Preparing for Reporting Under Subpart TT - Industrial Waste Landfills

September 18, 2012

Ellen Hewitt, Senior Consultant - Columbus, OH
Agenda

- Introduction
- Overview of Subpart TT
- Basic Requirements of Subpart TT
- Emission Calculations
- Reporting Requirements
  - E-GGRT Data Entry
- Conclusions
- Helpful Links
- FAQ
Critical Deadlines

> Completed registration for new reporters by July 30, 2012

> September 28, 2012: Reports Due

> March 31, 2013: Next reports due
Overview of Subpart TT
Applicability §98.460

> Covers industrial waste landfills that accepted waste after 1/1/80

> Located at facility with total design capacity ≥ 300,000 metric tons
  ❖ Sum all ‘disposal’ areas at the site to determine total capacity

> Subpart excludes:
  ❖ Construction/demo waste landfills
  ❖ Inert waste materials (listed next slide)
## Subpart TT Exclusions §98.460(c)

<table>
<thead>
<tr>
<th>Inert Material Excluded</th>
<th>Inert Material Excluded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal combustion/incinerator ash</td>
<td>Bricks, mortar, cement</td>
</tr>
<tr>
<td>Cement kiln dust</td>
<td>Furnace slag</td>
</tr>
<tr>
<td>Rocks/soil from excavation/construction</td>
<td>Materials used as refractory (e.g., alumina, silicon, fire clay, fire brick)</td>
</tr>
<tr>
<td>Glass</td>
<td>Plastics (e.g., polyethylene, polypropylene, PET, polystyrene, PVC)</td>
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<tr>
<td>Non-chemically bound sand</td>
<td>Other waste material with VOC &lt; 0.5% weight</td>
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<tr>
<td>Clay, gypsum, pottery cull</td>
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</table>
Applicability §98.460(d)

> Covers following sources:

- Landfills,
- Gas collection systems, and
- Destruction devices for landfill gases (including flares)
Reportable GHGs §98.462

- CH$_4$ generation and emissions from landfills
- CH$_4$ destruction from gas collection and destruction devices, if applicable
- CO$_2$, CH$_4$, N$_2$O under Subpart C for any stationary combustion units associated with destruction device
Monitoring & QA/QC §98.464

For each waste stream for which you calculate volatile solids concentration or \( \text{DOC}_x \) for that reporting year, take a sample by:

- Developing and following sampling plan
- Determine total % solids and % volatile solids concentration
- Determine DOC value using anaerobic degradation test or estimate based on total and volatile solids

*\( \text{DOC}_x = \) Degradable organic content of waste stream in Year X (weight fraction, wet basis)
For each waste stream for which you calculate volatile solids concentration for historical disposal years, determine using:

- ID similar waste stream & use its volatile solids concentration
- If no similar waste stream, use process knowledge & document basis
For gas collection systems:

- Maintain/calibrate CH$_4$ gas composition monitor
- Maintain/calibrate gas flow meter to measure volumetric flow rate per §98.344(c)
- Calibrate all temperature, pressure, and moisture content monitors specified by manufacturer
Monitoring & QA/QC §98.464 (cont’d)

- If measuring fraction by volume of CH₄ in landfill gas:
  - Use CH₄ gas composition monitor - calibrate and maintain per §98.344(b)
  - Use Equation TT-9 to correct CH₄ to 0% oxygen
  - Calibrate all temperature, pressure, and moisture content monitors specified by manufacturer
Monitoring & QA/QC §98.464 (cont’d)

- Documentation:
  - Procedures used to ensure accuracy of:
    - Disposal quantities
    - For gas collection - gas flow rate, gas composition, temp, pressure, & moisture content
    - Includes but not limited to calibration procedures
  - Estimated accuracy of measurements made with devices (Monitoring Plan)
  - Technical basis for estimates (Monitoring Plan)
Emission Calculations
Emissions Calculations

> Calculations required for each industrial landfill
  > Includes all disposal areas at the facility, such that each Subpart TT facility only includes a single landfill
> Calculations for initial reporting year (RY2011, due September 28, 2012) must consider historical operations
  > Must use available waste quantity and production information for each year since 1960 (or year landfill opened)
> Subsequent reporting years will add to this initial information
> If Landfill Gas (LFG) collection system in place, additional calculations required
Calculation Elements

- Waste stream quantities
  - Various possible methods identified in Subpart TT
  - More stringent requirements for RY2011+ quantities
  - See Trinity flowchart for guidance on Landfill Waste Stream Annual Quantity Determination

- Production information
- Degradable organic carbon content
- Fraction methane in LFG
- Landfill capacity and design elements
- Duration of landfill operation
- LFG monitoring data
Waste Stream Quantities

Current reporting years (2011+)

- Must use Direct Measurement Methods
  - Direct mass measurement
  - Direct volume measurement x waste stream density
  - Mass balance: (mass process inputs) - (mass process outputs)
  - Truck loads: (number of loads) x (mass per load)

- Each Direct Measurement Method deals with waste stream-specific quantity determinations
Waste Stream Quantities (Cont.)

- Historical reporting years (1960-2010)
  - If sufficient company records available, use Direct Measurement Methods
    - Waste stream-specific
  - Otherwise, if production data available, use Waste Disposal Factor (WDF)
    - Per Eq. TT-2 and Eq. TT-3
    - Waste stream-specific
  - Otherwise, use Bulk Waste Quantity
    - Per Eq. TT-4a or Eq. TT-4b, depending on whether data for consecutive years is available
    - Aggregates individual waste streams (NOT waste stream-specific)
Subpart TT: DATA FLOW for Industrial Landfills

Go To Subpart TT Overview

Go to Landfill Details (Click OPEN)

Enter Basic Info on Landfill and Values Used in Equation TT-1 and SAVE

From Subpart TT Overview Go To Methane Generation And Emissions (Click OPEN)

For landfills without Gas Collection, enter results for Eq. TT-6* and SAVE

For landfills with Gas Collection, enter results for Eq. TT-6, and HH-6, 7, 8** and info on GCS and monitoring equipment and SAVE

Complete Info on Waste Stream, years placed in landfill, and methods used for DOCx and waste quantities and SAVE

Return to Subpart TT Overview (add more waste streams, as appropriate)

Return to Subpart TT Overview to add another Subpart or Generate Report

From Subpart TT Overview Go To Estimated Waste Depths

Enter waste depths at landfill and SAVE

*For all equations, worksheet links are provided. Open equation worksheets as needed, enter data, calculate results, and enter the results into the red boxes provided

**Industrial Landfills with gas collection follow equations from subpart HH, MSW landfills, to calculate methane emissions.
Landfill Waste Disposal Quantity Year (y)

If y ≥ 2011

Current GHG Emissions Reporting Year

If 1960 ≤ y ≤ 2010

Historical Reporting Year

Is historical data available to use Direct Measurement Methods for year y?

Yes

DIRECT MEASUREMENT METHODS

Use any of the following methods to determine the annual quantity of each waste stream:
1) Direct mass measurements
2) Direct volume measurements x waste stream density
3) Mass balance:
   (mass process inputs) - (mass process outputs)
4) Trunk loads:
   (number of loads) x (mass waste per load)

No

Is production data available for year y?

Yes

WASTE DISPOSAL FACTOR (WDF) METHOD

Step 1 (EQTT-2): Develop a WDF for each waste stream using available waste/production data since 1960.
Step 2 (EQTT-3): Use these WDF's to calculate the quantity of each waste stream in year y based on the production rate during year y.

No

Is waste disposal quantity data available for consecutive years?

Yes

BULK WASTE QUANTITY METHOD

Calculate the annual bulk waste disposal quantity using EQTT-4a.

No

BULK WASTE QUANTITY METHOD

Calculate the annual bulk waste disposal quantity using EQTT-4a.

Landfill Waste Stream Annual Quantity Determination

40 CFR 98 Subpart TT
EPA Subpart TT Emission Calculation Options
Emissions Calculation Options

- EPA Optional Calculation Spreadsheets (released June, 2012)
- Custom built spreadsheets
- Third party EMIS (not covered here)
EPA Calculation Spreadsheets

> Optional - provided to assist with reporting and recordkeeping requirements, but not required
  ❖ Some documentation of calculations is required per 40 CFR 98.3(g)
> Cannot be submitted in e-GGRT
  ❖ Must transfer results to e-GGRT’s online worksheets, or use XML file generation option

http://www.ccdsupport.com/confluence/display/help/Optional+Calculation+Spreadsheet+Instructions
EPA Calculation Spreadsheets (Cont.)

> Separate spreadsheets provided for:
  - Equation TT-1
  - Equation TT-2
  - Equations TT-3, TT-4a, TT-4b
  - Equation TT-5
  - Equation TT-6
  - Equations HH-6, HH-7, HH-8

♦ Developed for municipal waste landfill subpart, but referenced by Subpart TT
Preparing for Submittal to EPA Through e-GGRT
Overview of e-GGRT System
Electronic Greenhouse Gas Reporting Tool (e-GGRT)

- Web based system to support facility and supplier reporting
- Entirely web based reporting system
- “Leveraging new technologies for easier reporting and analysis”
Getting Set Up in e-GGRT - First Time Users

1. Request “Electronic Signature Agreement” (ESA)
   1. Print and mail to Mclean, VA
   2. Must be approved by e-GGRT
   3. Once approved, provided with a login

2. Prepare the “Certificate of Representation” (COR)
   1. Can be prepared by an “Agent”
   2. Prior to the ID of a “Designated Representative,” this is where Agent has most power within the system.

Deadline passed on July 30, 2012
Certificate of Representation

- The COR is the official designation of the DR and ADR
- Once a DR/ADR is identified, they are the only ones to approve new DR or Agents
- If a DR has left the company, and no ADR is identified, work with “Help Desk” to make changes
  - This takes time!
e-GGRT Logistics

- e-GGRT logins appear to expire
- e-GGRT requires a high level of involvement by the Designated Representative
- The e-GGRT Help Desk is a great resource!
  - ghgreporting@epa.gov
EPA e-GGRT Web Forms
OVERVIEW OF SUBPART REPORTING REQUIREMENTS

Subpart TT requires industrial waste landfills to report methane (CH₄) generation and emissions quantities. First, provide the information requested in the Landfill Details page and e-GGRT will determine what additional information is required for reporting based on the information you provide about your landfill. Next, identify each waste stream placed into the landfill and provide the associated information requested by e-GGRT. For additional information about Subpart TT reporting, please use the e-GGRT Help link(s) provided.

EPA has finalized a rule that defers the deadline for reporting data elements used as inputs to emission equations for direct emitters. See 76 FR 53057 (published August 25, 2011). In accordance with the rule, e-GGRT is not currently collecting data used as inputs to emission equations.

WASTE STREAM SUMMARY

<table>
<thead>
<tr>
<th>Name/ID</th>
<th>Status</th>
<th>Delete</th>
</tr>
</thead>
<tbody>
<tr>
<td>No streams have been added</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Subpart TT: Industrial Waste Landfills (2011)

Subpart Overview » Landfill Details

## LANDFILL DETAILS

Much of the information on the form below is necessary to determine which annual reporting requirements apply to your landfill (e.g., does your landfill have a landfill gas collection system?). The answers you provide on this screen will determine what Greenhouse gas reporting elements are made available on your Subpart TT Overview page. For additional information about the facility information required by Subpart TT, please use the e-GGRT Help link(s) provided.

* denotes a required field

<table>
<thead>
<tr>
<th>In 2011, was the landfill open or closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Open (actively accepting waste)</td>
</tr>
<tr>
<td>☐ Closed (no longer accepting waste)</td>
</tr>
</tbody>
</table>

## LANDFILL GAS COLLECTION SYSTEM

<table>
<thead>
<tr>
<th>Does the landfill have a landfill gas collection system</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Yes</td>
</tr>
<tr>
<td>☐ No</td>
</tr>
</tbody>
</table>

## LANDFILL PASSIVE VENTS AND LEACHATE RECIRCULATION.

<table>
<thead>
<tr>
<th>Passive vents and/or flares are present (vents or flares that are not considered part of the gas collection system)</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ (check if true)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>An indication of whether leachate recirculation was used during the reporting year</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ (check if true)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The typical frequency of use of leachate recirculation over the past ten (10) years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select</td>
</tr>
</tbody>
</table>
COVER MATERIALS

Identify each type of cover material used
- Organic cover
- Sand cover
- Clay cover
- Other soil mixture

EQUATION TT-1 DETAILS

The fraction of CH₄ in landfill gas (F) is based on a measured value (not the default)
- (check if true)

An MCF value other than the default of 1 was used
- (check if true)

Note: The following data elements may or may not be required to be reported based on the methods you have employed to determine waste quantities disposed of at your landfill in years prior to the current reporting year. These methods are indicated by waste stream in the Waste Stream Summary section of your report. The following data elements serve as inputs to certain historical waste quantity equations and - in those cases - their reporting deadline has been deferred. See 76 FR 53057 (published August 25, 2011). Otherwise, they must be reported. Please follow the instructions provided below.

Number of waste streams added
0

The number of waste streams is automatically calculated by e-GGRT based on the number of waste streams added on the Subpart Overview page.

Landfill capacity
(metric tons)

Please report this data only if you DID NOT employ Equation TT-4a or TT-4b to calculate waste disposal quantities as described in 98.346(a)(2)(ii)(C).

Range of years for which both disposal and production data were used in Equation TT-2 to calculate the average waste disposal factor for the landfill

Please report the range of years only if you employed Equation TT-2 and TT-3 to calculate waste disposal quantities as described in 98.346(a)(2)(ii)(A) and (B).
### EQUATION TT-1 DETAILS

The fraction of CH₄ in landfill gas (F) is based on a measured value (not the default)

- [ ] (check if true)

An MCF value other than the default of 1 was used

- [ ] (check if true)

### ACTIVE AERATION INFORMATION

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeration blower capacity</td>
<td></td>
</tr>
<tr>
<td>Fraction of the landfill containing waste affected by the aeration</td>
<td></td>
</tr>
<tr>
<td>Total hours during the year aeration blower was operated</td>
<td></td>
</tr>
<tr>
<td>Other factors used as a basis for the selected MCF value</td>
<td></td>
</tr>
<tr>
<td>Description of the aeration system</td>
<td></td>
</tr>
</tbody>
</table>
OVERVIEW OF SUBPART REPORTING REQUIREMENTS

Subpart TT requires industrial waste landfills to report methane (CH4) generation and emissions quantities. First, provide the information requested in the Landfill Details page and e-GGRT will determine what additional information is required for reporting based on the information you provide about your landfill. Next, identify each waste stream placed into the landfill and provide the associated information requested by e-GGRT. For additional information about Subpart TT reporting, please use the e-GGRT Help link(s) provided.

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**WASTE STREAM SUMMARY**

<table>
<thead>
<tr>
<th>Name/ID</th>
<th>Status</th>
<th>Delete</th>
</tr>
</thead>
<tbody>
<tr>
<td>No streams have been added</td>
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<td></td>
</tr>
</tbody>
</table>

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**Reporting Information**

- **Landfill Details**
- **Methane Generation and Emissions for Landfills without LFG Collection Systems**

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EPA has finalized a rule that defers the deadline for reporting data elements used as inputs to emission equations for direct emitters. See 76 FR 53057 (published August 25, 2011). In accordance with the rule, e-GGRT is not currently collecting data used as inputs to emission equations.
Subpart TT: Industrial Waste Landfills (2011)

CH₄ EMISSIONS (FOR LANDFILLS WITHOUT A GAS COLLECTION SYSTEM)

Landfills that do not have a landfill gas collection system, are required to report annual CH₄ emissions (i.e., the CH₄ generation, adjusted for oxidation, calculated using Equation TT-6 of this subpart), reported in metric tons of CH₄. For additional information, please use the e-GGRT Help link(s) provided.

EQUATION TT-6 SUMMARY AND RESULT

\[ MG = G_{CH₄} \times (1 - OX) \]

Hover over an element in the equation above to reveal a definition of that element.

CH₄ generation, adjusted for oxidation, from the landfill in the reporting year.

Use Subpart TT-6 equation spreadsheet to calculate.

Spreadsheets are also available for calculating inputs to Equation TT-6. Use the Subpart TT-1, TT-2/TT-3, and TT-4a/TT-4b spreadsheets to calculate inputs to Equation TT-6 as needed.
Test Facility 196

Subpart TT: Industrial Waste Landfills (2011)

Subpart Overview » Add a Stream

**WASTE STREAM INFORMATION**

Subpart TT requires a facility to uniquely identify and provide the information described below for each waste stream placed into the landfill. For additional information about adding and editing a waste stream, please use the e-GGRT Help link(s) provided.

* denotes a required field

**WASTE STREAM INFORMATION**

Name or Identifier*  
(40 characters maximum)

Waste Stream Description

(List the types of materials in the waste stream, e.g., biosolids from wastewater sludge digester.)

Identify each type of waste present in the waste stream

- food processing
- pulp and paper
- wood and wood product
- construction and demolition
- inert waste
- other industrial solid waste

**DEGRADABLE ORGANIC CARBON (DOCx)**

Identify the method used for determining DOCx for this waste stream

- Default value from Table TT-1 for all years
- A measured value using a 60-day anaerobic biodegradation test for all years
- A value based on total and volatile solids measurements for all years
- Different methods for determining DOCx were used for different years
**METHOD(S) USED TO DETERMINE HISTORICAL WASTE STREAM QUANTITY**

Use the grid below to select the method(s) used to determine historical waste stream quantities in each year this waste stream was placed in the landfill. More than one method may be selected for a given year. See the explanation of methods below the grid.

If this waste stream was not placed in the landfill during one or more years, do not check any boxes corresponding to those years. If you wish to reduce the number of years displayed in the grid below, enter a ‘first’ and ‘last’ year below and click the FILTER GRID button.

Note that the ‘first’ and ‘last’ years are not reporting requirements and will not be included in your annual GHG report; they are only provided to manage the size of the grid for each waste stream. Please note that filtering the grid to remove rows will also remove any check box selections associated with the years removed.

<table>
<thead>
<tr>
<th>First year this waste stream was placed in the landfill</th>
<th>2010 (year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last year this waste stream was placed in the landfill</td>
<td>1960</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RY</th>
<th>Method #1</th>
<th>Method #2</th>
<th>Method #3</th>
<th>Method #4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Select All</td>
<td>Deselect All</td>
<td>Select All</td>
<td>Deselect All</td>
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<tr>
<td>2010</td>
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</table>

- **Method #1**: Used one of the waste quantity measurement methods specified in 98.463(a)(2)(i): direct mass measurements, direct volume measurements multiplied by waste stream density, mass balance procedures (difference between the mass of process inputs and the mass of process outputs), or the number of loads multiplied by the mass of waste per load based on the working capacity of the vehicle or container.
- **Method #2**: Calculated the average waste disposal rate per Equation TT-2 and calculated the waste disposal quantities for historic years in which direct waste disposal measurements are not available using historical production data per Equation TT-3.
- **Method #3**: Calculated an average annual bulk waste disposal quantity for historic years when waste quantity data as determined by other methods are available consecutively for the most recent disposal years (Equation TT-4a).
- **Method #4**: Calculated an average annual bulk waste disposal quantity for historic years when waste quantity data as determined by other methods are available for sporadic (non-consecutive) years (Equation TT-4b).

¹Refer to the e-GGRT Help link(s) provided for a complete description of each DOCx test method provided in the pick list.
Reminder!
Monitoring Plans

> Monitoring Plans must be updated to include TT requirements (see §98.3(g)(5))
  ❖ Who collects the data
  ❖ Explanation of processes and methods used to collect data
  ❖ Description of quality assurance procedures

> No need to submit, but must be provided upon request

> Keep it updated for TT revisions
Helpful Links & Resources

- EPA TT Training Slides:

- EPA’s Optional Calculation Spreadsheets (for multiple subparts, including TT):
  [http://www.ccdsupport.com/confluence/display/help/Optional+Calculation+Spreadsheet+Instructions](http://www.ccdsupport.com/confluence/display/help/Optional+Calculation+Spreadsheet+Instructions)

- EPA’s Rule FAQ:
  [http://www.ccdsupport.com/confluence/display/faq/FAQs](http://www.ccdsupport.com/confluence/display/faq/FAQs)

- EPA Help Desk Email:
  ghgreporting@epa.gov
**FAQ**

> How do I enter data for more than 1 landfill at my facility?

- EPA doesn’t allow multiple ‘landfill’ entry in e-GGRT. There are only multiple ‘disposal areas’ at one facility. Therefore, some data entry may include info on multiple disposal areas. For example:

  ♦ When identifying landfill cover, you may select more than one option if your disposal areas have more than one type of cover.

  ♦ When entering open and closure dates for the landfill, use the opening data of first disposal area and closure date of last disposal area. There may be other closure dates in between these years, but this is not required to be entered in e-GGRT.
North Landfill "Disposal Area 1"
- Opened 1965
- Closed 1980

South Landfill "Disposal Area 2"
- Opened 1975
- Closed 1990

Dates entered in e-GGRT
- Landfill Open: 1965
- Landfill Closed: 1990
FAQ (cont’d)

> Why doesn’t e-GGRT ask for all reportable data listed in Subpart under §98.466 “Data Reporting Requirements”?

- e-GGRT currently reflects the proposed rule deferring reporting of inputs to emission equations for direct emitters. This means that in certain web forms in e-GGRT, you can view a required equation, but you will only enter the RESULT of that equation into e-GGRT.

FAQ (cont’d)

> Must I use and submit EPA’s calculation spreadsheet in e-GGRT?

- EPA is providing OPTIONAL calculation spreadsheets that you can use to perform the emission calcs.
- Download them by clicking the hyperlink on the web-form to view and download for the equation you are working on. Enter required inputs and the spreadsheets will calculate the emission result for you. Enter the result onto the e-GGRT web form.
- OR, go to www.ccdsupport.com and search for calculation spreadsheets
- E-GGRT will NOT collect the calculation spreadsheets and you do NOT need to submit them outside of e-GGRT. Keep records of using these or other calculation spreadsheets under 40 CFR 98 3(g) and additional subpart-specific provisions
For Further Information

Ellen Hewitt
Senior Consultant

ehewitt@trinityconsultants.com