NORTH CAROLINA
DIVISION OF AIR QUALITY

Air Permit Review

Issue Date: October 19, 2021

Region: Winston-Salem Regional Office
County: Caswell
NC Facility ID: 1700016
Inspector's Name: To be assigned
Date of Last Inspection: N/A
Compliance Code: N/A

Facility Data

Applicant (Facility's Name): Carolina Sunrock LLC - Burlington North
Facility Address: 12971 S NC Highway 62
Burlington, NC 27127

SIC: 2951 / Paving Mixtures and Blocks
NAICS: 324121 / Asphalt Paving Mixture and Block Manufacturing
Facility Classification: Before: Permit Pending **After:** Synthetic Minor
Fee Classification: Before: N/A **After:** Synthetic Minor

Permit Applicability (this application only)

SIP: Yes
NSPS: Yes (40 CFR 60, Subparts I and OOO)
NESHAP: No
PSD: No
PSD Avoidance: Yes (SO_2)
NC Toxics: Yes (2D .1100 and 2Q .0711)
112(r): No
Other: Recycled Fuel Oil

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Scott Martino Compliance Manager (984) 202-4761 200 Horizon Drive Suite 100 Raleigh, NC 27615	Gregg Bowler CFO (919) 747-6400 200 Horizon Drive Suite 100 Raleigh, NC 27615	Scott Martino Compliance Manager (984) 202-4761 200 Horizon Drive Suite 100 Raleigh, NC 27615

Application Data

Application Number: 1700016.21A
Date Received: April 22, 2021
Application Type: Greenfield Facility
Application Schedule: State

Existing Permit Data

Existing Permit Number: N/A
Existing Permit Issue Date: N/A
Existing Permit Expiration Date: N/A

Review Engineer: Leo L. Governale, P.E. *JAH DAV*
Review Engineer's Signature:

Date: 10/19/2021

Comments / Recommendations:

Issue Permit Number: 10693R00
Permit Issue Date: October 19, 2021
Permit Expiration Date: September 30, 2029

I. PURPOSE OF APPLICATION

On April 22, 2021, WSRO-DAQ received an application package from Carolina Sunrock LLC, requesting an Air Permit for a new facility located at 12971 S NC Highway 62, Burlington, Caswell County, NC. Included in the submittal were the appropriate A, B, C and D forms along with supporting documentation and a check in the amount $400, the application fee required for a Greenfield Synthetic Minor facility. It is noted that this proposed site is located in an area without zoning; therefore, the applicant is required to publish a legal notice in accordance with 2Q .0113. The application also contained a letter that stated that a public notice was published on April 7, 2021 in the Caswell Messenger and a sign was posted on April 1, 2021. A notarized Affidavit of Publication was also included with a scanned copy of the newspaper clipping. Date-stamped photographs provided indicate that the sign was posted as required on April 1, 2021.

The contact information provided in the application was entered in the IBEAM database. Carolina Sunrock LLC is duly registered under this name with the North Carolina Secretary of State (NCSOS) – Division of Corporations and holds a current-active status, as verified by this reviewer via online search of the NCSOS database.

Application Chronology

Date	Event	Comment
April 22, 2021	Application received	Application deemed complete; clock started
June 14, 2021	Request for additional information; need completed C1 forms for Bagfilters and revised modeling analysis	Clock stopped
July 8, 2021	Additional information received	Clock restarted
August 9, 2021	Facility notified that draft permit will be noticed to the public and posted for public comment period.	Clock stopped

Application Chronology
(continued)

Date	Event	Comment
September 20, 2021	Public Hearing	Clock restarted
September 22, 2021	Public comment period ends	Clock remains on
October 19, 2021	Hearing Officer Report submitted	Clock remains on
October 19, 2021	Hearing Officer Report approval	
October 19, 2021	Permit issued	-----

II. DESCRIPTION OF BUSINESS

Information contained in the application states that this facility will include a Drum Mix Asphalt Plant (250 tons per hour maximum capacity), RAP Crushing System, and a Truck Mix Concrete Batch Plant (120 cubic yards per hour). The Permitted Emission Sources and Insignificant/Exempt Activities are listed in the following tables:

Permitted Emission Sources

Emission Source ID	Emission Source Description	Control System ID	Control System Description
One Drum Mix Asphalt Plant (250 tons per hour maximum capacity), consisting of:			
HMA-1 **(NSPS-I)**	Propane/Natural Gas/No. 2 Fuel Oil/Recycled No. 2 Fuel Oil/Recycled No. 4 Fuel Oil-fired Drum-type Hot Mix Asphalt Plant (80 million Btu per hour maximum heat input capacity)	HMA-CD1	Cyclone in series with Bagfilter (9,299 square feet of filter area)
HMA-Silo1	Hot Mix Asphalt Storage Silo (150 tons maximum capacity)	N/A	N/A
HMA-Silo2	Hot Mix Asphalt Storage Silo (150 tons maximum capacity)	N/A	N/A
HMA-Silo3	Hot Mix Asphalt Storage Silo (200 tons maximum capacity)	N/A	N/A
HMA-Silo4	Hot Mix Asphalt Storage Silo (200 tons maximum capacity)	N/A	N/A
HMA-Silo5	Hot Mix Asphalt Storage Silo (200 tons maximum capacity)	N/A	N/A
HMA-LO1	Asphalt Loadout Operation Silo 1	N/A	N/A
HMA-LO2	Asphalt Loadout Operation Silo 2	N/A	N/A
HMA-LO3	Asphalt Loadout Operation Silo 3	N/A	N/A
HMA-LO4	Asphalt Loadout Operation Silo 4	N/A	N/A
HMA-LO5	Asphalt Loadout Operation Silo 5	N/A	N/A
HMA-H1	Natural Gas/No. 2 Fuel ULSD Oil-fired Liquid Asphalt Cement Heater (1.2 million Btu per hour maximum heat input)	N/A	N/A
HMA-H2	Natural Gas/No. 2 Fuel ULSD Oil-fired Liquid Asphalt Cement Heater (1.1 million Btu per hour maximum heat input)	N/A	N/A
RAP Crushing System* consisting of:			
RAP-CRSH **[NSPS-OOO]**	RAP Impact Crusher (65 tons per hour maximum rated capacity)	N/A	N/A
RAP-CNV **[NSPS-OOO]**	Four (4) Conveyors	N/A	N/A
RAP-SCN **[NSPS-OOO]**	8' x 20' Double Deck Screen	N/A	N/A

Permitted Emission Sources
(continued)

Truck Mix Concrete Batch Plant (120 cubic yards per hour maximum capacity), consisting of:			
RM-1	Cement Storage Silo (200-ton capacity)	RMC-CD2	Bagfilter (1,433 square feet of filter area)
RM-2	Flyash Storage Silo (200-ton capacity)	N/A	N/A
RM-3	Truck Loadout Point		
RM-4	Cement/Flyash Weigh Batcher (5-ton maximum capacity)		
RM-5	Aggregate Weigh Batcher (20-ton maximum capacity)		

* According to the narrative submitted, *the RAP Crushing System will also periodically use a mobile crusher (also rated at 65 tph) which may temporarily reside at the new Burlington facility but moves from site to site. This crusher has an associated diesel-fired generator. This mobile crusher is exempt from permitting in accordance with 15A NCAC 2Q .0902, which exempts temporary crushers.* It is DAQ's policy, per the March 13, 2003 memorandum from Keith Overcash, that portable crushers are exempt from air permitting requirements.

Insignificant/Exempt Sources

Source	Exemption Regulation	Source of TAPs?	Source of Title V Pollutants?
IES-1, IES-2 - Two (2) Used Oil Storage Tanks associated with Asphalt Plant (20,000-gallon capacity, each)	2Q .0102 (g)(4)... "*storage tanks with no applicable requirements other than Stage I controls pursuant to 15A NCAC 02D .0928, Gasoline Service Stations Stage I*"	Yes	Yes
IES-3, IES-4 - Two (2) Liquid Asphalt Storage Tanks (30,000-gallon capacity, each)			
IES-5, IES-6 - Two (2) Diesel Fuel Storage Tanks associated with Asphalt Plant (20,000-gallon capacity, each)			

III. REVIEW OF REGULATIONS

The following North Carolina Administrative Code Title 15A regulations were evaluated under this review:

2D .0202 - Registration of Air Pollution Sources
2D .0501(c) - Compliance with National Ambient Air Quality Standards
2D .0503 - Particulates from Fuel Burning Indirect Heat Exchangers
2D .0506 - Particulates from Hot Mix Asphalt (HMA) Plants
2D .0510 - Particulates from Sand, Gravel, or Crushed Stone Operations
2D .0515 - Particulates from Miscellaneous Industrial Processes
2D .0516 - Sulfur Dioxide (SO_2) Emissions from Combustion Sources
2D .0521 - Control of Visible Emissions (VE)
2D .0524 - New Source Performance Standards (NSPS)
2D .0535 - Excess Emissions Reporting and Malfunctions
2D .0540 - Particulates from Fugitive Dust Emission Sources
2D .0605 - General Recordkeeping and Reporting Requirements
2D .0611 - Monitoring Emissions from Other Sources
2D .1100 - Control of Toxic Air Pollutants (TAPs)
2D .1806 - Control and Prohibition of Odorous Emissions
2Q .0304 - Zoning Specific Condition (Not Listed on Permit)
2Q .0315 - Synthetic Minor Facilities
2Q .0317 - Avoidance Condition (PSD and Toxics)
2Q .0711 - Emission Rates Requiring a Permit

CONTROL DEVICE EVALUATION
Bagfilter HMA-CD1

The proposed Bagfilter (HMA-CD1), associated with the Hot Mix Asphalt Plant (HMA-1), was evaluated using the NCDENR Bagfilter Evaluation Spreadsheet - Version 3.3, September 23, 1999 (see Attachment A1). The following table lists the characteristics based on the data provided on revised Form C1 dated July 7, 2021.

Material Controlled	Abrasive Dust
No. of Compartments	12
No. of Bags per Compartment	64
Bag Length / Bag Diameter	120 in. / 4 5/8 in.
Filter Surface Area	9,299 ft^2
Inlet Air Flow Rate:	51,111 ACFM
Air to Cloth Ratio	5.5:1
Filter Material	Aramid (Nomex)
Max. Operation Temperature	325 ^0F
Cleaning Procedure	Air Pulse
Claimed Capture Efficiency	99% for PM/PM_{10}

According to the spreadsheet, the filtering velocity of 5.5 fpm does not exceed the typical filtering velocity of 10.0 fpm and the filter fabric is appropriate for both the maximum operating temperature and chemical resistance to acids, alkalis, and organics. Also, the control efficiency as stated in the application seems reasonable, so the Bagfilter was assessed as an adequate control device. Pursuant to 15A NCAC 02Q .0112, the technical portions of the permit application related equipment controlling emissions of particulate matter with air flow rates of greater than 10,000 actual cubic feet per minute are required to be sealed by a licensed Professional Engineer (P.E.). This certification was provided on Application Form D5, bearing the seal and signature of Aimee L. Andrews, P.E., NC Professional Engineer No. 029987.

Bagfilter RMC-CD2

The proposed Bagfilter (RMC-CD2), associated with the Concrete Batch Plant, was evaluated using the NCDENR Bagfilter Evaluation Spreadsheet - Version 3.3, September 23, 1999 (see Attachment A2). The following table lists the characteristics based on the data provided on revised Form C1 dated July 7, 2021.

Material Controlled	Cement/Fly Ash
No. of Compartments	1
No. of Bags per Compartment	72
Bag Length / Bag Diameter	114 in. / 8 in.
Filter Surface Area	1,433 ft^2
Inlet Air Flow Rate:	6,500 ACFM
Air to Cloth Ratio	4.54:1
Filter Material	Felt Polyester (Dacron)
Max. Operation Temperature	70 ^0F
Cleaning Procedure	Air Pulse
Claimed Capture Efficiency	99% for PM/PM_{10}

According to the spreadsheet, the filtering velocity of 4.5 fpm does not exceed the typical filtering velocity of 8.0 fpm and the filter fabric is appropriate for both the maximum operating temperature and chemical resistance to acids, alkalis, and organics. Also, the control efficiency as stated in the application seems reasonable, so the Bagfilter was assessed as an adequate control device. It is noted that, because the air flow rate does not exceed 10,000 ACFM, a P.E. seal is not required.

2D .0202 – Registration of Air Pollution Sources

This regulation allows the Director to require a facility to report, as in this case, total weights and kinds of air pollution released as well as any other information considered essential in evaluating the potential of the source to cause air pollution. In accordance with this regulation, the facility will be required to submit a CY 2028 Emissions Inventory at least ninety (90) days prior to September 30, 2029, which is the expiration date of this Air Permit.

It is reasonable to anticipate compliance.

2D .0501(c) - Compliance with National Ambient Air Quality Standards

In addition to any control or manner of operation necessary to meet emission standards in 2D .0500, any source of air pollution shall be operated with such control or in such manner that the source shall not cause the ambient air quality standards pursuant to 2D .0400 to be exceeded at any point beyond the premises on which the source is located. When controls more stringent than those named in the applicable emission standards in this Section are required to prevent violation of the ambient air quality standards or are required to create an offset, the permit shall contain a condition requiring these controls.

A sitewide National Ambient Air Quality Standards (NAAQS) dispersion modeling analysis was reviewed by Matthew Porter, Meteorologist, Air Quality Analysis Branch (AQAB), based on information submitted by the Permittee on March 2, 2021, and revised March 10, 2021. The dispersion modeling analysis was conducted to evaluate the combined criteria air pollutant ambient impacts from all operations located at the site, which included emissions from the proposed construction and operation of a hot mix asphalt plant and concrete batch plant. Sitewide criteria pollutants including particulate matter (PM, $PM_{2.5}$ and PM_{10}), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2) were modeled for comparison with the NAAQS. Subsequently, Mr. Porter issued a memorandum, dated March 23, 2021, stating that the sitewide dispersion modeling analysis of criteria air pollutant emissions adequately demonstrated compliance with the NAAQS, on a source-by-source basis. The maximum modeled impacts are provided in following table.

Pollutant	Averaging Period	NAAQS (µg/m3)	Background Concentration (µg/m3)	Modeled Impact (µg/m3)	Total Impact (µg/m3)	% of NAAQS
PM	24-hour	150	--	145.32	145.32	97%
	Annual	75	--	27.36	27.36	36%
PM_{10}	24-hour	150	17	54.48	71.48	48%
$PM_{2.5}$	24-hour	35	15	8.80	23.80	68%
	Annual	12	7.3	1.35	8.65	72%
SO_2	1-hour	196	83.8	39.87	123.67	63%
NO_2	1-hour	188	15.3	129.73	145.03	77%

The following requirements will be placed in the permit under this condition:

Placement of the emission sources, configuration of the emission points, and operation of the sources shall be in accordance with the submitted sitewide NAAQS dispersion modeling analysis and should reflect the modeling analysis that was approved by the DAQ Air Quality Analysis Branch (AQAB) on March 23, 2021.

a. Production Limitations - To ensure compliance with 2D.0501(c), the Permittee shall operate the modeled sources in accordance with the operating restrictions presented in 2Q .0315 Synthetic Minor condition, below.

b. Water Truck – An operable water truck shall be available on site at all times while the plant is operating. The roads and front end loader work area shall be adequately maintained by wet suppression to minimize fugitive emissions.

2D .0503 – Particulates from Fuel Burning Indirect Heat Exchangers

This regulation applies to the two (2) Natural Gas/No. 2 Fuel ULSD Oil-fired Asphalt Cement Heaters (HMA-H1 and HMA-H2), and it limits particulate emissions according to the following equation:

$$E = 1.09 \times Q^{-0.2594}$$

where: **E** = allowable emission limit for particulate matter in lb./MMBtu
Q = maximum total heat input of all fuel burning indirect heat exchangers in MMBtu/hr.,
except where the maximum total heat input is ≤ 10 MMBtu/hr., as in this case, then **E** = 0.60 lb./MMBtu

Using the AP-42 emission factor for Fuel Oil – Tables 1.3-1 and 1.3-2, rev 5/10, and Natural Gas – Table 1.4-2, rev 7/98, the actual emissions rates are calculated as follows:

$$E_{actual\ -\ Natural\ Gas} = 7.6 \text{ lb. } PM_{total}/10^6 \text{ scf} / 1{,}020 \text{ MMBtu}/10^6 \text{ scf} = 0.007 \text{ lb. PM/MMBtu}$$

$$E_{actual\ -\ No.\ 2\ Fuel\ Oil} = (2 \text{ lb. } PM_{filterable} + 1.3 \text{ lb. } PM_{condensable})/10^3 \text{ gallons} / 140 \text{ MMBtu}/10^3 \text{ gallons} = 0.024 \text{ lb. PM/MMBtu}$$

0.007; 0.024 lb. PM/MMBtu < 0.60 lb. PM/MMBtu → O.K.

Based on the foregoing, actual emissions for combustion of No. 2 Fuel ULSD Oil and Natural Gas are less than the allowable emissions limit; therefore, compliance is demonstrated.

2D .0506 – "Particulates from Hot Mix Asphalt Plants"

This regulation is applicable to both filterable and condensable particulate emissions from the plant. It limits the allowable particulate matter emissions from Hot Mix Asphalt Plants as calculated by the following equations:

$E = 4.9445(P)^{0.4376}$ if **P** < 300 tons/hr.
$E = 60.00$ if **P** ≥ 300 tons/hr.

where: **P** = the process rate in tons/hr.
E = the maximum allowable emission rate for PM in lb./hr.

Since the permitted process rate is 250 tons per hour, this plant's allowable PM emission rate is calculated as follows:

$$E = 4.9445(250)^{0.4376} = 55.4 \text{ lb. PM/hr.}$$

Using AP-42 emission factor for Drum Mix Asphalt Plants (Table 11.1-3, 3/04), the emission factor total PM for a Drum Mix HMA plant controlled by a fabric filter is 0.033 lb. PM/ton of asphalt; therefore, the actual expected PM emission rate is calculated as follows:

PM = 0.033 lb. PM/ton x 250 ton/hr. = 8.25 lb. PM/hr.

8.25 lb. PM/hr. < 55.4 lb. PM/hr. → O.K.

Also, this regulation requires that visible emissions from stacks or vents at a HMA plant shall be less than 20% opacity when averaged over a six-minute period and that fugitive dust shall be controlled as required by 2D .0540 (discussed below). A source test on the Drum-type Hot Mix Asphalt Plant (HMA-1) controlled by a Bagfilter (HMA-CD1) will be required within 60 days after achieving the maximum production rate at which the affected source(s) will be operated, but not later than 180 days after the initial start-up of the affected source(s), the Permittee shall conduct the required performance test(s) to verify compliance with this rule and Subpart I. See 2D .0605 of this review for more details regarding testing. Per the Memorandum "Hot Mix Asphalt Plant Performance Testing/Emission Testing Frequency" issued August 13, 2013, by Sheila Holman, former DAQ Director, the facility must test for compliance at least once every ten (10) years. If the emission sources operate according to manufacturer specifications and with the permitted bagfilter, the sources should be in compliance with this regulation.

2D .0510 – Particulates from Sand, Gravel, or Crushed Stone Operations

This facility, engaging in sand, gravel, recycled asphalt pavement (RAP), or crushed stone operations, must not cause, allow, or permit any material to be produced, handled, transported, or stockpiled without taking measures to reduce to a minimum any particulate matter from becoming airborne. This is in order to prevent exceeding the ambient air quality standards beyond the property line for particulate matter. Fugitive dust shall be controlled as required by 2D .0540 as discussed below. Process generated emissions from crushers, conveyors, screens, and transfer points shall be controlled so that opacity standards required by 2D .0521 and 2D. 0524, as applicable, are not exceeded. It seems reasonable to anticipate compliance.

2D .0515 – Particulates from Miscellaneous Industrial Processes

This rule is applicable to particulate matter (PM) emissions from all Concrete Batch Plant sources at this facility and it limits the allowable PM emissions as derived by the following equations:

$$E = 4.10\ (P)^{0.67} \qquad \text{if } P \leq 30 \text{ tons per hour}$$

or

$$E = 55.0\ (P)^{0.11} - 40 \qquad \text{if } P > 30 \text{ tons per hour}$$

where: **P** = the process rate in tons per hour, and
E = maximum allowable emission rate of PM in pounds per hour

Expected actual controlled emission rates were calculated using the NCDENR Concrete Batch Plant Emissions Calculator Spreadsheet, Revision D - October 15, 2015. The process weight rates for the Cement Silo and Flyash Silo were taken from information provided with the application. Process weight rates for the Truck Loadout Point, Cement/Flyash Weigh Batcher and Aggregate Weigh Batcher were calculated by this reviewer as indicated in the table footnotes. The following table indicates that the facility can comply with this rule when the Bagfilter (RMC-CD2) is installed and properly operated and maintained on the respective emission sources.

Emission Source (ID No.)	Process Weight Rate (P) [tons/hr.]	Allowable Emissions Rate (E) 2D .0515 Limit [lb. PM/hr.]	Expected Controlled Actual Emissions Rate[5] [lb. PM/hr.]	Expected Uncontrolled Actual Emissions Rate [lb. PM/hr.]
Cement Silo (RM-1)	40.00[1]	42.53	0.027	27.00[7]
Flyash Silo (RM-2)	50.00[1]	44.58	0.079	79.0[7]
Truck Loadout Point (RM-3)	240.96[2]	60.55	1.001	52.21[7]
Cement/Flyash Weigh Batcher (RM-4)	35.76[3]	41.51	1.001[6]	52.21[7]
Aggregate Weigh Batcher (RM-5)	205.20[4]	58.78	N/A	0.985[8]

[1] Taken from information provided with the application and as shown on the NCDENR Spreadsheet.
[2] 120 yd^3/hr. × (448 lb. Cement/yd^3 + 148 lb. Flyash/yd^3 + 1,980 lb. Coarse Aggregate/yd^3 + 1,440 lb. Sand/yd^3) ÷ 2,000 lb./ton = 240.96 ton/hr.
[3] 120 yd^3/hr. × (448 lb. Cement/yd^3 + 148 lb. Flyash/yd^3) ÷ 2,000 lb./ton = 35.76 ton/hr.
[4] 120 yd^3/hr. × (1,980 lb. Coarse Aggregate/yd^3 + 1,440 lb. Sand/yd^3) ÷ 2,000 lb./ton = 205.20 ton/hr.
[5] From the NCDENR Spreadsheet. Aggregate Weigh Batcher emissions are uncontrolled.
[6] As noted in the spreadsheet *"Truck/Central Mix emission factors include emissions from cement and supplement weigh hoppers,"* and so, to be conservative, the Cement/Flyash Weigh Batcher emission rate is shown the same as the Truck Loadout emission rate.
[7] From NCDENR Concrete Batch Emissions Calculator Spreadsheet – Revision D, October 15, 2015.
[8] 205.20 tons/hr. x 0.0048 lb. PM/ton (uncontrolled PM emission factor from AP-42 Table 11.12-2) = 0.985 lb. PM/hr.

2D .0516 – Sulfur Dioxide Emissions from Combustion Sources

This regulation applies to the Propane/Natural Gas/No. 2 Fuel Oil/Recycled No. 2 Fuel Oil/Recycled No. 4 Fuel Oil-fired Drum-type Asphalt Plant (HMA-1) and the two (2) Natural Gas/No. 2 ULSD Fuel Oil-fired Asphalt Heaters (HMA-H1 and HMA-H2), and it limits the emissions of sulfur dioxide (SO_2) from any source of combustion that is discharged from any vent, stack, or chimney to 2.3 lb. SO_2 /MMBtu input.

For the drum dryer/mixer associated with the Asphalt Plant (HMA-1), the SO_2 emission rate is equal to 0.0003 lb./MMBtu when combusting Natural Gas, 0.253 lb./MMBtu when combusting No. 2 Fuel Oil, and 0.262 lb./MMBtu when combusting No. 4 Fuel Oil, as demonstrated below. It is assumed that No. 4 Fuel Oil has the same emission factor as Waste Oil and the emission factor for Propane is similar to that for Natural Gas.

Natural Gas (AP-42, Table 11.1-7)
SO_2 = 0.0001 lb./ton of asphalt produced × 250 ton/hr. ÷ 80 MMBtu/hr. = 0.0003 lb./MMBtu < 2.3 lb./MMBtu → O.K.

No. 2 Fuel Oil - 0.50% sulfur (NCDENR Asphalt Emissions Calculator Spreadsheet Revision G, 08/30/2019)
SO_2 = 0.0811 lb./ton of asphalt produced × 250 ton/hr. ÷ 80 MMBtu/hr. = 0.253 lb./MMBtu < 2.3 lb./MMBtu → O.K.

No. 4 Fuel Oil - 0.50% sulfur (NCDENR Asphalt Emissions Calculator Spreadsheet Revision G, 08/30/2019)
SO_2 = 0.0837 lb./ton of asphalt produced × 250 ton/hr. ÷ 80 MMBtu/hr. = 0.262 lb./MMBtu < 2.3 lb./MMBtu → O.K.

For the two (2) Natural Gas/No. 2 Fuel Oil-fired Asphalt Heaters (HMA-H1 and HMA-H2), the SO_2 emission rate is equal to 0.00059 lb./MMBtu when combusting Natural Gas and 0.00152 lb./MMBtu when combusting No. 2 ULSD Fuel Oil as demonstrated below. The first equation assumes the sulfur content of Natural Gas is 2,000 grains/10^6 scf, and the average heating value of Natural Gas is 1,020 Btu/scf. The second equation assumes a No. 2 ULSD Fuel Oil sulfur content (S) of 0.0015% by weight, and the average heating value of No. 2 Fuel Oil is 140,000 Btu/gal. Compliance is demonstrated.

Natural Gas (AP-42, Table 1.4-2)
SO_2 = 0.6 lb./10^6 scf × (10^6 scf/1,020 MMBtu) = 0.00059 lb./MMBtu < 2.3 lb./MMBtu → O.K.

No. 2 Fuel Oil (AP-42, Table 1.3-1)
SO_2 = 142×S (S = 0.0015) lb./10^3 gal × (10^3 gal/140 MMBtu) = 0.00152 lb./MMBtu < 2.3 lb./MMBtu → O.K.

2D .0521 - Control of Visible Emissions

This rule applies to all fuel burning operations and industrial processes where visible emissions can reasonably be expected to occur and limits visible emissions to 40% opacity for sources manufactured as of July 1, 1971 and to 20% opacity for sources manufactured after July 1, 1971, when averaged over a six-minute period. The visible emissions from the Drum-mix Hot Mix Asphalt Plant (HMA-1) is subject to both 2D .0506 and 2D .0524, and the RAP Operations are subject to 2D .0524. Therefore, this rule regulates visible emissions from the rest of the emission sources. Because all sources are new, it is reasonable to assume that they were manufactured after July 1, 1971, and so the 20% opacity limit applies. Compliance is expected with proper operation and maintenance of the subject equipment and associated control devices, where applicable.

2D .0524 – New Source Performance Standards (NSPS)

This facility is subject to **40 CFR Part 60, Subpart I – "Standards of Performance for Hot Mix Asphalt Plants,"** and it applies to particulate emissions from hot mix asphalt facilities that commence construction or modification after June 11, 1973, as in this case. Within 15 days after start-up of the HMA plant, the Permittee is required to notify the DAQ of the start-up date in writing. The facility shall not discharge into the atmosphere from the affected source any gases which contain particulate matter in excess of 90 mg/dscm (0.04 gr/dscf) or exhibit 20% opacity or greater. A source test on the HMA plant (HMA-1), controlled by a Bagfilter (HMA-CD1) will need to be conducted to determine the HMA plant's particulate matter and visible emissions. See 2D .0605 below for additional details regarding testing. It is reasonable to anticipate compliance.

The facility is also subject to **40 CFR 60, Subpart OOO for "Nonmetallic Mineral Processing Plants."** This rule applies to each crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, storage bin, enclosed truck, or railcar loading station (sources) at fixed or portable nonmetallic mineral processing plants that commenced construction, reconstruction, or modification after August 31, 1983, except, in part, to fixed plants with capacities of 25 tons per hour or less or portable plants with capacities of 150 tons per hour or less. Also, crushers and grinding mills at hot mix asphalt facilities that reduce the size of nonmetallic minerals embedded in recycled asphalt pavement and subsequent affected facilities up to, but not including, the first storage silo or bin are subject to the provisions of this Subpart. Therefore, the RAP Crushing System, comprising of the Crusher, four (4) Conveyors, and a Screen (RAP-CRSH, RAP-CNV, and ES-SCN, respectively), is subject to this rule. Within 15 days after start-up of each source, the facility is required to notify the DAQ of the start-up date in writing. For affected sources that commenced construction, modification, or reconstruction after August 31, 1983, but before April 22, 2008, visible emissions are limited to 15% opacity for crushers and 10% opacity for fugitive emissions from conveyor belts, screening operations, and other affected sources.

For sources constructed, modified, or reconstructed on or after April 22, 2008, visible emissions are limited to 12% opacity for crushers and 7% opacity for fugitive emissions from conveyor belts, screening operations, and other affected sources. Monthly inspection requirements apply for affected sources that were constructed on or after April 22, 2008, and that use wet suppression to control emissions. A source test using EPA Method 9 on the crusher, screen, and conveyor will need to be conducted to determine their compliance with the respective opacity limits. It is reasonable to anticipate compliance.

2D. 0535 – Excess Emissions Reporting and Malfunctions

This facility is subject to this regulation. In accordance with section (f) of this rule, the Permittee must notify DAQ in the event of a source of excess emissions that last for more than four (4) hours and that result from a malfunction, a breakdown of process or control equipment, or any other abnormal conditions. It is reasonable to anticipate compliance.

2D .0540 – Particulates from Fugitive Dust Emission Sources

This facility is subject to this regulation. It applies to particulate emissions that do not pass through a process stack or vent and are generated within plant property boundaries. If fugitive dust emissions cause excessive visible emissions beyond property boundaries, or cause substantive complaints, the Director may require the facility to develop, implement, and comply with a fugitive dust control plan. It is reasonable to anticipate compliance.

2D .0605 – General Recordkeeping and Reporting Requirements

This rule allows the DAQ to require any monitoring, recordkeeping, reporting, or testing it deems necessary for the facility to demonstrate compliance with an emission standard or permit condition. As mentioned previously, a memorandum titled "Hot Mix Asphalt Plant Performance Testing/Emission Testing Frequency" was issued August 13, 2013, by Sheila Holman, former DAQ Director. This requires all hot mix asphalt plants to test for compliance with 2D .0506 at least once every 10 years. The results also happen to reinforce compliance with 2D .0524 (NSPS Subpart I). The stack testing is for filterable and condensable particulate matter using EPA Methods 5 and 202, respectively. Additionally, EPA Method 9 is required for visible emissions from the HMA plant, as this is the initial test. The tests must be conducted within 60 days after achieving the maximum production rate at which the affected source(s) will be operated, but not later than 180 days after the initial start-up of the affected source(s), the Permittee shall conduct the required performance test(s) and submit two copies of a written report of the test(s) to the Regional Supervisor, DAQ. The facility must test while combusting the fuel that will be utilized for the majority of the operating time. In accordance with 2D .2602, a testing protocol must be provided to DAQ prior to testing. Protocols are not required to be approved before the test date, but those that are received at least 45 days prior to the test date will be reviewed. The facility must provide at least 30 days notice in written form of any required performance testing, to provide DAQ the opportunity to have an observer present. It is reasonable to anticipate compliance.

2D .0611 – Monitoring Emissions from Other Sources

This rule applies to the Cyclone in series with Bagfilter (HMA-CD1) associated with the Drum Mix Asphalt Plant and Bagfilter (RMC-CD2) associated with the Truck Mix Concrete Batch Plant. It allows the Director to require the facility to conduct monitoring in order to demonstrate compliance with rules in Subchapters 2D and 2Q and is the basis for requiring control device inspections in the Air Permit. This facility will be required to perform periodic inspections and maintenance (I&M) as recommended by the manufacturer. At a minimum, this facility will be required to perform an annual internal inspection of each bagfilter. Records of all inspections and maintenance with dates and descriptions should be kept in a log book (written or electronic format) located on-site. This log book should be made available to DAQ personnel upon request. It is reasonable to anticipate compliance.

2D .1100 – Control of Toxic Air Pollutants (TAPs)

A toxics review has been triggered because the HMA plant and associated sources will emit toxic air pollutants (TAPs). The facility modeled for Arsenic, Benzene, Formaldehyde, Mercury, and Nickel due to expected actual emissions of these TAPs being above their respective toxic permit emission rates (TPERs) listed at 2Q .0711. The sources of these TAP emissions are the HMA Plant (HMA1), the five (5) HMA Storage Silos (HMA-Silo1 through HMA-Silo5), the Asphalt Loadout Operations (HMA-LO1 through HMA-LO5), the two (2) Asphalt Cement Heaters (HMA-H1 and HMA-H2), and the Concrete Batch Plant. Note that the heaters cannot be exempt from toxics per 2Q .0702 (a)(18), because they are combustion sources permitted after July 10, 2010. TAPs are also expected to be emitted from the exempt storage tanks containing No. 4/Used Oil/Diesel Fuel[1] (IES-1, IES-2 and IES-3) and Liquid Asphalt[2] (IES-4 and IES-5), but these sources currently qualify for exemption from toxics rules per 2Q .0702 (a)(19)(B) for *"storage tanks used only to store: fuel oils [...] or petroleum products with a true vapor pressure (TVP) less than 1.5 pounds per square inch absolute."*

On July 27, 2021, Nancy Jones, Meteorologist, Air Quality Analysis Branch (AQAB) issued a Memorandum regarding the analysis stating that "*The purpose for modeling was to demonstrate compliance with guidelines specified in 15A NCAC 2D .1104 for Toxic Air Pollutants (TAPs) emitted in excess of the Toxic Permitting Emission Rates (TPERs) listed in 15A NCAC 2Q .0711. The modeling adequately demonstrates compliance, on a source-by-source basis, for all toxics modeled.*"

[1] Distillate Fuel Oil has a TVP of 0.062 kPa (0.0090 psi) at 700 F (AP-42 7.1, Organic Liquid Storage Tanks, rev. 11/06, Table 7.1-2).

[2] Liquid Asphalt has a TVP less than 0.12 kPa (0.017 psi) at 325° F (AP-42 11.1 HMA plants, background document, 2/2004, p. 4-82).

The following table illustrates the maximum impacts from the modeling:

Maximum Modeled TAP Impacts

TAP	Averaging Period	AAL [µg/m³]	AAL [%]
Arsenic	Annual	0.0021	5
Benzene		0.12	10
Formaldehyde	1-hr	150	4
Mercury	24-hr	0.60	<1
Nickel		6	1

TAP Emission Limits

Emission(s) Source	TAP (CAS #)	Emission Limit
Propane/Natural Gas/No. 2 Fuel Oil/Recycled No. 2 Fuel Oil/Recycled No. 4 Fuel Oil-fired Drum-type Hot Mix Asphalt Plant Baghouse (HMA-CD1)	Arsenic unlisted compounds (ASC-other)	1.23 lb./yr.
	Benzene (71-43-2)	854.0 lb./yr.
	Formaldehyde (50-00-0)	0.775 lb./hr.
	Mercury vapor (7439-97-6)	0.0156 lb./24-hr
	Nickel metal (7440-02-0)	0.379 lb./24-hr
Truck Mix Concrete Batch Plant Bagfilter (RMC-CD2)	Arsenic unlisted compounds (ASC-other)	0.577 lb./yr.
	Nickel metal (7440-02-0)	0.00462 lb./24-hr
Natural Gas/No. 2 Fuel Oil-fired Asphalt Cement Heater (HMA-H1)	Arsenic unlisted compounds (ASC-other)	0.042 lb./yr.
	Benzene (71-43-2)	0.206 lb./yr.
	Formaldehyde (50-00-0)	0.000411 lb./hr.
	Mercury vapor (7439-97-6)	0.0000864 lb./24-hr
	Nickel metal (7440-02-0)	0.0000864 lb./24-hr
Natural Gas/No. 2 Fuel Oil-fired Asphalt Cement Heater (HMA-H2)	Arsenic unlisted compounds (ASC-other)	0.0385 lb./yr.
	Benzene (71-43-2)	0.189 lb./yr.
	Formaldehyde (50-00-0)	0.000377 lb./hr.
	Mercury vapor (7439-97-6)	0.0000792 lb./24-hr
	Nickel metal (7440-02-0)	0.0000792 lb./24-hr
Five (5) Hot Mix Asphalt Storage Silos (HMA-Silo 1 through HMA-Silo 5)	Benzene (71-43-2)	8.54 lb./yr.
	Formaldehyde (50-00-0)	0.021 lb./hr.
Five (5) Asphalt Loadout Operation Silos (HMA-LO1 through HMA-LO5)	Benzene (71-43-2)	4.73 lb./yr.
	Formaldehyde (50-00-0)	0.000915 lb./hr.

Compliance with the above is demonstrated by complying with the Synthetic Minor limits noted under 2Q .0315 below. The heights and geodetic positions of the stacks and release points, as specified in the modeling and contained in this permit condition, shall remain unchanged. It is reasonable to anticipate compliance.

2D .1806 – Control and Prohibition of Odorous Emissions

This rule requires the facility to utilize management practices or odor control equipment sufficient to prevent odorous emissions from causing or contributing to objectionable emissions beyond the facility's boundaries. It is reasonable to anticipate compliance.

2Q .0304 – Zoning Specific Condition

This regulation is the basis for requesting that, prior to construction or operation of the facility under this permit, as prescribed by NCGS 143-215.108(f), *"An applicant for a permit under this section for a new facility or for the expansion of a facility permitted under this section shall request each local government having jurisdiction over any part of the land on which the facility and its appurtenances are to be located to issue a determination as to whether the local government has in effect a zoning or subdivision ordinance applicable to the facility and whether the proposed facility or expansion would be consistent with the ordinance."* As mentioned under Section I. of this review, this site is located in an area without zoning and the Applicant was required to publish a legal notice pursuant to 15A NCAC 02Q .0113. On Aril 7, 2021, the required legal notice was published in The Caswell Messenger, a local publication that services the area of the proposed facility. In addition, a sign was posted on the property on April 1, 2021. Since the facility completed all of the tasks that are required by 15A NCAC 02Q .0113, a permit condition for this rule will not appear in the permit.

2Q .0315 - Synthetic Minor Facilities

The facility is subject to this rule. It allows the facility to choose to have terms and conditions placed in their permit to restrict operation to limit the potential for the facility to emit in order to avoid Title V applicability and thus be classified as a Synthetic Minor facility. The facility has the potential without controls and limits to emit more than 100 tons of CO and SO_2 each per year. To ensure that the facility emits less than 100 tons of CO and SO_2 per year, the Permittee has requested via the application that production be limited to 500,000 tons of asphalt per consecutive 12-month period (see Attachment B for an excerpted copy of the application narrative requesting this production limit). According to the DAQ Asphalt Emissions Calculator Spreadsheet, Revision G – 08/30/2019 (Attachment E1), and based on a maximum annual asphalt production of 500,000 tons per year and a fuel sulfur content of 0.5% for Recycled No. 4 Fuel Oil (worst case), this facility would remain under the Synthetic Minor limits for SO_2 and CO of 100 tons per year, each. Therefore, the requested annual production limit is acceptable. This production limit will be placed in the permit under the Synthetic Minor condition.

The Permittee will be required to record monthly and total annually the amount of asphalt produced and keep fuel supplier certifications on-site and made available to DAQ personnel upon request. Within 30 days after each calendar year, regardless of actual emissions, the following data, including monthly and 12-month totals for the previous 12-month totals, should be reported to the Regional Supervisor: CO and SO_2 emissions, monthly asphalt production, and a summary of the sulfur content of the fuel oils from the fuel certification records for the previous 12 months. It is noted that the above production limit is required only to keep CO emissions below 100 tons per year. Compliance with SO_2 emission limitations is achieved by burning No. 2 Fuel Oil with a maximum sulfur content of 0.5%. It is reasonable to anticipate compliance.

2Q .0317 – Avoidance Conditions (2D .0530 PSD – Sulfur Dioxide)

This facility has the potential to emit more than 250 tons per year of sulfur dioxide (SO_2) emissions before controls and limits (see SECTION V. FACILITY-WIDE EMISSIONS). Compliance with the SO_2 emissions limit set forth under 2Q .0315 above ensures compliance with this regulation and will make the facility minor for PSD. Nonetheless, a PSD avoidance condition will be placed in this permit.

2Q .0317 – Avoidance Conditions (2Q .0700 – Recycled Fuel Oil)

This facility is subject to this rule for the avoidance of 2D .0530 "Prevention of Significant Deterioration" as previously mentioned above. It is also subject to this rule for the avoidance of 2Q .0700 "Toxic Air Pollutant Procedures" due to the use of recycled No. 2 and No. 4 fuel oils. The recycled fuel oil must be equivalent to its virgin counterpart. This can be met by following the allowable levels for arsenic, cadmium, chromium, lead, total halogens, flash point, sulfur, and ash as listed in the permit condition. The facility must record and maintain for a minimum of three (3) years the actual amount of recycled fuel oil delivered to and combusted on an annual basis. Each load received shall include a delivery manifest, a batch specific analytical report, batch signature information, and a certification indicating there were no detectable PCBs (<2ppm). It is reasonable to anticipate compliance.

2Q .0711 – Emission Rates Requiring a Permit (Toxics)

As previously discussed under 2D .1100, a toxics review has been triggered for this facility for certain TAP (i.e., Arsenic, Benzene, Formaldehyde, Mercury, and Nickel) because they are expected to be emitted above their respective toxic permit emission rates (TPER).

In addition, this facility will emit additional TAP as shown in the table below that are not expected to be emitted above their respective TPER.

This facility must be operated and maintained so that any toxic air pollutant (TAP) emitted does not exceed its respective toxic permit emission rate (TPER). Prior to exceeding any TPER, the facility must modify their air quality permit. The Permittee shall maintain records of operational information demonstrating that the TAP emissions do not exceed the TPERs. A toxics review has been triggered for this initial review for the emissions of TAPs listed in the table below due to the new HMA and Concrete Batch plants. The Hot Mix Asphalt Plant (HMA-1), the five HMA Storage Silos (HMA-Silo 1 through HMA-Silo 5) and five (5) Asphalt Loadout Operation Silos (HMA LO1 through HMA-LO5-5), the two (2) Asphalt Cement Heaters (HMA-H1 and HMA-H2), and the Concrete Batch Plant will be sources of these TAPs. The expected potential controlled emission rates of these TAPs were calculated using the NCDEQ Concrete Batch Plant, Asphalt, and Fuel Oil Combustion spreadsheets (Attachments C, D, E2 and E3) and the submitted spreadsheets. Expected potential controlled emission rates for the HMA plant are based on either Natural Gas or No. 4/No. 6 Fuel Oil combustion, to obtain the worst-case TAP emissions, and 500,000 tons of asphalt production per year. These emission rates will not exceed the TPERs as demonstrated below. It is reasonable to anticipate compliance.

Expected Potential Controlled Emission Rates

Toxic Air Pollutant (CAS #)	TPER per 2Q .0711(a)	Expected Potential Controlled Emission Rate
Acetaldehyde (75-07-0)	6.8 lb./hr.	0.325 lb./hr.
Acrolein (107-02-8)	0.02 lb./hr.	0.0065 lb./hr.
Ammonia (as NH3) (7664-41-7)	0.68 lb./hr.	0.00717 lb./hr.
Benzo(a)pyrene (Component of 83329/POMTV & 56553/7PAH) (50-32-8)	2.2 lb./yr.	0.0088 lb./yr.
Beryllium Metal (7440-41-7)	0.28 lb./yr.	0.10 lb./yr.
Cadmium metal (7440-43-9)	0.37 lb./yr.	0.27 lb./yr.
Carbon disulfide (75-15-0)	3.9 lb./day	0.015 lb./day
Chromium (VI) Soluble Chromate Compounds (Component of CRC) (SolCR6)	0.013 lb./day	0.0067 lb./day
Fluorides (16984-48-8)	0.34 lb./day 0.064 lb./hr.	0.0147 lb./day 0.00061 lb./hr.
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (57653- 85-7)	0.0051 lb./yr.	6.50×10^{-7} lb./yr.
Hexane, n- (110-54-3)	23 lb./day	5.74 lb./day
Hydrogen sulfide (7783-06-4)	1.7 lb./day	0.328 lb./day
MEK (methyl ethyl ketone, 2-butanone) (78-93-3)	78 lb./day 22.4 lb./hr.	0.161 lb./day 0.0067 lb./hr.
Manganese unlisted compounds (MNC)	0.63 lb./day	0.0645 lb./day
Methyl chloroform (71-55-6)	250 lb./day 64 lb./hr.	0.288 lb./day 0.012 lb./hr.
Methylene chloride (75-09-2)	1,600 lb./yr. 0.39 lb./hr.	0.0165 lb./yr. 8.23×10^{-6} lb./hr.
Perchloroethylene (tetrachloroethylene) (127-18-4)	13,000 lb./yr.	0.160 lb./yr.
Phenol (108-95-2)	0.24 lb./hr.	0.0010 lb./hr.
Styrene (100-42-5)	2.7 lb./hr.	0.00024 lb./hr.

Expected Potential Controlled Emission Rates (continued)

Toxic Air Pollutant (CAS #)	TPER per 2Q .0711(a)	Expected Potential Controlled Emission Rate
Tetrachlorodibenzo-p-dioxin 2,3,7,8 (1746-01-6)	0.00020 lb./yr.	1.05×10^{-7} lb./yr.

Toluene (108-88-3)	98 lb./day 14.4 lb./hr.	17.53 lb./day 0.73 lb./hr.
Xylene (mixed isomers) (1330-20-7)	57 lb./day 16.4 lb./hr.	1.45 lb./day 0.0604 lb./hr.

IV. NEW SOURCE PERFORMANCE STANDARDS (NSPS) / NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP) / PREVENTION OF SIGNIFICANT DETERIORATION (PSD) / EPA SECTION 112r / ATTAINMENT/NON-ATTAINMENT STATUS

- **NSPS APPLICABILITY** - As discussed in Section III. under 2D .0524, the facility **is** subject to 40 CFR 60 Subpart I – "Standards of Performance for Hot Mix Asphalt Facilities" and Subpart OOO for "Nonmetallic Mineral Processing Plants."

  The two Asphalt Cement Heaters (HMA-H1 and HMA-H2) **are not** subject to 40 CFR Part 60, Subpart Dc because the maximum heat input of each is less than 10 million Btu per hour.

  The insignificant aboveground storage tanks containing fuel oil and liquid asphalt (IES-1, IES-2, IES-4 and IES-5) are not subject to 40 CFR Part 60, Subpart Kb, because fuel oil has a true vapor pressure (TVP) less than 0.062 kilopascals (kPa), or 0.0090 psi, at 70^0 F. (AP-42 7.1, Organic Liquid Storage Tanks, rev. 11/06, Table 7.1-2), and liquid asphalt has a TVP of 0.12 kPa (0.017 psi) at 325 °F (AP-42 11.1 HMA plants, background document, 2/2004, p. 4-82).

- **NESHAP APPLICABILITY** - This facility **is not** subject to any current NESHAP regulation.

  The two Asphalt Cement Heaters (HMA-H1 and HMA-H2) **are not** subject to 40 CFR 63 Subpart JJJJJJ for Industrial, Commercial, and Institutional Boilers at Area Sources. This rule defines boilers as "an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam or hot water." These heaters are not considered boilers as defined by this rule, i.e., it is not used to create steam, and so this rule **does not** apply.

  The facility **is not** subject to 40 CFR 63 Subpart LLLLL - National Emission Standards for Hazardous Air Pollutants: Asphalt Processing and Asphalt Roofing Manufacturing. This facility is not defined as an asphalt processing plant or asphalt roofing manufacturer in this Subpart, and is classified as minor for HAP emissions, and so this rule **does not** apply.

- **PSD APPLICABILITY** - As discussed in Section III. under 2Q .0317, this facility has the potential to emit greater than 250 tons per year (after controls) of a criteria pollutant (SO_2) but has a permit condition under rule 2Q .0317 so that it can be considered minor for PSD purposes. This facility is not one of the twenty-eight named PSD source categories limited to 100 tons per year (after controls) of any criteria pollutant. Caswell County has not yet triggered a PSD baseline date. Therefore, increment tracking is not required.

- **TOXICS APPLICABILITY** - The facility will emit toxics and **is** subject to 2D .1100 and 2Q .0711. See Section III. for further discussion.

- **EPA SECTION 112(r)** - This facility **is** subject to the "General Duty Clause" of EPA Section 112(r) regulations; however, it **is not** subject to the Risk Management Plan (RMP) requirement.

- **ATTAINMENT/NON-ATTAINMENT STATUS** - Caswell County is considered in attainment or unclassifiable for all regulated pollutants.

V. FACILITY – WIDE EMISSIONS

The following table summarizes the facility-wide emissions. Potential emissions (before and after controls/limits) were calculated by adding emissions from the NCDEQ Asphalt, Fuel Oil Combustion, and Concrete Batch spreadsheets (Attachments C, D, E3, E4 and E5) as applicable. Potential emissions before controls/limits are based on the maximum rate of 250 tons per hour, for 8,760 hours per year with a

worst-case sulfur content of 2.1%. Potential emissions after controls/limits are based on the Synthetic Minor limits of 500,000 tons of asphalt per year and 0.5% sulfur content. As the asphalt spreadsheets do not include HAPs from the heaters, the NCDEQ Fuel Oil Combustion Emissions Calculator spreadsheet (Attachment D) was used to add potential HAPs from the heaters to the total potential HAPs from the plant. PM and PM_{10} emissions include fugitive emissions, as provided in the application, from paved/unpaved roads within the facility and stockpiles due to unloading and wind erosion. See Attachment E9 for a breakdown of facility-wide emissions.

Pollutant	Potential Emissions [tons/year]	
	Before controls/limits	After controls/limits
PM	544.85	38.05
PM_{10}	212.22	19.00
PM_{10} for Title V[1,2]	$39.00 + 0.23^1 + 0.99^2 = 40.22$	$7.34 + 0.23^1 + 0.99^2 = 8.56$
SO_2	665.81	26.06
NO_x	63.10	16.63
CO	145.84	33.85
VOC	52.70	12.06
HAP_{Total}	11.32	2.59
$HAP_{Highest}$ (Formaldehyde)	3.49	0.80

[1] For Title V applicability, only emissions from the cement and fly ash storage silos after controls are considered from the Concrete Batch Plant, because the EPA considers emissions from cement/fly ash scales (weigh batchers) and truck loading operations to be fugitive and uncontrolled. In addition, the EPA considers the bagfilter for the cement and fly ash silos to be integral. Therefore, the facility does not trigger Synthetic Minor for PM_{10}.

[2] Combined fugitive emissions from paved/unpaved roads and stockpiles are not considered with regard to Title V applicability. Also, all applicable NSPS and NESHAP emission standards can be considered when calculating emissions for Title V applicability.

VI. COMPLIANCE

There is no compliance history as this is a Greenfield facility. This facility will be targeted for a compliance inspection upon issuance of this permit.

VII. APPLICATION FEE

An application fee of $400, the required fee for a new permit for a Greenfield facility, was submitted along with the application.

VIII. ZONING CONSISTENCY DETERMINATION (ZCD)

A ZCD, signed by Bryan S. Miller, County Manager, Caswell County Local Government, dated March 30, 2021, attesting that *"the "proposed operation is consistent with applicable zoning and subdivision ordinances,"* was received with the application. Also, as mentioned previously, a sign was posted on the property on April 1, 2021 and a public notice was published in The Caswell Messenger on April 7, 2021. Photo images of the sign placement and Affidavit of Publication were also received with the application.

IX. RECOMMENDATION

It is recommended that Air Quality Permit No. 10693R00 be issued to Carolina Sunrock LLC – Burlington North.

X. SUMMARY OF ATTACHMENTS

The following attachments accompany this review:

Attachment	Description
A1	Bagfilter Evaluation for HMA-CD1
A2	Bagfilter Evaluation for RMC-CD2
B	Application narrative requesting asphalt production to be limited to 500,000 tons per year
C	NCDENR Concrete Batch Emissions Calculator spreadsheet

Attachment	Description
D	NCDENR Fuel Oil Emissions Calculator spreadsheet
E1	NCDENR Asphalt Emissions Calculator spreadsheet for Actual SO_2 and CO Emissions w/ Synthetic Minor Limits
E2	NCDENR Asphalt Emissions Calculator spreadsheet for Expected Actual Emissions using Natural Gas
E3	NCDENR Asphalt Emissions Calculator spreadsheet for Expected Actual Emissions using Waste/No. 4 Fuel Oil
E4	NCDENR Asphalt Emissions Calculator spreadsheet for Potential Emissions before controls/limits
E5	NCDENR Asphalt Emissions Calculator spreadsheet for Potential Emissions after controls/limits
E6	NCDENR Asphalt Emissions Calculator spreadsheet for Potential TAP Emissions using Natural Gas
E7	NCDENR Asphalt Emissions Calculator spreadsheet for Potential TAP Emissions using No. 4/No. 6 Fuel Oil
E8	NCDENR Concrete Batch Emissions Calculator spreadsheet for Potential TAP Emissions
E9	Facility-Wide Emissions Summary Spreadsheet

Bagfilter Evaluation - Carolina Sunrock - Burlington North - HMA-CD1

User Input

User must supply information in blue (double outline).

Optional user information is single outlined.

Particulate Material: Abrasive dust

Estimated Efficiency (%): 99

Actual Air Flow Rate (acfm): 51,111

Cloth Area (sq ft): 9,299

Maximum Operating Temperature (F): 325

Proposed Cloth Material: Nomex *

Pulse Jet?: yes

Uncontrolled Particulate Rate (lb/hr): 7,000.0

Process Rate (lb/hr): 500,000 **

Maximum Pressure Drop (in H2O): 9

No. of compartments: 12

Gas Stream Moisture (%):

Felted?: yes

Time Between Cleanings (min):

Cleaning Time (min):

Particle Size Distribution

Avg. Size (um)	Size Ranges (um)	Size (um)	Cumul. Mass (% < size)
1.25	0 - 2.5	0	5.8
3.75	2.5 - 5	2.5	16.5
7.5	5 - 10	5	40.3
12.5	10 - 15	10	51.6
17.5	15 - 20	15	57.0
20	> 20	20	100.0

Information Source(s)

* Filter Material --> Aramid = Nomex

**Process Rate = 250 tons/hr x 2,000 lb/ton = 500,000 lb/hr

Program Output

Filtering Velocity Analysis

Typical Filtering Velocity (fpm): 10.0

Applicant Filtering Velocity (fpm): 5.5

Typical filtering velocity not exceeded.

Fabric Durability Analysis

	Chemical Resistance		
	Acid	Alkali	Organics
Fabric appropriate for max. oper. temp.	Fair	Good	Good

Particulate Emissions Analysis

Controlled Particulate Rate (lb/hr): 10.953

Gas Stream Particulate Loadings (gr/dscf)

Uncontrolled: 10.93

Controlled: 0.0171

Note: Correct gas stream temperature and moisture content must be entered!

The estimated collection efficiency is reasonable.

Allowable Emissions per 2D .0515 (lb/hr): 60.96

Maximum Areal Dust Loading (gr/sq ft): 0.0

Dust drag (K2) parameter ((inH2O/fpm)/(lb/sq ft)): 0

Efficiency Calculations

Mass in Range (%)	Control Efficiency (%)	eta-m (%)
5.8	98.00	5.68
10.7	99.90	10.69
23.8	99.90	23.78
11.3	99.99	11.30
5.4	99.99	5.40
43.0	99.99	43.00
	Overall Control Efficiency =	99.84 %
	Penetration =	0.16 %

Bagfilter evaluation developed by:
William D. Willets, M.S., E.I.T.
North Carolina Division of Environmental Management
Air Quality Permitting
Version 3.3; September 23, 1999

ATTACHMENT A1

Bagfilter Evaluation - Carolina Sunrock - Burlington North - RMC-CD2

User Input

User must supply information in blue (double outline).

Optional user information is single outlined.

Particulate Material: Cement	Estimated Efficiency (%): 99
Actual Air Flow Rate (acfm): 6,500	Cloth Area (sq ft): 1,433
Maximum Operating Temperature (F): 70	Proposed Cloth Material: Dacron
	Pulse Jet?: yes
Uncontrolled Particulate Rate (lb/hr): 99.7	Process Rate (lb/hr): 4,156
Maximum Pressure Drop (in H2O): 9	No. of compartments: 1
Gas Stream Moisture (%):	Felted?: yes
Time Between Cleanings (min):	Cleaning Time (min):

Particle Size Distribution

Avg. Size (um)	Size Ranges (um)	Size (um)	Cumul. Mass (% < size)
1.25	0 - 2.5	0	5.8
3.75	2.5 - 5	2.5	16.5
7.5	5 - 10	5	40.3
12.5	10 - 15	10	51.6
17.5	15 - 20	15	57.0
20	> 20	20	100.0

Information Source(s)

* Filter Material --> Polyester = Dacron

**Process Rate = Cement 448 lb/r + Supplement 148 lb/hr + Aggregate 1,980 lb/hr + Sand 1,440 lb/hr + Water 140 lb/hr = 4,156 lb/hr

Program Output

Filtering Velocity Analysis

Typical Filtering Velocity (fpm)	Applicant Filtering Velocity (fpm)
8.0	4.5

Typical filtering velocity not exceeded.

Fabric Durability Analysis

	Chemical Resistance: Acid	Alkali	Organics	
Fabric appropriate for max. oper. temp.	Good	Fair	Good >	Except phenol

Particulate Emissions Analysis

Controlled Particulate Rate (lb/hr)	Gas Stream Particulate Loadings (gr/dscf)	
0.156	Uncontrolled: 1.81	Note: Correct gas stream temperature and
	Controlled: 0.0028	moisture content must be entered!

The estimated collection efficiency is reasonable.

Allowable Emissions per 2D .0515 (lb/hr)
6.69

Maximum Areal Dust Loading (gr/sq ft)	Dust drag (K2) parameter ((inH2O/fpm)/(lb/sq ft))
0.0	0

Efficiency Calculations

Mass in Range (%)	Control Efficiency (%)	eta-m (%)
5.8	98.00	5.68
10.7	99.90	10.69
23.8	99.90	23.78
11.3	99.99	11.30
5.4	99.99	5.40
43.0	99.99	43.00
	Overall Control Efficiency =	99.84 %
	Penetration =	0.16 %

Bagfilter evaluation developed by:
William D. Willets, M.S., E.I.T.
North Carolina Division of Environmental Management
Air Quality Permitting
Version 3.3; September 23, 1999

ATTACHMENT A2

2.2.2 Truck Mix Concrete Batch Plant

Carolina Sunrock is proposing a truck mix concrete batch plant (120 cubic yards per hour) consisting of:

- Cement silo (200 tons maximum capacity)
- Fly ash silo (200 tons maximum capacity)
- Truck loadout point
- Cement/flyash weight batcher (25 tons maximum capacity)
- Aggregate weigh batcher (50 tons maximum capacity)

Note that all the sources in the truck mix concrete batch plant except for the aggregate weight batcher will be controlled by a bagfilter.

2.2.3 Insignificant Activities

Carolina Sunrock is proposing the following insignificant activities which are exempt from permitting under 15A NCAC 02Q .0102:

- Two (2) Used Oil Storage Tank associated with HMA plant (20,000 gallons capacity each)
- Two (2) Diesel Fuel Storage Tanks associated with HMA plant (20,000 gallons capacity each)
- Liquid Asphalt Tank (30,000 gallons capacity); and
- Liquid Asphalt Tank (30,000 gallons capacity)

2.3 Synthetic Minor Permit Limitation Request

Unrestricted facility wide PTE emissions are over 100 tpy for PM and CO. Therefore, Carolina Sunrock is requesting synthetic minor limitations be included in the permit to limit PM and CO emissions and avoid major source status under the Title V regulations.

Carolina Sunrock is proposing the following synthetic minor limitations to ensure that the PM and CO PTE remains below 100 tpy:

- Production of the HMA plant (maximum design production of 250 tph) will be capped at 500,000 tpy.
- The facility requests no limitation on the concrete batch operations.

ATTACHMENT B

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - INPUT SCREEN

REVISION D; October 15, 2015

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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Directions: Enter and select information in the boxes that are highlighted in blue:

General Facility Information

COMPANY NAME:	Crolina Sunrock, LLC - Burlington North
FACILITY ID NUMBER:	1700016
PERMIT NUMBER	10628R00
FACILITY CITY:	Burlingto
FACILITY COUNTY:	Caswell
SPREADSHEET PREPARED BY:	LLG

General Facility Information

MAXIMUM HOURLY THROUGHPUT AT TRUCK LOAD OUT	120	(yd^3/hour)
ACTUAL ANNUAL PRODUCTION	432,000	(yd^3/year)
MAXIMUM ANNUAL PRODUCTION*	1,051,200	(yd^3/year)

*Default maximum annual production is maximum hourly throughput times 8,760 hours per year. Enter another limit if applicable (i.e. for arsenic modeling).

ACTUAL PRODUCTION

→ $\frac{12\,HR}{DAY} \times \frac{6\,DAYS}{WK} \times \frac{50\,WK}{YR}$

$= \frac{3600\,HR}{YR} \times \frac{120\,YD^3}{HR}$

$= \frac{432,000\,YD^3}{YR}$

Facility Production Information

PERCENT OF ANNUAL LOADOUT THROUGH TRUCK MIX	100	(% by volume)
PERCENT OF ANNUAL LOADOUT THROUGH CENTRAL MIX	0	(% by volume)

Facility Emissions Control Information

IS THERE A CONTROL DEVICE ON THE TRUCK MIX?	2	(1=No, 2=Yes)
IS THERE A CONTROL DEVICE ON THE CENTRAL MIX?	1	(1=No, 2=Yes)

Material Composition Information

			Typical NC Comp.*
Cement	448	lbs	*410 lbs*
Supplement	148	lbs	*120 lbs*
Coarse Aggregate	1980	lbs	*1884 lbs*
Sand	1440	lbs	*1443 lbs*
Water	140	lbs	*167 lbs*
Total	4156	lbs	*4024 lbs*

** North Carolina typical material composition is based on data from industry contacts. User may enter site-specific data.*

15A NCAC 2D .0515 "Particulates from Miscellaneous Industrial Processes"

	Cement Silo	Flyash silo	Sand&Agg Weigh hopper	Truck mix[1]	Central mix[1]	
Enter the process rate if different from default, otherwise leave blank						
Process Rate[2]	25	25	205.200	240.96	0.000	tons/hr
Maximum Allowable Emission Rate[3]	35.4	35.4	58.8	60.5	0.0	lbs/hr
PM Emission Rate Before controls	18.250	78.500	0.985	52.210	0.000	lbs/hr
PM Emission Rate After Controls	0.025	0.223	0.001	1.001	0.000	lbs/hr
Assumed control device efficiency for weigh hopper[4]			99.9%			
Complies with 2D .0515?	yes	yes	yes	yes	yes	
Control device required to comply?	no	yes	no	no	no	

[1] *Emission factors for truck/central mix include emissions from cement & supplement weigh hoppers.*

[2] *Default process rate for silo loading is 25 tons per hour. Default process weight for sand & aggr weigh hopper includes only aggr & sand. Default process rate for truck mix and central mix includes all components except water since assumes water is added directly to truck.*

[3] *Allowable emission rate should be calculated to 3 significant digits.*

[4] *Default efficiency is 99.9% for bagfilters. Enter 0 if weigh hopper is not controlled.*

ATTACHMENT C

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - OUTPUT SCREEN

REVISION D; October 15, 2015

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SOURCE / FACILITY / USER INPUT SUMMARY (FROM INPUT SCREEN)

General Facility Information

COMPANY NAME:	Carolina Sunrock, LLC - Burlington North
FACILITY ID NUMBER:	1700016
PERMIT NUMBER	10628R00
FACILITY CITY:	Burlingyon
FACILITY COUNTY:	Caswell
SPREADSHEET PREPARED BY:	LLG

General Facility Information

MAXIMUM HOURLY THROUGHPUT AT TRUCK LOAD OUT	120	(yd^3/hour)
ACTUAL ANNUAL PRODUCTION	432000	(yd^3/year)

Facility Production Information

PERCENT OF ANNUAL LOADOUT THROUGH TRUCK MIX	100	(% by volume)
PERCENT OF ANNUAL LOADOUT THROUGH CENTRAL MIX	0	(% by volume)

Facility Emissions Control Information

IS THERE A CONTROL DEVICE ON THE TRUCK MIX?	2	(1=No, 2=Yes)
IS THERE A CONTROL DEVICE ON THE CENTRAL MIX?	1	(1=No, 2=Yes)

Material Composition Information

			Typical NC Comp.*
Cement	448	lbs	*410 lbs*
Supplement	148	lbs	*120 lbs*
Coarse Aggregate	1980	lbs	*1884 lbs*
Sand	1440	lbs	*1443 lbs*
Water	140	lbs	*167 lbs*
Total	4156	lbs	*4024 lbs*

** North Carolina typical material composition is based on data from industry contacts. User may enter site-specific data.*

PARTICULATE MATTER EMISSIONS INFORMATION

PARTICULATE EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
	Pollutant	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
truck mix*	PM	1.001	1.802	52.210	228.678	1.001	4.386
	PM10	0.375	0.676	14.912	65.314	0.375	1.645
central mix*	PM	0.000	0.000	0.000	0.000	0.000	0.000
	PM10	0.000	0.000	0.000	0.000	0.000	0.000
cement silo	PM	0.027	0.048	19.622	85.946	0.027	0.117
	PM10	0.009	0.016	12.634	55.335	0.009	0.040
suppl. Silo	PM	0.079	0.142	27.883	122.128	0.079	0.346
	PM10	0.044	0.078	9.768	42.784	0.044	0.191
weigh hopper** [sand & aggr.]	PM	0.985	1.773	0.985	4.314	0.985	4.314
	PM10	0.575	1.034	0.575	2.517	0.575	2.517
sand & aggr.	PM	3.003	5.406	3.003	13.155	3.003	13.155
	PM10	1.433	2.579	1.433	6.275	1.433	6.275
TOTAL PM	PM	5.095	**9.172**	103.704	**454.222**	5.095	**22.318**
TOTAL PM10	PM10	2.435	**4.384**	39.321	**172.226**	2.435	**10.667**
Title V Potential	PM10						**0.231**

*Truck/Central mix emission factors include emissions from cement & supplement weigh hopper(s).

**Actual/Potential weigh hopper (sand & aggr) emissions assumed uncontrolled since AP-42 reports "no data" for controlled.

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - OUTPUT SCREEN

REVISION D; October 15, 2015

NCDENR

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TOXIC / HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION

POLLUTANT	CAS NUMBER	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS)	
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
Arsenic Unlisted Compounds (TH)	ASC-OTHER	6.59E-05	2.37E-01	2.49E-03	2.16E+01	6.59E-05	5.77E-01
Beryllium metal (TH)	7440-41-7	4.53E-06	1.63E-02	1.00E-05	8.77E-02	4.53E-06	3.97E-02
Cadmium Metal (TH)	7440-43-9	5.00E-07	1.80E-03	7.69E-06	6.74E-02	5.00E-07	4.38E-03
Chromic Acid (TH)	7738-94-5	1.58E-04	5.70E-01	4.25E-04	3.73E+00	1.58E-04	1.39E+00
Lead Unlisted Compounds (H)	PBC-OTHER	5.96E-05	2.15E-01	1.32E-03	1.16E+01	5.96E-05	5.22E-01
Manganese Unlisted compounds (TH)	MNC-OTHER	7.49E-04	2.70E+00	7.67E-03	6.72E+01	7.49E-04	6.56E+00
Nickel metal (TH)	7440-02-0	1.92E-04	6.92E-01	9.19E-04	8.05E+00	1.92E-04	1.68E+00
Phosphorus Metal Yellow or White (H)	7223-14-0	4.71E-04	1.70E+00	1.72E-03	1.51E+01	4.71E-04	4.13E+00
Selenium compounds (H)	SEC	4.68E-06	1.69E-02	9.43E-05	8.26E-01	4.68E-06	4.10E-02
Total HAPs		1.71E-03	6.14E+00	1.47E-02	1.28E+02	1.71E-03	1.49E+01
Highest HAP Manganese		7.49E-04	2.70E+00	7.67E-03	6.72E+01	7.49E-04	6.56E+00

TOXIC AIR POLLUTANT EMISSIONS INFORMATION (FOR PERMITTING PURPOSES)

EXPECTED EMISSIONS AFTER CONTROLS / LIMITATIONS

(Daily calculations are based on maximum hourly plant capacity operating at 24 hours per day. If over the TPER, the facility should more closely analyze the maximum daily emisions based on actual operation. Annual calculations are based on the actual annual production as entered on the INPUT worksheet.)

POLLUTANT	CAS NUMBER	lb/hr	lb/day	lb/yr
Arsenic Unlisted Compounds (TH)	ASC-OTHER			0.2371
Beryllium metal (TH)	7440-41-7			0.016
Cadmium Metal (TH)	7440-43-9			0.002
Chromic Acid (TH)	7738-94-5		0.0038	
Manganese Unlisted compounds (TH)	MNC-OTHER		0.018	
Nickel metal (TH)	7440-02-0		0.005	

ACTUAL EMISSIONS - HMA-H1 & HMA-H2

FUEL OIL COMBUSTION EMISSIONS CALCULATOR REVISION G 11/5/2012 - INPUT SCREEN

NCDENR

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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Directions: Enter and select information in the boxes that are highlighted in blue:

COMPANY NAME:	Carolina Sunrock, LLC - Burlington North
FACILITY ID NUMBER:	1700016
PERMIT NUMBER	10662R00
FACILITY CITY:	Burlington
FACILITY COUNTY:	Caswell
SPREADSHEET PREPARED BY:	LLG
EMISSION SOURCE DESCRIPTION:	No. 2 oil-fired Boiler
EMISSION SOURCE ID NO.:	HMA- H1 & HMA-H2
LATEST CONSTRUCTION/MODIFICATION DATE:	2021
SELECT THE TYPE OF BOILER FROM THE LISTS BELOW:	26

Boilers=>100 mmBtu/hr		Boilers=>100 mmBtu/hr (cont'd)	
1 =	No. 6 oil-fired, normal firing (U)	17 =	No. 2 oil-fired (C)
2 =	No. 6 oil-fired, normal firing (I)	18 =	No. 2 oil-fired, LNB/FGR (U)
3 =	No. 6 oil-fired, normal firing (C)	19 =	No. 2 oil-fired, LNB/FGR (I)
4 =	No. 6 oil-fired, normal firing, low Nox burner (U)	20 =	No. 2 oil-fired, LNB/FGR (C)
5 =	No. 6 oil-fired, normal firing, low Nox burner (I)		
6 =	No. 6 oil-fired, normal firing, low Nox burner (C)	21 =	Vertical fired utility boiler
7 =	No. 6 oil-fired, tangential firing (U)		
8 =	No. 6 oil fired, tangential firing, low Nox burner (U)	Small Boilers <100 mmBtu/hr	
9 =	No. 5 oil-fired, normal firing (U)	22 =	No. 6 oil-fired (I)
10 =	No. 5 oil-fired, normal firing (I)	23 =	No. 6 oil-fired (C)
11 =	No. 5 oil-fired, tangential firing (U)	24 =	No. 5 oil-fired (C)
12 =	No. 4 oil-fired, normal firing (U)	25 =	No. 4 oil-fired (C)
13 =	No. 4 oil-fired, normal firing (I)	26 =	No. 2 oil-fired (I)
14 =	No. 4 oil-fired, tangential firing (U)	27 =	No. 2 oil-fired (C)
15 =	No. 2 oil-fired (U)		
16 =	No. 2 oil-fired (I)	28 =	Residential Furnace

Note: The emission factors for fuel oil-fired boilers depend on the boiler size and application type. In the listing of boiler types, the following notation is used: U = Utility boilers (producing steam for the generation of electricity), I = Industrial boilers (generating steam or hot water for process heat, electricity generation, or space heat), C = Commercial or Institutional (used for space heating of commercial or institutional facilities) and residential (furnaces used for space heating purposes). Please be sure to select the proper boiler from the lists above.

EMISSION SOURCE INPUT DATA

MAXIMUM HEAT INPUT (MILLION BTU PER HOUR):	2.30	MMBTU/HR
ACTUAL ANNUAL FUEL USAGE (GALLONS PER YEAR):	59,142.9	GAL/YR
MAXIMUM ANNUAL FUEL USAGE (GALLONS PER YEAR)	143,914.3	GAL/YR
MAXIMUM FUEL SULFUR CONTENT (%):	0.0015	% - (TYPEOVER IF NECESSARY - DEFAULT VALUE = 2.1 FOR RESIDUAL FUEL OIL OR 0.5 FOR DISTILLATE FUEL OIL)
FUEL HEATING VALUE		
FUEL HEATING VALUE (BTU/GAL):	140,000	BTU/GAL

(2.3 mmBTU/hr x 3,600 hr/yr x 1,000,000) / 140,000 BTU/gal = 59,142.9 gal/yr.

DEFAULT WILL APPEAR AS FOLLOWS (not used for Greenhouse Gas calcs –See below for GHG defaults):
150,000 BTU/GAL FOR No. 6, 5, and 4 FUEL OIL
140,000 BTU/GAL ALL OTHERS
(TYPE OVER NUMBER AT RIGHT IF YOU HAVE SITE SPECIFIC DATA)

CONTROL DEVICE INPUT DATA

Note: Select the type of control devices from the pull-down menus below. Default control efficiencies will appear for each control device that is selected. The user may enter a different control efficiency to override these values if site specific data is available.

TYPE OF PARTICULATE CONTROL: NONE/OTHER	AVERAGE PARTICULATE CONTROL EFF.: 0
TYPE OF POSTCOMBUSTION SULFUR DIOXIDE CONTROL: NONE/OTHER	AVERAGE SULFUR DIOXIDE CONTROL EFF.: 0
TYPE OF NITROGEN OXIDE CONTROL: NONE/OTHER	AVERAGE NITROGEN OXIDE CONTROL EFF.: 0

REQUESTED PERMIT LIMITATIONS (IF APPLICABLE)

REQUESTED MAXIMUM FUEL USAGE LIMIT (GALLONS PER YEAR)	143,914.3	GAL/YR
REQUESTED MAXIMUM FUEL SULFUR CONTENT (%)	0.0015	%

(TYPEOVER IF NECESSARY - DEFAULT VALUES ARE THE CALCULATED POTENTIAL AND THE MAXIMUM SULFUR CONTENT AS SHOWN IN THE EMISSION SOURCE INPUT DATA SECTION)

ADDITIONAL INFORMATION FOR GREENHOUSE GAS EMISSIONS

ENTER CALCULATION TIER from EPA Mandatory Reporting Rule (MRR) Subpart C - www.epa.gov/climatechange/emissions/ghgrulemaking.html — TIER 1: DEFAULT HIGH HEAT VALUE AND DEFAULT EF

NOTE: EF is "Emission Factor"

SINCE TIER 3 IS NOT BEING USED, *FUEL CARBON CONTENT WILL NOT BE USED* — 2.7600 kg Carbon/gal

SELECT FUEL TYPE — Distillate Fuel Oil No. 2

HIGH HEAT VALUE (HHV) FOR GHGs
FOR TIER 1 and TIER 3, the FUEL HEATING VALUE entered above is overriden with the EPA DEFAULT from Table C-1 of the EPA MRR:

Distillate Fuel Oil No. 2	0.138 mmBTU/gal	THIS VALUE WILL BE USED FOR GHG calcuations- actual emissions
Distillate Fuel Oil No. 4	0.146 mmBTU/gal	
Residual Fuel Oil No. 5	0.14 mmBTU/gal	
Residual Fuel Oil No. 6	0.15 mmBTU/gal	

FOR TIER 2, the FUEL HEATING VALUE entered above is used. The value entered must be the annual average HHV of the fuel determined using procedures in the EPA MRR (see 98.33(a)(2))

Distillate Fuel Oil No. 2 DEFAULT HHV OF 0.138 mmBTU/gal THIS VALUE WILL BE USED FOR GHG calcuations- actual emissions

ATTACHMENT D

FUEL OIL COMBUSTION EMISSIONS CALCULATOR REVISION G 11/5/2012 - OUTPUT SCREEN

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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SOURCE / FACILITY / USER INPUT SUMMARY (FROM INPUT SCREEN)

COMPANY:	Carolina Sunrock, LLC - Burlington North	MAX HEAT INPUT:	2.30	MMBTU/HR
FACILITY ID NO.:	1700016	FUEL HEAT VALUE:	140,000	BTU/GAL
PERMIT NUMBER:	10682R00	HHV for GHG CALCULATIONS:	0.138	mm BTU/GAL
FACILITY CITY:	Burlington	ACTUAL ANNUAL FUEL USAGE:	59,143	GAL/YR
FACILITY COUNTY:	Caswell	MAXIMUM ANNUAL FUEL USAGE:	143,914	GAL/YR
USER NAME:	LLG	MAXIMUM SULFUR CONTENT:	0.0	%
EMISSION SOURCE DESCRIPTION:	No. 2 oil-fired Boiler	**REQUESTED PERMIT LIMITATIONS**		
EMISSION SOURCE ID NO.:	HMA- H1	MAX. FUEL USAGE:	143,914	GAL/YR
		MAX. SULFUR CONTENT:	0.0015	%

TYPE OF CONTROL DEVICES	POLLUTANT	CONTROL EFF.
NONE/OTHER	PM	0
NONE/OTHER	SO2	0
NONE/OTHER	NOx	0

METHOD USED TO COMPUTE ACTUAL GHG EMISSIONS: TIER 1: DEFAULT HIGH HEAT VALUE AND DEFAULT EF

CARBON CONTENT USED FOR GHGS (kg C/gal): CARBON CONTENT NOT USED FOR CALCULATION TIER CHOSEN

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION

	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)		EMISSION FACTOR (lb/10^3 gal)	
AIR POLLUTANT EMITTED	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	uncontrolled	controlled
TOTAL PARTICULATE MATTER (PM) (FPM+CPM)	0.05	0.10	0.05	0.24	0.05	0.24	3.30E+00	3.30E+00
FILTERABLE PM (FPM)	0.03	0.06	0.03	0.14	0.03	0.14	2.00E+00	2.00E+00
CONDENSABLE PM (CPM)	0.02	0.04	0.02	0.09	0.02	0.09	1.30E+00	1.30E+00
FILTERABLE PM<10 MICRONS (PM_{10})	0.02	0.03	0.02	0.07	0.02	0.07	1.00E+00	1.00E+00
FILTERABLE PM<2.5 MICRONS ($PM_{2.5}$)	0.00	0.01	0.00	0.02	0.00	0.02	2.50E-01	2.50E-01
SULFUR DIOXIDE (SO_2)	0.00	0.01	0.00	0.02	0.00	0.02	2.13E-01	2.13E-01
NITROGEN OXIDES (NO_x)	0.33	0.59	0.33	1.44	0.33	1.44	2.00E+01	2.00E+01
CARBON MONOXIDE (CO)	0.08	0.15	0.08	0.36	0.08	0.36	5.00E+00	5.00E+00
VOLATILE ORGANIC COMPOUNDS (VOC)	0.00	0.01	0.00	0.01	0.00	0.01	2.00E-01	2.00E-01
LEAD	0.00	0.00	0.00	0.00	0.00	0.00	1.26E-03	1.26E-03

TOXIC / HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION

		CAS	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)		EMISSION FACTOR (lb/10^3 gal)	
TOXIC / HAZARDOUS AIR POLLUTANT		NUMBER	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	uncontrolled	controlled
Antimony Unlisted Compounds	(H)	SBC-Other	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00E+00	0.00E+00
Arsenic Unlisted Compounds	(TH)	ASC-Other	9.2E-06	3.3E-02	9.2E-06	8.1E-02	9.2E-06	8.1E-02	5.60E-04	5.60E-04
Benzene	(TH)	71432	4.5E-05	1.6E-01	4.5E-05	4.0E-01	4.6E-05	4.0E-01	2.75E-03	2.75E-03
Beryllium Metal (unreacted)	(TH)	7440417	6.9E-06	2.5E-02	6.9E-06	6.0E-02	6.9E-06	6.0E-02	4.20E-04	4.20E-04
Cadium Metal (elemental unreacted)	(TH)	7440439	6.9E-06	2.5E-02	6.9E-06	6.0E-02	6.9E-06	6.0E-02	4.20E-04	4.20E-04
Chromic Acid (VI)	(TH)	7738945	6.9E-06	2.5E-02	6.9E-06	6.0E-02	6.9E-06	6.0E-02	4.20E-04	4.20E-04
Cobalt Unlisted Compounds	(H)	COC-Other	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00E+00	0.00E+00
Ethylbenzene	(H)	100414	1.3E-05	4.8E-02	1.3E-05	1.2E-01	1.3E-05	1.2E-01	8.17E-04	8.17E-04
Fluorides (sum fluoride compounds)	(T)	16984488	6.1E-04	2.2E+00	6.1E-04	5.4E+00	6.1E-04	5.4E+00	3.73E-02	3.73E-02
Formaldehyde	(TH)	50000	7.9E-04	2.8E+00	7.9E-04	6.9E+00	7.9E-04	6.9E+00	4.80E-02	4.80E-02
Lead Unlisted Compounds	(H)	PBC-Other	2.1E-05	7.5E-02	2.1E-05	1.8E-01	2.1E-05	1.8E-01	1.26E-03	1.26E-03
Manganese Unlisted Compounds	(TH)	MNC-Other	1.4E-05	5.0E-02	1.4E-05	1.2E-01	1.4E-05	1.2E-01	8.40E-04	8.40E-04
Mercury, vapor	(TH)	7439976	6.9E-06	2.5E-02	6.9E-06	6.0E-02	6.9E-06	6.0E-02	4.20E-04	4.20E-04
Methyl chloroform	(TH)	71556	3.9E-06	1.4E-02	3.9E-06	3.4E-02	3.9E-06	3.4E-02	2.36E-04	2.36E-04
Napthalene	(H)	91203	5.5E-06	2.0E-02	5.5E-06	4.8E-02	5.5E-06	4.8E-02	3.33E-04	3.33E-04
Nickle Metal	(TH)	7440020	6.9E-06	2.5E-02	6.9E-06	6.0E-02	6.9E-06	6.0E-02	4.20E-04	4.20E-04
Phosphorus Metal, Yellow or White	(H)	7723140	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00E+00	0.00E+00
POM rates uncontrolled	(H)	POM	5.4E-05	2.0E-01	5.4E-05	4.7E-01	5.4E-05	4.7E-01	3.30E-03	3.30E-03
Selenium compounds	(H)	SEC	3.5E-05	1.2E-01	3.5E-05	3.0E-01	3.5E-05	3.0E-01	2.10E-03	2.10E-03
Toluene	(TH)	108883	1.3E-03	4.7E+00	1.3E-03	1.1E+01	1.3E-03	1.1E+01	7.97E-02	7.97E-02
Xylene	(TH)	1330207	2.3E-05	8.3E-02	2.3E-05	2.0E-01	2.3E-05	2.0E-01	1.40E-03	1.40E-03
Total HAP	(H)		2.4E-03	8.5E+00	2.4E-03	2.1E+01	2.4E-03	2.1E+01	1.4E-01	1.4E-01
Largest HAP	(H)		1.31E-03	4.71E+00	1.31E-03	1.15E+01	1.31E-09	1.15E+01	7.97E-02	7.97E-02

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR PERMITTING PURPOSES

			EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS			EMISSION FACTOR (lb/10^3 gal)	
TOXIC AIR POLLUTANT		CAS Num.	lb/hr	lb/day	lb/yr	uncontrolled	controlled
Arsenic Unlisted Compounds	(TH)	ASC-Other	9.20E-06	2.21E-04	8.06E-02	5.60E-04	5.60E-04
Benzene	(TH)	71432	4.52E-05	1.08E-03	3.96E-01	2.75E-03	2.75E-03
Beryllium Metal (unreacted)	(TH)	7440417	6.90E-06	1.66E-04	6.04E-02	4.20E-04	4.20E-04
Cadium Metal (elemental unreacted)	(TH)	7440439	6.90E-06	1.66E-04	6.04E-02	4.20E-04	4.20E-04
Soluble chromate compounds, as chromium (VI	(TH)	SolCR6	6.90E-06	1.66E-04	6.04E-02	4.20E-04	4.20E-04
Fluorides (sum fluoride compounds)	(T)	16984488	6.13E-04	1.47E-02	5.37E+00	3.73E-02	3.73E-02
Formaldehyde	(TH)	50000	7.89E-04	1.89E-02	6.91E+00	4.80E-02	4.80E-02
Manganese Unlisted Compounds	(TH)	MNC-Other	1.38E-05	3.31E-04	1.21E-01	8.40E-04	8.40E-04
Mercury, vapor	(TH)	7439976	6.90E-06	1.66E-04	6.04E-02	4.20E-04	4.20E-04
Methyl chloroform	(TH)	71556	3.88E-06	9.31E-05	3.40E-02	2.36E-04	2.36E-04
Nickle Metal	(TH)	7440020	6.90E-06	1.66E-04	6.04E-02	4.20E-04	4.20E-04
Toluene	(TH)	108883	1.31E-03	3.14E-02	1.15E+01	7.97E-02	7.97E-02
Xylene	(TH)	1330207	2.30E-05	5.52E-04	2.02E-01	1.40E-03	1.40E-03

GREENHOUSE GAS EMISSIONS INFORMATION (FOR EMISSIONS INVENTORY PURPOSES) - CONSISTENT WITH EPA MANDATORY REPORTING RULE (MRR) METHOD

GHG - POTENTIAL TO EMIT NOT BASED ON EPA MRR METHOD

Distillate Fuel Oil No. 2

GREENHOUSE GAS POLLUTANT	ACTUAL EMISSIONS — EPA MRR CALCULATION METHOD: TIER 1			POTENTIAL EMISSIONS - utilize max heat input capacity and EPA MRR Emission Factors		POTENTIAL EMISSIONS With Requested Emission Limitation - utilize requested fuel limit and EPA MRR Emission Factors	
	metric tons/yr	metric tons/yr, CO2e	short tons/yr	short tons/yr	short tons/yr, CO2e	short tons/yr	short tons/yr, CO2e
CARBON DIOXIDE (CO_2)	603.64	603.64	665.40	1,642.60	1,642.60	1,642.60	1,642.60
METHANE (CH_4)	2.45E-02	5.14E-01	2.70E-02	6.66E-02	1.40E+00	6.66E-02	1.40E+00
NITROUS OXIDE (N_2O)	4.90E-03	1.52E+00	5.40E-03	1.33E-02	4.13E+00	1.33E-02	4.13E+00
	TOTAL	605.67		TOTAL	1,648.13	TOTAL	1,648.13

NOTES: 1) CO2e means CO2 equivalent

2) The DAQ Air Emissions Reporting Online (AERO) system requires short tons and the EPA MRR requires metric tons

ACTUAL SO_2 & CO EMISSIONS / TAP EMISSIONS

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 INPUT SCREEN

NCDENR

NOTICE: This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

Instructions: **1. Fill in all BLUE cells.**
2.Ensure all pull down boxes and BLUE cells reflect correct conditions.
3. Read the README sheet.
4. Use the mouse pointer to read the tips in the "red cornered" input cells. (See Tools->Options->Comments if these are not displayed.

Company Name:	Carilina Sunrock, LLC
Facility ID No.:	1700016
Permit No.:	10682R00
Facility City:	Burlington
Facility County:	Caswell
Spreadsheet Prepared by:	LLG

Is this spreadsheet being used for emissions inventory	2. NO		
Plant type:	Drum mix		
* Fuel type:	Waste, No.4 or No.5 fuel oil-fired		
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Controls:	Fabric filter controls		

Dryer heat input:	80	million Btu per hour
Plant maximum production capacity:	250	tons per hour

Asphalt Properties			
Asphalt temperature:	325	degrees	(default value of 325 degrees F)
Volatility loss (V):	-0.5	%	(default value of -0.5 %)

Silo Filling?	YES

RAP crushing on site?	YES				
Crushing Capacity?	65	tons per hour	No. of crushers:	1	
Hours of operation:	8760	hours per year	No. of screens:	1	
			No. of conveyors:	4	

Asphalt Cement Heater			
AC heater heat input:	2.3	million Btu per hour	(No.2 or diesel fuel oil -fired assumed)
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Hours of operation:	8760	hours per year	(default is 8760 hours per year unless specified otherwise)

Calculated Annual Production Limit:	1,488,581	tons per year	
* Requested Annual Production Limit:	500,000	tons per year	(if none desired leave default value =8760*tph)
Requested Daily Production Limit:		tons per day	**Are you SURE you want a restriction? If you do not want a daily restriction, make sure the cell has the value 24 hours/day *250 tons per hour = 6000 tons per day.**

Is this plant NSPS Subpart I affected?	YES	
Stack gas flow rate :	68,145	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	11.81	lb/hr
Control efficiency required:	99.831	%
Does Method 5 data already exist?:	NO	
Method 5 determined emission rate:	40.00	lb/hr
Control efficiency based on test data:	99.429	%

Allowable emission rate under 2 D .0506:	55.39	lb/hr
Does this plant emit less than this limit ?:	Yes	*(based on emission factors)*
Control efficiency required:	99.209	%

* SYNTHETIC MINOR LIMITS

ATTACHMENT E1

Dryer Emissions
Criteria Pollutants

Pollutant	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	uncontrolled emission rate (lb/hr)	controlled emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (with controls, 8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Condensible PM (or PM_{10})	0.0654	0.0194	16.35	4.85			
Filterable PM	28	0.014	7000	3.5			
Filterable PM10	6.4	0.0039	1600	0.975			
Total PM	28	0.033	7000	8.25	73.0	36.1	8.3
Total PM10	6.5	0.023	1625	5.75	33.1	25.2	5.8
SO2	0.0837	0.0837	20.93	20.93	91.69	91.69	20.93
CO	0.1300	0.130	32.5	32.5	142.4	142.4	32.5
NOx	0.0550	0.055	13.75	13.75	60.2	60.2	13.8
VOC	0.0320	0.032	8	8	35.0	35.0	8.0
HAPs, TOTAL		0.010		2.5	11.0	11.0	2.5

Silo Filling plus Load Out Emissions, Criteria Pollutants

Pollutant	Emission Factor, combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E-03	2.77E-01	1.2	1.2	0.3
CO	2.53E-03	6.32E-01	2.8	2.8	0.6
VOC	1.61E-02	4.02E+00	17.6	17.6	4.0
HAPs, TOTAL	2.74E-04	6.85E-02	0.3	0.3	0.1

Rap Crusher Emissions

Pollutant	Emission Factor, all sources combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0424	2.76E+00	12.1	12.1	2.8
Total PM10	0.0155	1.01E+00	4.4	4.4	1.0

Asphalt Cement Heater Emissions

Pollutant	Uncontrolled Emission Factor (lb/MMBtu)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0235714	5.42E-02	0.2	0.2	0.2
Total PM10	0.0235714	5.42E-02	0.2	0.2	0.2
SO2	0.5071429	1.17E+00	5.1	5.1	5.1
CO	0.0357143	8.21E-02	0.4	0.4	0.4
NOx	0.1428571	3.29E-01	1.4	1.4	1.4
VOC	0.0024286	5.59E-03	0.0	0.0	0.0

Facility-wide Criteria Pollutant Emissions Summary

Pollutant	Controlled Emission Rate, lb/hr	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E+01	86.5	49.7	11.5
Total PM10	6.81E+00	38.9	31.0	7.3
SO2	2.21E+01	96.8	96.8	26.0
CO	3.32E+01	145.5	145.5	33.5
NOx	1.41E+01	61.7	61.7	15.2
VOC	1.20E+01	52.7	52.7	12.0
HAPs, TOTAL	2.57E+00	11.3	11.3	2.6

Facility-wide Toxic Air Pollutants Summary

TAP	CAS No.	Action
Acetaldehyde (TH)	75070	NOTE 1
Acrolein (TH)	107028	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	NOTE 3
Benzene (TH)	71432	NOTE 3
Benzo(a)pyrene (T)	50328	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	NOTE 2
Carbon disulfide (TH)	75150	NOTE 1
Formaldehyde (TH)	50000	NOTE 3
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	NOTE 1
Hexane, n- (TH)	110543	NOTE 1
Hydrogen Sulfide (T)	7783064	NOTE 1
Manganese unlisted compounds (T)	MNC-other	NOTE 1
Methyl chloroform (TH)	71556	NOTE 1

TAP	CAS No.	Action
Mercury, vapor (TH)	7439976	NOTE 2
Methyl ethyl ketone (TH)	78933	NOTE 1
Methylene chloride (TH)	75092	NOTE 1
Nickel metal (TH)	7440020	NOTE 2
Perchloroethylene (tetrachloroethylene) (TH)	127184	NOTE 1
Phenol (TH)	108952	NOTE 1
Soluble Chromate Compounds as Chrome VI (TH)	7738945	NOTE 1
Styrene (TH)	100425	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	NOTE 1
Toluene (TH)	108883	NOTE 1
Trichloroethylene (TH)	79016	NOTE 1
Xylene (TH)	1330207	NOTE 1

NOTE 1: Include TAP in TPER stipulation.

NOTE 2: Include TAP in TPER stipulation with operation restrictions.

NOTE 3: Modeling Required. See "Toxic calculations" worksheet.

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 OUTPUT SCREEN

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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SOURCE / FACILITY / USER INPUT SUMMARY (FROM INPUT SCREEN)

COMPANY:	**Carilina Sunrock, LLC**	FACILITY ID NO.:	1700016
		PERMIT NUMBER:	10682R00
EMISSION SOURCE DESCRIPTION:	NSPS affected 250 tph Waste, No.4 or No.6 fuel oil-fired, Drum mix asphalt plant (80 mmBtu/hr heat input, w/silofill, with RAP, sulfur=0.5%)	FACILITY CITY:	Burlington
		FACILITY COUNTY:	Caswell

Annual Production Limit:	500,000	ton/year	**Daily Production Limit:**	0	ton/day
SPREADSHEET PREPARED BY:	LLG				

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	11.06	11.52		86.48		11.52
PARTICULATE MATTER<10 MICRONS (PM_{10})	6.81	7.27		38.93		7.27
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)						
* SULFUR DIOXIDE (SO2)	22.10	26.04		96.80		26.04
NITROGEN OXIDES (NOx)	14.08	15.19		61.66		15.19
* CARBON MONOXIDE (CO)	33.21	33.49		145.48		33.49
VOLATILE ORGANIC COMPOUNDS (VOC)	12.03	12.05		52.69		12.05
TOTAL HAP	2.57	2.57		11.25		2.57
LARGEST HAP (formaldehyde)	0.80	0.80		3.49		0.80

Attach INPUT worksheet

TOXIC / HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION

TOXIC / HAZARDOUS AIR POLLUTANT	CAS Number	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)		EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	
Acetaldehyde (TH)	75070	3.25E-01	6.50E+02	3.25E-01	2847.00	3.25E-01	6.50E+02	1.3E-03
Acrolein (TH)	107028	6.50E-03	1.30E+01	6.50E-03	56.94	6.50E-03	1.30E+01	2.6E-05
Antimony unlisted compounds (H)	SBC-other	4.50E-05	9.00E-02	4.50E-05	0.39	4.50E-05	9.00E-02	1.8E-07
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	2.80E-01	1.40E-04	1.23	1.40E-04	2.80E-01	5.6E-07
Benzene (TH)	71432	9.90E-02	1.98E+02	9.90E-02	867.38	9.90E-02	1.98E+02	4.0E-04
Benzo(a)pyrene (T)	50328	4.41E-06	8.82E-03	4.41E-06	0.04	4.41E-06	8.82E-03	1.8E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.05E-01	1.03E-04	0.90	1.03E-04	2.05E-01	4.1E-07
Carbon disulfide (TH)	75150	6.23E-04	1.25E+00	6.23E-04	5.45	6.23E-04	1.25E+00	2.5E-06
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	1.26E-03	2.53E+00	1.26E-03	11.06	1.26E-03	2.53E+00	5.1E-06
Chromic acid (VI) (component of solCR6 and CRC) (TH)	7738945	1.13E-04	2.25E-01	1.13E-04	0.99	1.13E-04	2.25E-01	4.5E-07
Cobalt unlisted compounds (H)	COC-other	6.50E-06	1.30E-02	6.50E-06	0.06	6.50E-06	1.30E-02	2.6E-08
Cumene (H)	98828	1.14E-03	2.29E+00	1.14E-03	10.02	1.14E-03	2.29E+00	4.6E-06
Ethyl benzene (H)	100414	6.41E-02	1.28E+02	6.41E-02	561.24	6.41E-02	1.28E+02	2.6E-04
Ethyl chloride (chloroethane) (H)	75003	2.18E-06	4.37E-03	2.18E-06	0.02	2.18E-06	4.37E-03	8.7E-09
Formaldehyde (TH)	50000	7.97E-01	1.59E+03	7.97E-01	6981.17	7.97E-01	1.59E+03	3.2E-03
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	6.50E-07	3.25E-10	0.00	3.25E-10	6.50E-07	1.3E-12
Hexane, n- (TH)	110543	2.39E-01	4.78E+02	2.39E-01	2095.50	2.39E-01	4.78E+02	9.6E-04
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	5.25E-02	1.05E+02	5.25E-02	459.90	5.25E-02	1.05E+02	2.1E-04
Hydrogen Sulfide (T)	7783064	1.37E-02	2.74E+01	1.37E-02	119.84	1.37E-02	2.74E+01	5.5E-05
Lead unlisted compounds (H)	PBC-other	3.75E-03	7.50E+00	3.75E-03	32.85	3.75E-03	7.50E+00	1.5E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	3.85E+00	1.93E-03	16.86	1.93E-03	3.85E+00	7.7E-06
Mercury, vapor (TH)	7439976	6.50E-04	1.30E+00	6.50E-04	5.69	6.50E-04	1.30E+00	2.6E-06
Methyl bromide (H)	74839	2.49E-04	4.98E-01	2.49E-04	2.18	2.49E-04	4.98E-01	1.0E-06
Methyl chloride (H)	74873	1.56E-04	3.12E-01	1.56E-04	1.37	1.56E-04	3.12E-01	6.2E-07
Methyl chloroform (TH)	71556	1.20E-02	2.40E+01	1.20E-02	105.12	1.20E-02	2.40E+01	4.8E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	1.34E+01	6.70E-03	58.67	6.70E-03	1.34E+01	2.7E-05
Methylene chloride (TH)	75092	8.23E-06	1.65E-02	8.23E-06	0.07	8.23E-06	1.65E-02	3.3E-08
Napthalene (H)	91203	1.65E-01	3.29E+02	1.65E-01	1442.95	1.65E-01	3.29E+02	6.6E-04
Nickel metal (TH)	7440020	1.58E-02	3.15E+01	1.58E-02	137.97	1.58E-02	3.15E+01	6.3E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.60E-01	8.01E-05	0.70	8.01E-05	1.60E-01	3.2E-07
Phenol (TH)	108952	1.01E-03	2.01E+00	1.01E-03	8.81	1.01E-03	2.01E+00	4.0E-06
Phosphorus Metal, Yellow or White (H)	7723140	7.00E-03	1.40E+01	7.00E-03	61.32	7.00E-03	1.40E+01	2.8E-05
Polycyclic Organic Matter (H)	POM	2.20E-01	4.40E+02	2.20E-01	1927.20	2.20E-01	4.40E+02	8.8E-04
Propionaldehyde (H)	123386	3.25E-02	6.50E+01	3.25E-02	284.70	3.25E-02	6.50E+01	1.3E-04
Quinone (H)	106514	4.00E-02	8.00E+01	4.00E-02	350.40	4.00E-02	8.00E+01	1.6E-04
Selenium compounds (H)	SEC	8.75E-05	1.75E-01	8.75E-05	0.77	8.75E-05	1.75E-01	3.5E-07

* BELOW SYNTHETIC MINOR LIMITS OF 100 TONS/YR, EACH

Styrene (TH)	100425	2.40E-04	4.81E-01	2.40E-04	2.11	2.40E-04	4.81E-01	9.6E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	1.05E-07	5.25E-11	0.00	5.25E-11	1.05E-07	2.1E-13
Toluene (TH)	108883	7.29E-01	1.46E+03	7.29E-01	6386.67	7.29E-01	1.46E+03	2.9E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Trimethylpentane, 2,2,4- (H)	540841	1.00E-02	2.01E+01	1.00E-02	87.85	1.00E-02	2.01E+01	4.0E-05
Xylene (TH)	1330207	6.04E-02	1.21E+02	6.04E-02	528.72	6.04E-02	1.21E+02	2.4E-04
Xylene, o- (H)	95476	2.57E-03	5.14E+00	2.57E-03	22.50	2.57E-03	5.14E+00	1.0E-05

TOXIC AIR POLLUTANT EMISSIONS INFORMATION (FOR PERMITTING PURPOSES)

Expected actual emissions after controls and limitations consisting of an annual production limit of 500000 tons and a daily production limit of 0 tons.

TOXIC AIR POLLUTANT	CAS Num.	lb/hr	lb/day	lb/yr	Modeling Required?	EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
Acetaldehyde (TH)	75070	3.25E-01	0.00E+00	6.50E+02	NO. Based on facility-wide potential.	1.30E-03
Acrolein (TH)	107028	6.50E-03	0.00E+00	1.30E+01	NO. Based on facility-wide potential.	2.60E-05
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	0.00E+00	2.80E-01	YES. Modeling required	5.60E-07
Benzene (TH)	71432	9.90E-02	0.00E+00	1.98E+02	YES. Modeling required	3.96E-04
Benzo(a)pyrene (T)	50328	4.41E-06	0.00E+00	8.82E-03	NO. Based on facility-wide potential.	1.76E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	0.00E+00	2.05E-01	NO. Because of operating restriction	4.10E-07
Carbon disulfide (TH)	75150	6.23E-04	0.00E+00	1.25E+00	NO. Based on facility-wide potential.	2.49E-06
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	1.13E-04	0.00E+00	2.25E-01	NO. Based on facility-wide potential.	4.50E-07
Formaldehyde (TH)	50000	7.97E-01	0.00E+00	1.59E+03	YES. Modeling required	3.19E-03
Hexane, n- (TH)	110543	2.39E-01	0.00E+00	4.78E+02	NO. Based on facility-wide potential.	9.57E-04
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	0.00E+00	6.50E-07	NO. Based on facility-wide potential.	1.30E-12
Hydrogen Sulfide (T)	7783064	1.37E-02	0.00E+00	2.74E+01	NO. Based on facility-wide potential.	5.47E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	0.00E+00	3.85E+00	NO. Based on facility-wide potential.	7.70E-06
Mercury, vapor (TH)	7439976	6.50E-04	0.00E+00	1.30E+00	NO. Because of operating restriction	2.60E-06
Methylene chloride (TH)	75092	8.23E-06	0.00E+00	1.65E-02	NO. Based on facility-wide potential.	3.29E-08
Methyl chloroform (TH)	71556	1.20E-02	0.00E+00	2.40E+01	NO. Based on facility-wide potential.	4.80E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	0.00E+00	1.34E+01	NO. Based on facility-wide potential.	2.68E-05
Nickel metal (TH)	7440020	1.58E-02	0.00E+00	3.15E+01	NO. Because of operating restriction	6.30E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	0.00E+00	1.60E-01	NO. Based on facility-wide potential.	3.20E-07
Phenol (TH)	108952	1.01E-03	0.00E+00	2.01E+00	NO. Based on facility-wide potential.	4.02E-06
Styrene (TH)	100425	2.40E-04	0.00E+00	4.81E-01	NO. Based on facility-wide potential.	9.62E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	0.00E+00	1.05E-07	NO. Based on facility-wide potential.	2.10E-13
Toluene (TH)	108883	7.29E-01	0.00E+00	1.46E+03	NO. Based on facility-wide potential.	2.92E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Xylene (TH)	1330207	6.04E-02	0.00E+00	1.21E+02	NO. Based on facility-wide potential.	2.41E-04

EXPECTED ACTUAL EMISSIONS - NATURAL GAS

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 INPUT SCREEN

NCDENR

NOTICE: This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

Instructions: 1. Fill in all BLUE cells.
2.Ensure all pull down boxes and BLUE cells reflect correct conditions.
3. Read the README sheet.
4. Use the mouse pointer to read the tips in the "red cornered" input cells. (See Tools->Options->Comments if these are not displayed.

Company Name:	Carolina Sunrock, LLC
Facility ID No.:	1700016
Permit No.:	10628R00
Facility City:	Burlington
Facility County:	Caswell
Spreadsheet Prepared by:	LLG

Is this spreadsheet being used for emissions inventory	2. NO
Plant type:	Drum mix
Fuel type:	Natural gas-fired
Fuel Sulfur Content:	0.50 %
Controls:	Fabric filter controls

Dryer heat input:	60	million Btu per hour
Plant maximum production capacity:	250	tons per hour

Asphalt Properties			
Asphalt temperature:	325	degrees	(default value of 325 degrees F)
Volatility loss (V):	-0.5	%	(default value of -0.5 %)

Silo Filling?	YES

RAP crushing on site?	YES				
Crushing Capacity?	65	tons per hour	No. of crushers:	1	
Hours of operation:	8760	hours per year	No. of screens:	1	
			No. of conveyors:	4	

Asphalt Cement Heater			
AC heater heat input:	2.3	million Btu per hour	(No.2 or diesel fuel oil -fired assumed)
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Hours of operation:	8760	hours per year	(default is 8760 hours per year unless specified otherwise)

Calculated Annual Production Limit:	1,488,581	tons per year	
Requested Annual Production Limit:	500,000	tons per year	(if none desired leave default value =8760*tph)
Requested Daily Production Limit:	6,000	tons per day	(if none desired leave default value = 24*tph)

Is this plant NSPS Subpart I affected?	YES	
Stack gas flow rate :	68,145	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	11.81	lb/hr
Control efficiency required:	99.831	%
Does Method 5 data already exist?:	NO	
Method 5 determined emission rate:	40.00	lb/hr
Control efficiency based on test data:	99.429	%

Allowable emission rate under 2 D .0506:	55.39	lb/hr
Does this plant emit less than this limit ?:	Yes	*(based on emission factors)*
Control efficiency required:	99.209	%

ATTACHMENT E2

Dryer Emissions
Criteria Pollutants

Pollutant	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	uncontrolled emission rate (lb/hr)	controlled emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (with controls, 8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Condensible PM (or PM_{10})	0.0654	0.0194	16.35	4.85			
Filterable PM	28	0.014	7000	3.5			
Filterable PM10	6.4	0.0039	1600	0.975			
Total PM	28	0.033	7000	8.25	73.0	36.1	8.3
Total PM10	6.5	0.023	1625	5.75	33.1	25.2	5.8
SO2	0.0001	0.0001	0.02	0.02	0.10	0.10	0.02
CO	0.1300	0.130	32.5	32.5	142.4	142.4	32.5
NOx	0.0260	0.026	6.5	6.5	28.5	28.5	6.5
VOC	0.0320	0.032	8	8	35.0	35.0	8.0
HAPs, TOTAL		0.005		1.325	5.8	5.8	1.3

Silo Filling plus Load Out Emissions, Criteria Pollutants

Pollutant	Emission Factor, combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E-03	2.77E-01	1.2	1.2	0.3
CO	2.53E-03	6.32E-01	2.8	2.8	0.6
VOC	1.61E-02	4.02E+00	17.6	17.6	4.0
HAPs, TOTAL	2.74E-04	6.85E-02	0.3	0.3	0.1

Rap Crusher Emissions

Pollutant	Emission Factor, all sources combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0424	2.76E+00	12.1	12.1	2.8
Total PM10	0.0155	1.01E+00	4.4	4.4	1.0

Asphalt Cement Heater Emissions

Pollutant	Uncontrolled Emission Factor (lb/MMBtu)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0235714	5.42E-02	0.2	0.2	0.2
Total PM10	0.0235714	5.42E-02	0.2	0.2	0.2
SO2	0.5071429	1.17E+00	5.1	5.1	5.1
CO	0.0357143	8.21E-02	0.4	0.4	0.4
NOx	0.1428571	3.29E-01	1.4	1.4	1.4
VOC	0.0024286	5.59E-03	0.0	0.0	0.0

Facility-wide Criteria Pollutant Emissions Summary

Pollutant	Controlled Emission Rate, lb/hr	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E+01	86.5	49.7	11.5
Total PM10	6.81E+00	38.9	31.0	7.3
SO2	1.19E+00	5.2	5.2	5.1
CO	3.32E+01	145.5	145.5	33.5
NOx	6.83E+00	29.9	29.9	7.9
VOC	1.20E+01	52.7	52.7	12.0
HAPs, TOTAL	1.39E+00	6.1	6.1	1.4

Facility-wide Toxic Air Pollutants Summary

TAP	CAS No.	Action
Acetaldehyde (TH)	75070	NOTE 1
Acrolein (TH)	107028	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	NOTE 3
Benzene (TH)	71432	NOTE 3
Benzo(a)pyrene (T)	50328	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	NOTE 2
Carbon disulfide (TH)	75150	NOTE 1
Formaldehyde (TH)	50000	NOTE 3
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	NOTE 1
Hexane, n- (TH)	110543	NOTE 1
Hydrogen Sulfide (T)	7783064	NOTE 1
Manganese unlisted compounds (T)	MNC-other	NOTE 1
Methyl chloroform (TH)	71556	NOTE 1

TAP	CAS No.	Action
Mercury, vapor (TH)	7439976	NOTE 1
Methyl ethyl ketone (TH)	78933	NOTE 1
Methylene chloride (TH)	75092	NOTE 1
Nickel metal (TH)	7440020	NOTE 3
Perchloroethylene (tetrachloroethylene) (TH)	127184	NOTE 1
Phenol (TH)	108952	NOTE 1
Soluble Chromate Compounds as Chrome VI (TH)	7738945	NOTE 1
Styrene (TH)	100425	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	NOTE 1
Toluene (TH)	108883	NOTE 1
Trichloroethylene (TH)	79016	NOTE 1
Xylene (TH)	1330207	NOTE 1

NOTE 1: Include TAP in TPER stipulation.

NOTE 2: Include TAP in TPER stipulation with operation restrictions.

NOTE 3: Modeling Required. See "Toxic calculations" worksheet.

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 OUTPUT SCREEN

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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SOURCE / FACILITY / USER INPUT SUMMARY (FROM INPUT SCREEN)

COMPANY:	**Carolina Sunrock, LLC**	FACILITY ID NO.:	1700016
		PERMIT NUMBER:	10628R00
EMISSION SOURCE DESCRIPTION:	NSPS affected 250 tph Natural gas-fired, Drum mix asphalt plant (80 mmBtu/hr heat input, w/silofill, with RAP, sulfur=n/a%)	FACILITY CITY:	Burlington
		FACILITY COUNTY:	Caswell

Annual Production Limit:	500,000	ton/year	**Daily Production Limit:**	n/a	ton/day
SPREADSHEET PREPARED BY:	LLG				

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	11.06	11.52		86.48		11.52
PARTICULATE MATTER<10 MICRONS (PM_{10})	6.81	7.27		38.93		7.27
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)						
SULFUR DIOXIDE (SO2)	1.19	5.13		5.21		5.13
NITROGEN OXIDES (NOx)	6.83	7.94		29.91		7.94
CARBON MONOXIDE (CO)	33.21	33.49		145.48		33.49
VOLATILE ORGANIC COMPOUNDS (VOC)	12.03	12.05		52.69		12.05
TOTAL HAP	1.39	1.39		6.10		1.39
LARGEST HAP (formaldehyde)	0.80	0.80		3.49		0.80

Attach INPUT worksheet

TOXIC / HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION

TOXIC / HAZARDOUS AIR POLLUTANT	CAS Number	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)		EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	
Acetaldehyde (TH)	75070	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Acrolein (TH)	107028	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Antimony unlisted compounds (H)	SBC-other	4.50E-05	9.00E-02	4.50E-05	0.39	4.50E-05	9.00E-02	1.8E-07
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	2.80E-01	1.40E-04	1.23	1.40E-04	2.80E-01	5.6E-07
Benzene (TH)	71432	9.90E-02	1.98E+02	9.90E-02	867.38	9.90E-02	1.98E+02	4.0E-04
Benzo(a)pyrene (T)	50328	4.41E-06	8.82E-03	4.41E-06	0.04	4.41E-06	8.82E-03	1.8E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.05E-01	1.03E-04	0.90	1.03E-04	2.05E-01	4.1E-07
Carbon disulfide (TH)	75150	6.23E-04	1.25E+00	6.23E-04	5.45	6.23E-04	1.25E+00	2.5E-06
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	1.26E-03	2.53E+00	1.26E-03	11.06	1.26E-03	2.53E+00	5.1E-06
Chromic acid (VI) (component of solCR6 and CRC) (TH)	7738945	1.13E-04	2.25E-01	1.13E-04	0.99	1.13E-04	2.25E-01	4.5E-07
Cobalt unlisted compounds (H)	COC-other	6.50E-06	1.30E-02	6.50E-06	0.06	6.50E-06	1.30E-02	2.6E-08
Cumene (H)	98828	1.14E-03	2.29E+00	1.14E-03	10.02	1.14E-03	2.29E+00	4.6E-06
Ethyl benzene (H)	100414	6.41E-02	1.28E+02	6.41E-02	561.24	6.41E-02	1.28E+02	2.6E-04
Ethyl chloride (chloroethane) (H)	75003	2.18E-06	4.37E-03	2.18E-06	0.02	2.18E-06	4.37E-03	8.7E-09
Formaldehyde (TH)	50000	7.97E-01	1.59E+03	7.97E-01	6981.17	7.97E-01	1.59E+03	3.2E-03
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Hexane, n- (TH)	110543	2.39E-01	4.78E+02	2.39E-01	2095.50	2.39E-01	4.78E+02	9.6E-04
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Hydrogen Sulfide (T)	7783064	1.37E-02	2.74E+01	1.37E-02	119.84	1.37E-02	2.74E+01	5.5E-05
Lead unlisted compounds (H)	PBC-other	1.55E-04	3.10E-01	1.55E-04	1.36	1.55E-04	3.10E-01	6.2E-07
Manganese unlisted compounds (T)	MNC-other	1.93E-03	3.85E+00	1.93E-03	16.86	1.93E-03	3.85E+00	7.7E-06
Mercury, vapor (TH)	7439976	6.00E-05	1.20E-01	6.00E-05	0.53	6.00E-05	1.20E-01	2.4E-07
Methyl bromide (H)	74839	2.49E-04	4.98E-01	2.49E-04	2.18	2.49E-04	4.98E-01	1.0E-06
Methyl chloride (H)	74873	1.56E-04	3.12E-01	1.56E-04	1.37	1.56E-04	3.12E-01	6.2E-07
Methyl chloroform (TH)	71556	1.20E-02	2.40E+01	1.20E-02	105.12	1.20E-02	2.40E+01	4.8E-05
Methyl ethyl ketone (TH)	78933	1.70E-03	3.40E+00	1.70E-03	14.87	1.70E-03	3.40E+00	6.8E-06
Methylene chloride (TH)	75092	8.23E-06	1.65E-02	8.23E-06	0.07	8.23E-06	1.65E-02	3.3E-08
Napthalene (H)	91203	2.47E-02	4.94E+01	2.47E-02	216.55	2.47E-02	4.94E+01	9.9E-05
Nickel metal (TH)	7440020	1.58E-02	3.15E+01	1.58E-02	137.97	1.58E-02	3.15E+01	6.3E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.60E-01	8.01E-05	0.70	8.01E-05	1.60E-01	3.2E-07
Phenol (TH)	108952	1.01E-03	2.01E+00	1.01E-03	8.81	1.01E-03	2.01E+00	4.0E-06
Phosphorus Metal, Yellow or White (H)	7723140	7.00E-03	1.40E+01	7.00E-03	61.32	7.00E-03	1.40E+01	2.8E-05
Polycyclic Organic Matter (H)	POM	4.75E-02	9.50E+01	4.75E-02	416.10	4.75E-02	9.50E+01	1.9E-04
Propionaldehyde (H)	123386	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Quinone (H)	106514	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Selenium compounds (H)	SEC	8.75E-05	1.75E-01	8.75E-05	0.77	8.75E-05	1.75E-01	3.5E-07

Styrene (TH)	100425	2.40E-04	4.81E-01	2.40E-04	2.11	2.40E-04	4.81E-01	9.6E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Toluene (TH)	108883	4.16E-02	8.31E+01	4.16E-02	364.17	4.16E-02	8.31E+01	1.7E-04
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Trimethylpentane, 2,2,4- (H)	540841	1.00E-02	2.01E+01	1.00E-02	87.85	1.00E-02	2.01E+01	4.0E-05
Xylene (TH)	1330207	6.04E-02	1.21E+02	6.04E-02	528.72	6.04E-02	1.21E+02	2.4E-04
Xylene, o- (H)	95476	2.57E-03	5.14E+00	2.57E-03	22.50	2.57E-03	5.14E+00	1.0E-05

TOXIC AIR POLLUTANT EMISSIONS INFORMATION (FOR PERMITTING PURPOSES)

Expected actual emissions after controls and limitations consisting of an annual production limit of 500000 tons .

TOXIC AIR POLLUTANT	CAS Num.	lb/hr	lb/day	lb/yr	Modeling Required?	EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
Acetaldehyde (TH)	75070	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Acrolein (TH)	107028	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	3.36E-03	2.80E-01	YES. Modeling required	5.60E-07
Benzene (TH)	71432	9.90E-02	2.38E+00	1.98E+02	YES. Modeling required	3.96E-04
Benzo(a)pyrene (T)	50328	4.41E-06	1.06E-04	8.82E-03	NO. Based on facility-wide potential.	1.76E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.46E-03	2.05E-01	NO. Because of operating restriction	4.10E-07
Carbon disulfide (TH)	75150	6.23E-04	1.49E-02	1.25E+00	NO. Based on facility-wide potential.	2.49E-06
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	1.13E-04	2.70E-03	2.25E-01	NO. Based on facility-wide potential.	4.50E-07
Formaldehyde (TH)	50000	7.97E-01	1.91E+01	1.59E+03	YES. Modeling required	3.19E-03
Hexane, n- (TH)	110543	2.39E-01	5.74E+00	4.78E+02	NO. Based on facility-wide potential.	9.57E-04
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Hydrogen Sulfide (T)	7783064	1.37E-02	3.28E-01	2.74E+01	NO. Based on facility-wide potential.	5.47E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	4.62E-02	3.85E+00	NO. Based on facility-wide potential.	7.70E-06
Mercury, vapor (TH)	7439976	6.00E-05	1.44E-03	1.20E-01	NO. Based on facility-wide potential.	2.40E-07
Methylene chloride (TH)	75092	8.23E-06	1.97E-04	1.65E-02	NO. Based on facility-wide potential.	3.29E-08
Methyl chloroform (TH)	71556	1.20E-02	2.88E-01	2.40E+01	NO. Based on facility-wide potential.	4.80E-05
Methyl ethyl ketone (TH)	78933	1.70E-03	4.07E-02	3.40E+00	NO. Based on facility-wide potential.	6.79E-06
Nickel metal (TH)	7440020	1.58E-02	3.78E-01	3.15E+01	YES. Modeling required	6.30E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.92E-03	1.60E-01	NO. Based on facility-wide potential.	3.20E-07
Phenol (TH)	108952	1.01E-03	2.41E-02	2.01E+00	NO. Based on facility-wide potential.	4.02E-06
Styrene (TH)	100425	2.40E-04	5.77E-03	4.81E-01	NO. Based on facility-wide potential.	9.62E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Toluene (TH)	108883	4.16E-02	9.98E-01	8.31E+01	NO. Based on facility-wide potential.	1.66E-04
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Xylene (TH)	1330207	6.04E-02	1.45E+00	1.21E+02	NO. Based on facility-wide potential.	2.41E-04

EXPECTED ACTUAL EMISSIONS - WASTE OIL / NO. 4 FUEL OIL

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 INPUT SCREEN

NCDENR

NOTICE: This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

Instructions: **1. Fill in all BLUE cells.**
2.Ensure all pull down boxes and BLUE cells reflect correct conditions.
3. Read the README sheet.
4. Use the mouse pointer to read the tips in the "red cornered" input cells. (See Tools->Options->Comments if these are not displayed.

Company Name:	Carolina Sunrock, LLC
Facility ID No.:	1700016
Permit No.:	10628R00
Facility City:	Burlington
Facility County:	Caswell
Spreadsheet Prepared by:	LLG

Is this spreadsheet being used for emissions inventory	2. NO
Plant type:	Drum mix
Fuel type:	Waste, No.4 or No.6 fuel oil-fired
Fuel Sulfur Content:	0.50 % (default value is 0.5 %)
Controls:	Fabric filter controls

Dryer heat input:	80	million Btu per hour
Plant maximum production capacity:	250	tons per hour

Asphalt Properties			
Asphalt temperature:	325	degrees	(default value of 325 degrees F)
Volatility loss (V):	-0.5	%	(default value of -0.5 %)

Silo Filling?	YES

RAP crushing on site?	YES				
Crushing Capacity?	65	tons per hour	No. of crushers:	1	
Hours of operation:	8760	hours per year	No. of screens:	1	
			No. of conveyors:	4	

Asphalt Cement Heater			
AC heater heat input:	2.3	million Btu per hour	(No.2 or diesel fuel oil -fired assumed)
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Hours of operation:	8760	hours per year	(default is 8760 hours per year unless specified otherwise)

Calculated Annual Production Limit:	1,488,581	tons per year	
Requested Annual Production Limit:	500,000	tons per year	(if none desired leave default value =8760*tph)
Requested Daily Production Limit:	6,000	tons per day	(if none desired leave default value = 24*tph)

Is this plant NSPS Subpart I affected?	YES	
Stack gas flow rate :	68,145	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	11.81	lb/hr
Control efficiency required:	99.831	%
Does Method 5 data already exist?:	NO	
Method 5-determined emission rate:	40.00	lb/hr
Control efficiency based on test data:	99.429	%

Allowable emission rate under 2 D .0506:	55.39	lb/hr
Does this plant emit less than this limit ?:	Yes	*(based on emission factors)*
Control efficiency required:	99.209	%

ATTACHMENT E3

Dryer Emissions
Criteria Pollutants

Pollutant	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	uncontrolled emission rate (lb/hr)	controlled emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (with controls, 8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Condensible PM (or PM_{10})	0.0654	0.0194	16.35	4.85			
Filterable PM	28	0.014	7000	3.5			
Filterable PM10	6.4	0.0039	1600	0.975			
Total PM	28	0.033	7000	8.25	73.0	36.1	8.3
Total PM10	6.5	0.023	1625	5.75	33.1	25.2	5.8
SO2	0.0837	0.0837	20.93	20.93	91.69	91.69	20.93
CO	0.1300	0.130	32.5	32.5	142.4	142.4	32.5
NOx	0.0550	0.055	13.75	13.75	60.2	60.2	13.8
VOC	0.0320	0.032	8	8	35.0	35.0	8.0
HAPs, TOTAL		0.010		2.5	11.0	11.0	2.5

Silo Filling plus Load Out Emissions, Criteria Pollutants

Pollutant	Emission Factor, combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E-03	2.77E-01	1.2	1.2	0.3
CO	2.53E-03	6.32E-01	2.8	2.8	0.6
VOC	1.61E-02	4.02E+00	17.6	17.6	4.0
HAPs, TOTAL	2.74E-04	6.85E-02	0.3	0.3	0.1

Rap Crusher Emissions

Pollutant	Emission Factor, all sources combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0424	2.76E+00	12.1	12.1	2.8
Total PM10	0.0155	1.01E+00	4.4	4.4	1.0

Asphalt Cement Heater Emissions

Pollutant	Uncontrolled Emission Factor (lb/MMBtu)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0235714	5.42E-02	0.2	0.2	0.2
Total PM10	0.0235714	5.42E-02	0.2	0.2	0.2
SO2	0.5071429	1.17E+00	5.1	5.1	5.1
CO	0.0357143	8.21E-02	0.4	0.4	0.4
NOx	0.1428571	3.29E-01	1.4	1.4	1.4
VOC	0.0024286	5.59E-03	0.0	0.0	0.0

Facility-wide Criteria Pollutant Emissions Summary

Pollutant	Controlled Emission Rate, lb/hr	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E+01	86.5	49.7	11.5
Total PM10	6.81E+00	38.9	31.0	7.3
SO2	2.21E+01	96.8	96.8	26.0
CO	3.32E+01	145.5	145.5	33.5
NOx	1.41E+01	61.7	61.7	15.2
VOC	1.20E+01	52.7	52.7	12.0
HAPs, TOTAL	2.57E+00	11.3	11.3	2.6

Facility-wide Toxic Air Pollutants Summary

TAP	CAS No.	Action
Acetaldehyde (TH)	75070	NOTE 1
Acrolein (TH)	107028	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	NOTE 3
Benzene (TH)	71432	NOTE 3
Benzo(a)pyrene (T)	50328	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	NOTE 2
Carbon disulfide (TH)	75150	NOTE 1
Formaldehyde (TH)	50000	NOTE 3
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	NOTE 1
Hexane, n- (TH)	110543	NOTE 1
Hydrogen Sulfide (T)	7783064	NOTE 1
Manganese unlisted compounds (T)	MNC-other	NOTE 1
Methyl chloroform (TH)	71556	NOTE 1

TAP	CAS No.	Action
Mercury, vapor (TH)	7439976	NOTE 3
Methyl ethyl ketone (TH)	78933	NOTE 1
Methylene chloride (TH)	75092	NOTE 1
Nickel metal (TH)	7440020	NOTE 3
Perchloroethylene (tetrachloroethylene) (TH)	127184	NOTE 1
Phenol (TH)	108952	NOTE 1
Soluble Chromate Compounds as Chrome VI (TH)	7738945	NOTE 1
Styrene (TH)	100425	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	NOTE 1
Toluene (TH)	108883	NOTE 1
Trichloroethylene (TH)	79016	NOTE 1
Xylene (TH)	1330207	NOTE 1

NOTE 1: Include TAP in TPER stipulation.

NOTE 2: Include TAP in TPER stipulation with operation restrictions.

NOTE 3: Modeling Required. See "Toxic calculations" worksheet.

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 OUTPUT SCREEN

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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SOURCE / FACILITY / USER INPUT SUMMARY (FROM INPUT SCREEN)

COMPANY:	**Carolina Sunrock, LLC**	FACILITY ID NO.:	1700016
		PERMIT NUMBER:	10628R00
EMISSION SOURCE DESCRIPTION:	NSPS affected 250 tph Waste, No.4 or No.6 fuel oil-fired, Drum mix asphalt plant (80 mmBtu/hr heat input, w/silofill, with RAP, sulfur=0.5%)	FACILITY CITY:	Burlington
		FACILITY COUNTY:	Caswell

Annual Production Limit:	500,000	ton/year	**Daily Production Limit:**	n/a	ton/day
SPREADSHEET PREPARED BY:	LLG				

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	11.06	11.52		86.48		11.52
PARTICULATE MATTER<10 MICRONS (PM_{10})	6.81	7.27		38.93		7.27
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)						
SULFUR DIOXIDE (SO2)	22.10	26.04		96.80		26.04
NITROGEN OXIDES (NOx)	14.08	15.19		61.66		15.19
CARBON MONOXIDE (CO)	33.21	33.49		145.48		33.49
VOLATILE ORGANIC COMPOUNDS (VOC)	12.03	12.05		52.69		12.05
TOTAL HAP	2.57	2.57		11.25		2.57
LARGEST HAP (formaldehyde)	0.80	0.80		3.49		0.80

Attach INPUT worksheet

TOXIC / HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION

TOXIC / HAZARDOUS AIR POLLUTANT	CAS Number	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)		EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	
Acetaldehyde (TH)	75070	3.25E-01	6.50E+02	3.25E-01	2847.00	3.25E-01	6.50E+02	1.3E-03
Acrolein (TH)	107028	6.50E-03	1.30E+01	6.50E-03	56.94	6.50E-03	1.30E+01	2.6E-05
Antimony unlisted compounds (H)	SBC-other	4.50E-05	9.00E-02	4.50E-05	0.39	4.50E-05	9.00E-02	1.8E-07
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	2.80E-01	1.40E-04	1.23	1.40E-04	2.80E-01	5.6E-07
Benzene (TH)	71432	9.90E-02	1.98E+02	9.90E-02	867.38	9.90E-02	1.98E+02	4.0E-04
Benzo(a)pyrene (T)	50328	4.41E-06	8.82E-03	4.41E-06	0.04	4.41E-06	8.82E-03	1.8E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.05E-01	1.03E-04	0.90	1.03E-04	2.05E-01	4.1E-07
Carbon disulfide (TH)	75150	6.23E-04	1.25E+00	6.23E-04	5.45	6.23E-04	1.25E+00	2.5E-06
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	1.26E-03	2.53E+00	1.26E-03	11.06	1.26E-03	2.53E+00	5.1E-06
Chromic acid (VI) (component of solCR6 and CRC) (TH)	7738945	1.13E-04	2.25E-01	1.13E-04	0.99	1.13E-04	2.25E-01	4.5E-07
Cobalt unlisted compounds (H)	COC-other	6.50E-06	1.30E-02	6.50E-06	0.06	6.50E-06	1.30E-02	2.6E-08
Cumene (H)	98828	1.14E-03	2.29E+00	1.14E-03	10.02	1.14E-03	2.29E+00	4.6E-06
Ethyl benzene (H)	100414	6.41E-02	1.28E+02	6.41E-02	561.24	6.41E-02	1.28E+02	2.6E-04
Ethyl chloride (chloroethane) (H)	75003	2.18E-06	4.37E-03	2.18E-06	0.02	2.18E-06	4.37E-03	8.7E-09
Formaldehyde (TH)	50000	7.97E-01	1.59E+03	7.97E-01	6981.17	7.97E-01	1.59E+03	3.2E-03
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	6.50E-07	3.25E-10	0.00	3.25E-10	6.50E-07	1.3E-12
Hexane, n- (TH)	110543	2.39E-01	4.78E+02	2.39E-01	2095.50	2.39E-01	4.78E+02	9.6E-04
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	5.25E-02	1.05E+02	5.25E-02	459.90	5.25E-02	1.05E+02	2.1E-04
Hydrogen Sulfide (T)	7783064	1.37E-02	2.74E+01	1.37E-02	119.84	1.37E-02	2.74E+01	5.5E-05
Lead unlisted compounds (H)	PBC-other	3.75E-03	7.50E+00	3.75E-03	32.85	3.75E-03	7.50E+00	1.5E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	3.85E+00	1.93E-03	16.86	1.93E-03	3.85E+00	7.7E-06
Mercury, vapor (TH)	7439976	6.50E-04	1.30E+00	6.50E-04	5.69	6.50E-04	1.30E+00	2.6E-06
Methyl bromide (H)	74839	2.49E-04	4.98E-01	2.49E-04	2.18	2.49E-04	4.98E-01	1.0E-06
Methyl chloride (H)	74873	1.56E-04	3.12E-01	1.56E-04	1.37	1.56E-04	3.12E-01	6.2E-07
Methyl chloroform (TH)	71556	1.20E-02	2.40E+01	1.20E-02	105.12	1.20E-02	2.40E+01	4.8E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	1.34E+01	6.70E-03	58.67	6.70E-03	1.34E+01	2.7E-05
Methylene chloride (TH)	75092	8.23E-06	1.65E-02	8.23E-06	0.07	8.23E-06	1.65E-02	3.3E-08
Napthalene (H)	91203	1.65E-01	3.29E+02	1.65E-01	1442.95	1.65E-01	3.29E+02	6.6E-04
Nickel metal (TH)	7440020	1.58E-02	3.15E+01	1.58E-02	137.97	1.58E-02	3.15E+01	6.3E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.60E-01	8.01E-05	0.70	8.01E-05	1.60E-01	3.2E-07
Phenol (TH)	108952	1.01E-03	2.01E+00	1.01E-03	8.81	1.01E-03	2.01E+00	4.0E-06
Phosphorus Metal, Yellow or White (H)	7723140	7.00E-03	1.40E+01	7.00E-03	61.32	7.00E-03	1.40E+01	2.8E-05
Polycyclic Organic Matter (H)	POM	2.20E-01	4.40E+02	2.20E-01	1927.20	2.20E-01	4.40E+02	8.8E-04
Propionaldehyde (H)	123386	3.25E-02	6.50E+01	3.25E-02	284.70	3.25E-02	6.50E+01	1.3E-04
Quinone (H)	106514	4.00E-02	8.00E+01	4.00E-02	350.40	4.00E-02	8.00E+01	1.6E-04
Selenium compounds (H)	SEC	8.75E-05	1.75E-01	8.75E-05	0.77	8.75E-05	1.75E-01	3.5E-07

Styrene (TH)	100425	2.40E-04	4.81E-01	2.40E-04	2.11	2.40E-04	4.81E-01	9.6E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	1.05E-07	5.25E-11	0.00	5.25E-11	1.05E-07	2.1E-13
Toluene (TH)	108883	7.29E-01	1.46E+03	7.29E-01	6386.67	7.29E-01	1.46E+03	2.9E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Trimethylpentane, 2,2,4- (H)	540841	1.00E-02	2.01E+01	1.00E-02	87.85	1.00E-02	2.01E+01	4.0E-05
Xylene (TH)	1330207	6.04E-02	1.21E+02	6.04E-02	528.72	6.04E-02	1.21E+02	2.4E-04
Xylene, o- (H)	95476	2.57E-03	5.14E+00	2.57E-03	22.50	2.57E-03	5.14E+00	1.0E-05

TOXIC AIR POLLUTANT EMISSIONS INFORMATION (FOR PERMITTING PURPOSES)

Expected actual emissions after controls and limitations consisting of an annual production limit of 500000 tons .

TOXIC AIR POLLUTANT	CAS Num.	lb/hr	lb/day	lb/yr	Modeling Required?	EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
Acetaldehyde (TH)	75070	3.25E-01	7.80E+00	6.50E+02	NO. Based on facility-wide potential.	1.30E-03
Acrolein (TH)	107028	6.50E-03	1.56E-01	1.30E+01	NO. Based on facility-wide potential.	2.60E-05
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	3.36E-03	2.80E-01	YES. Modeling required	5.60E-07
Benzene (TH)	71432	9.90E-02	2.38E+00	1.98E+02	YES. Modeling required	3.96E-04
Benzo(a)pyrene (T)	50328	4.41E-06	1.06E-04	8.82E-03	NO. Based on facility-wide potential.	1.76E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.46E-03	2.05E-01	NO. Because of operating restriction	4.10E-07
Carbon disulfide (TH)	75150	6.23E-04	1.49E-02	1.25E+00	NO. Based on facility-wide potential.	2.49E-06
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	1.13E-04	2.70E-03	2.25E-01	NO. Based on facility-wide potential.	4.50E-07
Formaldehyde (TH)	50000	7.97E-01	1.91E+01	1.59E+03	YES. Modeling required	3.19E-03
Hexane, n- (TH)	110543	2.39E-01	5.74E+00	4.78E+02	NO. Based on facility-wide potential.	9.57E-04
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	7.80E-09	6.50E-07	NO. Based on facility-wide potential.	1.30E-12
Hydrogen Sulfide (T)	7783064	1.37E-02	3.28E-01	2.74E+01	NO. Based on facility-wide potential.	5.47E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	4.62E-02	3.85E+00	NO. Based on facility-wide potential.	7.70E-06
Mercury, vapor (TH)	7439976	6.50E-04	1.56E-02	1.30E+00	YES. Modeling required	2.60E-06
Methylene chloride (TH)	75092	8.23E-06	1.97E-04	1.65E-02	NO. Based on facility-wide potential.	3.29E-08
Methyl chloroform (TH)	71556	1.20E-02	2.88E-01	2.40E+01	NO. Based on facility-wide potential.	4.80E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	1.61E-01	1.34E+01	NO. Based on facility-wide potential.	2.68E-05
Nickel metal (TH)	7440020	1.58E-02	3.78E-01	3.15E+01	YES. Modeling required	6.30E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.92E-03	1.60E-01	NO. Based on facility-wide potential.	3.20E-07
Phenol (TH)	108952	1.01E-03	2.41E-02	2.01E+00	NO. Based on facility-wide potential.	4.02E-06
Styrene (TH)	100425	2.40E-04	5.77E-03	4.81E-01	NO. Based on facility-wide potential.	9.62E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	1.26E-09	1.05E-07	NO. Based on facility-wide potential.	2.10E-13
Toluene (TH)	108883	7.29E-01	1.75E+01	1.46E+03	NO. Based on facility-wide potential.	2.92E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Xylene (TH)	1330207	6.04E-02	1.45E+00	1.21E+02	NO. Based on facility-wide potential.	2.41E-04

POTENTIAL EMISSIONS - BEFORE CONTROLS/LIMITS

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 INPUT SCREEN

NCDENR

NOTICE: This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

Instructions: **1. Fill in all BLUE cells.**
2.Ensure all pull down boxes and BLUE cells reflect correct conditions.
3. Read the README sheet.
4. Use the mouse pointer to read the tips in the "red cornered" input cells. (See Tools->Options->Comments if these are not displayed.

Company Name:	Carolina Sunrock, LLC
Facility ID No.:	1700016
Permit No.:	10628R00
Facility City:	Burlington
Facility County:	Caswell
Spreadsheet Prepared by:	LLG

Is this spreadsheet being used for emissions inventory	2. NO		
Plant type:	Drum mix		
Fuel type:	Waste, No.4 or No.6 fuel oil-fired		
Fuel Sulfur Content:	2.10	%	(default value is 0.5 %)
Controls:	Fabric filter controls		

Dryer heat input:	80	million Btu per hour
Plant maximum production capacity:	250	tons per hour

Asphalt Properties			
Asphalt temperature:	325	degrees	(default value of 325 degrees F)
Volatility loss (V):	-0.5	%	(default value of -0.5 %)

Silo Filling?	YES

RAP crushing on site?	YES				
Crushing Capacity?	65	tons per hour	No. of crushers:	1	
Hours of operation:	8760	hours per year	No. of screens:	1	
			No. of conveyors:	4	

Asphalt Cement Heater			
AC heater heat input:	2.3	million Btu per hour	(No.2 or diesel fuel oil -fired assumed)
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Hours of operation:	8760	hours per year	(default is 8760 hours per year unless specified otherwise)

Calculated Annual Production Limit:	311,227	tons per year	
Requested Annual Production Limit:	2,190,000	tons per year	**INVALID ENTRY. Value must be less than or equal to 311227 tpy.**
Requested Daily Production Limit:	6,000	tons per day	(if none desired leave default value = 24*tph)

Is this plant NSPS Subpart I affected?	YES	
Stack gas flow rate :	68,145	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	11.81	lb/hr
Control efficiency required:	99.831	%
Does Method 5 data already exist?:	NO	
Method 5 determined emission rate:	40.00	lb/hr
Control efficiency based on test data:	99.429	%

Allowable emission rate under 2 D .0506:	55.39	lb/hr
Does this plant emit less than this limit ?:	Yes	*(based on emission factors)*
Control efficiency required:	99.209	%

ATTACHMENT E4

Dryer Emissions
Criteria Pollutants

Pollutant	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	uncontrolled emission rate (lb/hr)	controlled emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (with controls, 8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Condensible PM (or PM_{10})	0.0654	0.0194	16.35	4.85			
Filterable PM	28	0.014	7000	3.5			
Filterable PM10	6.4	0.0039	1600	0.975			
Total PM	28	0.033	7000	8.25	73.0	36.1	36.1
Total PM10	6.5	0.023	1625	5.75	33.1	25.2	25.2
SO2	0.6034	0.6034	150.84	150.84	660.68	660.68	660.68
CO	0.1300	0.130	32.5	32.5	142.4	142.4	142.4
NOx	0.0550	0.055	13.75	13.75	60.2	60.2	60.2
VOC	0.0320	0.032	8	8	35.0	35.0	35.0
HAPs, TOTAL		0.010		2.5	11.0	11.0	11.0

Silo Filling plus Load Out Emissions, Criteria Pollutants

Pollutant	Emission Factor, combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E-03	2.77E-01	1.2	1.2	1.2
CO	2.53E-03	6.32E-01	2.8	2.8	2.8
VOC	1.61E-02	4.02E+00	17.6	17.6	17.6
HAPs, TOTAL	2.74E-04	6.85E-02	0.3	0.3	0.3

Rap Crusher Emissions

Pollutant	Emission Factor, all sources combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0424	2.76E+00	12.1	12.1	12.1
Total PM10	0.0155	1.01E+00	4.4	4.4	4.4

Asphalt Cement Heater Emissions

Pollutant	Uncontrolled Emission Factor (lb/MMBtu)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0235714	5.42E-02	0.2	0.2	0.2
Total PM10	0.0235714	5.42E-02	0.2	0.2	0.2
SO2	0.5071429	1.17E+00	5.1	5.1	5.1
CO	0.0357143	8.21E-02	0.4	0.4	0.4
NOx	0.1428571	3.29E-01	1.4	1.4	1.4
VOC	0.0024286	5.59E-03	0.0	0.0	0.0

Facility-wide Criteria Pollutant Emissions Summary

Pollutant	Controlled Emission Rate, lb/hr	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E+01	86.5	49.7	49.7
Total PM10	6.81E+00	38.9	31.0	31.0
SO2	1.52E+02	665.8	665.8	665.8
CO	3.32E+01	145.5	145.5	145.5
NOx	1.41E+01	61.7	61.7	61.7
VOC	1.20E+01	52.7	52.7	52.7
HAPs, TOTAL	2.57E+00	11.3	11.3	11.3

Facility-wide Toxic Air Pollutants Summary

TAP	CAS No.	Action
Acetaldehyde (TH)	75070	NOTE 1
Acrolein (TH)	107028	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	NOTE 3
Benzene (TH)	71432	NOTE 3
Benzo(a)pyrene (T)	50328	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	NOTE 3
Carbon disulfide (TH)	75150	NOTE 1
Formaldehyde (TH)	50000	NOTE 3
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	NOTE 1
Hexane, n- (TH)	110543	NOTE 1
Hydrogen Sulfide (T)	7783064	NOTE 1
Manganese unlisted compounds (T)	MNC-other	NOTE 1
Methyl chloroform (TH)	71556	NOTE 1

TAP	CAS No.	Action
Mercury, vapor (TH)	7439976	NOTE 3
Methyl ethyl ketone (TH)	78933	NOTE 1
Methylene chloride (TH)	75092	NOTE 1
Nickel metal (TH)	7440020	NOTE 3
Perchloroethylene (tetrachloroethylene) (TH)	127184	NOTE 1
Phenol (TH)	108952	NOTE 1
Soluble Chromate Compounds as Chrome VI (TH)	7738945	NOTE 1
Styrene (TH)	100425	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	NOTE 1
Toluene (TH)	108883	NOTE 1
Trichloroethylene (TH)	79016	NOTE 1
Xylene (TH)	1330207	NOTE 1

NOTE 1: Include TAP in TPER stipulation.

NOTE 2: Include TAP in TPER stipulation with operation restrictions.

NOTE 3: Modeling Required. See "Toxic calculations" worksheet.

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 OUTPUT SCREEN

NCDENR

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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SOURCE / FACILITY / USER INPUT SUMMARY (FROM INPUT SCREEN)

COMPANY:	**Carolina Sunrock, LLC**	FACILITY ID NO.:	1700016
		PERMIT NUMBER:	10628R00
EMISSION SOURCE DESCRIPTION:	NSPS affected 250 tph Waste, No.4 or No.6 fuel oil-fired, Drum mix asphalt plant (80 mmBtu/hr heat input, w/silofill, with RAP, sulfur=2.1%)	FACILITY CITY:	Burlington
		FACILITY COUNTY:	Caswell

Annual Production Limit:	2,190,000	ton/year	**Daily Production Limit:**	n/a	ton/day
SPREADSHEET PREPARED BY:	LLG				

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	11.06	49.66		86.48		49.66
PARTICULATE MATTER<10 MICRONS (PM_{10})	6.81	31.05		38.93		31.05
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)						
SULFUR DIOXIDE (SO2)	152.01	665.79		665.79		665.79
NITROGEN OXIDES (NOx)	14.08	61.66		61.66		61.66
CARBON MONOXIDE (CO)	33.21	145.48		145.48		145.48
VOLATILE ORGANIC COMPOUNDS (VOC)	12.03	52.69		52.69		52.69
TOTAL HAP	2.57	11.25		11.25		11.25
LARGEST HAP (formaldehyde)	0.80	3.49		3.49		3.49

Attach INPUT worksheet

TOXIC / HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION

TOXIC / HAZARDOUS AIR POLLUTANT	CAS Number	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)		EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	
Acetaldehyde (TH)	75070	3.25E-01	2.85E+03	3.25E-01	2847.00	3.25E-01	2.85E+03	1.3E-03
Acrolein (TH)	107028	6.50E-03	5.69E+01	6.50E-03	56.94	6.50E-03	5.69E+01	2.6E-05
Antimony unlisted compounds (H)	SBC-other	4.50E-05	3.94E-01	4.50E-05	0.39	4.50E-05	3.94E-01	1.8E-07
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	1.23E+00	1.40E-04	1.23	1.40E-04	1.23E+00	5.6E-07
Benzene (TH)	71432	9.90E-02	8.67E+02	9.90E-02	867.38	9.90E-02	8.67E+02	4.0E-04
Benzo(a)pyrene (T)	50328	4.41E-06	3.86E-02	4.41E-06	0.04	4.41E-06	3.86E-02	1.8E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	8.98E-01	1.03E-04	0.90	1.03E-04	8.98E-01	4.1E-07
Carbon disulfide (TH)	75150	6.23E-04	5.45E+00	6.23E-04	5.45	6.23E-04	5.45E+00	2.5E-06
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	1.26E-03	1.11E+01	1.26E-03	11.06	1.26E-03	1.11E+01	5.1E-06
Chromic acid (VI) (component of solCR6 and CRC) (TH)	7738945	1.13E-04	9.86E-01	1.13E-04	0.99	1.13E-04	9.86E-01	4.5E-07
Cobalt unlisted compounds (H)	COC-other	6.50E-06	5.69E-02	6.50E-06	0.06	6.50E-06	5.69E-02	2.6E-08
Cumene (H)	98828	1.14E-03	1.00E+01	1.14E-03	10.02	1.14E-03	1.00E+01	4.6E-06
Ethyl benzene (H)	100414	6.41E-02	5.61E+02	6.41E-02	561.24	6.41E-02	5.61E+02	2.6E-04
Ethyl chloride (chloroethane) (H)	75003	2.18E-06	1.91E-02	2.18E-06	0.02	2.18E-06	1.91E-02	8.7E-09
Formaldehyde (TH)	50000	7.97E-01	6.98E+03	7.97E-01	6981.17	7.97E-01	6.98E+03	3.2E-03
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	2.85E-06	3.25E-10	0.00	3.25E-10	2.85E-06	1.3E-12
Hexane, n- (TH)	110543	2.39E-01	2.10E+03	2.39E-01	2095.50	2.39E-01	2.10E+03	9.6E-04
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	5.25E-02	4.60E+02	5.25E-02	459.90	5.25E-02	4.60E+02	2.1E-04
Hydrogen Sulfide (T)	7783064	1.37E-02	1.20E+02	1.37E-02	119.84	1.37E-02	1.20E+02	5.5E-05
Lead unlisted compounds (H)	PBC-other	3.75E-03	3.29E+01	3.75E-03	32.85	3.75E-03	3.29E+01	1.5E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	1.69E+01	1.93E-03	16.86	1.93E-03	1.69E+01	7.7E-06
Mercury, vapor (TH)	7439976	6.50E-04	5.69E+00	6.50E-04	5.69	6.50E-04	5.69E+00	2.6E-06
Methyl bromide (H)	74839	2.49E-04	2.18E+00	2.49E-04	2.18	2.49E-04	2.18E+00	1.0E-06
Methyl chloride (H)	74873	1.56E-04	1.37E+00	1.56E-04	1.37	1.56E-04	1.37E+00	6.2E-07
Methyl chloroform (TH)	71556	1.20E-02	1.05E+02	1.20E-02	105.12	1.20E-02	1.05E+02	4.8E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	5.87E+01	6.70E-03	58.67	6.70E-03	5.87E+01	2.7E-05
Methylene chloride (TH)	75092	8.23E-06	7.21E-02	8.23E-06	0.07	8.23E-06	7.21E-02	3.3E-08
Napthalene (H)	91203	1.65E-01	1.44E+03	1.65E-01	1442.95	1.65E-01	1.44E+03	6.6E-04
Nickel metal (TH)	7440020	1.58E-02	1.38E+02	1.58E-02	137.97	1.58E-02	1.38E+02	6.3E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	7.01E-01	8.01E-05	0.70	8.01E-05	7.01E-01	3.2E-07
Phenol (TH)	108952	1.01E-03	8.81E+00	1.01E-03	8.81	1.01E-03	8.81E+00	4.0E-06
Phosphorus Metal, Yellow or White (H)	7723140	7.00E-03	6.13E+01	7.00E-03	61.32	7.00E-03	6.13E+01	2.8E-05
Polycyclic Organic Matter (H)	POM	2.20E-01	1.93E+03	2.20E-01	1927.20	2.20E-01	1.93E+03	8.8E-04
Propionaldehyde (H)	123386	3.25E-02	2.85E+02	3.25E-02	284.70	3.25E-02	2.85E+02	1.3E-04
Quinone (H)	106514	4.00E-02	3.50E+02	4.00E-02	350.40	4.00E-02	3.50E+02	1.6E-04
Selenium compounds (H)	SEC	8.75E-05	7.67E-01	8.75E-05	0.77	8.75E-05	7.67E-01	3.5E-07

Styrene (TH)	100425	2.40E-04	2.11E+00	2.40E-04	2.11	2.40E-04	2.11E+00	9.6E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	4.60E-07	5.25E-11	0.00	5.25E-11	4.60E-07	2.1E-13
Toluene (TH)	108883	7.29E-01	6.39E+03	7.29E-01	6386.67	7.29E-01	6.39E+03	2.9E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Trimethylpentane, 2,2,4- (H)	540841	1.00E-02	8.78E+01	1.00E-02	87.85	1.00E-02	8.78E+01	4.0E-05
Xylene (TH)	1330207	6.04E-02	5.29E+02	6.04E-02	528.72	6.04E-02	5.29E+02	2.4E-04
Xylene, o- (H)	95476	2.57E-03	2.25E+01	2.57E-03	22.50	2.57E-03	2.25E+01	1.0E-05

TOXIC AIR POLLUTANT EMISSIONS INFORMATION (FOR PERMITTING PURPOSES)

Expected actual emissions after controls and limitations consisting of an annual production limit of 2190000 tons .

TOXIC AIR POLLUTANT	CAS Num.	lb/hr	lb/day	lb/yr	Modeling Required?	EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
Acetaldehyde (TH)	75070	3.25E-01	7.80E+00	2.85E+03	NO. Based on facility-wide potential.	1.30E-03
Acrolein (TH)	107028	6.50E-03	1.56E-01	5.69E+01	NO. Based on facility-wide potential.	2.60E-05
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	3.36E-03	1.23E+00	YES. Modeling required	5.60E-07
Benzene (TH)	71432	9.90E-02	2.38E+00	8.67E+02	YES. Modeling required	3.96E-04
Benzo(a)pyrene (T)	50328	4.41E-06	1.06E-04	3.86E-02	NO. Based on facility-wide potential.	1.76E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.46E-03	8.98E-01	YES. Modeling required	4.10E-07
Carbon disulfide (TH)	75150	6.23E-04	1.49E-02	5.45E+00	NO. Based on facility-wide potential.	2.49E-06
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	1.13E-04	2.70E-03	9.86E-01	NO. Based on facility-wide potential.	4.50E-07
Formaldehyde (TH)	50000	7.97E-01	1.91E+01	6.98E+03	YES. Modeling required	3.19E-03
Hexane, n- (TH)	110543	2.39E-01	5.74E+00	2.10E+03	NO. Based on facility-wide potential.	9.57E-04
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	7.80E-09	2.85E-06	NO. Based on facility-wide potential.	1.30E-12
Hydrogen Sulfide (T)	7783064	1.37E-02	3.28E-01	1.20E+02	NO. Based on facility-wide potential.	5.47E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	4.62E-02	1.69E+01	NO. Based on facility-wide potential.	7.70E-06
Mercury, vapor (TH)	7439976	6.50E-04	1.56E-02	5.69E+00	YES. Modeling required	2.60E-06
Methylene chloride (TH)	75092	8.23E-06	1.97E-04	7.21E-02	NO. Based on facility-wide potential.	3.29E-08
Methyl chloroform (TH)	71556	1.20E-02	2.88E-01	1.05E+02	NO. Based on facility-wide potential.	4.80E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	1.61E-01	5.87E+01	NO. Based on facility-wide potential.	2.68E-05
Nickel metal (TH)	7440020	1.58E-02	3.78E-01	1.38E+02	YES. Modeling required	6.30E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.92E-03	7.01E-01	NO. Based on facility-wide potential.	3.20E-07
Phenol (TH)	108952	1.01E-03	2.41E-02	8.81E+00	NO. Based on facility-wide potential.	4.02E-06
Styrene (TH)	100425	2.40E-04	5.77E-03	2.11E+00	NO. Based on facility-wide potential.	9.62E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	1.26E-09	4.60E-07	NO. Based on facility-wide potential.	2.10E-13
Toluene (TH)	108883	7.29E-01	1.75E+01	6.39E+03	NO. Based on facility-wide potential.	2.92E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Xylene (TH)	1330207	6.04E-02	1.45E+00	5.29E+02	NO. Based on facility-wide potential.	2.41E-04

POTENTIAL EMISSIONS - AFTER CONTROLS/LIMITS

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 INPUT SCREEN

NCDENR

NOTICE: This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

Instructions: 1. Fill in all BLUE cells.
2.Ensure all pull down boxes and BLUE cells reflect correct conditions.
3. Read the README sheet.
4. Use the mouse pointer to read the tips in the "red cornered" input cells. (See Tools->Options->Comments if these are not displayed.

Company Name:	Carolina Sunrock, LLC
Facility ID No.:	1700016
Permit No.:	10628R00
Facility City:	Burlington
Facility County:	Caswell
Spreadsheet Prepared by:	LLG

Is this spreadsheet being used for emissions inventory	2. NO
Plant type:	Drum mix
Fuel type:	Waste, No.4 or No.6 fuel oil-fired
Fuel Sulfur Content:	0.50 % (default value is 0.5 %)
Controls:	Fabric filter controls

Dryer heat input:	80	million Btu per hour
Plant maximum production capacity:	250	tons per hour

Asphalt Properties			
Asphalt temperature:	325	degrees	(default value of 325 degrees F)
Volatility loss (V):	-0.5	%	(default value of -0.5 %)

Silo Filling?	YES

RAP crushing on site?	YES				
Crushing Capacity?	65	tons per hour	No. of crushers:	1	
Hours of operation:	8760	hours per year	No. of screens:	1	
			No. of conveyors:	4	

Asphalt Cement Heater			
AC heater heat input:	2.3	million Btu per hour	(No.2 or diesel fuel oil -fired assumed)
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Hours of operation:	8760	hours per year	(default is 8760 hours per year unless specified otherwise)

Calculated Annual Production Limit:	1,488,581	tons per year	
Requested Annual Production Limit:	500,000	tons per year	(if none desired leave default value =8760*tph)
Requested Daily Production Limit:	6,000	tons per day	(if none desired leave default value = 24*tph)

Is this plant NSPS Subpart I affected?	YES	
Stack gas flow rate :	68,145	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	11.81	lb/hr
Control efficiency required:	99.831	%
Does Method 5 data already exist?:	NO	
Method 5 determined emission rate:	40.00	lb/hr
Control efficiency based on test data:	99.429	%

Allowable emission rate under 2 D .0506:	55.39	lb/hr
Does this plant emit less than this limit ?:	Yes	*(based on emission factors)*
Control efficiency required:	99.209	%

ATTACHMENT E5

Dryer Emissions
Criteria Pollutants

Pollutant	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	uncontrolled emission rate (lb/hr)	controlled emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (with controls, 8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Condensible PM (or PM_{10})	0.0654	0.0194	16.35	4.85			
Filterable PM	28	0.014	7000	3.5			
Filterable PM10	6.4	0.0039	1600	0.975			
Total PM	28	0.033	7000	8.25	73.0	36.1	8.3
Total PM10	6.5	0.023	1625	5.75	33.1	25.2	5.8
SO2	0.0837	0.0837	20.93	20.93	91.69	91.69	20.93
CO	0.1300	0.130	32.5	32.5	142.4	142.4	32.5
NOx	0.0550	0.055	13.75	13.75	60.2	60.2	13.8
VOC	0.0320	0.032	8	8	35.0	35.0	8.0
HAPs, TOTAL		0.010		2.5	11.0	11.0	2.5

Silo Filling plus Load Out Emissions, Criteria Pollutants

Pollutant	Emission Factor, combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E-03	2.77E-01	1.2	1.2	0.3
CO	2.53E-03	6.32E-01	2.8	2.8	0.6
VOC	1.61E-02	4.02E+00	17.6	17.6	4.0
HAPs, TOTAL	2.74E-04	6.85E-02	0.3	0.3	0.1

Rap Crusher Emissions

Pollutant	Emission Factor, all sources combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0424	2.76E+00	12.1	12.1	2.8
Total PM10	0.0155	1.01E+00	4.4	4.4	1.0

Asphalt Cement Heater Emissions

Pollutant	Uncontrolled Emission Factor (lb/MMBtu)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0235714	5.42E-02	0.2	0.2	0.2
Total PM10	0.0235714	5.42E-02	0.2	0.2	0.2
SO2	0.5071429	1.17E+00	5.1	5.1	5.1
CO	0.0357143	8.21E-02	0.4	0.4	0.4
NOx	0.1428571	3.29E-01	1.4	1.4	1.4
VOC	0.0024286	5.59E-03	0.0	0.0	0.0

Facility-wide Criteria Pollutant Emissions Summary

Pollutant	Controlled Emission Rate, lb/hr	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E+01	86.5	49.7	11.5
Total PM10	6.81E+00	38.9	31.0	7.3
SO2	2.21E+01	96.8	96.8	26.0
CO	3.32E+01	145.5	145.5	33.5
NOx	1.41E+01	61.7	61.7	15.2
VOC	1.20E+01	52.7	52.7	12.0
HAPs, TOTAL	2.57E+00	11.3	11.3	2.6

Facility-wide Toxic Air Pollutants Summary

TAP	CAS No.	Action
Acetaldehyde (TH)	75070	NOTE 1
Acrolein (TH)	107028	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	NOTE 3
Benzene (TH)	71432	NOTE 3
Benzo(a)pyrene (T)	50328	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	NOTE 2
Carbon disulfide (TH)	75150	NOTE 1
Formaldehyde (TH)	50000	NOTE 3
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	NOTE 1
Hexane, n- (TH)	110543	NOTE 1
Hydrogen Sulfide (T)	7783064	NOTE 1
Manganese unlisted compounds (T)	MNC-other	NOTE 1
Methyl chloroform (TH)	71556	NOTE 1

TAP	CAS No.	Action
Mercury, vapor (TH)	7439976	NOTE 3
Methyl ethyl ketone (TH)	78933	NOTE 1
Methylene chloride (TH)	75092	NOTE 1
Nickel metal (TH)	7440020	NOTE 3
Perchloroethylene (tetrachloroethylene) (TH)	127184	NOTE 1
Phenol (TH)	108952	NOTE 1
Soluble Chromate Compounds as Chrome VI (TH)	7738945	NOTE 1
Styrene (TH)	100425	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	NOTE 1
Toluene (TH)	108883	NOTE 1
Trichloroethylene (TH)	79016	NOTE 1
Xylene (TH)	1330207	NOTE 1

NOTE 1: Include TAP in TPER stipulation.

NOTE 2: Include TAP in TPER stipulation with operation restrictions.

NOTE 3: Modeling Required. See "Toxic calculations" worksheet.

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 OUTPUT SCREEN

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

SOURCE / FACILITY / USER INPUT SUMMARY (FROM INPUT SCREEN)

COMPANY:	**Carolina Sunrock, LLC**	FACILITY ID NO.:	1700016
		PERMIT NUMBER:	10628R00
EMISSION SOURCE DESCRIPTION:	NSPS affected 250 tph Waste, No.4 or No.6 fuel oil-fired, Drum mix asphalt plant (80 mmBtu/hr heat input, w/silofill, with RAP, sulfur=0.5%)	FACILITY CITY:	Burlington
		FACILITY COUNTY:	Caswell

Annual Production Limit:	500,000	ton/year	**Daily Production Limit:**	n/a	ton/day
SPREADSHEET PREPARED BY:	LLG				

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	11.06	11.52		86.48		11.52
PARTICULATE MATTER<10 MICRONS (PM_{10})	6.81	7.27		38.93		7.27
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)						
SULFUR DIOXIDE (SO2)	22.10	26.04		96.80		26.04
NITROGEN OXIDES (NOx)	14.08	15.19		61.66		15.19
CARBON MONOXIDE (CO)	33.21	33.49		145.48		33.49
VOLATILE ORGANIC COMPOUNDS (VOC)	12.03	12.05		52.69		12.05
TOTAL HAP	2.57	2.57		11.25		2.57
LARGEST HAP (formaldehyde)	0.80	0.80		3.49		0.80

Attach INPUT worksheet

TOXIC / HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION

TOXIC / HAZARDOUS AIR POLLUTANT	CAS Number	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)		EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	
Acetaldehyde (TH)	75070	3.25E-01	6.50E+02	3.25E-01	2847.00	3.25E-01	6.50E+02	1.3E-03
Acrolein (TH)	107028	6.50E-03	1.30E+01	6.50E-03	56.94	6.50E-03	1.30E+01	2.6E-05
Antimony unlisted compounds (H)	SBC-other	4.50E-05	9.00E-02	4.50E-05	0.39	4.50E-05	9.00E-02	1.8E-07
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	2.80E-01	1.40E-04	1.23	1.40E-04	2.80E-01	5.6E-07
Benzene (TH)	71432	9.90E-02	1.98E+02	9.90E-02	867.38	9.90E-02	1.98E+02	4.0E-04
Benzo(a)pyrene (T)	50328	4.41E-06	8.82E-03	4.41E-06	0.04	4.41E-06	8.82E-03	1.8E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.05E-01	1.03E-04	0.90	1.03E-04	2.05E-01	4.1E-07
Carbon disulfide (TH)	75150	6.23E-04	1.25E+00	6.23E-04	5.45	6.23E-04	1.25E+00	2.5E-06
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	1.26E-03	2.53E+00	1.26E-03	11.06	1.26E-03	2.53E+00	5.1E-06
Chromic acid (VI) (component of solCR6 and CRC) (TH)	7738945	1.13E-04	2.25E-01	1.13E-04	0.99	1.13E-04	2.25E-01	4.5E-07
Cobalt unlisted compounds (H)	COC-other	6.50E-06	1.30E-02	6.50E-06	0.06	6.50E-06	1.30E-02	2.6E-08
Cumene (H)	98828	1.14E-03	2.29E+00	1.14E-03	10.02	1.14E-03	2.29E+00	4.6E-06
Ethyl benzene (H)	100414	6.41E-02	1.28E+02	6.41E-02	561.24	6.41E-02	1.28E+02	2.6E-04
Ethyl chloride (chloroethane) (H)	75003	2.18E-06	4.37E-03	2.18E-06	0.02	2.18E-06	4.37E-03	8.7E-09
Formaldehyde (TH)	50000	7.97E-01	1.59E+03	7.97E-01	6981.17	7.97E-01	1.59E+03	3.2E-03
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	6.50E-07	3.25E-10	0.00	3.25E-10	6.50E-07	1.3E-12
Hexane, n- (TH)	110543	2.39E-01	4.78E+02	2.39E-01	2095.50	2.39E-01	4.78E+02	9.6E-04
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	5.25E-02	1.05E+02	5.25E-02	459.90	5.25E-02	1.05E+02	2.1E-04
Hydrogen Sulfide (T)	7783064	1.37E-02	2.74E+01	1.37E-02	119.84	1.37E-02	2.74E+01	5.5E-05
Lead unlisted compounds (H)	PBC-other	3.75E-03	7.50E+00	3.75E-03	32.85	3.75E-03	7.50E+00	1.5E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	3.85E+00	1.93E-03	16.86	1.93E-03	3.85E+00	7.7E-06
Mercury, vapor (TH)	7439976	6.50E-04	1.30E+00	6.50E-04	5.69	6.50E-04	1.30E+00	2.6E-06
Methyl bromide (H)	74839	2.49E-04	4.98E-01	2.49E-04	2.18	2.49E-04	4.98E-01	1.0E-06
Methyl chloride (H)	74873	1.56E-04	3.12E-01	1.56E-04	1.37	1.56E-04	3.12E-01	6.2E-07
Methyl chloroform (TH)	71556	1.20E-02	2.40E+01	1.20E-02	105.12	1.20E-02	2.40E+01	4.8E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	1.34E+01	6.70E-03	58.67	6.70E-03	1.34E+01	2.7E-05
Methylene chloride (TH)	75092	8.23E-06	1.65E-02	8.23E-06	0.07	8.23E-06	1.65E-02	3.3E-08
Napthalene (H)	91203	1.65E-01	3.29E+02	1.65E-01	1442.95	1.65E-01	3.29E+02	6.6E-04
Nickel metal (TH)	7440020	1.58E-02	3.15E+01	1.58E-02	137.97	1.58E-02	3.15E+01	6.3E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.60E-01	8.01E-05	0.70	8.01E-05	1.60E-01	3.2E-07
Phenol (TH)	108952	1.01E-03	2.01E+00	1.01E-03	8.81	1.01E-03	2.01E+00	4.0E-06
Phosphorus Metal, Yellow or White (H)	7723140	7.00E-03	1.40E+01	7.00E-03	61.32	7.00E-03	1.40E+01	2.8E-05
Polycyclic Organic Matter (H)	POM	2.20E-01	4.40E+02	2.20E-01	1927.20	2.20E-01	4.40E+02	8.8E-04
Propionaldehyde (H)	123386	3.25E-02	6.50E+01	3.25E-02	284.70	3.25E-02	6.50E+01	1.3E-04
Quinone (H)	106514	4.00E-02	8.00E+01	4.00E-02	350.40	4.00E-02	8.00E+01	1.6E-04
Selenium compounds (H)	SEC	8.75E-05	1.75E-01	8.75E-05	0.77	8.75E-05	1.75E-01	3.5E-07

Styrene (TH)	100425	2.40E-04	4.81E-01	2.40E-04	2.11	2.40E-04	4.81E-01	9.6E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	1.05E-07	5.25E-11	0.00	5.25E-11	1.05E-07	2.1E-13
Toluene (TH)	108883	7.29E-01	1.46E+03	7.29E-01	6386.67	7.29E-01	1.46E+03	2.9E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Trimethylpentane, 2,2,4- (H)	540841	1.00E-02	2.01E+01	1.00E-02	87.85	1.00E-02	2.01E+01	4.0E-05
Xylene (TH)	1330207	6.04E-02	1.21E+02	6.04E-02	528.72	6.04E-02	1.21E+02	2.4E-04
Xylene, o- (H)	95476	2.57E-03	5.14E+00	2.57E-03	22.50	2.57E-03	5.14E+00	1.0E-05

TOXIC AIR POLLUTANT EMISSIONS INFORMATION (FOR PERMITTING PURPOSES)

Expected actual emissions after controls and limitations consisting of an annual production limit of 500000 tons .

TOXIC AIR POLLUTANT	CAS Num.	lb/hr	lb/day	lb/yr	Modeling Required?	EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
Acetaldehyde (TH)	75070	3.25E-01	7.80E+00	6.50E+02	NO. Based on facility-wide potential.	1.30E-03
Acrolein (TH)	107028	6.50E-03	1.56E-01	1.30E+01	NO. Based on facility-wide potential.	2.60E-05
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	3.36E-03	2.80E-01	YES. Modeling required	5.60E-07
Benzene (TH)	71432	9.90E-02	2.38E+00	1.98E+02	YES. Modeling required	3.96E-04
Benzo(a)pyrene (T)	50328	4.41E-06	1.06E-04	8.82E-03	NO. Based on facility-wide potential.	1.76E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.46E-03	2.05E-01	NO. Because of operating restriction	4.10E-07
Carbon disulfide (TH)	75150	6.23E-04	1.49E-02	1.25E+00	NO. Based on facility-wide potential.	2.49E-06
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	1.13E-04	2.70E-03	2.25E-01	NO. Based on facility-wide potential.	4.50E-07
Formaldehyde (TH)	50000	7.97E-01	1.91E+01	1.59E+03	YES. Modeling required	3.19E-03
Hexane, n- (TH)	110543	2.39E-01	5.74E+00	4.78E+02	NO. Based on facility-wide potential.	9.57E-04
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	3.25E-10	7.80E-09	6.50E-07	NO. Based on facility-wide potential.	1.30E-12
Hydrogen Sulfide (T)	7783064	1.37E-02	3.28E-01	2.74E+01	NO. Based on facility-wide potential.	5.47E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	4.62E-02	3.85E+00	NO. Based on facility-wide potential.	7.70E-06
Mercury, vapor (TH)	7439976	6.50E-04	1.56E-02	1.30E+00	YES. Modeling required	2.60E-06
Methylene chloride (TH)	75092	8.23E-06	1.97E-04	1.65E-02	NO. Based on facility-wide potential.	3.29E-08
Methyl chloroform (TH)	71556	1.20E-02	2.88E-01	2.40E+01	NO. Based on facility-wide potential.	4.80E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	1.61E-01	1.34E+01	NO. Based on facility-wide potential.	2.68E-05
Nickel metal (TH)	7440020	1.58E-02	3.78E-01	3.15E+01	YES. Modeling required	6.30E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.92E-03	1.60E-01	NO. Based on facility-wide potential.	3.20E-07
Phenol (TH)	108952	1.01E-03	2.41E-02	2.01E+00	NO. Based on facility-wide potential.	4.02E-06
Styrene (TH)	100425	2.40E-04	5.77E-03	4.81E-01	NO. Based on facility-wide potential.	9.62E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	1.26E-09	1.05E-07	NO. Based on facility-wide potential.	2.10E-13
Toluene (TH)	108883	7.29E-01	1.75E+01	1.46E+03	NO. Based on facility-wide potential.	2.92E-03
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Xylene (TH)	1330207	6.04E-02	1.45E+00	1.21E+02	NO. Based on facility-wide potential.	2.41E-04

POTENTIAL TAP EMISSIONS - NATURAL GAS

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 INPUT SCREEN

NCDENR

NOTICE: This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

Instructions: **1. Fill in all BLUE cells.**
2.Ensure all pull down boxes and BLUE cells reflect correct conditions.
3. Read the README sheet.
4. Use the mouse pointer to read the tips in the "red cornered" input cells. (See Tools->Options->Comments if these are not displayed.

Company Name:	Carolina Sunrock, LLC
Facility ID No.:	1700016
Permit No.:	10628R00
Facility City:	Burlington
Facility County:	Caswell
Spreadsheet Prepared by:	LLG

Is this spreadsheet being used for emissions inventory	2. NO
Plant type:	Drum mix
Fuel type:	Natural gas-fired
Fuel Sulfur Content	0.50 %
Controls:	Fabric filter controls

Dryer heat input:	80	million Btu per hour
Plant maximum production capacity:	250	tons per hour

Asphalt Properties			
Asphalt temperature:	325	degrees	(default value of 325 degrees F)
Volatility loss (V):	-0.5	%	(default value of -0.5 %)

Silo Filling?	YES

RAP crushing on site?	YES				
Crushing Capacity?	65	tons per hour	No. of crushers:	1	
Hours of operation:	8760	hours per year	No. of screens:	1	
			No. of conveyors:	4	

Asphalt Cement Heater			
AC heater heat input:	2.3	million Btu per hour	(No.2 or diesel fuel oil -fired assumed)
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Hours of operation:	8760	hours per year	(default is 8760 hours per year unless specified otherwise)

Calculated Annual Production Limit:	1,488,581	tons per year	
Requested Annual Production Limit:	500,000	tons per year	(if none desired leave default value =8760*tph)
Requested Daily Production Limit:	6,000	tons per day	(if none desired leave default value = 24*tph)

Is this plant NSPS Subpart I affected?	YES	
Stack gas flow rate :	68,145	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	11.81	lb/hr
Control efficiency required:	99.831	%
Does Method 5 data already exist?:	NO	
Method 5 data/mixed emission rate:	40.00	lb/hr
Control efficiency based on test data:	99.425	%

Allowable emission rate under 2 D .0506:	55.39	lb/hr
Does this plant emit less than this limit ?:	Yes	*(based on emission factors)*
Control efficiency required:	99.209	%

ATTACHMENT E6

Dryer Emissions
Criteria Pollutants

Pollutant	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	uncontrolled emission rate (lb/hr)	controlled emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (with controls, 8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Condensible PM (or PM_{10})	0.0654	0.0194	16.35	4.85			
Filterable PM	28	0.014	7000	3.5			
Filterable PM10	6.4	0.0039	1600	0.975			
Total PM	28	0.033	7000	8.25	73.0	36.1	8.3
Total PM10	6.5	0.023	1625	5.75	33.1	25.2	5.8
SO2	0.0001	0.0001	0.02	0.02	0.10	0.10	0.02
CO	0.1300	0.130	32.5	32.5	142.4	142.4	32.5
NOx	0.0260	0.026	6.5	6.5	28.5	28.5	6.5
VOC	0.0320	0.032	8	8	35.0	35.0	8.0
HAPs, TOTAL		0.005		1.325	5.8	5.8	1.3

Silo Filling plus Load Out Emissions, Criteria Pollutants

Pollutant	Emission Factor, combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E-03	2.77E-01	1.2	1.2	0.3
CO	2.53E-03	6.32E-01	2.8	2.8	0.6
VOC	1.61E-02	4.02E+00	17.6	17.6	4.0
HAPs, TOTAL	2.74E-04	6.85E-02	0.3	0.3	0.1

Rap Crusher Emissions

Pollutant	Emission Factor, all sources combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0424	2.76E+00	12.1	12.1	2.8
Total PM10	0.0155	1.01E+00	4.4	4.4	1.0

Asphalt Cement Heater Emissions

Pollutant	Uncontrolled Emission Factor (lb/MMBtu)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0235714	5.42E-02	0.2	0.2	0.2
Total PM10	0.0235714	5.42E-02	0.2	0.2	0.2
SO2	0.5071429	1.17E+00	5.1	5.1	5.1
CO	0.0357143	8.21E-02	0.4	0.4	0.4
NOx	0.1428571	3.29E-01	1.4	1.4	1.4
VOC	0.0024286	5.59E-03	0.0	0.0	0.0

Facility-wide Criteria Pollutant Emissions Summary

Pollutant	Controlled Emission Rate, lb/hr	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E+01	86.5	49.7	11.5
Total PM10	6.81E+00	38.9	31.0	7.3
SO2	1.19E+00	5.2	5.2	5.1
CO	3.32E+01	145.5	145.5	33.5
NOx	6.83E+00	29.9	29.9	7.9
VOC	1.20E+01	52.7	52.7	12.0
HAPs, TOTAL	1.39E+00	6.1	6.1	1.4

Facility-wide Toxic Air Pollutants Summary

TAP	CAS No.	Action
Acetaldehyde (TH)	75070	NOTE 1
Acrolein (TH)	107028	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	NOTE 3
Benzene (TH)	71432	NOTE 3
Benzo(a)pyrene (T)	50328	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	NOTE 2
Carbon disulfide (TH)	75150	NOTE 1
Formaldehyde (TH)	50000	NOTE 3
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	NOTE 1
Hexane, n- (TH)	110543	NOTE 1
Hydrogen Sulfide (T)	7783064	NOTE 1
Manganese unlisted compounds (T)	MNC-other	NOTE 1
Methyl chloroform (TH)	71556	NOTE 1

TAP	CAS No.	Action
Mercury, vapor (TH)	7439976	NOTE 1
Methyl ethyl ketone (TH)	78933	NOTE 1
Methylene chloride (TH)	75092	NOTE 1
Nickel metal (TH)	7440020	NOTE 2
Perchloroethylene (tetrachloroethylene) (TH)	127184	NOTE 1
Phenol (TH)	108952	NOTE 1
Soluble Chromate Compounds as Chrome VI (TH)	7738945	NOTE 1
Styrene (TH)	100425	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	NOTE 1
Toluene (TH)	108883	NOTE 1
Trichloroethylene (TH)	79016	NOTE 1
Xylene (TH)	1330207	NOTE 1

NOTE 1: Include TAP in TPER stipulation.

NOTE 2: Include TAP in TPER stipulation with operation restrictions.

NOTE 3: Modeling Required. See "Toxic calculations" worksheet.

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 OUTPUT SCREEN

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

SOURCE / FACILITY / USER INPUT SUMMARY (FROM INPUT SCREEN)

COMPANY:	**Carolina Sunrock, LLC**	FACILITY ID NO.:	1700016
		PERMIT NUMBER:	10628R00
EMISSION SOURCE DESCRIPTION:	NSPS affected 250 tph Natural gas-fired, Drum mix asphalt plant (80 mmBtu/hr heat input, w/silofill, with RAP, sulfur=n/a%)	FACILITY CITY:	Burlington
		FACILITY COUNTY:	Caswell

Annual Production Limit:	500,000	ton/year	**Daily Production Limit:**	n/a	ton/day
SPREADSHEET PREPARED BY:	LLG				

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
PARTICULATE MATTER (PM)	11.06	11.52		86.48		11.52
PARTICULATE MATTER<10 MICRONS (PM_{10})	6.81	7.27		38.93		7.27
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)						
SULFUR DIOXIDE (SO2)	1.19	5.13		5.21		5.13
NITROGEN OXIDES (NOx)	6.83	7.94		29.91		7.94
CARBON MONOXIDE (CO)	33.21	33.49		145.48		33.49
VOLATILE ORGANIC COMPOUNDS (VOC)	12.03	12.05		52.69		12.05
TOTAL HAP	1.39	1.39		6.10		1.39
LARGEST HAP (formaldehyde)	0.80	0.80		3.49		0.80

Attach INPUT worksheet

TOXIC / HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION

TOXIC / HAZARDOUS AIR POLLUTANT	CAS Number	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)		EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	
Acetaldehyde (TH)	75070	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Acrolein (TH)	107028	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Antimony unlisted compounds (H)	SBC-other	4.50E-05	9.00E-02	4.50E-05	0.39	4.50E-05	9.00E-02	1.8E-07
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	2.80E-01	1.40E-04	1.23	1.40E-04	2.80E-01	5.6E-07
Benzene (TH)	71432	9.90E-02	1.98E+02	9.90E-02	867.38	9.90E-02	1.98E+02	4.0E-04
Benzo(a)pyrene (T)	50328	4.41E-06	8.82E-03	4.41E-06	0.04	4.41E-06	8.82E-03	1.8E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	2.05E-01	1.03E-04	0.90	1.03E-04	2.05E-01	4.1E-07
Carbon disulfide (TH)	75150	6.23E-04	1.25E+00	6.23E-04	5.45	6.23E-04	1.25E+00	2.5E-06
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	1.26E-03	2.53E+00	1.26E-03	11.06	1.26E-03	2.53E+00	5.1E-06
Chromic acid (VI) (component of solCR6 and CRC) (TH)	7738945	1.13E-04	2.25E-01	1.13E-04	0.99	1.13E-04	2.25E-01	4.5E-07
Cobalt unlisted compounds (H)	COC-other	6.50E-06	1.30E-02	6.50E-06	0.06	6.50E-06	1.30E-02	2.6E-08
Cumene (H)	98828	1.14E-03	2.29E+00	1.14E-03	10.02	1.14E-03	2.29E+00	4.6E-06
Ethyl benzene (H)	100414	6.41E-02	1.28E+02	6.41E-02	561.24	6.41E-02	1.28E+02	2.6E-04
Ethyl chloride (chloroethane) (H)	75003	2.18E-06	4.37E-03	2.18E-06	0.02	2.18E-06	4.37E-03	8.7E-09
Formaldehyde (TH)	50000	7.97E-01	1.59E+03	7.97E-01	6981.17	7.97E-01	1.59E+03	3.2E-03
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Hexane, n- (TH)	110543	2.39E-01	4.78E+02	2.39E-01	2095.50	2.39E-01	4.78E+02	9.6E-04
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Hydrogen Sulfide (T)	7783064	1.37E-02	2.74E+01	1.37E-02	119.84	1.37E-02	2.74E+01	5.5E-05
Lead unlisted compounds (H)	PBC-other	1.55E-04	3.10E-01	1.55E-04	1.36	1.55E-04	3.10E-01	6.2E-07
Manganese unlisted compounds (T)	MNC-other	1.93E-03	3.85E+00	1.93E-03	16.86	1.93E-03	3.85E+00	7.7E-06
Mercury, vapor (TH)	7439976	6.00E-05	1.20E-01	6.00E-05	0.53	6.00E-05	1.20E-01	2.4E-07
Methyl bromide (H)	74839	2.49E-04	4.98E-01	2.49E-04	2.18	2.49E-04	4.98E-01	1.0E-06
Methyl chloride (H)	74873	1.56E-04	3.12E-01	1.56E-04	1.37	1.56E-04	3.12E-01	6.2E-07
Methyl chloroform (TH)	71556	1.20E-02	2.40E+01	1.20E-02	105.12	1.20E-02	2.40E+01	4.8E-05
Methyl ethyl ketone (TH)	78933	1.70E-03	3.40E+00	1.70E-03	14.87	1.70E-03	3.40E+00	6.8E-06
Methylene chloride (TH)	75092	8.23E-06	1.65E-02	8.23E-06	0.07	8.23E-06	1.65E-02	3.3E-08
Napthalene (H)	91203	2.47E-02	4.94E+01	2.47E-02	216.55	2.47E-02	4.94E+01	9.9E-05
Nickel metal (TH)	7440020	1.58E-02	3.15E+01	1.58E-02	137.97	1.58E-02	3.15E+01	6.3E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.60E-01	8.01E-05	0.70	8.01E-05	1.60E-01	3.2E-07
Phenol (TH)	108952	1.01E-03	2.01E+00	1.01E-03	8.81	1.01E-03	2.01E+00	4.0E-06
Phosphorus Metal, Yellow or White (H)	7723140	7.00E-03	1.40E+01	7.00E-03	61.32	7.00E-03	1.40E+01	2.8E-05
Polycyclic Organic Matter (H)	POM	4.75E-02	9.50E+01	4.75E-02	416.10	4.75E-02	9.50E+01	1.9E-04
Propionaldehyde (H)	123386	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Quinone (H)	106514	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Selenium compounds (H)	SEC	8.75E-05	1.75E-01	8.75E-05	0.77	8.75E-05	1.75E-01	3.5E-07

Styrene (TH)	100425	2.40E-04	4.81E-01	2.40E-04	2.11	2.40E-04	4.81E-01	9.6E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Toluene (TH)	108883	4.16E-02	8.31E+01	4.16E-02	364.17	4.16E-02	8.31E+01	1.7E-04
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.0E+00
Trimethylpentane, 2,2,4- (H)	540841	1.00E-02	2.01E+01	1.00E-02	87.85	1.00E-02	2.01E+01	4.0E-05
Xylene (TH)	1330207	6.04E-02	1.21E+02	6.04E-02	528.72	6.04E-02	1.21E+02	2.4E-04
Xylene, o- (H)	95476	2.57E-03	5.14E+00	2.57E-03	22.50	2.57E-03	5.14E+00	1.0E-05

TOXIC AIR POLLUTANT EMISSIONS INFORMATION (FOR PERMITTING PURPOSES)

Expected actual emissions after controls and limitations consisting of an annual production limit of 500000 tons and a daily production limit of 0 tons.

TOXIC AIR POLLUTANT	CAS Num.	lb/hr	lb/day	lb/yr	Modeling Required?	EMISSION FACTOR (lb/ton asphalt produced, with Fabric filter controls)
Acetaldehyde (TH)	75070	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Acrolein (TH)	107028	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	0.00E+00	2.80E-01	YES. Modeling required	5.60E-07
Benzene (TH)	71432	9.90E-02	0.00E+00	1.98E+02	YES. Modeling required	3.96E-04
Benzo(a)pyrene (T)	50328	4.41E-06	0.00E+00	8.82E-03	NO. Based on facility-wide potential.	1.76E-08
Beryllium metal (unreacted) (TH)	7440417	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Cadmium metal (elemental unreacted) (TH)	7440439	1.03E-04	0.00E+00	2.05E-01	NO. Because of operating restriction	4.10E-07
Carbon disulfide (TH)	75150	6.23E-04	0.00E+00	1.25E+00	NO. Based on facility-wide potential.	2.49E-06
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	1.13E-04	0.00E+00	2.25E-01	NO. Based on facility-wide potential.	4.50E-07
Formaldehyde (TH)	50000	7.97E-01	0.00E+00	1.59E+03	YES. Modeling required	3.19E-03
Hexane, n- (TH)	110543	2.39E-01	0.00E+00	4.78E+02	NO. Based on facility-wide potential.	9.57E-04
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Hydrogen Sulfide (T)	7783064	1.37E-02	0.00E+00	2.74E+01	NO. Based on facility-wide potential.	5.47E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	0.00E+00	3.85E+00	NO. Based on facility-wide potential.	7.70E-06
Mercury, vapor (TH)	7439976	6.00E-05	0.00E+00	1.20E-01	NO. Based on facility-wide potential.	2.40E-07
Methylene chloride (TH)	75092	8.23E-06	0.00E+00	1.65E-02	NO. Based on facility-wide potential.	3.29E-08
Methyl chloroform (TH)	71556	1.20E-02	0.00E+00	2.40E+01	NO. Based on facility-wide potential.	4.80E-05
Methyl ethyl ketone (TH)	78933	1.70E-03	0.00E+00	3.40E+00	NO. Based on facility-wide potential.	6.79E-06
Nickel metal (TH)	7440020	1.58E-02	0.00E+00	3.15E+01	NO. Because of operating restriction	6.30E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	0.00E+00	1.60E-01	NO. Based on facility-wide potential.	3.20E-07
Phenol (TH)	108952	1.01E-03	0.00E+00	2.01E+00	NO. Based on facility-wide potential.	4.02E-06
Styrene (TH)	100425	2.40E-04	0.00E+00	4.81E-01	NO. Based on facility-wide potential.	9.62E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Toluene (TH)	108883	4.16E-02	0.00E+00	8.31E+01	NO. Based on facility-wide potential.	1.66E-04
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	NO. Based on facility-wide potential.	0.00E+00
Xylene (TH)	1330207	6.04E-02	0.00E+00	1.21E+02	NO. Based on facility-wide potential.	2.41E-04

Toxic Air Pollutant (TAP) emission rate calculations page

This sheet presents the emission rate calculations that are necessary for modeling determinations.

Pollutant	CAS No.	emissions from dryer	emissions from handling	TPER	Units	TPER	Units	dryer: Controlled Emission Factor (lb/ton)	dryer: Controlled Emission Rate (lb/hour)	Silo Filling: Emission factor (lb/ton)	Silo Filling: Emission Rate (lb/hr)	Loadout: Emission factor (lb/ton)	Loadout: Emission Rate (lb/hr)	total handling: Emission Factor (lb/ton)	total handling: Emission Rate (lb/hour)	total: Controlled Emission Factor (lb/ton)	total: Controlled Emission Rate (lb/hour)	Controlled Emission Rate (lb/day)	Controlled Emission Rate (lb/year)	Controlled w/Limitations Emission Rate (lb/day)	Controlled w/Limitations Emission Rate (lb/year)	Controlled ER greater than TPER ?	Controlled w/Limitations ER greater than TPER ?	Comments
Acetaldehyde (TH)	75070	yes	no	6.8	lb/hr			0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No		NOTE 1
Acrolein (TH)	107028	yes	no	0.02	lb/hr			0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No		NOTE 1
Formaldehyde (TH)	50000	yes	yes	0.04	lb/hr			3.10E-03	7.75E-01	8.41E-05	2.10E-02	3.66E-05	9.15E-04	8.775E-05	2.19E-02	3.19E-03	7.97E-01	1.91E+01	6.98E+03	0.00E+00	1.59E+03	Yes		NOTE 3
Phenol (TH)	108952	no	yes	0.24	lb/hr					0.00E+00	0.00E+00	4.02E-06	1.01E-03	4.02E-06	1.01E-03	4.02E-06	1.01E-03	2.41E-02	8.81E+00	0.00E+00	2.01E+00	No		NOTE 1
Styrene (TH)	100425	no	yes	2.7	lb/hr					6.58E-07	1.65E-04	3.04E-07	7.59E-05	9.62E-07	2.40E-04	9.62E-07	2.40E-04	5.77E-03	2.11E+00	0.00E+00	4.81E-01	No		NOTE 1
Methyl chloroform (TH)	71556	yes	yes	64	lb/hr	250	lb/day	4.80E-05	1.20E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.80E-05	1.20E-02	2.88E-01	1.05E+02	0.00E+00	2.40E+01	No	No	NOTE 1
Methyl ethyl ketone (TH)	78933	yes	yes	22.4	lb/hr	78	lb/day	0.00E+00	0.00E+00	4.75E-06	1.19E-03	2.04E-06	5.09E-04	6.79E-06	1.70E-03	6.79E-06	1.70E-03	4.07E-02	1.49E+01	0.00E+00	3.40E+00	No	No	NOTE 1
Toluene (TH)	108883	yes	yes	14.4	lb/hr	98	lb/day	1.50E-04	3.75E-02	7.56E-06	1.89E-03	8.73E-06	2.18E-03	1.63E-05	4.07E-03	1.66E-04	4.16E-02	9.98E-01	3.64E+02	0.00E+00	8.31E+01	No	No	NOTE 1
Xylene (TH)	1330207	yes	yes	16.4	lb/hr	57	lb/day	2.00E-04	5.00E-02	2.44E-05	6.09E-03	1.71E-05	4.26E-03	4.14E-05	1.04E-02	2.41E-04	6.04E-02	1.45E+00	5.29E+02	0.00E+00	1.21E+02	No	No	NOTE 1
Methylene chloride (TH)	75092	no	yes	0.39	lb/hr	1600	lb/year			3.29E-08	8.23E-06	0.00E+00	0.00E+00	3.29E-08	8.23E-06	3.29E-08	8.23E-06	1.97E-04	7.21E-02	0.00E+00	1.65E-02	No	No	NOTE 1
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	yes	no	0.013	lb/day			4.50E-07	1.13E-04							4.50E-07	1.13E-04	2.70E-03	9.86E-01	0.00E+00	2.25E-01	No	No	NOTE 1
Hexane, n- (TH)	110543	yes	yes	23	lb/day			9.38E-04	2.35E-01	1.22E-05	3.05E-03	6.24E-06	1.56E-03	1.84E-05	4.61E-03	9.57E-04	2.39E-01	5.74E+00	2.10E+03	0.00E+00	4.78E+02	No	No	NOTE 1
Manganese unlisted compounds (T)	MNC-other	yes	no	0.63	lb/day			7.70E-06	1.93E-03							7.70E-06	1.93E-03	4.62E-02	1.69E+01	0.00E+00	3.85E+00	No	No	NOTE 1
Mercury, vapor (TH)	7439976	yes	no	0.013	lb/day			2.40E-07	6.00E-05							2.40E-07	6.00E-05	1.44E-03	5.26E-01	0.00E+00	1.20E-01	No	No	NOTE 1
Nickel metal (TH)	7440020	yes	no	0.13	lb/day			6.30E-05	1.58E-02							6.30E-05	1.58E-02	3.78E-01	1.38E+02	0.00E+00	3.15E+01	Yes	No	NOTE 2
Carbon disulfide (TH)	75150	no	yes	3.9	lb/day					1.95E-06	4.87E-04	5.41E-07	1.35E-04	2.49E-06	6.23E-04	2.49E-06	6.23E-04	1.49E-02	5.45E+00	0.00E+00	1.25E+00	No	No	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	yes	no	0.0002	lb/yr			0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	No	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	yes	no	0.016	lb/yr			5.60E-07	1.40E-04							5.60E-07	1.40E-04	3.36E-03	1.23E+00	0.00E+00	2.80E-01	Yes	Yes	NOTE 3
Benzene (TH)	71432	yes	yes	8.1	lb/yr			3.99E-04	9.75E-02	3.99E-06	9.75E-04	2.16E-06	5.41E-04	6.06E-06	1.52E-03	3.96E-04	9.99E-02	2.38E+00	8.67E+02	0.00E+00	1.98E+02	Yes	Yes	NOTE 3
Benzo(a)pyrene (T)	50328	yes	yes	2.2	lb/yr			9.80E-09	2.45E-06	0.00E+00	0.00E+00	7.84E-09	1.96E-06	7.84E-09	1.96E-06	1.76E-08	4.41E-06	1.06E-04	3.86E-02	0.00E+00	8.82E-03	No	No	NOTE 1
Hydrogen Sulfide (T)	7783064	yes	yes	1.7	lb/day			5.18E-05	1.30E-02	1.46E-06	3.65E-04	1.46E-06	3.65E-04	2.92E-06	7.30E-04	5.47E-05	1.37E-02	3.28E-01	1.20E+02	0.00E+00	2.74E+01	No	No	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	yes	no	0.28	lb/yr			0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	No	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	yes	no	0.37	lb/yr			4.10E-07	1.03E-04							4.10E-07	1.03E-04	2.46E-03	8.98E-01	0.00E+00	2.05E-01	Yes	No	NOTE 2
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	yes	no	0.0051	lb/yr			0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	No	NOTE 1
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	yes	no	0.18	lb/hr			0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No		NOTE 1
Perchloroethylene (tetrachloroethylene) (TH)	127184	no	yes	13000	lb/yr					0.00E+00	0.00E+00	3.20E-07	8.01E-05	3.20E-07	8.01E-05	3.20E-07	8.01E-05	1.92E-03	7.01E-01	0.00E+00	1.60E-01	No	No	NOTE 1
Trichloroethylene (TH)	79016	no	yes	4000	lb/yr					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	No	NOTE 1
Napthalene (H)	91203	yes	yes					9.00E-05	2.25E-02	4.62E-06	1.16E-03	4.26E-06	1.07E-03	8.88E-06	2.22E-03	9.89E-05	2.47E-02	5.93E-01	2.17E+02	0.00E+00	4.94E+01			
Phosphorus Metal, Yellow or White (H)	7723140	yes	no					2.80E-05	7.00E-03							2.80E-05	7.00E-03	1.68E-01	6.13E+01	0.00E+00	1.40E+01			
Polycyclic Organic Matter (H)	POM	yes	no					1.90E-04	4.75E-02							1.90E-04	4.75E-02	1.14E+00	4.16E+02	0.00E+00	9.50E+01			
Propionaldehyde (H)	123386	yes	no					0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Quinone (H)	106514	yes	no					0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			
Selenium compounds (H)	SEC	yes	no					3.50E-07	8.75E-05							3.50E-07	8.75E-05	2.10E-03	7.67E-01	0.00E+00	1.75E-01			
Trimethylpentane, 2,2,4- (H)	540841	yes	yes					4.00E-05	1.00E-02	3.78E-08	9.44E-06	7.49E-08	1.87E-05	1.13E-07	2.82E-05	4.01E-05	1.00E-02	2.41E-01	8.78E+01	0.00E+00	2.01E+01			
Antimony unlisted compounds (H)	SBC-other	yes	no					1.80E-07	4.50E-05							1.80E-07	4.50E-05	1.08E-03	3.94E-01	0.00E+00	9.00E-02			
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	yes	no					5.05E-06	1.26E-03							5.05E-06	1.26E-03	3.03E-02	1.11E+01	0.00E+00	2.53E+00			
Cobalt unlisted compounds (H)	COC-other	yes	no					2.60E-08	6.50E-06							2.60E-08	6.50E-06	1.56E-04	5.69E-02	0.00E+00	1.30E-02			
Ethyl benzene (H)	100414	yes	yes					2.40E-04	6.00E-02	4.63E-06	1.16E-03	1.16E-05	2.91E-03	1.63E-05	4.07E-03	2.56E-04	6.41E-02	1.54E+00	5.61E+02	0.00E+00	1.28E+02			
Lead unlisted compounds (H)	PBC-other	yes	no					6.20E-07	1.55E-04							6.20E-07	1.55E-04	3.72E-03	1.36E+00	0.00E+00	3.10E-01			
Methyl bromide (H)	74839	no	yes							5.97E-07	1.49E-04	3.99E-07	9.98E-05	9.96E-07	2.49E-04	9.96E-07	2.49E-04	5.98E-03	2.18E+00	0.00E+00	4.98E-01			
Cumene (H)	98828	no	yes							0.00E+00	0.00E+00	4.57E-06	1.14E-03	4.57E-06	1.14E-03	4.57E-06	1.14E-03	2.74E-02	1.00E+01	0.00E+00	2.29E+00			
Ethyl chloride (chloroethane) (H)	75003	no	yes							0.00E+00	0.00E+00	8.73E-09	2.18E-06	8.73E-09	2.18E-06	8.73E-09	2.18E-06	5.24E-05	1.91E-02	0.00E+00	4.37E-03			
Methyl chloride (H)	74873	no	yes							0.00E+00	0.00E+00	6.24E-07	1.56E-04	6.24E-07	1.56E-04	6.24E-07	1.56E-04	3.74E-03	1.37E+00	0.00E+00	3.12E-01			
Xylene, o- (H)	95476	no	yes							6.95E-06	1.74E-03	3.33E-06	8.32E-04	1.03E-05	2.57E-03	1.03E-05	2.57E-03	6.16E-02	2.25E+01	0.00E+00	5.14E+00			
HAPs, TOTAL								5.30E-03	1.33E+00	1.87E-04	4.68E-02	8.66E-05	2.17E-02	2.74E-04	6.85E-02	5.57E-03	1.39E+00	3.34E+01	1.22E+04	0.00E+00	2.79E+03			

POTENTIAL TAP EMISSIONS - NO.4 / NO.6 FUEL OIL

ASPHALT EMISSIONS CALCULATOR REVISION G 08/30/2019 INPUT SCREEN

NCDENR

NOTICE: This spreadsheet is for your use only and should be used with caution. DENR does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. DENR is not responsible for errors or omissions that may be contained herein.

Instructions: **1. Fill in all BLUE cells.**
2.Ensure all pull down boxes and BLUE cells reflect correct conditions.
3. Read the README sheet.
4. Use the mouse pointer to read the tips in the "red cornered" input cells. (See Tools->Options->Comments if these are not displayed.

Company Name:	Carolina Sunrock, LLC
Facility ID No.:	1700016
Permit No.:	10628R00
Facility City:	Burlington
Facility County:	Caswell
Spreadsheet Prepared by:	LLG

Is this spreadsheet being used for emissions inventory	2. NO		
Plant type:	Drum mix		
Fuel type:	Waste, No.4 or No.6 fuel oil-fired		
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Controls:	Fabric filter controls		

Dryer heat input:	80	million Btu per hour
Plant maximum production capacity:	250	tons per hour

Asphalt Properties			
Asphalt temperature:	325	degrees	(default value of 325 degrees F)
Volatility loss (V):	-0.5	%	(default value of -0.5 %)

Silo Filling?	YES

RAP crushing on site?	YES				
Crushing Capacity?	65	tons per hour	No. of crushers:	1	
Hours of operation:	8760	hours per year	No. of screens:	1	
			No. of conveyors:	4	

Asphalt Cement Heater			
AC heater heat input:	2.3	million Btu per hour	(No.2 or diesel fuel oil -fired assumed)
Fuel Sulfur Content:	0.50	%	(default value is 0.5 %)
Hours of operation:	8760	hours per year	(default is 8760 hours per year unless specified otherwise)

Calculated Annual Production Limit:	1,488,581	tons per year	
Requested Annual Production Limit:	500,000	tons per year	(if none desired leave default value =8760*tph)
Requested Daily Production Limit:	6,000	tons per day	(if none desired leave default value = 24*tph)

Is this plant NSPS Subpart I affected?	YES	
Stack gas flow rate :	68,145	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	11.81	lb/hr
Control efficiency required:	99.831	%
Does Method 5 data already exist?:	NO	
Method 5 determined emission rate:	40.80	lb/hr
Control efficiency based on test data:	98.429	%

Allowable emission rate under 2 D .0506:	55.39	lb/hr
Does this plant emit less than this limit ?:	Yes	*(based on emission factors)*
Control efficiency required:	99.209	%

ATTACHMENT E7

Dryer Emissions
Criteria Pollutants

Pollutant	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	uncontrolled emission rate (lb/hr)	controlled emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (with controls, 8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Condensible PM (or PM_{10})	0.0654	0.0194	16.35	4.85			
Filterable PM	28	0.014	7000	3.5			
Filterable PM10	6.4	0.0039	1600	0.975			
Total PM	28	0.033	7000	8.25	73.0	36.1	8.3
Total PM10	6.5	0.023	1625	5.75	33.1	25.2	5.8
SO2	0.0837	0.0837	20.93	20.93	91.69	91.69	20.93
CO	0.1300	0.130	32.5	32.5	142.4	142.4	32.5
NOx	0.0550	0.055	13.75	13.75	60.2	60.2	13.8
VOC	0.0320	0.032	8	8	35.0	35.0	8.0
HAPs, TOTAL		0.010		2.5	11.0	11.0	2.5

Silo Filling plus Load Out Emissions, Criteria Pollutants

Pollutant	Emission Factor, combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E-03	2.77E-01	1.2	1.2	0.3
CO	2.53E-03	6.32E-01	2.8	2.8	0.6
VOC	1.61E-02	4.02E+00	17.6	17.6	4.0
HAPs, TOTAL	2.74E-04	6.85E-02	0.3	0.3	0.1

Rap Crusher Emissions

Pollutant	Emission Factor, all sources combined (lb/ton)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0424	2.76E+00	12.1	12.1	2.8
Total PM10	0.0155	1.01E+00	4.4	4.4	1.0

Asphalt Cement Heater Emissions

Pollutant	Uncontrolled Emission Factor (lb/MMBtu)	emission rate (lb/hr)	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	0.0235714	5.42E-02	0.2	0.2	0.2
Total PM10	0.0235714	5.42E-02	0.2	0.2	0.2
SO2	0.5071429	1.17E+00	5.1	5.1	5.1
CO	0.0357143	8.21E-02	0.4	0.4	0.4
NOx	0.1428571	3.29E-01	1.4	1.4	1.4
VOC	0.0024286	5.59E-03	0.0	0.0	0.0

Facility-wide Criteria Pollutant Emissions Summary

Pollutant	Controlled Emission Rate, lb/hr	Title V, Potential Emissions (tpy) (no controls, 8760 hours per year operation)	PSD, Potential Emissions, (tpy) (8760 hours per year operation)	Synthetic Minor, Potential Emissions (tpy) (with all operation restrictions)
Total PM	1.11E+01	86.5	49.7	11.5
Total PM10	6.81E+00	38.9	31.0	7.3
SO2	2.21E+01	96.8	96.8	26.0
CO	3.32E+01	145.5	145.5	33.5
NOx	1.41E+01	61.7	61.7	15.2
VOC	1.20E+01	52.7	52.7	12.0
HAPs, TOTAL	2.57E+00	11.3	11.3	2.6

Facility-wide Toxic Air Pollutants Summary

TAP	CAS No.	Action
Acetaldehyde (TH)	75070	NOTE 1
Acrolein (TH)	107028	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	NOTE 3
Benzene (TH)	71432	NOTE 3
Benzo(a)pyrene (T)	50328	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	NOTE 2
Carbon disulfide (TH)	75150	NOTE 1
Formaldehyde (TH)	50000	NOTE 3
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	NOTE 1
Hexane, n- (TH)	110543	NOTE 1
Hydrogen Sulfide (T)	7783064	NOTE 1
Manganese unlisted compounds (T)	MNC-other	NOTE 1
Methyl chloroform (TH)	71556	NOTE 1

TAP	CAS No.	Action
Mercury, vapor (TH)	7439976	NOTE 3
Methyl ethyl ketone (TH)	78933	NOTE 1
Methylene chloride (TH)	75092	NOTE 1
Nickel metal (TH)	7440020	NOTE 3
Perchloroethylene (tetrachloroethylene) (TH)	127184	NOTE 1
Phenol (TH)	108952	NOTE 1
Soluble Chromate Compounds as Chrome VI (TH)	7738945	NOTE 1
Styrene (TH)	100425	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	NOTE 1
Toluene (TH)	108883	NOTE 1
Trichloroethylene (TH)	79016	NOTE 1
Xylene (TH)	1330207	NOTE 1

NOTE 1: Include TAP in TPER stipulation.

NOTE 2: Include TAP in TPER stipulation with operation restrictions.

NOTE 3: Modeling Required. See "Toxic calculations" worksheet.

Toxic Air Pollutant (TAP) emission rate calculations page

This sheet presents the emission rate calculations that are necessary for modeling determinations.

Pollutant	CAS No.	emissions from dryer	emissions from handling	TPER	Units	TPER	Units	dryer: Controlled Emission Factor (lb/ton)	dryer: Controlled Emission Rate (lb/hour)	Silo Filling: Emission factor (lb/ton)	Silo Filling: Emission Rate (lb/hr)	Loadout: Emission factor (lb/ton)	Loadout: Emission Rate (lb/hr)	total handling: Emission Factor (lb/ton)	total handling: Emission Rate (lb/hour)	total: Controlled Emission Factor (lb/ton)	total: Controlled Emission Rate (lb/hour)	Controlled Emission Rate (lb/day)	Controlled Emission Rate (lb/year)	Controlled w/Limitations Emission Rate (lb/day)	Controlled w/Limitations Emission Rate (lb/year)	Controlled ER greater than TPER ?	Controlled w/Limitations ER greater than TPER ?	Comments
Acetaldehyde (TH)	75070	yes	no	6.8	lb/hr			1.30E-03	3.25E-01							1.30E-03	3.25E-01	7.80E+00	2.85E+03	7.80E+00	6.50E+02	No		NOTE 1
Acrolein (TH)	107028	yes	no	0.02	lb/hr			2.60E-05	6.50E-03							2.60E-05	6.50E-03	1.56E-01	5.69E+01	1.56E-01	1.30E+01	No		NOTE 1
Formaldehyde (TH)	50000	yes	yes	0.04	lb/hr			3.10E-03	7.75E-01	8.41E-05	2.10E-02	3.68E-06	9.15E-04	8.77E-05	2.19E-02	3.19E-03	7.97E-01	1.91E+01	6.98E+03	1.91E+01	1.59E+03	Yes		NOTE 3
Phenol (TH)	108952	no	yes	0.24	lb/hr					0.00E+00	0.00E+00	4.02E-06	1.01E-03	4.02E-06	1.01E-03	4.02E-06	1.01E-03	2.41E-02	8.81E+00	2.41E-02	2.01E+00	No		NOTE 1
Styrene (TH)	100425	no	yes	2.7	lb/hr					6.58E-07	1.65E-04	3.04E-07	7.59E-05	9.62E-07	2.40E-04	9.62E-07	2.40E-04	5.77E-03	2.11E+00	5.77E-03	4.81E-01	No		NOTE 1
Methyl chloroform (TH)	71556	yes	yes	64	lb/hr	250	lb/day	4.80E-05	1.20E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.80E-05	1.20E-02	2.88E-01	1.05E+02	2.88E-01	2.40E+01	No	No	NOTE 1
Methyl ethyl ketone (TH)	78933	yes	yes	22.4	lb/hr	78	lb/day	2.00E-05	5.00E-03	4.75E-06	1.19E-03	2.04E-06	5.09E-04	6.79E-06	1.70E-03	2.68E-05	6.70E-03	1.61E-01	5.87E+01	1.61E-01	1.34E+01	No	No	NOTE 1
Toluene (TH)	108883	yes	yes	14.4	lb/hr	98	lb/day	2.90E-03	7.25E-01	7.56E-06	1.89E-03	8.73E-06	2.18E-03	1.63E-05	4.07E-03	2.92E-03	7.29E-01	1.75E+01	6.39E+03	1.75E+01	1.46E+03	No	No	NOTE 1
Xylene (TH)	1330207	yes	yes	16.4	lb/hr	57	lb/day	2.00E-04	5.00E-02	2.44E-05	6.09E-03	1.71E-05	4.26E-03	4.14E-05	1.04E-02	2.41E-04	6.04E-02	1.45E+00	5.29E+02	1.45E+00	1.21E+02	No	No	NOTE 1
Methylene chloride (TH)	75092	no	yes	0.39	lb/hr	1600	lb/year	3.29E-08	8.23E-06	0.00E+00	0.00E+00			3.29E-08	8.23E-06	3.29E-08	8.23E-06	1.97E-04	7.21E-02	1.97E-04	1.65E-02	No	No	NOTE 1
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	yes	no	0.013	lb/day			4.50E-07	1.13E-04							4.50E-07	1.13E-04	2.70E-03	9.86E-01	2.70E-03	2.25E-01	No	No	NOTE 1
Hexane, n- (TH)	110543	yes	yes	23	lb/day			9.38E-04	2.35E-01	1.22E-05	3.05E-03	6.24E-06	1.56E-03	1.84E-05	4.61E-03	9.57E-04	2.39E-01	5.74E+00	2.10E+03	5.74E+00	4.78E+02	No	No	NOTE 1
Manganese unlisted compounds (T)	MNC-other	yes	no	0.63	lb/day			7.70E-06	1.93E-03							7.70E-06	1.93E-03	4.62E-02	1.69E+01	4.62E-02	3.85E+00	No	No	NOTE 1
Mercury, vapor (TH)	7439976	yes	no	0.013	lb/day			2.60E-06	6.50E-04							2.60E-06	6.50E-04	1.56E-02	5.69E+00	1.56E-02	1.30E+00	Yes	Yes	NOTE 3
Nickel metal (TH)	7440020	yes	no	0.13	lb/day			6.30E-05	1.58E-02							6.30E-05	1.58E-02	3.78E-01	1.38E+02	3.78E-01	3.15E+01	Yes	Yes	NOTE 3
Carbon disulfide (TH)	75150	no	yes	3.9	lb/day					1.95E-06	4.87E-04	5.41E-07	1.35E-04	2.49E-06	6.23E-04	2.49E-06	6.23E-04	1.49E-02	5.45E+00	1.49E-02	1.25E+00	No	No	NOTE 1
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	yes	no	0.0002	lb/yr			2.10E-13	5.25E-11							2.10E-13	5.25E-11	1.26E-09	4.60E-07	1.26E-09	1.05E-07	No	No	NOTE 1
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	yes	no	0.016	lb/yr			5.60E-07	1.40E-04							5.60E-07	1.40E-04	3.36E-03	1.23E+00	3.36E-03	2.80E-01	Yes	Yes	NOTE 3
Benzene (TH)	71432	yes	yes	8.1	lb/yr			3.90E-04	9.75E-02	3.90E-06	9.75E-04	2.16E-06	5.41E-04	6.06E-06	1.52E-03	3.96E-04	9.90E-02	2.38E+00	8.67E+02	2.38E+00	1.98E+02	Yes	Yes	NOTE 3
Benzo(a)pyrene (T)	50328	yes	yes	2.2	lb/yr			9.80E-09	2.45E-06	0.00E+00	0.00E+00	7.84E-09	1.96E-06	7.84E-09	1.96E-06	1.76E-08	4.41E-06	1.06E-04	3.86E-02	1.06E-04	8.82E-03	No	No	NOTE 1
Hydrogen Sulfide (T)	7783064	yes	yes	1.7	lb/day			5.18E-05	1.30E-02	1.46E-06	3.65E-04	1.46E-06	3.65E-04	2.92E-06	7.30E-04	5.47E-05	1.37E-02	3.28E-01	1.20E+02	3.28E-01	2.74E+01	No	No	NOTE 1
Beryllium metal (unreacted) (TH)	7440417	yes	no	0.28	lb/yr			0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	No	NOTE 1
Cadmium metal (elemental unreacted) (TH)	7440439	yes	no	0.37	lb/yr			4.10E-07	1.03E-04							4.10E-07	1.03E-04	2.46E-03	8.98E-01	2.46E-03	2.05E-01	Yes	No	NOTE 2
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (TH)	57653857	yes	no	0.0051	lb/yr			1.30E-12	3.25E-10							1.30E-12	3.25E-10	7.80E-09	2.85E-06	7.80E-09	6.50E-07	No	No	NOTE 1
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	yes	no	0.18	lb/hr			2.10E-04	5.25E-02							2.10E-04	5.25E-02	1.26E+00	4.60E+02	1.26E+00	1.05E+02	No		NOTE 1
Perchloroethylene (tetrachloroethylene) (TH)	127184	no	yes	13000	lb/yr					0.00E+00	0.00E+00	3.20E-07	8.01E-05	3.20E-07	8.01E-05	3.20E-07	8.01E-05	1.92E-03	7.01E-01	1.92E-03	1.60E-01	No	No	NOTE 1
Trichloroethylene (TH)	79016	no	yes	4000	lb/yr					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	No	NOTE 1
Napthalene (H)	91203	yes	yes					6.50E-04	1.63E-01	4.62E-06	1.16E-03	4.26E-06	1.07E-03	8.88E-06	2.22E-03	6.59E-04	1.65E-01	3.95E+00	1.44E+03	3.95E+00	3.29E+02			
Phosphorus Metal, Yellow or White (H)	7723140	yes	no					2.80E-05	7.00E-03							2.80E-05	7.00E-03	1.68E-01	6.13E+01	1.68E-01	1.40E+01			
Polycyclic Organic Matter (H)	POM	yes	no					8.80E-04	2.20E-01							8.80E-04	2.20E-01	5.28E+00	1.93E+03	5.28E+00	4.40E+02			
Propionaldehyde (H)	123386	yes	no					1.30E-04	3.25E-02							1.30E-04	3.25E-02	7.80E-01	2.85E+02	7.80E-01	6.50E+01			
Quinone (H)	106514	yes	no					1.60E-04	4.00E-02							1.60E-04	4.00E-02	9.60E-01	3.50E+02	9.60E-01	8.00E+01			
Selenium compounds (H)	SEC	yes	no					3.50E-07	8.75E-05							3.50E-07	8.75E-05	2.10E-03	7.67E-01	2.10E-03	1.75E-01			
Trimethylpentane, 2,2,4- (H)	540841	yes	yes					4.00E-05	1.00E-02	3.78E-06	9.44E-06	7.49E-09	1.87E-05	1.13E-07	2.82E-05	4.01E-05	1.00E-02	2.41E-01	8.78E+01	2.41E-01	2.01E+01			
Antimony unlisted compounds (H)	SBC-other	yes	no					1.80E-07	4.50E-05							1.80E-07	4.50E-05	1.08E-03	3.94E-01	1.08E-03	9.00E-02			
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	yes	no					5.05E-06	1.26E-03							5.05E-06	1.26E-03	3.03E-02	1.11E+01	3.03E-02	2.53E+00			
Cobalt unlisted compounds (H)	COC-other	yes	no					2.60E-08	6.50E-06							2.60E-08	6.50E-06	1.56E-04	5.69E-02	1.56E-04	1.30E-02			
Ethyl benzene (H)	100414	yes	yes					2.40E-04	6.00E-02	4.63E-06	1.16E-03	1.18E-05	2.91E-03	1.63E-05	4.07E-03	2.56E-04	6.41E-02	1.54E+00	5.61E+02	1.54E+00	1.28E+02			
Lead unlisted compounds (H)	PBC-other	yes	no					1.50E-05	3.75E-03							1.50E-05	3.75E-03	9.00E-02	3.29E+01	9.00E-02	7.50E+00			
Methyl bromide (H)	74839	no	yes							5.97E-07	1.49E-04	3.99E-07	9.98E-05	9.96E-07	2.49E-04	9.96E-07	2.49E-04	5.98E-03	2.18E+00	5.98E-03	4.98E-01			
Cumene (H)	98828	no	yes							0.00E+00	0.00E+00	4.57E-06	1.14E-03	4.57E-06	1.14E-03	4.57E-06	1.14E-03	2.74E-02	1.00E+01	2.74E-02	2.29E+00			
Ethyl chloride (chloroethane) (H)	75003	no	yes							0.00E+00	0.00E+00	8.73E-09	2.18E-06	8.73E-09	2.18E-06	8.73E-09	2.18E-06	5.24E-05	1.91E-02	5.24E-05	4.37E-03			
Methyl chloride (H)	74873	no	yes							0.00E+00	0.00E+00	6.24E-07	1.56E-04	6.24E-07	1.56E-04	6.24E-07	1.56E-04	3.74E-03	1.37E+00	3.74E-03	3.12E-01			
Xylene, o- (H)	95476	no	yes							6.95E-06	1.74E-03	3.33E-06	8.32E-04	1.03E-05	2.57E-03	1.03E-05	2.57E-03	6.16E-02	2.25E+01	6.16E-02	5.14E+00			
HAPs, TOTAL								1.00E-02	2.50E+00	1.87E-04	4.68E-02	8.66E-05	2.17E-02	2.74E-04	6.85E-02	1.03E-02	2.57E+00	6.16E+01	2.25E+04	6.16E+01	5.14E+03			

POTENTIAL TAP EMISSION RATES
(ARSENIC, NICKEL)

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - INPUT SCREEN

REVISION D; October 15, 2015

Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

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Directions: Enter and select information in the boxes that are highlighted in blue:

General Facility Information

COMPANY NAME:	Carolina Sunrock, LLC - Burlington North
FACILITY ID NUMBER:	1700016
PERMIT NUMBER	10628Roo
FACILITY CITY:	Burlington
FACILITY COUNTY:	Caswell
SPREADSHEET PREPARED BY:	LLG

General Facility Information

MAXIMUM HOURLY THROUGHPUT AT TRUCK LOAD OUT	120	(yd^3/hour)
ACTUAL ANNUAL PRODUCTION	1,051,200	(yd^3/year)
MAXIMUM ANNUAL PRODUCTION*	1,051,200	(yd^3/year)

*Default maximum annual production is maximum hourly throughput times 8,760 hours per year. Enter another limit if applicable (i.e. for arsenic modeling).

Facility Production Information

PERCENT OF ANNUAL LOADOUT THROUGH TRUCK MIX	100	(% by volume)
PERCENT OF ANNUAL LOADOUT THROUGH CENTRAL MIX	0	(% by volume)

Facility Emissions Control Information

IS THERE A CONTROL DEVICE ON THE TRUCK MIX?	2	(1=No, 2=Yes)
IS THERE A CONTROL DEVICE ON THE CENTRAL MIX?	1	(1=No, 2=Yes)

Material Composition Information

			Typical NC Comp.*
Cement	448	lbs	*410 lbs*
Supplement	148	lbs	*120 lbs*
Coarse Aggregate	1980	lbs	*1884 lbs*
Sand	1440	lbs	*1443 lbs*
Water	140	lbs	*167 lbs*
Total	4156	lbs	*4024 lbs*

** North Carolina typical material composition is based on data from industry contacts. User may enter site-specific data.*

15A NCAC 2D .0515 "Particulates from Miscellaneous Industrial Processes"

	Cement Silo	Flyash silo	Sand&Agg Weigh hopper	Truck mix[1]	Central mix[1]	
Enter the process rate if different from default, otherwise leave blank						
Process Rate[2]	25	25	205.200	240.96	0.000	tons/hr
Maximum Allowable Emission Rate[3]	35.4	35.4	58.8	60.5	0.0	lbs/hr
PM Emission Rate Before controls	18.250	78.500	0.985	52.210	0.000	lbs/hr
PM Emission Rate After Controls	0.025	0.223	0.001	1.001	0.000	lbs/hr
Assumed control device efficiency for weigh hopper[4]			99.9%			
Complies with 2D .0515?	yes	yes	yes	yes	yes	
Control device required to comply?	no	yes	no	no	no	

[1] *Emission factors for truck/central mix include emissions from cement & supplement weigh hoppers.*

[2] *Default process rate for silo loading is 25 tons per hour. Default process weight for sand & aggr weigh hopper includes only aggr & sand. Default process rate for truck mix and central mix includes all components except water since assumes water is added directly to truck.*

[3] *Allowable emission rate should be calculated to 3 significant digits.*

[4] *Default efficiency is 99.9% for bagfilters. Enter 0 if weigh hopper is not controlled.*

ATTACHMENT E8

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - OUTPUT SCREEN

REVISION D; October 15, 2015

NCDENR

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SOURCE / FACILITY / USER INPUT SUMMARY (FROM INPUT SCREEN)

General Facility Information

COMPANY NAME:	Carolina Sunrock, LLC - Burlington North
FACILITY ID NUMBER:	1700016
PERMIT NUMBER	10628R00
FACILITY CITY:	Burlingyon
FACILITY COUNTY:	Caswell
SPREADSHEET PREPARED BY:	LLG

General Facility Information

MAXIMUM HOURLY THROUGHPUT AT TRUCK LOAD OUT	120	(yd^3/hour)
ACTUAL ANNUAL PRODUCTION	1051200	(yd^3/year)

Facility Production Information

PERCENT OF ANNUAL LOADOUT THROUGH TRUCK MIX	100	(% by volume)
PERCENT OF ANNUAL LOADOUT THROUGH CENTRAL MIX	0	(% by volume)

Facility Emissions Control Information

IS THERE A CONTROL DEVICE ON THE TRUCK MIX?	2	(1=No, 2=Yes)
IS THERE A CONTROL DEVICE ON THE CENTRAL MIX?	1	(1=No, 2=Yes)

Material Composition Information

			Typical NC Comp.*
Cement	448	lbs	*410 lbs*
Supplement	148	lbs	*120 lbs*
Coarse Aggregate	1980	lbs	*1884 lbs*
Sand	1440	lbs	*1443 lbs*
Water	140	lbs	*167 lbs*
Total	4156	lbs	*4024 lbs*

** North Carolina typical material composition is based on data from industry contacts. User may enter site-specific data.*

PARTICULATE MATTER EMISSIONS INFORMATION

PARTICULATE EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
	Pollutant	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
truck mix*	PM	1.001	4.386	52.210	228.678	1.001	4.386
	PM10	0.375	1.645	14.912	65.314	0.375	1.645
central mix*	PM	0.000	0.000	0.000	0.000	0.000	0.000
	PM10	0.000	0.000	0.000	0.000	0.000	0.000
cement silo	PM	0.027	0.117	19.622	85.946	0.027	0.117
	PM10	0.009	0.040	12.634	55.335	0.009	0.040
suppl. Silo	PM	0.079	0.346	27.883	122.128	0.079	0.346
	PM10	0.044	0.191	9.768	42.784	0.044	0.191
weigh hopper** [sand & aggr.]	PM	0.985	4.314	0.985	4.314	0.985	4.314
	PM10	0.575	2.517	0.575	2.517	0.575	2.517
sand & aggr.	PM	3.003	13.155	3.003	13.155	3.003	13.155
	PM10	1.433	6.275	1.433	6.275	1.433	6.275
TOTAL PM	PM	5.095	**22.318**	103.704	**454.222**	5.095	**22.318**
TOTAL PM10	PM10	2.435	**10.667**	39.321	**172.225**	2.435	**10.667**
Title V Potential	PM10						**0.231**

*Truck/Central mix emission factors include emissions from cement & supplement weigh hopper(s).

**Actual/Potential weigh hopper (sand & aggr) emissions assumed uncontrolled since AP-42 reports "no data" for controlled.

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - OUTPUT SCREEN

REVISION D; October 15, 2015

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TOXIC / HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION

POLLUTANT	CAS NUMBER	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMSSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS)	
		lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
Arsenic Unlisted Compounds (TH)	ASC-OTHER	6.59E-05	5.77E-01	2.49E-03	2.18E+01	6.59E-05	5.77E-01
Beryllium metal (TH)	7440-41-7	4.53E-06	3.97E-02	1.00E-05	8.77E-02	4.53E-06	3.97E-02
Cadmium Metal (TH)	7440-43-9	5.00E-07	4.38E-03	7.69E-06	6.74E-02	5.00E-07	4.38E-03
Chromic Acid (TH)	7738-94-5	1.58E-04	1.39E+00	4.25E-04	3.73E+00	1.58E-04	1.39E+00
Lead Unlisted Compounds (H)	PBC-OTHER	5.96E-05	5.22E-01	1.32E-03	1.16E+01	5.96E-05	5.22E-01
Manganese Unlisted compounds (TH)	MNC-OTHER	7.49E-04	6.56E+00	7.67E-03	6.72E+01	7.49E-04	6.56E+00
Nickel metal (TH)	7440-02-0	1.92E-04	1.68E+00	9.19E-04	8.05E+00	1.92E-04	1.68E+00
Phosphorus Metal Yellow or White (H)	7223-14-0	4.71E-04	4.13E+00	1.72E-03	1.51E+01	4.71E-04	4.13E+00
Selenium compounds (H)	SEC	4.68E-06	4.10E-02	9.43E-05	8.26E-01	4.68E-06	4.10E-02
Total HAPs		1.71E-03	1.49E+01	1.47E-02	1.28E+02	1.71E-03	1.49E+01
Highest HAP Manganese		7.49E-04	6.56E+00	7.67E-03	6.72E+01	7.49E-04	6.56E+00

TOXIC AIR POLLUTANT EMISSIONS INFORMATION (FOR PERMITTING PURPOSES)

EXPECTED EMISSIONS AFTER CONTROLS / LIMITATIONS

(Daily calculations are based on maximum hourly plant capacity operating at 24 hours per day. If over the TPER, the facility should more closely analyze the maximum daily emisions based on actual operation. Annual calculations are based on the actual annual production as entered on the INPUT worksheet.)

POLLUTANT	CAS NUMBER	lb/hr	lb/day	lb/yr
Arsenic Unlisted Compounds (TH)	ASC-OTHER			0.5769
Beryllium metal (TH)	7440-41-7			0.040
Cadmium Metal (TH)	7440-43-9			0.004
Chromic Acid (TH)	7738-94-5		0.0038	
Manganese Unlisted compounds (TH)	MNC-OTHER		0.018	
Nickel metal (TH)	7440-02-0		0.005	

FACILITY Carolina Sunrock - Burlington North **I.D. NO.** 1700016 **DATE** 7/20/2021
LOCATION Caswell **PERMIT NO.** 10628R00 **BY** LLG

FACILITY-WIDE EMISSIONS SUMMARY

POTENTIAL EMISSIONS BEFORE CONTROLS/LIMITS

SOURCE	PM ton/yr	PM_{10} ton/yr	SO_2 ton/yr	NOx ton/yr	CO ton/yr	VOC ton/yr	Total HAP lb/yr	Highest HAP lb/yr	
HMA-H1	86.42	38.93	665.79	61.66	145.48	52.69	22,500.00	6,980.00	Formaldehyde
[1] HMA-H1 & HMA-H2	0.24	0.07	0.02	1.44	0.36	0.01	21.00	11.50	Toluene
[2] RMC - Conc. Plant	454.22	172.23	0.00	0.00	0.00	0.00	128.00	67.20	Manganese
Paved Roads-Fugitive	2.37	0.47	0.00	0.00	0.00	0.00	0.00	0.00	
Unpaved Roads-Fug.	1.32	0.38	0.00	0.00	0.00	0.00	0.00	0.00	
Stockpiles-Unloading	0.22	0.11	0.00	0.00	0.00	0.00	0.00	0.00	
Stockpiles-Wind	0.06	0.03	0.00	0.00	0.00	0.00	0.00	0.00	
TOTALS	544.85	212.22	665.81	63.10	145.84	52.70	22,649.00	6,980.00	Formaldehyde
		40.22					11.325	3.490	
		$(38.93 + 0.07 + 0.23^2 + 0.99^3 = 40.22)$					ton/yr	ton/yr	

POTENTIAL EMISSIONS AFTER CONTROLS/LIMITS

SOURCE	PM ton/yr	PM_{10} ton/yr	SO_2 ton/yr	NOx ton/yr	CO ton/yr	VOC ton/yr	Total HAP lb/yr	Highest HAP lb/yr	
HMA-1	11.52	7.27	26.04	15.19	33.49	12.05	5,140.00	1,600.00	Formaldehyde
[1] HMA-H1 & HMA-H2	0.24	0.07	0.02	1.44	0.36	0.01	21.00	11.50	Toluene
[2] RMC - Conc. Plant	22.32	10.67	0.00	0.00	0.00	0.00	14.90	6.56	Manganese
Paved Roads-Fugitive	2.37	0.47	0.00	0.00	0.00	0.00	0.00		
Unpaved Roads-Fug	1.32	0.38	0.00	0.00	0.00	0.00	0.00		
Stockpiles-Unloading	0.22	0.11	0.00	0.00	0.00	0.00	0.00		
Stockpiles-Wind	0.06	0.03	0.00	0.00	0.00	0.00	0.00		
TOTALS	38.05	19.00	26.06	16.63	33.85	12.06	5,175.90	1,600.00	Formaldehyde
		8.56					2.588	0.800	
		$(7.27 + 0.07 + 0.23^2 + 0.99^3 = 8.56)$					ton/yr	ton/yr	

[1] Using ULSD Fuel Oil having 0.0015% sulfur content.

[2] For Title V applicability, only emissions from the cement and fly ash storage silos after controls are considered from the Concrete Batch Plant, because the EPA considers emissions from cement/fly ash scales (weigh batchers) and truck loading operations to be fugitive and uncontrolled. In addition, the EPA considers the bagfilter for the cement and fly ash silos to be integral. Therefore, the facility does not trigger Synthetic Minor for PM10.

[3] Combined fugitive emissions from paved/unpaved roads and stockpiles, also not considered with regard to Title V applicability

ATTACHMENT E9