Title V Minor Permit Modification Application

Installation of One (1) New 670 Hp Diesel-Fired Emergency Generator Engine to Replace One (1) Existing 168 Hp Diesel-Fired Emergency Generator Engine at The Dean Smith Center and Other Minor Permit Corrections

The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina

Facility ID: 6800043
Air Permit No.: 03069T35

Prepared For:

The University of North Carolina at Chapel Hill
Department of Environment, Health, and Safety
1120 Estes Drive Extension
Campus Box 1650
Chapel Hill, North Carolina 27599-1650

Prepared By:

ClimeCo Corporation
1 East Philadelphia Avenue
Boyertown, Pennsylvania 19512

May 2019
Contents

1.0 Introduction ............................................................................................................................................ 2

2.0 Rule 15A NCAC 2Q.0515 Minor Permit Modification ............................................................................... 2

2.1 Description of Proposed Changes ........................................................................................................... 3

2.2 Emissions Resulting from the Proposed Changes .................................................................................. 3

2.3 Identification of New Applicable Requirements .................................................................................... 4

2.4 Other Pending Applications Awaiting Group Processing ........................................................................ 4

2.5 Suggested Draft Permit .......................................................................................................................... 5

2.6 Certification That Proposed Modification Meets Rule .0515 Criteria .................................................. 5

2.7 Information for DAQ Notification of EPA and Affected States ............................................................. 6

Certification By Responsible Official ......................................................................................................... 7

3.0 Other Applicable Regulations .............................................................................................................. 8

3.1 CI NSPS Subpart III .................................................................................................................................. 8

3.2 N.C. DAQ Limits .................................................................................................................................... 8

3.3 PSD New Source Review ....................................................................................................................... 9

3.4 Toxic Air Pollutant (TAP) Permitting .................................................................................................... 9

4.0 Other Minor Permit Modifications ....................................................................................................... 9

5.0 Application Elements ............................................................................................................................. 9

Attachment A – Zoning Consistency Determination Request

Attachment B – Air Permit Application Forms

Attachment C – Supporting Emission Rate Calculations
1.0 Introduction

The University of North Carolina at Chapel Hill (the University) operates a 760-acre campus located in Chapel Hill, North Carolina. The University’s principal sources of regulated air pollutant emissions include a Cogeneration Facility on Cameron Avenue near the main campus and a Steam Plant on Manning Drive near the UNC Hospitals complex. These emission sources include large coal, natural gas, wood, and distillate oil-fired boilers and distillate oil-fired generators. In addition to the combustion sources at the Cogeneration Facility and Manning Drive Steam Plant, the University is permitted to operate eighty-four (84) existing emergency generator engines, three (3) diesel-fired fire pumps, and fifteen (15) small hotwater heaters/boilers located across the campus. With the exception of two (2) small natural gas-fired units, all of the permitted emergency generators are diesel-fired units. With this application, the University is proposing to revise the existing Title V air permit through the replacement of one (1) existing 168 Hp (125 kW) diesel-fired emergency generator engine with one (1) new 670 Hp (500 kW) diesel-fired emergency generator engine. The unit to be replaced is identified as ES-Gen-42 located at the Dean Smith Center. The new unit will retain the current air permit identification of ES-Gen-42. In addition to the replacement of the existing emergency generator engine at the Dean Smith Center, the University is requesting minor air permit revisions to remove decommissioned emergency generator engines, remove a decommissioned natural gas-fired hot water heater, and update the installed design capacity of a fire pump engine. These revisions are discussed in detail in Section 4.0 of this application.

2.0 Rule 15A NCAC 2Q .0515 Minor Permit Modification

Pursuant to the University’s March 29, 2019 Air Permitting Applicability request and the North Carolina Department of Air Quality’s (DAQ) April 17, 2019 response, the permitting of the Dean Smith generator engine replacement can be accomplished with a Rule 15A NCAC 2Q .0515 (Rule .0515) minor Title V permit modification. Rule .0515(f) specifies that a permit applicant may make changes proposed in a minor permit modification immediately after filing a completed application with the DAQ.

Under Rule .0515(b), a complete Title V permit application requesting processing as a minor modification must include:

1. An application form(s) including:
   a. a description of the change
   b. the emissions resulting from the change, and
   c. identification of any new applicable requirements that will apply if the change occurs;
2. A list of the facility’s other pending applications awaiting group processing;
3. The applicant’s suggested draft permit;
4. Certification by a responsible official that the proposed modification meets the criteria for using the procedures set out in this Rule and a request that these procedures be used; and
5. Complete information for DAQ to use to notify EPA and affected States.

Each of these items is discussed in the following Sections of this application.

2.1 Description of Proposed Changes

The University is permitted to operate emission source ID No. ES-Gen-42, which is a 168 Hp diesel-fired engine and mated 125 kW electrical generator to provided emergency power support to the Dean Smith Center arena. Due to the need for additional power support at this facility, the University wishes to replace the existing engine and generator with a 670 Hp diesel-fired engine mated to a 500 kW electrical generator. The new engine and generator will remain for emergency standby power support only. Since this is an equipment replacement, the University will retain the emission source identification number ES-Gen-42 for the new emergency engine and generator.

2.2 Emissions Resulting from the Proposed Changes

The criteria pollutant and hazardous/toxic air pollutant (HAP/TAP) emissions from the new 670 Hp (500 kW) emergency generator engine are presented in the calculation attachment included with this application (Attachment C). Emissions of carbon monoxide (CO), particulate matter (PM), and nitrogen oxides (NOx) from the new diesel-fired emergency generator engine have been calculated using EPA’s Tier 3 engine-design emission limits as specified in 40 CFR 60, Subpart III (CI NSPS). The CI NSPS applicable Tier 3 limit for NOx for the new emergency generator engine is presented as a combined limit for NOx and non-methane hydrocarbons (NMHC) at 4.0 g/kW-hr (NOx + NMHC). The potential NOx emissions presented with this application assumes that 88% of the allowed combined NOx + NMHC emission rate (4.0 g/kW-hr) is NOx. The conservative 88% NOx assumption is based on the NOx to NMHC ratio in 40 CFR 89.112, Table 1. Volatile Organic Compound (VOC) emissions are based on 12% of the combined 4.0 g/kW-hr (NOx + NMHC) Tier 3 emission limit. The potential sulfur dioxide (SO2) emissions are based on combustion of diesel fuel with a maximum sulfur content of 15 ppmw, as limited by the CI NSPS beginning on October 1, 2010. Due to this very low sulfur content restriction, SO2 emissions from the new emergency generator will also be very low. Emissions for HAP/TAP pollutants are calculated based on the emission factors presented in DAQ’s emissions spreadsheets for diesel-fired engines.

Potential annual emissions of all criteria and HAP/TAP pollutant emissions from the emergency generator engine have been estimated based on 100% capacity utilization at 500 hours of operation per year (hrs/yr). The 500 hrs/yr maximum potential operating rate is based on EPA guidance for emergency generators and related emergency equipment.
2.3 Identification of New Applicable Requirements

On June 15, 2004, the USEPA promulgated the RICE MACT at 40 CFR Part 63-Subpart ZZZZ. This standard was originally only applicable to engines larger than 500 Hp located at major HAP facilities. However, on January 18, 2008 and March 3, 2010, USEPA promulgated revisions to Subpart ZZZZ to extend the applicability of these standards to all sized units at both major and area (small) sources. Under these standards, new units designated solely for emergency use are excluded from all requirements except an initial notification if greater than 500 Hp. This initial notification must include a certification that the units are emergency use units and the requirement that the units comply with the specifications outlined in (1) 40 CFR Part 60, Subpart III (Cl NSPS) for compression ignition (diesel) engines, or (2) Subpart JJJ (Sl NSPS) for spark ignition engines. As discussed in Section 3.1, the Dean Smith replacement generator engine will be certified to comply with the CI NSPS. Since this engine will be greater than 500 Hp, a RICE MACT initial notification for the new generator will be submitted following start-up of the unit, as required by the MACT general provisions.

The current Dean Smith Center emergency generator is subject to the requirements of 40 CFR Part 63 Subpart ZZZZ (RICE MACT) and defined as Existing Emergency Reciprocating Internal Combustion Engines (RICE) ≤500 Hp since the unit was constructed prior to June 12, 2006. The replacement engine will also be subject to the RICE MACT; however, it will now be defined as New and Reconstructed RICE >500 Hp since it will have been constructed after June 15, 2004. The RICE MACT requirements that will be applicable to the Dean Smith Center replacement as a New, Reconstructed Emergency RICE >500 Hp will not be new to the University’s Title V operating permit as these requirements currently apply to eighteen (18) permitted campus emergency generator engines.

2.4 Other Pending Applications Awaiting Group Processing

The University currently has three (3) other pending active air permit applications:

1. Title V Permit Renewal (App. No. 6800043.15B),
2. 112(j) Limestone Injection/O2 Analyzer Operating Limits for Boiler Nos. 6 and 7 (App. No. 6800043.15A), and

It is the University’s understanding that these applications are being processed as a group separate to this minor modification application.
2.5 Suggested Draft Permit

Since the replacement of the Dean Smith Center emergency generator engine does not result in new permit conditions, the modifications of the current air permit (No. 03069T35) are minor. Based on this Title V Minor Permit Modification Application, the University suggests the following changes to the current Title V permit:

Section 1 – PERMITTED EMISSION SOURCE(S) AND ASSOCIATED AIR POLLUTION CONTROL DEVICE(S) AND APPURTENCES

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Emission Source ID No.</th>
<th>Emission Source Description</th>
<th>Control Device ID No.</th>
<th>Control Device Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.31-38</td>
<td>ES-Gen-42 MACT ZZZZ</td>
<td>Emergency generator (500 kW, diesel-fired) located at the Dean Smith Center</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>


Table 2.1.G3-1: New and Reconstructed Emergency RICE >500 hp

<table>
<thead>
<tr>
<th>ID Number</th>
<th>Source Description</th>
<th>Size of Generator (Maximum Output)</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES-Gen-42</td>
<td>Diesel-fired</td>
<td>500 kW</td>
<td>Dean Smith Center</td>
</tr>
</tbody>
</table>

Eighteen (18) Permitted New Emergency RICE > 500 hp

Table 2.1.G3-4: Existing Emergency RICE ≤500 hp

<table>
<thead>
<tr>
<th>ID Number</th>
<th>Source Description</th>
<th>Size of Generator (Maximum Output)</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES-Gen-42</td>
<td>Diesel-fired</td>
<td>125 kW</td>
<td>Dean Smith Center</td>
</tr>
</tbody>
</table>

Forty-four (44) Permitted Existing Emergency RICE ≤ 500 hp

2.6 Certification That Proposed Modification Meets Rule .0515 Criteria

A signed certification by the Responsible Official that the proposed modification(s) in this application meets the criteria for using the minor modification procedures set out in Rule 15A NCAC 2Q .0515 and a request that these procedures be used is presented on the following page.
2.7 Information for DAQ Notification of EPA and Affected States

It is believed that this permit application provides complete information for DAQ to use to notify EPA and affected States, if necessary. If any additional information is required, the University will provide the additional information requested.
Certification By Responsible Official

Based on the information presented in this permit modification application and the criteria presented in Rule 15A NCAC 2Q .0515, the undersigned certifies that the proposed modifications meet the criteria for using the procedures presented in Rule .0515 for processing of the application as a minor permit modification, and requests that these procedures be used to process this application.

Signature of Responsible Official

(Date)

Name:  Jonathan Pruitt, Vice Chancellor for Finance and Operations

Received
JUN 05 2019
Air Permits Section
3.0 Other Applicable Regulations

This section addresses other regulations applicable to the Dean Smith Center replacement emergency generator engine. As discussed in Section 2.3, there are no new applicable regulations associated with the modification of the University’s current Title V permit for replacement of the Dean Smith Center emergency generator engine.

3.1 Cl NSPS Subpart IIII

On July 11, 2006, the USEPA promulgated the Cl NSPS for compression ignition (diesel-fired) internal combustion engines at 40 CFR Part 60, Subpart IIII. The standard is applicable to new engines manufactured after April 1, 2006 regardless of size and requires the purchase of units certified by the manufacturer to meet model year-specific engine design emission limits. The standard also requires that affected units only burn diesel fuel with a maximum sulfur content of 15 ppmw beginning on October 1, 2010. The new emergency generator to be permitted with this application is subject to the Cl NSPS and will be manufacturer-certified to meet the applicable engine-specific emission limits specified in the standards. The limits applicable to the new 500 kW emergency generator are Tier 3 limits for units 450 ≤ kW to ≤ 560 kW in size. The applicable limits are 4.0 g/kW-hr-NOx + NMHC, 3.5 g/kW-hr-CO, and 0.20 g/kW-hr-PM.

3.2 N.C. DAQ Limits

The new Dean Smith Center emergency generator engine is also subject to the following DAQ emission limits.

- 15A NCAC 2D .0516 – Sulfur Dioxide Emissions from Combustion Sources
- 15A NCAC 2D .0521 – Control of Visible Emissions
- 15A NCAC 2D .0501(e) – Compliance with Emission Control Standards

Rule 15A NCAC 2D .0501(e) is a multiple-source emission limit that requires that all sources on the University’s campus and at the Cogeneration Facility be operated and controlled in a manner that will not cause an exceedance of the National Ambient Air Quality Standards (NAAQS). Under this rule, the DAQ has discretionary authority to require a dispersion modeling analysis of emissions from all sources at the University, all other offsite sources in the significant impact area of the University’s sources, and existing background concentrations to demonstrate compliance with the NAAQS. Because of the significant SO2 and NOx emissions from the Cogeneration Facility, prior applications to install or replace emergency generators included a NAAQS air dispersion modeling analysis. Based on a May 7, 2019 telephone discussion with the DAQ, the University will be submitting a separate, updated NAAQS air dispersion modeling analysis to support processing of air permit applications 6800043.15A, 6800043.15B, and 6800043.18A. Therefore, an air dispersion modeling analysis is not an element of this Title V Minor Modification Application.
3.3 PSD New Source Review

Because of the large boilers at the University’s Cogeneration Facility, the University is an existing major source for NOx and SO2. However, maximum potential NOx and SO2 emissions for the new Dean Smith Center emergency generator engine presented with this application do not exceed the major modification thresholds for NOx and SO2 subject to PSD new source review (NSR) permitting requirements. Additionally, the University is excluded from mandatory federal PSD modeling requirements as a “not for profit educational institution” under 40 CFR section 52.21(i)(1)(vi).

3.4 Toxic Air Pollutant (TAP) Permitting

Under 15A NCAC 2Q .0702(a)(27)(B), sources subject to a MACT regulation under 40 CFR Part 63 are excluded from the requirements to obtain a permit to emit TAPs. As noted above, the new Dean Smith Center emergency generator engine is subject to the RICE MACT at 40 CFR Part 63-Subpart ZZZZ and is excluded from TAP permitting requirements. The University understands that the DAQ may choose to perform air dispersion modeling of TAP emissions from permitted stationary sources.

4.0 Other Minor Permit Modifications

With this application, the University is requesting the following minor changes to the current Title V air permit:

1. Davis Library Fire Water Pump (ES-FP-3) – The Davis Library fire water pump engine was permitted with a 225 Hp design maximum output. The engine has been purchased and installed with an actual design maximum output of 123 Hp.
2. Henry Stadium water heaters (IES-SB-9 and IES-SB-10) – These insignificant natural-gas fired water heaters have been decommissioned and removed.
3. Kenan Chemistry Lab emergency generator (ES-Gen-29) – This diesel-fired 45 kW emergency engine and generator have been decommissioned and removed.
4. MacNider Hall emergency generator (ES-Gen-32) - This diesel-fired 100 kW emergency engine and generator have been decommissioned and removed.

5.0 Application Elements

In summary, this Title V Minor Permit Modification Application to replace the Dean Smith Center emergency generator contains the following elements:

- A $970 check for application processing
- Attachment A – Zoning Consistency Determination Request
- Attachment B – Air Permit Application Forms
- Attachment C – Supporting Emission Rate Calculations
ATTACHMENT A
Zoning Consistency Determination Request

Title V Minor Permit Modification
University of North Carolina at Chapel Hill
Chapel Hill, NC
May 28, 2019

Ben Hitchings
Director of Planning
Town of Chapel Hill, Planning Department
405 Martin Luther King, Jr. Blvd.
Chapel Hill, North Carolina 27514

Reference: Local Zoning Consistency Determination
One New Diesel-fired Emergency Generator Replacement
The University of North Carolina at Chapel Hill

Dear Mr. Hitchings:

The University of North Carolina at Chapel Hill (University) has prepared an air permit modification application for submittal to the N.C. Division of Air Quality for the installation of a new 500 kW diesel-fired emergency generator to replace an existing smaller diesel-fired emergency generator. Pursuant to the North Carolina General Statutes section 143-215.108 (d) and (f), an applicant for an air permit for a new or expanding facility must request the local government to issue a determination of local zoning consistency.

The University respectfully requests that the Town of Chapel Hill Planning Department issue a determination regarding whether the local government has in effect a zoning ordinance applicable to the proposed replacement emergency generator and whether installation of the proposed replacement emergency generator would be consistent with the ordinance. A copy of the air permit modification application for the replacement emergency generator is attached for your review. For your convenience, we have attached a suggested letter to the Division of Air Quality for your use in responding to this request.

Please respond to this request in writing to the following:

Mark Cuilla
North Carolina Department of Environment Quality
Division of Air Quality; Permits Branch
1641 Mail Service Center
Raleigh, North Carolina 27699-1641

Please also send a copy of your response to my attention.

If you have any questions or comments, please call me at 919.962.6666 or our consultant, Gary Yoder of ClimeCo Corporation at 919.301.0419. Thank you for your assistance with this matter.

Sincerely,

J. Laurence Daw, L.G.
Environmental Compliance Officer

Attachment

Cc: Nathan Harms
SUGGESTED LETTER TO NC DAQ

Town of Chapel Hill Planning Department Letterhead

(Date)

Mr. Mark Cuilla
North Carolina Department of Environmental Quality
Division of Air Quality – Permits Branch
1641 Mail Service Center
Raleigh, North Carolina 27699-1641

Reference:  Local Zoning Consistency Determination
One New Diesel-Fired Emergency Generator Replacement
The University of North Carolina at Chapel Hill

Dear Mr. Cuilla:

The University of North Carolina at Chapel Hill has provided this office a copy of an air permit
modification application for the installation of a new diesel-fired emergency generator to
replace an existing smaller diesel-fired emergency generator on their campus. A zoning
consistency determination for the replacement generator has been requested, in accordance with
North Carolina General Statute 143-215.180 (d) and (f). The proposed replacement generator is
located within the Town of Chapel Hill’s zoning jurisdiction. We have reviewed the permit
application and have determined that installation of the replacement generator is consistent with
all applicable zoning ordinances within the Town of Chapel Hill’s jurisdiction.

I therefore declare this replacement generator project to be consistent with all Town of Chapel
Hill zoning requirements.

Sincerely,

Ben Hitchings, FAICP, CZO
Director of Planning & Development Services
ATTACHMENT B
Air Permit Application Forms

*Title V Minor Permit Modification*
University of North Carolina at Chapel Hill
Chapel Hill, NC
**FORM A1**

**FACILITY (General Information)**

**NOTE: APPLICATION WILL NOT BE PROCESSED WITHOUT THE FOLLOWING:**

- Local Zoning Consistency Determination (if required)
- Facility Reduction & Recycling Survey Form (if Form A4)
- Responsible Official/Authorized Contact Signature
- Appropriate Number of Copies of Application
- Seal (if required)

**GENERAL INFORMATION**

**Legal Corporate/Owner Name:** The University of North Carolina at Chapel Hill

**Site Name:** The University of North Carolina at Chapel Hill

**Site Address (911 Address) Line 1:** 200 E. Cameron Avenue, CB# 1000

**City:** Chapel Hill  
**State:** North Carolina  
**Zip Code:** 27599-1000  
**County:** Orange

**CONTACT INFORMATION**

**Permit/Technical Contact:**

Name/Title: J. Laurence Daw/Environmental Compliance Officer  
Mailing Address Line 1: The University of North Carolina at Chapel Hill  
Mailing Address Line 2: 1120 Estes Drive Extension, CB#1650  
City: Chapel Hill  
State: North Carolina  
Zip Code: 27599-1650  
Phone No. (919) 962-6666  
Fax No. (919) 962-0227  
Email Address: jdaw@ehs.unc.edu

**Facility/Inspection Contact:**

Name/Title: J. Laurence Daw/Environmental Compliance Officer  
Mailing Address Line 1: The University of North Carolina at Chapel Hill  
Mailing Address Line 2: 1120 Estes Drive Extension, CB#1650  
City: Chapel Hill  
State: North Carolina  
Zip Code: 27599-1650  
Phone No. (919) 962-6666  
Fax No. (919) 962-0227  
Email Address: jdaw@ehs.unc.edu

**Responsible Official/Authorized Contact:**

Name/Title: Jonathan Pruitt/Deputy Chancellor for Finance & Operations  
Mailing Address Line 1: The University of North Carolina at Chapel Hill  
Mailing Address Line 2: 200 E. Cameron Avenue, CB# 1000  
City: Chapel Hill  
State: North Carolina  
Zip Code: 27599-1000  
Phone No. (919) 962-3795  
Fax No. (919) 962-0647  
Email Address: jpruitt@unc.edu

**APPLICATION IS BEING MADE FOR**

- New Non-permitted Facility/Greenfield
- Modification of Facility (permitted)
- Renewal with Modification
- Renewal (TV Only)
- Other

**FACILITY CLASSIFICATION AFTER APPLICATION (Check Only One)**

- General
- Small
- Prohibitory Small
- Synthetic Minor
- Title V

**FACILITY (Plant Site) INFORMATION**

**Educational Institution**

Primary SIC/NACICS Code: 8221/611310  
Current/Previous Air Permit No.: 03069T35  
Expiration Date: 3/31/21

**Facility Coordinates:** Latitude: 35.907072°  
Longitude: -79.062222°  
(Co-generation Facility)

Does this application contain confidential data?  
- YES  
- NO

**PERSON OR FIRM THAT PREPARED APPLICATION**

**Person Name:** Gary T. Yoder  
**Firm Name:** ClimeCo Corporation

**Mailing Address Line 1:** 1 E. Philadelphia Ave.  
**Mailing Address Line 2:**

**City:** Boyertown  
**State:** Pennsylvania  
**Zip Code:** 19512  
**County:** Berks

**Phone No.** (419) 301-0419  
**Fax No.** (419) 363-4022  
**Email Address:** gyoder@climeco.com

**SIGNATURE OF RESPONSIBLE OFFICIAL/AUTHORIZED CONTACT**

Name (Typed): Jonathan Pruitt  
Title: Vice Chancellor for Finance and Operations  
Signature/Blue Ink: 

**Date:** 5/1/19

Attach Additional Sheets As Necessary

**JUN 05 2019**

Air Permits Section
MINOR MODIFICATION QUALIFICATION CHECKLIST

☐ This change does not violate any existing requirement in the current Title V air quality permit.
☐ This change does not result in a significant change in existing monitoring, reporting or recordkeeping provisions in my current permit.
☐ This change does not require a case-by-case determination (e.g. BACT)
☐ This change is not a modification under Title I of the federal Clean Air Act.
☐ This change is not a significant modification. (See 15A NCAC 2Q .0515)
☐ This change does not require a change to an existing permit term that was taken to avoid an applicable requirement. (e.g. PSD avoidance condition)
☐ This change does not require a permit under the NC Toxics program.

MINOR MODIFICATION DESCRIPTION

Provide Description of Modification (e.g. Adding emergency generator) The proposed modification is to replace the existing 125 kW diesel-fired emergency generator at the Dean Smith Center with a 500 kW diesel-fired generator. The replacement generator will also provide emergency, standby electrical power support to the Dean Smith Center arena.

APPLICABLE REGULATIONS TO THE PROPOSED MODIFICATION (attach additional sheets if necessary)

|-----------------|-------|---------------------|------------------------|--------------------------------------------------|

ATTACH A COPY OF THE PROPOSED PERMIT CONDITIONS FOR EACH REQUIREMENT THAT APPLIES TO THE PERMIT MODIFICATION.

SPECIFIC PERMIT TERMS AND PROVISIONS AFFECTED BY THIS MODIFICATION (attach additional sheets if necessary)

<table>
<thead>
<tr>
<th>Source &amp; ID No.</th>
<th>Permit Condition</th>
<th>Specify Provisions Which No Longer Apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES-Gen-42</td>
<td>N/A</td>
<td>There are no provisions which no longer apply with this modification</td>
</tr>
</tbody>
</table>

Upon receipt of the completeness determination letter, you may make the modification in accordance with 15A NCAC 2Q .0515(t). A determination of application completeness by the DAQ is not a determination that each change qualifies as a minor permit modification. It is the responsibility of the applicant to ensure each proposed change meets the criteria of 15A NCAC 2Q .0515. The applicant assumes all financial risks associated with construction and operation without a permit revision. You shall comply with all the applicable requirements governing the change and the proposed permit conditions until final action is taken on the permit application. You need not comply with the existing permit terms and conditions you seek to modify. However, if you fail to comply with the proposed monitoring, the Director may enforce the terms and conditions of the existing permit that you seek to modify. You must certify compliance with the proposed permit terms on the annual compliance certification. The permit shield in 15A NCAC 2Q .0512(d) does not extend to this modification.
15A NCAC 02Q .0515 Minor Permit Modifications

15A NCAC 02Q .0515(b)(3) Applicant's Suggested Draft Permit

The suggested permit changes are minor with this permit modification and are presented in Section 2.5 of the introductory narrative of this application.
### Equipment To Be ADDED By This Application (New, Previously Unpermitted, or Replacement)

<table>
<thead>
<tr>
<th>Description</th>
<th>ID No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES-Gen-42 500 kW diesel-fired emergency generator</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>(New diesel-fired emergency generator to replace existing smaller diesel-fired emergency generator)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Existing Permitted Equipment To Be MODIFIED By This Application

<table>
<thead>
<tr>
<th>Description</th>
<th>ID No.</th>
<th>Description</th>
</tr>
</thead>
</table>

### Equipment To Be DELETED By This Application

<table>
<thead>
<tr>
<th>Description</th>
<th>ID No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES-Gen-42 125 kW diesel-fired emergency generator</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>(Existing diesel-fired emergency generator to be replaced by larger diesel-fired emergency generator)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ES-Gen-39 45 kW diesel-fired emergency generator</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>(Kenan Chemistry Lab emergency generator decommissioned)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ES-Gen-32 100 kW diesel-fired emergency generator</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>(MacNider Hall emergency generator decommissioned)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IES-SB-9 0.5 MMBtu/hr natural gas-fired water heater; Henry Stadium</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>IES-SB-10 0.75 MMBtu/hr natural gas-fired water heater; Henry Stadium</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

### 112(r) APPLICABILITY INFORMATION

**Is your facility subject to 40 CFR Part 88 "Prevention of Accidental Releases" - Section 112(r) of the Federal Clean Air Act?**

Yes / No

**If No, please specify in detail how your facility avoided applicability:**

No 112(r) hazardous or flammable materials stored in quantities above applicable thresholds.

**If your facility is Subject to 112(r), please complete the following:**

A. Have you already submitted a Risk Management Plan (RMP) to EPA Pursuant to 40 CFR Part 88.10 or Part 88.150?

Yes / No

Specify required RMP submittal date: __________

If submitted, RMP submittal date: __________

B. Are you using administrative controls to subject your facility to a lesser 112(r) program standard?

Yes / No

If yes, please specify:

### SURVEY OF FACILITY REDUCTION & RECYCLING ACTIVITIES

**Facility Name:** The University of North Carolina at Chapel Hill

**Mailing Address Line 1:** 1120 Estes Drive Extension, CB# 1650

**City:** Chapel Hill  **State:** North Carolina  **Zip Code:** 27599  **County:** Orange

**Phone No.** (919) 962-6666  **Fax No.** (919) 962-0227  **Email Address:** jdadw@ehs.unc.edu

**Pollutant**  
- Ongoing Source Reduction Activities (Enter Code)  
- Qty. Emitted Before Reduction (Ib/yr)  
- Qty. Emitted After Reduction (Ib/yr)  
- Planned Source Reduction Activities (Enter Code)

No facility reduction or recycling activities implemented with this permit application.

For assistance with Section A4, please contact the North Carolina Division of Pollution Prevention and Environmental Assistance at 1-800-763-6136 or nowaste@p2pays.org

Attach Additional Sheets As Necessary
FORM B
SPECIFIC EMISSIONS SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

EMISSION SOURCE DESCRIPTION: 500 kW diesel-fired emergency generator
OPERATING SCENARIO 1 OF 1

DESCRIBE IN DETAIL THE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
New 500 kW diesel-fired emergency engine to replace an existing 125 kW diesel-fired emergency generator at the Dean Smith Center.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):
- Coal, wood, oil, gas, other burner (Form B1)
- Woodworking (Form B4)
- Int. combustion engine/generator (Form B2)
- Liquid storage tanks (Form B3)
- Roofed/dismissed printing (Form B5)
- Incineration (Form B8)
- Other (Form B9)

START CONSTRUCTION DATE: TBD  OPERATION DATE: TBD  DATE MANUFACTURED: Tier 3 - After 2006

MANUFACTURER / MODEL NO.: TBD
EXPECTED OPER. SCHEDULE: NA

IS THIS SOURCE SUBJECT TO? NSPS (SUBPART)? Yes - Subpart III
NESHAP (SUBPART)? Yes - Subpart 2222

EXPECTED ANNUAL THROUGHPUT (%): DEC-FEB 25  MAR-MAY 25  JUN-AUG 25  SEP-NOV 25

EXPECTED ANNUAL HOURS OF OPERATION <500

VISIBLE STACK EMISSIONS UNDER NORMAL OPERATION: <10 % OPAQ

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

<table>
<thead>
<tr>
<th>AIR POLLUTANT EMITTED</th>
<th>SOURCE OF EMISSION</th>
<th>FACTOR</th>
<th>EXPECTED ACTUAL (AFTER CONTROLS LIMITS)</th>
<th>POTENTIAL EMISSIONS (AFTER CONTROLS LIMITS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>lb/hr / tons/yr</td>
<td>lb/hr / tons/yr</td>
</tr>
<tr>
<td>PARTICULATE MATTER (PM)</td>
<td>Tier 3</td>
<td>0.22</td>
<td>0.028</td>
<td>0.22</td>
</tr>
<tr>
<td>PARTICULATE MATTER&gt;10 MICRONS (PM10)</td>
<td>Tier 3</td>
<td>0.22</td>
<td>0.028</td>
<td>0.22</td>
</tr>
<tr>
<td>PARTICULATE MATTER&gt;2.5 MICRONS (PM2.5)</td>
<td>Tier 3</td>
<td>0.22</td>
<td>0.028</td>
<td>0.22</td>
</tr>
<tr>
<td>SULFUR DIOXIDE (SO2)</td>
<td>Calculated</td>
<td>0.008</td>
<td>0.0010</td>
<td>0.008</td>
</tr>
<tr>
<td>NITROGEN OXIDES (NOx)</td>
<td>Tier 3</td>
<td>3.88</td>
<td>0.48</td>
<td>3.88</td>
</tr>
<tr>
<td>CARBON MONOXIDE (CO)</td>
<td>Tier 3</td>
<td>3.86</td>
<td>0.48</td>
<td>3.86</td>
</tr>
<tr>
<td>VOLATILE ORGANIC COMPOUNDS (VOC)</td>
<td>Tier 3</td>
<td>0.53</td>
<td>0.07</td>
<td>0.53</td>
</tr>
<tr>
<td>LEAD</td>
<td></td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

<table>
<thead>
<tr>
<th>HAZARDOUS AIR POLLUTANT AND CAS NO.</th>
<th>SOURCE OF EMISSION</th>
<th>FACTOR</th>
<th>EXPECTED ACTUAL (AFTER CONTROLS LIMITS)</th>
<th>POTENTIAL EMISSIONS (AFTER CONTROLS LIMITS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaldehyde</td>
<td>DAQ</td>
<td>1.18E-04</td>
<td>1.48E-05</td>
<td>1.18E-04</td>
</tr>
<tr>
<td>Acrolein</td>
<td>DAQ</td>
<td>3.70E-05</td>
<td>4.26E-05</td>
<td>3.70E-05</td>
</tr>
<tr>
<td>Benzene</td>
<td>DAQ</td>
<td>3.64E-05</td>
<td>5.19E-05</td>
<td>3.64E-05</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>DAQ</td>
<td>1.21E-04</td>
<td>1.05E-04</td>
<td>1.21E-04</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>DAQ</td>
<td>3.70E-05</td>
<td>4.63E-05</td>
<td>3.70E-05</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>DAQ</td>
<td>6.06E-05</td>
<td>7.30E-05</td>
<td>6.06E-05</td>
</tr>
<tr>
<td>Toluene</td>
<td>DAQ</td>
<td>1.32E-04</td>
<td>1.65E-04</td>
<td>1.32E-04</td>
</tr>
<tr>
<td>Xylene</td>
<td>DAQ</td>
<td>9.05E-04</td>
<td>1.13E-04</td>
<td>9.05E-04</td>
</tr>
</tbody>
</table>

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

<table>
<thead>
<tr>
<th>TOXIC AIR POLLUTANT AND CAS NO.</th>
<th>EF SOURCE</th>
<th>lb/hr</th>
<th>lb/day</th>
<th>lb/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaldehyde</td>
<td>DAQ</td>
<td>1.18E-04</td>
<td>2.83E-03</td>
<td>5.90E-02</td>
</tr>
<tr>
<td>Acrolein</td>
<td>DAQ</td>
<td>3.70E-05</td>
<td>8.68E-04</td>
<td>1.85E-02</td>
</tr>
<tr>
<td>Benzene</td>
<td>DAQ</td>
<td>3.64E-05</td>
<td>8.74E-02</td>
<td>1.85E+00</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>DAQ</td>
<td>1.21E-04</td>
<td>2.90E-05</td>
<td>6.03E-04</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>DAQ</td>
<td>3.70E-04</td>
<td>8.88E-03</td>
<td>1.85E-01</td>
</tr>
<tr>
<td>Toluene</td>
<td>DAQ</td>
<td>1.32E-03</td>
<td>3.17E-02</td>
<td>6.05E-01</td>
</tr>
<tr>
<td>Xylene</td>
<td>DAQ</td>
<td>9.05E-04</td>
<td>2.17E-02</td>
<td>4.53E-01</td>
</tr>
</tbody>
</table>

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g., hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) do not include this form.

COMPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOURCE

Attach Additional Sheets As Necessary
FORM B2
EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/GENERATORS)

EMISSION SOURCE ID NO: ES-Gen-42
CONTROL DEVICE ID NO(S): NA
EMISSION POINT (STACK) ID NO(S): EP-Gen-42

EMISSION SOURCE DESCRIPTION:
500 kW diesel-fired emergency generator

OPERATING SCENARIO:
1 OF 1

CHECK ALL THAT APPLY
☐ EMERGENCY
☐ SPACE HEAT
☐ ELECTRICAL GENERATION

GENERATOR OUTPUT (KW):
500

ANTICIPATED ACTUAL HOURS OF OPERATION AS PEAK SHAVER (HRS/YR): NA

ENGINE OUTPUT (HP):
671

TYPE ICE:
☐ GASOLINE ENGINE
☐ DIESEL ENGINE UP TO 600 HP
☐ DIESEL ENGINE GREATER THAN 600 HP
☐ DUAL FUEL ENGINE

ENGINE TYPE:
☐ RICH BURN
☐ LEAN BURN
☐ NA

EMISSION REDUCTION MODIFICATIONS:
INJECTION TIMING RETARD
PREIGNITION CHAMBER COMBUSTION
OTHER (DESCRIBE):

FUEL USAGE (INCLUDE STARTUP/BACKUP FUEL):

FUEL TYPE | UNITS | MAXIMUM DESIGN CAPACITY (UNIT/HR) | REQUESTED CAPACITY LIMITATION (UNIT/HR)
---|---|---|---
Diesel Fuel | gal/hr | 40.0 | None

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE):

FUEL TYPE | BTU/UNIT | UNITS | SULFUR CONTENT (% BY WEIGHT)
---|---|---|---
Diesel Fuel | 130,000 | BTU/gal | Max. <0.0015%

(15 ppm per NSPS Subpart III)

MANUFACTURER'S SPECIFIC EMISSION FACTORS (IF AVAILABLE):

<table>
<thead>
<tr>
<th>POLLUTANT</th>
<th>NOx</th>
<th>CO</th>
<th>PM</th>
<th>PM2.5</th>
<th>VOC</th>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMISSION FACTOR LB/UNIT</td>
<td>lb/HP-hr</td>
<td>lb/HP-hr</td>
<td>lb/HP-hr</td>
<td>lb/HP-hr</td>
<td>lb/HP-hr</td>
<td></td>
</tr>
<tr>
<td>UNIT</td>
<td>0.00579</td>
<td>0.00575</td>
<td>0.000329</td>
<td>0.000329</td>
<td>0.000789</td>
<td>NA</td>
</tr>
</tbody>
</table>

DESCRIBE METHODS TO MINIMIZE VISIBLE EMISSIONS DURING IDLING, OR LOW LOAD OPERATIONS:

None - Unit will not normally be operated in idle or low load conditions.

COMMENTS:

Unit certified to meet Tier 3 and 40 CFR 60.4202(a)(2) emission limits.

Attach Additional Sheets As Necessary
Diesel-Fired Emergency Engine

Flow Diagram
**FORM E3**  
**EMISSION SOURCE COMPLIANCE METHOD**  
**NCDENR/Division Of Air Quality - Application for Air Permit to Construct/Operate**  
**E3**

<table>
<thead>
<tr>
<th>Emission Source ID NO.</th>
<th>ES-Gen-42</th>
<th>Regulated Pollutant</th>
<th>SO₂</th>
<th>Applicable Regulation</th>
<th>NSPS - Subpart III</th>
</tr>
</thead>
</table>

**Alternative Operating Scenario (AOS) NO:**  
Primary - Diesel Fuel

**ATTACH A SEPARATE PAGE TO EXPAND ON ANY OF THE BELOW COMMENTS**

### MONITORING REQUIREMENTS

<table>
<thead>
<tr>
<th>Is Compliance Assurance Monitoring (CAM) 40 CFR Part 64 Applicable?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>If yes, is CAM Plan Attached (if applicable, CAM plan must be attached)?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Describe Monitoring Device Type:</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Describe Monitoring Location:</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Other Monitoring Methods (Describe In Detail):</td>
<td>Fuel Supplier Fuel Sulfur Content Certifications (Max. 15 ppm October 2010)</td>
<td></td>
</tr>
</tbody>
</table>

Describe the frequency and duration of monitoring and how the data will be recorded (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average):

**Sulfur Content Certification with Every Fuel Oil Shipment**

### RECORDKEEPING REQUIREMENTS

<table>
<thead>
<tr>
<th>Data (Parameter) being recording:</th>
<th>Maximum Fuel Sulfur Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of recordkeeping (How often is data recorded?):</td>
<td>Sulfur content recorded for each shipment</td>
</tr>
</tbody>
</table>

### REPORTING REQUIREMENTS

<table>
<thead>
<tr>
<th>Generally describe what is being reported:</th>
<th>SO₂ annual emissions from each generator/fire pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency:</td>
<td><em>MONTHLY</em></td>
</tr>
<tr>
<td></td>
<td>X OTHER (DESCRIBE):</td>
</tr>
</tbody>
</table>

### TESTING

<table>
<thead>
<tr>
<th>Specify proposed reference test method:</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specify reference test method rule and citation:</td>
<td>NA</td>
</tr>
<tr>
<td>Specify testing frequency:</td>
<td>NA</td>
</tr>
</tbody>
</table>

**NOTE - Proposed test method subject to approval and possible change during the test protocol process**

Attach Additional Sheets As Necessary
**FORM E3**

**EMISSION SOURCE COMPLIANCE METHOD**

REVISED 12/01/01

NCDENR/Division Of Air Quality - Application for Air Permit to Construct/Operate

<table>
<thead>
<tr>
<th>Emission Source ID NO.</th>
<th>Regulated Pollutant</th>
<th>Applicable Regulation</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES-Gen-42</td>
<td></td>
<td></td>
<td>CI NSPS - Subpart III</td>
</tr>
</tbody>
</table>

**Alternative Operating Scenario (AOS) NO:** Primary - Diesel Fuel

**ATTACH A SEPARATE PAGE TO EXPAND ON ANY OF THE BELOW COMMENTS**

### MONITORING REQUIREMENTS

Is Compliance Assurance Monitoring (CAM) 40 CFR Part 64 Applicable?  
Yes  
No  

If yes, is CAM Plan Attached (if applicable, CAM plan must be attached)?  
NA Yes  
NA No  

Describe Monitoring Device Type:  
NA

Describe Monitoring Location:  
NA

Other Monitoring Methods (Describe in Detail):  
Certified by manufacturer to comply with 40 CFR 89.112
(EPA-Tier 3) or CI NSPS Subpart III

Describe the frequency and duration of monitoring and how the data will be recorded (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average):  
CI NSPS [§60.4202 (a)(2)]. Manufacturer specification sheet certifying compliance with EPA-Tier 3 for model year beginning in 2007.

| EPA Tier 3               |  
|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                         | 4.0 g/kW-hr, NMOC+NOx  | 3.5 g/kW-hr, CO         | 0.2 g/kW-hr, PM         |

### RECORDKEEPING REQUIREMENTS

Data (Parameter) being recording:  
Manufacturer Certification

Frequency of recordkeeping (How often is data recorded?):  
NA

### REPORTING REQUIREMENTS

Generally describe what is being reported:  
NA

Frequency:  
MONTHLY  
QUARTERLY  
EVERY 6 MONTHS  
X OTHER (DESCRIBE):  As requested by N.C. DAQ

### TESTING

Specify proposed reference test method:  
NA

Specify reference test method rule and citation:  
40 CFR 60, Subpart III

Specify testing frequency:  
As requested by N.C. DAQ

**NOTE** - Proposed test method subject to approval and possible change during the test protocol process

Attach Additional Sheets As Necessary
## FORM E3

**EMISSION SOURCE COMPLIANCE METHOD**

**REVISED 12/01/01**

NCDENR/Division Of Air Quality - Application for Air Permit to Construct/Operate

### Emission Source ID NO.** ES-Gen-42**

**Regulated Pollutant**

**HAPs**

**Applicable Regulation**

**MACT - Subpart ZZZZ**

**Alternative Operating Scenario (AOS) NO.** Primary - Diesel Fuel

**ATTACH A SEPARATE PAGE TO EXPAND ON ANY OF THE BELOW COMMENTS**

### MONITORING REQUIREMENTS

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is Compliance Assurance Monitoring (CAM) 40 CFR Part 64 Applicable?</td>
<td>___</td>
<td>X</td>
</tr>
<tr>
<td>If yes, is CAM Plan Attached (if applicable, CAM plan must be attached)?</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Describe Monitoring Device Type:</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Describe Monitoring Location:</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Other Monitoring Methods (Describe In Detail):</td>
<td>Initial notification certifying emergency use only</td>
<td></td>
</tr>
</tbody>
</table>

Describe the frequency and duration of monitoring and how the data will be recorded (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average):

- **Initial notification certifying emergency use only maintained in files**
- **Compliance with CI NSPS Subpart III or Tier 3** *(see previous sheets)*

### RECORDKEEPING REQUIREMENTS

**Data (Parameter) being recording:** Initial Notification

**Frequency of recordkeeping (How often is data recorded?):** NA

### REPORTING REQUIREMENTS

**Generally describe what is being reported:** NA

**Frequency:**

- ___ MONTHLY
- ___ QUARTERLY
- ___ EVERY 6 MONTHS
- X OTHER (DESCRIBE): As requested by N.C. DAQ

### TESTING

**Specify proposed reference test method:** NA

**Specify reference test method rule and citation:** 40 CFR 63, Subpart ZZZZ

**Specify testing frequency:** As requested by N.C. DAQ

**NOTE - Proposed test method subject to approval and possible change during the test protocol process**

*Attach Additional Sheets As Necessary*
**FORM E3**

**EMISSION SOURCE COMPLIANCE METHOD**

<table>
<thead>
<tr>
<th>Emission Source ID NO.</th>
<th>Regulated Pollutant</th>
<th>Opacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES-Gen-42</td>
<td></td>
<td>NCAC 2D.0521</td>
</tr>
</tbody>
</table>

**Alternative Operating Scenario (AOS) NO:** Primary - Diesel Fuel

**ATTACH A SEPARATE PAGE TO EXPAND ON ANY OF THE BELOW COMMENTS**

### MONITORING REQUIREMENTS

- Is Compliance Assurance Monitoring (CAM) 40 CFR Part 64 Applicable? [ ] Yes [X] No
- If yes, is CAM Plan Attached (if applicable, CAM plan must be attached)? [ ] Yes [X] No
- Describe Monitoring Device Type: NA
- Describe Monitoring Location: NA
- Other Monitoring Methods (Describe In Detail): Certified Method 9 Visible Emissions Test

Describe the frequency and duration of monitoring and how the data will be recorded (i.e., every 15 minutes, 1 minute instantaneous readings taken to produce an hourly average):

As requested by N.C. DAQ

### RECORDKEEPING REQUIREMENTS

- Data (Parameter) being recording: Six Minute Average Opacity
- Frequency of recordkeeping (How often is data recorded?): Records maintained for any M-9 Test requested by N.C. DAQ

### REPORTING REQUIREMENTS

- Generally describe what is being reported: Method 9 Test results, if requested by N.C. DAQ.

**Frequency:**

- [X] OTHER (DESCRIBE): As requested by N.C. DAQ

### TESTING

- Specify proposed reference test method: Method 9 Visible Emissions Test
- Specify reference test method rule and citation: 40 CFR 60, Appendix A
- Specify testing frequency: As requested by N.C. DAQ

**NOTE** - Proposed test method subject to approval and possible change during the test protocol process

Attach Additional Sheets As Necessary
Facility-wide Forms
### Facility-Wide Emissions Summary

**Criteria Air Pollutant Emissions Information - Facility-Wide**

<table>
<thead>
<tr>
<th>Air Pollutant Emitted</th>
<th>Expected Actual Emissions (After Controls / Limitations)</th>
<th>Potential Emissions (Before Controls / Limitations)</th>
<th>Potential Emissions (After Controls / Limitations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particulate Matter (PM)</td>
<td>12.50 tons/yr</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Particulate Matter &lt; 10 Microns (PM_{10})</td>
<td>12.50 tons/yr</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Particulate Matter &lt; 2.5 Microns (PM_{2.5})</td>
<td>9.00 tons/yr</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sulfur Dioxide (SO2)</td>
<td>291.10 tons/yr</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nitrogen Oxides (NOx)</td>
<td>294.60 tons/yr</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Carbon Monoxide (CO)</td>
<td>60.50 tons/yr</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Volatile Organic Compounds (VOC)</td>
<td>2.70 tons/yr</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Other**

- Actual Emissions from 2017 Annual Emissions Inventory

**Toxic Air Pollutant Emissions Information - Facility-Wide**

<table>
<thead>
<tr>
<th>Toxic Air Pollutant Emitted</th>
<th>CAS No.</th>
<th>Ib/hr</th>
<th>Ib/day</th>
<th>Ib/year</th>
<th>Modeling Required?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Extensive list of pollutants, see 2017 Annual Emissions Inventory for all actual TAP emissions)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

Attach Additional Sheets As Necessary
FORM E1
TITLE V GENERAL INFORMATION

Division of Air Quality - Application for Air Permit to Construct/Operate

REVISED: 12/01/01

IF YOUR FACILITY IS CLASSIFIED AS "MAJOR" FOR TITLE V YOU MUST COMPLETE THIS FORM AND ALL OTHER REQUIRED "E" FORMS (E2 THROUGH E5 AS APPLICABLE)

Indicate here if your facility is subject to Title V by: X Emissions X Other

If subject to Title V by other, check or specify: X NSPS X NESHAPS (MACT) NA TITLE IV

Other, specify:

If you are or will be subject to any maximum achievable control technology standards (MACT) issued pursuant to section 112(d) of the Clean Air Act, specify below:

<table>
<thead>
<tr>
<th>EMISSION SOURCE ID</th>
<th>DESCRIPTION</th>
<th>MACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES-001</td>
<td>323.17 MMBtu/hr boiler</td>
<td>40 CFR 63 - Subpart DDDDD - Boiler MACT</td>
</tr>
<tr>
<td>ES-002</td>
<td>323.17 MMBtu/hr boiler</td>
<td>40 CFR 63 - Subpart DDDDD - Boiler MACT</td>
</tr>
<tr>
<td>ES-003</td>
<td>338.0 MMBtu/hr boiler</td>
<td>40 CFR 63 - Subpart DDDDD - Boiler MACT</td>
</tr>
<tr>
<td>ES-004</td>
<td>249.0 MMBtu/hr boiler</td>
<td>40 CFR 63 - Subpart DDDDD - Boiler MACT</td>
</tr>
<tr>
<td>ES-005</td>
<td>249.0 MMBtu/hr boiler</td>
<td>40 CFR 63 - Subpart DDDDD - Boiler MACT</td>
</tr>
<tr>
<td>ES-SB-6</td>
<td>2.52 MMBtu/hr Boiler</td>
<td>40 CFR 63 - Subpart DDDDD - Boiler MACT</td>
</tr>
<tr>
<td>ES-006</td>
<td>2,000 kW generator</td>
<td>40 CFR 63 - Subpart ZZZZ - RICE MACT</td>
</tr>
<tr>
<td>ES-007</td>
<td>2,000 kW generator</td>
<td>40 CFR 63 - Subpart ZZZZ - RICE MACT</td>
</tr>
<tr>
<td>82 Em. Generators</td>
<td>All Emergency Generators</td>
<td>40 CFR 63 - Subpart ZZZZ - RICE MACT</td>
</tr>
<tr>
<td>3 Diesel fired pumps</td>
<td>All Diesel fire pumps</td>
<td>40 CFR 63 - Subpart ZZZZ - RICE MACT</td>
</tr>
</tbody>
</table>

List any additional regulation which are requested to be included in the shield and provide a detailed explanation as to why the shield should be granted:

<table>
<thead>
<tr>
<th>REGULATION</th>
<th>EMISSION SOURCE (Include ID)</th>
<th>EXPLANATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>All</td>
<td>See Permit No. 03069T35 for existing sources and applicable regulations</td>
</tr>
</tbody>
</table>

Comments:
1. All air pollution sources at the University and applicable regulations are identified in Permit No. 03069T35. All applicable regulations should be included in the permit shield.
2. The Kenan Chemistry Lab emergency generator (ES-Gen-29, 45 kW) and MacNider Hall emergency generator (ES-Gen-32, 100 kW) are being removed from the permit revising the total EG count on campus to 82.

Attach Additional Sheets As Necessary
<table>
<thead>
<tr>
<th>EMISSION SOURCE ID NO.</th>
<th>EMISSION SOURCE DESCRIPTION</th>
<th>OPERATING SCENARIO INDICATE PRIMARY (P) OR ALTERNATIVE (A)</th>
<th>POLLUTANT</th>
<th>APPLICABLE REGULATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES-Gen-42</td>
<td>500 kW Diesel-fired Emergency Engine</td>
<td>P-Diesel fuel</td>
<td>SO₂</td>
<td>15A NCAC 2D .0516</td>
</tr>
<tr>
<td>ES-Gen-42</td>
<td>500 kW Diesel-fired Emergency Engine</td>
<td>P-Diesel fuel</td>
<td>V.E.s</td>
<td>15A NCAC 2D .0521</td>
</tr>
<tr>
<td>ES-Gen-42</td>
<td>500 kW Diesel-fired Emergency Engine</td>
<td>P-Diesel fuel</td>
<td>HAPs</td>
<td>40 CFR 63, Subpart ZZZZ</td>
</tr>
<tr>
<td>ES-Gen-42</td>
<td>500 kW Diesel-fired Emergency Engine</td>
<td>P-Diesel fuel</td>
<td>Criteria</td>
<td>40 CFR 60, Subpart III</td>
</tr>
</tbody>
</table>

Significant Source Added With This Title V Permit Modification

Attach Additional Sheets As Necessary
FORM E4
EMISSION SOURCE COMPLIANCE SCHEDULE

COMPLIANCE STATUS WITH RESPECT TO ALL APPLICABLE REQUIREMENTS

Will each emission source at your facility be in compliance with all applicable requirements at the time of permit issuance and continue to comply with these requirements?

X Yes  No  If NO, complete A through F below for each requirement for which compliance is not achieved.

Will your facility be in compliance with all applicable requirements taking effect during the term of the permit and meet such requirements on a timely basis?

X Yes  No  If NO, complete A through F below for each requirement for which compliance is not achieved.

If this application is for a modification of existing emissions source(s), is each emission source currently in compliance with all applicable requirements?

X Yes  No  If NO, complete A through F below for each requirement for which compliance is not achieved.

A. Emission Source Description (Include ID NO.)

B. Identify applicable requirement for which compliance is not achieved:

C. Narrative description of how compliance will be achieved with this applicable requirements:

D. Detailed Schedule of Compliance:

<table>
<thead>
<tr>
<th>Step(s)</th>
<th>Date Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E. Frequency for submittal of progress reports (6 month minimum):

F. Starting date of submittal of progress reports:

Attach Additional Sheets As Necessary
In accordance with the provisions of Title 15A NCAC 2Q .0520 the responsible company official of:

| SITE NAME: | The University of North Carolina at Chapel Hill |
| SITE ADDRESS: | 200 E. Cameron Avenue, CB# 1000 |
| CITY, NC: | Chapel Hill, North Carolina |
| COUNTY: | Orange |
| PERMIT NUMBER: | 03069T35 |

CERTIFIES THAT (Check the appropriate box):

- [X] The facility is in compliance with all applicable requirements

  - [ ] The facility is not currently in compliance with all applicable requirements

  *If this box is checked, you must also complete form E4 “Emission Source Compliance Schedule”*

The undersigned certifies under the penalty of law, that all information and statements provided in the application, based on information and belief formed after reasonable inquiry, are true, accurate, and complete.

**Signature** of responsible company official (REQUIRED, USE BLUE INK)

**Jonathan Pruitt, Vice Chancellor for Finance and Operations**

Name, Title of responsible company official (Type or print)

Attach Additional Sheets As Necessary

*Received
JUN 05 2019
Air Permits Section*
ATTACHMENT C
Supporting Emission Rate Calculations

Title V Minor Permit Modification
University of North Carolina at Chapel Hill
Chapel Hill, NC
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The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Orange County

Operational Parameters
New Dean Smith Center Emergency Generator
500 kW, Maximum Output Rating
671 hp, Maximum Output Rating
0.0015 wt.%, Maximum Fuel Oil Sulfur Content NSPS
500 hr/yr, Maximum Operating Hours per Year

Potential Emissions - (1) 500 kW Emergency Generator

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Emission Factor</th>
<th>Emissions (lb/hr)</th>
<th>Emissions (lb/yr)</th>
<th>Emissions (ton/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(lb/hp-hr)1,2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOx²</td>
<td>5.79E-03</td>
<td>3.88</td>
<td>1,940.0</td>
<td>0.97</td>
</tr>
<tr>
<td>CO²</td>
<td>5.75E-03</td>
<td>3.86</td>
<td>1,929.0</td>
<td>0.96</td>
</tr>
<tr>
<td>SO₂²</td>
<td>1.21E-05</td>
<td>0.0081</td>
<td>4.1</td>
<td>0.0020</td>
</tr>
<tr>
<td>PM²</td>
<td>3.29E-04</td>
<td>0.22</td>
<td>110.2</td>
<td>0.055</td>
</tr>
<tr>
<td>VOC</td>
<td>7.89E-04</td>
<td>0.53</td>
<td>264.6</td>
<td>0.13</td>
</tr>
<tr>
<td>Acetaldehyde</td>
<td>1.76E-07</td>
<td>1.18E-04</td>
<td>5.9E-02</td>
<td>2.95E-05</td>
</tr>
<tr>
<td>Acrolein</td>
<td>5.52E-08</td>
<td>3.70E-05</td>
<td>1.9E-02</td>
<td>9.25E-06</td>
</tr>
<tr>
<td>Benzene</td>
<td>5.43E-06</td>
<td>3.64E-03</td>
<td>1.8E+00</td>
<td>9.10E-04</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>1.80E-09</td>
<td>1.21E-06</td>
<td>6.0E-04</td>
<td>3.02E-07</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>5.52E-07</td>
<td>3.70E-04</td>
<td>1.9E-01</td>
<td>9.25E-05</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>9.10E-07</td>
<td>6.10E-04</td>
<td>3.1E-01</td>
<td>1.53E-04</td>
</tr>
<tr>
<td>PAH</td>
<td>1.48E-06</td>
<td>9.92E-04</td>
<td>5.0E-01</td>
<td>2.48E-04</td>
</tr>
<tr>
<td>Toluene</td>
<td>1.97E-06</td>
<td>1.32E-03</td>
<td>6.6E-01</td>
<td>3.30E-04</td>
</tr>
<tr>
<td>Xylene</td>
<td>1.35E-06</td>
<td>9.05E-04</td>
<td>4.5E-01</td>
<td>2.26E-04</td>
</tr>
</tbody>
</table>

1 - Toxic pollutant emission factors were obtained from DAQ spreadsheet.

2 - SO₂ emissions presented here assume a maximum sulfur content of 15 ppm. CO, NOx, and PM emissions presented here are based on EPA Tier 3 engine limits. The applicable CI NSPS/Tier 3 limit for NOx plus NMHC is 4 g/kW-hr. The NOx:NMHC ratio in the Tier 3 engine exhaust is conservatively assumed to be 88:12.
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