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**Technical Support Document  
Proposed Title V Permit Renewal  
Sierra Estrella Landfill  
Permit #V20673.000**

<b>1. BACKGROUND .....</b>	<b>2</b>
1.1 APPLICANT/APPLICATION HISTORY .....	2
1.2 ATTAINMENT CLASSIFICATION.....	2
1.3 PERMITTING HISTORY .....	2
1.4 COMPLIANCE/ENFORCEMENT HISTORY .....	2
<b>2. PROCESS DESCRIPTION .....</b>	<b>3</b>
2.1 GENERAL PROCESS .....	3
<b>3. EMISSIONS .....</b>	<b>3</b>
3.1 GENERAL METHODOLOGY.....	3
3.1.1 <i>Landfill Gas Emissions</i> .....	3
3.1.2 <i>Particulate Matter from Landfill Operations</i> .....	4
3.1.3 <i>Leachate Management</i> .....	4
3.1.4 <i>Internal Combustion Engines</i> .....	4
3.1.5 <i>Underground Storage Tanks (USTs)</i> .....	4
3.1.6 <i>Asbestos</i> .....	5
3.2 ACTUAL AND POTENTIAL EMISSIONS .....	5
<b>4. REGULATORY REQUIREMENTS AND MONITORING .....</b>	<b>5</b>
4.1 TITLE V/PSD APPLICABILITY .....	5
4.2 NSPS/NESHAP APPLICABILITY .....	5
4.3 GHG EMISSIONS.....	6
4.4 REGULATORY EMISSION LIMITATIONS AND COMPLIANCE/MONITORING .....	6
4.4.1 <i>Compliance Assurance Monitoring (CAM)</i> .....	6
<b>5. AMBIENT IMPACT ASSESSMENT - PM10 .....</b>	<b>6</b>
<b>6. LIST OF ABBREVIATIONS .....</b>	<b>6</b>

## 1. BACKGROUND

### 1.1 Applicant/Application History

This permit renewal pertains to an existing solid waste landfill facility, owned and operated by Sierra Estrella Landfill, Inc., a subsidiary of Waste Management Arizona Landfills, an Arizona corporation. The facility opened in 1994, with an overall site area of about 300 acres. The facility, commonly known as the Sierra Estrella Landfill, is located on 22087 North Ralston Road, Maricopa, Arizona, upon a parcel also identified by Pinal County Assessor's Parcel #510-79-002C4.

This analysis reflects consideration of (at least) the following:

- Permit application signed by Damon De Frates on 9/12/17.

### 1.2 Attainment Classification

This facility is located in an area designated as non-attainment for PM10.

### 1.3 Permitting History

The following is a list of permits applied for and/or issued since 1990 with respect to the Sierra Estrella Landfill:

Permit #	Permit Type	Issued Date	Changes
A20500	Installation Permit	4/22/94	
V20605.000	Title V	6/15/98	Initial Title V
V20618.000	Renewal	8/22/03	Addition to the list of allowed "daily covers", and non-road engines.
V20634.000	Renewal	7/2/08	
V20655.000	Renewal	7/31/13	Renewal V20655.000 made the following changes: Fugitive emissions from the paved and unpaved roads were revised based upon a lower expected waste acceptance for future years of operations.
V20673.000	Renewal		Adds the West Pinal Fugitive Dust rule requirements, NSPS 40 CFR Part 60 Subpart IIII for engines and NESHAP ZZZZ 40 CFR Part 63 Subpart ZZZZ for engines and updates references

### 1.4 Compliance/Enforcement History

Sierra Estrella landfill has been inactive since 2000, and inspections have not been conducted during this shutdown period.

Annual NMOC report have been submitted in accordance with NSPS requirements, and the initial Tier 2 modeling was conducted in 2011 to determine site-specific parameters to analyze when the landfill will reach 50 Mg/yr of NMOC emissions, the threshold for the requirement to install controls. The Landfill completed its most recent landfill New Source Performance Standard (NSPS) Tier 2 sampling and analysis in January 2016 which was reported to the PCAQCD in March 2016. The results of the test showed an average non-methane organic compound (NMOC) concentration of approximately 249 parts per million volume as hexane (ppmv), and the resulting NMOC emission rate for 2016 was 3.0 Mg/yr. Based upon this and the low waste acceptance rate the Landfill would not exceed 50 Mg/yr during the next permit term (2018 – 2023).

## **2. PROCESS DESCRIPTION**

### **2.1 General Process**

The principal business activity consists of providing a controlled and managed repository for solid wastes. Examples of such wastes include municipal solid waste, construction debris, demolition material, dead animals, auto shredder fluff, incinerator ash, non-infectious medical wastes, dried waste water treatment plant sludge and petroleum contaminated soils. Asbestos materials are independently managed and segregated in a controlled area.

The natural decomposition of the waste materials, and to some extent the evaporation of volatile compounds in the waste materials, constitutes the primary sources of emissions.

Traffic delivering waste materials generates particulate emissions (PM<sub>10</sub>) or dust. In addition, the daily application of a cover layer of soil also produces PM<sub>10</sub> emissions, resulting from soil stockpiling, cover layer distribution, and wind erosion. Soil is typically used as a daily cover material; however, other alternatives as expressly approved under this permit may also be used. Diesel-driven equipment also emit oxides of nitrogen (NO<sub>x</sub>) and sulfur dioxide (SO<sub>2</sub>) and may operate at the facility.

The facility design includes a liner system, which collects any liquids, or leachate, that drains from the mass of waste materials. A collection system and pump allows the leachate to be extracted, collected, and eventually sprayed back onto lined cells in the facility, effectively amounting to a leachate drying system. Eventually, any volatile fraction will evaporate or decompose, and those compounds will escape as emissions.

## **3. EMISSIONS**

### **3.1 General Methodology**

#### **3.1.1 Landfill Gas Emissions**

The natural decomposition of waste materials produces surface emissions of VOCs, HAPs and NMOCs. EPA policy memorandum from 10/21/1994 indicates that landfill gas emissions which are reasonably collectable are to be considered non-fugitive regardless of whether a gas system is in-place. AP-42 suggests that 65-85% of the landfill gas should be considered collectable. Therefore, permittee has used the industry acceptable 75% for purposes of calculations. The remaining 25% are considered fugitive.

Landfill gas generation estimates were developed using a landfill gas model which mimics EPA's LandGEM 3.02, using the parameters recommended<sup>1</sup> in AP-42. Disposal rate projections result in a peak disposal capacity of 24,647,000 tons.

- Collectable Emissions:

75% of the landfill gas emissions are considered collectable, and since under the AOS, the landfill will reach 50 Mg/yr of NMOCs, the permittee is proposing a system that will collect landfill gas and control emissions of NMOCs with a destruction efficiency of at least 98%. The date of installation of this system will be determined by when the 50 Mg/yr level is triggered. NMOCs, VOCs and HAPs from the flare are estimated based on a 98% control efficiency. Emissions of PM10 and SOx are based on emission factors from AP-42, Section 2.4. And emissions of CO and NOx are based on manufacturer's guarantees.

- Fugitive Emissions:

NMOC emissions are based on the landfill's most recent Tier 2 Survey to determine the site specific NMOC content (249 ppmv). VOC emissions were estimated by assuming 39% of the NMOCs are VOCs, as indicated in AP-42, Table 2.4-2.

Concentrations of HAPs were taken from the Waste Industry Air Coalition (WIAC) study of constituents of landfill gas.

### 3.1.2 Particulate Matter from Landfill Operations

The following activities on-site generate fugitive particulate matter (PM10 and PM2.5) emissions: the use of paved and unpaved roads by vehicles (refuse and others); construction activities including heavy equipment traffic; and, the excavation, transportation, stockpiling, deposition of cover materials. PM10 and PM2.5 emissions have been calculated using AP-42 methodologies.

### 3.1.3 Leachate Management

Leachate is generated by precipitation and other moisture that percolates through the refuse mass and is collected in the leachate collection system and is sent to a tank for temporary storage prior to being used for dust control. The collection and storage of leachate generates emissions of VOCs and HAPs. Emissions from the leachate management were calculated using mass balance.

### 3.1.4 Internal Combustion Engines

The permit allows the use of a tipper engine, a light plant engine, a steam cleaner engine, a water pump and other sources defined as insignificant. Renewal V20673.000 adds NSPS 40 CFR Part 60 Subpart IIII for 2007 and newer engines and NESHAP ZZZZ 40 CFR Part 63 Subpart ZZZZ for 2006 and older engines. AP-42 emission factors have been used for calculating emissions from these equipment.

### 3.1.5 Underground Storage Tanks (USTs)

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<sup>1</sup>k = 0.02, L<sub>o</sub> = 100 m<sup>3</sup>/Mg

While no USTs are present on site, the permit allows the installation of up to 2 diesel and gasoline tanks on site, which due to their capacities will be considered Insignificant Activities. Most likely these tanks will be above ground storage tanks.

### 3.1.6 Asbestos

The landfill is permitted for disposal of both friable and non-friable asbestos-containing waste in accordance with the applicable regulations, and in a separate area of the facility.

## 3.2 Actual and Potential Emissions

Pollutant	2016 Actual (tpy)	PTE (tpy)
PM <sub>2.5</sub>	0.44	2.87
PM <sub>10</sub> <sup>3</sup>	0.88	7.70
CO	0.00	5.94
NOX	0.00	27.56
SO <sub>2</sub>	0.00	1.82
VOCs	4.88	3.49
NMOCs	12.52	3.30
HAPs	0.64	1.08

Notes: Actual and potential emissions are provided for informational purposes and are not compliance limits. Potential emissions are based on V20673.000 renewal application emission estimates plus potential emission from the stationary engines (on site more than 12 months) that were listed in the application.

## 4. REGULATORY REQUIREMENTS AND MONITORING

### 4.1 TITLE V/PSD Applicability

In accordance with PCAQCD §1-3-140.80, this source is not a major source since all the emissions are below 100 tons per year, and 10 tons per year of any single HAP or 25 tons per year of combined HAPs. While not a major source, landfills with a design capacity equal or greater than 2.5 million Megagrams are subject to 40 CFR Part 60, Subpart WWW and also subject to Part 70 permitting requirements. This facility first obtained a Title V permit in 1998.

### 4.2 NSPS/NESHAP Applicability

Permittee has been subject to the requirements of Subpart WWW since 2003. Annual NMOC reports or a five year estimate, whichever is applicable, are the indicator for whether the 50 Mg/yr of NMOC emissions has been reached.

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<sup>3</sup>This includes fugitive emissions, which are not counted towards the major source or significance thresholds.

The permit already requires a revision within 12 months of the NMOC report showing the 50 Mg/yr exceedance: “submit a control system design, prepared by a professional engineer to meet the requirements of 40 CFR §60.743.b.2.i, to the Control Officer for approval, as required under §60.752.b.2., as well as an application for a corresponding permit revision to incorporate such changes to this permit as may be required to accommodate the proposed control system physical configuration, operational requirements and compliance requirements arising under those provisions of Part 60.” Therefore any other requirements will be included in the permit at such time.

Renewal V20673.000 add NSPS 40 CFR Part 60 Subpart IIII for 2007 and newer engines and NESHAP ZZZZ 40 CFR Part 63 Subpart ZZZZ for 2006 and older engines.

While updated emission guidelines for existing landfills, 40 CFR Part 60 Subpart Cf, were finalized in 2016 these rules were stayed in 2017 and are currently involved in litigation at the Federal level. Since neither the EPA nor PCAQCD have adopted rules to implement the updated guidelines this renewal does not include the provisions of 40 CFR Part 60 Subpart Cf.

#### 4.3 GHG Emissions

A Supreme Court ruling in 2014 determined that a facility determined that a source must trigger PSD or NNSR applicability for other pollutants in order to trigger regulatory applicability for GHG emissions. Since this source is not a major source under the PSD or NNSR program the permit does not contain GHG regulatory provisions.

#### 4.4 Regulatory Emission Limitations and Compliance/Monitoring

##### 4.4.1 Compliance Assurance Monitoring (CAM)

The requirements of 40 CFR Part 64, CAM, do not apply to this source since it is not a major source for any pollutants.

### 5. AMBIENT IMPACT ASSESSMENT - PM10

The changes to the permit do not include significant increases in emissions of PM10, therefore, no additional impact assessments have been conducted for this revision.

### 6. LIST OF ABBREVIATIONS

AOS.....	Alternative Operating Scenario
AP-42 .....	“Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources”, 5 <sup>th</sup> Edition
CAA .....	Clean Air Act
CAM.....	Compliance Assurance Monitoring
CFR .....	Code of Federal Regulations
CO .....	Carbon Monoxide
EPA .....	Environmental Protection Agency
HAP .....	Hazardous Air Pollutant
hr .....	Hour
lb.....	Pound
MACT .....	Maximum Achievable Control Technology
MMBTU.....	Million British Thermal Units
NESHAP .....	National Emission Standards for Hazardous Air Pollutants
NMOC.....	Non-Methane Organic Compounds
NO <sub>x</sub> .....	Nitrogen Oxides

NSPS ..... New Source Performance Standard  
NSR ..... New Source Review  
PCAQCD..... Pinal County Air Quality Control District  
PGCAQCD..... Pinal-Gila Counties Air Quality Control District  
PM<sub>10</sub> ..... Particulate Matter nominally less than 10 Micrometers  
PM<sub>2.5</sub>..... Particulate Matter nominally less than 2.5 Micrometers  
PSD ..... Prevention of Significant Deterioration  
PTE..... Potential to Emit  
SIC ..... Standard Industrial Code  
SO<sub>x</sub>..... Sulfur Dioxide  
tpy..... tons per year  
TSD ..... Technical Support Document  
UST ..... Underground Storage Tank  
VOC ..... Volatile Organic Compound  
yr ..... Year