

**GOVERNMENT OF THE DISTRICT OF COLUMBIA**  
Department of Energy and Environment

**FACT SHEET AND STATEMENT OF BASIS  
FOR PROPOSED PERMITTING ACTION  
UNDER 20 DCMR 300 (TITLE V-OPERATING PERMIT PROGRAM)**

This “Fact Sheet and Statement of Basis” has been prepared pursuant to 20 DCMR 303.1(c) and 40 CFR 70.7(a)(5).

**PERMIT NO: 024-R2**

**APPLICANT AND PERMITTEE:**

Smithsonian Institution  
National Museum of Natural History  
1000 Constitution Avenue NW, MRC 132  
Washington, DC 20004

**FACILITY LOCATION:**

National Zoological Park  
3001 Connecticut Ave., NW  
Washington, DC 20008

**RESPONSIBLE OFFICIAL**

Mr. John Michael Bixler, Deputy Director of Facilities Management

**FACILITY DESCRIPTION:**

The National Zoological Park is a 163-acre zoo and botanical garden campus owned and operated by the Smithsonian Institution. The National Zoological Park is located within Rock Creek Park and is approximately bounded by Beach Drive NW to the north and east; Rock Creek to the south; and Connecticut Ave NW to the west. The purpose and function of the National Zoological Park (SIC Code 8422) is the daily operation of arboreta and of botanical or zoological gardens and exhibits.

The previous Title V operating permit (issued on September 27, 2004) listed twenty-nine (29) emissions units [three (3) dual fuel boilers, ten (10) small boilers, and sixteen (16) emergency generators). The National Zoological Park submitted an application to renew the Title V permit in March 2009 and provided revised applications in May 2009, April 2015, and October 2016. The facility includes emission units that are capable of operating twenty-four (24) hours per day, seven (7) days per week, and fifty-two (52) weeks per year. The facility consists of the following sources of air emissions at the campus (including identified miscellaneous/insignificant sources):

- Three (3) dual fuel boilers permitted to fire natural gas and No. 2 fuel oil;
- Five (5) natural gas hot water heaters;
- Two (2) diesel fired emergency generators;

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- Fourteen (14) natural gas fired emergency generators;
- Three (3) propane fired emergency generators;
- One (1) paint spray booth;
- One (1) sawdust collector for woodworking operations;
- One (1) above ground storage tank (AST) for gasoline and associated dispensing equipment;
- Twelve (12) ASTs for diesel;
- Numerous laboratory fume hoods;
- One (1) ethylene oxide sterilizer;
- Seven (7) cooling towers; and
- Numerous boilers, hot water heaters, and other fuel burning equipment with ratings of less than five (5) million BTU/hr of heat input and burning natural gas only.

The following emission units were included on the 2015 version of the Title V application; however, based on information provided by the Zoo on July 27, 2016 the units were either removed or replaced as follows:

- The emergency generator located at the Ape House (EG-17) is locked out/tagged out and will not be used or operated. This generator was removed from the Title V Permit and the potential to emit (PTE) calculations.
- The small boiler (Cleaver Brooks, Model No. CB 200-100-150ST) with a heat input rating of 4.18 million BTU per hour (MMBTU/hr) located at Amazonia is no longer in service and has been removed from the facility. This small boiler was removed from the Title V Permit and the potential to emit (PTE) calculations.
- The 4,000 gallon gasoline underground storage tank (UST) (T1) and 2,000 gallon diesel UST (T2) were removed and replaced by a 4,000 gallon AST in May 2015. The tank is split into the following two ASTs:
  - 3,000 gallon gasoline AST (T18), and
  - 1,000 gallon diesel AST (T19).

Additionally, per a request dated October 28, 2016, an 8 kWe diesel-fired emergency generator set at the Think Tank building was replaced by a 50 kWe natural gas-fired emergency generator set located at the building.

**EMISSIONS SUMMARY:**

The following is an estimate of overall potential emissions from the facility:

<b>FACILITY-WIDE EMISSIONS SUMMARY [TONS PER YEAR]</b>	
<b>Pollutants</b>	<b>Potential Emissions</b>
Sulfur Dioxide (SO <sub>2</sub> )	0.56
Oxides of Nitrogen (NO <sub>x</sub> )	66.25
Total Particulate Matter (PM Total)	8.43

<b>FACILITY-WIDE EMISSIONS SUMMARY [TONS PER YEAR]</b>	
<b>Pollutants</b>	<b>Potential Emissions</b>
Volatile Organic Compounds (VOCs)	14.90
Carbon Monoxide (CO)	54.41
Total Hazardous Air Pollutants (HAPs)	4.51

**BASIS OF 20 DCMR CHAPTER 3 (TITLE V) APPLICABILITY:**

The National Zoological Park has the PTE 66.25 tons per year (TPY) of NO<sub>x</sub>. This total exceeds the major source threshold in the District of Columbia of 25 TPY of NO<sub>x</sub> or VOCs, and/or 100 TPY of any other criteria pollutant. Because potential emissions of NO<sub>x</sub> exceed the relevant major source threshold, pursuant to 20 DCMR 300.1(a), the source is subject to Chapter 3 and must obtain an operating permit in accordance with that regulation and Title V of the federal Clean Air Act.

**LEGAL AND FACTUAL BASIS FOR DRAFT PERMIT CONDITIONS:**

The conditions contained in the draft Title V operating permit are based on underlying requirements of 20 DCMR as well as various federal regulations promulgated pursuant to the federal Clean Air Act. The regulations that are the basis of each condition are cited in the permit, except those conditions added to make another condition, with a direct underlying regulation, enforceable as a practical matter may, in some cases, not have a specific citation. These latter, un-cited conditions generally consist of monitoring, recordkeeping, and reporting requirements authorized under 20 DCMR 500.1.

The draft Title V operating permit has been developed to incorporate the requirements of all applicable requirements as defined in 20 DCMR 399.1 along with additional conditions necessary to make all such requirements enforceable as a practical matter.

Any condition of the draft Title V operating permit that is enforceable by the District but is not federally-enforceable is identified in the draft Title V operating permit as such with an asterisk.

It should also be noted that this permit is being issued pursuant to the District's authority under 20 DCMR Chapter 2 as well as Chapter 3. When the permit is issued for public review, the public notice will reflect this fact.

**REGULATORY REVIEW:**

This facility has been found to be subject to the requirements of the following regulations (except as specified in the discussion below):

Federal and District Enforceable:

20 DCMR Chapter 1 - General Rules

20 DCMR Chapter 2 - General and Non-Attainment Area Permits

- 20 DCMR Chapter 3 - Operating Permits and Acid Rain Programs
- 20 DCMR 500 - Records and Reports
- 20 DCMR 502 - Sampling, Tests, and Measurements
- 20 DCMR 600 - Fuel-Burning Particulate Emission
- 20 DCMR 603 - Particulate Process Emissions
- 20 DCMR 604 - Open Burning
- 20 DCMR 605 - Control of Fugitive Dust
- 20 DCMR 606 - Visible Emissions
- 20 DCMR 700 - Miscellaneous Volatile Organic Compounds (VOCs)
- 20 DCMR 704 - Stage I Vapor Recovery
- 20 DCMR 705 - Stage II Vapor Recovery
- 20 DCMR 774 - Architectural and Industrial Maintenance Coatings
- 20 DCMR 800 - Control of Asbestos
- 20 DCMR 801 - Sulfur Contents of Fuel Oils
- 20 DCMR 805 - Reasonably Available Control Technology for Major Stationary Sources of the Oxides of Nitrogen
- 20 DCMR 1407 - Emission Standards for Hospitals and Other Ethylene Oxide Sterilizers
- 40 CFR 51.212, 52.12, 52.30, 60.11, and 61.12 - Credible Evidence
- 40 CFR 60, Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units
- 40 CFR 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI-ICE)
- 40 CFR 60, Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI-ICE)
- 40 CFR 63, Subpart CCCCCC - National Emission Standards for Hazardous Air Pollutants (NESHAP) for Source Category: Gasoline Dispensing Facilities
- 40 CFR 63, Subparts O - Ethylene Oxide Emissions Standards for Sterilization Facilities
- 40 CFR 63, Subparts WWWW - National Emission Standards for Hospital Ethylene Oxide Sterilizers
- 40 CFR 63, Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants (NESHAP) for Reciprocating Internal Combustion Engines (RICE)
- 40 CFR 82, Subpart G - Protection of Stratospheric Ozone (Federally enforceable only except through Title V) *(Note: Air Quality Division [AQD] did not make a positive determination that this regulation was applicable to the facility, but included it as a standard requirement in the permit.)*
- 40 CFR 82, Subpart H - Halon Emissions Reduction (Federally enforceable only except through Title V) *(Note: AQD did not make a positive determination that this regulation was applicable to the facility, but included it as a standard requirement in the permit.)*

**District Enforceable Only:**

- 20 DCMR 402 - Chemical Accident Prevention *(Note: AQD did not make a positive determination that this regulation was applicable to the facility, but included it as a standard requirement in the permit.)*

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- 20 DCMR 900 - Engine idling
- 20 DCMR 901 - Vehicular exhaust emissions
- 20 DCMR 902 - Lead Content of Gasoline
- 20 DCMR 903 - Odorous or other nuisance air pollutants

**20 DCMR 704: Stage I Vapor Recovery:**

The capacity of the gasoline AST at the facility exceeds two hundred and fifty (250) gallons. Thus 20 DCMR 704 is applicable and has been included in the permit.

**20 DCMR 705: Stage II Vapor Recovery:**

The throughput for the 3,000 gallon capacity gasoline storage tank is less than 10,000 gallons per month. The threshold for 20 DCMR 705 is 10,000 gallons per month throughput per 20 DCMR 705.3. Thus 20 DCMR 705 is not applicable and has not been included in the permit.

**20 DCMR 801: Sulfur Content of Fuel Oils:**

This regulation limits fuel oil sulfur content to 1% by weight. After July 1, 2016, for commercial fuel oil classified as No. 2 fuel oil, this level is reduced to 0.05% by weight and 0.0015% by weight after July 1, 2018. However, the permit application asserted that potential emissions of SO<sub>2</sub> were based on the use of 0.0015% by weight sulfur No. 2 fuel oil currently. As a result, pursuant to authority under Chapter 2, the 0.0015% level was adopted as a limitation in the permit, a level more stringent than the requirement of 20 DCMR 801.

**New Source Performance Standards (NSPS) [40 CFR 60]:**

NSPS apply to this facility as the following NSPS analyses and applicability determination indicate:

1. NSPS: Diesel emergency generators subject to Subpart IIII

Pursuant to 40 CFR 60, NSPS Subpart IIII applies to stationary compression ignition internal combustion engines (CIICE): 1) with model years of 2007 or later, 2) that commenced construction after July 11, 2005 and were manufactured after April 1, 2006, or 3) that were modified or reconstructed after July 11, 2005. This subpart does not apply to any of the diesel emergency generators because the units were installed in 2004 or earlier.

2. NSPS: Natural gas emergency generators subject to Subpart JJJJ

Pursuant to 40 CFR 60, NSPS Subpart JJJJ applies to stationary spark ignition internal combustion engines (SIICE) with the construction or modification/reconstruction date of June 12, 2006, or the manufacture date of July 1, 2008. Seven (7) natural gas burning and one (1) propane burning emergency generators are subject to Subpart JJJJ as follows:

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<b>Equipment Location</b>	<b>Emission Unit Description</b>	<b>Chapter 2 Permit No.</b>	<b>Generator Model Number/ Engine Model Number</b>
Reptile House	One (1) 180 kWe Power Systems International, Inc. (PSI, Inc.) generator set with 302 hp natural gas engine (manufactured 2009/installed 2012)	7002	180REZXB/D111L
General Services Building	One (1) 200 kWe PSI, Inc. generator set with 302 hp natural gas engine (manufactured 2009/installed 2013)	6885	G5002N6SRAS0984/D111L
Cheetah Springs	One (1) 35 kWe Generac generator set with 54 hp natural gas engine (manufactured 2009/installed 2011)	6592-R1	13445040200/4.2L
Central Heating Plant	One (1) 130 kWe Ford generator set with 189 hp natural gas engine (manufactured 2009/installed 2011)	6593-R1	13440230100
Lion/Tiger House	One (1) 25 kWe PSI, Inc. generator set with 52 hp propane engine (manufactured 2009/installed 2011)	6553-R1	25REZG/39001019
Seal/Sea Lion	One (1) 200 kWe PSI, Inc. generator set with 302 hp natural gas engine (manufactured 2009/installed 2010)	7003	200REZX/D111L
Greenhouse Area	One (1) 14 kWe Generac generator set with 32 hp natural gas engine (manufactured 2009/installed 2012)	6982	0055030/068244
Genetics	One (1) 100 kWe Cummins generator set with 153 hp natural gas engine (manufactured 2009/installed 2010)	6314-R1	GGHH-816085/ WSG-1068
Think Tank	One (1) 50 kWe Generac generator set with 80 hp natural gas engine (model year 2016/installed 2017)	7043-SC-0015	

3. NSPS: Dual fuel boilers subject to Subpart Dc

Combustion units operating as dual fuel boilers are subject to NSPS Subpart Dc. Applicability for NSPS for boilers is based on unit size and age. The boilers must have heat input ratings greater than 10 MMBTU/hr and less than 100 MMBTU/hr, and must have been installed after June 9, 1989. Both criteria for age and size must be met for applicability of 40 CFR 60.40c – Subpart Dc to be triggered. The facility has three (3) dual fuel boilers in operation: Boiler 1 (ID# CU-1), Boiler 2 (ID# CU-2), and Boiler 3 (ID# CU-3). These boilers each have a heat input capacity of 20.41 MMBTU/hr and were installed in 1995. The units meet both the size and age limitations, therefore, Subpart Dc is applicable to these units. The requirements of Subpart Dc have been incorporated in the permit as applicable. Note that the

“Standard for particulate matter (PM)” in 40 CFR 60.43c is not applicable to these units as they are below 30 MMBTU/hr in rated heat input.

20 DCMR 1407: Emission Standards for Hospitals and Other Ethylene Oxide Sterilizers, 40 CFR 63, Subparts O: Ethylene Oxide Emissions Standards for Sterilization Facilities, and 40 CFR 63, Subparts WWWW - National Emission Standards for Hospital Ethylene Oxide Sterilizers

20 DCMR 1407, and 40 CFR 63, Subparts O and WWWW are not applicable to the ethylene oxide sterilizer located at the facility. This unit is used for Animal Care Sciences (also known as the Veterinary Clinic) for sterilizing its medical instruments. 20 DCMR 1407 and 40 CFR 63, subpart O do not apply to ethylene oxide sterilization operations at stationary sources such as hospitals, doctors offices, clinics, or other facilities whose primary purpose is to provide medical services to humans or animals. Therefore, 40 CFR 63, subpart, O does not apply for the unit located at National Zoo.

Based on email correspondence from EPA Region III (Ray Chalmers) to Sally Atkins (URS Corporation, contractor for National Zoological Park), veterinary hospitals are not covered by 40 CFR 63, Subpart WWWW. Therefore, 40 CFR 63, Subpart WWWW does not apply to the ethylene oxide sterilizer located at the facility.

40 CFR 63, Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines (NESHAP for RICE)

Subpart ZZZZ of 40 CFR 63 regulates/monitors HAPs such as acetaldehyde, acrolein, benzene, toluene, xylene, cadmium, chromium, lead, etc., through surrogate compounds such as formaldehyde, CO and/or VOC. A facility that emits or has the PTE 10 tons/year of any single HAP or 25 tons/year of any combination of HAPs, is considered a major source of HAPs. Any source that is not a major source is an area source of HAPs. Because this facility does not have the PTE more than 10 tons/year of a single HAP or an aggregate of more than 25 tons of total HAPs, it is not a major source; it is an area source.

Subpart ZZZZ is applicable to new or reconstructed spark ignition (SI) and compression ignition (CI) engines at this facility, where “new” is defined as those engines that are manufactured or reconstructed after June 12, 2006. Note that Subpart ZZZZ defers regulations of new engines to the NSPS, 40 CFR Part 60 Subpart IIII and Subpart JJJJ. Seven (7) natural gas fired engines and one (1) propane fired engine for emergency generators fall into this category (as listed within the table under Subpart JJJJ). The Title V permit has been drafted to include the applicable requirements of the NSPS for these units.

Additionally, Subpart ZZZZ covers existing engines at the facility. These consist of three (3) diesel, six (6) natural gas fired emergency generator sets, and two (2) propane fired emergency generator sets. As such, the requirements of Subpart ZZZZ have been added to the relevant sections of the permit.

40 CFR 63, Subpart JJJJJ - National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers Area Sources

This regulation does not apply to the three (3) 20.41 MMBTU/hr boilers as they are prohibited from operating using No. 2 fuel oil except during natural gas interruptions and for up to 48 hours per year for periodic testing. See Condition III(a)(2)(D) of the permit. This limitation was established at the applicant's request (see the email from Chuku Oje of AECOM to Younus Burhan of TetraTech and copied to Stephen Ours, dated July 18, 2016, for documentation of this request). Note that this rule does not cover the small fuel burning equipment in the miscellaneous/insignificant activities section of the permit as those units burn natural gas exclusively.

40 CFR 63 Subpart CCCCC - National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities:

40 CFR 63 Subpart CCCCC applies to any existing or new gasoline distribution facility that is located at an area source of HAPs as defined in 40 CFR 63.2 (See 40 CFR 63.11111(a)). The facility has gasoline dispensing facilities, including a gasoline storage tank with a throughput of less than 10,000 gallons per month as confirmed by information provided by the applicant. Thus 40 CFR 63, Subpart CCCCC was determined to be applicable and the requirements of 40 CFR 63.11116 apply to the facility per 40 CFR 63.11111(b).

Compliance Assurance Monitoring (CAM) [40 CFR 64]:

A CAM Plan does not apply to the emission units at National Zoological Park that are covered by the draft Title V permit. The emissions units covered in the permit include primarily boilers, engines, heaters, and emergency generators. These combustion units do not use control devices other than the inherent design of the units. Emissions from these units are products of the combustion of fuel burned and are controlled by proper operation, good combustion, and maintenance practices. Individually, emissions from each of these units will not exceed the major source threshold for air contaminant emissions identified within 40 CFR 64; therefore none of the units meet the criteria for CAM applicability.

Greenhouse Gas (GHG) Requirements:

Because Chapter 3 (Title V) was triggered by other pollutants, no evaluation was made to determine if the facility would trigger Title V applicability under the GHG Tailoring Rule (which has been overturned by the courts in any event). No modifications have been made to the source that would trigger Prevention of Significant Deterioration (PSD) applicability. Other than this requirement, there are no other applicable requirements related to GHGs at this time, therefore none were included in the permit.

20 DCMR Chapter 2 Permits:

AQD is using Chapter 2 authority to update other permit requirements where applicable. As such, this draft Title V permit will be issued for public notice pursuant to both Chapter 2 and



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Chapter 3 public notice requirements. The requirements of the following new permits issued under the authority of 20 DCMR Chapter 2 have been incorporated into the draft Title V permit and updated where appropriate. The following table summarizes the Chapter 2 permits issued since the 2004 permit:

<b>Chapter 2 Permit No.</b>	<b>Equipment Location</b>	<b>Equipment Description</b>	<b>Date Issued</b>
6191-R2	Visitor Center	One (1) 150 kWe generator set with 228 hp natural gas engine (manufactured 2008/installed 2010)	8/11/15
6209-R2	Elephant House	One (1) 230 kWe generator set with 357 hp natural gas engine (manufactured 2008/installed 2012)	10/20/15
6216-R2	Sloth Bear Area	One (1) 85 kWe generator set with 164 hp natural gas engine (manufactured 1998/installed 2006)	8/11/15
6217-R2	Panda	One (1) 200 kWe generator set with 309 hp natural gas engine (manufactured 2004/installed 2004)	9/1/15
6314-R1	Genetics	One (1) 100 kWe generator set with 153 hp natural gas engine (manufactured 2009/installed 2010)	12/3/14
6553-R1	Lion/Tiger House	One (1) 25 kWe generator set with 52 hp propane engine (manufactured 2009/installed 2011)	7/7/15
6592-R1	Cheetah Springs	One (1) 35 kWe generator set with 54 hp natural gas engine (manufactured 2009/installed 2011)	9/1/15
6593-R1	Central Heat Plant	One (1) 130 kWe generator set with 189 hp natural gas engine (manufactured 2009/installed 2011)	9/1/15
6885	General Service Building	One (1) 200 kWe generator set with 302 hp natural gas engine (manufactured 2009/installed 2013)	12/3/14
6982	Greenhouse Area	One (1) 14 kWe generator set with 32 hp natural gas engine (manufactured 2009/installed 2012)	10/13/15
7002	Reptile House	One (1) 180 kWe generator set with 302 hp natural gas engine (manufactured 2009/installed 2012)	8/20/15
7003	Seal/Sea Lion Area	One (1) 200 generator set with 302 hp natural gas engine (manufactured 2009/installed 2010)	8/20/15
Coverage Approval 7043-SC-0015	Think Tank	One (1) 50 kWe Generac generator set with 80 hp natural gas engine (model year 2016/installed 2017)	11/18/16
6978	General Services Building	One (1) Binks water wash paint spray booth	8/11/15
6979	General Services Building	One (1) sawdust collector for woodworking operations	8/11/15

**COMPLIANCE HISTORY:**

The applicant has been subject to no enforcement actions by AQD in the past three (3) years. According to the EPA Enforcement and Compliance History Online (ECHO) database, there was one federal enforcement case issued against the facility during that timeframe for failure to keep gasoline throughput data as required by 40 CFR 63, Subpart CCCCCC. This order was issued on July 22, 2015.

**COMMENT PERIOD:**

Beginning Date: March 17, 2017  
Ending Date: April 17, 2017

All written comments should be addressed to the following individual and office:

Stephen S. Ours, P.E.  
Chief, Permitting Branch  
Department of Energy and Environment  
Air Quality Division  
1200 First Street, NE, 5<sup>th</sup> Floor  
Washington, DC 20002

**PROCEDURE FOR REQUESTING PUBLIC HEARING:**

During the public comment period, any interested person may submit written comments on the draft Title V permit and may request a public hearing, if no public hearing has already been scheduled. A request for public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. The Department shall grant such a request if it is deemed appropriate. The venue, date, and time for any public hearing shall be announced in the D.C. Register and a daily newspaper.

**POINT OF CONTACT FOR INQUIRIES:**

N. Olivia Achuko  
Environmental Engineer  
Department of Energy and Environment  
Air Quality Division  
1200 First Street NE, 5<sup>th</sup> Floor  
Washington, DC 20002  
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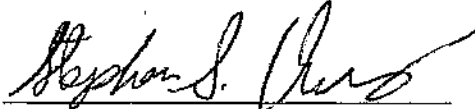
**REVIEWS:**

Prepared by:



N. Olivia Achuko  
Environmental Engineer

Approved by:



Stephen S. Ours, P.E.  
Chief, Permitting Branch

SSO:NOA

