

system and providing a unique identification location label for each collector.

(1) Each owner or operator subject to the provisions of this subpart shall keep up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under § 60.755(b).

(2) Each owner or operator subject to the provisions of this subpart shall keep readily accessible documentation of the nature, date of deposition, amount, and location of asbestos-containing or nondegradable waste excluded from collection as provided in § 60.759(a)(3)(i) as well as any non-productive areas excluded from collection as provided in § 60.759(a)(3)(ii).

(e) Except as provided in § 60.752(b)(2)(i)(B), each owner or operator subject to the provisions of this subpart shall keep for at least 5 years up-to-date, readily accessible records of all collection and control system exceedances of the operational standards in § 60.753, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance.

(f) Landfill owners or operators who convert design capacity from volume to mass or mass to volume to demonstrate that landfill design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, as provided in the definition of "design capacity", shall keep readily accessible, on-site records of the annual recalculation of site-specific density, design capacity, and the supporting documentation. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.

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**§ 60.759 Specifications for active collection systems.**

(a) Each owner or operator seeking to comply with § 60.752(b)(2)(i) shall site active collection wells, horizontal collectors, surface collectors, or other extraction devices at a sufficient density throughout all gas producing areas using the following procedures unless alternative procedures have been ap-

proved by the Administrator as provided in § 60.752(b)(2)(i)(C) and (D):

(1) The collection devices within the interior and along the perimeter areas shall be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues shall be addressed in the design: depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandibility, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, and resistance to the refuse decomposition heat.

(2) The sufficient density of gas collection devices determined in paragraph (a)(1) of this section shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior.

(3) The placement of gas collection devices determined in paragraph (a)(1) of this section shall control all gas producing areas, except as provided by paragraphs (a)(3)(i) and (a)(3)(ii) of this section.

(i) Any segregated area of asbestos or nondegradable material may be excluded from collection if documented as provided under § 60.758(d). The documentation shall provide the nature, date of deposition, location and amount of asbestos or nondegradable material deposited in the area, and shall be provided to the Administrator upon request.

(ii) Any nonproductive area of the landfill may be excluded from control, provided that the total of all excluded areas can be shown to contribute less than 1 percent of the total amount of NMOC emissions from the landfill. The amount, location, and age of the material shall be documented and provided to the Administrator upon request. A separate NMOC emissions estimate shall be made for each section proposed for exclusion, and the sum of all such sections shall be compared to the NMOC emissions estimate for the entire landfill. Emissions from each section shall be computed using the following equation:

**§ 60.759**

**40 CFR Ch. I (7-1-14 Edition)**

$Q_i = 2 k L_o M_i (e^{-kt} i) (C_{NMOC}) (3.6 \times 10^{-9})$   
where,

$Q_i$  = NMOC emission rate from the  $i^{th}$  section,  
megagrams per year

$k$  = methane generation rate constant,  
year<sup>-1</sup>

$L_o$  = methane generation potential, cubic  
meters per megagram solid waste

$M_i$  = mass of the degradable solid waste in  
the  $i^{th}$  section, megagram

$t_i$  = age of the solid waste in the  $i^{th}$  section,  
years

$C_{NMOC}$  = concentration of nonmethane or-  
ganic compounds, parts per million by  
volume

$3.6 \times 10^{-9}$  = conversion factor

(iii) The values for  $k$  and  $C_{NMOC}$  deter-  
mined in field testing shall be used if  
field testing has been performed in de-  
termining the NMOC emission rate or  
the radii of influence (this distance  
from the well center to a point in the  
landfill where the pressure gradient ap-  
plied by the blower or compressor ap-  
proaches zero). If field testing has not  
been performed, the default values for  
 $k$ ,  $L_o$  and  $C_{NMOC}$  provided in  
§60.754(a)(1) or the alternative values  
from §60.754(a)(5) shall be used. The  
mass of nondegradable solid waste con-  
tained within the given section may be  
subtracted from the total mass of the  
section when estimating emissions pro-  
vided the nature, location, age, and  
amount of the nondegradable material  
is documented as provided in paragraph  
(a)(3)(i) of this section.

(b) Each owner or operator seeking to  
comply with §60.752(b)(2)(i)(A) shall  
construct the gas collection devices  
using the following equipment or pro-  
cedures:

(1) The landfill gas extraction compo-  
nents shall be constructed of polyvinyl  
chloride (PVC), high density poly-  
ethylene (HDPE) pipe, fiberglass, stain-  
less steel, or other nonporous corrosion  
resistant material of suitable dimen-  
sions to: convey projected amounts of  
gases; withstand installation, static,  
and settlement forces; and withstand  
planned overburden or traffic loads.  
The collection system shall extend as  
necessary to comply with emission and  
migration standards. Collection de-  
vices such as wells and horizontal col-  
lectors shall be perforated to allow gas  
entry without head loss sufficient to  
impair performance across the in-  
tended extent of control. Perforations

shall be situated with regard to the  
need to prevent excessive air infiltra-  
tion.

(2) Vertical wells shall be placed so as  
not to endanger underlying liners and  
shall address the occurrence of water  
within the landfill. Holes and trenches  
constructed for piped wells and hori-  
zontal collectors shall be of sufficient  
cross-section so as to allow for their  
proper construction and completion in-  
cluding, for example, centering of pipes  
and placement of gravel backfill. Col-  
lection devices shall be designed so as  
not to allow indirect short circuiting of  
air into the cover or refuse into the  
collection system or gas into the air.  
Any gravel used around pipe perfora-  
tions should be of a dimension so as  
not to penetrate or block perforations.

(3) Collection devices may be con-  
nected to the collection header pipes  
below or above the landfill surface. The  
connector assembly shall include a  
positive closing throttle valve, any  
necessary seals and couplings, access  
couplings and at least one sampling  
port. The collection devices shall be  
constructed of PVC, HDPE, fiberglass,  
stainless steel, or other nonporous ma-  
terial of suitable thickness.

(c) Each owner or operator seeking to  
comply with §60.752(b)(2)(i)(A) shall  
convey the landfill gas to a control sys-  
tem in compliance with §60.752(b)(2)(iii)  
through the collection header pipe(s).  
The gas mover equipment shall be sized  
to handle the maximum gas generation  
flow rate expected over the intended  
use period of the gas moving equipment  
using the following procedures:

(1) For existing collection systems,  
the flow data shall be used to project  
the maximum flow rate. If no flow data  
exists, the procedures in paragraph  
(c)(2) of this section shall be used.

(2) For new collection systems, the  
maximum flow rate shall be in accord-  
ance with §60.755(a)(1).

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