



39395 W. Twelve Mile Road, Suite 103 • Farmington Hills, MI 48331 • (877) 633-5520 • Fax: (248) 994-5456

March 21, 2011

Mr. John A. Benedict
Director
WV Department of Environmental Protection
Division of Air Quality
601 57th Street SE
Charleston, WV 25304

Re: Title V Permit Renewal Application
Short Creek Landfill (Permit #R30-06900071-2006)
Project Number 110138

Dear Mr. Benedict:

On Behalf of American Disposal Services of West Virginia, Inc., Cornerstone Environmental Group, LLC (Cornerstone) respectfully submits the attached application to renew the Title V Permit for the Short Creek Landfill (SCL) located in Short Creek, West Virginia. On September 22, 2006, West Virginia Department of Environmental Protection (WV DEP) issued a Title V Permit to Operate to SCL. This permit will expire on September 22, 2011. West Virginia Code requires a renewal application to be submitted to the WV DEP no later than six months prior to the expiration date. Therefore, this Title V renewal application is required to be submitted to WV DEP no later than March 22, 2011.

As required for all Title V renewal applications, this package contains two copies of the application forms requiring signatures of a Responsible Official and two CDs with copies of all other application forms, site plans, process flow diagram, and emission calculations. We are also providing a printed copy of a complete application for your convenience. This Title V Renewal Application has been prepared to meet the requirements of "Title V Permit Application Checklist for Administrative Completeness" guidance published by WV DEP.

The SCL currently operates a Gas Collection and Control System (GCCS) consisting of approximately 36 gas extraction wells and an open flare. Potential emissions from the roadway traffic and the landfill activities have been provided in the renewal application.

SCL received a permit for a Rock Crusher (Permit R13-2822) on May 4, 2010 from WV DEP. This renewal application requests to include this new emission unit in the Title V operating permit.

Division of Air Quality
March 21, 2011
Page 2

Finally, the emission units at SCL are not subject to the Compliance Assurance Monitoring (CAM) requirements of 40 CFR Part 64. The municipal solid waste landfill is currently regulated by 40 CFR Part 60, Subpart WWW, which is an NSPS standard promulgated after November 15, 1990.

Should you have any questions or comments regarding this submittal or require further information, please contact Mr. Travis Bayes of Short Creek Landfill at (216) 965-9992 or Mr. Khaled Mahmood of Cornerstone at (586) 582-9313.

Sincerely,

Cornerstone Environmental Group, LLC



Geed Latif, E.I.T.
Project Engineer



Khaled Mahmood, P.E.
Senior Project Manager

Enclosure: Title V Renewal Application

cc: Travis Bayes – Short Creek Landfill



Short Creek Landfill Title V Permit Renewal Application

Project Number 110138
March 2011



Prepared for:
American Disposal Services of West
Virginia, Inc.



Short Creek Landfill
258 North Fork Road
Wheeling, WV 26003



39395 W. Twelve Mile Rd., Suite 103, Farmington Hills, MI 48331

Building lifetime relationships with our clients and employees.

TITLE V PERMIT RENEWAL APPLICATION
SHORT CREEK LANDFILL
SHORT CREEK, WV

Prepared for
American Disposal Services of West Virginia, Inc.
March 2011

Prepared by



39395 W. Twelve Mile Road
Farmington Hills, MI 48331

Project 110138-001

**Title V Renewal Permit Application
Short Creek Landfill
Short Creek, WV**

The material and data in this report were prepared under the supervision and direction of the undersigned.

Cornerstone Environmental Group, LLC



Geed Latif, E.I.T.
Project Engineer



Khlaed Mahmood, P.E.
Senior Project Manager

TABLE OF CONTENTS

LIST OF TABLES, FIGURES AND DRAWINGS	ii
1 INTRODUCTION	1-2
1.1 PURPOSE	1-2
2 EXISTING SITE CONDITIONS	2-1
2.1 LANDFILL DESCRIPTION	2-1
2.2 LANDFILL GAS COLLECTION AND CONTROL SYSTEM.....	2-1
3 PROCESS DESCRIPTION	3-1
4 REGULATORY DISCUSSION	4-1
4.1 NEW SOURCE PERFORMANCE STANDARDS.....	4-1
4.2 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS	4-1
5 AIR EMISSION ESTIMATES	5-1
5.1 LANDFILL.....	5-1
5.1.1 <i>Fugitive Dust Emissions</i>	5-1
5.2 CONTROL EQUIPMENT EMISSIONS	5-2
5.3 INSIGNIFICANT SOURCES	5-2
5.4 NEW PERMITTED SOURCE	5-2
6 FACILITY EMISSIONS SUMMARY	6-3
7 CURRENT SITE STATUS	7-4
8 TITLE V RENEWAL APPLICATION FORMS	8-1
8.1 WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION RENEWAL APPLICATION FORMS 8-1	
LIMITATIONS	1
 APPENDICES	
APPENDIX A SITE PLAN	
APPENDIX B EMISSION CALCULATION	
APPENDIX C PROCESS FLOW DIAGRAM	
APPENDIX D ROCK CRUSHER CONSTRUCTION PERMIT	

LIST OF TABLES, FIGURES AND DRAWINGS

Tables

(6-1) FACILITY EMISSION SUMMARY

1 INTRODUCTION

1.1 Purpose

This renewal application has been prepared for the Short Creek Landfill, located in Short Creek, Ohio County, West Virginia. The Short Creek Landfill currently operates under Title V Permit No: R30-06900071-2006, which was issued September 22, 2006. The current Title V Permit expires on September 22, 2011. As required by General Condition #2.3 of the Title V Permit, this renewal application is being submitted at least six months prior to the expiration of the current permit.

This Title V Renewal Application has been prepared to meet the requirements of “Title V Permit Application Checklist for Administrative Completeness” guidance published by WV DEP.

2 EXISTING SITE CONDITIONS

2.1 Landfill Description

The Short Creek Landfill is located in Short Creek, West Virginia and accepts municipal and other wastes in accordance with its operating license issued by the West Virginia Department of Environmental Protection (WVDEP). The Short Creek Landfill is owned and operated by American Disposal Services of West Virginia, Inc.

Per current operating license, the Short Creek Landfill contains three existing separate fill areas, as follows:

- The area filled to final grade, closed and capped, Older Construction and Demolition debris Waste Area, is approximately 11 acres without an active GCCS. This landfill was previously known as the North Fork Landfill.
- The area filled to final grade, closed and capped, Existing Landfill, is approximately 34 acres with an active GCCS.
- The active waste filling area, New Landfill, currently includes approximately 22 constructed acres and landfill footprint.

The landfill design capacity is approximately 13,818,248 million cubic meters. The landfill reportedly began receiving refuse in 1980.

2.2 Landfill Gas Collection and Control System

The Short Creek Landfill has installed and currently operates a GCCS for the expansion fill areas and the areas filled to final grade. The existing GCCS consists of approximately 36 gas extraction wells. These extraction wells convey the landfill gas (LFG) from the refuse, through a series of lateral and header pipes, to a utility (candlestick) flare for destruction. If the flare shuts down, an automatic valve on the main gas header that feeds the blower closes. This automation helps prevent the free-venting of raw LFG to the atmosphere.

The average spacing between vertical wells is approximately 200 to 250 feet.

The vertical wells are generally positioned on the landfill plateau. The lateral and header pipes are installed below grade and are constructed of high-density polyethylene (HDPE) pipe. The LFG is conveyed through this pipe network to the flare located along the southwest corner of the site.

3 PROCESS DESCRIPTION

The main process at the SCL is landfilling of non-hazardous municipal solid waste (MSW). This process is identified as emission units 01-C1 (closed CDD waste area), 01-C2 (closed existing landfill area), and 01-A1 (active disposal area) in the Title V Permit to Operate. A landfill consists of an area of land that has been permitted and constructed according to solid waste regulations for the acceptance and disposal of solid waste materials.

Waste is hauled to the landfill by a waste carrying truck or other vehicles. Waste acceptance typically occurs by waste hauling trucks carrying waste material to the landfill "active face". The active face is an approximate 0.25-acre area on any given day. The location varies throughout the landfill as operations progress. As the waste is unloaded from the waste carrying vehicles, it is moved to its final location by bulldozers and densified in place by compactor units.

Landfilling involves covering the refuse at the end of the day with soil or approved alternate daily cover (tarps or other inert materials as approved by the WVDEP) thereby creating anaerobic conditions for refuse decomposition. As the waste decomposes within the landfill, a composite gas consisting primarily of methane and carbon dioxide is produced. Methane is not a regulated air pollutant; however, the landfill gas also contains small amounts of non-methane organic compounds (NMOC), volatile organic compounds (VOC) and hazardous air pollutants (HAPs), which are regulated air pollutants. In essence, the degradation process is analogous to that occurring in a sewage sludge digester; the major difference is that optimum conditions for methane production are rarely encountered in a landfill. Gas generation volumes vary over the landfill life but generally increase year to year until a peak volume is reached shortly after landfill closure.

Landfill gas emissions are minimized by placing daily, intermediate, and final soil cover on the waste to help prevent the gases from migrating out of the landfill.

The SCL is required by the New Source Performance Standards (NSPS), being 40 CFR 60 Subpart WWW, and the National Emission Standard for Hazardous Air Pollutants (NESHAPs), being 40 CFR 63 Subpart AAAAA, to install a landfill gas collection and control system (GCCS) because NMOC emissions exceed 50 Mg/year. Currently, the GCCS at SCL includes one (1) open flare and approximately 15 gas extraction wells. The open flare is designed to process a maximum of 2,500 standard cubic feet per minute (scfm) of landfill gas.

Emissions of particulate matter (PM), particulate matter with an aerometric diameter less than 10 micrometers (PM₁₀), and particulate matter with an aerometric diameter less than 2.5 micrometers (PM_{2.5}), are generated by vehicles traveling on paved and unpaved roads located throughout the landfill. These emissions are generated by trucks bringing refuse and construction materials to the landfill face on paved and unpaved roads. Emissions associated with the truck traffic are identified as emission unit 01-P1 (paved roadways) and 01-UP1 (unpaved roadways) in the Title V Permit to Operate.

4 REGULATORY DISCUSSION

4.1 New Source Performance Standards

The United States Environmental Protection Agency (USEPA) promulgated New Source Performance Standards (NSPS) and Emission Guidelines (EG) for MSW landfills on March 12, 1996. These standards include requirements for landfill gas collection and control systems at MSW landfills, and apply to many of the larger landfills in the U.S. Because SCL was constructed, reconstructed, or modified after May 30, 1991, it is subject to the NSPS, specifically Subpart WWW.

4.2 National Emission Standards for Hazardous Air Pollutants

The USEPA promulgated the NESHAP for MSW landfills on January 16, 2003. This NESHAP sets a Maximum Achievable Control Technology (MACT) standard for MSW landfills that is based primarily upon the NSPS Subpart WWW requirements. This NESHAP also requires SCL to devise and implement a startup, shutdown, and malfunction plan (SSM) for the GCCS and to submit semi-annual reports of the operation of the GCCS and open flare.

5 AIR EMISSION ESTIMATES

Air emission calculations were performed to estimate potential emissions from SCL for regulated and hazardous air pollutants.

5.1 Landfill

Two sources of emissions are associated with the landfill. The first is the release of fugitive LFG from the MSW landfill and the second is the generation of fugitive dust from particulates from truck and heavy equipment operations on the landfill.

5.1.1 Fugitive Dust Emissions

Emissions of PM and particulate matter with an aerometric diameter less than 10 micrometers (PM₁₀) are generated by vehicles traveling on paved and unpaved roads located throughout the landfill and by moving soil to create and cover the landfill. Fugitive emissions of PM and PM₁₀ are generated by trucks bringing refuse to the landfill face on paved and unpaved roads. Calculated typical emissions are shown in Attachment B.

Emissions of PM, PM₁₀, and PM_{2.5} from landfill material handling (includes solid waste handling, daily and intermediate cover) were calculated using the equations in Section 13.2.4 of AP-42. Estimates of materials handled were obtained from the facility.

5.1.2 Fugitive Landfill Gas Emissions

Potential fugitive emissions for regulated and hazardous air pollutants from the MSW landfill (01-C1, 01-C2, and 01-A1) were calculated using the USEPA's Landfill Gas Emissions Model, Version 3.02 (LANDGEM). Yearly waste acceptance rates beginning 1986 through 2010 were used with an estimated design capacity of approximately 10.66 million tons municipal solid waste. The output of the model, as well as potential NMOC, VOC and HAP emissions calculations for the MSW landfill, are included as part of Attachment B.

Fugitive HAP emissions from the landfill were calculated using 25% of the maximum landfill gas emission rate predicted by LANDGEM (25% of landfill gas in uncontrolled, the other 75% is collected), based on AP-42 emission factors and assuming that there are no controls. The landfill fugitive HAPs emission calculations are included in Attachment B.

5.2 Control Equipment Emissions

Emissions from flares include particles, unburned hydrocarbons, carbon monoxide, and other partially burned and altered hydrocarbons. Also emitted are nitrogen oxides and sulfur containing material such as hydrogen sulfide or mercaptans. These emissions were calculated either using equations from AP-42 with manufacturer's emission rates or AP-42 emission rates.

The primary method of controlling the landfill gas is the currently permitted 2,500 scfm open flare. Calculated potential emissions from the open flare is included as part of Attachment B.

5.3 Insignificant Sources

Several facility emission sources have been identified as insignificant emission units. These sources include:

- One 48,000 gallon and one 675,000 gallon leachate storage tank (AST)
- One 100 gallon Gasoline storage tank (AST)
- One 4,000 and one 3,000 gallon Diesel fuel storage tanks (AST)
- One 275 gallon Hydraulic Oil storage tank (AST)
- One 275 gallon Motor Oil storage tank (AST)
- One 275 gallon Waste Oil storage tank (AST)
- One 275 gallon Waste Antifreeze storage tank (AST)
- One 100 lb Propane cylinder
- One 1,000 gallon Propane storage tank (AST)
- One 300 Btu/hr Sterling space heater
- One diesel pressure washer
- Two Hobart welder
- Diesel-powered heavy equipment, such as generator and compressor truck mounted, dozers, trucks, and loaders capable of moving under their own power

5.4 New Permitted Source

Since the previous Title V Permit was issued, one new piece of equipment has been permitted at the site. The permit for the new Rock Crusher (Permit R13-2822) was issued on May 4, 2010. A copy of the construction permit is attached in Appendix D.

6 FACILITY EMISSIONS SUMMARY

Below is a summary of facility wide potential to emit.

TABLE (6-1) – FACILITY WIDE POTENTIAL EMISSIONS (TON/YR)

Unit Description	Regulatory Status	Potential Emissions (tons per year)						
		VOCs	NO _x	SO _x	CO	PM10	PM2.5	PM
MSW Landfill	Permitted – TV Permit	8.91	-	-	-	-	-	-
Flare	Permitted – TV Permit	0.69	24.57	5.50	133.70	-	5.56	-
Roadway	Permitted – TV Permit	-	-	-	-	5.7	0.72	22.30
Rock Crusher	Permitted – Construction Permit R13-2822	1.4	17.21	1.13	3.71	16.88	3.09	37.48
TOTAL		11.00	41.78	6.63	137.41	28.23	3.81	59.78

7 CURRENT SITE STATUS

Short Creek Landfill is located in Ohio County which is currently designated as non-attainment area for PM_{2.5}. The existing facility is considered to be a minor source for Prevention of Significant Deterioration (PSD) for all criteria pollutants' potential emission rates are less than 100 tons per year for PM_{2.5} and less than 250 tons per year for all other criteria pollutants.

8 TITLE V RENEWAL APPLICATION FORMS

8.1 West Virginia Department of Environmental Protection Renewal Application Forms

Following are the required forms as submitted in the Title V Permit Renewal Application.



WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street SE
Charleston, WV 25304
Phone: (304) 926-0475

www.dep.wv.gov/daq

INITIAL/RENEWAL TITLE V PERMIT APPLICATION - GENERAL FORMS

Section 1: General Information

Form with 10 sections: 1. Name of Applicant, 2. Facility Name or Location, 3. DAQ Plant ID No., 4. Federal Employer ID No. (FEIN), 5. Permit Application Type, 6. Type of Business Entity, 7. Is the Applicant the..., 8. Number of onsite employees, 9. Governmental Code, 10. Business Confidentiality Claims.

11. Mailing Address		
Street or P.O. Box: 258 North Fork Road		
City: Wheeling	State: WV	Zip: 26003-
Telephone Number: (304) 336-7038	Fax Number: (304) 336-7831	

12. Facility Location		
Street: 258 North Fork Road	City: Short Creek	County: Ohio
UTM Easting: 4444.10 km	UTM Northing: 530.57 km	Zone: <input checked="" type="checkbox"/> 17 or <input type="checkbox"/> 18
Directions: From the city of Wheeling, take Route 2 North, turn right onto Girty Point Road and follow Road to landfill		
Portable Source? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Is facility located within a nonattainment area? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, for what air pollutants? PM _{2.5}	
Is facility located within 50 miles of another state? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, name the affected state(s). Pennsylvania Ohio	
Is facility located within 100 km of a Class I Area ¹ ? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, name the area(s).	
If no, do emissions impact a Class I Area ¹ ? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
¹ Class I areas include Dolly Sods and Otter Creek Wilderness Areas in West Virginia, and Shenandoah National Park and James River Face Wilderness Area in Virginia.		

13. Contact Information		
Responsible Official: Jeff Harvey		Title: General Manager
Street or P.O. Box: 258 North Fork Road		
City: Wheeling	State: WV	Zip: 26003-
Telephone Number: (304) 277-2088 x315	Fax Number: (304) 336-7831	
E-mail address: JHarvey@republicservices.com		
Environmental Contact: Travis Bayes		Title: Environmental Manager
Street or P.O. Box: 258 North Fork Road		
City: Wheeling	State: WV	Zip: 26003-
Telephone Number: (216) 965-9992	Fax Number: (304) 336-7831	
E-mail address: TBayes@republicservices.com		
Application Preparer: Khaled Mahmood		Title: Sr. Project Manager
Company: Cornerstone Environmental Group, LLC		
Street or P.O. Box: 39395 W. Twelve Mile Rd.		
City: Farmington Hills	State: MI	Zip: 48331-
Telephone Number: (630) 633-5856	Fax Number: (248) 994-5456	
E-mail address: Khaled.Mahmood@cornerstoneeg.com		

14. Facility Description

List all processes, products, NAICS and SIC codes for normal operation, in order of priority. Also list any process, products, NAICS and SIC codes associated with any alternative operating scenarios if different from those listed for normal operation.

Process	Products	NAICS	SIC
Municipal Solid Waste Landfill	Disposal of Solid Waste	562212	4953

Provide a general description of operations.

The Short Creek Landfill is located in Ohio County, West Virginia. The total permitted area for waste disposal is approximately 115 acres. The landfill has a total design capacity of approximately 10.66 million tons of municipal solid waste (MSW) and consists of two segregated fill areas designated Landfill A and Landfill B. Waste placement in Landfill A began in approximately 1986 and continued through 2000. The total MSW placement in these areas is approximately 1.83 million tons.

Landfill A encompasses approximately 34 acres and is a certified closed and capped pre-Subtitle D disposal area, underlain by a natural clay liner, with a compacted clay soil cover. Landfill A has two separate areas; one consists of 11 acres of Construction/Demolition (CD) waste area, which has no GCCS components. The second portion of Landfill A is MSW disposal area, approximately 23 acres; an active GCCS is installed and operating in this area. Waste placement in Landfill B began in 2001 and is expected to continue through 2050, given the current rate of waste acceptance.

Landfill B has a MSW capacity of approximately 8.83 million tons. The total permitted area for waste disposal in Landfill B is approximately 81 acres. Currently, 22 acres has been developed, underlain by a double composite base liner system. The final cover system for Landfill B will consist of a composite geosynthetic/low permeability soil barrier.

15. Provide an **Area Map** showing plant location as **ATTACHMENT A**.

16. Provide a **Plot Plan(s)**, e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is located as **ATTACHMENT B**. For instructions, refer to "Plot Plan - Guidelines."

17. Provide a detailed **Process Flow Diagram(s)** showing each process or emissions unit as **ATTACHMENT C**. Process Flow Diagrams should show all emission units, control equipment, emission points, and their relationships.

Section 2: Applicable Requirements

18. Applicable Requirements Summary	
Instructions: Mark all applicable requirements.	
<input type="checkbox"/> SIP	<input type="checkbox"/> FIP
<input type="checkbox"/> Minor source NSR (45CSR13)	<input type="checkbox"/> PSD (45CSR14)
<input checked="" type="checkbox"/> NESHAP (45CSR15)	<input type="checkbox"/> Nonattainment NSR (45CSR19)
<input type="checkbox"/> Section 111 NSPS	<input type="checkbox"/> Section 112(d) MACT standards
<input type="checkbox"/> Section 112(g) Case-by-case MACT	<input type="checkbox"/> 112(r) RMP
<input type="checkbox"/> Section 112(i) Early reduction of HAP	<input type="checkbox"/> Consumer/commercial prod. reqts., section 183(e)
<input type="checkbox"/> Section 129 Standards/Reqs.	<input type="checkbox"/> Stratospheric ozone (Title VI)
<input type="checkbox"/> Tank vessel reqt., section 183(f)	<input type="checkbox"/> Emissions cap 45CSR§30-2.6.1
<input type="checkbox"/> NAAQS, increments or visibility (temp. sources)	<input type="checkbox"/> 45CSR27 State enforceable only rule
<input checked="" type="checkbox"/> 45CSR4 State enforceable only rule	<input type="checkbox"/> Acid Rain (Title IV, 45CSR33)
<input type="checkbox"/> Emissions Trading and Banking (45CSR28)	<input type="checkbox"/> Compliance Assurance Monitoring (40CFR64)
<input type="checkbox"/> CAIR NO _x Annual Trading Program (45CSR39)	<input type="checkbox"/> CAIR NO _x Ozone Season Trading Program (45CSR40)
<input type="checkbox"/> CAIR SO ₂ Trading Program (45CSR41)	

19. Non Applicability Determinations
<p>List all requirements which the source has determined not applicable and for which a permit shield is requested. The listing shall also include the rule citation and the reason why the shield applies.</p> <p>NA</p>
<input type="checkbox"/> Permit Shield

20. Facility-Wide Applicable Requirements

List all facility-wide applicable requirements. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements).

Applicable Requirement: C.S.R. □ 45-6-3.1., Permit Condition Number: III.B.1.a.i.
Applicable Requirement: C.S.R. □ 45-6-3.2., Permit Condition Number: III.B.1.a.ii.
Applicable Requirements: 40 C.F.R. □ 61.145, 61.148, and 61.150; Permit Condition Number: III.B.1.a.iii.
Applicable Requirement: C.S.R. □ 45-30-4.3.h.1.B., Permit Condition Number: III.B.1.a.iv.
Applicable Requirement: WV Code □ 22-5-4(a)(15), Permit Condition Number: III.B.1.a.v.
Applicable Requirement: C.S.R. □ 45-4-3.1. Permit Condition Number: III.B.1.b.
Applicable Requirement: C.S.R. □ 45-11-5.2. Permit Condition Number: III.B.2.a.i.
Applicable Requirement: C.S.R. □ 45-17 Permit Condition Number: III.B.2.b.i.
Applicable Requirements: C.F.R. □ 40-60-752, C.F.R 40-60-753, C.F.R 40-60-755, C.F.R 40-60-756; Permit Condition Numbers: III.B.2.a.iii., III.B.2.a.iv.(a)-(h)
Applicable Requirement: WV Code □ 22-5-4(a)(14); Permit Condition Number: III.B.2.a.v

Permit Shield

For all facility-wide applicable requirements listed above, provide monitoring/testing / recordkeeping / reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number and/or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

C.S.R. □ 45-6-3.1., Permit Condition Number: III.B.1.a.i – open burning is prohibited
C.S.R. □ 45-6-3.2., Permit Condition Number: III.B.1.a.ii - open burning is prohibited
40 C.F.R. □ 61.145, 61.148, and 61.150; Permit Condition Number: III.B.1.a.iii – no friable asbestos waste is currently accepted
C.S.R. □ 45-30-4.3.h.1.B., Permit Condition Number: III.B.1.a.iv – site will notify and submit compliance schedule as necessary.
WV Code □ 22-5-4(a)(15), Permit Condition Number: III.B.1.a.v. – testing conducted under condition III.B.1.a.v.
C.S.R. □ 45-4-3.1. Permit Condition Number: III.B.1.b. – reporting under condition III.C.18
C.S.R. □ 45-11-5.2. Permit Condition Number: III.B.2.a.i. – site will submit standby plan if requested.
C.S.R. □ 45-17 Permit Condition Number: III.B.2.b.i – Submission of control program under condition III.C.1.
C.F.R. □ 40-60-752, C.F.R 40-60-753, C.F.R 40-60-755, C.F.R 40-60-756; Permit Condition Numbers: III.B.2.a.iii., III.B.2.a.iv.(a)-(h) – Recordkeeping and reporting under conditions III.C.3, III.C.4, III.C.6, III.C.7, III.C.8, III.C.11, III.C.13, III.C.14
WV Code □ 22-5-4(a)(14); Permit Condition Number: III.B.2.a.v – Reporting under condition III.B.2.a.v.

Are you in compliance with all facility-wide applicable requirements? Yes No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

22. Inactive Permits/Obsolete Permit Conditions

Permit Number	Date of Issuance	Permit Condition Number
	MM/DD/YYYY	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	
	/ /	

Section 3: Facility-Wide Emissions

23. Facility-Wide Emissions Summary [Tons per Year]	
Criteria Pollutants	Potential Emissions
Carbon Monoxide (CO)	137.41
Nitrogen Oxides (NO _x)	41.78
Lead (Pb)	NA
Particulate Matter (PM _{2.5}) ¹	3.81
Particulate Matter (PM ₁₀) ¹	28.23
Total Particulate Matter (TSP)	59.78
Sulfur Dioxide (SO ₂)	6.63
Volatile Organic Compounds (VOC)	11.00
Hazardous Air Pollutants ²	Potential Emissions
See HAPs emission calculation in Attachment B	
Regulated Pollutants other than Criteria and HAP	Potential Emissions
NMOC	22.84
¹ PM _{2.5} and PM ₁₀ are components of TSP. ² For HAPs that are also considered PM or VOCs, emissions should be included in both the HAPs section and the Criteria Pollutants section.	

Section 4: Insignificant Activities

24. Insignificant Activities (Check all that apply)	
<input checked="" type="checkbox"/>	1. Air compressors and pneumatically operated equipment, including hand tools.
<input checked="" type="checkbox"/>	2. Air contaminant detectors or recorders, combustion controllers or shutoffs.
<input checked="" type="checkbox"/>	3. Any consumer product used in the same manner as in normal consumer use, provided the use results in a duration and frequency of exposure which are not greater than those experienced by consumer, and which may include, but not be limited to, personal use items; janitorial cleaning supplies, office supplies and supplies to maintain copying equipment.
<input checked="" type="checkbox"/>	4. Bathroom/toilet vent emissions.
<input checked="" type="checkbox"/>	5. Batteries and battery charging stations, except at battery manufacturing plants.
<input type="checkbox"/>	6. Bench-scale laboratory equipment used for physical or chemical analysis, but not lab fume hoods or vents. Many lab fume hoods or vents might qualify for treatment as insignificant (depending on the applicable SIP) or be grouped together for purposes of description.
<input type="checkbox"/>	7. Blacksmith forges.
<input type="checkbox"/>	8. Boiler water treatment operations, not including cooling towers.
<input checked="" type="checkbox"/>	9. Brazing, soldering or welding equipment used as an auxiliary to the principal equipment at the source.
<input type="checkbox"/>	10. CO ₂ lasers, used only on metals and other materials which do not emit HAP in the process.
<input checked="" type="checkbox"/>	11. Combustion emissions from propulsion of mobile sources, except for vessel emissions from Outer Continental Shelf sources.
<input checked="" type="checkbox"/>	12. Combustion units designed and used exclusively for comfort heating that use liquid petroleum gas or natural gas as fuel.
<input checked="" type="checkbox"/>	13. Comfort air conditioning or ventilation systems not used to remove air contaminants generated by or released from specific units of equipment.
<input type="checkbox"/>	14. Demineralized water tanks and demineralizer vents.
<input type="checkbox"/>	15. Drop hammers or hydraulic presses for forging or metalworking.
<input type="checkbox"/>	16. Electric or steam-heated drying ovens and autoclaves, but not the emissions from the articles or substances being processed in the ovens or autoclaves or the boilers delivering the steam.
<input type="checkbox"/>	17. Emergency (backup) electrical generators at residential locations.
<input type="checkbox"/>	18. Emergency road flares.
<input type="checkbox"/>	19. Emission units which do not have any applicable requirements and which emit criteria pollutants (CO, NO _x , SO ₂ , VOC and PM) into the atmosphere at a rate of less than 1 pound per hour and less than 10,000 pounds per year aggregate total for each criteria pollutant from all emission units. Please specify all emission units for which this exemption applies along with the quantity of criteria pollutants emitted on an hourly and annual basis: _____ _____ _____ _____ _____ _____ _____ _____

24. Insignificant Activities (Check all that apply)	
<input type="checkbox"/>	<p>20. Emission units which do not have any applicable requirements and which emit hazardous air pollutants into the atmosphere at a rate of less than 0.1 pounds per hour and less than 1,000 pounds per year aggregate total for all HAPs from all emission sources. This limitation cannot be used for any source which emits dioxin/furans nor for toxic air pollutants as per 45CSR27.</p> <p>Please specify all emission units for which this exemption applies along with the quantity of hazardous air pollutants emitted on an hourly and annual basis:</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<input type="checkbox"/>	21. Environmental chambers not using hazardous air pollutant (HAP) gases.
<input checked="" type="checkbox"/>	22. Equipment on the premises of industrial and manufacturing operations used solely for the purpose of preparing food for human consumption.
<input type="checkbox"/>	23. Equipment used exclusively to slaughter animals, but not including other equipment at slaughterhouses, such as rendering cookers, boilers, heating plants, incinerators, and electrical power generating equipment.
<input checked="" type="checkbox"/>	24. Equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis.
<input checked="" type="checkbox"/>	25. Equipment used for surface coating, painting, dipping or spray operations, except those that will emit VOC or HAP.
<input checked="" type="checkbox"/>	26. Fire suppression systems.
<input checked="" type="checkbox"/>	27. Firefighting equipment and the equipment used to train firefighters.
<input type="checkbox"/>	28. Flares used solely to indicate danger to the public.
<input checked="" type="checkbox"/>	29. Fugitive emission related to movement of passenger vehicle provided the emissions are not counted for applicability purposes and any required fugitive dust control plan or its equivalent is submitted.
<input type="checkbox"/>	30. Hand-held applicator equipment for hot melt adhesives with no VOC in the adhesive formulation.
<input checked="" type="checkbox"/>	31. Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning or machining wood, metal or plastic.
<input type="checkbox"/>	32. Humidity chambers.
<input type="checkbox"/>	33. Hydraulic and hydrostatic testing equipment.
<input type="checkbox"/>	34. Indoor or outdoor kerosene heaters.
<input checked="" type="checkbox"/>	35. Internal combustion engines used for landscaping purposes.
<input type="checkbox"/>	36. Laser trimmers using dust collection to prevent fugitive emissions.
<input type="checkbox"/>	37. Laundry activities, except for dry-cleaning and steam boilers.
<input type="checkbox"/>	38. Natural gas pressure regulator vents, excluding venting at oil and gas production facilities.
<input type="checkbox"/>	39. Oxygen scavenging (de-aeration) of water.
<input type="checkbox"/>	40. Ozone generators.
<input checked="" type="checkbox"/>	41. Plant maintenance and upkeep activities (e.g., grounds-keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots) provided these activities are not conducted as part of a manufacturing process, are not related to the source's primary business activity, and not otherwise triggering a permit modification. (Cleaning and painting activities qualify if they are not subject to VOC or HAP control requirements. Asphalt batch plant

24. Insignificant Activities (Check all that apply)	
	owners/operators must still get a permit if otherwise requested.)
<input checked="" type="checkbox"/>	42. Portable electrical generators that can be moved by hand from one location to another. "Moved by Hand" means that it can be moved without the assistance of any motorized or non-motorized vehicle, conveyance, or device.
<input type="checkbox"/>	43. Process water filtration systems and demineralizers.
<input checked="" type="checkbox"/>	44. Repair or maintenance shop activities not related to the source's primary business activity, not including emissions from surface coating or de-greasing (solvent metal cleaning) activities, and not otherwise triggering a permit modification.
<input type="checkbox"/>	45. Repairs or maintenance where no structural repairs are made and where no new air pollutant emitting facilities are installed or modified.
<input type="checkbox"/>	46. Routing calibration and maintenance of laboratory equipment or other analytical instruments.
<input type="checkbox"/>	47. Salt baths using nonvolatile salts that do not result in emissions of any regulated air pollutants. Shock chambers.
<input type="checkbox"/>	48. Shock chambers.
<input type="checkbox"/>	49. Solar simulators.
<input checked="" type="checkbox"/>	50. Space heaters operating by direct heat transfer.
<input checked="" type="checkbox"/>	51. Steam cleaning operations.
<input type="checkbox"/>	52. Steam leaks.
<input type="checkbox"/>	53. Steam sterilizers.
<input type="checkbox"/>	54. Steam vents and safety relief valves.
<input checked="" type="checkbox"/>	55. Storage tanks, reservoirs, and pumping and handling equipment of any size containing soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized.
<input checked="" type="checkbox"/>	56. Storage tanks, vessels, and containers holding or storing liquid substances that will not emit any VOC or HAP. Exemptions for storage tanks containing petroleum liquids or other volatile organic liquids should be based on size limits such as storage tank capacity and vapor pressure of liquids stored and are not appropriate for this list.
<input type="checkbox"/>	57. Such other sources or activities as the Director may determine.
<input type="checkbox"/>	58. Tobacco smoking rooms and areas.
<input type="checkbox"/>	59. Vents from continuous emissions monitors and other analyzers.

Section 5: Emission Units, Control Devices, and Emission Points

25. Equipment Table
Fill out the Title V Equipment Table and provide it as ATTACHMENT D .
26. Emission Units
For each emission unit listed in the Title V Equipment Table , fill out and provide an Emission Unit Form as ATTACHMENT E .
For each emission unit not in compliance with an applicable requirement, fill out a Schedule of Compliance Form as ATTACHMENT F .
NA. All emission units are in compliance with the applicable requirement.
27. Control Devices
For each control device listed in the Title V Equipment Table , fill out and provide an Air Pollution Control Device Form as ATTACHMENT G .
For any control device that is required on an emission unit in order to meet a standard or limitation for which the potential pre-control device emissions of an applicable regulated air pollutant is greater than or equal to the Title V Major Source Threshold Level, refer to the Compliance Assurance Monitoring (CAM) Form(s) for CAM applicability. Fill out and provide these forms, if applicable, for each Pollutant Specific Emission Unit (PSEU) as ATTACHMENT H .
NA. The emission units at Short Creek Landfill are not subject to the Compliance Assurance Monitoring (CAM) requirements of 40 CFR Part 64.

Section 6: Certification of Information

28. Certification of Truth, Accuracy and Completeness and Certification of Compliance

*Note: This Certification must be signed by a responsible official. The **original**, signed in **blue ink**, must be submitted with the application. Applications without an **original** signed certification will be considered as incomplete.*

a. Certification of Truth, Accuracy and Completeness

I certify that I am a responsible official (as defined at 45CSR§30-2.38) and am accordingly authorized to make this submission on behalf of the owners or operators of the source described in this document and its attachments. I certify under penalty of law that I have personally examined and am familiar with the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine and/or imprisonment.

b. Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

Responsible official (type or print)

Name: Jeff Harvey	Title: General Manager
-------------------	------------------------

Responsible official's signature:

Signature: _____ Signature Date: _____
 (Must be signed and dated in blue ink)

Note: Please check all applicable attachments included with this permit application:

<input checked="" type="checkbox"/>	ATTACHMENT A: Area Map
<input checked="" type="checkbox"/>	ATTACHMENT B: Plot Plan(s)
<input checked="" type="checkbox"/>	ATTACHMENT C: Process Flow Diagram(s)
<input checked="" type="checkbox"/>	ATTACHMENT D: Equipment Table
<input checked="" type="checkbox"/>	ATTACHMENT E: Emission Unit Form(s)
<input type="checkbox"/>	ATTACHMENT F: Schedule of Compliance Form(s)
<input checked="" type="checkbox"/>	ATTACHMENT G: Air Pollution Control Device Form(s)
<input type="checkbox"/>	ATTACHMENT H: Compliance Assurance Monitoring (CAM) Form(s)

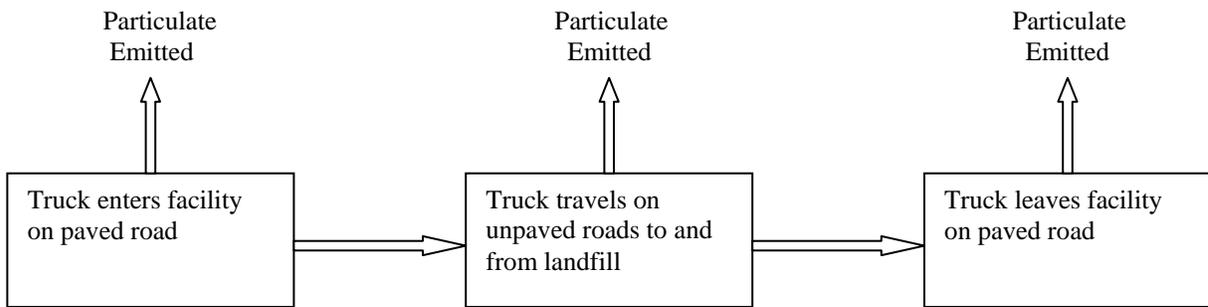
All of the required forms and additional information can be found and downloaded from, the DEP website at www.dep.wv.gov/dag, requested by phone (304) 926-0475, and/or obtained through the mail.

Area Map – Short Creek Landfill – Short Creek, WV

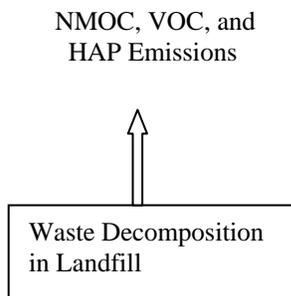
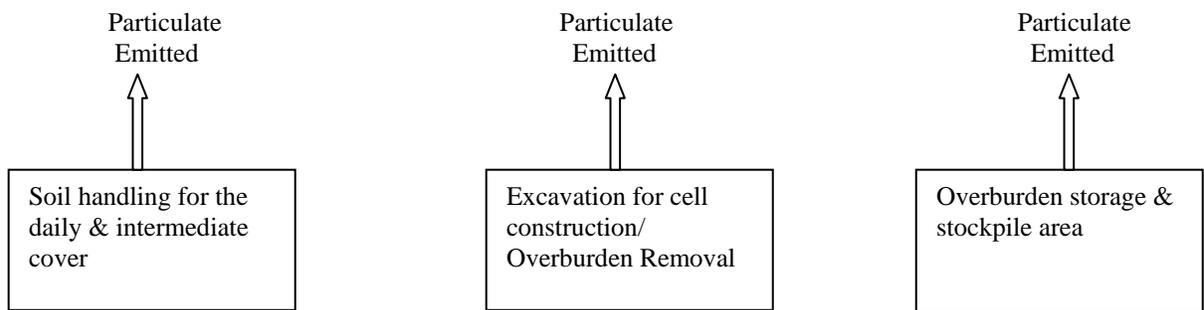


Process Flow Diagram

Fugitive Emissions: Roadway Traffic (01-P1 and 01-UP1)

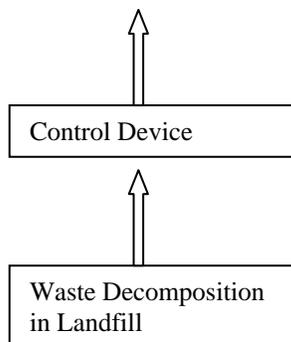


Fugitive Emissions: Landfill Operations (01-C1, 01-C2, and 01-A1)



Stack Emissions: Open Flare System (01-F1)

Emissions from control equipment
(CO, NO_x, SO₂, PM, NMOC, VOC, HAPs)



ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: 01-C1, 01-C2, 01-A1	Emission unit name: Sanitary Landfill	List any control devices associated with this emission unit: Open Flare – 01-F1
--	---	---

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
 Disposal of solid waste, compaction of same, and daily cover with native soils. This waste decomposes and generates methane and non-methane VOCs. Emission Point 01-C1 is the older CDD waste area which is closed and capped. Emission Point 01-C2 is the existing landfill which is closed and capped. Emission Point 01-A1 is the new landfill which is an active disposal area. One combined emission estimate has been calculated covering emissions from all three emission points.

Manufacturer: NA	Model number: NA	Serial number: NA
----------------------------	----------------------------	-----------------------------

Construction date: 10/01/1986	Installation date: 10/01/1986	Modification date(s): MM/DD/YYYY
---	---	--

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 13,818,248 million cubic meters of waste disposal capacity.

Maximum Hourly Throughput:	Maximum Annual Throughput: Approximately 250,000 tons	Maximum Operating Schedule: 8760 hr/yr
-----------------------------------	---	--

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired
---	--

Maximum design heat input and/or maximum horsepower rating:	Type and Btu/hr rating of burners:
--	---

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value

<i>Emissions Data</i>		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)		
Nitrogen Oxides (NO _x)		
Lead (Pb)		
Particulate Matter (PM _{2.5})		
Particulate Matter (PM ₁₀)		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO ₂)		
Volatile Organic Compounds (VOC)		8.91
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY
NMOC		22.84
<p>List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).</p> <p>Potential fugitive emissions for regulated and hazardous air pollutants from the MSW landfill (01-C1, 01-C2, and 01-A1) were calculated using the USEPA's Landfill Gas Emissions Model, Version 3.02 (LANDGEM). Yearly waste acceptance rates beginning 1986 through 2010 were used with an estimated design capacity of approximately 13,818,248 million cubic meters. The output of the model, as well as potential NMOC, VOC and HAP emissions calculations for the MSW landfill, are included as part of Attachment E.</p>		

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or **construction permit** with the condition number. (Note: Title V permit condition numbers alone are not the underlying applicable requirements). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Applicable Requirement; Permit Condition; Limit/Standard; Compliance Demonstration
C.S.R. 45-23, C.F.R. 40-60.757(a); III.B.2.a.ii.; Design Capacity; Volume Calculation – III.C.2 and III.C.3.

Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Applicable Requirement; Permit Condition; Limit/Standard; Compliance Demonstration
C.S.R. 45-23, C.F.R. 40-60.757(a); III.B.2.a.ii.; Design Capacity; Volume Calculation – III.C.2 and III.C.3.

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: LST001 and LST002	Emission unit name: Leachate Storage Tanks	List any control devices associated with this emission unit. N/A
--	--	--

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Open top aboveground leachate storage tanks – 48,000 gallon tank located on NW corner of existing landfill and 675,000 gallon tank located on SW corner of new landfill.

Manufacturer: N/A	Model number: N/A	Serial number: N/A
-----------------------------	-----------------------------	------------------------------

Construction date: 1984	Installation date: 1984	Modification date(s): MM/DD/YYYY
-----------------------------------	-----------------------------------	--

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): Tank capacities 48,000 gallons and 675,000 gallons

Maximum Hourly Throughput:	Maximum Annual Throughput:	Maximum Operating Schedule: 8,760 hours/yr
-----------------------------------	-----------------------------------	--

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired
--	--

Maximum design heat input and/or maximum horsepower rating: N/A	Type and Btu/hr rating of burners: N/A
---	--

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
N/A

Describe each fuel expected to be used during the term of the permit. N/A

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)		
Nitrogen Oxides (NO _x)		
Lead (Pb)		
Particulate Matter (PM _{2.5})		
Particulate Matter (PM ₁₀)		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO ₂)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

N/A

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the rule citation and/or permit with the condition number. If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Applicable Requirement; Permit Condition; Compliance Demonstration
C.F.R. 40-60.116b(b); III.B.2.a.vi; Recordkeeping – III.B.2.a.vi.
C.F.R. 40-60.116b(d); III.B.2.a.vii; Maximum true vapor pressure 5.2 KPa; Notification – III.B.2.a.vii.

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

C.F.R. 40-60.116b(b); III.B.2.a.vi; Recordkeeping – III.B.2.a.vi.
C.F.R. 40-60.116b(d); III.B.2.a.vii; Maximum true vapor pressure 5.2 KPa; Notification – III.B.2.a.vii.

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: 01-P1	Emission unit name: Paved Roadways	List any control devices associated with this emission unit. N/A
--	--	--

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Emissions of PM and particulate matter with an aerometric diameter less than 10 micrometers (PM₁₀) are generated by vehicles traveling on paved roads located throughout the landfill and by moving soil to create and cover the landfill.

Manufacturer: N/A	Model number: N/A	Serial number: N/A
-----------------------------	-----------------------------	------------------------------

Construction date: 10/01/1986	Installation date: 10/01/1986	Modification date(s): MM/DD/YYYY
---	---	--

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): N/A

Maximum Hourly Throughput:	Maximum Annual Throughput:	Maximum Operating Schedule: 3,744 hours/yr (maximum 6 day/week & 12 hours per day)
-----------------------------------	-----------------------------------	--

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired
--	--

Maximum design heat input and/or maximum horsepower rating: N/A	Type and Btu/hr rating of burners: N/A
---	--

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
N/A

Describe each fuel expected to be used during the term of the permit. N/A

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)		
Nitrogen Oxides (NO _x)		
Lead (Pb)		
Particulate Matter (PM _{2.5})	0.17	0.25
Particulate Matter (PM ₁₀)	0.71	1.01
Total Particulate Matter (TSP)	3.53	5.04
Sulfur Dioxide (SO ₂)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Emissions of PM and particulate matter with an aerometric diameter less than 10 micrometers (PM₁₀) are generated by vehicles traveling on paved roads located throughout the landfill and by moving soil to create and cover the landfill. Fugitive emissions of PM and PM₁₀ are generated by trucks bringing refuse to the landfill face on paved roads. Calculated typical emissions are shown in Attachment E.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the rule citation and/or permit with the condition number. If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

N/A

Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

N/A

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number: 01-UP1	Emission unit name: Unpaved Roadways	List any control devices associated with this emission unit. N/A
---	--	--

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Emissions of PM and particulate matter with an aerometric diameter less than 10 micrometers (PM₁₀) are generated by vehicles traveling on unpaved roads located throughout the landfill and by moving soil to create and cover the landfill.

Manufacturer: N/A	Model number: N/A	Serial number: N/A
-----------------------------	-----------------------------	------------------------------

Construction date: 10/01/1986	Installation date: 10/01/1986	Modification date(s): MM/DD/YYYY
---	---	--

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): N/A

Maximum Hourly Throughput:	Maximum Annual Throughput:	Maximum Operating Schedule: 3,744 hours/yr (maximum 6 day/week & 12 hours per day)
-----------------------------------	-----------------------------------	--

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired
--	--

Maximum design heat input and/or maximum horsepower rating: N/A	Type and Btu/hr rating of burners: N/A
---	--

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
N/A

Describe each fuel expected to be used during the term of the permit. N/A

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)		
Nitrogen Oxides (NO _x)		
Lead (Pb)		
Particulate Matter (PM _{2.5})	0.33	0.47
Particulate Matter (PM ₁₀)	3.26	4.66
Total Particulate Matter (TSP)	12.08	17.27
Sulfur Dioxide (SO ₂)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

Emissions of PM and particulate matter with an aerometric diameter less than 10 micrometers (PM₁₀) are generated by vehicles traveling on unpaved roads located throughout the landfill and by moving soil to create and cover the landfill. Fugitive emissions of PM and PM₁₀ are generated by trucks bringing refuse to the landfill face on unpaved roads. Calculated typical emissions are shown in Attachment E.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the rule citation and/or permit with the condition number. If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

N/A

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

N/A

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT E - Emission Unit Form

Emission Unit Description: Portable rock crushing and sizing plant

Emission unit ID number:	Emission unit name: Rock Crusher, Conveyor Belt	List any control devices associated with this emission unit. N/A
---------------------------------	---	--

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
125 ton/hr portable rock crusher/conveyor with a self-contained 350 Hp diesel engine. Processed rock will be used on an as-needed basis as part of the landfill's construction and operations. All crushed rock will be used on-site and will not be sold or hauled off-site.

Manufacturer: N/A	Model number: N/A	Serial number: N/A
-----------------------------	-----------------------------	------------------------------

Construction date: 5/2010	Installation date: 5/2010	Modification date(s): MM/DD/YYYY
-------------------------------------	-------------------------------------	--

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 250 tons/hr for rock crusher; 18.9 gallons/hr diesel fuel for 350 Hp diesel engine, 125 tons/hr for conveyor belt.

Maximum Hourly Throughput: 125 tons/hr	Maximum Annual Throughput: Total throughput not to exceed 1,095,000 tons	Maximum Operating Schedule: 8,760 hours/yr
--	--	--

Fuel Usage Data (fill out all applicable fields)

Does this emission unit combust fuel? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, is it? <input type="checkbox"/> Indirect Fired <input type="checkbox"/> Direct Fired
--	--

Maximum design heat input and/or maximum horsepower rating: 350 Hp diesel engine	Type and Btu/hr rating of burners:
--	---

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Diesel fuel, 18.9 gallons/hr.

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Diesel Fuel	15 ppm		

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	0.85	3.71
Nitrogen Oxides (NO _x)	3.93	17.21
Lead (Pb)		
Particulate Matter (PM _{2.5})	0.71	3.09
Particulate Matter (PM ₁₀)	3.85	16.88
Total Particulate Matter (TSP)	8.56	37.48
Sulfur Dioxide (SO ₂)	0.26	1.13
Volatile Organic Compounds (VOC)	0.32	1.40
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

See attached calculation in Appendix B.

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the rule citation and/or permit with the condition number. If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

Permit Condition 4.1.1.a-c: Emissions from screening unit and two belt conveyors shall not exceed: PM 3.97 lb/hr; PM10 1.41 lb/hr; PM2.5 1.41 lb/hr.

Permit Condition 4.1.1.d: maximum throughput of raw material not to exceed 125 tons/hr.

Permit Condition 4.1.1.f: Visible emissions from the crushing not to exceed 20% opacity. This limit does not include visible emissions from the exhaust of the diesel engine.

Permit Condition 4.1.2.a: Emissions from the engine shall not exceed: NOx 4.0 g/kw-hr; CO 3.5 g/kw-hr; PM 0.2 g/kw-hr.

____ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

Permit Condition 4.1.1.a-d: recordkeeping of amount of rock processed and hours the engine operated on a daily basis.

Permit Condition 4.1.1.f: conduct visible emission check/opacity monitoring and recordkeeping

Permit Condition 4.1.2.a: recordkeeping, emissions calculated using AP-42 emission factors

Are you in compliance with all applicable requirements for this emission unit? Yes No

If no, complete the **Schedule of Compliance Form** as ATTACHMENT F.

ATTACHMENT G - Air Pollution Control Device Form

Control device ID number: 01	List all emission units associated with this control device. 01-F1
--	--

Manufacturer: LFG Specialties, Inc.	Model number: PCF61816	Installation date: 01/01/2001
---	----------------------------------	---

Type of Air Pollution Control Device:

<input type="checkbox"/> Baghouse/Fabric Filter	<input type="checkbox"/> Venturi Scrubber	<input type="checkbox"/> Multiclone
<input type="checkbox"/> Carbon Bed Adsorber	<input type="checkbox"/> Packed Tower Scrubber	<input type="checkbox"/> Single Cyclone
<input type="checkbox"/> Carbon Drum(s)	<input type="checkbox"/> Other Wet Scrubber	<input type="checkbox"/> Cyclone Bank
<input type="checkbox"/> Catalytic Incinerator	<input type="checkbox"/> Condenser	<input type="checkbox"/> Settling Chamber
<input type="checkbox"/> Thermal Incinerator	<input checked="" type="checkbox"/> Flare	<input type="checkbox"/> Other (describe) _____
<input type="checkbox"/> Wet Plate Electrostatic Precipitator		<input type="checkbox"/> Dry Plate Electrostatic Precipitator

List the pollutants for which this device is intended to control and the capture and control efficiencies.

Pollutant	Capture Efficiency	Control Efficiency
Landfill Gas	100%	98%

Explain the characteristic design parameters of this control device (flow rates, pressure drops, number of bags, size, temperatures, etc.).

The flare is rated to handle a gas flow up to 2,500 cubic feet per minute. Current LFG inlet flow to flare is 700-850 scfm.

Is this device subject to the CAM requirements of 40 C.F.R. 64? Yes No

If Yes, **Complete ATTACHMENT H**

If No, **Provide justification.**

Describe the parameters monitored and/or methods used to indicate performance of this control device.

Flare is equipped with a continuous flow monitor. The blower/flare skid is equipped with both manual and automatic isolation valves. If the flare shuts down, an automatic valve on the main gas header that feeds the blower closes. This automation helps prevent the free-venting of raw LFG to the atmosphere.

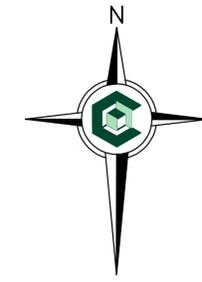
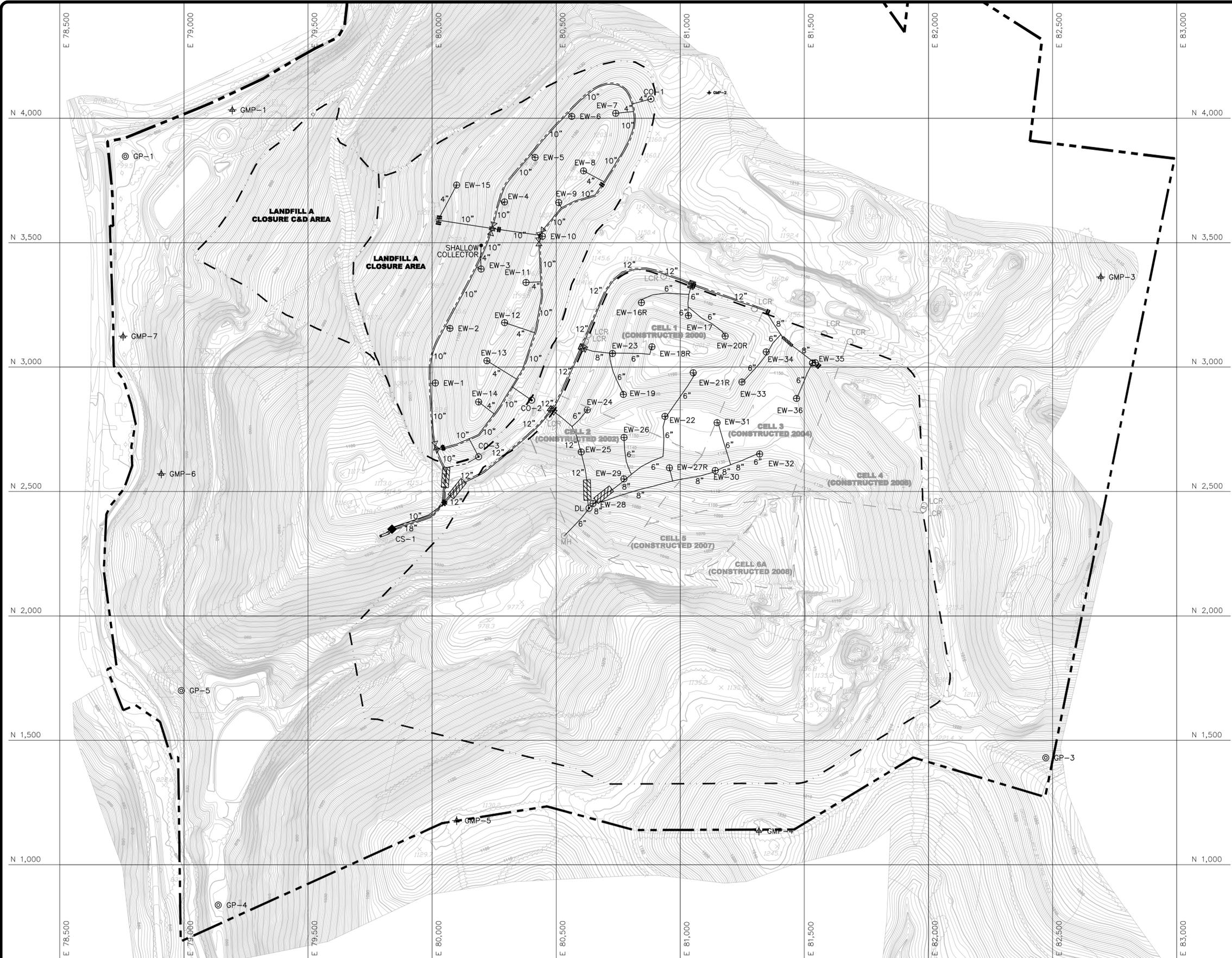
LIMITATIONS

The work product included in the attached was undertaken in full conformity with generally accepted professional consulting principles and practices and to the fullest extent as allowed by law we expressly disclaim all warranties, express or implied, including warranties of merchantability or fitness for a particular purpose. The work product was completed in full conformity with the contract with our client and this document is solely for the use and reliance of our client (unless previously agreed upon that a third party could rely on the work product) and any reliance on this work product by an unapproved outside party is at such party's risk.

The work product herein (including opinions, conclusions, suggestions, etc.) was prepared based on the situations and circumstances as found at the time, location, scope and goal of our performance and thus should be relied upon and used by our client recognizing these considerations and limitations. Cornerstone shall not be liable for the consequences of any change in environmental standards, practices, or regulations following the completion of our work and there is no warrant to the veracity of information provided by third parties, or the partial utilization of this work product.

APPENDIX A

SITE PLAN



LEGEND

- EXISTING PROPERTY BOUNDARY
- PERMITTED SOLID WASTE BOUNDARY
- FINAL GRADE 10' CONTOUR
- FINAL GRADE 5' CONTOUR
- 18" EXISTING LANDFILL GAS HEADER
- EXISTING AIR AND FORCEMAIN
- EW-11 EXISTING LFG EXTRACTION WELL
- EXISTING CONTROL VALVE
- EXISTING BLIND FLANGE
- EXISTING FLANGE CONNECTION
- CO-1 EXISTING CONDENSATE DRIPLEG
- CS-1 EXISTING CONDENSATE PUMP STATION
- GP-1 EXISTING GAS MONITORING PROBE (IN GROUND)
- GMP-1 EXISTING GAS MONITORING POINT (AMBIENT AIR)
- EXISTING ROAD CROSSING

NOTES:

1. EXISTING TOPOGRAPHY TAKEN FROM AERIAL MAPPING PERFORMED BY KEDDAL AERIAL MAPPING, PHOTOGRAPHY DATED 12/29/2008, UPDATED WITH 1ST QUARTER FIELD SURVEY PERFORMED BY BAIR GOODIE AND ASSOCIATES, SURVEY DATED 03/31/09.
2. GCCS AS-BUILT INFORMATION PROVIDED BY BAIR GOODIE AND ASSOCIATES, INC.

The X:\PROJECTS\SHORT CREEK - 2010 GCCS DESIGN PLAN - 1001401_PROJECT DRAWINGS\FINAL\SCS\SP01.dwg Layout: Layout1 User: hysing\hys Aug 11, 2010 - 12:27pm
 1" = 1/2" 0"



REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
08/11/10						



This drawing represents intellectual property of Cornerstone Environmental Group, LLC. Any modification to the original by other than Cornerstone Environmental Group, LLC personnel violates its original purpose and its use is rendered void. Cornerstone Environmental Group, LLC will not be held liable for any changes made to this document without express written consent of the originator.

AMERICAN DISPOSAL SERVICES OF WEST VIRGINIA, INC.
 SHORT CREEK LANDFILL
 OHIO COUNTY, WEST VIRGINIA

EXISTING CONDITIONS SITE PLAN

SHEET NO.
1
 PROJECT NO.
 100140

APPENDIX B
EMISSION CALCULATION



Summary Report

Landfill Name or Identifier: Short Creek Landfill

Date: Monday, March 21, 2011

Description/Comments:

About LandGEM:

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^n \sum_{j=0.1}^1 kL_o \left(\frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where,

Q_{CH_4} = annual methane generation in the year of the calculation ($m^3/year$)

i = 1-year time increment

n = (year of the calculation) - (initial year of waste acceptance)

j = 0.1-year time increment

k = methane generation rate ($year^{-1}$)

L_o = potential methane generation capacity (m^3/Mg)

M_i = mass of waste accepted in the i^{th} year (Mg)

t_{ij} = age of the j^{th} section of waste mass M_i accepted in the i^{th} year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at <http://www.epa.gov/ttnatw01/landfill/landflpg.html>.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for conventional landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

Input Review

LANDFILL CHARACTERISTICS

Landfill Open Year	1986	
Landfill Closure Year (with 80-year limit)	2039	
Actual Closure Year (without limit)	2039	
Have Model Calculate Closure Year?	Yes	
Waste Design Capacity	10,787,930	<i>short tons</i>

MODEL PARAMETERS

Methane Generation Rate, k	0.040	<i>year⁻¹</i>
Potential Methane Generation Capacity, L ₀	100	<i>m³/Mg</i>
NMOC Concentration	595	<i>ppmv as hexane</i>
Methane Content	50	<i>% by volume</i>

GASES / POLLUTANTS SELECTED

Gas / Pollutant #1:	Total landfill gas
Gas / Pollutant #2:	Methane
Gas / Pollutant #3:	Carbon dioxide
Gas / Pollutant #4:	NMOC

WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
1986	9,359	10,295	0	0
1987	37,387	41,125	9,359	10,295
1988	44,058	48,464	46,746	51,421
1989	41,816	45,998	90,805	99,885
1990	89,101	98,011	132,621	145,883
1991	88,205	97,026	221,722	243,894
1992	114,198	125,618	309,927	340,920
1993	104,966	115,463	424,125	466,537
1994	130,004	143,005	529,091	582,000
1995	136,702	150,372	659,096	725,005
1996	125,971	138,568	795,798	875,377
1997	154,790	170,269	921,769	1,013,945
1998	195,584	215,142	1,076,559	1,184,214
1999	195,584	215,142	1,272,142	1,399,356
2000	195,584	215,142	1,467,726	1,614,498
2001	142,248	156,473	1,663,309	1,829,640
2002	178,098	195,908	1,805,558	1,986,113
2003	193,825	213,208	1,983,656	2,182,022
2004	231,436	254,580	2,177,481	2,395,229
2005	166,370	183,007	2,408,918	2,649,809
2006	183,697	202,067	2,575,287	2,832,816
2007	179,772	197,749	2,758,985	3,034,883
2008	162,287	178,515	2,938,756	3,232,632
2009	134,533	147,987	3,101,043	3,411,147
2010	115,957	127,553	3,235,576	3,559,134
2011	227,273	250,000	3,351,534	3,686,687
2012	227,273	250,000	3,578,806	3,936,687
2013	227,273	250,000	3,806,079	4,186,687
2014	227,273	250,000	4,033,352	4,436,687
2015	227,273	250,000	4,260,625	4,686,687
2016	227,273	250,000	4,487,897	4,936,687
2017	227,273	250,000	4,715,170	5,186,687
2018	227,273	250,000	4,942,443	5,436,687
2019	227,273	250,000	5,169,715	5,686,687
2020	227,273	250,000	5,396,988	5,936,687
2021	227,273	250,000	5,624,261	6,186,687
2022	227,273	250,000	5,851,534	6,436,687
2023	227,273	250,000	6,078,806	6,686,687
2024	227,273	250,000	6,306,079	6,936,687
2025	227,273	250,000	6,533,352	7,186,687

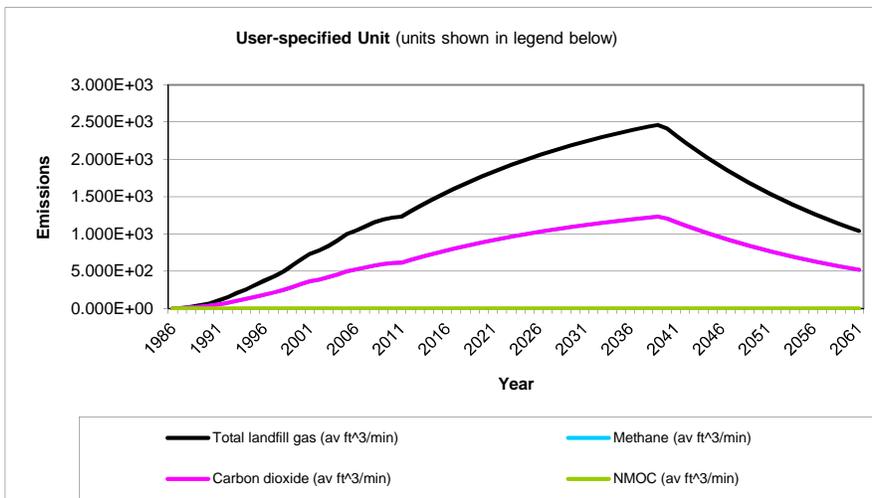
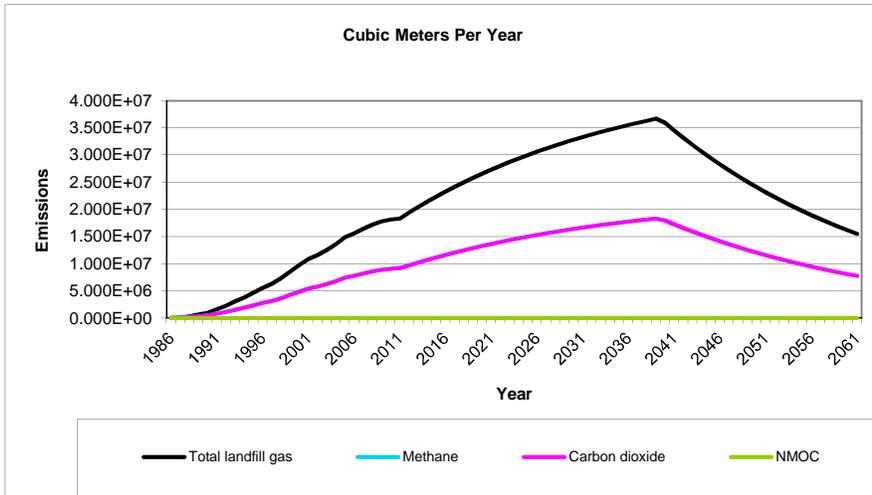
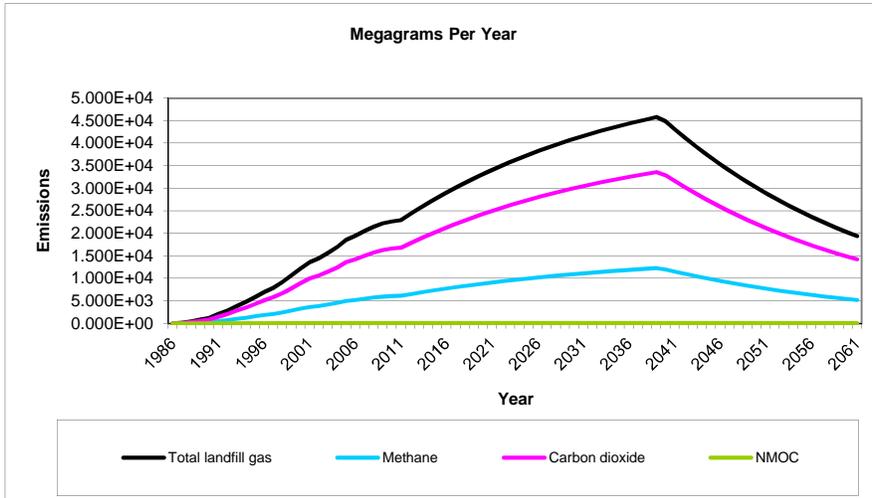
WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
2026	227,273	250,000	6,760,625	7,436,687
2027	227,273	250,000	6,987,897	7,686,687
2028	227,273	250,000	7,215,170	7,936,687
2029	227,273	250,000	7,442,443	8,186,687
2030	227,273	250,000	7,669,715	8,436,687
2031	227,273	250,000	7,896,988	8,686,687
2032	227,273	250,000	8,124,261	8,936,687
2033	227,273	250,000	8,351,534	9,186,687
2034	227,273	250,000	8,578,806	9,436,687
2035	227,273	250,000	8,806,079	9,686,687
2036	227,273	250,000	9,033,352	9,936,687
2037	227,273	250,000	9,260,625	10,186,687
2038	227,273	250,000	9,487,897	10,436,687
2039	92,039	101,243	9,715,170	10,686,687
2040	0	0	9,807,209	10,787,930
2041	0	0	9,807,209	10,787,930
2042	0	0	9,807,209	10,787,930
2043	0	0	9,807,209	10,787,930
2044	0	0	9,807,209	10,787,930
2045	0	0	9,807,209	10,787,930
2046	0	0	9,807,209	10,787,930
2047	0	0	9,807,209	10,787,930
2048	0	0	9,807,209	10,787,930
2049	0	0	9,807,209	10,787,930
2050	0	0	9,807,209	10,787,930
2051	0	0	9,807,209	10,787,930
2052	0	0	9,807,209	10,787,930
2053	0	0	9,807,209	10,787,930
2054	0	0	9,807,209	10,787,930
2055	0	0	9,807,209	10,787,930
2056	0	0	9,807,209	10,787,930
2057	0	0	9,807,209	10,787,930
2058	0	0	9,807,209	10,787,930
2059	0	0	9,807,209	10,787,930
2060	0	0	9,807,209	10,787,930
2061	0	0	9,807,209	10,787,930
2062	0	0	9,807,209	10,787,930
2063	0	0	9,807,209	10,787,930
2064	0	0	9,807,209	10,787,930
2065	0	0	9,807,209	10,787,930

Pollutant Parameters

Gas / Pollutant Default Parameters:				User-specified Pollutant Parameters:	
	Compound	Concentration (ppmv)	Molecular Weight	Concentration (ppmv)	Molecular Weight
Gases	Total landfill gas		0.00		
	Methane		16.04		
	Carbon dioxide		44.01		
	NMOC	4,000	86.18		
Pollutants	1,1,1-Trichloroethane (methyl chloroform) - HAP	0.48	133.41		
	1,1,1,2-Tetrachloroethane - HAP/VOC	1.1	167.85		
	1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	2.4	98.97		
	1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.20	96.94		
	1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.41	98.96		
	1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.18	112.99		
	2-Propanol (isopropyl alcohol) - VOC	50	60.11		
	Acetone	7.0	58.08		
	Acrylonitrile - HAP/VOC	6.3	53.06		
	Benzene - No or Unknown Co-disposal - HAP/VOC	1.9	78.11		
	Benzene - Co-disposal - HAP/VOC	11	78.11		
	Bromodichloromethane - VOC	3.1	163.83		
	Butane - VOC	5.0	58.12		
	Carbon disulfide - HAP/VOC	0.58	76.13		
	Carbon monoxide	140	28.01		
	Carbon tetrachloride - HAP/VOC	4.0E-03	153.84		
	Carbonyl sulfide - HAP/VOC	0.49	60.07		
	Chlorobenzene - HAP/VOC	0.25	112.56		
	Chlorodifluoromethane	1.3	86.47		
	Chloroethane (ethyl chloride) - HAP/VOC	1.3	64.52		
	Chloroform - HAP/VOC	0.03	119.39		
	Chloromethane - VOC	1.2	50.49		
	Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147		
	Dichlorodifluoromethane	16	120.91		
	Dichlorofluoromethane - VOC	2.6	102.92		
	Dichloromethane (methylene chloride) - HAP	14	84.94		
	Dimethyl sulfide (methyl sulfide) - VOC	7.8	62.13		
	Ethane	890	30.07		
	Ethanol - VOC	27	46.08		

Graphs



Results

Year	Total landfill gas			Methane		
	(Mg/year)	(m ³ /year)	(av ft ³ /min)	(Mg/year)	(m ³ /year)	(av ft ³ /min)
1986	0	0	0	0	0	0
1987	9.184E+01	7.354E+04	4.941E+00	2.453E+01	3.677E+04	2.471E+00
1988	4.551E+02	3.644E+05	2.449E+01	1.216E+02	1.822E+05	1.224E+01
1989	8.696E+02	6.964E+05	4.679E+01	2.323E+02	3.482E+05	2.339E+01
1990	1.246E+03	9.976E+05	6.703E+01	3.328E+02	4.988E+05	3.352E+01
1991	2.071E+03	1.659E+06	1.114E+02	5.533E+02	8.293E+05	5.572E+01
1992	2.856E+03	2.287E+06	1.536E+02	7.628E+02	1.143E+06	7.682E+01
1993	3.864E+03	3.094E+06	2.079E+02	1.032E+03	1.547E+06	1.040E+02
1994	4.743E+03	3.798E+06	2.552E+02	1.267E+03	1.899E+06	1.276E+02
1995	5.833E+03	4.671E+06	3.138E+02	1.558E+03	2.335E+06	1.569E+02
1996	6.945E+03	5.562E+06	3.737E+02	1.855E+03	2.781E+06	1.868E+02
1997	7.909E+03	6.333E+06	4.255E+02	2.113E+03	3.167E+06	2.128E+02
1998	9.118E+03	7.301E+06	4.906E+02	2.436E+03	3.651E+06	2.453E+02
1999	1.068E+04	8.552E+06	5.746E+02	2.853E+03	4.276E+06	2.873E+02
2000	1.218E+04	9.753E+06	6.553E+02	3.253E+03	4.877E+06	3.277E+02
2001	1.362E+04	1.091E+07	7.329E+02	3.639E+03	5.454E+06	3.664E+02
2002	1.448E+04	1.160E+07	7.793E+02	3.869E+03	5.799E+06	3.896E+02
2003	1.566E+04	1.254E+07	8.427E+02	4.184E+03	6.271E+06	4.214E+02
2004	1.695E+04	1.357E+07	9.120E+02	4.528E+03	6.787E+06	4.560E+02
2005	1.856E+04	1.486E+07	9.985E+02	4.957E+03	7.430E+06	4.992E+02
2006	1.946E+04	1.558E+07	1.047E+03	5.199E+03	7.792E+06	5.236E+02
2007	2.050E+04	1.642E+07	1.103E+03	5.476E+03	8.209E+06	5.515E+02
2008	2.146E+04	1.719E+07	1.155E+03	5.733E+03	8.593E+06	5.774E+02
2009	2.221E+04	1.779E+07	1.195E+03	5.933E+03	8.894E+06	5.976E+02
2010	2.266E+04	1.815E+07	1.219E+03	6.053E+03	9.074E+06	6.097E+02
2011	2.291E+04	1.835E+07	1.233E+03	6.120E+03	9.173E+06	6.164E+02
2012	2.424E+04	1.941E+07	1.304E+03	6.476E+03	9.707E+06	6.522E+02
2013	2.552E+04	2.044E+07	1.373E+03	6.818E+03	1.022E+07	6.866E+02
2014	2.675E+04	2.142E+07	1.439E+03	7.146E+03	1.071E+07	7.197E+02
2015	2.793E+04	2.237E+07	1.503E+03	7.461E+03	1.118E+07	7.515E+02
2016	2.907E+04	2.328E+07	1.564E+03	7.765E+03	1.164E+07	7.820E+02
2017	3.016E+04	2.415E+07	1.623E+03	8.056E+03	1.208E+07	8.113E+02
2018	3.121E+04	2.499E+07	1.679E+03	8.336E+03	1.249E+07	8.395E+02
2019	3.221E+04	2.580E+07	1.733E+03	8.605E+03	1.290E+07	8.666E+02
2020	3.318E+04	2.657E+07	1.785E+03	8.863E+03	1.328E+07	8.926E+02
2021	3.411E+04	2.731E+07	1.835E+03	9.111E+03	1.366E+07	9.176E+02
2022	3.500E+04	2.803E+07	1.883E+03	9.350E+03	1.401E+07	9.416E+02
2023	3.586E+04	2.872E+07	1.929E+03	9.579E+03	1.436E+07	9.647E+02
2024	3.668E+04	2.938E+07	1.974E+03	9.799E+03	1.469E+07	9.869E+02
2025	3.748E+04	3.001E+07	2.016E+03	1.001E+04	1.500E+07	1.008E+03
2026	3.824E+04	3.062E+07	2.057E+03	1.021E+04	1.531E+07	1.029E+03
2027	3.897E+04	3.120E+07	2.097E+03	1.041E+04	1.560E+07	1.048E+03
2028	3.967E+04	3.177E+07	2.134E+03	1.060E+04	1.588E+07	1.067E+03
2029	4.035E+04	3.231E+07	2.171E+03	1.078E+04	1.615E+07	1.085E+03
2030	4.099E+04	3.283E+07	2.206E+03	1.095E+04	1.641E+07	1.103E+03
2031	4.162E+04	3.332E+07	2.239E+03	1.112E+04	1.666E+07	1.120E+03
2032	4.221E+04	3.380E+07	2.271E+03	1.128E+04	1.690E+07	1.136E+03
2033	4.279E+04	3.426E+07	2.302E+03	1.143E+04	1.713E+07	1.151E+03
2034	4.334E+04	3.471E+07	2.332E+03	1.158E+04	1.735E+07	1.166E+03
2035	4.387E+04	3.513E+07	2.360E+03	1.172E+04	1.757E+07	1.180E+03

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	(m ³ /year)	(av ft ³ /min)	(Mg/year)	(m ³ /year)	(av ft ³ /min)
2036	4.438E+04	3.554E+07	2.388E+03	1.186E+04	1.777E+07	1.194E+03
2037	4.487E+04	3.593E+07	2.414E+03	1.199E+04	1.797E+07	1.207E+03
2038	4.534E+04	3.631E+07	2.440E+03	1.211E+04	1.815E+07	1.220E+03
2039	4.580E+04	3.667E+07	2.464E+03	1.223E+04	1.834E+07	1.232E+03
2040	4.490E+04	3.596E+07	2.416E+03	1.199E+04	1.798E+07	1.208E+03
2041	4.314E+04	3.455E+07	2.321E+03	1.152E+04	1.727E+07	1.161E+03
2042	4.145E+04	3.319E+07	2.230E+03	1.107E+04	1.660E+07	1.115E+03
2043	3.983E+04	3.189E+07	2.143E+03	1.064E+04	1.595E+07	1.071E+03
2044	3.826E+04	3.064E+07	2.059E+03	1.022E+04	1.532E+07	1.029E+03
2045	3.676E+04	2.944E+07	1.978E+03	9.820E+03	1.472E+07	9.890E+02
2046	3.532E+04	2.828E+07	1.900E+03	9.435E+03	1.414E+07	9.502E+02
2047	3.394E+04	2.718E+07	1.826E+03	9.065E+03	1.359E+07	9.130E+02
2048	3.261E+04	2.611E+07	1.754E+03	8.710E+03	1.305E+07	8.772E+02
2049	3.133E+04	2.509E+07	1.686E+03	8.368E+03	1.254E+07	8.428E+02
2050	3.010E+04	2.410E+07	1.619E+03	8.040E+03	1.205E+07	8.097E+02
2051	2.892E+04	2.316E+07	1.556E+03	7.725E+03	1.158E+07	7.780E+02
2052	2.779E+04	2.225E+07	1.495E+03	7.422E+03	1.112E+07	7.475E+02
2053	2.670E+04	2.138E+07	1.436E+03	7.131E+03	1.069E+07	7.182E+02
2054	2.565E+04	2.054E+07	1.380E+03	6.851E+03	1.027E+07	6.900E+02
2055	2.464E+04	1.973E+07	1.326E+03	6.583E+03	9.867E+06	6.629E+02
2056	2.368E+04	1.896E+07	1.274E+03	6.324E+03	9.480E+06	6.369E+02
2057	2.275E+04	1.822E+07	1.224E+03	6.076E+03	9.108E+06	6.120E+02
2058	2.186E+04	1.750E+07	1.176E+03	5.838E+03	8.751E+06	5.880E+02
2059	2.100E+04	1.682E+07	1.130E+03	5.609E+03	8.408E+06	5.649E+02
2060	2.018E+04	1.616E+07	1.086E+03	5.389E+03	8.078E+06	5.428E+02
2061	1.939E+04	1.552E+07	1.043E+03	5.178E+03	7.761E+06	5.215E+02
2062	1.863E+04	1.491E+07	1.002E+03	4.975E+03	7.457E+06	5.010E+02
2063	1.789E+04	1.433E+07	9.628E+02	4.780E+03	7.165E+06	4.814E+02
2064	1.719E+04	1.377E+07	9.250E+02	4.592E+03	6.884E+06	4.625E+02
2065	1.652E+04	1.323E+07	8.888E+02	4.412E+03	6.614E+06	4.444E+02
2066	1.587E+04	1.271E+07	8.539E+02	4.239E+03	6.354E+06	4.270E+02
2067	1.525E+04	1.221E+07	8.204E+02	4.073E+03	6.105E+06	4.102E+02
2068	1.465E+04	1.173E+07	7.883E+02	3.913E+03	5.866E+06	3.941E+02
2069	1.408E+04	1.127E+07	7.574E+02	3.760E+03	5.636E+06	3.787E+02
2070	1.352E+04	1.083E+07	7.277E+02	3.613E+03	5.415E+06	3.638E+02
2071	1.299E+04	1.041E+07	6.991E+02	3.471E+03	5.203E+06	3.496E+02
2072	1.248E+04	9.997E+06	6.717E+02	3.335E+03	4.999E+06	3.359E+02
2073	1.200E+04	9.605E+06	6.454E+02	3.204E+03	4.803E+06	3.227E+02
2074	1.152E+04	9.229E+06	6.201E+02	3.078E+03	4.614E+06	3.100E+02
2075	1.107E+04	8.867E+06	5.958E+02	2.958E+03	4.433E+06	2.979E+02
2076	1.064E+04	8.519E+06	5.724E+02	2.842E+03	4.260E+06	2.862E+02
2077	1.022E+04	8.185E+06	5.500E+02	2.730E+03	4.093E+06	2.750E+02
2078	9.821E+03	7.864E+06	5.284E+02	2.623E+03	3.932E+06	2.642E+02
2079	9.436E+03	7.556E+06	5.077E+02	2.520E+03	3.778E+06	2.538E+02
2080	9.066E+03	7.259E+06	4.878E+02	2.422E+03	3.630E+06	2.439E+02
2081	8.710E+03	6.975E+06	4.686E+02	2.327E+03	3.487E+06	2.343E+02
2082	8.369E+03	6.701E+06	4.503E+02	2.235E+03	3.351E+06	2.251E+02
2083	8.041E+03	6.439E+06	4.326E+02	2.148E+03	3.219E+06	2.163E+02
2084	7.725E+03	6.186E+06	4.156E+02	2.064E+03	3.093E+06	2.078E+02
2085	7.422E+03	5.944E+06	3.993E+02	1.983E+03	2.972E+06	1.997E+02
2086	7.131E+03	5.711E+06	3.837E+02	1.905E+03	2.855E+06	1.918E+02

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	(m ³ /year)	(av ft ³ /min)	(Mg/year)	(m ³ /year)	(av ft ³ /min)
2087	6.852E+03	5.487E+06	3.686E+02	1.830E+03	2.743E+06	1.843E+02
2088	6.583E+03	5.271E+06	3.542E+02	1.758E+03	2.636E+06	1.771E+02
2089	6.325E+03	5.065E+06	3.403E+02	1.689E+03	2.532E+06	1.702E+02
2090	6.077E+03	4.866E+06	3.270E+02	1.623E+03	2.433E+06	1.635E+02
2091	5.839E+03	4.675E+06	3.141E+02	1.560E+03	2.338E+06	1.571E+02
2092	5.610E+03	4.492E+06	3.018E+02	1.498E+03	2.246E+06	1.509E+02
2093	5.390E+03	4.316E+06	2.900E+02	1.440E+03	2.158E+06	1.450E+02
2094	5.178E+03	4.147E+06	2.786E+02	1.383E+03	2.073E+06	1.393E+02
2095	4.975E+03	3.984E+06	2.677E+02	1.329E+03	1.992E+06	1.338E+02
2096	4.780E+03	3.828E+06	2.572E+02	1.277E+03	1.914E+06	1.286E+02
2097	4.593E+03	3.678E+06	2.471E+02	1.227E+03	1.839E+06	1.236E+02
2098	4.413E+03	3.534E+06	2.374E+02	1.179E+03	1.767E+06	1.187E+02
2099	4.240E+03	3.395E+06	2.281E+02	1.132E+03	1.698E+06	1.141E+02
2100	4.074E+03	3.262E+06	2.192E+02	1.088E+03	1.631E+06	1.096E+02
2101	3.914E+03	3.134E+06	2.106E+02	1.045E+03	1.567E+06	1.053E+02
2102	3.760E+03	3.011E+06	2.023E+02	1.004E+03	1.506E+06	1.012E+02
2103	3.613E+03	2.893E+06	1.944E+02	9.650E+02	1.447E+06	9.719E+01
2104	3.471E+03	2.780E+06	1.868E+02	9.272E+02	1.390E+06	9.338E+01
2105	3.335E+03	2.671E+06	1.794E+02	8.908E+02	1.335E+06	8.972E+01
2106	3.204E+03	2.566E+06	1.724E+02	8.559E+02	1.283E+06	8.620E+01
2107	3.079E+03	2.465E+06	1.656E+02	8.224E+02	1.233E+06	8.282E+01
2108	2.958E+03	2.369E+06	1.591E+02	7.901E+02	1.184E+06	7.957E+01
2109	2.842E+03	2.276E+06	1.529E+02	7.591E+02	1.138E+06	7.645E+01
2110	2.731E+03	2.187E+06	1.469E+02	7.294E+02	1.093E+06	7.346E+01
2111	2.624E+03	2.101E+06	1.412E+02	7.008E+02	1.050E+06	7.058E+01
2112	2.521E+03	2.018E+06	1.356E+02	6.733E+02	1.009E+06	6.781E+01
2113	2.422E+03	1.939E+06	1.303E+02	6.469E+02	9.696E+05	6.515E+01
2114	2.327E+03	1.863E+06	1.252E+02	6.215E+02	9.316E+05	6.259E+01
2115	2.236E+03	1.790E+06	1.203E+02	5.972E+02	8.951E+05	6.014E+01
2116	2.148E+03	1.720E+06	1.156E+02	5.737E+02	8.600E+05	5.778E+01
2117	2.064E+03	1.653E+06	1.110E+02	5.512E+02	8.263E+05	5.552E+01
2118	1.983E+03	1.588E+06	1.067E+02	5.296E+02	7.939E+05	5.334E+01
2119	1.905E+03	1.525E+06	1.025E+02	5.089E+02	7.627E+05	5.125E+01
2120	1.830E+03	1.466E+06	9.848E+01	4.889E+02	7.328E+05	4.924E+01
2121	1.759E+03	1.408E+06	9.462E+01	4.697E+02	7.041E+05	4.731E+01
2122	1.690E+03	1.353E+06	9.091E+01	4.513E+02	6.765E+05	4.545E+01
2123	1.623E+03	1.300E+06	8.734E+01	4.336E+02	6.500E+05	4.367E+01
2124	1.560E+03	1.249E+06	8.392E+01	4.166E+02	6.245E+05	4.196E+01
2125	1.499E+03	1.200E+06	8.063E+01	4.003E+02	6.000E+05	4.031E+01
2126	1.440E+03	1.153E+06	7.747E+01	3.846E+02	5.765E+05	3.873E+01

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m ³ /year)	(av ft ³ /min)	(Mg/year)	(m ³ /year)	(av ft ³ /min)
1986	0	0	0	0	0	0
1987	6.731E+01	3.677E+04	2.471E+00	1.569E-01	4.376E+01	2.940E-03
1988	3.336E+02	1.822E+05	1.224E+01	7.773E-01	2.168E+02	1.457E-02
1989	6.373E+02	3.482E+05	2.339E+01	1.485E+00	4.143E+02	2.784E-02
1990	9.131E+02	4.988E+05	3.352E+01	2.128E+00	5.936E+02	3.988E-02
1991	1.518E+03	8.293E+05	5.572E+01	3.538E+00	9.869E+02	6.631E-02
1992	2.093E+03	1.143E+06	7.682E+01	4.877E+00	1.361E+03	9.142E-02
1993	2.832E+03	1.547E+06	1.040E+02	6.600E+00	1.841E+03	1.237E-01
1994	3.476E+03	1.899E+06	1.276E+02	8.100E+00	2.260E+03	1.518E-01
1995	4.275E+03	2.335E+06	1.569E+02	9.961E+00	2.779E+03	1.867E-01
1996	5.090E+03	2.781E+06	1.868E+02	1.186E+01	3.309E+03	2.223E-01
1997	5.797E+03	3.167E+06	2.128E+02	1.351E+01	3.768E+03	2.532E-01
1998	6.683E+03	3.651E+06	2.453E+02	1.557E+01	4.344E+03	2.919E-01
1999	7.827E+03	4.276E+06	2.873E+02	1.824E+01	5.088E+03	3.419E-01
2000	8.927E+03	4.877E+06	3.277E+02	2.080E+01	5.803E+03	3.899E-01
2001	9.983E+03	5.454E+06	3.664E+02	2.326E+01	6.490E+03	4.361E-01
2002	1.061E+04	5.799E+06	3.896E+02	2.474E+01	6.901E+03	4.637E-01
2003	1.148E+04	6.271E+06	4.214E+02	2.675E+01	7.463E+03	5.014E-01
2004	1.242E+04	6.787E+06	4.560E+02	2.895E+01	8.076E+03	5.427E-01
2005	1.360E+04	7.430E+06	4.992E+02	3.169E+01	8.842E+03	5.941E-01
2006	1.426E+04	7.792E+06	5.236E+02	3.324E+01	9.273E+03	6.230E-01
2007	1.503E+04	8.209E+06	5.515E+02	3.501E+01	9.768E+03	6.563E-01
2008	1.573E+04	8.593E+06	5.774E+02	3.665E+01	1.023E+04	6.871E-01
2009	1.628E+04	8.894E+06	5.976E+02	3.794E+01	1.058E+04	7.111E-01
2010	1.661E+04	9.074E+06	6.097E+02	3.870E+01	1.080E+04	7.255E-01
2011	1.679E+04	9.173E+06	6.164E+02	3.913E+01	1.092E+04	7.335E-01
2012	1.777E+04	9.707E+06	6.522E+02	4.140E+01	1.155E+04	7.761E-01
2013	1.871E+04	1.022E+07	6.866E+02	4.359E+01	1.216E+04	8.171E-01
2014	1.961E+04	1.071E+07	7.197E+02	4.569E+01	1.275E+04	8.564E-01
2015	2.047E+04	1.118E+07	7.515E+02	4.771E+01	1.331E+04	8.942E-01
2016	2.130E+04	1.164E+07	7.820E+02	4.964E+01	1.385E+04	9.306E-01
2017	2.210E+04	1.208E+07	8.113E+02	5.151E+01	1.437E+04	9.655E-01
2018	2.287E+04	1.249E+07	8.395E+02	5.330E+01	1.487E+04	9.990E-01
2019	2.361E+04	1.290E+07	8.666E+02	5.501E+01	1.535E+04	1.031E+00
2020	2.432E+04	1.328E+07	8.926E+02	5.667E+01	1.581E+04	1.062E+00
2021	2.500E+04	1.366E+07	9.176E+02	5.825E+01	1.625E+04	1.092E+00
2022	2.565E+04	1.401E+07	9.416E+02	5.978E+01	1.668E+04	1.121E+00
2023	2.628E+04	1.436E+07	9.647E+02	6.124E+01	1.709E+04	1.148E+00
2024	2.689E+04	1.469E+07	9.869E+02	6.265E+01	1.748E+04	1.174E+00
2025	2.747E+04	1.500E+07	1.008E+03	6.400E+01	1.786E+04	1.200E+00
2026	2.802E+04	1.531E+07	1.029E+03	6.530E+01	1.822E+04	1.224E+00
2027	2.856E+04	1.560E+07	1.048E+03	6.655E+01	1.857E+04	1.247E+00
2028	2.907E+04	1.588E+07	1.067E+03	6.775E+01	1.890E+04	1.270E+00
2029	2.957E+04	1.615E+07	1.085E+03	6.890E+01	1.922E+04	1.292E+00
2030	3.004E+04	1.641E+07	1.103E+03	7.001E+01	1.953E+04	1.312E+00
2031	3.050E+04	1.666E+07	1.120E+03	7.107E+01	1.983E+04	1.332E+00
2032	3.094E+04	1.690E+07	1.136E+03	7.209E+01	2.011E+04	1.351E+00
2033	3.136E+04	1.713E+07	1.151E+03	7.308E+01	2.039E+04	1.370E+00
2034	3.176E+04	1.735E+07	1.166E+03	7.402E+01	2.065E+04	1.387E+00
2035	3.215E+04	1.757E+07	1.180E+03	7.493E+01	2.090E+04	1.404E+00

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m ³ /year)	(av ft ³ /min)	(Mg/year)	(m ³ /year)	(av ft ³ /min)
2036	3.253E+04	1.777E+07	1.194E+03	7.580E+01	2.115E+04	1.421E+00
2037	3.289E+04	1.797E+07	1.207E+03	7.663E+01	2.138E+04	1.436E+00
2038	3.323E+04	1.815E+07	1.220E+03	7.744E+01	2.160E+04	1.452E+00
2039	3.356E+04	1.834E+07	1.232E+03	7.821E+01	2.182E+04	1.466E+00
2040	3.291E+04	1.798E+07	1.208E+03	7.669E+01	2.139E+04	1.437E+00
2041	3.162E+04	1.727E+07	1.161E+03	7.368E+01	2.056E+04	1.381E+00
2042	3.038E+04	1.660E+07	1.115E+03	7.079E+01	1.975E+04	1.327E+00
2043	2.919E+04	1.595E+07	1.071E+03	6.801E+01	1.897E+04	1.275E+00
2044	2.804E+04	1.532E+07	1.029E+03	6.535E+01	1.823E+04	1.225E+00
2045	2.694E+04	1.472E+07	9.890E+02	6.279E+01	1.752E+04	1.177E+00
2046	2.589E+04	1.414E+07	9.502E+02	6.032E+01	1.683E+04	1.131E+00
2047	2.487E+04	1.359E+07	9.130E+02	5.796E+01	1.617E+04	1.086E+00
2048	2.390E+04	1.305E+07	8.772E+02	5.569E+01	1.554E+04	1.044E+00
2049	2.296E+04	1.254E+07	8.428E+02	5.350E+01	1.493E+04	1.003E+00
2050	2.206E+04	1.205E+07	8.097E+02	5.140E+01	1.434E+04	9.636E-01
2051	2.119E+04	1.158E+07	7.780E+02	4.939E+01	1.378E+04	9.258E-01
2052	2.036E+04	1.112E+07	7.475E+02	4.745E+01	1.324E+04	8.895E-01
2053	1.957E+04	1.069E+07	7.182E+02	4.559E+01	1.272E+04	8.546E-01
2054	1.880E+04	1.027E+07	6.900E+02	4.380E+01	1.222E+04	8.211E-01
2055	1.806E+04	9.867E+06	6.629E+02	4.209E+01	1.174E+04	7.889E-01
2056	1.735E+04	9.480E+06	6.369E+02	4.044E+01	1.128E+04	7.580E-01
2057	1.667E+04	9.108E+06	6.120E+02	3.885E+01	1.084E+04	7.282E-01
2058	1.602E+04	8.751E+06	5.880E+02	3.733E+01	1.041E+04	6.997E-01
2059	1.539E+04	8.408E+06	5.649E+02	3.586E+01	1.001E+04	6.723E-01
2060	1.479E+04	8.078E+06	5.428E+02	3.446E+01	9.613E+03	6.459E-01
2061	1.421E+04	7.761E+06	5.215E+02	3.311E+01	9.236E+03	6.206E-01
2062	1.365E+04	7.457E+06	5.010E+02	3.181E+01	8.874E+03	5.962E-01
2063	1.311E+04	7.165E+06	4.814E+02	3.056E+01	8.526E+03	5.729E-01
2064	1.260E+04	6.884E+06	4.625E+02	2.936E+01	8.192E+03	5.504E-01
2065	1.211E+04	6.614E+06	4.444E+02	2.821E+01	7.870E+03	5.288E-01
2066	1.163E+04	6.354E+06	4.270E+02	2.711E+01	7.562E+03	5.081E-01
2067	1.118E+04	6.105E+06	4.102E+02	2.604E+01	7.265E+03	4.882E-01
2068	1.074E+04	5.866E+06	3.941E+02	2.502E+01	6.980E+03	4.690E-01
2069	1.032E+04	5.636E+06	3.787E+02	2.404E+01	6.707E+03	4.506E-01
2070	9.912E+03	5.415E+06	3.638E+02	2.310E+01	6.444E+03	4.330E-01
2071	9.523E+03	5.203E+06	3.496E+02	2.219E+01	6.191E+03	4.160E-01
2072	9.150E+03	4.999E+06	3.359E+02	2.132E+01	5.948E+03	3.997E-01
2073	8.791E+03	4.803E+06	3.227E+02	2.049E+01	5.715E+03	3.840E-01
2074	8.446E+03	4.614E+06	3.100E+02	1.968E+01	5.491E+03	3.689E-01
2075	8.115E+03	4.433E+06	2.979E+02	1.891E+01	5.276E+03	3.545E-01
2076	7.797E+03	4.260E+06	2.862E+02	1.817E+01	5.069E+03	3.406E-01
2077	7.491E+03	4.093E+06	2.750E+02	1.746E+01	4.870E+03	3.272E-01
2078	7.198E+03	3.932E+06	2.642E+02	1.677E+01	4.679E+03	3.144E-01
2079	6.915E+03	3.778E+06	2.538E+02	1.611E+01	4.496E+03	3.021E-01
2080	6.644E+03	3.630E+06	2.439E+02	1.548E+01	4.319E+03	2.902E-01
2081	6.384E+03	3.487E+06	2.343E+02	1.488E+01	4.150E+03	2.788E-01
2082	6.133E+03	3.351E+06	2.251E+02	1.429E+01	3.987E+03	2.679E-01
2083	5.893E+03	3.219E+06	2.163E+02	1.373E+01	3.831E+03	2.574E-01
2084	5.662E+03	3.093E+06	2.078E+02	1.319E+01	3.681E+03	2.473E-01
2085	5.440E+03	2.972E+06	1.997E+02	1.268E+01	3.536E+03	2.376E-01
2086	5.227E+03	2.855E+06	1.918E+02	1.218E+01	3.398E+03	2.283E-01

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m ³ /year)	(av ft ³ /min)	(Mg/year)	(m ³ /year)	(av ft ³ /min)
2087	5.022E+03	2.743E+06	1.843E+02	1.170E+01	3.265E+03	2.193E-01
2088	4.825E+03	2.636E+06	1.771E+02	1.124E+01	3.137E+03	2.107E-01
2089	4.636E+03	2.532E+06	1.702E+02	1.080E+01	3.014E+03	2.025E-01
2090	4.454E+03	2.433E+06	1.635E+02	1.038E+01	2.895E+03	1.945E-01
2091	4.279E+03	2.338E+06	1.571E+02	9.971E+00	2.782E+03	1.869E-01
2092	4.111E+03	2.246E+06	1.509E+02	9.580E+00	2.673E+03	1.796E-01
2093	3.950E+03	2.158E+06	1.450E+02	9.205E+00	2.568E+03	1.725E-01
2094	3.795E+03	2.073E+06	1.393E+02	8.844E+00	2.467E+03	1.658E-01
2095	3.646E+03	1.992E+06	1.338E+02	8.497E+00	2.371E+03	1.593E-01
2096	3.503E+03	1.914E+06	1.286E+02	8.164E+00	2.278E+03	1.530E-01
2097	3.366E+03	1.839E+06	1.236E+02	7.844E+00	2.188E+03	1.470E-01
2098	3.234E+03	1.767E+06	1.187E+02	7.536E+00	2.102E+03	1.413E-01
2099	3.107E+03	1.698E+06	1.141E+02	7.241E+00	2.020E+03	1.357E-01
2100	2.985E+03	1.631E+06	1.096E+02	6.957E+00	1.941E+03	1.304E-01
2101	2.868E+03	1.567E+06	1.053E+02	6.684E+00	1.865E+03	1.253E-01
2102	2.756E+03	1.506E+06	1.012E+02	6.422E+00	1.792E+03	1.204E-01
2103	2.648E+03	1.447E+06	9.719E+01	6.170E+00	1.721E+03	1.157E-01
2104	2.544E+03	1.390E+06	9.338E+01	5.928E+00	1.654E+03	1.111E-01
2105	2.444E+03	1.335E+06	8.972E+01	5.696E+00	1.589E+03	1.068E-01
2106	2.348E+03	1.283E+06	8.620E+01	5.472E+00	1.527E+03	1.026E-01
2107	2.256E+03	1.233E+06	8.282E+01	5.258E+00	1.467E+03	9.856E-02
2108	2.168E+03	1.184E+06	7.957E+01	5.052E+00	1.409E+03	9.469E-02
2109	2.083E+03	1.138E+06	7.645E+01	4.854E+00	1.354E+03	9.098E-02
2110	2.001E+03	1.093E+06	7.346E+01	4.663E+00	1.301E+03	8.741E-02
2111	1.923E+03	1.050E+06	7.058E+01	4.480E+00	1.250E+03	8.398E-02
2112	1.847E+03	1.009E+06	6.781E+01	4.305E+00	1.201E+03	8.069E-02
2113	1.775E+03	9.696E+05	6.515E+01	4.136E+00	1.154E+03	7.753E-02
2114	1.705E+03	9.316E+05	6.259E+01	3.974E+00	1.109E+03	7.449E-02
2115	1.638E+03	8.951E+05	6.014E+01	3.818E+00	1.065E+03	7.157E-02
2116	1.574E+03	8.600E+05	5.778E+01	3.668E+00	1.023E+03	6.876E-02
2117	1.512E+03	8.263E+05	5.552E+01	3.524E+00	9.833E+02	6.606E-02
2118	1.453E+03	7.939E+05	5.334E+01	3.386E+00	9.447E+02	6.347E-02
2119	1.396E+03	7.627E+05	5.125E+01	3.253E+00	9.077E+02	6.099E-02
2120	1.341E+03	7.328E+05	4.924E+01	3.126E+00	8.721E+02	5.859E-02
2121	1.289E+03	7.041E+05	4.731E+01	3.003E+00	8.379E+02	5.630E-02
2122	1.238E+03	6.765E+05	4.545E+01	2.886E+00	8.050E+02	5.409E-02
2123	1.190E+03	6.500E+05	4.367E+01	2.772E+00	7.735E+02	5.197E-02
2124	1.143E+03	6.245E+05	4.196E+01	2.664E+00	7.431E+02	4.993E-02
2125	1.098E+03	6.000E+05	4.031E+01	2.559E+00	7.140E+02	4.797E-02
2126	1.055E+03	5.765E+05	3.873E+01	2.459E+00	6.860E+02	4.609E-02

**Emissions Calculations
Short Creek Landfill
Short Creek, WV**

Fugitive Gas Flow from Landfill in year 2039

616 scfm

LFG Compound	HAP	VOC	CAS	MW (lb/lb-mol)	Compound Conc	Fugitive HAP Emissions	
					in Gas (ppmv) ^a	lb/hr	ton/yr
1,1,1 - Trichloroethane (methyl chloroform)	x	--	71-55-6	133.41	0.48	6.23E-03	2.73E-02
1,1,2,2 - Tetrachloroethane	x	x	79-34-5	167.85	1.11	1.81E-02	7.94E-02
1,1,2 - Trichloroethane (1,1,2 TCA)	x	x	79-00-5	133.41	0.10	1.30E-03	5.69E-03
1,1 - Dichloroethane (ethylidene dichloride)	x	x	75-34-3	98.96	2.35	2.26E-02	9.91E-02
1,1 - Dichloroethene (vinylidene chloride)	x	x	75-35-4	96.94	0.20	1.90E-03	8.31E-03
1,2 - Dichloroethane (ethylene dichloride)	x	x	107-06-2	98.96	0.41	3.92E-03	1.72E-02
1,2 - Dichloropropane (propylene dichloride)	x	x	78-87-5	112.99	0.18	1.98E-03	8.67E-03
2-Propanol (isopropyl alcohol)	--	y	67-63-0	60.11	50.1	2.93E-01	1.28E+00
Acetone (2-propanone)	--	--	67-64-1	58.08	7.01	3.96E-02	1.74E-01
Acrylonitrile (Propenenitrile)	x	x	107-13-1	53.06	6.33	3.27E-02	1.43E-01
Benzene	x	x	71-43-2	78.12	1.91	1.45E-02	6.36E-02
Bromodichloromethane	--	y	75-27-4	163.83	3.13	4.99E-02	2.19E-01
Butane	--	y	106-97-8	58.12	5.03	2.85E-02	1.25E-01
Carbon Disulfide	x	x	75-15-0	76.14	0.58	4.32E-03	1.89E-02
Carbon Tetrachloride	x	x	56-23-5	153.84	0.004	5.99E-05	2.62E-04
Carbonyl Sulfide	x	x	463-58-1	60.07	0.49	2.87E-03	1.25E-02
Chlorobenzene (monochlorobenzene)	x	x	108-90-7	112.56	0.25	2.78E-03	1.22E-02
Chlorodifluoromethane (CFC-22, freon-22)	--	--	75-45-6	86.47	1.30	1.09E-02	4.79E-02
Chloroethane (ethyl chloride)	x	x	75-00-3	64.52	1.25	7.85E-03	3.44E-02
Chloroform (trichloromethane)	x	x	67-66-3	119.38	0.03	3.49E-04	1.53E-03
Chloromethane (methyl chloride)	x	x	74-87-3	50.49	1.21	5.95E-03	2.60E-02
1,4 Dichlorobenzene (p-dichlorobenzene)	x	x	106-46-7	147	0.21	3.05E-03	1.33E-02
Dichlorodifluoromethane (CFC-12, freon-12)	--	--	75-71-8	120.91	15.7	1.85E-01	8.09E-01
Dichlorofluoromethane (freon-21)	--	--	75-43-4	102.92	2.62	2.62E-02	1.15E-01
Dichloromethane (methylene chloride)	x	--	75-09-2	84.93	14.3	1.18E-01	5.18E-01
Dimethyl Sulfide (methyl sulfide)	--	y	75-18-3	62.13	7.82	4.73E-02	2.07E-01
Ethane	--	--	74-84-0	30.07	889	2.60E+00	1.14E+01
Ethanol (ethyl alcohol)	--	y	64-17-5	46.08	27.2	1.22E-01	5.34E-01
Ethylbenzene	x	x	100-41-4	106.17	4.61	4.76E-02	2.09E-01
Ethyl Mercaptan (ethanethiol)	--	y	75-08-1	62.13	1.25	7.56E-03	3.31E-02
Ethylene dibromide (1,2 dibromoethane)	x	x	106-93-4	187.88	0.001	1.83E-05	8.01E-05
Fluorotrichloromethane (CFC-11, freon-11)	--	--	75-69-4	137.37	0.76	1.02E-02	4.45E-02
Hexane	x	x	110-54-3	86.18	6.57	5.51E-02	2.41E-01
Hydrogen Sulfide	--	--	7783-06-4	34.08	35.5	1.18E-01	5.16E-01
Mercury (total)	x	--	7439-97-6	200.61	2.92E-04	5.70E-06	2.50E-05
Methyl Ethyl Ketone (2-butanone)	x	x	78-93-3	72.11	7.09	4.98E-02	2.18E-01
Methyl Isobutyl Ketone (hexone)	x	x	108-10-1	100.16	1.87	1.82E-02	7.99E-02
Methyl Mercaptan	--	y	74-93-1	48.11	2.49	1.17E-02	5.11E-02
Pentane	--	y	109-66-0	72.15	3.29	2.31E-02	1.01E-01
Tetrachloroethylene (perchloroethylene, -ethene)	x	x	127-18-4	165.83	3.73	6.02E-02	2.64E-01
Propane	--	y	74-98-6	44.1	11.1	4.76E-02	2.09E-01
Toluene (methylbenzene)	x	x	108-88-3	92.14	39.3	3.52E-01	1.54E+00
Trichloroethylene (trichloroethene)	x	x	79-01-6	131.38	2.82	3.61E-02	1.58E-01
t - 1,2 - Dichloroethene (1,2 dichloroethylene)	--	--	156-60-5	96.94	2.84	2.68E-02	1.17E-01
Vinyl Chloride (chloroethylene, VCM)	x	x	75-01-4	62.50	7.34	4.47E-02	1.96E-01
Xylenes (m, o, p)	x	x	1330-20-7	106.17	12.1	1.25E-01	5.48E-01
Total HAP						1.04	4.55
Maximum Single HAP						0.35	1.54
VOC (Non-HAP)						0.63	2.76

^aU.S. E.P.A., *Compilation of Air Pollutant Emission Factors, Volume I. Stationary Point and Area Sources ("AP-42"), 5th Ed.*, November 1998.

Tables 2.4-1, 2.4-2, 2.4-3.

Fugitive NMOC and VOC Emissions
Short Creek Landfill
Short Creek, West Virginia

Fugitive NMOC Emissions were calculated using the following equation^(a):

$$CM_p = \left[UM_p * \left(1 - \frac{n_{col}}{100} \right) \right] + \left[UM_p * \frac{n_{col}}{100} * \left(1 - \frac{n_{cnt}}{100} \right) \right]$$

- where:
- CM_p = Fugitive mass emissions of NMOC.
 - UM_p = Uncontrolled mass emissions of NMOC, calculated by the EPA Landfill Gas Emissions Model to be 86.21 tons (78.21 Mg) in 2039
 - n_{col} = Collection efficiency of the landfill gas collection system
 - n_{cnt} = Control efficiency of the landfill gas control device

Using the above referenced values, the controlled mass emissions of NMOC for 2039 is as follows:

$$CM_p = \left[86.21 * \left(1 - \frac{75}{100} \right) \right] + \left[86.21 * \frac{75}{100} * \left(1 - \frac{98}{100} \right) \right]$$

In accordance with AP-42, Section 2.4 (11/98), approximately 39% of NMOCs are VOCs.

Total fugitive mass emissions of NMOC for 2039 = 22.84 tons

Total fugitive mass emissions of VOC for 2039 = 8.91 tons

^(a) Equation taken from the AP-42, Section 2.4

Emission Unit Description	Emissions																
	LFG Flow	NO _x		CO		SO ₂		PM/PM ₁₀		NMOC		VOC		HAP (Total)		HAP (Single)	
	(scfm)	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Open Flare	2,500	5.61	24.57	30.53	133.70	1.26	5.50	1.29	5.65	NA	NA	0.16	0.69	2.50	10.93	0.89	3.88

Category	Value	Equivalent
Standard Temperature ^a	60 °F	520 °R
Universal Gas Constant	0.7302 atm-ft ³ /lb-mol ^o R	
Pressure ^a	1 atm	
Methane Heating Value ^o	1,000 Btu/ft ³	
LFG Methane Component ^c	55%	
LFG Typical Heating Value	550 Btu/ft ³	
LFG Temperature ^c	100 °F	560 °R
LFG Moisture ^c	8%	

^aIndustrial STP (60°F, 30.00 in. Hg, 1 atm)

^oTypical

^cAssumed

Operating Parameters - Inputted and Calculated

Flare Information	Value	Equivalent
Hours per Day Operation	24 hours	
Days per Year Operation	365 days	
Operation Period ^a	8,760 hours	
LFG inlet flow, standard ^o	2,500 scfm	
LFG Inlet Flow, dry standard	2,300 dscfm	
Heat Input	83 MMBtu/hr	
Design Flare Operating Temperature ^c	1,400 °F	1,860 °R
Exhaust Flow, standard	2,500 scfm	
Exhaust Flow, actual	2,692 acfm	
Exit Diameter ^o	6.0 ft	
Exhaust Velocity	95 ft/min	1.6 ft/s
Height ^o	20 ft	

^aWorst-case/default = 24 hrs/day, 365 days/yr, 8760 hours.

^oFlare manufacturer

^cFlare temperature cannot be monitored or verified on an open, utility flare. Values of 1400°F is an assumed value based on design goals to reduce organic compounds.

Operation Period 8,760 hr
LFG inlet flow, standard 2,500 scfm
Heat Input 83 MMBtu/hr

SO₂ Emission Rate

SO₂ concentration in exhaust gas 49.60 ppmv
SO₂ emission rate 1.26 lb/hr 5.5 ton/yr

Sulfur Compound	CAS	MW (lb/lb-mol)	Conc (ppmv) ^a	Control Eff ^b	Individual Compound Contribution to SO ₂		
					No. of S Atoms	S Conc (ppmv)	SO ₂ Emiss (lb/hr)
Carbon Disulfide	75-15-0	76.13	0.58	99.7%	2	1.16	0.03
Carbonyl Sulfide	463-58-1	60.07	0.49	99.7%	1	0.49	0.01
Dimethyl Sulfide (methyl sulfide)	75-18-3	62.13	7.82	99.7%	1	7.80	0.20
Ethyl Mercaptan (ethanethiol)	75-08-1	62.13	2.28	99.7%	1	2.27	0.06
Hydrogen Sulfide	7783-06-4	34.08	35.50	99.7%	1	35.4	0.90
Methyl Mercaptan	74-93-1	48.11	2.49	99.7%	1	2.48	0.06
Total Contribution to SO₂^a:						49.60	1.26

PM/PM₁₀ Emission Rate

PM emission factor^{a,d} 17 lb/MM dscf CH₄
PM emission rate 1.29 lb/hr 5.7 ton/yr

NO₂ Emission Rate

NO₂ emission factor^c 0.07 lb/MMBtu
NO₂ emission rate 5.6 lb/hr 24.6 ton/yr

CO Emission Rate

CO emission factor^c 0.37 lb/MMBtu
CO emission rate 30.5 lb/hr 134 ton/yr

NMOC Emission Rate

NMOC conc inlet gas^a 595 ppmv
MW hexane 86.18 lb/lb-mol
destruction efficiency 98%
mass NMOC inlet gas 20.3 lb/hr
NMOC emission rate 0.41 lb/hr 1.77 ton/yr

VOC Emission Rate

NMOC conc inlet gas^a 595 ppmv
VOC fraction of NMOC^a 39%
VOC concentration in inlet gas 232 ppmv
MW hexane 86.18 lb/lb-mol
mass VOC inlet gas 7.9 lb/hr
destruction efficiency 98%
VOC emission rate 0.16 lb/hr 0.69 ton/yr

^aU.S. E.P.A., *Compilation of Air Pollutant Emission Factors, Volume I, Stationary Point and Area Sources* ("AP-42"), 5th Ed., November 1998. Tables 2.4-1, 2.4-2, 2.4-3, 2.4-5.

^bAP-42 gives ranges for control efficiencies. Control efficiencies for halogenated species range from 91 to 99.7 percent. The upper end of the range is used here resulting in maximum calculated emissions of SO₂.

^cLFG Specialties Inc. (typical)

^dFrom AP-42 Table 2.4-5. No data on PM size distributions were available, however for other gas-fired combustion sources, most of the particulate matter is less than 2.5 microns in diameter. But, to be conservative all particulate emissions assumed to be PM and PM10.

LFG inlet flow 2,500 scfm

LFG Compound	HAP	VOC	CAS	MW (lb/lb-mol)	Compound Conc & Mass in Inlet Gas		Control Eff ^a	Flare Exhaust	
					(ppmv)	(lb/hr)		lb/hr	ton/yr
1,1,1 - Trichloroethane (methyl chloroform)	x	--	71-55-6	133.41	0.48	2.53E-02	91.0%	2.28E-03	9.97E-03
1,1,2,2 - Tetrachloroethane	x	x	79-34-5	167.85	1.11	7.36E-02	91.0%	6.62E-03	2.90E-02
1,1,2 - Trichloroethane (1,1,2 TCA)	x	x	79-00-5	133.41	0.10	5.27E-03	91.0%	4.74E-04	2.08E-03
1,1 - Dichloroethane (ethylidene dichloride)	x	x	75-34-3	98.96	2.35	9.19E-02	91.0%	8.27E-03	3.62E-02
1,1 - Dichloroethene (vinylidene chloride)	x	x	75-35-4	96.94	0.20	7.70E-03	91.0%	6.93E-04	3.03E-03
1,2 - Dichloroethane (ethylene dichloride)	x	x	107-06-2	98.96	0.41	1.59E-02	91.0%	1.43E-03	6.27E-03
1,2 - Dichloropropane (propylene dichloride)	x	x	78-87-5	112.99	0.18	8.03E-03	91.0%	7.23E-04	3.17E-03
2-Propanol (isopropyl alcohol)	--	y	67-63-0	60.11	50.1	1.19E+00	38.0%	7.38E-01	3.23E+00
Acetone (2-propanone)	--	--	67-64-1	58.08	7.01	1.61E-01	38.0%	9.97E-02	4.37E-01
Acrylonitrile (Propenenitrile)	x	x	107-13-1	53.06	6.33	1.33E-01	38.0%	8.23E-02	3.60E-01
Benzene	x	x	71-43-2	78.12	1.91	5.89E-02	38.0%	3.65E-02	1.60E-01
Bromodichloromethane	--	y	75-27-4	163.83	3.13	2.03E-01	91.0%	1.82E-02	7.99E-02
Butane	--	y	106-97-8	58.12	5.03	1.15E-01	38.0%	7.16E-02	3.14E-01
Carbon Disulfide	x	x	75-15-0	76.14	0.58	1.75E-02	38.0%	1.09E-02	4.76E-02
Carbon Tetrachloride	x	x	56-23-5	153.84	0.004	2.43E-04	91.0%	2.19E-05	9.58E-05
Carbonyl Sulfide	x	x	463-58-1	60.07	0.49	1.16E-02	38.0%	7.21E-03	3.16E-02
Chlorobenzene (monochlorobenzene)	x	x	108-90-7	112.56	0.25	1.13E-02	91.0%	1.02E-03	4.45E-03
Chlorodifluoromethane (CFC-22, freon-22)	--	--	75-45-6	86.47	1.30	4.44E-02	91.0%	4.00E-03	1.75E-02
Chloroethane (ethyl chloride)	x	x	75-00-3	64.52	1.25	3.19E-02	91.0%	2.87E-03	1.26E-02
Chloroform (trichloromethane)	x	x	67-66-3	119.38	0.03	1.41E-03	91.0%	1.27E-04	5.58E-04
Chloromethane (methyl chloride)	x	x	74-87-3	50.49	1.21	2.41E-02	91.0%	2.17E-03	9.51E-03
1,4 Dichlorobenzene (p-dichlorobenzene)	x	x	106-46-7	147	0.21	1.24E-02	91.0%	1.11E-03	4.88E-03
Dichlorodifluoromethane (CFC-12, freon-12)	--	--	75-71-8	120.91	15.7	7.50E-01	91.0%	6.75E-02	2.96E-01
Dichlorofluoromethane (freon-21)	--	--	75-43-4	102.92	2.62	1.07E-01	91.0%	9.59E-03	4.20E-02
Dichloromethane (methylene chloride)	x	--	75-09-2	84.93	14.3	4.80E-01	91.0%	4.32E-02	1.89E-01
Dimethyl Sulfide (methyl sulfide)	--	y	75-18-3	62.13	7.82	1.92E-01	38.0%	1.19E-01	5.21E-01
Ethane	--	--	74-84-0	30.07	889	1.06E+01	38.0%	6.55E+00	2.87E+01
Ethanol (ethyl alcohol)	--	y	64-17-5	46.08	27.2	4.95E-01	38.0%	3.07E-01	1.34E+00
Ethylbenzene ^d	x	x	100-41-4	106.17	4.61	1.93E-01	38.0%	1.20E-01	5.25E-01
Ethyl Mercaptan (ethanethiol)	--	y	75-08-1	62.13	1.25	3.07E-02	38.0%	1.90E-02	8.33E-02
Ethylene dibromide (1,2 dibromoethane)	x	x	106-93-4	187.88	0.001	7.42E-05	91.0%	6.68E-06	2.93E-05
Fluorotrichloromethane (CFC-11, freon-11)	--	--	75-69-4	137.37	0.76	4.12E-02	91.0%	3.71E-03	1.63E-02
Hexane	x	x	110-54-3	86.18	6.57	2.24E-01	38.0%	1.39E-01	6.07E-01
Hydrogen Sulfide	--	--	7783-06-4	34.08	35.5	4.78E-01	38.0%	2.96E-01	1.30E+00
Mercury (total)	x	--	7439-97-6	200.61	2.92E-04	2.31E-05	0.0%	2.31E-05	1.01E-04
Methyl Ethyl Ketone (2-butanone)	x	x	78-93-3	72.11	7.09	2.02E-01	38.0%	1.25E-01	5.48E-01
Methyl Isobutyl Ketone (hexone)	x	x	108-10-1	100.16	1.87	7.40E-02	38.0%	4.59E-02	2.01E-01
Methyl Mercaptan	--	y	74-93-1	48.11	2.49	4.73E-02	38.0%	2.93E-02	1.29E-01
Pentane	--	y	109-66-0	72.15	3.29	9.38E-02	38.0%	5.81E-02	2.55E-01
Tetrachloroethylene (perchloroethylene, -ethen)	x	x	127-18-4	165.83	3.73	2.44E-01	91.0%	2.20E-02	9.63E-02
Propane	--	y	74-98-6	44.1	11.1	1.93E-01	38.0%	1.20E-01	5.25E-01
Toluene (methylbenzene)	x	x	108-88-3	92.14	39.3	1.43E+00	38.0%	8.87E-01	3.88E+00
Trichloroethylene (trichloroethene)	x	x	79-01-6	131.38	2.82	1.46E-01	91.0%	1.32E-02	5.77E-02
t - 1,2 - Dichloroethene (1,2 dichloroethylene)	--	--	156-60-5	96.94	2.84	1.09E-01	91.0%	9.79E-03	4.29E-02
Vinyl Chloride (chloroethylene, VCM)	x	x	75-01-4	62.50	7.34	1.81E-01	91.0%	1.63E-02	7.14E-02
Xylenes (m, o, p)	x	x	1330-20-7	106.17	12.1	5.07E-01	38.0%	3.15E-01	1.38E+00
Hydrogen Chloride	x	--	7647-01-0	36.50	42.0	6.06E-01	0.0%	6.06E-01	2.65E+00
Total HAP								2.50	10.9
Maximum Single HAP								0.89	3.88
VOC (Non-HAP)								1.48	6.5

^aU.S. E.P.A., *Compilation of Air Pollutant Emission Factors, Volume I. Stationary Point and Area Sources* ("AP-42"), 5th Ed., November 1998.

Tables 2.4-1, 2.4-2, 2.4-3.

^bAP-42 gives ranges for control efficiencies. Control efficiencies for halogenated species range from 91 to 99.7 percent and control.

Control efficiencies for non-halogenated species range from 38 to 91 percent. For permitting purposes, the lower end of each range is used here.

^cProduct of combustion

^dBecause HCl is a production of combustion, a default outlet concentration is listed: AP-42, Section 2.4.4.

Note: "x" denotes a HAP only or a HAP and VOC; "y" denotes a VOC only

Symbols and Abbreviations Definitions

atm-ft³/lb-mol^oR----atmosphere cubic foot per pound mole degree Rankine
acfm----actual cubic foot per minute
atm----atmosphere
bhp----brake horsepower
Btu----british thermal unit
cal/s----calorie per second
CO----carbon monoxide
ft³----cubic foot
m³----cubic meter
d----day
°F----degree Fahrenheit
°R----degree Rankine
dscfm----dry standard cubic foot, feet per minute
dsl/min----dry standard litre per minute
ft----foot
ft/min----foot per minute
ft/s----foot per second
g----gram
hr----hour
HAP----hazardous air pollutant
HV----heating value
HHV----higher heating value
in----inch
kW----kilowatt
kWh----kilowatt hour
l----litre
LHV----lower heating value
m----meter
m/s----meter per second
CH₄----methane
Hg----mercury
mg----microgram
mg/dsl----microgram per dry standard litre
mg----milligram
MM----million
MMBtu----million british thermal units
min----minute
mol----mole
NO₂----nitrogen dioxide
Nox----nitrogen oxides
NMOC----non-methane organic compounds
PM₁₀----particulate matter less than or equal to 10 microns
Pb----lead
ppmv----parts per million by volume
ppmw----parts per million by weight
lb/hr----pound per hour
s----second
scf-standard cubic foot
scfm-standard cubic foot per minute
STP----standard temperature and pressure
SO₂----sulfur dioxide
ton----ton
ton/yr----ton per y
R----universal gas constant
VOC----volatile organic compound

Sample Calculations

Standard Conditions and Constants

$$^{\circ}\text{R} = ^{\circ}\text{F} + 460$$

standard temperature = 60 $^{\circ}\text{F}$

standard pressure = 1 atm

Universal gas constant (R) = 0.7302 atm-ft³/lb-mol $^{\circ}\text{R}$

Flow

dscfm = scfm * (1 - % moisture)

acfm = scfm * (actual temp [$^{\circ}\text{R}$]) / (standard temp [$^{\circ}\text{R}$]) * {(standard press [atm]) / (actual press [atm])}

CO and NO_x Emissions

(lb/MMbtu) * (MMbtu/hr) = lb/hr

SO₂ Emissions

typically, 86% to 99.7% of sulfur compounds convert to SO₂ during combustion

{(scfm) * (60 min/hr) * (total sulfur concentration [ppmv]) * (1 - control efficiency) * (MW SO₂)} / {(R) * (T)} = lb/hr

PM₁₀ Emissions

(dscfm) * (CH₄ component) * (1E-6 MMscf/scf) * (lb PM/MMscf CH₄) * (60 min/hr) = lb/hr

VOC Emissions

{(scfm * 60 min/hr * concentration_{compound} [ppmv] * MW_{compound}) / (R) * (T)} * (1 - control efficiency) = lb/hr

OR

VOCs are 39 percent of NMOC, as prescribed in AP-42

VOC concentration [ppmv] = NMOC concentration [as hexane] * 39%

flare and/or engines typically combust 98% of VOCs

{(scfm * 60 min/hr * concentration_{hexane} [ppmv] * MW_{hexane}) / (R) * (T)} * (0.39) = lb/hr

LFG Compound Emissions

{(scfm * 60 min/hr * concentration_{compound} [ppmv] * MW_{compound}) / (R) * (T)} * (1 - control efficiency)

HCl Emissions

typically, 86% to 99.7% of chlorine compounds convert to HCl during combustion

(concentration_{compound} [ppm]) * (control efficiency) * (no. of chlorine atoms) = HCl concentration [ppm] in outlet gas from each

{HCl concentration_{each compound} [ppm] * scfm * MW_{HCl}} / {(R) * (T)} * (60 min/hr) = lb/hr

OR

{(scfm) * (60 min/hr) * (HCl outlet concentration per AP-42 [ppmv]) * (1 - control efficiency) * (MW)} / {(R) * (T)} = lb/hr

Emissions Summary

Emission Unit	Description	Calculated Emissions		
		PM _{2.5} (tpy)	PM ₁₀ (tpy)	PM ₃₀ (TSP) (tpy)
--	Paved Road(s)	0.25	1.01	5.04
--	Unpaved Road(s)	0.47	4.66	17.27
--	Aggregate Handling/Storage Piles	0.00	0.01	0.02
	Total	0.72	5.7	22.3

Site Specific Information	Value	Reference
Paved Road Length (one way).....	0.6 mi	1
Unpaved Road Length (one way).....	0.7 mi	1
No. of Hours of Operation Per Day.....	10 hr/day	1
No. of Days in Averaging Period, N.....	286 day/yr	1
No. of Hours of Operation Per Averaging Period.....	2860 hr/yr	-
No. of "Wet" Days (i.e., at least 0.01 in. precip), P.....	150 day	3
Silt Loading, sL.....	7.4 g/m ²	3
Surface Material Silt Content, s.....	6.4%	3
Control Efficiency, CE.....	80%	1,5

Calculation of Mean Vehicle Weight

Vehicle Type	Vehicle Weight ¹		Average (ton)	Vehicles Per Day	Reference
	Unloaded (ton)	Loaded (ton)			
Transfer Trailer.....	20	40	30	8	1
Front Loader.....	21	29	25	12	1
Rear Loader.....	22	28.5	25	16	1
Roll Off.....	16	28	22	50	1
Dump Truck.....	13	20	17	6	1
Other: Pick Ups.....	3	3.5	3	5	1
Total Vehicle Count.....	97 per day				
Mean Vehicle Weight, W.....	22.1 ton				

Paved Road Emissions	Value	References
Predictive Emission Factor Equation.....	$E = \{[k*(sL)^{0.91}*(W)^{1.02}]*\{(1-P/4N)\}*CE$	3
Particle Size Multiplier - PM2.5, k.....	0.00054	3
Particle Size Multiplier - PM10, k.....	0.0022	3
Particle Size Multiplier2 - PM30, k.....	0.011	3
Calculated Emission Factor - PM2.5, E.....	0.08 lb/VMT	-
Calculated Emission Factor - PM10, E.....	0.32 lb/VMT	-
Calculated Emission Factor - PM30, E.....	1.60 lb/VMT	-
Total Miles Travelled - Paved Roads.....	31,570 VMT/yr	-
Calculated Emissions - PM2.5.....	0.25 tpy 0.173 lb/hr	-
Calculated Emissions - PM10.....	1.01 tpy 0.705 lb/hr	-
Calculated Emissions - PM30.....	5.04 tpy 3.525 lb/hr	-

Unpaved Road Emissions	Value	References
Predictive Emission Factor Equation.....	$[k*(s/12)^a*(W/3)^b]*\{(365-P)/365\}$	4
Particle Size Multiplier - PM2.5, k.....	0.15	4
Particle Size Multiplier - PM10, k.....	1.50	4
Particle Size Multiplier2 - PM30, k.....	4.90	4
Calculated Emission Factor - PM2.5, E.....	0.12 lb/VMT	-
Calculated Emission Factor - PM10, E.....	1.23 lb/VMT	-
Calculated Emission Factor - PM30, E.....	4.56 lb/VMT	-
Total Miles Travelled - Unpaved Roads.....	37,840 VMT/yr	-
Calculated Emissions - PM2.5.....	0.47 tpy 0.33 lb/hr	-
Calculated Emissions - PM10.....	4.66 tpy 3.26 lb/hr	-
Calculated Emissions - PM30.....	17.27 tpy 12.08 lb/hr	-

Site Specific Information	Value	References
Amount of Material Handled Per Day.....	446 ton/day	1
No. of Hours of Operation Per Day.....	10 hr/day	1
No. of Days in Averaging Period, N.....	286 day/yr	1
No. of Hours of Operation Per Averaging Period.....	2860 hr/yr	-
Mean Wind Speed, U.....	9 mph	2
Surface Material Moisture Content, M.....	14.2%	3

Aggregate Handling & Storage Pile Emissions	Value	References
Predictive Emission Factor Equation.....	$E = [k * 0.0032] * [(U/5)^{1.3} / ((M/2)^{1.4})]$	6
Particle Size Multiplier - PM2.5, k.....	0.053	6
Particle Size Multiplier - PM10, k.....	0.35	6
Particle Size Multiplier2 - PM30, k.....	0.74	6
Calculated Emission Factor - PM2.5, E.....	2.34E-05 lb/ton	-
Calculated Emission Factor - PM10, E.....	1.55E-04 lb/ton	-
Calculated Emission Factor - PM30, E.....	3.27E-04 lb/ton	-
Calculated Emissions - PM2.5.....	1.49E-03 tpy	1.04E-03 lb/hr
Calculated Emissions - PM10.....	9.86E-03 tpy	6.90E-03 lb/hr
Calculated Emissions - PM30.....	2.09E-02 tpy	1.46E-02 lb/hr

- 1 Site Specific - Specify Actual Source
- 2 National Climatic Data Center, "Climatic Wind Data for the United States," November 1998.
- 3 EPA, "Emissions Factors & AP 42, Compilation of Air Pollutant Emission Factors," Section 13.2.1, January 2011.
- 4 EPA, "Emissions Factors & AP 42, Compilation of Air Pollutant Emission Factors," Section 13.2.2, November 2006.
- 5 Countess Environmental, "WRAP Fugitive Dust Handbook," November 15, 2004.
- 6 EPA, "Emissions Factors & AP 42, Compilation of Air Pollutant Emission Factors," Section 13.2.4, November 2006.

<u>Letter Symbol</u>	<u>Definition</u>
E.....	emission factor (lb/VMT or g/VMT)
g/m ²	grams per meter squared
g/VMT.....	grams per vehicle mile travelled
hr.....	hour
lb/hr.....	pounds per hour
lb/VMT.....	pounds per vehicle mile travelled
mi.....	mile (or VMT)
mph.....	miles per hour
P.....	number of "wet" days (at least 0.01 in. precip)
PM _x	particulate matter less than or equal to "x" microns
sL.....	silt loading
tpy.....	tons per year
W.....	mean vehicle weight
s.....	surface material silt content
S.....	mean vehicle speed
TSP.....	total suspended particulate
M.....	surface moisture content
U.....	mean wind speed

For Reference Only

Paved Roads	Sweep streets	4 – 26%
	Minimize trackout	40 – 80%
	Remove deposits on road ASAP	> 90%
Unpaved Roads	Limit vehicle speed to 25 mph	44%
	Apply water	10 – 74%
	Apply dust suppressant	84%
	Pave the surface	>90%

Total Emissions from proposed Rock Crushing Operations at Short Creek Landfill

	NOx	CO	PM	PM10	PM2.5	SO2	TOC
	(tons/yr)						
Generator	17.21	3.71		1.21		1.13	1.40
Screening & Conveying	--	--	16.97	5.97	0.04	--	--
Load-in/Loadout, Wind Erosion	--	--	20.51	9.70	3.05	--	--
Total	17.21	3.71	37.48	16.88	3.09	1.13	1.40

Proposed Rock Crusher - Diesel Fired Engine

Design Capacity

350 hp
0.89075 MMBTU/hr

Pollutant	Emission Point Type	Emission Factor ¹	Estimated Emissions	
		(lb/MMBTU)	(lb/hr)	(tons/yr)
CO	Stack	0.95	0.85	3.71
NOx	Stack	4.41	3.93	17.21
PM10	Stack	0.31	0.28	1.21
SO2	Stack	0.29	0.26	1.13
TOC	Stack	0.36	0.32	1.40

(1) Emission factors were obtained from AP-42 5th Edition - Section 3.3 Gasoline and Diesel Industrial Engines (10/96).

Rock Crusher Handling and Transfer

T = Conveyor Transfer Point - Emission Factors taken from AP-42 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing.

S = Screening - Emission Factors taken from AP-42 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing.

of same operation (see process flow diagram for location)

2 T
1 S

Operation Description		Emission Factors ¹			Processing Rate (tons/hr) (tons/yr)		Total Hourly Emissions			Total Annual Emissions		
		PM (lb/ton)	PM10 (lb/ton)	PM2.5 ² (lb/ton)			PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Type	#											
Screening	1	0.025	0.0087	0.00005	125	1,095,000	3.13	1.09	6.25E-03	13.69	4.76	0.03
Conveyor	2	0.003	0.0011	0.000013	125	1,095,000	0.75	0.28	3.25E-03	3.29	1.20	0.01

1: U.S. E.P.A., *Compilation of Air Pollutant Emission Factors, Volume I. Stationary Point and Area Sources* ("AP-42") 5th Ed., August, 2004. Section 11.19.2, Crushed Stone Processing and Pulverized Mineral Processing.

2: No data available for the uncontrolled screening and transfer operation, therefore PM emission factor of the controlled screening and transfer operation was used.

Notes: There are no emission factors in AP-42 for primary crushing of rock. As a conservative estimate of emissions, it is assumed that no controls are used during the screening and transfer operations.

L,W = Load in/Load out of storage piles and wind erosion of storage piles.
of same operation (Load in/Load out, Wind Erosion): 3

Variables Required by Rock Handling and Storage Pile(s) Equation and Calculated Emission Factors

Category, Variable	Value	
Mean Wind Speed, U	5.8	mph
Material Moisture Content ^a , M	0.7	%
No. of Days in Averaging Period	365	day
Particle Size Multiplier - PM _{2.5} , k	0.11	
Particle Size Multiplier - PM ₁₀ , k	0.35	
Particle Size Multiplier ^b - PM ₃₀ , k	0.74	
Calculated Emission Factor - PM _{2.5} , E	0.001856277	lb/ton
Calculated Emission Factor - PM ₁₀ , E	0.00591	lb/ton
Calculated Emission Factor - PM ₃₀ , E	0.01249	lb/ton

^aSpecific for Crushed Limestone

^bPM₃₀ is sometimes termed "suspensible particulate" (SP) and is often used as a surrogate for "total suspended particulate" (TSP) per AP-42).

Note: The emission factor equation is valid for the following ranges: silt content (0.44-0.19%), moisture content (0.25-4.8%), and wind speed (1.3-15 mph). The confidence factor decreases if any value (used) is beyond these ranges.

Source: U.S. E.P.A., *Compilation of Air Pollutant Emission Factors, Volume I. Stationary Point and Area Sources* ("AP-42") 5th Ed., January 1995. Section 13.2.4

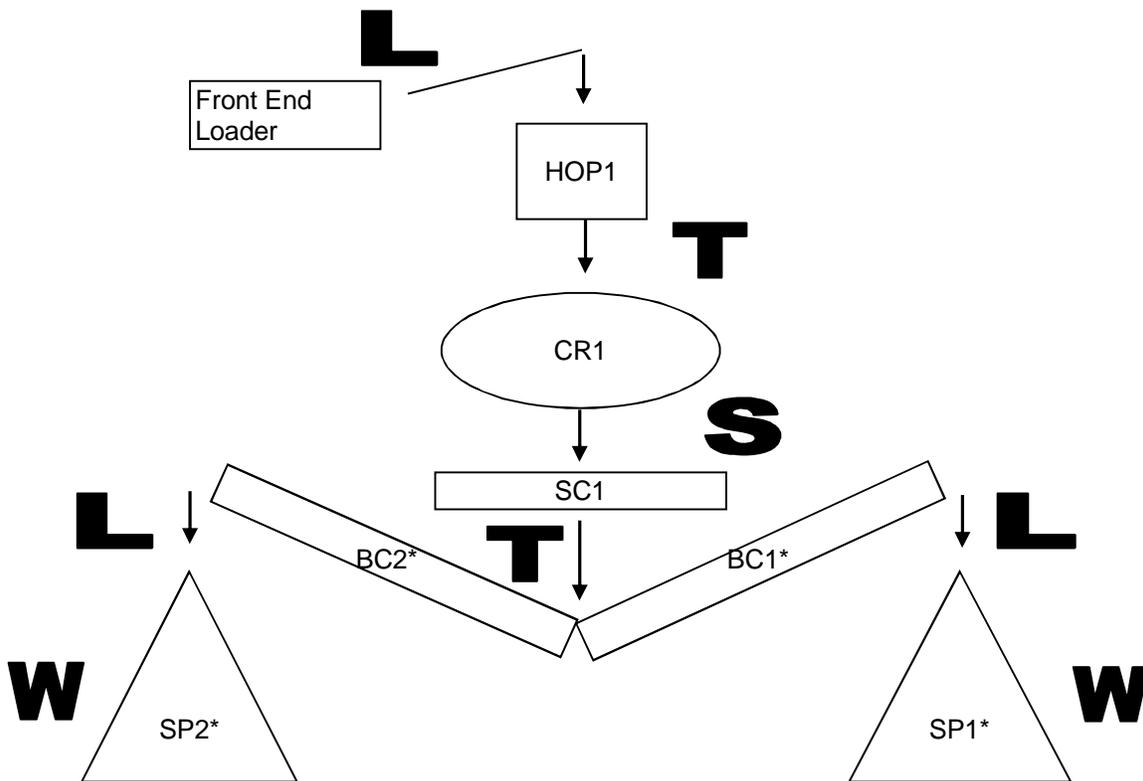
Calculated PM Emissions from Rock Handling and Storage Pile(s)

Category	Value		Equivalent
Amount of Material Handled Per Day	3,000	ton/day	125 tons/hr
Number of Drop/Wind Erosion Operations	3		
No. of Hours of Operation Per Day	24	hr/day	
No. of Hours of Operation Per Averaging Period	8,760	hr/avg per	
Calculated Emissions - PM _{2.5}	0.70	lb/hr	3.05 ton/yr
Calculated Emissions - PM ₁₀	2.21	lb/hr	9.70 ton/yr
Calculated Emissions - PM ₃₀	4.68	lb/hr	20.51 ton/yr

Process Description

A front end loader will feed the raw stone into hopper HOP1 that feeds directly to the crusher CR1. The sized material then drops from crusher CR1 onto the screen SC1. Two conveyors, BC1 and BC2, transfer the sized stone to two open stockpiles, SP1 and SP2. Short Creek Landfill will not be trucking any raw stone to the site to be processed or any sized stone from the site; they will be moving and using the stone separately.

Equipment ID	Description	Design Capacity		Control Measures
		tons/hr	tons/yr	
HOP1	Feed Hopper - receives raw stone from a front end loader and drops it directly into CR1	125	1,095,000	None
CR1	Jaw Crusher - receives raw stone from HOP1, crushes it and then drops it to SC1	125	1,095,000	None
SC1	Double Deck Screen - receives crushed stine from CR1, sizes it and then drops it to BC1 or BC2	125	1,095,000	None
BC1	Belt Conveyor - receives crushed stone from SC1 and transfers it to SP1	125	1,095,000	None
SP1	Sized Stone Stockpile - 1,800 sq. ft. base area and 20 ft high - receives sized stone from BC1 , stores it and until the landfill uses it later.	125	1,095,000	Water Spray
BC2	Belt Conveyor - receives crushed stone from SC1 and transferes it to SP2	125	1,095,000	None
SP2	Sized Stone Stockpile - 1,800 sq. ft. base area and 20 ft high - receives sized stone from BC2 , stores it and until the landfill uses it later.	125	1,095,000	Water Spray
DG	Diesel Generator - 1.24 MMBTU/hr - used to power the crushing and screening plant.	NA	NA	None

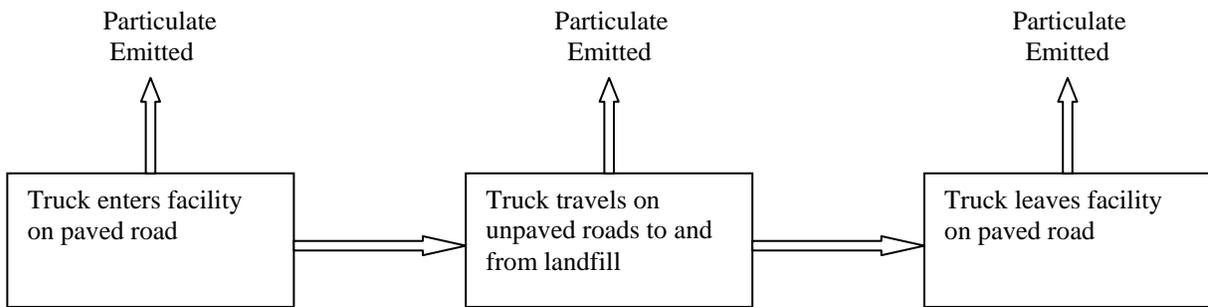


*Note: Crushed material goes to only one of two stockpiles, to avoid double counting the load-in of piles and wind erosion of piles, the whole material throughput is considered to go into one pile.

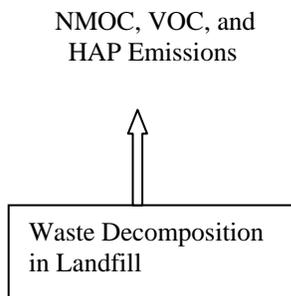
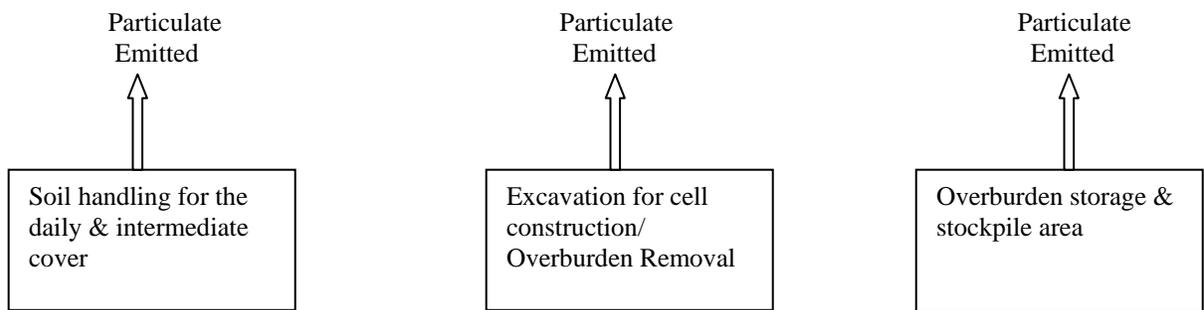
APPENDIX C
PROCESS FLOW DIAGRAM

Process Flow Diagram

Fugitive Emissions: Roadway Traffic (01-P1 and 01-UP1)

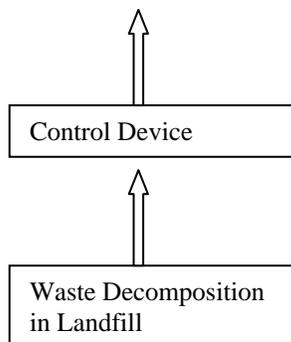


Fugitive Emissions: Landfill Operations (01-C1, 01-C2, and 01-A1)



Stack Emissions: Open Flare System (01-F1)

Emissions from control equipment
(CO, NO_x, SO₂, PM, NMOC, VOC, HAPs)



APPENDIX D

ROCK CRUSHER CONSTRUCTION PERMIT



west virginia department of environmental protection

Division of Air Quality
601 57th Street, SE
Charleston, WV 25304-2345
Phone: 304 926 0475 • Fax: 304 926 0479

Joe Manchin III, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

May 4, 2010

Mr. Khaled Mahmood, P.E.
Senior Project Manager
Cornerstone Environmental Group, LLC
400 Quadrangle Drive, Suite E
Bolingbrook, IL 60440

Re: Response to Comments
American Disposal Services of West Virginia, Inc.
Short Creek Landfill
Permit No. R13-2822
Plant ID No. 069-00071

Dear: Mr. Mahmood:

This letter is in response to your comments received by the Division of Air Quality (DAQ) on April 26, 2010, concerning the construction permit application for American Disposal Services of West Virginia, Inc's Short Creek Landfill. The following are the DAQ's responses to your comments.

Your calculations didn't account for PM, PM₁₀, and PM_{2.5} emissions from crushing of stone. This was noted in the evaluation. Because AP-42 notes No data (ND) for primary crushing in Table 11.19.2-2, does not mean that there is no potential for the primary crushing of stone to emit particulate matter. As noted in the evaluation, the DAQ has adopted an uncontrolled emission factor of 0.0007 lb per ton of stone processed from primary crushing of stone. The use of this factor from primary crushing increases the PTE of the proposed source by 0.0875 pounds per hours for PM, which was noted as 3.97 lb per hour in the permit instead of proposed rate of 3.88 pounds per hour.

There was an error in item b of Condition 4.1.1., which noted an annual limit for PM_{2.5}. This has been omitted. As you noted in other comments why is there requirement for 12 month rolling total. The emission limits in this permit is set to hourly limit only. As you noted, the PTE is based on 8,760 hours of operation per year. Therefore, potential and the permitted emissions on basis are the same maximum operating schedule.

However, the proposed unit is design to handle 125 tons of stone per hour and is not subject to 40CFR60, Subpart OOO. To ensure there are no changes to the unit that would change the applicability status of with regards to Subpart OOO, the permit requires 12-month total of stone processed records and hour meter on the engine. In addition, these information would be need to properly calculate annual emissions as required under 45CSR30 (Title V) for the facility's Certified Emission Statements. Condition 4.2.1. was revised to clarify this issue.

Comments regarding Subpart IIII, your comments are correct that the wrong regulation citation was listed. This citation was used in the evaluation. With regards to the specific emission standard under Subpart IIII, 40CFR60.4204(b) states that owners of CI engines with a displacement of 30 liter per cylinder or less must comply with the emission standards for new CI engine in §60.4201 For the proposed engine in question, §60.4201 states that the engine shall be certified to the emission standards in 40CFR89.112.

The emission standard for the proposed engine is listed in Table 1 of §89.112(a). For a 261 kW engine, Table 1 set the PM limit for it at 0.20 g/kW-hr. These emission standards are the same standards that the engine was compared to when the manufacturer certified this engine. Table 1 of §89.112(a) and page 3 of the engine performance data are attached to this letter.

You are correct that Subpart IIII does not require the non-resettable hour meter. However, this facility is subject to 45CSR30 and this is facility is located in an area that is classified as non-attainment for PM_{2.5}. The DAQ feels that requiring a non-resettable hour meter is a reasonable requirement under 45CSR§§13-5.11. and 6.1.

You made several other comments with regards to standard record keeping conditions. These may or may not be applicable to this facility at this time. However, the DAQ feels that these are reasonable conditions under 45CSR§§13-5.11. and 6.1.

Should you have any questions, please contact me at (304)926-0499ext.1214.

Sincerely,



Edward S. Andrews, P.E.
Engineer

c: WVDEP/Division of Air Quality, NPRO
Mr. Jeff Harvey, American Disposal Services of West Virginia, Inc.

Table 1.—Emission Standards (g/kW-hr)

Rated Power (kW)	Tier	Model Year ¹	NOx	HC	NMHC + NOx	CO	PM
kW<8	Tier 1	2000	—	—	10.5	8.0	1.0
	Tier 2	2005	—	—	7.5	8.0	0.80
8<kW<19	Tier 1	2000	—	—	9.5	6.6	0.80
	Tier 2	2005	—	—	7.5	6.6	0.80
19<kW<37	Tier 1	1999	—	—	9.5	5.5	0.80
	Tier 2	2004	—	—	7.5	5.5	0.60
37<kW<75	Tier 1	1998	9.2	—	—	—	—
	Tier 2	2004	—	—	7.5	5.0	0.40
	Tier 3	2008	—	—	4.7	5.0	
75<kW<130	Tier 1	1997	9.2	—	—	—	—
	Tier 2	2003	—	—	6.6	5.0	0.30
	Tier 3	2007	—	—	4.0	5.0	
130<kW<225	Tier 1	1996	9.2	1.3	—	11.4	0.54
	Tier 2	2003	—	—	6.6	3.5	0.20
	Tier 3	2006	—	—	4.0	3.5	
225<kW<450	Tier 1	1996	9.2	1.3	—	11.4	0.54
	Tier 2	2001	—	—	6.4	3.5	0.20
	Tier 3	2006	—	—	4.0	3.5	
450<kW<560	Tier 1	1996	9.2	1.3	—	11.4	0.54
	Tier 2	2002	—	—	6.4	3.5	0.20
	Tier 3	2006	—	—	4.0	3.5	
kW>560	Tier 1	2000	9.2	1.3	—	11.4	0.54
	Tier 2	2006	—	—	6.4	3.5	0.20

¹ The model years listed indicate the model years for which the specified tier of standards take effect.

Performance Data

EMISSIONS DATA

EPN PTER-3 2000 - 2000 ***** 05
 Gaseous emissions data measurements are consistent with those described in
 in 47 CFR, EU 67/98/EC, ECE Regulation No. 94 and ISO 8178 for measuring
 HC, CO, PM and NOx.

Gaseous emissions values are WEIGHTED CYCLE AVERAGES and are in compliance
 with the following non-road regulations:

LOCALITY	AGENCY/LEVEL	MAX LIMITS - g/kwh-hr		
U. S. (incl Calif)	EPA/Title 3	CO:3.5	NOx: 10.0	HC:0.2
Europe	EU/Stage-TTCA	CO:3.0	NOx: 10.0	THD:0.2

EU SEAME-1112100 - 2010 ***** 05
 Gaseous emissions data measurements are consistent with those described in
 in 47 CFR, EC 94/91/EC, ECE Regulation No. 94 and ISO 8178 for measuring
 HC, CO, NO and NOx.

Gaseous emissions values are WEIGHTED CYCLE AVERAGES and are in compliance
 with the following non-road regulations:

LOCALITY	AGENCY/LEVEL	MAX LIMITS - g/kwh-hr		
U. S. (incl Calif)	EPA/Title 3	CO:3.5	NOx: 10.0	HC:0.2
Europe	EU/Stage-TTCA	CO:3.0	NOx: 10.0	THD:0.2

REFERENCE EXHAUST STACK DIAMETER	4
WET EXHAUST MASS	3,833.7 LB/HR
WET EXHAUST FLOW (966.20 F STACK TEMP)	2,348.43 CFM
WET EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	799.00 STD CFM
DRY EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	731.72 STD CFM
FUEL FLOW RATE	19.6 AL/HR



west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone: (304) 926-0475 • FAX: (304) 926-0479

Joe Manchin III, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

May 4, 2010

CERTIFIED MAIL

91 7108 2133 3936 1554 1628

Mr. Jeff Harvey
General Manager
American Disposal Services of West Virginia, Inc.
258 North Fork Road
Short Creek, WV 26003

Re: American Disposal Services of West Virginia, Inc.
Short Creek Landfill
Permit No. R13-2822
Plant ID No. 069-00071

Dear Mr. Harvey:

Your application for a permit as required by Section 5 of 45CSR13 - "Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permit, General Permit, and Procedures for Evaluation" has been approved. The enclosed permit R13-2822 is hereby issued pursuant to Subsection 5.7 of 45CSR13. Please be aware of the notification requirements in the permit which pertain to commencement of construction, modification, or relocation activities; startup of operations; and suspension of operations.

The source is subject to 45CSR30. Changes authorized by this permit must also be incorporated into the facility's Title V operating permit. Commencement of the operations authorized by this permit shall be determined by the appropriate timing limitations associated with Title V permit revisions per 45CSR30.

In accordance with 45CSR30- Operating Permit Program, the permittee shall submit a certified emissions statement and pay fees on an annual basis in accordance with the submittal requirements of the Division of Air Quality. A receipt for the appropriate fee shall be maintained on the premises for which the receipt has been issued, and shall be made immediately available for inspection by the Secretary or his/her duly authorized representative.

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board

Permit Cover Letter to Mr. Harvey
May 3, 2010
Page 2 of 2

pursuant to article one [§§22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §§22-5-14.

Should you have any questions or comments, please contact me at (304) 926-0499, extension 1214.

Sincerely,


Edward S. Andrews, P.E.
Engineer

Enclosures

c: WVDEP/Division of Air Quality, NPRO
Mr. Khaled Mahmoud, P.E., Cornerstone Environmental Group, LLC

West Virginia Department of Environmental Protection

Joe Manchin, III
Governor

Division of Air Quality

Randy C. Huffman
Cabinet Secretary

Permit to Construct

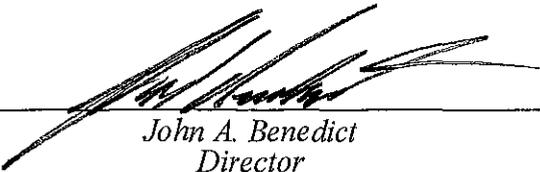


R13-2822

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§ 22-5-1 et seq.) and 45 C.S.R. 13 — Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation. The permittee identified at the facility listed below is authorized to construct the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Issued to:

American Disposal Services of West Virginia, Inc
Short Creek Landfill
069-00071



John A. Benedict
Director

Issued: May 4, 2010

Facility Location: Short Creek, Ohio County, West Virginia
Mailing Address: 258 North Fork Road
Short Creek, WV 26003
Facility Description: Rock Crushing and Sizing Plant
SIC Codes: 1422
UTM Coordinates: 530.6 km Easting • 4,444.1 km Northing • Zone 17
Permit Type: Construction
Description of Change: Installation of a portable rock crushing and sizing plant.

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§ 22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §22-5-14.

The source is subject to 45CSR30. Changes authorized by this permit must also be incorporated into the facility's Title V operating permit. Commencement of the operations authorized by this permit shall be determined by the appropriate timing limitations associated with Title V permit revisions per 45CSR30.

Table of Contents

1.0. Emission Units	4
2.0. General Conditions	5
2.1. Definitions	5
2.2. Acronyms	5
2.3. Authority	6
2.4. Term and Renewal	6
2.5. Duty to Comply	6
2.6. Duty to Provide Information	6
2.7. Duty to Supplement and Correct Information	7
2.8. Administrative Permit Update	7
2.9. Permit Modification	7
2.10. Major Permit Modification	7
2.11. Inspection and Entry	7
2.12. Emergency	7
2.13. Need to Halt or Reduce Activity Not a Defense	8
2.14. Suspension of Activities	8
2.15. Property Rights	8
2.16. Severability	9
2.17. Transferability	9
2.18. Notification Requirements	9
2.19. Credible Evidence	9
3.0. Facility-Wide Requirements	10
3.1. Limitations and Standards	10
3.2. Monitoring Requirements	10
3.3. Testing Requirements	10
3.4. Recordkeeping Requirements	11
3.5. Reporting Requirements	12
4.0. Source-Specific Requirements	13
4.1. Limitations and Standards	13
4.2. Monitoring Requirements	14
4.3. Testing Requirements	15
4.4. Recordkeeping Requirements	15
4.5. Reporting Requirements	17
APPENDIX A	18
CERTIFICATION OF DATA ACCURACY	19

1.0 Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
HOP1	RC-E	Feed Hopper	2010	125 TPH	None
CR1	RC-E	Jaw Crusher	2010	125 TPH	None
SC1	RC-E	Double Deck Vibrating Screen	2010	125 TPH	None
BC1		Belt Conveyor from SC1 to SP1	2010	125 TPH	Minimized drop height
SP1		Open Stockpile	2010	1,800 sq ft.	
BC2		Belt Conveyor from SC1 to SP2	2010	125 TPH	Minimized drop height
SP2		Open Stockpile	2010	1,800 sq ft.	
DG	DG-E	Generator Set power by a diesel engine	2010	261 kw	None

2.0. General Conditions

2.1. Definitions

- 2.1.1. All references to the "West Virginia Air Pollution Control Act" or the "Air Pollution Control Act" mean those provisions contained in W.Va. Code §§ 22-5-1 to 22-5-18.
- 2.1.2. The "Clean Air Act" means those provisions contained in 42 U.S.C. §§ 7401 to 7671q, and regulations promulgated thereunder.
- 2.1.3. "Secretary" means the Secretary of the Department of Environmental Protection or such other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45 CSR § 30-2.12.). The Director of the Division of Air Quality is the Secretary's designated representative for the purposes of this permit.

2.2. Acronyms

CAAA	Clean Air Act Amendments	NO_x	Nitrogen Oxides
CBI	Confidential Business Information	NSPS	New Source Performance Standards
CEM	Continuous Emission Monitor	PM	Particulate Matter
CES	Certified Emission Statement	PM_{2.5}	Particulate Matter less than 2.5µm in diameter
C.F.R. or CFR	Code of Federal Regulations	PM₁₀	Particulate Matter less than 10µm in diameter
CO	Carbon Monoxide	Ppb	Pounds per Batch
C.S.R. or CSR	Codes of State Rules	pph	Pounds per Hour
DAQ	Division of Air Quality	ppm	Parts per Million
DEP	Department of Environmental Protection	Ppmv or ppmv	Parts per million by volume
dscm	Dry Standard Cubic Meter	PSD	Prevention of Significant Deterioration
FOIA	Freedom of Information Act	psi	Pounds per Square Inch
HAP	Hazardous Air Pollutant	SIC	Standard Industrial Classification
HON	Hazardous Organic NESHAP	SIP	State Implementation Plan
HP	Horsepower	SO₂	Sulfur Dioxide
lbs/hr	Pounds per Hour	TAP	Toxic Air Pollutant
LDAR	Leak Detection and Repair	TPY	Tons per Year
M	Thousand	TRS	Total Reduced Sulfur
MACT	Maximum Achievable Control Technology	TSP	Total Suspended Particulate
MDHI	Maximum Design Heat Input	USEPA	United States Environmental Protection Agency
MM	Million	UTM	Universal Transverse Mercator
MMBtu/hr or mmbtu/hr	Million British Thermal Units per Hour	VEE	Visual Emissions Evaluation
MMCF/hr or mmcf/hr	Million Cubic Feet per Hour	VOC	Volatile Organic Compounds
NA	Not Applicable	VOL	Volatile Organic Liquids
NAAQS	National Ambient Air Quality Standards		
NESHAPS	National Emissions Standards for Hazardous Air Pollutants		

2.3. Authority

This permit is issued in accordance with West Virginia Air Pollution Control Law W.Va. Code §§22-5-1 et seq. and the following Legislative Rules promulgated thereunder:

- 2.3.1. 45CSR13 – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation;*

2.4. Term and Renewal

- 2.4.1. This permit shall remain valid, continuous and in effect unless it is revised, suspended, revoked or otherwise changed under an applicable provision of 45CSR13 or any applicable legislative rule.

2.5. Duty to Comply

- 2.5.1. The permitted facility shall be constructed and operated in accordance with the plans and specifications filed in Permit Application R13-2822 and any modifications, administrative updates, or amendments thereto. The Secretary may suspend or revoke a permit if the plans and specifications upon which the approval was based are not adhered to;
[45CSR§§13-5.11 and 13-10.3]
- 2.5.2. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA;
- 2.5.3. Violations of any of the conditions contained in this permit, or incorporated herein by reference, may subject the permittee to civil and/or criminal penalties for each violation and further action or remedies as provided by West Virginia Code 22-5-6 and 22-5-7;
- 2.5.4. Approval of this permit does not relieve the permittee herein of the responsibility to apply for and obtain all other permits, licenses and/or approvals from other agencies; i.e., local, state and federal, which may have jurisdiction over the construction and/or operation of the source(s) and/or facility herein permitted.

2.6. Duty to Provide Information

The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for administratively updating, modifying, revoking or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.

2.7. Duty to Supplement and Correct Information

Upon becoming aware of a failure to submit any relevant facts or a submittal of incorrect information in any permit application, the permittee shall promptly submit to the Secretary such supplemental facts or corrected information.

2.8. Administrative Update

The permittee may request an administrative update to this permit as defined in and according to the procedures specified in 45CSR13.

[45CSR§13-4]

2.9. Permit Modification

The permittee may request a minor modification to this permit as defined in and according to the procedures specified in 45CSR13.

[45CSR§13-5.4.]

2.10. Major Permit Modification

The permittee may request a major modification as defined in and according to the procedures specified in 45CSR14 or 45CSR19, as appropriate.

[45CSR§13-5.1]

2.11. Inspection and Entry

The permittee shall allow any authorized representative of the Secretary, upon the presentation of credentials and other documents as may be required by law, to perform the following:

- a. At all reasonable times (including all times in which the facility is in operation) enter upon the permittee's premises where a source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times (including all times in which the facility is in operation) any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;
- d. Sample or monitor at reasonable times substances or parameters to determine compliance with the permit or applicable requirements or ascertain the amounts and types of air pollutants discharged.

2.12. Emergency

- 2.12.1. An "emergency" means any situation arising from sudden and reasonable unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission

limitation under the permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

- 2.12.2. Effect of any emergency. An emergency constitutes an affirmative defense to an action brought for noncompliance with such technology-based emission limitations if the conditions of Section 2.12.3 are not met.
- 2.12.3. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - a. An emergency occurred and that the permittee can identify the cause(s) of the emergency;
 - b. The permitted facility was at the time being properly operated;
 - c. During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in the permit; and,
 - d. The permittee submitted notice of the emergency to the Secretary within one (1) working day of the time when emission limitations were exceeded due to the emergency and made a request for variance, and as applicable rules provide. This notice must contain a detailed description of the emergency, any steps taken to mitigate emission, and corrective actions taken.
- 2.12.4. In any enforcement proceeding, the permittee seeking to establish the occurrence of an emergency has the burden of proof.
- 2.12.5. The provisions of this section are in addition to any emergency or upset provision contained in any applicable requirement.

2.13. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it should have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in determining penalties for noncompliance if the health, safety, or environmental impacts of halting or reducing operations would be more serious than the impacts of continued operations.

2.14. Suspension of Activities

In the event the permittee should deem it necessary to suspend, for a period in excess of sixty (60) consecutive calendar days, the operations authorized by this permit, the permittee shall notify the Secretary, in writing, within two (2) calendar weeks of the passing of the sixtieth (60) day of the suspension period.

2.15. Property Rights

This permit does not convey any property rights of any sort or any exclusive privilege.

2.16. Severability

The provisions of this permit are severable and should any provision(s) be declared by a court of competent jurisdiction to be invalid or unenforceable, all other provisions shall remain in full force and effect.

2.17. Transferability

This permit is transferable in accordance with the requirements outlined in Section 10.1 of 45CSR13. [45CSR§13-10.1]

2.18. Notification Requirements

The permittee shall notify the Secretary, in writing, no later than thirty (30) calendar days after the actual startup of the operations authorized under this permit.

2.19. Credible Evidence

Nothing in this permit shall alter or affect the ability of any person to establish compliance with, or a violation of, any applicable requirement through the use of credible evidence to the extent authorized by law. Nothing in this permit shall be construed to waive any defense otherwise available to the permittee including, but not limited to, any challenge to the credible evidence rule in the context of any future proceeding.

3.0. Facility-Wide Requirements

3.1. Limitations and Standards

- 3.1.1. **Open burning.** The open burning of refuse by any person, firm, corporation, association or public agency is prohibited except as noted in 45CSR§6-3.1.
[45CSR§6-3.1.]
- 3.1.2. **Open burning exemptions.** The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause, suffer, allow or permit any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible.
[45CSR§6-3.2.]
- 3.1.3. **Asbestos.** The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management and the Bureau for Public Health - Environmental Health require a copy of this notice to be sent to them.
[40CFR§61.145(b) and 45CSR§34]
- 3.1.4. **Odor.** No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.
[45CSR§4-3.1 State-Enforceable only.]
- 3.1.5. **Permanent shutdown.** A source which has not operated at least 500 hours in one 12-month period within the previous five (5) year time period may be considered permanently shutdown, unless such source can provide to the Secretary, with reasonable specificity, information to the contrary. All permits may be modified or revoked and/or reapplication or application for new permits may be required for any source determined to be permanently shutdown.
[45CSR§13-10.5.]
- 3.1.6. **Standby plan for reducing emissions.** When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45 C.S.R. 11.
[45CSR§11-5.2.]

3.2. Monitoring Requirements

[Reserved]

3.3. Testing Requirements

- 3.3.1. **Stack testing.** As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in

this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:

- a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63 in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4 or 45CSR§13-5.4 as applicable.
- b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.a. of this permit. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4 or 45CSR§13-5.4 as applicable.
- c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.
[WV Code § 22-5-4(a)(15)]

3.4. Recordkeeping Requirements

- 3.4.1. **Retention of records.** The permittee shall maintain records of all information (including monitoring data, support information, reports and notifications) required by this permit recorded in a form suitable and readily available for expeditious inspection and review. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation. The files shall be maintained for at least five (5) years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. Where appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

- 3.4.2. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.
[45CSR§4. *State-Enforceable only.*]

3.5. Reporting Requirements

- 3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate and complete.
- 3.5.2. **Confidential information.** A permittee may request confidential treatment for the submission of reporting required by this permit pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31.
- 3.5.3. **Correspondence.** All notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, or mailed first class with postage prepaid to the address(es) set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

If to the DAQ:

Director
WVDEP
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304-2345

If to the USEPA:

Associate Director
Office of Enforcement and Permits Review
(3AP12)
U. S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

3.5.4. **Operating Fee.**

- 3.5.4.1. In accordance with 45CSR30 – Operating Permit Program, the permittee shall submit a Certified Emissions Statement (CES) and pay fees on an annual basis in accordance with the submittal requirements of the Division of Air Quality. A receipt for the appropriate fee shall be maintained on the premises for which the receipt has been issued, and shall be made immediately available for inspection by the Secretary or his/her duly authorized representative.
- 3.5.5. **Emission inventory.** At such time(s) as the Secretary may designate, the permittee herein shall prepare and submit an emission inventory for the previous year, addressing the emissions from the facility and/or process(es) authorized herein, in accordance with the emission inventory submittal requirements of the Division of Air Quality. After the initial submittal, the Secretary may, based upon the type and quantity of the pollutants emitted, establish a frequency other than on an annual basis.

4.0. Source-Specific Requirements

4.1. Limitations and Standards

4.1.1. The permittee shall employ one rock crusher, a double deck screening unit and two belt conveyors identified as Rock Crusher. Such emissions unit(s) shall be installed, operated, and maintained in accordance with the following limitation:

- a. PM emissions from the sizing and handling of rock shall not exceed 3.97 pounds per hour;
- b. PM₁₀ emissions from the sizing and handling of rock shall not exceed 1.41 pounds per hour;
- c. PM_{2.5} emissions from the sizing and handling of rock shall not exceed 1.41 pounds per hour;
- d. Compliance with the emissions limits of items a. through c. shall be met by limiting the processing rate of rock not exceed 125 tons per hour for any given hour.
- e. The height of the drop point from each belt conveyor shall be minimized at times in effort to minimize fugitive particulate from being discharged into the atmosphere.
[45CSR§7-5.1]
- f. Visible emissions from the portable crushing/sizing unit (RC-E) shall not be discharged to the atmosphere in amounts greater than 20% opacity. This limit shall not include visible emissions from the exhaust of the diesel engine.
[45CSR§7-3.1]

4.1.2. The portable crushing and sizing unit is permitted to be operated by its own dedicated internal combustion engine. This engine shall be installed, operated, maintained in accordance following limitations:

- a. Emissions for each engine shall not exceed the following limits:

Pollutant	NMHC+NO _x	CO	PM
	g/kw-hr	g/kw-hr	g/kw-hr
Caterpillar C9 DITA Engine 261kw (350bhp)	4.0	3.5	0.2

- b. The engine shall be equipped with a non-resettable hour meter prior to the start-up of the engine;
- c. The engine shall be operated and maintained in accordance with the manufacturer's written instructions. A copy of such instruction shall be permanently maintain on site for the life of the engine;
- d. The engine shall only consume diesel fuel meeting the following requirements until October 1, 2010;
 - i. Maximum sulfur content of 500 ppm;

- ii. Cetane index or aromatic content as follows:
 - (1) A minimum cetane index of 40; or
 - (2) A minimum aromatic content of 35 % by volume.
[40CFR§§80.510(a)]
- e. After October 1, 2010, the engine shall only consume diesel fuel meeting following requirements:
 - i. Maximum sulfur content of 15 ppm;
 - ii. Cetane index or aromatic content as follows:
 - (1) A minimum cetane index of 40; or
 - (2) A minimum aromatic content of 35 % by volume.
[40CFR§§80.510(b)]

4.1.3. The permittee shall maintain a water truck on site and in good operating condition, and shall utilize same to apply water, or a mixture of water and an environmentally acceptable dust control additive, hereinafter referred to as solution, as often as is necessary in order to minimize the atmospheric entrainment of fugitive particulate emissions that may be generated from haulroads and other work areas where mobile equipment is used.

The spray bar(s) shall be equipped with commercially available spray nozzles, of sufficient size and number, so as to provide adequate coverage to the surface being treated.

The pump delivering the water, or solution, shall be of sufficient size and capacity so as to be capable of delivering to the spray nozzle(s) an adequate quantity of water, or solution, and at a sufficient pressure, so as to assure that the treatment process will minimize the atmospheric entrainment of fugitive particulate emissions.

[45CSR§7-5.2.]

4.1.4. **Operation and Maintenance of Air Pollution Control Equipment.** The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.

[45CSR§13-5.11.]

4.2. Monitoring Requirements

- 4.2.1. For the purposes of demonstrating compliance with Condition 4.1.1.a. through 4.1.1.d. and 4.1.2.b., the permittee shall monitor the amount of rock processed, and hours the engine operated on a daily basis. Records of such monitoring and a 12-month rolling total of stone processed shall be maintained in accordance with Condition 3.4.1. of this permit.

- 4.2.2. For the purpose of determining compliance with the opacity limits of condition 4.1.1.f., the permittee shall conduct visible emission checks and/or opacity monitoring and recordkeeping for all emission sources subject to an opacity limit.

The visible emission check shall determine the presence or absence of visible emissions. At a minimum, the observer must be trained and knowledgeable regarding the effects of background contrast, ambient lighting, observer position relative to lighting, wind, and the presence of uncombined water (condensing water vapor) on the visibility of emissions. This training may be obtained from written materials found in the References 1 and 2 from 40 CFR Part 60, Appendix A, Method 22 or from the lecture portion of the 40CFR Part 60, Appendix A, Method 9 certification course.

Visible emission checks shall be conducted at least once per calendar week. These checks shall be performed at each source (stack, transfer point, fugitive emission source, etc.) for a sufficient time interval, but no less than one (1) minute, to determine if any visible emissions are present. Visible emission checks shall be performed during periods of normal facility operation and appropriate weather conditions.

If visible emissions are detected during the weekly observation, then the permittee shall conduct a opacity reading of the respective source(s) using the procedures and requirements of 45CSR7A as soon as practicable, but within seventy-two (72) hours of the weekly check. This 45CSR7A observation is to determine if the source is operating in compliance with the visible emission standard in Condition 4.1.1.f.

If, after a period of four consecutive weeks, readings have been taken according to schedule and with no exceedances beyond the limit set forth in Condition 4.1.1.f. of this permit and no individual readings greater than 40% opacity have been taken, subsequent readings may be taken once every month, with each set of readings covering one continuous, five minute period while the portable crushing and screening unit is operating. If at any time a set of readings indicates a exceedance of the limit set forth in Condition 4.1.1.f. of this permit or contains an individual reading of greater than 40% opacity, subsequent sets of readings will be taken once every week until a period of four consecutive weeks passes during which readings have been taken according to schedule and no exceedances of the limit set forth in Condition 4.1.1.f. or no individual readings greater than 40% opacity have been observed. Such records shall be maintained in accordance with Condition 3.4.1 of this permit.

4.3. Testing Requirements

[Reserved]

4.4. Recordkeeping Requirements

- 4.4.1. **Record of Monitoring.** The permittee shall keep records of monitoring information that include the following:
- a. The date, place as defined in this permit and time of sampling or measurements;
 - b. The date(s) analyses were performed;
 - c. The company or entity that performed the analyses;

- d. The analytical techniques or methods used;
 - e. The results of the analyses; and
 - f. The operating conditions existing at the time of sampling or measurement.
- 4.4.2. **Record of Maintenance of Air Pollution Control Equipment.** For all pollution control equipment listed in Section 1.0, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.
- 4.4.3. **Record of Malfunctions of Air Pollution Control Equipment.** For all air pollution control equipment listed in Section 1.0, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:
- a. The equipment involved.
 - b. Steps taken to minimize emissions during the event.
 - c. The duration of the event.
 - d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

- e. The cause of the malfunction.
 - f. Steps taken to correct the malfunction.
 - g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.
- 4.4.4. The permittee shall keep on site all information or documents noting that internal combustion engine for the portable crushing and screening unit is certified in accordance with 40 CFR Part 89 for the same model year and engine power or records of performance test results showing compliance with emission limits of 4.1.2.a. Such records maintain on site for the life of the engine at the facility.
- 4.4.5. The permittee shall maintain records of all monitoring data required by Condition 4.2.2. documenting the date and time of each visible emission check, the emission point or equipment/source identification number, the name or means of identification of the observer, the results of the check(s), whether the visible emissions are normal for the process, and, if applicable, all corrective measures taken or planned. The permittee shall also record the general weather conditions (i.e. sunny, approximately 80°F, 6 - 10 mph NE wind) during the visual emission check(s). An example form is supplied as Appendix A. Should a visible emission observation be required to be performed per the requirements specified 45CSR7A, the data records of each observation shall be maintained per the requirements of 45CSR7A. For an emission unit out of service during the normal monthly evaluation, the record of observation may note "out of service" (O/S) or equivalent.

4.5. Reporting Requirements

- 4.5.1. Any exceedances of the allowable visible emission requirement for any emission source discovered during observations using method specified in 45CSR7A must be reported in writing to the Director of the Division of Air Quality as soon as practicable, but within ten (10) calendar days, of the occurrence and shall include, at a minimum, the following information: the results of the visible determination of opacity of emissions, the cause or suspected cause of the exceedances, and any corrective measures taken or planned.

CERTIFICATION OF DATA ACCURACY

I, the undersigned, hereby certify that, based on information and belief formed after reasonable inquiry, all information contained in the attached _____, representing the period beginning _____ and ending _____, and any supporting documents appended hereto, is true, accurate, and complete.

Signature¹ _____
(please use blue ink) Responsible Official or Authorized Representative Date

Name and Title _____
(please print or type) Name Title

Telephone No. _____ Fax No. _____

- ¹ This form shall be signed by a "Responsible Official." "Responsible Official" means one of the following:
- a. For a corporation: The president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:
 - (i) the facilities employ more than 250 persons or have a gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars), or
 - (ii) the delegation of authority to such representative is approved in advance by the Director;
 - b. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;
 - c. For a municipality, State, Federal, or other public entity: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of USEPA); or
 - d. The designated representative delegated with such authority and approved in advance by the Director.