TSDFs, type of activities/ land use that can be considered through sustainable approach and the safeguards to be followed.

2.0 Important Aspects

2.1 Treatment, Storage, and Disposal Facilities (TSDFs): TSDFs are hazardous waste management facilities for treatment, storage and disposal (through incineration or secured landfills). Secured Landfills (SLF) are constructed and/or engineered sites where hazardous waste is deposited for final disposal. These sites are designed to minimize the chance of release or impact of hazardous waste on the environment**.**

2.1.1 Operational TSDF: It is a TSDF that is currently in use for the disposal of hazardous waste as per the Consent of the regulatory agency. Such TSDF can potentially discharge landfill gas, leachate, contaminated surface water, offensive odours, noise, litter, dust and risk of fires during operation.

2.1.2 Closed TSDF: When a landfill cell of TSDF reaches its maximum designed and consented capacity, it has to be closed with proper cover system as per the procedures laid down under CPCB guideline. The closed landfill has potential to release gas and

leachate over years (more than 30 years). TSDF is defined closed when all the cells are completely filled and capped and no more disposal of any waste is practiced. Closure & capping of the last cell and stoppage of incinerator operations in that particular TSDF will be considered as the date of closure of TSDF.

2.2 Buffer Zone: It is a zone which separates TSDF and surrounding land uses. TSDF buffer zone is provided to manage the risk of landfill gas, release of leachate and amenity impacts including odour, noise, dust and litter and also to manage the risk of impacts from unintended events such as slope instability of landfill, liner failure, etc.

2.3 Development Projects: Development projects include Building/Construction projects/Area Development projects and Townships, Physical Infrastructure including Environmental Services, Manufacturing/Fabrication, Materials Processing, Materials Production, Primary Processing, Mining, extraction of natural resources and power generation (for a specified production capacity) and Service Sectors, etc.

3.0 Scope

This protocol shall provide the procedure to be adopted for taking an appropriate decision on permitting the development proposals within the buffer zone of closed TSDFs including scientific studies with administrative provisions to be carried out prior to arriving at such decision.

4.0 Legal Framework

This protocol shall be applicable within framework of existing rules and regulations of the country.

The relevant documents published by MoEF&CC & CPCB pertaining to TSDF are given below:

(i) "Guidelines for Conducting Environmental Impact Assessment: Site Selection for Common Hazardous Waste Management Facility" by CPCB, 2003. The provision for land use around the site mentioned in the said guideline is stated as below:

"…The proposed land-use around the sites by the local development authority is another major consideration for evaluation of the sites. If the development authority near the site envisages any sort of development, the site should not be

preferred. If the area around the site has the potentiality for development, the relative value of 1 i.e. bad has to be given otherwise a relative value of 5 i.e. excellent has to be assigned…"

(ii) "Criteria for Hazardous Waste Landfills" by CPCB, February, 2001 wherein, provision for buffer zone near habitation is notified as:

"…A landfill site shall be at least 500 m from a notified habitated area. A zone of 500 m around a landfill boundary should be declared a no-development buffer zone after the landfill location is finalized…"

The criteria laid down for post closure monitoring of TSDF are given below:

"…After closure of the landfill, the owner/operator shall continue to operate all leachate, gas and surface water management systems as well as continue environmental monitoring of the landfill for a period of 30 years or until such time that harmful leachate is not produced for 5 continuous years…"

"…Period inspection and routine maintenance at a closed landfill site shall be carried out for a period of 30 years after closure. The SPCB/PCC shall inspect all facilities during the closure and post closure period at least once a year. The owner/operator shall provide a copy of the environmental monitoring record to the SPCB/PCC once a year…"

(iii) EIA notification, 2006 issued by MoEF&CC [Various development projects activities w.r.t residential/ industrial/ etc. are listed in Schedule-I of said notification including Common Hazardous Waste Treatment, Storage, and Disposal Facilities (CHWTSDF)].

5.0 Protocol Applicability

This protocol shall only be applicable for assessing proposals of development projects in the buffer zone of closed TSDFs. However, this protocol does not absolve of the provisions laid down in above said guidelines and notifications. This protocol presented as per Precautionary Principle of Environment Law that advocates safeguards to be adopted in anticipation of damage even in absence of a scientific study.

6.0 Approach for considering development proposals within buffer zone of closed TSDF

The assessment should focus on environmental assessment of proposed project site, around TSDF and risk assessment due to TSDF. In addition, the requirements of other regulations, mainly, EIA notification, 2006 is also to be considered. Possible migration of pollutants and emissions from the closed SLF is to be estimated and accordingly possible impacts by the proposed activity need to be estimated.

During consideration of development proposals in buffer of closed TSDF, buffers should be measured from the land use to the boundary of the nearest closed SLF.

7.0 Protocol for assessment of development projects in buffer zone of closed TSDF

a. As a pre-requisite, a cooling period of 5 years should be left after the capping of the final cell in the TSDF (i.e. closure of TSDF) before considering any new development projects. If there is any leakage or increase in trend of concentration found by the end of the 5^{th} year, the cooling period may be extended till there is no release occurred for consecutive 05 years.

b. SPCB/PCC shall examine the closure audit report of TSDF. This report may contain information on lay out, size and cross section details of landfill, type and quantity of hazardous waste disposed with and without stabilization, system for runoff collection and disposal, leachate quantity & quality, treatment and disposal method, monitoring wells, air quality etc. apart from monitoring data of closed TSDF.

c. SPCB/ PCC shall assess the proposals for development projects and may acquire technical assistance from CPCB and experts from reputed organizations such as NEERI, School of Planning and Architecture, Hydro geological/ Geotechnical Institute, etc. and concerned local authorities (Development Authority, Municipal Corporation, District Magistrate).

d. SPCB may seek a feasibility report from the project proponent that may contain environmental site assessment of proposed site.

e. Based on closure audit, pre-requisite conditions and site assessment report, SPCB/PCC shall decide whether a fresh study on environmental assessment of proposed site and also around TSDF and, risk assessment due to TSDF, is necessary

or not. Necessary requisites for environmental assessment and risk assessment may be examined as per **Annexure – I**.

f. If required, SPCB/PCC shall recommend for the fresh study by Project Proponent and formulate a Terms of Reference (TOR) that would essentially address the following:
    - Past history of the TSDF including quantity and type of hazardous waste disposed, design, operational details, thickness of liner used, past complaints and/or accidents, if any, etc.
    - Post closure monitoring data, hydrogeology of the area, water resources, nearby land use pattern, geography, wind patterns and climatic conditions, sampling requirements, parameters to be monitored, etc.
    - Potential risks due to failures in TSDF for any possible reason.
    - Area of the fresh study and time frame.
    - Expected outcome including possible safe buffer radius.

g. Development project/activity established in the 500m radius of TSDF before publishing CPCB guideline, 2001, shall require detailed environmental site assessment including risk assessment by the concerned development authority or the State. Based on assessment, SPCB/PCC may issue advisory or suggestive as well as protective measures to the owner of project/land.

h. Development project/activity established in buffer zone of 500m of TSDF after 2001, is to be treated as violation of CPCB guideline and SPCB/PCC may take appropriate actions. Also, the development authority need to conduct detailed environmental site assessment including risk assessment and based on the extent of the risk, shall take necessary measures required (if any).

i. However, if concerned authority/land owner desire to continue with the Development project/activity in the buffer zone in both scenarios as mentioned above (i.e. Development project/activity established before and after 2001), the feasibility for continuation of such Development project/activity shall be reviewed by the development authority along-with SPCB/PCC including the additional protective measures for the safeguard of already existing habitation, if required.

j. SPCB/PCC shall ensure through all assessment studies that the buffer site is not contaminated. However, if any contamination is found, then it shall recommend for a model study including monitoring of the site and surrounding areas of TSDF. Further, the concerned land owning agency shall be directed to carry out remediation and only after completion of action, it may be allowed for further

consideration. Relocation may be considered as an option in extreme scenarios such as complete contaminated or damaged environment.

k. A minimum of 100 metres of green belt from the boundary of closed SLF shall be maintained as no development zone to reduce/minimize the harmful effect arise due to TSDF. However, the same may be relaxed upto 30 metres in exceptional cases subject to the examination by MoEF&CC.

l. SPCB/PCC shall categorise remaining buffer zone as low and high-risk zone based on assessment studies. Low-risk zones are the areas, which have less harmful effects by TSDF w.r.t wind direction, subsurface water flow direction, and hydrological conditions. Low-risk zones may be prioritised for considering development projects and high-risk zone may be left untouched for precautionary measures.

m. SPCB/PCC shall restrict sensitive projects/ activities having maximum period of human exposure and may consider the other projects with minimum human exposure. An indicative list of projects is given below:

Sensitive Projects	**Other Projects**
• Healthcare facilities (such as Hospitals) • Educational Institutions • Residential Activities • Agriculture • Drains and water canals	• Non-polluting activities such as Storage of non-hazardous material (not in loose form that is prone to fugitive emission), • Retail Shopping • General Business and Commerce • District & Community Centre • Non-hierarchical Commercial Centre • Cold Storage, Wholesale & Warehousing • Hotel • Regional Park, City Park, District Park, Community Park, • Historical Monument / Archaeological Park • Water & Sewerage (Treatment Plant Etc.) • Electricity (Power House, Sub-Station Etc.) • Terminal / Depot / Yard - Rail / Bus / Truck • Circulation - Rail / Road /High Speed Rail • Religious Burial Ground / Cremation Ground / Cemetery • Sports Facilities / Complex / Stadium /Sports Centre

n. As far as possible, no residential activities shall be allowed within the buffer zone. However, the residential activity may be permitted in the low risk buffer zone.

o. Restrict open excavation/ projects with possible deep excavation as it may disturb the subsurface features. However, open excavation may be restricted after assessing the hydrogeological conditions prevailing there.

p. Wide access road to closed TSDF should be made available for necessary safeguards.

q. Based on the assessment, SPCB/PCC shall take appropriate action on the consent to proposal, buffer radius and other statutory limitations within the framework of existing rules.

r. SPCB/PCC shall inform the recommendations to concerned authority and project proponent for further necessary action.

s. The concerned authority shall ensure further consideration of the project based on the findings and recommendations of SPCB/PCC and ensuring all the necessary safeguard including appropriate buffer upon examining the impact of proposed project.

t. Before permitting any development activity in buffer zone of 500m, development plan should be prepared and get approved by District / concerned local authorities as well as should obtain Environmental Clearance as notified in EIA Notification, 2006 and amended thereafter for the projects falling under Schedule of the said notification.

u. While allowing the development proposals in buffer zone of closed TSDF, the extent of buffer zone be clearly demarcated on a GIS based plan, which shall also include the land-uses adjacent to the buffer zone.

v. Concerned local authorities shall ensure that ground water withdrawal restriction in an area of atleast one kilometre (1km) radius of TSDF site be maintained and water supply be made available through surface water sources only.

w. Thick plantation in 500m around TSDF shall be carried out and maintained by local Municipal Corporation/Urban Development Authority. In case of old TSDF (established before 2001), the plantation may be ensured in atleast 100m around the TSDF sites.

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1. Environmental Assessment and Risk Assessment:

A proponent of new project proposal for development in buffer zone of closed TSDF shall be liable for conducting a pre-feasibility study and submit the report to SPCB/PCC while applying for permission, and if required, environmental assessment around TSDF and, risk assessment due to TSDF shall also be provided. Such environment assessment and risk assessment shall be carried with requisites mentioned below (i.e., 1.1 & 1.2 sections) but not limited to.

1.1 Necessary requisites during Environmental assessment.

i. Hazardous waste dumped in terms of types and quantity with stabilization done.
ii. Layout showing landfill cells and their liner system including that of cover, runoff collection & disposal, leachate quantity and quality data, with details on treatment & disposal of leachate.
iii. Present land use (agricultural, forest, water body such as tanks, ponds, etc.) in 500 m buffer zone and its adjoining area (habitat, industries, any other).
iv. Hydro-geological and Meteorological study covering geological strata, air quality, ground water table, ground water flow direction, quality of water as well as soil at least in 1 km radius (including 500 meters of buffer zone) of TSDF. Information on abstraction of ground water.

1.2 Necessary requisites during Risk Assessment

i. The release of vent gases, landfill gases, slope instability and leachate may pose serious threat on the environment. Thus, it is considered necessary to carry out a risk assessment and disaster management plan for the proposed development project. An essential part of major hazard control has therefore, to be concerned with mitigating the effects of such emergency and restoration of normalcy at the earliest.
ii. SPCB/PCC shall recommend to carry out detail Risk Assessment due to TSDF on case to case basis, which may include leachate treatment & its disposal, vent gases as well as ambient air quality around TSDF, subsurface / ground water pathway, surface water pathway, air pathway (gases, odour, dust), fire and explosion, etc.

iii. Physical and chemical nature of TSDF shall also be assessed for human health risk assessment.

Note: Additional information may be reviewed by SPCB/PCC during preliminary study as per necessity:

- Year of establishment of project as well as TSDF
- Whether the TSDF is notified or not
- Whether the buffer zone around TSDF is notified or not
- Terms and condition of Consent to Establish, renewed Authorization and Environmental Clearance of TSDF as well as existing projects (whichever applicable)
- Size of land considered beyond TSDF as buffer
- Land use of buffer zone specified in Town planning scheme
- Previous land use change of buffer (if any)
- Land owner of buffer zone/existing projects (Municipal Council, Private land owner, Development Authority, etc.)
- List of conditions permitted to owner of land or project.

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