

Document Number	Air Quality Permit Compliance SOP D.36.01
Owner/Contact Information:	Jon Soter
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Related Policies and Procedures	None

### 1. Purpose/Introduction

To establish a standard operating practice regarding the University of North Carolina at Greensboro's compliance with Air Quality Permit regulations which apply to emissions from combustion of fuel in boilers, stationary standby/emergency generators, and other equipment.

### 2. Definitions

- 2.1 Air Quality Permit. The permit issued by the North Carolina Department of Environmental Quality (Authority Having Jurisdiction) and enforced by their Air Quality Division. The current Permit Number 09176R05 expires on March 31, 2024.
- 2.2 Red Binder. A three-ring binder with red cover kept available during all business hours for inspection by the Authority Having Jurisdiction during their unannounced inspection visits. The binder contains crucial documentation for permit compliance.
- 2.3 Emission Source ID List. The official list of all boilers, generators, and other equipment operated by UNCG. The list is maintained by the Campus Mechanical Engineer. See Appendix A.
- 2.4 Fuel Purchase Spreadsheet. The official ledger listing supplier/vendor, \$ cost, quantity of fuel purchased, and location where each fuel delivery occurred. The ledger records the number of gallons of fuel delivered to <u>each</u> generator, Steam Plant fuel tank, etc. The spreadsheet/ledger is maintained by Facilities Operations Accounting personnel. See Appendix B.
- 2.5 Generator Runtime Log. A spreadsheet where the Generator Technician records monthly runtime meter readings of each generator to document the number of hours each generator is operated (combusting fuel) each month. See Appendix C.
- 2.6 Steam Plant Boiler Operations Log. A spreadsheet where the Steam Plant Supervisor or designee records daily/monthly boiler operating parameters, including quantity of fuel combusted, both natural gas and No. 2 fuel oil. See Appendix D.
- 2.7 Emissions Calculation Spreadsheet. The official spreadsheet listing all emission sources with monthly generator runtimes (diesel), monthly generator natural gas consumption, and monthly fuel consumption of Steam Plant boilers. Year-to-Date totals are for calendar year, which

matches the Air Quality Permit reporting year. This spreadsheet is maintained by the Campus Mechanical Engineer (This is a CHANGE – currently being done by Facilities Operations Accounting personnel). See Appendix E.

- 2.8 Compliance Personnel. Key UNCG personnel responsible for Air Quality Permit compliance include:
  - 2.8.1 Generator Technician
  - 2.8.2 Steam Plant Supervisor
  - 2.8.3 Accountant
  - 2.8.4 Campus Mechanical Engineer
  - 2.8.5 Director of Facilities Operations

### 3. Procedural Steps

- 3.1 Generator Technician Responsibilities.
  - 3.1.1 Maintain all generators in good running order and address any smoky or anomalous emissions immediately.
  - 3.1.2 Monthly update the Generator Runtime Log with current runtime meter readings of each generator. Check readings to identify any runtime meters that are no longer working properly.
  - 3.1.3 Immediately repair or replace any runtime meters that are no longer working properly and update the Generator Runtime Log with the new runtime meter reading and a note documenting the date the runtime meter was replaced.
  - 3.1.4 Monthly forward a copy of the Generator Runtime Log to the Campus Mechanical Engineer (This is a CHANGE from currently forwarding the log to the Accountant).
  - 3.1.5 Coordinate with fuel supplier for periodic fuel deliveries to generators. Write the generator location on each original fuel ticket provided by the fuel supplier which indicates not only the quantity of fuel delivered to each generator but also the specific fuel characteristics. Typically, the preferred fuel is ultra-low sulfur diesel for compliance with the Air Quality Permit.
  - 3.1.6 Forward all original fuel tickets to the Accountant.
  - 3.1.7 Escort the Authority Having Jurisdiction to generators of interest during their unannounced inspection visits.
  - 3.1.8 Participate in contractor load test of new generators and obtain and forward the following information to the Campus Mechanical Engineer:
    - 3.1.8.1 Generator location
    - 3.1.8.2 Year Manufactured
    - 3.1.8.3 Manufacturer & Model Number
    - 3.1.8.4 Serial Number
    - 3.1.8.5 kiloWatt (kW) Rating
    - 3.1.8.6 Fuel Source
    - 3.1.8.7 Base Tank Size if Diesel (No. 2 Fuel Oil)
    - 3.1.8.8 Diesel Supplier's Fuel Ticket from Initial Filling of Tank
    - 3.1.8.9 Manufacturer's EPA Exhaust Emission Compliance Statement

- 3.2 Steam Plant Supervisor Responsibilities.
  - 3.2.1 Coordinate with fuel supplier for periodic No. 2 fuel oil deliveries. Write the tank number in which the fuel was placed on each manifest (Bill of Lading) provided by the supplier. Run a copy of each manifest and update the Steam Plant In-House Fuel Delivery Log for supplier, delivery date, quantity, and tank number of each delivery. See Appendix F.
  - 3.2.2 Forward the original No. 2 fuel oil delivery manifests to the Accountant.
  - 3.2.3 Maintain all boilers and associated equipment in good operational condition and address any smoky or anomalous emissions immediately.
  - 3.2.4 Conduct periodic fugitive or smoke emission inspections as required by the Air Quality Permit and place a copy of the documentation in the Red Binder.
  - 3.2.5 Daily update the Steam Plant Boiler Operations Log with the following information for each boiler.
    - 3.2.5.1 Steam generated
    - 3.2.5.2 Natural Gas consumed (cubic feet)
    - 3.2.5.3 No. 2 Fuel Oil consumed (gallons)
    - 3.2.5.4 Total makeup water for Steam Plant
  - 3.2.6 Monthly forward a copy of the Steam Plant Boiler Operations Log to the Campus Mechanical Engineer (This is a CHANGE do not forward the log to the Accountant).
  - 3.2.7 Escort the Authority Having Jurisdiction through the Steam Plant during their unannounced inspection visits.
- 3.3 Accountant Responsibilities.
  - 3.3.3 Receive original generator fuel tickets from the Generator Technician and update the Fuel Purchase Spreadsheet with supplier/vendor, \$ cost, quantity of fuel purchased, and location where each fuel delivery occurred, including gallons for each generator.
  - 3.3.4 Place original generator fuel tickets in the Red Binder along with at least a monthly printout of the Fuel Purchase Spreadsheet.
  - 3.3.5 Receive original No. 2 fuel oil delivery manifests (Bill of Lading) from the Steam Plant Supervisor and update the Fuel Purchase Spreadsheet with supplier/vendor, \$ cost, quantity of fuel purchased, and location where each fuel delivery occurred.
  - 3.3.6 Place original No. 2 fuel oil delivery manifests matched with their invoices in the Red Binder along with at least a monthly printout of the Fuel Purchase Spreadsheet.
  - 3.3.7 Monthly update the natural gas purchase spreadsheet with location-specific quantities of natural gas consumed (therms) and the cost thereof. Place a monthly printout in the Red Binder.
- 3.4 Campus Mechanical Engineer Responsibilities.
  - 3.4.3 Prepare Semi-Annual Air Quality Permit Reports using information gathered from this SOP and submit two (2) copies to the Authority Having Jurisdiction not later than January 30 and July 30 of each year.
  - 3.4.4 Place a copy of each Semi-Annual Air Quality Permit Report in the Red Binder.
  - 3.4.5 Periodically update the Emission Source ID List as needed to add new generators or to delete equipment taken out of service and place a printout of the current version in the Red Binder.

- 3.4.6 Receive Generator Runtime Log monthly update from the Generator Technician, place a printout in the Red Binder, and update the Emissions Calculation Spreadsheet (This is a CHANGE currently being done by Facilities Operations Accounting personnel).
- 3.4.7 Receive Steam Plant Boiler Operations Log monthly update from the Steam Plant Supervisor and update the Emissions Calculation Spreadsheet (This is a CHANGE – currently being done by Facilities Operations Accounting personnel).
- 3.4.8 Place a monthly printout of the current calendar year Emissions Calculation Spreadsheet in the Red Binder (This is a CHANGE – currently being done by Facilities Operations Accounting personnel).

### 3.5 Director of Facilities Operations Responsibilities.

3.5.3 Ensure the Red Binder is kept available during all business hours for inspection by the Authority Having Jurisdiction during their unannounced inspection visits.

### 4 Appendices

The following appendices are included to show the current format of the lists, logs, and spreadsheets referenced in this SOP.

Emission Source ID List
Fuel Purchase Spreadsheet
Generator Runtime Log
Steam Plant Boiler Operations Log
Emissions Calculation Spreadsheet
Steam Plant In-House Fuel Delivery Log

### 5 Revision Table

Revision #	Section #	Summary of Changes	Approval Date
D.36.01		Established a SOP regarding the UNC Greensboro's	02/01/20
		compliance with Air Quality Permit regulations.	

### Appendix A Emission Source ID List

Emission Source Description	<u></u>		 NCDEQ Emission Sourc
STEAM PLANT BOILERS			<u>ID</u> #
BOILER-1			 ES01
BOILER-2			 ES02
BOILER-3			 ES03
BOILER-4			 ES04
GENERATORS	kW	FUEL	
STEAM PLANT	600	#2	ES05
McNUTT BLDG (Data Center)	800	#2	 ES07
EVENDTED			 
UNCG AUDITORIUM (formariu Au	125	NATGAS	LEG.1a
BASEBALL	80	NATGAS	 LFG.14
BRYAN	150	#2	 LEG-2
BBYAN DATA CENTER	400	#2	 I-EG-27
BBYAN (SPARE)	135	NATGAS	 I-EG-28
CHEMICAL STORAGE (Safetu)	60	NATGAS	 I-EG-15
CONE ABT (Weatherspoon)	30	#2	 I-EG-3
CONE RESIDENCE HALL	80	#2	 I-EG-49 (2017)
DINING HALL - MORAN COMMO	250	#2	 I-EG-37 (2012)
EUC - Elliott University Center	135	NAT GAS	 I-EG-16
EBERHART	400	NAT GAS	 I-EG-12
FERGUSON	125	#2	 I-EG-6
FORNEY	150	NAT GAS	 I-EG-29
GRAHAM	20	PROPANE	 I-EG-17
GROGAN RESIDENCE HALL	250	#2	 I-EG-44 (2014)
HAYWOOD RESIDENCE HALL	80	#2	I-EG-39 (2013)
HIGHLAND RESIDENCE HALL	80	#2	I-EG-41 (2013)
COLEMAN Building (formerly HH	75	#2	I-EG-7
HUMANITIES	125	NAT GAS	I-EG-30
JACKSONLIBRARY	35	NAT GAS	I-EG-18
JEFFERSON SUITES	125	#2	I-EG-35
LEE RESIDENCE HALL	80	#2	I-EG-38 (2013)
LEXINGTON RESIDENCE HALL	150	#2	 I-EG-48 (2017)
LOFTS ON LEE	60	#2	 I-EG-36 (2012)
MolVER DECK	100	NATGAS	 I-EG-19
MCCORMICK RESIDENCE HALL	150	#2	 I-EG-47 (2017)
MOURE-STRUNG RESIDENCET	35	#2	 I-EG-8
MUURE NURSING	20	NATGAS	 I-EG-20
MUSSIMAN BUILDING	20	NAT GAS	 I-EG-45 (2015)
	200	MATGAS	 1-EG-21
DUILLIDS UNVING Decidence L	100	#2	 1-EG-51
PRILLIPS-RAWKINS Residence n 1996 Spring Gordon Street Dida	20	#4 NATGAS	 LEG 22
PEYMOL DE PERIDENCE LALL	125	NATGAS	 LEG-22
SULLIVAN SCIENCE BLDG	325	NATGAS	 LEG-32
1510 Walker Avenue Bidd (Was SB	100	#2	 LEG-32
SINK	80	NAT GAS	 LEG-23
SOCCEB	40	#2	 I-EG-10
STONE	200	#2	 I-EG-34
KAPLAN CFW (Student Recreation	150	#2	 I-EG-46 (2015)
STUDIO ARTS	350	#2	 I-EG-33
TOWER VILLAGE	20	NATGAS	 I-EG-25
UNCG POLICE BUILDING	550	#2	 I-EG-43 (2013)
UNION RESIDENCE HALL	80	#2	 I-EG-40 (2013)
WALKER DECK	200	#2	I-EG-13
WEIL-WINFIELD RESIDENCE HA	150	#2	 I-EG-51
BOILERS	MBTU/br	FUFI	
915 NORTHRIDGE ST	2.52	NATIGAS	I-B-2
1100 WEST MARKET ST	1.75	NATGAS	 i-B-3
CHEMICAL STORAGE	5.22	NATGAS	 I-B-4
TOVER VILLAGE	2.72	NATGAS	 I-B-1
UNCG POLICE BUILDING	2 @ 0.75 each	NATGAS	 I-B-5 & I-B-6
KAPLAN CFW (Student Recreation	5@2.0each	NAT GAS	 I-B-7, 8, 9, 10, & 11

# Appendix B Fuel Purchase Spreadsheet

DATE Reference		Charged to Fund #	Bill To	Vendor	Description	Fuel #2 or #5 - Not Ste # Gallons	om Pint Cesr	<u>#2 - Steam Plan</u> # Gallons Cear	#2 or Pro Heat (to) with Utilit # Gallons	pane for the billed ty Billing Cost	Propen Gener # GaRons	e - for atora Cost
					*	(c)	nored FY201	n Genie				
11/7/201 11/8/201 11/13/201 11/15/201	9 PC-468880 9 P0051661 9 PC-469726 9 PC-470135	117504 117508 117508 117508		Feneligas Sampson-Bladen Foneligas Foneligas	duplicate payment to Ferreligas Fuel OII Invoice #0237395-IN Heating propare for turf shop Heating propare for turf shop			7470 \$ 14.96	9.14 203.3 38.2	172.85 34.44		
11/12/201	9 P0051817	117505 117505 117505 117505 117505	pp-219449 pp-219452 pp-219455 pp-219458 pp-219460	Berico Fuels Berico Fuels Berico Fuels Berico Fuels Berico Fuels	Coleman Gym McNutt Bryan Bidg Ferguson Cone Art	76.3 \$ 587.4 \$ 145.1 \$ 233.4 \$ 64.4 \$	206.44 1.589.27 392.58 631.49 174.24					
1/15/201	9 P0051835	117505 117505 117505 117505 117505 117505 117505 117505	pp-219815 pp-219817 pp-219819 pp-219820 pp-219820	Benco Fuels Benco Fuels Benco Fuels Benco Fuels Benco Fuels Benco Fuels Benco Fuels Benco Fuels	Campus Police Bryan Data Dining Union Haywood HaMand Owwww.	172 5 267 5 144 5 27.4 5 37.5 5 30.1 5 43.2 5	455.36 776.51 389.61 60.61 101.46 81.44 116.88 125.18					
		117505 ( 117505 ( 117505 ( 117505 ( 130035 ( 130034	pp-219822 pp-219823 pp-219824 pp-219825	Benco Fuels Benco Fuels Benco Fuels Benco Fuels Benco Fuels Benco Fuels	Grogan Cone Philip Hawkins Moole diesel fuel for Kaplan generator diesel fuel for Soccer Stadium	100.6 S 55.7 S 43.4 S 12.4 S 36.3 S 36.7 S	272.16 150.70 117.42 33.55 96.51 96.59					
1/26/201	9 P0049785	117508		Ferreligas	heating for turl shop				80.2	73.94		
1/27/201	9 PO49785	117508		- courges	reading to car shop				34.1	31.70		

## Appendix C Generator Runtime Log

		Buildin <u>c</u>	LOCATION	October-19 🚽	November-19 👻	Monthly Run Time 🖵
WEDNESDAY	8:00	135	SOCCER FIELD	1,914.4	1917.4	3.0
MONDAY	4:00	134	1510 Walker (formerly SRF)	2,067.7	2070.9	3.2
MONDAY	9:00	58	GRAHAM	1,095.4	1098.4	3.0
MONDAY	7:00	98	COLEMAN (HHP)	1,309.7	1311.8	2.1
MONDAY	14:30	40	EUC	866.7	869.2	2.5
TUESDAY	7:00	48	SINK	941.1	944.1	3.0
TUESDAY	5:00	56	MOORE NURSING	1,360.1	1363.5	3.4
WEDNESDAY	1:30	20	GROGAN	223.0	225.8	2.8
TUESDAY	9:00	137	TOWER VILLAGE	1,199.8	1201.9	2.1
TUESDAY	6:00	174	CHEMICAL STORAGE	1,058.0	1061	3.0
TUESDAY	9:00	177	BASEBALL	644.5	646.4	1.9
WEDNESDAY	6:00	39	LIBRARY	341.5	343.9	2.4
WEDNESDAY	8:00	82	BRYAN B&E	2,061.5	2064.5	3.0
WEDNESDAY	6:00	99	CONE ART	958.2	960.9	2.7
WEDNESDAY	6:00	169	McIVER DECK	1,196.5	1199.7	3.2
WEDNESDAY	13:00	31	STONE BLDG	1,030.2	1033.2	3.0
WEDNESDAY	4:00	141	WALKER DECK	1,318.5	1319.4	0.9
THURSDAY	7:00	63	EBERHART BLDG	734.4	737.2	2.8
THURSDAY	7:00	34	University Auditorium (former AYCOCK	439.6	443.2	3.6
WEDNESDAY	6:00	22	DINING HALL NEW	368.4	371.4	3.04
FRIDAY	9:00	304	CAMPUS POLICE BUILDING	222.7	225.3	2.6
THURSDAY	13:00	80	MOSSMAN BLDG	190.1	193.5	3.4
FRIDAY	9:00	89	996 TATE ST	148.5	151.5	3.0
TUESDAY	7:00	86	FERGUSON	593.2	593.9	0.7
FRIDAY	14:15	13	MOORE STRONG	966.1	968	1.9
FRIDAY	8:15	170	MUSIC BLDG	780.1	782.2	2.1
ANY TIME	anytime	49	STEAM PLANT	423.2	426	2.8
TUESDAY	7:00	178	SULLIVAN SCIENCE	811.0	814	3.0
TUESDAY	7:00	252	OAKLAND DECK	194.9	203.6	8.7
TUESDAY	7:00	82_C	B&E COMPUTER	451.6	455.4	3.8
THURSDAY	5:00	37	FORNEY	594.2	597.5	3.3
THURSDAY	2:30	200	LEE RES HALL	379.3	383.5	4.2
WEDNESDAY	2:30	202	HAYWOOD RES HALL	355.3	360.6	5.3
THURSDAY	1:30	201	HIGHLAND RES HALL	393.4	398.4	5.0
WEDNESDAY	1:30	203	UNION RES HALL	240.3	242.9	2.6
THURSDAY	6:00	247	STUDIO ARTS	907.1	909.9	2.8
TUESDAY	6:00	246	HUMANITIES	804.2	808	3.8
THURSDAY	5:00	57	McNUTT	170.4	178.2	7.8
THURSDAY	1:00	238	JEFFERSON SUITES	384.7	387.3	2.6
WEDNESDAY	1:00	239	LOFTS ON LEE	358.0	360.7	2.7
WEDNESDAY	1:30	19	REYNOLDS DORM	216.0	220.1	4.1
MONDAY	1:30	308	KAPLAN WELLNESS CENTER	144.4	148.6	4.2
FRIDAY	13:00	205	LEXINGTON BLDG	101.0	104.3	3.3
THURSDAY	10:00	204	McCORMICK BLDG	105.2	107.9	2.7
TUESDAY	10:00	21	CONE DORM	78.7	83.2	4.5
THURSDAY	13:00	15	PHILLIPS-HAWKINS DORM	38.4	41.6	3.2

# Appendix D Steam Plant Boiler Operations Log

	#1 Boller	#2 Boller	#3 Boller	#4 Boller	Total	Gallons	/1000cf	/1000cf	Gallons	014	Electric	*	Muf		D	eka Therm	
Date	Ibs/stm	lbs/stm	lbs/stm	Ibs/stm	Steam	Muf	Gas 1-3	Gas 4	OII 1-3	v1.082 cf	KW/Hr	Muf	GRM	% Eff	Gas	OII	Total
1	0	458,000	463,000	0	921,000	22,784	1,072	0	0	0	1,654	20.61%	16	83.34%	1,072	0	1,072
2	0	458,000	477,000	4,000	939,000	26,000	1,087	11	0	0	1,688	23.07%	18	82.95%	1,098	0	1,098
3	0	477,000	497,000	10,000	984,000	26,704	1,131	16	0	0	1,755	22.61%	19	83.22%	1,147	0	1,147
4	0	449,000	467,000	4,000	920,000	24,011	1,062	11	0	0	1,727	21.74%	17	83.17%	1,073	0	1,073
5	0	406,000	424,000	3,000	833,000	24,938	958	9	0	0	1,658	24.94%	17	83.56%	967	0	967
6	284,000	412,000	194,000	5,000	895,000	25,036	989	12	0	0	1,660	23.30%	17	86.73%	1,001	0	1,001
7	462,000	267,000	1,000	90,000	820,000	24,721	852	115	0	0	1,774	25.11%	17	82.25%	967	0	967
8	454,000	2,000	222,000	317,000	995,000	26,105	780	381	0	0	1,981	21.85%	18	83.13%	1,161	0	1,161
9	413,000	0	181,000	458,000	1,052,000	23,929	696	546	0	0	2,359	18.95%	17	82.16%	1,242	0	1,242
10	380,000	3,000	116,000	419,000	918,000	21,445	582	498	0	0	2,128	19.46%	15	82.45%	1,080	0	1,080
11	406,000	0	238,000	211,000	855,000	20,712	746	251	0	0	1,747	20.18%	14	83.18%	997	0	997
12	485,000	0	552,000	2,000	1,039,000	24,362	1,195	9	0	0	1,759	19.53%	17	83.71%	1,204	0	1,204
13	204,000	406,000	623,000	1,000	1,234,000	26,300	1,446	6	0	0	1,967	17.75%	18	82.44%	1,452	0	1,452
14	32,000	583,000	579,000	18,000	1,212,000	26,419	1,382	28	0	0	2,065	18.16%	18	83.38%	1,410	0	1,410
15	1,000	538,000	546,000	1,000	1,086,000	21,819	1,275	3	0	0	1,787	16.74%	15	82.43%	1,278	0	1,278
16	2,000	534,000	541,000	0	1,077,000	19,530	1,250	0	0	0	1,747	15.11%	14	83.58%	1,250	0	1,250
17	1,000	510,000	518,000	0	1,029,000	18,393	1,207	0	0	0	1,707	14.89%	13	82.70%	1,207	0	1,207
18	1,000	516,000	522,000	0	1,039,000	16,703	1,213	0	0	0	1,737	13.39%	12	83.09%	1,213	0	1,213
19	0	487,000	492,000	0	979,000	16,852	1,128	0	0	0	1,691	14.34%	12	84.34%	1,126	0	1,126
20	1,000	458,000	460,000	21,000	940,000	17,758	1,068	33	0	0	1,779	15.74%	12	82.82%	1,101	0	1,101
21	1,000	449,000	463,000	69,000	982,000	17,069	1,044	86	0	0	1,963	14.48%	12	84.30%	1,130	0	1,130
22	76,000	451,000	225,000	91,000	843,000	16,718	875	105	0	0	1,900	16.52%	12	83.53%	979	0	979
23	468,000	482,000	1,000	0	951,000	17,294	1,105	0	0	0	1,594	15.15%	12	83.48%	1,105	0	1,105
24	460,000	475,000	1,000	52,000	988,000	18,999	1,083	67	0	0	1,813	16.02%	13	83.34%	1,150	0	1,150
25	468,000	459,000	2,000	50,000	979,000	19,874	1,095	58	0	0	1,842	16.91%	14	82.36%	1,153	0	1,153
26	447,000	434,000	0	58,000	939,000	22,178	1,026	72	0	0	1,875	19.67%	15	82.95%	1,098	0	1,098
27	403,000	427,000	1,000	63,000	894,000	22,096	948	75	0	0	1,798	20.59%	15	84.77%	1,023	0	1,023
28	470,000	359,000	128,000	6,000	963,000	24,041	1,131	9	0	0	1,640	20.80%	17	81.94%	1,140	0	1,140
29	457,000	1,000	509,000	9,000	976,000	23,667	1,125	15	0	0	1,693	20.20%	16	83.05%	1,140	0	1,140
30	458,000	2,000	487,000	21,000	968,000	23,936	1,099	29	0	0	1,697	20.60%	17	83.24%	1,128	0	1,128
Totals	6.834.000	10.503.000	9,930,000	1,983,000	29,250,000	660.394	31.647	2.445	0	0	54,185	18.81%	15	83.22%	34.092	0	34.092
				mfu base	d on city wa	ter meter											
	EDG run bra	End	Start	Totals	a on ony wa	SOx	18.988278	1.466922	0	0	total	20.4552	bs				
	total	427	424.8	22		NOx	3164.713	244.487	0	0	total	3409.2	bs				
	power out			0		CO	2658.35892	205.36908	0	0	total	2863.728	bs				
		maint.	Total	22													

# Appendix E Emissions Calculation Spreadsheet

October-19	SULFUR	CONTENT	OF #2 F	UEL (%)	0.0015				NCDEQ
	SULFUR	CONTENT	OF NAT	GAS	0.00				Source
Source			HRS	NAT GAS	<b>#</b> 2	_SO2_}	NOX :		
STEAM PLANT BOILERS				CUFT	GALS	LBS		LBS	
BOILER-1				236,806	0	0.14	23.68	19.89	ES01
BOILER-2				5,772,597	0	3.46	577.26	484.90	E\$02
BUILER-3				11,446,426	ÿ	6.87	1,144.64	961.50	ES03
					¥	4.29	357.56	<u>_600.70</u>	ES04
	-22-	- 5,5 -					÷		
BASEBALL	80	NATIGAS	1.9	700		0.00	6.32	1.36	I-EG-14
BRYAN (B & E)	150	#2	3.0			0.73	18.71	4.03	1-EG-2
BRYAN COMPUTER (B&E)	400	#2	3.8			2.47	63.19	13.62	I-EG-27
UNCG POLICE 1200 V LEE (new	550	#2	2.6			2.32	59.45;	12.81	I-EG-43
CHEMICAL STORAGE	60	NAT GAS	3.0	1000		0.00	7.48	1.61	I-EG-15
CONE ART	30	#2	2.7			0.13	3.37	0.73	I-EG-3
CUNE RES HALL [new 2018]	80	#2	4.5			0.58	14.97	3.22	1.50.03
EUC	200	HAT GAS	2.5	72100		0.00	14.02	2.02	I-EG-31
EBEBHABT	400	NAT GAS	2.8	6400		0.00	46.56	10.02	I-EG-12
FERGUSON	125	#2	0.7	0,00		0.14	3.64	0.78	I-EG-6
FORNEY	150	NAT GAS	3.3	1500		0.00	20.58	4.43	I-EG-29
GROGAN (new 2014)	250	#2	2.8			1.14	29.10;	6.27	I-EG-44
GRAHAM	20	<b>PROPANE</b>	3.0	Ū		0.00	2.49	0.54	I-EG-17
HAYVOOD RES HALL (new 2013	80	#2	5.3			0.69	8.81	3.80	I-EG-39
UULEMAN (Formerly HHP)		#2	2.1			0.26	3.275	1.41	1-EG-7
HIGHLAND RES HALL (NEW 2013	125	#2 NAT GAS	2.0	1100		0.60	9.31;	3.08	I-EG-41
JACKSONUBBABY	35	NAT GAS	24	300		0.00	175	0.75	I-EG-18
JEFFERSON SUITES	125	#2	2.6			0.53	6.76:	2.91	1-EG-35
LEE RESIDENCE HALL (new 201	80	#2	4.2			0.55	6.98;	3.01	I-EG-38
LEXINGTON RES HALL (new 201	150	#2	3.3			0.80	10.29	4.43	I-EG-48
LOFTS ON LEE (new 2012)	60	#2	2.7			0.26	3.37	1.45	I-EG-36
McCORMICK RES HALL (new 2)	150	#2	2.7			0.66	8.42;	3.63	I-EG-47
	100	NAT GAS	3.2	2100		10.00	6.65;	2.87	I-EG-19
MOSSMAN (paul 10/2015)	25	HAT GAS	7.0 2.4	003		0.00	123.70	00.30	LEG-45
MOORE-STRONG	35	#2	1.9	000		0.11	1.38:	0.60	I-EG-8
MOORE NURSING	20	NAT GAS	3.4	300		0.00	1.41	0.61	I-EG-20
MUSIC BLDG	60	NAT GAS	2.1	1000		0.00	2.62	1.13	I-EG-21
OAKLAND DECK	200	NAT GAS	8.7	4000		0.00	36.17	15.59	I-EG-31
996 SPRING GARDEN STREET	30	NAT GAS	3.0	500		0.00	1.87;	0.81	I-EG-22
PHILLIPS-HAWKINS RES HALL	100	#2	3.2	1100		0.52	6.65	2.87	1-EG-50
RETINUEDS RESIDENCE HALL	225	NAT GAS	9.1	1400		0.00	10.65	4.53	1-EG-42
1510 VALKER (formerlu SBE)	325	NAT GAS #2	3.0	4700		0.00	6.65	2.87	1-EG-32
KAPLAN WELLNESS CTR (new	150	#2	4.2			1.02	13.09	5.64	I-EG-46
SINK	80	NAT GAS	3.0	1400		0.00	4.99	2.15	I-EG-23
SOCCER FIELD	40	#2	3.0			0.19	2.49	1.07	I-EG-10
STEAM PLANT	600	#2	2.8			2.73	34.92	15.05	E\$05
STONE	200	#2	3.0			0.97	12.47	5.37	I-EG-34
STUDIO ARTS	350	#2	2.8			1.59	20.37	8.78	I-EG-33
TOVER VILLAGE	20	NAT GAS	2.1	1000		0.00	0.87:	0.38	I-EG-25
UNIVERSITY AUDITORIUM (for	125	NAT GAS	3.6	800		0.00	18.71	4.03	I-EG-1a
UNION RES HALL [New 2013]	200	#2	2.6			0.34	4.32	1.86	1-EG-40
	200	#2 #2	2.8			0.23	3.74 8.73	3.76	I-EG-13
	100	π2 Γινη	2.0			0.00	0.10		reast
	MBT0/hr	FUEL		1100		0.0007	0.44	0.00	18.0
1100 V MARKET	175	NAT GAS		162200		0.0007	16 22	13.62	I-B-2
CHEMICAL STORAGE	5,22	NAT GAS		4700		0,0028	0.47	0.39	I-B-4
TOWER VILLAGE	2.72	NAT GAS		45800		0.0275	4.58	3.85	I-B-1
UNCG POLICE BLDG (1200 V G/	1.5	NAT GAS		39500		0.0237	3.95	3.32	I-B-5 & 6
KAPLAN WELLNESS CTR	10	NAT GAS		2973605		1.7842	297.36	249.78	I-B-7 to 11

## Appendix F Steam Plant In-House Fuel Delivery Log

UNCG STEAM PLANT

HEATING (FUEL) OIL LOG

DATE	BILL OF	GROSS GAL.	NO. 1 TNK	NO. 1 TNK GAL.	NO. 2 TNK	NO. 2 TNK GAL.	NO. 3 TNK IN.	NO. 3 TNK GAL.	TOTAL FUEL	GAL.+-	RECEIVED		DATED ORDER PLACED	SPOKE			
1/6/2019		46,243	92.3	16,811	93.4	16,991	70.8	12,441	46,244	27.80	LOSS	-					
1/22/2019	844976									47738.00	dh/cm	tk3	1/22/2019	mf			
1/22/2019	845013	47,738	92	16,816	78.5	14,147	92.3	16,775	47,738	-47738.00	dh	tk3	1/22/2019	mf			
2/3/2019		43,574	92.261	16,812	59.252	9,927	92.492	16,835	43,574	4164.50							
3/10/2019		43,483	92	16,816	59.069	9,886	92.38	16,781	43,483	90.50							
4/7/2019		43,857	92.721	16,895	58.951	9,860	94.211	17,102	43,857	-374.00		tk3 p-off	set adjustmen	t			
5/5/2019		43,900	92.997	16,944	58.98	9,867	94,134	17.089	43,900	-42.70							
6/18/2019		44,110	93.216	16,983	59.25	9,989	94,421	17,138	44,110	-209.80		tk#2 stic	k reading.prot	be out			
7/14/2019		44.052	93,366	17,008	59.04	9,880	94,576	17,164	44,052	57.50		100000		1.00012			
11/8/2019		51,590	93.336	17,008	95.5	17,418	94.576	17,164	51,590	-7538.00	DR/CM						
12/8/2019		51,300	93,048	16,948	95,496	17.351	93,631	17.001	51,300	290.20							1
				1000	1.					51299.80							
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