



Climate Change Rules for Landfills

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Climate Change Rules

- ❖ Mandatory Reporting of GHG
- ❖ EPA's Tailoring Rule





Background Mandatory GHG Reporting Rule

- ❖ EPA Proposed Rule issued on March 10, 2009.
- ❖ Final rule issued on September 22, 2009.
- ❖ Significant Public Comments received.
- ❖ Revisions are ongoing.

What Are GHG's

- ❖ Gases that are believed to cause global warming/climate change.
- ❖ Includes carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydroflourocarbons, perflourocarbons and other fluorinated gases.
- ❖ For landfills, primarily methane.

General Rule Provisions

- ❖ The rule is divided into four main categories of facilities
 - ▶ Category 1 – Specific sources (including landfills that generate more than 25,000 mtCO_{2e}/year.
 - ▶ Category 2 – Specific facilities that emit more than 25,000 mtCO_{2e}/year (including iron and steel production and pulp and paper manufacturing)
 - ▶ Category 3 – Has a boiler and emit more than 25,000 mtCO_{2e}/year
 - ▶ Category 4 – Product suppliers that have a likelihood of emit GHGs like natural gas suppliers.

Landfill Specific Provisions

- ❖ Landfills are identified as category 1 facilities. To be applicable;
 - ▶ Landfills must have accepted waste on or after January 1, 1980;
 - ▶ Must generate more than 25,000 mtCO_{2e}/year (~ 250 cfm of LFG);
 - ▶ Does not apply to hazardous waste landfills, and C&D landfills
 - ▶ Industrial landfills brought in July 12, 2010.



Landfill Specific Provisions

- ❖ Landfills that meet the threshold criteria need to report for 2010
 - ▶ The methane generation and methane emissions from the landfill;
 - ▶ The methane destruction resulting from a LFG collection and control system
 - ▶ If a stationary combustion unit is used, the also report CO₂, CH₄ and N₂O from the unit. (See Subpart C)

Landfill Specific Provisions

- ❖ Step 1 – Determine if the landfill generates 25,000 mtCO_{2e}/year.
 - ▶ Document how the tonnage was supplied (scale tickets preferred, otherwise use Equation HH-2)
- ❖ Step 2 – If no active LFG collection system, then document waste quantities using a NIST certified scale. (NIST Handbook 44, 2009).
 - ▶ Calculate methane emitted using Equation HH-5 (10% reduction due to oxidation).
 - ▶ Develop reporting data and records for 2010 year

Landfill Specific Provisions

- ❖ Step 3 – If the landfill has an active LFG collection system...
 - ▶ Need to continuously monitor methane content, flow rate, temperature, pressure and moisture content of landfill gas collected prior to any treatment
 - ▶ Methane meters need to be calibrated prior to the first year (2009) and recalibrated annually or the minimum frequency recommended by the manufacturer or error is greater than $\pm 10\%$. GEM-2000 calibration is every 6 months.



Landfill Specific Provisions

❖ Methane Monitoring

- ▶ Use a continuous methane monitor that uses gas chromatography (ASTM D1946, EPA Method 18 and others). Records every 15 minutes.
- ▶ Use an FID or Infrared Monitor at least weekly and determine annually the non-methane organic carbon correction factor using a gas chromatograph

Landfill Specific Provisions

❖ Flow meter

- ▶ Continuous monitoring (once every 15 minutes) and be certified by ASME. Calibrated in 2009 and every 2 years or more frequently
- ▶ Does it compensate for moisture, temperature and pressure? (ACFM versus SCFM)

❖ Pressure, Temperature and moisture content meters. Calibrated according to manufacturer requirements.

Landfill Specific Provisions

❖ Flares

- ▶ Destruction efficiency as determined by the manufacturer, test, or 99% whichever is lower.
- ▶ Does not consider CO₂
- ▶ If the LFG is transported off site, destruction efficiency is 100%

❖ Engines/Boilers/Turbines

- ▶ Detailed in Subpart C. Four Tiers
- ▶ Must report emissions of CO₂, CH₄ and N₂O
- ▶ Tier 1 (default values) can be used if the rated heat input is less than 250 mmBTU/hour (8,000 cfm) to determine CO₂, CH₄ and N₂O emissions
- ▶ Can use Tier 2 fuel specific HHV if desired. Quarterly testing.



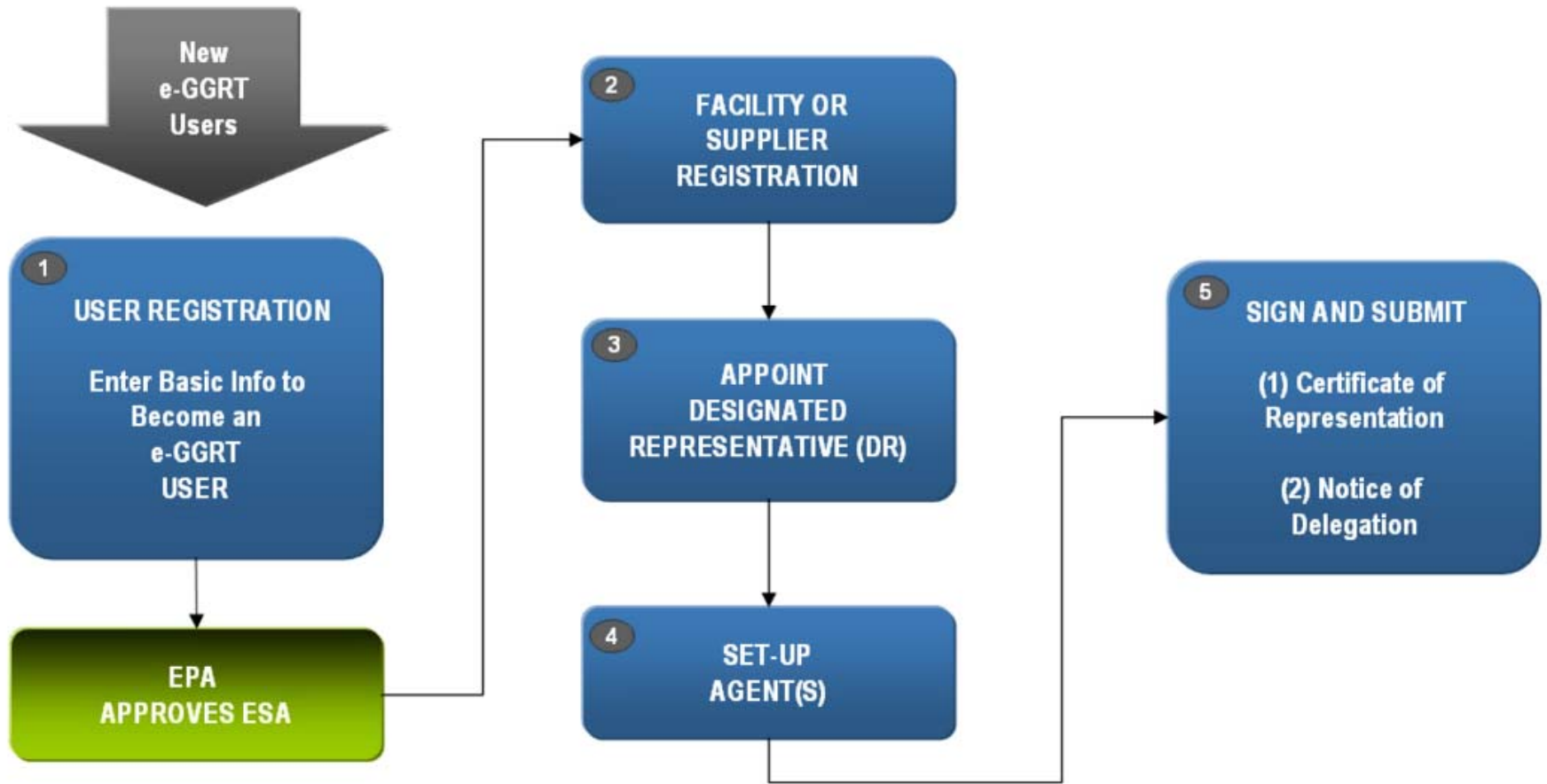
Landfill Specific Provisions

❖ Develop a GHG Plan

- ▶ Responsible Official
- ▶ Explain process and method to collect data
- ▶ QA/QC procedures
- ▶ Maintenance and calibration certifications

❖ Missing Data Provisions

- ▶ Rule provides guidance on missing data



Landfill Specific Provisions

❖ GHG Reporting

- ▶ First report due on March 31, 2011
- ▶ Format as specified by EPA
- ▶ Likely an electronic submittal form
 - ◆ Facility Name
 - ◆ Year/months covered by the report
 - ◆ Date of submittal
 - ◆ Annual emission in CO_{2e}
 - ◆ Annual emission of CH₄
 - ◆ Annual generation of CH₄
 - ◆ Landfill classification (open/closed)
 - ◆ Waste disposal history
 - ◆ Waste disposal capacity
 - ◆ Leachate recirculation?
 - ◆ Estimated waste methodology
 - ◆ Waste composition (if available)
 - ◆ Landfill surface area and type of cover (daily, intermediate, final)
 - ◆ Monthly average LFG temperature and pressure
 - ◆ Total volume of LFG collected for destruction
 - ◆ Methane content of the LFG
 - ◆ All calculations, assumptions and values used.

Landfill Specific Provisions

❖ Best Available Monitoring Methods (BAMM)

- ▶ Had until March 31, 2010 to use best available monitoring methods
- ▶ April 1, 2010 need to use rule specific methods and standards
- ▶ Could request an extension until December 31, 2010 but no longer.

Landfill Specific Provisions

❖ Ending GHG reporting

- ▶ Reported emissions are less than 25,000 mtCO_{2e} for five consecutive years.
- ▶ Reported emissions are less than 15,000 mtCO_{2e} for three consecutive years.
- ▶ Emission sources shut down or removed.

❖ Not Reporting

- ▶ \$37,500 per day per violation + criminal proceedings



GHG Tailoring Rule

- ❖ Applies to all sources of GHG emitting above the threshold value
- ❖ Tailoring in that the rule is phased in
- ❖ Addresses PSD and Title V provisions
- ❖ Some legal debate on EPA authority to “tailor” rules

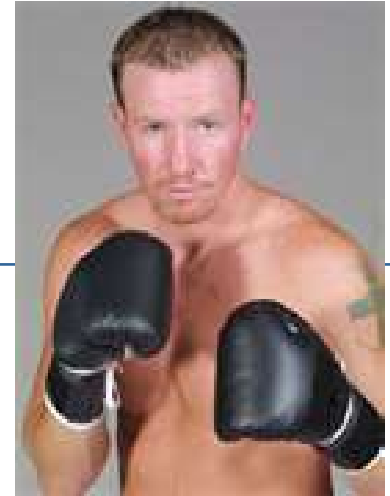


GHG Tailoring Rule

- ❖ Issued May 13, 2010
- ❖ “Common Sense” approach
- ❖ Initially focus on large source
- ❖ Smaller sources exempt until 4/30/2016



GHG Tailoring Rule



- ❖ Round 1 (1/2/11 to 6/30/11)
 - ▶ PSD Sources only
 - ◆ New projects greater than 75,000 TPY of GHGs require BACT for GHGs
 - ▶ Existing Title V sources would be subject to the rule
 - ▶ No sources just because of GHGs



GHG Tailoring Rule

- ❖ Round Two (7/1/2011 to 6/30/2013)
 - ▶ PSD for new projects greater than 100,000 tpy of GHGs emitted.
 - ▶ Modified sources PSD threshold is 75,000 tpy increase
 - ▶ Existing sources that emit greater than 100,000 tpy of GHG require Title V permits



GHG Tailoring Rule



❖ Round 3

- ▶ Additional rulemaking on small sources
- ▶ Streamlining permitting
- ▶ Permits for sources less than 50,000 TPY not required
- ▶ No permitting of small sources until 4/30/16

GHG Tailoring Rule

- ❖ Significant legal debate
- ❖ Some provisions may not stand
- ❖ Could take years to resolve
- ❖ Could be eliminated by Congress
- ❖ States are set to implement in 2011





Take a Deep Breath

❖ Questions



