

**DAVIS-MONTHAN AFB**  
**SIC CODE, MAJOR GROUP – ‘49’ ELECTRIC GAS AND SANITARY SERVICES**

**TECHNICAL SUPPORT DOCUMENT (TSD)**  
**For**  
**AIR QUALITY PERMIT 3002**

**I. GENERAL COMMENTS:**

**A. Company Information**

1. Source Name: Davis-Monthan AFB, SIC Code, Major Group – ‘49’ – Electric, Gas, and Sanitary Services
2. Source Address: 3775 S. 5<sup>th</sup> Street, Tucson, AZ 85707

**B. Background**

Davis-Monthan AFB (DMAFB) currently operates under 7 older Class II/III air quality permits. It is considered a synthetic minor source of HAPs and a true minor for all other pollutants. The activities and operations covered by this permit fall under the following industrial classification:

- SIC Code, Major Group – ‘49’ Electric, Gas, and Sanitary Services
- North American Industry Classification System (NAICS): 221210-330 & 562211-219

This TSD was updated for the renewal of the previous 5 year permit. The existing permit was issued on June 1, 2004 and expired May 31, 2009. DMAFB continues to operate under the expired permit pursuant to Pima Count Code (PCC) 17.12.165.J and submitted a timely renewal applications on November 25, 2008, which were updated on October 16, 2015.

With this renewal, PDEQ plans to terminate permit #1701 and incorporate the voluntary synthetic minor HAPs limitations into the following permits. The allowable HAPs emissions apply base-wide to sources under the common control of DMAFB and have been divided among the permits with the concomitant monitoring and reporting in each permit as summarized in the following table.

<b>Allowable HAPs &amp; Voluntary Limits, Tons Per Year</b>	<b>Stationary Source Air Permits</b>
3.5	Permit #3000: DMAFB, Major Group – 42 – Special Warehousing and Storage
13.0	Permit #3001: DMAFB, Major Group – 45 – Transportation by Air
1.5	Permit #3002: DMAFB, Major Group – 49 – Electric, Gas, and Sanitary Services
1.5	Permit #3004: DMAFB, Major Group – 65 – Real Estate
1.5	Permit #3005: DMAFB, Major Group – 80 – Health Services
1.5	Permit #3006: DMAFB, Major Group – 97 – National Security
<b>22.5 TPY Total <sup>1</sup></b>	<b>Permit #'s 3000, 3001, 3002, 3004, 3005, 3006 <sup>1</sup></b>

<sup>1</sup> The HAPs emissions are limited fence-line to fence-line, in accordance with section 112 of the Act within the contiguous or adjacent areas under the common control of the DMAFB. In general, PDEQ considers individual military services including the National Guard, and the Department of Defense agencies not to be under common control, when taken collectively. National Guard units as well as Department of Defense agencies and their operations at DMAFB may be considered to be under separate control, but are viewed as being under common control within each division. PDEQ also considers leased activities “or tenants” at DMAFB under separate control and therefore not regulated as part of DMAFB operations, whereas contract-for-service activities or contractor-operated activities are. Leased activities may be considered by PDEQ to be under common control when they also have a contract-for-service relationship to provide more than 50% of the goods or services to the military installation and should be evaluated on a case-by-case basis. (See Footnote on Page 2, Ref. EPA Guidance Document).

## Permitting History

The Pima County Department of Environmental Quality (PDEQ) received a Title V permit application from DMAFB on May 9, 1995. Later, in April 1996 DMAFB submitted a significant revision to establish voluntary and federally enforceable emission limits on hazardous air pollutants (HAPs) to remain below major source levels under Section 112 of the Act and within the meaning in PCC 17.04.340.A.128.b. This was done in part to avoid federally applicable requirements in 40 CFR Part 63, Subpart GG – National Emission Standards for Aerospace Manufacturing and Rework Facilities. As a result, PDEQ issued Permit # 1701 to DMAFB in August of 1998 limiting the HAP emission to below major source levels and establishing DMAFB as a synthetic minor source of HAP.

Davis-Monthan AFB continued to operate under Permit #1701 until the permit was renewed in 2003. At that time DMAFB submitted applications and a strategy to divide the operations and activities into functionally distinct industrial SIC Code Groupings, on the basis of the definition of a major stationary source under 40 CFR §70.2 and EPA Guidance.<sup>2</sup> PDEQ subsequently issued 7 separate synthetic minor stationary source permits for criteria air pollutants in June 2004 (Permit #'s 3000 – 3006), while maintaining the existing synthetic minor HAPs permit (Permit # 1701). Permit # 3003 was later terminated on December 2005 as a result of the removal of a lone diesel generator covered under the permit.

On May 28, 2009, DMAFB submitted a Title V application for the renewal and combination of the Criteria and HAPs permits into one permit. DMAFB later withdrew the Title V application on April 2, 2015 and reapplied on October 16, 2015 for synthetic minor permits under the functionally distinct industrial SIC Code Groupings.

### **C. Attainment Classification**

The DMAFB is located in an area that is in attainment for all pollutants.

## **II. SOURCE DESCRIPTION**

### **A. Process Description**

Davis-Monthan Air Force Base (DMAFB) is a key Air Combat Command (ACC) installation of the United States Air Force (USAF). The base is located approximately five miles south-southeast of downtown Tucson, Arizona. The 355th Fighter Wing (355 FW) is the host unit, providing medical, logistical, mission, and operational support to all assigned units. As the location of the USAF Materiel Command's 309th Aerospace Maintenance and Regeneration Group (AMARG), Davis-Monthan AFB is the aircraft boneyard for excess military and government aircraft. Davis-Monthan AFB is a large multi-faceted installation which is comparable in size and function to a small city. Specifically, the base has operations including, but not limited to: retail markets, hospital and dental clinics, public works, warehouse facilities, utilities, recreational facilities, an airfield, maintenance operations, and auto/wood hobby shops.

The activities and operations covered by this permit are those stationary sources which fall under the industrial classification SIC Code: Major Group 49 – Electric, Gas, and Sanitary Services (NAICS 221210-330 & 562211-219)

The permitted activities and operations covered under this permit includes: various stationary rotating machinery including emergency and non-emergency engines.

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<sup>2</sup> Reference: EPA Guidance Document: Major Source Determinations for Military Installations under the Air Toxics, New Source Review, and Title V Operating Permit Programs of the Clean Air Act”, dated August 2, 1996.

**B. Operating Capacity and Schedule**

The operating schedule at the facility is not limited and the equipment is permitted for operation 7/days/week, 24 hours a day, 365 days a year subject to the fuel and hour limitations in the equipment list.

**C. Air Pollution Control Equipment**

Post combustion controls may be employed as needed by the engine manufacturer’s to comply with federal standards and requirements for internal combustion engines.

**III. REGULATORY HISTORY**

DMAFB is currently in compliance with all Pima County Code requirements.

**IV. EMISSIONS ESTIMATES**

DMAFB conducts activities and operations that have a potential to emit Hazardous Air Pollutants in excess of major source thresholds without voluntarily accepted emission limitations and operating restrictions in this and other permits to limit HAPs emissions to less than major source levels (< 22.5 tons/year).

Emission estimates for internal combustion engines were derived using standard emission factors and methods from AP-42 Compilation of Air Pollution Emission Factors – Volume 1: Stationary and Area Sources and/or factors in the Air Emissions Guide for Air Force Stationary Sources, October 2014 . The PTE has been calculated using the voluntary fuel limitations of diesel, natural gas, and gasoline proposed by the Permittee for firing in the engines and appropriate emission factors.

The permit also requires Permittee to maintain additional records for miscellaneous chemical/materials issues for sources covered by this permit (SIC major group ‘49’) and to maintain a materials inventory system to track the mass of combined and individual HAP emitted from materials issues using mass balance methods.

The following table outlines DMAFB’s potential to emit pollutants.

<i>Controlled<sup>1</sup> Facility-Wide Potential Emissions of Pollutants (tons/yr)</i>										
Conventional or Criteria Air Pollutant								NSPS	HAPs	
PM <sub>2.5</sub>	PM <sub>10</sub>	PM	NO <sub>x</sub>	VOC	CO	SO <sub>2</sub>	Lead <sup>2</sup>	N/A	Total	Single Formaldehyde
5.07	5.07	5.07	81.08	25	25.77	4.15	Negligible	N/A	< 1.5	< 0.8

<sup>1</sup> PTE is calculated on the voluntary limitation on the amount of fuels fired in the permitted emergency, non-emergency, and fire pump engines and voluntary HAPs limits.

**V. APPLICABLE REQUIREMENTS**

**40 CFR, Part 60 Standards of Performance for New Stationary Sources**

- Subpart A General Provisions
- Subpart III Standards of Performance for Stationary Compression Ignition Engines
- Appendix A Test Methods

## **40 CFR, Part 63 National Emissions Standards for Hazardous Air Pollutants for Source Categories**

Subpart A General Provisions

Subpart ZZZZ NESHAP for Stationary Reciprocating Internal Combustion Engines

### **Pima County Code Title 17, Chapter 17.12 – Permits and Permit Revisions**

#### **Article I – General Provisions**

- 17.12.010 Statutory Authority
- 17.12.020 Planning, Constructing, or Operating Without a Permit
- 17.12.040 Reporting requirements
- 17.12.045 Test methods and procedures
- 17.12.050 Performance tests
- 17.12.080 Permit Display or Posting

#### **Article II – Individual Source Permits**

- 17.12.165 Permit application processing procedures for Class II and Class III permits
- 17.12.185 Permit contents for Class II and Class III permits
- 17.12.190 Permits containing synthetic emission limitations and standards
- 17.12.235 Permit Changes that require a permit revision
- 17.12.240 Procedures for certain changes that do not require a permit revision Class II or Class III
- 17.12.255 Minor Permit Revision
- 17.12.260 Significant Permit Revision
- 17.12.270 Permit Reopenings – Revocation and reissuance – Termination
- 17.12.350 Material permit condition

#### **Article VI – Individual Source Permits**

- 17.12.520 Fees related to Class II and Class III permits

### **Pima County Code Title 17, Chapter 17.16 – Emission Limiting Standards**

#### **Article I – General Provisions**

- 17.16.010 Local rules and standards; Applicability of more than one standard
- 17.16.020 Noncompliance with applicable standards
- 17.16.030 Odor limiting standards

#### **Article II – Visible Emission Standards**

- 17.16.040 Standards and applicability (includes NESHAP)
- 17.16.050 Visibility limiting standard

**Article IV – New and Existing Stationary Source Performance Standards**

- 17.16.130 Applicability
- 17.16.230 Standards of performance for storage vessels of petroleum liquids
- 17.16.340 Standards of performance for stationary rotating machinery
- 17.16.400 Organic solvents and other organic materials
- 17.16.430 Standards of performance for unclassified sources

**Pima County Code Title 17, Chapter 17.20 – Emissions Source Testing and Monitoring**

- 17.20.010 Source sampling, monitoring and testing
- 17.20.040 Concealment of emissions

**Pima County Code Title 17, Chapter 17.24 – Emission Source Recordkeeping and Reporting**

- 17.24.020 Recordkeeping for compliance determination
- 17.24.050 Reporting as permit requirement

**VI. REQUIREMENTS SPECIFICALLY IDENTIFIED AS NON-APPLICABLE**

In accordance with PCC 17.04.340.A.(114) PDEQ has determined that 8 runway barrier engines (8 units @ 65 hp each), and a small 10 hp gasoline powered emergency generator are insignificant activities due to the estimated emissions from these units being de-minimus at less than 5 tpy of VOC and less than 0.1 tpy of HAPs.

**VII. PERMIT CHANGES and APPLICABILITY DETERMINATIONS**

**A. Permit and Permit Summary:**

The Specific Conditions have been organized into permit sections specific to the equipment and emission source categories at the facility. Some conditions in the previous permit may no longer apply or not be included. Conditions to voluntarily limit the emissions of HAPs from sources covered by this permit previously contained in Air Permit #1701 have been incorporated into the permit. The permit limits the amount of fuels (natural gas, diesel, and gasoline) that can be fired in the engines and provides corresponding monitoring and recordkeeping for these amounts in addition to the applicable federal emission standards and monitoring applicable for each of the emergency and fire pump engine classes. Additional monitoring for miscellaneous chemicals/materials usage and portable sources that may become stationary sources have also been added to Section 2 of the permit.

**B. General Applicability (Section 1):**

This Section of the permit incorporates provisions relating the statutory authority, permit classification, and provides a summary of the permitted facility sources and the organization of the permit sections.

**C. Permit-Wide Operations (Section 2):**

This Section incorporates permit-wide provisions applicable to all sources covered under this permit and is used to streamline provisions applicable to the specific sources in other Sections of the permit. The facility-wide provisions include the following: voluntary emission limitations, general control standards, materials handling standards, odor limiting standard, opacity limit, visibility limiting standard, portable sources, miscellaneous chemical/materials use, and asbestos requirements for demolition and renovation activities. This Section also includes the facility-wide provisions for monitoring, recordkeeping, reporting requirements, facility changes, and testing requirements.

**D. NESHAP for Stationary CI RICE (Section 3):**

This Section incorporates the specific federal limits and requirements for the operation of existing emergency stationary compression ignition engines subject to 40 CFR 63, NESHAP Subpart ZZZZ. The federal requirements limit these engines to less than 100 hours per calendar year for maintenance and testing and less than 50 of the 100 hours per year are allowed for non-emergency situations. There are no limitations for use of the emergency generators in true emergencies

**E. NESHAP for Stationary SI RICE (Section 4):**

This Section incorporates the specific federal limits and requirements for the operation of two non-emergency stationary 4SLB spark ignition engines subject to 40 CFR 63, Subpart ZZZZ.

**F. NSPS for Stationary Internal Combustion Engines ‘ICE’ (Section 5):**

This Section incorporates specific federal emission limits and requirements for installation and operation of emergency stationary compression ignition engines subject to 40 CFR Part 60, NSPS Subpart IIII. The federal requirements limit emergency engines to less than 100 hours per calendar year for maintenance and testing and less than 50 of the 100 hours per year are allowed for non-emergency situations if they qualify per 40 CFR 60.6640(f)(4)(ii). There are no limitations for the use of the emergency generators for true emergencies.

**F. Specific Applicability Provisions (Section 6):**

This Section of the permit includes specific conditions on the applicability of the permitted facility sources and relates the specific applicability to source categories in each Section of the permit.

**VII. Periodic Monitoring**

This is a Class II permit and as such does not include the mandatory submittal of a semiannual summary report of required monitoring or an annual compliance certification to the Control Officer. The permit requires the facility to maintain the required periodic monitoring records and/or reports on site.

**IX. Control Technology Determination**

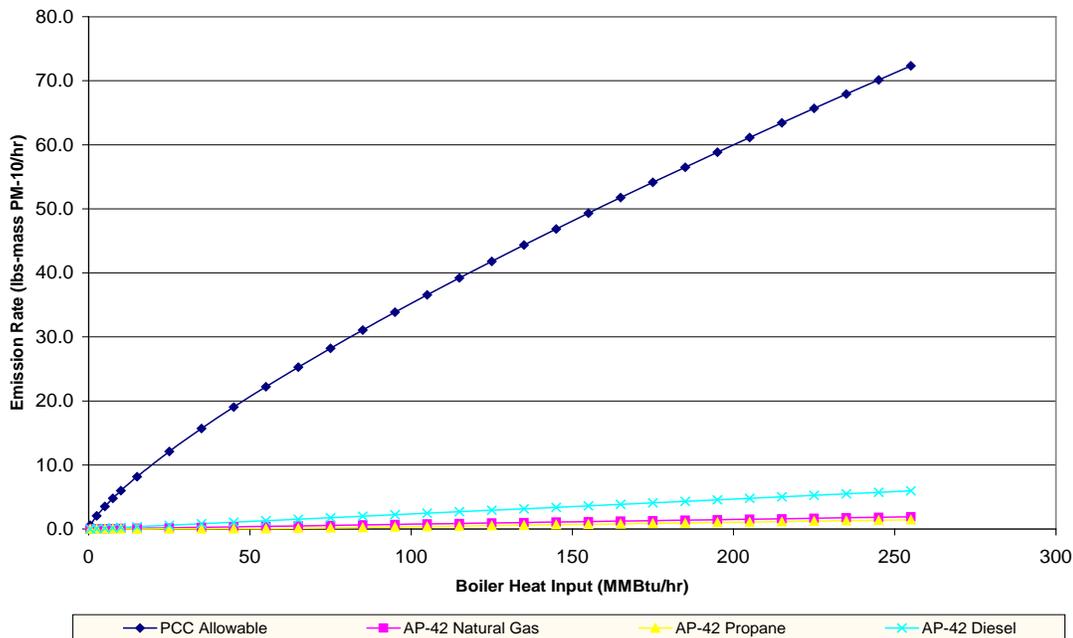
No control technologies needed to be determined; the source is not subject to RACT, BACT or LAER.

## X. Exclusion of PCC Particulate Matter Discharge Rate Standards

The applicable PCC rules for the maximum particulate discharge rates are not normally included for Class II area source permits as explained below.

- For particulate matter sources, the calculated maximum particulate matter discharge rate, as provided in Title 17, yields maximum rates that far exceed the emissions expected from most typical area sources. For example a 200 ton/hour process source, which is typical for an average construction aggregate, screening operation, would be limited to a maximum particulate matter discharge rate of 40.4 lbs/hour or 177 tons/year. This limit far exceeds estimated emissions from typical sources using EPA AP-42 emission factors and the source is far more likely to exceed opacity and visibility limiting standards well before reaching this limit.
- With regard to fuel burning equipment, PCC 17.16.165.C limits the emissions of particulate matter from commercial and industrial fossil-fuel fired equipment (including but not limited to boilers). This limit is not normally included in permits because allowable emissions are consistently over an entire order of magnitude higher than EPA AP-42 estimated potential emissions. The chart below, illustrates the point.

Comparison of Emissions of PM-10 for Boilers: PCC Allowable vs AP-42 Estimated



Comparative Chart of Allowable Particulate Emissions Under Pima County Code, Title 17, and Estimated Potential Emissions based on EPA AP-42 Estimates for External Combustion Sources. Allowable emissions are consistently over ten times estimated potential emissions. Therefore, it is not necessary to include the standard in the permit explicitly, but by reference in Attachment 1.

## XI. Exclusion of PCC Sulfur Dioxide Emission Standards

Compliance with the fuel sulfur limitation requirements in the permit shall ensure compliance with the Sulfur Dioxide Standards of PCC 17.16.165.E and 17.16.340.F; which limit the emission of SO<sub>2</sub> to 1.0 pound per million BTU of heat input when burning low sulfur fuel. The definition of low sulfur fuel (PCC 17.04.340.A. “Low Sulfur Fuel”) is fuel oil containing less than 0.9 percent sulfur by weight. “High Sulfur Fuel” is defined as fuel oil containing 0.9% wt. or more Sulfur. In accordance with EPA AP-42 Appendix A, page A-5, the heating value of diesel fuel is estimated at 137,000 BTU per gallon. Thus, 1 million BTU of heat input is equivalent to 7.3 gallons of diesel. At 7.05 lbs per gallon, 51.47 lbs of diesel will produce 1 million BTU. At 0.9% 51.47 lbs of diesel contains 0.46 lbs of sulfur. Combined with Oxygen to form SO<sub>2</sub>, and assuming 100% of the sulfur in the fuel forms SO<sub>2</sub>, this would yield 0.92 lb SO<sub>2</sub> per 1MMBtu. Thus, low sulfur fuel oil will produce 0.92 lbs of SO<sub>2</sub> per million BTU of heat input. This is roughly 8% less than the prescribed 1.0 pound SO<sub>2</sub> per million BTU limit.

An excess emissions report is required to be submitted to the control officer should the fuel oils fired in fuel burning equipment, to include non NSPS / non NESHAP rotating machinery, contain 0.9% wt. Sulfur or greater since the permit explicitly prohibits the use of high sulfur oil by the Permittee.

Jet fuel, natural gas, gasoline, and No. 1 and 2 distillate fuel oils and diesel delivered to Pima County consistently show sulfur levels below this limit as shown in fuel supplier certifications which verify the sulfur content of the fuel fired. The equipment specific sulfur content limitations in the permit and the prohibition to use high sulfur oil allow for the omission of PCC 17.16.165.E and PCC 17.16.340.F These rules are incorporated by reference in Attachment 1 of the permit.