

**DENR ADMINISTRATIVE ORDER**  
**No. 50**  
**Series of 1998**

**Subject: ADOPTING THE LANDFILL SITE IDENTIFICATION AND SCREENING CRITERIA FOR MUNICIPAL SOLID WASTE DISPOSAL FACILITIES**

**WHEREAS**, the DENR is the government agency responsible for the management and development of the country's environment and natural resources;

**WHEREAS**, by virtue of a Presidential Memorandum Circular No. 88, series of 1994, the DENR was made Chairman of the Presidential Task Force on Waste Management (PTFWM);

**WHEREAS**, under Republic Act 7160, otherwise known as the Local Government Code, local government units are responsible for the provision of basic services to their constituents;

**WHEREAS**, the basic services and facilities, include, but are not limited to general hygiene and sanitation, beautification and solid waste management;

**WHEREAS**, by virtue of Presidential Decree 1152 and Executive Order No, 192, there is a need to provide technical assistance on municipal solid waste management system in the country;

**NOW, THEREFORE**, for and in consideration of the above premises and consistent with the provisions of PD 1152, PD 984, the Department of Environment and Natural Resources hereby adopts and promulgates the following guidelines and criteria:

**Section 1. Statement of Policy.** It is the declared policy of the Department as provided in the "Philippine Environment Code (PD 1152), and the Pollution Control Decree of 1976 (PD (984)" and their implementing rules and regulations, to adopt a system for a safe and sanitary disposal of waste.

**Section 2. Definition of Terms.** As used in and for the purpose of these guidelines, the following terms and phrases shall have the corresponding meaning herein below stated:

- Absolute criteria** - - this sets the minimum requirement(s) that a site must meet for it to be considered.
- Conditional criteria** - this indicates that a certain site has met the absolute Condition/requirements but is still subject to or dependent upon certain additional conditions that can Enhance the site selection process but are not exclusionary.
- Confined aquifers** - an aquifer located between two relatively Impermeable layers.
- Generation rate** - the amount of waste generated, usually expressed as Kg/person/day.

<b>Haul distance</b>	-	the distance a collection vehicle travels from its service area (collection area) to a treatment and/or to the disposal facility.
<b>Impervious</b>	-	does not allow passage to, or is impermeable.
<b>Leachate</b>	-	liquid contaminated from contact with decomposing Wastes containing bacteria and other materials that drain out of dumpsites and landfills.
<b>Liners</b>	-	act as a low-permeability barrier to eliminate leakage or minimize the rate at which leachate within the waste facility escape into the surrounding environment. Liners may be clayey soils or synthetic materials (e.g. high density polyethylene, or a combination of both).
<b>Liquefaction</b>	-	the process of making or becoming liquid or the state of being liquid.
<b>Perennial</b>	-	present at all season of the year.
<b>Permeability</b>	-	the rate at which a substance can penetrate or pass through a medium (e. g. soil ).
<b>Recharge area</b>	-	a highly permeable region or area that serves as a recur.
<b>Sanitary Landfill</b>	-	a waste disposal site designed, constructed, operated and maintained in a manner that exerts engineering control over significant potential environment impacts arising from the development and operation of the facility.
<b>Seismic</b>	-	refers to earth movement or vibration.
<b>Sinkholes</b>	-	a hallow or depression in which drainage collects.
<b>Transfer station</b>	-	a place or facility where wastes are transferred from smaller collection vehicles into larger transport vehicles for transport to the final disposal site.
<b>Topography</b>	-	the physical configuration of a surface detailing the natural and man-made features, showing their relative position and elevations
<b>Up-gradient</b>	-	up-slope or upstream
<b>Visual barriers</b>	-	refer to natural or man-made barriers used to keep a disposal area visually inaccessible.
<b>Waste characteristic</b>	-	refer to the properties of the waste stream (e.g. type, physical and chemical composition).

**Section 3. Scope.** These guidelines shall apply to all waste disposal site in the country, be they operated by Local Government Units (LGUs) and/or the private sector.

**Section 4. Landfill Site Identification and Screening Criteria.** The following criteria shall be used to identify and screen possible site of Sanitary Landfill:

- (1) Area Capacity and Availability
- (2) Haul Distance and Time
- (3) Proximity to Sensitive Groundwater Resources
- (4) Proximity to Perennial Surface Water
- (5) Occurrence of Flooding
- (6) Proximity to Sensitive Land Users
- (7) Local Ecological Conditions
- (8) Current and Future Land Use
- (9) Seismic Condition
- (10) Geologic Condition
- (11) Soil/Land Condition
- (12) Topography
- (13) Proximity to Airports

The attached **ANNEX A** provides the details of these guidelines and shall form an integral part of this Order.

**Section 5. Site Identification and Screening Methodology.** The sanitary landfill site identification methodology shall be composed of the following steps:

- a. data acquisition
- b. plotting of excluded areas, identified on the basis of the absolute criteria, in an appropriate map;
- c. identification of candidate areas from the map for field survey;
- d. site survey and evaluation; and
- e. selection of preferred site(s).

Data can be obtained from existing maps (1:50,000 or 1:200,000), aerial photographs, site visits and interviews with local officials and residents. The results of the siting process should be presented in the form of an acceptability matrix showing the quantitative evaluation of each site based on the site identification and screening criteria.

The acceptability matrix will aid the local officials in assessing the best site for the proposed landfill and ecological waste management center. The final decision should be approved by the council of elected officials after due public consultation, taking account of both the technical and financial considerations.

**Section 6. Separability Clause.** If any section or provision of these guidelines is held or declared unconstitutional or invalid by a complete court, the other section or provisions hereof shall continue to be in force as if the section or provisions so annulled or voided have never been incorporated herein.

**Section 7. Repealing Clause.** All pertinent guidelines or rules and regulations inconsistent with these guidelines are hereby revised, amended and/or modified accordingly.

**Section 8. Amendments.** These guidelines may be amended and/or modified from time to time by the Department of Environment and Natural Resources.

**Section 9. Effectivity.** These guidelines shall take effect thirty (30) days after publication in the official Gazette or in a newspaper of general circulation.

(Sgd.) **VICTOR O. RAMOS**  
Secretary  
Chairman, Presidential Task  
Force on Waste Management

**LANDFILL SITE IDENTIFICATION AND SCREENING CRITERIA  
FOR LOCAL GOVERNMENTS<sup>1</sup>**

Criteria	Screening Guidelines		Considerations	Data Sources
	Absolute	Conditional		
Area Capacity & Availability	The site area should be sufficient for a landfill with a target service life of not less than 5 years.	The area should be sufficient for a landfill with a target service life of approximately 10 years (based on 2.6 ha/100,000 population, 0.5 kg/person/day, 0.7 t/m <sup>3</sup> density and 10 m depth).	The minimum land area depends on the total service population, waste characteristics and generation rate, and expected landfill service life. Consideration for land ownership should also be taken into account, giving priority to publicly-owned lands.	Field Survey, interviews with local residents and data from the City Assessor's Office
Haul Distance & Time		Avoid areas more than 15 to 20 kilometers or 30 minutes travel time from the waste generation centers (road and traffic conditions should be considered).	If the distance or travel time is more than the indicated limits, investment in either larger capacity collection vehicles or transfer stations may be necessary (load capacity of bridges should also be considered).	Field survey, Topographic Map, aerial photos, City Road Map and engineering judgment of municipal engineer
Proximity to Sensitive Groundwater Resources	The site should not be located in or up gradient of shallow unconfined aquifers for drinking water supply.	Avoid areas considered part of a 10-year recharge area for existing or future potable water sources and confined aquifers (deepwells) for drinking water supply.  Avoid areas 500 meters up gradient of private or public drinking, irrigation or	If the candidate site is situated on a well field with confined aquifers or within a 10-year recharge area, proper engineering measures are required to avoid the risk of ground water contamination. Existing or future drinking wells may be abandoned if	Field survey, Hydrogeologic Map and data from Local Water Utilities Administration, Local Water District and National Water Resources Board

		livestock water supply wells.	alternative water supply sources/sites are readily and economically available, and the owners have given written consent to the potential risk of abandoning their wells.	
Proximity to Perennial Surface Waters	The site should not be located within 300 meters up gradient of any surface waters used for drinking purposes.	Avoid areas within 300 meters up gradient of a perennial river or stream.	The conditional requirement may be adjusted if it is feasible to protect the stream from contamination through engineering measures.	Field survey, Topographic Map, aerial photos and river basin data from Department of Public Works and Highways
Occurrence of Flooding		Avoid locating site in areas prone to flooding. Also avoid salt lakes, swamplands, and low lying coastal areas.	The site may be located in swamplands or any low lying areas although, in such cases, stricter engineering measures will be required to avoid the risk of pollution due to surface water and ground water contamination. Engineering design should include protective measures, such as impervious dikes and liners to protect sites against a 100 year flood.	Topographic Map, flood control/monitoring data from Department of Public Works and Highways, and interviews with the residents in the vicinity and government officials.
Proximity to Sensitive Land users	The site should not be located in existing or proposed residential, commercial or urban development areas, and areas with archeological, cultural and historical	Avoid areas within 250 meters of residential and industrial developments and within 1 km. Of memorial sites, churches, schools, historical site is otherwise isolated from these	This distance constraint will depend on the topography of surrounding land and prevailing wind direction. Proper engineering and management measures, including visual barriers,	Land use Map, aerial photos and field visits

	importance.	sensitive receivers.  Avoid areas encroaching boundaries of any non-participating municipality.	should be implemented as the site's distance to sensitive public places decreases.  The suitability of sites encroaching political boundaries will depend on the proximity, density of the nearest households and acceptability of the other political entity.	
Local Ecological Conditions	The site should not be located within ecologically sensitive areas proclaimed by law as national parks (areas judged to be of national significance in terms of their natural landscape values or wildlife), conservation parks (areas with valuable wildlife or interesting natural features), recreation parks ( areas managed primarily for public recreation in pleasant surrounding with some native vegetation), game reserves (areas of land and water for the conservation of native game species), forest reserves, sites of flora and fauna of national or regional significance, or wetlands of	Avoid areas within 500 meters of any ecologically sensitive areas proclaimed by law.	Consideration for sites near ecologically sensitive areas will depend on the local conditions and accompanying engineering measures. The exact extent of any ecologically sensitive areas should be verified by reconnaissance survey.	Aerial photos, Land Use Map and data and maps from the Parks and Wildlife Bureau of DENR regional and community offices and NAMRIA

	important biodiversity.			
Current and Future Land use	The site should not be located in areas with valuable mineral and energy resources, tourist destinations or across major transportation routes.	Avoid areas classified as prime agricultural land and areas with major water, gas, electrical power or communication transmission infrastructure.	The site may be located where there are existing infrastructure routes as long as their presence will not affect the landfill operation or rerouting is economically feasible. Land purchase costs for prime agricultural land will be relatively high and a change of land use will require a permit from the Department of Agrarian Reform. Stricter landfill operation will be required to avoid damage to crops on adjacent land.	Land Use Map, aerial photos, data from the regional offices of Department of Agrarian Reform and Bureau of Soils and Water Management
Seismic Conditions		Avoid areas with an average return period between 50 to 100 years for an earthquake of magnitude 6 and above.	If the entire municipality is subject to this seismic risk, engineering measures may be applied to avoid the risk of groundwater contamination.	Seismicity Map and historical earthquake data from Philippine Institute of Volcanology and Seismology
Geologic Conditions	The site should not be located within 500 meters of active fault lines.	Avoid areas with sinkholes, caverns or solution channels. Avoid jointed, fractured or fissured rocks, carbonate rocks (limestone) or other porous rock formations.	If the site is to be located within an area of fissured, fractured or similar rock, stringent engineering design will be required to avoid landfill gas and leachate migration to groundwater. Areas with underground mines should be avoided unless the owners give explicit consent. Abandoned open pits used for mining	Tectonic or Earthquake Generators Map, Geologic Map and preliminary site investigation results from Mines and Geosciences Bureau

			precious metals may require additional field investigations relating to heavy metal contamination.	
Soil/Land Conditions	The site should not be located in soft and settling soils (sand, coarse sand, and fine sand) with a potential for liquefaction, slumping or erosion.	Avoid areas with highly permeable soils (loamy fine sand, loamy sand, sandy loam, fine sandy loam and very fine sandy loam).	Use of areas with high permeability soils will necessitate the use of appropriate liners and engineering measures to prevent contamination of groundwater by leachate and landfill gas migration.	Regional Soils Map from Bureau of Soils, soil survey reports and visual inspection
Topography		Avoid hilly area with ground slopes nominally greater than 20 %.	Landfilling within hilly areas is feasible but steep slopes will increase the costs associated with the engineering and access arrangements.	Topographic Map, aerial photos and visual inspection
Proximity to Airports	The site should not be located within 3 kilometers of an airport servicing turbojet aircraft or 1.6 kilometers of an airport servicing piston driven or turboprop (propeller) aircraft.	Permission should be sought from the Air Transportation Office (ATO) if the site is located within 13 kilometers <sup>3</sup> of the nearest airport	The site should be located so as to reduce bird-strike hazard to aircraft and to ensure that the landfill's proposed final elevation will not exceed the maximum allowable top elevation as per ATO Guidelines.	Land use Map, aerial photos, Topographic Map and field survey

**Note:** This set of criteria is designed to aid the LGUs in identifying and screening potential sites for developments as landfills. In cases where it is difficult to identify candidate sites based on the above criteria, the conditional criteria may be relaxed (see column 3) although this may necessitate the use of more expensive engineering in the design of the landfill site to achieve adequate environmental protection.

1 Developed from Badilla-Ramos, A. (1997). *Working Paper: Development of Appropriate Landfill Siting Criteria and Framework for the Philippines*. Griffith University, Queensland.

2 The absolute and conditional guidelines are based on the Presidential Task Force on Solid Waste Management/PMO

(1996), *Handbook on Solid Waste Management for Local Governments*; and interviews and consultations with experts from various government and private institutions.

- 3 ICAO, *Airport Services Manual, Part 3, Chapter 7, Sec. 7.9 - Environmental Management and Site Modification*.

### **Site Identification and Screening Methodology**

The sanitary landfill site identification and screening methodology is composed of the following:

1. data acquisition;
2. plotting of excluded areas, identified on the basis of the absolute criteria, on an appropriate map;
3. identification of candidate areas from the map for field surveys;
4. site survey and evaluation; and
5. selection of preferred site(s)

The results of the siting process are most conveniently presented in the form of an "acceptability matrix" showing the qualitative evaluation for each site based on the site identification and screening criteria. Data can be obtained from existing maps (1:10,000, 1:50,000 or 1:200,000), aerial photos, site visits and interviews with local officials and residents. The siting report will then be submitted to the LGU for its approval so that the relevant committee or council of elected officials may ratify the results of the site selection.

The acceptability matrix will aid the local officials in assessing the best site for the proposed landfill and ecological waste management center. Ultimately, a judgment may need to be made based on the extent of the conditional limitations of candidate sites, land acquisition arrangements and the accompanying financial considerations. The final decision of the siting process will lie with the LGUs.