

# Guidelines for Industrial Landfills



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The following apply to the design and operation of a proposed industrial landfill site which does not accept hazardous wastes. Although listed separately in this document, it is strongly recommended that landfill site operation must be considered at the design stage since many design factors affect the day-to-day operation of such a landfill.

## 1. Related to Landfill Site Design

### (a) Liner

Separation of waste material from the bedrock or seasonally high water table level shall be with a synthetic liner or 1.5 meters of native clay till with permeability  $10^{-6}$  cm/sec or less. Exception to the depth of clay till liner will be considered dependent upon site specifics such as watercourses, water table, very low permeability soils, etc., but in no case shall this liner depth be less than 1.0 meter.

### (b) Buffer Zone

The buffer zone around the landfill will be a minimum of 30 m. The buffer zone to the active area will usually be within the ratios 1:1 to 2:1 depending on whether the design includes leachate collection and treatment.

### (c) Surface Run-On and Run-Off

The landfill site must have a drainage system to prevent the infiltration of surface water into the solid waste deposited at the landfill site.

Surface drainage which has not come into contact with the solid waste will be directed to the sediment control ponds if treatment for total suspended solids (TSS) is required. TSS limits will be set as a stipulation of the approval at the time of issuance.

Surface water that has been contaminated by contact with the solid waste shall be handled as if it were leachate.

### (d) Groundwater Monitoring Systems

A groundwater monitoring system consisting of observation wells located in areas hydraulically upgradient (background quality) and downgradient of the active area must be installed at the landfill site.

The installation of each well should be at an adequate depth as to provide an indication of the potential impact of the landfill on the upper water-bearing strata.

The number of observation wells required is dependent upon the size of the predicted leachate plume. A sufficient number of wells is required to assure that the potential for leachate to affect off-site groundwater quality can be adequately assessed.

### (e) Leachate Collection and Treatment

An engineered leachate collection and removal/treatment system must be installed at the site if natural leachate attenuation capabilities at the site are not sufficient to prevent the contamination of groundwater resources outside the site boundary.

Leachate collected shall be either pumped back to the landfill site to recirculation galleries or treated through a treatment system before released. Water quality parameters shall be defined in the approval issued by Nova Scotia Environment and Labour if treated leachate is to be released to the environment. Among other parameters to be defined in the approval will be the requirement for the treated leachate to be non-acutely lethal, as established by approved procedures for a static 96 hour LC-50 test.

For this application, groundwater resources will be considered to be contaminated if the quality of the groundwater in the potential zone of influence, (as determined by the groundwater monitoring system), is sufficiently elevated above background quality so that the intended use, when compared to the latest edition of the *Canadian Drinking Water Quality Guidelines*, is restricted or prohibited.

Site boundary, as referred to in this section, is property boundary of the landfill site as established by a legal land survey.

(f) Conceptual Closure Plan

A conceptual closure plan is required within the first year of operation.

**2. Related to Landfill Operation**

(a) Compaction

The solid waste must be compacted to the maximum amount possible as it is deposited. The compacted waste lift height should be designed to suit daily operation.

(b) Interim Cover

In order to minimize leachate production, regular interim cover of the solid waste is required.

An interim cover depth of one-third of a meter should be sufficient cover.

Since the frequency of the cover is influenced by the nature of the solid waste and the frequency and amount of the precipitation, it can vary but in no case is it to be less than once every month.

More frequent, "Intermediate" cover is also required if the solid waste generates odours.

(c) Domestic Garbage

No domestic refuse will be disposed of in an industrial landfill site.

(d) Burning

The burning of wastes is not permitted on industrial landfill sites.

(e) Surface and Groundwater Monitoring

Baseline data shall be collected covering the quality of the existing surface waters in the area including all lakes, rivers, and streams as well as groundwater in the boreholes on and around the landfill site including wells of residents in the potential zone of influence.

