



**TECHNICAL REVIEW AND EVALUATION
OF APPLICATION FOR
AIR QUALITY PERMIT No. 95333**

I. INTRODUCTION

This Class I Renewal permit is for the continued operation of Pen-Rob, Inc.'s Painted Desert Landfill (PDLF). Permit No. 95333 renews and supersedes Permit No. 67216. A Class I permit is required because this facility has exceeded a design capacity of 2.5 million cubic meters and 2.5 million megagrams and is subject to A.A.C. R18-2-731 "Standards of Performance for Existing Municipal Solid Waste Landfills", and is required to comply with New Source Performance Standard (NSPS) Subpart Cf "Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills", which requires the Permittee to obtain a Title V permit. This facility is also subject to the requirements of National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart AAAA "Municipal Solid Waste Landfills". Permit No. 67216 had an expiration date of January 28, 2023, and the application for this permit renewal was submitted on July 14, 2022. This submission satisfied the permit condition requiring that a complete and timely application be submitted by the Permittee at least six (6) months, but no earlier than eighteen (18) months, prior to the expiration date of the current permit.

A. Company Information

Facility Name: Pen-Rob, Inc.
Mailing Address: P. O. Box 190, Joseph City, AZ 86032
Facility Location: 9001 North Porter Avenue, Joseph City, Navajo County, Arizona 86032

B. Attainment Classification

This facility is located in an area which is designated attainment/unclassified for all criteria pollutants.

II. PROCESS DESCRIPTION

A. Process Description

The PDLF began operation in 1988 and consists of 640 acres of land, of which approximately 274.7 acres are permitted for refuse disposal. The PDLF is operating as an area fill landfill. The primary activities of the PDLF are the deposition of refuse along with the excavation and stockpiling of cover material and soil. A defined area of the landfill is excavated and prepared to receive waste prior to the acceptance of refuse. Cell construction will continue as an area fill operation, and excavated materials will be used for daily, intermediate, and/or final cover. Existing site development includes unpaved access roads, maintenance activities, a scale house office with a truck scale, storage trailer, fuel storage tank, water well, and utilities. The design capacity for the landfill is estimated at 49.3 million cubic yards (approximately 20.7 million tons). At the end of the 2021 calendar year, there will be approximately 3.3 million tons of waste in place at the PDLF.

Assuming a conservative constant growth rate of 6 percent per year, the PDLF's capacity would be reached in the year 2060. The Landfill received an average 350 tons per operating day of residential, commercial, industrial, and inert wastes over the last permit period. These wastes are placed into the disposal area, spread, and compacted with heavy equipment, then covered with acceptable cover/soil materials.

Landfill gas (LFG) generation occurs as microorganisms within the landfill degrade the waste. This decay of the waste results in the generation of carbon dioxide and methane. As the LFG is generated, it builds pressure and moves through the waste, where it encounters and joins with other gaseous compounds that are present in the waste. These constituents can include nitrogen, hydrogen, and small amounts of non-methane organic compounds (NMOC), including hazardous air pollutants (HAPs) and volatile organic compounds (VOCs). Fugitive emissions from the landfill surface include methane, carbon dioxide and the pollutants in the waste that the LFG encounters.

Most of the LFG is collected and conveyed to the control station, where it is combusted in a non-enclosed flare. Emissions from the flare include the LFG pollutants that are not completely combusted and the products of combustion including carbon monoxide, nitrous oxide, and sulfur dioxide, particulate matter, and trace amounts of hydrogen chloride.

B. Control Devices

PDLF was subject to NSPS Subpart WWW and was required to install and operate a landfill gas collection and control system (GCCS) after uncontrolled emissions exceeded 50 megagrams per year (Mg/yr) of nonmethane organic compounds (NMOC) in 2006. The GCCS was operational in 2009.

PDLF initially had 16 vertical gas extraction wells routed to a candlestick flare. Normally, the wells would be operated under negative pressure. However, due to poor flow and gas quality at eight of the wells (EW-5 to EW-12), the Permittee proposed to operate eight of the wells under positive pressure. ADEQ approved this variance in a letter to Jack Kolopanis on October 11, 2011. The Permittee sends yearly status reports on the methane flow rates and concentration at the wells covered by the variances. The Permittee will also notify ADEQ 15 days prior to operating the wells at negative pressure. ADEQ was notified on March 6, 2017 that previously decommissioned wells 1 - 4 were abandoned on January 30, 2017. In addition, ADEQ was notified on March 6, 2017 that wells 6, 8, 10, 12 and 15 were being decommissioned and new Horizontal Well 17 was being installed. The current collection system is comprised of vertical wells 5, 7, 9, 11, 13, 14 and 16, and horizontal collector 17 (first month monitoring was October 2017).

C. Process Flow Diagram(s)

A process flow diagram can be found in Appendix A.

III. COMPLIANCE HISTORY

A. Physical Inspections and Compliance Certification Review

During the five-year permit term that PDLF operated under Permit No. 67216, this facility had ten (10) physical inspections and nine (9) compliance certification reviews. No deficiencies were noted during these inspections or compliance certification report reviews.

B. Excess Emissions and Permit Deviation Report Review

During the five-year permit term that PDLF operated under Permit No. 67216, one (1) deviation and no excess emission has been reported.

1. Deviations

a. Inspection ID: 309947; Case ID: 178636

This deviation reported that monitoring for pressure, temperature, and oxygen was not conducted on Well 7 and Well 9 from February 2018 to August 2018 because they were incorrectly re-labeled as decommissioned wells. There were no excess emissions recorded during that period of time. An NOV resulted from this inspection. Painted Desert Landfill corrected the labeling error for Wells 7 and 9 and monitored for pressure, temperature, and oxygen in September 2018, and would re-train its gas technicians and operations employees to utilize “as built” and site drawings when re-labeling wells as a preventive measure. This NOV was closed on November 1, 2018.

IV. EMISSIONS

The potential-to-emit (PTE) was calculated based on EPA’s Compilation of Air Pollution Emission Factors (AP-42 Section 2.4 and Section 13.5) and EPA Landfill Gas Emissions Model LandGEM Version 3.03. To calculate the total landfill gas emissions, the methane generation rate k of 0.02 per year for areas receiving less than 25 inches/yr rainfall, the potential methane generation capacity L_0 of 100 m^3/Mg as recommended by AP-42 Section 2.4, and the waste acceptable rates provided by the PDLF were used in LandGEM Version 3.03. The growth rate of the waste acceptable rates was assumed to be 6% per year, and the Landfill’s capacity would be reached in the year of 2060. The NMOC concentration of 333.33 ppmv as hexane of the total landfill gas from the 2021 Tier 2 NMOC sampling was used to calculate the NMOC emission rate. The volatile organic compounds (VOCs) emission was based on 39% of the NMOC emissions for no or unknown sites as recommended by AP-42 Section 2.4.

The PDLF is not a source listed in A.A.C. R18-2-101.23 (non-categorical source) so the PTE only includes non-fugitive emissions and is provided in Table 1 below. As mentioned in AP-42 Section 2.4, only 75% of the total landfill gas is “collectable” and is considered non-fugitive. With that being said, only 75% of the total NMOC emissions and 75% of the total VOC emissions from the landfill is included in the PTE. The emission changes from the last permit renewal are not due to changes in operations and are due to the updated performance test results and the change of the way to calculate the PTE.

Table 1: Potential to Emit (tpy)

Pollutant	PTE from LTF # 67216	Change in PTE	PTE	Permitting Exemption Threshold	Minor NSR Triggered?
NO _x	4.44	+0.55	4.99	20	No
PM ₁₀	0.07	+1.15	1.22	7.5	No
PM _{2.5}	0.07	+1.15	1.22	5	No
CO	24.17	-1.41	22.76	50	No
SO ₂	0.99	+4.89	5.88	20	No
VOC	0.08	0	0.08	20	No
HAPs	0.88	+0.71	1.59	N/A	N/A
NMOC	0.21	0	0.21	N/A	N/A
GHG (CO ₂ e)	15,645	+2,120	17,765	N/A	N/A

V. MINOR NEW SOURCE REVIEW (NSR)

Minor new source review is required if the emissions of any physical change or change in the method of an operation of an emission unit or stationary source that results in an increase in emissions of any regulated minor NSR pollutant by an amount equal to or greater than the permitting exemption threshold (PET). As shown in Table 1 above, the emission increases resulting from this renewal permit are all below the permitting exemption thresholds, so minor NSR is not required at this time.

VI. APPLICABLE REGULATIONS

Table 2 identifies applicable regulations and verification as to why that standard applies. The table also contains a discussion of any regulations the emission unit is exempt from.

Table 2: Applicable Regulations

Unit & year	Control Device	Rule	Discussion
Municipal Solid Waste (MSW) Landfill	Unenclosed Flare, Active Collection System	<p>A.A.C. R18-2-731; 40 CFR Part 60 Subpart Cf</p> <p>40 CFR Part 63 Subpart AAAA</p>	<p>A.A.C. R18-2-731 applies to MSW landfills that began construction, reconstruction, or modification on or before July 17, 2014 and accepted waste at any time since November 8, 1987 or has capacity available for future waste deposition, which is applicable to PDLF. Landfills covered by A.A.C. R18-2-731 are required to comply with 40 Code of Federal Regulations (CFR) Part 60, Subpart Cf, effective as of the date of EPA approval of the state plan under section 111(d) of the Act (August 27, 2020). 40 CFR Part 60, Subpart Cf is adopted by ADEQ and hereby incorporated by reference as applicable requirements.</p> <p>40 CFR Part 60 Subpart Cf regulates emissions of landfill gas from MSW landfills for which construction, reconstruction, or modification was commenced on or before July 17, 2014.</p> <p>40 CFR Part 63 Subpart AAAA applies to MSW landfills that has accepted waste since November 1987, or has additional capacity for waste deposition, and has a design capacity greater than 2.5 million megagrams and 2.5 million cubic meters with estimated uncontrolled emissions equal to or greater than 50 Mg/yr NMOC. PDLF has accepted waste since November 1987, has a design capacity greater than 2.5 million megagrams and 2.5 million cubic meters, and triggered the NMOC 50 Mg/yr threshold under 40 CFR Part 60 Subpart WWW in 2006 and started to operate a GCCS in 2009. This is applicable to PDLF.</p>

Unit & year	Control Device	Rule	Discussion
		40 CFR Part 60 Subpart WWW	PDLF was subject to Subpart WWW, however, as of August 27, 2020 this rule is no longer applicable since EPA approved Arizona's state plan to promulgate the EPA Emissions Guidelines and Compliance Times for MSW landfills. PDLF is now subject to the more stringent requirements in 40 CFR Part 60 Subpart Cf per 40 CFR 60.750(d)(1).
		40 CFR Part 62, Subpart OOO	This subpart is not applicable because PDLF is regulated by an EPA-approved and currently effective state plan implementing 40 CFR Part 60, subpart Cf per 40 CFR 62.16711(b).
Asbestos Handling	N/A	40 CFR 61.154 Subpart M	40 CFR 61.154 Subpart M applies to active waste disposal sites that receive asbestos-containing waste material from asbestos mills; manufacturing, fabricating, demolition, renovation, and spraying operations; and operations that convert asbestos containing waste into nonasbestos (asbestos-free) material.
Fugitive dust sources	Water Trucks, Dust Suppressants	A.A.C. R18-2 Article 6 A.A.C. R18-2- 702	These standards are applicable to all fugitive dust sources at the facility.
Abrasive Blasting	Wet blasting; Dust collecting equipment; Other approved methods	A.A.C. R-18-2- 702 A.A.C. R-18-2- 726	These standards are applicable to any abrasive blasting operation.
Spray Painting	Enclosures	A.A.C. R18-2- 702 A.A.C. R-18-2- 727	These standards are applicable to any spray painting operation.
Demolition/renovation Operations	N/A	A.A.C. R18-2- 1101.A.12	This standard is applicable to any asbestos related demolition or renovation operations.

VII. PREVIOUS PERMIT REVISIONS AND CONDITIONS

A. Previous Permit Revisions

The Permittee has not submitted any permit revision requests during the previous permit term.

B. Changes to Current Renewal

Table 3 addresses the changes made to the sections and conditions from Permit No. 67216:

Table 3: Previous Permit Conditions

Section No.	Determination			Comments
	Added	Revised	Deleted	
Att. "A"		X		General Provisions: Revised to represent the most recent template language
Att. "B" Section I		X		Facility Wide Requirements: Revised to represent the most recent template language
Att. "B" Section II		X		Landfill Requirements: Revised to reflect the requirements of NSPS Subpart Cf and NESHAP Subpart AAAA
Att. "B" Section III		X		Asbestos: Revised to clarify applicability.
Att. "C"		X		Equipment List: Revised to reflect the most recent equipment operating at the facility and to include equipment information provided.

VIII. MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS

Table 4 contains an inclusive but not an exhaustive list of the monitoring, recordkeeping and reporting requirements prescribed by the air quality permit. The table below is intended to provide insight to the public for how the Permittee is required to demonstrate compliance with the emission limits in the permit. Records are required be kept for a minimum of 5 years as outlined in Section XII of Attachment “A” of the permit.

Table 4: Permit No. 95333

Emission Unit	Pollutant	Emission Limit	Monitoring Requirements	Recordkeeping Requirements	Reporting Requirements
MSW Landfill	NMOC Methane	N/A	<p>Monitor landfill gas temperature on a monthly basis. Enhanced monitoring is required if well temperature exceeds 63.8 degrees Celsius (145 degrees Fahrenheit) and 73.9 degrees Celsius (165 degrees Fahrenheit.</p> <p>Install, operate, and maintain a heat sensing device at the pilot light or flame, and a device that records flow to the flare and bypass of the flare.</p> <p>Conduct surface emissions monitoring for methane on a quarterly basis.</p>	<p>Keep records of the design capacity report, current amount of solid waste in place, and the year-by-year waste acceptance rate.</p> <p>Keep records of control system equipment data as measured during the initial performance test or compliance determination.</p> <p>Keep records of equipment operating parameters.</p> <p>Keep a readily accessible plot map showing each existing and planned collector in the system.</p> <p>Keep records of exceedances of operational standards and associated corrective actions and monitoring.</p>	<p>Submit an amended design capacity report to provide notification of an increase in design capacity of the landfill within 90 days of the increase.</p> <p>Submit a revised design plan at least 90 days before expanding operations to an area not covered by the previously approved plan, or prior to installing or expanding the system in a way that is not consistent with the previously submitted design plan.</p> <p>Submit a closure report within 90 days of waste acceptance cessation.</p> <p>Submit an equipment removal report 30 days prior to removal</p>

Emission Unit	Pollutant	Emission Limit	Monitoring Requirements	Recordkeeping Requirements	Reporting Requirements
				<p>Keep records of the annual recalculation of site-specific density, design capacity, and supporting documentation.</p> <p>Keep records of all collection and control system monitoring data for measured operating parameters.</p>	<p>or cessation of the control equipment.</p> <p>Submit semiannual reports documenting parameter exceedances, control system bypass, periods the system was not operating, locations of each exceedance of 500-ppm methane concentration standard, date and location of new wells or collection systems, corrective actions taking more than 60 days to correct the exceedance, and enhance monitoring (if applicable).</p> <p>Submit reports of date, time, well identifier, temperature, and carbon monoxide reading within 24 hours if well temperature exceeds 76.7 degrees Celsius and carbon monoxide concentration is greater than or equal to 1,000 ppmv.</p> <p>Submit reports documenting corrective action and corresponding timeline</p>

Emission Unit	Pollutant	Emission Limit	Monitoring Requirements	Recordkeeping Requirements	Reporting Requirements
					associated with exceedances of well temperature standards.
Asbestos Handling	Asbestos	N/A	N/A	Maintain waste shipment records, retain a copy of all records and reports for at least 2 years; maintain records of the location, depth and area, and quantity of asbestos-containing material within the disposal site on a map or diagram of the disposal area.	As soon as possible and no longer than 30 days after receipt of the waste, send a copy of the signed waste shipment record to the waste generator. If the discrepancy between the quantity of waste designated on the waste shipment records and the quantity actually received is not resolved within 15 days, report in writing to the local, State, or EPA. Submit a copy of records of asbestos waste disposal locations and quantities. Notify the Director in writing at least 45 days prior to excavating or disturbing any asbestos-containing waste material that has been deposited at a waste disposal site and is covered.
Fugitive Dust	PM	40% Opacity	A Method 9 observer is required to conduct a monthly survey of visible emissions.	Record of the dates and types of dust control measures employed, and if applicable, the results of any Method 9 observations, and any corrective action	N/A

Emission Unit	Pollutant	Emission Limit	Monitoring Requirements	Recordkeeping Requirements	Reporting Requirements
				taken to lower the opacity of any excess emissions.	
Abrasive Blasting	PM	20% Opacity	N/A	Record the date, duration and pollution control measures of any abrasive blasting project.	N/A
Spray Painting	VOC	20% Opacity Control 96% of the overspray	N/A	Maintain records of the date, duration, quantity of paint used, any applicable MSDS, and pollution control measures of any spray painting project.	N/A
Demolition/ Renovation	Asbestos	N/A	N/A	Maintain records of all asbestos related demolition or renovation projects including the “NESHAP Notification for Renovation and Demolition Activities” form and all supporting documents	N/A

IX. COMPLIANCE ASSURANCE MONITORING (CAM)

The CAM rule applies to pollutant-specific emission units (PSEU) at a major Title V source if the unit meets all of the following criteria:

- A. The unit is subject to an emission limit or standard for the applicable regulated air pollutant;
- B. The unit uses a control device to achieve compliance with the emission limit or standard; and
- C. The unit has "potential pre-control device emissions" of the applicable regulated air pollutant equal to or greater than 100% of the amount (tons/year) required for a source to be classified as a major source. "Potential pre-control device emissions" means potential to emit (PTE, as defined in Title V) except emissions reductions achieved by the applicable control device are not taken into account.

PDLF is not subject to the CAM rules because this facility is not subject to an emission limit or standard, and it does not have potential pre-control device emissions equal to or greater than the major source threshold.

X. ENVIRONMENTAL JUSTICE ANALYSIS

The United States Environmental Protection Agency (EPA) defines Environmental Justice (EJ) to include the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income. The goal of evaluating EJ in permitting is to provide an opportunity for meaningful participation in the permitting process for overburdened populations or communities to allow for meaningful participation in the permitting process. Overburdened is used to describe the minority, low-income, tribal and indigenous populations or communities that potentially experience disproportionate environmental harms and risks due to exposures or cumulative impacts or greater vulnerability to environmental hazards. This renewal permit has emission increases significantly below the permitting exemption thresholds and will not result in any additional impacts from the time of the initial permitting of the operation.

XI. LEARNING SITE EVALUATION

In accordance with ADEQ's Environmental Permits and Approvals near Learning Sites Policy, the Department is required to conduct an evaluation to determine if any nearby learning sites would be adversely impacted by the facility. Learning sites consist of all existing public schools, charter schools and private schools the K-12 level, and all planned sites for schools approved by the Arizona School Facilities Board. The learning sites policy was established to ensure that the protection of children at learning sites is considered before a permit approval is issued by ADEQ.

The Department did not identify any learning sites within two miles of this facility.

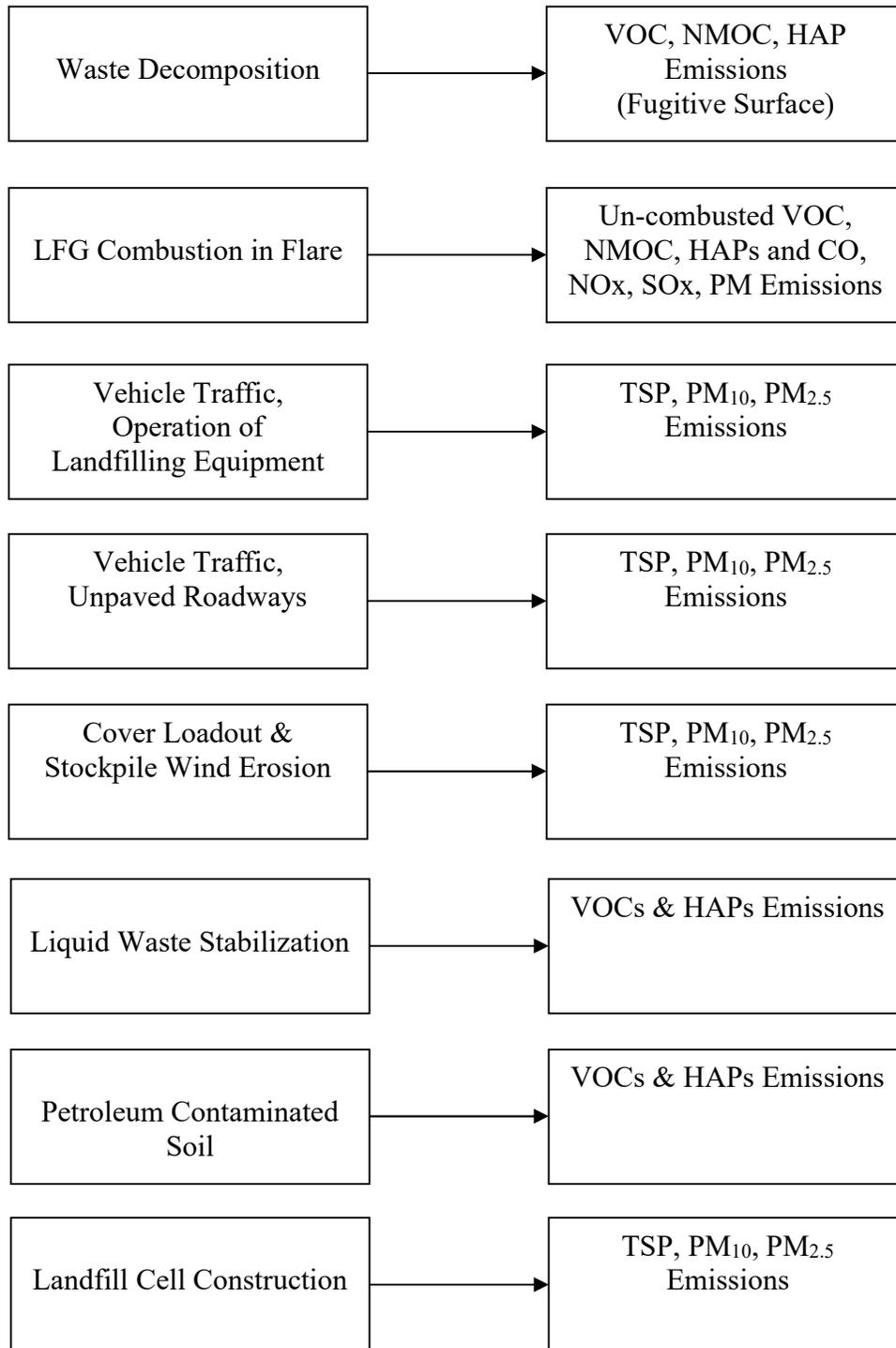
XII. AMBIENT AIR IMPACT ANALYSIS

The emission increases resulting from this renewal permit are significantly below the permitting exemption thresholds, therefore an ambient air impact analysis is not required for this renewal permit.

XIII. LIST OF ABBREVIATIONS

A.A.C.	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
CAM	Compliance Assurance Monitoring
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO _{2e}	CO ₂ equivalent basis
EJ	Environmental Justice
EPA	Environmental Protection Agency
GCCS	Gas Collection and Control System
GHG	Greenhouse Gases
HAPs	Hazardous Air Pollutants
LFG	Landfill gas
MSW	Municipal Solid Waste
NESHAP	National Emission Standards for Hazardous Air Pollutants
NMOC	Non-Methane Organic Compound
NO _x	Nitrogen Oxides
NOV	Notice of Violation
NSPS	New Source Performance Standards
NSR	New Source Review
PDLF	Painted Desert Landfill
PET	Permitting exemption threshold
PM	Particulate Matter
PM ₁₀	Particulate Matter no larger than 10 µm nominal aerodynamic diameter
PM _{2.5}	Particulate Matter no larger than 2.5 µm nominal aerodynamic diameter
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
SO ₂	Sulfur Dioxide Significant Impact Levels
TPY	Tons per Year
VOCs	Volatile Organic Compounds
yr	Year

Appendix A – Process Flow Diagram



**Process Flow
Diagram**

**PAINTED DESERT
LANDFILL
2022 Title V Permit Renewal**