PUBLIC NOTICE

Arnold Engineering Development Complex has applied to the Tennessee Department of Environment and Conservation, Division of Air Pollution Control for a significant modification to their existing major source (Title V) operating permit subject to the provisions of Tennessee Air Pollution Control Regulations 1200-03-09-.02(11) (Title V Regulations). A major source operating permit is required by both the Federal Clean Air Act and Tennessee's air pollution control regulations. However, it should be noted that this facility has a current major source operating permit.

The Title V operating permit subject to the modification is identified as follows: Division identification number 16-0010/570221. The specific permit conditions affected by this modification are identified as follows: E1 (fee payment); E2 (reporting requirements); added E29-1 through E29-6 (source specific conditions for 16-0010-75). Additional a greement letters were added to Attachment 4. Only the portions of the Title V permit affected by this significant modification #2 are open for comment during the notice period.

EPA has a greed to treat this draft significant modification #2 to permit no. 570221 as a proposed Part 70 significant permit modification and to perform its 45-day review provided by the law concurrently with the public notice period. If any substantive comments are received, EPA's 45-day review period will cease to be performed concurrently with the public notice period. In this case, EPA's 45-day review period will start once the public notice period has been completed and EPA receives notification from the Tennessee Air Pollution Control Division that comments have been received and resolved. The status regarding EPA's 45-day review of these permits and the deadline for submitting a citizen's petition can be found at the following website address:

https://www.epa.gov/caa-permitting/tennessee-proposed-title-v-permits

Copies of the application materials and draft permits are available for public inspection during normal business hours at the following locations:

and

Columbia Environmental Field Office Division of Air Pollution Control 1421 Hampshire Pike Columbia, TN 38401 Tennessee Department of Environment and Conservation Division of Air Pollution Control William R. Snodgrass Tennessee Tower

312 Rosa L. Parks Avenue, 15th Floor Nashville, TN 37243

Electronic copies of the draft permit and application materials are available by accessing the TDEC internet site located at:

http://www.tn.gov/environment/ppo-public-participation/ppo-public-participation/ppo-air.html

Questions concerning the source(s) may be addressed to Justin Dolzen at (615) 532-0575 or by e-mail at Justin. Dolzen@tn.gov.

Interested parties are invited to review these materials and comment. In addition, a public hearing may be requested at which written or oral presentations may be made. To be considered, written comments or requests for a public hearing must be received no later than 4:30 PM on **April 17, 2024**. To assure that written comments are received and addressed in a timely manner, written comments must be submitted using one of the following methods:

- 1. **Mail, private carrier, or hand delivery:** Address written comments to Ms. Michelle W. Owenby, Director, Division of Air Pollution Control, William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue 15th Floor, Nashville, Tennessee 37243.
- 2. **E-mail**: Submit electronic comments to <u>air.pollution.control@tn.gov</u>.

A final determination will be made after weighing all relevant comments.

Individuals with disabilities who wish to review information maintained at the above-mentioned depositories should contact the Tennessee Department of Environment and Conservation to discuss any auxiliary aids or services needed to facilitate such review. Such contact may be in person, by writing, telephone, or other means, and should be made no less than ten days prior to the end of the public comment period to allow time to provide such aid or services. Contact the Tennessee Department of Environment and Conservation ADA Coordinator, William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue 22nd Floor, Nashville, TN 37243, 1-(866)-253-5827. Hearing impaired callers may use the Tennessee Relay Service, 1-(800)-848-0298.

TITLE V PERMIT STATEMENT

Significant Modification #2

Facility Name: Arnold Engineering Development Complex (AEDC)

City: Arnold Air Force Base (Tullahoma)

County: Coffee

Date Renewal Application Received: April 22, 2015 and September 13, 2016

Date Application Deemed Complete: September 13, 2016

Emission Source Reference No.:16-0010

Permit No.: 570221

INTRODUCTION

This narrative is being provided to assist the reader in understanding the content of the attached Title V operating permit. This Title V Permit Statement is written pursuant to Tennessee Air Pollution Control Rule 1200-03-09-.02(11)(f)1.(v). The primary purpose of the Title V operating permit is to consolidate and identify existing state and federal air requirements applicable to *Arnold Engineering Development Complex* and to provide practical methods for assuring compliance with these requirements. The following narrative is designed to accompany the renewal Title V Operating Permit. It initially describes the facility receiving the permit, then the applicable requirements and their significance, and finally the compliance status with those applicable requirements. This narrative is intended only as an adjunct for the reviewer and has no legal standing. Any revisions made to the permit in response to comments received during the public participation process will be described in an addendum to this narrative.

Acronyms

PSD - Prevention of Significant Deterioration

NESHAP - National Emission Standards for Hazardous Air Pollutants

NSPS - New Source Performance Standards

MACT - Maximum Achievable Control Technology

NSR - New Source Review

GHGs - Greenhouse Gasses

I. Identification Information

A. Source Description

AEDC is a military installation with a primary function as a flight simulation test facility. The site consists of numerous propulsion wind tunnels, rocket and turbine engine test cells, and other specialized testing units engaged in the testing and development of aircraft, missiles, aircraft engines, rocket motors, and satellites. The aero propulsion test facilities consist of the Engine Test Facility (ETF, Sources 06 and 19), Aero propulsion Systems Test Facility (ASTF, Sources 30, 31, and 46), and the Sea Level Test Facilities (SL-1, SL-2, and SL-3, Sources 53 and 56). The aerodynamic test facilities consist of the Propulsion Wind Tunnel (PWT, Sources 08 and 52) facility and the Aerodynamic and Propulsion Test Unit (APTU, Source 14). The rocket testing facilities consist of the Liquid and Solid Rocket Engine Test Facilities (Sources 17 and 18, respectively). Hypersonic testing facilities include the ASTF and the Von Karmen Gas Dynamics (VKF, Sources 07, 28, 35, 42, and 50) facility. Other miscellaneous emission sources at the facility are steam plant A (Sources 01, 02, 03, and

04), steam plant C (Source 43), emergency engines (Source 70), desiccant drying units (Source 72), a high pressure indirect fired air heater (source), two RSH heaters (Source 76), three electric DF ARC Heaters (Source 78).

B. Facility Classification

1. Attainment or Non-Attainment Area Location

Area is designated as an attainment area for all criteria pollutants.

2. Company is located in a Class II area (this means that the facility is not located within a national park or national wilderness area; see 40 CFR 52.21(e) for complete definition.)

C. Regulatory Status

1. PSD/NSR

This facility is a major source under PSD.

2. Title V Major Source Status by Pollutant (Emission rates following Minor Modification #2)

	Is the		
Pollutant	pollutant emitted?	Emissions (tpy)	Major Source?
PM	Yes	185.02	Yes
PM_{10}	Yes	included in PM	Yes
SO_2	Yes	628.88	Yes
VOC	Yes	345.08	Yes
NO_X	Yes	1346.18	Yes
СО	Yes	2,180.02	Yes
Individual HAP	Yes	>10	Yes
Total HAPs	Yes	>25	Yes
CO ₂ e	Yes	>100,000	Yes

3. MACT Standards

This facility is a major source for HAPs.

This facility is subject to final MACT Standards: 40 CFR Part 63, Subpart ZZZZ, 40 CFR Part 63, Subpart DDDDD, and 40 CFR Part 61, Subpart I

4. Program Applicability

Are the following programs applicable to the facility?

PSD yes

NESHAP Yes

NSPS Yes

II. Compliance Information

A. Compliance Status

Is the facility currently in compliance with all applicable requirements? Yes

Are there any applicable requirements that will become effective during the permit term? Yes

III. Other Requirements

A. Emissions Trading

The facility is not involved in an emission trading program.

B. Acid Rain Requirements

This facility is not subject to any requirements in Title IV of the Clean Air Act.

C. Prevention of Accidental Releases

Not applicable

D. Greenhouse Gas Emissions

This facility's potential to emit greenhouse gases is greater than the major source threshold

IV. Public Participation Procedures

Notification of this draft permit was emailed to the following environmental agencies:

- 1. EPA Region IV
- 2. State of Alabama
- 3. State of Georgia
- 4. Metro Nashville

V. Permit History (First Renewal):

Title V Operating Permit No. 560453 represents the first renewal of the original Title V Permit No. 546264 issued May 9, 2002.

Permit Modification and Changes since last permit: The following changes have occurred under the last Title V Permit No. 560453:

- A. The first Title V Permit Renewal (560453) issued on December 1, 2010.
- B. Administrative Amendment #1, December 1, 2010: Correction of typographical error to the reporting periods in Conditions E2(a) and E2(b).
- C. Minor Modification #1, May 20, 2011: Certain existing emergency engines previously deemed insignificant activities are now subject to the RICE MACT (subpart ZZZZ). This permit action incorporates these engines into the Title V permit. Also, 4 new emergency engines are going to be installed, replacing 4 older emergency engines. These new engines are subject to the CI RICE NSPS (subpart IIII).
- D. Significant Modification #1, October 10, 2011: Some solid rocket test articles at Source 18 will contain radiological materials, and testing of these articles will be subject to 40 CFR 61, Subpart I.
- E. Minor Modification #2, March 9, 2012: Emergency engine was installed at the Commissary, replacing an existing emergency engine. The new engine is subject to the CI RICE NSPS (subpart IIII).
- F. Minor Modification #2, March 9, 2012: Emergency engine was installed at the Dispensary, replacing an existing emergency engine. The new engine is subject to the CI RICE NSPS (subpart IIII).
- G. Minor Modification #2, March 9, 2012: Removed sources 67 and 71 (AC&T Air Stripper and SWMU10 Thermal Treatment Project) as both activities have ceased operation. Also corrected typographical error in Condition E26-4.
- H. Administrative Amendment #2, September 28, 2012: Changed facility name to Arnold Engineering Development Complex, and responsible official to Raymond G. Toth.
- I. Minor Modification #3, October 22, 2012: Emergency engine was removed from the Mark I area.
- J. Minor Modification #4, April 1, 2013: Silane usage was increased (and thereby, allowable PM emissions) at the APTU Test Facility.
- K. Minor Modification #5, April 29, 2013: A hydrogen fluoride emission limit was established for the ETF Test Cells (source 19).
- L. Minor Modification #6, September 9, 2013: Emergency engine to be installed at the Main Gate
- M. Addition of new test rig with isobutane heater and small propane burner (Minor Modification #7, October 14, 2013)
- N. Established a permit limit on operating hours of the VKF auxiliary heater (source 35) to classify the unit as "limited use" under the major source boiler MACT. Also, each source at the facility that is affected by the boiler MACT was identified and noted as such. Opacity matrix decision tree was updated. The permit modification incorporated all previous changes that have occurred at the facility to date (Significant Modification #2, May 20, 2014)
- O. Emergency engine was removed from the Propulsion Wind Tunnel area. (Minor Modification #8, May 20, 2014)
- P. A VOC emission limit was established for the Aerodynamic Propulsion Test Unit (source 14) (Minor Modification #9, May 20, 2014)
- Q. Minor Permit Modification #10 requests the removal of the Aero-Propulsion System Test Facility (ASTF) Air Stripper (16-0010-45) from the permit, in a letter dated December 5, 2014. Conditions E20-1 through E20-4 are being removed. Conditions E1 and E2 are being modified accordingly, to remove references to Conditions E20-1 through E20-4.

VI. Permit History (Second Renewal):

Title V Operating Permit No. 570221 represents the second renewal of the original Title V Permit No. 546264 issued May 9, 2002 and subsequent renewal permit No. 560453 issued December 1, 2010.

Permit Modification and Changes since last permit: The following changes have occurred under the last Title V Permit No. 570221:

- A. The second Title V Permit Renewal (570221) issued on June 22, 2017.
- B. Minor Permit Modification #1 was issued January 28, 2018. In an application dated August 25, 2017, AEDC requested a minor permit modification for the following changes for source 16-0010-07:
 - (1) Replacing four existing heaters (W15, W16, W17, & W18; total heat input 29.6 MMBtu/hr) with two (2) new heaters (Heater #1: 19.1 MMBtu/hr and Heater #2: 12.7 MMBtu/hr; total 31.8 MMBtu/hr).
 - (2) Conditions E7-1 (MM1) for design input rate and E7-3 (MM1) for TSP emission rate, have been modified to account for the new heaters.
- C. Significant Permit Modification #1 was issued July 30, 2020. In applications dated April 5, 2019, and July 23, 2019, AEDC requested a significant permit modification for the following changes for source 16-0010-06, 07, 08, and 28:
 - (1) Application of a 10% annual capacity factor limit to each source. This will reclassify these heaters as "limited use" units, which only require tune-ups once every five years according to 40 CFR 63 Subpart DDDDD. The annual emissions for each source are now limited by the new annual capacity factor instead of by agreement letter and fuel usage restrictions. See supporting calculations in item 13.
 - (2) Conditions E6-6, E7-6, and E8-8 have been added to apply the 10% annual capacity factor limit to source 06, 07, and 08.
 - (3) Condition E13-3 was modified to change the 3000 hour operating limit to a more restrictive 10% annual capacity factor. The 3000 hour operating limit was taken for PSD avoidance purposes, therefore if the 10% annual capacity factor is removed the operating hours for this source must remain restricted to no more than 3000 hours per year. The letter agreeing to the operating hour limitation dated May 5, 1982, has been added to Attachment 4 of the permit.
 - (4) Condition E2 was modified to include the new recordkeeping required by E6-6, E7-6, and E8-8, as well as the modified recordkeeping requirement of E13-3.
 - (5) Permit shell conditions were updated.
 - (6) Responsible/Technical/Billing contacts were updated.
 - (7) Compliance with Condition E16-5 was added to the compliance method for E16-3 and E16-4.
 - (8) A reference to the agreement letter dated May 17, 1993, which established the existing emission limits contained in E23-4, E23-5, and E23-6 was added.
 - (9) E1 Fee summary table was updated based on this significant modification and existing permit limits.
 - (10)APC Fee Selection form was added as Attachment 3.
 - (11) Agreement letters were added as Attachment 4.
 - (12) Compliance methods were added to Conditions E6-2, E7-2, E8-2, and E13-3.
 - (13) AP 42 Factors for Natural Gas Combustion

Pollutant	Factor (lb/10 ⁶ ft ³)	Emissions (lb/hr)	Emissions (tpy)	Source
PM	7.6	4.99	2.19	16-0010-06
SO_2	0.6	0.39	0.17	10-0010-00
PM	7.6	1.54	5.81	16-0010-07*
SO_2	0.6	0.12	0.46	10-0010-07
PM	7.6	0.38	0.17	16-0010-08
SO_2	0.6	0.03	0.01	10-0010-00

^{*} This source is made up of 3 heating units, 2 with an annual capacity factor and 1 with no limit

AP 42 Factors for Propane Combustion

Pollutant	Factor (lb/10 ³ gal)	Emissions (lb/hr)	Emissions (tpy)	Source
PM	0.7	0.83	0.36	16-0010-28
SO_2	0.10(S)	0.02	0.01	10-0010-28

- D. Minor Permit Modification #2 was issued February 16, 2023. In an application dated May 2, 2022, AEDC requested a minor modification to add two process heaters to the facility permit. Per §63.9(b)(1)(iii) the Division has allowed the Minor Modification application to fulfill the Initial Notification requirements of 40 CFR 63 Subpart DDDDD. The following changes were made:
 - (1) The fee table in Condition E1 was updated.
 - (2) Condition E3-1 was updated to contain a more detailed description of 40 CFR 63 Subpart DDDDD requirements.
 - (3) Condition E4-2 was updated to apply to all sources unless otherwise noted in the permit.
 - (4) The Responsible Official listed in E4-10 was updated.
 - (5) Conditions E29-1 through E29-8 were added.
 - (6) Agreement letter dated February 10, 2023, was added to Attachment 4.
 - (7) Table 10 to Subpart DDDDD was added as Attachment 5.
- E. In an application dated January 31, 2023, AEDC requested a minor modification to add three electric arc heaters to the facility permit (Source 78). Additional information from AEDC representative Mr. Jeffrey Holt regarding the potential to emit for this source is included as Attachment 1 to this statement of basis. In an application dated May 25, 2023, AEDC requested a significant modification to place a federally enforceable annual capacity factor of 10% on the C1 high pressure indirect fired air heater (Source 75) so that the unit would meet the definition of "limited-use boiler or process heater" as defined in 40 CFR 63 Subpart DDDDD §63.7575. These modifications were processed concurrently. The following changes were made:
 - (1) Paragraph (d) and (e) were added to Condition A11.
 - (2) A requirement to comply with any applicable requirement that becomes effective during the permit term no later than required by the provisions of the new applicable requirement was added to Condition A18.
 - (3) Condition B7 was reserved.
 - (4) A requirement to report the probable cause of a deviation and any corrective actions or preventative measures taken was added to Condition B8.
 - (5) The fee table in Condition E1 was updated.
 - (6) Condition E2(a) was updated to include monitoring and recordkeeping requirements for Sources 75 and 78.
 - (7) Conditions E29-1 through E29-8 (Source 77) were updated to Conditions E30-1 through E30-8.
 - (8) Source 75 was incorporated into this permit. Conditions E29-1 through E29-6 (Source 75) were added.
 - (9) Conditions E31-1 and E31-2 (Source 78) were added.
 - (10) Agreement letters dated February 11, 2021, and March 7, 2024, were added to Attachment 5.

From: HOLT, JEFFREY K CTR USAF AFMC AEDC/SE < jeffrey.holt.3.ctr@us.af.mil>

Sent: Friday, May 12, 2023 11:08 AM

To: Justin Dolzen Justin.Dolzen@tn.gov; LE, TRUNG V CIV USAF AFMC AEDC/TSDCI trung.le@us.af.mil>

Subject: RE: More Details: 16-0010/570221 minor modification

Justin,

For security reasons, I cannot go into a detailed description of the individual steps that must be taken for each test. I have kept it general but hopefully there is enough information to meet your requirements. I have broken the information into 3 pieces: information that applies to all arc heater tests, info that applies only to sub-atmospheric pressure tests and info that applies only to atmospheric pressure testing.

There are 50 work weeks per year (subtracting the 10 holidays per year). At 5 days per week, we have 250 workdays in a year. The PTE was calculated assuming 175 sub atmospheric pressure tests plus an additional 125 atmospheric pressure for a total of 300 tests per year.

Over the past several years, hypersonic systems testing has become an extremely high priority for our nation's national defense. Our other arc heater facility was and still is under great pressure to test as much and as frequently as possible. Even under these circumstances, the combined number of sub-atmospheric and atmospheric tests have never even approached the PTE assumption of 175 sub atmospheric tests in one year. In fact, we have only conducted a total of 200 tests (sub-atmospheric) in the past THREE years. We have assumed 4.5 times the number of tests as our PTE than we were able to do at near our maximum capabilities, and nearly 5 times the run time than we were able to complete. We are quite confident in the PTE we have included in the application for NOx generation.

All DF Arc Heater Tests

Test articles (models) are supposed to arrive at least 14 days prior to the test. Since each test has its own set of unique requirements, the test cell hardware must be reconfigured to accommodate the data demands of the test customer and the particular test article.

Each test requires many steps that must occur prior to and after the actual test day. These details cannot be listed for obvious reasons.

We have never conducted more than 1 test in a single day even including multiple test cells.

Days prior to the test: Each model must undergo a thorough inspection prior to installation to ensure no damage has occurred during shipment or that there are not any manufacturing defects. The facility configuration is modified to meet the requirements for that specific test and specific test article.

At least one day prior to the test, there are a series of checks to ensure the hardware changes meet the necessary criteria. Then, the model is installed into the test cell.

On the day of the test, detailed pre-ops are performed to ensure proper function of all hardware including the test article. This process takes several hours, and commonly requires the test to be delayed one or more days to complete. At the conclusion of the test, the test cell is purged with clean air for a specified period of time to ensure all NO2 has been eliminated. This is verified using NO2 detectors to ensure the safety of personnel. Then, the post-ops are performed in somewhat reverse order of the pre-ops. The model is removed and undergoes rigorous inspection for artifacts, damage, anticipated ablation measurements etc. The test operation group performs as many parallel tasks as possible but many of these steps must be performed in a linear sequence.

In the days after the test series has concluded, we remove any remaining test specific hardware from the test cell and reconfigure for the next series coming in as there will always be changes to be made. Additionally, the facility and supporting plant infrastructure require preventative maintenance and/or repairs to keep the entire facility operational. These tasks can vary from an hour to whole shifts. If there are any support facility changes that are required between models, then this will add yet another day to the turnaround for the next test.

3

The model buildup, installation and breakdown take a lot longer than one would think. Plus, there are a lot of meetings to discuss technical objectives that aren't even being considered in this description.

Sub-atmospheric test schedule:

Assuming a best-case scenario where we could average testing every other workday, we have included an additional 50 extra tests per year for a total of 175 tests per year. This assumes that there are no hardware malfunctions which is not reality. These are extremely harsh environments and hardware malfunctions occur very frequently which reduces duration of that particular test and delays the start of the next test.

The average test is approximately 3.73 minutes long. To be conservative again, we increased this value by 50% to 5.59 minutes (round it to 336 seconds).

When the electrical arc is stopped at the end of the test, we allowed for an additional 20 seconds cool-down period to ensure the air temperature has dropped below 2,000 F. Thermal NOx is not produced at temperatures below 2,000 F. NOx is also produced a much lower rate during this cool-down time, but we are assuming the NOx generation remains constant during cool-down as well.

So, 336 + 20 = 356 seconds of operation per test.

The average NOx generation was determined to be about 0.53 lb/s, but we are using a value of 1 lb/s just to add yet another layer of conservatism.

The total sub-atmospheric NOx generation is: 356 seconds per test x 175 tests per year x 1.0 lbs NOx per second = 62.300 lbs of NOx per year or 31.15 tons NOx per year.

Atmospheric test schedule:

These tests require similar setup times. From an environmental perspective, atmospheric tests of much lower concern due to the NOx emission rate being nearly 14 times lower than that for sub-atmospheric tests. The demand for atmospheric pressure testing is much lower than sub-atmospheric demand for somewhat obvious reasons. Most objects to not fly at sea level, but rather at altitude.

We assumed 125 atmospheric tests per year.

5.6 minute test duration (50% higher than actual) plus the 20 second cool-down period

356 seconds per test x 125 tests per year x 0.071 lb/s NOx = 3,204 lbs/year = 1.6 tons NOx per year

Total NOx emission = 31.15 + 1.6 = 32.75 tons per year

One other point... You asked about other associated emissions to ensure the PTE was below the 40 tpy threshold. I told you no, and that is still the case. We plan to use air ejectors to produce the necessary vacuum to simulate altitude conditions. A bank of high pressure air tanks will be on-site to supply the air ejectors. These tanks will be repressurized between test periods using existing electrically-powered air compressors. This may reduce the potential test frequency because it takes hours to recharge these for a test.

At one time, we considered using high pressure steam ejectors. But, our existing steam boilers did not produce the necessary volume and pressure. We evaluated purchasing a natural gas-fired boiler to supply the steam, but then we discovered that our water plant didn't have the excess capacity to supply the boilers with feedwater. This would force us to construct another water treatment plant to supply the new boilers needed to supply the high pressure steam to the test cell. When we evaluated the cost of a new boiler and a new water plant, the entire idea was rejected. If we were to use a boiler specifically dedicated to supplying steam for the DF Arc Heaters, the NOx emissions were determined to add 3.4 tons per year of NOx. If included in the PSD threshold calculation it would still be less than the 40 tpy threshold. As far as I know, we are still going with air ejectors so there will be no boiler emissions from this project.

One other thing I will mention is the potential to construct a cooling tower. Arc heaters use non-contact, water-cooled heat exchangers to decrease the water temperature prior to discharge through our NPDES permitted outfalls. This operation will not emit any air pollutants. Even if the design specifies that this water will be sprayed directly into the exhaust, this water would capture NO2 and it wouldn't be removed in the cooling tower. Even if all this captured NO2 were released in the air from this cooling water, there is a zero increase in NOx emissions over what was already calculated.

Let me know if this is sufficient justification.

STATE OF TENNESSEE AIR POLLUTION CONTROL BOARD DEPARTMENT OF ENVIRONMENT AND CONSERVATION NASHVILLE, TENNESSEE 37243



SIGNIFICANT MODIFICATION #2 To

OPERATING PERMIT (TITLE V) Issued Pursuant to Tennessee Air Quality Act

This permit fulfills the requirements of Title V of the Federal Clean Air Act (42 U.S.C. 7661a-7661e) and the federal regulations promulgated thereunder at 40 CFR Part 70 (FR Vol. 57, No. 140, Tuesday, July 21, 1992 p.32295-32312). This permit is issued in accordance with the provisions of paragraph 1200-03-09-.02(11) of the Tennessee Air Pollution Control Regulations (TAPCR). The permittee has been granted permission to operate an air contaminant source in accordance with emissions limitations and monitoring requirements set forth herein.

Date Issued: June 22, 2017 **Permit Number:**

Date of Significant Modification #2: draft 570221

Date Expires: June 21, 2022

Issued To:
Arnold Engineering Development Complex

Installation Address:
100 Kindel Drive

100 Kindel Drive Arnold Air Force Base

Primary SIC: 97

Installation Description:

Flight simulation test facilities with aerodynamic and propulsion wind tunnels, rocket and turbine engine test cells, space environment chambers, are heaters, ballistic ranges and other specialized units. (See next page for details)

Facility ID: 16-0010

Renewal Application Due Date:

Between September 24, 2021 and December 23, 2021

Information Relied Upon:

Application dated: April 22, 2015, and revision application updated September 13, 2016. Minor Modification Application Dated: August 25, 2017
Significant Modification Applications Dated: April 5, 2019, and July 23, 2019
Minor Modification Application Dated May 2, 2022
Minor Modification Application Dated January 31, 2023
Significant Modification Application Dated May 25, 2023

(continued on the next page)

 TECHNICAL SECRETARY	

No Authority is Granted by this Permit to Operate, Construct, or Maintain any Installation in Violation of any Law, Statute, Code, Ordinance, Rule, or Regulation of the State of Tennessee or any of its Political Subdivisions.

POST AT INSTALLATION ADDRESS

Rev. 7/11/19 RDA-1298

Installation Description (cont.):

Source Number:	Description:	
01 & 02:	Steam Plant A (MACT) Boilers 01, 02, 03, 04	
06:	ETF Heaters (MACT) North and South Heaters	
07:	VKF Heaters (MACT) Heater W15, Heater W16, Heater W17, Heater W18, Process Heater	
08:	PWT Air Dryer (MACT)	
14:	APTU Test Facility Iso-butane fired heaters for Testing Solid and Liquid Rocket Motors as well as Aircraft Engines.	
17:	Liquid Rocket Testing This testing may be conducted either in 16-0010-17 Liquid Rocket Test Cell Facility, 16-0010-18 Solid Rocket Test Cell Facility, 16-0010-19 ETF Test Cells, or 16-0010-31 ASTF Test Cells	
18:	Solid Rocket Testing (MACT) This testing may be conducted either in 16-0010-18 Solid Rocket Test Cell Facility, 16-0010-19 ETF Test Cells, or 16-0010-31 ASTF Test Cells, as well as enclosed chambers, such as the J6 dehumidification chamber, within the Solid Rocket Test Complex.	
19:	ETF Test Cells	
28:	HB1 Heaters 1A & 1B (MACT)	
30:	ASTF Heaters (MACT)	
31:	ASTF Test Cells and Glycol Reboilers EG-A & EG-B	
35:	VKF Auxiliary Heater (MACT)	
40:	Chemical Cleaning Facility	
42:	ARC Heaters (3)	
43:	Steam Plant C (MACT)	
46:	T-3 Air Heater (MACT)	
52:	PWT Engine Testing	
53:	SL1 Test Cell	
56:	SL2/SL3 Test Cells	
70:	Engines for Emergency Generators (NSPS/MACT)	
72:	Desiccant Dryers (MACT)	
75:	C1 High Pressure Indirect Fired Air Heater (MACT)	
76:	Air Purge from PWT Test Facility	
77:	RSH Heaters (2) (MACT)	
78:	DF Arc Heaters (DF-4, DF-5, DF-6)	

CONTENTS

SECTION A

GENERAL PERMIT CONDITIO	NS.
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A1.	Definitions	1
A2.	Compliance requirement	1
A3.	Need to halt or reduce activity	1
A4.	The permit	1
A5.	Property rights	1
A6.	Submittal of requested information	1
A7.	Severability clause	1
A8.	Fee payment	2
A9.	Permit revision not required	2
A10.	Inspection and entry	2
A11.	Permit shield	3
A12.	Permit renewal and expiration	3
A13.	Reopening for cause	3
A14.	Permit transference	4
A15.	Air pollution alert	4
A16.	Construction permit required	4
A17.	Notification of changes	5
A18.	Schedule of compliance	5
A19.	Title VI	5
A20.	112 (r)	5

SECTION B

GENERAL CONDITIONS for MONITORING, REPORTING, and ENFORCEMENT

B1.	Recordkeeping	6
B2.	Retention of monitoring data	6
B3.	Reporting	6
B4.	Certification	6
B5.	Annual compliance certification	6
B6.	Submission of compliance certification	7
B7.	Reserved	7
B8.	Excess emissions reporting	7
B9.	Malfunctions, startups and shutdowns - reasonable measures required	7
B10.	Reserved	8
B11.	Report required upon the issuance of notice of violation for excess emissions	8

12

	CONTENTS	
	SECTION C	
	PERMIT CHANGES	
C1.	Operational flexibility changes	9
C2.	Section 502(b)(10) changes	9
C3.	Administrative amendment	9
C4.	Minor permit modifications	10
C5.	Significant permit modifications	10
C6.	New construction or modifications	10
	SECTION D	
	GENERAL APPLICABLE REQUIREMENTS	
D1.	Visible emissions	11
D2.	General provisions and applicability for non-process gaseous emissions	11
D3.	Non-process emission	11
D4.	General provisions and applicability for process gaseous emissions	11
D5.	Particulate emissions from process emission sources	11
D6.	Sulfur dioxide emission standards	11
D7.	Fugitive dust	11
D8.	Open burning	12
D9.	Asbestos	12
D10.	Annual certification of compliance	12
D11.	Emission Standards for Hazardous Air Pollutant	12
D12.	Standards of Performance for New Stationary Sources	12
D13.	Dispensing Facilities	12

D14. Internal Combustion Engines

CONTENTS

SECTION E

SOURCE SPECIF	IC EMISSION STAN	DARDS, OPERATING	LIMITATIONS, and
MONITORING	, RECORDKEEPING	G and REPORTING F	EQUIREMENTS

E1.	Fee payment:	13
E1. E2.	Reporting requirements	15 15
112.	(a) Semiannual reports	10
	(b) Annual compliance certification	
	(c) Retention of records	
	(d) NSPS reports for certain engines	
E3.	40 CFR 63, Subpart DDDDD	17
E4.	General Permit Requirements	19
E5.	Steam Plant A (01, 02)	21
E6.	ETF Heaters (06)	24
E7.	VKF Heaters (07)	25
E8.	PWT Air Dryer (08)	26
E9.	APTUTest Facility (14)	28
E10.	Liquid Rocket Testing (17)	30
E11.	Solid Rocket Testing (18)	31
E12.	ETF Test Cells (19)	32
E13.	HB1 Heaters 1A & 1B (28)	34
E14.	ASTF Heaters (30)	36
E15.	ASTF Test Cells And Glycol Reboilers EG-A & EG-B (31)	38
E16.	VKF Auxiliary Heater (35)	39
E17.	Chemical Cleaning Facility (40)	40
E18.	ARC Heaters (42)	40
E19.	Steam Plant C (43)	41
E21.	T-3 Air Heater (46)	42
E22.	PWT Engine Testing (52)	43
E23.	SL1 Test Cell (53)	45
E24.	SL2/SL3 Test Cells (56)	47
E26.	Emergency Engines (70)	49
E28.	Desiccant Dryers (72)	54
E29.	CI High Pressure Indirect Fired Air Heater (75)	56
E30.	RSH Heaters (77)	57
E31.	DF Electric Arc Heaters (78)	58
End of	Significant Modification #2 to Permit Number 570221	59
ATTA	CHMENT 1 Opacity Matrix Decision Tree for Visible Emission Evaluation Methods 2, 3, & 9, dated June 18, 1996 (amended September 11, 2013)	3 pages
ATTA	CHMENT 2 Emission Factors for Various Aircraft Engines, Rocket Motors, and Arc H	leaters 8 pages
ATTA	CHMENT 3 Title V Fee Selection Form – APC 36 (CN-1583)	2 pages
ATTA	CHMENT 4 Agreement Letters	32 pages
ATTA	CHMENT 5 Table 10 to Subpart DDDDD – Applicability of General Provisions to Subpart DDDDD of Part 63	3 pages

SECTION A

GENERAL PERMIT CONDITIONS

A permit issued under the provisions of Tennessee Air Pollution Control Regulations (TAPCR) paragraph 1200-03-09-.02(11) is a permit issued pursuant to the requirements of Title V of the Federal Act and its implementing Federal regulations promulgated at 40 CFR, Part 70.

A1. Definitions. Terms not otherwise defined in the permit shall have the meaning assigned to such terms in the referenced regulations.

TAPCR 1200-03 and 0400-30

A2. Compliance requirement. All terms and conditions in a permit issued pursuant to TAPCR paragraph 1200-03-09-.02(11), including any provisions designed to limit a source's potential to emit, are enforceable by the Administrator and citizens under the Federal Act. The permittee shall comply with all conditions of its permit. Except for requirements specifically designated herein as not being federally enforceable (State Only), non-compliance with the permit requirements is a violation of the Federal Act and the Tennessee Air Quality Act and is grounds for enforcement action; for a permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. Non-compliance with permit conditions specifically designated herein as not being federally enforceable (State Only) is a violation of the Tennessee Air Quality Act and may be grounds for these actions.

TAPCR 1200-03-09-.02(11)(e)2(i) and 1200-03-09-.02(11)(e)1(vi)(I)

A3. Need to halt or reduce activity. The need to halt or reduce activity is not a defense for noncompliance. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit. However, nothing in this item shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in assessing penalties for noncompliance if the health, safety, or environmental impacts of halting or reducing operations would be more serious than the impacts of continuing operations.

TAPCR 1200-03-09-.02(11)(e)1(vi)(II)

A4. The permit. The permit may be modified, revoked, reopened, and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

TAPCR 1200-03-09-.02(11)(e)1(vi)(III)

A5. Property rights. The permit does not convey any property rights of any sort, or any exclusive privilege.

TAPCR 1200-03-09-.02(11)(e)1(vi)(IV)

A6. Submittal of requested information. The permittee shall furnish to the Technical Secretary, within a reasonable time, any information that the Technical Secretary may request in writing to determine whether cause exists for modifying, revoking and reissuing, or termination of the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Technical Secretary copies of records required to be kept by the permit. If the permittee claims that such information is confidential, the Technical Secretary may review that claim and hold the information in protected status until such time that the Board can hear any contested proceedings regarding confidentiality disputes. If the information is desired by EPA, the permittee may mail the information directly to EPA. Any claims of confidentiality for federal purposes will be determined by EPA.

TAPCR 1200-03-09-.02(11)(e)1(vi)(V)

A7. <u>Severability clause.</u> The requirements of this permit are severable. A dispute regarding one or more requirements of this permit does not invalidate or otherwise excuse the permittee from their duty to comply with the remaining portion of the permit.

TAPCR 1200-03-09.02(11)(e)1(v)

A8. Fee payment.

- (a) The permittee shall pay an annual Title V emission fee based upon the responsible official's choice of actual emissions, allowable emissions, or a combination of actual and allowable emissions; and on the responsible official's choice of annual accounting period. An emission cap of 4,000 tons per year per regulated pollutant per major source SIC Code shall apply to actual or allowable based emission fees. A Title V annual emission fee will not be charged for emissions in excess of the cap. Title V annual emission fees will not be charged for carbon monoxide or for greenhouse gas pollutants solely because they are greenhouse gases.
- (b) Title V sources shall pay allowable based emission fees until the beginning of the next annual accounting period following receipt of their initial Title V operating permit. At that time, the permittee shall begin paying their Title V fee based upon their choice of actual or allowable based fees, or mixed actual and allowable based fees. Once permitted, the Responsible Official may revise their existing fee choice by submitting a written request to the Division no later than December 31 of the annual accounting period for which the fee is due.
- (c) When paying annual Title V emission fees, the permittee shall comply with all provisions of TAPCR Rule 1200-03-26-.02 and paragraph 1200-03-09-.02(11) applicable to such fees.
- (d) Where more than one allowable emission limit is applicable to a regulated pollutant, the allowable emissions for the regulated pollutants shall not be double counted. Major sources subject to the provisions of TAPCR paragraph 1200-03-26-.02(9) shall apportion their emissions as follows to ensure that their fees are not double counted.
 - 1. Sources that are subject to federally promulgated hazardous air pollutant standards that can be imposed under TAPCR Chapter 0400-30-38 or Chapter 1200-03-31 will place such regulated emissions in the regulated hazardous air pollutant (HAP) category.
 - 2. A category of miscellaneous HAPs shall be used for hazardous air pollutants listed at TAPCR part 1200-03-26-.02(2)(i)12 that are not subject to federally promulgated hazardous air pollutant standards under 40 CFR 60, 61, or 63 or TAPCR chapter 1200-03-31.
 - 3. HAPs that are also in the family of volatile organic compounds, particulate matter, or PM₁₀ shall not be placed in either the regulated HAP category or miscellaneous HAP category.
 - **4.** Sources that are subject to a provision of TAPCR chapter 1200-03-16 New Source Performance Standards (NSPS) or chapter 0400-30-39 Standards of Performance for New Stationary Sources for pollutants that are neither particulate matter, PM₁₀, sulfur dioxide (SO₂), volatile organic compounds (VOC), nitrogen oxides (NO_x), or hazardous air pollutants (HAPs) will place such regulated emissions in an NSPS pollutant category.
 - 5. The regulated HAP category, the miscellaneous HAP category, and the NSPS pollutant category are each subject to the 4,000 ton cap provisions of TAPCR subparagraph 1200-03-26-.02(2)(i).
 - Major sources that wish to pay annual emission fees for PM $_{10}$ on an allowable emission basis may do so if they have a specific PM $_{10}$ allowable emission standard. If a major source has a total particulate emission standard, but wishes to pay a nnual emission fees on an actual PM $_{10}$ emission basis, it may do so if the PM $_{10}$ actual emission levels are proven to the satisfaction of the Technical Secretary. The method to demonstrate the actual PM $_{10}$ emission levels must be made as part of the source's major source operating permit in advance in order to exercise this option. The PM $_{10}$ emissions reported under these options shall not be subject to fees under the family of particulate emissions. The 4,000 ton cap provisions of TAPCR subparagraph 1200-03-26-.02(2)(i) shall also apply to PM $_{10}$ emissions.

TAPCR 1200-03-26-.02 and 1200-03-09-.02(11)(e)1(vii)

A9. Permit revision not required. A permit revision will not be required under any approved economic incentives, marketable permits, emissions trading and other similar programs or process for changes that are provided for in the permit.

TAPCR 1200-03-09-.02(11)(e)1(viii)

- **A10.** <u>Inspection and entry.</u> Upon presentation of credentials and other documents as may be required by law, the permittee shall allow the Technical Secretary or an authorized representative to perform the following for the purposes of determining compliance with the permit applicable requirements:
 - (a) Enter upon, at reasonable times, the permittee's premises where a source is located or emissions-related activity is conducted, or where records must be kept under the conditions of the permit;
 - (b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit;
 - (c) Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit; and
 - (d) As authorized by the Clean Air Act and Chapter 1200-03-10 of the TAPCR, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit or applicable requirements.

SIGNIFICANT MODIFICATION #2 EXPIRATION DATE: JUNE 21, 2022

(e) "Reasonable times" shall be considered to be customary business hours unless reasonable cause exists to suspect noncompliance with the Act, TAPCR Division 1200-03 or any permit issued pursuant thereto and the Technical Secretary specifically authorizes an inspector to inspect a facility at any other time.

TAPCR 1200-03-09-.02(11)(e)3(ii)

A11(SM2). Permit shield.

- (a) Compliance with the conditions of this permit shall be deemed compliance with all applicable requirements as of the date of permit issuance, provided that:
 - 1. Such applicable requirements are included and are specifically identified in the permit; or
 - 2. The Technical Secretary, in acting on the permit application or revision, determines in writing that other requirements specifically identified are not applicable to the source, and the permit includes the determination or a concise summary thereof.
- (b) Nothing in this permit shall alter or affect the following:
 - 1. The provisions of section 303 of the Federal Act (emergency orders), including the authority of the Administrator under that section. Similarly, the provisions of T.C.A. §68-201-109 (emergency orders) including the authority of the Governor under the section;
 - 2. The liability of an owner or operator of a source for any violation of applicable requirements prior to or at the time of permit issuance;
 - 3. The applicable requirements of the acid rain program, consistent with section 408(a) of the Federal Act; or
 - **4.** The ability of EPA to obtain information from a source pursuant to section 114 of the Federal Act.
- (c) Permit shield is granted to the permittee.
- (d) The permit shield does not apply to permit changes made under the minor permit modification procedures of TAPCR subpart 1200-03-09-.02(11)(f)5(ii) nor the administrative permit amendment procedures of TAPCR part 1200-03-09-.02(11)(f)4, except that the permit shield may be extended for administrative permit amendments that meet the relevant requirements of TAPCR subparagraph 1200-03-09-.02(11)(e), subparagraph 1200-03-09-.02(11)(f) and subparagraph 1200-03-09-.02(11)(g) for significant permit modifications.
- (e) The permit shield does not apply to off-permit changes made under the operational flexibility provisions of TAPCR part 1200-03-09-.02(11)(a)4.

TAPCR 1200-03-09-.02(11)(e)6 and 1200-03-09-.02(11)(f)4(iv)

A12. Permit renewal and expiration.

- (a) An application for permit renewal must be submitted at least 180 days, but no more than 270 days, prior to the expiration of this permit. Permit expiration terminates the source's right to operate unless a timely and complete renewal application has been submitted.
- (b) If the permittee submits a timely and complete application for permit renewal the source will not be considered to be operating without a permit until the Technical Secretary takes final action on the permit application, except as otherwise noted in TAPCR paragraph 1200-03-09-.02(11).
- (c) This permit, its shield provided in Condition A11, and its conditions will be extended and effective after its expiration date provided that the source has submitted a timely, complete renewal application to the Technical Secretary.

TAPCR 1200-03-09-.02(11)(f)2 and 3, 1200-03-09-.02(11)(d)1(i)(III), and 1200-03-09-.02(11)(a)2

A13. Reopening for cause.

- (a) A permit shall be reopened and revised prior to the expiration of the permit under any of the circumstances listed below:
 - 1. Additional applicable requirements under the Federal Act become applicable to the sources contained in this permit provided the permit has a remaining term of 3 or more years. Such a reopening shall be completed not later than 18 months after promulgation of the applicable requirement. No such reopening is required if the effective date of the requirement is later than the permit expiration date of this permit, unless the original has been extended pursuant to TAPCR part 1200-03-09-.02(11)(a)2.
 - **2.** Additional requirements become applicable to an affected source under the acid rain program.
 - 3. The Technical Secretary or EPA determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of the permit.
 - 4. The Technical Secretary or EPA determines that the permit must be revised or revoked to a ssure compliance with the applicable requirements.

- (b) Proceedings to reopen and issue a permit shall follow the same proceedings as apply to initial permit issuance and shall affect only those parts of the permit for which cause to reopen exists, and not the entire permit. Such reopening shall be made as expeditiously as practicable.
- (c) Reopenings for cause shall not be initiated before a notice of such intent is provided to the permittee by the Technical Secretary at least 30 days in advance of the date that the permit is to be reopened except that the Technical Secretary may provide a shorter time period in the case of an emergency. An emergency shall be established by the criteria of T.C.A. 68-201-109 or other compelling reasons that public welfare is being adversely affected by the operation of a source that is in compliance with its permit requirements.
- (d) If the Administrator finds that cause exists to terminate, modify, or revoke and reissue a permit as identified in A13, the Administrator is required under federal rules to notify the Technical Secretary and the permittee of such findings in writing. Upon receipt of such notification, the Technical Secretary shall investigate the matter in order to determine if he/she agrees or disagrees with the Administrator's findings. If the Technical Secretary a grees with the Administrator's findings, the Technical Secretary shall conduct the reopening in the following manner:
 - 1. The Technical Secretary shall, within 90 days after receipt of such notification, forward to EPA a proposed determination of termination, modification, or revocation and reissuance, as a ppropriate. If the Administrator grants additional time to secure permit applications or additional information from the permittee, the Technical Secretary shall have the additional time period added to the standard 90-day time period.
 - 2. EPA will evaluate the Technical Secretary's proposed revisions and respond as to their evaluation.
 - 3. If EPA agrees with the proposed revisions, the Technical Secretary shall proceed with the reopening in the same manner prescribed under Condition A13(b) and Condition A13(c).
 - 4. If the Technical Secretary disagrees with either the findings or the Administrator that a permit should be reopened or an objection of the Administrator to a proposed revision to a permit submitted pursuant to Condition A13(d), the Technical Secretary shall bring the matter to the Board at its next regularly scheduled meeting for instructions as to how the Division should proceed. The permittee shall be required to file a written brief expressing their position relative to the Administrator's objection and have a responsible official present at the meeting to answer questions for the Board. If the Board a grees that EPA is wrong in their demand for a permit revision, they shall instruct the Technical Secretary to conform to EPA's demand, but to issue the permit under protest preserving all rights available for litigation against EPA.

TAPCR 1200-03-09-.02(11)(f)6 and 7

- **A14. Permit transference.** An administrative permit amendment allows for a change of ownership or operational control of a source where the Technical Secretary determines that no other change in the permit is necessary, provided that the following requirements are met:
 - (a) Transfer of ownership permit application is filed consistent with the provisions of TAPCR paragraph 1200-03-09-.03(6), and
 - (b) written a greement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new permittee has been submitted to the Technical Secretary.

TAPCR 1200-03-09-.02(11)(f)4(i)(IV) and 1200-03-09-.03(6)

- A15. <u>Air pollution alert.</u> When the Technical Secretary has declared that an air pollution alert, an air pollution warning, or an air pollution emergency exists, the permittee must follow the requirements for that episode level as outlined in TAPCR paragraph 1200-03-09-.03(1) and TAPCR Rule 1200-03-15-.03.
- A16. Construction permit required. Except as exempted in TAPCR Rule 1200-03-09-.04, or excluded in TAPCR subparagraph 1200-03-02-.01(1)(aa) or TAPCR subparagraph 1200-03-02-.01(1)(cc), this facility shall not begin the construction of a new air contaminant source or the modification of an air contaminant source which may result in the discharge of air contaminants without first having applied for and received from the Technical Secretary a construction permit for the construction or modification of such air contaminant source.

TAPCR 1200-03-09-.01(1)(a)

- **A17.** Notification of changes. The permittee shall notify the Technical Secretary 30 days prior to commencement of any of the following changes to an air contaminant source which would not be a modification requiring a construction permit.
 - (a) change in air pollution control equipment
 - (b) change in stack height or diameter
 - (c) change in exit velocity of more than 25 percent or exit temperature of more than 15 percent based on a bsolute temperature.

TAPCR 1200-03-09-.02(7)

A18(SM2). Schedule of compliance. The permittee will comply with any applicable requirement that becomes effective during the permitterm on a timely basis and no later than required by the provisions of the new applicable requirement. If the permittee is not in compliance the permittee must submit a schedule for coming into compliance which must include a schedule of remedial measure(s), including an enforceable set of deadlines for specific actions.

TAPCR 1200-03-09-.02(11)(d)3, 1200-03-09-.03(8), 0400-30-38, 0400-30-39, and 40 CFR Part 70.5(c)

A19. Title VI.

- (a) The permittee shall comply with the standards for recycling and emissions reduction pursuant to 40 CFR, Part 82, Subpart F, except as provided for motor vehicle air conditioners (MVACs) in Subpart B:
 - 1. Persons opening appliances for maintenance, service, repair, or disposal must comply with the required practices pursuant to Section 82.156.
 - **2.** Equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment pursuant to Section 82.158.
 - 3. Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program pursuant to Section 82.161.
- (b) If the permittee performs a service on motor (fleet) vehicles when this service involves ozone depleting substance refrigerant in the motor vehicle air conditioner (MVAC), the permittee is subject to all the applicable requirements as specified in 40 CFR, Part 82, Subpart B, Servicing of Motor Vehicle Air Conditioners.
- (c) The permittee shall be allowed to switch from any ozone-depleting substance to any alternative that is listed in the Significant New Alternatives Program (SNAP) promulgated pursuant to 40 CFR, Part 82, Subpart G, Significant New Alternatives Policy Program.

TAPCR 1200-03-09-.03(8)

A20. 112 (r). Sources which are subject to the provisions of Section 112(r) of the federal Clean Air Act or any federal regulations promulgated thereunder, shall annually certify in writing to the Technical Secretary that they are properly following their accidental release plan. The annual certification is due in the office of the Technical Secretary no later than January 31 of each year. Said certification will be for the preceding calendar year.

TAPCR 1200-03-32-.03(3)

SECTION B

GENERAL CONDITIONS for MONITORING, REPORTING, and ENFORCEMENT

- **Recordkeeping.** Monitoring and related record keeping shall be performed in accordance with the requirements specified in the permit conditions for each individual permit unit. In no case shall reports of any required monitoring and record keeping be submitted less frequently than every six months.
 - (a) Where applicable, records of required monitoring information include the following:
 - 1. The date, place as defined in the permit, and time of sampling or measurements;
 - 2. The date(s) analyses were performed;
 - 3. The company or entity that performed the analysis;
 - 4. The analytical techniques or methods used;
 - 5. The results of such analyses; and
 - **6.** The operating conditions as existing at the time of sampling or measurement.
 - (b) Digital data accumulation which utilizes valid data compression techniques shall be acceptable for compliance determination as long as such compression does not violate an applicable requirement and its use has been approved in advance by the Technical Secretary.

TAPCR 1200-03-09-.02(11)(e)1(iii)

Retention of monitoring data. The permittee shall retain records of all required monitoring data and support information for a period of at least 5 years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit.

TAPCR 1200-03-09-.02(11)(e)1(iii)(II)II

Reporting. Reports of any required monitoring and record keeping shall be submitted to the Technical Secretary in accordance with the frequencies specified in the permit conditions for each individual permit unit. Reports shall be submitted within 60 days of the close of the reporting period unless otherwise noted. All instances of deviations from permit requirements must be clearly identified in such reports. All required reports must be certified by a responsible official. Reports required under "State only requirements" are not required to be certified by a responsible official.

TAPCR 1200-03-09-.02(11)(e)1(iii)

B4. Certification. Except for reports required under "State Only" requirements, any application form, report or compliance certification submitted pursuant to the requirements of this permit shall contain certification by a responsible official of truth, accuracy and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate and complete.

TAPCR 1200-03-09-.02(11)(d)4

- **Annual compliance certification.** The permittee shall submit annually compliance certifications with terms and conditions contained in Sections A, B, D and E of this permit, including emission limitations, standards, or work practices. This compliance certification shall include all of the following (provided that the identification of applicable information may cross-reference the permit or previous reports, as applicable):
 - (a) The identification of each term or condition of the permit that is the basis of the certification;
 - (b) The identification of the method(s) or other means used by the owner or operator for determining the compliance status with each term and condition during the certification period; such methods and other means shall include, at a minimum, the methods and means required by this permit. If necessary, the owner or operator also shall identify any other material information that must be included in the certification to comply with section 113(c)(2) of the Federal Act, which prohibits knowingly making a false certification or omitting material information;
 - (c) The status of compliance with the terms and conditions of the permit for the period covered by the certification, including whether compliance during the period was continuous or intermittent. The certification shall be based on the method or means designated in B5(b) above. The certification shall identify each deviation and take it into account in the compliance

SIGNIFICANT MODIFICATION #2 **EXPIRATION DATE: JUNE 21, 2022**

certification. The certification shall also identify as possible exceptions to compliance any periods during which compliance is required and in which an excursion* or exceedance** as defined below occurred; and

- Such other facts as the Technical Secretary may require to determine the compliance status of the source.
- * "Excursion" shall mean a departure from an indicator range established for monitoring under this paragraph, consistent with any averaging period specified for averaging the results of the monitoring.
- ** "Exceedance" shall mean a condition that is detected by monitoring that provides data in terms of an emission limitation or standard and that indicates that emissions (or opacity) are greater than the applicable emission limitation or standard (or less than the applicable standard in the case of a percent reduction requirement) consistent with any averaging period specified for averaging the results of the monitoring.

40 CFR Part 70.6(c)(5)(iii) as a mended in the Federal Register Vol. 79, No.144, July 28, 2014, pages 43661 through 43667

B6. Submission of compliance certification. The compliance certification shall be submitted to:

The Tennessee Department of	and	Air Enforcement Branch
Environment and Conservation		US EPA Region IV
Environmental Field Office specified in		61 Forsyth Street, SW
Section E of this permit		Atlanta, Georgia 30303

TAPCR 1200-03-09-.02(11)(e)3(v)(IV)

B7(SM2). Reserved

B8(SM2). Excess emissions reporting.

- The permittee shall promptly notify the Technical Secretary when any emission source, air pollution control equipment, or related facility breaks down in such a manner to cause the emission of air contaminants in excess of the applicable emission standards contained in TAPCR Division 1200-03 or any permit issued thereto, or of sufficient duration to cause damage to property or public health. The permittee must provide the Technical Secretary with a statement giving all pertinent facts, including the estimated duration of the breakdown, the probable cause of the deviation, and any corrective actions or preventative measures taken. Violations of the visible emission standard which occur for less than 20 minutes in one day (midnight to midnight) need not be reported. Prompt notification will be within 24 hours of the malfunction and shall be provided by telephone to the Division's Nashville office. The Technical Secretary shall be notified when the condition causing the failure or breakdown has been corrected. In attainment and unclassified areas if emissions other than from sources designated as significantly impacting on a nonattainment area in excess of the standards will not and do not occur over more than a 24-hour period (or will not recur over more than a 24-hour period) and no damage to property and or public health is anticipated, notification is not required.
- Any malfunction that creates an imminent hazard to health must be reported by telephone immediately to the Division's Nashville office at (615) 532-0554 and to the State Civil Defense.
- A log of all malfunctions, startups, and shutdowns resulting in emissions in excess of the standards in TAPCR Division 1200-03 or any permit issued thereto must be kept at the plant. All information shall be entered in the log no later than twentyfour (24) hours after the startup or shutdown is complete, or the malfunction has ceased or has been corrected. Any later discovered corrections can be added in the log as footnotes with the reason given for the change. This log must record at least the following:
 - 1. Stack or emission point involved
 - 2. Time malfunction, startup, or shutdown began and/or when first noticed
 - 3. Type of malfunction and/or reason for shutdown
 - 4. Time startup or shutdown was complete or time the air contaminant source returned to normal operation
 - The company employee making entry on the log must sign, date, and indicate the time of each log entry

The information under items 1, and 2, must be entered into the log by the end of the shift during which the malfunction or startup began. For any source utilizing continuous emission(s) monitoring, continuous emission(s) monitoring collection satisfies the above log keeping requirement.

TAPCR 1200-03-20-.03 and .04

B9. Malfunctions, startups and shutdowns - reasonable measures required. The permittee must take all reasonable measures to keep emissions to a minimum during startups, shutdowns, and malfunctions. These measures may include installation and use of alternate control systems, changes in operating methods or procedures, cessation of operation until the process equipment and/or air pollution control equipment is repaired, maintaining sufficient spare parts, use of overtime labor, use of outside consultants and contractors, and other appropriate means. Failures that are caused by poor maintenance, careless operation or

SIGNIFICANT MODIFICATION #2 EXPIRATION DATE: JUNE 21, 2022

any other preventable upset condition or preventable equipment breakdown shall not be considered malfunctions. This provision does not apply to standards found in 40 CFR, Parts 60(Standards of performance for new stationary sources), 61(National emission standards for hazardous air pollutants) and 63(National emission standards for hazardous air pollutants for source categories).

TAPCR 1200-03-20-.02

- **B10.** Reserved.
- **Report required upon the issuance of a notice of violation for excess emissions.** The permittee must submit, within twenty days after receipt of the notice of violation, the data required below. If this data has been made available to the Te chnical Secretary prior to the issuance of the notice of violation no further action is required of the violating source. However, if the source desires to submit additional information, then this must be submitted within the same 20-day time period. The minimum data requirements are:
 - (a) The identity of the stack and/or other emission point where the excess emission(s) occurred;
 - (b) The magnitude of the excess emissions expressed in pounds per hour and the units of the applicable emission limitation(s) and the operating data and calculations used in determining the magnitude of the excess emissions;
 - (c) The time and duration of the emissions;
 - (d) The nature and cause of such emissions;
 - (e) For malfunctions, the steps taken to correct the situation and the action taken or planned to prevent the recurrence of such malfunctions;
 - (f) The steps taken to limit the excess emissions during the occurrence reported, and
 - (g) If applicable, documentation that the air pollution control equipment, process equipment, or processes were at all times maintained and operated in a manner consistent with good operating practices for minimizing emissions. Failure to submit the required report within the 20-day period specified shall preclude the admissibility of the data for determination of potential enforcement action.

TAPCR 1200-03-20-.06(2), (3) and (4)

SECTION C

PERMIT CHANGES

- **C1.** Operational flexibility changes. The source may make operational flexibility changes that are not addressed or prohibited by the permit without a permit revision subject to the following requirements:
 - (a) The change cannot be subject to a requirement of Title IV of the Federal Act or TAPCR Chapter 1200-03-30.
 - (b) The change cannot be a modification under any provision of Title I of the federal Act or TAPCR Division 1200-03.
 - (c) Each change shall meet all applicable requirements and shall not violate any existing permit term or condition.
 - (d) The source must provide contemporaneous written notice to the Technical Secretary and EPA of each such change, except for changes that are below the threshold of levels that are specified in TAPCR Rule 1200-03-09-.04.
 - (e) Each change shall be described in the notice including the date, any change in emissions, pollutants emitted, and any applicable requirements that would apply as a result of the change.
 - (f) The change shall not qualify for a permit shield under the provisions of TAPCR part 1200-03-09-.02(11)(e)6.
 - (g) The permittee shall keep a record describing the changes made at the source that result in emissions of a regulated air pollutant subject to an applicable requirement, but not otherwise regulated under the permit, and the emissions resulting from those changes. The records shall be retained until the changes are incorporated into subsequently issued permits.

TAPCR 1200-03-09-.02(11)(a)4(ii)

C2. Section 502(b)(10) changes.

- The permittee can make certain changes without requiring a permit revision, if the changes are not modifications under Title I of the Federal Act or TAPCR Division 1200-03 and the changes do not exceed the emissions allowable under the permit. The permittee must, however, provide the Administrator and Technical Secretary with written notification within a minimum of 7 days in advance of the proposed changes. The Technical Secretary may waive the 7 day advance notice in instances where the source demonstrates in writing that an emergency necessitates the change. Emergency shall be demonstrated by the criteria of TAPCR part 1200-03-09-.02(11)(e)7 and in no way shall it include changes solely to take advantages of an unforeseen business opportunity. The Technical Secretary and EPA shall attach each such notice to their copy of the relevant permit.
- (b) The written notification must be signed by a facility Title V responsible official and include the following:
 - 1. a brief description of the change within the permitted facility;
 - 2. the date on which the change will occur;
 - 3. a declaration and quantification of any change in emissions;
 - 4. a declaration of any permit term or condition that is no longer applicable as a result of the change; and
 - 5. <u>a declaration that the requested change is not a Title I modification and will not exceed allowable emissions under the permit.</u>
- (c) The permit shield provisions of TAPCR part 1200-03-09-.02(11)(e)6 shall not apply to Section 502(b)(10) changes.

TAPCR 1200-03-09-.02(11)(a)4(i)

C3. Administrative amendment.

- (a) Administrative permit a mendments to this permit shall be in accordance with TAPCR part 1200-03-09-.02(11)(f)4. The source may implement the changes a ddressed in the request for an administrative amendment immediately upon submittal of the request.
- (b) The permit shield shall be extended as part of an administrative permit amendment revision consistent with the provisions of TAPCR part 1200-03-09-.02(11)(e)6 for such revisions made pursuant to item (c) of this condition which meet the relevant requirements of TAPCR subparagraph 1200-03-09-.02(11)(e), TAPCR subparagraph 1200-03-09-.02(11)(f) and TAPCR subparagraph 1200-03-09-.02(11)(g) for significant permit modifications.
- (c) Proceedings to review and grant administrative permit a mendments shall be limited to only those parts of the permit for which cause to amend exists, and not the entire permit.

TAPCR 1200-03-09-.02(11)(f)4

C4. Minor permit modifications.

- (a) The permittee may submit an application for a minor permit modification in accordance with TAPCR subpart 1200-03-09-.02(11)(f)5(ii).
- (b) The permittee may make the change proposed in its minor permit modification immediately after an application is filed with the Technical Secretary.
- (c) Proceedings to review and modify permits shall be limited to only those parts of the permit for which cause to modify exists, and not the entire permit.
- (d) Minor permit modifications do not qualify for a permit shield.

TAPCR 1200-03-09-.02(11)(f)5(ii)

C5. Significant permit modifications.

- (a) The permittee may submit an application for a significant modification in accordance with TAPCR subpart 1200-03-09-.02(11)(f)5(iv).
- (b) Proceedings to review and modify permits shall be limited to only those parts of the permit for which cause to modify exists, and not the entire permit.

TAPCR 1200-03-09-.02(11)(f)5(iv)

C6. New construction or modifications.

Future construction at this facility that is subject to the provisions of TAPCR Rule 1200-03-09-.01 shall be governed by the following:

- (a) The permittee shall designate in their construction permit application the route that they desire to follow for the purposes of incorporating the newly constructed or modified sources into their existing operating permit. The Technical Secretary shall use that information to prepare the operating permit application submittal deadlines in their construction permit.
- (b) Sources desiring the permit shield shall choose the administrative amendment route of TAPCR part 1200-03-09-.02(11)(f)4 or the significant modification route of TAPCR subpart 1200-03-09-.02(11)(f)5(iv).
- (c) Sources desiring expediency instead of the permit shield shall choose the minor permit modification procedure route of TAPCR subpart 1200-03-09-.02(11)(f)5(ii) or group processing of minor modifications under the provisions of TAPCR subpart 1200-03-09-.02(11)(f)5(iii) as applicable to the magnitude of their construction.

TAPCR 1200-03-09-.02(11)(d)1(i)(V)

SECTION D

GENERAL APPLICABLE REQUIREMENTS

D1. <u>Visible emissions.</u>

- (a) With the exception of air emission sources exempt from the requirements of TAPCR Chapter 1200-03-05 and air emission sources for which a different opacity standard is specifically provided elsewhere in this permit, the permittee shall not cause, suffer, allow or permit discharge of a visible emission from any air contaminant source with an opacity in excess of twenty (20) percent for an aggregate of more than five (5) minutes in any one (1) hour or more than 20 minutes in any twenty-four (24) hour period; provided, however, that for fuel burning installations with fuel burning equipment of input capacity greater than 600 million btu per hour, the permittee shall not cause, suffer, allow, or permit discharge of a visible emission from any fuel burning installation with an opacity in excess of 20 percent (6-minute average) except for one six minute period per one hour of not more than 40 percent opacity. Sources constructed or modified after July 7, 1992, shall utilize 6-minute averaging.
- (b) Consistent with the requirements of TAPCR Chapter 1200-03-20, due allowance may be made for visible emissions in excess of that permitted under TAPCR Chapter 1200-03-05 which are necessary or unavoidable due to routine startup and shutdown conditions. The facility shall maintain a continuous, current log of all excess visible emissions showing the time at which such conditions began and ended and that such record shall be available to the Technical Secretary or an authorized representative upon request.

TAPCR 1200-03-05-.01(1), TAPCR 1200-03-05-.03(6) and TAPCR 1200-03-05-.02(1)

D2. General provisions and applicability for non-process gaseous emissions. Any person constructing or otherwise establishing a non-portable air contaminant source emitting gaseous air contaminants after April 3, 1972, or relocating an air contaminant source more than 1.0 km from the previous position after November 6, 1988, shall install and utilize the best equipment and technology currently available for controlling such gaseous emissions.

TAPCR 1200-03-06-.03(2)

- **Non-process emission standards.** The permittee shall not cause, suffer, allow, or permit particulate emissions from non-process sources in excess of the standards in TAPCR Chapter 1200-03-06.
- **D4.** General provisions and applicability for process gaseous emissions. Any person constructing or otherwise establishing an air contaminant source emitting gaseous air contaminants after April 3, 1972, or relocating an air contaminant source more than 1.0 km from the previous position after November 6, 1988, shall install and utilize equipment and technology which is deemed reasonable and proper by the Technical Secretary.

TAPCR 1200-03-07-.07(2)

- **D5.** Particulate emissions from process emission sources. The permittee shall not cause, suffer, allow, or permit particulate emissions from process sources in excess of the standards in TAPCR part 1200-03-07.
- **D6.** Sulfur dioxide emission standards. The permittee shall not cause, suffer, allow, or permit sulfur dioxide emissions from process and non-process sources in excess of the standards in TAPCR Chapter 1200-03-14. Regardless of the specific emission standard, new process sources shall utilize the best available control technology as deemed appropriate by the Technical Secretary of the Tennessee Air Pollution Control Board.

D7. Fugitive Dust.

- (a) The permittee shall not cause, suffer, allow, or permit any materials to be handled, transported, or stored; or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne. Such reasonable precautions shall include, but not be limited to, the following:
 - 1. Use, where possible, of water or chemicals for control of dust in demolition of existing buildings or structures, construction operations, grading of roads, or the clearing of land;
 - 2. Application of a sphalt, water, or suitable chemicals on dirt roads, material stockpiles, and other surfaces which can create airborne dusts;
 - 3. Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials. Adequate containment methods shall be employed during sandblasting or other similar operations.

SIGNIFICANT MODIFICATION #2 EXPIRATION DATE: JUNE 21, 2022

(b) The permittee shall not cause, suffer, allow, or permit fugitive dust to be emitted in such manner to exceed five (5) minutes per hour or 20 minutes per day as to produce a visible emission beyond the property line of the property on which the emission originates, excluding malfunction of equipment as provided in TAPCR Chapter 1200-03-20.

TAPCR 1200-03-08

D8. Open burning. The permittee shall comply with the TAPCR Chapter 1200-03-04 for all open burning activities at the facility.

TAPCR 1200-03-04

D9. Asbestos. Where applicable, the permittee shall comply with the requirements of 40 CFR Part 61 when conducting any renovation or demolition activities at the facility.

TAPCR 0400-30-38-.01(2) and 40 CFR, Part 61

- **D10.** Annual certification of compliance. The generally applicable requirements set forth in Section D of this permit are intended to apply to activities and sources that are insignificant emission units or activities. By annual certification of compliance with the conditions in this Section the permittee shall be considered to meet the monitoring and related record keeping and reporting requirements of TAPCR subpart 1200-03-09-.02(11)(e)1(iii) and part 1200-03-10-.04(2)(b)1 and the compliance requirements of TAPCR subpart 1200-03-09-.02(11)(e)3(i). The permittee shall submit compliance certification for these conditions annually.
- **D11.** Emission Standards for Hazardous Air Pollutants. The permittee shall comply with all applicable requirements of TAPCR Chapter 0400-30-38 for all emission sources subject to a requirement contained therein.
- **D12.** Standards of Performance for New Stationary Sources. The permittee shall comply with all applicable requirements of TAPCR chapters 0400-30-39 and 1200-03-16 for all emission sources subject to a requirement contained therein.
- **D13.** Gasoline Dispensing Facilities. The permittee shall comply with all applicable requirements of TAPCR Rule 1200-03-18-24 for all emission sources subject to a requirement contained therein.

D14. <u>Internal Combustion Engines.</u>

- (a) All stationary reciprocating internal combustion engines, including engines deemed insignificant activities and insignificant emission units, shall comply with the applicable provisions of TAPCR Rule 0400-30-38-.01.
- (b) All stationary compression ignition internal combustion engines, including engines deemed insignificant activities and insignificant emission units, shall comply with the applicable provisions of TAPCR Chapter 0400-30-39.
- (c) All stationary spark ignition internal combustion engines, including engines deemed insignificant activities and insignificant emission units, shall comply with the applicable provisions of TAPCR Chapter 0400-30-39.

TAPCR 0400-30-38 and 39

SECTION E

SOURCE SPECIFIC EMISSION STANDARDS, OPERATING LIMITATIONS, and MONITORING, RECORDKEEPING and REPORTING REQUIREMENTS

16-0010 <u>Facility Description</u>:

Arnold Engineering Development Complex is a complex of flight simulation test facilities with a erodynamic and propulsion wind tunnels, rocket and aircraft engine test cells, space environmental chambers, are heaters, ballistic ranges and other specialized units.

Conditions E1, E2, and E4-1 through E4-8 apply to all sources in Section E of the permit unless otherwise noted

E1(SM1). Fee payment:

FEE EMISSIONS SUMMARY TABLE FOR MAJOR SOURCE 16-0010

	ALLOWABLE	ACTUAL			
	EMISSIONS	EMISSIONS			
REGULATED POLLUTANTS	(tons per AAP)	(tons per AAP)	COMMENTS		
PARTICULATE MATTER (PM)	186.82	AEAR	Includes all fee emissions.		
PM_{10}	N/A	N/A	Included with PM fee emissions		
SO_2	628.93	AEAR	Includes all fee emissions.		
VOC	344.85	AEAR	Includes all fee emissions.		
NO _x	1,341.88	AEAR	Includes all fee emissions.		
CATEGORY OF MISCELLANE	OUS HAZARDOI	US AIR POLLUTA	ANTS (HAP WITHOUT A STANDARD)*		
VOC FAMILY GROUP	N/A	AEAR	Included in VOC above.		
NON-VOC GASEOUS GROUP	6.12	AEAR	HCl and HF, not included above		
PM FAMILY GROUP	N/A	AEAR	Included in PM above.		
CATEGORY OF SPECIFI	C HAZARDOUS	AIR POLLUTAN	TS (HAP WITH A STANDARD)**		
VOC FAMILY GROUP	N/A	N/A	Not applicable.		
NON-VOC GASEOUS GROUP	N/A	N/A	Not applicable.		
PM FAMILY GROUP	N/A	N/A	Not applicable.		
	CATEGORY OF NSPS POLLUTANTS NOT LISTED ABOVE***				
EACH NSPS POLLUTANT NOT LISTED ABOVE	N/A	N/A	Not applicable.		

NOTES

The Annual Accounting Period (AAP) is a 12 consecutive month period that either (a) begins each July 1st and ends June 30th of the following year when fees are paid on a fiscal year basis, or (b) begins January 1st and ends December 31st of the same year when paying on a calendar year basis. The Annual Accounting Period at the time of permit renewal issuance began July 1, 2016, and ends June 30, 2017. The next Annual Accounting Period begins July 1, 2017, and ends June 30, 2018, unless a request to change the annual accounting period is submitted by the responsible official as required by subparagraph 1200-03-26-.02(9)(b) and approved by the Technical Secretary. If the permittee wishes to revise their annual accounting period or their annual emission fee basis as allowed by subparagraph 1200-03-26-.02(9)(b), the responsible official must submit the request to the Division in writing on or before December 31 of the annual accounting period for which the fee is due. If a change in fee basis from allowable emissions to actual emissions for any pollutant is requested, the request from the responsible official must include the methods that will be used to determine actual emissions. Changes in fee bases must be made using the Title V Fee Selection form, form number APC 36 (CN-1583), included as an attachment to this permit and available on the Division of Air Pollution Control's website.

N/A N/A indicates that no emissions are specified for fee computation.

AEAR If the permittee is paying annual emission fees on an actual emissions basis, **AEAR** indicates that an **Actual Emissions Analysis** is **Required** to determine the actual emissions of:

SIGNIFICANT MODIFICATION #2 **EXPIRATION DATE: JUNE 21, 2022**

- **(1)** each regulated pollutant (Particulate matter, SO₂, VOC, NO_X and so forth. See TAPCR 1200-03-26-.02(2)(i) for the definition of a regulated pollutant.),
- each pollutant group (VOC Family, Non-VOC Gaseous, and Particulate Family), **(2)**
- the Miscellaneous HAP Category, **(3)**
- **(4)** the Specific HAP Category, and
- the NSPS Category **(5)**

under consideration during the **Annual Accounting Period**.

- * Category Of Miscellaneous HAP (HAP Without A Standard): This category is made-up of hazardous air pollutants that do not have a federal or state standard. Each HAP is classified into one of three groups, the VOC Family group, the Non-VOC Gaseous group, or the Particulate (PM) Family group. For fee computation, the Miscellaneous HAP Category is subject to the 4,000 ton cap provisions of subparagraph 1200-03-26-.02(2)(i) of the TAPCR.
- ** **Category Of Specific HAP (HAP With A Standard):** This category is made-up of hazardous air pollutants (HAP) that are subject to Federally promulgated Hazardous Air Pollutant Standards that can be imposed under Chapter 1200-03-11 or Chapter 1200-03-31. Each individual hazardous air pollutant is classified into one of three groups, the **VOC Family** group, the Non-VOC Gaseous group, or the Particulate (PM) Family group. For fee computation, each individual hazardous air pollutant of the Specific HAP Category is subject to the 4,000 ton cap provisions of subparagraph 1200-03-26-.02(2)(i) of the TAPCR.
- *** Category Of NSPS Pollutants Not Listed Above: This category is made-up of each New Source Performance Standard (NSPS) pollutant whose emissions are not included in the PM, SO_2 , VOC or NO_X emissions from each source in this permit. For fee computation, each NSPS pollutant not listed above is subject to the 4,000 ton cap provisions of subparagraph 1200-03-26-.02(2)(i) of the TAPCR.

END NOTES

- **The permittee shall:** (1) Pay Title V annual emission fees, on the emissions and year bases requested by the responsible official and approved by the Technical Secretary, for each annual accounting period (AAP) by the payment deadline(s) established in TAPCR 1200-03-26-.02(9)(g). Fees may be paid on an actual, allowable, or mixed emissions basis; and on either a state fiscal year or a calendar year, provided the requirements of TAPCR 1200-03-26-.02(9)(b) are met. If any part of any fee imposed under TAPCR 1200-03-26-.02 is not paid within 15 days of the due date, penalties shall at once accrue as specified in TAPCR 1200-03-26-.02(8).
 - (2) Sources paying annual emissions fees on an allowable emissions basis: pay annual allowable based emission fees for each annual accounting period no later than April 1 of each year pursuant to TAPCR 1200-03-26-.02(9)(d).
 - Sources paying annual emissions fees on an actual emissions basis: prepare an actual emissions analysis for each AAP and pay actual based emission fees pursuant to TAPCR 1200-03-26-.02(9)(d). The actual emissions analysis shall include:
 - (a) the completed Fee Emissions Summary Table.
 - (b) each actual emissions analysis required, and
 - (c) the actual emission records for each pollutant and each source as required for actual emission fee determination, or a summary of the actual emission records required for fee determination, as specified by the Technical Secretary or the Technical Secretary's representative. The summary must include sufficient information for the Technical Secretary to determine the accuracy of the calculations. These calculations must be based on the annual fee basis approved by the Technical Secretary (a state fiscal year [July 1 through June 30] or a calendar year [January 1 through December 31]). These records shall be used to complete the actual emissions analyses required by the above Fee Emissions Summary Table.
 - (4) Sources paying annual emissions fees on a mixed emissions basis: for all pollutants and all sources for which the permittee has chosen an actual emissions basis, prepare an actual emissions analysis for each AAP and pay actual based emission fees pursuant to TAPCR 1200-03-26-.02(9)(d). The actual emissions analysis shall include:
 - (a) the completed Fee Emissions Summary Table,
 - (b) each actual emissions analysis required, and

SIGNIFICANT MODIFICATION #2 EXPIRATION DATE: JUNE 21, 2022

(c) the actual emission records for each pollutant and each source as required for actual emission fee determination, or a summary of the actual emission records required for fee determination, as specified by the Technical Secretary or the Technical Secretary's representative. The summary must include sufficient information for the Technical Secretary to determine the accuracy of the calculations. These calculations must be based on the fee bases approved by the Technical Secretary (payment on an actual or mixed emissions basis) and payment on a state fiscal year (July 1 through June 30) or a calendar year (January 1 through December 31). These records shall be used to complete the actual emissions analysis.

For all pollutants and all sources for which the permittee has chosen an allowable emissions basis, pay allowable based emission fees pursuant to TAPCR 1200-03-26-.02(9)(d).

(5) When paying on an actual or mixed emissions basis, submit the **actual emissions analyses** at the time the fees are paid in full.

The annual emission fee due dates are specified in TAPCR 1200-03-26-.02(9)(g) and are dependent on the Responsible Official's choice of fee bases as described above. If any part of any fee imposed under TAPCR 1200-03-26-.02 is not paid within 15 days of the due date, penalties shall at once accrue as specified in TAPCR 1200-03-26-.02(8). Emissions for regulated pollutants shall not be double counted as specified in Condition A8(d) of this permit.

Payment of the fee due and the actual emissions analysis (if required) shall be submitted to The Technical Secretary at the following address:

and

Payment of Fee to:
The Tennessee Department of Environment and
Conservation
Division of Fiscal Services
Consolidated Fee Section – APC
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 10th Floor
Nashville, Tennessee 37243

Actual Emissions Analyses to: The Tennessee Department of Environment and Conservation Division of Air Pollution Control Emission Inventory Program William R. Snodgrass Tennessee Tower 312 Rosa L. Parks Avenue, 15th Floor Nashville, Tennessee 37243

or

An electronic copy (PDF) of actual emissions analysis can also be submitted to: apc.inventory@tn.gov

E2(SM2). Reporting requirements.

(a) <u>Semiannual reports.</u> In order to maintain the same reporting schedule established in the original Title V permit, the first report for this renewal shall cover the following permits and time periods:

Permit	Report period begins	Report period ends
560453 (original)	January 1, 2017	June 30, 2017
570221 (renewal)	July 1, 2017	December 31, 2017

The report covering the full 6-month period shall be submitted within 60 days after <u>June 30, 2017</u>. Subsequent reports revert fully to permit #570221 and shall be submitted within 60 days after the end of each 6-month period following the first report.

The semiannual reports for Title V permit #570221 shall include:

- (1) Any monitoring and recordkeeping required by Conditions E5-6, E5-7, E5-9, E6-6(SM1), E7-6(SM1), E8-6(SM1), E9-4, E9-6, E9-8, E11-3, E12-2, E12-3, E12-4, E12-5, E12-6, E13-3(SM1), E14-3, E14-4, E15-1, E15-2, E15-3, E16-5, E18-1, E21-3, E22-1, E22-2, E22-3, E22-4, E23-2, E23-3, E23-4, E23-5, E23-6, E23-7, E24-3, E24-4, E24-5, E24-6, E24-7, E24-9, E26-6(e), E28-3, E29-6(SM2), and E31-2(MM3) of this permit.
- (2) The visible emission evaluation readings from Conditions **E4-1 and E4-2** of this permit, if required. However, a summary report of this data is acceptable provided there is sufficient information to enable the Technical Secretary to evaluate compliance.
- (3) Identification of all instances of deviations from **ALL PERMIT REQUIREMENTS**.

These reports must be certified by a responsible official consistent with condition B4 of this permit and shall be submitted to The Technical Secretary at the address in Condition E2(b) of this permit.

TAPCR 1200-03-09-.02(11)(e)1(iii)

- (b) Annual compliance certification. The permittee shall submit annually compliance certifications with terms and conditions contained in Sections A, B, D, and E of this permit, including emission limitations, standards, or work practices. This compliance certification shall include all of the following (provided that the identification of applicable information may cross-reference the permit or previous reports, as applicable):
 - (1) The identification of each term or condition of the permit that is the basis of the certification;
 - (2) The identification of the method(s) or other means used by the owner or operator for determining the compliance status with each term and condition during the certification period; Such methods and other means shall include, at a minimum, the methods and means required by this permit. If necessary, the owner or operator also shall identify any other material information that must be included in the certification to comply with section 113(c)(2) of the Federal Act, which prohibits knowingly making a false certification or omitting material information:
 - (3) The status of compliance with each term or condition of the permit for the period covered by the certification, including whether compliance during the period was continuous or intermittent. The certification shall be based on the method or means designated in E2(b)2 above. The certification shall identify each deviation and take it into account in the compliance certification. The certification shall also identify as possible exceptions to compliance any periods during which compliance is required and in which an excursion* or exceedance** as defined below occurred; and
 - (4) Such other facts as the Technical Secretary may require to determine the compliance status of the source.
- * "Excursion" shall mean a departure from an indicator range established for monitoring under this paragraph, consistent with any averaging period specified for averaging the results of the monitoring.
- ** "Exceedance" shall mean a condition that is detected by monitoring that provides data in terms of an emission limitation or standard and that indicates that emissions (or opacity) are greater than the applicable emission limitation or standard (or less than the applicable standard in the case of a percent reduction requirement) consistent with any averaging period specified for a veraging the results of the monitoring.

In order to maintain the same reporting schedule established in the original Title V permit, the first certification for this renewal shall cover the following permits and time periods:

Permit	Report period begins	Report period ends
560453 (previous)	July 1, 2016	June 30, 2017
570221 (renewal)	July 1, 2017	June 30, 2018

The certification covering the full 12 month period shall be submitted within 60 days after <u>June 30, 2017</u>. Subsequent certifications revert fully to permit #570221 and shall be submitted within 60 days after the end of each 12-month period following the first certification.

These certifications shall be submitted to:

Columbia Environmental Field Office Division of Air Pollution Control 1421 Hampshire Pike Columbia, TN 38401 Or by email to: APC.ColuEFO@tn.gov and Air Enforcement Branch US EPA Region IV 61 Forsyth Street, SW Atlanta, Georgia 30303

40 CFR Part 70.6(c)(5)(iii) as amended in the Federal Register Vol.79, No.144, July 28, 2014, pages 43661 through 43667 TAPCR 1200-03-09-.02(11)(e)3(v)

(c) <u>Retention of Records.</u> All records required by any condition in Section E of this permit must be retained for a period of not less than five years. Additionally, these records shall be kept a vailable for inspection by the Technical Secretary or Division representative.

TAPCR 1200-03-09-.02(11)(e)1(iii)(II)II

- (d) <u>NSPS annual report.</u> The 40 CFR, Part 60, Subpart IIII report, if required to be submitted per **Condition E26-3(k)** must contain the following information:
 - (1) Company name and address where each affected engine is located.
 - (2) Date of the report and beginning and ending dates of the reporting period.
 - (3) Engine site rating and model year.
 - (4) Latitude and longitude of each engine in decimal degrees reported to the fifth decimal place.
 - Hours operated for the purposes specified in **Condition E26-3(h)(3)(i)** including the date, start time, and end time for engine operation for the purposes specified in **Condition E26-3(h)(3)(i)**. The report must also identify the entity that dispatched the engine and the situation that necessitated the dispatch of the engine.

The reporting schedule is synchronized with the Title V reporting schedule, covering each twelve month period of July 1 – June 30, and must be submitted no later than August 29 of each year. The annual report must be submitted electronically using the subpart specific reporting form in the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (www.epa.gov/cdx). However, if the reporting form specific to this subpart is not a vailable in CEDRI at the time that the report is due, the written report must be submitted to the Technical Secretary at one of the addresses listed in below:

By mail: Division of Air Pollution Control William R. Snodgrass Tennessee Tower 312 Rosa L. Parks Avenue, 15th Floor Nashville, TN 37243 Or By email: Air.Pollution.Control@tn.gov

40 CFR §60.4214(d)

E3. 40 CFR Part 63, Subpart DDDDD Requirements.

- E3-1(MM2). Boilers and process heaters located at a major source of hazardous air pollutants <u>are subject</u> to 40 CFR Part 63, Subpart DDDDD NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR MAJOR SOURCES: INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL BOILERS AND PROCESS HEATERS (Subpart DDDDD), including <u>any and/or all applicable</u> emission limitations, notifications, compliance options, records, reports, etc. as summarized, but not limited to the following in this condition.
 - (a) Pursuant to §63.7495(a), each new or reconstructed boiler and/or process heater must comply with Subpart DDDDD upon startup.
 - (b) Pursuant to §63.7500, the permittee must meet each applicable emission limit and work practice standard in Tables 1 through 3, and 11 through 13 to subpart DDDDD for each affected unit
 - (c) Pursuant to 40 CFR §63.7500(a)(3), at all times, the permittee must operate and maintain each affected boiler, including a ssociated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.
 - (d) Pursuant to 40 CFR §63.7545 and §63.7530(f), the permittee must submit all of the notifications in §63.7(b) and (c), §63.8(e), (f)(4) and (6), and §63.9(b) through (h), including a Notification of Compliance Status. If required to conduct an initial compliance demonstration as specified in §63.7530, the Notification of Compliance Status, containing the results of the initial compliance demonstration, must be submitted before close of business on the 60th day following startup of each affected source. The Notification of Compliance Status must contain all the information specified in paragraphs (1) through (8) of this condition. If an initial compliance demonstration is not required for an affected unit as specified in §63.7530(a), the Notification of Compliance Status must only contain the information specified in paragraphs (1) and (8) below. All notifications must be submitted to the Permitting Program at the address specified in Condition E2(d).
 - (1) A description of the affected unit(s) including identification of which subcategories the unit is in, the design heat input capacity of the unit, a description of the add-on controls used on the unit to comply with Subpart DDDDD, description of the fuel(s) burned, including whether the fuel(s) were a secondary material determined by the

- permittee or the EPA through a petition process to be a non-waste under 40 CFR §241.3, whether the fuel(s) were a secondary material processed from discarded non-hazardous secondary materials within the meaning of 40 CFR §241.3, and justification for the selection of fuel(s) burned during the compliance demonstration.
- (2) Summary of the results of all performance tests and fuel analyses, and calculations conducted to demonstrate initial compliance including all established operating limits, and including:
 - Identification of whether the permittee is complying with the PM emission limit or the alternative TSM emission limit.
 - (ii) Identification of whether the permittee is complying with the output-based emission limits or the heat input-based (i.e., lb/MMBtu or ppm) emission limits,
 - (iii) Identification of whether the permittee is complying the arithmetic mean of all valid hours of data from the previous 30 operating days or of the previous 720 hours. This identification shall be specified separately for each operating parameter.
- (3) A summary of the maximum CO emission levels recorded during the performance test to show that the permittee has met any applicable emission standard in Tables 1, 2, or 11 through 13 to this subpart, if the permittee is not using a CO CEMS to demonstrate compliance.
- (4) Identification of whether the permittee plans to demonstrate compliance with each applicable emission limit through performance testing, a CEMS, or fuel analysis.
- (5) Identification of whether the permittee plans to demonstrate compliance by emissions a veraging and identification of whether the permittee plans to demonstrate compliance by using efficiency credits through energy conservation:
 - (i) If the permittee plans to demonstrate compliance by emission averaging, report the emission level that was being achieved or the control technology employed on January 31, 2013.
- (6) A signed certification that the permittee has met all applicable emission limits and work practice standards.
- (7) If a deviation from any emission limit, work practice standard, or operating limit occurred, the permittee must also submit a description of the deviation, the duration of the deviation, and the corrective action taken in the Notification of Compliance Status report.
- (8) In addition to the information required in §63.9(h)(2), the Notification of Compliance Status must include the following certification(s) of compliance, as applicable, and signed by a responsible official:
 - (i) "This facility completed the required initial tune-up for all of the boilers and process heaters covered by 40 CFR part 63 subpart DDDDD at this site according to the procedures in § 63.7540(a)(10)(i) through (vi)."
 - (ii) "This facility has had an energy assessment performed according to § 63.7530(e)."
 - (iii) Except for units that burn only natural gas, refinery gas, or other gas 1 fuel, or units that qualify for a statutory exemption as provided in section 129(g)(1) of the Clean Air Act, include the following: "No secondary materials that are solid waste were combusted in any affected unit."
- (e) Pursuant to \$63.7515(d) and \$63.7540(a)(10), (11), and (12), the permittee must conduct annual, biennial, and/or 5-year, as applicable, tune-ups of each boiler and/or process heater. Each annual tune up specified in \$63.7540(a)(10) must be no more than 13 months after the previous tune up. Each biennial tune-up specified in \$63.7540(a)(11) must be conducted no more than 25 months after the previous tune-up. Each 5-year tune-up specified in \$63.7540(a)(12) must be conducted no more than 61 months after the previous tune-up. For a new or reconstructed affected source, the first a nnual, biennial, or 5-year tune up must be no later than 13 months, 25 months, or 61 months, respectively after the initial startup of the new or reconstructed affected source. Pursuant to \$63.7540(a)(13), if the unit is not operating on the required date for a tune-up, the tune-up must be conducted within 30 calendar days of startup. The tune-ups must be conducted as specified in paragraphs (1) through (6) below.
 - (1) As applicable, inspect the burner, and clean or replace any components of the burner as necessary (the permittee may delay the burner inspection until the next scheduled unit shutdown). Units that produce electricity for sale may delay the burner inspection until the first outage, not to exceed 36 months from the previous inspection. At units where entry into a piece of process equipment or into a storage vessel is required to complete the tune-up inspections, inspections are required only during planned entries into the storage vessel or process equipment;
 - (2) Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available;
 - (3) Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly (the permittee may delay the inspection until the next scheduled unit shutdown). Units that produce electricity for sale may delay the inspection until the first outage, not to exceed 36 months from the previous inspection;
 - (4) Optimize total emissions of CO. This optimization should be consistent with the manufacturer's specifications, if available, and with any NO_x requirement to which the unit is subject;
 - (5) Measure the concentration in the effluent stream of CO in parts per million, by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either of a dry or wet basis, as long as it

SIGNIFICANT MODIFICATION #2 EXPIRATION DATE: JUNE 21, 2022

- is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer; and
- (6) Maintain on-site and submit, if requested by the Technical Secretary, an annual report containing the information in paragraphs (f)(i) through (iii) of this condition,
 - (i) The concentrations of CO in the effluent stream in parts per million by volume, and oxygen in -volume percent, measured at high fire or typical operating load, before and after the tune-up of the boiler or process heater;
 - (ii) A description of any corrective actions taken as a part of the tune-up; and
 - (iii) The type and amount of fuel used over the 12 months prior to the tune-up, but only if the unit was physically and legally capable of using more than one type of fuel during that period. Units sharing a fuel meter may estimate the fuel used by each unit.
- (f) Pursuant to 40 CFR §63.7550, the permittee must submit a nnual, biennial, and/or 5-year compliance reports, whichever are applicable. Pursuant to §63.9(i), in order to synchronize the DDDDD reporting with existing reporting deadlines specified in **Condition E2**, the permittee has requested, and the Technical Secretary has approved, an adjustment to the postmark deadlines for the annual, biennial, and/or 5-year compliance reports. Each report must be postmarked or submitted within 60 days after the end of the applicable reporting period. The first compliance report for new affected units must cover the period beginning on the date of startup and ending on December 31 within one year when annual reports are required, within two years when biennial reports are required, and within five years when 5-year reports are required. Each report must contain the following information specified in paragraphs (1) through (5), as applicable.
 - (1) Company and Facility name and address.
 - (2) Process unit information, emissions limitations, and operating parameter limitations.
 - (3) Date of report and beginning and ending dates of the reporting period.
 - (4) Include the date of the most recent tune-up for each unit subject to only the requirement to conduct tune-ups in accordance with **Condition E3-1(f)**. Include the date of the most recent burner inspection if it was not done annually and was delayed until the next scheduled or unscheduled unit shutdown.
 - (5) Statement by a responsible official with that official's name, title, and signature, certifying the truth, accuracy, and completeness of the content of the report.

Pursuant to §63.7550(h)(3), the permittee must submit all reports required by Table 9 of Subpart DDDDD electronically to the EPA via the CEDRI. (CEDRI can be accessed through the EPA's CDX.) The permittee must use the appropriate electronic report in CEDRI for Subpart DDDDD. Instead of using the electronic report in CEDRI for Subpart DDDDD, the permittee may submit an alternate electronic file consistent with the XML schema listed on the CEDRI Web site (http://www.epa.gov/tm/chief/cedri/index.html), once the XML schema is available. If the reporting form specific to Subpart DDDDD is not available in CEDRI at the time that the report is due, the permittee must submit the report to the EPA Administrator at the appropriate address listed in §63.13. The permittee must begin submitting reports via CEDRI no later than 90 days after the form becomes available in CEDRI.

Copies of all reports must be submitted to the Permitting Program at the address specified in Condition E2(d).

- (g) Pursuant to 40 CFR §63.7555 and §63.7560, the permittee must keep records pertaining to 40 CFR 63, Subpart DDDDD in a form suitable and readily a vailable for expeditious review, according to §63.10(b)(1). The permittee must keep each record for five years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. Each record must be kept on site, or they must be accessible from on site (for example, through a computer network), for at least two years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to § 63.10(b)(1). Records may be kept off site for the remaining three years.
- (h) Pursuant to 40 CFR §63.7565, the permittee must comply with the requirements of 40 CFR Part 63, Subpart A, according to the applicability of 40 CFR Part 63, Subpart A as identified in **Attachment 5** of this permit. In the event of a discrepancy between the requirements shown in **Attachment 5** and the requirements of Subpart A as published in the Federal Register, the Federal Register language shall be controlling.

E4. General Permit Requirements.

E4-1. Visible emissions for sources 02, 06, 07, 18, 28, 30, 40, 43, and 46 shall not exhibit greater than 20% opacity, except for an aggregate of no more than five minutes in any one-hour period, and no more than 20 minutes in any 24-hour period. Visible emissions from these sources shall be determined by Tennessee Visible Emission Evaluation Method 2, (aggregate count).

TAPCR 1200-03-05-.01(1)

Compliance Method: The permittee shall a ssure compliance with the opacity standard by utilizing the opacity matrix dated June 18, 1996 (amended on September 11, 2013) that is enclosed as Attachment 1. Reports and certifications shall be submitted in accordance with **Condition E2** of this permit.

If the magnitude and frequency of excursions reported by the permittee in the periodic monitoring for emissions is unsatisfactory to the Technical Secretary, this permit may be reopened to impose additional opacity monitoring requirements.

E4-2(MM2). Visible emissions from the facility, unless otherwise noted in this permit, shall not exhibit greater than 20% opacity, except for one six-minute period in any one-hour period, and for no more than four six-minute periods in any 24-hour period. Visible emissions from these sources shall be determined by EPA Method 9, as published in the current 40 CFR 60, Appendix A (six-minute average).

TAPCR 1200-03-05-.01(1) and 1200-03-05-.03(6)

Compliance Method: The permittee shall a ssure compliance with the opacity standard by utilizing the opacity matrix dated June 18, 1996 (amended on September 11, 2013) that is enclosed as Attachment 1. Reports and certifications shall be submitted in accordance with **Condition E2** of this permit.

If the magnitude and frequency of excursions reported by the permittee in the periodic monitoring for emissions is unsatisfactory to the Technical Secretary, this permit may be reopened to impose additional opacity monitoring requirements.

- **E4-3.** This Title V Operating Permit No. 570221 represents the second renewal of the original Title V Operating Permit No. 546264 issued May 9, 2002, and subsequent renewal permit No. 560453 issued December 1, 2010. The requirements of Title V Operating Permit No. 560453 will remain in effect through June 30, 2017. The requirements of this Title V Operating Permit No. 570221 will take effect on July 1, 2017.
- **E4-4.** The permittee is not required to file an accidental release plan pursuant to Section 112(r) of the Clean Air Act and 1200-03-32 of TAPCR.
- **E4-5.** CAM Plan. This facility is not currently subject to regulations under 40 CFR part 64 (Compliance Assurance Monitoring).
- **E4-6.** Regarding recordkeeping of logs, the following is applicable:
 - a) For monthly recordkeeping, all data, including the results of all calculations, must be entered into the log no later than 30 days from the end of the month for which the data is required.
 - b) For weekly recordkeeping, all data, including the results of all calculations, must be entered into the log no later than seven days from the end of the week for which the data is required.
 - c) For daily recordkeeping, all data, including the results of all calculations, must be entered into the log no later than seven days from the end of the day for which the data is required. TAPCR 1200-03-09
- **E4-7.** Recordkeeping, data collection, monitoring and reporting for any new requirement(s) not previously specified in the original Title V permit or any of its revisions, shall commence on the first day of the month no later than 45 days from the issuance date of this Title V permit renewal unless stipulated otherwise. TAPCR 1200-03-09
- **E4-8.** Logs and records specified in this permit shall be made available upon request by the Technical Secretary or his representative and shall be retained for a period of not less than five years unless otherwise noted. Logs and records contained in this permit may be based on a recommended format. Any logs that have an alternative format may be utilized provided such logs contain the same information that is required. Computer-generated logs are also acceptable. Logs and records are not required to be submitted semiannually unless specified in **Condition E2(a)(1)**.

E4-9. Insignificant activities.

Insignificant activities as identified in the Title V Application dated April 22, 2015, per Rule 1200-3-9-.04(5) are listed in the approved application. Additional insignificant activities may be added and operated at any time with the provision that a written notification shall be submitted to the Technical Secretary including an updated APC 2 Application Form a long with a Truth, Accuracy, and Completeness Statement signed by a responsible official. The permit may be updated to include additional insignificant sources by means of an Administrative Amendment, if necessary.

E4-10(MM2). Identification of Responsible Official, Technical Contact, and Billing Contact

- (a) The application that was utilized in the preparation of this permit is dated April 22, 2015, and signed by Rodney F. Todaro, Colonel, USAF, Commander of the permitted facility. Notification was received June 16, 2022, that Randel J. Gordon, Colonel, USAF Commander is now the Responsible Official. If this person terminates employment or is a ssigned different duties and is no longer a Responsible Official for this facility as defined in part 1200-03-09-.02(11)(b)21 of the Tennessee Air Pollution Control Regulations, the owner or operator of this air contaminant source shall notify the Technical Secretary of the change. Said notification must be in writing and must be submitted within 30 days of the change. The notification shall include the name and title of the new Responsible Official and certification of truth and accuracy. All representations, agreement to terms and conditions, and covenants made by the former Responsible Official that were used in the establishment of the permit terms and conditions will continue to be binding on the facility until such time that a revision to this permit is obtained that would change said representations, agreements, and/or covenants.
- (b) The application that was utilized in the preparation of this permit is dated April 22, 2015, and identifies Nicole E. Tracey, as the Principal Technical Contact for the permitted facility. Notification was received April 22, 2019, that David L. Carlon, Chief, Installation Management Section, is the new Technical Contact for this facility. If this person terminates employment or is assigned different duties and no longer the Principal Technical Contact for this facility, the owner or operator of this air contaminant source shall notify the Technical Secretary of the change. Said notification must be in writing and must be submitted within 30 days of the change. The notification shall include the name and title of the new Principal Technical Contact and certification of truth and accuracy.
- (c) The application that was utilized in the preparation of this permit is dated April 22, 2015, and identifies Nicole E. Tracey, as the Billing Contact for the permitted facility. Notification was received April 22, 2019, that David L. Carlon, Chief, Installation Management Section, is the new Billing Contact for this facility. If this person terminates employment or is assigned different duties and is no longer the Billing Contact for this facility, the owner or operator of this air contaminant source shall notify the Technical Secretary of the change. Said notification must be in writing and must be submitted within 30 days of the change. The notification shall include the name and title of the new Billing Contact and certification of truth and accuracy.

Source Specific Emission Standards:

16-0010-01 and 02	Steam Plant A	Boilers 01, 02, 03, and 04 used for plant operations. Unit designated to burn g	
		subcategory as given in 40 CFR Part 63 Subpart DDDDD (§63.7500(a)(3)(c))	

Conditions E5-1 through E5-10 apply to sources 16-0010-01 and 02.

E5-1. The total stated design heat input capacity of boiler 01 is 42 million British thermal units per hour (MMBtu/hr), on a daily a verage basis. This is the capacity of the boiler a stated in the application dated November 15, 1996. These boilers are equipped with continuous O₂-trim.

Compliance Method: This condition is a statement of the design heat input capacity for this source. If the permittee needs to increase the design or maximum capacity of this source, the permittee shall pursue the appropriate Title V procedure in accordance with TAPCR 1200-03-09-.02(11). If a construction permit is applied for, this shall be done in accordance with TAPCR 1200-03-09-.01(1).

- **E5-2.** The total stated design heat input capacity of boilers 02, 03, and 04 is 229.2 million British thermal units per hour (MMBtu/hr), on a daily average basis. This is the capacity of the boilers as stated in the application dated November 15, 1996.
 - **Compliance Method:** This condition is a statement of the design heat input capacity for this source. If the permittee needs to increase the design or maximum capacity of this source, the permittee shall pursue the appropriate Title V procedure in accordance with TAPCR 1200-03-09-.02(11). If a construction permit is applied for, this shall be done in accordance with TAPCR 1200-03-09-.01(1).
- **E5-3.** Natural gas is the primary fuel source for these boilers. The company also agrees to limit the use of liquid fuel to 48 hours per year per boiler for periodic testing, maintenance and operator training as specified in 40 CFR Part 63 Subpart DDDDD (§ 63.75750)

PERMIT NO. 570221

defined as "Unit designated to burn gas 1 subcategory" and the information contained in the agreement letter dated September 13, 2016 of the revised APC 1 Form of the revision application.

E5-4. Particulate matter emitted from boiler 01 shall not exceed 0.27 pound per MMBtu (11.4 lb/hr maximum and 5.0 tons/year (TPY)). This limitation is established pursuant to TAPCR 1200-03-06-.02(2)(a) and the information contained in the a greement letter dated November 22, 2016.

Compliance Method: Compliance shall be assured by compliance with **Condition E5-3**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.3, Fuel Oil Combustion.

E5-5. Particulate matter emitted from boilers 02, 03, and 04 shall not exceed 5.5 pounds per hour and 25.0 TPY. This limitation is established pursuant to TAPCR 1200-03-06-.01(7) and the information contained in the a greement letter dated November 22, 2016.

Compliance Method: Compliance shall be assured by compliance with **Condition E5-3**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.3, Fuel Oil Combustion.

E5-6. In the event of gas curtailment emergency, if liquid fuel oil/other various combinations of fuels are used (JP fuels, a viation fuels and/or #2 fuel oil), the sulfur content of the fuel oil shall not exceed 0.3 percent by weight. This limitation is established pursuant to TAPCR 1200-03-14-.01(3) and the information contained in the agreement letter dated October 21, 1998.

Compliance Method: The permittee shall EITHER, annually provide a written statement from each fuel vendor guaranteeing in advance that the sulfur content limit will not be exceeded OR, provide a sulfur content analysis semi-annually along with the Semi-annual report (SAR) for the period when the liquid fuel is used (gas curtailment emergency). These records shall be kept a vailable for inspection by the Technical Secretary or his representative and be retained for a period of not less than five years. These records must be maintained at the source location and kept a vailable for inspection by the Technical Secretary or a Division representative. These records must be used for annual compliance certification.

E5-7. Sulfur dioxide emitted from boiler 01 shall not exceed 0.5 pound per MMBtu (21 lb/hr maximum), nor 39 tons during any 12-consecutive month period. These limitations are established pursuant to TAPCR 1200-03-14-.01(3) and the information contained in the agreement letter dated May 2, 1990.

Compliance Method: Compliance with the hourly emission limit is assured by compliance with Conditions E5-3 and E5-6, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.3, Fuel Oil Combustion. The permittee shall calculate the actual 12-consecutive month SO_2 emission rate to show compliance with the 12-consecutive month emission limit using emission factors from AP-42, and the fuel usage records required by Condition E5-9.

E5-8. Sulfur dioxide emitted from boilers 02, 03 and 04 shall not exceed 72 pounds per hour (and 12.0 TPY), combined. This limitation is established pursuant to TAPCR 1200-03-14-.01(3) and the information contained in the agreement letter dated November 22, 2016.

Compliance Method: Compliance with this emission limit is assured by compliance with **Conditions E5-3 and E5-6**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.3, Fuel Oil Combustion.

E5-9. The permittee shall maintain records of liquid fuel usage in boiler 01 and calculate the monthly SO₂ emission rate in a format (see example below) that readily shows compliance with annual SO₂ emission limit in **Condition E5-7.** These records must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition **E2** of this permit and be retained for a period of not less than five years.

MONTHLY LIQUID FUEL USAGE LOG AND SO₂ emissions for boiler 01 (16-0010-01)

Month	Liquid fuel usage (gallon/month)	Emission Factor	SO ₂ emissions (Tons per Month)	SO ₂ emissions (Tons per 12- Consecutive Months)

E5-10. For fee purposes, the permittee shall keep a log of the amount of natural gas burned (in standard cubic feet, scf) per month by this source, and calculate the annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this fuel-burning source using current AP-42 uncontrolled emission factors, in conjunction with fuel usage. The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition **E1** of this permit.

Monthly log of emissions from Boilers 01, 02, 03, & 04 (16-0010-01 & 02)

Month_____ Year____

	Emissions from Combustion of Liquid Fuels				
Pollutant	Usage (gal)	Emission Factor (lb/10 ³ gal of fuel)	AP-42 Reference	Emissions (tons)	
NO _x			Table 1.3-1, September 1998		
SO_2			Table 1.3-1, September 1998		
PM			Table 1.3-1 & 2, Sept. 1998		
VOC			Table 1.3-3, September 1998		

Month_____ Year____

	Emissions from Natural Gas Combustion					
Pollutant	Usage (scf)	Emission Factor (lb/10 ⁶ scf of NG)	AP-42 Reference	Emissions (tons)		
NO_x		100	Table 1.4-1, July 1998			
SO_2		0.6	Table 1.4-2, July 1998			
PM		7.6	Table 1.4-2, July 1998			
VOC		5.5	Table 1.4-2, July 1998			

Fiscal Year log of emissions from Boilers 01, 02, 03, & 04 (16-0010-01 & 02)

July 1, _____ to June 30, _____

Pollutant	Emissions from NG (tons)	Emissions from liquid fuels (tons)	Total Emissions (tons)
NO _x			
SO_2			
PM			
VOC			

16-0010-06	ETF Heaters	Provide heated air for testing operations at the engine testing facility (ETF): North Heater and
		South Heater
		MACT, Subpart DDDDD ("limited use unit") (SM1)

Conditions E6-1 through E6-6 apply to source 16-0010-06.

E6-1. The total stated design heat input capacity of this source is 670 million British thermal units per hour (MMBtu/hr), on a daily average basis. This is the capacity of the source as stated in the application dated November 15, 1996.

Compliance Method: This condition is a statement of the design heat input capacity for this source. If the permittee needs to increase the design or maximum capacity of this source, the permittee shall pursue the appropriate Title V procedure in accordance with TAPCR 1200-03-09-.02(11). If a construction permit is applied for, this shall be done in accordance with TAPCR 1200-03-09-.01(1).

E6-2(SM1). Natural gas shall be the only fuel used for these heaters.

TAPCR 1200-03-09-.03(8)

Compliance Method: Compliance with this operating restriction shall be assured through the recordkeeping required by **Condition E6-6**.

E6-3(SM1). Particulate matter (PM) emitted from this source shall not exceed 5.1 pounds per hour, on a daily average basis. This limitation is established pursuant to TAPCR 1200-03-06-.01(7) and the information contained in the agreement letter dated September 6, 2002.

Compliance Method: Compliance shall be assured by compliance with **Conditions E6-1 and E6-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E6-4(SM1). Sulfur dioxide (SO₂) emitted from this source shall not exceed 0.4 pound per hour, on a daily average basis. This limitation is established pursuant to TAPCR 1200-03-14-.01(3) and the information contained in the agreement letter dated April 3, 1982.

Compliance Method: Compliance shall be assured by compliance with **Conditions E6-1 and E6-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E6-5(SM1). For fee purposes, the permittee shall calculate the annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this fuel-burning source using AP-42 uncontrolled emission factors, in conjunction with the fuel usage records required by **Condition E6-6**. The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition **E1** of this permit.

Monthly log of emissions from ETF heaters (16-0010-06) Month_____ Year_____

	Emissions from Natural Gas Combustion				
Pollutant	Usage (scf)	Emission Factor (lb/10 ⁶ scf of NG)	AP-42 Reference	Emissions (tons)	
NO_x		280	Table 1.4-1, July 1998		
SO_2		0.6	Table 1.4-2, July 1998		
PM		7.6	Table 1.4-2, July 1998		
VOC		5.5	Table 1.4-2, July 1998	·	

Fiscal Year log of emissions from ETF heaters (16-0010-06) July 1, _____ to June 30, _____

Pollutant	Total Emissions (tons)
NO_x	
SO_2	
PM	
VOC	

E6-6(SM1). The actual heat input for the North Heater and the South Heater shall not exceed 10% of the maximum potential heat input for each heater on a calendar year basis. The maximum annual natural gas usage, for each heater, shall not exceed 287.7 million standard cubic feet based on the stated design heat input capacity of 335 MMBtu/hr for each unit. This limitation is established pursuant to Rule 1200-03-09-.03(8) of the Tennessee Air Pollution Control Regulations and the information contained in the significant modification applications dated April 5, 2019, and July 23, 2019. The permittee has requested this federally enforceable 10% annual capacity factor limit be placed on these heaters so that they meet the definition of *Limiteduse boiler or process heater*, as defined in 40 CFR §63.7575.

40 CFR §63.7555(a)(3), TAPCR 1200-03-09-.03(8), and 1200-03-10-.02(2)(a)

Compliance Method: A record of the natural gas combusted in each heater on the days these units are operating must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with **Condition E2** of this permit and be retained for a period of not less than five years.

16-0010-07	VKF Heaters	Dryer Reactivation Heaters: Process Heater (175 MMBtu/hr) Heater #1 (19.1 MMBtu/hr) and Heater #2 (12.7 MMBtu/hr), used for heating air for testing operations at the Von Kamaín
		Gas Dynamics Facility (VKF). MACT, Subpart DDDDD ("limited use unit") (SM1)

Conditions E7-1 through E7-6 apply to source 16-0010-07.

E7-1(MM1). The total stated design heat input capacity of this modified source is 206.8 million British thermal units per hour (MMBtu/hr), on a daily average basis. This is the capacity of the source as stated in the applications dated August 25, 2017. November 15, 1996 and September 6, 2002.

Compliance Method: This condition is a statement of the design heat input capacity for this source. If the permittee needs to increase the design or maximum capacity of this source, the permittee shall pursue the appropriate Title V procedure in accordance with TAPCR 1200-03-09-.02(11). If a construction permit is applied for, this shall be done in accordance with TAPC R 1200-03-09-.01(1).

E7-2(SM1). Natural gas shall be the only fuel used at this source.

TAPCR 1200-03-09-.03(8)

Compliance Method: Compliance with this operating restriction shall be assured through the recordkeeping required by **Condition E7-6**.

E7-3(SM1). Particulate matter (PM) emitted from this modified source shall not exceed 0.11 lb/MMBtu (22.75 pounds per hour), on a daily a verage basis and 7 tons per 12 consecutive months. This limitation is established pursuant to TAPCR 1200-03-06-.01(7) and the agreement letter dated November 16, 2007.

Compliance Method: Compliance shall be assured by compliance with **Conditions E7-1 and E7-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E7-4(SM1). Sulfur dioxide (SO₂) emitted from this source shall not exceed 0.2 pound per hour, on a daily average basis. This limitation is established pursuant to TAPCR 1200-03-14-.01(3) and the information contained in the agreement letter dated June 8, 2010.

Compliance Method: Compliance shall be assured by compliance with **Conditions E7-1 and E7-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E7-5(SM1). For fee purposes, the permittee shall calculate the annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this fuel-burning source using AP-42 uncontrolled emission factors, in conjunction with the fuel usage records required by **Condition E7-6**. The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition **E1** of this permit.

Monthly log of emissions from VKF heaters (16-0010-07) Month____ Year____

	Emissions from Natural Gas Combustion				
D-11-44	Usage (scf)	Emission Factor	AD 42 Deferred	Emissions	
Pollutant	(SCI)	$(lb/10^6 scf of NG)$	AP-42 Reference	(tons)	
NO_x		100	Table 1.4-1, July 1998		
SO_2		0.6	Table 1.4-2, July 1998		
PM		7.6	Table 1.4-2, July 1998		
VOC		5.5	Table 1.4-2, July 1998		

Fiscal	Year l	log of	emissions	from	VKF	heaters	(16-0010	-07)
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July 1, _____ to June 30, _____

Pollutant	Total Emissions (tons)
NO_x	
SO_2	
PM	
VOC	

E7-6(SM1). The actual heat input for VKF Heater 1 and 2 shall not exceed 10% of the maximum potential heat input for each heater on a calendar year basis. The maximum annual natural gas usage for VKF Heater 1 and 2 shall not exceed 16.4 and 10.9 million standard cubic feet, respectively, based on the stated design heat input capacity of 19.1 MMBtu/hr for VKF Heater 1 and 12.7 MMBtu/hr for VKF Heater 2. This limitation is established pursuant to Rule 1200-03-09-.03(8) of the Tennessee Air Pollution Control Regulations and the information contained in the significant modification applications dated April 5, 2019, and July 23, 2019. The permittee has requested this federally enforceable 10% annual capacity factor limit be placed on these heaters so that they meet the definition of *Limited-use boiler or process heater*, as defined in 40 CFR §63.7575.

40 CFR §63.7555(a)(3), TAPCR 1200-03-09-.03(8), and 1200-03-10-.02(2)(a)

Compliance Method: A record of the natural gas combusted in each heater on the days these units are operating must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with **Condition E2** of this permit and be retained for a period of not less than five years.

16-0010-08	PWT Air Dryers	Two atmospheric air dryers (AAD-1: 51 MMBtu/hour and AAD-2: 60 MMBtu/hour) used to re-activate desiccant beds that condition the supply air for testing operations at the propulsion wind tunnel (PWT) facility.
		MACT, Subpart DDDDD ("limited use unit") (SM1)

Conditions E8-1 through E8-5 apply to source 16-0010-08.

E8-1. The total stated design heat input capacity of this source is 111 million British thermal units per hour (MMBtu/hr), on a daily average basis. This is the capacity of the source as stated in the application dated June 10, 1999.

Compliance Method: This condition is a statement of the design heat input capacity for this source. If the permittee needs to increase the design or maximum capacity of this source, the permittee shall pursue the appropriate Title V procedure in accordance with TAPCR 1200-03-09-.02(11). If a construction permit is applied for, this shall be done in accordance with TAPCR 1200-03-09-.01(1).

E8-2(SM1). Natural gas shall be the only fuel used for this source.

TAPCR 1200-03-09-.03(8)

Compliance Method: Compliance with this operating restriction shall be assured through the recordkeeping required by **Condition E8-6**.

E8-3(SM1). Particulate matter (PM) emitted from this source shall not exceed 2.0 pounds per hour, on a daily average basis. This limitation is established pursuant to TAPCR 1200-03-06-.01(7) and the information contained in the agreement letter dated April 3, 1982.

Compliance Method: Compliance shall be assured by compliance with **Conditions E8-1 and E8-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E8-4(SM1). Sulfur dioxide (SO₂) emitted from this source shall not exceed 1.0 pound per hour, on a daily average basis. This limitation is established pursuant to TAPCR 1200-03-14-.01(3) and the information contained in the agreement letter dated April 3, 1982.

Compliance Method: Compliance shall be assured by compliance with **Conditions E8-1 and E8-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E8-5(SM1). For fee purposes, the permittee shall calculate the annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this fuel-burning source using updated AP-42 uncontrolled emission factors, in conjunction with the fuel usage records required by **Condition E8-6**. The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition **E1** of this permit.

Monthly log of emissions from PWT Air Dryers (16-0010-08) Month_____ Year_____

	Emissions from Natural Gas Combustion				
Pollutant	Usage (scf)	Emission Factor (lb/106 scf of NG)	AP-42 Reference	Emissions (tons)	
NO_x		100	Table 1.4-1, July 1998		
SO_2		0.6	Table 1.4-2, July 1998		
PM		7.6	Table 1.4-2, July 1998		
VOC		5.5	Table 1.4-2, July 1998		

Fiscal Year log of emissions from PWT Air Dryers (16-0010-08)

July 1, _____ to June 30, _____

Pollutant	Total Emissions (tons)
NO _x	
SO_2	
PM	
VOC	

E8-6(SM1). The actual heat input for atmospheric air dryers AAD-1 and AAD-2 shall not exceed 10% of the maximum potential heat input for each heater on a calendar year basis. The maximum natural gas usage for the atmospheric air dryers AAD-1 and AAD-2 shall not exceed 43.8 and 51.5 million standard cubic feet, respectively, based on the stated heat input capacity of 51 MMBtu/hr for AAD-1 and 60 MMBtu/hr for AAD-2. This limitation is established pursuant to Rule 1200-03-09-.03(8) of the Tennessee

Air Pollution Control Regulations and the information contained in the significant modification applications dated April 5, 2019, and July 23, 2019. The permittee has requested this federally enforceable 10% annual capacity factor limit be placed on these dryers so that they meet the definition of *Limited-use boiler or process heater*, as defined in 40 CFR §63.7575.

Compliance Method: A record of the natural gas usage for these dryers on the days these units are operating must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with **Condition E2** of this permit and be retained for a period of not less than five years.

16-0010-14	APTU Test Facility	Vitiated Air Heaters (VAH), Sudden Expansion Heater (SUE), or Gas Generator with
		hydrocarbon fuel cracking and silane flare for Testing Solid and Liquid Rocket Motors and Aircraft Engines, and ELRAY Heaters for Testing Flammable Gas Mixtures. Water
		sprays are primarily used as a safety measure to lower the temperature of the exhaust.

Conditions E9-1 through E9-10 apply to source 16-0010-14.

E9-1. The heat input capacities of the heaters at this source as stated in the applications dated March 1, 2000, May 6, 2013, and August 9, 2013 are as follows:

Unit	Heat input (MMBtu/hr)
Vitiated air heater	167.00
Sudden expansion heater	167.00
ELRAY isobutane & propane heaters	6.53 combined (5.53 and 1.0, respectively)

The maximum total heat capacity of this source is 167 MMBtu/hr based on the physical operational constraint that only one heater at the APTU facility can be used at one time. TAPCR 1200-03-09

Compliance Method: This condition is a statement of the design heat input capacity for this source. If the permittee needs to increase the design or maximum capacity of the heaters, the permittee shall pursue the appropriate Title V procedure in accordance with TAPCR 1200-03-09-.02(11). If a construction permit is applied for, this shall be done in accordance with TAPCR 1200-03-09-.01(1).

- **E9-2.** Isobutane, propane, or equivalent grade fuels only shall be used for the heaters. TAPCR 1200-03-09
- **E9-3.** Fuels (for rockets and aircraft engines) shall not contain beryllium. TAPCR 1200-03-09
- **E9-4.** Each rocket shall not contain more than 150 pounds of solid rocket propellants or 1,700 pounds of liquid rocket propellants. Aircraft engine testing shall not exceed 5,520 pounds per hour of hydrocarbon fuel. TAPCR 1200-03-09

Compliance Method: A record of each test and weight of fuel and propellant used for this testing must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. This record must be retained for a period of not less than five years.

E9-5. Particulate matter emitted from this source shall not exceed 48.3 pounds per hour, nor 4.2 tons per year. These limitations are established pursuant to 1200-03-06-.02(2) and 1200-03-06-.01(7) of the Tennessee Air Pollution Control regulations, and the information contained in the agreement letter dated January 2, 2013 from the permittee.

Compliance Method: Compliance with these emission limits is a ssured based on calculations utilizing emission factors from AP-42, Chapter 1.5, Liquefied Petroleum Gas Combustion and the Aircraft Engine Emission Estimator (see Attachment #2), compliance with **Conditions E9-4 and E9-6**, and, when testing solid rocket motors, compliance with **Condition E9-9**.

E9-6. Silane (SiH₄) usage shall not exceed 25 pounds per hour, nor 2,500 pounds per year. TAPCR 1200-03-09

Compliance Method: A record of each test and weight of silane used for this testing that readily demonstrates compliance with these limits must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition **E2** of this permit and be retained for a period of not less than five years.

E9-7. Sulfur dioxide emitted from this source shall not exceed 4.0 pounds per hour (and 1.0 TPY). This limitation is established pursuant to TAPCR 1200-03-14-.03(5) and the information contained in the agreement letter dated November 22, 2016.

Compliance Method: Compliance shall be assured by compliance with **Conditions E9-2 and E9-4**, and calculations utilizing emission factors from AP-42, Chapter 1.5, Liquified Petroleum Gas Combustion and Aircraft Engine Emission Estimator, Attachment #2 of this permit.

E9-8. The total VOC emitted from this source during all testing modes (isobutane and propane combustion in heaters and flare, aircraft engine testing, liquid and solid rocket testing, fuel cracking and fuel overboard tests, and silane combustion) shall not exceed 10.1 tons per State FY (July-June). TAPCR 1200-03-06-.03(2) and 1200-03-07-.07(2)

Compliance Method: The permittee shall calculate the VOC emissions from all testing conducted at this source and record the results in a log that readily demonstrates compliance with this condition. These records must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition **E2** of this permit and be retained for a period of not less than five years.

- E9-9. During solid rocket motor testing, this source shall not operate without its water spray system. TAPCR 1200-03-09
- **E9-10.** For fee purposes, the permittee shall keep a log of the amounts of isobutane, propane, solid rocket propellants, liquid rocket propellants, and fuels for aircraft engine testing per month by this source and calculate the annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this fuel-burning source using appropriate emission factors, in conjunction with fuel usage. The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition **E1** of this permit.

Monthly log of emissions from isobutane fired heaters (16-0010-14)

Month_____ Year____

	Emissions from Combustion of Isobutane					
D-11-44	Usage	Emission Factor	Emission Factor	Emissions		
Pollutant	(gal)	(lb/10 ³ gal of fuel)	Reference	(tons)		
NO_x		15	Table 1.5-1, July 2008			
SO_2			Table 1.5-1, July 2008			
PM		0.8	Table 1.5-1, July 2008			
VOC		0.9	Table 1.5-1, July 2008			

Monthly log of emissions from propane fired heater (16-0010-14)

Month_____ Year____

	Emissions from Combustion of Propane					
Pollutant	Usage (gal)	Emission Factor (lb/10 ³ gal of fuel)	Emission Factor Reference	Emissions (tons)		
NO_x		13	Table 1.5-1, July 2008			
SO_2			Table 1.5-1, July 2008			
PM		0.7	Table 1.5-1, July 2008			
VOC		0.8	Table 1.5-1, July 2008			

Monthly log of emissions from testing aircraft engines (16-0010-14)

Month_____ Year____

	Emissions from Aircraft Engine Testing					
Pollutant	Fuel Usage (lbs)	Emission Factor (lb/10³ lb of fuel)	Emission Factor Reference	Emissions* (tons)		
NO _x	(103)	(16/10 16 of fuel)	Reference	(tons)		
SO_2						
PM						
VOC						

*include emissions from fuel cracking, silane combustion, fuel overboard, and flare, if applicable

Monthly	logo	f emissions fron	tocting colid	rocket motors	(16,0010,14)
MIOHUHA	102 0	1 611118810118 11 011	i tesung soma	Tocket motors	(10-0010-1 4)

Month_____ Year____

	Emissions from Solid Rocket Testing					
Pollutant	Fuel Usage (lbs)	Emission Factor (lb/lb of fuel)	Emission Factor Reference	Emissions* (tons)		
NO _x						
SO_2						
PM						
VOC						

^{*}include emissions from silane combustion and flare, if applicable

Monthly log of emissions from testing liquid rocket motors (16-0010-14)

Month_____ Year____

	Emissions from Liquid Rocket Testing					
Pollutant	Fuel Usage (lbs)	Emission Factor (lb/lb of fuel)	Emission Factor Reference	Emissions* (tons)		
NO_x						
SO_2						
PM						
VOC						

^{*}include emissions from silane combustion and flare, if applicable

Fiscal Year log of total emissions from APTU Test Facility (16-0010-14)

July 1, _____ to June 30, _____

Pollutant	Emissions from isobutane heaters (tons)	Emissions from propane heater (tons)	Emissions from aircraft engine testing (tons)	Emissions from liquid and solid rocket testing (tons)	Total Emissions (tons)
NO _x			_		
SO ₂					
PM					
VOC					

16-0010-17	Liquid Rocket Testing	This testing may be conducted either in 16-0010-17 Liquid Rocket Test Cell Facility,
		16-0010-18 Solid Rocket Test Cell Facility, 16-0010-19 ETF Test Cells, or 16-0010-31 ASTF Test Cells
		31 ASTI Test Cells

Condition E10-1 applies to Liquid Rocket Testing.

E10-1. Propellant usage for this testing shall not exceed the following:

Propellant <u>Usage [pounds / State FY (July-June)]</u>.

Hydrazine fuels 327,000 Nitrogen Tetroxide 585,000

 (N_2O_4)

This is the capacity of this source as stated in the application dated November 15, 1996.

Compliance Method: A record of the pounds of hydrazine fuel and tetroxide used for liquid rocket testing must be maintained at the source location and kept available for inspection by the Technical Secretary or his representative. This record must be retained for a period of not less than five years.

16-0010-18	Solid Rocket Testing:	Solid rocket testing may be conducted either in 16-0010-18 Solid Rocket Test Cell
		Facility, 16-0010-19 ETF Test Cells, or 16-0010-31 ASTF Test Cells as well as
		enclosed chambers, such as the J6 dehumidification chamber, within the Solid Rocket
		Test Complex. Tests with radionuclide emissions will be subject 40 CFR 61, Subpart
		I. Water sprays are primarily used as a safety measure to lower the temperature of the
		exhaust.

Conditions E11-1 through E11-6 apply to Solid Rocket Testing.

E11-1. Propellant burned shall not exceed 120,000 pounds per engine tested. This is equivalent to the capacity of this source as stated in the application dated November 15, 1996 since physically engines cannot be tested at a frequency of more than one per hour. TAPCR 1200-03-09

Compliance Method: A record of each solid rocket test and propellant weight used for this testing must be maintained at the source location and kept available for inspection by the Technical Secretary or his representative. This record must be retained for a period of not less than five years.

E11-2. Particulate matter emitted from solid rocket testing shall not exceed 0.02 grain per dry standard cubic foot of exhaust gas (531.7 lb/hr (and 10.0 TPY)). TAPCR 1200-03-07-.04(1) and the information contained in the a greement letter dated November 22, 2016.

Compliance Method: Compliance with this emission standard is assured by compliance with **Conditions E11-1 and E11-4**, and the emission factors developed by the facility through engineering estimates found in Attachment #2 of this permit.

E11-3. Carbon monoxide (CO) emitted from this testing shall not exceed 23,040 lb/hr and 168 tons per State FY (July-June). The hourly limitation is established pursuant to TAPCR 1200-03-07-.07(2), and the annual limitation is established pursuant to TAPCR 1200-03-07-.01(5) and the information contained in the agreement letter dated February 29, 1988.

Compliance Method: Compliance with the hourly emission standard is assured by compliance with Condition E11-1, and the emission factor developed by the facility through engineering estimates found in Attachment #2 of this permit. The permittee shall calculate the monthly CO emission rate utilizing the same engineering estimates and the logs required by Condition E11-1 to show compliance with the annual emission standard. These records must be maintained at the source location and kept available for inspection by the Technical Secretary or his representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five (5) years.

- **E11-4.** Whenever test conditions allow, this source shall not operate without its water spray system.
- E11-5. For fee purposes, the permittee shall calculate the annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this source using appropriate emission factors, in conjunction with fuel usage records (Conditions E11-1). The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition E1 of this permit.

Monthly log of emissions from testing solid rocket motors (16-0010-18) Month_____ Year____

	Emissions from Solid Rocket Testing					
Pollutant	Fuel Usage (lbs)	Emission Factor (lb/lb of fuel)	Emission Factor Reference	Emissions (tons)		
NO _x						
SO_2						
PM						
VOC						

Fiscal Year log of emissions from Solid Rocket Testing (16-0010-18) July 1, to June 30,

	Total Emissions
Pollutant	(tons)
NO_x	
SO_2	
PM	
VOC	

- E11-6. Solid rockettests that have the potential for radionuclide emissions are subject to the following regulations under 40 CFR Part 61, Subpart I, NATIONAL EMISSION STANDARDS FOR RADIONUCLIDE EMISSIONS FROM FEDERAL FACILITIES OTHER THAN NUCLEAR REGULATORY COMMISSION LICENSEES AND NOT COVERED BY SUBPART H.
 - (a) Emissions of radionuclides, including iodine, to the ambient air from a facility regulated under this subpart shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/yr.

40 CFR 61.102(a)

Compliance Method: Compliance with the emission standard in this subpart shall be determined through the use of either the EPA computer code COMPLY or the alternative requirements of 40 CFR 61, appendix E. The source terms to be used for input into COMPLY shall be determined through the use of the measurement procedures listed in 40 CFR 61.107 or the emission factors in 40 CFR 61, appendix D, or through alternative procedures for which EPA has granted prior approval.

40 CRF 61.103(a)

(b) Facilities emitting radionuclides in an amount that would cause less than 10% of the dose standard in **Condition E11-6(a)**, as determined by the compliance method, are exempt from the reporting requirements of 40 CFR 61.104(a). Facilities shall annually make a new determination whether they are exempt from reporting.

40 CFR 61.104(b)

(c) The permittee must maintain records documenting the source of input parameters including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine compliance. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard, and, if claimed, qualification for exemption from reporting. These records must be kept at the site of the facility for at least five years and upon request be made available for inspection by the Technical Secretary or a Division representative.

40 CFR 61.105

16-0010-19	ETF Test Cells	Engine Test Facility (ETF) for development and evaluation of propulsion systems with
		water spray.

Conditions E12-1 through E12-9, apply to source 16-0010-19.

E12-1. Aviation fuel input rate for a ir-breathing propulsion engine testing shall not exceed 80,000 pounds per hour. This is the capacity of this source as stated in the application dated November 15, 1996. TAPCR 1200-03-09

Compliance Method: A record of the aviation fuel used for this testing must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. This record must be retained for a period of not less than five years.

E12-2. Particulate matter emitted shall not exceed 12.0 lb/hr during air-breathing propulsion engine testing. Total particulate matter emitted from aircraft engine testing using ETF Test Cells (Source 19), and the ASTF Test Cells (Source 31) shall not exceed 21.6

tons per State FY (July - June). This limitation is established pursuant to TAPCR 1200-03-26-.02(9)(g) and the information contained in the agreement letters dated April 12, 1995 and May 26, 1999.

Compliance Method: Compliance with the hourly emission standard is a ssured based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment #2 of this permit. The permittee shall calculate the monthly PM emission rate utilizing the same engineering estimates and the logs required by Condition E12-1, and record the results in the logs required by Condition E12-7 to show compliance with the annual emission standard. These records must be maintained at the source location and kept a vailable for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five years.

E12-3. Sulfur dioxide (SO₂) emitted from air-breathing propulsion engine testing shall not exceed 97.0 lb/hr during air-breathing propulsion engine testing. Total sulfur dioxide emitted from aircraft engine testing using ETF Test Cells (Source 19), and the ASTF Test Cells (Source 31) shall not exceed 174.6 tons per State FY (July - June). This limitation is established pursuant to TAPCR 1200-03-14-.01(3) and the information contained in the agreement letters dated April 3, 1992 and May 26, 1999.

Compliance Method: Compliance with the hourly emission standard is assured based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment #2 of this permit. The permittee shall calculate the monthly SO₂ emission rate utilizing the same engineering estimates and the logs required by Condition E12-1, and record the results in the logs required by Condition E12-7 to show compliance with the annual emission standard. These records must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five years.

E12-4. Nitrogen oxides (NO_x) emitted from air-breathing propulsion engine testing shall not exceed 483.0 lb/hr. The total nitrogen oxides emitted from this source during all air-breathing propulsion engine testing modes shall not exceed 176.0 tons per State FY (July-June). This limitation is established pursuant to TAPCR 1200-03-26-.02(9)(g) and the information contained in the agreement letter dated April 12, 1995.

Compliance Method: Compliance with the hourly emission standard is assured based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment #2 of this permit. The permittee shall calculate the monthly NO_x emission rate utilizing the same engineering estimates and the logs required by **Condition E12-1**, and record the results in the logs required by **Condition E12-7** to show compliance with the annual emission standard. These records must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition **E2** of this permit and be retained for a period of not less than five years.

E12-5. Carbon monoxide (CO) emitted from air-breathing propulsion engine testing shall not exceed 320.0 lb/hr. The total CO emitted from air-breathing propulsion engine testing during all testing modes shall not exceed 83.0 tons per State FY (July-June).

TAPCR 1200-03-07-.07(2)

Compliance Method: Compliance with the hourly emission standard is assured based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment#2 of this permit. The permittee shall calculate the monthly CO emission rate utilizing the same engineering estimates and the logs required by Condition E12-1, and record the results to show compliance with the annual emission standard. These records must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five years.

E12-6. Volatile organic compounds (VOC) emitted from air-breathing propulsion engine testing, excluding the glycol reboiler emissions, shall not exceed 9.9 lb/hr. The total VOC emitted from air-breathing propulsion engine during all testing modes, excluding the glycol reboiler emissions, shall not exceed 7.0 tons per State FY (July-June).

TAPCR 1200-03-07-.07(2)

Compliance Method: Compliance with the hourly emission standard is based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment #2 of this permit. The permittee shall calculate the monthly VOC emission rate utilizing the same engineering estimates and the logs required by Condition E12-1, and record the results in the logs required by Condition E12-7 to show compliance with the annual emission standard. These records must be maintained at the source location and kept a vailable for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five years.

E12-7. Hydrogen fluoride emitted from this source shall not exceed 2.9 tons during any 12-consecutive month period.

TAPCR 1200-03-07-.07(2)

Compliance Method: During tests that generate acid gases, this source shall not operate without the use of its water spray system.

E12-8. During tests that generate a cid gases, the exhaust gases from the test cells shall be discharged unobstructed vertically upwards to the ambient air from stack E1 with an exit diameter of 7 feet, not less than 65 feet above ground level, stack E2M with an exit diameter of 3.3 feet, not less than 70 feet above ground level, and stack E2H with an exit diameter of 2.5 feet, not less than 70 feet above ground level.

TAPCR 1200-03-03-.03

E12-9. For fee purposes, the permittee shall calculate the annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, volatile organic compound (VOC) emissions, and hydrogen fluoride (HF) emissions from this fuel-burning source using appropriate emission factors and engineering judgment, in conjunction with fuel usage records (Conditions E12-1). The permittee shall calculate its annual actual ethylene glycol emissions from this source using a material balance that assumes the quantity of ethylene glycol purchased to replenish the system is equal to the emissions to the air, minus losses related to liquid spills or disposal as waste. The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition E1 of this permit.

TAPCR 1200-03-09

Monthly log of emissions from testing aircraft engines (16-0010-19) Month_____ Year____

Emissions from Aircraft Engine Testing						
	Fuel Usage Emission Factor Emission Factor Emissions					
Pollutant	(lbs)	(lb/10 ³ lb of fuel)	Reference	(tons)		
NO_x						
SO_2						
PM						
VOC						
HF						

Fiscal Year log of total emissions from ETF Test Cells (16-0010-19) July 1, ____ to June 30, ____

Pollutant	Emissions from aircraft engine testing (tons)	Emissions from glycol reboilers (tons)	*Total Emissions (tons)
NO_x			
SO_2			
PM			
VOC			
HF			

^{*}Do not double count emissions associated with the ASTF Test Cells (Source 31)

16-0010-28	HB Heaters 1A & 1B	Two 54 MMBtu/hr heaters to provide heated a ir for testing operations at the Von
		Karmán Gas Dynamics Facility (VKF).
		MACT, Subpart DDDDD ("limited use unit") (SM1)

Conditions E13-1 through E13-6 apply to source 16-0010-28.

E13-1. The total stated design heat input capacity of this source is 108 million British thermal units per hour (MMBtu/hr), on a daily average basis. This is the capacity of the source as stated in the application dated November 15, 1996.

Compliance Method: This condition is a statement of the design heat input capacity for this source. If the permittee needs to increase the design or maximum capacity of this source, the permittee shall pursue the appropriate Title V procedure in accordance with TAPCR 1200-03-09-.02(11). If a construction permit is applied for, this shall be done in accordance with TAPCR 1200-03-09-.01(1).

E13-2(SM1). Natural gas or propane shall be the only fuels used for this source.

TAPCR 1200-03-09-.03(8)

Compliance Method: Compliance with this operating restriction shall be assured through the recordkeeping required by **Condition E13-3**.

E13-3(SM1). The actual heat input for all fuels combusted by the VKF Heaters HB-1A and HB-1B combined shall not exceed 10% of the maximum potential heat input for each heater on a calendar year basis. The actual heat input to each heater shall be calculated on a monthly basis using Equation 1 below, and shall not exceed 47,304 MMBtu per heater per calendar year. These limitations are established pursuant to Rule 1200-03-09-.03(8) of the Tennessee Air Pollution Control Regulations and the information contained in the significant modification applications dated April 5, 2019, and July 23, 2019. The permittee has requested this federally enforceable 10% annual capacity factor limit be placed on these heaters so that they meet the definition of *Limiteduse boiler or process heater*, as defined in 40 CFR §63.7575.

Btu/month = NG * 1,020 Btu/scf + P * 90,500 Btu/gal

Equation 1

Where:

NG = standard cubic feet of natural gas combusted, per month

P= gallons of propane combusted, per month

This operating restriction replaces the previous operating hour restriction of 3,000 hours per year. The operating hour restriction was requested in order to avoid PSD applicability.

Compliance Method: A record of the natural gas and/or propane usage for these heaters on the days these units are operating and the results of the monthly heat input calculations shall be recorded and maintained in a tabular form onsite. These records must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five years. If the permittee needs to increase the design or maximum capacity of these units, the permittee shall pursue the appropriate Title V procedure in accordance with 1200-03-09-.02(11) of TAPCR.

E13-4(SM1). Particulate matter (PM) emitted from this source shall not exceed 0.16 lb/MMBtu (17.23 pounds per hour, on a daily average basis). TAPCR 1200-03-06-.02(2)(a).

Compliance Method: Compliance with this emission limitation is a ssured by compliance with **Conditions E13-1 and E13-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.5, Liquefied Petroleum Gas Combustion.

E13-5(SM1). Sulfur dioxide (SO₂) emitted from this source shall not exceed 5 lb/MMBtu (540 pounds per hour, on a daily average basis). TAPCR 1200-03-14-.02(2)(a)

Compliance Method: Compliance with this emission limitation is assured by compliance with **Conditions E13-1 and E13-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.5, Liquefied Petroleum Gas Combustion.

E13-6(SM1). For fee purposes, the permittee shall calculate the annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this fuel-burning source using AP-42 emission factors, in conjunction with the fuel usage records required by **Condition E13-3**. The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition **E1** of this permit.

Monthly log of emissions from HB Heaters 1A & 1B (16-0010-28) Month_____ Year____

	Emissions from Combustion of Propane					
Pollutant	Usage (gal)	Emission Factor (lb/10 ³ gal of fuel)	AP-42 Reference	Emissions (tons)		
NO_x		13	Table 1.5-1, July 2008			
SO_2			Table 1.5-1, July 2008			
PM		0.7	Table 1.5-1, July 2008			
VOC		0.8	Table 1.5-1, July 2008			

MonthY	Year
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Emissions from Natural Gas Combustion					
Pollutant Usage Emission Factor (lb/106 scf of NG)			AP-42 Reference	Emissions (tons)	
NO _x		100	Table 1.4-1, July 1998		
SO_2		0.6	Table 1.4-2, July 1998		
PM		7.6	Table 1.4-2, July 1998		
VOC		5.5	Table 1.4-2, July 1998		

Fiscal Year log of emissions from HB Heaters 1A & 1B (16-0010-28) July 1, _____ to June 30, ____

Pollutant	Emissions from NG (tons)	Emissions from propane (tons)	Total Emissions (tons)
NO_x			
SO_2			
PM			
VOC			

16-0010-30	ASTF Heaters	Aero propulsion System Test Facility (ASTF) heaters C1-1, C1-2, C2-1, and C2-2 (504 MMBtu/hr, each) used for aero propulsion testing. Subpart DDDDD
	ASTF Heaters	The permittee (AEDC) has a greed to limit the usage of the amount of fuel to be used, thus qualifying this to be a limited use heaters as defined in Subpart DDDDD .

Conditions E14-1 through E14-8 apply to source 16-0010-30.

E14-1. The total stated design heat input capacity of this source is 2,016 million British thermal units per hour (MMBtu/hr), on a daily average basis. This is the capacity of the source as stated in the application dated March 1, 2000.

Compliance Method: None. This condition is a statement of design input capacity for this source. If the permittee needs to increase the design or maximum capacity of this source, the permittee shall pursue the appropriate Title V procedure in accordance with 1200-03-09-.02(11) of TAPCR. If a construction permit is applied for, this shall be done in accordance with 1200-03-09-.01(1) of TAPCR.

- **E14-2.** Commingled fuel consisting of various combinations of fuels such as JP fuels, a viation fuels, and/or #2 fuel oil shall be the only fuel used for these heaters.
- **E14-3.** The maximum fuel usage for this source shall not exceed 1,500,000 gallons of aircraft fuel (limited use heaters) per State FY (July-June). This limitation is established by the information contained in the agreement letter dated May 10, 1999 from the permittee for fee purposes and to a void PSD, pursuant to Rules 1200-03-26-.02(6)(b), 1200-03-07-.01(5), 1200-03-06-.01(7), and 1200-03-14-.01(3) of the TAPCR.

Limited use Heater (as defined in Subpart DDDD): Limited-use boiler or process heater means any boiler or process heater that burns any amount of solid, liquid, or gaseous fuels and has a federally enforceable annual capacity factor of no more than 10 percent.

Compliance Method: A record of the fuel usage must be maintained at the source location and kept a vailable for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition **E2** of this permit and be retained for a period of not less than five years.

E14-4. The sulfur content of the fuel oil shall not exceed 0.3 percent by weight. This limitation is established pursuant to TAPCR 1200-03-14-.01(3) and the information contained in the agreement letter dated April 3, 1992.

Compliance Method: The permittee shall EITHER, annually provide a written statement from each fuel vendor guaranteeing in advance that the sulfur content limit will not be exceeded OR, provide a sulfur content analysis semi-annually along with the Semi-annual report (SAR). These records shall be kept a vailable for inspection by the Technical Secretary or a Division representative and be retained for a period of not less than five years. These records must be maintained at the source location and kept a vailable for inspection by the Technical Secretary or a Division representative. These records must also be reported in accordance with condition **E2** of this permit..

E14-5. Particulate matter emitted from this source shall not exceed 47.5 pounds per hour (and 3.0 TPY). This limitation is established pursuant to Rule 1200-03-06-.01(7) of the Tennessee Air Pollution Control Regulations, and the information contained in the agreement letter dated November 22, 2016 from the permittee.

Compliance Method: Compliance with this emission standard is assured by compliance with **Condition E14-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.3, Fuel Oil Combustion.

E14-6. Sulfur dioxide emitted from this source shall not exceed 690 pounds per hour (and 36.0 TPY). This limitation is established pursuant to Rule 1200-03-14-.01(3) of the Tennessee Air Pollution Control Regulations and the information contained in the agreement letter dated November 22, 2016 from the permittee.

Compliance Method: Compliance with this emission standard is assured by compliance with **Conditions E14-2 and E14-4**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.3, Fuel Oil Combustion.

E14-7. Nitrogen oxide emitted from this source shall not exceed 324 pounds per hour (and 18.0 TPY). This limitation is established pursuant to Rule 1200-03-06-.01(7) of the Tennessee Air Pollution Control Regulations and the information contained in the agreement letter dated November 22, 2016 from the permittee.

Compliance Method: Compliance with this emission standard is assured by compliance with **Condition E14-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.3, Fuel Oil Combustion.

E14-8. For fee purposes, the permittee shall calculate the annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this fuel-burning source using uncontrolled AP-42 emission factors, in conjunction with fuel usage records. The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition **E1** of this permit.

Monthly log of emissions from ASTF heaters (16-0010-30) Month_____ Year_____

	Emissions from Combustion of Liquid Fuels					
Pollutant	Usage (gal)	Emission Factor (lb/10³ gal of fuel)	AP-42 Reference	Emissions (tons)		
NO_x			Table 1.3-1, September 1998			
SO_2			Table 1.3-1, September 1998			
PM			Table 1.3-1 & 2, Sept. 1998			
VOC			Table 1.3-3, September 1998			

Fiscal Year log of emissions from ASTF heaters (16-0010-30)

July 1, _____ to June 30, _____

Pollutant	Total Emissions (tons)
NO_x	
SO_2	
PM	
VOC	

16-0010-31	ASTF Test Cells	Aero Propulsion System Test Facility (ASTF) used to evaluate aircraft engines under various conditions (Including Glycol Reboilers EG-A & EG-B) with water
		spray and vapor condenser control

Conditions E15-1 through E15-4 apply to source 16-0010-31.

E15-1. Input capacity for aircraft engine testing shall not exceed 80,000 pounds per hour of aircraft fuels, and 90,000 pounds per hour of Liquid Hydrogen. This is the capacity of this source as stated in the application dated November 15, 1996. TAPCR 1200-03-09

Compliance Method: A record of the fuel used for this testing must be maintained at the source location and kept available for inspection by the Technical Secretary or his representative. These logs must also be reported in accordance with condition **E2** of this permit and be retained for a period of not less than five years.

E15-2. Particulate matter emitted shall not exceed 12.0 lb/hr during air-breathing propulsion engine testing. Total particulate matter emitted from aircraft engine testing using ETF Test Cells (Source 19), and the ASTF Test Cells (Source 31) shall not exceed 21.6 tons per State FY (July - June). This limitation is established pursuant to TAPCR 1200-03-26-.02(9)(g) and the information contained in the agreement letters dated April 3, 1992 and May 26, 1999.

Compliance Method: Compliance with the hourly emission standard is assured based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment #2 of this permit. The permittee shall calculate the monthly PM emission rate utilizing the same engineering estimates and the logs required by Condition E15-1, and record the results in the logs required by Condition E15-4 to show compliance with the annual emission standard. These records must be maintained at the source location and kept a vailable for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five years.

E15-3. Sulfur dioxide (SO₂) emitted from air-breathing propulsion engine testing shall not exceed 97.0 lb/hr during air-breathing propulsion engine testing. Total sulfur dioxide emitted from aircraft engine testing using ETF Test Cells (Source 19), and the ASTF Test Cells (Source 31) shall not exceed 174.6 tons per State FY (July - June). This limitation is established pursuant to TAPCR 1200-03-26-.02(9)(g) and the information contained in the agreement letters dated April 3, 1992, and May 26, 1999.

Compliance Method: Compliance with the hourly emission standard is assured based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment #2 of this permit. The permittee shall calculate the monthly SO₂ emission rate utilizing the same engineering estimates and the logs required by Condition E15-1, and record the results in the logs required by Condition E15-4 to show compliance with the annual emission standard. These records must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five years.

E15-4. For fee purposes, the permittee shall calculate the annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this fuel-burning source using appropriate emission factors, in conjunction with fuel usage records (**Conditions E15-1**). The permittee shall calculate its annual actual ethylene glycol emissions from this source using a material balance that assumes the quantity of ethylene glycol purchased to replenish the system is equal to the emissions to the air, minus losses related to liquid spills or disposal as waste. The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in a ccordance with condition **E1** of this permit.

Monthly log of emissions from testing aircraft engines (16-0010-31)

Month_____Year___

	Emissions from Aircraft Engine Testing					
Pollutant	Fuel Usage (lbs)	Emission Factor (lb/10³ lb of fuel)	Emission Factor Reference	Emissions (tons)		
NO_x						
SO_2						
PM						
VOC						

Fiscal Year log of total emissions from ASTF Test Cells (16-0010-31)

July 1, _____ to June 30, _____

Pollutant	Emissions from aircraft engine testing (tons)	Emissions from glycol reboilers (tons)	*Total Emissions (tons)
NO _x			
SO_2			
PM			
VOC			

^{*}Do not double count emissions associated with the ETF Test Cells (Source 19)

16-0010-35	VKF Auxiliary Heater	Von Karmán Gas Dynamics Facility (VKF) auxiliary heater (16 MMBtu/hr) to provided heated air to the VKF wind tunnels. MACT, Subpart DDDDD ("limited use unit")
		use unit)

Conditions E16-1 through E16-6 apply to source 16-0010-35.

E16-1. The total stated design heat input capacity of this source is 16 million British thermal units per hour (MMBtu/hr), on a daily average basis. This is the capacity of the source as stated in the application dated November 15, 1996.

Compliance Method: This condition is a statement of the design heat input capacity for this source. If the permittee needs to increase the design or maximum capacity of this source, the permittee shall pursue the appropriate Title V procedure in accordance with TAPCR 1200-03-09-.02(11). If a construction permit is a pplied for, this shall be done in accordance with TAPCR 1200-03-09-.01(1).

- **E16-2.** Natural gas shall be the only fuel used for this heater.
- **E16-3.** Particulate matter emitted from this source shall not exceed 0.5 pound per hour (and 1.0 TPY). This limitation is established pursuant to TAPCR 1200-03-06-.01(7) and the information contained in the agreement letter dated November 22, 2016.

Compliance Method: Compliance shall be assured by compliance with **Conditions E16-1 and E16-2** and the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E16-4. Sulfur dioxide emitted from this source shall not exceed 0.5 pound per hour (and 1.0 TPY). This limitation is established pursuant to TAPCR 1200-03-14-.01(3) and the information contained in the agreement letter dated November 22, 2016.

Compliance Method: Compliance shall be assured by compliance with **Conditions E16-1 and E16-2** and the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E16-5. Operating time of this heater shall not exceed 876 hours per State FY (July-June). This limitation is established pursuant to TAPCR 1200-03-06-.01(3) and the information contained in the agreement letter dated September 30, 2013 from the permittee. The permittee requested this limit to establish this unit as a "limited use" unit under 40 CFR 63, Subpart DDDDD.

Compliance Method: A record of the hours of operation for this source must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition **E2** of this permit and be retained for a period of not less than five years.

E16-6. For fee purposes, the permittee shall keep a log of the amount of natural gas burned (in standard cubic feet, scf) per month by this source and calculate the annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this fuel-burning source using uncontrolled AP-42 emission factors, in conjunction with fuel usage. The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition E1 of this permit.

NO _x	Collutant (scf) (lb/10 ⁶ scf of NG) AP-42 Reference (tons)	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		Emissions (tons)
SO ₂	O.6 Table 1.4-2, July 1998		able 1 4-1 July 1998	
PM 7.6 Table 1.4-2, July 1998 VOC 5.5 Table 1.4-2, July 1998 or log of emissions from VKF auxiliary heater (16-0010-35) to June 30, Pollutant Total Emissions	7.6 Table 1.4-2, July 1998	O ₂ 0.6 Ta	acic 1.1 1,3 aly 1770	
VOC 5.5 Table 1.4-2, July 1998 ar log of emissions from VKF auxiliary heater (16-0010-35) to June 30, Pollutant Total Emissions	r log of emissions from VKF auxiliary heater (16-0010-35) to June 30, Pollutant Total Emissions (tons)	- 2	able 1.4-2, July 1998	
ar log of emissions from VKF auxiliary heater (16-0010-35) Logical Total Emissions Pollutant Total Emissions	r log of emissions from VKF auxiliary heater (16-0010-35) to June 30, Pollutant Total Emissions (tons)	M 7.6 Ta	able 1.4-2, July 1998	
Pollutant Total Emissions	Pollutant Total Emissions (tons)	OC 5.5 Ta	able 1.4-2, July 1998	
Pallitant I I I I I I I I I I I I I I I I I I I	Pollutant (tons)	log of emissions from VKF auxiliary heate	, <u>, , , , , , , , , , , , , , , , , , </u>	
	NO _x	Politiant		

16-0010-40	Chemical Cleaning Facility	Cleaning and degreasing operation
Conditions E17-1	and E17-2 apply to source 16-0	0010-40.

E17-1. A log of all VOC-containing materials used shall be maintained at the source location. For fee purposes, the permittee shall calculate the total a mount of VOC emitted from this source during each calendar month and maintain records of these emissions (see example below). These records shall be reported in accordance with condition **E1** of this permit.

Monthly Usage and VOC Emission Log Month Year

Process Materials Usage (gal/month) (lb/gal) VOC Emitted (ton/month)

Material#1

Material#2
etc. Total:

Total VOC emissions for **Fiscal Year** July 1, _____ to June 30, _____ is ____ Tons

E17-2. A construction permit will be required prior to usage of any halogenated solvents subject to MACT (Maximum Achievable Control Technology) Standards.

16-0010-42 ARC Heaters (3) HR, H1, and H2 arc heaters that supply high temperature air for materials research development
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Conditions E18-1 through E18-3 apply to source 16-0010-42.

E18-1. Operating time shall not exceed 27 hours per State FY (July-June) for all three (3) heaters combined. This limitation is established pursuant to TAPCR 1200-03-26-.02(9)(g) and the information contained in the agreement letter dated September 17, 1996 from the permittee.

Compliance Method: A record of the hours of operation for this source must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition **E2** of this permit and be retained for a period of not less than five years.

E18-2. Nitrogen oxides (NO_x) emitted from this source shall not exceed 20.4 tons per State FY (June - July). This limitation is established pursuant to TAPCR 1200-03-07-.01(5) and the information contained in the agreement letter dated September 17, 1996.

Compliance Method: Compliance shall be assured by compliance with Condition E18-1, and the emission factor of 0.42 lb/second NO_x generation developed by the facility through engineering estimates found in Attachment #2 of this permit.

E18-3. For fee purposes, the permittee shall calculate the annual actual oxides of nitrogen (NO_x) emissions from this source. The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition **E1** of this permit.

Monthly log and Fiscal Year log of emissions from ARC Heaters (16-0010-42)

Month Year

Pollutant	Hours of	Emission Factor	Emissions
Ponutant	Operation	(lb NO _x /sec)	(tons)
NOv		0.42	

Total emissions for fiscal year			
July 1,	to June 30,		
	tons		

16-0010-43	Steam Plant C	One 50 MMBtu/hr natural gas fired boiler MACT, Subpart DDDDD	

Conditions E19-1 through E19-5 apply to source 16-0010-43.

E19-1. The total stated design heat input capacity of this source is 50 million British thermal units per hour (MMBtu/hr), on a daily average basis. This is the capacity of the source as stated in the application dated November 15, 1996. This boiler is equipped with continuous O₂-trim.

Compliance Method: This condition is a statement of the design heat input capacity for this source. If the permittee needs to increase the design or maximum capacity of this source, the permittee shall pursue the appropriate Title V procedure in accordance with TAPCR 1200-03-09-.02(11). If a construction permit is applied for, this shall be done in accordance with TAPCR 1200-03-09-.01(1).

- **E19-2.** Natural gas shall be the only fuel used for this source.
- **E19-3.** Particulate matter emitted from this source shall not exceed 0.24 lb/MMBtu (12.3 pounds per hour, maximum and 2.0 TPY). This limitation is established pursuant to TAPCR 1200-03-06-.02(2) and the information contained in the agreement letter dated November 22, 2016.

Compliance Method: Compliance shall be a ssured by compliance with **Condition E19-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E19-4. Sulfur dioxide emitted from this source shall not exceed 0.1 pound per hour (and 1.0 TPY). This limitation is established pursuant to TAPCR 1200-03-14-.01(3) and the information contained in the agreement letter dated November 22, 2016.

Compliance Method: Compliance shall be assured by compliance with **Condition E19-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E19-5. For fee purposes, the permittee shall keep a log of the amount of natural gas burned (in standard cubic feet, scf) per month by this source and calculate the annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this fuel-burning source using uncontrolled AP-42 emission factors, in conjunction with fuel usage. The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition E1 of this permit.

Monthly log of emissions from Steam Plant C (16-0010-43)

Pollutant	NG Usage (scf)	Emission Factor (lb/10 ⁶ scf of NG)	AP-42 Reference	Emissions (tons)
NO_x		100	Table 1.4-1, July 1998	
SO_2		0.6	Table 1.4-2, July 1998	
PM		7.6	Table 1.4-2, July 1998	
VOC		5.5	Table 1.4-2, July 1998	

Fiscal Year log of emissions from Steam Plant C (16-0010-43)

July 1, _____ to June 30, _____

Pollutant	Total Emissions (tons)
NO_x	
SO_2	
PM	
VOC	

16-0010-46 T-3	T 2 Air Haatan	One 188 MMBtu/hr natural gas fired air heater	MACT, Subpart DDDDD
	T-3 Air Heater	("limited use unit")	

Conditions E21-1 through E21-6 apply to source 16-0010-46.

E21-1. The total stated design heat input capacity of this source is 188 million British thermal units per hour (MMBtu/hr), on a daily average basis. This is the capacity of the source as stated in the application dated November 15, 1996.

Compliance Method: This condition is a statement of the design heat input capacity for this source. If the permittee needs to increase the design or maximum capacity of this source, the permittee shall pursue the appropriate Title V procedure in accordance with TAPCR 1200-03-09-.02(11). If a construction permit is applied for, this shall be done in accordance with TAPCR 1200-03-09-.01(1).

- **E21-2.** Natural gas shall be the only fuel used for this source. This condition is established pursuant to Rule 1200-03-06-.01(7) of the Tennessee Air Pollution Control Regulations and the information contained in the agreement letter dated December 21, 1989 from the permittee to avoid PSD.
- **E21-3.** Operating time shall not exceed four hundred six teen (416) hours per State FY (July-June). This limitation is established pursuant to Rule 1200-03-06-.01(7) of the Tennessee Air Pollution Control Regulations and the information contained in the agreement letter dated December 21, 1989 from the permittee to avoid PSD.

Limited use Heater (as defined in Subpart DDDDD): Limited-use boiler or process heater means any boiler or process heater that burns any amount of solid, liquid, or gaseous fuels and has a federally enforceable annual capacity factor of no more than 10 percent.

Compliance Method: A record of the hours of operation for this source must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in a ccordance with condition **E2** of this permit and be retained for a period of not less than five years.

E21-4. Particulate matter emitted from this source shall not exceed 0.12 lb/MMBtu (22.03 pounds per hour maximum and 1.0 TPY). This limitation is established pursuant to TAPCR 1200-03-06-.02(2)(a) and the information contained in the agreement letter dated November 22, 2016.

Compliance Method: Compliance shall be assured by compliance with **Condition E21-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E21-5. Sulfur dioxide emitted from this source shall not exceed 0.2 pound per hour (and 1.0 TPY). This limitation is established pursuant to TAPCR 1200-03-14-.01(3) and the information contained in the agreement letter dated November 22, 2016.

Compliance Method: Compliance shall be assured by compliance with **Condition E21-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E21-6. For fee purposes, the permittee shall keep a log of the amount of natural gas burned (in standard cubic feet, scf) per month by this source and calculate its annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this fuel-burning source using uncontrolled AP-42 emission factors, in conjunction with fuel usage. The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition E1 of this permit.

Monthly log of emissions from T-3 Air Heater (16-0010-46)

Month_____ Year____

Emissions from Natural Gas Combustion						
Pollutant Usage (scf) Emission Factor (lb/10 ⁶ scf of NG) AP-42 Reference						
NO _x		280	Table 1.4-1, July 1998			
SO_2		0.6	Table 1.4-2, July 1998			
PM		7.6	Table 1.4-2, July 1998			
VOC		5.5	Table 1.4-2, July 1998			

Fiscal Year log of emissions from T-3 Air Heater (16-0010-46)

July 1, _____ to June 30, _____

Pollutant	Total Emissions (tons)
NO_x	
SO_2	
PM	
VOC	

16-0010-52 PWT Engine Testing

Engine testing conducted in the propulsion wind tunnel (PWT) to simulate various flight conditions during engine operation with water spray control

Conditions E22-1 through E22-5 apply to source 16-0010-52.

E22-1. The fuel input rate shall not exceed the following:

i) Aircraft engines: 80,000 lbs/hour.

ii) Small liquid rocket motors: 30,000 lbs / State FY (July-June)

iii) Small solid rocket motors: 30,300 lbs / State FY (July-June)

This is the capacity of this source as stated in the application dated November 15, 1996.

Compliance Method: A record of the test article fuel type, fuel usage rate (aircraft engine), and fuel quantity (rocket) must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition **E2** of this permit and be retained for a period of not less than five years.

E22-2. Particulate matter emitted from this source shall not exceed 3.8 lb/hr for aircraft engine testing, 6.5 lb/second for solid rocket testing and 1.0 ton per State FY (July-June) for all types of testing. This limitation is established pursuant to TAPCR 1200-03-07-.01(5) and the information contained in the agreement letter dated April 6, 1995 from the permittee.

Compliance Method: Compliance with the hourly emission standards is a ssured based on calculations utilizing the emission factors developed by the facility through engineering estimates found in Attachment #2 of this permit. The permittee shall calculate the monthly PM emission rate utilizing the same engineering estimates and the logs required by **Condition E22-1**,

and record the results in the logs required by **Condition E22-5** to show compliance with the annual emission standard. These records must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition **E2** of this permit and be retained for a period of not less than five years.

E22-3. Sulfur dioxide emitted from this source during testing of engines shall not exceed 0.6 lb/hr during idle mode, 12.0 lb/hr during military mode, and 81 lb/hr during afterburner mode of the aircraft engines being tested and the annual emissions shall not exceed 1.4 tons per State FY (July-June).

TAPCR 1200-03-14-.03(5)

Compliance Method: Compliance with the hourly emission standard is assured based on calculations utilizing the emission factors developed by the facility through engineering estimates found in Attachment #2 of this permit. The permittee shall calculate the monthly SO₂ emission rate utilizing the same engineering estimates and the logs required by Condition E22-1, and record the results in the logs required by Condition E22-5 to show compliance with the annual emission standard. These records must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five years.

E22-4. Hydrogen chloride (HCl) emitted from this source shall not exceed 12.7 lb/second during boost and 2.4 lb/second during sustain mode of testing for solid rocket motor testing and the total annual emissions shall not exceed 3.22 tons per State FY (July-June).

TAPCR 1200-03-07-.07(2)

Compliance Method: Compliance with the hourly emission standard is assured based on calculations utilizing the emission factors developed by the facility through engineering estimates found in Attachment #2 of this permit. The permittee shall calculate the monthly HCl emission rate utilizing the same engineering estimates and the logs required by Condition E22-1, and record the results in the logs required by Condition E22-5 to show compliance with the annual emission standard. These records must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five years.

E22-5. For fee purposes, the permittee shall calculate the annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, volatile organic compound (VOC) emissions, and hydrogen chloride (HCl) emissions from this source using appropriate emission factors, in conjunction with fuel usage records (Conditions E22-1). The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition E1 of this permit.

Monthly lo	g of emissio	ns from test	ting aircraft	t engines (1	16-0010-52)
Month	Y	ear			

	Emissions from Aircraft Engine Testing							
Pollutant	Fuel Usage (lbs)	Emission Factor (lb/10³ lb of fuel)	Emission Factor Reference	Emissions (tons)				
NO_x								
SO_2								
PM								
VOC								

Monthly log of emissions from testing solid rocket motors (16-0010-52)

Month	Year	

Emissions from Solid Rocket Testing						
	Fuel Usage Emission Factor Emission Factor Emissions					
Pollutant	(lbs)	(lb/lb of fuel)	Reference	(tons)		
NO_x						
SO_2						
PM						
VOC						
HCl						

Monthly log of emissions from testing liquid rocket motors (16-0010-52)

Month_____ Year____

Emissions from Liquid Rocket Testing							
	Fuel Usage Emission Factor Emission Factor Emissions						
Pollutant	(lbs)	(lb/lb of fuel)	Reference	(tons)			
NO_x							
SO_2							
PM							
VOC	·						

Fiscal	Vear log	of total	emissions	from PWT	engine	testing ((16-0010-	52
riscai	I car rug	or war	CIIIISSIUIIS	1101111 111	CHEIL	woung v	.10-0010-	24

July 1, _____ to June 30, _____

Pollutant	Emissions from aircraft engine testing (tons)	Emissions from liquid and solid rocket testing (tons)	Total Emissions (tons)
NO _x			
SO_2			
PM			
VOC			

16-0010-53	SL1 Test Cell	Testing of aircraft engines under various load conditions

Conditions E23-1 through E23-8 apply to source 16-0010-53.

E23-1. Aircraft fuel usage rate shall not exceed 1,220,000 gallons per State FY (July-June).

Compliance Method: Compliance shall be determined from the record keeping requirement of Condition E23-7.

E23-2. Particulate matter emitted from this source shall not exceed 13.3 lb/hr and 0.9 tons per State FY (July-June). This limitation is established pursuant to TAPCR 1200-03-07-.01(5) and the information contained in the agreement letter dated May 17, 1993.

Compliance Method: Compliance with the hourly emission standard is assured based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment #2 of this permit. The permittee shall calculate the monthly PM emission rate utilizing the same engineering estimates and the logs required by **Condition E23-7**, and record the results in the logs required by **Condition E23-8** to show compliance with the annual emission standard. These records must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition **E2** of this permit and be retained for a period of not less than five years.

E23-3. Sulfur dioxide (SO₂) emitted from this source shall not exceed 108 lb/hr and 7.5 tons per State FY (July-June). This limitation is established pursuant to TAPCR 1200-03-14-.01(3) and the information contained in the agreement letter dated May 17, 1993.

Compliance Method: Compliance with the hourly emission standard is assured based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment #2 of this permit. The permittee shall calculate the monthly SO₂

emission rate utilizing the same engineering estimates and the logs required by **Condition E23-7**, and record the results in the logs required by **Condition E23-8** to show compliance with the annual emission standard. These records must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition **E2** of this permit and be retained for a period of not less than five years.

 $\textbf{E23-4.} \ \ \text{Nitrogen oxides (NO}_{x}) \ emitted \ from \ this source shall not exceed 544 \ lb/hr \ and 37.9 \ tonsper \ State \ FY \ (July-June). \ This \ limitation is established pursuant to TAPCR 1200-03-07-.07(2) \ and the information contained in the agreement letter dated May 17, 1993.$

Compliance Method: Compliance with the hourly emission standard is assured based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment#2 of this permit. The permittee shall calculate the monthly NO_x emission rate utilizing the same engineering estimates and the logs required by Condition E23-7, and record the results in the logs required by Condition E23-8 to show compliance with the annual emission standard. These records must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five years.

E23-5. Carbon monoxide (CO) emitted from this source shall not exceed 360 lbs/hr and 17.9 tons per State FY (July-June). This limitation is established pursuant to TAPCR 1200-03-07-.07(2) and the information contained in the agreement letter dated May 17, 1993.

Compliance Method: Compliance with the hourly emission standard is assured based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment #2 of this permit. The permittee shall calculate the monthly CO emission rate utilizing the same engineering estimates and the logs required by Condition E23-7, and record the results in the logs required by Condition E23-8 to show compliance with the annual emission standard. These records must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five years.

E23-6. Volatile organic compounds (VOC) emitted from this source shall not exceed 11.2 lb/hr and 1.6 tons per State FY (July-June). This limitation is established pursuant to TAPCR 1200-03-07-.07(2) and the information contained in the agreement letter dated May 17, 1993.

Compliance Method: Compliance with the hourly emission standard is assured based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment #2 of this permit. The permittee shall calculate the monthly VOC emission rate utilizing the same engineering estimates and the logs required by **Condition E23-7**, and record the results in the logs required by **Condition E23-8** to show compliance with the annual emission standard. These records must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition **E2** of this permit and be retained for a period of not less than five years.

- **E23-7.** A record of the fuel usage rate that readily shows compliance with **Condition E23-1** must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition **E2** of this permit and be retained for a period of not less than five years.
- **E23-8.** For fee purposes, the permittee shall calculate the annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this fuel-burning source using a ppropriate emission factors, in conjunction with fuel usage records (**Conditions E23-7**). The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition **E1** of this permit.

Monthly	log of emissions fro	om testing ai	ircraft engines (16-0010-53)
Month	Vear			

	Emissions from Aircraft Engine Testing						
Pollutant	Fuel Usage (lbs)	Emission Factor (lb/10³ lb of fuel)	Emission Factor Reference	Emissions (tons)			
NO_x							
SO_2							
PM							
VOC							

Fiscal Year log of total emissions from SL1 Test Cell (16-0010-53)

July 1, _____ to June 30, _____

Pollutant	Total Emissions (tons)
NO_x	
SO_2	
PM	
VOC	

16-0010-56 SL2/SL3 Test Cells (Large Engine Test Facility) PSD/BACT

Testing of aircraft engines under various load conditions

Conditions E24-1 through E24-11 apply to source 16-0010-56.

E24-1. Maximum fuel input rate shall not exceed 90,000 pounds per hour per cell, and 180,000 pounds per hour for both cells combined. This is the capacity of this source as stated in the application dated October 14, 1999.

Compliance Method: Compliance shall be assured by the record keeping requirements of Condition E24-9.

- **E24-2.** Only aircraft fuels shall be used as fuel(s) at this source.
- **E24-3.** Particulate matter emitted from this source during all engine testing modes shall not exceed 0.01 grain per dry standard cubic foot of exhaust airflow and 91 tons during all consecutive twelve month periods. TAPCR 1200-03-09-.01(4)

Compliance Method: Compliance with this emission standard is a ssured based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment #2, of this permit along with engineering calculations using pounds per hour rate and airflow from existing engine test data and records required by **Condition E24-9**.

E24-4. Sulfur dioxide (SO₂) emitted from this source during all engine testing modes shall not exceed 114 tons during all intervals of twelve consecutive months. TAPCR 1200-03-09-.01(4)

Compliance Method: The permittee shall calculate the monthly SO_2 emission rate based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment #2 of this permit, and the logs required by Condition E24-9. The results shall be recorded in the logs required by Condition E24-11 to show compliance with the annual emission standard. These records must be maintained at the source location and kept a vailable for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five years.

E24-5. Nitrogen oxides (NOx) emitted from this source during all engine testing modes shall not exceed 1,038 tons during all intervals of twelve consecutive months. This limitation is established pursuant to TAPCR 1200-03-09-.01(4).

Compliance Method: The permittee shall calculate the monthly NO_X emission rate based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment #2 of this permit, and the logs required by Condition E24-9. The results shall be recorded in the logs required by Condition E24-11 to show compliance with the annual emission standard. These records must be maintained at the source location and kept a vailable for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five years.

E24-6. Volatile organic compounds (VOC) emitted from this source during all engine testing modes shall not exceed 325 tons during all intervals of twelve consecutive months. This limitation is established pursuant to TAPCR 1200-03-09-.01(4).

Compliance Method: The permittee shall calculate the monthly VOC emission rate based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment #2 of this permit, and the logs required by Condition E24-9. The results shall be recorded in the logs required by Condition E24-11 to show compliance with the annual emission standard. These records must be maintained at the source location and kept a vailable for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five years.

E24-7. Carbon monoxide (CO) emitted from this source during all engine testing modes shall not exceed 1,890 tons during all intervals of twelve consecutive months. This limitation is established pursuant to TAPCR 1200-03-09-.01(4).

Compliance Method: The permittee shall calculate the monthly CO emission rate based on calculations utilizing emission factors from Aircraft Engine Emission Estimator, Attachment #2 of this permit, and the logs required by Condition E24-9. The results shall be recorded in the logs required by Condition E24-11 to show compliance with the annual emission standard. These records must be maintained at the source location and kept a vailable for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition E2 of this permit and be retained for a period of not less than five years.

- **E24-8.** The exhaust gases from the SL2/SL3 test facility shall be discharged unobstructed vertically upwards to the ambient air from a stack with an equivalent exit diameter of 29.85 feet (not more than 700 square feet cross sectional) and not less than 47 feet above ground level. This condition is established pursuant to Rule 1200-03-09-.01(4) of the Tennessee Air Pollution Control Regulations and the information contained in the PSD dispersion modeling results for the source dated August 1, 2002.
- **E24-9.** A log of the fuel usage rate, operating time, type of fuel used, and type of aircraft engine tested in a form that readily show compliance with **conditions E24-1 through E24-7** must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. This record must be retained for a period of not less than five years.
- E24-10. The Arnold Engineering Development Center (AEDC) shall continually seek new technology to include, but not be limited to, control for NOx, SO₂, CO, and VOC emissions from a irreaft engine test cells when technically and economically acceptable and a vailable to the engine test cell facilities. Status reports shall be submitted to the Technical Secretary addressing each emerging technology, when a vailable.
- **E24-11.** For fee purposes, the permittee shall calculate the annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this fuel-burning source using appropriate emission factors, in conjunction with fuel usage records (**Conditions E24-9**). The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition **E1** of this permit.

Monthly log of emissions from testing aircr	raft engines (16-0010-56)
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Month	Year

	Emissions from Aircraft Engine Testing				
Pollutant	Fuel Usage (lbs)	Emission Factor (lb/10³ lb of fuel)	Emission Factor Reference	Emissions (tons)	
NO _x	(IDS)	(16/10 16 01 1del)	Meterence	(tons)	
SO_2					
PM					
VOC					

Fiscal Year log of total emissions from SL2/SL3 Test Cells (16-0010-56)

July 1, _____ to June 30, _____

Pollutant	Total Emissions (tons)
NO _x	(*****)
SO_2	
PM	
VOC	

16-0010-70	Emergency Engines	Engines for emergency generators used in the event of electrical power failure
10 0010 70	Emergency Engines	(40 CFR 60, Subparts IIII and JJJJ, and 40 CFR 63, Subpart ZZZZ, as indicated)

Conditions E26-1 through E26-7 apply to source 16-0010-70.

On the permit application, the permittee stated that these emergency engines each with generator are used for emergency purposes. Therefore, based on EPA policy, the allowable emissions were calculated using 500 hours per year. This condition is for fee and informational purposes only and is not a limitation.

E26-1. The total heat input capacity of this source is 64,663,742 British Thermal Units per hour. TAPCR 1200-03-09

Compliance Method: This condition is a statement of the design heat input capacity for this source. If the permittee needs to increase the design or maximum capacity of this source, the permittee shall pursue the appropriate Title V procedure in accordance with TAPCR 1200-03-09-.02(11). If a construction permit is applied for, this shall be done in accordance with TAPCR 1200-03-09-.01(1).

E26-2. Sulfur dioxide (SO₂) emitted from this source shall not exceed 26.0 pounds per hour. TAPCR 1200-03-14-.03(5)

Compliance Method: Compliance with the emission limit is assured based on compliance with **Conditions E26-1 and E26-3c** of this permit, and the emission factors in AP-42, Chapter 3.3, Gasoline and Diesel Industrial Engines, and Chapter 3.4, Large Stationary Diesel and All Stationary Dual-fuel Engines.

E26-3. The following engines driving emergency generators are subject to regulations under 40 CFR, Part 60, Subpart IIII, STANDARDS OF PERFORMANCE FOR STATIONARY COMPRESSION IGNITION INTERNAL COMBUSTION ENGINES.

Engine Manufacturer/Model#	Engine Model YR	Engine input (br-hp)	EPA Certified
Cummins 450DFEJ	2008	755	Tier 2
Cummins 300DQHAB	2008	470	Tier 3
Cummins 200DGFC	2006	352	Tier 1
Cummins 50DGHE	2007	82	Tier 2
John Deere 4024HF285	2010	80	Tier 3
Cummins 25DSKCA	2008	48.9	Tier 4
Volvo Penta TAD1641GE	2006	758*	Tier 1
John Deere 4024HF285B	2010	80	Tier 3
Cummins QSB5-G3 NR3	2010	145	Tier 3
John Deere 6068HF485T	2010	315	Tier 3
Caterpillar C32	2011	1,474	Tier 2
Kubota V2203-M	2011	36.1	Tier 4
John Deere 5030HF285G	2011	97	Tier 3
Cummins QSB5-G3 NR3	2013	145	Tier 3
Caterpillar C7.1	2017	279	Tier 3

^{*} Approximate horsepower converted from 565 kW

a) Pursuant to 40 CFR §60.4205(a) and 40 CFR §60.4205(b), emissions from the subject units shall meet the following emissions standards, in grams per kilowatt-hour:

Engine Model	450DFEJ, C32	300DQHAB, 6068HF485T	200DGFC, TAD1641GE	50DGHE	4024HF285, 4024HF285B, 5030HF285G	25DSKCA, V2203-M	QSB5- G3 NR3
Pollutant	Pollutant Limits (g/kW-hr)						
$NMHC + NO_X$	6.4	4.0		7.5	4.7	7.5	4.0
CO	3.5	3.5	11.4	5.0	5.0	5.5	5.0
PM	0.2	0.2	0.54	0.4	0.4	0.30	0.30
HC			1.3				
NO_X			9.2				

- b) Pursuant to 40 CFR §60.4206, the permittee must operate and maintain each stationary CIICE that achieves the emission standards in (a) above over the entire life of each engine.
- c) Pursuant to 40 CFR §60.4207(b), the permittee must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for nonroad diesel fuel, except that any existing diesel fuel purchased (or otherwise obtained) prior to October 1, 2010, may be used until depleted. Except as otherwise specifically provided, the diesel fuel is subject to the following per-gallon standards:
 - (1) Sulfur content of 15 ppm maximum.
 - (2) Cetane index or aromatic content, as follows:
 - (i) A minimum cetane index of 40; or
 - (ii) A maximum aromatic content of 35 volume percent.

The permittee shall maintain purchase receipts, vendor certifications, material safety data sheets, or other records to demonstrate that all fuel purchased for this source meets the requirements of 40 CFR §60.4207(b) (any fuel labeled as ultra-low sulfur non-highway diesel fuel or ultra-low sulfur highway diesel fuel meets these requirements). These records shall be made a vailable to the Technical Secretary for inspection upon request and be maintained for a period of at least five (5) years from the purchase date.

- d) Monitoring for the subject units shall meet all applicable monitoring requirements specified in section §60.4209, including the installation of a non-resettable hour meter prior to startup of each engine, if applicable.
- e) Pursuant to 40 CFR §60.4211(a), the permittee must do all of the following, except as permitted in (g) below:
 - (1) Operate and maintain each affected stationary CI internal combustion engine and control device a ccording to the manufacturer's emission-related written instructions;
 - (2) Change only those emission-related settings that are permitted by the manufacturer; and
 - (3) Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply.
- f) Pursuant to 40 CFR §60.4211(b) & (c), for each pre-2007 model year stationary CI internal combustion engine, the permittee must demonstrate compliance according to one of the methods specified in (1) through (5) below:
 - (1) Purchasing an engine certified according to 40 CFR part 89 or 40 CFR part 94, as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications.
 - (2) Keeping records of performance test results for each pollutant for a test conducted on a similar engine. The test must have been conducted using the same methods specified in subpart IIII and these methods must have been followed correctly.
 - (3) Keeping records of engine manufacturer data indicating compliance with the standards.
 - (4) Keeping records of control device vendor data indicating compliance with the standards.
 - (5) Conducting an initial performance test to demonstrate compliance with the emission standards according to the requirements specified in §60.4212, as applicable.

For each 2007 model year and later stationary CI internal combustion engine, the permittee must comply by purchasing an engine certified to the emission standards in § 60.4204(b), or § 60.4205(b) or (c), as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's emission-related specifications, except as permitted in (g) below.

- g) Pursuant to 40 CFR §60.4211(g), if any engine and control device is not installed, configured, operated, and maintained engine according to the manufacturer's emission-related written instructions, or an emission-related setting is changed in a way that is not permitted by the manufacturer, the permittee must demonstrate compliance as follows:
 - (1) For stationary CI internal combustion engines with maximum engine power less than 100 HP, the permittee must keep a maintenance plan and records of conducted maintenance to demonstrate compliance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, if the engine and control device are not installed and configured a coording to the manufacturer's emission-related written instructions, or an emission-related setting is changed in a way that is not permitted by the manufacturer, the permittee must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of such action.

- (2) For stationary CI internal combustion engines greater than or equal to 100 HP and less than or equal to 500 HP, the permittee must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, the permittee must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after an engine and control device is no longer installed, configured, operated, and maintained in accordance with the manufacturer's emission-related written instructions, or within 1 year after changing an emission-related settings in a way that is not permitted by the manufacturer.
- (3) For stationary CI internal combustion engines greater than 500 HP, the permittee must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, the permittee must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after an engine and control device is no longer installed, configured, operated, and maintained in accordance with the manufacturer's emission-related written instructions, or within 1 year after changing an emission-related settings in a way that is not permitted by the manufacturer. The permittee must conduct subsequent performance testing every 8,760 hours of engine operation or 3 years, whichever comes first, thereafter to demonstrate compliance with the applicable emission standards.
- h) Pursuant to 40 CFR §60.4211(f), the permittee must operate the emergency stationary ICE according to the requirements in (1) through (3) below. In order for an engine to be considered an emergency stationary ICE under this subpart, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as described in (1) through (3) below, is prohibited. If an engine is not operated according to the requirements in (1) through (3) below, the engine will not be considered an emergency engine under subpart IIII, and must meet all requirements for non-emergency engines.
 - (1) There is no time limit on the use of emergency stationary ICE in emergency situations.
 - (2) The permittee may operate an emergency stationary ICE for any combination of the purposes specified in (i) below for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by (3) below counts as part of the 100 hours per calendar year.
 - (i) Emergency stationary ICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The permittee may petition the Technical Secretary for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the permittee maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year.
 - (3) Emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing provided in (2) above. Except as provided in (i) below, the 50 hours per calendar year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power a spart of a financial arrangement with another entity.
 - (i) The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the following conditions are met:
 - (A) The engine is dispatched by the local balancing authority or local transmission and distribution system operator;
 - (B) The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.
 - (C) The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.
 - (D) The power is provided only to the facility itself or to support the local transmission and distribution system.
 - (E) The permittee identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for

dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the permittee.

- i) Pursuant to 40 CFR §60.4214(b), if the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, the permittee must keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The permittee must record the time of operation of the engine and the reason the engine was in operation during that time.
- j) Pursuant to 40 CFR §60.4214(c), if a stationary CI internal combustion engine is equipped with a diesel particulate filter, the permittee must keep records of any corrective action taken after the backpressure monitor has notified the permittee that the high backpressure limit of the engine is approached.
- k) Pursuant to 40 CFR §60.4214(d), if an emergency stationary CIICE with a maximum engine power more than 100 HP operates for the purposes specified in (h)(3)(i) above, the permittee must submit an annual report according to the requirements in Condition E2(d).

E26-4. The following engines driving emergency generators are subject to regulations under 40 CFR, Part 63, Subpart ZZZZ, NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES.

En sin a Ma nu fa atuman/Ma dal #	Engine	Engine input	EPA
Engine Manufacturer/Model#	Model YR	(br-hp)	Certified
Cummins 450DFEJ	2008	755	Tier 2
Cummins 300DQHAB	2008	470	Tier 3
Cummins 200DGFC	2006	352	Tier 1
Cummins 50DGHE	2007	82	Tier 2
John Deere 4024HF285	2010	80	Tier 3
Cummins 25DSKCA	2008	48.9	Tier 4
Hercules D3400X298	1989	110	n/a
Cummins 4BTA3.9G3	2004	130	n/a
Cummins 4BT3.9-G2	1997	102	n/a
Unknown Volvo*	1989	168	n/a
Cummins 6BT5.9-G6	1989	166	n/a
Allis Chalmers DG-516	1959	101	n/a
Volvo TID718GP868451	1989	252	n/a
Caterpillar 3408	1997	520	n/a
Volvo Penta TAD1641GE	2006	758^	Tier 1
Cummins 6CTAB.36	1998	277	n/a
Caterpillar SR4	1991	1,600	n/a
Cummins 6CTA-B.3-G	1989	277	n/a
Unknown Cummins**	1999	20	n/a
Detroit Diesel 6063MK35	2001	415	n/a
Cummins 4B3.3-G1	2006	42	n/a
John Deere 4024HF285B	2010	80	Tier 3
Cummins QSB5-G3 NR3	2010	145	Tier 3
John Deere 6068HF485T	2010	315	Tier 3
Caterpillar C32	2011	1,474	Tier 2
Kubota V2203-M	2011	36.1	Tier 4
John Deere 5030HF285G	2011	97	Tier 3
Cummins QSB5-G3 NR3	2013	145	Tier 3
Caterpillar C7.1	2017	279	Tier 3

^{* 100} KW generator set, DLC 100V Pow'rGard, serving VKF facility

a) Pursuant to 40 CFR §63.6605, the permittee must be in compliance with the emission limitations, operating limitations, and other requirements of subpart ZZZZ applicable to each engine at all times. Also at all times, the permittee must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to

^{** 11.5} KW generator set, DNAD Onan, serving the Main Sewage Treatment Plant

[^] Approximate horsepower converted from 565 kW

minimize emissions does not require the permittee to make any further efforts to reduce emissions if levels required by this standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Technical Secretary which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

- b) Pursuant to 40 CFR §63.6640(f), the permittee must operate each emergency stationary RICE according to the requirements in (1) through (3) below in order for the engines to be considered emergency stationary RICE under subpart ZZZZ. Any operation other than emergency operation, maintenance and testing, and operation in nonemergency situations for 50 hours per year, as described in (1) through (3) below, is prohibited. If any engine is not operated according to the requirements in (1) through (3) below, the engine will not be considered an emergency engine under subpart ZZZZ and must meet all requirements for non-emergency engines.
 - (1) There is no time limit on the use of emergency stationary RICE in emergency situations.
 - (2) The permittee may operate each emergency stationary RICE for any combination of the purposes specified in (i) below for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by (3) below counts as part of the 100 hours per calendar year.
 - (i) Emergency stationary RICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The permittee may petition the Technical Secretary for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the permittee maintains records indicating that federal, state, or local standards require maintenance and testing of emergency RICE beyond 100 hours per calendar year.
 - (3) Emergency stationary RICE located at major sources of HAP may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing provided in (2) above. The 50 hours per year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.
- c) Reserved.
- d) Reserved.
- e) Pursuant to 40 CFR §63.6625(h), the permittee must minimize each engine's time spent at idle during startup and minimize each engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup apply.
- **E26-5.** Pursuant to 40 CFR §63.6590(c), for the emergency engine model numbers 300DQHAB, 200DGFC, 50DGHE, 4024HF285, 25DSKCA, 4024HF285B, QSB5-G3 NR3, 6068HF485T, V2203-M, and 5030HF285G (emergency NSPS engines less than 500 brake horsepower), the permittee shall meet the requirements of 40 CFR Part 63, Subpart ZZZZ, by meeting the requirements of 40 CFR Part 60, Subpart IIII. No further requirements apply for these emergency engines under 40 CFR Part 63, Subpart ZZZZ.
- **E26-6.** Pursuant to 40 CFR §63.6602, for the emergency engine model numbers D3400X298, 4BTA3.9G3, 4BT3.9-G2, unknown Volvo driving the 100 KW DLC 100V Pow'rGard generator set serving VKF facility, 6BT5.9-G6, DG-516, TID718GP868451, 6CTAB.36, 6CTA-B.3-G, unknown Cummins driving the 11.5 KW DNAD Onan generator set serving the Main Sewage Treatment Plant, 6063MK35, and 4B3.3-G1 (non-NSPS emergency engines less than 500 brake horsepower), the permittee shall meet the following requirements (a) through (g):
 - (a) Change oil and filter every 500 hours of operation or annually, whichever comes first; however, the permittee has the option to utilize an oil analysis program as described in §63.6625(i) in order to extend the specified oil change requirement.
 - (b) Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first; and
 - (c) Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.

If an emergency engine is operating during an emergency and it is not possible to shut down the engine in order to perform the management practice requirements as described in (a), (b), and (c) above, or if performing the management practice on the required schedule would otherwise pose an unacceptable risk under Federal, State, or local law, the management practice can

be delayed until the emergency is over or the unacceptable risk under Federal, State, or local law has abated. The management practice should be performed as soon as practicable after the emergency has ended or the unacceptable risk under Federal, State, or local law has abated. The permittee must report any failure to perform the management practice on the schedule required and the Federal, State or local law under which the risk was deemed unacceptable.

- (d) The permittee must install a non-resettable hour meter to each existing engine if one is not a lready installed in accordance with 40 CFR §63.6625(f).
- (e) Pursuant to 40 CFR §63.6655(f), the permittee must keep records of the hours of operation of each engine that is recorded through the non-resettable hour meter. The permittee must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation. These logs must be maintained at the facility and kept available for inspection by the Technical Secretary or his representative. These logs must also be reported in accordance with **Condition E2(a)** of this permit and be retained for a period of not less than five (5) years.
- (f) Pursuant to 40 CFR §63.6625(e)(2), the permittee must operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions.
- (g) Pursuant to 40 CFR §63.6655(e), the permittee must keep records of the maintenance conducted on the stationary RICE in order to demonstrate that the engine and a fter-treatment control device (if any) were operated and maintained according to the maintenance plan.
- **E26-7.** For fee purposes, the permittee shall calculate its annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this fuel-burning source using appropriate emission factors supplied by the equipment vendor, or those found in EPA AP-42, in conjunction with hours of operation of each engine. If a vendor provided emission factor for individual pollutants NO_x and VOC are combined into one value, i.e. NMHC + NO_x, the permittee may separate the amounts of each pollutant using the ratio predicted by EPA, AP-42. This ratio is approximately 92.5% NO_x and 7.5% VOC for engines less than 600 brake horsepower, and 97.3% NO_x and 2.7% VOC for engines 600 brake horsepower and greater. The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with Condition **E1** of this permit.

Fiscal Year log of total emissions from emergency diesel engines (16-0010-70)

Engine______ July 1, _____ to June 30, ______

Emissions from emergency diesel engines				
Pollutant	Operating time (hr)	Emission Factor (gm/hp-hr)	Emissions (tons)	
NO_x				
SO_2				
PM				
VOC (NMHC)				

16-0010-72 Desiccant Drying Units

Eight desiccant drying units, each with two 1.5 MMBtu/hr burners (16 identical burners with 24 MMBtu/hr, total), to condition and dehumidify air supplied to testing operations. 40 CFR 63, Subpart DDDDD

Conditions E28-1 through E28-6 apply to source 16-0010-72.

E28-1. The total stated design heat input capacity of this source is 24 million British thermal units per hour (MMBtu/hr), on a daily average basis. This is the capacity of the source as stated in the application dated September 14, 2009.

Compliance Method: This condition is a statement of the design heat input capacity for this source. If the permittee needs to increase the design or maximum capacity of this source, the permittee shall pursue the appropriate Title V procedure in accordance with TAPCR 1200-03-09-.02(11). If a construction permit is applied for, this shall be done in a ccordance with TAPCR 1200-03-09-.01(1).

- **E28-2.** Natural gas shall be the only fuel used for this source.
- **E28-3.** The combined operating time of all the burners shall not exceed 64,000 hours per State FY (July-June). This limitation is established pursuant to TAPCR 1200-03-06-.01(7) and the information contained in the a greement letter dated September 14, 2009.

Compliance Method: A record of the hours of operation of this source must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. These logs must also be reported in accordance with condition **E2** of this permit and be retained for a period of not less than five years.

E28-4. Particulate matter emitted from this source shall not exceed 0.37 lbs/MM Btu (8.85 pounds per hour and 1.0 TPY). This limitation is established pursuant to TAPCR 1200-03-06-.02(2) and the information contained in the agreement letter dated November 22, 2016.

Compliance Method: Compliance with this emission standard is assured by compliance with **Condition E28-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E28-5. Sulfur dioxide emitted from this source shall not exceed 1.0 lbs/hr (and 1.0 TPY). This limitation is established pursuant to TAPCR 1200-03-14-.01(3) and the information contained in the agreement letter dated November 22, 2016.

Compliance Method: Compliance with this emission standard is assured by compliance with **Condition E28-2**, and the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E28-6. For fee purposes, the permittee shall keep a log of the amount of natural gas burned (in standard cubic feet, scf) per month by this source and calculate its annual actual oxides of nitrogen (NO_x) emissions, particulate matter (PM) emissions, sulfur dioxide (SO₂) emissions, and volatile organic compound (VOC) emissions from this fuel-burning source using uncontrolled AP-42 emission factors, in conjunction with fuel usage. The results of these calculations shall be recorded and maintained in tabular form (see example below) and shall be retained for a period of not less than five years. These records shall be reported in accordance with condition E1 of this permit.

Monthly log of emissions from Desiccant Drying Units (16-0010-72)

Month_____ Year____

Emissions from Natural Gas Combustion				
	Usage	Emission Factor		Emissions
Pollutant	(scf)	$(lb/10^6 scf of NG)$	AP-42 Reference	(tons)
NO_x		100	Table 1.4-1, July 1998	
SO_2		0.6	Table 1.4-2, July 1998	
PM		7.6	Table 1.4-2, July 1998	
VOC		5.5	Table 1.4-2, July 1998	

Fiscal Year log of emissions from Desiccant Drving Units (16-0010-72)

July 1, _____ to June 30, _____

Pollutant	Total Emissions (tons)
NO _x	
SO_2	
PM	
VOC	

16-0010-75(SM2)	C1 High Pressure Indirect	Provide heated air for aerospace testing	
	Fired Air Heater	MACT, Subpart DDDDD ("limited use unit")	

Conditions E29-1 through E29-6 apply to source 16-0010-75.

E29-1. The stated design heat input capacity of this source is 98 million British thermal units per hour (MMBtu/hr). Should the permittee need to modify the source in a manner that increases the capacity, a construction permit or Title V modification shall first be applied for and received in accordance with TAPCR 1200-03-09-01 or TAPCR 1200-03-09-.02(11)(d)1(i)(V) prior to making the change.

TAPCR 1200-03-09-.01(1)(d) and the application dated August 7, 2019

Compliance Method: The permittee shall maintain documentation to demonstrate the capacity of this source. Documentation may include, but is not limited to, purchase records, operating manuals, or a tag affixed to the unit by the manufacturer. These documents shall be kept readily a vailable/accessible and made available upon request by the Technical Secretary or a Division representative.

E29-2. Only natural gas shall be used as fuel for this source. Should the permittee need to modify the source to allow the use of a fuel other than natural gas, a construction permit or Title V modification shall first be applied for and received in accordance with TAPCR 1200-03-09-01 or TAPCR 1200-03-09-.02(11)(d)1(i)(V) prior to making the change.

TAPCR 1200-03-09-.01(1)(d) and the application dated June 11, 2018

Compliance Method: The permittee shall maintain documentation to demonstrate the type(s) of fuel used by this source. Documentation may include, but is not limited to, purchase records, operating manuals, or a tag affixed to the unit by the manufacturer. These documents shall be kept readily a vailable/accessible and made a vailable upon request by the Technical Secretary or a Division representative.

E29-3. PM emitted from this source shall not exceed 5.6 pounds per hour, on a daily average basis.

TAPCR 1200-03-06-.01(7) and the agreement letter dated September 25, 2018

Compliance Method: Compliance shall be assured by compliance with **Conditions E29-1 and E29-2** and using the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E29-4. SO₂ emitted from this source shall not exceed 0.6 pounds per hour, on a daily average basis.

TAPCR 1200-03-14-.01(3) and the agreement letter dated February 11, 2021

Compliance Method: Compliance shall be assured by compliance with **Conditions E29-1 and E29-2** and using the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E29-5. NO_X emitted from this source shall not exceed 4.29 tons per calendar year.

TAPCR 1200-03-06-.03(2) and 40 CFR §63.7575

Compliance Method: Compliance shall be assured by compliance with **Conditions E29-1**, **E29-2**, **E29-6**, and using the appropriate uncontrolled emission factors from AP-42, Chapter 1.4, Natural Gas Combustion.

E29-6. The actual heat input for the C1 High Pressure Heater shall not exceed 10% of the maximum potential heat input of the heater on a calendar year basis. The maximum annual natural gas usage shall not exceed 85.85 million standard cubic feet based on the stated design heat input capacity of 98 MMBtu/hr. The permittee has requested this federally enforceable 10% annual capacity factor limit be placed on this heater so that it meets the definition of *Limited-use boiler or process heater*, as defined in 40 CFR §63.7575. This limit was requested to avoid PSD review.

40 CFR \$63.7525(k), \$63.7555(a)(3), TAPCR 1200-03-10-.02(2)(a), 0400-30-38-.01(1), 1200-03-09-.01(4), and the significant modification application dated May 25, 2023

Compliance Method: A record of the natural gas combusted in the heater on the days this unit is operating, and the unit operating hours must be maintained at the source location and kept available for inspection by the Technical Secretary or a Division representative. If gas consumption cannot be determined from meters, the gas usage will be determined from the rated capacity of the unit and the hours of operation records. This log must also be reported in accordance with Condition E2 of this permit and be maintained as specified in Conditions E4-6 and E4-8.

16-0010-77(MM2)	Two Regenerative	J5 RSH East heater and J5 RSH West heater (18.9 MMBtu/hr each) to supply heate	
	Storage Heaters (RSH)	air in support of aerospace testing. 40 CFR 63, Subpart DDDDD	

Conditions E30-1 (SM2) through E30-8 (SM2) apply to source 16-0010-77.

E30-1. The stated design heat input capacity of each heater shall not exceed 18.9 MMBtu/hr.

TAPCR 1200-03-09-.02(11)(f)5(ii) and the Minor Modification application dated May 2, 2022

Compliance Method: The permittee shall maintain documentation to substantiate the rated heat input capacity of each heater. Documentation may include, but is not limited to, purchase records, manufacturer's specifications, operating manuals, or a tag affixed to the unit by the manufacturer. This information shall be kept readily accessible and made available upon request by the Technical Secretary or a Division representative. If the permittee wishes to increase or modify the design heat input capacity a heater, the permittee shall pursue the appropriate Title V procedure in accordance with TAPCR 1200-03-09-.02(11). If a construction permit is applied for, this shall be done in accordance with TAPCR 1200-03-09-.01(1).

E30-2. Only natural gas shall be used as fuel for each heater.

TAPCR 1200-03-09-.02(11)(f)5(ii) and the Minor Modification application dated May 2, 2022

Compliance Method: The permittee shall maintain documentation to demonstrate the type(s) of fuel used by each heater. Documentation shall include, but is not limited to, manufacturer's specifications, purchase records, operating manuals, or a tag affixed to the unit by the manufacturer. These documents shall be kept readily available/accessible and made available upon request by the Technical Secretary or a Division representative. If the permittee wishes to modify a heater to allow the use of a fuel other than natural gas, the permittee shall pursue the appropriate Title V procedure in accordance with TAPCR 1200-03-09-.02(11). If a construction permit is applied for, this shall be done in accordance with TAPCR 1200-03-09-.01(1).

E30-3. PM emissions from this source shall not exceed 0.3 lb/hr on a daily average basis.

TAPCR 1200-03-06-.01(7) and the agreement letter dated February 10, 2023

Compliance Method: Compliance with this limitation is assured by compliance with **Conditions E30-1, E30-2,** and the use of emission factors from AP-42, Tables 1.4-1 and 1.4-2 for natural gas combustion.

E30-4. SO₂ emissions from this source shall not exceed 0.1 lb/hr on a daily average basis.

TAPCR 1200-03-14-.01(3) and the agreement letter dated February 10, 2023

Compliance Method: Compliance with this limitation is assured by compliance with **Conditions E30-1, E30-2,** and the use of emission factors from AP-42, Tables 1.4-1 and 1.4-2 for natural gas combustion.

E30-5. CO emissions from this source shall not exceed 13.91 tons during any period of 12 consecutive months.

TAPCR 1200-03-06-.03(2)

Compliance Method: Compliance with this limitation is assured by compliance with **Conditions E30-1, E30-2,** and the use of emission factors from Ap-42, Tables 1.4-1 and 1.4-2 for natural gas combustion.

E30-6. NO_X emissions from this source shall not exceed 8.28 tons during any period of 12 consecutive months.

TAPCR 1200-03-06-.03(2)

Compliance Method: Compliance with this limitation is a ssured by compliance with Conditions E30-1, E30-2, and the use of low-NO_X burners. The permittee has specified that each heater is equipped with low-NO_X burners. Each heater shall not operate unless the low-NO_X burners are fully operational. Documentation from the manufacturer for each heater which specifies this feature is present, and which also provides confirmation of a maximum NO_X emission rate of 50 lb NO_X/MMSCF shall be retained in accordance with Condition E4-7 and E4-8.

E30-7. VOC emissions from this source shall not exceed 0.91 tons during any period of 12 consecutive months.

TAPCR 1200-03-06-.03(2)

Compliance Method: Compliance with this limitation is assured by compliance with **Conditions E30-1, E30-2,** and the use of emission factors from AP-42 Tables 1.4-1 and 1.4-2 for natural gas combustion.

E30-8. Each heater is subject to and shall comply with all applicable requirements of 40 CFR 63, Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants: Industrial, Commercial, and Institutional Boilers and Process Heaters (Subpart DDDDD). This subpart applies to industrial, commercial, or institutional boilers and process heaters located at major sources of HAP. The applicable requirements are summarized in Section E3 of this permit.

40 CFR §63.7485 and §63.7499

16-0010-78(MM3)	Three Electric DF Arc	Provide heated air for aerospace testing.
	Heaters (DF-4, DF-5, DF-6)	

Conditions E31-1 and E31-2 apply to source 16-0010-78.

E31-1. NO_x emitted from all heaters at this source combined shall not exceed 39.0 tons during all intervals of 12 consecutive months.

TAPCR 1200-03-07-07(2) and the agreement letter dated March 7, 2024

Compliance Method: Compliance with this condition shall be demonstrated by calculating actual NO_X emissions during each calendar month and each period of 12-consecutive months and recording the emissions in a log in the format below, or an alternative format which provides the same information. The emission rates provided by the permittee in the minor modification application dated January 31, 2023, and the actual hours of operation for this source shall be used for calculating emissions. The permittee shall maintain documentation of the calculations used to estimate these emission rates. These documents shall be kept readily available/accessible and made available upon request by the Technical Secretary or a Division representative.

Source 78 NO _X Emissions Log					
Month/Year	Monthly NO _X Emissions (tons)	12-consecutive month NO _x Emissions (tons)			

E31-2. Operating hours for this source shall not exceed 21.7 hours for sub-atmospheric testing and 300 hours for atmospheric testing during any interval of 12 consecutive months.

TAPCR 1200-03-09-.03(8) and the agreement letter dated March 7,2024

Compliance Method: The permittee shall record the actual operating hours of this source during each calendar month and each period of 12-consecutive months in a log in the format below, or in an alternative format, which provides the same information. This log must also be reported in accordance with **Condition E2** of this permit and be maintained as specified in **Conditions E4-6** and **E4-8**.

Source 78 Operating Hours Log						
Month/Year	Sub-atmospheric testing monthly total (hours)	Sub-atmospheric testing 12-consecutive month total (hours)	Atmospheric testing monthly total (hours)	Atmospheric testing 12-consecutive month total (hours)		
Monul/Tear	(nours)	monui wtai (nours)	monumy total (nours)	wtai (nours)		

The tons per 12-consecutive month values are the sum of the operating hours in the 11 months preceding the month just completed + the operating hours in the month just completed. If data is not available for the 11 months preceding the initial use of the table, this value will be equal to the value for hours per month. For the second month, it will be the sum of the first month and the second month. Indicate in parentheses the number of months summed [i.e., 6 (2) represents 6 tons emitted in 2 months].

END OF SIGNIFICANT MODIFICATION #2 TO PERMIT NUMBER: 570221

ATTACHMENT 1

OPACITY MATRIX DECISION TREE for VISIBLE EMISSION EVALUATION METHODS 2, 3 & 9 dated JUNE 18, 1996 and amended September 11, 2013

Decision Tree PM for Opacity for Sources Subject to Rule 1200-03-05-.01 **Utilizing TVEE Method 2**

Notes:

PM = Periodic Monitoring required by 1200-03-09-.02(11)(e)(iii).

This Decision Tree outlines the criteria by which major sources can meet the periodic monitoring and testing requirements of Title V for demonstrating compliance with the visible emission standard in Rule 1200-03-05-.01. It is not intended to determine compliance requirements for EPA's Compliance Assurance Monitoring (CAM) Rule (formerly referred to as Enhanced Monitoring -Proposed 40 CFR 64).

Examine each emission unit using this Decision Tree to determine the PMT required.

Use of continuous emission monitoring systems eliminates the need to do any additional periodic monitoring.

Visible Emission Evaluations (VEEs) are to be conducted utilizing Tennessee Visible Emission Evaluation Method 2. The observer must be properly certified according to the criteria specified in EPA Method 9 to conduct TVEE Method 2 evaluations.

Typical Pollutants Particulates, VOC, CO, SO2, NOx, HCl, HF, HBr, Ammonia, and Methane.

Initial observations are to be repeated within 90 days of startup of a modified source, if a new construction permit is issued for modification of the source.

A VEE conducted by TAPCD personnel after the Title V permit is issued will also constitute an initial reading.

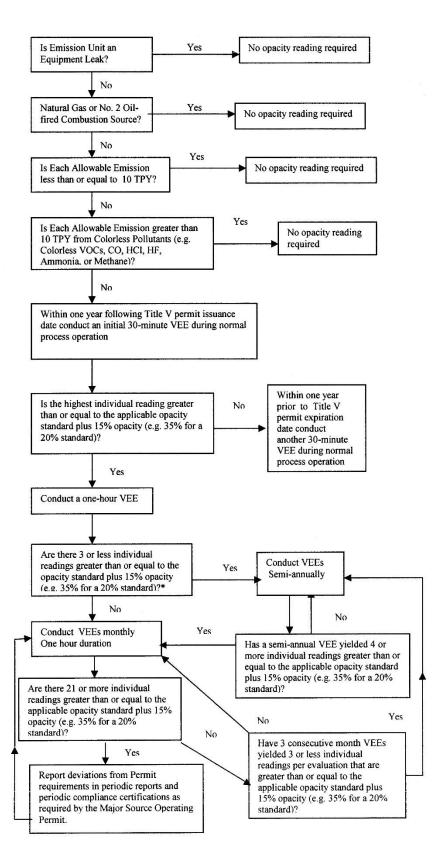
Reader Error

TVEE Method 2: The TAPCD declares non-compliance when 21 observations are read at the standard plus 15% opacity (e.g. 35% for a 20% standard).

*The rationale for this is the fact that Rule 1200-03-05-.01 allows for an exemption of 5 minutes (20 readings) per hour and up to 20 minutes (80 readings) per day. With 4 or more excessive individual readings per hour the possibility of a daily exceedance

Note: A company could mutually agree to have all of its sources regulated by EPA Method 9. Caution: Agreement to use Method 9 could potentially place some sources in non-compliance with visible emission standards. Please be sure before you agree.

> Dated June 18, 1996 Amended September 11, 2013



Decision Tree PM for Opacity where The Opacity Standard is Zero Percent Opacity Utilizing TVEE Method 3

Notes:

The use of Tennessee Visible Emission Evaluation (TVEE) Method 3 is only applicable where the use of the method is specified as a permit condition.

PM = Periodic Monitoring required by 1200-03-09-.02(11)(e)(1)(iii).

This Decision Tree outlines the criteria by which major sources can meet the PM requirements of Title V for demonstrating compliance with the visible emissions standards of zero percent opacity where the use of TVEE Method 3 is specified as a permit condition. It is not intended to determine compliance requirements for EPA's Compliance Assurance Monitoring (CAM) Rule (formerly referred to as Enhanced Monitoring – Proposed 40 CFR 64).

Examine each emission source using this Decision Tree to determine PM required.

Use of continuous emission monitoring systems eliminates the need to do any additional periodic monitoring.

Visible Emissions Evaluations (VEEs) are to be conducted utilizing TVEE Method 3. The observer must be properly certified according to criteria specified in TVEE Method 3 to conduct Method 3 evaluations.

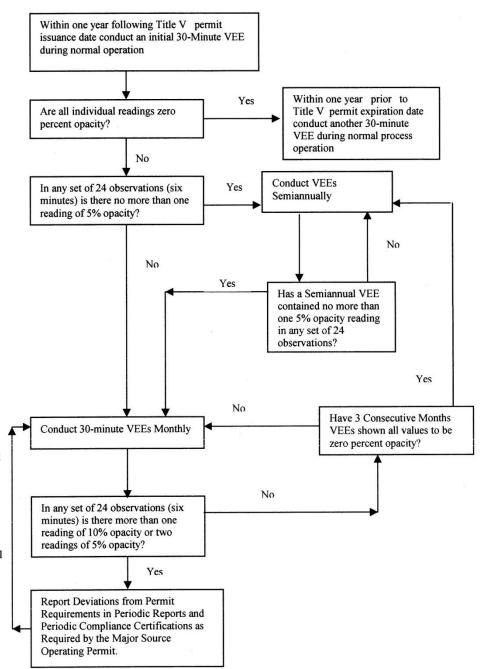
Initial observations are to be repeated within 90 days of startup of a modified source if a new construction permit is issued for modification of the source.

A VEE conducted by TDAPC personnel after the Title V permit is issued will also constitute an initial reading.

Reader Error

For TVEE Method 3, the TDAPC declares non-compliance when during any set of 24 observations any combination of readings exceed 10% opacity (e.g. one reading of 10% opacity or two readings of 5% opacity).

Dated June 18, 1996 Amended September 11, 2013



Sources Utilizing EPA Method 9*

Decision Tree PM for Opacity for

Notes:

PM = Periodic Monitoring required by 1200-03-09-.02(11)(e)(iii).

This Decision Tree outlines the criteria by which major sources can meet the periodic monitoring and testing requirements of Title V for demonstrating compliance with the visible emission standards set forth in the permit. It is not intended to determine compliance requirements for EPA's Compliance Assurance Monitoring (CAM) Rule (formerly referred to as Enhanced Monitoring – Proposed 40 CFR 64).

Examine each emission unit using this Decision Tree to determine the PM required.*

Use of continuous emission monitoring systems eliminates the need to do any additional periodic monitoring.

Visible Emission Evaluations (VEEs) are to be conducted utilizing EPA Method 9. The observer must be properly certified to conduct valid evaluations.

Typical Pollutants Particulates, VOC, CO, SO₂, NO_x, HCl, HF, HBr, Ammonia, and Methane.

Initial observations are to be repeated within 90 days of startup of a modified source, if a new construction permit is issued for modification of the source.

A VEE conducted by TAPCD personnel after the Title V permit is issued will also constitute an initial reading.

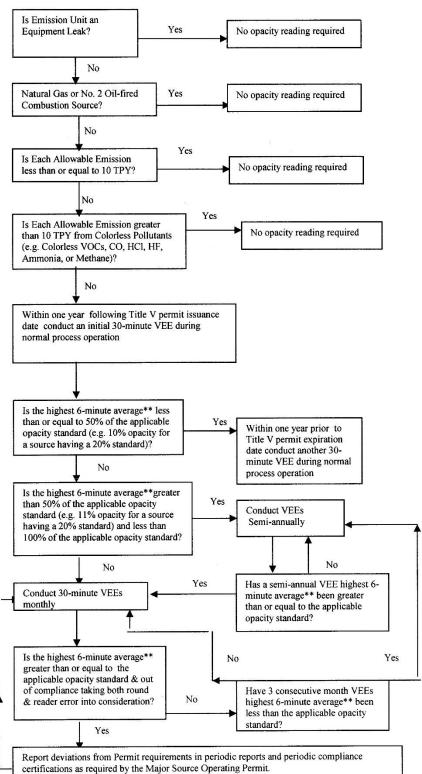
Reader Error

EPA Method 9, Non-NSPS or NESHAPS stipulated opacity standards:
The TAPCD guidance is to declares non-compliance when the highest six-minute average** exceeds the standard plus 6.8% opacity (e.g. 26.8% for a 20% standard).

EPA Method 9, NSPS or NESHAPS stipulate opacity standards:
EPA guidance is to allow only engineering round. No allowance for reader error is given.

- *Not applicable to Asbestos manufacturing subject to 40 CFR 61.142
- **Or second highest six-minute average, if the source has an exemption period stipulated in either the regulations or in the permit.

Dated June 18, 1996 Amended September 11, 2013



ATTACHMENT 2

Emission Factors for Various Aircraft Engines, Rocket Motors, and Arc Heaters

EMISSION FACTORS FOR J-33-35 TURBINE ENGINE

	Idle A	PP oach	intermediate 🔏	VIII ELE INTIES INSTITUTES
္ပ	127	84.6	49.1	31.3 lb/1000 lb fuel Aircraft Engine Emissions Estimator Fel. TD 25 44
NOx	1.5	1.9	2.7	3.6 lb/1000 lb fuel Aircraft Fnoine Emissions Estimator Est TD os 45
SOx	0.30	0.38	0.54	b/1000 lb file Aircraft Engine Emissions Estimator
TSP	0.73	0.57	0.02	0.02 lb/1000 lb file Aircraft Engine Emissions Estimator ESI TE 05 47
Voc	19.5	6.5	1.3	0.5 lb/1000 lb fuel Aircraft Engine Emissions Estimator ESI - TR-85-18

Note: Sources using these factors include: 14.

EMISSION FACTORS FOR F100-100 TURBINE ENGINE

	idle 💶	Approach	intermediate	Militany	MedburnedReteanse
00	24	5.8	1.6	6.0	4 Aircraft Engine Emissions Estimator ESL-TR-85-14
NOx	3.3	6.7	8.6	27	
SOx	99.0	1.34	1.96	5.40	ESI -TR-85-
TSP	0.12	0.27	0.47	0.34	0.15 Aircraft Engine Emissions Estimator ESI -TR-85-17
voc	3.2	1.9	0.1	0.1	0.01 Aircraft Engine Emissions Estimator ESI -TR-85-18

Note: All emission factors are in lb/1000 lb fuel.

Sources using these factors include: 19, 31, & 53.

EMISSION FACTORS FOR F101-100 TURBINE ENGINE

	die	Military	Afferbumer.	SE AUDI(SAR	Reference
လ	120.1	9.7		16.7 lb/1000 lb fuel	Aircraft Engine Emissions Estimator. ESL-TR-85-14
NOX	7.3	2.3	4.6	lb/1000 lb fuel	Aircraft Engine Emissions Estimator, ESL-TR-85-15
SOx	1.2	1.2	1.2	1b/1000 lb fuel	Aircraft Engine Emissions Estimator, ESL-TR-85-16
TSP	0.09	0.02	90.0	lb/1000 lb fuel	Aircraft Engine Emissions Estimator, ESL-TR-85-17
VOC	25.2	0.4	0.1	lb/1000 lb fuel	Aircraft Engine Emissions Estimator, ESL-TR-85-18

Note: Sources using these factors include: 52.

EMISSION FACTORS FOR A PROFILE OF TURBINE ENGINES

The State of the S	A TOP THE STATE OF	idie	Approach	int/Mil	Approach Int/Mil Afterburner Reference	
CO	Large	25.4	10.5	17.5	1289 Eng. Est. based upon combination of engines	bination of engines
00	Medium	101	13.7	6	843 Eng. Est. based upon combination of engines	bination of engines
8	Helicopter				3.15 Eng. Est. based upon combination of engines	bination of engines
XON	Large	7	23	352	255 Eng. Est. based upon combination of engines	bination of engines
NOX	Medium	0.72	16.2	198	241 Eng. Est. based upon combination of engines	bination of engines
XON	Helicopter				12.1 Eng. Est. based upon combination of engines	bination of engines
202	Large	1.1	2.5	10.5	15.5 Eng. Est. based upon combination of engines	oination of engines
SO2	Medium	1.1	2.5	10.5	15.5 Eng. Est. based upon combination of engines	oination of engines
802	Helicopter				1.8 Eng. Est. based upon combination of engines	oination of engines
TSP	Large	0.15	8.1	8.1	5.7 Eng. Est. based upon combination of engines	oination of engines
TSP	Medium	10.3	16	23.5	24.1 Eng. Est. based upon combination of engines	oination of engines
TSP	Helicopter				1.78 Eng. Est. based upon combination of engines	oination of engines
TSP	Salt				0.108 Eng. Est. based upon combination of engines	oination of engines
TSP	Sand				23.79558385 Eng. Est. based upon combination of engines	oination of engines
Voc	Large	1.1	1.4	2.6	1213 Eng. Est. based upon combination of engines	oination of engines
000	Medium	36.3	1.55	2.6	71.5 Eng. Est. based upon combination of engines	oination of engines
Voc	Helicopter				1.7 Eng. Est. based upon combination of engines	oination of engines
						30

Note: All emission factors are in lb/hr. Factors were determined based upon consideration of several engines of each type expected to be tested.

Sources using these factors include: 56.

The engineering estimate was derived from a cross-section of various engines expected to be evaluated in this facility using various established references such as the "Aircraft Engine Emissions Estimator," ESL-TR-85-14 Page E-11

EMISSION FACTORS FOR HAPS FROM TURBINE ENGINES

e de la companya de Companya de la companya de la	Factor	Units	Reference
Acetaldehyde	0.0483	lb/lb VOC	SPECIATE, Profile 1097
Acrolein			SPECIATE, Profile 1097
Benzene	0.0202	lb/lb VOC	SPECIATE, Profile 1097
1,3-Butadiene	0.0189	lb/lb VOC	SPECIATE, Profile 1097
Ethylbenzene	0.0018	lb/lb VOC	SPECIATE, Profile 1097
Formaldehyde			SPECIATE, Profile 1097
Naphthalene	0.0060	lb/lb VOC	SPECIATE, Profile 1097
Phenol	0.0026	lb/lb VOC	SPECIATE, Profile 1097
Propionaldehyde	0.0098	lb/lb VOC	SPECIATE, Profile 1097
Styrene	0.0041	lb/lb VOC	SPECIATE, Profile 1097
Toluene	0.0055	lb/lb VOC	SPECIATE, Profile 1097
o-Xylene	0.0020	lb/lb VOC	SPECIATE, Profile 1097
As			CARB (1991), Profile 110 for SCCs 2-04-001-01 & -02
Cd	0.0005	lb/lb TSP	CARB (1991), Profile 110 for SCCs 2-04-001-01 & -02
Cr	0.0053	lb/lb TSP	CARB (1991), Profile 110 for SCCs 2-04-001-01 & -02
Pb	0.0055	lb/lb TSP	CARB (1991), Profile 110 for SCCs 2-04-001-01 & -02
Se	0.0005	lb/lb TSP	CARB (1991), Profile 110 for SCCs 2-04-001-01 & -02

Note: All turbine engines are assumed to be speciated according to these factors.

Sources using these factors include: 14, 19, 31, 53, & 56.

EMISSION FACTORS FOR SOLID ROCKET MOTORS

MARKET STATE	Factor	Units	Reference
CO	0.1920	lb/lb propellant	Engineering Estimate
TSP	0.29	lb/lb propellant	Engineering Estimate
HCI	0.208	lb/lb propellant	Engineering Estimate
HCN	0.0006	lb/lb propellant	Engineering Estimate

Note: Sources using these factors include: 14 & 18.

EMISSION FACTORS FOR LIQUID ROCKET MOTORS

	All	Units	Reference
CO	0.135	lb/lb propellant	Engineering Estimate
CH4	0.012	lb/lb propellant	Engineering Estimate
NH3	0.015	lb/lb propellant	Engineering Estimate

Note: Sources using these factors include: 14 & 17.

EMISSION FACTORS FOR ARC HEATERS

	Source	Factor	Unit	Reference
NOx	#42	0.42	lb/sec	Engineering Estimate
NOx	#50	1.00	lb/min	Engineering Estimate

Note: Sources these factors include: 42 & 50.

ATTACHMENT 3

Title V Fee Selection Form APC 36 (CN-1583)



DEPARTMENT OF ENVIRONMENT AND CONSERVATION DIVISION OF AIR POLLUTION CONTROL

APC 36

William R. Snodgrass Tennessee Tower 312 Rosa L. Parks Avenue, 15th Floor, Nashville, TN 37243 Telephone: (615) 532-0554, Email: <u>Air.Pollution.Control@TN.gov</u>

TITLE V FEE SELECTION

		Type or prin	t and submit to	the email address above	ve.	
			FACILITY INFO	ORMATION		
1. Organizati	on's legal nar	ne and SOS co	ontrol number [a	as registered with the T	N Secretary of State (SOS)]	
2. Site name	(if different f	rom legal nam	e)			
3. Site addre	ss (St./Rd./Hv	vy.)			County name	
City					Zip code	
4. Emission s	ource referer	ice number		5. Title V permit num	ber	
			FEE SELE	CTION		
	lection form is				is selection will be effective until on or before December 31 of the	
6. Payment S	Schedule (cho	ose one):				
Calendar Ye	ear Basis (Janua	ary 1 – Decemb	er 31) 🔲	Fiscal Year Bas	is (July 1 – June 30)	
7. Payment I	Basis (choose	one):				
Actual Emissio	ons Basis 🔲	Allowable Emis	sions Basis	Combination of Actual a	and Allowable Emissions Basis	
8. If Payme	nt Basis is "Ac	tual Emissions	s" or "Combinat	ion of Actual and Allov	wable Emissions", complete the	
_	table for eacons for further	•	ource and each	pollutant for which fe	es are due for that source. See	
If allowable emissions: Specify condition number and limit.						
	Allowable If actual emissions: Describe calculation method and provide					
	or Actual example. Provide condition number that specifies method, if					
Source ID	Pollutant	Emissions		applicab	le.	

8. (Continue	d)					
			If allowable er	missions: Specify co	ondition number and limit.	
		Allowable	If actual emissi	ons: Describe calcu	llation method and provide	
		or Actual	example. Provi	de condition numb	er that specifies method, if	
Source ID	Pollutant	Emissions		applicab	le.	
		C	ONTACT INFORMATION	ON (BILLING)		
9. Billing contact Phone number with area code Eav number with area code						
Mailing address (St./Rd./Hwy.)				Fax number with area code		
City		State	Email address			
		SIG	NATURE BY RESPONS	SIBLE OFFICIAL		
•				• • •	esponsible person of the above	
	-				rate and true to the best of my	
		ICA Section	39-16-702(a)(4), this	declaration is made	e under penalty of perjury.	
10. Signature	2				Date	
Signer's r	name (type or	print)	Title		Phone number with area code	

ATTACHMENT 4

Agreement Letters





DEPARTMENT OF THE AIR FORCE HEADQUARTERS ARNOLD ENGINEERING DEVELOPMENT COMPLEX (AFMC) ARNOLD AIR FORCE BASE TENNESSEE

NOV 2 2 2016

Colonel Rodney F. Todaro
Commander, Arnold Air Force Base
100 Kindel Drive, Suite A-303
Arnold AFB TN 37389-1303

DEC 9 2016 AN9:57

Ms. Michelle W. Owenby Tennessee Department of Environment and Conservation Division of Air Pollution Control 312 Rosa L. Parks Avenue, 15th Floor Nashville TN 37243

Dear Ms. Owenby

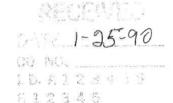
Arnold Engineering Development Complex (AEDC), Permit No. 560453 requests maximum emission limits for the following sources as indicated below:

- a. 16-0010-01: Steam Plant A, Boiler 01 (Condition E5-4)—Particulate Matter limited to 5.0 tons per year.
- b. 16-0010-02: Steam Plant A, Boiler 02, 03, and 04 (Condition E5-5)—Particulate Matter limited to 25.0 tons per year and (Condition E5-8)—Sulfur Dioxide limited to 12.0 tons per year.
- c. 16-0010-06: ETF Heaters (Condition E6-3)—Particulate Matter limited to 23.0 tons per year and (Condition E6-4)—Sulfur Dioxide limited to 2.0 tons per year.
- d. 16-0010-07: VKF Heaters (Condition E7-3)—Particulate Matter limited to 7.0 tons per year.
- e. 16-0010-08: PWT Air Dryers (Condition E8-3)—Particulate Matter limited to 4.0 tons per year and (Condition E8-4)—Sulfur Dioxide limited to 1.0 ton per year.
- f. 16-0010-14: APTU Test Facility (Condition E9-7)-Sulfur Dioxide limited to 1.0 ton per year.
- g. 16-0010-18: Solid Rocket Testing (Condition E11-2)—Particulate Matter limited to 10.0 tons per year.
- h. 16-0010-28: HB Heaters 1A & 1B (Condition E13-4)-Particulate Matter limited to 4.0 tons per year and (Condition E13-5) Sulfur Dioxide limited to 1.0 ton per year.

1







TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT CUSTOMS HOUSE 701 BROADWAY NASHVILLE, TENNESSEE 37219-5403

DEC 2 1 1989

CERTIFIED MAIL P 307 583 421 RETURN RECEIPT REQUESTED

Stephen P. Condon, Col., USAF Commander, Arnold Engineering Development Center Arnold Airforce Base, TN 37389

Re: 16-0010-46

Dear Mr. Condon:

Your application for a permit from the Division of Air Pollution Control has been favorably reviewed. The permit is included with this letter.

In order to alleviate the administrative and technical requirements involved in a Prevention of Significant Deterioration review, you may choose to agree to the following limitation(s) concerning your 188 MM Btu/hour, high pressure air, free standing indirect gas-fired heater system pursuant to Rule 1200-3-6-.01(7) of the Tennessee Air Pollution Control Regulations:

The operating hours shall not exceed four hundred and sixteen (416) hours/year.

Natural gas shall only be used as fuels.

Agreement to the above condition(s) will mean that you will need a construction permit if you wish to exceed the limitation(s). The source will also be subject to any restrictions which apply to new sources at the time the new construction permit is issued.

If you have any questions concerning this letter, please contact Manir Ahmed at 615-741-3651.

To signify your agreement, please sign below and return this letter to Manir Ahmed, Air Pollution Control Division, New Source Review Section, Customs House, 701 Broadway, Nashville, Tennessee 37219-5403.

Since we have already received your verbal agreement to the above limitation(s), the enclosed permit will be valid as of the issue date, provided your signed agreement is received by the Tennessee Division of Air Pollution Control within (10) days of its receipt.

Thank you for your cooperation in this matter.

Very truly yours,

John W. Walton

PERMIT NO. 570221

SIGNIFICANT MODIFICATION #2 EXPIRATION DATE: JUNE 21, 2022

Tennessee Air Pollution Control Board

APC-7A HEH/MA/F1209212

cc: Field Office

hereby agrees to the above limitation(s), in behalf of Warren L. Riles hereby agrees to Arnold Engineering Development Center.

Signature:

WARREN L. RILES, Colonel, USAF Vice Commander

Date: 22 Jan 98



Cletand 01 MAR 1860

TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT CUSTOMS HOUSE 701 BROADWAY NASHVILLE, TENNESSEE 37219-5403

CERTIFIED MAIL PS07583/64 RETURN RECEIPT REQUESTED

FEB 29 1988

Col. Stephen P. Condon, USAF Commander Arnold Engineering Development Center Arnold Air Force Base, TN 37389

Re: 16-0010-18

Dear Col. Condon:

We have received your application for a permit dated January 20, 1988. In order to expedite your permit and alleviate the administrative and technical requirements involved in a Prevention of Significant Deterioration review, you may choose to agree to the following limitation(s) concerning your solid rocket test facility pursuant to Rule 1200-3-7-.01(5) of the Tennessee Air Pollution Control Regulations:

- Carbon monoxide emitted from this facility shall not exceed 168 TPY
- Total operating time for this facility shall not exceed 30 hours per vear.

Agreement to the above condition(s) will mean that you will need a construction permit if you wish to exceed the limitation(s). The source will also be subject to any restrictions which apply to new sources at the time the new construction permit is issued.

If you have any questions concerning this letter, please contact Bill Cleland at 615-741-3651.

To signify your agreement, please sign below and return this letter within thirty days of its receipt to Bill Cleland, Air Pollution Control Division, New Source Review Section, Customs House, 701 Broadway, Nashville, Tennessee 37219-5403.

Thank you for your cooperation in this matter.

Very truly yours,

W. Walter Harold E. Hodges, P.E. Technical Secretary

Tennessee Air Pollution Control Board

HEH/F3018048 APC-132-PSD singular

SIGNIFICANT MODIFICATION #2 EXPIRATION DATE: JUNE 21, 2022

Colonel Roger L. Jacks USAF hereby agrees to the above limitation(s), in behalf of Arnold Engineering Development Center.

Signature:

Title: Vice Commander, AEDC

Date: 27 April 1988



APR 0 8 REC'D

STATE OF TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

DIVISION OF AIR POLLUTION CONTROL 701 BROADWAY, CUSTOMS HOUSE, NASHVILLE, TN 37243-1531

APR 0 3 1992

CERTIFIED MAIL P 878 226 981 RETURN RECEIPT REQUESTED

Mr. William M. Dunne Director of Environmental Planning Arnold Engineering & Development Center Arnold Air Force Base, TN 37389-5000

RE: 16-0010-CL

ANNUAL EMISSION FEE - REASSESSMENT AGREEMENT

Dear Mr. Dunne:

Your annual emission fee has been reassessed in accordance with the provisions of Division Rule 1200-3-26-.02(6)(b), per our discussion on January 27, 1992 with Mr. Ruel Burns of your staff. This reassessment will remain in effect providing that you comply with the following limitations at your facility. The following limitation(s) are included in your operating permit(s):

16-0010-02,03,04 Steam Plant 'A'-(3) Boilers

- 1. Operating time shall not exceed 6,000 hours per year per boiler.
- Sulfur dioxide emitted from this source shall not exceed 53.7 pounds per hour.
- 3. Particulate emitted from this source shall not exceed 5.0 pounds per hour,
- The sulfur content of the fuel shall not exceed 0.3 percent.

16-0010-05 Steam Plant 'B'- Boiler

- 1. Operating time shall not exceed 2,000 hours per year.
- Sulfur dioxide emitted from this source shall not exceed 21.2 pounds per hour.
- 3. Particulate emitted from this source shall not exceed 2.0 pounds per hour.
- 4. The sulfur content of the fuel shall not exceed 0.3 percent.

CERTIFIED MAIL P 878 226 981 Arnold Engineering & Development Center Page 2

16-0010-06 ETF Continuous Air Heaters

- Sulfur dioxide emitted from this source shall not exceed 0.4 pounds per hour.
- The maximum fuel usage for this source shall not exceed 100 million cubic feet of gas per year.
- 3. Particulate emitted from this source shall not exceed 3.4 pounds per hour.
- Nitrogen oxides emitted from this source shall not exceed 368.5 pounds per hour.

16-0010-08 PWT Atmospheric Air Dryer

- 1. Operating time shall not exceed 780 hours per year.
- Sulfur dioxide emitted from this source shall not exceed 0.5 pounds per hour.
- 3. Particulate emitted from this source shall not exceed 0.5 pounds per hour.

16-0010-19 Turbine Engine Testing Facility (Bldg. 878)

- Sulfur dioxide emitted from this source shall not exceed 97.0 pounds per hour.
- 2. The sulfur content of the fuel shall not exceed 0.3 percent.
- 3. Operating time shall not exceed 2,500 hours per year.

CERTIFIED MAIL P 878 226 981 Arnold Engineering & Development Center Page 3

16-0010-30 (4) ASTF Air Heaters

- The maximum fuel usage for this source shall not exceed 200,000 gallons of jet fuel per year.
- 2. The sulfur content of the fuel shall not exceed 0.3 percent.
- 3. Particulate emitted from this source shall not exceed 32.4 pounds per hour.
- Sulfur dioxide emitted from this source shall not exceed 690.0 pounds per hour.
- Nitrogen oxides emitted from this source shall not exceed 324.0 pounds per hour.
- Carbon monoxide emitted from this source shall not exceed 81.0 pounds per hour.

16-0010-31 ASTF Test Cells-NASP Test with Liquid Hydrogen

- 1. Operating time shall not exceed 832 hours per year.
- Sulfur dioxide emitted from this source shall not exceed 97.0 pounds per hour.
- 3. Particulate emitted from this source shall not exceed 12.0 pounds per hour.

16-0010-35 VKF Auxiliary Mass Flow Heater I.

- Sulfur dioxide emitted from this source shall not exceed 0.5 pounds per hour.
- 2. Particulate emitted from this source shall not exceed 0.5 pounds per hour.
- Visible emissions emitted from this source shall not exceed 20 percent or greater opacity as determined by EPA Method 9, as published in the Federal Register, Volume 39, No. 219 on November 12, 1974. (6 Minute Average)

16-0010-41 Process Air Heater Research Cell (Bldg. 878)

- 1. Operating time shall not exceed 416 hours per year.
- Sulfur dioxide emitted from this source shall not exceed 0.5 pounds per hour.
- 3. Particulate emitted from this source shall not exceed 0.5 pounds per hour.

CERTIFIED MAIL P 878 226 981 Arnold Engineering & Development Center Page 4:

Your annual emission fee has been recalculated on 1,374 tons per year of regulated pollutants. The adjusted fee is \$4,180.00 based on the recalculation of allowable emissions for your facility. Your adjusted allowable ton per year emission totals are as follows:

							TPY	
PART	VCC	SO2	NOX	CO	MISC	· EXEMPT •	TOTALS	
 155	100	000	120	327	00 30			1.4
135	125	282	478	327	5	, 2	1,374	

RECALCULATED ANNUAL EMISSION FEE

 $1374 - (327(CO) + 2(EX)) = 1045 \times $4.00 / ton rate = $4.180.00$

The \$4,180.00 adjusted annual emission fee is due March 15, 1992. Please include your company name and reference number (RE), or a copy of this letter with your payment.

In the future, if you wish to increase or change any of the above limitations a construction permit will be required, and your annual emission fee will be reassessed accordingly. All construction permits issued will be subject to any restrictions which apply to new sources at the time.

To signify your agreement to the above limitations, please sign below and return this letter to Vicki L. Lowe, Tennessee Division of Air Pollution Control, Customs House, 701 Broadway, Nashville, TN 37243-1531.

Since we have already received your verbal agreement to the above limitations, the enclosed permit(s) will be valid as of the issue date, provided your signed agreement is received by the Tennessee Division of Air-Pollution Control within ten(10) days of its receipt.

CERTIFIED MAIL P 878 226 981 Arnold Engineering & Development Center Page 5

If you have any questions concerning this agreement or your annual emission fee, please contact Vicki L. Lowe at 615-741-3931. Your cooperation in this matter is greatly appreciated.

Sincerely,

,			Loure		
407	Harold E. Technical	Hod	ges, P.E.		
, '	Technical	Sec	retary		
	Tennessee	Air	Pollution	Control	Board

Enclosures

cc: Columbia Field Office

Mr. William M. Dunne hereby agrees to the above limitations, in behalf of Arnold Engineering & Development Center, and represents that he has the necessary corporate authority to enter into such an agreement.

Signature:	
	a a
Title:	
Date:	



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS ARNOLD ENGINEERING DEVELOPMENT CENTER (AFMORECE VED
ARNOLD AIR FORCE BASE, TENNESSEE

DATE MAY 19 1993. CO. NO.16-0010-53

I.D. A123456

WAY 1 7 1993

B12345

FROM: AEDC CEV

100 Kindel Drive Suite B-314

Arnold AFB TN 37389-2314

CS OTHER

SUBJ:

Air Quality Construction Permit Request, Emission Source Reference No.

16-0010-53, T9 Test Cell

TO:

Tennessee Department of Environment & Conservation

Air Pollution Control Division

ATTN: Joe Aisien 9th Floor, L&C Annex 401 Church Street

Nashville, TN 37243-1531

1. We agree that the total operating time for the referenced facility will not exceed 480 hours per year and the following yearly and hourly emission ceilings will apply:

	Tons/Year	Pounds/Hour
Total Suspended Particulates	0.9	13.3
NOX	37.8	542
SO ₂	7.5	108
Hydrocarbons	1.5	8.8
Carbon Monoxide	17.8	358

2. Please contact Capt Dan Taylor at (615) 454-6089 or myself at (615) 454-4345 if we can be of further assistance.

WILLIAM M. DUNNE

Chief, Environmental Mgmt Division

lliam m Tunne

Facilities Directorate

16-0010-5

6 April 1995





100 Kindel Drive, Suite B-314 Arnold Air Station, TN 37389-2314

Tennessee Department of Environment and Conservation Attn: Dr Richard Beckwith Air Pollution Control Division 9th Floor, L&C Annex 401 Church Street Nashville, TN 37243-1531

Dear Dr Beckwith,

We agree to limit the particulate emissions from the operation of the Test Model Combustor (Emission Source #16-0010-52) per your request. The particulate emissions from this source will not exceed the following limits:

- 6.5 lbm/sec for rocket motor testing
- 3.8 lbm/hr for engine testing
- -1 ton/yr for all testing at the source

We appreciate your help in finalizing this permit. If you have additional questions, please call me at (615)-454-7115.

Sincerely,

CLARK BRANDON Deputy Director

Environmental Management Division

Facilities Directorate





DEPARTMENT OF THE AIR FORCE HEADQUARTERS ARNOLD ENGINEERING DEVELOPMENT CENTER (AFMC) ARNOLD AIR STATION, TENNESSEE

SIGNIFICANT MODIFICATION #2

AEDC CEV 100 Kindel Drive, Suite B-314 Arnold Air Station, TN 37389-2314 12 April 1995

Tennessee Department of Environment and Conservation Dr. Richard Beckwith Air Pollution Control Division 9th Floor, L&C Annex 401 Church Street Nashville, TN 37243-1531

Dear Dr. Beckwith,

As requested, I am forwarding information regarding AEDC's Turbine Engine Testing Facility, Emission Source Reference No. 16-0010-19. We do not believe that our recently requested modification represents an increase in emissions from this source. Our emissions from this source are in agreement with information submitted to TDEC in 1992 to establish permit fees, based on our potential to emit (see attachments 1 and 2). This same information was discussed with TDEC and used in establishing a new permit emission limit of 97 lb/hr for SO₂ and an annual operating limit of 2500 hours (see attachment 3) in 1992. AEDC's calculations and TDEC's Annual Emission Fee letter are in exact agreement concerning annual operating hours in each engine mode and the maximum SO₂ emission rates. This data was used in preparation for our recently submitted modification.

Prior to 1992, this permit contained no hourly or emission limits (see attachment 4). In addition, our permit applications contained emission estimates which were based upon actual emissions and not upon potential emissions. Prior to 1992, we believe that our 'potential to emit' would be based upon continuous operation (8760 hours per year) and would be substantially higher than the emissions listed in the most recent permit modification application.

We appreciate your help in finalizing this permit. If you have additional questions, please call me at (615) 454-7115.

Sincerely,

CLARK BRANDON Deputy Director

Environmental Management Division

Facilities Directorate

Attachments:

- 1. Potential to Emit Calculations
- 2. TDEC's Emission Fee Assessment
- 3. 1992 Operating Permit
- 4. 1989 Operating Permit

P.1/4

AEDC Air Permit Emissions + Fee Calcul., 3m, 1/19/92 [Source#19] Turbine Engine Test Facility, Bldgs. 878, 880.

- A) Use F100-100 Engine for Emission Cakulation Under Au Operational Modes.
- B) Use Emission Factors from Dowment ESL-TR-85-14 " Arrese, Engine Emission Estimator", Telle 3. Fox
- For SO2 Emission Factor, Use 20% of Value for NOx Emission Fact Given in Table 3. Basis: Table A-13, P.67 of Reference Doc. Shows 503 Factor of 0.2 for 100 & TGO Cycles for Floo-loo engine.
- D) & Multiply Fuel Flow Values by Factor of 1.74 to Reflect Maximum

 Fiel Use Rate of 80,000 Panels Basis: 80,000 #/# AB Mode Fin-10
- E Engine Mode Proportions:

 I de 40%.

 Approach 20

 Intermediate 10

 Military 20

 Afterburner 10
- E Annual Ceiling on Air On Harrs = 2500 Hrs/gr = Eggin Ron J.

Continue

Source # 19 Torbine Egine Test Facility, Bldg. 878, 380

Sample Calculation for NOX Tons/yr, Approxish Morde.

W = NFte

W = Pounds Pollistant = ?

N = Nonboy 1 Engine = 1

F = Freel Flow = 3000 # X1.74

HY

= 8.7 Tons/yam

L = Time in Morde = 0.2 (2500 HM

7/

e = NO, Emission Fector = 6.7 # Nox

/on # Full

ingine ode	Fuel Flow #/Hr	Time in Mode Hrs./yr.	TSP		502		Nox		HC		Co	
			e #3#	Tons/yr	(0.2)(No)	TPY	e.	TPY	e	TPY	е	TP,
ALE	2470	1000	0.12	0.15	0.66	0.81	3.3	4.1	3.2	3.9	24	29.
Approach	5220	500	0.27	0.35	1.34	1.7	6.7	8.7	1.9	2.5	5.8	7.6
ntermediate	8890	250	0.47	0.52	1.9	2.1	9.8	10.9	0.1	0.11	1.6	1.8
Military	17950	500	0.34	1.5	5.4	24.0	27	121.0	0.1	0.45	0.9	4.0
4 B	80000	250	0.15	1.5	0.62	6.2	3.1	31.0	0.01	0.1	4.0	40.
				4 TP7 TSP		34.8 197		175-7 175-7		7.1 TRY MC	-	83 TP7

Source 19 Turbine Engine Test Facility, Blogs. 878, 880.

[Firel Use Rate]: Approach: For free flow rates under each engine mode, calculate the emission rate (in prinds per how).

The highest emission rate for the exhaust product and the corresponding fuel flow rate are selected for permit limit cakelets.

Emission Fuchoss Used Are Some As Before.

Engine	Firel Flow #/Hr	TSP #/H.	502 #/Hr	Nox #/H-	HC #/4r	Co #/Hv	1
Idle	2470	0.3	1.6	8.1	7.9	59	t
Approach	5220	1.41	7	34.9	79.97	30	
Intermediate	8890	4.2	16.9	87	0.9	14	
Military	17950	6.1	1974	1483	1.8	16	
After berner	80000	112	50	248	0.8	T320	

Set Ful Use Rate At:

80,000 Points/Hr for TSP Cakerletion 17,950 Points/Hr for SOZ Cakerletion 17,950 Points/Hr for NOx Cakerletion 5,220 Points/Hr for HC Cakerletion -80,000 Points/Hr for Co Cakerletion

Set TSP Emission Rete at 12 Pounds | Hr]
Set Soz Emission Rete at 97 Pounds |

To Continued

SOURCE 19] Turbine Engine Test Facility, Blog. 878, 880
PROPOSE

- 1) LIMIT OPERATING HOURS TO 2500 HOURS PER YEAR.
- (2) LIMIT SO, EMISSION RATE TO 97 POUNDS PER HOUR (SAME AS SON
- (3) LIMIT TSP EMISSION RATE TO 12 POWNDS PER HOUR (SAME AS SOURCE
- @ MAINTAIN A LOG OF OPERATION HOURS.
- 5) TPY FOR FEE ASSESSMENT:

MISC. TSP SO2 NOX HC CO

8 4 35 176 7 83





DEPARTMENT OF THE AIR FORCE HEADQUARTERS ARNOLD ENGINEERING DEVELOPMENT CENTER (AFMC) ARNOLD AIR FORCE BASE, TENNESSEE

17 Sep 96

AEDC SDE 1100 Kindel Drive Arnold AFB TN 37389-1806

Mr. Manir Ahmed
Tennessee Department of Environment and Conservation
Air Pollution Control Division
9th Floor, L&C Annex
401 Church Street
Nashville TN 37243-1531

Dear Mr. Ahmed

Please review and approve our request for a Construction/Operating permit for the Arc Heaters (H1, H2 & HR), Emission Reference No. 16-0010-42. We are requesting that the annual operating hours be increased to 27, and the allowable No_x emissions be increased to 20.412 tons/year for this source.

Please contract Mr. Clark Brandon of my staff at (615) 454-7115 for additional information.

Sincerely

Original Signed
CHARLES H. KING
Chief, Environmental Management Division
Support Directorate

Attachments:

- 1. Permit Application
- 2. Arc Heater Schematic
- 3. Existing Permit

AIR 0211012641C WELL SP . 33 RT - 30ELL FLANTKOULFLITHE LEHLLITIAG > HETYC



DEPARTMENT OF THE AIR FORCE HEADQUARTERS ARNOLD ENGINEERING DEVELOPMENT CENTER (AFMC) ARNOLD AIR FORCE BASE, TENNESSEE

26 May 1999

AEDC/SDE 1100 Kindel Drive Arnold AFB TN 37389-1806

Mr. Stan Lodl
Tennessee Department of Environment and Conservation
Air Pollution Control Division
9th Floor, L&C Annex
401 Church Street
Nashville TN 37243-1531

Dear Mr. Lod!

Please review and approve our request to modify the annual operating times for the ETF Turbine Engine Test Cells (Emission Source Reference #16-0010-19) and the ASTF Test Cells (Emission Source Reference #16-0010-31) to reflect a combined operating time for both sources. Currently ETF and ASTF are permitted for 2,500 and 1,100 hours per year, respectively, and we request that these two sources be limited to a combined 3,600 hours per year. Combining the operating hours of these two sources do not result in any emission increase, as demonstrated in the attachment.

A timely decision on your part will be greatly appreciated. If you have any questions, please contact Mr. Trung Le at (931) 454-5873.

Sincerely

CHARLES H. KING

Chief, Environmental Mgmt Division

Support Directorate

Atch:

Emission Calculations

JEF



DEPARTMENT OF THE AIR FORCE HEADQUARTERS ARNOLD ENGINEERING DEVELOPMENT CENTER (AFMC) ARNOLD AIR FORCE BASE, TENNESSEE

2010 JUN 10 Pt. 12- 55

8 June 2010

704 CES/CEA 100 Kindel Drive, Ste B-305 Arnold AFB TN 37389-2307

Mr. Barry Stephens, P.E. Technical Secretary TN Division of Air Pollution Control 9th Floor, L&C Tower 401 Church Street Nashville TN 37243-1531

Dear Mr. Stephens

Arnold Engineering Development Center (AEDC), Permit No. 546264, requests restriction of sulfur dioxide emissions from the following sources to less than that allowed by Tennessee regulation as indicated below:

- 1. Sources 02, 03, and 04: Combined sulfur dioxide emissions be limited to 72 pounds per hour
- 2. Source 7: Sulfur dioxide emissions be limited to 0.2 pounds per hour
- 3. Source 43: Sulfur dioxide emissions be limited to 0.1 pounds per hour
- 4. Source 46: Sulfur dioxide emissions be limited to 0.2 pounds per hour
- 5. Source 71: Sulfur dioxide emissions from the boiler be limited to 72 pounds per hour

If you have any questions concerning this information, please contact Mr. Trung Le at (931) 454-5873.

Sincerely

PAMELA F. KIN

Chief, Asset Management Flight 704th Civil Engineering Squadron

C:

ATA (Mr. J. Holt)



TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT CUSTOMS HOUSE 701 BROADWAY NASHVILLE, TENNESSEE 37219-5403

CERTIFIED MAIL P 465 405 996 RETURN RECEIPT REQUESTED

55

MAY 0 2 1990

Stephen P. Condon, Colonel USAF Commander Arnold Engineering Development Center Arnold Air Force Base, TN 37389

Re: 16-0010-47 48

Dear Colonel Condon:

Your application for a permit from the Division of Air Pollution Control has been favorably reviewed. The permit is included with this letter.

In order to alleviate the administrative and technical requirements involved in a Prevention of Significant Deterioration review, you may choose to agree to the following limitation(s) concerning your new steam boiler (42 MM Btu/hr) to replace the existing boiler #1 (25.6 MM Btu/hr) at Steam Plant A, Building 1411 pursuant to Rules 1200-3-6-.01(7) and 1200-3-14-.01(3) of the Tennessee Air Pollution Control Regulations:

- s0₂ emissions shall not exceed 39 TPY.
- b. NO, emissions shall not exceed 39 TPY.

This source is also subject to proposed Federal New Source Performance Standards (NSPS) that have not as yet been promulgated. In order for Tennessee Air Pollution Control Division to continue to function as the primary regulator, you may choose to agree to the following limitations and conditions pursuant to rule 1200-3-6-.01(7) and 1200-3-14-.01(3) of the Tennessee Air Pollution Control Regulations:

- a. SO₂ emissions shall not exceed 0.5 1b/MM Btu of heat input (21 lb/hour).
- b. NO emission shall not exceed 1.0 1b/MM Btu of heat input (42 1b/hr.)
- c. Visible emissions shall not exceed 20 percent or greater opacity as determined by EPA Method 9, as published in the Federal Register, Volume 39, No. 219 on November 12, 1974. (6 minute average)

Agreement to the above condition(s) will mean that you will need a construction permit if you wish to exceed the limitation(s). The source will also be subject to any restrictions which apply to new sources at the time the new construction permit is issued.

If you have any questions concerning this letter, please contact Manir Ahmed at 615-741-3651.

To signify your agreement, please sign below and return this letter to Manir Ahmed, Air Pollution Control Division, New Source Review Section, Customs House, 701 Broadway, Nashville, Tennessee 37219-5403.

Since we have already received your verbal agreement to the above limitation(s), the enclosed permit will be valid as of the issue date, provided your signed agreement is received by the Tennessee Division of Air Pollution Control within (10) days of its receipt.

RECEIVED
DATE JUN 0 7 1990
CO. NO.
1. D. A 1 2 3 4 5 6
B 1 2 3 4 5
CS
OTHER

MAY 0 2 1990

Stephen P. Condon, Colonel USAF Page Two

Thank you for your cooperation in this matter.

Very truly yours,

Harold E. Hodges, P.E. Technical Secretary Tennessee Air Pollution Control Board

HEH/MA/F5020095 APC-7A

CC: Field Office

Will
Stephen F. Condon, Colonel USAF, Commander hereby agrees to the above limitation(s), in behalf of Arnold Engineering Development Center.

Signature:

Waven WARREN L. RILES, Colonel, USAF Title: Vice Commander

JUN 5 1990 Date:



DEPARTMENT OF THE AIR FORCE

HEADQUARTERS ARNOLD ENGINEERING DEVELOPMENT CENTER (AFMC) ARNOLD AIR FORCE BASE TENNESSEE

2009 SEP 21 AM 10: 26

AEDC/CC 100 Kindel Drive, Suite A-303 Arnold AFB TN 37389-1303

SEP 1 4 2009

Mr. Barry Stephens, P.E. Technical Secretary Tennessee Air Pollution Control Division 9th Floor, L&C Annex 401 Church Street Nashville TN 37243-1531

Dear Mr. Stephens

Arnold Engineering Development Center (AEDC) is planning to install eight Desiccant Drying Units (DDUs) to condition and dehumidify air supplied to test cell facilities. As the DDUs become saturated with moisture, heated air shall be used to regenerate the desiccant beds. Heated air will be obtained by passing ambient air through heat exchangers. A total of sixteen identical natural gas-fired burners (two per DDU) will be used as the energy source for the heat exchangers.

The operating permit application and proposed permit conditions are attached for your review. The proposed changes at this facility meet the criteria for use of minor permit modification procedures and I request that such procedures be used. The modification does not violate any applicable requirement. The change is not a modification under Title I of the Federal Act.

To the best of my knowledge and based on the information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate, and complete.

Sincerely

MICHAEL T. PANARISI, Colonel, USAF

Commander

Attachments:

- 1. Permit Modification Application
- 2. Proposed Permit Conditions

Attachment 2

Proposed Permit Conditions

Desiccant Drying Unit Burners

AEDC suggests the following permit conditions for determining compliance certification for operation of the Desiccant Drying Unit Burners.

- **E36-1.** The combined total heat input to these sixteen (16) heaters shall not exceed 24 million Btu per hour.
- E36-2. Natural gas shall be the only fuel used for these heaters.
- **E36-3.** The combined total operating time for all sixteen (16) heaters shall not exceed 64,000 hours per State FY (July-June).
- E36-4. Particulate matter emitted from this source shall not exceed 8.85 pounds per hour.
- E36-5. Sulfur dioxide emitted from this source shall not exceed 1.0 pounds per hour.
- E36-6. Nitrogen oxides emitted from this source shall not exceed 5.0 tons per year.



SIGNIFICANT MODIFICATION #2

6 SEP 2002

AEDC/CV 100 Kindel Drive, Suite A303 Arnold AFB TN 37389-1303

Mr. Eric Flowers
Tennessee Department of Environment and Conservation
Air Pollution Control Division
9th Floor, L&C Annex
401 Church Street
Nashville TN 37243-1531

16-0010

Dear Mr. Flowers

Arnold Engineering Development Center (AEDC) holds Title V Permit Number 546264. This letter is an application for a minor modification under TN Rule 1200-3-9-.02 (11)(f)4. The requested modifications involve the following sources:

Source	Source Number
Steam Plant A, Boiler #2	16-0010-02
Steam Plant A, Boiler #3	16-0010-03
Steam Plant A, Boiler #4	16-0010-04
ETF Heaters	16-0010-06
ASTF Heaters	16-0010-30

The air pollutant emission rates from many of AEDC's sources are calculated using EPA's AP-42 emission factors. During the time period between when AEDC applied for the Title V permit and when the TDEC issued the permit, EPA made revisions to these published factors. The new factors for natural gas and oil combustion are shown in Tables 1 and 2.

AEDC has identified three (3) Title V permit conditions that require changing as a result of the new factors. TDEC has suggested that these changes can be accommodated in AEDC's Title V permit through a Minor Permit modification. Specifically, AEDC requests that the following permit conditions be changed:

E4-6	Change allowable particulate emission rate from 5.0 lb/hr to 5.5 lb/hr
E6-3	Change allowable particulate emission rate from 3.4 lb/hr to 5.1 lb/hr
E16-5	Change allowable particulate emission rate from 32.4 lb/hr to 47.5 lb/hr

This modification does not violate any applicable requirements. No new applicable requirements will apply as a result of these modifications. AEDC is a major source for PSD purposes.

To the best of my knowledge, and based on the information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate, and complete. Furthermore, the modifications meet the criteria for use of minor permit modification procedures. Therefore, please use the minor permit modification procedures to effect these modifications.

Sincerely

LARRY V. JUDGE, CAPT, USN

Vice Commander

Attachment:

Permit Modification Application

cc:

TDEC (Mr. A. Payne) w/o Atchs AEDC/SDE (Mr. C. King) w/Atchs

ACS (Mr. J. Holt) w/Atchs SvT (Mr. B. Partin) w/o Atchs



STATE OF TENNESSEE DEPARTMENT OF PUBLIC HEALTH

CORDELL HULL BUILDING NASHVILLE, TENNESSEE 37219 150 9th Avenue, North

May 5, 1982

Mr. Charles R. Smith Air Force Regional Civil Engineer Eastern Region 526 Title Building 30 Pryor Street, S.W. Atlanta, GA 30303

Re: 16-0010

Dear Mr. Smith:

We have received your application for a construction permit dated March 18, 1982. In order to expedite your permit and alleviate the administrative and technical requirements involved in a Prevention of Significant Deterioration review, you may choose to agree to the following limitations concerning your two (2) natural gas heaters pursuant to Rule 1200-3-7-,01(5) of the Tennessee Air Pollution Control Regulations:

(a.) Limiting the operating time to 3000 hours per year.

Agreement to the above conditions will mean that you will need another construction permit if you wish to exceed these limitations. The source will also be subject to any restrictions which apply to new sources at the time the new construction permit is issued.

If you have any questions concerning this letter, please contact Al Lewis at 615-741-3651.

To signify your agreement, please sign below and return this letter to Al Lewis Air Pollution Control, New Source Review Section, 150 Ninth Avenue North, Nashville, Tennessee 37203

Thank you for your cooperation in this matter.

Very truly yours,

Harold E. Hodges

Technical Secretary Tennessee Air Pollution Control Board

HEH/AJL:bec APC 132

cc: Regional Office

U. S. Air Force hereby agrees to the above limitations.

Signature:

Title: Regional Civil Engineer

Charle Bon

Date: 13 May 1982



10 February 2023

Colonel Randel J. Gordon, USAF Commander Arnold Engineering Development Complex 100 Kindel Drive, Ste A-303 Arnold AFB TN 37389-1303

Mr. Justin Dolzen Tennessee Department of Environment and Conservation Division of Air Pollution Control William R. Snodgrass Tennessee Tower 312 Rosa L. Parks Avenue, 11th Floor Nashville TN 37243

Dear Mr. Dolzen

Arnold Engineering Development Complex (AEDC) agrees to limit the Particulate Matter (PM) emissions to 0.3 lb/hr and the Sulfur Dioxide (SO2) emissions to 0.1 lb/hr on a daily average for the Regenerative Storage Heaters (Emission Source 16-0010-77(MM2).

If you have any questions, please contact Mrs. Shannon Allen, Chief – Installation Management Section at (931) 454-6290.

Sincerely

GORDON.RAND Digitally signed by GORDON.RANDEL.J.1020484116 Date: 2023.02.11 06:45:13-06'00' RANDEL J. GORDON, Colonel, USAF Commander

cc: TSDCI (Mrs. S. Allen, Mr. T. Le) FSS (Mrs. T Crisp, Mrs. M. Benton) TOS (Mr. J. Holt)



25 September 2018

Colonel Scott A. Cain Commander, AEDC 100 Kindel Drive, Suite A-303 Arnold AFB TN 37389-1303 16-0010

APC ROUD

1 OCT 2018 PM12:42

Ms. Michelle Walker-Owenby Tennessee Air Pollution Control Division William R. Snodgrass Tennessee Tower 312 Rosa L. Parks Avenue, 15th Floor Nashville TN 37243

Dear Ms. Owenby

Arnold Engineering Development Complex (AEDC) agrees to limit the operation for the construction permit of the proposed C1 High Pressure Indirect Fired Air Heater to no more than 2,800 hours per year and to 5.6 lbs/hour of particulate emission based upon an assumed thermal input of 150 million BTUs per hour. We accept this limitation to avoid the Prevention of Significant Air Quality Deterioration as recommended by Mr. Manir Ahmed (TDEC permit writer).

If you have any questions, please contact Ms. Nicole Tracey, Chief of Installation Management, at (931) 454-6290.

Sincerely,

SCOTT A. CAIN, Colonel, USAF

Commander

cc:

AEDC/JA (Mr. G. Porter) AEDC/TSDCI (Mr. N. Tracey) TOS (Mr. J. Holt) FSS (Mr. J. Russell)



11 February 2021

Colonel Jeffrey T. Geraghty, USAF Commander, AEDC 100 Kindel Drive, Ste A-303 Amold AFB TN 37389

Ms. Michelle W. Owenby Tennessee Department of Environment and Conservation Division of Air Pollution Control William R. Snodgrass Tennessee Tower 312 Rosa L. Parks Avenue, 15th Floor Nashville, TN 37243

Dear Ms. Owenby,

Arnold Air Force Base (AAFB) would like to request that Tennessee Department of Environment and Conservation (TDEC) review and approve the request for limitation of the operation of Source 16-0010-75, C1 High Pressure Air Heater, to 2800 hours per year. AAFB will also request an agreement that the SO2 emissions from the source do not exceed the 0.6 pounds per hour (0.1 TPY) limit outlined in the construction permit and pursuant with the regulations.

If you have any questions, please contact Mr. David Carlon, Chief – Installation Management Section at (931) 454-6290.

Sincerely,

GERAGHTY.JEFFREY GERAGHTY.JEFFREY.THOMAS.11
.THOMAS.1154983399 5488399
Debi: 2021.02.11 14:50:52-08'00'
JEFFREY T. GERAGHTY, Colonel, USAF

cc: TSDCI (Mr. T. Le) FSS (Mr. J. Russell, Mr. S. Farrington) TOS (Mr. J. Holt)



7 March 2024

Colonel Randel J. Gordon, USAF Commander Arnold Engineering Development Complex 100 Kindel Drive, Ste A-303 Arnold AFB TN 37389-1303

Mr. Justin Dolzen Tennessee Department of Environment and Conservation Division of Air Pollution Control William R Snodgrass Tennessee Tower, 11th Floor 312 Rosa L. Parks Avenue Nashville TN 37243

Dear Mr. Dolzen

For Emission Source 16-0010-78, Conditions E31-1 and E31-2, Arnold Engineering Development Complex (AEDC) agrees to limit combined NOx emissions for Emission Source 16-0010-78 to 39.0 tons or less during all intervals of 12 consecutive months. Additionally, the operating hours for this source will be limited to 21.7 hours or less for sub-atmospheric testing and 300 hours or less for atmospheric testing during any interval of 12 consecutive months.

If you have any questions, please contact Mrs. Shannon Allen, Chief – Installation Management Section at (931) 454-6290.

Sincerely

GORDON.RANDE Digitally signed by GORDON.RANDEL.J.1020484116 Date: 2024.03.08 07:50:36-06'00' RANDEL J. GORDON, Colonel, USAF Commander

cc:

TSDCI (Mrs. S. Allen, Mr. T. Le) FSS (Mrs. H. Reese, Mrs. M. Benton) TOS (Mr. J. Holt)

ATTACHMENT 5

Table 10 to 40 CFR 63 Subpart DDDDD Applicability of General Provisions to Subpart DDDDD

You are required to comply with the following General Provisions of the federal National Emission Standards for Hazardous Air Pollutants (NESHAP):

General Provisions Citation 40 CFR	Subject of Citation	Applies to Subpart	Explanation
§63.1	Applicability	Yes ⊠ No □	Î
§63.2	Definitions	Yes ⊠ No □	Yes. Additional terms defined in §63.7575
§63.3	Units and Abbreviations	Yes ⊠ No □	
63.5	Preconstruction Review and Notification Requirements	Yes ⊠ No □	Area sources are not subject to subpart IIII.
§63.6(a), (b)(1)- (b)(5), (b)(7), (c)	Compliance with Standards and Maintenance Requirements	Yes ⊠ No □	
§63.6(e)(1)(i)	General Duty to Minimize Emissions	Yes □ No ⊠	No. See §63.7500(a)(3) for the general duty requirement.
§63.6(e)(1)(ii)	Requirement to correct malfunctions as soon as practicable	Yes □ No ⊠	
§63.6(e)(3)	Startup, shutdown, and malfunction plan requirements	Yes □ No ⊠	
§63.6(f)(1)	Startup, shutdown, and malfunction exemptions for compliance with non-opacity emission standards	Yes □ No ⊠	
§63.6(f)(2) and (3)	Compliance with non-opacity emissions standards	Yes ⊠ No □	
§63.6(g)	Use of alternative standards	Yes ⊠ No □	Yes, except §63.7555(d)(13) specifies the procedure for application and approval of an alternative timeframe with the PM controls requirement in the startup work practice (2)
§63.6(h)(2) to (h)(9)	Determining compliance with opacity emission standards	Yes □ No ⊠	No. Subpart DDDDD specifies opacity as an operating limit not an emission standard.
§63.6(i)	Extension of compliance	Yes ⊠ No □	Yes. Note: Facilities may also request extensions of compliance for the installation of combined heat and power, waste heat recovery, or gas pipeline or fuel feeding infrastructure as a means of complying with this subpart.
§63.6(j)	Presidential exemption	Yes ⊠ No □	
§63.7(a), (b), (c), and (d)	Performance testing requirements	Yes ⊠ No □	
§63.7(e)(1)	Conditions for conducting performance tests	Yes □ No ⊠	No. Subpart DDDDD specifies conditions for conduction performance tests at §63.7520(a) to (c)
§63.7(e)(2)-(e)(9), (f), (g), and (h)	Performance testing requirements	Yes ⊠ No □	
§63.8(a) and (b)	Applicability and conduct of monitoring	Yes ⊠ No □	
§63.8(c)(1)	Operation and maintenance of CMS	Yes ⊠ No □	
§63.8(c)(1)(i)	General duty to minimize emissions and CMS operation	Yes □ No ⊠	No. See §63.7500(a)(3)
§63.8(c)(1)(ii)	Operation and maintenance of CMS	Yes ⊠ No □	
§63.8(c)(1)(iii)	Startup, shutdown, and malfunction plans for CMS	Yes □ No ⊠	
§63.8(c)(2) to (c)(9)	Operation and maintenance of CMS	Yes ⊠ No □	

SIGNIFICANT MODIFICATION #2 EXPIRATION DATE: JUNE 21, 2022

General Provisions Citation 40 CFR	Subject of Citation	Applies to Subpart	Explanation
§63.8(d)(1) and (2)	Monitoring requirements, quality control program	Yes ⊠ No □	
§63.8(d)(3)	Written Procedures for CMS	Yes ⊠ No □	Yes, except for the last sentence, which refers to a startup, shutdown, and malfunction plan. Startup, shutdown, and malfunction plans are not required
§63.8(e)	Performance evaluation of CMS	Yes ⊠ No □	
§63.8(f)	Use of an alternative monitoring method	Yes ⊠ No □	
§63.8(g)	Reduction of monitoring data	Yes ⊠ No □	
§63.9	Notification Requirements	Yes ⊠ No □	
§63.10(a), (b)(1)	Recordkeeping and reporting requirements	Yes ⊠ No □	
§63.10(b)(2)(i)	Recordkeeping of occurrence and duration of startups or shutdowns	Yes ⊠ No □	
§63.10(b)(2)(ii)	Recordkeeping of malfunctions	Yes □ No ⊠	No. See §63.7555(d)(7) for recordkeeping of occurrence and duration and §63.7555(d)(8) for actions taken during malfunctions
§63.10(b)(2)(iii)	Maintenance records	Yes ⊠ No □	
\$63.10(b)(2)(iv) and (v)	Actions taken to minimize emissions during startup, shutdown, or malfunction	Yes □ No ⊠	
§63.10(b)(2)(vi)	Recordkeeping for CMS malfunctions	Yes ⊠ No □	
§63.10(b)(2)(vii) to (xiv)	Other CMS requirements	Yes ⊠ No □	
§63.10(b)(3)	Recordkeeping requirements for applicability determinations	Yes □ No ⊠	
§63.10(c)(1) to (9)	Recordkeeping for sources with CMS	Yes ⊠ No □	
§63.10(c)(10) and (11)	Recording nature and cause of malfunctions, and corrective actions	Yes □ No ⊠	No. See §63.7555(d)(7) for recordkeeping of occurrence and duration and §63.7555(d)(8) for actions during malfunctions
§63.10(c)(12) and (13)	Recordkeeping for sources with CMS	Yes ⊠ No □	
§63.10(c)(15)	Use of startup, shutdown, and malfunction plant	Yes □ No ⊠	
§63.10(d)(1) and (2)	General reporting requirements	Yes ⊠ No ⊠	
§63.10(d)(3)	Reporting opacity or visible emission observation results	Yes □ No ⊠	
§63.10(d)(4)	Progress reports under an extension of compliance	Yes ⊠ No □	
§63.10(d)(5)	Startup, shutdown, and malfunction reports	Yes □ No ⊠	No. See §63.7550(c)(11) for malfunction reporting requirements.
§63.10(e)	Additional reporting requirements for sources with CMS	Yes ⊠ No ⊠	
§63.10(f)	Waiver of recordkeeping or reporting requirements	Yes ⊠ No □	
§63.11	Control Device Requirements	Yes □ No ⊠	

PERMIT NO. 570221

SIGNIFICANT MODIFICATION #2 EXPIRATION DATE: JUNE 21, 2022

General Provisions Citation 40 CFR	Subject of Citation	Applies to Subpart	Explanation
§63.12	State Authority and delegation	Yes ⊠ No □	
§63.13-16	Addresses, incorporation by reference, availability of information, performance track provisions	Yes ⊠ No □	
\$63.1(a)(5), (a)(7)-(a)(9), (c)(3)-(4), (d), \$63.6(b)(6), (c)(3), (c)(4), (d), (e)(2), (e)(3)(ii), (h)(3), (h)(5)(iv), \$63.8(a)(3), \$63.9(b)(3), (h)(4), \$63.10(c)(2)-(4), (c)(9)		Yes □ No ⊠	

TAPCR 1200-03-09-.03(8)