



Landfills As An Air Emission Source

Pamela G. Monroe
Compliance Bureau Administrator
New Hampshire Department Of Environmental Services
Air Resources Division

STAPPA/ALAPCO
Enforcement and Compliance Workshop
June 13, 2006
Austin, Texas



Landfill #3



Landfill #3



Landfill #3



Regulatory Framework



- Title V
- Prevention of Significant Deterioration
- 40 CFR 60, Subpart WWW
 - Standards of Performance for Municipal Solid Waste Landfills
- Existing Device Specific Permits
- State Air Toxics Program
 - Air dispersion modeling is used to demonstrate compliance
- 40 CFR 60, Subpart GG
 - Standards of Performance for Stationary Source Gas Turbines
- 40 CFR 63, Subpart AAAA



Background



- In early 2004, odor complaints began to rise
- In March 2004, EPA/DES conducted a joint compliance inspection in preparation for the Title V permit hearing

Background



- Title V permit hearing held in April 2004 was attended by many citizens that expressed concerns
- In April 2004, EPA issued a Section 114 letter requiring quarterly surface monitoring and landfill gas testing
- Surface monitoring requirements were more specific than the NSPS



Background



- In May 2004, the company supplied new information that the total sulfur content of the LFG was as much as 15 times higher than AP-42

Facility Specifics



- Three landfills
- Landfill # 1
 - 49 acres
 - Operated from 1979 – 1992
 - Capped and closed

Facility Specifics



- Landfill # 2
 - 50 acres
 - Operated from 1990 – 1997
 - Capped and closed

Facility Specifics



- Landfill # 3
 - 100 acres
 - Opened in 1995
 - Active
 - Accepts appx. 1 million tons of waste annually
 - Eight phases being sequentially developed
 - Side slopes have final cover
 - Interim soil cover and temporary geomembrane cover

Facility Specifics



- Two landfill gas turbines
- Four flares
- Four landfill gas reciprocating engines
- One leachate treatment plant landfill gas-fired boiler
- Two emergency generators

C & D Fines



- Landfill # 3
 - Used C & D fines as Alternate Daily Cover (“ADC”) commencing in 2000
 - In 2002 and 2003, approximately 109,000 tons and 130,000 tons of C & D fines, respectively, used as ADC

C & D Fines



- Calcium Sulfate (CaSO_4) is a major component of gypsum wallboard. H_2S is created when the sulfur-reducing bacteria consume and metabolize sulfate
- In July 2004, DES banned the use of C & D fines as ADC for all landfills in the State
- A committee was formed to review alternatives

Surface Monitoring



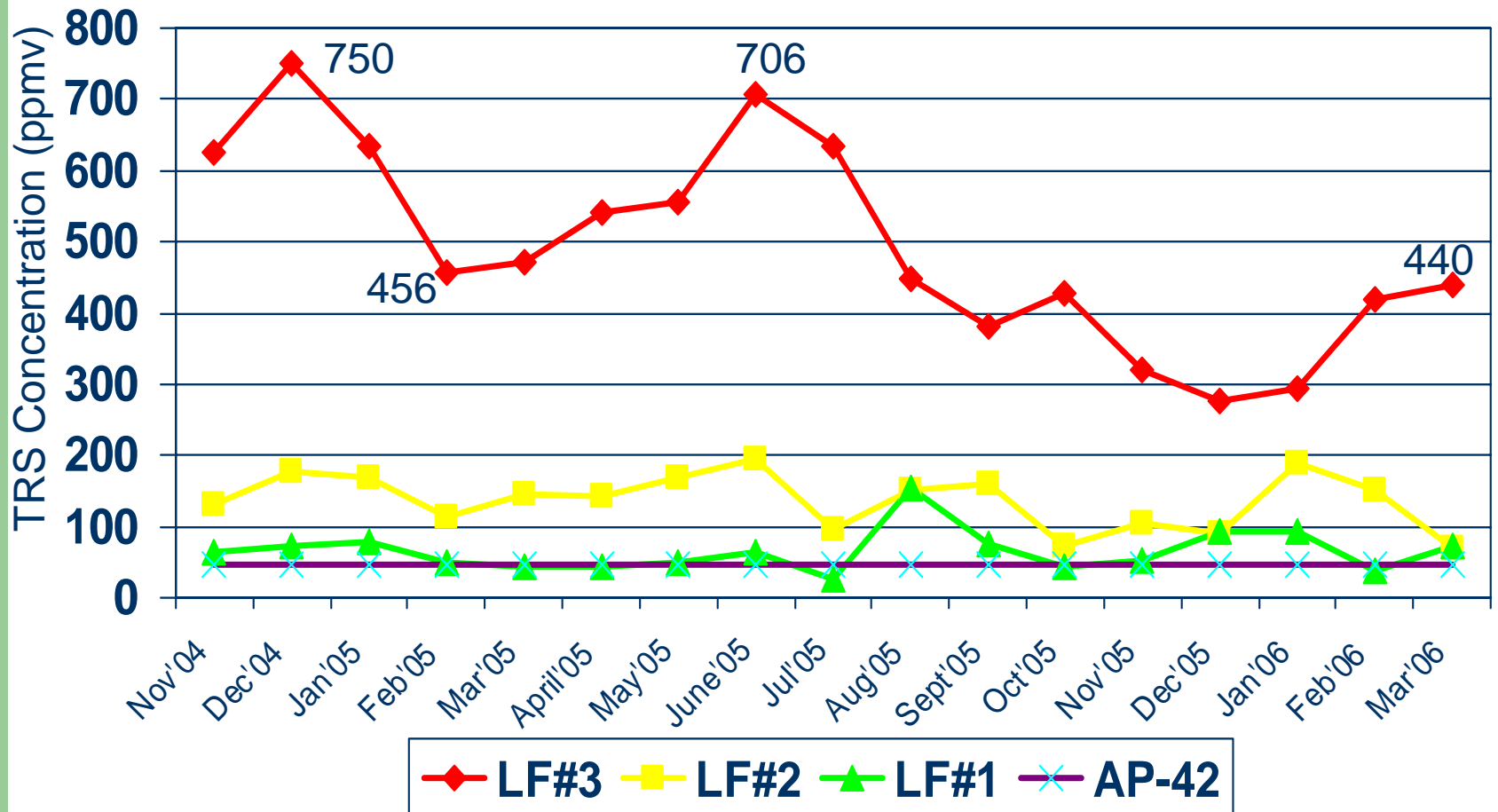
- Prior notification required to both EPA and DES
- EPA and DES coordinated oversight of the surface monitoring
- Surface monitoring methodology was discussed at length
- First monitoring event resulted in identifying 200+ exceedances of the 500 ppm methane standard

Total Reduced Sulfur



- Previous testing had been conducted using stainless steel containers resulting in sulfur scavenging
- Protocol developed and reviewed by EPA and DES
- Testing with oversight was conducted

Total Reduced Sulfur as Hydrogen Sulfide in Landfill Gas



Compliance with Air Toxics



- Air dispersion modeling is used for demonstrating compliance. H_2S was the limiting pollutant
- Modeling inputs refined and a protocol was developed
- Variables in the inputs obviously result in different results

Modeling Variables



- Release height
- Gas generation rates
- Collection efficiency
- Control efficiency
- Sulfur concentration

Remedies



- Installed three H₂S ambient air monitors to get actual ambient data measurements
- Gas Collection System Upgrades
- Facility Wide Emissions Cap
- Annual Odor Evaluation
- Additional Landfill Gas Control Capacity

Remedies



- Monthly landfill gas sulfur monitoring
- Recordkeeping and reporting requirements
- Extensive monitoring
 - Wellhead monitoring
 - Annual camera inspections
 - Surface monitoring
 - Monthly cover integrity monitoring

Next Steps



- Working with smaller landfills on voluntary measures
- Developing rules to fill in the gaps of the NSPS requirements. Issues that need to be resolved include:
 - More stringent applicability
 - Ambient monitoring
 - Surface monitoring
 - Define sufficient gas collection rate
 - Define sufficient density of gas collectors (radius of influence)

Next Steps



- Continue internal coordination with solid waste management bureau
- Continue coordination with EPA
- Continue landfill specific data gathering
- Refine air dispersion modeling inputs
- Refine gas generation estimates

Testing Results

Total Reduced Sulfur in Landfill Gas At LF#4

