



Landfill Gas Internal Combustion Engines

Corporate Wide Compliance

A CASE STUDY

Presented By

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Compliance Requirements

State

Title V

State Operating Permits

Landfill

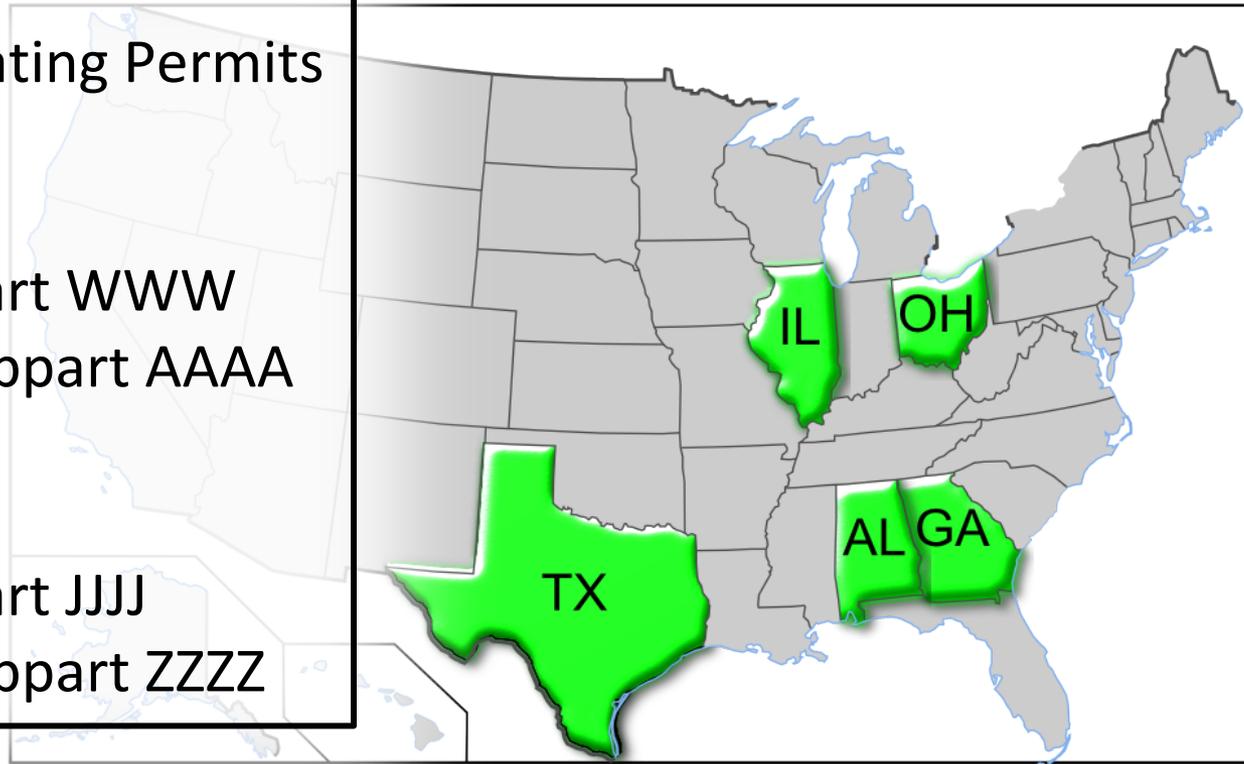
NSPS Subpart WWW

NESHAP Subpart AAAA

Engine

NSPS Subpart JJJ

NESHAP Subpart ZZZZ



General Compliance Specifications for Project – What Do We Have?

- ▶ **Spark ignition internal combustion engines firing landfill gas**
- ▶ **Various manufacture and construction dates**
- ▶ **1,825 hp to 2,233 hp**
- ▶ **Some sites include LFG treatment**
- ▶ **Area source for hazardous air pollutants**



Subpart WWW (MSW Landfill NSPS)

▶ §60.752(b)(2)(iii)(B)and(C)

§60.752(b)(2)(iii)(C)

MSW

Route gas to treatment
system for subsequent
sale/reuse

Landfill Owner

§60.752(b)(2)(iii)(B)

NMOC reduced by 98%
or
NMOC < 20 ppm

LFGTE Treatment Owner



Subpart AAAA (MSW Landfill NESHAP)

- ▶ **Comply with MSW Landfill NSPS**
- ▶ **Collection and Control System Startup, Shutdown and Malfunction (SSM) Plans and Reports**
- ▶ **Submit Subpart WWW Annual Report Semi-Annually**



NESHAP Subpart ZZZZ

NSPS Subpart JJJJ

▶ **NESHAP Subpart ZZZZ**

- Existing Area Source, ≥ 500 hp
- Change oil and filter every 1,440 hrs

▶ **NSPS Subpart JJJJ**

- ≥ 500 hp, Landfill/Digester Gas
- NO_x , CO and VOC emission standards
- Purchase certified engine



Engine Compliance - Reconstruction

What is reconstruction?



What is Reconstruction?

▶ Subpart ZZZZ (NESHAP)

- 40 CFR 63 Subpart A definition + applicable dates
 - §63.2: Cost of new components > 50% cost to construct a comparable new source AND feasible to meet new standards

Compliance Strategy

- ▶ **Recordkeeping and Reporting Practices**
- ▶ **Onsite Recordkeeping**
- ▶ **Other Compliance Practices**



Compliance Recordkeeping and Reporting Practices

▶ **Develop Central File Repository**

- File naming system
- Available to onsite personnel and corporate compliance managers

▶ **Review Air Permits**

- Delegated reviewer/preparer for state electronic reporting
- Compliance requirements
- Filing requirements



Compliance Recordkeeping and Reporting Practices

▶ Evaluate Federal Regulatory Applicability

- NSPS Subpart JJJJ (Engines)
- NESHAP Subpart ZZZZ (Engines)
- NSPS Subpart WWW and NESHAP Subpart AAAA (Gas Treatment)

▶ Review and Refine Existing Spreadsheets



Emissions Spreadsheet

Basic Data	Recurring Data
Permit Dates	Test Dates / Results
Emission Standards	Operating Hours (Meter)

[Engine ID]	Hours	Total	Rolling Total	Gas Flow to Engine	Gas Flow to Engine	MMBtu/hr
Date	(meter)	Hours	(hrs)	(scfm)	(dcfm)	(Actual)
08/22/06	1234	1234	1234			
10/24/06	1542	308	1542			
01/04/07	1782	240	1782			
05/23/07	1900	118	1900			
08/29/07	2200	300	966			
11/30/07	2600	400				
02/16/08	3000	400				

Rolling total hrs based on:	12	months
Rolling total gas flow based on:	3	months



Emissions Spreadsheet

Unhide for Historical Permit Conditions →	
[Engine ID]	[Facility Eng ID]
NO_x	
Std Effective Date	12/15/08
Emission Standard (g/hp-hr)	0.6
Emission Standard (lb/hr)	2.87
Emission Standard (tpy)	12.58
Basis	10
Test Frequency*	
Months	3
Hours in this Period	998
Alternate (Months)	12
Next Test Date	09/02/13
Next Test (Alt)	06/02/14

*Testing required every 3 months for engines running 1,000 hrs in 3 months; otherwise once per year.

Rolling Total		
NO_x	Emissions	NO_x
(lb/hr)	(tpy)	(g/hp-hr)
2.67	1.6	0.50
2.73	2.1	0.60
2.6	2.3	0.61
2.19	2.1	0.49
1.99	1.0	0.36
2.57	1.4	0.45
2.5	1.5	0.62



Compliance Calendar

LFG IC Engines Compliance Calendar			
Forms Link	Permit Section or Applicable Regulation	Compliance Item	
Document and Records Maintained On Site			
	11	TV	Title V Permit XXXXX issued January 10, 2011 and Application
	8.A,B	NSR	Permit YYYYY and PSD-TX-XXXX modified January XX, 20XX and Application
	8.C	NSR	Initial Stack Test Results (Life of Permit)
	2.G	TV	SSM Plan issued July 20XX
	2.G	TV	SSM Action Logs (last 5 years)
	3.A, 3.B	TV	VE Observation Records (last 5 years)

EPA Reporting Deadline ●															
May				June				July				August			
Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4
										●	●				
										●	●				
●												●	●		
●												●	●		
												●	●		
												●	●		

Recordkeeping/Compliance Frequency ●							
On	15-minutes	One-Hour	Daily	Weekly	Monthly	Quarterly	Se
urrence							
						●	
						●	
						●	



Onsite Audits



Onsite Audits: Reporting, Recordkeeping and Data Management

▶ **Semi-Annual Compliance Reports**

▶ **Deviation Reports**

▶ **Record Retrieval System**

- Continue efforts toward central file repository

▶ **Data Recording**

- Manual, automatic
- Laborious, “on-demand”
- Emissions spreadsheet
- Standardized forms



Onsite Audits: RICE Rule

▶ **NESHAP Subpart ZZZZ**

- Monitoring, maintenance and recordkeeping requirements (October 2013)
- Every 1,440 hours
 - Oil change
 - Inspect spark plug, belt and hoses

▶ **Corporate-wide maintenance intervals ranged from 1,000 – 1,500 hrs**



Onsite Audits: Spill Prevention, Control and Countermeasure (SPCC) Plans

▶ **Site Inspection**

- Containment structures
- Leak prevention
- Inspection

▶ **Overhead Oil Fill and Discharge Galleys**

- Potential for release
- Work practices
- Specific contingency plan

▶ **Initial and Annual Training**



Onsite Audits: Start-up, Shutdown and Malfunction (SSM)

- ▶ **Interview with site personnel**
- ▶ **Piping and Instrumentation Diagrams**
 - Potential untreated LFG by-pass
- ▶ **Engine and Treatment System**
 - Valves: fail-safe closed, pneumatic, redundant



Onsite Audits: Start-up, Shutdown and Malfunction (SSM)

- ▶ **Standardize SSM Documentation Company-wide**
- ▶ **Recordkeeping and reporting for each individual SSM event**
- ▶ **Manual log: Add checkbox for “No discharge of untreated or treated landfill gas has occurred.”**
- ▶ **Manual log: Add steps to be taken if untreated LFG is discharged during a recordable SSM event**



Onsite Audit: Observation of Conditions Associated with Frequent OSHA Violations

- ▶ **Immediately retrievable MSDS for industrial and household products**
 - Proper labeling
- ▶ **Bloodborne pathogen clean-up kits**
- ▶ **Hazard Communication Plan**



Conclusions

- ▶ **Challenging to manage LFGTE facilities with varying compliance requirements**
- ▶ **Understand and verify facility compliance requirements**
- ▶ **Consolidate data and records**
 - Emissions spreadsheet
- ▶ **Provide means of efficient notification**
 - Compliance calendar



Conclusions

- ▶ **Streamline data management**
 - Central file repository
 - Standardize forms
- ▶ **Site specific recordkeeping and data management audit**
- ▶ **SPCC and SSM audit**
- ▶ **Common OSHA violations**



Thank You



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