



Lane Regional Air Protection Agency
Standard Air Contaminant Discharge Permit

Review Report

Delta Sand & Gravel Co. – Delta Landfill

Permit No. 202144

999 Division Avenue
Eugene, Oregon 97404
Website: <https://deltasg.com/>

Source Information:

Primary SIC	4953
Secondary SIC	--
Primary NAICS	562119
Secondary NAICS	--
Public Notice Category	III

Source Category (OAR chapter 340 division 216-8010 Table 1)	C:8. Landfills with more than 200,000 tons of waste in place and calculated methane generation rate is greater than or equal to 664 metric tons per year which are subject to the requirements in OAR chapter 340 division 239
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Compliance and Emissions Monitoring Requirements:

Unassigned emissions	0
Emission credits	N
Compliance schedule	N
Source test [date(s)]	See Permit

COMS	N
CEMS	N
CPMS	N
Ambient monitoring	N

Reporting Requirements

Annual report (due date)	Feb 15
Emission fee report (due date)	N
Semi-Annual Report (due date)	August 15
Greenhouse Gas Report (due date)	March 31

Quarterly report (due dates)	N
Monthly report (due dates)	N
Excess emissions report	Immediately
Other reports	N

Air Programs

NSPS (list subparts)	N
NESHAP (list subparts)	A, ZZZZ
CAM	N
Regional Haze (RH)	N
Synthetic Minor (SM)	N
Part 68 Risk Management	N
Major HAP source	N

Federal major source	N
NSR	N
PSD	N
Acid Rain	N
Clean Air Mercury Rule	N
TACT	N
>20 Megawatts	N

Table of Contents

Permittee Identification	3
General Background.....	3
Reason for Permit Action and Fee Basis	3
Attainment Status	4
Permitting History	4
Emission Unit Descriptions.....	4
Operating Scenario.....	4
Emission Limits and Standards	4
Plant Site Emission Limits (PSELs).....	5
Significant Emission Rate (SER).....	6
New Source Review (NSR) and Prevention of Significant Deterioration (PSD)	6
Type A and Type B State NSR.....	7
Air Quality Analysis.....	7
Federal Hazardous Air Pollutants/Toxic Air Contaminants	7
New Source Performance Standards (NSPS).....	9
National Emission Standards for Hazardous Air Pollutants (NESHAP).....	9
Toxic Release Inventory	9
Compliance History	10
Performance Test Results	10
Recordkeeping Requirements	10
Recordkeeping Requirements	12
Public Notice.....	13
Abbreviations, Acronyms, and Definitions.....	14
Detail Sheets:	15

Permittee Identification

1. Delta Sand & Gravel Co. – Delta Landfill (“Delta”, “landfill”, “facility” or “source”) owns and operates a Construction and Demolition debris landfill facility located at 999 Division Avenue, Eugene Oregon.

General Background

2. Delta Sand & Gravel Co. (Delta S&G) owns and operates a rock mining and crushing operation and owns and operates a landfill. Delta S&G and Delta Landfill have separate permits. Though the facilities are owned and operated by the same company and the property is adjacent and contiguous, the facilities do not share the same two-digit Standard Industrial Classification (SIC) code to be considered the same major industrial group. The facilities also do not rely on the other for materials. The facilities operate independently from each other.
3. Delta Landfill is considered a Construction and Demolition (C&D) debris landfill. The C&D debris landfill accepts concrete, lumber, asphalt, gypsum, metal, bricks, etc., tires of which most are shredded on site, and stumps. The C&D debris landfill was created to fill the cells that Delta S&G had completely mined.
4. Delta S&G develops cells by mining the cell for rock to be used in their crushing operation. Once a cell is completely mined, Delta S&G starts the remediation process for that cell. This is done by filling the cell with C&D debris, tires and stumps to bring the cell back to grade level. The landfill’s current footprint includes Cells 1, 2 and 3 of Delta S&G’s site. The landfill started accepting C&D debris in the late 1940’s to start the process of filling in Cell 1 and stopped accepting C&D materials for Cell 1 in 1978. Cell 2 accepted C&D debris until 1988. Cell 3 is currently active and accepts C&D debris, tires, and stumps. Cell 3 is approximately 30% filled. The facility started accepting tires in 1994, which Delta would be shipped off-site to be shredded. The shredded tires would then be returned and placed in the landfill. In July 2018, the landfill purchased a tire shredder and a diesel generator and started shredding to tires onsite. Cell 4 is being currently being mined but once mining is complete, Cell 4 will not be become part of the C&D debris landfill, as it is cost prohibitive to install the required liner to meet federal and state solid waste requirements.

Reason for Permit Action and Fee Basis

5. Delta Sand & Gravel Co. – Delta Landfill was required to submit an initial Waste-In-Place (WIP) Notification and Methane Generation Rate Report for their landfill. The Delta S&G supplied LRAPA with the required WIP Notification and Methane Generation Rate Report in April 2022. LRAPA reviewed the WIP Notification and Methane Generation Rate Report, and it was determined by LRAPA that the landfill met the applicability criteria of OAR 340-239-0100 because the WIP being greater than or equal to 200,000 tons and the generation of methane was greater than or equal to 664 metric tons but less than 7,755 metric tons per year. The facility was required to apply for a new Standard Air Contaminant Discharge Permit (ACDP) per OAR 340-239-0010(2) and OAR 340-216-8010 Table 1 part C effective date October 1, 2021. Delta S&G submitted the application for a new Standard ACDP for Delta Landfill on October 3, 2022.
6. The landfill has a passive gas collection system. The gas collection system is a trench that has been dug along the south and west sides of Cells 1 and 2. The trench is approximately 30 feet deep and 45 feet wide and has been filled with compacted earthen/inert materials, 8-ounce non-woven separation fabric, crushed stone and compacted soil. The landfill gas collects in the trench and is vented to the atmosphere through six (6) vents along the property line. There are 12 soil gas monitoring wells are between the property line and the gas collection trench that are monitored for ensure that no landfill gas is going beyond the property line.

7. The associated emission units for the landfill are a 10 ton per hour tire shredder, a 250-kilowatt MagnaPlus generator with a 465-horsepower diesel-fired Caterpillar engine manufactured in 1992, and paved and unpaved roads.
8. The landfill was assigned an initial permitting application fee with associated annual and CAO fees.

Attainment Status

9. Delta Landfill is located inside the Eugene-Springfield Air Quality Management Area. The facility is located in an area that has been designated attainment/unclassified for PM_{2.5}, ozone (VOC), NO₂, SO₂, and Pb and a maintenance area for CO and PM₁₀. The facility is located within 100 kilometers of two (2) Class I air quality protection areas: Diamond Peak Wilderness and Three Sisters Wilderness area.

Permitting History

10. LRAPA has reviewed the following actions for this facility:

Date	Action Type	Description
4/22/2022	Landfill Gas Emissions Information Request	Waste-In-Place Report and Annual Methane Generation Rate Report for evaluation
10/03/2022	New Standard ACDP	An application (Application #68748) for a New Standard ACDP based on annual landfill methane emissions per OAR 340-239

Emission Unit Descriptions

11. The emission units (EU) regulated by the permit are the following:

Emission Unit (EU) Description	EU ID	Pollution Control Devices (PCD) Description
Fugitive Landfill Gas	LFG	Passive Collection System
Tire Shredder Generator: MagnaPlus Generator 250 kW-hr with a diesel-fired 465 horsepower Caterpillar engine	GEN	NA
Paved Industrial Roads	PIR	Water application and sweeping
Unpaved Roads	UPR	Water application, chemical suppressant, and/or gravel application (as applicable)
Aggregate Insignificant Emissions: <ul style="list-style-type: none"> • Tire Shredder 	AIE	NA

Operating Scenario

12. Delta Landfill operates receiving waste during Delta S&G normal business hours.

Emission Limits and Standards

13. The facility is subject to the visible emissions limitations under LRAPA 32-010(3). For sources, other than wood-fired boilers, no person may emit or allow to be emitted any visible emissions that equal

or exceed an average of 20 percent opacity for a period or periods aggregating more than three (3) minutes in any one (1) hour.

14. The Tire Shredder (EU: AIE) must not emit particulate matter in any one (1) hour more than the process weight rate allocated for such process located in LRAPA Table 32-8010.
15. Outdoor burning is prohibited, except as may be allowed by LRAPA title 47.
16. The Tire Shredder Generator (EU: GEN) must be operated to minimize air contaminant discharges in accordance with LRAPA's highest and best requirements under LRAPA 32-005.
17. The non-fuel burning equipment at this source that emit particulate matter are subject to the particulate matter emission limit for sources installed, constructed or modified on or after June 1, 1970 but prior to April 16, 2015 for which there are not represented compliance test results, the particulate matter emission limit is 0.14 grains per dry standard cubic foot.

Plant Site Emission Limits (PSELs)

18. Provided below is a summary of the baseline emission rate, netting basis, plant site emission limits, and potential-to-emit (PTE):

Pollutant	Baseline Emission Rate (tpy)	Netting Basis		Plant Site Emission Limits (PSEL)		PTE (tpy)
		Previous (tpy)	Proposed (tpy)	Previous PSEL (tpy)	Proposed PSEL (tpy)	
PM	0	NA	0	0	2.3	2.26
PM ₁₀	0	NA	0	0	1.4	1.44
PM _{2.5}	0	NA	0	0	1.2	1.15
CO	0	NA	0	0	3.3	3.33
NO _x	0	NA	0	0	15	15.45
SO ₂	0	NA	0	0	1.0	1.02
VOC	0	NA	0	0	1.8	1.83
Single HAP	0	NA	0	0	0	6.53
Aggregate HAP	0	NA	0	0	0	8.85
GHG	32,500	NA	32,500	0	36,000	35,722

- 18.a. The Baseline Emission Rate (BER) was set at zero (0) tons per year for criteria pollutants. Though the landfill was in operation in 1978, there were no pollutants above de minimis thresholds at that time.
- 18.b. Netting Basis was not established for this permitting action because netting was not triggered under the requirements of LRAPA 42-0046.
- 18.c. PSELs for the tire shredder generator (EU: GEN) are based on the 2014 tonnage of shredded tires placed in the landfill. Using the last ten years data of shredded tires tonnage from 2011 through 2021, the basis for the PSELs for the tire shredder generator (EU: GEN) was based on the year with the maximum tonnage of shredder tires placed in the landfill.

- 18.d. Because the Delta Landfill ACDP will be issued after the March 1, 2023 effective date for amended OAR 340-222-0035(2), source specific PSELs levels were set in accordance with amended OAR 340-222-0035(2) for PM, PM₁₀, PM_{2.5}, CO, NO_x, SO₂ and VOC, and GHG.
- 18.e. The PTE for a Single HAP or Aggregate HAPs demonstrates that the landfill HAP emissions are well below the SM-80 thresholds for HAP and therefore, a PSEL for Single HAP and Aggregate HAPs is not required to be in the permit.
- 18.f. GHG Baseline Emission Rate and Netting Basis:
 - 18.f.i. Baseline Emission Rate (BER): According to LRAPA 42-0048(1)(b) the BER was based on an approximation of fugitive landfill gas being emitted in 2010. Using information from Short Mountain Landfill (SML) LandGEM, LRAPA utilized SML's information to estimate a GHG emission rate for the BER year of 2010. The GHG BER is a conservative estimation, because SML is a municipal solid waste landfill, where the methane emission rate is a significantly higher than a C&D debris landfill that Delta owns.
 - 18.f.ii. Netting Basis: According to LRAPA 42-0046(1)(b), the initial Netting Basis calculated using the BER for GHG.
- 18.g. The PSEL is a federally enforceable limit on the potential to emit.

Significant Emission Rate (SER)

- 19. The PSEL increase over the netting basis is less than the Significant Emission Rate (SER) as defined in LRAPA title 12 for all pollutants as shown below.

Pollutant	Proposed PSEL (tpy)	PSEL Increase Over Netting Basis (tpy)	PSEL Increase Due to Utilizing Existing Baseline Period Capacity (tpy)	PSEL Increase Due to Modification (tpy)	SER (tpy)
PM	2.3	2.3	0	0	25
PM ₁₀	1.4	1.4	0	0	15
PM _{2.5}	1.2	1.2	0	0	10
CO	3.3	3.3	0	0	100
NO _x	15	15	0	0	40
SO ₂	1.0	1.0	0	0	40
VOC	1.8	1.8	0	0	40
Single HAP	0	0	0	0	10
Aggregate HAPs	0	0	0	0	25
GHG	36,000	3,500	0	0	75,000

New Source Review (NSR) and Prevention of Significant Deterioration (PSD)

- 20. This facility is located in an area that is designated attainment or unclassified for all regulated pollutants other than CO and PM₁₀. For pollutants other than CO and PM₁₀, the proposed PSELs are less than the federal major source threshold for non-listed sources of 250 tons per year per regulated pollutant and are not subject to Major NSR. For CO and PM₁₀, the source is located in a maintenance

area. The proposed PSEs for CO and PM₁₀, are less than the 100 tons per year threshold that determines the applicability of Major NSR.

Type A and Type B State NSR

21. The proposed new Standard ACDP will not have emissions per regulated pollutant equal to or greater than the SER over the netting basis that would require a Type A or B State NSR.

Air Quality Analysis

22. Under LRAPA 40-0050(1), a facility must demonstrate compliance with the NAAQS, PSD increments, and other requirements in PSD Class II areas. LRAPA was not required to perform a single source impact analysis because the single source did not have emission increases equal to or greater than an SER above the netting basis due to the proposed source being evaluated are less than the Class II Significant Air Quality Levels specified in title 12, Table 1.

Federal Hazardous Air Pollutants/Toxic Air Contaminants

23. Delta Landfill is a new source of FHAPs emissions. LRAPA is using the EPA AP-42 Chapter 2.4: *Municipal Solid Waste Landfill*, Table 2.4-1. – Default Concentrations for LFG Constituents to calculate the worse-case scenario of possible FHAP emissions. Because the landfill does not accept Municipal Solid Waste (MSW), but Construction and Demolition (C&D) debris, tires and stumps, the FHAP emissions are less than if the facility was an actual MSW landfill. With C&D debris the materials being accepted are more controlled than a MSW landfill, with most materials being nondegradable. Therefore, using Table 2.4.1 for the basis of the possible FHAPs emissions from the fugitive landfill gas (EU: LFG) is a conservative approach.
24. LRAPA applied the emission factors from EPA AP-42 Chapter 3.3: Gasoline and Diesel Industrial Engines, Table 3.3-2. – Speciated Organic Compounds Emission Factors for Uncontrolled Diesel Engines to calculate FHAPs for the tire shredder generator (EU: GEN). LRAPA used the year with the most hours the tire shredder generator (EU: GEN) was operated, which was 2014, and calculated the FHAPs.
25. Under the Cleaner Air Oregon program, only existing sources that have been notified by LRAPA and new sources are required to perform risk assessments. Though the landfill is currently receiving its initial permit, the facility is considered an 'existing' source because it has accepted solid waste (C&D debris) since 1987. Prior to October 2022, only Municipal Solid Waste Landfill (MSWL) were required to be permitted. The landfill has not been notified by LRAPA and is therefore, not yet required to perform a risk assessment or report annual emissions of toxic air contaminants. LRAPA required reporting of approximately 600 toxic air contaminants in 2016 and 2020 and regulates approximately 260 toxic air contaminants that have Risk Based Concentrations established in rule. The landfill was not required to report in 2016 or 2020 because it was not a permitted facility. All FHAPs are on the list of approximately 600 toxic air contaminants. The FHAPs and toxic air contaminants listed below are based upon source testing and standard emission factors for the types of emission units at this facility. After the source is notified by LRAPA, they must update their inventory and perform a risk assessment to see if they must reduce risk from their toxic air contaminant emissions. Until then, sources will be required to report toxic air contaminant emissions triennially.
26. The table below represents the potential emissions of FHAPs/TACs from Delta Landfill assuming the facility has fugitive emissions similar to a MSW Landfill and the generator (EU: GEN) combustion of diesel.

CAS Number	Pollutant	PTE (tpy)	FHAP	CAO TAC
71-55-6	1,1,1-Trichloroethane (methyl chloroform)	0.0163	Yes	Yes
79-34-5	1,1,2,2-Tetrachloroethane	0.0474	Yes	Yes
75-34-3	1,1-Dichloroethane (ethylidene dichloride)	0.0592	Yes	Yes
75-35-4	1,1-Dichloroethene (vinylidene chloride)	0.0049	Yes	Yes
107-06-2	1,2-Dichloroethane (ethylene dichloride)	0.0103	Yes	Yes
78-87-5	1,2 -Dichloropropane (propylene dichloride)	0.0052	Yes	Yes
106-99-0	1,3-Butadiene	0.0000	Yes	Yes
67-63-0	2-Propanol (isopropyl alcohol)	0.7666	No	Yes
67-64-1	Acetone	0.1036	No	Yes
75-07-0	Acetaldehyde	0.0010	Yes	Yes
107-02-8	Acrolein	0.0001	Yes	Yes
208-96-8	Acenaphthylene	0.0000	No	Yes
83-32-9	Acenaphthene	0.0000	No	Yes
107-13-1	Acrylonitrile	0.0855	Yes	Yes
120-12-7	Anthracene	0.0000	No	Yes
71-43-2	Benzene	0.1121	Yes	Yes
56-55-3	Benzo[a]anthracene	0.0000	No	Yes
205-99-2	Benzo[b]fluoranthene	0.0000	No	Yes
207-08-9	Benzo[k]fluoranthene	0.0000	No	Yes
50-32-8	Benzo[a]pyrene	0.0000	No	Yes
191-24-2	Benzo[g,h,i]perylene	0.0000	No	Yes
75-27-4	Bromodichloromethane	0.1305	No	Yes
75-15-0	Carbon disulfide	0.0112	Yes	Yes
56-23-5	Carbon tetrachloride	0.0002	Yes	Yes
463-58-1	Carbonyl sulfide	0.0075	Yes	Yes
108-90-7	Chlorobenzene	0.0072	Yes	Yes
75-45-6	Chlorodifluoromethane	0.0286	No	Yes
75-00-3	Chloroethane (ethyl chloride)	0.0205	Yes	Yes
67-66-3	Chloroform	0.0009	Yes	Yes
74-87-3	Chloromethane (methyl chloride)	0.0156	Yes	Yes
218-01-9	Chrysene	0.0000	No	Yes
53-70-3	Dibenz[a,h]anthracene	0.0000	No	Yes
106-46-7	Dichlorobenzene	0.0079	Yes	Yes
75-71-8	Dichlorodifluoromethane	0.4832	No	Yes
75-43-4	Dichlorofluoromethane	0.0686	No	Yes
75-09-2	Dichloromethane (methylene chloride)	0.3092	Yes	Yes
100-41-4	Ethylbenzene	0.1246	Yes	Yes
106-93-4	Ethylene dibromide	0.0000	Yes	Yes
75-69-4	Trichlorofluoromethane (Fluorotrichloromethane)	0.0266	No	Yes
50-00-0	Formaldehyde	0.0015	Yes	Yes
86-73-7	Fluorene	0.0000	No	Yes
206-44-0	Fluoranthene	0.1441	No	Yes
110-54-3	Hexane	0.0000	Yes	Yes
193-39-5	Indeno[1,2,3-cd]pyrene	0.0000	No	Yes
7439-97-6	Mercury	0.1302	Yes	Yes
78-93-3	Methyl ethyl ketone	0.0477	No	Yes
108-10-1	Methyl isobutyl ketone	0.0001	Yes	Yes
91-20-3	Naphthalene	0.1575	Yes	Yes
127-18-4	Perchloroethylene (tetrachloroethylene)	0.0000	Yes	Yes

CAS Number	Pollutant	PTE (tpy)	FHAP	CAO TAC
85-01-8	Phenanthrene	0.0033	No	Yes
115-07-1	Propylene	0.0000	No	Yes
129-00-0	Pyrene	0.0701	No	Yes
156-60-5	t-1,2-dichloroethene	0.0943	No	Yes
79-01-6	Trichloroethylene (trichloroethene)	2.6927	Yes	Yes
108-88-3	Toluene	0.1168	Yes	Yes
75-01-4	Vinyl chloride	1.0496	Yes	Yes
1330-20-7	Xylenes	0.0163	Yes	Yes
Total HAPs and TACs (tpy)			4.43	6.24

New Source Performance Standards (NSPS)

- 27. Delta is not subject to these Federal NSPS because the facility is not a Municipal Solid Waste Landfill:
 - 27.a. 40 CFR part 60 subpart Cc – Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills.
 - 27.b. 40 CFR part 60 subpart Cf – Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills requirement of destruction efficiency for Non-Methane Organic Compounds (NMOC) for a control.
 - 27.c. 40 CFR part 60 subpart WWW – Standards of Performance for Municipal Solid Waste Landfills that Commenced Construction, Reconstruction, or Modification on or after May 30, 1991 but before July 18, 2014.
 - 27.d. 40 CFR part 60 subpart XXX – Standards of Performance for Municipal Solid Waste Landfills that Commenced Construction, Reconstruction, or Modification on or after July 17, 2014.
- 28. 40 CFR part 60 subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines in not applicable to Delta because the generator engine was manufactured in 1992, which before all of the compliance dates specified in the NSPS.
- 29. 40 CFR part 60 subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines is not applicable to Delta because the generator engine is not a spark ignition internal combustion engine.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

- 30. 40 CFR part 61 subpart M – National Emission Standard for Asbestos. Delta is not subject to this subpart because the landfill does not accept any asbestos waste.
- 31. 40 CFR part 63 subpart AAAA – National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfill is not applicable to Delta because the facility is not a Municipal Solid Waste Landfill.
- 32. 40 CFR part 63 subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines is applicable to Delta's generator engine because it meets the applicability of 40 CFR 63.6585(a) and (c) and 63.6590(a)(1)(iii).

Toxic Release Inventory

- 33. The Toxics Release Inventory (TRI) is a federal program that tracks the management of certain toxic chemicals that may pose a threat to human health and the environment. It is a resource for learning

about toxic chemical releases and pollution prevention activities reported by certain industrial facilities. Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) created the TRI Program. In general, chemicals covered by the TRI Program are those that cause:

Cancer or other chronic human health effects;
Significant adverse acute human health effects; or
Significant adverse environmental effects.

There are currently over 650 chemicals covered by the TRI Program. Facilities that manufacture, process or otherwise use these chemicals in amounts above established levels must submit annual TRI reports on each chemical. NOTE: The TRI Program is a federal program over which LRAPA has no regulatory authority. LRAPA does not guarantee the accuracy of any information copied from EPA's TRI website.

In order to report emissions to the TRI program, a facility must operate under a reportable NAICS code, meet a minimum employee threshold, and manufacture, process, or otherwise use chemicals in excess of the applicable reporting threshold for the chemical. For NAICS codes starting with 5621 – Waste Collection only NAICS 562112 – Hazardous Waste Collection is listed. Delta's NAICS code is 562119 – Other Waste Collection and therefore, the facility is not covered under TRI and does not have to report any emissions to the TRI program.

Compliance History

34. Delta Landfill has not had any compliance issues or LRAPA inspections.
35. Delta was required to submit the Landfill Gas Emissions Information Request form to determine the amount of Waste-In-Place and methane generation at the facility. The facility submitted the form on April 22, 2022. LRAPA evaluated the information, and it was determined that Delta was required to submit a Standard ACDP application to LRAPA by October 1, 2022. Delta submitted the Standard ACDP application on October 3, 2022, after being given an extension by LRAPA.

Performance Test Results

36. Delta landfill must performance test the tire shredder generator (EU: GEN) within 180 days after of the issuance of this ACDP. The generator (EU: GEN) must be tested for CO and formaldehyde. The generator must meet the CO emission limitation in 40 CFR part 63 subpart ZZZZ Table 2d – Requirements for Existing Stationary RICE Located at Area Sources of HAP Emissions, #2(a) or 2(b).

Recordkeeping Requirements

37. The facility is required to keep and maintain a record of the following information for a period of five (5) years:

Activity	Units	Recording Frequency
PSEL calculation according to Condition 5.	Tons	Monthly
Tire Shredder Generator (EU: GEN) hours of operation according to Condition 5.a	Hours	Monthly
Vehicle miles traveled on Paved Industrial Roads (EU: PIR) and on Unpaved Roads (EU: UPR) according to Condition 5.b	Miles	Monthly
GHG emission calculations according to Condition 7.	Metric tons	Annually

Activity	Units	Recording Frequency
Visible Emission (VE) survey logs according to Condition 9.	Percent opacity	Monthly
OAR 340-239 Requirements: Landfill Gas (EU: LFG)		
All gas collection system downtime exceeding five (5) days according to Condition 38.a.	NA	Annually
All instantaneous surface readings of 100 ppmv methane or greater according to Condition 38.b.	ppmv	Annually
Solid waste acceptance rate according to Condition 38.c.	Tons	Annually
Current waste-in-place according to Condition 38.d.	Tons	Annually
Deposition of nondecomposable waste according to Condition 38.e.	NA	Annually
Mitigation measures according to Condition 38.f.	NA	Annually
Construction activities according to Condition 38.g.	NA	Annually
Conversion of waste-in-place from volume to mass according to Condition 38.h.	NA	Annually
Date of initial placement of waste in newly constructed landfill cells according to Condition 38.i.	NA	Documentation
Component leaks above 250 ppmv according to Condition 38.j.	ppmv	Annually
Maximum design capacity according to Condition 38.k.	Tons	Documentation
40 CFR part 63 subpart ZZZZ Requirements: Tire Shredder Generator (EU: GEN)		
A copy of the Initial Notification or Notification of Compliance Status according to Condition 60.a.	NA	Documentation
Records of malfunction of operation according to Condition 60.b.	NA	Annually
Records of performance test or evaluations according to Condition 60.c.	NA	Documentation
Records of maintenance performed according to Condition 60.d.	NA	Annually
Records of actions taken during periods of malfunction according to Condition 60.e.	NA	Annually

*All condition references are located in Delta Landfill's Standard ACDP.

38. The facility must maintain logs of all written or telephone complaints.
39. All records and reports for OAR chapter 340 division 239 must be provided to LRAPA within five (5) days of request.

Recordkeeping Requirements

40. The facility must submit to LRAPA the following reports by the dates indicated:

Report	Reporting Period	Due Date
PSEL calculations according to Condition 5.	Annual	February 15
Tire Shredder Generator (EU: GEN) hours of operation according to Condition 5.a	Annual	February 15
Vehicle miles traveled on Paved Industrial Roads (EU: PIR) and on Unpaved Roads (EU: UPR) according to Condition 5.b	Annual	February 15
GHG Report, if required according to Condition 7.	Annual	March 31
Visible Emission (VE) survey logs according to Condition 9.	Semi-Annual	February 15 and August 15
The upset log information required by Condition G.13, if required by G.13.	Annual	February 15
OAR 340-239 Requirements: Landfill Gas (EU: LFG)		
All instantaneous surface readings of 100 ppmv methane or greater according to Condition 40.c.	Semi-Annual	February 15 and August 15
Instantaneous Surface Monitoring Report according to Condition 40.i.	Semi-Annual	February 15 and August 15
Average composition of the landfill gas collected over the reporting period according to Condition 40.d.ii.	Annual	February 15
Most recent topographic map of site according to Condition 40.d.iii.	Annual	February 15
All gas collection system downtime exceeding five (5) days according to Condition 40.d.iv.	Annual	February 15
Current waste-in-place according to Condition 40.d.iv.	Annual	February 15
Mitigation measures according to Condition 40.d.iv.	Annual	February 15
Construction activities according to Condition 40.d.iv.	Annual	February 15
Instrument specifications for all instruments used for monitoring compliance according to Condition 40.d.v.	Annual	February 15
Waste-In-Place Report according to Condition 40.e.	Annual	February 15
Methane Generation Rate Report according to Condition 40.f.	Annual	February 15
Amended Design Plan according to Condition 40.h.	Upon occurrence	Within 90 days of any event that required a change to the Design Plan
Closure Notification according to Condition 40.a.	Upon occurrence	Within 30 days of waste acceptance cessation
Equipment Removal Report according to Condition 40.b.	Upon occurrence	30 days prior to well capping, removal/cessation of gas collection,

Report	Reporting Period	Due Date
		treatment or control system equipment
40 CFR part 63 subpart ZZZZ Requirements: Tire Shredder Generator (EU: GEN)		
All reports required by Table 7 according to Conditions 71 through 74.	Semi-Annual	February 15 and August 15
Each time the generator engine did not meet emission or operating limitations according to Condition 66.	Semi-Annual	February 15 and August 15
Each instance the generator engine did not meet the requirements of Table 8 according to Condition 67.	Upon occurrence	As required
All applicable notifications according to Condition 68.	Upon occurrence	As required
Notification of Intent to conduct a performance test according to Condition 69 and 85.	Upon occurrence	At least 60 days before performance test is scheduled to begin
Notice of Compliance Status according to Conditions 65 and 70.	Upon occurrence	Before the close of business on the 30 th day following the completion of the initial compliance demonstration
Percent load during a performance test according to Condition 64.	Upon occurrence	Before the close of business on the 30 th day following the completion of the initial compliance demonstration

Public Notice

41. The draft permit was on public notice from February 27, 2023 to April 2, 2023. No comments were received.

The table in the “Federal hazardous Air Pollutants/Toxic Air Contaminants” section of the was corrected during the public comment period. The HAP and TAC emissions are less than the public notice totals.

BE/RR
 4/5/2023

Abbreviations, Acronyms, and Definitions

ACDP	Air Contaminant Discharge Permit	NO _x	Nitrogen oxides
AIE	Aggregate Insignificant Emissions	NSPS	New Source Performance Standard
Agency	Lane Regional Air Protection Agency	NSR	New Source Review
ASTM	American Society for Testing and Materials	O ₂	Oxygen
AQMA	Air Quality Maintenance Area	OAR	Oregon Administrative Rules
Calendar year	The 12-month period beginning January 1 st and ending December 31 st	ORS	Oregon Revised Statues
CFR	Code of Federal Regulations	O&M	Operation and Maintenance
CMS	Continuous Monitoring System	Pb	Lead
CO	Carbon monoxide	PCD	Pollution control device
DEQ	Oregon Department of Environmental Quality	PIR	Paved Industrial Roads
dscf	dry standard cubic foot	PM	Particulate matter
EPA	US Environmental Protection Agency	PM ₁₀	Particulate matter less than 10 microns in size
FCAA	Federal Clean Air Act	PM _{2.5}	Particulate matter less than 2.5 microns in size
gal	gallon(s)	ppmv	Part per million by volume
GEN	Generator engine	PSD	Prevention of Significant Deterioration
gr/dscf	Grains per dry standard cubic foot	PSEL	Plant Site Emission Limit
HAP	Hazardous Air Pollutant as defined by LRAPA title 44	PTE	Potential to Emit
IC	Internal Combustion	RACT	Reasonable Available Control Technology
I&M	Inspection and maintenance	RICE	Reciprocating Internal Combustion Engine
lb	pound(s)	scf	Standard cubic foot
LFG	Landfill Gas	SER	Significant Emission Rate
LRAPA	Lane Regional Air Protection Agency	SEM	Surface Emission Monitor
MMBtu	Million British thermal units	SIC	Standard Industrial Code
MMcf	Million cubic feet	SIP	State Implementation Plan
NA	Not applicable	SM-80	Synthetic minor source
NESHAP	National Emissions Standards for Hazardous Air Pollutants	SO ₂	Sulfur dioxide
NMOC	Non-Methane Organic Compound	Special Control Area	As defined in LRAPA title 29
		TRS	Total Reduced Sulfur
		THC	Total Hydrocarbon
		UPR	Unpaved Roads
		VE	Visible emissions
		VOC	Volatile organic compound
		WIP	Waste-In-Place
		Year	A period consisting of any 12-consecutive calendar months

Detail Sheets:

PLANT SITE EMISSION LIMITS										
Emission Units	PM	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	Single HAP ^{(1) (2)}	Aggregate HAP ⁽²⁾	GHG
	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
Fugitive Landfill Gas (F-LFG) (Uncontrolled)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.69	4.42	35,286
Paved Industrial Roads (PIR)	0.20	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unpaved Paved Road (UPR)	0.94	0.29	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tire Shredder Generator (GEN)	1.10	1.10	1.10	15.45	3.33	1.02	0.57	0.00	0.00	436
Tire Shredding (AIE) ⁽²⁾	0.01	0.01	0.01	0.00	0.00	0.00	1.25	0.00	0.00	0.00
Potential to Emit (PTE)	2.26	1.44	1.15	15.45	3.33	1.02	1.83	2.69	4.43	35,722
PSELs ⁽⁴⁾	2.3	1.4	1.2	15	3.3	1.0	1.8	0	0	36,000
<p>(1) Only using the highest single HAP, which is Propylene in the combustion of diesel for the generator.</p> <p>(2) There is no PSELs for Single and Aggregate HAP. It is demonstrated that the landfill at maximum capacity do not exceed the Single or Aggregate Major Source thresholds and therefore, not required to be in the permit.</p> <p>(3) Aggregate Insignificant Emissions = the annual actual emissions of any regulated air pollutant from one or more designated activities at a source that are less than or equal to the lowest applicable level specified in this section (1 ton for criteria pollutants). The total emissions from each designated activity and the aggregate emissions from all designated activities must be less than or equal to the lowest applicable level (1 ton for criteria pollutants)</p> <p>(4) PSELs are rounded to two significant digits. Any number above ten is to the nearest integer and any numbers below are rounded to the first decimal place (or tenth).</p>										

EPA AP-42 TABLE 2.4-1: DEFAULT CONCENTRATIONS FOR LANDFILL GAS CONSTITUENTS AND FUGITIVE LANDFILL GAS EMISSIONS								
TAC	HAP	Compound	CAS	Molecular Weight (lb/lb mol)	Default Concentration (ppmv)	EF (lb/cf)	EF (lb/MMcf)	Fugitive Emissions (ton/yr)
TAC	HAP	1,1,1-Trichloroethane (methyl chloroform)	71-55-6	133.41	0.48	1.66E-07	0.17	0.0163
TAC	HAP	1,1,2,2-Tetrachloroethane	79-34-5	167.85	1.11	4.84E-07	0.48	0.0474
TAC	HAP	1,1-Dichloroethane (ethylidene dichloride)	75-34-3	98.97	2.35	6.04E-07	0.60	0.0592
TAC	HAP	1,1-Dichloroethene (vinylidene chloride)	75-35-4	96.94	0.2	5.03E-08	0.050	0.0049
TAC	HAP	1,2-Dichloroethane (ethylene dichloride)	107-06-2	98.96	0.41	1.05E-07	0.11	0.0103
TAC	HAP	1,2 -Dichloropropane (propylene dichloride)	78-87-5	112.99	0.18	5.28E-08	0.053	0.0052
TAC		2-Propanol (isopropyl alcohol)	67-63-0	60.11	50.1	7.82E-06	7.82	0.7666
TAC		Acetone	67-64-1	58.08	7.01	1.06E-06	1.06	0.1036
TAC	HAP	Acrylonitrile	107-13-1	53.06	6.33	8.72E-07	0.87	0.0855
TAC	HAP	Benzene	71-43-2	78.11	1.91	3.87E-07	0.39	0.1109
TAC		Bromodichloromethane	75-27-4	163.83	3.13	1.33E-06	1.33	0.1305
		Butane	106-97-8	58.12	5.03	7.59E-07	0.76	0.0744
TAC	HAP	Carbon disulfide	75-15-0	76.13	0.58	1.15E-07	0.11	0.0112
TAC	HAP	Carbon tetrachloride	56-23-5	153.84	0.004	1.60E-09	0.0016	0.0002
TAC	HAP	Carbonyl sulfide	463-58-1	60.07	0.49	7.64E-08	0.076	0.0075
TAC	HAP	Chlorobenzene	108-90-7	112.56	0.25	7.31E-08	0.073	0.0072
TAC		Chlorodifluoromethane	75-45-6	86.47	1.3	2.92E-07	0.29	0.0286
TAC	HAP	Chloroethane (ethyl chloride)	75-00-3	64.52	1.25	2.09E-07	0.21	0.0205
TAC	HAP	Chloroform	67-66-3	119.39	0.03	9.30E-09	0.009	0.0009
TAC	HAP	Chloromethane (methyl chloride)	74-87-3	50.49	1.21	1.59E-07	0.16	0.0156
TAC	HAP	Dichlorobenzene ¹	106-46-7	147	0.21	8.02E-08	0.080	0.0079
TAC		Dichlorodifluoromethane	75-71-8	120.91	15.7	4.93E-06	4.93	0.4832
TAC		Dichlorofluoromethane	75-43-4	102.92	2.62	7.00E-07	0.70	0.0686
TAC	HAP	Dichloromethane (methylene chloride)	75-09-2	84.94	14.3	3.15E-06	3.15	0.3092
		Dimethyl sulfide (methyl sulfide)	75-18-3	62.13	7.82	1.26E-06	1.26	0.1237
		Ethane	74-84-0	30.07	889	6.94E-05	69.42	6.8052
		Ethanol	64-17-5	46.08	27.2	3.25E-06	3.25	0.3191
		Ethyl mercaptan (ethanethiol)	78-08-1	62.13	2.28	3.68E-07	0.37	0.0361
TAC	HAP	Ethylbenzene	100-41-4	106.16	4.61	1.27E-06	1.27	0.1246
TAC	HAP	Ethylene dibromide	106-93-4	187.88	0.001	4.88E-10	0.00049	0.0000
TAC		Trichlorofluoromethane (Fluorotrichloromethane)	75-69-4	137.38	0.76	2.71E-07	0.27	0.0266
TAC	HAP	Hexane	110-54-3	86.18	6.57	1.47E-06	1.47	0.1441

TAC	HAP	Mercury	7439-97-6	200.61	0.000292	1.52E-10	0.00015	0.0000
TAC		Methyl ethyl ketone	78-93-3	72.11	7.09	1.33E-06	1.33	0.1302
TAC	HAP	Methyl isobutyl ketone	108-10-1	100.16	1.87	4.86E-07	0.49	0.0477
		Methyl mercaptan	74-93-1	48.11	2.49	3.11E-07	0.31	0.0305
		Pentane	109-66-0	72.15	3.29	6.16E-07	0.62	0.0604
TAC	HAP	Perchloroethylene (tetrachloroethylene)	127-18-4	165.83	3.73	1.61E-06	1.61	0.1575
		Propane	74-98-6	44.09	11.1	1.27E-06	1.27	0.1246
TAC		t-1,2-dichloroethene	156-60-5	96.95	2.84	7.15E-07	0.71	0.0701
TAC	HAP	Trichloroethylene (trichloroethene)	79-01-6	131.4	2.82	9.62E-07	0.96	0.0943
TAC	HAP	Toluene	108-88-3	92.13	39.3	9.40E-06	9.40	2.6922
TAC	HAP	Vinyl chloride	75-01-4	62.5	7.34	1.19E-06	1.19	0.1168
TAC	HAP	Xylenes	1330-20-7	106.16	12.1	3.34E-06	3.34	0.3270
							Total HAP (tpy)	4.42
							Total TAC (tpy)	6.23

Constants Used for Fugitive Landfill Gas Emissions		
LandGEM Emissions (Approximate Calculation) ⁽¹⁾	1,492.15	scfm
	60	mins/hr
	8760	hrs/year
	2000	lb/ton
Conversion factor (385.1 x 10 ⁶)	385,100,000	scf/lb mol
Conversion to lb/MMscf	1.00E+06	
Total Fugitive Emissions (conservative amount)	784.27	MMscf/yr
(1) Short Mountain Landfill's (SML) LandGEM was utilized to get what the potential scfm was for Delta Landfill fugitive emissions. The documented Waste-In-Place that Delta provided to find the scfm to be used in the HAP/TAC calculations		

TIRE SHREDDER GENERATOR INFORMATION:		
Horsepower of generator MagnaPlus Generator w/ Caterpillar Engine*	465.00	hp-hr
Delta's Maximum yearly hours of operation	2,143	hrs/year
Maximum hourly capacity of the tire shredder	10	tons/hr
Maximum hourly diesel fuel combusted	18	gal/hr

TIRE SHREDDER GENERATOR DIESEL COMBUSTION EMISSIONS					
Pollutant	Max Design Capacity (hp-hr)	Emission Factors		Hourly Emission Rate (lbs/hr)	Annual Emissions (tpy) ⁽²⁾
		Factors ⁽¹⁾	Units		
PM	465.00	2.20E-03	lb/hp-hr	1.02	1.10
PM ₁₀	465.00	2.20E-03	lb/hp-hr	1.02	1.10
PM _{2.5}	465.00	2.20E-03	lb/hp-hr	1.02	1.10
SO ₂	465.00	2.05E-03	lb/hp-hr	0.95	1.02
NO _x	465.00	3.10E-02	lb/hp-hr	14.42	15.45
CO	465.00	6.68E-03	lb/hp-hr	3.11	3.33
VOC	465.00	2.51E-03	lb/hp-hr	1.17	1.25
Emission factors are based for an uncontrolled diesel industrial engine factors found in EPA AP-42 Table 3.3-1. Emission Factors For Uncontrolled Gasoline and Diesel Industrial Engines.					
Hours per year are based on maximum tonnage tire shredding and average over a 9 year average and divided by maximum rated capacity of 10 tons/hour. This projects the worse-case scenario for total emissions for any pollutant (See Tire Shredding Table)					

Diesel Generator Information for HAP Calculations:		
Diesel engine (No. 2 Fuel Oil): MagnaPlus Generator with Caterpillar Engine	465	hp-hr
Btu per hour of generator	1,181,595	MMBtu-hr
MMBtu per hour of generator	1.181595	MMBtu/hr
Delta's Maximum yearly hours of operation	2,143	hrs/year

EPA AP-42 TABLE 3.3-2: Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines							
TAC	HAP	Compound	CAS	Emission Factor lb/MMBtu	MMBtu/hr	Hourly Emission Rate (lb/hr)	Annual Emission Rate (tpy)
TAC	HAP	1,3-Butadiene	106-99-0	3.91E-05	1.181595	4.62E-05	0.00005
TAC	HAP	Acetaldehyde	75-07-0	7.67E-04	1.181595	9.06E-04	0.00097
TAC	HAP	Acrolein	107-02-8	9.25E-05	1.181595	1.09E-04	0.00012
TAC		Acenaphthylene	208-96-8	5.06E-06	1.181595	5.98E-06	0.00001
TAC		Acenaphthene	83-32-9	1.42E-06	1.181595	1.68E-06	0.00000
TAC		Anthracene	120-12-7	1.87E-06	1.181595	2.21E-06	0.00000
TAC	HAP	Benzene	71-43-2	9.33E-04	1.181595	1.10E-03	0.00118
TAC		Benzo[a]anthracene	56-55-3	1.68E-06	1.181595	1.99E-06	0.00000
TAC		Benzo[b]fluoranthene	205-99-2	9.91E-08	1.181595	1.17E-07	0.00000
TAC		Benzo[k]fluoranthene	207-08-9	1.55E-07	1.181595	1.83E-07	0.00000
TAC		Benzo[a]pyrene	50-32-8	1.88E-07	1.181595	2.22E-07	0.00000
TAC		Benzo[g,h,i]perylene	191-24-2	4.89E-07	1.181595	5.78E-07	0.00000
TAC		Chrysene	218-01-9	3.53E-07	1.181595	4.17E-07	0.00000
TAC		Dibenz[a,h]anthracene	53-70-3	5.83E-07	1.181595	6.89E-07	0.00000
TAC	HAP	Formaldehyde	50-00-0	1.18E-03	1.181595	1.39E-03	0.00149
		Fluorene	86-73-7	2.92E-05	1.181595	3.45E-05	0.00004
TAC		Fluoranthene	206-44-0	7.61E-06	1.181595	8.99E-06	0.00001
TAC		Indeno[1,2,3-cd]pyrene	193-39-5	3.75E-07	1.181595	4.43E-07	0.00000
TAC	HAP	Naphthalene	91-20-3	8.48E-05	1.181595	1.00E-04	0.00011
TAC		Phenanthrene	85-01-8	2.94E-05	1.181595	3.47E-05	0.00004
TAC		Propylene	115-07-1	2.58E-03	1.181595	3.05E-03	0.00327
TAC		Pyrene	129-00-0	4.78E-06	1.181595	5.65E-06	0.00001
TAC	HAP	Toluene	108-88-3	4.09E-04	1.181595	4.83E-04	0.00052
TAC	HAP	Xylenes	1330-20-7	2.85E-04	1.181595	3.37E-04	0.00036
						Total HAP	0.005
						Total TAC	0.01

Tire Shredder Information		
Max Capacity of Tire Shredder ⁽¹⁾	10	tons/hour
Shredding: Grinding: PM Emission Factor ⁽²⁾	9.09E-07	lb/lb

TIRE SHREDDING THROUGHPUT FOR LAST TEN YEARSB10:O32B33B10:O35B10:O33													
Year	January	February	March	April	May	June	July	August	September	October	November	December	Yearly Totals
	tons/month	tons/month	tons/month	tons/month	tons/month	tons/month	tons/month	tons/month	tons/month	tons/month	tons/month	tons/month	tpy
2012	1,376.82	1,321.95	1,389.77	1,504.58	1,677.16	1,661.70	0.00	0.00	0.00	348.64	149.62	111.85	9,542.09
2013	293.94	164.58	382.61	608.03	487.25	1,395.82	1,628.15	564.93	1,140.10	2,460.88	1,925.00	2,120.00	13,171.29
2014 ⁽³⁾	1,865.00	1,699.13	1,767.70	1,879.89	1,861.56	1,239.10	2,300.31	1,882.03	2,111.80	1,849.77	1,716.37	1,261.30	21,433.96
2015	2,129.40	2,011.65	2,145.23	847.14	956.11	698.24	2,552.63	2,262.00	1,976.42	1,435.76	727.33	725.83	18,467.74
2016	250.69	73.22	281.90	145.22	733.78	752.60	27.18	872.80	635.99	1,193.16	1,669.56	1,116.29	7,752.39
2017	1,351.40	654.58	747.62	583.87	677.13	596.01	481.51	1,443.36	1,208.97	1,018.40	307.93	755.74	9,826.52
2018	604.36	432.80	290.62	340.60	530.40	411.99	585.45	798.04	668.79	867.50	787.86	628.54	6,946.95
2019	865.89	515.35	640.45	647.15	746.27	660.15	839.62	815.25	818.37	918.59	689.26	588.35	8,744.70
2020	879.90	722.66	775.05	790.56	730.29	838.19	919.13	926.27	850.45	1,010.65	850.50	871.37	10,165.02
2021	2,863.93			3,128.84			3,349.62			3,032.87			12,375.26
Year with Highest Throughput												21,433.96 tpy	
Maximum capacity per hour of the Tire Shredder												10 tons/hour	
Total Hours of Operation of the Tire Shredder (monthly hours multiplied by 12 months)												2,143 hrs/year	
Maximum Capacity per Hour of Tire Shredder in pounds												20,000 lbs/hour	
PM Emissions based on AP-42												0.02 lbs/hour	
PM Emissions per year in pound												39 lbs/year	
PM Emissions for Tire Shredding ⁽²⁾												0.02 tons/year	
(1) Maximum Capacity for Tire Shredder is based on manufacturer's specification provided from Delta Sand & Gravel													
(2) Emission Factor for PM for Tire Shredding is based on EPA AP-42 Chapter 4.12 Manufacture of Rubber Products, Emission Factors Table (xls), Grinding Tab - Retread. The emission factors for tire retread buffing were used because this type of operation is more representative to tire shredding, carcass rubber, or sidewall/white wall rubber grinding operations. Since this tire shredding operation is utilized for a landfill, the tires are not heated so the emission factors for VOCs and HAPs wer not used.													
(3) Utilized 2014 as the maximum tonnage of shredded tires placed in the landfill.													

Paved Industrial Roads: EU - PIR		
Methodology	Empirical Equation	
Source Used	EPA AP-42, Chapter 13.2.1, Eq. 3	
Equation	$E = [k*(sL)^{0.91}(W)^{1.02}](1-1.2P/N)$	
Variable Descriptions and Calculations		
PM		
E =		Emission Factor, pounds per vehicle miles traveled (lb/VMT)
k =	0.011	Particle size multiplier for particulate size range (lb/VMT), AP-42, Table 13.2.1-1
sL =	1.1	Road surface silt loading (g/m ²), AP-42, Table 13.2.1-3
W =	25	Average vehicle weight, tons (source supplied)
E =	0.32	lb/VMT (PM ₁₀ emission factor)
P =	150	Number of annual days with at least 0.01 inches of precipitation, unitless (AP-42 Figure 13.2.2-1)
N =	365	Number of days in annual averaging period
E(ext) =	0.162	EF adjusted for rain days (AP-42, 13.2.1.3, Eq 3), 75% reduction - wet supp
PM10		
E =		Emission Factor, pounds per vehicle miles traveled (lb/VMT)
k =	0.0022	Particle size multiplier for particulate size range (lb/VMT), AP-42, Table 13.2.1-1
sL =	1.1	Road surface silt loading (g/m ²), AP-42, Table 13.2.1-3
W =	25	Average vehicle weight, tons (source supplied)
E =	0.06	lb/VMT (PM ₁₀ emission factor)
p =	150	Number of annual days with at least 0.01 inches of precipitation, unitless (AP-42 Figure 13.2.2-1)
N =	365	Number of days in averaging period
E(ext) =	0.032	EF adjusted for rain days (AP-42, 13.2.1.3, Eq 3), 75% reduction - wet supp
PM2.5		
E =		Emission Factor, pounds per vehicle miles traveled (lb/VMT)
k =	0.00054	Particle size multiplier for particulate size range (lb/VMT), AP-42, Table 13.2.1-1
sL =	1.1	Road surface silt loading (g/m ²), AP-42, Table 13.2.1-3
W =	25	Average vehicle weight, tons (source supplied)
E =	0.02	lb/VMT (PM ₁₀ emission factor)
p =	150	Number of annual days with at least 0.01 inches of precipitation, unitless (AP-42
N =	365	Number of days in averaging period
E(ext) =	0.008	EF adjusted for rain days (AP-42, 13.2.1.3, Eq 3), 75% reduction - wet supp
Annual Vehicle Miles Traveled, EU: PIR		
VMT	2,485	
Total Annual Particulate Matter Emissions, tons ((E x VMT)/2000 lb/ton)		
PM	0.20	tons per year
PM10	0.04	tons per year
PM2.5	0.01	tons per year

Unpaved Roads: EU - UPR		
Methodology	Empirical Equation	
Source Used	EPA AP-42, Chapter 13.2.2, Eq. 1a	
Equation	$E = k(s/12)^a(W/3)^b$	
Variable Descriptions and Calculations		
PM		
E =		Emission Factor, pounds per vehicle miles traveled (lb/VMT)
k =	4.9	Particle size multiplier (lb/VMT), AP-42, Table 13.2.2.2
a =	0.7	Unitless constant, AP-42, Table 13.2.2.2
b =	0.45	Unitless constant, AP-42, Table 13.2.2.3
s =	6.4	Silt Content of road surface material, %, AP-42, Table 13.2.2.1
W =	25	Mean vehicle weight, tons (source supplied)
E =	7.23	lb/VMT (PM ₁₀ emission factor)
p =	150	Number of annual days with at least 0.01 inches of precipitation, unitless (AP-42)
E(ext) =	1.06	EF adjusted for rain days (AP-42, 13.2.2, Eq (2)), 75% reduction - wet supp
PM10		
E =		Emission Factor, pounds per vehicle miles traveled (lb/VMT)
k =	1.5	Particle size multiplier (lb/VMT), AP-42, Table 13.2.2.2
a =	0.9	Unitless constant, AP-42, Table 13.2.2.2
b =	0.45	Unitless constant, AP-42, Table 13.2.2.3
s =	6.4	Silt Content of road surface material, %, AP-42, Table 13.2.2.1
W =	25	Mean vehicle weight, tons (source supplied)
E =	2.21	lb/VMT (PM ₁₀ emission factor)
p =	150	Number of annual days with at least 0.01 inches of precipitation, unitless (AP-42)
E(ext) =	0.33	EF adjusted for rain days (AP-42, 13.2.2, Eq (2)), 75% reduction - wet supp
PM2.5		
E =		Emission Factor, pounds per vehicle miles traveled (lb/VMT)
k =	0.15	Particle size multiplier (lb/VMT), AP-42, Table 13.2.2.2
a =	0.9	Unitless constant, AP-42, Table 13.2.2.2
b =	0.45	Unitless constant, AP-42, Table 13.2.2.3
s =	6.4	Silt Content of road surface material, %, AP-42, Table 13.2.2.1
W =	25	Mean vehicle weight, tons (source supplied)
E =	0.22	lb/VMT (PM ₁₀ emission factor)
p =	150	Number of annual days with at least 0.01 inches of precipitation, unitless (AP-42)
E(ext) =	0.033	EF adjusted for rain days (AP-42, 13.2.2, Eq (2)), 75% reduction - wet supp
Annual Vehicle Miles Traveled, EU: UPR		
VMT	1,776	
Total Annual Particulate Matter Emissions, tons ((E x VMT)/2000 lb/ton)		
PM	0.94	tons per year
PM10	0.29	tons per year
PM2.5	0.03	tons per year
Through emails and a voice message it was determine that the vehicle weight of haulers of demolition was 10 yard dump trucks. This is the most widely used and averaged between small pick-up trucks and larger dump trucks. The Gross Vehicle Weight Rating for the average 10 yard dump truck is 6.5 tons without a load. I added a 1/2 ton more to be conservative. I found the GVWR here: https://www.prettypmotors.com/how-much-does-a-10-yard-dump-truck-weigh/		

GREENHOUSE GAS EMISSIONS FOR FUGITIVE LANDFILL GAS		
Methane Emissions ⁽¹⁾	1,411.44	tpy
Global Warming Potential (GWP)	25	GWP
Greenhouse Gas Emissions	35,286	tpy
⁽¹⁾ Methane emissions were provided by Delta Landfill on the initial Methane Generation Report.		
BASELINE EMISSION RATE FOR 2010 GREENHOUSE GAS EMISSIONS FOR FUGITIVE LANDFILL GAS		
Methane Emissions ⁽¹⁾	1,300.00	tpy
Global Warming Potential (GWP)	25	GWP
Greenhouse Gas Emissions	32,500	tpy
⁽¹⁾ Methane emission where based on LandGEM for Short Mountain Landfill (SML). Because Delta Landfill is not a municiple solid waste landfill, but a Construction and Demolition debris landfill, utilizing SML's LandGEM information will over estimate the actual methane that is produced.		

INFORMATION USED FOR GHG CALS FOR GENERATOR		
Tons per Hour of Shredded Tires	10	ton/hour
Maximum Hours Generator operated	2,143	hours/year
Maximum amount of Diesel used in an hour	18	gal/hr
Maximum Diesel fuel combusted in 2000	38,581.13	Gals/yr

COMBUSTION GHG:

Enter emissions information				Convert to mmBtu				Emissions (kg/mmBtu)			CO ₂ Equivalent			Anthropogenic (mtCO ₂ e)			Biogenic (mtCO ₂)
Emissions unit ¹	Fuel Type ²	Quantity ³	Fuel units ³	HHV Units	HHV Unit	HHV	mmBtu	CH ₄	CO ₂	N ₂ O	CH ₄	CO ₂	N ₂ O	CH ₄	CO ₂	N ₂ O	Biogenic (mtCO ₂)
Generator (GEN)	Distillate oil 2	38,581.13	Gallon	38,581	gallon	0.138	5,324	0	74	0	25	1	298	0.4	393.8	1.0	0
				0	0	0	0	0	0	0	25	1	298	0	0	0	0
				0	0	0	0	0	0	0	25	1	298	0	0	0	0
				0	0	0	0	0	0	0	25	1	298	0	0	0	0
				0	0	0	0	0	0	0	25	1	298	0	0	0	0
				0	0	0	0	0	0	0	25	1	298	0	0	0	0
				0	0	0	0	0	0	0	25	1	298	0	0	0	0
				0	0	0	0	0	0	0	25	1	298	0	0	0	0
				0	0	0	0	0	0	0	25	1	298	0	0	0	0
				0	0	0	0	0	0	0	25	1	298	0	0	0	0
				0	0	0	0	0	0	0	25	1	298	0	0	0	0

Anthropogenic combustion emissions (mtCO ₂ e):	395.1
Biogenic combustion emissions (mtCO ₂ e):	0
Total combustion emissions (mtCO₂e):	395.1

Conversion to short tons	
Anthropogenic combustion emissions:	436
Biogenic combustion emissions:	0
Total combustion emissions:	436