Air Quality Construction Permit Application

CAROLINA SUNROCK LLC •
PROSPECT HILL, NORTH CAROLINA

SUNROCK®

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1.1. EXECUTIVE SUMMARY

Carolina Sunrock LLC (Carolina Sunrock) currently owns and operates several hot mix asphalt and concrete batching plants across North Carolina. Carolina Sunrock plans to build a new hot mix asphalt, truck mix concrete batch plant, and quarry at 1238 Wrenn Road in Prospect Hill, Caswell County, North Carolina. Carolina Sunrock also operates a separate Prospect Hill site located at 57 Wrenn Road. Therefore, to differentiate between the two Prospect Hill facilities, this site will be called Prospect Hill Quarry and Distribution Center.

For this proposed facility, Carolina Sunrock is requesting a construction and operating permit be issued in accordance with Title 15A of North Carolina Administrative Code (15A NCAC) Chapter 2Q .0304 and 2Q .0305. In accordance with 15A NCAC 2Q .0305(a)(1), the required number of copies (3) have been included as required by Rule 2Q .0305(b), and the copies have been signed as required by Rule 2Q .0304(j).

The new facility will be a synthetic minor facility for particulate matter (PM) emissions and carbon monoxide (CO) and an area source of hazardous air pollutants (HAPs). Therefore, the permit application fee for a new synthetic minor facility ($400) is enclosed as required under 2Q .0304(k) and 2Q .0305(a)(1)(A). Furthermore, as required by 2Q .0304(b)(1), a zoning consistency determination has been submitted as part of this application.

1.2. APPLICATION CONTENTS

Three copies of this air permit application and application processing fee of $400 are enclosed. This application contains the following information:

- Section 2 provides a project description and discusses air emissions,
- Section 3 discusses regulatory applicability,
- Section 4 contains the air dispersion modeling analysis,
- Section 5 provides general facility permit application forms,
- Section 6 provides source specific permit application forms,
- Appendix A1 contains facility-wide emission summaries,
- Appendix A2 contains combustion source emission summaries,
- Appendix A3 contains DEQ spreadsheet calculations for the HMA plant,
- Appendix A4 contains DEQ spreadsheet calculations for the concrete batch plant,
- Appendix A5 contains DEQ spreadsheet calculations for the quarry operations,
- Appendix B contains the modeling files and protocol,
- Appendix C presents a copy of the local zoning consistency request submitted to the local zoning department, and
- Appendix D contains the quarry operations equipment list and process flow diagram.

2. BACKGROUND AND PROCESS DESCRIPTION

2.1. BACKGROUND

Carolina Sunrock is submitting this application to build a new hot mix asphalt (HMA), truck mix concrete batch plant, and quarry in Prospect Hill, North Carolina. The facility requests following permitted manufacturing operations be included as emission sources in the permit:

- Hot mix asphalt plant
- RAP crushing system
- Truck mix batch concrete plant
- Quarry operations
- Electricity generation (power generators)

The new plant's processes are discussed in detail in Section 2.2. Facility-wide potential emission estimates associated with the facility's operations are included in Appendix A.

A detailed description of the production process and associated emissions sources are provided in the following subsections. NCDEQ's source-specific application forms are included in Section 6 of this application.

2.2. PROCESS DESCRIPTION

2.2.1. Hot Mix Asphalt Plant

Carolina Sunrock is proposing the following emission sources associated with a hot mix asphalt plant (250 tons per hour capacity) consisting of:

- 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 MMBtu/hr maximum heat input capacity) – controlled by a 45,000 cfm bagfilter
- Two (2) hot mix asphalt storage silos (150 tons maximum capacity, each)
- Three (3) hot mix asphalt storage silos (200 tons maximum capacity, each)
- Asphalt loadout operation
- Truck loadout operation

In association with the asphalt plant, Carolina Sunrock is also proposing a reclaimed asphalt pavement (RAP) crushing system consisting of:

- One crusher (65 tph)
- One RAP bin and feeder
- One double deck screen
- Six conveyors

The RAP crushing system will also periodically use a mobile crusher (also rated at 65 tph) which may temporarily reside at the new Prospect Hill 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. This exemption is discussed further in Section 3.5.12.

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 (150 tons maximum capacity)
- Truck loadout point
- Cement/flyash weight batcher (5 tons maximum capacity)
- Aggregate weigh batcher (20 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 6500 cfm bagfilter.

2.2.3. Quarry Operations

Carolina Sunrock is proposing to operate a quarry operation with a 1500 ton per hour primary crushing, secondary crushing, aggregate screening/washing, and aggregate conveyance. There will be several diesel-fired generators associated with certain quarry equipment such as primary crushers, screens, and cone crushers, and are listed below:

Emission Source ID	Rating	Units
GEN-1 (J50V2)	350	hp
GEN-1a (J45)	350	hp
GEN-2 (S190dt)	125	hp
GEN-3 (PS1300 Maxtrack)	440	hp
GEN-4 (TF80)	125	hp
GEN-5 (PS1300 Maxtrack)	450	hp
GEN-7 (PS100 Maxtrack)	350	hp

The full equipment list and process flow diagram for the quarry are included in Appendix D of this application.

Quarry operations (that are not wet material processing operations) will be subject to NSPS Subpart OOO, discussed in Section 3.4.2 below. The diesel generators used to power certain quarry equipment (listed above) will be subject to the RICE MACT (40 CFR 63 Subpart ZZZZ) and subsequently the NSPS Subpart IIII for compression ignition RICE, discussed in Section 3.4.4.

2.2.4. Large Natural Gas/Propane Power Generators

The facility will use electricity generated by large natural gas/propane fired generators. Two generators are rated at 2065 hp and one is rated at 1721 hp. Propane will likely only be used for a few weeks during plant startup until the natural gas pipeline is completed. Therefore, to be able to combust either fuel the plant requests the engines be permitted as natural gas and/or propane-fired units.

The potential emissions from these large generators are based on 8,760 hrs/year of operation since they are providing electricity to the site and may be run continuously. The generators will be model year 2019 or later depending on when construction commences at the site; therefore, the generators will be subject to NSPS Subpart JJJJ for spark ignition RICE (discussed in Section 3.4). Each generator will be equipped with catalytic oxidation to mitigate CO emissions.

Potential emissions are included in Appendix A. AP-42 emission factors were used for all pollutants except for NOx, CO, and VOC. The vendor-provided NOx and CO emission factors were used to estimate NOx and CO emissions for each generator. The NSPS emission standard for VOC was used to estimate VOC emissions from each generator.

In order to avoid major source status under Title V, the facility is requesting an operational limitation on the generators such that only two out of three generators may run simultaneously. For conservatism, this application assumes the two largest engines may run at the same time.

2.2.5. Insignificant Activities

Carolina Sunrock is proposing the following insignificant activities which are exempt from permitting (See Form D4 in Section 5):

- IES-1 – Used Oil Storage Tank associated with asphalt plant (20,000 gallon capacity);
- IES-2 – Used Oil Storage Tank associated with asphalt plant (20,000 gallon capacity);
- IES-3 – Liquid Asphalt Tank (30,000 gallon capacity);
- IES-4 – Liquid Asphalt Tank (30,000 gallon capacity);
- IES-5 – Diesel Fuel Storage Tank associated with asphalt plant (20,000 gallon capacity);
- IES-6 – Diesel Fuel Storage Tank associated with asphalt plant (20,000 gallon capacity);
- IES-13 – Diesel Fuel Storage tank associated with quarry (20,000 gallon capacity);
- IES-14 – Diesel Fuel Storage tank associated with quarry (20,000 gallon capacity);
- IES-15 – Propane Storage Tank (100,000 gallon capacity);
- IES-16 – Natural gas/No. 2 fuel oil-fired Asphalt Cement Heater (1.2 MMBtu/hr); and
- IES-17 – Natural gas/No. 2 fuel oil-fired Liquid Asphalt Tank Heater (1.1 MMBtu/hr).

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.

The DEQ spreadsheets used for the HMA, concrete batch, and quarry emissions included in Appendix A include emission estimates at a maximum 8760 hours per year of operation. The Emission Summary table on Page 1 in Appendix A includes a summary of the controlled potential emissions at full maximum operation of 8760 hours per year. Table 1 also includes a summary of the potential emissions in tons per year after applying the synthetic minor limitations.

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

- Production of the HMA plant (maximum design production of 250 tph) will be capped at 40% of maximum annual operation. Therefore, 250 tph * 8760 hrs/yr = 2,190,000 tpy * 40% = 876,000 tpy

  Therefore Carolina Sunrock requests an annual production limitation of 876,000 tpy for the HMA plant.

- Production of the quarry operations (maximum design production of 1500 tph) will be capped based on a maximum of 4745 hours per year of operation. Therefore, 1500 tph * 4745 hrs/yr = 7,117,500 tpy

  Therefore, Carolina Sunrock requests an annual production limitation of 7,117,500 tpy for the quarry operations. No limit on operating hours is proposed.

- Operation of the large natural gas/propane-fired power generators (each equipped with catalytic oxidation) will be limited to only operating two out of three of the generators simultaneously. Therefore, the generators cannot run more than 17,520 hours per year.

- The facility requests no limitation on the concrete batch operations.

3. REGULATORY APPLICABILITY ANALYSIS

3.1. TITLE V APPLICABILITY

40 CFR Part 70 establishes the federal Title V operating permit program. North Carolina has incorporated the provisions of this federal program in its Title V operating permit program under 15A NCAC 2Q .0500. The major source thresholds with respect to the North Carolina Title V operating permit program regulations are 10 tons per year of a single HAP, 25 tpy of any combination of HAP, 100 tpy of certain other regulated pollutants, and 100,000 tpy for CO_2e.

The facility is a synthetic minor source because potential uncontrolled emissions for particulate matter (PM) and carbon monoxide (CO) exceeds the applicable threshold of 100 tpy. The facility is a minor source of HAPs because potential uncontrolled HAP emissions are less than 10/25 tpy.

3.2. PSD APPLICABILITY

North Carolina has implemented the federal PSD requirements of 40 CFR 51.166 under North Carolina Regulation 15A NCAC 2D .0530. Under the PSD regulations, a major stationary source for PSD is defined as any source in one of the 28 named source categories with the potential to emit 100 tpy or more of any regulated pollutant, or any source not in one of the 28 named source categories with the potential to emit 250 tpy or more of any regulated pollutant other than carbon dioxide equivalent (CO_2e), for which the threshold is 100,000 tpy.[1] The facility does not qualify for classification in one of the 28 listed source categories; therefore, the facility's major source threshold for PSD is 250 tpy.

As shown in Appendix A, emissions of PSD-regulated compounds are below PSD thresholds, therefore the facility is not a major stationary source in regards to PSD regulations.

3.3. NESHAP APPLICABILITY

Potential emissions of HAPs are not greater than the major source thresholds of 10/25 tpy for HAPs. Therefore, Carolina Sunrock is a minor source of HAPs.

3.3.1. Stationary Reciprocating Internal Combustion Engines MACT [40 CFR 63 Subpart ZZZZ]

40 CFR 63 Subpart ZZZZ applies to reciprocating internal combustion engines (RICE) located at a major or area source of HAP emissions. This facility will be an area source of HAPs. A stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile.

This facility is proposing three large spark ignition engines to provide electricity generation to the site (ES-PGEN1 through ES-PGEN3). The facility will also be installing diesel fired compression ignition engines for certain quarry equipment (see list in 2.2.3).

[1] 40 CFR §52.21(b)(1)(i)

Stationary RICE at area sources are considered new if construction commences on or after June 12, 2006 (§63.6590(a)(2)(iii)); therefore, all the engines permitted in this application will be new sources.

Per §63.6590(c), a new or reconstructed stationary RICE located at an area source must meet the requirements of this part by meeting the requirements of 40 CFR 60 Subpart IIII, for compression ignition engines, and 40 CFR 60 Subpart JJJJ, for spark ignition engines. See Section 3.4.3 for more information regarding NSPS Subpart IIII and Section 3.4.4 for Subpart JJJJ.

3.4. NSPS APPLICABILITY

3.4.1. Standards of Performance for Hot Mix Asphalt Facilities NSPS [40 CFR 60 Subpart I]

The provisions of this subpart are applicable to hot mix asphalt facilities that commence construction or modification after June 11, 1973; therefore this rule applies to Carolina Sunrock's hot mix asphalt plant (ID No. HMA-1).

3.4.1.1. Emission Standards

In accordance with §60.92, Carolina Sunrock must not discharge into the atmosphere any gases which:

- Contain PM in excess of 90 mg/dscm (0.04 gr/dscf)
- Exhibit 20 percent opacity, or greater.

3.4.1.2. Testing Requirements

Per §60.93, the facility shall conduct a performance test as required in §60.8, using the following test methods:

- Method 5 for determining compliance with PM standard
- Method 9 and §60.11 procedures for determining opacity

3.4.2. Standards of Performance for Nonmetallic Mineral Processing Plants NSPS [40 CFR 60 Subpart OOO]

Per §60.670(a)(1), the provisions of this subpart are applicable to crushers and grinding mills at hot mix asphalt facilities that reduce the size of nonmetallic minerals embedded in RAP up to the first storage silo or bin. Therefore, the RAP Crushing System at the facility is subject to this regulation including the RAP crusher, conveyor, and screen. The quarry operations are also subject to this standard.

3.4.2.1. Emission Standards

In accordance with table 3 and §60.672(b), for affected facilities that commence construction after April 22, 2008, the fugitive emission limit for the RAP Crushing System and quarry crushers (crusher only) is 12 percent opacity. For the RAP and quarry conveyors and screens, the fugitive emissions limit is 7 percent opacity.

The facility must demonstrate compliance with these limits by conducting an initial performance test per §60.11 and §60.675 and perform periodic inspections of water sprays per §60.674(b) and §60.676(b). The facility must also perform a repeat performance test within 5 years from the previous performance test from affected facilities without water sprays (facilities controlled by water carryover from upstream water sprays that are inspected are exempt from the repeat testing requirement).

3.4.2.2. Exemption for Portable Crushers

The facility may also periodically utilize a portable RAP crushing system that moves from site to site. It is exempt from Subpart OOO in accordance with §60.670(c)(2) since its capacity is 65 tons per hour, which is less than the 150 tons per hour threshold specified in this exemption. This portable crusher is also exempt from permitting per 15A NCAC 2Q .0902 which is further discussed in Section 3.5.12.

3.4.3. NSPS Subpart Subpart IIII - Stationary Compression Ignition Internal Combustion Engines

The NSPS Subpart IIII applicability definition provides:

> *(a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition(CI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (3) of this section....*
>
> *(1) Manufacturers of stationary CI ICE with a displacement of less than 10 liters per cylinder where the model year is:*
>
> *i. 2007 or later, for engines that are not fire pump engines.*
>
> *(2) Owners and operators of stationary CI ICE that commence construction after July 11, 2005 where the stationary CI ICE are:*
>
> *i. Manufactured after April 1, 2006 and are not fire pump engines.*

The diesel fired generators associated with quarry equipment, described in Section 2.2.3 above, are non emergency generators (model year 2019 or later depending on the date construction begins) that combust ultra-low sulfur diesel (ULSD). The date of manufacture for the engine and date of construction will occur after the applicability dates specified above. Therefore, the generators are subject to the provisions of Subpart IIII.

Because the engines will be used to operate certain quarry equipment for non-emergency purposes and cylinder displacement is less than 10 liters/cylinder, the engine is subject to the emission limits in 40 CFR §60.4201 and the fuel specifications of 40 CFR 60.4207.

The proposed generator must meet the following Tier 4 emissions and opacity standards:

- 0.67 grams per kilowatt hour (g/kw-hr) of NOX,
- 0.19 grams per kilowatt hour (g/kw-hr) of HC[2]
- 3.5 g/kw-hr of CO, and
- 0.03 g/kw-hr of PM.

As provided in 40 CFR §60.4211(c), to demonstrate compliance with these emission standards, Carolina Sunrock will purchase certified engines to meet the emission limits listed 40 CFR 60.4201,

and will install and configure the engines according to the manufacturer's specifications. No performance testing is required.

Effective October 1, 2010, only diesel fuel that meets the requirements set forth in 40 CFR §80.510(b) may be used in accordance with 40 CFR §60.4207(b). This regulation states that the sulfur content must remain less than or equal to 15 ppm, and either the cetane index must be at least 40, or the aromatic content must be less than or equal to 35 volume percent.

3.4.4. NSPS Subpart Subpart JJJJ - Stationary Spark Ignition Internal Combustion Engines

The NSPS Subpart JJJJ applicability definition provides:

> *(a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary spark ignition (SI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (6) of this section...*
>
> > *(4) Owners and operators of stationary SI ICE that commence construction after June 12, 2006, where the stationary SI ICE are manufactured:*
> >
> > > *(i) On or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 HP (except lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP);*
> >
> > *(6) The provisions of §60.4236 of this subpart are applicable to all owners and operators of stationary SI ICE that commence construction after June 12, 2006.*

The three natural gas/propane-fired generators (each equipped with catalytic oxidation) are subject to Subpart JJJJ since they are larger than 500 hp and will commence construction after the applicability dates specified above.

According to §60.4233(e), the facility's large power generators are subject to the emission standards in Table 1 for Non-Emergency SI Natural Gas and Non-Emergency SI Lean Burn LPG greater than 500 hp (manufactured after July 1, 2010) must comply with the following emission standards:

- 1.0 grams per horsepower hour (g/hp-hr) of NO_X,
- 2.0 g/hp-hr of CO, and
- 0.7g/hp-hr of VOC.

To meet the compliance requirements of §60.4243(b)(1), Carolina Sunrock plans to purchase certified engines where the engine and control device (i.e., catalytic oxidation) are operated and maintained according to the manufacturer's emission-related instructions. The facility will keep records of conducted maintenance to demonstrate compliance. The engine settings will only be adjusted according to and consistent with the manufacturer's instructions. If the site purchases a certified natural gas engine and combusts only natural gas, there are no requirements to keep a maintenance plan, conducting performance tests, or submitting an initial notification.

If the site purchases a certified natural gas unit but combusts propane as the fuel, the site shall treat the unit as a non-certified engine. As such, when combusting propane, the site will demonstrate compliance as follows: Uncertified engines > 500 HP must keep maintenance plan and records demonstrating compliance, conduct initial performance testing within 60 days of startup and subsequent testing every 8760 hours or three years, whichever comes first. An Initial Notification

must be submitted in accordance with 40 CFR 60.7(a)(1) for all SI ICE > 500 HP that have not been certified to meet emissions standards in NSPS JJJJ.

3.4.5. Non-Applicable NSPS

The basis for non-applicability of a potential NSPS is provided below.

Subpart Kb: Subpart Kb applies to volatile organic liquid storage vessels with a volume greater than 75 m^3 (19,813 gallons). In addition, tanks with capacities of greater than 151 m^3 (39,890 gallons), containing VOCs with a vapor pressure less than 3.5 kPa (0.5 psia) are exempt from this NSPS. This project will add several storage tanks for storing ULSD, used oil, liquid asphalt, and pressurized propane, which all have vapor pressures below the applicability cutoff per AP-42 Table 7.1-2, and are therefore exempt from this regulation.

3.5. NORTH CAROLINA REGULATIONS

The applicability of key North Carolina State Implementation Plan (SIP) regulations is discussed below.

3.5.1. Particulates from Hot Mix Asphalt Plants (15A NCAC 2D .0506)

Particulate matter emissions resulting from the operation of a hot mix asphalt plant shall not exceed allowable emission rates. The allowable emission rates are, as defined in 15A NCAC 2D .0506, a function of the process weight rate and shall be determined by the following equation (calculated to three significant figures), where P is the process throughput rate in tons per hour (tons/hr) and E is the allowable emission rate in pounds per hour (lbs/hr).

$E = 4.9445 * (P)^{0.4376}$ for P < 300 tons/hr, or

E = 60 lbs/hr for P >=300 tons/hr

Since the process weight rate is 250 tons/hour, the allowable emission rate is 55.4 lb/hr. Controlled PM emissions are 1.28 lb/hr, well under the allowable emission rate.

3.5.2. Particulates from Sand, Gravel, or Crushed Stone Operations (15A NCAC 2D .0510)

This regulation applies to the RAP crushing system and quarry operations at Carolina Sunrock.

As required by 15A NCAC 2D .0510 "Particulates from Sand, Gravel, or Crushed Stone Operations," the following requirements apply:

a. The Permittee of a sand, gravel, recycled asphalt pavement (RAP), or crushed stone operation shall 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 to prevent exceeding the ambient air quality standards beyond the property line for particulate matter, both PM_{10} and total suspended particulates.

b. Fugitive dust emissions from sand, gravel, RAP, or crushed stone operations shall be controlled by 15A NCAC 2D .0540 "Particulates from Fugitive Dust Emission Sources."

c. The Permittee of any sand, gravel, RAP, or crushed stone operation shall control process-generated emissions:

   i. From crushers with wet suppression (excluding RAP crushers); and

   ii. From conveyors, screens, and transfer points

   such that the applicable opacity standards in 15A NCAC 2D .0521 Control of Visible Emissions," or 15A NCAC 2D .0524 "New Source Performance standards" are not exceeded.

3.5.3. Particulates from Miscellaneous Industrial Processes (15A NCAC 2D .0515)

This regulation applies to the following truck mix concrete batch plant emission sources: cement/flyash weigh batcher, cement/flyash silos, aggregate weigh batcher, and truck loadout point.

As required by 15A NCAC 2D .0515 "Particulates from Miscellaneous Industrial Processes," particulate matter emissions from the emission sources shall not exceed allowable emission rates. The allowable emission rates are, as defined in 15A NCAC 2D .0515, a function of the process weight rate and shall be determined by the following equation(s), where P is the process throughput rate in tons per hour (tons/hr) and E is the allowable emission rate in pounds per hour (lbs/hr).

$E = 4.10 * (P)^{0.67}$ for P <= 30 tons/hr, or

$E = 55 * (P)^{0.11} - 40$ for P >30 tons/hr

See Appendix A, Concrete Batch Plant Emissions Calculator – Input Screen, for the allowable emission rate calculation for each source. The emission rate from each source is less than the maximum allowable emission rate, and thus shows compliance with this regulation.

3.5.4. Control of Visible Emissions (15A NCAC 2D .0521)

Visible emissions from the HMA plant, concrete batch plant, and quarry's emission sources, manufactured after July 1, 1971, shall not be more than 20 percent opacity when averaged over a six-minute period, except that six-minute periods averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. However, sources which must comply with 15A NCAC 2D .0524 "New Source Performance Standards" or .1110 "National Emission Standards for Hazardous Air Pollutants" must comply with applicable visible emissions requirements contained therein.

3.5.5. Particulates from Fugitive Dust Emission Sources (15A NCAC 2D .0540)

The facility shall not cause or allow fugitive dust emissions to cause or contribute to substantive complaints or excess visible emissions beyond the property boundary. If substantive complaints or

excessive fugitive dust emissions from the facility are observed beyond the property boundaries for six minutes in any one hour (using Reference Method 22 in 40 CFR, Appendix A), the owner or operator may be required to submit a fugitive dust plan as described in 2D .0540(f).

"Fugitive dust emissions" means particulate matter that does not pass through a process stack or vent and that is generated within plant property boundaries from activities such as: unloading and loading areas, process areas stockpiles, stock pile working, plant parking lots, and plant roads (including access roads and haul roads).

3.5.6. Sulfur Dioxide Emissions from Combustion Sources (15A NCAC 2D .0516)

As required by 15A NCAC 2D .0516 "Sulfur Dioxide Emissions from Combustion Sources," sulfur dioxide emissions from the combustion sources shall not exceed 2.3 pounds per million Btu heat input. The combustion sources proposed in this application will comply with this regulation through combusting natural gas, propane, or ultra low sulfur diesel fuel.

3.5.7. New Source Performance Standards (15A NCAC 2D .0524)

For Propane/Natural Gas/No. 2 fuel oil/recycled No. 2 fuel oil/No. 4 fuel oil/recycled No.4 fuel oil fired batch type hot mix asphalt plant (250 tons/hour maximum capacity, 80 MMBtu/hr maximum heat input) (ID No. ES-1), the facility shall comply with all applicable provisions, including the notification, testing, reporting, recordkeeping, and monitoring requirements contained in 15A NCAC 2D .0524 "New Source Performance Standards" (NSPS) as promulgated in 40 CFR 60, Subpart I, including Subpart A "General Provisions."

For the nonmetallic mineral processing equipment (RAP Crushing System and quarry operations), the facility shall comply with all applicable provisions, including the notification, testing, reporting, recordkeeping, and monitoring requirements contained in 15A NCAC 20 .0524 "New Source Performance Standards" (NSPS) as promulgated in 40 CFR 60, Subpart OOO including Subpart A General Provisions.

The power generators and diesel fired quarry equipment generators will be subject to NSPS Subpart JJJJ and IIII, respectively.

See Section 3.4 for further details.

3.5.8. Excess Emissions Reporting and Malfunctions (15A NCAC 2D .0535)

As required by 15A NCAC 2D .0535, if a source of excess emissions lasts for more than four hours and results from a malfunction, a breakdown of process or control equipment or any other abnormal conditions, the facility shall:

a. Notify the Director or his designee of any such occurrence by 9:00 a.m. Eastern time of the Division's next business day of becoming aware of the occurrence and describe:

i. the name and location ofthe facility,
ii. the nature and cause of the malfunction or breakdown,
iii.the time when the malfunction or breakdown is first observed,
iv. the expected duration, and

v. an estimated rate of emissions.

b. Notify the Director or his designee immediately when the corrective measures have been accomplished.

3.5.9. Control and Prohibition of Odorous Emissions (15A NCAC 2D .1806)

The facility shall not operate without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility's boundary.

3.5.10. Limitation to Avoid Title V Permit (15A NCAC 2Q .0501)

Pursuant to 15A NCAC 2Q .0315 "Synthetic Minor Facilities," to avoid the applicability of 15A NCAC 2Q .0501 "Purpose of Section and Requirement for a Permit," Carolina Sunrock requests that facility-wide emissions be limited to less than 100 tons per consecutive 12-month period for the following pollutants:

- PM
- CO

The facility requests the limitations discussed in Section 2.3 above.

3.5.11. Toxic Air Pollutant Procedures (15A NCAC 2Q .0700)

Under the NC air toxics program regulations, facility-wide modeling and permitting is required if total facility-wide emissions of regulated air toxics emitted from non-exempt, new or modified emission units exceed the toxics de minimis emissions rates (a.k.a., "TPERS") established under the 15A NCAC 2Q .0700 regulations.

Carolina Sunrock has triggered modeling for the following pollutants since total facility wide emissions exceed the respective TPERs: arsenic, benzene, cadmium, formaldehyde, and nickel. Therefore, Carolina Sunrock is submitting an air dispersion modeling analysis (See Section 4) and requests TAP limits be added to the permit according to Table 4-6 in the following section.

3.5.12. Permit Exemptions - Temporary Crushers (15A NCAC 2Q .0902)

The facility may periodically use a mobile RAP crushing system that moves around other Carolina Sunrock sites. This temporary crusher has a maximum capacity of 65 tons per hour. It is exempt from permitting since it meets the criteria specified in 2Q .0902 and will not be operated at this facility for more than 12 months. In addition, the crusher:

- Will crush no more than 300,000 tons at the facility
- Will burn no more than 17,000 gallons of diesel fuel at the facility
- Does not operate at a quarry that has an air permit
- Will continuously use water spray to control emissions from the crusher, and
- Does not operate at a facility that is required to have a mining permit issued by Division of Energy, Mineral, and Land Resources.

The diesel fired emergency generator associated with this temporary crusher was not included in the TAP modeling demonstration since it is exempt from permitting and will only be operated on a short term basis. The generator is also subject to RICE MACT (40 CFR 63, Subpart ZZZZ).

4. AIR DISPERSION MODELING ANALYSIS

This section presents the input data and modeling methodology utilized in the TAP modeling compliance demonstration. The modeling methodology conforms to the Guidelines for Evaluating the Air Quality Impacts of Toxic Pollutants in North Carolina (May 2018) and more recent changes posted on NCDAQ's Air Quality Analysis Branch (AQAB) website. In lieu of a modeling protocol, a protocol checklist is provided in Appendix B.

As previously discussed, potential emissions of five (5) compounds regulated under 15A NCAC 2Q .0700 (NC Air Toxics) exceed their TPER and this air dispersion modeling evaluation has been conducted to demonstrate compliance with all applicable AAL.

4.1. FACILITY LOCATION

Figure 4-1 provides a topographical map of the area surrounding the Carolina Sunrock Prospect Hill property. The approximate central Universal Transverse Mercator (UTM) coordinates of the facility are 664.4 kilometers (km) east and 4,018.7 km north in Zone 17 (NAD 83).

For modeling purposes, the appropriate urban/rural land use classification for the area was determined using the Auer technique, which is recommended in the *Guideline on Air Quality Models.* In accordance with this technique, the area within a 3-km radius of the facility was identified on US Geological Survey (USGS) topographic maps (and was delineated by land use type). More than 50 percent of the surrounding land use can be classified as undeveloped rural (i.e., Auer's A4 classification), therefore the area is classified as rural.

Figure 4-1. Map of Area Surrounding Carolina Sunrock

4.2. MODEL SELECTION

The AERMOD dispersion model (version 19091) was used to calculate off-property concentrations in the modeling analysis. AERMOD was promulgated as the preferred model in 40 CFR 51, Appendix W on November 9, 2005 and is recommended by the NCDAQ for evaluating criteria and toxic air pollutant concentrations from industrial facilities such as Carolina Sunrock's Prospect Hill #2 facility.[2] AERMOD was run using the regulatory default option, which automatically implements NCDAQ and U.S. EPA recommended model options.

4.3. SOURCE DESCRIPTION

Tables 4-1 and 4-2 presents a table of the modeled point and volume sources, respectively, including their locations at the facility. All locations are expressed in UTM Zone 18 (NAD83) coordinates.

Table 4-1. Modeled Point Source Locations

Model ID	Description	UTM-E (m)	UTM-N (m)	Elevation (m)
PGEN1	Power Engine 1	664,047.9	4,018,679.7	205.0
PGEN2	Power Engine 2	664,050.7	4,018,673.3	205.2
PGEN3	Power Engine 3	664,053.4	4,018,667.0	205.4
CD1	Asphalt Plant Baghouse	664,069.6	4,018,718.7	204.6
IES4	Asphalt Heater	664,066.8	4,018,732.0	204.7
IES5	Liquid Asphalt Heater	664,071.1	4,018,735.0	204.8
HMASILO1	Asphalt Silo 1 Vent	664,109.1	4,018,719.0	205.1
HMASILO2	Asphalt Silo 2 Vent	664,112.0	4,018,721.4	205.1
HMASILO3	Asphalt Silo 3 Vent	664,115.0	4,018,723.7	205.0
HMASILO4	Asphalt Silo 4 Vent	664,117.9	4,018,726.2	204.9
HMASILO5	Asphalt Silo 5 Vent	664,106.1	4,018,716.5	205.2
CD2	Concrete Plant Baghouse	664,155.2	4,018,786.6	202.2
GEN1	Quarry Generator	664,799.0	4,018,997.2	191.0
GEN1A	Quarry Generator	665,048.1	4,018,924.3	186.6
GEN2	Quarry Generator	664,815.4	4,019,139.4	190.8
GEN3	Quarry Generator	664,617.9	4,018,936.2	199.0
GEN5	Quarry Generator	664,627.5	4,018,930.4	198.4
GEN7	Quarry Generator	664,636.8	4,018,891.0	197.4
GEN4	Quarry Generator	665,031.3	4,019,118.9	188.2

[2] 40 CFR 51, Appendix W–*Guideline on Air Quality Models*, Appendix A.1– AMS/EPA Regulatory Model (AERMOD).

Table 4-2. Modeled Volume Source Locations

Model ID	Description	UTM-E (m)	UTM-N (m)	Elevation (m)
HMALO1	Asphalt Loadout 1	664,109.1	4,018,719.0	205.1
HMALO2	Asphalt Loadout 2	664,112.0	4,018,721.4	205.1
HMALO3	Asphalt Loadout 3	664,115.0	4,018,723.7	205.0
HMALO4	Asphalt Loadout 4	664,117.9	4,018,726.2	204.9
HMALO5	Asphalt Loadout 5	664,106.1	4,018,716.5	205.2

Tables 4-3 and 4-4 present the stack parameters input to the model for each of the point and volume sources, respectively. The stacks for sources IES4 and IES5 are vertical stacks but will have raincaps and thus, per NCDAQ guidance, were modeled with an exit velocity of 0.01 m/s. The HMASILO vents are characterized as point sources with ambient release characteristics, so per NCDAQ guidance, were modeled with an exit velocity of 0.01 m/s and exit temperature of 25 deg. C. The volume source parameters were calculated based on NCDAQ *Guidance* for surface-based volume sources.

Table 4-3. Modeled Point Source Parameters

Model ID	Stack Height (m)	Exit Temp. (K)	Exit Velocity (m/s)	Stack Diameter (m)
PGEN1	5.18	788.71	22.02	0.15
PGEN2	5.18	788.71	22.02	0.15
PGEN3	5.18	788.71	22.02	0.15
CD1	9.22	388.71	29.41	0.96
IES4	2.74	435.93	0.01	0.30
IES5	4.57	435.93	0.01	0.05
HMASILO1	19.81	298.15	0.01	0.30
HMASILO2	19.81	298.15	0.01	0.30
HMASILO3	18.29	298.15	0.01	0.30
HMASILO4	18.29	298.15	0.01	0.30
HMASILO5	18.29	298.15	0.01	0.30
CD2	10.67	298.15	24.38	0.46
GEN1	3.66	797.04	29.11	0.15
GEN1A	3.66	797.04	29.11	0.15
GEN2	3.66	797.04	29.11	0.15
GEN3	3.66	797.04	29.11	0.15
GEN5	3.66	797.04	29.11	0.15
GEN7	3.66	797.04	29.11	0.15
GEN4	1.83	778.71	15.07	0.15

Table 4-4. Modeled Volume Source Parameters

Model ID	Release Height (m)	Init. Lat. Dimension (K)	Init. Vert. Dimension (m/s)
HMALO1	3.66	0.15	1.70
HMALO2	3.66	0.15	1.70
HMALO3	3.66	0.15	1.70
HMALO4	3.66	0.15	1.70
HMALO5	3.66	0.15	1.70

Table 4-5 presents the emission rates modeled for each of the triggered TAPs. These rates represent values that are in excess of the calculated potential rates in order to provide the facility with operational flexibility.

Table 4-5. Modeled Emission Rates

	Modeled Emission Rates (g/s)				
Model ID	**FORM**	**NICKEL**	**ARSENIC**	**BENZENE**	**CADMIUM**
PGEN1	1.01E-01	0.00E+00	0.00E+00	3.17E-03	0.00E+00
PGEN2	1.01E-01	0.00E+00	0.00E+00	3.17E-03	0.00E+00
PGEN3	8.38E-02	0.00E+00	0.00E+00	2.64E-03	0.00E+00
CD1	9.77E-02	1.99E-03	1.76E-05	1.23E-02	1.30E-05
IES4	3.56E-05	4.54E-07	6.05E-07	3.10E-07	4.54E-07
IES5	3.27E-05	4.16E-07	5.54E-07	2.84E-07	4.16E-07
HMASILO1	5.29E-04	0.00E+00	0.00E+00	2.46E-05	0.00E+00
HMASILO2	5.29E-04	0.00E+00	0.00E+00	2.46E-05	0.00E+00
HMASILO3	5.29E-04	0.00E+00	0.00E+00	2.46E-05	0.00E+00
HMASILO4	5.29E-04	0.00E+00	0.00E+00	2.46E-05	0.00E+00
HMASILO5	5.29E-04	0.00E+00	0.00E+00	2.46E-05	0.00E+00
CD2	0.00E+00	2.42E-05	8.30E-06	0.00E+00	6.30E-08
GEN1	3.64E-04	9.26E-07	1.24E-06	2.88E-04	9.26E-07
GEN1A	3.64E-04	9.26E-07	1.24E-06	2.88E-04	9.26E-07
GEN2	1.30E-04	3.31E-07	4.41E-07	1.03E-04	3.31E-07
GEN3	4.58E-04	1.16E-06	1.55E-06	3.62E-04	1.16E-06
GEN5	4.68E-04	1.19E-06	1.59E-06	3.70E-04	1.19E-06
GEN7	3.64E-04	9.26E-07	1.24E-06	2.88E-04	9.26E-07
GEN4	1.30E-04	3.31E-07	4.41E-07	1.03E-04	3.31E-07
HMALO1	2.31E-05	0.00E+00	0.00E+00	1.36E-05	0.00E+00
HMALO2	2.31E-05	0.00E+00	0.00E+00	1.36E-05	0.00E+00
HMALO3	2.31E-05	0.00E+00	0.00E+00	1.36E-05	0.00E+00
HMALO4	2.31E-05	0.00E+00	0.00E+00	1.36E-05	0.00E+00
HMALO5	2.31E-05	0.00E+00	0.00E+00	1.36E-05	0.00E+00

As previously described, the following sources are subject to a NESHAP standard:

- PGEN1
- PGEN2
- PGEN3
- GEN1 (J50V2)
- GEN1A (J45)
- GEN2 (S190dt)
- GEN3 (PS1300 Maxtrack)
- GEN5 (PS1300 Maxtrack)
- GEN7 (PS100 Maxtrack)
- GEN4 (TF80)

Since the above sources were included in the TAP modeling analysis, which demonstrates no unacceptable risk to the public, TAP permit limitations are not required for those sources. As such, Carolina Sunrock is requesting the TAP limits in Table 4-6 be included in the permit, based on the modeled emission rates in Table 4-5 (in g/s) and scaled to the appropriate averaging period.

Table 4-6. Requested Permit Limits

	Requested Permit Limits				
Model ID	FORM (lb/hr)	NICKEL (lb/day)	ARSENIC (lb/yr)	BENZENE (lb/yr)	CADMIUM (lb/yr)
CD1	7.75E-01	3.79E-01	1.23E+00	8.54E+02	9.02E-01
IES4	2.83E-04	8.64E-05	4.20E-02	2.15E-02	3.15E-02
IES5	2.59E-04	7.92E-05	3.85E-02	1.97E-02	2.89E-02
HMASILO1	4.20E-03	-	-	1.71E+00	-
HMASILO2	4.20E-03	-	-	1.71E+00	-
HMASILO3	4.20E-03	-	-	1.71E+00	-
HMASILO4	4.20E-03	-	-	1.71E+00	-
HMASILO5	4.20E-03	-	-	1.71E+00	-
CD2	0.00E+00	4.62E-03	5.77E-01	0.00E+00	4.38E-03
HMALO1	1.83E-04	-	-	9.48E-01	-
HMALO2	1.83E-04	-	-	9.48E-01	-
HMALO3	1.83E-04	-	-	9.48E-01	-
HMALO4	1.83E-04	-	-	9.48E-01	-
HMALO5	1.83E-04	-	-	9.48E-01	-

4.4. METEOROLOGICAL DATA

The AERMOD modeling results were based on sequential hourly surface observations from Danville, NC (DAN) and upper air data also from Greensboro, NC (GSO). These stations are

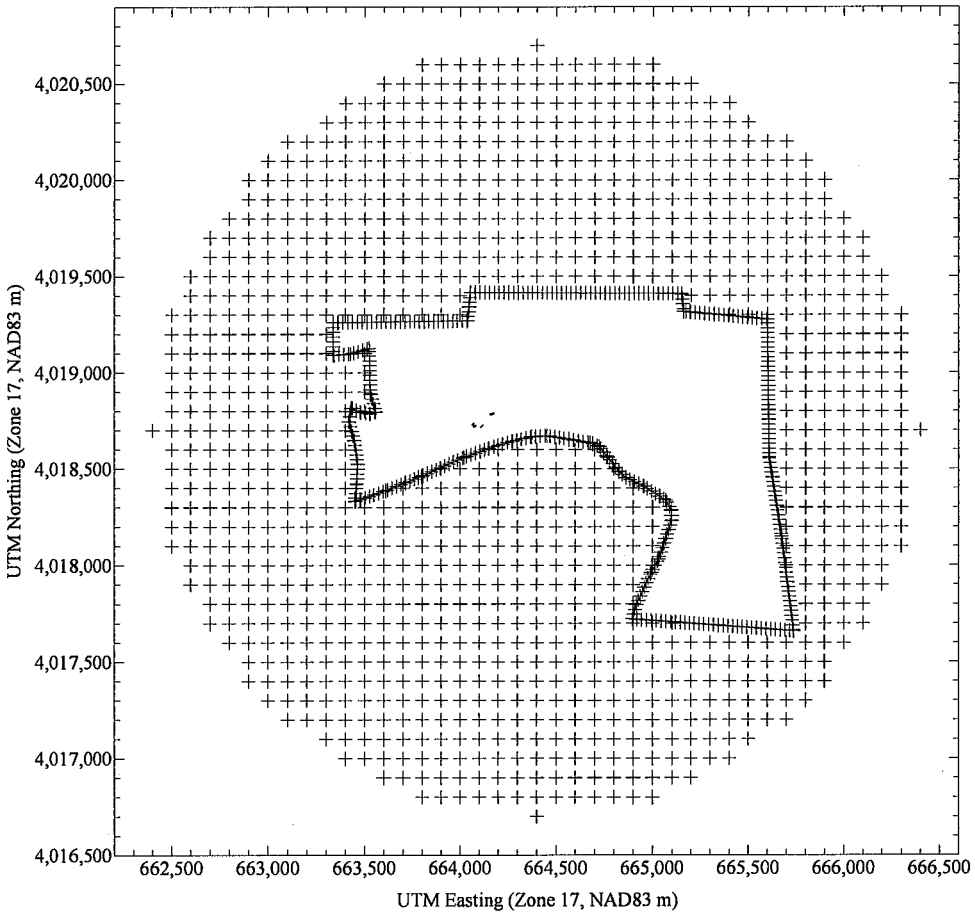
recommended by NCDAQ for modeling facilities located in Caswell County.[3] The base elevation for the surface station is 174 m.[4]

Since the modeled impacts for at least one modeled TAP exceeded 50% of the AAL, five (5) years of data were modeled. The 5, most recent years of meteorological data (2014-2018) were downloaded from NCDAQ's website and input to AERMOD.

4.5. MODELED RECEPTORS

The receptors included in the modeling analysis consisted of property line receptors, spaced 25 meters (m) apart, and Cartesian receptor points spaced every 100 m, extending out 3 km from the center of the facility. There are no public right-of-ways (e.g. roads) traversing the property line, so only a single property line was included in the modeling. The impacts were reviewed to ensure that the maximum impacts were captured within the 100 m spaced grid. Figure 4-2 shows the receptors included in the modeling analysis.

Figure 4-2. Modeled Receptor Grid



[3] https://deq.nc.gov/about/divisions/air-quality/air-quality-permits/modeling-meteorology/meteorological-data

[4] https://files.nc.gov/ncdeq/Air%20Quality/permits/mets/ProfileBaseElevations_2018.pdf

The AERMOD model is capable of handling both simple and complex terrain. Through the use of the AERMOD terrain preprocessor (AERMAP), AERMOD incorporates not only the receptor heights, but also an effective height (hill height scale) that represents the significant terrain features surrounding a given receptor that could lead to plume recirculation and other terrain interaction.[5]

Receptor terrain elevations input to the model were interpolated from National Elevation Database (NED) data obtained from the USGS. NED data consist of arrays of regularly spaced elevations. The array elevations are at a resolution of 1 arcsecond (approximately 30 m intervals) and were interpolated using the latest version of AERMAP (version 18081) to determine elevations at the defined receptor intervals. The data obtained from the NED files were checked for completeness and spot-checked for accuracy against elevations on corresponding USGS 1:24,000 scale topographical quadrangle maps. AERMAP was also used to establish the base elevation of all Carolina Sunrock structures and emission sources.

4.6. BUILDING DOWNWASH

AERMOD incorporates the Plume Rise Model Enhancements (PRIME) downwash algorithms. Direction specific building parameters required by AERMOD are calculated using the BPIP-PRIME preprocessor (version 04274).

EPA has promulgated stack height regulations that restrict the use of stack heights in excess of "Good Engineering Practice" (GEP) in air dispersion modeling analyses. Under these regulations, that portion of a stack in excess of the GEP height is generally not creditable when modeling to determine source impacts. This essentially prevents the use of excessively tall stacks to reduce ground-level pollutant concentrations. The minimum stack height not subject to the effects of downwash, called the GEP stack height, is defined by the following formula:

$H_{GEP} = H + 1.5L$, where:

H_{GEP} = minimum GEP stack height,
H = structure height, and
L = lesser dimension of the structure (height or projected width).

This equation is limited to stacks located within 5L of a structure. Stacks located at a distance greater than 5L are not subject to the wake effects of the structure. The wind direction-specific downwash dimensions and the dominant downwash structures used in this analysis are determined using BPIP. In general, the lowest GEP stack height for any source is 65 meters by default.[6] None of the proposed emission units at the Prospect Hill facility will exceed GEP height.

Figures 4-3 presents a site layout for the facility that shows the source and building arrangement as modeled. The electronic BPIP input and output files are included on the CD-ROM in Appendix B.

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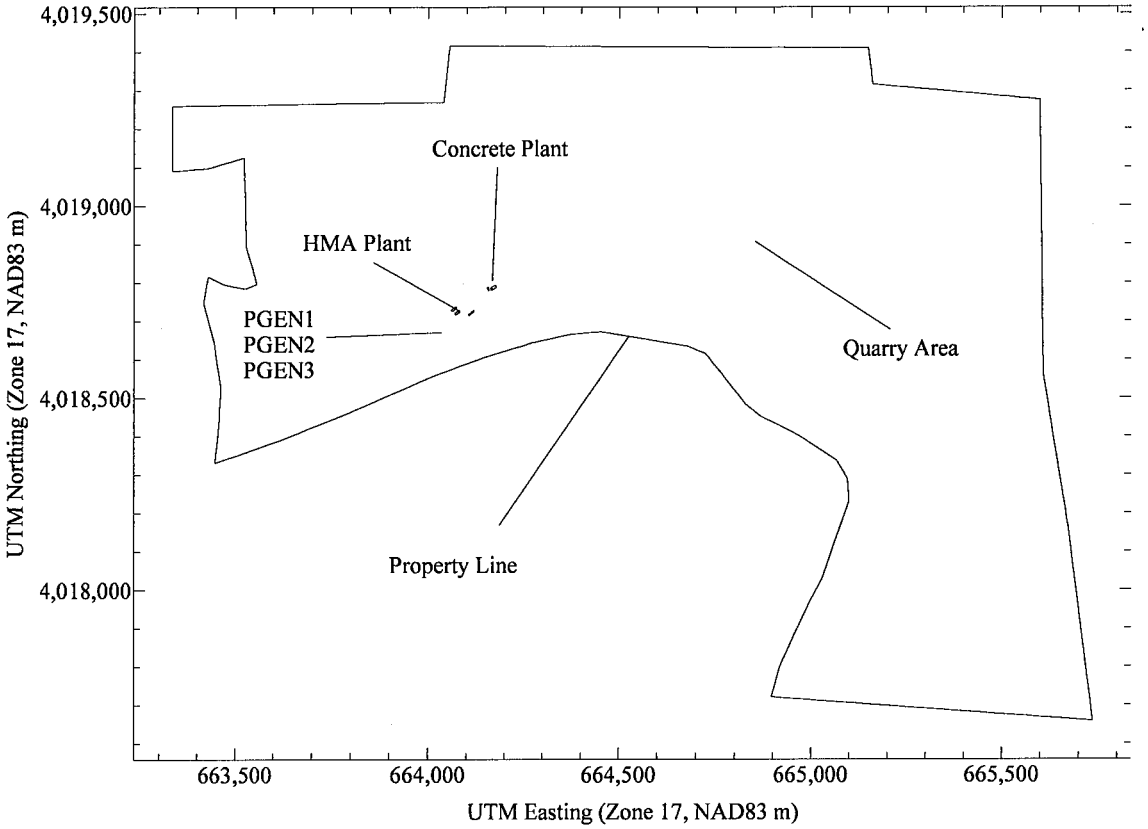
5 US EPA, *Users Guide for the AERMOD Terrain Preprocessor (AERMAP)*, EPA-454/B-03-003, Research Triangle Park, NC.
6 40 CFR §51.100(ii)

Figure 4-3. Carolina Sunrock Prospect Hill #2 Site Layout



4.7. TAP MODELING RESULTS

Table 4-7 presents the model results for each of the triggered TAP. As shown, all impacts are below their respective AAL. The electronic modeling files used in the TAP analysis are contained on the CD-ROM in Appendix B.

Table 4-7. TAP Modeling Results

Pollutant	Avg. Period	UTM-E (m)	UTM-N (m)	Date/Time or Year	Max. Modeled Impact ($\mu g/m^3$)	AAL ($\mu g/m^3$)	% of AAL (%)
Formaldehyde	1-Hour	664,020.1	4,018,559.7	14012802	94.50	150	63.00%
Nickel	24-Hour	663,919.1	4,018,515.6	15100424	3.89E-02	6	0.65%
Arsenic	Annual	664,127.9	4,018,599.1	2018	1.20E-04	2.10E-03	5.71%
Benzene	Annual	663,964.9	4,018,535.6	2015	1.14E-01	0.12	94.81%
Cadmium	Annual	664,127.9	4,018,599.1	2018	6.00E-05	5.50E-03	1.09%

5. NCDEQ GENERAL FACILITY APPLICATION FORMS

This section contains DEQ permit application forms for the general facility.

FACILITY FORMS

- Form A – Facility (General Information)
- Form A2 – Emission Source Listing
- Form A3 – 112(r) Applicability Information
- Form D1 – Facility-wide Emissions Summary
- Form D4 – Exempt and Insignificant Activities Summary
- Form D5 – P.E. Seal Form

FORM A

GENERAL FACILITY INFORMATION

REVISED 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — A

NOTE- APPLICATION WILL NOT BE PROCESSED WITHOUT THE FOLLOWING:

- ☑ Local Zoning Consistency Determination (new or modification only)
- ☑ Responsible Official/Authorized Contact Signature
- ☑ Appropriate Number of Copies of Application
- ☑ P.E. Seal (if required)

Application Fee (please check one option below): ☐ Not Required ☐ ePayment ☑ Check Enclosed

GENERAL INFORMATION

Legal Corporate/Owner Name:	Carolina Sunrock LLC
Site Name:	Prospect Hill Quarry and Distribution Center
Site Address (911 Address) Line 1:	1238 Wrenn Road
Site Address Line 2:	
City:	Prospect Hill
State:	North Carolina
Zip Code:	27314
County:	Caswell

CONTACT INFORMATION

Responsible Official/Authorized Contact:		*Invoice Contact:*	
Name/Title:	Gregg W. Bowler - COO, CFO & Executive VP	Name/Title:	Accounts Payable
Mailing Address Line 1:	200 Horizon Drive Suite 100	Mailing Address Line 1:	200 Horizon Drive Suite 100
Mailing Address Line 2:		Mailing Address Line 2:	
City:	Raleigh	City:	Raleigh
State:	NC	State:	NC
Zip Code:	27615	Zip Code:	27615
Primary Phone No.:	(919) 747-6400	Primary Phone No.:	(919) 747-6400
Fax No.:	(919) 747-6357	Fax No.:	(919) 747-6357
Secondary Phone No.:		Secondary Phone No.:	
Email Address:	gbowler@thesunrockgroup.com	Email Address:	ap@thesunrockgroup.com
Facility/Inspection Contact:		*Permit/Technical Contact:*	
Name/Title:	Scott Martino - Compliance Manager	Name/Title:	Scott Martino - Compliance Manager
Mailing Address Line 1:	200 Horizon Drive Suite 100	Mailing Address Line 1:	200 Horizon Drive Suite 100
Mailing Address Line 2:		Mailing Address Line 2:	
City:	Raleigh	City:	Raleigh
State:	NC	State:	NC
Zip Code:	27615	Zip Code:	27615
Primary Phone No.:	(919) 747-6336	Primary Phone No.:	(919) 747-6336
Fax No.:	(919) 747-6357	Fax No.:	(919) 747-6357
Secondary Phone No.:	(984) 202-4761	Secondary Phone No.:	(984) 202-4761
Email Address:	smartino@thesunrockgroup.com	Email Address:	smartino@thesunrockgroup.com

APPLICATION IS BEING MADE FOR

☑ New Non-permitted Facility/Greenfield ☐ Modification of Facility (permitted) ☐ Renewal Title V ☐ Renewal Non-Title V
☐ Name Change ☐ Ownership Change ☐ Administrative Amendment ☐ Renewal with Modification

FACILITY CLASSIFICATION AFTER APPLICATION (Check Only One)

☐ General ☐ Small ☐ Prohibitory Small ☑ Synthetic Minor ☐ Title V

FACILITY (Plant Site) INFORMATION

Describe nature of (plant site) operation(s): The Facility is a Drum Mix Hot mix Asphalt Plant, Truck Mix Concrete Batch Plant, and Quarry

		Facility ID No.	
Primary SIC/NAICS Code	2951,3273, 1423, 1429	Current/Previous Air Permit No.	Expiration Date:
Facility Coordinates: Latitude:	36.297972	Longitude:	-79.173845

Does this application contain confidential data? ☐ YES ☑ NO ***If yes, please contact the DAQ Regional Office prior to submitting this application.*** (See Instructions)

PERSON OR FIRM THAT PREPARED APPLICATION

Person Name:	Aimee Andrews	Firm Name:	Trinity Consultants
Mailing Address Line 1:	One Copley Parkway	Mailing Address Line 2:	Suite 205
City:	Morrisville	State:	NC
Zip Code:	27560	County:	Wake
Phone No.:	(919)462-9693	Fax No.:	
Email Address:	aandrews@trinityconsultants.com		

SIGNATURE OF RESPONSIBLE OFFICIAL/AUTHORIZED CONTACT

Name (typed): Gregg W. Bowler — Title: COO, CFO & Executive VP

X Signature(Blue Ink): — Date: 11/1/19

Attach Additional Sheets As Necessary — Page 1 of 2

NC Department of Environmental Quality
Received
NOV 18 2019
Winston-Salem Regional Office

Check # 3293
$400.00
Received 11/18/2019

FORM A (continued, page 2 of 2)
GENERAL FACILITY INFORMATION

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SECTION AA1 - APPLICATION FOR NON-TITLE V PERMIT RENEWAL

_____ (Company Name) hereby formally requests renewal of Air Permit No. _____

There have been no modifications to the originally permitted facility or the operations therein that would require an air permit since the last permit was issued.

Is your facility subject to 40 CFR Part 68 "Prevnetion of Accidental Releases" - Section 112(r) of the Clean Air Act? ☐ YES ☐ NO

If yes, have you already submitted a Risk Manage Plan (RMP) to EPA? ☐ YES ☐ NO Date Submitted: _____

Did you attach a current emissions inventory? ☐ YES ☐ NO

If no, did you submit the inventory via AERO or by mail? ☐ Via AERO ☐ Mailed Date Mailed: _____

SECTION AA2- APPLICATION FOR TITLE V PERMIT RENEWAL

In accordance with the provisions of Title 15A 2Q .0513, the responsible official of _____ (Company Name) hereby formally requests renewal of Air Permit No. _____ (Air Permit No.) and further certifies that:

(1) The current air quality permit identifies and describes all emissions units at the above subject facility, except where such units are exempted under the North Carolina Title V regulations at 15A NCAC 2Q .0500;

(2) The current air quality permit cits all applicable requirements and provides the method or methods for determing compliance with the applicable requirements;

(3) The facility is currently in compliance, and shall continue to comply, with all applicable requiremetns. (Note: As provided under 15A NCAC 2Q .0512 compliance with the conditions of the permit shall be deemed compliance with the applicable requirements specifically identified in the permit);

(4) For applicable requirements that become effective during the term of the renewed permit that the facility shall comply on a timely basis;

(5) The facility shall fulfill applicable enhanced monitoring requirements and submit a compliance certification as required by 40 CFR Part 64.

The responsible official (signature on page 1) certifies under the penalty of law that all information and statements provided above, based on information and belief formed after reasonable inquiry, are true, accurate, and complete.

SECTION AA3- APPLICATION FOR NAME CHANGE

New Facility Name: _____

Former Facility Name: _____

An official facility name change is requested as described above for the air permit mentioned on page 1 of this form. Complete the other sections if there have been modifications to the originally premitted facility that would requie an air quality permit since the last permit was issued and if ther has been an ownership change associated with this name change.

SECTION AA4- APPLICATION FOR AN OWNERSHIP CHANGE

By this application we hereby request transfer of Air Quality Permit No. _____ from the former owner to the new owner as described below.

The transfer of permit responsibility, coverage and liability shall be effective _____ (immediately or insert date.) The legal ownership of the facility described on page 1 of this form has been or will be transferred on _____ (date). There have been no modifications to the originally permitted facility that would require an air quality permit since the last permit was issued.

Signature of New (Buyer) Responsible Official/Authorized Contact (as typed on page 1):

X Signature (Blue Ink): _____

Date:

New Facility Name:

Former Facility Name:

Signature of Former (Seller) Responsible Official/Authorized Contact:

Name (typed or print):

Title:

X Signature (Blue Ink): _____

Date:

Former Legal Corporate/Owner Name:

In lieu of the seller's signature on this form, a letter may be submitted with the seller's signature indicating the ownership change

SECTION AA5- APPLICATION FOR ADMINISTRATIVE AMENDMENT

Describe the requested administrative amendment here (attach additional documents as necessary):

Attach Additional Sheets As Necessary **Page 2 of 2**

FORMs A2, A3

EMISSION SOURCE LISTING FOR THIS APPLICATION - A2

112r APPLICABILITY INFORMATION - A3

REVISED 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — A2

EMISSION SOURCE LISTING: New, Modified, Previously Unpermitted, Replaced, Deleted

EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	CONTROL DEVIC ID NO.	CONTROL DEVICE DESCRIPTION
Equipment To Be ADDED By This Application (New, Previously Unpermitted, or Replacement)			
Drum Mix Asphalt Plant (250 tons per hour capacity) Consisting of the Following:			
HMA-1	Propane/Natural Gas/No. 2 Fuel Oil/Recycled No. 2 Fuel Oil/Recycled No.4 Fuel Oil-fired drum type hot asphalt plant (80 MMBtu/hr maximum heat input capacity)	HMA-CD1	Bagfilter (7,778 square feet of filter area)
HMA Silo1	Hot mix asphalt storage silo (150 tons maximum capacity)	NA	NA
HMA Silo2	Hot mix asphalt storage silo (150 tons maximum capacity)	NA	NA
HMA Silo3	Hot mix asphalt storage silo (200 tons maximum capacity)	NA	NA
HMA Silo4	Hot mix asphalt storage silo (200 tons maximum capacity)	NA	NA
HMA Silo5	Hot mix asphalt storage silo (200 tons maximum capacity)	NA	NA
HMA-LO1	Asphalt Loadout Operation	NA	NA
HMA-LO2	Truck Loadout Operation	NA	NA
RAP Crushing System Consisting of the Following:			
RAP-BF1	RAP bin and feeder	NA	NA
RAP-CR1	RAP impact Crusher (65 tons per hour maximum rated capacity)	NA	NA
RAP-SC1	8' X 20' Double Deck Screen	NA	NA
RAP-C1	RAP 36" Conveyor (C-1) Feeder to Crusher (RAP-CR1)	NA	NA
RAP-C2	RAP 36" Conveyor (C-2) Cursher to Screen	NA	NA
RAP-C3	RAP 36" Conveyor (C-3) Screen to Plant	NA	NA
RAP-C4	RAP 36" Conveyor (C-4) Screen to Conveyor (C-5)	NA	NA
RAP-C5	RAP 36" Conveyor (C-5) Conveyor (C-5) to Conveyor (C-6)	NA	NA
RAP-C5	RAP 36" Conveyor (C-6) Conveyor (C-6) to Crusher (RAP-CR1)	NA	NA
Truck Mix Concrete Batch Plant (120 cubic yards per hour capacity) Consisting of the Following:			
RMC-Silo1	Cement Storage Silo (200-ton capacity)	RMC-CD2	Bagfilter (1,433 square feet of filter area)
RMC-Silo2	Flyash Storage Silo (150-ton Capacity)	RMC-CD2	Bagfilter (1,433 square feet of filter area)
RMC-LO1	Truck Loadout point	RMC-CD2	Bagfilter (1,433 square feet of filter area)
RMC-WB1	Cement/Flyash Weigh Batcher (5-ton max Capacity)	RMC-CD2	Bagfilter (1,433 square feet of filter area)
RMC-WB2	Aggregate Weigh Batcher (20-ton max Capacity)	NA	NA
Quarry List See Equipment list and Flow Diagram in Appendix D			
See App D	1500 TPH Primary Crusher	NA	NA
See App D	Secondary Crushing	NA	NA
See App D	Aggregate Screening and Washing	NA	NA
See App D	Aggregate Conveyance	NA	NA
GEN-1 (J50V2)	350 hp Primary crusher diesel generator	NA	NA
GEN-1a (J45)	350 hp Primary crusher diesel generator	NA	NA
GEN-2 (S190dt)	125 hp screen diesel generator	NA	NA
GEN-3 (PS1300 Maxtrack)	440 hp cone crusher diesel generator	NA	NA
GEN-4 (TF80)	125 hp TF80 diesel generator	NA	NA
GEN-5 (PS1300 Maxtrack)	450 hp cone crusher diesel generator	NA	NA
GEN-7 (PS100 Maxtrack)	350 hp cone crusher diesel generator	NA	NA
Power Generators			
ES-PGEN1	2065 hp Natural Gas/Propane Fired Generator #1	CD-PGEN1	Catalytic Oxidation
ES-PGEN2	2065 hp Natural Gas/Propane Fired Generator #2	CD-PGEN2	Catalytic Oxidation
ES-PGEN3	1721 hp Natural Gas/Propane Fired Generator #3	CD-PGEN3	Catalytic Oxidation
Existing Permitted Equipment To Be MODIFIED By This Application			
Equipment To Be DELETED By This Application			

112(r) APPLICABILITY INFORMATION — A 3

Is your facility subject to 40 CFR Part 68 "Prevention of Accidental Releases" - Section 112(r) of the Federal Clean Air Act? ☐ Yes ☑ No

If No, please specify in detail how your facility avoided applicability: The site does not store propane for other purposes than fuel combusti

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

A. Have you already submitted a Risk Management Plan (RMP) to EPA Pursuant to 40 CFR Part 68.10 or Part 68.150?

☐ Yes ☐ No Specify required RMP submittal date: _____ If submitted, RMP submittal date: _____

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

☐ Yes ☐ No If yes, please specify: _____

C. List the processes subject to 112(r) at your facility:

PROCESS DESCRIPTION	PROCESS LEVEL (1, 2, or 3)	HAZARDOUS CHEMICAL	MAXIMUM INTENDED INVENTORY (LBS)

Attach Additional Sheets As Necessary

FORM D4
EXEMPT AND INSIGNIFICANT ACTIVITIES SUMMARY

ACTIVITIES EXEMPTED PER 2Q .0102 OR INSIGNIFICANT ACTIVITIES PER 2Q .0503 FOR TITLE V SOURCES

DESCRIPTION OF EMISSION SOURCE	SIZE OR PRODUCTION RATE	BASIS FOR EXEMPTION OR INSIGNIFICANT ACTIVITY
1. IES-1 – Used Oil Storage Tank associated with asphalt plant	20,000 gallon	2Q .0102(g)(4)
2. IES-2 – Used Oil Storage Tank associated with asphalt plant	20,000 gallon	2Q .0102(g)(4)
3. IES-3 – Liquid Asphalt Tank	30,000 gallon	2Q .0102(g)(14)(B)
4. IES-4 – Liquid Asphalt Tank	30,000 gallon	2Q .0102(g)(14)(B)
5. IES-5 – Diesel Fuel Storage Tank associated with asphalt plant	20,000 gallon	2Q .0102(g)(4)
6. IES-6 – Diesel Fuel Storage Tank associated with asphalt plant	20,000 gallon	2Q .0102(g)(4)
7. IES-13 – Diesel Fuel Storage tank associated with quarry	20,000 gallon	2Q .0102(g)(4)
8. IES-14 – Diesel Fuel Storage tank associated with quarry	20,000 gallon	2Q .0102(g)(4)
9. IES-15 – Propane Storage tank	100,000 gallon	2Q .0102(g)(4)
10. IES-16 – Natural gas/No. 2 fuel oil-fired Asphalt Cement Heater	1.2 MMBtu/hr	2Q .0102(h)(1)(A)
11. IES-17 – Natural gas/No. 2 fuel oil-fired Liquid Asphalt Tank Heater	1.1 MMBtu/hr	2Q .0102(h)(1)(A)

Attach Additional Sheets As Necessary

FORM D1

FACILITY-WIDE EMISSIONS SUMMARY

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operat** **D1**

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

AIR POLLUTANT EMITTED	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS) tons/yr
PARTICULATE MATTER (PM)		**161.67**	**94.30**
PARTICULATE MATTER < 10 MICRONS (PM_{10})		**79.19**	**46.17**
PARTICULATE MATTER < 2.5 MICRONS ($PM_{2.5}$)		**56.65**	**33.96**
SULFUR DIOXIDE (SO_2)		**70.10**	**29.55**
NITROGEN OXIDES (NOx)		**84.89**	**44.96**
CARBON MONOXIDE (CO)		**196.75**	**99.22**
VOLATILE ORGANIC COMPOUNDS (VOC)		**78.33**	**43.84**
LEAD			
GREENHOUSE GASES (GHG) (SHORT TONS)			
OTHER			

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

HAZARDOUS AIR POLLUTANT EMITTED	CAS NO.	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS) tons/yr
Acetaldehyde			**2.36E+00**	**1.37E+00**
Acrolein			**1.94E-02**	**9.68E-03**
Antimony unlisted compounds			**1.34E-04**	**6.70E-05**
Arsenic unlisted cmpds (comp. of ASC)			**7.05E-04**	**4.97E-04**
Benzene			**6.70E-01**	**4.02E-01**
Beryllium metal (unreacted)			**1.99E-05**	**1.99E-05**
Cadmium metal (elemental unreacted)			**3.07E-04**	**1.55E-04**
Carbon disulfide			**1.85E-03**	**9.27E-04**
Chromium unlisted cmpds (add w/chrom acid to get CRC)			**3.76E-03**	**1.88E-03**
Chromic acid (VI) (component of solCR6 and CRC)			**1.03E-03**	**8.61E-04**
Cobalt unlisted compounds			**1.94E-05**	**9.68E-06**
Cumene			**3.41E-03**	**1.70E-03**
Ethyl benzene			**1.91E-01**	**9.54E-02**
Ethyl chloride (chloroethane)			**6.50E-06**	**3.25E-06**
Formaldehyde			**1.24E+01**	**8.22E+00**
Hexane, n-			**7.12E-01**	**3.56E-01**
Hydrogen Chloride (hydrochloric acid)			**1.56E-01**	**7.82E-02**
Lead unlisted compounds			**1.14E-02**	**5.84E-03**
Mercury, vapor			**1.94E-03**	**9.68E-04**
Methyl bromide			**7.42E-04**	**3.71E-04**
Methyl chloride			**4.64E-04**	**2.32E-04**
Methyl chloroform			**3.57E-02**	**1.79E-02**
Methyl ethyl ketone			**1.99E-02**	**9.97E-03**
Methylene chloride			**2.64E-02**	**1.86E-02**
Napthalene			**4.90E-01**	**2.45E-01**
Nickel metal			**4.77E-02**	**2.43E-02**
Perchloroethylene (tetrachloroethylene)			**2.38E-04**	**1.19E-04**
Phenol			**1.05E-02**	**6.83E-03**
Phosphorus Metal, Yellow or White			**2.29E-02**	**1.25E-02**
Polycyclic Organic Matter			**6.55E-01**	**3.27E-01**
Propionaldehyde			**9.68E-02**	**4.84E-02**
Quinone			**1.19E-01**	**5.95E-02**
Selenium compounds			**1.29E-03**	**6.96E-04**
Styrene			**1.05E-02**	**7.30E-03**
Tetrachlorodibenzo-p-dioxin, 2,3,7,8-			**1.56E-10**	**7.82E-11**
Toluene			**2.22E+00**	**1.11E+00**
Trimethylpentane, 2,2,4-			**2.99E-02**	**1.49E-02**
Xylene			**1.80E-01**	**8.98E-02**

TOXIC AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

~~INDICATE REQUESTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS. EMISSIONS ABOVE THE TOXIC PERMIT~~

EMISSION RATE (TPER) IN 15A NCAC 2Q .0711 MAY REQUIRE AIR DISPERSION MODELING. USE NETTING FORM D2 IF NECESSARY

TOXIC AIR POLLUTANT EMITTED	CAS NO.	lb/hr	lb/day	lb/year	Modeling Required ? Yes	No	
See Appendix A1, Facility wide Potential Emission Summary - Toxic Air Pollutants							

COMMENTS:

Attach Additional Sheets As Necessary

FORM D5
TECHNICAL ANALYSIS TO SUPPORT PERMIT APPLICATION

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operat** **D5**

PROVIDE DETAILED TECHNICAL CALCULATIONS TO SUPPORT ALL EMISSION, CONTROL, AND REGULATORY DEMONSTRATIONS MADE IN THIS APPLICATION. INCLUDE A COMPREHENSIVE PROCESS FLOW DIAGRAM AS NECESSARY TO SUPPORT AND CLARIFY CALCULATIONS AND ASSUMPTIONS. ADDRESS THE FOLLOWING SPECIFIC ISSUES ON SEPARATE PAGES:

A **SPECIFIC EMISSIONS SOURCE (EMISSION INFORMATION) (FORM B and B1 through B9) -** SHOW CALCULATIONS USED, INCLUDING EMISSION FACTORS, MATERIAL BALANCES, AND/OR OTHER METHODS FROM WHICH THE POLLUTANT EMISSION RATES IN THIS APPLICATION WERE DERIVED. INCLUDE CALCULATION OF POTENTIAL BEFORE AND, WHERE APPLICABLE, AFTER CONTROLS. CLEARLY STATE ANY ASSUMPTIONS MADE AND PROVIDE ANY REFERENCES AS NEEDED TO SUPPORT MATERIAL BALANCE

B **SPECIFIC EMISSION SOURCE (REGULATORY INFORMATION)(FORM E2 - TITLE V ONLY) -** PROVIDE AN ANALYSIS OF ANY REGULATIONS APPLICABLE TO INDIVIDUAL SOURCES AND THE FACILITY AS A WHOLE. INCLUDE A DISCUSSION OUTING METHODS (e.g. FOR TESTING AND/OR MONITORING REQUIREMENTS) FOR COMPLYING WITH APPLICABLE REGULATIONS, PARTICULARLY THOSE REGULATIONS LIMITING EMISSIONS BASED ON PROCESS RATES OR OTHER OPERATIONAL PARAMETERS. PROVIDE JUSTIFICATION FOR AVOIDANCE OF ANY FEDERAL REGULATIONS (PREVENTION OF SIGNIFICANT DETERIORATION (PSD), NEW SOURCE PERFORMANCE STANDARDS (NSPS), NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS), TITLE V), INCLUDING EXEMPTIONS FROM THE FEDERAL REGULATIONS WHICH WOULD OTHERWISE BE APPLICABLE TO THIS FACILITY. SUBMIT

C **CONTROL DEVICE ANALYSIS (FORM C and C1 through C9) -** PROVIDE A TECHNICAL EVALUATION WITH SUPPORTING REFERENCES FOR ANY CONTROL EFFICIENCIES LISTED ON SECTION C FORMS, OR USED TO REDUCE EMISSION RATES IN CALCULATIONS UNDER ITEM "A" ABOVE. INCLUDE PERTINENT OPERATING PARAMETERS (e.g. OPERATING CONDITIONS, MANUFACTURING RECOMMENDATIONS, AND PARAMETERS AS APPLIED FOR IN THIS APPLICATION) CRITICAL TO ENSURING PROPER PERFORMANCE OF THE CONTROL DEVICES). INCLUDE AND LIMITATIONS OR MALFUNCTION POTENTIAL FOR THE PARTICULAR CONTROL DEVICES AS EMPLOYED AT THIS FACILITY. DETAIL PROCEDURES FOR ASSURING PROPER OPERATION OF THE CONTROL DEVICE INCLUDING

D **PROCESS AND OPERATIONAL COMPLIANCE ANALYSIS - (FORM E3 - TITLE V ONLY)-** SHOWING HOW COMPLIANCE WILL BE ACHIEVED WHEN USING PROCESS, OPERATIONAL, OR OTHER DATA TO DEMONSTRATE COMPLIANCE. REFER TO COMPLIANCE REQUIREMENTS IN THE REGULATORY ANALYSIS IN ITEM "B" WHERE APPROPRIATE. LIST ANY CONDITIONS OR PARAMETERS THAT CAN BE MONITORED AND REPORTED TO DEMONSTRATE COMPLIANCE WITH THE APPLICABLE REGULATIONS

E **PROFESSIONAL ENGINEERING SEAL -** PURSUANT TO 15A NCAC 2Q .0112 "APPLICATION REQUIRING A PROFESSIONAL ENGINEERING A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA SHALL BE REQUIRED TO SEAL TECHNICAL PORTIONS OF THIS APPLIC NEW SOURCES AND MODIFICATIONS OF EXISTING SOURCES. (SEE INSTRUCTIONS FOR FURTHER APPLICABILITY).

I, **Aimee Andrews** *attest that this application for* **Carolina Sunrock** *has been reviewed by me and is accurate, complete and consistent with the information supplied in the engineering plans, calculations, and all other supporting documentation to the best of my knowledge. I further attest that to the best of my knowledge the proposed design has been prepared in accordance with the applicable regulations. Although certain portions of this submittal package may have been developed by other professionals, inclusion of these materials under my seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design. Note: In accordance with NC General Statutes 143-215.6A and 143-215.6B, any person who knowingly makes any false statement, representation, or certification in any application shall be guilty of a Class 2 misdemeanor which may include a fine not to exceed $10,000 as well as civil penalties up to $25,000 per violation.*

(PLEASE USE BLUE INK TO COMPLETE THE FOLLOWING)

NAME: **Aimee L. Andrews, P.E.**
DATE: 11/7/19
COMPANY: **Trinity Consultants of NC, PC**
ADDRESS: **One Copley Parkway, Suite 205, Morrisville, NC 27560**
TELEPHONE: **(919) 462-9693**
SIGNATURE: Aimee L Andrews
PAGES CERTIFIED: **All**

(IDENTIFY ABOVE EACH PERMIT FORM AND ATTACHMENT THAT IS BEING CERTIFIED BY THIS SEAL)

PLACE NORTH CAROLINA SEAL HERE

Attach Additional Sheets As Necessary

6. NCDEQ SOURCE SPECIFIC APPLICATION FORMS

This section contains DEQ source-specific permit application forms for the proposed operations.

HMA Plant:

- Form B – Specific Emissions Source Information (HMA Plant)
- Form B9 – Emission Source-Other (HMA Plant)
- Form B1 – Emission Source Burner (HMA Dryer Heater)
- Form B6 – Emission Source Storage Silo/Bins (HMA Silo 1)
- Form B6 – Emission Source Storage Silo/Bins (HMA Silo 2)
- Form B6 – Emission Source Storage Silo/Bins (HMA Silo 3)
- Form B6 – Emission Source Storage Silo/Bins (HMA Silo 4)
- Form B6 – Emission Source Storage Silo/Bins (HMA Silo 5)
- Form C1 – Control Device (HMA Fabric Filter)
- Form B – Specific Emissions Source Information (RAP Crushing)
- Form B9 – Emission Source-Other (RAP Crushing)

Truck Mix Concrete Batch Plant:

- Form B – Specific Emissions Source Information (Concrete Batch Plant)
- Form B9 – Emission Source-Other (Concrete Batch Plant)
- Form C1 – Control Device (Concrete Batch Fabric Filter)

Quarry Operations:

- Form B – Specific Emissions Source Information (Quarry)
- Form B9 – Emission Source-Other (Quarry)
- Form B – Specific Emissions Source Information (Quarry)
- Form B – Specific Emissions Source Information (Quarry) GEN1
- Form B2 – Emission Source (ICE) GEN1
- Form B – Specific Emissions Source Information (Quarry) GEN1a
- Form B2 – Emission Source (ICE) GEN1a
- Form B – Specific Emissions Source Information (Quarry) GEN2
- Form B2 – Emission Source (ICE) GEN2
- Form B – Specific Emissions Source Information (Quarry) GEN3
- Form B2 – Emission Source (ICE) GEN3
- Form B – Specific Emissions Source Information (Quarry) GEN4
- Form B2 – Emission Source (ICE) GEN4
- Form B – Specific Emissions Source Information (Quarry) GEN5
- Form B2 – Emission Source (ICE) GEN5
- Form B – Specific Emissions Source Information (Quarry) GEN7
- Form B2 – Emission Source (ICE) GEN7

Power Generators:

- Form B – Specific Emissions Source Information (PGEN1)
- Form B2 – Emission Source (ICE) PGEN1
- Form B – Specific Emissions Source Information (PGEN1)
- Form B2 – Emission Source (ICE) PGEN2
- Form B – Specific Emissions Source Information (PGEN2)
- Form B2 – Emission Source (ICE) PGEN3

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/ NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate **B**

EMISSION SOURCE DESCRIPTION: **250 TPH HMA Double Barrel Drum Plant**	EMISSION SOURCE ID NO: **HMA-1**
	CONTROL DEVICE ID NO(S): **HMA-CD1**
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): **EP-1**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

1. Drying of Aggregate (drying drum) 2. Mixing of Aggregate, RAP, and Liquid Asphalt (Mixing Drum) 3. Storage of Final Product (Silos)

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☑ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form
☐ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form	☐ Incineration (Form B8)
☑ Liquid storage tanks (Form B3)	☑ Storage silos/bins (Form B6)	☑ Other (Form B9)

START CONSTRUCTION DATE:	DATE MANUFACTURED:
MANUFACTURER / MODEL NO.: **Aztec 95-138**	EXPECTED OP. SCHEDULE: **12** HR/DAY **6** DAY/WK
IS THIS SOURCE SUBJEC ☑ NSPS (SUBPARTS?): **1** ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **15** MAR-MAY **30** JUN-AUG **30** SEI	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
PARTICULATE MATTER (PM)	**See DEQ Emission Spreadsheet Appendix A3**						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
		See DEQ Emission Spreadsheet Appendix A3						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION	XPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATION lb/hr	lb/day	lb/yr
		See DEQ Emission Spreadsheet Appendix A3			

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

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

Attach Additional Sheets As Necessary

FORM B1
EMISSION SOURCE (WOOD, COAL, OIL, GAS, OTHER FUEL-FIRED BURNER)

REVISED 09/22/ **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B1**

EMISSION SOURCE DESCRIPTION: **HMA Drum Plant Dryer Heater (80 MMBTU/hr burner)**	EMISSION SOURCE ID NO: **HMA-1**
	CONTROL DEVICE ID NO(S): **HMA-CD1**
OPERATING SCENARIO: _____ OF _____	EMISSION POINT (STACK) ID NO(S): **CD1**

DESCRIBE USE: ☑ PROCESS HEAT ☐ SPACE HEAT ☐ ELECTRICAL GENERATION
☐ CONTINUOUS USE ☐ STAND BY/EMERGENCY ☐ OTHER (DESCRIBE): _____

HEATING MECHANISM: ☐ INDIRECT ☑ DIRECT

MAX. FIRING RATE (MMBTU/HOUR): **80**

WOOD-FIRED BURNER

WOOD TYPE: ☐ BARK ☐ WOOD/BARK ☐ WET WOOD ☐ DRY WOOD ☐ OTHER (DESCRIBE): _____

PERCENT MOISTURE OF FUEL: _____

☐ UNCONTROLLED ☐ CONTROLLED WITH FLYASH REINJECTION ☐ CONTROLLED W/O REINJECTION

FUEL FEED METHOD: _____ T TRANSFER MEDIA: ☐ STEAM ☐ AI ☐ OTHER (DESCRIBE) _____

COAL-FIRED BURNER

TYPE OF BOILER IF OTHER DESCRIBE:

PULVERIZ	OVERFEED STOKER	UNDERFEED STOKER	SPREADER STOKER	FLUIDIZED BED
☐ WET BED	☐ UNCONTROLLED	☐ UNCONTROLLED	☐ UNCONTROLLED	☐ CIRCULATING
☐ DRY BED	☐ CONTROLLED	☐ CONTROLLED	☐ FLYASH REINJECTION	☐ RECIRCULATING
			☐ NO FLYASH REINJECTION	

OIL/GAS-FIRED BURNER

TYPE OF BOILER: ☐ UTILITY ☑ INDUSTRIAL ☐ COMMERCIAL ☐ INSTITUTIONAL
TYPE OF FIRING: ☑ NORMAL ☐ TANGENTIAL ☐ LOW NOX BURNERS ☐ NO LOW NOX BURNER

OTHER FUEL-FIRED BURNER

TYPE(S) OF FUEL: _____
TYPE OF BOILER: ☐ UTILITY ☐ INDUSTRIAL ☐ COMMERCIAL ☐ INSTITUTIONAL
TYPE OF FIRING: _____ TYPE(S) OF CONTROL(S) (IF ANY): _____

FUEL USAGE (INCLUDE STARTUP/BACKUP FUELS)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Propane/NG/ #2/ Rec #2/ Re	**cf/gallons**	**80 MMBtu/hr**	

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	SPECIFIC BTU CONTENT	SULFUR CONTENT (% BY WEIGHT)	ASH CONTENT (% BY WEIGHT)

COMMENT

Attach Additional Sheets As Necessary

FORM B6
EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B6**

EMISSION SOURCE DESCRIPTION: **Hot Mix Aspahlt Storage Silo (150-ton)**	EMISSION SOURCE ID NO: **HMA-Silo1**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT(STACK) ID NO(S): **HMASILO1**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Filling, Storage, and loadout of Hot Mix Asphalt Storage Silo (150-Ton)

MATERIAL STORED: **Hot Mix Asphalt**				DENSITY OF MATERIAL (LB/FT3):	
CAPACITY	CUBIC FEET:			TONS: **150**	
DIMENSIONS (FEET)	HEIGHT: **65**	DIAMETER: **12**	***(OR)***	LENGTH: WIDTH:	HEIGHT:
NNUAL PRODUCT THROUGHPUT (TONS	ACTUAL:			MAXIMUM DESIGN CAPACITY: **150**	

PNEUMATICALLY FILLED	MECHANICALLY FILLED	FILLED FROM
☐ BLOWER	☐ SCREW CONVEYOR	☐ RAILCAR
☐ COMPRESSOR	☐ BELT CONVEYOR	☐ TRUCK
☐ OTHER:	☑ BUCKET ELEVATOR	☐ STORAGE PILE
	☐ OTHER:	☑ OTHER: **Plant**

NO. FILL TUBES:	
MAXIMUM ACFM:	

MATERIAL IS UNLOADED TO:

Over the road Truck

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?

Gravity via Hydraulic Clam Hatch

MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): **220**

MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): **132**

COMMENTS:

Oil filled Seal at top of Silo

Attach Additional Sheets As Necessary

FORM B6
EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B6**

EMISSION SOURCE DESCRIPTION: **Hot Mix Aspahlt Storage Silo (150-ton)**	EMISSION SOURCE ID NO: **HMA-Silo2**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT(STACK) ID NO(S): **HMASILO2**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Filling, Storage, and loadout of Hot Mix Asphalt Storage Silo (150-Ton)

MATERIAL STORED: **Hot Mix Asphalt**			DENSITY OF MATERIAL (LB/FT3):	
CAPACITY	CUBIC FEET:		TONS: **150**	
DIMENSIONS (FEET)	HEIGHT: **65**	DIAMETER: **12** ***(OR)***	LENGTH:	WIDTH: HEIGHT:
NNUAL PRODUCT THROUGHPUT (TONS	ACTUAL:		MAXIMUM DESIGN CAPACITY: **150**	

PNEUMATICALLY FILLED	MECHANICALLY FILLED	FILLED FROM
☐ BLOWER	☐ SCREW CONVEYOR	☐ RAILCAR
☐ COMPRESSOR	☐ BELT CONVEYOR	☐ TRUCK
☐ OTHER:	☑ BUCKET ELEVATOR	☐ STORAGE PILE
	☐ OTHER:	☑ OTHER: **Plant**

NO. FILL TUBES:	
MAXIMUM ACFM:	

MATERIAL IS UNLOADED TO:

Over the road Truck

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?

Gravity via Hydraulic Clam Hatch

MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): **220**

MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): **132**

COMMENTS:

Oil filled Seal at top of Silo

Attach Additional Sheets As Necessary

FORM B6
EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B6**

EMISSION SOURCE DESCRIPTION: **Hot Mix Aspahlt Storage Silo (200-ton)**	EMISSION SOURCE ID NO: **HMA-Silo3**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT(STACK) ID NO(S): **HMASILO3**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Filling, Storage, and loadout of Hot Mix Asphalt Storage Silo (200-Ton

MATERIAL STORED: **Hot Mix Asphalt**			DENSITY OF MATERIAL (LB/FT3):	
CAPACITY	CUBIC FEET:		TONS: 200	
DIMENSIONS (FEET)	HEIGHT: **65**	DIAMETER: **14** ***(OR)***	LENGTH: WIDTH: HEIGHT:	
NNUAL PRODUCT THROUGHPUT (TONS	ACTUAL:		MAXIMUM DESIGN CAPACITY: **200**	

PNEUMATICALLY FILLED	MECHANICALLY FILLED	FILLED FROM
☐ BLOWER	☐ SCREW CONVEYOR	☐ RAILCAR
☐ COMPRESSOR	☐ BELT CONVEYOR	☐ TRUCK
☐ OTHER:	☑ BUCKET ELEVATOR	☐ STORAGE PILE
	☐ OTHER:	☑ OTHER: **Plant**

NO. FILL TUBES:	
MAXIMUM ACFM:	

MATERIAL IS UNLOADED TO:

Over the road Truck

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?

Gravity via Hydraulic Clam Hatch

MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): **220**

MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): **200**

COMMENTS:

Oil filled Seal at top of Silo

198

9.0909

Attach Additional Sheets As Necessary

FORM B6
EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B6**

EMISSION SOURCE DESCRIPTION: **Hot Mix Aspahlt Storage Silo (200-ton)**	EMISSION SOURCE ID NO: **HMA-Silo4**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT(STACK) ID NO(S): **HMASILO4**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Filling, Storage, and loadout of Hot Mix Asphalt Storage Silo (200-Ton

MATERIAL STORED: **Hot Mix Asphalt**			DENSITY OF MATERIAL (LB/FT3):	
CAPACITY	CUBIC FEET:		TONS: 200	
DIMENSIONS (FEET)	HEIGHT: **65**	DIAMETER: **14** ***(OR)***	LENGTH: WIDTH: HEIGHT:	
NNUAL PRODUCT THROUGHPUT (TON	ACTUAL:		MAXIMUM DESIGN CAPACITY: **200**	

PNEUMATICALLY FILLED	MECHANICALLY FILLED	FILLED FROM
☐ BLOWER	☐ SCREW CONVEYOR	☐ RAILCAR
☐ COMPRESSOR	☐ BELT CONVEYOR	☐ TRUCK
☐ OTHER:	☑ BUCKET ELEVATOR	☐ STORAGE PILE
	☐ OTHER:	☑ OTHER: **Plant**

NO. FILL TUBES:	
MAXIMUM ACFM:	

MATERIAL IS UNLOADED TO:
Over the road Truck

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?
Gravity via Hydraulic Clam Hatch

MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): **220**

MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): **200**

COMMENTS:
Oil filled Seal at top of Silo

Attach Additional Sheets As Necessary

198

9.0909

FORM B6
EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B6**

EMISSION SOURCE DESCRIPTION: **Hot Mix Aspahlt Storage Silo (200-ton)**	EMISSION SOURCE ID NO: **HMA-Silo5**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT(STACK) ID NO(S): **HMASILO5**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Filling, Storage, and loadout of Hot Mix Asphalt Storage Silo (200-Ton)

MATERIAL STORED: **Hot Mix Asphalt**				DENSITY OF MATERIAL (LB/FT3):	
CAPACITY	CUBIC FEET:			TONS: 200	
DIMENSIONS (FEET)	HEIGHT: **65**	DIAMETER: **14**	***(OR)***	LENGTH: WIDTH: HEIGHT:	
NNUAL PRODUCT THROUGHPUT (TONS	ACTUAL:			MAXIMUM DESIGN CAPACITY: **200**	

PNEUMATICALLY FILLED	MECHANICALLY FILLED	FILLED FROM
☐ BLOWER	☐ SCREW CONVEYOR	☐ RAILCAR
☐ COMPRESSOR	☐ BELT CONVEYOR	☐ TRUCK
☐ OTHER:	☑ BUCKET ELEVATOR	☐ STORAGE PILE
	☐ OTHER:	☑ OTHER: **Plant**

NO. FILL TUBES:	
MAXIMUM ACFM:	

MATERIAL IS UNLOADED TO:

Over the road Truck

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?

Gravity via Hydraulic Clam Hatch

MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): **220**

MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): **200**

COMMENTS:

Oil filled Seal at top of Silo

Attach Additional Sheets As Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **C1**

CONTROL DEVICE ID NO: **HMA-CD1**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **See Form A2**
EMISSION POINT (STACK) ID NO **EP-1**	POSITION IN SERIES OF CONTROLS NO. **1** OF **1** UNITS
OPERATING SCENARIO:	
	P.E. SEAL REQUIRED (PER 2q .011) ☐ YES ☑ NO

DESCRIBE CONTROL SYSTEM: **Astec Model RBH-45 - 45,000 CFM to control emissions from drying and mixing drums**

POLLUTANTS COLLECTED:	**PM**	**PM10**		
BEFORE CONTROL EMISSION RATE (LB/HR):	**See Appendix A3**			
CAPTURE EFFICIENCY:	**99.99** %	**99.99** %	%	%
CONTROL DEVICE EFFICIENCY:	**90** %	**90** %	%	%
CORRESPONDING OVERALL EFFICIENCY:	**93** %	**90** %	%	%
EFFICIENCY DETERMINATION CODE:	**1**	**1**		
TOTAL AFTER CONTROL EMISSION RATE (LB/H	**See Appendix A3**			

PRESSURE DROP (IN H_2O): MIN: MAX: GAUGE? ☑ YES ☐ NO		
BULK PARTICLE DENSITY (LB/FT^3):	INLET TEMPERATURE MIN	MAX
POLLUTANT LOADING RATE: ☐ LB/HR ☐ GR/FT^3	OUTLET TEMPERATUR MIN	MAX
INLET AIR FLOW RATE (ACFM): **45,000 cfm**	FILTER OPERATING TEMP (^{o}f):	

NO. OF COMPARTMENTS: **1**	NO. OF BAGS PER COMPARTMENT: **640**	LENGTH OF BAG (IN.): **120.5**
NO. OF CARTRIDGES: **640**	FILTER SURFACE AREA PER CARTRIDGE (FT^2):	DIAMETER OF BAG (IN.): **4 5/8**
TOTAL FILTER SURFACE AREA (FT^2): **7,778**	AIR TO CLOTH RATIO: **5.78:1**	
DRAFT TYPE: ☑ INDUCED/NEGATIVE ☐ FORCED/POSITIVE	FILTER MATERIAL: ☐ WOVEN ☑ FELTED	

DESCRIBE CLEANING PROCED

- ☐ AIR PULSE
- ☑ REVERSE FLOW
- ☐ MECHANICAL/SHAKER
- ☐ OTHER:
- ☐ SONIC
- ☐ SIMPLE BAG COLLAPSE
- ☐ RING BAG COLLAPSE

DESCRIBE INCOMING AIR STREAM: **Hot Air from Drying and Mixing Drums in HMA Plant**

PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	**40**	**40.2**
1-10	**60**	**100**
10-25		
25-50		
50-100		
>100		
	TOTAL = 100	

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: **RAP Crushing System**	EMISSION SOURCE ID NO: **RAP-CR1, RAP-SC1, RAP-C1 thr**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **NA**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

1. Recycle Asphalt Crushing consisting of one (1) 65 TPH crusher, one (1) 8'X20' double deck scene, and six (6) 36" conveyor Belts.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form B	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☑ Other (Form B9)

START CONSTRUCTION DATE: DATE MANUFACTURED:

MANUFACTURER / MODEL NO.: **Telsmith HIS 2421** EXPECTED OP. SCHEDULE: **12** HR/DAY **6** DAY/WK **50** WK/

IS THIS SOURCE SUBJEC ☑ NSPS (SUBPARTS?): **OOO** ☐ NESHAP (SUBPARTS?):

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **15** MAR-MAY **30** JUN-AUG **30** SEP-NOV **25**

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See DEQ Emission Spreadsheet Appendix A3**						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
		See DEQ Emission Spreadsheet Appendix A3						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS lb/hr	lb/day	lb/yr
		See DEQ Emission Spreadsheet Appendix A3			

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOU

Attach Additional Sheets As Necessary

FORM B9
EMISSION SOURCE (OTHER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operat** **B9**

EMISSION SOURCE DESCRIPTION: **RAP Crushing System**	EMISSION SOURCE ID NO: **RAP-CR1, RAP-SC1, RAP-C1 thru C-6**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: _____ OF _____	EMISSION POINT (STACK) ID NO(S): **NA**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

1. Recycle Asphalt Crushing consisting of one (1) 65 TPH crusher, one (1) 8'X20' double deck scene, and six (6) 36" conveyor Belts.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
RAP	**tons**	**65**	

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH	LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED:	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):
MAX. CAPACITY HOURLY FUEL USE:	REQUESTED CAPACITY ANNUAL FUEL USE:

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22/ **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: **Truck Mix Concrete Batch Plant (120 cubic yards per hour)**	EMISSION SOURCE ID NO: **RMC-Silo1, RMC-Silo2, RMC-LO1, RMC-WB2**
	CONTROL DEVICE ID NO(S): **RMC-CD2**
OPERATING SCENARIO **1** OF **1**	EMISSION POINT (STACK) ID NO(S): **RMC-CD2**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Truck Mix Concrete Batch Plant (120 cubic yards per hour) Consiting of: One (1) 200-ton Cement Silo, One (1) 150-ton Flyash Silo, Truck Loadout point, 5-ton Cement/Flyash Weight Batcher, and One (1) 20-ton Aggregate Weight Batcher.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☐ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☑ Storage silos/bins (Form B6)	☑ Other (Form B9)

START CONSTRUCTION DATE:	DATE MANUFACTURED:
MANUFACTURER / MODEL NO.:	EXPECTED OP. SCHEDULE: **12** HR/DAY **6** DAY/WK **50** WK/YR
IS THIS SOURCE SUBJEC ☑ NSPS (SUBPARTS?):	☐ NESHAP (SUBPARTS?):
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **15**	MAR-MAY **30** JUN-AUG **30** SEP-NOV **25**

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See DEQ Emission Spreadsheet Appendix A4**						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
		See DEQ Emission Spreadsheet Appendix A4						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS lb/hr	lb/day	lb/yr
		See DEQ Emission Spreadsheet Appendix A4			

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

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

Attach Additional Sheets As Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **C1**

CONTROL DEVICE ID NO: **RMC-CD2**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **See Form A2**
EMISSION POINT (STACK) ID NO **EP-2**	POSITION IN SERIES OF CONTROLS NO. **1** OF **1** UNITS
OPERATING SCENARIO:	
	P.E. SEAL REQUIRED (PER 2q .011 ☐ YES ☑ NO

DESCRIBE CONTROL SYSTEM: **C&W Manufacturing - RA-140 - 6500 CFM to control emissions from cement/fly ash silos and aggregate and truck loading.**

POLLUTANTS COLLECTED:	**PM**	**PM10**		
BEFORE CONTROL EMISSION RATE (LB/HR)	**See Appendix A4**			
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	**99.9** %	**99.9** %	%	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (L	**See Appendix A4**			

PRESSURE DROP (IN H_2O): MIN: M/ GAUGE? ☑ YES ☐ NO		
BULK PARTICLE DENSITY (LB/FT^3):	INLET TEMPERATURE (MIN MAX	
POLLUTANT LOADING RATE: ☐ LB/HR ☐ GR/FT^3	OUTLET TEMPERATUR MIN MAX	
INLET AIR FLOW RATE (ACFM): **6,500 cfm**	FILTER OPERATING TEMP (°f): **Ambient**	
NO. OF COMPARTMENTS: **2**	NO. OF BAGS PER COMPARTMENT: **36**	LENGTH OF BAG (IN.): **114**
NO. OF CARTRIDGES: **72**	FILTER SURFACE AREA PER CARTRIDGE (FT^2):	DIAMETER OF BAG (IN.): **4**
TOTAL FILTER SURFACE AREA (FT^2): **1,43**	AIR TO CLOTH RATIO: **4.54:1**	
DRAFT TYPE: ☑ INDUCED/NEGATIVE ☐ FORCED/POSITIVE	FILTER MATERIAL: ☐ WOVEN ☑ FELTED	

DESCRIBE CLEANING PROCED

☐ AIR PULSE ☐ SONIC
☑ REVERSE FLOW ☐ SIMPLE BAG COLLAPSE
☐ MECHANICAL/SHAKER ☐ RING BAG COLLAPSE
☐ OTHER:

PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	**40**	**40.2**
1-10	**60**	**100**
10-25		
25-50		
50-100		
>100		
	TOTAL = 100	

DESCRIBE INCOMING AIR STREAM: **Hot Air from Drying and Mixing Drums in HMA Plant**

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOU

COMMENTS:

Attach Additional Sheets As Necessary

FORM B6
EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B6**

EMISSION SOURCE DESCRIPTION:	EMISSION SOURCE ID NO: **RMC-Silo1**
Ready Mix Cement Storage Silo (200-ton)	CONTROL DEVICE ID NO(S): **RMC-CD2**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT(STACK) ID NO(S): **RMC-CD2**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Filling, Storage, and loadout of Cement Storage Silo (200-Ton)

MATERIAL STORED: **Cement**				DENSITY OF MATERIAL (LB/FT3):	
CAPACITY	CUBIC FEET:			TONS: **200**	
DIMENSIONS (FEET)	HEIGHT: **80**	DIAMETER: **12**	***(OR)***	LENGTH:	WIDTH: HEIGHT:
NNUAL PRODUCT THROUGHPUT (TONS	ACTUAL:			MAXIMUM DESIGN CAPACITY: **200**	

PNEUMATICALLY FILLED	MECHANICALLY FILLED	FILLED FROM
☑ BLOWER	☐ SCREW CONVEYOR	☐ RAILCAR
☐ COMPRESSOR	☐ BELT CONVEYOR	☑ TRUCK
☐ OTHER:	☐ BUCKET ELEVATOR	☐ STORAGE PILE
	☐ OTHER:	☐ OTHER: **Plant**

NO. FILL TUBES: **1**

MAXIMUM ACFM: **25**

MATERIAL IS UNLOADED TO:

Cement and Fly Ash Weight Batcher

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?

Gravity

MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): **40**

MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): **5**

COMMENTS:

Attach Additional Sheets As Necessary

FORM B6
EMISSION SOURCE (STORAGE SILO/BINS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B6**

EMISSION SOURCE DESCRIPTION: **Ready Mix Cement Storage Silo (150-ton**	EMISSION SOURCE ID NO: **RMC-Silo2**
	CONTROL DEVICE ID NO(S): **RMC-CD2**
OPERATING SCENARIO: 1 OF 1	EMISSION POINT(STACK) ID NO(S): **RMC-CD2**

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Filling, Storage, and loadout of Fly Ash Storage Silo (150-Ton)

MATERIAL STORED: **Fly ash**				DENSITY OF MATERIAL (LB/FT3):	
CAPACITY	CUBIC FEET:			TONS: **150**	
DIMENSIONS (FEET)	HEIGHT: **65**	DIAMETER: **12**	***(OR)***	LENGTH:	WIDTH: HEIGHT:
NNUAL PRODUCT THROUGHPUT (TONS	ACTUAL:			MAXIMUM DESIGN CAPACITY: **200**	

PNEUMATICALLY FILLED	MECHANICALLY FILLED	FILLED FROM
☑ BLOWER	☐ SCREW CONVEYOR	☐ RAILCAR
☐ COMPRESSOR	☐ BELT CONVEYOR	☑ TRUCK
☐ OTHER:	☐ BUCKET ELEVATOR	☐ STORAGE PILE
	☐ OTHER:	☐ OTHER: **Plant**

NO. FILL TUBES: **1**

MAXIMUM ACFM: **25**

MATERIAL IS UNLOADED TO:

Cement and Fly Ash Weight Batcher

BY WHAT METHOD IS MATERIAL UNLOADED FROM SILO?

Screw Conveyor

MAXIMUM DESIGN FILLING RATE OF MATERIAL (TONS/HR): **50**

MAXIMUM DESIGN UNLOADING RATE OF MATERIAL (TONS/HR): **5**

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: **1500 TPH Quarry Operation**	EMISSION SOURCE ID NO: **See Equipment List and Flow Dia**
	CONTROL DEVICE ID NO(S):
OPERATING SCENARIO **1** OF **1**	EMISSION POINT (STACK) ID NO(S):

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):

Quarry Operations: 1500 TPH Primary Crusher, Secondary Crushing, Aggregate Screening/Washing, and Aggregate Conveyance. See Equipment List and Flow Diagram for details in Appendix D.

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Form B7)
☑ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Forn	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☑ Other (Form B9)

START CONSTRUCTION DATE:	DATE MANUFACTURED:
MANUFACTURER / MODEL NO.:	EXPECTED OP. SCHEDULE: **12** HR/DAY **6** DAY/WK **52** WK
IS THIS SOURCE SUBJEC ☐ NSPS (SUBPARTS?): **OOO** ☐ NESHAP (SUBPARTS?):	
PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25** MAR-MAY **25** JUN-AUG **25** SEP-NOV **25**	

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
PARTICULATE MATTER (PM)	**See DEQ Quarry Spreadsheet, Appendix A5**						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS) tons/yr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr
		See DEQ Quarry Spreadsheet, Appendix A5						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS lb/hr	lb/day	lb/yr
		See Appendix A			

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

MPLETE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH SOU

Attach Additional Sheets As Necessary

FORM B9
EMISSION SOURCE (OTHER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operat** **B9**

EMISSION SOURCE DESCRIPTION: **1500 TPH Quarry Operation**	EMISSION SOURCE ID NO: **See Equipment List and Flow Diagra**
	CONTROL DEVICE ID NO(S):
OPERATING SCENARIO: OF	EMISSION POINT (STACK) ID NO(S):

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Quarry Operations: 1500 TPH Primary Crusher, Secondary Crushing, Aggregate Screening/Washing, and Aggregate Conveyance. See Equipment List and Flow Diagram for details in Appendix D.

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)
Stone/Rock/Aggregate/Fines	**tons**	**1500**	**7,117,500 tons/yr**

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH	LIMITATION (UNIT/BATCH)

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED:	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):
MAX. CAPACITY HOURLY FUEL USE:	REQUESTED CAPACITY ANNUAL FUEL USE:

COMMENTS:

Attach Additional Sheets as Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: **2016 McCloskey J50V2 Track Jaw Crusher**	EMISSION SOURCE ID NO: **GEN-1 (J50V2)**
	CONTROL DEVICE ID NO(S): **N/A**
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S):

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
2016 McCoskey J50V2 Track Mounted Jaw Crusher 350HP engine

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Forr
☑ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Forn	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE:	DATE MANUFACTURED: **2016**
MANUFACTURER / MODEL NO.:	EXPECTED OP. SCHEDULE: 12 HR/DAY 6 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJEC ☐ NSPS (SUBPARTS?):	☐ NESHAP (SUBPARTS?):

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25** MAR-MAY **25** JUN-AUG **25** SEP

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
PARTICULATE MATTER (PM)	**See Combustion Calculations Appendix A2**						
PARTICULATE MATTER<10 MICRONS (PM_{10})							
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
		See Combustion Calculations Appendix A2						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION	XPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATION lb/hr	lb/day	lb/yr
		See Combustion Calculations Appendix A2			

Attachments: (1) emissions calculations and supporting documentation, (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

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

Attach Additional Sheets As Necessary

FORM B2

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B2**

EMISSION SOURCE DESCRIPTION: **2016 McCloskey J50V2 Track Jaw Crusher**	EMISSION SOURCE ID NO: **GEN-1 (J50V2)**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: _____ OF _____	EMISSION POINT (STACK) ID NO(S): **GEN1**

ENGINE SERVICE (CHECK ALL THAT APPL) ☐ EMERGENCY ☐ PEAK SHAVER ☐ SPACE HEAT ☑ OTHER (DESCRIBE): Engine to run Quarry Equipment ☐ ELECTRICAL GENERATION

GENERATOR OUTPUT (KW):	ANTICIPATED ACTUAL HOURS OF OPERATION (HRS/YR): **3744**
ENGINE OUTPUT (HP):	

TYPE ICE: ☐ GASOLINE ENGINE ☑ DIESEL ENGINE UP TO 600 ☐ DIESEL ENGINE GREATER THAN 6 ☐ DUAL FUEL ENGI
☐ OTHER (DESCRIBE): _____ (complete below)

ENGINE TYPE ☐ RICH BURN ☐ LEAN BURN

EMISSION REDUCTION MODIFICA ☐ INJECTION TIMING RETAR ☐ PREIGNITION CHAMBER COMBUS ☐ OTHER _____

OR ☐ STATIONARY GAS TURBINE (complete bel ☐ NATURAL GAS PIPELINE COMPRESSOR OR TURBINE (complete below)

FUEL ☐ NATURAL GAS ☐ OIL ☐ OTHER (DESCRIBE): _____

CYCLE: ☐ COGENERATIO ☐ SIMPLE ☐ REGENERATIVE ☐ COMBINED

CONTROLS: ☐ WATER-STEAM INJECTIO ☐ UNCONTROLLED ☐ LEAN-PREMIX ☐ OTHER (SPECIFY): _____

ENGINE TYP ☐ 2-CYCLE LEAN BURN ☐ 4-CYCLE LEAN ☐ TURBINE ☐ 4-CYCLE RICH BURN ☐ OTHER (DESCRIBE): _____

CONTROLS: ☐ COMBUSTION MODIFICATIONS (DESCRIBE): _____ ☐ NONSELECTIVE CATALYTIC REDUC ☐ SELECTIVE CATALYTIC REDUCTIO ☐ CLEAN BURN AND PRECOMBUSTION C ☐ UNCONTROLLED

FUEL USAGE (INCLUDE STARTUP/BACKUP FUEL)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Diesel/No. 2 Fuel Oil	**Btu**		

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	BTU/UNIT	UNITS	SULFUR CONTENT (% BY WEIGHT)
Diesel/No. 2 Fuel Oil	**0.138**	**MMBtu/gal**	**0.0015%**

MANUFACTURER'S SPECIFIC EMISSION FACTORS (IF AVAILABLE)

POLLUTANT	NOX	CO	PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT						
UNIT						

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22. **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: **2015 McCloskey J45 Track Jaw Crusher.**	EMISSION SOURCE ID NO: **GEN-1a (J45)**
	CONTROL DEVICE ID NO(S): **N/A**
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): **GEN1a**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
2015 McCoskey J45 Track Mounted Jaw Crusher 350HP engine

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Forr
☑ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Forn	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE:	DATE MANUFACTURED: **2015**
MANUFACTURER / MODEL NO.:	EXPECTED OP. SCHEDULE: 12 HR/DAY 6 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJEC ☐ NSPS (SUBPARTS?):	☐ NESHAP (SUBPARTS?):

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

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED 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)							
PARTICULATE MATTER<10 MICRONS (PM_{10})	**See Combustion Calculations Appendix A2**						
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED 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
		See Combustion Calculations Appendix A2						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	OF EMISSION FACTOR	XPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATION		
			lb/hr	lb/day	lb/yr
		See Combustion Calculations Appendix A2			

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

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

Attach Additional Sheets As Necessary

FORM B2

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B2**

EMISSION SOURCE DESCRIPTION: **2015 McCloskey J45 Track Jaw Crusher**	EMISSION SOURCE ID NO: **GEN-1a (J45)**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: _____ OF _____	EMISSION POINT (STACK) ID NO(S): **GEN1a**
ENGINE SERVICE ☐ EMERGENCY ☐ SPACE HEAT ☐ ELECTRICAL GENERATION	
(CHECK ALL THAT APP ☐ PEAK SHAVER ☑ OTHER (DESCRIBE): Engine to run Quarry Equipment	
GENERATOR OUTPUT (KW):	ANTICIPATED ACTUAL HOURS OF OPERATION (HRS/YR): **3744**
ENGINE OUTPUT (HP): **350**	
TYPE ICE: ☐ GASOLINE ENGINE ☑ DIESEL ENGINE UP TO 600 ☐ DIESEL ENGINE GREATER THAN 6 ☐ DUAL FUEL ENGI	
☐ OTHER (DESCRIBE): _____ (complete below)	
ENGINE TYPE ☐ RICH BURN ☐ LEAN BURN	
EMISSION REDUCTION MODIFICA ☐ INJECTION TIMING RETARI ☐ PREIGNITION CHAMBER COMBUS ☐ OTHER _____	
OR ☐ STATIONARY GAS TURBINE (complete bel ☐ NATURAL GAS PIPELINE COMPRESSOR OR TURBINE (complete below)	

FUEL ☐ NATURAL GAS ☐ OIL	**ENGINE TYP** ☐ 2-CYCLE LEAN BURN ☐ 4-CYCLE LEAN ☐ TURBINE
☐ OTHER (DESCRIBE): _____	☐ 4-CYCLE RICH BURN ☐ OTHER (DESCRIBE): _____
CYCLE: ☐ COGENERATIOI ☐ SIMPLE	**CONTROLS:** ☐ COMBUSTION MODIFICATIONS (DESCRIBE): _____
☐ REGENERATIVE ☐ COMBINED	☐ NONSELECTIVE CATALYTIC REDUC ☐ SELECTIVE CATALYTIC REDUCTIO
CONTROLS: ☐ WATER-STEAM INJECTIOI	☐ CLEAN BURN AND PRECOMBUSTION C ☐ UNCONTROLLED
☐ UNCONTROLLED ☐ LEAN-PREMIX	
☐ OTHER (SPECIFY): _____	

FUEL USAGE (INCLUDE STARTUP/BACKUP FUEL)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Diesel/No. 2 Fuel Oil	**Btu**		

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	BTU/UNIT	UNITS	SULFUR CONTENT (% BY WEIGHT)
Diesel/No. 2 Fuel Oil	**0.138**	**MMBtu/gal**	**0.0015%**

MANUFACTURER'S SPECIFIC EMISSION FACTORS (IF AVAILABLE)

POLLUTANT	NOX	CO	PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT						
UNIT						

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: **2016 McCloskey S190DT 2-deck 20'X5' Track Screen**	EMISSION SOURCE ID NO: **GEN-2 (S190dt)**
OPERATING SCENARIO _____ OF _____	CONTROL DEVICE ID NO(S):
	EMISSION POINT (STACK) ID NO(S):

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
2016 McCloskey S190DT 2-deck 20'X5' Track Mounted Screen

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Forr
☑ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE:	DATE MANUFACTURED: **2016**
MANUFACTURER / MODEL NO.:	EXPECTED OP. SCHEDULE: **12** HR/DAY **6** DAY/WK **52** WK/YR
IS THIS SOURCE SUBJEC ☐ NSPS (SUBPARTS?):	☐ NESHAP (SUBPARTS?):

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25** MAR-MAY **25** JUN-AUG **25** SEP

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
PARTICULATE MATTER (PM)							
PARTICULATE MATTER<10 MICRONS (PM_{10})	**See Combustion Calculations Appendix A2**						
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
		See Combustion Calculations Appendix A2						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION	XPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATION lb/hr	lb/day	lb/yr
		See Combustion Calculations Appendix A2			

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

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

Attach Additional Sheets As Necessary

FORM B2

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B2**

EMISSION SOURCE DESCRIPTION: **2016 McCloskey S190DT 2-deck 20'X5' Track Screen**	EMISSION SOURCE ID NO: **GEN-2 (S190dt)**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: _____ OF _____	EMISSION POINT (STACK) ID NO(S): **GEN2**

ENGINE SERVICE (CHECK ALL THAT APPL) ☐ EMERGENCY ☐ PEAK SHAVER ☐ SPACE HEAT ☑ OTHER (DESCRIBE): Engine to run Quarry Equipment ☐ ELECTRICAL GENERATION

GENERATOR OUTPUT (KW): | ANTICIPATED ACTUAL HOURS OF OPERATION (HRS/YR): **3744**

ENGINE OUTPUT (HP): **125**

TYPE ICE: ☐ GASOLINE ENGINE ☑ DIESEL ENGINE UP TO 600 ☐ DIESEL ENGINE GREATER THAN 6 ☐ DUAL FUEL ENGI ☐ OTHER (DESCRIBE): _____ (complete below)

ENGINE TYPE ☐ RICH BURN ☐ LEAN BURN

EMISSION REDUCTION MODIFICA ☐ INJECTION TIMING RETARI ☐ PREIGNITION CHAMBER COMBUS ☐ OTHER _____

OR ☐ STATIONARY GAS TURBINE (complete bel ☐ NATURAL GAS PIPELINE COMPRESSOR OR TURBINE (complete below)

FUEL: ☐ NATURAL GAS ☐ OIL ☐ OTHER (DESCRIBE): _____

CYCLE: ☐ COGENERATIOI ☐ SIMPLE ☐ REGENERATIVE ☐ COMBINED

CONTROLS: ☐ WATER-STEAM INJECTIOI ☐ UNCONTROLLED ☐ LEAN-PREMIX ☐ OTHER (SPECIFY): _____

ENGINE TYPI ☐ 2-CYCLE LEAN BURN ☐ 4-CYCLE LEAN ☐ TURBINE ☐ 4-CYCLE RICH BURN ☐ OTHER (DESCRIBE): _____

CONTROLS: ☐ COMBUSTION MODIFICATIONS (DESCRIBE): _____ ☐ NONSELECTIVE CATALYTIC REDUC ☐ SELECTIVE CATALYTIC REDUCTIO ☐ CLEAN BURN AND PRECOMBUSTION C ☐ UNCONTROLLED

FUEL USAGE (INCLUDE STARTUP/BACKUP FUEL)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Diesel/No. 2 Fuel Oil	**Btu**		

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	BTU/UNIT	UNITS	SULFUR CONTENT (% BY WEIGHT)
Diesel/No. 2 Fuel Oil	**0.138**	**MMBtu/gal**	**0.0015%**

MANUFACTURER'S SPECIFIC EMISSION FACTORS (IF AVAILABLE)

POLLUTANT	NOX	CO	PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT						
UNIT						

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: **2006 Powerscreen 1300 Maxtrak Cone Crusher**	EMISSION SOURCE ID NO: **GEN-3 (PS1300MaxTrak)**
	CONTROL DEVICE ID NO(S):
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S):

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
2006 Powerscreen 1300 Maxtrak track mounted Cone Crusher

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Forn
☑ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE:	DATE MANUFACTURED: **2006**
MANUFACTURER / MODEL NO.:	EXPECTED OP. SCHEDULE: **12** HR/DAY **6** DAY/WK **52** WK/YR
IS THIS SOURCE SUBJECT TO? ☐ NSPS (SUBPARTS?):	☐ NESHAP (SUBPARTS?):

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25** MAR-MAY **25** JUN-AUG **25** SEP-N

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
PARTICULATE MATTER (PM)							
PARTICULATE MATTER<10 MICRONS (PM_{10})	**See Combustion Calculations Appendix A2**						
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
		See Combustion Calculations Appendix A2						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION	XPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATION lb/hr	lb/day	lb/yr
		See Combustion Calculations Appendix A2			

Attachments: (1) emissions calculations and supporting documentation, (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

:TE THIS FORM AND COMPLETE AND ATTACH APPROPRIATE B1 THROUGH B9 FORM FOR EACH

Attach Additional Sheets As Necessary

FORM B2

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B2**

EMISSION SOURCE DESCRIPTION: **2006 Powerscreen 1300 Maxtrak Cone Crusher**	EMISSION SOURCE ID NO: **GEN-3 (PS1300 Maxtra**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: _____ OF _____	EMISSION POINT (STACK) ID NO(S): **GEN3**

ENGINE SERVICE ☐ EMERGENCY ☐ SPACE HEAT ☐ ELECTRICAL GENERATION
(CHECK ALL THAT APP ☐ PEAK SHAVER ☑ OTHER (DESCRIBE): Engine to run Quarry Equipment

GENERATOR OUTPUT (KW):	ANTICIPATED ACTUAL HOURS OF OPERATION (HRS/YR): **3744**
ENGINE OUTPUT (HP): **440**	

TYPE ICE: ☐ GASOLINE ENGINE ☑ DIESEL ENGINE UP TO 600 ☐ DIESEL ENGINE GREATER THAN 6 ☐ DUAL FUEL ENGI
☐ OTHER (DESCRIBE): (complete below)

ENGINE TYPE ☐ RICH BURN ☐ LEAN BURN
EMISSION REDUCTION MODIFICA ☐ INJECTION TIMING RETARI ☐ PREIGNITION CHAMBER COMBUS ☐ OTHER

OR ☐ STATIONARY GAS TURBINE (complete bel ☐ NATURAL GAS PIPELINE COMPRESSOR OR TURBINE (complete below)

FUEL ☐ NATURAL GAS ☐ OIL
☐ OTHER (DESCRIBE):
CYCLE: ☐ COGENERATIOI ☐ SIMPLE
☐ REGENERATIVE ☐ COMBINED
CONTROLS: ☐ WATER-STEAM INJECTIOI
☐ UNCONTROLLED ☐ LEAN-PREMIX
☐ OTHER (SPECIFY):

ENGINE TYP ☐ 2-CYCLE LEAN BURN ☐ 4-CYCLE LEAN ☐ TURBINE
☐ 4-CYCLE RICH BURN ☐ OTHER (DESCRIBE):
CONTROLS: ☐ COMBUSTION MODIFICATIONS (DESCRIBE):
☐ NONSELECTIVE CATALYTIC REDUC ☐ SELECTIVE CATALYTIC REDUCTIO
☐ CLEAN BURN AND PRECOMBUSTION C ☐ UNCONTROLLED

FUEL USAGE (INCLUDE STARTUP/BACKUP FUEL)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Diesel/No. 2 Fuel Oil	**Btu**		

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	BTU/UNIT	UNITS	SULFUR CONTENT (% BY WEIGHT)
Diesel/No. 2 Fuel Oil	**0.138**	**MMBtu/gal**	**0.0015%**

MANUFACTURER'S SPECIFIC EMISSION FACTORS (IF AVAILABLE)

POLLUTANT	NOX	CO	PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT						
UNIT						

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22. **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: 2016 McCloskey TF80 Track stockpiling ConveyorScreen	EMISSION SOURCE ID NO: GEN-4 (TF80)
	CONTROL DEVICE ID NO(S):
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S):

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
2016 McCloskey TF80 Track Mounted stockpiling ConveyorScreen

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Forn
☑ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE:	DATE MANUFACTURED: 2016
MANUFACTURER / MODEL NO.:	EXPECTED OP. SCHEDULE: 12 HR/DAY 6 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJEC ☐ NSPS (SUBPARTS?):	☐ NESHAP (SUBPARTS?):

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

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
PARTICULATE MATTER (PM)							
PARTICULATE MATTER<10 MICRONS (PM_{10})	**See Combustion Calculations Appendix A2**						
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
		See Combustion Calculations Appendix A2						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION	XPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATION lb/hr	lb/day	lb/yr
		See Combustion Calculations Appendix A2			

Attachments: (1) emissions calculations and supporting documentation, (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

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

Attach Additional Sheets As Necessary

FORM B2

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B2**

EMISSION SOURCE DESCRIPTION: **2016 McCloskey TF80 Track stockpiling ConveyorScreen**	EMISSION SOURCE ID NO: **GEN-4 (TF80)**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: ____ OF ____	EMISSION POINT (STACK) ID NO(S): **GEN4**

ENGINE SERVICE ☐ EMERGENCY ☐ SPACE HEAT ☐ ELECTRICAL GENERATION
(CHECK ALL THAT APPL ☐ PEAK SHAVER ☑ OTHER (DESCRIBE): Engine to run Quarry Equipment

GENERATOR OUTPUT (KW):	ANTICIPATED ACTUAL HOURS OF OPERATION (HRS/YR): **3744**
ENGINE OUTPUT (HP): **125**	

TYPE ICE: ☐ GASOLINE ENGINE ☑ DIESEL ENGINE UP TO 600 ☐ DIESEL ENGINE GREATER THAN 6 ☐ DUAL FUEL ENGI
☐ OTHER (DESCRIBE): (complete below)

ENGINE TYPE ☐ RICH BURN ☐ LEAN BURN
EMISSION REDUCTION MODIFICA ☐ INJECTION TIMING RETARI ☐ PREIGNITION CHAMBER COMBUS ☐ OTHER
OR ☐ STATIONARY GAS TURBINE (complete bel ☐ NATURAL GAS PIPELINE COMPRESSOR OR TURBINE (complete below)

FUEL ☐ NATURAL GAS ☐ OIL
☐ OTHER (DESCRIBE):
CYCLE: ☐ COGENERATIOI ☐ SIMPLE
☐ REGENERATIVE ☐ COMBINED
CONTROLS: ☐ WATER-STEAM INJECTIOI
☐ UNCONTROLLED ☐ LEAN-PREMIX
☐ OTHER (SPECIFY):

ENGINE TYPI ☐ 2-CYCLE LEAN BURN ☐ 4-CYCLE LEAN ☐ TURBINE
☐ 4-CYCLE RICH BURN ☐ OTHER (DESCRIBE):
CONTROLS: ☐ COMBUSTION MODIFICATIONS (DESCRIBE):
☐ NONSELECTIVE CATALYTIC REDUC ☐ SELECTIVE CATALYTIC REDUCTIO
☐ CLEAN BURN AND PRECOMBUSTION C ☐ UNCONTROLLED

FUEL USAGE (INCLUDE STARTUP/BACKUP FUEL)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Diesel/No. 2 Fuel Oil	**Btu**		

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	BTU/UNIT	UNITS	SULFUR CONTENT (% BY WEIGHT)
Diesel/No. 2 Fuel Oil	**0.138**	**MMBtu/gal**	**0.0015%**

MANUFACTURER'S SPECIFIC EMISSION FACTORS (IF AVAILABLE)

POLLUTANT	NOX	CO	PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT						
UNIT						

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: **2017 Powerscreen 1300 Maxtrak Cone Crusher**	EMISSION SOURCE ID NO: **GEN-5 (PS1300MaxTrak)**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): **GEN-5**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
2017 Powerscreen 1300 Maxtrak track mounted Cone Crusher

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

- ☐ Coal,wood,oil, gas, other burner (Form B1)
- ☑ Int.combustion engine/generator (Form B2)
- ☐ Liquid storage tanks (Form B3)
- ☐ Woodworking (Form B4)
- ☐ Coating/finishing/printing (Form
- ☐ Storage silos/bins (Form B6)
- ☐ Manuf. of chemicals/coatings/inks (Form
- ☐ Incineration (Form B8)
- ☐ Other (Form B9)

START CONSTRUCTION DATE: DATE MANUFACTURED: **2017**

MANUFACTURER / MODEL NO.: EXPECTED OP. SCHEDULE: 12 HR/DAY 6 DAY/WK 52 WK/YR

IS THIS SOURCE SUBJEC ☐ NSPS (SUBPARTS?): ☐ NESHAP (SUBPARTS?):

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

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
PARTICULATE MATTER (PM)							
PARTICULATE MATTER<10 MICRONS (PM_{10})	**See Combustion Calculations Appendix A2**						
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
		See Combustion Calculations Appendix A2						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION	XPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATION lb/hr	lb/day	lb/yr
		See Combustion Calculations Appendix A2			

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

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

Attach Additional Sheets As Necessary

FORM B2

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B2**

EMISSION SOURCE DESCRIPTION: **2017 Powerscreen 1300 Maxtrak Cone Crusher**	EMISSION SOURCE ID NO: **GEN-5 (PS1300 Maxtra**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: _____ OF _____	EMISSION POINT (STACK) ID NO(S): **GEN5**

ENGINE SERVICE ☐ EMERGENCY ☐ SPACE HEAT ☐ ELECTRICAL GENERATION
(CHECK ALL THAT APPL ☐ PEAK SHAVER ☑ OTHER (DESCRIBE): Engine to run Quarry Equipment

GENERATOR OUTPUT (KW):	ANTICIPATED ACTUAL HOURS OF OPERATION (HRS/YR): **3744**
ENGINE OUTPUT (HP): **450**	

TYPE ICE: ☐ GASOLINE ENGINE ☑ DIESEL ENGINE UP TO 600 ☐ DIESEL ENGINE GREATER THAN 6 ☐ DUAL FUEL ENGI
☐ OTHER (DESCRIBE): (complete below)

ENGINE TYPE ☐ RICH BURN ☐ LEAN BURN
EMISSION REDUCTION MODIFICA ☐ INJECTION TIMING RETARI ☐ PREIGNITION CHAMBER COMBUS ☐ OTHER _____

OR ☐ STATIONARY GAS TURBINE (complete bel ☐ NATURAL GAS PIPELINE COMPRESSOR OR TURBINE (complete below)

FUEL ☐ NATURAL GAS ☐ OIL
☐ OTHER (DESCRIBE): _____
CYCLE: ☐ COGENERATIOI ☐ SIMPLE
☐ REGENERATIVE ☐ COMBINED
CONTROLS: ☐ WATER-STEAM INJECTIOI
☐ UNCONTROLLED ☐ LEAN-PREMIX
☐ OTHER (SPECIFY): _____

ENGINE TYP ☐ 2-CYCLE LEAN BURN ☐ 4-CYCLE LEAN ☐ TURBINE
☐ 4-CYCLE RICH BURN ☐ OTHER (DESCRIBE): _____
CONTROLS: ☐ COMBUSTION MODIFICATIONS (DESCRIBE): _____
☐ NONSELECTIVE CATALYTIC REDUC ☐ SELECTIVE CATALYTIC REDUCTIO
☐ CLEAN BURN AND PRECOMBUSTION C ☐ UNCONTROLLED

FUEL USAGE (INCLUDE STARTUP/BACKUP FUEL)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Diesel/No. 2 Fuel Oil	**Btu**		

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	BTU/UNIT	UNITS	SULFUR CONTENT (% BY WEIGHT)
Diesel/No. 2 Fuel Oil	**0.138**	**MMBtu/gal**	**0.0015%**

MANUFACTURER'S SPECIFIC EMISSION FACTORS (IF AVAILABLE)

POLLUTANT	NOX	CO	PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT						
UNIT						

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: **2017 Powerscreen 1000 Maxtrak Cone Crusher**	EMISSION SOURCE ID NO: **GEN-7 (PS1000 Maxtrak)**
	CONTROL DEVICE ID NO(S):
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S):

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
2017 Powerscreen 1000 Maxtrak Cone Crusher

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Forn
☑ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Forn	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE:	DATE MANUFACTURED: **2017**
MANUFACTURER / MODEL NO.:	EXPECTED OP. SCHEDULE: 12 HR/DAY 6 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJEC ☐ NSPS (SUBPARTS?):	☐ NESHAP (SUBPARTS?):

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

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
PARTICULATE MATTER (PM)							
PARTICULATE MATTER<10 MICRONS (PM_{10})	**See Combustion Calculations Appendix A2**						
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
		See Combustion Calculations Appendix A2						

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION	XPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATION lb/hr	lb/day	lb/yr
		See Combustion Calculations Appendix A2			

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

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

Attach Additional Sheets As Necessary

FORM B2

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B2**

EMISSION SOURCE DESCRIPTION: **2017 Powerscreen 1000 Maxtrak Cone Crusher**	EMISSION SOURCE ID NO: **GEN-7 (PS1000MaxTra**
	CONTROL DEVICE ID NO(S): **NA**
OPERATING SCENARIO: _____ OF _____	EMISSION POINT (STACK) ID NO(S): **GEN7**
ENGINE SERVICE ☐ EMERGENCY ☐ SPACE HEAT ☐ ELECTRICAL GENERATION	
(CHECK ALL THAT APP ☐ PEAK SHAVER ☑ OTHER (DESCRIBE): Engine to run Quarry Equipment	
GENERATOR OUTPUT (KW):	ANTICIPATED ACTUAL HOURS OF OPERATION (HRS/YR): **3744**
ENGINE OUTPUT (HP): **350**	

TYPE ICE: ☐ GASOLINE ENGINE ☑ DIESEL ENGINE UP TO 600 ☐ DIESEL ENGINE GREATER THAN 6 ☐ DUAL FUEL ENGI
☐ OTHER (DESCRIBE): _____ (complete below)

ENGINE TYPE ☐ RICH BURN ☐ LEAN BURN

EMISSION REDUCTION MODIFICA ☐ INJECTION TIMING RETARI ☐ PREIGNITION CHAMBER COMBUS ☐ OTHER _____

OR ☐ STATIONARY GAS TURBINE (complete bel ☐ NATURAL GAS PIPELINE COMPRESSOR OR TURBINE (complete below)

FUEL ☐ NATURAL GAS ☐ OIL
☐ OTHER (DESCRIBE): _____

CYCLE: ☐ COGENERATIOI ☐ SIMPLE
☐ REGENERATIVE ☐ COMBINED

CONTROLS: ☐ WATER-STEAM INJECTIOI
☐ UNCONTROLLED ☐ LEAN-PREMIX
☐ OTHER (SPECIFY): _____

ENGINE TYP ☐ 2-CYCLE LEAN BURN ☐ 4-CYCLE LEAN ☐ TURBINE
☐ 4-CYCLE RICH BURN ☐ OTHER (DESCRIBE): _____

CONTROLS: ☐ COMBUSTION MODIFICATIONS (DESCRIBE): _____
☐ NONSELECTIVE CATALYTIC REDUC ☐ SELECTIVE CATALYTIC REDUCTIO
☐ CLEAN BURN AND PRECOMBUSTION C ☐ UNCONTROLLED

FUEL USAGE (INCLUDE STARTUP/BACKUP FUEL)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Diesel/No. 2 Fuel Oil	**Btu**		

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	BTU/UNIT	UNITS	SULFUR CONTENT (% BY WEIGHT)
Diesel/No. 2 Fuel Oil	**0.138**	**MMBtu/gal**	**0.0015%**

MANUFACTURER'S SPECIFIC EMISSION FACTORS (IF AVAILABLE)

POLLUTANT	NOX	CO	PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT						
UNIT						

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: **2065 hp Natural Gas/Propane Generator**	EMISSION SOURCE ID NO: **ES-PGEN1**
	CONTROL DEVICE ID NO(S): **CD-PGEN1**
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): **PGEN1**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
2065 hp Natural Gas/Propane Power Generator equipped with catalytic oxidation

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Forr
☑ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE:	DATE MANUFACTURED: **2019 or later**
MANUFACTURER / MODEL NO.:	EXPECTED OP. SCHEDULE: **24** HR/DAY **7** DAY/WK **52** WK/YR
IS THIS SOURCE SUBJEC ☑ NSPS (SUBPARTS?): **JJJJ**	☑ NESHAP (SUBPARTS?): **ZZZZ**

PERCENTAGE ANNUAL THROUGHPUT (%): DEC-FEB **25** MAR-MAY **25** JUN-AUG **25** SEP

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
PARTICULATE MATTER (PM)							
PARTICULATE MATTER<10 MICRONS (PM_{10})	**See Combustion Calculations Appendix A2**						
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
	See Combustion Calculations Appendix A2							

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION	XPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATION lb/hr	lb/day	lb/yr
	See Combustion C				

Attachments: (1) emissions calculations and supporting documentation, (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

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

Attach Additional Sheets As Necessary

FORM B2

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B2**

EMISSION SOURCE DESCRIPTION: **2065 hp Natural Gas/Propane Generator with catalytic oxidation**	EMISSION SOURCE ID NO: **ES-PGEN1** CONTROL DEVICE ID NO(S): **CD-PGEN1**
OPERATING SCENARIO: _____ OF _____	EMISSION POINT (STACK) ID NO(S): **PGEN1**
ENGINE SERVICE ☐ EMERGENCY ☐ SPACE HEAT ☑ ELECTRICAL GENERATION (CHECK ALL THAT APPL ☐ PEAK SHAVER ☐ OTHER (DESCRIBE):	
GENERATOR OUTPUT (KW):	ANTICIPATED ACTUAL HOURS OF OPERATION (HRS/YR): **8760**
ENGINE OUTPUT (HP): **2065**	

TYPE ICE: ☐ GASOLINE ENGINE ☐ DIESEL ENGINE UP TO 600 ☐ DIESEL ENGINE GREATER THAN 6 ☑ DUAL FUEL ENGINE ☐ OTHER (DESCRIBE): _____ (complete below)

ENGINE TYPE ☐ RICH BURN ☑ LEAN BURN

EMISSION REDUCTION MODIFICA ☐ INJECTION TIMING RETAR ☐ PREIGNITION CHAMBER COMBUS ☐ OTHER _____

OR ☐ STATIONARY GAS TURBINE (complete bel ☐ NATURAL GAS PIPELINE COMPRESSOR OR TURBINE (complete below)

FUEL ☐ NATURAL GAS ☐ OIL ☐ OTHER (DESCRIBE): _____

CYCLE: ☐ COGENERATIO ☐ SIMPLE ☐ REGENERATIVE ☐ COMBINED

CONTROLS: ☐ WATER-STEAM INJECTIO ☐ UNCONTROLLED ☐ LEAN-PREMIX ☐ OTHER (SPECIFY): _____

ENGINE TYP ☐ 2-CYCLE LEAN BURN ☐ 4-CYCLE LEAN ☐ TURBINE ☐ 4-CYCLE RICH BURN ☐ OTHER (DESCRIBE): _____

CONTROLS: ☐ COMBUSTION MODIFICATIONS (DESCRIBE): _____ ☐ NONSELECTIVE CATALYTIC REDUC ☐ SELECTIVE CATALYTIC REDUCTION ☐ CLEAN BURN AND PRECOMBUSTION C ☐ UNCONTROLLED

FUEL USAGE (INCLUDE STARTUP/BACKUP FUEL)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Natural Gas/Propane	**MMBtu**	**14.46**	

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	BTU/UNIT	UNITS	SULFUR CONTENT (% BY WEIGHT)
Natural Gas	**1020**	**Btu/scf**	
Propane	**97500**	**Btu/gal**	

MANUFACTURER'S SPECIFIC EMISSION FACTORS (IF AVAILABLE)

POLLUTANT	NOX	CO	PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT	**1.0**	**0.7**			**0.7**	
UNIT	**g/hp-hr**	**g/hp-hr**			**g/hp-hr**	

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: **2065 hp Natural Gas/Propane Generator**	EMISSION SOURCE ID NO: **ES-PGEN2**
	CONTROL DEVICE ID NO(S): **CD-PGEN2**
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): **PGEN2**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
2065 hp Natural Gas/Propane Power Generator equipped with catalytic oxidation

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Forr
☑ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Form	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE: DATE MANUFACTURED: **2019 or later**

MANUFACTURER / MODEL NO.: EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR

IS THIS SOURCE SUBJEC ☑ NSPS (SUBPARTS?): **JJJJ** ☑ NESHAP (SUBPARTS?): **ZZZZ**

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

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
PARTICULATE MATTER (PM)							
PARTICULATE MATTER<10 MICRONS (PM_{10})	**See Combustion Calculations Appendix A2**						
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
	See Combustion Calculations Appendix A2							

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION	XPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATION lb/hr	lb/day	lb/yr
	See Combustion C				

Attachments: (1) emissions calculations and supporting documentation, (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

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

Attach Additional Sheets As Necessary

FORM B2

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B2**

EMISSION SOURCE DESCRIPTION: **2065 hp Natural Gas/Propane Generator with catalytic oxidation**	EMISSION SOURCE ID NO: **ES-PGEN2**
	CONTROL DEVICE ID NO(S): **CD-PGEN2**
OPERATING SCENARIO: _____ OF _____	EMISSION POINT (STACK) ID NO(S): **PGEN2**

ENGINE SERVICE ☐ EMERGENCY ☐ SPACE HEAT ☑ ELECTRICAL GENERATION
(CHECK ALL THAT APPL) ☐ PEAK SHAVER ☐ OTHER (DESCRIBE): _____

GENERATOR OUTPUT (KW):	ANTICIPATED ACTUAL HOURS OF OPERATION (HRS/YR): **8760**
ENGINE OUTPUT (HP): **2065**	

TYPE ICE: ☐ GASOLINE ENGINE ☐ DIESEL ENGINE UP TO 600 ☐ DIESEL ENGINE GREATER THAN 6 ☑ DUAL FUEL ENGI
☐ OTHER (DESCRIBE): _____ (complete below)

ENGINE TYPE ☐ RICH BURN ☑ LEAN BURN

EMISSION REDUCTION MODIFICA ☐ INJECTION TIMING RETARI ☐ PREIGNITION CHAMBER COMBUS ☐ OTHER _____

OR ☐ STATIONARY GAS TURBINE (complete bel ☐ NATURAL GAS PIPELINE COMPRESSOR OR TURBINE (complete below)

FUEL ☐ NATURAL GAS ☐ OIL
☐ OTHER (DESCRIBE): _____

CYCLE: ☐ COGENERATIOI ☐ SIMPLE
☐ REGENERATIVE ☐ COMBINED

CONTROLS: ☐ WATER-STEAM INJECTIOI
☐ UNCONTROLLED ☐ LEAN-PREMIX
☐ OTHER (SPECIFY): _____

ENGINE TYP ☐ 2-CYCLE LEAN BURN ☐ 4-CYCLE LEAN ☐ TURBINE
☐ 4-CYCLE RICH BURN ☐ OTHER (DESCRIBE): _____

CONTROLS: ☐ COMBUSTION MODIFICATIONS (DESCRIBE): _____
☐ NONSELECTIVE CATALYTIC REDUC ☐ SELECTIVE CATALYTIC REDUCTIO
☐ CLEAN BURN AND PRECOMBUSTION C ☐ UNCONTROLLED

FUEL USAGE (INCLUDE STARTUP/BACKUP FUEL)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Natural Gas/Propane	**MMBtu**	**14.46**	

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	BTU/UNIT	UNITS	SULFUR CONTENT (% BY WEIGHT)
Natural Gas	**1020**	**Btu/scf**	
Propane	**97500**	**Btu/gal**	

MANUFACTURER'S SPECIFIC EMISSION FACTORS (IF AVAILABLE)

POLLUTANT	NOX	CO	PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT	**1.0**	**0.7**			**0.7**	
UNIT	**g/hp-hr**	**g/hp-hr**			**g/hp-hr**	

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

COMMENTS:

Attach Additional Sheets As Necessary

FORM B

SPECIFIC EMISSION SOURCE INFORMATION (REQUIRED FOR ALL SOURCES)

REVISED 09/22 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B**

EMISSION SOURCE DESCRIPTION: 1721 hp Natural Gas/Propane Generator	EMISSION SOURCE ID NO: **ES-PGEN3**
	CONTROL DEVICE ID NO(S): **CD-PGEN3**
OPERATING SCENARIO 1 OF 1	EMISSION POINT (STACK) ID NO(S): **PGEN3**

DESCRIBE IN DETAILTHE EMISSION SOURCE PROCESS (ATTACH FLOW DIAGRAM):
1721 hp Natural Gas/Propane Power Generator equipped with catalytic oxidation

TYPE OF EMISSION SOURCE (CHECK AND COMPLETE APPROPRIATE FORM B1-B9 ON THE FOLLOWING PAGES):

☐ Coal,wood,oil, gas, other burner (Form B1)	☐ Woodworking (Form B4)	☐ Manuf. of chemicals/coatings/inks (Forr
☑ Int.combustion engine/generator (Form B2)	☐ Coating/finishing/printing (Forn	☐ Incineration (Form B8)
☐ Liquid storage tanks (Form B3)	☐ Storage silos/bins (Form B6)	☐ Other (Form B9)

START CONSTRUCTION DATE:	DATE MANUFACTURED: **2019 or later**
MANUFACTURER / MODEL NO.:	EXPECTED OP. SCHEDULE: 24 HR/DAY 7 DAY/WK 52 WK/YR
IS THIS SOURCE SUBJEC ☑ NSPS (SUBPARTS?): **JJJJ**	☑ NESHAP (SUBPARTS?): **ZZZZ**

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

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

AIR POLLUTANT EMITTED	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
PARTICULATE MATTER (PM)							
PARTICULATE MATTER<10 MICRONS (PM_{10})	**See Combustion Calculations Appendix A2**						
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)							
SULFUR DIOXIDE (SO2)							
NITROGEN OXIDES (NOx)							
CARBON MONOXIDE (CO)							
VOLATILE ORGANIC COMPOUNDS (VOC)							
LEAD							
OTHER							

HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

HAZARDOUS AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION FACTOR	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS BEFORE CONTROLS / LIMITS tons/yr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS lb/hr	POTENTIAL EMISSIONS AFTER CONTROLS / LIMITS tons/yr
	See Combustion Calculations Appendix A2							

TOXIC AIR POLLUTANT EMISSIONS INFORMATION FOR THIS SOURCE

TOXIC AIR POLLUTANT	CAS NO.	SOURCE OF EMISSION	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATION lb/hr	lb/day	lb/yr
	See Combustion C				

Attachments: (1) emissions calculations and supporting documentation; (2) indicate all requested state and federal enforceable permit limits (e.g. hours of operation, emission rates) and describe how these are monitored and with what frequency; and (3) describe any monitoring devices, gauges, or test ports for this source.

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

Attach Additional Sheets As Necessary

FORM B2

EMISSION SOURCE (INTERNAL COMBUSTION ENGINES/TURBINES/GENERATORS)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B2**

EMISSION SOURCE DESCRIPTION: **1721 hp Natural Gas/Propane Generator with catalytic oxidation**	EMISSION SOURCE ID NO: **ES-PGEN3**
	CONTROL DEVICE ID NO(S): **CD-PGEN3**
OPERATING SCENARIO: _____ OF _____	EMISSION POINT (STACK) ID NO(S): **PGEN3**
ENGINE SERVICE ☐ EMERGENCY ☐ SPACE HEAT ☑ ELECTRICAL GENERATION (CHECK ALL THAT APPL ☐ PEAK SHAVER ☐ OTHER (DESCRIBE): _____	
GENERATOR OUTPUT (KW):	ANTICIPATED ACTUAL HOURS OF OPERATION (HRS/YR): **8760**
ENGINE OUTPUT (HP): **2065**	

TYPE ICE: ☐ GASOLINE ENGINE ☐ DIESEL ENGINE UP TO 600 ☐ DIESEL ENGINE GREATER THAN 6 ☑ DUAL FUEL ENGI
☐ OTHER (DESCRIBE): _____ (complete below)

ENGINE TYPE ☐ RICH BURN ☑ LEAN BURN

EMISSION REDUCTION MODIFICA ☐ INJECTION TIMING RETARI ☐ PREIGNITION CHAMBER COMBUS ☐ OTHER _____

OR ☐ STATIONARY GAS TURBINE (complete bel ☐ NATURAL GAS PIPELINE COMPRESSOR OR TURBINE (complete below)

FUEL ☐ NATURAL GAS ☐ OIL ☐ OTHER (DESCRIBE): _____

CYCLE: ☐ COGENERATIOI ☐ SIMPLE ☐ REGENERATIVE ☐ COMBINED

CONTROLS: ☐ WATER-STEAM INJECTIOI ☐ UNCONTROLLED ☐ LEAN-PREMIX ☐ OTHER (SPECIFY): _____

ENGINE TYP ☐ 2-CYCLE LEAN BURN ☐ 4-CYCLE LEAN ☐ TURBINE ☐ 4-CYCLE RICH BURN ☐ OTHER (DESCRIBE): _____

CONTROLS: ☐ COMBUSTION MODIFICATIONS (DESCRIBE): _____ ☐ NONSELECTIVE CATALYTIC REDUC ☐ SELECTIVE CATALYTIC REDUCTIO ☐ CLEAN BURN AND PRECOMBUSTION C ☐ UNCONTROLLED

FUEL USAGE (INCLUDE STARTUP/BACKUP FUEL)

FUEL TYPE	UNITS	MAXIMUM DESIGN CAPACITY (UNIT/HR)	REQUESTED CAPACITY LIMITATION (UNIT/HR)
Natural Gas/Propane	**MMBtu**	**12.05**	

FUEL CHARACTERISTICS (COMPLETE ALL THAT ARE APPLICABLE)

FUEL TYPE	BTU/UNIT	UNITS	SULFUR CONTENT (% BY WEIGHT)
Natural Gas	**1020**	**Btu/scf**	
Propane	**97500**	**Btu/gal**	

MANUFACTURER'S SPECIFIC EMISSION FACTORS (IF AVAILABLE)

POLLUTANT	NOX	CO	PM	PM10	VOC	OTHER
EMISSION FACTOR LB/UNIT	**1.0**	**0.7**			**0.7**	
UNIT	**g/hp-hr**	**g/hp-hr**			**g/hp-hr**	

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

COMMENTS:

Attach Additional Sheets As Necessary

APPENDIX A1 - FACILITY WIDE EMISSION SUMMARIES

EMISSION CALCULATIONS
Emissions Summary

Carolina Sunrock
Prospect Hill Quarry & Distribution Center

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions				Controlled Potential Emissions				Potential Emissions w/ Synthetic Minor Limits****
			(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(tons/yr)
Hot Mix Asphalt Plant*	PM		1.61E+01	3.87E+02	1.41E+05	7.06E+01	1.14E+01	1.92E+02	7.00E+04	34.99	14.00
	PM10		8.11E+00	1.95E+02	7.11E+04	3.55E+01	6.93E+00	1.18E+02	4.32E+04	21.61	8.64
	PM2.5		8.11E+00	1.95E+02	7.11E+04	3.55E+01	6.93E+00	1.18E+02	4.32E+04	21.61	8.64
	SO2		2.21E+01	5.30E+02	1.94E+05	9.68E+01	2.15E+01	3.69E+02	1.35E+05	67.43	26.97
	NOx		1.41E+01	3.38E+02	1.23E+05	6.17E+01	1.39E+01	2.32E+02	8.48E+04	42.38	16.95
	CO		3.32E+01	7.97E+02	2.91E+05	1.45E+02	3.32E+01	5.42E+02	1.98E+05	99.00	39.60
	VOC		1.20E+01	2.89E+02	1.05E+05	5.27E+01	1.20E+01	1.96E+02	7.16E+04	35.82	14.33
	Acetaldehyde	H/T	3.25E-01	7.80E+00	2.85E+03	1.42E+00	3.25E-01	7.80E+00	1.94E+03	9.68E-01	3.87E-01
	Acrolein	H/T	6.50E-03	1.56E-01	5.69E+01	2.85E-02	6.50E-03	1.56E-01	3.87E+01	1.94E-02	9.68E-03
	Antimony unlisted compounds	H	4.50E-05	1.08E-03	3.94E-01	1.97E-04	4.50E-05	1.08E-03	2.68E-01	1.34E-04	6.70E-05
	Arsenic unlisted cmpds (comp. of ASC)	H/T	1.40E-04	3.36E-03	1.23E+00	6.13E-04	1.40E-04	3.36E-03	8.34E-01	4.17E-04	2.08E-04
	Benzene	H/T	9.90E-02	2.38E+00	8.67E+02	4.34E-01	9.90E-02	2.38E+00	5.90E+02	2.95E-01	1.47E-01
	Benzo(a)pyrene	T	4.41E-06	1.06E-04	3.86E-02	1.93E-05	4.41E-06	1.06E-04	2.63E-02	1.31E-05	6.57E-06
	Beryllium metal (unreacted)	H/T	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
	Cadmium metal (elemental unreacted)	H/T	1.03E-04	2.46E-03	8.98E-01	4.49E-04	1.03E-04	2.46E-03	6.10E-01	3.05E-04	1.53E-04
	Carbon disulfide	H/T	6.23E-04	1.49E-02	5.45E+00	2.73E-03	6.23E-04	1.49E-02	3.71E+00	1.85E-03	9.27E-04
	Chromium unlisted cmpds (add w/chrom acid to get CRC)	H	1.26E-03	3.03E-02	1.11E+01	5.53E-03	1.26E-03	3.03E-02	7.52E+00	3.76E-03	1.88E-03
	Chromic acid (VI) (component of solCR6 and CRC)	H/T	1.13E-04	2.70E-03	9.86E-01	4.93E-04	1.13E-04	2.70E-03	6.70E-01	3.35E-04	1.67E-04
	Cobalt unlisted compounds	H	6.50E-06	1.56E-04	5.69E-02	2.85E-05	6.50E-06	1.56E-04	3.87E-02	1.94E-05	9.68E-06
	Cumene	H	1.14E-03	2.74E-02	1.00E+01	5.01E-03	1.14E-03	2.74E-02	6.81E+00	3.41E-03	1.70E-03
	Ethyl benzene	H	6.41E-02	1.54E+00	5.61E+02	2.81E-01	6.41E-02	1.54E+00	3.81E+02	1.91E-01	9.54E-02
	Ethyl chloride (chloroethane)	H	2.18E-06	5.24E-05	1.91E-02	9.56E-06	2.18E-06	5.24E-05	1.30E-02	6.50E-06	3.25E-06
	Formaldehyde	H/T	7.97E-01	1.91E+01	6.98E+03	3.49E+00	7.97E-01	1.91E+01	4.75E+03	2.37E+00	1.19E+00
	Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8	T	3.25E-10	7.80E-09	2.85E-06	1.42E-09	3.25E-10	7.80E-09	1.94E-06	9.68E-10	4.84E-10
	Hexane, n-	H/T	2.39E-01	5.74E+00	2.10E+03	1.05E+00	2.39E-01	5.74E+00	1.42E+03	7.12E-01	3.56E-01
	Hydrogen Chloride (hydrochloric acid)	H/T	5.25E-02	1.26E+00	4.60E+02	2.30E-01	5.25E-02	1.26E+00	3.13E+02	1.56E-01	7.82E-02
	Hydrogen Sulfide	T	1.37E-02	3.28E-01	1.20E+02	5.99E-02	1.37E-02	3.28E-01	8.15E+01	4.07E-02	2.04E-02
	Lead unlisted compounds	H	3.75E-03	9.00E-02	3.29E+01	1.64E-02	3.75E-03	9.00E-02	2.23E+01	1.12E-02	5.58E-03
	Manganese unlisted compounds	T	1.93E-03	4.62E-02	1.69E+01	8.43E-03	1.93E-03	4.62E-02	1.15E+01	5.73E-03	2.87E-03
	Mercury, vapor	H/T	6.50E-04	1.56E-02	5.69E+00	2.85E-03	6.50E-04	1.56E-02	3.87E+00	1.94E-03	9.68E-04
	Methyl bromide	H	2.49E-04	5.98E-03	2.18E+00	1.09E-03	2.49E-04	5.98E-03	1.48E+00	7.42E-04	3.71E-04
	Methyl chloride	H	1.56E-04	3.74E-03	1.37E+00	6.83E-04	1.56E-04	3.74E-03	9.29E-01	4.64E-04	2.32E-04
	Methyl chloroform	H/T	1.20E-02	2.88E-01	1.05E+02	5.26E-02	1.20E-02	2.88E-01	7.15E+01	3.57E-02	1.79E-02
	Methyl ethyl ketone	H/T	6.70E-03	1.61E-01	5.87E+01	2.93E-02	6.70E-03	1.61E-01	3.99E+01	1.99E-02	9.97E-03
	Methylene chloride	H/T	8.23E-06	1.97E-04	7.21E-02	3.60E-05	8.23E-06	1.97E-04	4.90E-02	2.45E-05	1.22E-05
	Napthalene	H	1.65E-01	3.95E+00	1.44E+03	7.21E-01	1.65E-01	3.95E+00	9.81E+02	4.90E-01	2.45E-01
	Nickel metal	H/T	1.58E-02	3.78E-01	1.38E+02	6.90E-02	1.58E-02	3.78E-01	9.38E+01	4.69E-02	2.34E-02
	Perchloroethylene (tetrachloroethylene)	H/T	8.01E-05	1.92E-03	7.01E-01	3.51E-04	8.01E-05	1.92E-03	4.77E-01	2.38E-04	1.19E-04
	Phenol	H/T	1.01E-03	2.41E-02	8.81E+00	4.41E-03	1.01E-03	2.41E-02	5.99E+00	2.99E-03	1.50E-03
	Phosphorus Metal, Yellow or White	H	7.00E-03	1.68E-01	6.13E+01	3.07E-02	7.00E-03	1.68E-01	4.17E+01	2.08E-02	1.04E-02
	Polycyclic Organic Matter	H	2.20E-01	5.28E+00	1.93E+03	9.64E-01	2.20E-01	5.28E+00	1.31E+03	6.55E-01	3.27E-01
	Propionaldehyde	H	3.25E-02	7.80E-01	2.85E+02	1.42E-01	3.25E-02	7.80E-01	1.94E+02	9.68E-02	4.84E-02
	Quinone	H	4.00E-02	9.60E-01	3.50E+02	1.75E-01	4.00E-02	9.60E-01	2.38E+02	1.19E-01	5.95E-02
	Selenium compounds	H	8.75E-05	2.10E-03	7.67E-01	3.83E-04	8.75E-05	2.10E-03	5.21E-01	2.61E-04	1.30E-04
	Styrene	H/T	2.40E-04	5.77E-03	2.11E+00	1.05E-03	2.40E-04	5.77E-03	1.43E+00	7.16E-04	3.58E-04
	Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	H/T	5.25E-11	1.26E-09	4.60E-07	2.30E-10	5.25E-11	1.26E-09	3.13E-07	1.56E-10	7.82E-11
	Toluene	H/T	7.29E-01	1.75E+01	6.39E+03	3.19E+00	7.29E-01	1.75E+01	4.34E+03	2.17E+00	1.09E+00
	Trichloroethylene	H/T	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
	Trichlorofluoromethane (CFC 111)	T	1.35E-05	3.24E-04	1.18E-01	5.92E-05	1.35E-05	3.24E-04	8.05E-02	4.02E-05	2.01E-05
	Trimethylpentane, 2,2,4-	H	1.00E-02	2.41E-01	8.78E+01	4.39E-02	1.00E-02	2.41E-01	5.97E+01	2.99E-02	1.49E-02
	Xylene	H/T	6.04E-02	1.45E+00	5.29E+02	2.64E-01	6.04E-02	1.45E+00	3.59E+02	1.80E-01	8.98E-02
Concrete Batch Plant	PM		5.10E+00	1.22E+02	9.08E+05	4.54E+02	5.10E+00	1.22E+02	4.46E+04	22.32	22.32
	PM10		2.44E+00	5.85E+01	3.44E+05	1.72E+02	2.44E+00	5.85E+01	2.13E+04	10.67	10.67
	PM2.5		2.44E+00	5.85E+01	3.44E+05	1.72E+02	2.44E+00	5.85E+01	2.13E+04	10.67	10.67
	Arsenic unlisted cmpds (comp. of ASC)	H/T	6.59E-05	1.58E-03	2.18E+01	1.09E-02	6.59E-05	1.58E-03	5.77E-01	2.88E-04	2.88E-04
	Beryllium metal (unreacted)	H/T	4.53E-06	1.09E-04	8.77E-02	4.38E-05	4.53E-06	1.09E-04	3.97E-02	1.99E-05	1.99E-05
	Cadmium metal (elemental unreacted)	H/T	5.00E-07	1.20E-05	6.74E-02	3.37E-05	5.00E-07	1.20E-05	4.38E-03	2.19E-06	2.19E-06
	Chromic acid (VI) (component of solCR6 and CRC)	H	1.58E-04	3.80E-03	3.73E+00	1.86E-03	1.58E-04	3.80E-03	1.39E+00	6.93E-04	6.93E-04
	Lead unlisted compounds	H	5.96E-05	1.43E-03	1.16E+01	5.78E-03	5.96E-05	1.43E-03	5.22E-01	2.61E-04	2.61E-04
	Manganese unlisted compounds	H/T	7.49E-04	1.80E-02	6.72E+01	3.36E-02	7.49E-04	1.80E-02	6.56E+00	3.28E-03	3.28E-03
	Nickel metal	H/T	1.92E-04	4.62E-03	8.05E+00	4.02E-03	1.92E-04	4.62E-03	1.68E+00	8.42E-04	8.42E-04
	Phosphorus Metal, Yellow or White	H	4.71E-04	1.13E-02	1.51E+01	7.54E-03	4.71E-04	1.13E-02	4.13E+00	2.06E-03	2.06E-03
	Selenium compounds	H	4.68E-06	1.12E-04	8.26E-01	4.13E-04	4.68E-06	1.12E-04	4.10E-02	2.05E-05	2.05E-05
Asphalt Cement Heater**	2-Methylnaphthalene		2.81E-08	6.74E-07	2.46E-04	1.23E-07	2.81E-08	6.74E-07	2.46E-04	1.23E-07	1.23E-07
	3-Methylchloranthrene		2.11E-09	5.05E-08	1.84E-05	9.22E-09	2.11E-09	5.05E-08	1.84E-05	9.22E-09	9.22E-09
	7,12-Dimethylbenz(a)anathracene		1.87E-08	4.49E-07	1.64E-04	8.20E-08	1.87E-08	4.49E-07	1.64E-04	8.20E-08	8.20E-08
	Acenaphthene	H	1.81E-07	4.34E-06	1.58E-03	7.92E-07	1.81E-07	4.34E-06	1.58E-03	7.92E-07	7.92E-07
	Acenaphtylene	H	2.17E-09	5.20E-08	1.90E-05	9.50E-09	2.17E-09	5.20E-08	1.90E-05	9.50E-09	9.50E-09
	Acetaldehyde	H/T	1.78E-08	4.27E-07	1.56E-04	7.79E-08	1.78E-08	4.27E-07	1.56E-04	7.79E-08	7.79E-08
	Acrolein	H/T	2.11E-08	5.05E-07	1.84E-04	9.22E-08	2.11E-08	5.05E-07	1.84E-04	9.22E-08	9.22E-08
	Ammonia	T	3.74E-03	8.98E-02	3.28E+01	1.64E-02	3.74E-03	8.98E-02	3.28E+01	1.64E-02	1.64E-02
	Anthracene	H	1.05E-08	2.51E-07	9.16E-05	4.58E-08	1.05E-08	2.51E-07	9.16E-05	4.58E-08	4.58E-08
	Benz(a)anthracene	H	3.44E-08	8.25E-07	3.01E-04	1.51E-07	3.44E-08	8.25E-07	3.01E-04	1.51E-07	1.51E-07
	Benzene	H/T	2.46E-06	5.89E-05	2.15E-02	1.08E-05	2.46E-06	5.89E-05	2.15E-02	1.08E-05	1.08E-05
	Benzo(a)pyrene	H/T	1.40E-09	3.37E-08	1.23E-05	6.15E-09	1.40E-09	3.37E-08	1.23E-05	6.15E-09	6.15E-09
	Benzo(b)fluoranthene	H	1.27E-08	3.04E-07	1.11E-04	5.56E-08	1.27E-08	3.04E-07	1.11E-04	5.56E-08	5.56E-08
	Benzo(g,h,i)perylene	H	1.94E-08	4.65E-07	1.70E-04	8.48E-08	1.94E-08	4.65E-07	1.70E-04	8.48E-08	8.48E-08
	Benzo(k)fluoranthene	H	2.11E-09	5.05E-08	1.84E-05	9.22E-09	2.11E-09	5.05E-08	1.84E-05	9.22E-09	9.22E-09
	Butane		2.46E-03	5.89E-02	2.15E+01	1.08E-02	2.46E-03	5.89E-02	2.15E+01	1.08E-02	1.08E-02
	Chrysene	H	2.04E-08	4.90E-07	1.79E-04	8.94E-08	2.04E-08	4.90E-07	1.79E-04	8.94E-08	8.94E-08
	Dibenzo(a,h)anthracene	H	1.43E-08	3.44E-07	1.25E-04	6.27E-08	1.43E-08	3.44E-07	1.25E-04	6.27E-08	6.27E-08
	Dichlorobenzene	H/T	1.40E-06	3.37E-05	1.23E-02	6.15E-06	1.40E-06	3.37E-05	1.23E-02	6.15E-06	6.15E-06
	Ethane		3.63E-03	8.70E-02	3.18E+01	1.59E-02	3.63E-03	8.70E-02	3.18E+01	1.59E-02	1.59E-02
	Ethylbenzene	H	5.45E-07	1.31E-05	4.78E-03	2.39E-06	5.45E-07	1.31E-05	4.78E-03	2.39E-06	2.39E-06
	Fluoranthene	H	4.15E-08	9.96E-07	3.63E-04	1.82E-07	4.15E-08	9.96E-07	3.63E-04	1.82E-07	1.82E-07
	Fluorene	H	3.83E-08	9.20E-07	3.36E-04	1.68E-07	3.83E-08	9.20E-07	3.36E-04	1.68E-07	1.68E-07

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions				Controlled Potential Emissions				Potential Emissions w/ Synthetic Minor Limits****
			(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(tons/yr)
	Formaldehyde	H/T	2.83E-04	6.79E-03	2.48E+00	1.24E-03	2.83E-04	6.79E-03	2.48E+00	1.24E-03	1.24E-03
	Hexane	H/T	2.11E-03	5.05E-02	1.84E+01	9.22E-03	2.11E-03	5.05E-02	1.84E+01	9.22E-03	9.22E-03
	Indeno(1,2,3-cd)pyrene	H	1.83E-08	4.40E-07	1.61E-04	8.03E-08	1.83E-08	4.40E-07	1.61E-04	8.03E-08	8.03E-08
	Naphthalene	H	9.69E-06	2.32E-04	8.48E-02	4.24E-05	9.69E-06	2.32E-04	8.48E-02	4.24E-05	4.24E-05
	OCDD		2.66E-11	6.38E-10	2.33E-07	1.16E-10	2.66E-11	6.38E-10	2.33E-07	1.16E-10	1.16E-10
	Pentane		3.04E-03	7.30E-02	2.66E+01	1.33E-02	3.04E-03	7.30E-02	2.66E+01	1.33E-02	1.33E-02
	Phenanathrene	H	9.00E-08	2.16E-06	7.88E-04	3.94E-07	9.00E-08	2.16E-06	7.88E-04	3.94E-07	3.94E-07
	Propane		1.87E-03	4.49E-02	1.64E+01	8.20E-03	1.87E-03	4.49E-02	1.64E+01	8.20E-03	8.20E-03
	Pyrene	H	3.64E-08	8.74E-07	3.19E-04	1.60E-07	3.64E-08	8.74E-07	3.19E-04	1.60E-07	1.60E-07
	Toluene	H/T	5.31E-05	1.28E-03	4.66E-01	2.33E-04	5.31E-05	1.28E-03	4.66E-01	2.33E-04	2.33E-04
	1,1,1-Trichloroethane		2.02E-06	4.85E-05	1.77E-02	8.86E-06	2.02E-06	4.85E-05	1.77E-02	8.86E-06	8.86E-06
	Xylene	H/T	9.34E-07	2.24E-05	8.18E-03	4.09E-06	9.34E-07	2.24E-05	8.18E-03	4.09E-06	4.09E-06
	Arsenic	H/T	4.80E-06	1.15E-04	4.20E-02	2.10E-05	4.80E-06	1.15E-04	4.20E-02	2.10E-05	2.10E-05
	Barium		5.15E-06	1.24E-04	4.51E-02	2.25E-05	5.15E-06	1.24E-04	4.51E-02	2.25E-05	2.25E-05
	Beryllium	H/T	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.60E-06	8.64E-05	3.15E-02	1.58E-05	1.58E-05
	Cadmium	H/T	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.60E-06	8.64E-05	3.15E-02	1.58E-05	1.58E-05
	Chromium (as chromic acid)	H/T	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.60E-06	8.64E-05	3.15E-02	1.58E-05	1.58E-05
	Cobalt		9.82E-08	2.36E-06	8.61E-04	4.30E-07	9.82E-08	2.36E-06	8.61E-04	4.30E-07	4.30E-07
	Copper		7.20E-06	1.73E-04	6.31E-02	3.15E-05	7.20E-06	1.73E-04	6.31E-02	3.15E-05	3.15E-05
	Lead	H	1.08E-05	2.59E-04	9.46E-02	4.73E-05	1.08E-05	2.59E-04	9.46E-02	4.73E-05	4.73E-05
	Manganese	H/T	7.20E-06	1.73E-04	6.31E-02	3.15E-05	7.20E-06	1.73E-04	6.31E-02	3.15E-05	3.15E-05
	Mercury	H/T	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.60E-06	8.64E-05	3.15E-02	1.58E-05	1.58E-05
	Molybdenum		1.29E-06	3.09E-05	1.13E-02	5.64E-06	1.29E-06	3.09E-05	1.13E-02	5.64E-06	5.64E-06
	Nickel	H/T	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.60E-06	8.64E-05	3.15E-02	1.58E-05	1.58E-05
	Selenium	H	1.80E-05	4.32E-04	1.58E-01	7.88E-05	1.80E-05	4.32E-04	1.58E-01	7.88E-05	7.88E-05
	Vanadium		2.69E-06	6.46E-05	2.36E-02	1.18E-05	2.69E-06	6.46E-05	2.36E-02	1.18E-05	1.18E-05
	Zinc		3.39E-05	8.14E-04	2.97E-01	1.49E-04	3.39E-05	8.14E-04	2.97E-01	1.49E-04	1.49E-04
Liquid Asphalt Tank Heater* **	PM		1.57E-02	3.77E-01	1.38E+02	6.88E-02	1.57E-02	3.77E-01	1.38E+02	6.88E-02	6.88E-02
	PM10		9.75E-03	2.34E-01	8.54E+01	4.27E-02	9.75E-03	2.34E-01	8.54E+01	4.27E-02	4.27E-02
	PM2.5		9.75E-03	2.34E-01	8.54E+01	4.27E-02	9.75E-03	2.34E-01	8.54E+01	4.27E-02	4.27E-02
	SO2		5.58E-01	1.34E+01	4.89E+03	2.44E+00	5.58E-01	1.34E+01	4.89E+03	2.44E+00	2.44E+00
	NOx		1.57E-01	3.77E+00	1.38E+03	6.88E-01	1.57E-01	3.77E+00	1.38E+03	6.88E-01	6.88E-01
	VOCs		5.90E-03	1.42E-01	5.17E+01	2.58E-02	5.90E-03	1.42E-01	5.17E+01	2.58E-02	2.58E-02
	CO		9.01E-02	2.16E+00	7.89E+02	3.94E-01	9.01E-02	2.16E+00	7.89E+02	3.94E-01	3.94E-01
	2-Methylnaphthalene		2.57E-08	6.18E-07	2.25E-04	1.13E-07	2.57E-08	6.18E-07	2.25E-04	1.13E-07	1.13E-07
	3-Methylchloranthrene		1.93E-09	4.63E-08	1.69E-05	8.45E-09	1.93E-09	4.63E-08	1.69E-05	8.45E-09	8.45E-09
	7,12-Dimethylbenz(a)anathracene		1.72E-08	4.12E-07	1.50E-04	7.51E-08	1.72E-08	4.12E-07	1.50E-04	7.51E-08	7.51E-08
	Acenaphthene	H	1.66E-07	3.98E-06	1.45E-03	7.26E-07	1.66E-07	3.98E-06	1.45E-03	7.26E-07	7.26E-07
	Acenaphtylene	H	1.99E-09	4.77E-08	1.74E-05	8.71E-09	1.99E-09	4.77E-08	1.74E-05	8.71E-09	8.71E-09
	Acetaldehyde	H/T	1.63E-08	3.91E-07	1.43E-04	7.14E-08	1.63E-08	3.91E-07	1.43E-04	7.14E-08	7.14E-08
	Acrolein	H/T	1.93E-08	4.63E-07	1.69E-04	8.45E-08	1.93E-08	4.63E-07	1.69E-04	8.45E-08	8.45E-08
	Ammonia	T	3.43E-03	8.23E-02	3.01E+01	1.50E-02	3.43E-03	8.23E-02	3.01E+01	1.50E-02	1.50E-02
	Anthracene	H	9.59E-09	2.30E-07	8.40E-05	4.20E-08	9.59E-09	2.30E-07	8.40E-05	4.20E-08	4.20E-08
	Benz(a)anthracene	H	3.15E-08	7.56E-07	2.76E-04	1.38E-07	3.15E-08	7.56E-07	2.76E-04	1.38E-07	1.38E-07
	Benzene	H/T	2.25E-06	5.40E-05	1.97E-02	9.86E-06	2.25E-06	5.40E-05	1.97E-02	9.86E-06	9.86E-06
	Benzo(a)pyrene	H/T	1.29E-09	3.09E-08	1.13E-05	5.64E-09	1.29E-09	3.09E-08	1.13E-05	5.64E-09	5.64E-09
	Benzo(b)fluoranthene	H	1.16E-08	2.79E-07	1.02E-04	5.09E-08	1.16E-08	2.79E-07	1.02E-04	5.09E-08	5.09E-08
	Benzo(g,h,i)perylene	H	1.78E-08	4.26E-07	1.56E-04	7.78E-08	1.78E-08	4.26E-07	1.56E-04	7.78E-08	7.78E-08
	Benzo(k)fluoranthene	H	1.93E-09	4.63E-08	1.69E-05	8.45E-09	1.93E-09	4.63E-08	1.69E-05	8.45E-09	8.45E-09
	Butane		2.25E-03	5.40E-02	1.97E+01	9.86E-03	2.25E-03	5.40E-02	1.97E+01	9.86E-03	9.86E-03
	Chrysene	H	1.87E-08	4.49E-07	1.64E-04	8.19E-08	1.87E-08	4.49E-07	1.64E-04	8.19E-08	8.19E-08
	Dibenzo(a,h)anthracene	H	1.31E-08	3.15E-07	1.15E-04	5.75E-08	1.31E-08	3.15E-07	1.15E-04	5.75E-08	5.75E-08
	Dichlorobenzene	H/T	1.29E-06	3.09E-05	1.13E-02	5.64E-06	1.29E-06	3.09E-05	1.13E-02	5.64E-06	5.64E-06
	Ethane		3.32E-03	7.98E-02	2.91E+01	1.46E-02	3.32E-03	7.98E-02	2.91E+01	1.46E-02	1.46E-02
	Ethylbenzene	H	5.00E-07	1.20E-05	4.38E-03	2.19E-06	5.00E-07	1.20E-05	4.38E-03	2.19E-06	2.19E-06
	Fluoranthene	H	3.80E-08	9.13E-07	3.33E-04	1.67E-07	3.80E-08	9.13E-07	3.33E-04	1.67E-07	1.67E-07
	Fluorene	H	3.51E-08	8.43E-07	3.08E-04	1.54E-07	3.51E-08	8.43E-07	3.08E-04	1.54E-07	1.54E-07
	Formaldehyde	H/T	2.59E-04	6.22E-03	2.27E+00	1.14E-03	2.59E-04	6.22E-03	2.27E+00	1.14E-03	1.14E-03
	Hexane	H/T	1.93E-03	4.63E-02	1.69E+01	8.45E-03	1.93E-03	4.63E-02	1.69E+01	8.45E-03	8.45E-03
	Indeno(1,2,3-cd)pyrene	H	1.68E-08	4.04E-07	1.47E-04	7.36E-08	1.68E-08	4.04E-07	1.47E-04	7.36E-08	7.36E-08
	Naphthalene	H	8.88E-06	2.13E-04	7.78E-02	3.89E-05	8.88E-06	2.13E-04	7.78E-02	3.89E-05	3.89E-05
	OCDD		2.44E-11	5.85E-10	2.13E-07	1.07E-10	2.44E-11	5.85E-10	2.13E-07	1.07E-10	1.07E-10
	Pentane		2.79E-03	6.69E-02	2.44E+01	1.22E-02	2.79E-03	6.69E-02	2.44E+01	1.22E-02	1.22E-02
	Phenanathrene	H	8.25E-08	1.98E-06	7.23E-04	3.61E-07	8.25E-08	1.98E-06	7.23E-04	3.61E-07	3.61E-07
	Propane		1.72E-03	4.12E-02	1.50E+01	7.51E-03	1.72E-03	4.12E-02	1.50E+01	7.51E-03	7.51E-03
	Pyrene	H	3.34E-08	8.01E-07	2.93E-04	1.46E-07	3.34E-08	8.01E-07	2.93E-04	1.46E-07	1.46E-07
	Toluene	H/T	4.87E-05	1.17E-03	4.27E-01	2.13E-04	4.87E-05	1.17E-03	4.27E-01	2.13E-04	2.13E-04
	1,1,1-Trichloroethane		1.85E-06	4.45E-05	1.62E-02	8.12E-06	1.85E-06	4.45E-05	1.62E-02	8.12E-06	8.12E-06
	Xylene	H/T	8.56E-07	2.06E-05	7.50E-03	3.75E-06	8.56E-07	2.06E-05	7.50E-03	3.75E-06	3.75E-06
	Arsenic	H/T	4.40E-06	1.06E-04	3.85E-02	1.93E-05	4.40E-06	1.06E-04	3.85E-02	1.93E-05	1.93E-05
	Barium		4.72E-06	1.13E-04	4.13E-02	2.07E-05	4.72E-06	1.13E-04	4.13E-02	2.07E-05	2.07E-05
	Beryllium	H/T	3.30E-06	7.92E-05	2.89E-02	1.45E-05	3.30E-06	7.92E-05	2.89E-02	1.45E-05	1.45E-05
	Cadmium	H/T	3.30E-06	7.92E-05	2.89E-02	1.45E-05	3.30E-06	7.92E-05	2.89E-02	1.45E-05	1.45E-05
	Chromium (as chromic acid)	H/T	3.30E-06	7.92E-05	2.89E-02	1.45E-05	3.30E-06	7.92E-05	2.89E-02	1.45E-05	1.45E-05
	Cobalt		9.01E-08	2.16E-06	7.89E-04	3.94E-07	9.01E-08	2.16E-06	7.89E-04	3.94E-07	3.94E-07
	Copper		6.60E-06	1.58E-04	5.78E-02	2.89E-05	6.60E-06	1.58E-04	5.78E-02	2.89E-05	2.89E-05
	Lead	H	9.90E-06	2.38E-04	8.67E-02	4.34E-05	9.90E-06	2.38E-04	8.67E-02	4.34E-05	4.34E-05
	Manganese	H/T	6.60E-06	1.58E-04	5.78E-02	2.89E-05	6.60E-06	1.58E-04	5.78E-02	2.89E-05	2.89E-05
	Mercury	H/T	3.30E-06	7.92E-05	2.89E-02	1.45E-05	3.30E-06	7.92E-05	2.89E-02	1.45E-05	1.45E-05
	Molybdenum		1.18E-06	2.83E-05	1.03E-02	5.17E-06	1.18E-06	2.83E-05	1.03E-02	5.17E-06	5.17E-06
	Nickel	H/T	3.30E-06	7.92E-05	2.89E-02	1.45E-05	3.30E-06	7.92E-05	2.89E-02	1.45E-05	1.45E-05
	Selenium	H	1.65E-05	3.96E-04	1.45E-01	7.23E-05	1.65E-05	3.96E-04	1.45E-01	7.23E-05	7.23E-05
	Vanadium		2.47E-06	5.92E-05	2.16E-02	1.08E-05	2.47E-06	5.92E-05	2.16E-02	1.08E-05	1.08E-05
	Zinc		3.11E-05	7.46E-04	2.72E-01	1.36E-04	3.11E-05	7.46E-04	2.72E-01	1.36E-04	1.36E-04

EMISSION CALCULATIONS
Emissions Summary

Carolina Sunrock
Prospect Hill Quarry & Distribution Center

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions (lb/hr)	Uncontrolled Potential Emissions (lbs/day)	Uncontrolled Potential Emissions (lbs/yr)	Uncontrolled Potential Emissions (tons/yr)	Controlled Potential Emissions (lb/hr)	Controlled Potential Emissions (lbs/day)	Controlled Potential Emissions (lbs/yr)	Controlled Potential Emissions (tons/yr)	Potential Emissions w/ Synthetic Minor Limits**** (tons/yr)
Quarry	PM		2.40E-02	5.77E-01	1.91E+05	95.31	2.40E-02	5.77E-01	1.91E+05	95.31	51.63
	PM10		9.36E-03	2.25E-01	7.58E+04	37.89	9.36E-03	2.25E-01	7.58E+04	37.89	20.53
	PM2.5		4.17E-03	1.00E-01	3.07E+04	15.35	4.17E-03	1.00E-01	3.07E+04	15.35	8.32
Quarry Equipment Generators	PM		7.19E-02	1.73E+00	6.30E+02	3.15E-01	7.19E-02	1.73E+00	6.30E+02	3.15E-01	1.71E-01
	PM10		7.19E-02	1.73E+00	6.30E+02	3.15E-01	7.19E-02	1.73E+00	6.30E+02	3.15E-01	1.71E-01
	PM2.5		7.19E-02	1.73E+00	6.30E+02	3.15E-01	7.19E-02	1.73E+00	6.30E+02	3.15E-01	1.71E-01
	SO_2		2.66E-02	6.38E-01	2.33E+02	1.16E-01	2.66E-02	6.38E-01	2.33E+02	0.12	6.31E-02
	NOx		1.44E+00	3.45E+01	1.26E+04	6.30E+00	1.44E+00	3.45E+01	1.26E+04	6.30	3.41E+00
	CO		1.32E+01	3.17E+02	1.16E+05	5.78E+01	1.32E+01	3.17E+02	1.16E+05	57.84	3.13E+01
	VOC		6.83E-01	1.64E+01	5.99E+03	2.99E+00	6.83E-01	1.64E+01	5.99E+03	2.99	1.62E+00
	Acetaldehyde		1.18E-02	2.82E-01	1.03E+02	5.15E-02	1.18E-02	2.82E-01	1.03E+02	5.15E-02	2.79E-02
	Acrolein		1.42E-03	3.40E-02	1.24E+01	6.21E-03	1.42E-03	3.40E-02	1.24E+01	6.21E-03	3.36E-03
	Arsenic		6.13E-05	1.47E-03	5.37E-01	2.69E-04	6.13E-05	1.47E-03	5.37E-01	2.69E-04	1.45E-04
	Benzene		1.43E-02	3.43E-01	1.25E+02	6.26E-02	1.43E-02	3.43E-01	1.25E+02	6.26E-02	3.39E-02
	Benzo(a)pyrene		2.88E-06	6.92E-05	2.52E-02	1.26E-05	2.88E-06	6.92E-05	2.52E-02	1.26E-05	6.84E-06
	Beryllium		4.60E-05	1.10E-03	4.03E-01	2.01E-04	4.60E-05	1.10E-03	4.03E-01	2.01E-04	1.09E-04
	1,3-Butadiene		5.99E-04	1.44E-02	5.25E+00	2.63E-03	5.99E-04	1.44E-02	5.25E+00	2.63E-03	1.42E-03
	Cadmium		4.60E-05	1.10E-03	4.03E-01	2.01E-04	4.60E-05	1.10E-03	4.03E-01	2.01E-04	1.09E-04
	Chromium (as chromic acid)		4.60E-05	1.10E-03	4.03E-01	2.01E-04	4.60E-05	1.10E-03	4.03E-01	2.01E-04	1.09E-04
	Formaldehyde		1.81E-02	4.34E-01	1.58E+02	7.92E-02	1.81E-02	4.34E-01	1.58E+02	7.92E-02	4.29E-02
	Lead		1.38E-04	3.31E-03	1.21E+00	6.04E-04	1.38E-04	3.31E-03	1.21E+00	6.04E-04	3.27E-04
	Manganese unlisted compounds		9.20E-05	2.21E-03	8.06E-01	4.03E-04	9.20E-05	2.21E-03	8.06E-01	4.03E-04	2.18E-04
	Mercury vapor		4.60E-05	1.10E-03	4.03E-01	2.01E-04	4.60E-05	1.10E-03	4.03E-01	2.01E-04	1.09E-04
	Napthalene		1.30E-03	3.12E-02	1.14E+01	5.69E-03	1.30E-03	3.12E-02	1.14E+01	5.69E-03	3.08E-03
	Nickel metal		4.60E-05	1.10E-03	4.03E-01	2.01E-04	4.60E-05	1.10E-03	4.03E-01	2.01E-04	1.09E-04
	Selenium compounds		2.30E-04	5.52E-03	2.01E+00	1.01E-03	2.30E-04	5.52E-03	2.01E+00	1.01E-03	5.46E-04
	Toluene		6.27E-03	1.50E-01	5.49E+01	2.75E-02	6.27E-03	1.50E-01	5.49E+01	2.75E-02	1.49E-02
	Xylene		4.37E-03	1.05E-01	3.83E+01	1.91E-02	4.37E-03	1.05E-01	3.83E+01	1.91E-02	1.04E-02
Quarry NG/Propane Large Generators	PM		1.98E+00	4.75E+01	1.73E+04	8.67E+00	1.98E+00	4.75E+01	1.73E+04	8.67	6.12
	PM10		1.98E+00	4.75E+01	1.73E+04	8.67E+00	1.98E+00	4.75E+01	1.73E+04	8.67	6.12
	PM2.5		1.98E+00	4.75E+01	1.73E+04	8.67E+00	1.98E+00	4.75E+01	1.73E+04	8.67	6.12
	SO2		2.41E-02	5.78E-01	2.11E+02	1.05E-01	2.41E-02	5.78E-01	2.11E+02	0.11	0.07
	NOx		8.11E+00	1.95E+02	7.11E+04	3.55E+01	8.11E+00	1.95E+02	7.11E+04	35.53	23.91
	VOC		9.02E+00	2.17E+02	7.90E+04	3.95E+01	9.02E+00	2.17E+02	7.90E+04	39.51	27.89
	CO		9.02E+00	2.17E+02	7.90E+04	3.95E+01	9.02E+00	2.17E+02	7.90E+04	39.51	27.89
	CH4		2.71E-01	6.50E+00	2.37E+03	1.19E+00	2.71E-01	6.50E+00	2.37E+03	1.19E+00	8.37E-01
	N2O		5.42E-02	1.30E+00	4.75E+02	2.37E-01	5.42E-02	1.30E+00	4.75E+02	2.37E-01	1.67E-01
	CO2		5.55E+03	1.33E+05	4.86E+07	2.43E+04	5.55E+03	1.33E+05	4.86E+07	2.43E+04	1.72E+04
	CO2e		5.57E+03	1.34E+05	4.88E+07	2.44E+04	5.57E+03	1.34E+05	4.88E+07	2.44E+04	1.72E+04
	Acenaphthene	HAP	5.45E-05	1.31E-03	4.77E-01	2.39E-04	5.45E-05	1.31E-03	4.77E-01	2.39E-04	1.68E-04
	Acenaphtylene	HAP	1.30E-04	3.12E-03	1.14E+00	5.69E-04	1.30E-04	3.12E-03	1.14E+00	5.69E-04	4.01E-04
	Acetaldehyde	HAP/TAP	3.18E-01	7.63E+00	2.78E+03	1.39E+00	3.18E-01	7.63E+00	2.78E+03	1.39E+00	9.83E-01
	Acrolein	HAP/TAP	3.19E-01	7.65E+00	2.79E+03	1.40E+00	3.19E-01	7.65E+00	2.79E+03	1.40E+00	9.85E-01
	Anthracene	HAP	2.94E-05	7.06E-04	2.58E-01	1.29E-04	2.94E-05	7.06E-04	2.58E-01	1.29E-04	9.09E-05
	Benzo(a)anthracene	HAP	1.38E-05	3.30E-04	1.21E-01	6.03E-05	1.38E-05	3.30E-04	1.21E-01	6.03E-05	4.25E-05
	Benzene	HAP/TAP	7.13E-02	1.71E+00	6.24E+02	3.12E-01	7.13E-02	1.71E+00	6.24E+02	3.12E-01	2.20E-01
	Benzo(a)pyrene	HAP/TAP	2.33E-07	5.58E-06	2.04E-03	1.02E-06	2.33E-07	5.58E-06	2.04E-03	1.02E-06	7.19E-07
	Benzo(b)fluoranthene	HAP	1.02E-06	2.44E-05	8.90E-03	4.45E-06	1.02E-06	2.44E-05	8.90E-03	4.45E-06	3.14E-06
	Benzo(k)fluoranthene	HAP	3.49E-07	8.37E-06	3.05E-03	1.53E-06	3.49E-07	8.37E-06	3.05E-03	1.53E-06	1.08E-06
	Benzo(g,h,i)perylene	HAP	1.74E-07	4.19E-06	1.53E-03	7.64E-07	1.74E-07	4.19E-06	1.53E-03	7.64E-07	5.39E-07
	Biphenyl	HAP	1.62E-04	3.88E-03	1.42E+00	7.09E-04	1.62E-04	3.88E-03	1.42E+00	7.09E-04	5.00E-04
	Carbon Tetrachloride	HAP/TAP	2.49E-03	5.97E-02	2.18E+01	1.09E-02	2.49E-03	5.97E-02	2.18E+01	1.09E-02	7.69E-03
	Chlorobenzene	HAP/TAP	1.82E-03	4.36E-02	1.59E+01	7.96E-03	1.82E-03	4.36E-02	1.59E+01	7.96E-03	5.62E-03
	Chloroform	HAP/TAP	1.93E-03	4.63E-02	1.69E+01	8.45E-03	1.93E-03	4.63E-02	1.69E+01	8.45E-03	5.96E-03
	Chrysene	HAP	2.75E-05	6.61E-04	2.41E-01	1.21E-04	2.75E-05	6.61E-04	2.41E-01	1.21E-04	8.51E-05
	Ethylbenzene	HAP	4.42E-03	1.06E-01	3.87E+01	1.94E-02	4.42E-03	1.06E-01	3.87E+01	1.94E-02	1.37E-02
	Ethylene Dibromide	HAP/TAP	3.01E-03	7.21E-02	2.63E+01	1.32E-02	3.01E-03	7.21E-02	2.63E+01	1.32E-02	9.29E-03
	Fluoranthene	HAP	1.48E-05	3.55E-04	1.30E-01	6.48E-05	1.48E-05	3.55E-04	1.30E-01	6.48E-05	4.57E-05
	Fluorene	HAP	6.92E-05	1.66E-03	6.06E-01	3.03E-04	6.92E-05	1.66E-03	6.06E-01	3.03E-04	2.14E-04
	Formaldehyde	HAP/TAP	2.26E+00	5.43E+01	1.98E+04	9.90E+00	2.26E+00	5.43E+01	1.98E+04	9.90E+00	6.99E+00
	Indeno(1,2,3-c,d)pyrene	HAP	4.07E-07	9.76E-06	3.56E-03	1.78E-06	4.07E-07	9.76E-06	3.56E-03	1.78E-06	1.26E-06
	Methanol	HAP	1.02E-01	2.44E+00	8.90E+02	4.45E-01	1.02E-01	2.44E+00	8.90E+02	4.45E-01	3.14E-01
	Methylene Chloride	HAP/TAP	6.02E-03	1.44E-01	5.27E+01	2.64E-02	6.02E-03	1.44E-01	5.27E+01	2.64E-02	1.86E-02
	n-Hexane	HAP/TAP	1.82E-02	4.37E-01	1.60E+02	7.98E-02	1.82E-02	4.37E-01	1.60E+02	7.98E-02	5.63E-02
	Naphthalene	HAP	3.94E-03	9.47E-02	3.46E+01	1.73E-02	3.94E-03	9.47E-02	3.46E+01	1.73E-02	1.22E-02
	Phenanthrene	HAP	1.45E-04	3.47E-03	1.27E+00	6.33E-04	1.45E-04	3.47E-03	1.27E+00	6.33E-04	4.47E-04
	Phenol	HAP/TAP	1.72E-03	4.14E-02	1.51E+01	7.55E-03	1.72E-03	4.14E-02	1.51E+01	7.55E-03	5.33E-03
	Pyrene	HAP	2.39E-05	5.74E-04	2.10E-01	1.05E-04	2.39E-05	5.74E-04	2.10E-01	1.05E-04	7.39E-05
	Styrene	HAP/TAP	2.24E-03	5.39E-02	1.97E+01	9.83E-03	2.24E-03	5.39E-02	1.97E+01	9.83E-03	6.94E-03
	Toluene	HAP/TAP	3.94E-03	9.47E-02	3.46E+01	1.73E-02	3.94E-03	9.47E-02	3.46E+01	1.73E-02	1.22E-02
	Vinyl Chloride	HAP/TAP	1.01E-03	2.43E-02	8.86E+00	4.43E-03	1.01E-03	2.43E-02	8.86E+00	4.43E-03	3.13E-03
	Xylene	HAP/TAP	1.10E-03	2.63E-02	9.62E+00	4.81E-03	1.10E-03	2.63E-02	9.62E+00	4.81E-03	3.39E-03
Total	PM		2.33E+01	5.59E+02	1.26E+06	629.21	1.86E+01	3.64E+02	3.23E+05	161.67	94.30
	PM10		1.26E+01	3.03E+02	5.09E+05	254.68	1.14E+01	2.27E+02	1.58E+05	79.19	46.17
	PM2.5		1.26E+01	3.03E+02	4.64E+05	232.14	1.14E+01	2.26E+02	1.13E+05	56.65	33.96
	SO2		2.27E+01	5.45E+02	1.99E+05	99.46	2.22E+01	3.84E+02	1.40E+05	70.10	29.55
	NOx		2.38E+01	5.71E+02	2.08E+05	104.18	2.36E+01	4.65E+02	1.70E+05	84.89	44.96
	CO		5.55E+01	1.33E+03	4.86E+05	243.23	5.55E+01	1.08E+03	3.93E+05	196.75	99.22
	VOC		2.17E+01	5.22E+02	1.90E+05	95.20	2.17E+01	4.29E+02	1.57E+05	78.33	43.84
	Acetaldehyde	H/T	6.43E-01	1.54E+01	5.63E+03	2.82E+00	6.43E-01	1.54E+01	4.72E+03	2.36E+00	1.37E+00
	Acrolein	H/T	6.50E-03	1.56E-01	5.69E+01	2.85E-02	6.50E-03	1.56E-01	3.87E+01	1.94E-02	9.68E-03
	Antimony unlisted compounds	H	4.50E-05	1.08E-03	3.94E-01	1.97E-04	4.50E-05	1.08E-03	2.68E-01	1.34E-04	6.70E-05
	Arsenic unlisted cmpds (comp. of ASC)	H/T	2.06E-04	4.94E-03	2.30E+01	1.15E-02	2.06E-04	4.94E-03	1.41E+00	7.05E-04	4.97E-04
	Benzene	H/T	1.85E-01	4.43E+00	1.62E+03	8.08E-01	1.85E-01	4.43E+00	1.34E+03	6.70E-01	4.02E-01

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions				Controlled Potential Emissions				Potential Emissions w/ Synthetic Minor Limits****
			(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(tons/yr)
	Benzo(a)pyrene	T	4.41E-06	1.06E-04	3.86E-02	1.93E-05	4.41E-06	1.06E-04	2.63E-02	1.31E-05	6.57E-06
	Beryllium metal (unreacted)	H/T	4.53E-06	1.09E-04	8.77E-02	4.38E-05	4.53E-06	1.09E-04	3.97E-02	1.99E-05	1.99E-05
	Cadmium metal (elemental unreacted)	H/T	1.03E-04	2.47E-03	9.65E-01	4.83E-04	1.03E-04	2.47E-03	6.15E-01	3.07E-04	1.55E-04
	Carbon disulfide	H/T	6.23E-04	1.49E-02	5.45E+00	2.73E-03	6.23E-04	1.49E-02	3.71E+00	1.85E-03	9.27E-04
	Chromium unlisted cmpds (add w/chrom acid to get CRC)	H	1.26E-03	3.03E-02	1.11E+01	5.53E-03	1.26E-03	3.03E-02	7.52E+00	3.76E-03	1.88E-03
	Chromic acid (VI) (component of solCR6 and CRC)	H/T	2.71E-04	6.50E-03	4.71E+00	2.36E-03	2.71E-04	6.50E-03	2.06E+00	1.03E-03	8.61E-04
	Cobalt unlisted compounds	H	6.50E-06	1.56E-04	5.69E-02	2.85E-05	6.50E-06	1.56E-04	3.87E-02	1.94E-05	9.68E-06
	Cumene	H	1.14E-03	2.74E-02	1.00E+01	5.01E-03	1.14E-03	2.74E-02	6.81E+00	3.41E-03	1.70E-03
	Ethyl benzene	H	6.41E-02	1.54E+00	5.61E+02	2.81E-01	6.41E-02	1.54E+00	3.81E+02	1.91E-01	9.54E-02
	Ethyl chloride (chloroethane)	H	2.18E-06	5.24E-05	1.91E-02	9.56E-06	2.18E-06	5.24E-05	1.30E-02	6.50E-06	3.25E-06
	Formaldehyde	H/T	3.08E+00	7.38E+01	2.69E+04	1.35E+01	3.08E+00	7.38E+01	2.47E+04	1.24E+01	8.22E+00
	Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8	T	3.25E-10	7.80E-09	2.85E-06	1.42E-09	3.25E-10	7.80E-09	1.94E-06	9.68E-10	4.84E-10
	Hexane, n-	H/T	2.39E-01	5.74E+00	2.10E+03	1.05E+00	2.39E-01	5.74E+00	1.42E+03	7.12E-01	3.56E-01
	Hydrogen Chloride (hydrochloric acid)	H/T	5.25E-02	1.26E+00	4.60E+02	2.30E-01	5.25E-02	1.26E+00	3.13E+02	1.56E-01	7.82E-02
	Hydrogen Sulfide	T	1.37E-02	3.28E-01	1.20E+02	5.99E-02	1.37E-02	3.28E-01	8.15E+01	4.07E-02	2.04E-02
	Lead unlisted compounds	H	3.81E-03	9.14E-02	4.44E+01	2.22E-02	3.81E-03	9.14E-02	2.29E+01	1.14E-02	5.84E-03
	Manganese unlisted compounds	T	2.77E-03	6.64E-02	8.49E+01	4.24E-02	2.77E-03	6.64E-02	1.88E+01	9.42E-03	6.37E-03
	Mercury, vapor	H/T	6.50E-04	1.56E-02	5.69E+00	2.85E-03	6.50E-04	1.56E-02	3.87E+00	1.94E-03	9.68E-04
	Methyl bromide	H	2.49E-04	5.98E-03	2.18E+00	1.09E-03	2.49E-04	5.98E-03	1.48E+00	7.42E-04	3.71E-04
	Methyl chloride	H	1.56E-04	3.74E-03	1.37E+00	6.83E-04	1.56E-04	3.74E-03	9.29E-01	4.64E-04	2.32E-04
	Methyl chloroform	H/T	1.20E-02	2.88E-01	1.05E+02	5.26E-02	1.20E-02	2.88E-01	7.15E+01	3.57E-02	1.79E-02
	Methyl ethyl ketone	H/T	6.70E-03	1.61E-01	5.87E+01	2.93E-02	6.70E-03	1.61E-01	3.99E+01	1.99E-02	9.97E-03
	Methylene chloride	H/T	6.03E-03	1.45E-01	5.28E+01	2.64E-02	6.03E-03	1.45E-01	5.28E+01	2.64E-02	1.86E-02
	Napthalene	H	1.65E-01	3.95E+00	1.44E+03	7.21E-01	1.65E-01	3.95E+00	9.81E+02	4.90E-01	2.45E-01
	Nickel metal	H/T	1.59E-02	3.83E-01	1.46E+02	7.30E-02	1.59E-02	3.83E-01	9.55E+01	4.77E-02	2.43E-02
	Perchloroethylene (tetrachloroethylene)	H/T	8.01E-05	1.92E-03	7.01E-01	3.51E-04	8.01E-05	1.92E-03	4.77E-01	2.38E-04	1.19E-04
	Phenol	H/T	2.73E-03	6.55E-02	2.39E+01	1.20E-02	2.73E-03	6.55E-02	2.11E+01	1.05E-02	6.83E-03
	Phosphorus Metal, Yellow or White	H	7.47E-03	1.79E-01	7.64E+01	3.82E-02	7.47E-03	1.79E-01	4.58E+01	2.29E-02	1.25E-02
	Polycyclic Organic Matter	H	2.20E-01	5.28E+00	1.93E+03	9.64E-01	2.20E-01	5.28E+00	1.31E+03	6.55E-01	3.27E-01
	Propionaldehyde	H	3.25E-02	7.80E-01	2.85E+02	1.42E-01	3.25E-02	7.80E-01	1.94E+02	9.68E-02	4.84E-02
	Quinone	H	4.00E-02	9.60E-01	3.50E+02	1.75E-01	4.00E-02	9.60E-01	2.38E+02	1.19E-01	5.95E-02
	Selenium compounds	H	3.22E-04	7.73E-03	3.61E+00	1.80E-03	3.22E-04	7.73E-03	2.58E+00	1.29E-03	6.96E-04
	Styrene	H/T	2.48E-03	5.96E-02	2.18E+01	1.09E-02	2.48E-03	5.96E-02	2.11E+01	1.05E-02	7.30E-03
	Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	H/T	5.25E-11	1.26E-09	4.60E-07	2.30E-10	5.25E-11	1.26E-09	3.13E-07	1.56E-10	7.82E-11
	Toluene	H/T	7.39E-01	1.77E+01	6.48E+03	3.24E+00	7.39E-01	1.77E+01	4.43E+03	2.22E+00	1.11E+00
	Trichloroethylene	H/T	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
	Trichlorofluoromethane (CFC 111)	T	1.35E-05	3.24E-04	1.18E-01	5.92E-05	1.35E-05	3.24E-04	8.05E-02	4.02E-05	2.01E-05
	Trimethylpentane, 2,2,4-	H	1.00E-02	2.41E-01	8.78E+01	4.39E-02	1.00E-02	2.41E-01	5.97E+01	2.99E-02	1.49E-02
	Xylene	H/T	6.04E-02	1.45E+00	5.29E+02	2.64E-01	6.04E-02	1.45E+00	3.59E+02	1.80E-01	8.98E-02
	Highest Single HAP (formaldehyde)		3.08E+00	7.38E+01	2.69E+04	1.35E+01	3.08E+00	7.38E+01	2.47E+04	12.36	8.22
	Total HAP		5.60E+00	1.34E+02	4.91E+04	2.45E+01	5.60E+00	1.34E+02	4.09E+04	20.45	12.54

*** Potential Controlled emissions from the hot mix asphalt plant, quarry, quarry generators, and large NG/Propane generators are based on the synthetic minor limit and not based on 8760 hr/yr of operation.**
**** Criteria pollutant emissions from the asphalt cement heater are included in the Hot Mix Asphalt Plant Emissions since the NCDEQ Emission Calculation Spreadsheet for Hot Mix Asphalt plants was used (which incorporates criteria pollutant emissions for an asphalt cement heater).**
***** Criteria and HAP/TAP pollutant emissions for the liquid asphalt tank heater are not included in the NCDEQ Emission Calculation Spreadsheet for Hot Mix Asphalt plants, therefore, these emissions are calculated separately.**
****** Potential Emissions with Synthetic Minor Limits are explained and discussed in Section 2.3 of the application.**

EMISSION CALCULATIONS
Facility Potential Emissions Summary - Toxic Air Pollutants (TAPs)

Carolina Sunrock
Prospect Hill Quarry & Distribution Center

Source Name	Pollutant	Total Controlled Potential Emissions (lb/hr)	(lbs/day)	(lbs/yr)	TPER Threshold* lb/hr	lb/day	lb/yr	Above TPER Threshold lb/hr	lb/day	lb/yr
Hot Mix Asphalt	Acetaldehyde	3.25E-01	7.80E+00	1.94E+03						
	Acrolein	6.50E-03	1.56E-01	3.87E+01						
	Arsenic unlisted cmpds (comp. of ASC)	1.40E-04	3.36E-03	8.34E-01						
	Benzene	9.90E-02	2.38E+00	5.90E+02						
	Benzo(a)pyrene	4.41E-06	1.06E-04	2.63E-02						
	Beryllium metal (unreacted)	0.00E+00	0.00E+00	0.00E+00						
	Cadmium metal (elemental unreacted)	1.03E-04	2.46E-03	6.10E-01						
	Carbon disulfide	6.23E-04	1.49E-02	3.71E+00						
	Soluble Chromate compounds as Chrome (VI)	1.13E-04	2.70E-03	6.70E-01						
	Formaldehyde	7.97E-01	1.91E+01	4.75E+03						
	Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8	3.25E-10	7.80E-09	1.94E-06						
	Hexane, n-	2.39E-01	5.74E+00	1.42E+03						
	Hydrogen Chloride (hydrochloric acid)	5.25E-02	1.26E+00	3.13E+02						
	Hydrogen Sulfide	1.37E-02	3.28E-01	8.15E+01						
	Manganese unlisted compounds	1.93E-03	4.62E-02	1.15E+01						
	Mercury, vapor	6.50E-04	1.56E-02	3.87E+00						
	Methyl chloroform	1.20E-02	2.88E-01	7.15E+01						
	Methyl ethyl ketone	6.70E-03	1.61E-01	3.99E+01						
	Methylene chloride	8.23E-06	1.97E-04	4.90E-02						
	Nickel metal	1.58E-02	3.78E-01	9.38E+01						
	Perchloroethylene (tetrachloroethylene)	8.01E-05	1.92E-03	4.77E-01						
	Phenol	1.01E-03	2.41E-02	5.99E+00						
	Styrene	2.40E-04	5.77E-03	1.43E+00						
	Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	5.25E-11	1.26E-09	3.13E-07						
	Toluene	7.29E-01	1.75E+01	4.34E+03						
	Trichloroethylene	0.00E+00	0.00E+00	0.00E+00						
	Trichlorofluoromethane (CFC 111)	1.35E-05	3.24E-04	8.05E-02						
	Xylene	6.04E-02	1.45E+00	3.59E+02						
Concrete Batch Plant	Arsenic unlisted cmpds (comp. of ASC)	6.59E-05	1.58E-03	5.77E-01						
	Beryllium metal (unreacted)	4.53E-06	1.09E-04	3.97E-02						
	Cadmium metal (elemental unreacted)	5.00E-07	1.20E-05	4.38E-03						
	Soluble Chromate compounds as Chrome (VI)	1.58E-04	3.80E-03	1.39E+00						
	Lead unlisted compounds	5.96E-05	1.43E-03	5.22E-01						
	Manganese unlisted compounds	7.49E-04	1.80E-02	6.56E+00						
	Nickel metal	1.92E-04	4.62E-03	1.68E+00						
Asphalt Cement Heater IES-4	Acetaldehyde	1.78E-08	4.27E-07	1.56E-04						
	Acrolein	2.11E-08	5.05E-07	1.84E-04						
	Ammonia	3.74E-03	8.98E-02	3.28E+01						
	Benzene	2.46E-06	5.89E-05	2.15E-02						
	Benzo(a)pyrene	1.40E-09	3.37E-08	1.23E-05						
	Dichlorobenzene	1.40E-06	3.37E-05	1.23E-02						
	Formaldehyde	2.83E-04	6.79E-03	2.48E+00						
	Hexane, n-	2.11E-03	5.05E-02	1.84E+01						
	Toluene	5.31E-05	1.28E-03	4.66E-01						
	Xylene	9.34E-07	2.24E-05	8.18E-03						
	Arsenic unlisted cmpds (comp. of ASC)	4.80E-06	1.15E-04	4.20E-02						
	Beryllium metal (unreacted)	3.60E-06	8.64E-05	3.15E-02						
	Cadmium metal (elemental unreacted)	3.60E-06	8.64E-05	3.15E-02						
	Soluble Chromate compounds as Chrome (VI)	3.60E-06	8.64E-05	3.15E-02						
	Manganese unlisted compounds	7.20E-06	1.73E-04	6.31E-02						
	Mercury, vapor	3.60E-06	8.64E-05	3.15E-02						
	Nickel metal	3.60E-06	8.64E-05	3.15E-02						
Liquid Asphalt Tank Heater IES-5	Acetaldehyde	1.63E-08	3.91E-07	1.43E-04						
	Acrolein	1.93E-08	4.63E-07	1.69E-04						
	Ammonia	3.43E-03	8.23E-02	3.01E+01						
	Benzene	2.25E-06	5.40E-05	1.97E-02						
	Benzo(a)pyrene	1.29E-09	3.09E-08	1.13E-05						
	Dichlorobenzene	1.29E-06	3.09E-05	1.13E-02						
	Formaldehyde	2.59E-04	6.22E-03	2.27E+00						
	Hexane, n-	1.93E-03	4.63E-02	1.69E+01						
	Toluene	4.87E-05	1.17E-03	4.27E-01						
	Xylene	8.56E-07	2.06E-05	7.50E-03						
	Arsenic unlisted cmpds (comp. of ASC)	4.40E-06	1.06E-04	3.85E-02						
	Beryllium metal (unreacted)	3.30E-06	7.92E-05	2.89E-02						
	Cadmium metal (elemental unreacted)	3.30E-06	7.92E-05	2.89E-02						
	Soluble Chromate compounds as Chrome (VI)	3.30E-06	7.92E-05	2.89E-02						
	Manganese unlisted compounds	6.60E-06	1.58E-04	5.78E-02						
	Mercury, vapor	3.30E-06	7.92E-05	2.89E-02						
	Nickel metal	3.30E-06	7.92E-05	2.89E-02						
Facility-wide	Acetaldehyde	3.25E-01	7.80E+00	1.94E+03	28.43			No		
	Acrolein	6.50E-03	1.56E-01	3.87E+01	0.08			No		
	Ammonia	7.17E-03	1.72E-01	6.28E+01	2.84			No		
	Benzo(a)pyrene	2.69E-09	6.46E-08	2.36E-05			3.044			No
	Dichlorobenzene	2.69E-06	6.46E-05	2.36E-02	69.5			No		
	Formaldehyde	7.97E-01	1.91E+01	4.75E+03	0.16			Yes		
	Hexane, n-	2.43E-01	5.84E+00	1.46E+03		46.3			No	
	Phenol	1.01E-03	2.41E-02	5.99E+00	1.00			No		
	Styrene	2.40E-04	5.77E-03	1.43E+00	11.16			No		
	Trichlorofluoromethane (CFC 111)	1.35E-05	3.24E-04	8.05E-02	589.66			No		
	Methyl chloroform	1.20E-02	2.88E-01	7.15E+01	257.98	505.4		No	No	
	Methyl ethyl ketone	6.70E-03	1.61E-01	3.99E+01		155.8			No	
	Toluene	7.29E-01	1.75E+01	4.34E+03	58.97	197.96		No	No	
	Xylene	6.04E-02	1.45E+00	3.59E+02	68.44	113.7		No	No	
	Methylene chloride	8.23E-06	1.97E-04	4.90E-02	1.79		2213.752	No		No
**	Soluble Chromate compounds as Chrome (VI)	2.78E-04	6.66E-03	2.12E+00		2.6E-02			No	
	Hexane, n-	2.43E-01	5.84E+00	1.46E+03		46.3			No	
	Manganese unlisted compounds	2.69E-03	6.45E-02	1.81E+01		1.3			No	
	Mercury, vapor	6.57E-04	1.58E-02	3.93E+00		2.5E-02			No	
	Nickel metal	1.59E-02	3.83E-01	9.55E+01		0.3			Yes	
	Carbon disulfide	6.23E-04	1.49E-02	3.71E+00		7.8			No	
	Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	5.25E-11	1.26E-09	3.13E-07			2.767E-04			No
	Arsenic unlisted cmpds (comp. of ASC)	2.15E-04	5.16E-03	1.49E+00			0.194			Yes
	Benzene	9.90E-02	2.38E+00	5.90E+02			11.069			Yes
	Benzo(a)pyrene	4.41E-06	1.06E-04	2.63E-02			3.044			No
	Hydrogen Sulfide	1.37E-02	3.28E-01	8.15E+01		5.1			No	
	Beryllium metal (unreacted)	1.14E-05	2.74E-04	1.00E-01			0.378			No
	Cadmium metal (elemental unreacted)	1.10E-04	2.64E-03	6.75E-01			0.507			Yes
	Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8	3.25E-10	7.80E-09	1.94E-06			0.007			No
	Hydrogen Chloride (hydrochloric acid)	5.25E-02	1.26E+00	3.13E+02	0.74			No		
	Perchloroethylene (tetrachloroethylene)	8.01E-05	1.92E-03	4.77E-01			17525.534			No
	Trichloroethylene	0.00E+00	0.00E+00	0.00E+00			5442.140			No

* Per 15A NCAC 2Q .0711(a) (vertically oriented emission release points)
** Chromic acid (VI) (component of solCR6 and CRC) from Concrete Batch and HMA emissions are counted towards the 'Soluble chromate compounds as Chrome (VI)' total

APPENDIX A2 - COMBUSTION CALCULATIONS

EMISSION CALCULATIONS

Sources: **Asphalt Cement Heater IES-4**

Carolina Sunrock
Prospect Hill Quarry & Distribution Center

Description 1.2 MMBtu/hr heater for asphalt cement
Heatec HCS-70 Heater

Factors

Maximum Hours per Day = 24 hrs/day
Maximum Days of Production per Year = 365 days/yr
Heating Value for NG = 1026 Btu/scf Based on EPA's GHG MRR Rule (40 CFR Part 98)
Heating Value for No. 2 Fuel Oil = 140 MMBtu/10^3 gal
Sulfur Content in No. 2 Fuel Oil = 0.5 %

Source Description	Maximum Heat Input Rating	Units	Maximum Gas Usage for Natural Gas (MMscf/hr)	Maximum Fuel Oil Usage for Natural Gas (10^3 gal/hr)
Direct Heater	1.2	MMBtu/hr	1.17E-03	8.57E-03

NG Emissions (lb/yr) = Emission Factor (lb/MMscf) * Potential Fuel Usage (MMscf/yr)
NG Emissions (tpy) = Emissions (lb/yr) / (2000 lb/ton)

No. 2 Fuel Emissions (lb/yr) = Emission Factor (lb/MMBtu) * Potential Fuel Usage (10^3 gal/yr) * Heating Value for No. 2 Fuel Oil (140 MMBtu/10^3gal)
No. 2 Fuel Oil Emissions (tpy) = Emissions (lb/yr) / (2000 lb/ton)

Pollutant	Uncontrolled Emission Factor from NG Combustion (lb/mmft^3)[1]	Emissions from NG				Uncontrolled Emission Factor from No. 2 Fuel Oil Combustion (lb/10^3 gal)[2]	Emissions from No. 2 fuel oil				Max Total Emissions from NG & No. 2 fuel oil firing (lb/yr)	Max Total Emissions from NG & No. 2 fuel oil firing (tpy)
		(lb/hr)	(lb/day)	(lb/yr)	(tpy)		(lb/hr)	(lb/day)	(lb/yr)	(tpy)		
2-Methylnaphthalene	2.40E-05	2.81E-08	6.74E-07	2.46E-04	1.23E-07		0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.46E-04	1.23E-07
3-Methylchloranthrene	1.80E-06	2.11E-09	5.05E-08	1.84E-05	9.22E-09		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.84E-05	9.22E-09
7,12-Dimethylbenz(a)anathracene	1.60E-05	1.87E-08	4.49E-07	1.64E-04	8.20E-08		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.64E-04	8.20E-08
Acenaphthene	1.80E-06	2.11E-09	5.05E-08	1.84E-05	9.22E-09	2.11E-05	1.81E-07	4.34E-06	1.58E-03	7.92E-07	1.58E-03	7.92E-07
Acenaphtylene	1.80E-06	2.11E-09	5.05E-08	1.84E-05	9.22E-09	2.53E-07	2.17E-09	5.20E-08	1.90E-05	9.50E-09	1.90E-05	9.50E-09
Acetaldehyde	1.52E-05	1.78E-08	4.27E-07	1.56E-04	7.79E-08		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.56E-04	7.79E-08
Acrolein	1.80E-05	2.11E-08	5.05E-07	1.84E-04	9.22E-08		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.84E-04	9.22E-08
Ammonia	3.20E+00	3.74E-03	8.98E-02	3.28E+01	1.64E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.28E+01	1.64E-02
Anthracene	2.40E-06	2.81E-09	6.74E-08	2.46E-05	1.23E-08	1.22E-06	1.05E-08	2.51E-07	9.16E-05	4.58E-08	9.16E-05	4.58E-08
Benz(a)anthracene	1.80E-06	2.11E-09	5.05E-08	1.84E-05	9.22E-09	4.01E-06	3.44E-08	8.25E-07	3.01E-04	1.51E-07	3.01E-04	1.51E-07
Benzene	2.10E-03	2.46E-06	5.89E-05	2.15E-02	1.08E-05	2.14E-04	1.83E-06	4.40E-05	1.61E-02	8.03E-06	2.15E-02	1.08E-05
Benzo(a)pyrene	1.20E-06	1.40E-09	3.37E-08	1.23E-05	6.15E-09		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.23E-05	6.15E-09
Benzo(b)fluoranthene	1.80E-06	2.11E-09	5.05E-08	1.84E-05	9.22E-09	1.48E-06	1.27E-08	3.04E-07	1.11E-04	5.56E-08	1.11E-04	5.56E-08
Benzo(g,h,i)perylene	1.20E-06	1.40E-09	3.37E-08	1.23E-05	6.15E-09	2.26E-06	1.94E-08	4.65E-07	1.70E-04	8.48E-08	1.70E-04	8.48E-08
Benzo(k)fluoranthene	1.80E-06	2.11E-09	5.05E-08	1.84E-05	9.22E-09		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.84E-05	9.22E-09
Butane	2.1	2.46E-03	5.89E-02	2.15E+01	1.08E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.15E+01	1.08E-02
Chrysene	1.80E-06	2.11E-09	5.05E-08	1.84E-05	9.22E-09	2.38E-06	2.04E-08	4.90E-07	1.79E-04	8.94E-08	1.79E-04	8.94E-08
Dibenzo(a,h)anthracene	1.20E-06	1.40E-09	3.37E-08	1.23E-05	6.15E-09	1.67E-06	1.43E-08	3.44E-07	1.25E-04	6.27E-08	1.25E-04	6.27E-08
Dichlorobenzene	1.20E-03	1.40E-06	3.37E-05	1.23E-02	6.15E-06		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.23E-02	6.15E-06
Ethane	3.1	3.63E-03	8.70E-02	3.18E+01	1.59E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.18E+01	1.59E-02
Ethylbenzene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.36E-05	5.45E-07	1.31E-05	4.78E-03	2.39E-06	4.78E-03	2.39E-06
Fluoranthene	3.00E-06	3.51E-09	8.42E-08	3.07E-05	1.54E-08	4.84E-06	4.15E-08	9.96E-07	3.63E-04	1.82E-07	3.63E-04	1.82E-07
Fluorene	2.80E-06	3.27E-09	7.86E-08	2.87E-05	1.43E-08	4.47E-06	3.83E-08	9.20E-07	3.36E-04	1.68E-07	3.36E-04	1.68E-07
Formaldehyde	7.50E-02	8.77E-05	2.11E-03	7.68E-01	3.84E-04	3.30E-02	2.83E-04	6.79E-03	2.48E+00	1.24E-03	2.48E+00	1.24E-03
Hexane	1.8	2.11E-03	5.05E-02	1.84E+01	9.22E-03		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.84E+01	9.22E-03
Indeno(1,2,3-cd)pyrene	1.80E-06	2.11E-09	5.05E-08	1.84E-05	9.22E-09	2.14E-06	1.83E-08	4.40E-07	1.61E-04	8.03E-08	1.61E-04	8.03E-08
Naphthalene	6.10E-04	7.13E-07	1.71E-05	6.25E-03	3.12E-06	1.13E-03	9.69E-06	2.32E-04	8.48E-02	4.24E-05	8.48E-02	4.24E-05
OCDD		0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.10E-09	2.66E-11	6.38E-10	2.33E-07	1.16E-10	2.33E-07	1.16E-10
Pentane	2.6	3.04E-03	7.30E-02	2.66E+01	1.33E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.66E+01	1.33E-02
Phenanathrene	1.70E-05	1.99E-08	4.77E-07	1.74E-04	8.71E-08	1.05E-05	9.00E-08	2.16E-06	7.88E-04	3.94E-07	7.88E-04	3.94E-07
Propane	1.6	1.87E-03	4.49E-02	1.64E+01	8.20E-03		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.64E+01	8.20E-03

Pyrene	5.00E-06	5.85E-09	1.40E-07	5.12E-05	2.56E-08	4.25E-06	3.64E-08	8.74E-07	3.19E-04	1.60E-07	3.19E-04	1.60E-07
Toluene	3.40E-02	3.98E-05	9.54E-04	3.48E-01	1.74E-04	6.20E-03	5.31E-05	1.28E-03	4.66E-01	2.33E-04	4.66E-01	2.33E-04
1,1,1-Trichloroethane		0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.36E-04	2.02E-06	4.85E-05	1.77E-02	8.86E-06	1.77E-02	8.86E-06
Xylene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.09E-04	9.34E-07	2.24E-05	8.18E-03	4.09E-06	8.18E-03	4.09E-06
Arsenic	2.00E-04	2.34E-07	5.61E-06	2.05E-03	1.02E-06	5.60E-04	4.80E-06	1.15E-04	4.20E-02	2.10E-05	4.20E-02	2.10E-05
Barium	4.40E-03	5.15E-06	1.24E-04	4.51E-02	2.25E-05		0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.51E-02	2.25E-05
Beryllium	1.20E-05	1.40E-08	3.37E-07	1.23E-04	6.15E-08	4.20E-04	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.15E-02	1.58E-05
Cadmium	1.10E-03	1.29E-06	3.09E-05	1.13E-02	5.64E-06	4.20E-04	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.15E-02	1.58E-05
Chromium (as chromic acid)	1.40E-03	1.64E-06	3.93E-05	1.43E-02	7.17E-06	4.20E-04	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.15E-02	1.58E-05
Cobalt	8.40E-05	9.82E-08	2.36E-06	8.61E-04	4.30E-07		0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.61E-04	4.30E-07
Copper	8.50E-04	9.94E-07	2.39E-05	8.71E-03	4.35E-06	8.40E-04	7.20E-06	1.73E-04	6.31E-02	3.15E-05	6.31E-02	3.15E-05
Lead	5.00E-04	5.85E-07	1.40E-05	5.12E-03	2.56E-06	1.26E-03	1.08E-05	2.59E-04	9.46E-02	4.73E-05	9.46E-02	4.73E-05
Manganese	3.80E-04	4.44E-07	1.07E-05	3.89E-03	1.95E-06	8.40E-04	7.20E-06	1.73E-04	6.31E-02	3.15E-05	6.31E-02	3.15E-05
Mercury	2.60E-04	3.04E-07	7.30E-06	2.66E-03	1.33E-06	4.20E-04	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.15E-02	1.58E-05
Molybdenum	1.10E-03	1.29E-06	3.09E-05	1.13E-02	5.64E-06		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-02	5.64E-06
Nickel	2.10E-03	2.46E-06	5.89E-05	2.15E-02	1.08E-05	4.20E-04	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.15E-02	1.58E-05
Selenium	2.40E-05	2.81E-08	6.74E-07	2.46E-04	1.23E-07	2.10E-03	1.80E-05	4.32E-04	1.58E-01	7.88E-05	1.58E-01	7.88E-05
Vanadium	2.30E-03	2.69E-06	6.46E-05	2.36E-02	1.18E-05		0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.36E-02	1.18E-05
Zinc	2.90E-02	3.39E-05	8.14E-04	2.97E-01	1.49E-04	5.60E-04	4.80E-06	1.15E-04	4.20E-02	2.10E-05	2.97E-01	1.49E-04

[1] - AP-42; Compilation of Air Pollutant Emission Factors Vol. 1 - Stationary Sources USEPA, 5th ed. Section 1.4, 7/98 - with following exceptions:
Acetaldehyde, ammonia, acrolein are from WebFIRE database.

[2] - AP-42; Compilation of Air Pollutant Emission Factors Vol. 1 - Stationary Sources USEPA, 5th ed. Section 1.3, 9/98

EMISSION CALCULATIONS

Sources: **Heater for Liquid Asphalt Tank IES-5**

Carolina Sunrock
Prospect Hill Quarry & Distribution Center

Description 1.1 MMBtu/hr heater for liquid asphalt tank
Heatec Direct Heater

Factors

Maximum Hours per Day = 24 hrs/day
Maximum Days of Production per Year = 365 days/yr
Heating Value for NG = 1026 Btu/scf Based on EPA's GHG MRR Rule (40 CFR Part 98)
Heating Value for No. 2 Fuel Oil = 140 MMBtu/10^3 gal
Sulfur Content in No. 2 Fuel Oil = 0.5 %

Source Description	Maximum Heat Input Rating	Units	Maximum Gas Usage for Natural Gas (MMscf/hr)	Maximum Fuel Oil Usage for Natural Gas (10^3 gal/hr)
Direct Heater	1.1	MMBtu/hr	1.07E-03	7.86E-03

NG Emissions (lb/yr) = Emission Factor (lb/MMscf) * Potential Fuel Usage (MMscf/yr)
NG Emissions (tpy) = Emissions (lb/yr) / (2000 lb/ton)

No. 2 Fuel Emissions (lb/yr) = Emission Factor (lb/MMBtu) * Potential Fuel Usage (10^3 gal/yr) * Heating Value for No. 2 Fuel Oil (140 MMBtu/10^3gal)
No. 2 Fuel Oil Emissions (tpy) = Emissions (lb/yr) / (2000 lb/ton)

		Emissions from NG					Emissions from No. 2 fuel oil					
Pollutant	Uncontrolled Emission Factor from NG Combustion (lb/mmft^3)[1]	(lb/hr)	(lb/day)	(lb/yr)	(tpy)	Uncontrolled Emission Factor from No. 2 Fuel Oil Combustion (lb/10^3 gal)[2]	(lb/hr)	(lb/day)	(lb/yr)	(tpy)	Max Total Emissions from NG & No. 2 fuel oil firing (lb/yr)	Max Total Emissions from NG & No. 2 fuel oil firing (tpy)
PM	7.6	8.15E-03	1.96E-01	7.14E+01	3.57E-02	2	1.57E-02	3.77E-01	1.38E+02	6.88E-02	1.38E+02	6.88E-02
PM10	7.6	8.15E-03	1.96E-01	7.14E+01	3.57E-02	1.241	9.75E-03	2.34E-01	8.54E+01	4.27E-02	8.54E+01	4.27E-02
PM2.5	7.6	8.15E-03	1.96E-01	7.14E+01	3.57E-02	1.241	9.75E-03	2.34E-01	8.54E+01	4.27E-02	8.54E+01	4.27E-02
SO_2	0.6000	6.43E-04	1.54E-02	5.64E+00	2.82E-03	71	5.58E-01	1.34E+01	4.89E+03	2.44E+00	4.89E+03	2.44E+00
NOx	100	1.07E-01	2.57E+00	9.39E+02	4.70E-01	20	1.57E-01	3.77E+00	1.38E+03	6.88E-01	1.38E+03	6.88E-01
VOCs	5.500	5.90E-03	1.42E-01	5.17E+01	2.58E-02	0.556	4.37E-03	1.05E-01	3.83E+01	1.91E-02	5.17E+01	2.58E-02
CO	84	9.01E-02	2.16E+00	7.89E+02	3.94E-01	5	3.93E-02	9.43E-01	3.44E+02	1.72E-01	7.89E+02	3.94E-01
2-Methylnaphthalene	2.40E-05	2.57E-08	6.18E-07	2.25E-04	1.13E-07		0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.25E-04	1.13E-07
3-Methylchloranthrene	1.80E-06	1.93E-09	4.63E-08	1.69E-05	8.45E-09		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.69E-05	8.45E-09
7,12-Dimethylbenz(a)anathracene	1.60E-05	1.72E-08	4.12E-07	1.50E-04	7.51E-08		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.50E-04	7.51E-08
Acenaphthene	1.80E-06	1.93E-09	4.63E-08	1.69E-05	8.45E-09	2.11E-05	1.66E-07	3.98E-06	1.45E-03	7.26E-07	1.45E-03	7.26E-07
Acenaphtylene	1.80E-06	1.93E-09	4.63E-08	1.69E-05	8.45E-09	2.53E-07	1.99E-09	4.77E-08	1.74E-05	8.71E-09	1.74E-05	8.71E-09
Acetaldehyde	1.52E-05	1.63E-08	3.91E-07	1.43E-04	7.14E-08		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.43E-04	7.14E-08
Acrolein	1.80E-05	1.93E-08	4.63E-07	1.69E-04	8.45E-08		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.69E-04	8.45E-08
Ammonia	3.20E+00	3.43E-03	8.23E-02	3.01E+01	1.50E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.01E+01	1.50E-02
Anthracene	2.40E-06	2.57E-09	6.18E-08	2.25E-05	1.13E-08	1.22E-06	9.59E-09	2.30E-07	8.40E-05	4.20E-08	8.40E-05	4.20E-08
Benz(a)anthracene	1.80E-06	1.93E-09	4.63E-08	1.69E-05	8.45E-09	4.01E-06	3.15E-08	7.56E-07	2.76E-04	1.38E-07	2.76E-04	1.38E-07
Benzene	2.10E-03	2.25E-06	5.40E-05	1.97E-02	9.86E-06	2.14E-04	1.68E-06	4.04E-05	1.47E-02	7.36E-06	1.97E-02	9.86E-06
Benzo(a)pyrene	1.20E-06	1.29E-09	3.09E-08	1.13E-05	5.64E-09		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-05	5.64E-09
Benzo(b)fluoranthene	1.80E-06	1.93E-09	4.63E-08	1.69E-05	8.45E-09	1.48E-06	1.16E-08	2.79E-07	1.02E-04	5.09E-08	1.02E-04	5.09E-08
Benzo(g,h,i)perylene	1.20E-06	1.29E-09	3.09E-08	1.13E-05	5.64E-09	2.26E-06	1.78E-08	4.26E-07	1.56E-04	7.78E-08	1.56E-04	7.78E-08
Benzo(k)fluoranthene	1.80E-06	1.93E-09	4.63E-08	1.69E-05	8.45E-09		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.69E-05	8.45E-09
Butane	2.1	2.25E-03	5.40E-02	1.97E+01	9.86E-03		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.97E+01	9.86E-03
Chrysene	1.80E-06	1.93E-09	4.63E-08	1.69E-05	8.45E-09	2.38E-06	1.87E-08	4.49E-07	1.64E-04	8.19E-08	1.64E-04	8.19E-08
Dibenzo(a,h)anthracene	1.20E-06	1.29E-09	3.09E-08	1.13E-05	5.64E-09	1.67E-06	1.31E-08	3.15E-07	1.15E-04	5.75E-08	1.15E-04	5.75E-08
Dichlorobenzene	1.20E-03	1.29E-06	3.09E-05	1.13E-02	5.64E-06		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-02	5.64E-06
Ethane	3.1	3.32E-03	7.98E-02	2.91E+01	1.46E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.91E+01	1.46E-02
Ethylbenzene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.36E-05	5.00E-07	1.20E-05	4.38E-03	2.19E-06	4.38E-03	2.19E-06
Fluoranthene	3.00E-06	3.22E-09	7.72E-08	2.82E-05	1.41E-08	4.84E-06	3.80E-08	9.13E-07	3.33E-04	1.67E-07	3.33E-04	1.67E-07
Fluorene	2.80E-06	3.00E-09	7.20E-08	2.63E-05	1.31E-08	4.47E-06	3.51E-08	8.43E-07	3.08E-04	1.54E-07	3.08E-04	1.54E-07
Formaldehyde	7.50E-02	8.04E-05	1.93E-03	7.04E-01	3.52E-04	3.30E-02	2.59E-04	6.22E-03	2.27E+00	1.14E-03	2.27E+00	1.14E-03

Hexane	1.8	1.93E-03	4.63E-02	1.69E+01	8.45E-03		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.69E+01	8.45E-03
Indeno(1,2,3-cd)pyrene	1.80E-06	1.93E-09	4.63E-08	1.69E-05	8.45E-09	2.14E-06	1.68E-08	4.04E-07	1.47E-04	7.36E-08	1.47E-04	7.36E-08
Naphthalene	6.10E-04	6.54E-07	1.57E-05	5.73E-03	2.86E-06	1.13E-03	8.88E-06	2.13E-04	7.78E-02	3.89E-05	7.78E-02	3.89E-05
OCDD		0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.10E-09	2.44E-11	5.85E-10	2.13E-07	1.07E-10	2.13E-07	1.07E-10
Pentane	2.6	2.79E-03	6.69E-02	2.44E+01	1.22E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.44E+01	1.22E-02
Phenanathrene	1.70E-05	1.82E-08	4.37E-07	1.60E-04	7.98E-08	1.05E-05	8.25E-08	1.98E-06	7.23E-04	3.61E-07	7.23E-04	3.61E-07
Propane	1.6	1.72E-03	4.12E-02	1.50E+01	7.51E-03		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.50E+01	7.51E-03
Pyrene	5.00E-06	5.36E-09	1.29E-07	4.70E-05	2.35E-08	4.25E-06	3.34E-08	8.01E-07	2.93E-04	1.46E-07	2.93E-04	1.46E-07
Toluene	3.40E-02	3.65E-05	8.75E-04	3.19E-01	1.60E-04	6.20E-03	4.87E-05	1.17E-03	4.27E-01	2.13E-04	4.27E-01	2.13E-04
1,1,1-Trichloroethane		0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.36E-04	1.85E-06	4.45E-05	1.62E-02	8.12E-06	1.62E-02	8.12E-06
Xylene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.09E-04	8.56E-07	2.06E-05	7.50E-03	3.75E-06	7.50E-03	3.75E-06
Arsenic	2.00E-04	2.14E-07	5.15E-06	1.88E-03	9.39E-07	5.60E-04	4.40E-06	1.06E-04	3.85E-02	1.93E-05	3.85E-02	1.93E-05
Barium	4.40E-03	4.72E-06	1.13E-04	4.13E-02	2.07E-05		0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.13E-02	2.07E-05
Beryllium	1.20E-05	1.29E-08	3.09E-07	1.13E-04	5.64E-08	4.20E-04	3.30E-06	7.92E-05	2.89E-02	1.45E-05	2.89E-02	1.45E-05
Cadmium	1.10E-03	1.18E-06	2.83E-05	1.03E-02	5.17E-06	4.20E-04	3.30E-06	7.92E-05	2.89E-02	1.45E-05	2.89E-02	1.45E-05
Chromium (as chromic acid)	1.40E-03	1.50E-06	3.60E-05	1.31E-02	6.57E-06	4.20E-04	3.30E-06	7.92E-05	2.89E-02	1.45E-05	2.89E-02	1.45E-05
Cobalt	8.40E-05	9.01E-08	2.16E-06	7.89E-04	3.94E-07		0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.89E-04	3.94E-07
Copper	8.50E-04	9.11E-07	2.19E-05	7.98E-03	3.99E-06	8.40E-04	6.60E-06	1.58E-04	5.78E-02	2.89E-05	5.78E-02	2.89E-05
Lead	5.00E-04	5.36E-07	1.29E-05	4.70E-03	2.35E-06	1.26E-03	9.90E-06	2.38E-04	8.67E-02	4.34E-05	8.67E-02	4.34E-05
Manganese	3.80E-04	4.07E-07	9.78E-06	3.57E-03	1.78E-06	8.40E-04	6.60E-06	1.58E-04	5.78E-02	2.89E-05	5.78E-02	2.89E-05
Mercury	2.60E-04	2.79E-07	6.69E-06	2.44E-03	1.22E-06	4.20E-04	3.30E-06	7.92E-05	2.89E-02	1.45E-05	2.89E-02	1.45E-05
Molybdenum	1.10E-03	1.18E-06	2.83E-05	1.03E-02	5.17E-06		0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-02	5.17E-06
Nickel	2.10E-03	2.25E-06	5.40E-05	1.97E-02	9.86E-06	4.20E-04	3.30E-06	7.92E-05	2.89E-02	1.45E-05	2.89E-02	1.45E-05
Selenium	2.40E-05	2.57E-08	6.18E-07	2.25E-04	1.13E-07	2.10E-03	1.65E-05	3.96E-04	1.45E-01	7.23E-05	1.45E-01	7.23E-05
Vanadium	2.30E-03	2.47E-06	5.92E-05	2.16E-02	1.08E-05		0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.16E-02	1.08E-05
Zinc	2.90E-02	3.11E-05	7.46E-04	2.72E-01	1.36E-04	5.60E-04	4.40E-06	1.06E-04	3.85E-02	1.93E-05	2.72E-01	1.36E-04

[1] - AP-42; Compilation of Air Pollutant Emission Factors Vol. 1 - Stationary Sources USEPA, 5th ed. Section 1.4, 7/98 - with following exceptions:
Acetaldehyde, ammonia, acrolein are from WebFIRE database.

[2] - AP-42; Compilation of Air Pollutant Emission Factors Vol. 1 - Stationary Sources USEPA, 5th ed. Section 1.3, 9/98

EMISSION CALCULATIONS
Sources: Large Natural Gas/Propane Fired Generator

Carolina Sunrock
Prospect Hill Quarry & Distribution Center

The Generator can burn propane or natural gas. Emissions were calculated below using vendor supplied guarantees, and NSPS JJJJ emission factors, and AP-42: Compilation of Air Pollutant Emission Factors Vol. 1 - Stationary Sources USEPA, 5th ed. Section 3.2, 10/96
The quarry will permit 3 propane/or natural gas fired generators, operating only 2 simultaneously. Therefore, the Total with Synthetic Minor Limits column below totals the two largest generators, assumign only they will operate at one time. The third is redundant for backup power

Average Brake Specific Fuel Consumption= 7,000 Btu/hp-hr Source: AP-42, Table 3.3-1, Note (a)
1 hp = 0.74558 kw; Per AP-42 Appendix A to convert from kw to hp
Annual Hours of Operation = 8,760 hrs/yr

Source ID	Source Description	Power Output	Units	Maximum Fuel Usage (MMBtu/hr)	
ES-PGEN1	Jenbacher J420-GS-B86	2065	hp	14.46	Equipped with catalytic oxidation
ES-PGEN2	Jenbacher J420-GS-B86	2065	hp	14.46	Equipped with catalytic oxidation
ES-PGEN3	Jenbacher J420-GS-C685	1721	hp	12.05	Equipped with catalytic oxidation

Generator Emissions:

						ES-PGEN1			ES-PGEN2			ES-PGEN3			TOTAL			Total w/ Synthetic Minor Limits		
Pollutant	Pollutant Type	Uncontrolled Emission Factor for Propane Engines NSPS JJJJ limits (g/hp-hr)	Uncontrolled Emission Factor for Engines Vendor for J420-GS-C685 (g/hp-hr)	Uncontrolled Emission Factor for Engines Vendor for J420-GS-B86 (g/hp-hr)	Uncontrolled Emission Factor for Propane Engines (lb/MMBtu) [1,2]	Propane/NG Potential Emissions			Propane/NG Potential Emissions			Propane/NG Potential Emissions			Propane/NG Potential Emissions			Propane/NG Potential Emissions		
						lb/hr	lb/yr	tpy	lb/hr	lb/yr	tpy	lb/hr	lb/yr	tpy	lb/hr	lb/yr	tpy	lb/hr	lb/yr	tpy
PM	Criteria				0.05	6.98E-01	6.12E+03	3.06E+00	6.98E-01	6.12E+03	3.06E+00	5.82E-01	5.10E+03	2.55E+00	1.98E+00	1.73E+04	8.67	1.40E+00	1.22E+04	6.12
PM10	Criteria				0.05	6.98E-01	6.12E+03	3.06E+00	6.98E-01	6.12E+03	3.06E+00	5.82E-01	5.10E+03	2.55E+00	1.98E+00	1.73E+04	8.67	1.40E+00	1.22E+04	6.12
PM2.5	Criteria				0.05	6.98E-01	6.12E+03	3.06E+00	6.98E-01	6.12E+03	3.06E+00	5.82E-01	5.10E+03	2.55E+00	1.98E+00	1.73E+04	8.67	1.40E+00	1.22E+04	6.12
SO_2	Criteria				0.00059	8.50E-03	7.45E+01	3.72E-02	8.50E-03	7.45E+01	3.72E-02	7.08E-03	6.21E+01	3.10E-02	2.41E-02	2.11E+02	0.11	1.70E-02	1.49E+02	0.07
NOx	Criteria	1.0	0.7	0.6	[redacted]	2.73	23907	11.9533	2.73	23907	11.9533	2.65	23245	11.6224	8.11E+00	7.11E+04	35.53	5.46E+00	4.78E+04	23.91
VOC	Criteria	0.7			[redacted]	3.18	27891	13.9456	3.18	27891	13.9456	2.65	23245	11.6224	9.02E+00	7.90E+04	39.51	6.37E+00	5.58E+04	27.89
CO	Criteria	0.70			[redacted]	3.18	2.79E+04	1.39E+01	3.18	2.79E+04	1.39E+01	2.65	2.32E+04	1.16E+01	9.02E+00	7.90E+04	39.51	6.37E+00	5.58E+04	27.89
CH4	GHG				6.61E-03	9.56E-02	8.37E+02	4.19E-01	9.56E-02	8.37E+02	4.19E-01	7.97E-02	6.98E+02	3.49E-01	2.71E-01	2.37E+03	1.19E+00	1.91E-01	1.67E+03	8.37E-01
N2O	GHG				1.32E-03	1.91E-02	1.67E+02	8.37E-02	1.91E-02	1.67E+02	8.37E-02	1.59E-02	1.40E+02	6.98E-02	5.42E-02	4.75E+02	2.37E-01	3.82E-02	3.35E+02	1.67E-01
CO2	GHG				1.35E+02	1.96E+03	1.72E+07	8.58E+03	1.96E+03	1.72E+07	8.58E+03	1.63E+03	1.43E+07	7.15E+03	5.55E+03	4.86E+07	2.43E+04	3.92E+03	3.43E+07	1.72E+04
CO2e	GHG				1.36E+02	1.97E+03	1.72E+07	8.61E+03	1.97E+03	1.72E+07	8.61E+03	1.64E+03	1.44E+07	7.18E+03	5.57E+03	4.88E+07	2.44E+04	3.93E+03	3.45E+07	1.72E+04
Acenaphthene	HAP				1.33E-06	1.92E-05	1.68E-01	8.42E-05	1.92E-05	1.68E-01	8.42E-05	1.60E-05	1.40E-01	7.02E-05	5.45E-05	4.77E-01	2.39E-04	3.85E-05	3.37E-01	1.68E-04
Acenaphtylene	HAP				3.17E-06	4.58E-05	4.01E-01	2.01E-04	4.58E-05	4.01E-01	2.01E-04	3.82E-05	3.35E-01	1.67E-04	1.30E-04	1.14E+00	5.69E-04	9.16E-05	8.03E-01	4.01E-04
Acetaldehyde	HAP/TAP				7.76E-03	1.12E-01	9.83E+02	4.91E-01	1.12E-01	9.83E+02	4.91E-01	9.35E-02	8.19E+02	4.09E-01	3.18E-01	2.78E+03	1.39E+00	2.24E-01	1.97E+03	9.83E-01
Acrolein	HAP/TAP				7.78E-03	1.12E-01	9.85E+02	4.93E-01	1.12E-01	9.85E+02	4.93E-01	9.37E-02	8.21E+02	4.11E-01	3.19E-01	2.79E+03	1.40E+00	2.25E-01	1.97E+03	9.85E-01
Anthracene	HAP				7.18E-07	1.04E-05	9.09E-02	4.55E-05	1.04E-05	9.09E-02	4.55E-05	8.65E-06	7.58E-02	3.79E-05	2.94E-05	2.58E-01	1.29E-04	2.08E-05	1.82E-01	9.09E-05
Benzo(a)anthracene	HAP				3.36E-07	4.86E-06	4.25E-02	2.13E-05	4.86E-06	4.25E-02	2.13E-05	4.05E-06	3.55E-02	1.77E-05	1.38E-05	1.21E-01	6.03E-05	9.71E-06	8.51E-02	4.25E-05
Benzene	HAP/TAP				1.74E-03	2.52E-02	2.20E+02	1.10E-01	2.52E-02	2.20E+02	1.10E-01	2.10E-02	1.84E+02	9.18E-02	7.13E-02	6.24E+02	3.12E-01	5.03E-02	4.41E+02	2.20E-01
Benzo(a)pyrene	HAP/TAP				5.68E-09	8.21E-08	7.19E-04	3.60E-07	8.21E-08	7.19E-04	3.60E-07	6.84E-08	5.99E-04	3.00E-07	2.33E-07	2.04E-03	1.02E-06	1.64E-07	1.44E-03	7.19E-07
Benzo(b)fluoranthene	HAP				2.48E-08	3.58E-07	3.14E-03	1.57E-06	3.58E-07	3.14E-03	1.57E-06	2.99E-07	2.62E-03	1.31E-06	1.02E-06	8.90E-03	4.45E-06	7.17E-07	6.28E-03	3.14E-06
Benzo(k)fluoranthene	HAP				8.51E-09	1.23E-07	1.08E-03	5.39E-07	1.23E-07	1.08E-03	5.39E-07	1.03E-07	8.98E-04	4.49E-07	3.49E-07	3.05E-03	1.53E-06	2.46E-07	2.16E-03	1.08E-06
Benzo(g,h,i)perylene	HAP				4.26E-09	6.16E-08	5.39E-04	2.70E-07	6.16E-08	5.39E-04	2.70E-07	5.13E-08	4.50E-04	2.25E-07	1.74E-07	1.53E-03	7.64E-07	1.23E-07	1.08E-03	5.39E-07
Biphenyl	HAP				3.95E-06	5.71E-05	5.00E-01	2.50E-04	5.71E-05	5.00E-01	2.50E-04	4.76E-05	4.17E-01	2.08E-04	1.62E-04	1.42E+00	7.09E-04	1.14E-04	1.00E+00	5.00E-04
Carbon Tetrachloride	HAP/TAP				6.07E-05	8.77E-04	7.69E+00	3.84E-03	8.77E-04	7.69E+00	3.84E-03	7.31E-04	6.41E+00	3.20E-03	2.49E-03	2.18E+01	1.09E-02	1.75E-03	1.54E+01	7.69E-03
Chlorobenzene	HAP/TAP				4.44E-05	6.42E-04	5.62E+00	2.81E-03	6.42E-04	5.62E+00	2.81E-03	5.35E-04	4.69E+00	2.34E-03	1.82E-03	1.59E+01	7.96E-03	1.28E-03	1.12E+01	5.62E-03
Chloroform	HAP/TAP				4.71E-05	6.81E-04	5.96E+00	2.98E-03	6.81E-04	5.96E+00	2.98E-03	5.67E-04	4.97E+00	2.49E-03	1.93E-03	1.69E+01	8.45E-03	1.36E-03	1.19E+01	5.96E-03
Chrysene	HAP				6.72E-07	9.71E-06	8.51E-02	4.25E-05	9.71E-06	8.51E-02	4.25E-05	8.10E-06	7.09E-02	3.55E-05	2.75E-05	2.41E-01	1.21E-04	1.94E-05	1.70E-01	8.51E-05
Ethylbenzene	HAP				1.08E-04	1.56E-03	1.37E+01	6.84E-03	1.56E-03	1.37E+01	6.84E-03	1.30E-03	1.14E+01	5.70E-03	4.42E-03	3.87E+01	1.94E-02	3.12E-03	2.74E+01	1.37E-02
Ethylene Dibromide	HAP/TAP				7.34E-05	1.06E-03	9.29E+00	4.65E-03	1.06E-03	9.29E+00	4.65E-03	8.84E-04	7.75E+00	3.87E-03	3.01E-03	2.63E+01	1.32E-02	2.12E-03	1.86E+01	9.29E-03
Fluoranthene	HAP				3.61E-07	5.22E-06	4.57E-02	2.29E-05	5.22E-06	4.57E-02	2.29E-05	4.35E-06	3.81E-02	1.90E-05	1.48E-05	1.30E-01	6.48E-05	1.04E-05	9.14E-02	4.57E-05
Fluorene	HAP				1.69E-06	2.44E-05	2.14E-01	1.07E-04	2.44E-05	2.14E-01	1.07E-04	2.04E-05	1.78E-01	8.92E-05	6.92E-05	6.06E-01	3.03E-04	4.89E-05	4.28E-01	2.14E-04
Formaldehyde	HAP/TAP				5.52E-02	7.98E-01	6.99E+03	3.49E+00	7.98E-01	6.99E+03	3.49E+00	6.65E-01	5.83E+03	2.91E+00	2.26E+00	1.98E+04	9.90E+00	1.60E+00	1.40E+04	6.99E+00
Indeno(1,2,3-c,d)pyrene	HAP				9.93E-09	1.44E-07	1.26E-03	6.29E-07	1.44E-07	1.26E-03	6.29E-07	1.20E-07	1.05E-03	5.24E-07	4.07E-07	3.56E-03	1.78E-06	2.87E-07	2.51E-03	1.26E-06
Methanol	HAP				2.48E-03	3.58E-02	3.14E+02	1.57E-01	3.58E-02	3.14E+02	1.57E-01	2.99E-02	2.62E+02	1.31E-01	1.02E-01	8.90E+02	4.45E-01	7.17E-02	6.28E+02	3.14E-01
Methylene Chloride	HAP/TAP				1.47E-04	2.12E-03	1.86E+01	9.31E-03	2.12E-03	1.86E+01	9.31E-03	1.77E-03	1.55E+01	7.76E-03	6.02E-03	5.27E+01	2.64E-02	4.25E-03	3.72E+01	1.86E-02
n-Hexane	HAP/TAP				4.45E-04	6.43E-03	5.63E+01	2.82E-02	6.43E-03	5.63E+01	2.82E-02	5.36E-03	4.70E+01	2.35E-02	1.82E-02	1.60E+02	7.98E-02	1.29E-02	1.13E+02	5.63E-02
Naphthalene	HAP				9.63E-05	1.39E-03	1.22E+01	6.10E-03	1.39E-03	1.22E+01	6.10E-03	1.16E-03	1.02E+01	5.08E-03	3.94E-03	3.46E+01	1.73E-02	2.78E-03	2.44E+01	1.22E-02
Phenanthrene	HAP				3.53E-06	5.10E-05	4.47E-01	2.23E-04	5.10E-05	4.47E-01	2.23E-04	4.25E-05	3.73E-01	1.86E-04	1.45E-04	1.27E+00	6.33E-04	1.02E-04	8.94E-01	4.47E-04
Phenol	HAP/TAP				4.21E-05	6.09E-04	5.33E+00	2.67E-03	6.09E-04	5.33E+00	2.67E-03	5.07E-04	4.44E+00	2.22E-03	1.72E-03	1.51E+01	7.55E-03	1.22E-03	1.07E+01	5.33E-03
Pyrene	HAP				5.84E-07	8.44E-06	7.39E-02	3.70E-05	8.44E-06	7.39E-02	3.70E-05	7.04E-06	6.16E-02	3.08E-05	2.39E-05	2.10E-01	1.05E-04	1.69E-05	1.48E-01	7.39E-05
Styrene	HAP/TAP				5.48E-05	7.92E-04	6.94E+00	3.47E-03	7.92E-04	6.94E+00	3.47E-03	6.60E-04	5.78E+00	2.89E-03	2.24E-03	1.97E+01	9.83E-03	1.58E-03	1.39E+01	6.94E-03
Toluene	HAP/TAP				9.63E-05	1.39E-03	1.22E+01	6.10E-03	1.39E-03	1.22E+01	6.10E-03	1.16E-03	1.02E+01	5.08E-03	3.94E-03	3.46E+01	1.73E-02	2.78E-03	2.44E+01	1.22E-02
Vinyl Chloride	HAP/TAP				2.47E-05	3.57E-04	3.13E+00	1.56E-03	3.57E-04	3.13E+00	1.56E-03	2.98E-04	2.61E+00	1.30E-03	1.01E-03	8.86E+00	4.43E-03	7.14E-04	6.26E+00	3.13E-03
Xylene	HAP/TAP				2.68E-05	3.87E-04	3.39E+00	1.70E-03	3.87E-04	3.39E+00	1.70E-03	3.23E-04	2.83E+00	1.41E-03	1.10E-03	9.62E+00	4.81E-03	7.75E-04	6.79E+00	3.39E-03

Potential Emissions (lb/yr) = Emission Factor (lb/MMBtu) * Fuel Input (MMBtu/hr) * Hours of Operation (8760 hrs/year)

[1] - AP-42; Compilation of Air Pollutant Emission Factors Vol. 1 - Natural gas-fired Reciprocating Engines Stationary Sources USEPA, 5th ed. Section 3.2, 10/96; for 4 SLB engines
[2] - No AP-42 emission factors for propane so natural gas emission factors are used for all except GHG calculations. Propane is worst case for GHG emissions

Emission Source ID	Description	Rating	Units
GEN-1 (J50V2)	Primary crusher generator - Mobile	350	hp
GEN-1a (J45)	Primary crusher generator - Mobile	350	hp
GEN-2 (S190dt)	Screen generator	125	hp
GEN-3 (PS1300 Maxtrack)	Cone crusher generator	440	hp
GEN-4 (TF80)		125	hp
GEN-5 (PS1300 Maxtrack)	Pegson Automax 1300 Cone Crusher Generator	450	hp
GEN-7 (PS100 Maxtrack)	Pegson Automax 1100 Cone Crusher Generator	350	hp

Assumed that all engines associated with this equipment will be model year 2019 or later.

Maximum Hours of Operation = 8760 hr/yr

Actual Hours of Operation = 4160 hr/yr

Sulfur Content = 0.0015% or 15 ppm

Heating Value = 0.138 MMBtu/gal

							Potential Emissions							
Pollutant	Pollutant Type	Emission Factor[1]	Units	Emission Factor[2]	Emission Factor[3]	Units	GEN-1 (J50V2)	GEN-1a (J45)	GEN-2 (S190dt)	GEN-3 (PS1300 Maxtrack)	GEN-4 (TF80)	GEN-5 (PS1300 Maxtrack)	GEN-7 (PS100 Maxtrack)	Total
							lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
PM	Criteria		lb/hp-hr	3.29E-05		lb/hp-hr	0.011	0.011	0.004	0.014	0.004	0.015	0.011	7.19E-02
PM10	Criteria		lb/hp-hr	3.29E-05		lb/hp-hr	0.011	0.011	0.004	0.014	0.004	0.015	0.011	7.19E-02
PM2.5	Criteria		lb/hp-hr	3.29E-05		lb/hp-hr	0.011	0.011	0.004	0.014	0.004	0.015	0.011	7.19E-02
SO_2	Criteria	1.21E-05	lb/hp-hr				0.004	0.004	0.002	0.005	0.002	0.005	0.004	2.66E-02
NOx	Criteria		lb/hp-hr	6.57E-04		lb/hp-hr	0.23	0.23	0.08	0.29	0.08	0.30	0.23	1.44E+00
CO	Criteria		lb/hp-hr	5.75E-03	8.21E-03	lb/hp-hr	2.01	2.01	1.03	2.53	1.03	2.59	2.01	1.32E+01
VOC	Criteria		lb/hp-hr	3.12E-04		lb/hp-hr	0.11	0.11	0.04	0.14	0.04	0.14	0.11	6.83E-01
Acetaldehyde	H/T	5.37E-06	lb/hp-hr				1.88E-03	1.88E-03	6.71E-04	2.36E-03	6.71E-04	2.42E-03	1.88E-03	1.18E-02
Acrolein	H/T	6.48E-07	lb/hp-hr				2.27E-04	2.27E-04	8.09E-05	2.85E-04	8.09E-05	2.91E-04	2.27E-04	1.42E-03
Arsenic	H/T	2.80E-08	lb/hp-hr				9.80E-06	9.80E-06	3.50E-06	1.23E-05	3.50E-06	1.26E-05	9.80E-06	6.13E-05
Benzene	H/T	6.53E-06	lb/hp-hr				2.29E-03	2.29E-03	8.16E-04	2.87E-03	8.16E-04	2.94E-03	2.29E-03	1.43E-02
Benzo(a)pyrene	H/T	1.32E-09	lb/hp-hr				4.61E-07	4.61E-07	1.65E-07	5.79E-07	1.65E-07	5.92E-07	4.61E-07	2.88E-06
Beryllium	H/T	2.10E-08	lb/hp-hr				7.35E-06	7.35E-06	2.63E-06	9.24E-06	2.63E-06	9.45E-06	7.35E-06	4.60E-05
1,3-Butadiene	H/T	2.74E-07	lb/hp-hr				9.58E-05	9.58E-05	3.42E-05	1.20E-04	3.42E-05	1.23E-04	9.58E-05	5.99E-04
Cadmium	H/T	2.10E-08	lb/hp-hr				7.35E-06	7.35E-06	2.63E-06	9.24E-06	2.63E-06	9.45E-06	7.35E-06	4.60E-05
Chromium (as chromic acid)	H/T	2.10E-08	lb/hp-hr				7.35E-06	7.35E-06	2.63E-06	9.24E-06	2.63E-06	9.45E-06	7.35E-06	4.60E-05
Formaldehyde	H/T	8.26E-06	lb/hp-hr				2.89E-03	2.89E-03	1.03E-03	3.63E-03	1.03E-03	3.72E-03	2.89E-03	1.81E-02
Lead	H	6.30E-08	lb/hp-hr				2.21E-05	2.21E-05	7.88E-06	2.77E-05	7.88E-06	2.84E-05	2.21E-05	1.38E-04
Manganese unlisted compou	H/T	4.20E-08	lb/hp-hr				1.47E-05	1.47E-05	5.25E-06	1.85E-05	5.25E-06	1.89E-05	1.47E-05	9.20E-05
Mercury vapor	H/T	2.10E-08	lb/hp-hr				7.35E-06	7.35E-06	2.63E-06	9.24E-06	2.63E-06	9.45E-06	7.35E-06	4.60E-05
Napthalene	H/T	5.94E-07	lb/hp-hr				2.08E-04	2.08E-04	7.42E-05	2.61E-04	7.42E-05	2.67E-04	2.08E-04	1.30E-03
Nickel metal	H/T	2.10E-08	lb/hp-hr				7.35E-06	7.35E-06	2.63E-06	9.24E-06	2.63E-06	9.45E-06	7.35E-06	4.60E-05
Selenium compounds	H/T	1.05E-07	lb/hp-hr				3.68E-05	3.68E-05	1.31E-05	4.62E-05	1.31E-05	4.73E-05	3.68E-05	2.30E-04
Toluene	H/T	2.86E-06	lb/hp-hr				1.00E-03	1.00E-03	3.58E-04	1.26E-03	3.58E-04	1.29E-03	1.00E-03	6.27E-03
Xylene	H/T	2.00E-06	lb/hp-hr				6.98E-04	6.98E-04	2.49E-04	8.78E-04	2.49E-04	8.98E-04	6.98E-04	4.37E-03
Highest HAP (Formaldehyde)		8.26E-06	lb/hp-hr				2.89E-03	2.89E-03	1.03E-03	3.63E-03	1.03E-03	3.72E-03	2.89E-03	1.81E-02

Total HAPs							9.41E-03	9.41E-03	3.36E-03	1.18E-02	3.36E-03	1.21E-02	9.41E-03	5.89E-02

		Potential Emissions							
Pollutant	Pollutant Type	GEN-1 (J50V2) lb/yr	GEN-1a (J45) lb/yr	GEN-2 (S190dt) lb/yr	GEN-3 (PS1300 Maxtrack) lb/yr	GEN-4 (TF80) lb/yr	GEN-5 (PS1300 Maxtrack) lb/yr	GEN-7 (PS100 Maxtrack) lb/yr	Total lb/yr
PM	Criteria	101	101	36	127	36	129	101	630
PM10	Criteria	101	101	36	127	36	129	101	630
PM2.5	Criteria	101	101	36	127	36	129	101	630
SO_2	Criteria	37.21	37.21	13.29	46.77	13.29	47.84	37.21	232.80
NOx	Criteria	2014	2014	719	2532	719	2590	2014	12604
CO	Criteria	17626	17626	8993	22158	8993	22662	17626	115683
VOC	Criteria	957	957	342	1203	342	1230	957	5987
Acetaldehyde	H/T	16.46	16.46	5.88	20.69	5.88	21.16	16.46	103.00
Acrolein	H/T	1.99	1.99	0.71	2.50	0.71	2.55	1.99	12.42
Arsenic	H/T	0.09	0.09	0.03	0.11	0.03	0.11	0.09	0.54
Benzene	H/T	20.02	20.02	7.15	25.17	7.15	25.75	20.02	125.29
Benzo(a)pyrene	H/T	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.03
Beryllium	H/T	0.06	0.06	0.02	0.08	0.02	0.08	0.06	0.40
1,3-Butadiene	H/T	0.84	0.84	0.30	1.05	0.30	1.08	0.84	5.25
Cadmium	H/T	0.06	0.06	0.02	0.08	0.02	0.08	0.06	0.40
Chromium (as chromic acid)	H/T	0.06	0.06	0.02	0.08	0.02	0.08	0.06	0.40
Formaldehyde	H/T	25.33	25.33	9.04	31.84	9.04	32.56	25.33	158.46
Lead	H	0.19	0.19	0.07	0.24	0.07	0.25	0.19	1.21
Manganese unlisted compou	H/T	0.13	0.13	0.05	0.16	0.05	0.17	0.13	0.81
Mercury vapor	H/T	0.06	0.06	0.02	0.08	0.02	0.08	0.06	0.40
Napthalene	H/T	1.82	1.82	0.65	2.29	0.65	2.34	1.82	11.39
Nickel metal	H/T	0.06	0.06	0.02	0.08	0.02	0.08	0.06	0.40
Selenium compounds	H/T	0.32	0.32	0.11	0.40	0.11	0.41	0.32	2.01
Toluene	H/T	8.78	8.78	3.13	11.04	3.13	11.29	8.78	54.92
Xylene	H/T	6.12	6.12	2.18	7.69	2.18	7.86	6.12	38.27
Highest HAP (Formaldehyde)		25.33	25.33	9.04	31.84	9.04	32.56	25.33	158.46
Total HAPs		82.41	82.41	29.43	103.60	29.43	105.95	82.41	515.62

		Potential Emissions							
Pollutant	Pollutant Type	GEN-1 (J50V2) tpy	GEN-1a (J45) tpy	GEN-2 (S190dt) tpy	GEN-3 (PS1300 Maxtrack) tpy	GEN-4 (TF80) tpy	GEN-5 (PS1300 Maxtrack) tpy	GEN-7 (PS100 Maxtrack) tpy	Total tpy
PM	Criteria	0.050	0.050	0.018	0.063	0.018	0.065	0.050	0.315
PM10	Criteria	0.050	0.050	0.018	0.063	0.018	0.065	0.050	0.315
PM2.5	Criteria	0.050	0.050	0.018	0.063	0.018	0.065	0.050	0.315
SO_2	Criteria	0.019	0.019	0.007	0.023	0.007	0.024	0.019	0.116
NOx	Criteria	1.01	1.01	0.36	1.27	0.36	1.29	1.01	6.30
CO	Criteria	8.81	8.81	4.50	11.08	4.50	11.33	8.81	57.84
VOC	Criteria	0.48	0.48	0.17	0.60	0.17	0.62	0.48	2.99
Acetaldehyde	H/T	8.23E-03	8.23E-03	2.94E-03	1.03E-02	2.94E-03	1.06E-02	8.23E-03	5.15E-02
Acrolein	H/T	9.93E-04	9.93E-04	3.55E-04	1.25E-03	3.55E-04	1.28E-03	9.93E-04	6.21E-03
Arsenic	H/T	4.29E-05	4.29E-05	1.53E-05	5.40E-05	1.53E-05	5.52E-05	4.29E-05	2.69E-04
Benzene	H/T	1.00E-02	1.00E-02	3.58E-03	1.26E-02	3.58E-03	1.29E-02	1.00E-02	6.26E-02
Benzo(a)pyrene	H/T	2.02E-06	2.02E-06	7.21E-07	2.54E-06	7.21E-07	2.59E-06	2.02E-06	1.26E-05
Beryllium	H/T	3.22E-05	3.22E-05	1.15E-05	4.05E-05	1.15E-05	4.14E-05	3.22E-05	2.01E-04
1,3-Butadiene	H/T	4.20E-04	4.20E-04	1.50E-04	5.27E-04	1.50E-04	5.39E-04	4.20E-04	2.63E-03
Cadmium	H/T	3.22E-05	3.22E-05	1.15E-05	4.05E-05	1.15E-05	4.14E-05	3.22E-05	2.01E-04
Chromium (as chromic acid)	H/T	3.22E-05	3.22E-05	1.15E-05	4.05E-05	1.15E-05	4.14E-05	3.22E-05	2.01E-04
Formaldehyde	H/T	1.27E-02	1.27E-02	4.52E-03	1.59E-02	4.52E-03	1.63E-02	1.27E-02	7.92E-02

Lead	H	9.66E-05	9.66E-05	3.45E-05	1.21E-04	3.45E-05	1.24E-04	9.66E-05	6.04E-04
Manganese unlisted compou	H/T	6.44E-05	6.44E-05	2.30E-05	8.09E-05	2.30E-05	8.28E-05	6.44E-05	4.03E-04
Mercury vapor	H/T	3.22E-05	3.22E-05	1.15E-05	4.05E-05	1.15E-05	4.14E-05	3.22E-05	2.01E-04
Napthalene	H/T	9.10E-04	9.10E-04	3.25E-04	1.14E-03	3.25E-04	1.17E-03	9.10E-04	5.69E-03
Nickel metal	H/T	3.22E-05	3.22E-05	1.15E-05	4.05E-05	1.15E-05	4.14E-05	3.22E-05	2.01E-04
Selenium compounds	H/T	1.61E-04	1.61E-04	5.75E-05	2.02E-04	5.75E-05	2.07E-04	1.61E-04	1.01E-03
Toluene	H/T	4.39E-03	4.39E-03	1.57E-03	5.52E-03	1.57E-03	5.64E-03	4.39E-03	2.75E-02
Xylene	H/T	3.06E-03	3.06E-03	1.09E-03	3.84E-03	1.09E-03	3.93E-03	3.06E-03	1.91E-02
Highest HAP (Formaldehyde)		1.27E-02	1.27E-02	4.52E-03	1.59E-02	4.52E-03	1.63E-02	1.27E-02	7.92E-02
Total HAPs		0.041	0.041	0.015	0.052	0.015	0.053	0.041	0.258

[1] Emission factors from NCDEQ Emission Calculation Spreadsheet for GAS & DIESEL INTERNAL COMBUSTION ENGINES with power rating of <= 600 HP for diesel engines and <= 250 HP for gasoline engines
EMISSIONS CALCULATOR REVISION S 6/22/2015
HAP/TAP emission factors are from AP-42, Chapter 3.3 (revised 10/96) and Chapter 1.3 (revised 5/10) for metal HAP
SOx factors for Diesel fuel are from AP-42 - Chapter 3.4 (revised 10/96).

[2] Emission factors are for US Tier 4 engines based on NSPS Subpart IIII (assuming model year 2019 and later will be installed) for engines > 174 hp and < 751 hp.

[3] Emission factors are for US Tier 4 engines based on NSPS Subpart IIII (assuming model year 2019 and later will be installed) for engines > 100 hp and < 173 hp.

APPENDIX A3 - HMA PLANT DEQ SPREADSHEET CALCULATIONS

ASPHALT EMISSIONS CALCULATOR REVISION F 07/18/2012 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 inf
This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current informatio
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 displa

Company Name:	Carolina Sunrock LLC
Facility ID No.:	TBD
Permit No.:	TBD
Facility City:	ect Hill Quarry & Distribution
Facility County:	Caswell
Spreadsheet Prepared by:	Scott Martino

Is this spreadsheet being used for emissions inventory purposes?	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 F	(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:	6	

Asphalt Cement Heater			
AC heater heat input:	1.2	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:	1,491,177	tons per year
Requested Annual Production Limit:	876,000	tons per year
Requested Daily Production Limit:		tons per day

(if none desired leave default value =8760*tph)
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 :	45,000	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	7.80	lb/hr
Control efficiency required:	99.889	%
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	%

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 (with all o
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	55.4	36.1	
Total PM10	6.5	0.023	1625	5.75	29.0	25.2	
SO2	0.0837	0.0837	20.93	20.93	91.69	91.69	
CO	0.1300	0.130	32.5	32.5	142.4	142.4	
NOx	0.0550	0.055	13.75	13.75	60.2	60.2	
VOC	0.0320	0.032	8	8	35.0	35.0	
HAPs, TOTAL		0.010		2.5	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 (with all o
Total PM	1.11E-03	2.77E-01	1.2	1.2	
CO	2.53E-03	6.32E-01	2.8	2.8	
VOC	1.61E-02	4.02E+00	17.6	17.6	
HAPs, TOTAL	2.74E-04	6.85E-02	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 (with all o
Total PM	0.0484	3.15E+00	13.8	13.8	
Total PM10	0.0177	1.15E+00	5.0	5.0	

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 (with all o
Total PM	0.0235714	2.83E-02	0.1	0.1	
Total PM10	0.0235714	2.83E-02	0.1	0.1	
SO2	0.5071429	6.09E-01	2.7	2.7	
CO	0.0357143	4.29E-02	0.2	0.2	
NOx	0.1428571	1.71E-01	0.8	0.8	
VOC	0.0024286	2.91E-03	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 (with all o
Total PM	1.14E+01	70.5	51.3	
Total PM10	6.93E+00	35.4	31.6	
SO2	2.15E+01	94.4	94.4	
CO	3.32E+01	145.3	145.3	
NOx	1.39E+01	61.0	61.0	
VOC	1.20E+01	52.7	52.7	
HAPs, TOTAL	2.57E+00	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 2
Carbon disulfide (TH)	75150	NOTE 1
Formaldehyde (TH)	50000	NOTE 3
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (T)	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
Trichlorofluoromethane (CFC 111) (T)	75694	NOTE 1
Xylene (TH)	1330207	NOTE 1

NOTE 1: Include TAP in

NOTE 2: Include TAP in with operation restriction

NOTE 3: Modeling Requ calculations" worksheet.

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', Potential Emissions (tpy) peration restrictions)
14.5
10.1
36.68
56.9
24.1
14.0
4.4
', Potential Emissions (tpy) peration restrictions)
0.5
1.1
7.1
0.1
', Potential Emissions (tpy) peration restrictions)
5.5
2.0
', Potential Emissions (tpy) peration restrictions)
0.1
0.1
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ASPHALT EMISSIONS CALCULATOR REVISION F 07/18/2012 - 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.

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

COMPANY:	**Carolina Sunrock LLC**	FACILITY ID NO.:	TBD
		PERMIT NUMBER:	TBD
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:	Hill Quarry & Distributi
		FACILITY COUNTY:	Caswell

Annual Production Limit: 876,000 ton/year

Daily Production Limit: 0 ton/day

SPREADSHEET PREPARED BY: Scott Martino

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)	11.42	20.57		70.51		20.57
PARTICULATE MATTER<10 MICRONS (PM_{10})	6.93	12.70		35.43		12.70
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)						
SULFUR DIOXIDE (SO2)	21.54	39.34		94.35		39.34
NITROGEN OXIDES (NOx)	13.92	24.84		60.98		24.84
CARBON MONOXIDE (CO)	33.18	58.24		145.31		58.24
VOLATILE ORGANIC COMPOUNDS (VOC)	12.03	21.08		52.68		21.08
TOTAL HAP	2.57	4.50		11.25		4.50
LARGEST HAP (formaldehyde)	0.80	1.40		3.49		1.40

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	1.14E+03	3.25E-01	2847.00	3.25E-01	1.14E+03	1.3E-03
Acrolein (TH)	107028	6.50E-03	2.28E+01	6.50E-03	56.94	6.50E-03	2.28E+01	2.6E-05
Antimony unlisted compounds (H)	SBC-other	4.50E-05	1.58E-01	4.50E-05	0.39	4.50E-05	1.58E-01	1.8E-07
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	4.91E-01	1.40E-04	1.23	1.40E-04	4.91E-01	5.6E-07
Benzene (TH)	71432	9.90E-02	3.47E+02	9.90E-02	867.38	9.90E-02	3.47E+02	4.0E-04
Benzo(a)pyrene (T)	50328	4.41E-06	1.55E-02	4.41E-06	0.04	4.41E-06	1.55E-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	3.59E-01	1.03E-04	0.90	1.03E-04	3.59E-01	4.1E-07
Carbon disulfide (TH)	75150	6.23E-04	2.18E+00	6.23E-04	5.45	6.23E-04	2.18E+00	2.5E-06
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	1.26E-03	4.42E+00	1.26E-03	11.06	1.26E-03	4.42E+00	5.1E-06
Chromic acid (VI) (component of solCR6 and CRC) (TH)	7738945	1.13E-04	3.94E-01	1.13E-04	0.99	1.13E-04	3.94E-01	4.5E-07
Cobalt unlisted compounds (H)	COC-other	6.50E-06	2.28E-02	6.50E-06	0.06	6.50E-06	2.28E-02	2.6E-08
Cumene (H)	98828	1.14E-03	4.01E+00	1.14E-03	10.02	1.14E-03	4.01E+00	4.6E-06
Ethyl benzene (H)	100414	6.41E-02	2.24E+02	6.41E-02	561.24	6.41E-02	2.24E+02	2.6E-04
Ethyl chloride (chloroethane) (H)	75003	2.18E-06	7.65E-03	2.18E-06	0.02	2.18E-06	7.65E-03	8.7E-09
Formaldehyde (TH)	50000	7.97E-01	2.79E+03	7.97E-01	6981.17	7.97E-01	2.79E+03	3.2E-03
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (T)	57653857	3.25E-10	1.14E-06	3.25E-10	0.00	3.25E-10	1.14E-06	1.3E-12
Hexane, n- (TH)	110543	2.39E-01	8.38E+02	2.39E-01	2095.50	2.39E-01	8.38E+02	9.6E-04
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	5.25E-02	1.84E+02	5.25E-02	459.90	5.25E-02	1.84E+02	2.1E-04
Hydrogen Sulfide (T)	7783064	1.37E-02	4.79E+01	1.37E-02	119.84	1.37E-02	4.79E+01	5.5E-05
Lead unlisted compounds (H)	PBC-other	3.75E-03	1.31E+01	3.75E-03	32.85	3.75E-03	1.31E+01	1.5E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	6.75E+00	1.93E-03	16.86	1.93E-03	6.75E+00	7.7E-06
Mercury, vapor (TH)	7439976	6.50E-04	2.28E+00	6.50E-04	5.69	6.50E-04	2.28E+00	2.6E-06
Methyl bromide (H)	74839	2.49E-04	8.73E-01	2.49E-04	2.18	2.49E-04	8.73E-01	1.0E-06
Methyl chloride (H)	74873	1.56E-04	5.46E-01	1.56E-04	1.37	1.56E-04	5.46E-01	6.2E-07
Methyl chloroform (TH)	71556	1.20E-02	4.20E+01	1.20E-02	105.12	1.20E-02	4.20E+01	4.8E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	2.35E+01	6.70E-03	58.67	6.70E-03	2.35E+01	2.7E-05
Methylene chloride (TH)	75092	8.23E-06	2.88E-02	8.23E-06	0.07	8.23E-06	2.88E-02	3.3E-08
Napthalene (H)	91203	1.65E-01	5.77E+02	1.65E-01	1442.95	1.65E-01	5.77E+02	6.6E-04
Nickel metal (TH)	7440020	1.58E-02	5.52E+01	1.58E-02	137.97	1.58E-02	5.52E+01	6.3E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	2.81E-01	8.01E-05	0.70	8.01E-05	2.81E-01	3.2E-07
Phenol (TH)	108952	1.01E-03	3.52E+00	1.01E-03	8.81	1.01E-03	3.52E+00	4.0E-06
Phosphorus Metal, Yellow or White (H)	7723140	7.00E-03	2.45E+01	7.00E-03	61.32	7.00E-03	2.45E+01	2.8E-05
Polycyclic Organic Matter (H)	POM	2.20E-01	7.71E+02	2.20E-01	1927.20	2.20E-01	7.71E+02	8.8E-04
Propionaldehyde (H)	123386	3.25E-02	1.14E+02	3.25E-02	284.70	3.25E-02	1.14E+02	1.3E-04
Quinone (H)	106514	4.00E-02	1.40E+02	4.00E-02	350.40	4.00E-02	1.40E+02	1.6E-04
Selenium compounds (H)	SEC	8.75E-05	3.07E-01	8.75E-05	0.77	8.75E-05	3.07E-01	3.5E-07
Styrene (TH)	100425	2.40E-04	8.42E-01	2.40E-04	2.11	2.40E-04	8.42E-01	9.6E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	1.84E-07	5.25E-11	0.00	5.25E-11	1.84E-07	2.1E-13

Toluene (TH)	108883	7.29E-01	2.55E+03	7.29E-01	6386.67	7.29E-01	2.55E+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
Trichlorofluoromethane (CFC 111) (T)	75694	1.35E-05	4.74E-02	1.35E-05	0.12	1.35E-05	4.74E-02	5.4E-08
Trimethylpentane, 2,2,4- (H)	540841	1.00E-02	3.51E+01	1.00E-02	87.85	1.00E-02	3.51E+01	4.0E-05
Xylene (TH)	1330207	6.04E-02	2.11E+02	6.04E-02	528.72	6.04E-02	2.11E+02	2.4E-04
Xylene, o- (H)	95476	2.57E-03	9.00E+00	2.57E-03	22.50	2.57E-03	9.00E+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 876000 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	1.14E+03	NO. Based on facility-wide potential.	1.30E-03
Acrolein (TH)	107028	6.50E-03	0.00E+00	2.28E+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	4.91E-01	YES. Modeling required	5.60E-07
Benzene (TH)	71432	9.90E-02	0.00E+00	3.47E+02	YES. Modeling required	3.96E-04
Benzo(a)pyrene (T)	50328	4.41E-06	0.00E+00	1.55E-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	0.00E+00	3.59E-01	NO. Because of operating restriction	4.10E-07
Carbon disulfide (TH)	75150	6.23E-04	0.00E+00	2.18E+00	NO. Based on facility-wide potential.	2.49E-06
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	1.13E-04	0.00E+00	3.94E-01	NO. Based on facility-wide potential.	4.50E-07
Formaldehyde (TH)	50000	7.97E-01	0.00E+00	2.79E+03	YES. Modeling required	3.19E-03
Hexane, n- (TH)	110543	2.39E-01	0.00E+00	8.38E+02	NO. Based on facility-wide potential.	9.57E-04
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (T)	57653857	3.25E-10	0.00E+00	1.14E-06	NO. Based on facility-wide potential.	1.30E-12
Hydrogen Sulfide (T)	7783064	1.37E-02	0.00E+00	4.79E+01	NO. Based on facility-wide potential.	5.47E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	0.00E+00	6.75E+00	NO. Based on facility-wide potential.	7.70E-06
Mercury, vapor (TH)	7439976	6.50E-04	0.00E+00	2.28E+00	NO. Because of operating restriction	2.60E-06
Methylene chloride (TH)	75092	8.23E-06	0.00E+00	2.88E-02	NO. Based on facility-wide potential.	3.29E-08
Methyl chloroform (TH)	71556	1.20E-02	0.00E+00	4.20E+01	NO. Based on facility-wide potential.	4.80E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	0.00E+00	2.35E+01	NO. Based on facility-wide potential.	2.68E-05
Nickel metal (TH)	7440020	1.58E-02	0.00E+00	5.52E+01	NO. Because of operating restriction	6.30E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	0.00E+00	2.81E-01	NO. Based on facility-wide potential.	3.20E-07
Phenol (TH)	108952	1.01E-03	0.00E+00	3.52E+00	NO. Based on facility-wide potential.	4.02E-06
Styrene (TH)	100425	2.40E-04	0.00E+00	8.42E-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	1.84E-07	NO. Based on facility-wide potential.	2.10E-13
Toluene (TH)	108883	7.29E-01	0.00E+00	2.55E+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
Trichlorofluoromethane (CFC 111) (T)	75694	1.35E-05	0.00E+00	4.74E-02	NO. Based on facility-wide potential.	5.41E-08
Xylene (TH)	1330207	6.04E-02	0.00E+00	2.11E+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.

								dryer		Silo Filling		Loadout		total handling		total							
Pollutant	CAS No.	emissions from dryer	emissions from handling	TPER	Units	TPER	Units	Controlled Emission Factor (lb/ton)	Controlled Emission Rate (lb/hour)	Emission factor (lb/ton)	Emission Rate (lb/hr)	Emission factor (lb/ton)	Emission Rate (lb/hr)	Emission Factor (lb/ton)	Emission Rate (lb/hour)	Controlled Emission Factor (lb/ton)	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	0.00E+00	1.14E+03	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	0.00E+00	2.28E+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	3.66E-06	9.15E-04	8.775E-05	2.19E-02	3.19E-03	7.97E-01	1.91E+01	6.98E+03	0.00E+00	2.79E+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	3.52E+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	8.42E-01	No		NOTE 1
Trichlorofluoromethane (CFC 111) (T)	75694	no	yes	140	lb/hr					0.00E+00	0.00E+00	5.41E-08	1.35E-05	5.41E-08	1.35E-05	5.41E-08	1.35E-05	3.24E-04	1.18E-01	0.00E+00	4.74E-02	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	4.20E+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	0.00E+00	2.35E+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	0.00E+00	2.55E+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	0.00E+00	2.11E+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	2.88E-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	3.94E-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	8.38E+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	6.75E+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	0.00E+00	2.28E+00	Yes	No	NOTE 2
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	5.52E+01	Yes	No	NOTE 2
Carbon disulfide (TH)	75150	no	yes	3.9	lb/day					1.95E-06	4.87E-04	9.41E-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	2.18E+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	0.00E+00	1.84E-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	0.00E+00	4.91E-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	0.00E+00	3.47E+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	1.55E-02	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	4.79E+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	3.59E-01	Yes	No	NOTE 2
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (T)	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	0.00E+00	1.14E-06	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	0.00E+00	1.84E+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	0.00E+00	2.81E-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	0.00E+00	5.77E+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	0.00E+00	2.45E+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	0.00E+00	7.71E+02			
Propionaldehyde (H)	123386	yes	no					1.30E-04	3.25E-02							1.30E-04	3.25E-02	7.80E-01	2.85E+02	0.00E+00	1.14E+02			
Quinone (H)	106514	yes	no					1.60E-04	4.00E-02							1.60E-04	4.00E-02	9.60E-01	3.50E+02	0.00E+00	1.40E+02			
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	3.07E-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	3.51E+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	1.58E-01			
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	4.42E+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	2.28E-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	2.24E+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	0.00E+00	1.31E+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	8.73E-01			
Cumene (H)	98828	no	yes							0.00E+00	0.00E+00	4.57E-06	1.14E-03	4.57E-06	1.14E-03	2.74E-02	1.00E+01	0.00E+00	4.01E+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	7.65E-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	3.74E-03	1.37E+00	0.00E+00	5.48E-01					
Xylene, o- (H)	95476	no	yes							6.95E-08	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	9.00E+00			
HAPs, TOTAL								1.00E-02	2.50E+00	1.87E-04	4.68E-02	8.68E-05	2.17E-02	2.74E-04	6.85E-02	1.03E-02	2.57E+00	6.16E+01	2.25E+04	0.00E+00	9.00E+03			

Asphalt cement heater

heat input	1.2	MMBtu/hr
sulfur content	0.50	%S

Assumptions:

Fired with distillate oil (No.2 or diesel)
Emission factors taken from AP-42 section 1.3 Fuel Oil Combustion
Heating value 140 MMBtu/ 1000 gallons

Pollutant	factors (lb/1000 gallon)			factors lb/MMBtu
SO2	142	S	where S = % sulfur	0.5071
NOx	20			0.1429
CO	5			0.0357
VOC (NMTOC)	0.34			0.0024
filterable PM	2			0.0143
condensible PM	1.3			0.0093
total PM	3.3			0.0236
total PM10	3.3			0.0236

Emission factors taken from AP-42,Table 11.19.2-2, 8/04, Crushed Stone Processing and Pulverized Mineral Processing

RAP crusher

maximum capacity	65	tph
hours of operation	8760	hours

	emission factors (dry) (lb/ton)		emissions (lb/hr)		emissions ton/yr	
	TSP	**PM-10**	**TSP**	**PM-10**	**TSP**	**PM-10**
primary crusher	0.0054	0.0024	0.351	0.156	1.54	0.68
screening	0.025	0.0087	1.625	0.5655	7.12	2.48
conveyor transfer point	0.018	0.0066	1.17	0.429	5.12	1.88
	total		**3.15**	**1.15**	**13.78**	**5.04**

combined EF	0.0484	0.0177

Emissions summary from Silo Filling and Loadout operations

Pollutant	CAS Nos.	Emission Factors (lb/ton) Silo Filling SCC-3-05-002-13	Emission Factors (lb/ton) Load out SCC-3-05-002-14	Potential Emissions (lb/hr) Silo Filling SCC-3-05-002-13	Potential Emissions (lb/hr) Load out SCC-3-05-002-14	Emission factors (lb/ton) Silo Filling plus Load Out
Total PM		5.86E-04	5.22E-04	1.46E-01	1.30E-01	1.11E-03
CO		1.18E-03	1.35E-03	2.95E-01	3.37E-01	2.53E-03
VOC		1.22E-02	3.91E-03	3.05E+00	9.77E-01	1.61E-02
PAH HAPs TOTAL		2.89E-05	2.02E-05	7.24E-03	5.05E-03	4.92E-05
Volatile organic HAPs, TOTAL		1.58E-04	6.24E-05	3.96E-02	1.56E-02	2.21E-04
HAPs, TOTAL		1.87E-04	8.66E-05	4.68E-02	2.17E-02	2.74E-04
Benzo(a)pyrene (T)	50328	0.00E+00	7.84E-09	0.00E+00	1.96E-06	7.84E-09
Napthalene (H)	91203	4.62E-06	4.26E-06	1.16E-03	1.07E-03	8.88E-06
Phenol (TH)	108952	0.00E+00	4.02E-06	0.00E+00	1.01E-03	4.02E-06
Benzene (TH)	71432	3.90E-06	2.16E-06	9.75E-04	5.41E-04	6.06E-06
Methyl bromide (H)	74839	5.97E-07	3.99E-07	1.49E-04	9.98E-05	9.96E-07
Methyl ethyl ketone (TH)	78933	4.75E-06	2.04E-06	1.19E-03	5.09E-04	6.79E-06
Carbon disulfide (TH)	75150	1.95E-06	5.41E-07	4.87E-04	1.35E-04	2.49E-06
Cumene (H)	98828	0.00E+00	4.57E-06	0.00E+00	1.14E-03	4.57E-06
Ethyl benzene (H)	100414	4.63E-06	1.16E-05	1.16E-03	2.91E-03	1.63E-05
Ethyl chloride (chloroethane) (H)	75003	0.00E+00	8.73E-09	0.00E+00	2.18E-06	8.73E-09
Formaldehyde (TH)	50000	8.41E-05	3.66E-06	2.10E-02	9.15E-04	8.77E-05
Hexane, n- (TH)	110543	1.22E-05	6.24E-06	3.05E-03	1.56E-03	1.84E-05
Methyl chloride (H)	74873	0.00E+00	6.24E-07	0.00E+00	1.56E-04	6.24E-07
Methyl chloroform (TH)	71556	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylene chloride (TH)	75092	3.29E-08	0.00E+00	8.23E-06	0.00E+00	3.29E-08
Perchloroethylene (tetrachloroethylene) (TH)	127184	0.00E+00	3.20E-07	0.00E+00	8.01E-05	3.20E-07
Styrene (TH)	100425	6.58E-07	3.04E-07	1.65E-04	7.59E-05	9.62E-07
Toluene (TH)	108883	7.56E-06	8.73E-06	1.89E-03	2.18E-03	1.63E-05
Trichloroethylene (TH)	79016	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichlorofluoromethane (CFC 111) (T)	75694	0.00E+00	5.41E-08	0.00E+00	1.35E-05	5.41E-08
Trimethylpentane, 2,2,4- (H)	540841	3.78E-08	7.49E-08	9.44E-06	1.87E-05	1.13E-07
Xylene (TH)	1330207	2.44E-05	1.71E-05	6.09E-03	4.26E-03	4.14E-05
Xylene, o- (H)	95476	6.95E-06	3.33E-06	1.74E-03	8.32E-04	1.03E-05
Hydrgen Sulfide (T)	7783064	1.46E-06	1.46E-06	3.65E-04	3.65E-04	2.92E-06

Plant maximum production capacity:	250	tons per hour
Requested Annual Production Limit:	876,000	tons per year
Requested Daily Production Limit:	0	tons per day

V -0.5 %
t 325 oF
785 oR

Table 11.1-14

Predictive Emission Factor Equations for Load-out and silo Filling Operations

source	pollutant	EF (lb/ton)
Load out SCC-3-05-002-14	Total PM	0.000521937
	Organic PM	0.000340937
	TOC	0.004158948
	CO	0.00134924
Silo Filling SCC-3-05-002-13	Total PM	0.000585889
	Organic PM	0.000253889
	TOC	0.012186685
	CO	0.001179981

Table 11.1-15
Speciation Profiles for Load-out, Silo Filling and Asphalt Storage Emissions - Organic PM based Compounds

		Spec. profile for Load-out and yard emissions	Spec. profile for Silo filling and asphalt storage tank emissions	loadout emission factors (lb/ton)	Silo filling emission factors (lb/ton)
		% Compound / Organic PM	% Compound / Organic PM		
Benzo(a)pyrene (T)	50328	0.0023	0	7.84155E-09	0
Napthalene (H)	91203	1.25	1.82	4.26171E-06	4.62078E-06
PAH HAPs TOTAL		5.93	11.4	2.02176E-05	2.89434E-05
Phenol (TH)	108952	1.18	0	4.02306E-06	0

Table 11.1-16

Speciation Profiles for Load-out, Silo Filling and Asphalt Storage Emissions - Organic Volatile based Compounds

		Spec. profile for Load-out and yard emissions	Spec. profile for Silo filling and asphalt	loadout emission factors (lb/ton)	Silo filling emission factors (lb/ton)
		% Compound / TOC	% Compound / TOC		
VOC		94	100	0.003909411	0.012186685
Benzene (TH)	71432	0.052	0.032	2.16265E-06	3.89974E-06
Methyl bromide (H)	74839	0.0096	0.0049	3.99259E-07	5.97148E-07
Methyl ethyl ketone (TH)	78933	0.049	0.039	2.03788E-06	4.75281E-06
Carbon disulfide (TH)	75150	0.013	0.016	5.40663E-07	1.94987E-06
Cumene (H)	98828	0.11	0	4.57484E-06	0
Ethyl benzene (H)	100414	0.28	0.038	1.16451E-05	4.63094E-06
Ethyl chloride (chloroethane) (H)	75003	0.00021		8.73379E-09	0
Formaldehyde (TH)	50000	0.088	0.69	3.65987E-06	8.40881E-05
Hexane, n- (TH)	110543	0.15	0.1	6.23842E-06	1.21867E-05
Methyl chloride (H)	74873	0.015		6.23842E-07	0
Methyl chloroform (TH)	71556	0	0	0	0
Methylene chloride (TH)	75092	0	0.00027	0	3.29041E-08
Perchloroethylene (tetrachloroethylene) (TH)	127184	0.0077	0	3.20239E-07	0
Styrene (TH)	100425	0.0073	0.0054	3.03603E-07	6.58081E-07
Toluene (TH)	108883	0.21	0.062	8.73379E-06	7.55574E-06
Trichloroethylene (TH)	79016	0	0	0	0
Trichlorofluoromethane (CFC 111) (T)	75694	0.0013	0	5.40663E-08	0
Trimethylpentane, 2,2,4- (H)	540841	0.0018	0.00031	7.48611E-08	3.77787E-08
Xylene (TH)	1330207	0.41	0.2	1.70517E-05	2.43734E-05
Xylene, o- (H)	95476	0.08	0.057	3.32716E-06	6.94641E-06
Volatile organic HAPs, TOTAL		1.5	1.3	6.23842E-05	0.000158427

		loadout emission factors (lb/ton)	Silo filling emission factors (lb/ton)
Hydrogen Sulfide	7783064	0.00000146	0.00000146

*** These emissions factors were taken from the October 12, 2005 letter from Keith Overcash stating the emissions factors resulting from testing at Mangum Asphalt Services, Knightdale, Wake County, and at S.T. Wooten Asphalt Services, Sanford, Lee County.

Emission factors current as of				BATCH	BATCH	BATCH	DRUM	DRUM	DRUM	DRUM	DRUM	DRUM	DRUM	DRUM
KEY: Metals in Red; Drums in Green; All blue cells on this sheet are linked to other cells. Correct original cell; All black cells are original cells				Dryer, hot screens and mixer (with fabric filter)	Natural gas or No 2 fuel oil-fired dryer, hot screens and mixer with fabric filter	Waste oil, drain oil- or No 6 fuel oil-fired dryer, hot screens and mixer with fabric filter	Natural gas-fired dryer with fabric filter	No 2 fuel oil-fired dryer with fabric filter	Waste oil-fired dryer with fabric filter	Fuel oil or waste oil-fired dryer with fabric filter	Fuel oil or waste oil-fired dryer uncontrolled	Fuel oil-fired dryer uncontrolled	Natural gas or propane-fired dryer with fabric filter	No 2 fuel oil, waste oil, drain oil No 6 fuel oil -fired dryer with fabric filter
				SCC 3-05-002-45, -46, -47	SCC 3-05-002-45, -46	SCC 3-05-002-47	SCC 3-05-002-55, -56, -57	SCC 3-05-002-58, -59, -60	SCC 3-05-002-61, -62, -63	SCC 3-05-002-58, -59, -60, -61, -62, -63	SCC 3-05-002-58, -59, -60, -61, -62, -63	SCC 3-05-002-58, -59, -60	SCC 3-05-002-55, -56, -57	SCC 3-05-002-58, -59, -60, -61, -62, -63
				Table 11.1-11 METALS	Table 11.1-9	Table 11.1-9	Table 11.1-10	Table 11.1-10	Table 11.1-10	Table 11.1-10 CHROMIUS	Table 11.1-10 CHROMIUS	Table 11.1-12 METALS	Table 11.1-12 METALS	Table 11.1-12 METALS
T	H	Acetaldehyde (TH)	75070		0.00032	0.00032			0.0013					
T	H	Acrolein (TH)	107028						0.000026					
	H	Antimony unlisted compounds (H)	SBC-other				0.00000018	0.00000018	0.00000018				0.00000018	0.00000018
T	H	Arsenic unlisted compounds (component of ASC) (TH)	ASC-other	0.00000045	0.00000046	0.00000046	0.00000056	0.00000056	0.00000056			0.0000013	0.00000056	0.00000056
T	H	Benzene (TH)	71432		0.00028	0.00026	0.00039	0.00039	0.00039					
T	H	Benzo(a)pyrene (TH)	50328		3.10E-10	3.10E-10	9.80E-09	9.80E-09	9.80E-09					
T	should als	Benzo(k)pyrene (T)	50328		3.10E-10	3.10E-10	9.80E-09	9.80E-09	9.80E-09					
T	H	Beryllium metal (unreacted) (TH)	7440417	0.00000015	0.00000015	0.00000015	0	0	0			0	0	0
T	H	Cadmium metal (elemental unreacted) (TH)	7440439	0.00000061	0.00000061	0.00000061	0.00000041	0.00000041	0.00000041			0.0000042	0.00000041	0.00000041
	H	Chromium unlisted cmpds (excl w/chrom acid to get CRC) (H)	CRC-other	0.00000522	0.00000522	0.00000522	0.00000505	0.00000505	0.00000506			0.000024	0.00000505	0.00000505
T	H	Chromic Acid (VI) (component of SolCRS and CRC) (TH)	7738945	0.00000048	0.00000048	0.00000048	0.00000045	0.00000045	0.00000045				0.00000045	0.00000045
	H	Cobalt unlisted compounds (H)	COC-other				0.00000026	0.00000026	0.00000026			0.000015	0.00000026	0.00000026
	H	Ethyl benzene (H)	100414		0.0022	0.0022	0.00024	0.00024	0.00024					
T	H	Formaldehyde (TH)	50000		0.00074	0.00074	0.0031	0.0031	0.0031					
T		Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (T)	57653857				1.3E-12	1.3E-12	1.3E-12	1.5E-12				
T	H	Hexane, n- (TH)	110543				0.00092	0.00092	0.00092					
T	H	Hydrochloric acid (unreacted HCl) (TH)	7647010				0.0000518	0.0000518	0.0000518					
T		Hydrogen sulfide (T)	7783064		0.0000518	0.0000518	0.0000518	0.0000518	0.0000518					
	H	Lead unlisted compounds (H)	PBC-other	0.00000089	0.00000089	0.00000089	0.00000062	0.000015	0.000015			0.00054	0.00000062	0.000015
T	H	Manganese unlisted compounds (T)	MNC-other	0.0000069	0.0000069	0.0000069	0.0000077	0.0000077	0.0000077			0.00065	0.0000077	0.0000077
T	H	Mercury, vapor (TH)	7439976	0.00000041	0.00000041	0.00000041	0.00000024	0.0000026	0.0000026				0.00000024	0.0000026
T	H	Methyl chloroform (TH)	71556				4.80E-05	4.80E-05	4.80E-05					
T	H	Methyl ethyl ketone (TH)	78933						0.00002					
	H	Naphthalene (H)	91203		3.60E-05	3.60E-05	9.00E-05	6.50E-04	6.50E-04					
T	H	Nickel metal (TH)	7440020	0.000003	0.000003	0.000003	0.000063	0.000063	0.000063			0.0013	0.000063	0.000063
	H	Phosphorus Metal, Yellow or White (H)	7723140				0.000028	0.000028	0.000028			0.0012	0.000028	0.000028
	H	Polycyclic Organic Matter (H)	POM		0.00011	0.00023	0.00019	0.00068	0.00068	1.20E-10	3.00E-09			
	H	Propionaldehyde (H)	123386						0.00013					
	H	Quinone (H)	106514		0.00027	0.00027			0.00015					
	H	Selenium compounds (H)	SEC	0.00000049	0.00000049	0.00000049	0.00000035	0.00000035	0.00000035				0.00000035	0.00000035
T	H	Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016					2.1E-13	2.1E-13	2.1E-13				
T	H	Toluene (TH)	108883		0.001	0.001	0.00015	0.0029	0.0029					
	H	Trimethylpentane, 2,2,4- (H)	540841				4.00E-05	4.00E-05	4.00E-05					
T	H	Xylene (TH)	1330207		0.0027	0.0027	0.0002	0.0002	0.0002					
		sums			0.00772128	0.00784128								
		Non- PAH HAPs, TOTAL			0.0075	0.0075	0.0051	0.0078	0.0095					
		PAH HAPs, TOTAL			0.00011	0.00023	0.00019	0.00068	0.00068					
		HAPs, TOTAL			0.0076	0.0077	0.0053	0.0067	0.01					
		Total PCDD						7.90E-11	7.90E-11	7.90E-11	2.80E-09			
		Total PCDF						4.00E-11	4.00E-11	4.00E-11	1.50E-10			
		tal PCDD/PCDF						1.20E-10	1.20E-10	1.20E-10	3.00E-09			

2	plant types
1	1. Batch mix
2	2. Drum mix

3	fuel type
1	1.Natural gas-fired
2	2. No.2 fuel oil-fired
3	3. Waste or No.6 fuel oil-fired

2	controls
1	1. uncontrolled
2	2. Fabric filter controls
3	3. Venturi or wet scrubber controls

Table 11.1-1
PM Emission Factors for Batch Mix HMAPs

dryer, hot screens, mixer SCC 3-05-002-45, -46, -47	filterable PM	filterable PM10	inorganic condensible PM	organic condensible PM	TOTAL condensible PM	total PM	total PM10
uncontrolled	32	4.5	0.013	0.0041	0.0171	32	4.5
fabric filter	0.025	0.0098	0.013	0.0041	0.0171	0.042	0.027
venturi or wet scrubber	0.12	0.12	0.013	0.0041	0.0171	0.14	0.14

Table 11.1-3
PM Emission Factors for Drum Mix HMAPs

dryer, hot screens, mixer SCC 3-05-002-05, -55 to -63	filterable PM	filterable PM10	inorganic condensible PM	organic condensible PM	TOTAL condensible PM	total PM	total PM10
uncontrolled	28	6.4	0.0074	0.058	0.0654	28	6.5
fabric filter	0.014	0.0039	0.0074	0.012	0.0194	0.033	0.023
venturi or wet scrubber	0.026	0.026	0.0074	0.012	0.0194	0.045	0.045

Table 11.1-5 and 6

Emission Factors for CO, CO2, Nox and SO2 from Batch Mix HMAPs

	CO	CO2	NOx	SO2	VOC
Natural gas fired dryer, hot screens and mixer SCC 3-05-002-45	0.4	37	0.025		0.0082
No.2 fuel oil-fired dryer, hot screens and mixer SCC 3-05-002-46	0.4	37	0.12		0.0082
Waste oil-fired dryer, hot screens and mixer SCC 3-05-002-47	0.4	37	0.12		0.036
Coal-fired dryer, hot screens and mixer SCC 3-05-002-98	ND	37	ND		
No.6 fuel oil-fired dryer, hot screens and mixer SCC 3-05-002-47					0.036

Table 11.1-7 and 8

Emission Factors for CO, CO2, Nox and SO2 from Drum Mix HMAPs

	CO	CO2	NOx	SO2	VOC	HCL
Natural gas fired dryer SCC 3-05-002-55, -56, -57	0.13	33	0.026		0.032	ND
No.2 fuel oil-fired dryer SCC 3-05-002-58, -59, -60	0.13	33	0.055		0.032	ND
Waste oil-fired dryer SCC 3-05-002-61, -62, -63	0.13	33	0.055		0.032	0.00021
Coal-fired dryer, SCC 3-05-002-98	ND	33	ND			

from Chapter 1.3 , AP-42, Fuel Oil Combustion, revised 09/98, Table 1.3.1		
	over 100 mmBtu/hr	under 100 mmBtu/hr
No.6, No.5	157	157
no.2	157	142

Plant maximum production capacity:	250	tons per hour
Dryer heat input:	80	million Btu per hour
Fuel Sulfur Content:	0.5	%

natural gas HV	1020 mmBtu/million scf
emissionNG combustion EF	0.6 lb SO2/ million scf
	0.000588 lb SO2/ mmBtu

No. 2 HV	140 mmBtu/1000 gallons
No. 6 HV	150 mmBtu/1000 gallons

		EF (lb/ton)
3	fuel type	
1	1.Natural gas-fired	0.0001
2	2. No.2 fuel oil-fired	0.0697
3	3. Waste or No.6 fuel oil-fired	0.0837

Note : 50% of the fuel bound sulfur up to a maximum (as SO2) of 0.1 lb/ton of product is expected to be retained in product.
0.1 lb SO2 retained / ton of product

plant types	SCCs	SO emission factor (lb/1000 gallons)/ %S	SO emission factor (lb/mmBtu)	SO emission rate (lb/hr)	SO emission rate (lb/ton asphalt produced)	50% of fuel bound sulfur (as SO2, lb/ton)	less than 0.1 lb/ton?	Corrected SO emission rate (lb/ton asphalt produced)
1. Batch mix, natural gas-fired, no controls			0.000588235	0.047	0.0002	0.0001	9.41176E-05	0.0001
2. Batch mix, natrual gas-fired, fabric filter controls	3-05-002-45		0.000588235	0.047	0.0002	0.0001	9.41176E-05	0.0001
3. Batch mix, natrual gas-fired, venturi or wet scrubber controls			0.000588235	0.047	0.0002	0.0001	9.41176E-05	0.0001
4. Batch mix, No.2 fuel oil-fired, no controls		157	0.560714286	44.857	0.1794	0.0897	0.089714286	0.0897
5. Batch mix, No.2 fuel oil-fired, fabric filter controls	3-05-002-46	157	0.560714286	44.857	0.1794	0.0897	0.089714286	0.0897
6. Batch mix, No.2 fuel oil-fired, venturi or wet scrubber controls		157	0.560714286	44.857	0.1794	0.0897	0.089714286	0.0897
7. Batch mix, waste or No.6 fuel oil-fired, no controls		157	0.523333333	41.867	0.1675	0.0837	0.083733333	0.0837
8. Batch mix, waste or No.6 fuel oil-fired, fabric filter controls	3-05-002-47	157	0.523333333	41.867	0.1675	0.0837	0.083733333	0.0837
9. Batch mix, waste or No.6 fuel oil-fired, venturi or wet scrubber controls		157	0.523333333	41.867	0.1675	0.0837	0.083733333	0.0837
10. Drum mix, natural gas-fired, no controls			0.000588235	0.047	0.0002	0.0001	9.41176E-05	0.0001
11. Drum mix, natrual gas-fired, fabric filter controls	3-05-002-55, -56, -57		0.000588235	0.047	0.0002	0.0001	9.41176E-05	0.0001
12. Drum mix, natrual gas-fired, venturi or wet scrubber controls			0.000588235	0.047	0.0002	0.0001	9.41176E-05	0.0001
13. Drum mix, No.2 fuel oil-fired, no controls		157	0.560714286	44.857	0.1794	0.0897	0.089714286	0.0897
14. Drum mix, No.2 fuel oil-fired, fabric filter controls	3-05-002-58, -59, -60	157	0.560714286	44.857	0.1794	0.0897	0.089714286	0.0897
15. Drum mix, No.2 fuel oil-fired, venturi or wet scrubber controls		157	0.560714286	44.857	0.1794	0.0897	0.089714286	0.0897
16. Drum mix, waste or No.6 fuel oil-fired, no controls		157	0.523333333	41.867	0.1675	0.0837	0.083733333	0.0837
17. Drum mix, waste or No.6 fuel oil-fired, fabric filter controls	3-05-002-61, -62, -63	157	0.523333333	41.867	0.1675	0.0837	0.083733333	0.0837
18. Drum mix, waste or No.6 fuel oil-fired, venturi or wet scrubber controls		157	0.523333333	41.867	0.1675	0.0837	0.083733333	0.0837

APPENDIX A4 - CONCRETE BATCH PLANT DEQ SPREADSHEET CALCULATIONS

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
FACILITY ID NUMBER:	TBD
PERMIT NUMBER	TBD
FACILITY CITY:	Prospect Hill
FACILITY COUNTY:	Caswell
SPREADSHEET PREPARED BY:	Scott Martino

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.*

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**
FACILITY ID NUMBER:	**TBD**
PERMIT NUMBER	**TBD**
FACILITY CITY:	**Prospect Hill**
FACILITY COUNTY:	**Caswell**
SPREADSHEET PREPARED BY:	**Scott Martino**

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	

TPER
0.053 lb/yr
0.28 lb/yr
0.37 lb/yr
0.013 lb/day
0.63 lb/day
0.13 lb/day

Appendix A4
Page 5 of 8

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - TAP CALCULATIONS

REVISION D; October 15, 2015

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ARSENIC (HAP/TAP) EMISSIONS INFORMATION

ARSENIC EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	Pollutant	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Arsenic	5.69E-05	4.98E-01	2.43E-03	2.13E+01	5.69E-05	4.98E-01
central mix	Arsenic	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Arsenic	1.14E-07	9.98E-04	4.52E-05	3.96E-01	1.14E-07	9.98E-04
supplement silo*	Arsenic	8.88E-06	7.78E-02	8.88E-06	7.78E-02	8.88E-06	7.78E-02
TOTAL	**Arsenic**	**6.59E-05**	**5.77E-01**	**2.49E-03**	**2.18E+01**	**6.59E-05**	**5.77E-01**

(Arsenic TPER: 0.053 lb/yr)

BERYLLIUM (HAP/TAP) EMISSIONS INFORMATION

BERYLLIUM EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	Pollutant	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Beryllium	3.72E-06	3.26E-02	8.73E-06	7.64E-02	3.72E-06	3.26E-02
central mix	Beryllium	-	-	-	-	-	-
cement silo	Beryllium	1.31E-08	1.14E-04	4.81E-07	4.21E-03	1.31E-08	1.14E-04
supplement silo*	Beryllium	8.03E-07	7.03E-03	8.03E-07	7.03E-03	8.03E-07	7.03E-03
TOTAL	**Beryllium**	**4.53E-06**	**3.97E-02**	**1.00E-05**	**8.77E-02**	**4.53E-06**	**3.97E-02**

(Beryllium TPER: 0.28 lb/yr)

CADMIUM (HAP/TAP) EMISSIONS INFORMATION

CADMIUM EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	Pollutant	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Cadmium	3.24E-07	2.84E-03	1.22E-06	1.07E-02	3.24E-07	2.84E-03
central mix	Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Cadmium	-	-	6.29E-06	5.51E-02	-	-
supplement silo*	Cadmium	1.76E-07	1.54E-03	1.76E-07	1.54E-03	1.76E-07	1.54E-03
TOTAL	**Cadmium**	**5.00E-07**	**4.38E-03**	**7.69E-06**	**6.74E-02**	**5.00E-07**	**4.38E-03**

(Cadmium TPER: 0.37 lb/yr)

CHROMIUM (HAP/TAP) EMISSIONS INFORMATION

CHROMIUM EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	Pollutant	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Chromium	1.47E-04	1.28E+00	4.08E-04	3.57E+00	1.47E-04	1.28E+00
central mix	Chromium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Chromium	7.80E-07	6.83E-03	6.77E-06	5.93E-02	7.80E-07	6.83E-03
supplement silo*	Chromium	1.08E-05	9.49E-02	1.08E-05	9.49E-02	1.08E-05	9.49E-02
TOTAL	**Chromium**	**1.58E-04**	**1.39E+00**	**4.25E-04**	**3.73E+00**	**1.58E-04**	**1.39E+00**

(Chromium TPER: 0.013 lb/day)

CONCRETE BATCH PLANT EMISSIONS CALCULATOR - TAP CALCULATIONS

REVISION D; October 15, 2015

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LEAD (HAP) EMISSIONS INFORMATION

LEAD EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	Pollutant	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Lead	5.47E-05	4.79E-01	1.29E-03	1.13E+01	5.47E-05	4.79E-01
central mix	Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Lead	2.93E-07	2.57E-03	1.98E-05	1.73E-01	2.93E-07	2.57E-03
supplement silo*	Lead	4.62E-06	4.05E-02	4.62E-06	4.05E-02	4.62E-06	4.05E-02
TOTAL	**Lead**	**5.96E-05**	**5.22E-01**	**1.32E-03**	**1.16E+01**	**5.96E-05**	**5.22E-01**

MANGANESE (HAP/TAP) EMISSIONS INFORMATION

MANGANESE EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	Pollutant	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Manganese	7.44E-04	6.52E+00	2.19E-03	1.92E+01	7.44E-04	6.52E+00
central mix	Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Manganese	3.14E-06	2.75E-02	5.48E-03	4.80E+01	3.14E-06	2.75E-02
supplement silo*	Manganese	2.27E-06	1.99E-02	2.27E-06	1.99E-02	2.27E-06	1.99E-02
TOTAL	**Manganese**	**7.49E-04**	**6.56E+00**	**7.67E-03**	**6.72E+01**	**7.49E-04**	**6.56E+00**

(Manganese TPER: 0.63 lb/day)

NICKEL (HAP/TAP) EMISSIONS INFORMATION

NICKEL EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	Pollutant	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Nickel	1.71E-04	1.50E+00	4.26E-04	3.73E+00	1.71E-04	1.50E+00
central mix	Nickel	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Nickel	1.12E-06	9.84E-03	4.73E-04	4.14E+00	1.12E-06	9.84E-03
supplement silo*	Nickel	2.02E-05	1.77E-01	2.02E-05	1.77E-01	2.02E-05	1.77E-01
TOTAL	**Nickel**	**1.92E-04**	**1.68E+00**	**9.19E-04**	**8.05E+00**	**1.92E-04**	**1.68E+00**

(Nickel TPER: 0.13 lb/day)

PHOSPHORUS (HAP) EMISSIONS INFORMATION

PHOSPHORUS EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	Pollutant	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Phosphorus	4.40E-04	3.85E+00	1.37E-03	1.20E+01	4.40E-04	3.85E+00
central mix	Phosphorus	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
cement silo	Phosphorus	-	-	3.17E-04	2.78E+00	-	-
supplement silo*	Phosphorus	3.14E-05	2.75E-01	3.14E-05	2.75E-01	3.14E-05	2.75E-01
TOTAL	**Phosphorus**	**4.71E-04**	**4.13E+00**	**1.72E-03**	**1.51E+01**	**4.71E-04**	**4.13E+00**

SELENIUM (HAP) EMISSIONS INFORMATION

SELENIUM EMISSIONS		ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS)		POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITS)		POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITS)	
Source	Pollutant	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr
truck mix	Selenium	4.04E-06	3.54E-02	9.37E-05	8.21E-01	4.04E-06	3.54E-02
central mix	Selenium	-	-	-	-	-	-
cement silo	Selenium	-	-	-	-	-	-
supplement silo*	Selenium	6.43E-07	5.63E-03	6.43E-07	5.63E-03	6.43E-07	5.63E-03
TOTAL	**Selenium**	**4.68E-06**	**4.10E-02**	**9.43E-05**	**8.26E-01**	**4.68E-06**	**4.10E-02**

EMISSION FACTOR SUMMARY FOR READY-MIXED CONCRETE BATCH FACILITIES

Emission Source Description	PM Emission Factors	PM_{10} Emission Factors	Arsenic Emission Factors	References
Cement Silo without controls	0.73 lb/ton cement	0.47 lb/ton cement	1.68E-06 lb/ton cement	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-2 (PM/PM10) & Table 11.12-8 (As)
Cement Silo with controls	0.00099 lb/ton cement	0.00034 lb/ton cement	4.24E-09 lb/ton cement	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-2 (PM/PM10) & Table 11.12-8 (As)
Suppl Silo without controls	3.14 lb/ton suppl	1.1 lb/ton suppl	No Data -	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-2 (PM/PM10)
Suppl Silo with controls	0.0089 lb/ton suppl	0.0049 lb/ton suppl	0.000001 lb/ton suppl	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-2 (PM/PM10) & Table 11.12-8 (As)
Weigh Hopper without controls	0.0048 lb/ton aggr+sand	0.0028 lb/ton aggr+sand	No Data -	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-2 (PM/PM10)
Weigh Hopper with controls	No Data -	No Data -	No Data -	-
Truck Mix without controls	1.46 lb/ton cement+suppl	0.417 lb/ton cement+suppl	6.80E-05 lb/ton cement+suppl	Memorandum, Emission Factors for Ready-Mixed Concrete Facilities. From Mr. Keith Overcash (NC DAQ, Director) to Section Chiefs/Regional Supervisors. June 8, 2005.
Truck Mix with controls	0.028 lb/ton cement+suppl	0.0105 lb/ton cement+suppl	1.59E-06 lb/ton cement+suppl	Memorandum, Emission Factors for Ready-Mixed Concrete Facilities. From Mr. Keith Overcash (NC DAQ, Director) to Section Chiefs/Regional Supervisors. June 8, 2005.
Central Mix without controls	0.683 lb/ton cement+suppl	0.181 lb/ton cement+suppl	2.80E-05 lb/ton cement+suppl	Memorandum, Emission Factors for Ready-Mixed Concrete Facilities. From Mr. Keith Overcash (NC DAQ, Director) to Section Chiefs/Regional Supervisors. June 8, 2005.
Central Mix with controls	0.0212 lb/ton cement+suppl	0.00577 lb/ton cement+suppl	8.85E-07 lb/ton cement+suppl	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-2 (PM/PM10) & Table 11.12-8 (As)
Sand Plant-Wide*	0.0063 lb/ton sand	0.00297 lb/ton sand	No Data -	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-2 (PM/PM10)
Aggr Plant-Wide*	0.0207 lb/ton aggr	0.0099 lb/ton aggr	No Data -	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-2 (PM/PM10)

*There are 3 emission points for sand transfer and 3 emission points for aggr transfer plant-wide, so those emission factors are multiplied by 3 to get a plant-wide emission factor (consistent with Table 11.12-5

Emission Source Description	Beryllium Emission Factors	Cadmium Emission Factors	Chromium Emission Factors	Lead Emission Factors	References
Cement Silo without controls	1.79E-08 lb/ton cement	2.34E-07 lb/ton cement	2.52E-07 lb/ton cement	7.36E-07 lb/ton cement	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-8
Cement Silo with controls	4.86E-10 lb/ton cement	No Data -	2.9E-08 lb/ton cement	1.09E-08 lb/ton cement	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-8
Suppl Silo without controls	No Data -	No Data -	No Data -	No Data -	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-8
Suppl Silo with controls	9.04E-08 lb/ton suppl	1.98E-08 lb/ton suppl	1.22E-06 lb/ton suppl	5.2E-07 lb/ton suppl	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-8
Weigh Hopper without controls	No Data -	No Data -	No Data -	No Data -	-
Weigh Hopper with controls	No Data -	No Data -	No Data -	No Data -	-
Truck Mix without controls	2.44E-07 lb/ton cement+suppl	3.42E-08 lb/ton cement+suppl	1.14E-05 lb/ton cement+suppl	3.62E-05 lb/ton cement+suppl	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-8
Truck Mix with controls	1.04E-07 lb/ton cement+suppl	9.06E-09 lb/ton cement+suppl	4.10E-06 lb/ton cement+suppl	1.53E-08 lb/ton cement+suppl	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-8
Central Mix without controls	No Data -	1.18E-08 lb/ton cement+suppl	1.42E-06 lb/ton cement+suppl	3.82E-07 lb/ton cement+suppl	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-8
Central Mix with controls	No Data -	7.10E-10 lb/ton cement+suppl	1.27E-07 lb/ton cement+suppl	3.66E-08 lb/ton cement+suppl	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-8
Sand & Aggr Plant-Wide	No Data -	No Data -	No Data -	No Data -	-

Emission Source Description	Manganese Emission Factors	Nickel Emission Factors	Phosphorous Emission Factors	Selenium Emission Factors	References
Cement Silo without controls	0.000204 lb/ton cement	0.0000176 lb/ton cement	0.0000118 lb/ton cement	No Data -	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-8
Cement Silo with controls	1.17E-07 lb/ton cement	4.18E-08 lb/ton cement	No Data -	No Data -	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-8
Suppl Silo without controls	No Data -	No Data -	No Data -	No Data -	-
Suppl Silo with controls	2.56E-07 lb/ton suppl	2.28E-06 lb/ton suppl	3.54E-06 lb/ton suppl	7.24E-08 lb/ton suppl	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-8
Weigh Hopper without controls	No Data -	No Data -	No Data -	No Data -	-
Weigh Hopper with controls	No Data -	No Data -	No Data -	No Data -	-
Truck Mix without controls	6.12E-05 lb/ton cement+suppl	1.19E-05 lb/ton cement+suppl	3.84E-05 lb/ton cement+suppl	2.62E-06 lb/ton cement+suppl	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-8
Truck Mix with controls	2.08E-05 lb/ton cement+suppl	4.78E-06 lb/ton cement+suppl	1.23E-05 lb/ton cement+suppl	1.13E-07 lb/ton cement+suppl	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-8
Central Mix without controls	6.12E-05 lb/ton cement+suppl	3.28E-06 lb/ton cement+suppl	2.02E-05 lb/ton cement+suppl	No Data -	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-8
Central Mix with controls	3.78E-06 lb/ton cement+suppl	2.48E-07 lb/ton cement+suppl	1.20E-06 lb/ton cement+suppl	No Data -	U.S. EPA, Office of Air Quality Planning and Standards. AP-42; Chapter 11.12 (June 2006 w/ Feb2011), Table 11.12-8
Sand & Aggr Plant-Wide	No Data -	No Data -	No Data -	No Data -	-

APPENDIX A5 - QUARRY DEQ SPREADSHEET CALCULATIONS

STONE CRUSHING EMISSIONS CALCULATOR REVISION C 05/23/2011
PERMITTING AND MODELING 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. Enter emission source / facility data on this sheet *for permitting and/or modeling*. The air emission results and summary for each type of equipment will be on its own sheet (e.g., crushers output, screens output). The facility-wide totals are summarized on the "OUTPUT" sheet. The different tabs are on the bottom of this screen.
2. For each type of equipment fill in all *BLUE* fields.

Company Name:	Carolina Sunrock LLC
Facility ID No.:	N/A
Permit No.:	N/A
Facility City:	Prospect Hill
Facility County:	Caswell
Spreadsheet Prepared by:	Aimee Andrews, Trinity Consultants

Actual hours of operation:	3744	hours
Total Plant Maximum Rated Capacity:	1500	tons per hour
Actual Annual Total Plant Production:	5616000	tons
Potential Annual Total Plant Production:	7117500	tons

Crusher Input

How many crushers total ? 10

*Note: If wet supression is not applied on an automatic and continuous basis during the operation of the crusher, answer "no" for "wet supression (Y/N)?".

Crusher ID No.	Type of crusher	Maximum Rated Capacity (tons/hr)	*wet supression (Y/N) ?	actual yearly throughput (tons)
J50	Primary	400	wet	1,497,600
J45	Primary	400	wet	1,497,600
CR-BTI	Primary	400	wet	1,497,600
4860	Primary	1200	wet	4,492,800
CR2-57SBS	Secondary or Tertiary	400	wet	1,497,600
GEN3	Secondary or Tertiary	400	wet	1,497,600
CR2-HP500	Secondary or Tertiary	500	wet	1,872,000
GEN5	Secondary or Tertiary	500	wet	1,872,000
CR3	Fines	155	wet	580,320
GEN7	Fines	155	wet	580,320
	Primary	0	wet	0
	Primary	0	wet	0
	Primary	0	wet	0
	Primary	0	dry	0
	Primary	0	dry	0

Screens Input

How many screens total ? 8

Screen ID No.	Type of screen	Maximum Rated Capacity (tons/hr)	wet supression (Y/N) ?	actual yearly throughput (tons)
SC-1	Normal	1000	wet	3744000
SS1KF-1	Normal	400	wet	1497600
SC-2	Normal	600	wet	2246400
SC-GEN-2	Normal	125	wet	468000
SC-3	Normal	600	wet	2246400
SC-3	Normal	600	wet	2246400
FM	Fines	290	wet	1085760
SC4	Fines	310	wet	1160640
	Normal	0	wet	0
	Normal	0	wet	0
	Normal	0	wet	0
	Normal	0	wet	0
	Normal	0	wet	0
	Normal	0	wet	0
	Normal	0	wet	0

Conveyor Input (1/3)

How many conveyors total ? 62

***NOTE: Each conveyor will have one transfer point, the point where it drops product, not receives product. Answer "no" if the conveyor drops to a screen or a crusher. The transfer points to the crushers and screens are already accounted for in the emission factors for these units.**

Conveyor ID No.	*Conveyor transfer point ?	Maximum Rated Capacity (tons/hr)	wet supression (Y/N) ?	actual yearly throughput (tons)
C-1	yes	1200	wet	7,200,000
C-2	yes	1200	wet	7,200,000
C-3	no	1200	wet	7,200,000
C-4	yes	1200	wet	7,200,000
C-5	yes	1200	wet	7,200,000
C-6	yes	1200	wet	7,200,000
SP1KF-1	no	375	wet	2,250,000
SP1KF-2	no	375	wet	2,250,000
SP1KF-3	yes	375	wet	2,250,000
C-7	yes	1000	wet	6,000,000
C-8	yes	400	wet	2,400,000
C-9	yes	400	wet	2,400,000
C-10	yes	400	wet	2,400,000
C-11	yes	200	wet	1,200,000
C-12	no	200	wet	1,200,000
C-13	yes	200	wet	1,200,000
TC-1ABC	yes	200	wet	1,200,000
C-14	yes	400	wet	2,400,000
C-15	yes	400	wet	2,400,000
TC-2RRB	yes	400	wet	2,400,000
C-16	yes	800	wet	4,800,000
C-17	no	800	wet	4,800,000
SP2KF-1	yes	300	dry	1,800,000
SP2KF-2	yes	300	dry	1,800,000
C-18	yes	600	dry	3,600,000

Conveyor Input (2/3)

Conveyor ID No.	*Conveyor transfer point ?	Maximum Rated Capacity (tons/hr)	wet supression (Y/N) ?	actual yearly throughput (tons)
SC2-C1	yes	500	wet	3,000,000
C-19	yes	500	wet	3,000,000
CR3KF-1	no	500	wet	3,000,000
C-20	yes	500	wet	3,000,000
C-21	yes	500	wet	3,000,000
SC2-C2	yes	600	wet	3,600,000
C-22	no	500	wet	3,000,000
C-23	no	290	wet	1,740,000
C-24	yes	290	wet	1,740,000
C-25	yes	290	wet	1,740,000
TC-3DS	yes	290	wet	1,740,000
C-26	yes	155	wet	930,000
C-27	yes	155	wet	930,000
C-28	yes	155	wet	930,000
CR4KF-1	no	155	wet	930,000
C-29	yes	155	wet	930,000
C-30	yes	290	wet	1,740,000
C-31	yes	290	wet	1,740,000
TP-4S	yes	290	wet	1,740,000
C-32	yes	155	wet	930,000
C-33	yes	155	wet	930,000
C-34	no	310	wet	1,860,000
C-35	yes	46	dry	276,000
C-36	yes	162	dry	972,000
C-37	yes	100	dry	600,000

Conveyor Input (3/3)

Conveyor ID No.	*Conveyor transfer point ?	Maximum Rated Capacity (tons/hr)	wet supression (Y/N) ?	actual yearly throughput (tons)
FB1	yes	45	wet	270,000
FB2	yes	162	wet	972,000
FB3	no	100	wet	600,000
C-38	yes	45	wet	270,000
C-39	yes	162	wet	972,000
C-40	yes	100	wet	600,000
C-41	no	45	wet	270,000
C-42	no	162	wet	972,000
C-43	yes	100	wet	600,000
TC-5-67s	yes	100	wet	600,000
TC-6-57s	yes	290	wet	1,740,000
TC-7-78s	yes	290	wet	1,740,000
	yes	0	wet	0
	yes	0	wet	0
	no	0	wet	0
	yes	0	wet	0
	yes	0	wet	0
	yes	0	wet	0
	yes	0	wet	0
	yes	0	wet	0
	yes	0	wet	0
	yes	0	wet	0
	no	0	wet	0
	yes	0	dry	0
	yes	0	dry	0
	yes	0	dry	0

STONE QUARRY EMISSIONS CALCULATOR REVISION C 05/23/2011 - 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.

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.

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

COMPANY:	Carolina Sunrock LLC
FACILITY ID NO.:	N/A
PERMIT NUMBER:	N/A
FACILITY CITY:	Prospect Hill
FACILITY COUNTY:	Caswell
SPREADSHEET PREPARED BY:	Aimee Andrews, Trinity

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS lb/hr	POTENTIAL EMSSIONS tons/yr
PARTICULATE MATTER (PM)	2.40E-02	48.08	21.72	95.31
PARTICULATE MATTER<10 MICRONS (PM_{10})	9.36E-03	18.73	8.64	37.89
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)	4.17E-03	8.35	3.50	15.35
DIOXIDE (SO2)				
OXIDES (NOx)				
ONOXIDE (CO)				
IC COMPOUNDS (VOC)				
EAD				

TOXIC / HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION

OUS AIR POLLUTANT	CAS NUMBER	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) lb/hr	ACTUAL EMISSIONS (AFTER CONTROLS / LIMITS) tons/yr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) lb/hr	POTENTIAL EMSSIONS (AFTER CONTROLS / LIMITS) tons/yr	EMISSION FACTOR lb/mmBtu uncontrolled	EMISSION FACTOR lb/mmBtu controlled

TOXIC AIR POLLUTANT EMISSIONS INFORMATION (FOR PERMITTING PURPOSES)

S AFTER CONTROLS / LIMITATIONS R POLLUTANT	CAS Num.	lb/hr	lb/day	lb/yr	EMISSION FACTOR lb/mmBtu uncontrolled	EMISSION FACTOR lb/mmBtu controlled

Crusher Calculations and Output

		5.97	2.64	0.44	26.15	11.56	1.93	11.18	4.94	0.83		
Company Name:	Carolina Sunrock LLC	hourly potential TSP emissions	hourly potential PM_{10} emissions	hourly potential PM2.5 emissions	yearly potential TSP emissions	yearly potential PM_{10} emissions	yearly potential PM2.5 emissions	yearly actual TSP emissions	yearly actual PM_{10} emissions	yearly actual PM2.5 emissions	TSP emission	PM_{10} emission
Facility ID No.:	N/A											
Permit No.:	N/A											
Facility City:	Prospect Hill											
Facility County:	Caswell	(lb/hr)	(lb/hr)	(lb/hr)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	factor (lb/ton)	factor (lb/ton)
Primary Crusher ID No. J50 with wet supression												
Maximum Rated Capacity	400 tons/hour	0.48	0.216	0.04	2.1024	0.94608	0.1752	0.89856	0.404352	0.07488	0.0012	0.00054
Actual annual throughput	1,497,600 tons											
Primary Crusher ID No. J45 with wet supression												
Maximum Rated Capacity	400 tons/hour	0.48	0.216	0.04	2.1024	0.94608	0.1752	0.89856	0.404352	0.07488	0.0012	0.00054
Actual annual throughput	1,497,600 tons											
Primary Crusher ID No. CR-BTI with wet supression												
Maximum Rated Capacity	400 tons/hour	0.48	0.216	0.04	2.1024	0.94608	0.1752	0.89856	0.404352	0.07488	0.0012	0.00054
Actual annual throughput	1,497,600 tons											
Primary Crusher ID No. 4860 with wet supression												
Maximum Rated Capacity	1200 tons/hour	1.44	0.648	0.12	6.3072	2.83824	0.5256	2.69568	1.213056	0.22464	0.0012	0.00054
Actual annual throughput	4,492,800 tons											
Secondary or Tertiary Crusher ID No. CR2-57SBS with wet supression												
Maximum Rated Capacity	400 tons/hour	0.48	0.216	0.04	2.1024	0.94608	0.1752	0.89856	0.404352	0.07488	0.0012	0.00054
Actual annual throughput	1,497,600 tons											
Secondary or Tertiary Crusher ID No. GEN3 with wet supression												
Maximum Rated Capacity	400 tons/hour	0.48	0.216	0.04	2.1024	0.94608	0.1752	0.89856	0.404352	0.07488	0.0012	0.00054
Actual annual throughput	1,497,600 tons											
Secondary or Tertiary Crusher ID No. CR2-HP500 with wet supression												
Maximum Rated Capacity	500 tons/hour	0.6	0.27	0.05	2.628	1.1826	0.219	1.1232	0.50544	0.0936	0.0012	0.00054
Actual annual throughput	1,872,000 tons											
Secondary or Tertiary Crusher ID No. GEN5 with wet supression												
Maximum Rated Capacity	500 tons/hour	0.6	0.27	0.05	2.628	1.1826	0.219	1.1232	0.50544	0.0936	0.0012	0.00054
Actual annual throughput	1,872,000 tons											
Fines Crusher ID No. CR3 with wet supression												
Maximum Rated Capacity	155 tons/hour	0.465	0.186	0.01085	2.0367	0.81468	0.047523	0.87048	0.348192	0.0203112	0.003	0.0012
Actual annual throughput	580,320 tons											
Fines Crusher ID No. GEN7 with wet supression												
Maximum Rated Capacity	155 tons/hour	0.465	0.186	0.01085	2.0367	0.81468	0.047523	0.87048	0.348192	0.0203112	0.003	0.0012
Actual annual throughput	580,320 tons											
				0						0		
				0						0		
				0						0		
				0						0		
				0						0		

Screens Calculations and Output

Company Name: Carolina Sunrock LLC Facility ID No.: N/A Permit No.: N/A Facility City: Prospect Hill Facility County: Caswell	9.48 hourly potential TSP emissions (lb/hr)	3.78 hourly potential PM_{10} emissions (lb/hr)	1.49 hourly potential PM_{10} emissions (lb/hr)	41.50 yearly potential TSP emissions (tpy)	16.56 yearly potential PM_{10} emissions (tpy)	6.51 yearly potential PM2.5 emissions (tpy)	17.74 yearly actual TSP emissions (tpy)	7.08 yearly actual PM_{10} emissions (tpy)	2.78 yearly actual PM2.5 emissions (tpy)	TSP emission factor (lb/ton)	PM_{10} emission factor (lb/ton)
Normal Screen ID No. SC-1 with wet supression											
Maximum Rated Capacity 1000 tons/hour Actual annual throughput 3,744,000 tons	2.2	0.74	0.05	9.636	3.2412	0.219	4.1184	1.38528	0.0936	0.0022	0.00074
Normal Screen ID No. SS1KF-1 with wet supression											
Maximum Rated Capacity 400 tons/hour Actual annual throughput 1,497,600 tons	0.88	0.296	0.02	3.8544	1.29648	0.0876	1.64736	0.554112	0.03744	0.0022	0.00074
Normal Screen ID No. SC-2 with wet supression											
Maximum Rated Capacity 600 tons/hour Actual annual throughput 2,246,400 tons	1.32	0.444	0.03	5.7816	1.94472	0.1314	2.47104	0.831168	0.05616	0.0022	0.00074
Normal Screen ID No. SC-GEN-2 with wet supression											
Maximum Rated Capacity 125 tons/hour Actual annual throughput 468,000 tons	0.275	0.0925	0.00625	1.2045	0.40515	0.027375	0.5148	0.17316	0.0117	0.0022	0.00074
Normal Screen ID No. SC-3 with wet supression											
Maximum Rated Capacity 600 tons/hour Actual annual throughput 2,246,400 tons	1.32	0.444	0.03	5.7816	1.94472	0.1314	2.47104	0.831168	0.05616	0.0022	0.00074
Normal Screen ID No. SC-3 with wet supression											
Maximum Rated Capacity 600 tons/hour Actual annual throughput 2,246,400 tons	1.32	0.444	0.03	5.7816	1.94472	0.1314	2.47104	0.831168	0.05616	0.0022	0.00074
Fines Screen ID No. FM with wet supression											
Maximum Rated Capacity 290 tons/hour Actual annual throughput 1,085,760 tons	1.044	0.638	0.638	4.57272	2.79444	2.79444	1.954368	1.194336	1.194336	0.0036	0.0022
Fines Screen ID No. SC4 with wet supression											
Maximum Rated Capacity 310 tons/hour Actual annual throughput 1,160,640 tons	1.116	0.682	0.682	4.88808	2.98716	2.98716	2.089152	1.276704	1.276704	0.0036	0.0022
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Conveyors Calculations and Output

Company Name:	Carolina Sunrock LLC	6.27	2.22	1.57	27.66	9.77	6.91	19.17	6.71	4.74			
Facility ID No.:	N/A	hourly potential TSP emissions (lb/hr)	hourly potential PM_{10} emissions (lb/hr)	hourly potential PM2.5 emissions (lb/hr)	yearly potential TSP emissions (tpy)	yearly potential PM_{10} emissions (tpy)	yearly potential PM2.5 emissions (tpy)	yearly actual TSP emissions (tpy)	yearly actual PM_{10} emissions (tpy)	yearly actual PM2.5 emissions (tpy)	TSP emission factor (lb/ton)	PM_{10} emission factor (lb/ton)	PM2.5 emission factor (lb/ton)
Permit No.:	N/A												
Facility City:	Prospect Hill												
Facility County:	Caswell												
Conveyor ID No. C-1 with wet supression													
Maximum Rated Capacity	1200 tons/hour	0.168	0.0552	0.0156	0.73584	0.241776	0.068328	0.504	0.1656	0.0468	0.00014	0.000046	0.000013
Actual annual throughput	7,200,000 tons												
Conveyor ID No. C-2 with wet supression													
Maximum Rated Capacity	1200 tons/hour	0.168	0.0552	0.0156	0.73584	0.241776	0.068328	0.504	0.1656	0.0468	0.00014	0.000046	0.000013
Actual annual throughput	7,200,000 tons												
Conveyor ID No. C-3 with wet supression													
Maximum Rated Capacity	1200 tons/hour	0	0	0	0	0	0	0	0	0	0	0	0
Actual annual throughput	7,200,000 tons												
Conveyor ID No. C-4 with wet supression													
Maximum Rated Capacity	1200 tons/hour	0.168	0.0552	0.0156	0.73584	0.241776	0.068328	0.504	0.1656	0.0468	0.00014	0.000046	0.000013
Actual annual throughput	7,200,000 tons												
Conveyor ID No. C-5 with wet supression													
Maximum Rated Capacity	1200 tons/hour	0.168	0.0552	0.0156	0.73584	0.241776	0.068328	0.504	0.1656	0.0468	0.00014	0.000046	0.000013
Actual annual throughput	7,200,000 tons												
Conveyor ID No. C-6 with wet supression													
Maximum Rated Capacity	1200 tons/hour	0.168	0.0552	0.0156	0.73584	0.241776	0.068328	0.504	0.1656	0.0468	0.00014	0.000046	0.000013
Actual annual throughput	7,200,000 tons												
Conveyor ID No. SP1KF-1 with wet supression													
Maximum Rated Capacity	375 tons/hour	0	0	0	0	0	0	0	0	0	0	0	0
Actual annual throughput	2,250,000 tons												
Conveyor ID No. SP1KF-2 with wet supression													
Maximum Rated Capacity	375 tons/hour	0	0	0	0	0	0	0	0	0	0	0	0
Actual annual throughput	2,250,000 tons												
Conveyor ID No. SP1KF-3 with wet supression													
Maximum Rated Capacity	375 tons/hour	0.0525	0.01725	0.004875	0.22995	0.075555	0.0213525	0.1575	0.05175	0.014625	0.00014	0.000046	0.000013
Actual annual throughput	2,250,000 tons												
Conveyor ID No. C-7 with wet supression													
Maximum Rated Capacity	1000 tons/hour	0.14	0.046	0.013	0.6132	0.20148	0.05694	0.42	0.138	0.039	0.00014	0.000046	0.000013
Actual annual throughput	6,000,000 tons												
Conveyor ID No. C-8 with wet supression													
Maximum Rated Capacity	400 tons/hour	0.056	0.0184	0.0052	0.24528	0.080592	0.022776	0.168	0.0552	0.0156	0.00014	0.000046	0.000013
Actual annual throughput	2,400,000 tons												
Conveyor ID No. C-9 with wet supression													
Maximum Rated Capacity	400 tons/hour	0.056	0.0184	0.0052	0.24528	0.080592	0.022776	0.168	0.0552	0.0156	0.00014	0.000046	0.000013
Actual annual throughput	2,400,000 tons												
Conveyor ID No. C-10 with wet supression													
Maximum Rated Capacity	400 tons/hour	0.056	0.0184	0.0052	0.24528	0.080592	0.022776	0.168	0.0552	0.0156	0.00014	0.000046	0.000013
Actual annual throughput	2,400,000 tons												
Conveyor ID No. C-11 with wet supression													
Maximum Rated Capacity	200 tons/hour	0.028	0.0092	0.0026	0.12264	0.040296	0.011388	0.084	0.0276	0.0078	0.00014	0.000046	0.000013
Actual annual throughput	1,200,000 tons												
Conveyor ID No. C-12 with wet supression													
Maximum Rated Capacity	200 tons/hour	0	0	0	0	0	0	0	0	0	0	0	0
Actual annual throughput	1,200,000 tons												
Conveyor ID No. C-13 with wet supression													
Maximum Rated Capacity	200 tons/hour	0.028	0.0092	0.0026	0.12264	0.040296	0.011388	0.084	0.0276	0.0078	0.00014	0.000046	0.000013
Actual annual throughput	1,200,000 tons												
Conveyor ID No. TC-1ABC with wet supression													
Maximum Rated Capacity	200 tons/hour	0.028	0.0092	0.0026	0.12264	0.040296	0.011388	0.084	0.0276	0.0078	0.00014	0.000046	0.000013
Actual annual throughput	1,200,000 tons												
Conveyor ID No. C-14 with wet supression													
Maximum Rated Capacity	400 tons/hour	0.056	0.0184	0.0052	0.24528	0.080592	0.022776	0.168	0.0552	0.0156	0.00014	0.000046	0.000013
Actual annual throughput	2,400,000 tons												
Conveyor ID No. C-15 with wet supression													
Maximum Rated Capacity	400 tons/hour	0.056	0.0184	0.0052	0.24528	0.080592	0.022776	0.168	0.0552	0.0156	0.00014	0.000046	0.000013
Actual annual throughput	2,400,000 tons												

Conveyors Calculations and Output

Company Name: Carolina Sunrock LLC Facility ID No.: N/A Permit No.: N/A Facility City: Prospect Hill Facility County: Caswell	6.27 hourly potential TSP emissions (lb/hr)	2.22 hourly potential PM_{10} emissions (lb/hr)	1.57 hourly potential PM2.5 emissions (lb/hr)	27.66 yearly potential TSP emissions (tpy)	9.77 yearly potential PM_{10} emissions (tpy)	6.91 yearly potential PM2.5 emissions (tpy)	19.17 yearly actual TSP emissions (tpy)	6.71 yearly actual PM_{10} emissions (tpy)	4.74 yearly actual PM2.5 emissions (tpy)	TSP emission factor (lb/ton)	PM_{10} emission factor (lb/ton)	PM2.5 emission factor (lb/ton)
Conveyor ID No. TC-2RRB with wet supression												
Maximum Rated Capacity 400 tons/hour		0.0184	0.0052	0	0.080592	0.022776	0.168	0.0552	0.0156	0.00014	0.000046	0.000013
Actual annual throughput 2,400,000 tons												
Conveyor ID No. C-16 with wet supression												
Maximum Rated Capacity 800 tons/hour	0.112	0.0368	0.0104	0.49056	0.161184	0.045552	0.336	0.1104	0.0312	0.00014	0.000046	0.000013
Actual annual throughput 4,800,000 tons												
Conveyor ID No. C-17 with wet supression												
Maximum Rated Capacity 800 tons/hour	0	0	0	0	0	0	0	0	0	0	0	0
Actual annual throughput 4,800,000 tons												
Conveyor ID No. SP2KF-1 with dry supression												
Maximum Rated Capacity 300 tons/hour	0.9	0.33	0.33	3.942	1.4454	1.4454	2.7	0.99	0.99	0.003	0.0011	0.0011
Actual annual throughput 1,800,000 tons												
Conveyor ID No. SP2KF-2 with dry supression												
Maximum Rated Capacity 300 tons/hour	0.9	0.33	0.33	3.942	1.4454	1.4454	2.7	0.99	0.99	0.003	0.0011	0.0011
Actual annual throughput 1,800,000 tons												
Conveyor ID No. C-18 with dry supression												
Maximum Rated Capacity 600 tons/hour	1.8	0.66	0.66	7.884	2.8908	2.8908	5.4	1.98	1.98	0.003	0.0011	0.0011
Actual annual throughput 3,600,000 tons												
Conveyor ID No. SC2-C1 with wet supression												
Maximum Rated Capacity 500 tons/hour	0.07	0.023	0.0065	0.3066	0.10074	0.02847	0.21	0.069	0.0195	0.00014	0.000046	0.000013
Actual annual throughput 3,000,000 tons												
Conveyor ID No. C-19 with wet supression												
Maximum Rated Capacity 500 tons/hour	0.07	0.023	0.0065	0.3066	0.10074	0.02847	0.21	0.069	0.0195	0.00014	0.000046	0.000013
Actual annual throughput 3,000,000												
Conveyor ID No. CR3KF-1 with wet supression												
Maximum Rated Capacity 500 tons/hour	0.07	0.023	0.0065	0.3066	0.10074	0.02847	0.21	0.069	0.0195	0.00014	0.000046	0.000013
Actual annual throughput 3,000,000 tons												
Conveyor ID No. C-20 with wet supression												
Maximum Rated Capacity 500 tons/hour	0.07	0.023	0.0065	0.3066	0.10074	0.02847	0.21	0.069	0.0195	0.00014	0.000046	0.000013
Actual annual throughput 3,000,000 tons												
Conveyor ID No. C-21 with wet supression												
Maximum Rated Capacity 500 tons/hour	0.07	0.023	0.0065	0.3066	0.10074	0.02847	0.21	0.069	0.0195	0.00014	0.000046	0.000013
Actual annual throughput 3,000,000 tons												
Conveyor ID No. SC2-C2 with wet supression												
Maximum Rated Capacity 600 tons/hour	0.084	0.0276	0.0078	0.36792	0.120888	0.034164	0.252	0.0828	0.0234	0.00014	0.000046	0.000013
Actual annual throughput 3,600,000 tons												
Conveyor ID No. C-22 with wet supression												
Maximum Rated Capacity 500 tons/hour	0.07	0.023	0.0065	0.45781194	0.150358209	0.042492537	0.313432838	0.102985075	0.029104478	0.00014	0.000046	0.000013
Actual annual throughput 3,000,000 tons												
Conveyor ID No. C-23 with wet supression												
Maximum Rated Capacity 290 tons/hour	0	0	0	0	0	0	0	0	0	0.00014	0.000046	0.000013
Actual annual throughput 1,740,000 tons												
Conveyor ID No. C-24 with wet supression												
Maximum Rated Capacity 290 tons/hour	0.0406	0.01334	0.00377	0.177828	0.0584292	0.0165126	0.1218	0.04002	0.01131	0.00014	0.000046	0.000013
Actual annual throughput 1,740,000 tons												
Conveyor ID No. C-25 with wet supression												
Maximum Rated Capacity 290 tons/hour	0.0406	0.01334	0.00377	0.177828	0.0584292	0.0165126	0.1218	0.04002	0.01131	0.00014	0.000046	0.000013
Actual annual throughput 1,740,000 tons												
Conveyor ID No. TC-3DS with wet supression												
Maximum Rated Capacity 290 tons/hour	0.0406	0.01334	0.00377	0.177828	0.0584292	0.0165126	0.1218	0.04002	0.01131	0.00014	0.000046	0.000013
Actual annual throughput 1,740,000 tons												
Conveyor ID No. C-26 with wet supression												
Maximum Rated Capacity 155 tons/hour	0.0217	0.00713	0.002015	0.095046	0.0312294	0.0088257	0.0651	0.02139	0.006045	0.00014	0.000046	0.000013
Actual annual throughput 930,000 tons												
Conveyor ID No. C-27 with wet supression												
Maximum Rated Capacity 155 tons/hour	0.0217	0.00713	0.002015	0.095046	0.0312294	0.0088257	0.0651	0.02139	0.006045	0.00014	0.000046	0.000013
Actual annual throughput 930,000 tons												

Conveyors Calculations and Output

Company Name:	Carolina Sunrock LLC	6.27	2.22	1.57	27.66	9.77	6.91	19.17	6.71	4.74			
Facility ID No.:	N/A	hourly potential TSP emissions (lb/hr)	hourly potential PM_{10} emissions (lb/hr)	hourly potential PM2.5 emissions (lb/hr)	yearly potential TSP emissions (tpy)	yearly potential PM_{10} emissions (tpy)	yearly potential PM2.5 emissions (tpy)	yearly actual TSP emissions (tpy)	yearly actual PM_{10} emissions (tpy)	yearly actual PM2.5 emissions (tpy)	TSP emission factor (lb/ton)	PM_{10} emission factor (lb/ton)	PM2.5 emission factor (lb/ton)
Permit No.:	N/A												
Facility City:	Prospect Hill												
Facility County:	Caswell												
Conveyor ID No. C-28 with wet supression													
Maximum Rated Capacity	155 tons/hour	0.0217	0.00713	0.002015	0.095046	0.0312294	0.0088257	0.0851	0.02139	0.006045	0.00014	0.000046	0.000013
Actual annual throughput	930,000 tons												
Conveyor ID No. CR4KF-1 with wet supression													
Maximum Rated Capacity	155 tons/hour	0.0217	0.00713	0.002015	0.095046	0.0312294	0.0088257	0.0851	0.02139	0.006045	0.00014	0.000046	0.000013
Actual annual throughput	930,000 tons												
Conveyor ID No. C-29 with wet supression													
Maximum Rated Capacity	155 tons/hour	0.0217	0.00713	0.002015	0.095046	0.0312294	0.0088257	0.0851	0.02139	0.006045	0.00014	0.000046	0.000013
Actual annual throughput	930,000 tons												
Conveyor ID No. C-30 with wet supression													
Maximum Rated Capacity	tons/hour	0	0	0	0	0	0	0.1218	0.04002	0.01131	0.00014	0.000046	0.000013
Actual annual throughput	1,740,000 tons												
Conveyor ID No. C-31 with wet supression													
Maximum Rated Capacity	290 tons/hour	0.0406	0.01334	0.00377	0.177828	0.0584292	0.0165126	0.1218	0.04002	0.01131	0.00014	0.000046	0.000013
Actual annual throughput	1,740,000 tons												
Conveyor ID No. TP-4S with wet supression													
Maximum Rated Capacity	290 tons/hour	0.0406	0.01334	0.00377	0.177828	0.0584292	0.0165126	0.1218	0.04002	0.01131	0.00014	0.000046	0.000013
Actual annual throughput	1,740,000 tons												
Conveyor ID No. C-32 with wet supression													
Maximum Rated Capacity	155 tons/hour	0.0217	0.00713	0.002015	0.095046	0.0312294	0.0088257	0.0851	0.02139	0.006045	0.00014	0.000046	0.000013
Actual annual throughput	930,000 tons												
Conveyor ID No. C-33 with wet supression													
Maximum Rated Capacity	155 tons/hour	0.0217	0.00713	0.002015	0.095046	0.0312294	0.0088257	0.0851	0.02139	0.006045	0.00014	0.000046	0.000013
Actual annual throughput	930,000 tons												
Conveyor ID No. C-34 with wet supression													
Maximum Rated Capacity	310 tons/hour	0.0434	0.01426	0.00403	0.190082	0.0624588	0.0176514	0.1302	0.04278	0.01209	0.00014	0.000046	0.000013
Actual annual throughput	1,860,000 tons												
Conveyor ID No. C-35 with wet supression													
Maximum Rated Capacity	46 tons/hour	0.00644	0.002116	0.000598	0.0282072	0.00926808	0.00261924	0.01932	0.006348	0.001794	0.00014	0.000046	0.000013
Actual annual throughput	276,000 tons												
Conveyor ID No. C-36 with wet supression													
Maximum Rated Capacity	162 tons/hour	0.02268	0.007452	0.002106	0.0993384	0.03263976	0.00922428	0.06804	0.022356	0.006318	0.00014	0.000046	0.000013
Actual annual throughput	972,000 tons												
Conveyor ID No. C-37 with wet supression													
Maximum Rated Capacity	100 tons/hour	0.014	0.0046	0.0013	0.06132	0.020148	0.005694	0.042	0.0138	0.0039	0.00014	0.000046	0.000013
Actual annual throughput	600,000 tons												
Conveyor ID No. FB1 with wet supression													
Maximum Rated Capacity	45 tons/hour	0.0063	0.00207	0.000585	0.027594	0.0090666	0.0025623	0.0189	0.00621	0.001755	0.00014	0.000046	0.000013
Actual annual throughput	270,000 tons												
Conveyor ID No. FB2 with wet supression													
Maximum Rated Capacity	162 tons/hour	0.02268	0.007452	0.002106	0.0993384	0.03263976	0.00922428	0.06804	0.022356	0.006318	0.00014	0.000046	0.000013
Actual annual throughput	972,000												
Conveyor ID No. FB3 with dry supression													
Maximum Rated Capacity	100 tons/hour	0.014	0.0046	0.0013	0.06132	0.020148	0.005694	0.042	0.0138	0.0039	0.00014	0.000046	0.000013
Actual annual throughput	600,000 tons												
Conveyor ID No. C-38 with wet supression													
Maximum Rated Capacity	45 tons/hour	0.0063	0.00207	0.000585	0.027594	0.0090666	0.0025623	0.0189	0.00621	0.001755	0.00014	0.000046	0.000013
Actual annual throughput	270,000 tons												
Conveyor ID No. C-39 with wet supression													
Maximum Rated Capacity	162 tons/hour	0.02268	0.007452	0.002106	0.0993384	0.03263976	0.00922428	0.06804	0.022356	0.006318	0.00014	0.000046	0.000013
Actual annual throughput	972,000 tons												
Conveyor ID No. C-40 with wet supression													
Maximum Rated Capacity	100 tons/hour	0.014	0.0046	0.0013	0.06132	0.020148	0.005694	0.042	0.0138	0.0039	0.00014	0.000046	0.000013
Actual annual throughput	600,000 tons												
Conveyor ID No. C-41 with wet supression													
Maximum Rated Capacity	45 tons/hour	0.0217	0.00713	0.002015	0.141859701	0.046611045	0.013172687	0.026208955	0.009268657	0.002619403	0.00014	0.000046	0.000013
Actual annual throughput	270,000 tons												
Conveyor ID No. C-42 with wet supression													
Maximum Rated Capacity	162 tons/hour	0	0	0	0	0	0	0	0	0	0.00014	0.000046	0.000013

Conveyors Calculations and Output

Company Name:	Carolina Sunrock LLC
Facility ID No.:	N/A
Permit No.:	N/A
Facility City:	Prospect Hill
Facility County:	Caswell

Actual annual throughput 972,000 tons

Conveyor	hourly potential TSP emissions (lb/hr)	hourly potential PM_{10} emissions (lb/hr)	hourly potential PM2.5 emissions (lb/hr)	yearly potential TSP emissions (tpy)	yearly potential PM_{10} emissions (tpy)	yearly potential PM2.5 emissions (tpy)	yearly actual TSP emissions (tpy)	yearly actual PM_{10} emissions (tpy)	yearly actual PM2.5 emissions (tpy)	TSP emission factor (lb/ton)	PM_{10} emission factor (lb/ton)	PM2.5 emission factor (lb/ton)
Totals	6.27	2.22	1.57	27.66	9.77	6.91	19.17	6.71	4.74			
Conveyor ID No. C-43 with wet supression; Maximum Rated Capacity 100 tons/hour; Actual annual throughput 600,000 tons	0.014	0.0046	0.0013	0.06132	0.020148	0.005694	0.042	0.0138	0.0039	0.00014	0.000046	0.000013
Conveyor ID No. TC-5-67s with wet supression; Maximum Rated Capacity 100 tons/hour; Actual annual throughput 600,000 tons	0.014	0.0046	0.0013	0.06132	0.020148	0.005694	0.042	0.0138	0.0039	0.00014	0.000046	0.000013
Conveyor ID No. TC-6-57s with wet supression; Maximum Rated Capacity 290 tons/hour; Actual annual throughput 1,740,000 tons	0.0406	0.01334	0.00377	0.177828	0.0584292	0.0165126	0.1218	0.04002	0.01131	0.00014	0.000046	0.000013
Conveyor ID No. TC-7-78s with wet supression; Maximum Rated Capacity 290 tons/hour; Actual annual throughput 1,740,000 tons	0.0406	0.01334	0.00377	0.177828	0.0584292	0.0165126	0.1218	0.04002	0.01131	0.00014	0.000046	0.000013
Conveyor ID No. with wet supression; Maximum Rated Capacity 0 tons/hour; Actual annual throughput 0 tons	0	0	0	0	0	0	0	0	0	0.00014	0.000046	0.000013
Conveyor ID No. with wet supression; Maximum Rated Capacity 0 tons/hour; Actual annual throughput 0 tons	0	0	0	0	0	0	0	0	0	0.00014	0.000046	0.000013
Conveyor ID No. with wet supression; Maximum Rated Capacity 0 tons/hour; Actual annual throughput 0 tons	0	0	0	0	0	0	0	0	0	0.00014	0.000046	0.000013
Conveyor ID No. with wet supression; Maximum Rated Capacity 0 tons/hour; Actual annual throughput 0 tons	0	0	0	0	0	0	0	0	0	0.00014	0.000046	0.000013
Conveyor ID No. with wet supression; Maximum Rated Capacity tons/hour; Actual annual throughput 0 tons	0	0	0	0	0	0	0	0	0	0.00014	0.000046	0.000013
Conveyor ID No. with wet supression; Maximum Rated Capacity 0 tons/hour; Actual annual throughput 0 tons	0	0	0	0	0	0	0	0	0	0.00014	0.000046	0.000013
Conveyor ID No. with wet supression; Maximum Rated Capacity 0 tons/hour; Actual annual throughput 0 tons	0	0	0	0	0	0	0	0	0	0.00014	0.000046	0.000013
Conveyor ID No. with wet supression; Maximum Rated Capacity 0 tons/hour; Actual annual throughput 0 tons	0	0	0	0	0	0	0	0	0	0.00014	0.000046	0.000013
Conveyor ID No. with wet supression; Maximum Rated Capacity 0 tons/hour; Actual annual throughput 0 tons	0	0	0	0	0	0	0	0	0	0.00014	0.000046	0.000013
Conveyor ID No. with wet supression; Maximum Rated Capacity 0 tons/hour; Actual annual throughput 0 tons	0	0	0	0	0	0	0	0	0	0.00014	0.000046	0.000013
Conveyor ID No. with wet supression; Maximum Rated Capacity 0 tons/hour; Actual annual throughput 0 tons	0	0	0	0	0	0	0	0	0	0.00014	0.000046	0.000013
Conveyor ID No. with wet supression; Maximum Rated Capacity 0 tons/hour; Actual annual throughput 0 tons	0	0	0	0	0	0	0	0	0	0.00014	0.000046	0.000013
Conveyor ID No. with wet supression; Maximum Rated Capacity 0 tons/hour; Actual annual throughput 0 tons	0	0	0	0	0	0	0	0	0	0.00014	0.000046	0.000013

Emission Factors
Taken from AP-42, Crushed Stone Processing, 08/04. Table 11.19.2-2

Source	SCC	TPM lb/ton	emission factor rating	PM-10 lb/ton	emission factor rating	PM-2.5 lb/ton	emission factor rating
screening	3-05-020-02,03	**0.025**	E	**0.0087**	C	**0.0087**	ND
screening (controlled)	3-05-020-02,03	**0.0022**	E	**0.00074**	C	**0.000050**	E
primary crushing	3-05-020-01	**0.0054**	ND[g]	**0.0024**	ND[g]	**0.0024**	ND[g]
primary crushing (controlled)	3-05-020-01	**0.0012**	ND[g]	**0.00054**	ND[g]	**0.00010**	ND[g]
secondary crushing	3-05-020-02	**0.0054**	ND[g]	**0.0024**	ND[g]	**0.0024**	ND[g]
secondary crushing (controlled)	3-05-020-02	**0.0012**	ND[g]	**0.00054**	ND[g]	**0.00010**	ND[g]
tertiary crushing	3-05-020-03	**0.0054**	E	**0.0024**	C	**0.0024**	ND
tertiary crushing (controlled)	3-05-020-03	**0.0012**	E	**0.00054**	C	**0.00010**	E
fines crushing	3-05-020-05	**0.0390**	E	**0.0150**	E	**0.0150**	ND
fines crushing (controlled)	3-05-020-05	**0.0030**	E	**0.0012**	E	**0.000070**	E
fines screening	3-05-020-21	**0.30**	E	**0.072**	E	**0.072**	ND
fines screening (controlled)	3-05-020-21	**0.0036**	E	**0.0022**	E	**0.0022**	ND
conveyor transfer point	3-05-020-06	**0.0030**	E	**0.00110**	D	**0.00110**	ND
conveyor transport (controlled)	3-05-020-06	**0.00014**	E	**4.60E-05**	D	**1.30E-05**	D
wet drilling: unfragmented stone	3-05-020-10	**0.000168**	d, ND1	**8.00E-05**	E	**8.00E-05**	ND
truck unloading: fragmented stone	3-05-020-31	**0.0000336**	d, ND1	**1.60E-05**	E	**1.60E-05**	ND
truck loading-conveyor:crushed stone	3-05-020-32	**0.00021**	d, ND1	**0.00010**	E	**0.00010**	ND

C,D,E - emission factor rating

d - Emission factors for total particulate are not presented pending a reevaluation of the EPA method 201A test data and/or results of emission testing. This re-evaluation is expected to be completed by July 1995. Without this re-evaluation this emission factor is simply 2.1 * emission factor for PM-10 (consistent with previous spreadsheet revision 5b-1.0a, updated 06/05/97).

ND1 - No data available

ND[g] - No data available, but emissions factors for PM-10 from tertiary crushing can be used as an upper limit for primary and secondary crushing.

e - PM-10 emission factor is TSP emission factor divided by 2.1

APPENDIX B - MODELING PROTOCOL AND FILES

A.1
North Carolina Modeling Protocol Checklist

The North Carolina Modeling Protocol Checklist may be used in lieu of developing the traditional written modeling plan for North Carolina toxics and criteria pollutant modeling. The protocol checklist is designed to provide the same level of information as requested in a modeling protocol as discussed in Chapter 2 of the *Guideline for Evaluating the Air Quality Impacts of Toxic Pollutants in North Carolina.* The modeling protocol checklist is submitted with the modeling analysis.

Although most of the information requested in the modeling protocol checklist is self explanatory, additional comments are provided, where applicable, and are discussed in greater detail in the toxics modeling guidelines referenced above. References to sections, tables, figures, appendices, etc., in the protocol checklist are found in the toxics modeling guidelines.

INSTRUCTIONS: The modeling report supporting the compliance demonstration should include most of the information listed below. As appropriate, answer the following questions or indicate by check mark the information provided or action taken is reflected in your report.

FACILITY INFORMATION	
Name: Carolina Sunrock **Facility ID: TBD** **Address: 1238 Wrenn Rd.** **Prospect Hill, NC 27314**	**Consultant (if applicable): Trinity Consultants** 1 Copley Parkway Suite 205 Morrisville, NC 27560
Contact Name: Scott Martino	**Contact Name: Jonathan Hill**
Phone Number: 984-202-4761 **Email: smartino@thesunrockgroup.com**	**Phone Number: 919-462-9693** **Email: jhill@trinityconsultants.com**

GENERAL

Description of New Source or Source / Process Modification: provide a short description of the new or modified source(s) and a brief discussion of how this change affects facility production or process operation.	**X**
Source / Pollutant Identification: provide a table of the affected pollutants, by source, which identifies the source type (point, area, or volume), maximum pollutant emission rates over the applicable averaging period(s), and, for point sources, indicate if the stack is capped or non-vertical (C/N).	**X**
Pollutant Emission Rate Calculations: indicate how the pollutant emission rates were derived (e.g., AP-42, mass balance, etc.) and where applicable, provide the calculations.	**X**
Site / Facility Diagram: provide a diagram or drawing showing the location of all existing and proposed emission sources, buildings or structures, public right-of-ways, and the facility property (toxics) / fence line (criteria pollutants) boundaries. The diagram should also include a scale, true north indicator, and the UTM or latitude/longitude of at least one point.	**X**
Certified Plat or Signed Survey: a certified plat (map) from the County Register of Deeds or a signed survey must be submitted to validate property boundaries modeled.	**SS**
Topographic Map: A topographic map covering approximately 5km around the facility must be submitted. The facility boundaries should be annotated on the map as accurately as possible.	**X**
Cavity Impact Analysis: No cavity analysis is required if using AERMOD. *See Section 4.2*	**NA**

Background Concentrations (criteria pollutant analyses only): Background concentrations must be determined for each pollutant for each averaging period evaluated. The averaged background value used (e.g., high, high-second-high, high-third-high, etc.) is based on the pollutant and averaging period evaluated. The background concentrations are added to the modeled concentrations, which are then compared to the applicable air quality standard to determine compliance.	**NA**
Offsite Source Inventories (criteria pollutant analyses only): Offsite source inventories must be developed and modeled for all pollutants for which onsite sources emissions are modeled in excess of the specific pollutant significant impact levels (SILs) as defined in the PSD New Source Review Workshop Manual. The DAQ AQAB must approve the inventories. An initial working inventory can be requested from the AQAB.	**NA**

SCREEN LEVEL MODELING

Model: The latest version of the AERSCREEN model must be used. The use of other screening models should be approved by NCDAQ prior to submitting the modeling report.	**NA**
Source / Source emission parameters: Provide a table listing the sources modeled and the applicable source emission parameters. See NC Form 3 – Appendix A.	**NA**
Merged Sources: Identify merged sources and show all appropriate calculations. See Section 3.3	**NA**
GEP Analysis: See Section 3.2 and NC Form 1 – Appendix A	**NA**
Terrain: Indicate the terrain modeled: simple (Section 4.4), and complex (Section 4.5 and NC Form 4 – Appendix A). If complex terrain is within 5 kilometers of the facility, complex terrain must be evaluated. Simple terrain must include terrain elevations if any terrain is greater than the stack base of any source modeled. Simple: _____ Complex:_____	NA
Meteorology: Refer to Section 4.1 for AERSCREEN inputs.	**NA**
Receptors: AERSCREEN – use shortest distance to property boundary for each source modeled and use sufficient range to find maximum (See Section 4.1 (i) and (j)). Terrain above stack base must be evaluated.	**NA**
Modeling Results: For each affected pollutant, modeling results should be summarized, converted to the applicable averaging period (See Table 3), and presented in tabular format indicating compliance status with the applicable AAL, SIL, or NAAQS. See NC Form S5 – Appendix A.	**NA**
Modeling Files: Either electronic or hard copies of AERSCREEN output must be submitted.	**NA**

REFINED LEVEL MODELING

Model: The latest version of AERMOD should be used, and may be found at http://www.epa.gov/scram001/dispersion_prefrec.htm. The use of other refined models must be approved by NCDAQ prior to submitting the modeling report.	**AERMOD v19191**
Source / Source emission parameters: Provide a table listing the sources modeled and the applicable source emission parameters. See NC Form 3 - Appendix A.	**X**
GEP Analysis: Use BPIP-Prime with AERMOD.	**X**
Cavity Impact Analysis: No separate cavity analysis is required when using AERMOD as long as receptors are placed in cavity susceptible areas. See Section 4.2 and 5.2.	**NA**
Terrain: Use digital elevation data from the USGS NED database (http://seamless.usgs.gov/index.php). Use of other sources of terrain elevations or the non-regulatory Flat Terrain option will require prior approval from DAQ AQAB.	**X**
Coordinate System: Specify the coordinate system used (e.g., NAD27, NAD83, etc.) to identify the source, building, and receptor locations. Note: Be sure to specify in the AERMAP input file the correct base datum (NADA) to be used for identifying source input data locations. Clearly note in both the protocol checklist and the modeling report which datum was used.	**NAD83**
Receptors: The receptor grid should be of sufficient size and resolution to identify the maximum pollutant impact. See Section 5.3.	**X**

Meteorology: Indicate the AQAB, pre-processed, 5-year data set used in the modeling demonstration: (See Section 5.5 and Appendix B) _2014-2018 DAN/GSO____ If processing your own raw meteorology, then pre-approval from AQAB is required. Additional documentation files (e.g. AERMET stage processing files) will also be necessary. For NC toxics, the modeling demonstration requires only the last year of the standard 5 year data set (e.g., 2005) provided the maximum impacts are less than 50% of the applicable AAL(s).	X
Modeling Results: For each affected pollutant and averaging period, modeling results should be summarized and presented in tabular format indicating compliance status with the applicable AAL, SIL or NAAQS. See NC Form R5 - Appendix A.	**X**
Modeling Files: Submit input and output files for AERMOD. Also include BPIP-Prime files, AERMAP files, DEM files, and any AERMET input and output files, including raw meteorological data.	**X**

APPENDIX C - LOCAL ZONING CONSISTENCY DETERMINATION

Aimee Andrews

From: Matthew Hoagland <mhoagland@caswellcountync.gov>
Sent: Thursday, November 07, 2019 9:27 AM
To: Aimee Andrews
Cc: 'Scott Martino'
Subject: RE: Zoning Consistency Determination Request for Carolina Sunrock
Attachments: MP0133-005 Zoning Consistency Form.pdf

Good morning, Aimee.

I have received the request and completed the necessary form for zoning confirmation. Please see that form attached.

One additional note: though this proposal complies with our existing zoning and subdivision regulations, there are additional watershed regulations that will apply before final permitting can be approved.

Thank you,

Matthew Hoagland
Caswell County Planner

144 Main Street / P.O. Box 1406
Yanceyville, NC 27379
(336)-694-9731 ext. 6205
Department Website
Connect Caswell 2020

From: Aimee Andrews [mailto:AAndrews@trinityconsultants.com]
Sent: Wednesday, November 6, 2019 7:00 PM
To: mhoagland@caswellcountync.gov
Cc: Scott Martino <smartino@thesunrockgroup.com>
Subject: Zoning Consistency Determination Request for Carolina Sunrock

Mr. Hoagland,

I am working with Carolina Sunrock on permitting a new facility. They are proposing to construct a new hot mix asphalt, ready mix concrete batch plant, and quarry in Prospect Hill, Caswell County. Scott Martino supplied me your contact information. In order to complete the submittal of our air permit application to NCDEQ, we must provide proof that we have requested a zoning consistency determination from the local zoning authority.

Please review the attached letter request (Appendix C of the attached air permit application) and complete the form required by NCDEQ. For purposes of our submittal, please reply to this email with "Received" or otherwise indicate you have received our request.

Thank you for your attention to this request,
Aimee

Aimee Andrews, PE
Managing Consultant

Trinity Consultants
One Copley Parkway, Suite 205 | Morrisville, North Carolina 27560

NOTE: SUITE NUMBER HAS CHANGED!

Office: **919-462-9693 x 1705**
Fax: **919-578-3690**
Email: aandrews@trinityconsultants.com

Subscribe today to receive Trinity's free *Environmental Quarterly*.
Learn about Trinity's courses for environmental professionals.

Trinity Consultants

SUNROCK®
CAROLINA SUNROCK LLC

Scott Martino
Environmental Compliance Manager
200 Horizon Drive, Suite 100
Raleigh, NC 27615, NC 27615

November 6, 2019

Mr. Matthew Hoagland
Planning Director
Caswell County Planning Department
144 Main Street
Yanceyville, NC 27379
VIA email: mhoagland@caswellcountync.gov

Re: Air Permit Application Zoning Consistency Determination Request
Carolina Sunrock LLC

Dear Mr. Hoagland:

Carolina Sunrock LLC (Carolina Sunrock) is planning to construct a drum mix hot asphalt plant, truck mix concrete plant, and quarry operations at: ***1238 Wrenn Road, Prospect Hill, NC 27314.*** The purpose of this letter is to request a zoning consistency determination for the air permit construction application as required by General Statute §143-215.108(f).

A copy of the permit application is included with this zoning consistency determination request (see Appendix C). Once a determination has been made we respectfully request that you fax a copy of the determination directly to North Carolina Department of Environmental Quality, Winston-Salem Regional Office (NCDEQ, fax # 336.776.9797, Attention: Lisa Edwards, Regional Supervisor) as well as a copy to Carolina Sunrock (fax # 919.747.6305 to my attention).

Thank you for your assistance in this important matter. Should you have any questions please contact Ms. Aimee Andrews, Trinity Consultants, at 919.462.9693 or aandrews@trinityconsultants.com, or me at 919.747.6336.

Sincerely,
Carolina Sunrock LLC

Scott Martino,
Manager Environmental Compliance

Enclosures
Air Permit Construction Application

smartino@thesunrockgroup.com
Phone: 919.747.6336
Fax: 919.747.6305

Zoning Consistency Determination

Facility Name	Carolina Sunrock LLC – Prospect Hill Quarry & Distribution Center
Facility Street Address	1238 Wrenn Road
Facility City	Prospect Hill
Description of Process	Drum mix hot asphalt plant & truck mix ready concrete plant & quarry operations
SIC Code/NAICS	2951, 3273, 1423, 1429
Facility Contact	Scott Martino
Phone Number	984-202-4761
Mailing Address	200 Horizon Drive Suite 100
Mailing City, State Zip	Raleigh, NC 27615

Based on the information given above:

☐ I have received a copy of the air permit application (draft or final) AND...

☐ There are no applicable zoning and subdivision ordinances for this facility at this time

☐ The proposed operation IS consistent with applicable zoning and subdivision ordinances

☐ The proposed operation IS NOT consistent with applicable zoning and subdivision ordinances (please include a copy of the rules in the package sent to the air quality office)

☐ The determination is pending further information and can not be made at this time

☐ Other: _____

Agency _____

Name of Designated Official _____

Title of Designated Official _____

Signature _____

Date _____

Please forward to the mailing address listed above and the air quality office at the appropriate address as checked on the back of this form.

Courtesy of the Small Business Assistance Program
toll free at 1-877-623-6748 or on the web at www.envhelp.org/sb

All PSD and Title V Applications

Attn: Major Source Review Branch Supervisor
DAQ – Permitting Section
1641 Mail Service Center
Raleigh, NC 27699-1641

Local Programs

☐ Attn: David Brigman
Western NC Regional Air Quality Agency
49 Mount Carmel Road
Asheville, NC 28806
(828) 250-6777

☐ Attn: Leslie Rhodes
Mecklenburg County
Department of Environmental Protection
700 N. Tryon Street, Suite 205
Charlotte, NC 28202
(704) 336-55430

☐ Attn: William Minor Barnette
Forsyth County
Environmental Affairs Department
201 North Chestnut Street
Winston-Salem, NC 27101
(336) 703-2440

Division of Air Quality Regional Offices

☐ Attn: Paul Muller
Asheville Regional Office
2090 US Highway 70
Asheville, NC 28801
(828) 296-4500

☐ Attn: Steven Vozzo
Fayetteville Regional Office
225 Green Street, Suite 714
Fayetteville, NC 28301
(910) 486-1541

Attn: Bruce Ingles
Mooresville Regional Office
610 East Center Avenue Suite
301
Mooresville, NC 28115
(704) 663-1699

Attn: Patrick Butler
Raleigh Regional Office
3800 Barrett Drive
Raleigh, NC 27609
(919) 571-4700

☐ Attn: Robert Fisher
Washington Regional Office
943 Washington Square Mall
Washington, NC 27889
(252) 946-6481

☐ Attn: Brad Newland
Wilmington Regional Office
127 Cardinal Drive
Wilmington, NC 28405
(910) 395-3900

X Attn: Lisa Edwards
Winston-Salem Regional Office
450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
(336) 776-9800

Courtesy of the Small Business Assistance Program
toll free at 1-877-623-6748 or on the web at www.envhelp.org/sb

APPENDIX D - QUARRY EQUIPMENT LIST AND PROCESS FLOW DIAGRAM

SUNROCK

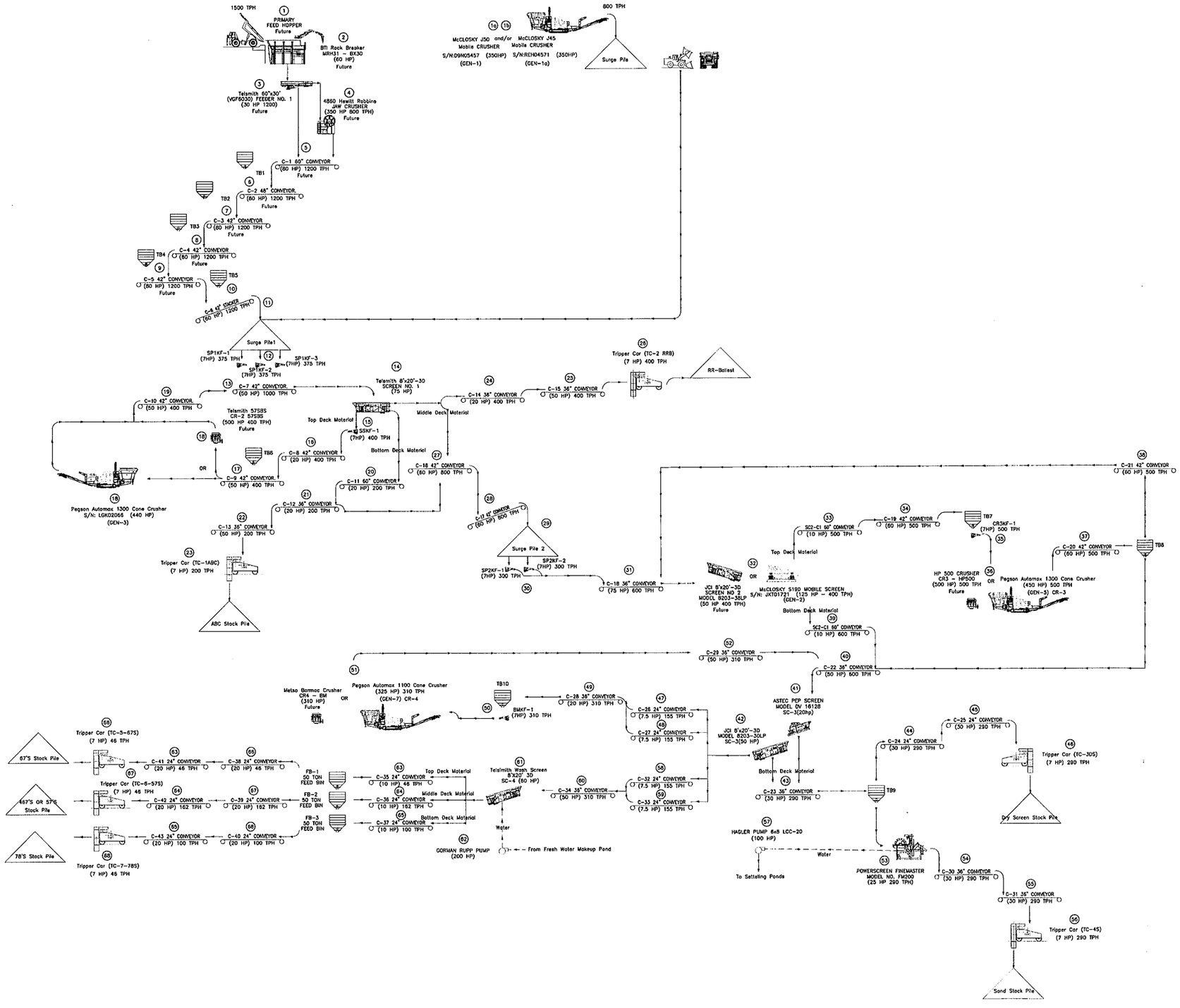
CAROLINA SUNROCK LLC

Prospect Hill Quarry Equipment List

Equipment ID Name	Equipment ID	Horse Power	Tons/Hour	Location/Direction of Flow	Equipment Type	Crushers	Wet suppression
Primary Dump Hopper	Primary Dump Hopper	-	1,200	Truck to Grizzly/Primary Crusher	Hopper		Yes
McClosky J50 Mobil Crusher	J50	350	400	USED AS PRIMARY CRUSHER HAULED TO SP-1	Crusher	Primary	Yes
McClosky J45 Mobil Crusher	J45	350	400	USED AS PRIMARY CRUSHER HAULED TO SP-1	Crusher	Primary	Yes
BTI Rock Breaker MRH31 - BX30	CR-BTI	60	-	Primary Dump Hopper to Primary Crusher	Crusher	Primary	Yes
Telsmith Vibrating Grizzly Feeder VGF6030 (60"X30')	VGF1	30	1,200	Dump Hopper to Primary Crusher/Conveyor 1	Vibrating Grizzly Feeder		Yes
4860 Hewitt Robbins Jaw Crusher	4860	350	1,200	Grizzly to C-1	Crusher	Primary	Yes
Conveyor - 1	C-1	75	1,200	Primary Crusher to TB1	Conveyor		Yes
Transfer Box 1	TB-1	-	1,200	C-1 to C-2			Yes
Conveyor - 2	C-2	75	1,200	TB1 to TB2	Conveyor		Yes
Transfer Box 2	TB2	-	1,200	C-2 to C-3			Yes
Conveyor - 3	C-3	75	1,200	TB2 to TB3	Conveyor		Yes
Transfer Box 3	TB3	-	1,200	C-3 to C4			Yes
Conveyor - 4	C-4	75	1,200	TB3 to TB4	Conveyor		Yes
Transfer Box 4	TB4	-	1,200	C-4 to C5			Yes
Conveyor - 5	C-5	75	1,200	TB4 to TB5	Conveyor		Yes
Transfer Box 5	TB5	-	1,200	C-5 to C6			Yes
Conveyor - 6	C-6	60	1,200	TB5 to Surge Pile 1	Conveyor		Yes
Surge Pile 1	SP-1	-	-	C-6 to SP1KF-1,2,3			Yes
Surge Pile 1 Kinergy Feeder 1	SP1KF-1	7	375	Surge Pile 1 to C-7	Conveyor		Yes
Surge Pile 1 Kinergy Feeder 2	SP1KF-2	7	375	Surge Pile 1 to C-7	Conveyor		Yes
Surge Pile 1 Kinergy Feeder 3	SP1KF-3	7	375	Surge Pile 1 to C-7	Conveyor		Yes
Conveyor - 7	C-7	50	1,000	Feeders to SC-1	Conveyor		Yes
Scalping Station Screen 1 (8'X20' triple Deck Screen)	SC-1	75	1,000	C-7 to SSKF-1, C-8, C-11, C-14, C-16	Screen		Yes
Scalping Screen 1 Kinergy Feeder 1	SS1KF-1	7	400	Scalping Screen Top Deck to C-8	Screen		Yes
Conveyor 8	C-8	20	400	SS1KF to TB6	Conveyor		Yes
Transfer Box 6	TB6	-	400	C-8 to C-9			Yes
Conveyor 9	C-9	50	400	TB3 to TB4	Conveyor		Yes
Telsmith 57SBS	CR2 57SBS	500	400	C-12 to C-13	Crusher	Secondary or Tertiary	Yes
Pegson Automax 1300 Cone Crusher	GEN-3	440	400	Used as Replacement for CR2 57SBS	Crusher	Secondary or Tertiary	Yes
Conveyor -10	C-10	50	400	CR2 57SBS/Gen-3 to C-7	Conveyor		Yes
Conveyor - 11	C-11	20	200	Scalping Screen Bottom Deck to C-12	Conveyor		Yes
Conveyor - 12	C-12	20	200	C-11 to C-12	Conveyor		Yes
Conveyor -13	C-13	50	200	C-12 to TC-1ABC	Conveyor		Yes
Tripper Car	TC-1ABC	7	200	Belt 13 to ABC Stock Pile	Conveyor		Yes
Conveyor -14	C-14	20	400	Scalping Screen Middle Deck to C-15	Conveyor		Yes
Conveyor - 15	C-15	50	400	C-14 to TC-2RRB	Conveyor		Yes
Tripper Car	TC-2RRB	7	400	Belt 15 to RRB Stock Pile	Conveyor		Yes
Conveyor - 16	C-16	60	800	Scalping Screen Middle Deck to C-17	Conveyor		Yes
Conveyor - 17	C-17	60	800	C-16 to Surge Pile 2	Conveyor		Yes
Surge Pile 2	SP-2	-	-	C-17 to SP2KF-1,2			Yes
Surge Pile 2 Kinergy Feeder 1	SP2KF-1	7	300	Surge Pile 2 to C-18	Conveyor		Yes
Surge Pile 2 Kinergy Feeder 1	SP2KF-2	7	300	Surge Pile 2 to C-18	Conveyor		Yes
Conveyor - 18	C-18	75	600	TB7 to TB5	Conveyor		Yes
8' X20' 3-Deck JCI Screen 2 (Model 8203-38LP)	SC-2	50	600	C-18 to SC2C1/SC2C2	Screen		Yes
McClosky S190 Screen Plant	GEN-2	125	125	C-18 to SC2C1/SC2C2	Screen		Yes
Conveyor SC2-C1	SC2-C1	10	500	SC2/GEN-2 to C-19 (Top Deck)	Conveyor		Yes

Conveyor - 19	C-19	60	500	SC2C1 to TB7	Conveyor		Yes
Transfer Box 7	TB7	-	500	C-19 to CR3KF-1			Yes
CR3 Kinergy Feeder 1	CR3KF-1	7	500	TB7 to CR-3	Conveyor		Yes
Metso HP 500 Crusher	CR2 - HP500	500	500	CR3KF-1 to C-20	Crusher	Secondary or Tertiary	Yes
Pegson Automax 1300 Cone Crusher	GEN-5	440	500	Used as Replacement for CR3 HP500	Crusher	Secondary or Tertiary	Yes
Conveyor - 20	C-20	60	500	CR3-HP500/GEN-5 to C-20	Conveyor		Yes
Transfer Box 8	TB8	-	500	C-20 to C-21			Yes
Conveyor - 21	C-21	60	500	TB8 to C-10	Conveyor		Yes
Conveyor SC2-C2	SC2-C2	10	600	SC2/GEN-2 to C- 22 (Bottom Deck)	Conveyor		Yes
Conveyor - 22	C-22	50	500	SC2-C2 to SC3	Conveyor		Yes
Azteck Pep Screen(DV1612B)	SC-3	20	600	C-22 to JCI 8203-30LP	Screen		Yes
8'X20' 3-Deck JCI 8203-30LP	SC-3	50	600	DV1612B to C-23	Screen		Yes
Conveyor - 23	C-23	30	290	SC3 to TB9	Conveyor		Yes
Transfer Box 9	TB9	-	290	C-23 to C-24			Yes
Conveyor - 24	C-24	30	290	TB-9 to C-25	Conveyor		Yes
Conveyor - 25	C-25	30	290	C-24 to TC-3DS	Conveyor		Yes
Tripper Car	TC-3DS	7	290	C-25 to Dry Screen Stockpile	Conveyor		Yes
Conveyor - 26	C-26	7.5	155	SC-3 to C-28	Conveyor		Yes
Conveyor - 27	C-27	7.5	155	SC-3 to C-28	Conveyor		Yes
Conveyor - 28	C-28	20	155	C-26/C-27 to TB10	Conveyor		Yes
Transfer Box 8	TB8	-	155	C-28 to CR4KF-1			Yes
CR-4 Kinergy Feeder 1	CR4KF-1	7	155	CR4KF-1 to CR4	Conveyor		Yes
Metso Barmac Crusher	CR3	300	155	C-23 to C-20	Crusher	Fines	Yes
Pegson Automax 1100 Cone Crusher	GEN-7	325	155	Used as Replacement for CR4 Barmac	Crusher	Fines	Yes
Conveyor - 29	C-29	50	155	C-26A to FM/Dry Fines Stock Pile	Conveyor		Yes
Power screen Fines master 200	FM	25	290	TB9 to C-30	Screen		Yes
Conveyor - 30	C-30	30	290	FM to C-31	Conveyor		Yes
Conveyor - 31	C-31	30	290	C-30 to TC-4S	Conveyor		Yes
Tripper Car	TP-4S	7	290	C-31 to Sand Stock Pile	Conveyor		Yes
Hagler Pump 6X8 LCC20	Recycle Pump	100	-	FM to Recycle Wash Water Ponds			Yes
Conveyor - 32	C-32	7.5	155	SC-3 to C-24	Conveyor		Yes
Conveyor - 32	C-33	7.5	155	SC-3 to C-24	Conveyor		Yes
Conveyor - 34	C-34	50	310	C-32/C-33 to SC4	Conveyor		Yes
Telsmith Wash Screen (8'X20') 3- Deck	SC4	60	310	C-34 to C-35, C-36, C-37	Screen		Yes
Gorman Rupp Pump	Fresh Water Input	200	-	Fresh Water Pond to SC4			
Conveyor - 35	C-35	10	46	SC4 to FB-1	Conveyor		No
Conveyor -36	C-36	10	162	SCR to FB-2	Conveyor		No
Conveyor - 37	C-37	10	100	SC1 to FB-3	Conveyor		No
50 Ton Feed Bin - Truck loadout	FB1	-	45	C-35A to C-38	Conveyor		
50 Ton Feed Bin - Truck loadout	FB2	-	162	C-36 to C-39	Conveyor		
50 Ton Feed Bin - Truck loadout	FB3	-	100	C-37 to C-40	Conveyor		
Conveyor - 38	C-38	20	45	FB-1 to C-41	Conveyor		Yes
Conveyor - 39	C-39	20	162	FB-2 to C-42	Conveyor		Yes
Conveyor - 40	C-40	20	100	FB-3 to C-43	Conveyor		Yes
Conveyor - 41	C-41	20	45	C-38 to TC-5-67s	Conveyor		Yes
Conveyor - 42	C-42	20	162	C-39 to TC-6-57s	Conveyor		Yes
Conveyor - 43	C-43	20	100	C-40 to TC-7-78s	Conveyor		Yes
Tripper Car	TC-5-67s	15	100	C-41 to 67s Stock Pile	Conveyor		Yes
Tripper Car	TC-6-57s	15	290	C-42 to 57s Stock Pile	Conveyor		Yes
Tripper Car	TC-7-78s	10	290	C-43 to 78s Stock Pile	Conveyor		Yes

Number of crushers for DEQ spreadsheet =	10
Number of conveyors for DEQ spreadsheet =	62
Number of screens for DEQ spreadsheet =	8
Actual Operating Schedule =	3744



General Notes

No.	Revision/Issue	Date

Firm Name and Address

SUNROCK
CAROLINA SUNROCK LLC

200 HORIZON DRIVE, SUITE 100
RALEIGH, NC 27615

Project Name and Address

Prospect Hill Quarry FLOW DIAGRAM

Drawn By: Scott Martino

Project	Sheet
FLOW DIAGRAM	1
Date: 02-13-2019	
Scale: N.T.S.	

Wright, Dylan A

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Friday, January 3, 2020 9:49 PM
To: Wright, Dylan A
Cc: Edwards, Lisa; Hartsfield, Taylor; Alexander Culpepper
Subject: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center
Attachments: MERCURY1418D.INP; MERCURY1418D.OUT; Appendix A1 Facility Wide & TAP summary 2020-01-03-revised 4SLB factors.pdf; Carolina Sunrock Prospect Hill 2 Construction Application 2020-01-03-Rev....pdf

Hi Dylan

Attached is the modeling, and updated facility wide documentation you requested. Keep me posted as to what else you need and I'll be happy to help get you what you need.

Thanks

Scott

Scott Martino

Environmental Compliance Manager/Mine Engineer
Carolina Sunrock
200 Horizon Drive Suite 100
Raleigh, NC 27615
Office Phone:(919) 7476336 Cell (984) 202-4761

This section presents the input data and modeling methodology utilized in the TAP modeling compliance demonstration. The modeling methodology conforms to the Guidelines for Evaluating the Air Quality Impacts of Toxic Pollutants in North Carolina (May 2018) and more recent changes posted on NCDAQ's Air Quality Analysis Branch (AQAB) website. In lieu of a modeling protocol, a protocol checklist is provided in Appendix B.

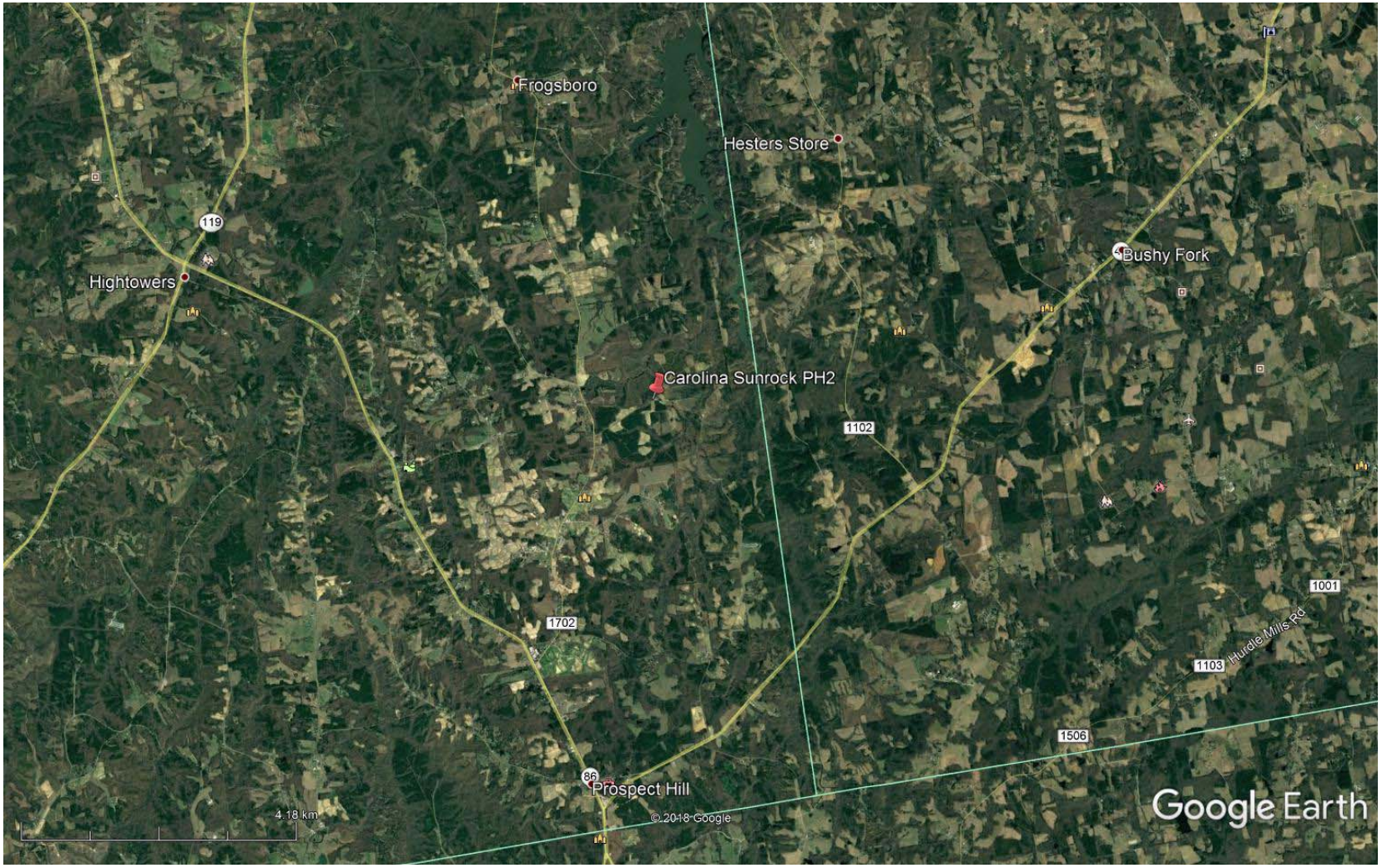
As previously discussed, potential emissions of six (6) compounds regulated under 15A NCAC 2Q .0700 (NC Air Toxics) exceed their TPER and this air dispersion modeling evaluation has been conducted to demonstrate compliance with all applicable AAL.

4.1. FACILITY LOCATION

Figure 4-1 provides a topographical map of the area surrounding the Carolina Sunrock Prospect Hill property. The approximate central Universal Transverse Mercator (UTM) coordinates of the facility are 664.4 kilometers (km) east and 4,018.7 km north in Zone 17 (NAD 83).

For modeling purposes, the appropriate urban/rural land use classification for the area was determined using the Auer technique, which is recommended in the *Guideline on Air Quality Models.* In accordance with this technique, the area within a 3-km radius of the facility was identified on US Geological Survey (USGS) topographic maps (and was delineated by land use type). More than 50 percent of the surrounding land use can be classified as undeveloped rural (i.e., Auer's A4 classification), therefore the area is classified as rural.

Figure 4-1. Map of Area Surrounding Carolina Sunrock



4.2. MODEL SELECTION

The AERMOD dispersion model (version 19091) was used to calculate off-property concentrations in the modeling analysis. AERMOD was promulgated as the preferred model in 40 CFR 51, Appendix W on November 9, 2005 and is recommended by the NCDAQ for evaluating criteria and toxic air pollutant concentrations from industrial facilities such as Carolina Sunrock's Prospect Hill #2 facility.[2] AERMOD was run using the regulatory default option, which automatically implements NCDAQ and U.S. EPA recommended model options.

4.3. SOURCE DESCRIPTION

Tables 4-1 and 4-2 presents a table of the modeled point and volume sources, respectively, including their locations at the facility. All locations are expressed in UTM Zone 18 (NAD83) coordinates.

Table 4-1. Modeled Point Source Locations

Model ID	Description	UTM-E (m)	UTM-N (m)	Elevation (m)
PGEN1	Power Engine 1	664,047.9	4,018,679.7	205.0
PGEN2	Power Engine 2	664,050.7	4,018,673.3	205.2
PGEN3	Power Engine 3	664,053.4	4,018,667.0	205.4
CD1	Asphalt Plant Baghouse	664,069.6	4,018,718.7	204.6
IES4	Asphalt Heater	664,066.8	4,018,732.0	204.7
IES5	Liquid Asphalt Heater	664,071.1	4,018,735.0	204.8
HMASILO1	Asphalt Silo 1 Vent	664,109.1	4,018,719.0	205.1
HMASILO2	Asphalt Silo 2 Vent	664,112.0	4,018,721.4	205.1
HMASILO3	Asphalt Silo 3 Vent	664,115.0	4,018,723.7	205.0
HMASILO4	Asphalt Silo 4 Vent	664,117.9	4,018,726.2	204.9
HMASILO5	Asphalt Silo 5 Vent	664,106.1	4,018,716.5	205.2
CD2	Concrete Plant Baghouse	664,155.2	4,018,786.6	202.2
GEN1	Quarry Generator	664,799.0	4,018,997.2	191.0
GEN1A	Quarry Generator	665,048.1	4,018,924.3	186.6
GEN2	Quarry Generator	664,815.4	4,019,139.4	190.8
GEN3	Quarry Generator	664,617.9	4,018,936.2	199.0
GEN5	Quarry Generator	664,627.5	4,018,930.4	198.4
GEN7	Quarry Generator	664,636.8	4,018,891.0	197.4
GEN4	Quarry Generator	665,031.3	4,019,118.9	188.2

[2] 40 CFR 51, Appendix W–*Guideline on Air Quality Models*, Appendix A.1– AMS/EPA Regulatory Model (AERMOD).

Table 4-2. Modeled Volume Source Locations

Model ID	Description	UTM-E (m)	UTM-N (m)	Elevation (m)
HMALO1	Asphalt Loadout 1	664,109.1	4,018,719.0	205.1
HMALO2	Asphalt Loadout 2	664,112.0	4,018,721.4	205.1
HMALO3	Asphalt Loadout 3	664,115.0	4,018,723.7	205.0
HMALO4	Asphalt Loadout 4	664,117.9	4,018,726.2	204.9
HMALO5	Asphalt Loadout 5	664,106.1	4,018,716.5	205.2

Tables 4-3 and 4-4 present the stack parameters input to the model for each of the point and volume sources, respectively. The stacks for sources IES4 and IES5 are vertical stacks but will have raincaps and thus, per NCDAQ guidance, were modeled with an exit velocity of 0.01 m/s. The HMASILO vents are characterized as point sources with ambient release characteristics, so per NCDAQ guidance, were modeled with an exit velocity of 0.01 m/s and exit temperature of 25 deg. C. The volume source parameters were calculated based on NCDAQ *Guidance* for surface-based volume sources.

Table 4-3. Modeled Point Source Parameters

Model ID	Stack Height (m)	Exit Temp. (K)	Exit Velocity (m/s)	Stack Diameter (m)
PGEN1	5.18	788.71	22.02	0.15
PGEN2	5.18	788.71	22.02	0.15
PGEN3	5.18	788.71	22.02	0.15
CD1	9.22	388.71	29.41	0.96
IES4	2.74	435.93	0.01	0.30
IES5	4.57	435.93	0.01	0.05
HMASILO1	19.81	298.15	0.01	0.30
HMASILO2	19.81	298.15	0.01	0.30
HMASILO3	18.29	298.15	0.01	0.30
HMASILO4	18.29	298.15	0.01	0.30
HMASILO5	18.29	298.15	0.01	0.30
CD2	10.67	298.15	24.38	0.46
GEN1	3.66	797.04	29.11	0.15
GEN1A	3.66	797.04	29.11	0.15
GEN2	3.66	797.04	29.11	0.15
GEN3	3.66	797.04	29.11	0.15
GEN5	3.66	797.04	29.11	0.15
GEN7	3.66	797.04	29.11	0.15
GEN4	1.83	778.71	15.07	0.15

Table 4-4. Modeled Volume Source Parameters

Model ID	Release Height (m)	Init. Lat. Dimension (K)	Init. Vert. Dimension (m/s)
HMALO1	3.66	0.15	1.70
HMALO2	3.66	0.15	1.70
HMALO3	3.66	0.15	1.70
HMALO4	3.66	0.15	1.70
HMALO5	3.66	0.15	1.70

Table 4-5 presents the emission rates modeled for each of the triggered TAPs. These rates represent values that are in excess of the calculated potential rates in order to provide the facility with operational flexibility.

Table 4-5. Modeled Emission Rates

	Modeled Emission Rates (g/s)					
Model ID	**FORM**	**MERCURY**	**NICKEL**	**ARSENIC**	**BENZENE**	**CADMIUM**
PGEN1	1.005E-01	0.000E+00	0.000E+00	0.000E+00	3.169E-03	0.000E+00
PGEN2	1.005E-01	0.000E+00	0.000E+00	0.000E+00	3.169E-03	0.000E+00
PGEN3	8.379E-02	0.000E+00	0.000E+00	0.000E+00	2.641E-03	0.000E+00
CD1	9.765E-02	8.190E-05	1.991E-03	1.764E-05	1.229E-02	1.298E-05
IES4	3.564E-05	4.536E-07	4.536E-07	6.048E-07	3.095E-07	4.536E-07
IES5	3.267E-05	4.158E-07	4.158E-07	5.544E-07	2.837E-07	4.158E-07
HMASILO1	5.292E-04	0.000E+00	0.000E+00	0.000E+00	2.457E-05	0.000E+00
HMASILO2	5.292E-04	0.000E+00	0.000E+00	0.000E+00	2.457E-05	0.000E+00
HMASILO3	5.292E-04	0.000E+00	0.000E+00	0.000E+00	2.457E-05	0.000E+00
HMASILO4	5.292E-04	0.000E+00	0.000E+00	0.000E+00	2.457E-05	0.000E+00
HMASILO5	5.292E-04	0.000E+00	0.000E+00	0.000E+00	2.457E-05	0.000E+00
CD2	0.000E+00	0.000E+00	2.423E-05	8.297E-06	0.000E+00	6.298E-08
GEN1	3.643E-04	0.000E+00	9.261E-07	1.235E-06	2.880E-04	9.261E-07
GEN1A	3.643E-04	0.000E+00	9.261E-07	1.235E-06	2.880E-04	9.261E-07
GEN2	1.301E-04	0.000E+00	3.308E-07	4.410E-07	1.029E-04	3.308E-07
GEN3	4.579E-04	0.000E+00	1.164E-06	1.552E-06	3.621E-04	1.164E-06
GEN5	4.683E-04	0.000E+00	1.191E-06	1.588E-06	3.703E-04	1.191E-06
GEN7	3.643E-04	0.000E+00	9.261E-07	1.235E-06	2.880E-04	9.261E-07
GEN4	1.301E-04	0.000E+00	3.308E-07	4.410E-07	1.029E-04	3.308E-07
HMALO1	2.306E-05	0.000E+00	0.000E+00	0.000E+00	1.363E-05	0.000E+00
HMALO2	2.306E-05	0.000E+00	0.000E+00	0.000E+00	1.363E-05	0.000E+00
HMALO3	2.306E-05	0.000E+00	0.000E+00	0.000E+00	1.363E-05	0.000E+00
HMALO4	2.306E-05	0.000E+00	0.000E+00	0.000E+00	1.363E-05	0.000E+00
HMALO5	2.306E-05	0.000E+00	0.000E+00	0.000E+00	1.363E-05	0.000E+00

As previously described, the following sources are subject to a NESHAP standard:

- PGEN1
- PGEN2
- PGEN3
- GEN1 (J50V2)
- GEN1A (J45)
- GEN2 (S190dt)
- GEN3 (PS1300 Maxtrack)
- GEN5 (PS1300 Maxtrack)
- GEN7 (PS100 Maxtrack)
- GEN4 (TF80)

Since the above sources were included in the TAP modeling analysis, which demonstrates no unacceptable risk to the public, TAP permit limitations are not required for those sources. As such, Carolina Sunrock is requesting the TAP limits in Table 4-6 be included in the permit, based on the modeled emission rates in Table 4-5 (in g/s) and scaled to the appropriate averaging period.

Table 4-6. Requested Permit Limits

Model ID	Requested Permit Limits FORM (lb/hr)	MERCURY (lb/day)	NICKEL (lb/day)	ARSENIC (lb/yr)	BENZENE (lb/yr)	CADMIUM (lb/yr)
PGEN1	7.98E-01	-	-	-	2.20E+02	-
PGEN2	7.98E-01	-	-	-	2.20E+02	-
PGEN3	6.65E-01	-	-	-	1.84E+02	-
CD1	7.75E-01	1.56E-02	3.79E-01	1.23E+00	8.54E+02	9.02E-01
IES4	2.83E-04	8.64E-05	8.64E-05	4.20E-02	2.15E-02	3.15E-02
IES5	2.59E-04	7.92E-05	7.92E-05	3.85E-02	1.97E-02	2.89E-02
HMASILO1	4.20E-03	-	-	-	1.71E+00	-
HMASILO2	4.20E-03	-	-	-	1.71E+00	-
HMASILO3	4.20E-03	-	-	-	1.71E+00	-
HMASILO4	4.20E-03	-	-	-	1.71E+00	-
HMASILO5	4.20E-03	-	-	-	1.71E+00	-
CD2	0.00E+00	-	4.62E-03	5.77E-01	0.00E+00	4.38E-03
GEN1	2.89E-03	-	1.76E-04	8.59E-02	2.00E+01	6.44E-02
GEN1A	2.89E-03	-	1.76E-04	8.59E-02	2.00E+01	6.44E-02
GEN2	1.03E-03	-	6.30E-05	3.07E-02	7.15E+00	2.30E-02
GEN3	3.63E-03	-	2.22E-04	1.08E-01	2.52E+01	8.09E-02
GEN5	3.72E-03	-	2.27E-04	1.10E-01	2.57E+01	8.28E-02
GEN7	2.89E-03	-	1.76E-04	8.59E-02	2.00E+01	6.44E-02
GEN4	1.03E-03	-	6.30E-05	3.07E-02	7.15E+00	2.30E-02
HMALO1	1.83E-04	-	-	-	9.48E-01	-
HMALO2	1.83E-04	-	-	-	9.48E-01	-
HMALO3	1.83E-04	-	-	-	9.48E-01	-
HMALO4	1.83E-04	-	-	-	9.48E-01	-
HMALO5	1.83E-04	-	-	-	9.48E-01	-

4.4. METEOROLOGICAL DATA

The AERMOD modeling results were based on sequential hourly surface observations from Danville, NC (DAN) and upper air data also from Greensboro, NC (GSO). These stations are recommended by NCDAQ for modeling facilities located in Caswell County.[3] The base elevation for the surface station is 174 m.[4]

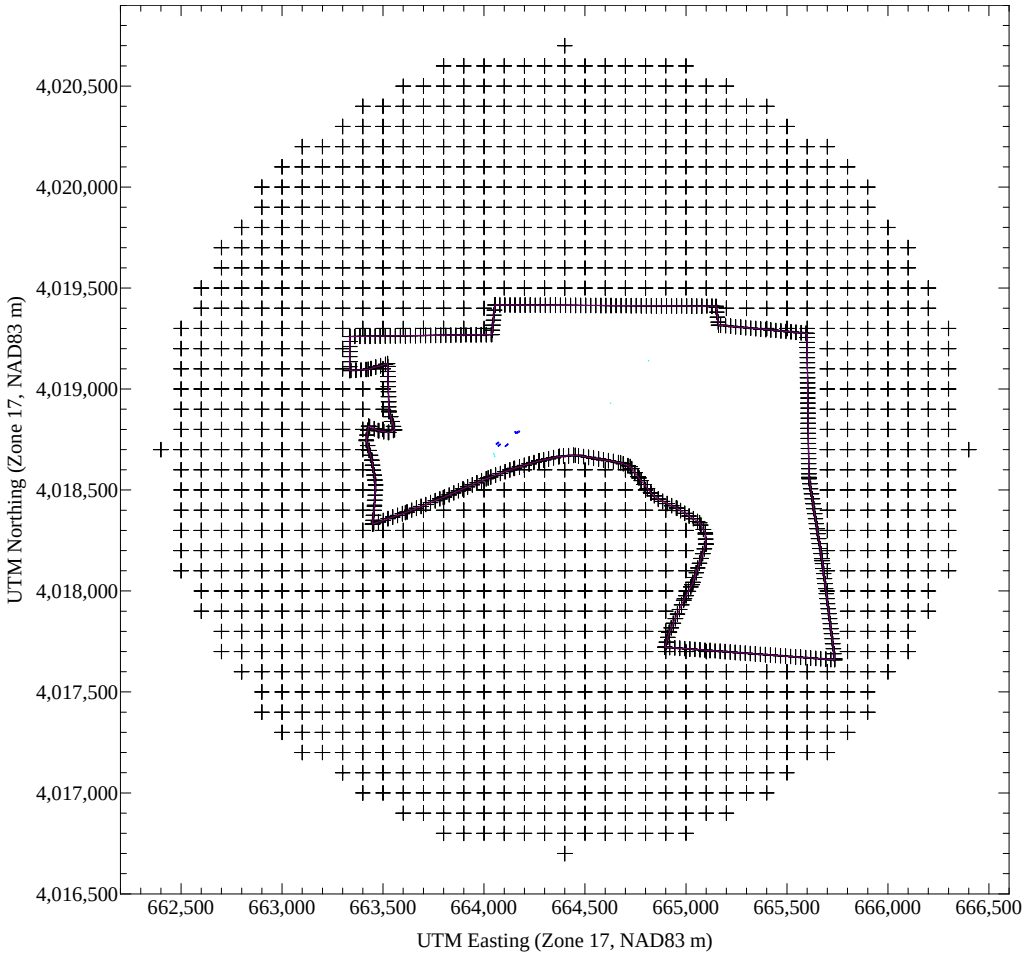
Since the modeled impacts for at least one modeled TAP exceeded 50% of the AAL, five (5) years of data were modeled. The 5, most recent years of meteorological data (2014-2018) were downloaded from NCDAQ's website and input to AERMOD.

[3] https://deq.nc.gov/about/divisions/air-quality/air-quality-permits/modeling-meteorology/meteorological-data
[4] https://files.nc.gov/ncdeq/Air%20Quality/permits/mets/ProfileBaseElevations_2018.pdf

4.5. MODELED RECEPTORS

The receptors included in the modeling analysis consisted of property line receptors, spaced 25 meters (m) apart, and Cartesian receptor points spaced every 100 m, extending out 3 km from the center of the facility. There are no public right-of-ways (e.g. roads) traversing the property line, so only a single property line was included in the modeling. The impacts were reviewed to ensure that the maximum impacts were captured within the 100 m spaced grid. Figure 4-2 shows the receptors included in the modeling analysis.

Figure 4-2. Modeled Receptor Grid



The AERMOD model is capable of handling both simple and complex terrain. Through the use of the AERMOD terrain preprocessor (AERMAP), AERMOD incorporates not only the receptor heights, but also an effective height (hill height scale) that represents the significant terrain features surrounding a given receptor that could lead to plume recirculation and other terrain interaction.[5]

Receptor terrain elevations input to the model were interpolated from National Elevation Database (NED) data obtained from the USGS. NED data consist of arrays of regularly spaced elevations. The array elevations are at a resolution of 1 arcsecond (approximately 30 m intervals) and were

5 US EPA, *Users Guide for the AERMOD Terrain Preprocessor (AERMAP)*, EPA-454/B-03-003, Research Triangle Park, NC.

interpolated using the latest version of AERMAP (version 18081) to determine elevations at the defined receptor intervals. The data obtained from the NED files were checked for completeness and spot-checked for accuracy against elevations on corresponding USGS 1:24,000 scale topographical quadrangle maps. AERMAP was also used to establish the base elevation of all Carolina Sunrock structures and emission sources.

4.6. BUILDING DOWNWASH

AERMOD incorporates the Plume Rise Model Enhancements (PRIME) downwash algorithms. Direction specific building parameters required by AERMOD are calculated using the BPIP-PRIME preprocessor (version 04274).

EPA has promulgated stack height regulations that restrict the use of stack heights in excess of "Good Engineering Practice" (GEP) in air dispersion modeling analyses. Under these regulations, that portion of a stack in excess of the GEP height is generally not creditable when modeling to determine source impacts. This essentially prevents the use of excessively tall stacks to reduce ground-level pollutant concentrations. The minimum stack height not subject to the effects of downwash, called the GEP stack height, is defined by the following formula:

$H_{GEP} = H + 1.5L$, where:

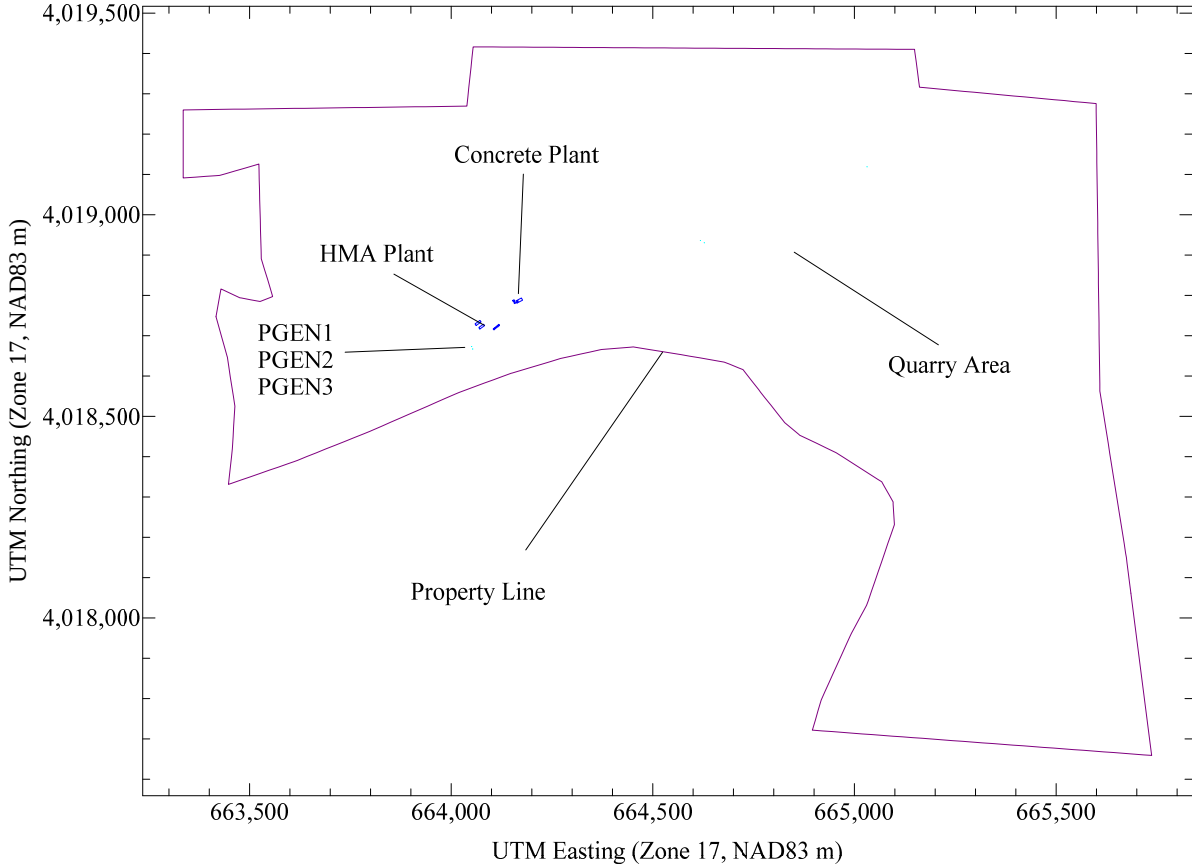
H_{GEP} = minimum GEP stack height,
H = structure height, and
L = lesser dimension of the structure (height or projected width).

This equation is limited to stacks located within 5L of a structure. Stacks located at a distance greater than 5L are not subject to the wake effects of the structure. The wind direction-specific downwash dimensions and the dominant downwash structures used in this analysis are determined using BPIP. In general, the lowest GEP stack height for any source is 65 meters by default.[6] None of the proposed emission units at the Prospect Hill facility will exceed GEP height.

Figures 4-3 presents a site layout for the facility that shows the source and building arrangement as modeled. The electronic BPIP input and output files are included on the CD-ROM in Appendix B.

[6] 40 CFR §51.100(ii)

Figure 4-3. Carolina Sunrock Prospect Hill #2 Site Layout



4.7. TAP MODELING RESULTS

Table 4-7 presents the model results for each of the triggered TAP. As shown, all impacts are below their respective AAL. The electronic modeling files used in the TAP analysis are contained on the CD-ROM in Appendix B.

Table 4-7. TAP Modeling Results

Pollutant	Avg. Period	UTM-E (m)	UTM-N (m)	Date/Time or Year	Max. Modeled Impact ($\mu g/m^3$)	AAL ($\mu g/m^3$)	% of AAL (%)
Formaldehyde	1-Hour	664,020.1	4,018,559.7	14012802	94.50	150	63.00%
Mercury	24-Hour	664,247.2	4,018,636.3	14111424	2.45E-03	0.6	0.41%
Nickel	24-Hour	663,919.1	4,018,515.6	15100424	3.89E-02	6	0.65%
Arsenic	Annual	664,127.9	4,018,599.1	2018	1.20E-04	2.10E-03	5.71%
Benzene	Annual	663,964.9	4,018,535.6	2015	1.14E-01	0.12	94.81%
Cadmium	Annual	664,127.9	4,018,599.1	2018	6.00E-05	5.50E-03	1.09%

FORMs A2, A3

EMISSION SOURCE LISTING FOR THIS APPLICATION - A2

112r APPLICABILITY INFORMATION - A3

REVISED 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — **A2**

EMISSION SOURCE LISTING: New, Modified, Previously Unpermitted, Replaced, Deleted

EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	CONTROL DEVICE ID NO.	CONTROL DEVICE DESCRIPTION
Equipment To Be ADDED By This Application (New, Previously Unpermitted, or Replacement)			
Drum Mix Asphalt Plant (250 tons per hour capacity) Consisting of the Following			
HMA-1	Propane/Natural Gas/No. 2 Fuel Oil/Recycled No. 2 Fuel Oil/Recycled No.4 Fuel Oil-fired drum type hot asphalt plant (80 MMBtu/hr maximum heat input capacity)	HMA-CD1	Bagfilter (7,778 square feet of filter area)
HMA Silo1	Hot mix asphalt storage silo (150 tons maximum capacity)	NA	NA
HMA Silo2	Hot mix asphalt storage silo (150 tons maximum capacity)	NA	NA
HMA Silo3	Hot mix asphalt storage silo (200 tons maximum capacity)	NA	NA
HMA Silo4	Hot mix asphalt storage silo (200 tons maximum capacity)	NA	NA
HMA Silo5	Hot mix asphalt storage silo (200 tons maximum capacity)	NA	NA
HMA-LO1	Asphalt Loadout Operation Silo 1	NA	NA
HMA-LO2	Asphalt Loadout Operation Silo 2	NA	NA
HMA-LO3	Asphalt Loadout Operation Silo 3	NA	NA
HMA-LO4	Asphalt Loadout Operation Silo 4	NA	NA
HMA-LO5	Asphalt Loadout Operation Silo 5	NA	NA
RAP Crushing System Consisting of the Following			
RAP-BF1	RAP bin and feeder	NA	NA
RAP-CR1	RAP impact Crusher (65 tons per hour maximum rated capacity)	NA	NA
RAP-SC1	8' X 20' Double Deck Screen	NA	NA
RAP-C1	RAP 36" Conveyor (C-1) Feeder to Crusher (RAP-CR1)	NA	NA
RAP-C2	RAP 36" Conveyor (C-2) Cursher to Screen	NA	NA
RAP-C3	RAP 36" Conveyor (C-3) Screen to Plant	NA	NA
RAP-C4	RAP 36" Conveyor (C-4) Screen to Conveyor (C-5)	NA	NA
RAP-C5	RAP 36" Conveyor (C-5) Conveyor (C-5) to Conveyor (C-6)	NA	NA
RAP-C5	RAP 36" Conveyor (C-6) Conveyor (C-6) to Crusher (RAP-CR1)	NA	NA
Existing Permitted Equipment To Be MODIFIED By This Application			
Equipment To Be DELETED By This Application			

112(r) APPLICABILITY INFORMATION — A 3

Is your facility subject to 40 CFR Part 68 "Prevention of Accidental Releases" - Section 112(r) of the Federal Clean Air Act? ☐ Yes ☐ No

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

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

A. Have you already submitted a Risk Management Plan (RMP) to EPA Pursuant to 40 CFR Part 68.10 or Part 68.150?

☐ Yes ☐ No Specify required RMP submittal date: _____ If submitted, RMP submittal date: _____

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

☐ Yes ☐ No If yes, please specify: _____

C. List the processes subject to 112(r) at your facility:

PROCESS DESCRIPTION	PROCESS LEVEL (1, 2, or 3)	HAZARDOUS CHEMICAL	INVENTORY (LBS)

Attach Additional Sheets As Necessary

FORMs A2, A3

EMISSION SOURCE LISTING FOR THIS APPLICATION - A2

112r APPLICABILITY INFORMATION - A3

REVISED 09/22/16 | **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** | **A2**

EMISSION SOURCE LISTING: New, Modified, Previously Unpermitted, Replaced, Deleted

EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	CONTROL DEVICE ID NO.	CONTROL DEVICE DESCRIPTION
Equipment To Be ADDED By This Application (New, Previously Unpermitted, or Replacement)			
Truck Mix Concrete Batch Plant (120 cubic yards per hour capacity) Consisting of the Following			
RMC-Silo1	Cement Storage Silo (200-ton capacity)	RMC-CD2	Bagfilter (1,433 square feet of filter area)
RMC-Silo2	Flyash Storage Silo (150-ton Capacity)	RMC-CD2	Bagfilter (1,433 square feet of filter area)
RMC-LO1	Truck Loadout point	RMC-CD2	Bagfilter (1,433 square feet of filter area)
RMC-WB1	Cement/Flyash Weigh Batcher (5-ton max Capacity)	RMC-CD2	Bagfilter (1,433 square feet of filter area)
RMC-WB2	Aggregate Weigh Batcher (20-ton max Capacity)	NA	NA
Existing Permitted Equipment To Be MODIFIED By This Application			
Equipment To Be DELETED By This Application			

112(r) APPLICABILITY INFORMATION — A 3

Is your facility subject to 40 CFR Part 68 "Prevention of Accidental Releases" - Section 112(r) of the Federal Clean Air Act? ☐ Yes ☐ No

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

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

A. Have you already submitted a Risk Management Plan (RMP) to EPA Pursuant to 40 CFR Part 68.10 or Part 68.150?

☐ Yes ☐ No Specify required RMP submittal date: _____ If submitted, RMP submittal date: _____

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

☐ Yes ☐ No If yes, please specify: _____

C. List the processes subject to 112(r) at your facility:

PROCESS DESCRIPTION	PROCESS LEVEL (1, 2, or 3)	HAZARDOUS CHEMICAL	MAXIMUM INTENDED INVENTORY (LBS)

Attach Additional Sheets As Necessary

FORM D5
TECHNICAL ANALYSIS TO SUPPORT PERMIT APPLICATION

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operat** **D5**

PROVIDE DETAILED TECHNICAL CALCULATIONS TO SUPPORT ALL EMISSION, CONTROL, AND REGULATORY DEMONSTRATIONS MADE IN THIS APPLICATION. INCLUDE A COMPREHENSIVE PROCESS FLOW DIAGRAM AS NECESSARY TO SUPPORT AND CLARIFY CALCULATIONS AND ASSUMPTIONS. ADDRESS THE FOLLOWING SPECIFIC ISSUES ON SEPARATE PAGES:

A **SPECIFIC EMISSIONS SOURCE (EMISSION INFORMATION) (FORM B and B1 through B9) -** SHOW CALCULATIONS USED, INCLUDING EMISSION FACTORS, MATERIAL BALANCES, AND/OR OTHER METHODS FROM WHICH THE POLLUTANT EMISSION RATES IN THIS APPLICATION WERE DERIVED. INCLUDE CALCULATION OF POTENTIAL BEFORE AND, WHERE APPLICABLE, AFTER CONTROLS. CLEARLY STATE ANY ASSUMPTIONS MADE AND PROVIDE ANY REFERENCES AS NEEDED TO SUPPORT MATERIAL BALANCE

B **SPECIFIC EMISSION SOURCE (REGULATORY INFORMATION)(FORM E2 - TITLE V ONLY) -** PROVIDE AN ANALYSIS OF ANY REGULATIONS APPLICABLE TO INDIVIDUAL SOURCES AND THE FACILITY AS A WHOLE. INCLUDE A DISCUSSION OUTING METHODS (e.g. FOR TESTING AND/OR MONITORING REQUIREMENTS) FOR COMPLYING WITH APPLICABLE REGULATIONS, PARTICULARLY THOSE REGULATIONS LIMITING EMISSIONS BASED ON PROCESS RATES OR OTHER OPERATIONAL PARAMETERS. PROVIDE JUSTIFICATION FOR AVOIDANCE OF ANY FEDERAL REGULATIONS (PREVENTION OF SIGNIFICANT DETERIORATION (PSD), NEW SOURCE PERFORMANCE STANDARDS (NSPS), NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS), TITLE V), INCLUDING EXEMPTIONS FROM THE FEDERAL REGULATIONS WHICH WOULD OTHERWISE BE APPLICABLE TO THIS FACILITY. SUBMIT

C **CONTROL DEVICE ANALYSIS (FORM C and C1 through C9) -** PROVIDE A TECHNICAL EVALUATION WITH SUPPORTING REFERENCES FOR ANY CONTROL EFFICIENCIES LISTED ON SECTION C FORMS, OR USED TO REDUCE EMISSION RATES IN CALCULATIONS UNDER ITEM "A" ABOVE. INCLUDE PERTINENT OPERATING PARAMETERS (e.g. OPERATING CONDITIONS, MANUFACTURING RECOMMENDATIONS, AND PARAMETERS AS APPLIED FOR IN THIS APPLICATION) CRITICAL TO ENSURING PROPER PERFORMANCE OF THE CONTROL DEVICES). INCLUDE AND LIMITATIONS OR MALFUNCTION POTENTIAL FOR THE PARTICULAR CONTROL DEVICES AS EMPLOYED AT THIS FACILITY. DETAIL PROCEDURES FOR ASSURING PROPER OPERATION OF THE CONTROL DEVICE INCLUDING

D **PROCESS AND OPERATIONAL COMPLIANCE ANALYSIS - (FORM E3 - TITLE V ONLY)** - SHOWING HOW COMPLIANCE WILL BE ACHIEVED WHEN USING PROCESS, OPERATIONAL, OR OTHER DATA TO DEMONSTRATE COMPLIANCE. REFER TO COMPLIANCE REQUIREMENTS IN THE REGULATORY ANALYSIS IN ITEM "B" WHERE APPROPRIATE. LIST ANY CONDITIONS OR PARAMETERS THAT CAN BE MONITORED AND REPORTED TO DEMONSTRATE COMPLIANCE WITH THE APPLICABLE REGULATIONS

E **PROFESSIONAL ENGINEERING SEAL -** PURSUANT TO 15A NCAC 2Q .0112 "APPLICATION REQUIRING A PROFESSIONAL ENGINEERING A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA SHALL BE REQUIRED TO SEAL TECHNICAL PORTIONS OF THIS APPLIC NEW SOURCES AND MODIFICATIONS OF EXISTING SOURCES. (SEE INSTRUCTIONS FOR FURTHER APPLICABILITY).

I, **Aimee Andrews** *attest that this application for* **Carolina Sunrock** *has been reviewed by me and is accurate, complete and consistent with the information supplied in the engineering plans, calculations, and all other supporting documentation to the best of my knowledge. I further attest that to the best of my knowledge the proposed design has been prepared in accordance with the applicable regulations. Although certain portions of this submittal package may have been developed by other professionals, inclusion of these materials under my seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design. Note: In accordance with NC General Statutes 143-215.6A and 143-215.6B, any person who knowingly makes any false statement, representation, or certification in any application shall be guilty of a Class 2 misdemeanor which may include a fine not to exceed $10,000 as well as civil penalties up to $25,000 per violation.*

(PLEASE USE BLUE INK TO COMPLETE THE FOLLOWING)

NAME: **Aimee L. Andrews, P.E.**
DATE: 1/14/2020
COMPANY: **Trinity Consultants of NC, PC**
ADDRESS: **One Copley Parkway, Suite 205, Morrisville, NC 27560**
TELEPHONE: **(919) 462-9693**
SIGNATURE: Aimee L. Andrews
PAGES CERTIFIE **All**

(IDENTIFY ABOVE EACH PERMIT FORM AND ATTACHMENT THAT IS BEING CERTIFIED BY THIS SEAL)

PLACE NORTH CAROLINA SEAL HERE

Attach Additional Sheets As Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **C1**

CONTROL DEVICE ID NO: **HMA-CD1**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **See Form A2**
EMISSION POINT (STACK) ID NO: **EP-1**	POSITION IN SERIES OF CONTROLS NO. **1** OF **1** UNITS
OPERATING SCENARIO:	
	P.E. SEAL REQUIRED (PER 2q .011 ☐ YES ☑ NO

DESCRIBE CONTROL SYSTEM: **Astec Model RBH-45 - 45,000 CFM to control emissions from drying and mixing drums**

POLLUTANTS COLLECTED:	**PM**	**PM10**		
BEFORE CONTROL EMISSION RATE (LB/HR):	**See Appendix A3**			
CAPTURE EFFICIENCY:	**99.99** %	**99.99** %	%	%
CONTROL DEVICE EFFICIENCY:	**90** %	**90** %	%	%
CORRESPONDING OVERALL EFFICIENCY:	**93** %	**90** %	%	%
EFFICIENCY DETERMINATION CODE:	**1**	**1**		
TOTAL AFTER CONTROL EMISSION RATE (LB/H	**See Appendix A3**			

PRESSURE DROP (IN H_20): MIN: MAX: GAUGE? ☑ YES ☐ NO		
BULK PARTICLE DENSITY (LB/FT^3):	INLET TEMPERATURE MIN **Ambient** MAX **350**	
POLLUTANT LOADING RATE: ☐ LB/HR ☐ GR/FT^3	OUTLET TEMPERATUR MIN **180** MAX **350**	
INLET AIR FLOW RATE (ACFM): **45,000 cfm**	FILTER OPERATING TEMP (^{o}f):	
NO. OF COMPARTMENTS: **1**	NO. OF BAGS PER COMPARTMENT: **640**	LENGTH OF BAG (IN.): **120.5**
NO. OF CARTRIDGES: **640**	FILTER SURFACE AREA PER CARTRIDGE (FT^2):	DIAMETER OF BAG (IN.): **4 5/8**
TOTAL FILTER SURFACE AREA (FT^2): **7,778**	AIR TO CLOTH RATIO: **5.78:1**	
DRAFT TYPE: ☑ INDUCED/NEGATIVE ☐ FORCED/POSITIVE	FILTER MATERIAL: ☐ WOVEN ☑ FELTED	

DESCRIBE CLEANING PROCEDU

☐ AIR PULSE ☐ SONIC
☑ REVERSE FLOW ☐ SIMPLE BAG COLLAPSE
☐ MECHANICAL/SHAKER ☐ RING BAG COLLAPSE
☐ OTHER:

DESCRIBE INCOMING AIR STREAM: **Hot Air from Drying and Mixing Drums in HMA Plant**

PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	**40**	**40.2**
1-10	**60**	**100**
10-25		
25-50		
50-100		
>100		
	TOTAL = 100	

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE

COMMENTS:

Attach Additional Sheets As Necessary

FORM C1
CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **C1**

CONTROL DEVICE ID NO: **RMC-CD2**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **See Form A2**
EMISSION POINT (STACK) ID NO: **EP-2**	POSITION IN SERIES OF CONTROLS NO. **1** OF **1** UNITS
OPERATING SCENARIO:	
	P.E. SEAL REQUIRED (PER 2q .011 ☐ YES ☑ NO

DESCRIBE CONTROL SYSTEM: **C&W Manufacturing - RA-140 - 6500 CFM to control emissions from cement/fly ash silos and aggregate and truck loading.**

POLLUTANTS COLLECTED:	**PM**	**PM10**		
BEFORE CONTROL EMISSION RATE (LB/HR)	**See Appendix A4**			
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	**99.9** %	**99.9** %	%	%
CORRESPONDING OVERALL EFFICIENCY:	%	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (L	**See Appendix A4**			

PRESSURE DROP (IN H_2O): MIN: MA	GAUGE? ☑ YES ☐ NO	
BULK PARTICLE DENSITY (LB/FT^3):	INLET TEMPERATURE MIN	MAX
POLLUTANT LOADING RATE: ☐ LB/HR ☐ GR/FT^3	OUTLET TEMPERATUR MIN	MAX
INLET AIR FLOW RATE (ACFM): **6,500 cfm**	FILTER OPERATING TEMP (^0f): **Ambient**	
NO. OF COMPARTMENTS: **2**	NO. OF BAGS PER COMPARTMENT: **36**	LENGTH OF BAG (IN.): **114**
NO. OF CARTRIDGES: **72**	FILTER SURFACE AREA PER CARTRIDGE (FT^2):	DIAMETER OF BAG (IN.): **8**
TOTAL FILTER SURFACE AREA (FT^2): **1,43**	AIR TO CLOTH RATIO: **4.54:1**	Filter material: **felt polyester bags**
DRAFT TYPE: ☑ INDUCED/NEGATIVE ☐ FORCED/POSITIVE	FILTER MATERIAL: ☐ WOVEN ☑ FELTED	

DESCRIBE CLEANING PROCED

- ☐ AIR PULSE
- ☑ REVERSE FLOW
- ☐ MECHANICAL/SHAKER
- ☐ OTHER:
- ☐ SONIC
- ☐ SIMPLE BAG COLLAPSE
- ☐ RING BAG COLLAPSE

PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	**40**	**40.2**
1-10	**60**	**100**
10-25		
25-50		
50-100		
>100		
	TOTAL = 100	

DESCRIBE INCOMING AIR STREAM: **Hot Air from Drying and Mixing Drums in HMA Plant**

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOU

COMMENTS:

Attach Additional Sheets As Necessary

FORM C3
CONTROL DEVICE (THERMAL OR CATALYTIC)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **C3**

QUIRED BY 15A NCAC 2Q .0112, THIS FORM MUST BE SEALED BY A PROFESSIONAL ENGINEER (P.E.) LICENSED IN NORTH CARO

CONTROL DEVICE ID NO: **CD-PGEN1**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **ES-PGEN1**
EMISSION POINT (STACK) ID NO(S): **PGEN1**	POSITION IN SERIES OF CONTROLS NO. _____ OF _____ UNITS
MANUFACTURER: **Miratech**	MODEL NO: **IQ2-28-14-HSG-0 (housing); MECB-OX-RB2894-2675-0000-29**
OPERATING SCENARIO:	
_____ OF _____	

TYP ☐ AFTERBURNER ☐ REGENERATIVE THERMAL OXIDATIO ☐ RECUPERATIVE THERMAL OXIDA ☑ CATALYTIC OXIDATI

EXPECTED LIFE OF CATALYST (YRS): **3**	METHOD OF DETECTING WHEN CATALYST NEEDS REPLACMENT: **Monitor**

CATALYST MASKING AGENT IN AIR ST ☐ HALOGEN ☐ SILICONE ☐ PHOSPHOROUS COMPOUND ☐ HEAVY METAL
☑ SULFUR COMPOUND ☐ OTHER (SPECIFY) _____ ☐ NONE

TYPE OF CATALYST: **Platinum/Rhodiu**	CATALYST VOL (FT^3): **TBD**	VELOCITY THROUGH CATALYST (FPS):
SCFM THROUGH CATALYST:		

DESCRIBE CONTROL SYSTEM, INCLUDING RELATION TO OTHER CONTROL DEVICES AND SOURCES, AND ATTACH DIAGRAM OF SYSTEM:

POLLUTANT(S) COLLECTED:	**CO**			
BEFORE CONTROL EMISSION RATE (LB/HR):	**9.55**			
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	%	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	**66.7** %	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (LB/HR)	**3.18**			

PRESSURE DROP (IN. I MIN MAX **5.0**	OUTLET TEMPERATURE (^oF): MIN **1350** MAX
INLET TEMPERATURE **550** MIN **1250** MAX	RESIDENCE TIME (SECONDS):
INLET AIR FLOW RATE (ACFM): (SCFM): **4162**	COMBUSTION TEMPERATURE (^oF):
COMBUSTION CHAMBER VOLUME (FT^3):	INLET MOISTURE CONTENT (%): **11**
% EXCESS AIR:	CONCENTRATION (ppmv) _____ INLET _____ OUTLET
AUXILIARY FUEL USED: **NA**	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):

DESCRIBE MAINTENANCE PROCEDURES:

DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED INTO THE CONTROL SYSTEM:

COMMENTS:

Attach Additional Sheets As Necessary

FORM C3
CONTROL DEVICE (THERMAL OR CATALYTIC)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **C3**

)UIRED BY 15A NCAC 2Q .0112, THIS FORM MUST BE SEALED BY A PROFESSIONAL ENGINEER (P.E.) LICENSED IN NORTH CAR

CONTROL DEVICE ID NO: **CD-PGEN2**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **ES-PGEN2**
EMISSION POINT (STACK) ID NO(S): **PGEN2**	POSITION IN SERIES OF CONTROLS NO. _____ OF _____ UNITS
MANUFACTURER: **Miratech**	MODEL NO: **IQ2-28-14-HSG-0 (housing); MECB-OX-RB2894-2675-0000-2**
OPERATING SCENARIO:	
_____ OF _____	

TYP ☐ AFTERBURNER ☐ REGENERATIVE THERMAL OXIDAT ☐ RECUPERATIVE THERMAL OXIDA ☑ CATALYTIC OXIDATI

EXPECTED LIFE OF CATALYST (YRS): **3**	METHOD OF DETECTING WHEN CATALYST NEEDS REPLACMENT: **Monitor**

CATALYST MASKING AGENT IN AIR ☐ HALOGEN ☐ SILICONE ☐ PHOSPHOROUS COMPOUND ☐ HEAVY METAL
☑ SULFUR COMPOUND ☐ OTHER (SPECIFY) _____ ☐ NONE

TYPE OF CATALYST: **Platinum/Rho**	CATALYST VOL (FT^3): **TBD**	VELOCITY THROUGH CATALYST (FPS):
SCFM THROUGH CATALYST:		

DESCRIBE CONTROL SYSTEM, INCLUDING RELATION TO OTHER CONTROL DEVICES AND SOURCES, AND ATTACH DIAGRAM OF SYSTEM:

POLLUTANT(S) COLLECTED:	**CO**			
BEFORE CONTROL EMISSION RATE (LB/HR):	**9.55**			
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	%	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	**66.7** %	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (LB/H	**3.18**			

PRESSURE DROP (IN. I MIN MAX **5.0**	OUTLET TEMPERATURE (^oF): MIN **1350** MAX
INLET TEMPERATURE **550** MIN **1250** MAX	RESIDENCE TIME (SECONDS):
INLET AIR FLOW RATE (ACFM): (SCFM): **4162**	COMBUSTION TEMPERATURE (^oF):
COMBUSTION CHAMBER VOLUME (FT^3):	INLET MOISTURE CONTENT (%): **11**
% EXCESS AIR:	CONCENTRATION (ppmv) _____ INLET _____ OUTLET
AUXILIARY FUEL USED: **NA**	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):

DESCRIBE MAINTENANCE PROCEDURES:

DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED INTO THE CONTROL SYSTEM:

COMMENTS:

Attach Additional Sheets As Necessary

FORM C3
CONTROL DEVICE (THERMAL OR CATALYTIC)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **C3**

EQUIRED BY 15A NCAC 2Q .0112, THIS FORM MUST BE SEALED BY A PROFESSIONAL ENGINEER (P.E.) LICENSED IN NORTH CARO

CONTROL DEVICE ID NO: **CD-PGEN2**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **ES-PGEN2**
EMISSION POINT (STACK) ID NO(S): **PGEN2**	POSITION IN SERIES OF CONTROLS NO. _____ OF _____ UNITS
MANUFACTURER: **Miratech**	MODEL NO: **IQ2-28-14-HSG-0 (housing); MECB-OX-RB2894-2675-0000-291 (el**
OPERATING SCENARIO:	
_____ OF _____	

TYP ☐ AFTERBURNER ☐ REGENERATIVE THERMAL OXIDAT ☐ RECUPERATIVE THERMAL OXIDA ☑ CATALYTIC OXIDATION

EXPECTED LIFE OF CATALYST (YRS): **3**	METHOD OF DETECTING WHEN CATALYST NEEDS REPLACMENT: **Monitor**

CATALYST MASKING AGENT IN AIR ☐ HALOGEN ☐ SILICONE ☐ PHOSPHOROUS COMPOUND ☐ HEAVY METAL ☑ SULFUR COMPOUND ☐ OTHER (SPECIFY) _____ ☐ NONE

TYPE OF CATALYST: **Platinum/Rho**	CATALYST VOL (FT^3): **TBD**	VELOCITY THROUGH CATALYST (FPS):

SCFM THROUGH CATALYST:

DESCRIBE CONTROL SYSTEM, INCLUDING RELATION TO OTHER CONTROL DEVICES AND SOURCES, AND ATTACH DIAGRAM OF SYSTEM:

POLLUTANT(S) COLLECTED:	**CO**			
BEFORE CONTROL EMISSION RATE (LB/HR):	**9.55**			
CAPTURE EFFICIENCY:	%	%	%	%
CONTROL DEVICE EFFICIENCY:	%	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	**66.7** %	%	%	%
EFFICIENCY DETERMINATION CODE:				
TOTAL AFTER CONTROL EMISSION RATE (LB/H	**3.18**			

PRESSURE DROP (IN. I MIN MAX **5.0**	OUTLET TEMPERATURE (^oF): MIN **1350** MAX
INLET TEMPERATURE **550** MIN **1250** MAX	RESIDENCE TIME (SECONDS):
INLET AIR FLOW RATE (ACFM): (SCFM): **4162**	COMBUSTION TEMPERATURE (^oF):
COMBUSTION CHAMBER VOLUME (FT^3):	INLET MOISTURE CONTENT (%): **11**
% EXCESS AIR:	CONCENTRATION (ppmv) _____ INLET _____ OUTLET
AUXILIARY FUEL USED: **NA**	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):

DESCRIBE MAINTENANCE PROCEDURES:

DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED INTO THE CONTROL SYSTEM:

COMMENTS:

Attach Additional Sheets As Necessary

APPENDIX A1 – FACILITY WIDE EMISSION SUMMARIES

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions				Controlled Potential Emissions				Potential Emissions w/ Synthetic Minor Limits****
			(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(tons/yr)
Hot Mix Asphalt Plant*	PM		16.10	386.36	141,022	70.51	11.42	77.43	28,263	14.13	14.13
	PM10		8.09	194.11	70,850	35.43	6.93	47.87	17,474	8.74	8.74
	PM2.5		8.09	194.11	70,850	35.43	6.93	47.87	17,474	8.74	8.74
	SO2		21.54	517.01	188,707	94.35	21.54	152.25	55,571	27.79	27.79
	NOx		13.92	334.11	121,952	60.98	13.92	94.53	34,502	17.25	17.25
	CO		33.18	796.20	290,614	145.31	33.18	218.88	79,893	39.95	39.95
	VOC		12.03	288.65	105,356	52.68	12.03	79.13	28,883	14.44	14.44
	Acetaldehyde	H/T	3.25E-01	7.80E+00	2.85E+03	1.42E+00	3.25E-01	7.80E+00	7.80E+02	3.90E-01	1.56E-01
	Acrolein	H/T	6.50E-03	1.56E-01	5.69E+01	2.85E-02	6.50E-03	1.56E-01	1.56E+01	7.80E-03	3.90E-03
	Antimony unlisted compounds	H	4.50E-05	1.08E-03	3.94E-01	1.97E-04	4.50E-05	1.08E-03	1.08E-01	5.40E-05	2.70E-05
	Arsenic unlisted cmpds (comp. of ASC)	H/T	1.40E-04	3.36E-03	1.23E+00	6.13E-04	1.40E-04	3.36E-03	3.36E-01	1.68E-04	8.40E-05
	Benzene	H/T	9.90E-02	2.38E+00	8.67E+02	4.34E-01	9.90E-02	2.38E+00	2.38E+02	1.19E-01	5.94E-02
	Benzo(a)pyrene	T	4.41E-06	1.06E-04	3.86E-02	1.93E-05	4.41E-06	1.06E-04	1.06E-02	5.29E-06	2.65E-06
	Beryllium metal (unreacted)	H/T	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
	Cadmium metal (elemental unreacted)	H/T	1.03E-04	2.46E-03	8.98E-01	4.49E-04	1.03E-04	2.46E-03	2.46E-01	1.23E-04	6.15E-05
	Carbon disulfide	H/T	6.23E-04	1.49E-02	5.45E+00	2.73E-03	6.23E-04	1.49E-02	1.49E+00	7.47E-04	3.74E-04
	Chromium unlisted cmpds (add w/chrom acid to get CRC)	H	1.26E-03	3.03E-02	1.11E+01	5.53E-03	1.26E-03	3.03E-02	3.03E+00	1.52E-03	7.58E-04
	Chromic acid (VI) (component of solCR6 and CRC)	H/T	1.13E-04	2.70E-03	9.86E-01	4.93E-04	1.13E-04	2.70E-03	2.70E-01	1.35E-04	6.75E-05
	Cobalt unlisted compounds	H	6.50E-06	1.56E-04	5.69E-02	2.85E-05	6.50E-06	1.56E-04	1.56E-02	7.80E-06	3.90E-06
	Cumene	H	1.14E-03	2.74E-02	1.00E+01	5.01E-03	1.14E-03	2.74E-02	2.74E+00	1.37E-03	6.86E-04
	Ethyl benzene	H	6.41E-02	1.54E+00	5.61E+02	2.81E-01	6.41E-02	1.54E+00	1.54E+02	7.69E-02	3.84E-02
	Ethyl chloride (chloroethane)	H	2.18E-06	5.24E-05	1.91E-02	9.56E-06	2.18E-06	5.24E-05	5.24E-03	2.62E-06	1.31E-06
	Formaldehyde	H/T	7.97E-01	1.91E+01	6.98E+03	3.49E+00	7.97E-01	1.91E+01	1.91E+03	9.56E-01	4.78E-01
	Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8	T	3.25E-10	7.80E-09	2.85E-06	1.42E-09	3.25E-10	7.80E-09	7.80E-07	3.90E-10	1.95E-10
	Hexane, n-	H/T	2.39E-01	5.74E+00	2.10E+03	1.05E+00	2.39E-01	5.74E+00	5.74E+02	2.87E-01	1.44E-01
	Hydrogen Chloride (hydrochloric acid)	H/T	5.25E-02	1.26E+00	4.60E+02	2.30E-01	5.25E-02	1.26E+00	1.26E+02	6.30E-02	3.15E-02
	Hydrogen Sulfide	T	1.37E-02	3.28E-01	1.20E+02	5.99E-02	1.37E-02	3.28E-01	3.28E+01	1.64E-02	8.21E-03
	Lead unlisted compounds	H	3.75E-03	9.00E-02	3.29E+01	1.64E-02	3.75E-03	9.00E-02	9.00E+00	4.50E-03	2.25E-03
	Manganese unlisted compounds	T	1.93E-03	4.62E-02	1.69E+01	8.43E-03	1.93E-03	4.62E-02	4.62E+00	2.31E-03	1.16E-03
	Mercury, vapor	H/T	6.50E-04	1.56E-02	5.69E+00	2.85E-03	6.50E-04	1.56E-02	1.56E+00	7.80E-04	3.90E-04
	Methyl bromide	H	2.49E-04	5.98E-03	2.18E+00	1.09E-03	2.49E-04	5.98E-03	5.98E-01	2.99E-04	1.49E-04
	Methyl chloride	H	1.56E-04	3.74E-03	1.37E+00	6.83E-04	1.56E-04	3.74E-03	3.74E-01	1.87E-04	9.36E-05
	Methyl chloroform	H/T	1.20E-02	2.88E-01	1.05E+02	5.26E-02	1.20E-02	2.88E-01	2.88E+01	1.44E-02	7.20E-03
	Methyl ethyl ketone	H/T	6.70E-03	1.61E-01	5.87E+01	2.93E-02	6.70E-03	1.61E-01	1.61E+01	8.04E-03	4.02E-03
	Methylene chloride	H/T	8.23E-06	1.97E-04	7.21E-02	3.60E-05	8.23E-06	1.97E-04	1.97E-02	9.87E-06	4.94E-06
	Napthalene	H	1.65E-01	3.95E+00	1.44E+03	7.21E-01	1.65E-01	3.95E+00	3.95E+02	1.98E-01	9.88E-02
	Nickel metal	H/T	1.58E-02	3.78E-01	1.38E+02	6.90E-02	1.58E-02	3.78E-01	3.78E+01	1.89E-02	9.45E-03
	Perchloroethylene (tetrachloroethylene)	H/T	8.01E-05	1.92E-03	7.01E-01	3.51E-04	8.01E-05	1.92E-03	1.92E-01	9.61E-05	4.80E-05
	Phenol	H/T	1.01E-03	2.41E-02	8.81E+00	4.41E-03	1.01E-03	2.41E-02	2.41E+00	1.21E-03	6.03E-04
	Phosphorus Metal, Yellow or White	H	7.00E-03	1.68E-01	6.13E+01	3.07E-02	7.00E-03	1.68E-01	1.68E+01	8.40E-03	4.20E-03
	Polycyclic Organic Matter	H	2.20E-01	5.28E+00	1.93E+03	9.64E-01	2.20E-01	5.28E+00	5.28E+02	2.64E-01	1.32E-01
	Propionaldehyde	H	3.25E-02	7.80E-01	2.85E+02	1.42E-01	3.25E-02	7.80E-01	7.80E+01	3.90E-02	1.95E-02
	Quinone	H	4.00E-02	9.60E-01	3.50E+02	1.75E-01	4.00E-02	9.60E-01	9.60E+01	4.80E-02	2.40E-02
	Selenium compounds	H	8.75E-05	2.10E-03	7.67E-01	3.83E-04	8.75E-05	2.10E-03	2.10E-01	1.05E-04	5.25E-05
	Styrene	H/T	2.40E-04	5.77E-03	2.11E+00	1.05E-03	2.40E-04	5.77E-03	5.77E-01	2.89E-04	1.44E-04
	Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	H/T	5.25E-11	1.26E-09	4.60E-07	2.30E-10	5.25E-11	1.26E-09	1.26E-07	6.30E-11	3.15E-11
	Toluene	H/T	7.29E-01	1.75E+01	6.39E+03	3.19E+00	7.29E-01	1.75E+01	1.75E+03	8.75E-01	4.37E-01
	Trichloroethylene	H/T	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
	Trichlorofluoromethane (CFC 111)	T	1.35E-05	3.24E-04	1.18E-01	5.92E-05	1.35E-05	3.24E-04	3.24E-02	1.62E-05	8.11E-06
	Trimethylpentane, 2,2,4-	H	1.00E-02	2.41E-01	8.78E+01	4.39E-02	1.00E-02	2.41E-01	2.41E+01	1.20E-02	6.02E-03
	Xylene	H/T	6.04E-02	1.45E+00	5.29E+02	2.64E-01	6.04E-02	1.45E+00	1.45E+02	7.24E-02	3.62E-02
Concrete Batch Plant	PM		5.10E+00	1.22E+02	9.08E+05	4.54E+02	5.10E+00	1.22E+02	4.46E+04	22.32	22.32
	PM10		2.44E+00	5.85E+01	3.44E+05	1.72E+02	2.44E+00	5.85E+01	2.13E+04	10.67	10.67
	PM2.5		2.44E+00	5.85E+01	3.44E+05	1.72E+02	2.44E+00	5.85E+01	2.13E+04	10.67	10.67
	Arsenic unlisted cmpds (comp. of ASC)	H/T	6.59E-05	1.58E-03	2.18E+01	1.09E-02	6.59E-05	1.58E-03	5.77E-01	2.88E-04	2.88E-04
	Beryllium metal (unreacted)	H/T	4.53E-06	1.09E-04	8.77E-02	4.38E-05	4.53E-06	1.09E-04	3.97E-02	1.99E-05	1.99E-05
	Cadmium metal (elemental unreacted)	H/T	5.00E-07	1.20E-05	6.74E-02	3.37E-05	5.00E-07	1.20E-05	4.38E-03	2.19E-06	2.19E-06
	Chromic acid (VI) (component of solCR6 and CRC)	H	1.58E-04	3.80E-03	3.73E+00	1.86E-03	1.58E-04	3.80E-03	1.39E+00	6.93E-04	6.93E-04
	Lead unlisted compounds	H	5.96E-05	1.43E-03	1.16E+01	5.78E-03	5.96E-05	1.43E-03	5.22E-01	2.61E-04	2.61E-04
	Manganese unlisted compounds	H/T	7.49E-04	1.80E-02	6.72E+01	3.36E-02	7.49E-04	1.80E-02	6.56E+00	3.28E-03	3.28E-03
	Nickel metal	H/T	1.92E-04	4.62E-03	8.05E+00	4.02E-03	1.92E-04	4.62E-03	1.68E+00	8.42E-04	8.42E-04
	Phosphorus Metal, Yellow or White	H	4.71E-04	1.13E-02	1.51E+01	7.54E-03	4.71E-04	1.13E-02	4.13E+00	2.06E-03	2.06E-03
	Selenium compounds	H	4.68E-06	1.12E-04	8.26E-01	4.13E-04	4.68E-06	1.12E-04	4.10E-02	2.05E-05	2.05E-05

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions				Controlled Potential Emissions				Potential Emissions w/ Synthetic Minor Limits****
			(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(tons/yr)
Asphalt Cement Heater**	2-Methylnaphthalene		2.81E-08	6.74E-07	2.46E-04	1.23E-07	2.81E-08	6.74E-07	2.46E-04	1.23E-07	1.23E-07
	3-Methylchloranthrene		2.11E-09	5.05E-08	1.84E-05	9.22E-09	2.11E-09	5.05E-08	1.84E-05	9.22E-09	9.22E-09
	7,12-Dimethylbenz(a)anathracene		1.87E-08	4.49E-07	1.64E-04	8.20E-08	1.87E-08	4.49E-07	1.64E-04	8.20E-08	8.20E-08
	Acenaphthene	H	1.81E-07	4.34E-06	1.58E-03	7.92E-07	1.81E-07	4.34E-06	1.58E-03	7.92E-07	7.92E-07
	Acenaphtylene	H	2.17E-09	5.20E-08	1.90E-05	9.50E-09	2.17E-09	5.20E-08	1.90E-05	9.50E-09	9.50E-09
	Acetaldehyde	H/T	1.78E-08	4.27E-07	1.56E-04	7.79E-08	1.78E-08	4.27E-07	1.56E-04	7.79E-08	7.79E-08
	Acrolein	H/T	2.11E-08	5.05E-07	1.84E-04	9.22E-08	2.11E-08	5.05E-07	1.84E-04	9.22E-08	9.22E-08
	Ammonia	T	3.74E-03	8.98E-02	3.28E+01	1.64E-02	3.74E-03	8.98E-02	3.28E+01	1.64E-02	1.64E-02
	Anthracene	H	1.05E-08	2.51E-07	9.16E-05	4.58E-08	1.05E-08	2.51E-07	9.16E-05	4.58E-08	4.58E-08
	Benz(a)anthracene	H	3.44E-08	8.25E-07	3.01E-04	1.51E-07	3.44E-08	8.25E-07	3.01E-04	1.51E-07	1.51E-07
	Benzene	H/T	2.46E-06	5.89E-05	2.15E-02	1.08E-05	2.46E-06	5.89E-05	2.15E-02	1.08E-05	1.08E-05
	Benzo(a)pyrene	H/T	1.40E-09	3.37E-08	1.23E-05	6.15E-09	1.40E-09	3.37E-08	1.23E-05	6.15E-09	6.15E-09
	Benzo(b)fluoranthene	H	1.27E-08	3.04E-07	1.11E-04	5.56E-08	1.27E-08	3.04E-07	1.11E-04	5.56E-08	5.56E-08
	Benzo(g,h,i)perylene	H	1.94E-08	4.65E-07	1.70E-04	8.48E-08	1.94E-08	4.65E-07	1.70E-04	8.48E-08	8.48E-08
	Benzo(k)fluoranthene	H	2.11E-09	5.05E-08	1.84E-05	9.22E-09	2.11E-09	5.05E-08	1.84E-05	9.22E-09	9.22E-09
	Butane		2.46E-03	5.89E-02	2.15E+01	1.08E-02	2.46E-03	5.89E-02	2.15E+01	1.08E-02	1.08E-02
	Chrysene	H	2.04E-08	4.90E-07	1.79E-04	8.94E-08	2.04E-08	4.90E-07	1.79E-04	8.94E-08	8.94E-08
	Dibenzo(a,h)anthracene	H	1.43E-08	3.44E-07	1.25E-04	6.27E-08	1.43E-08	3.44E-07	1.25E-04	6.27E-08	6.27E-08
	Dichlorobenzene	H/T	1.40E-06	3.37E-05	1.23E-02	6.15E-06	1.40E-06	3.37E-05	1.23E-02	6.15E-06	6.15E-06
	Ethane		3.63E-03	8.70E-02	3.18E+01	1.59E-02	3.63E-03	8.70E-02	3.18E+01	1.59E-02	1.59E-02
	Ethylbenzene	H	5.45E-07	1.31E-05	4.78E-03	2.39E-06	5.45E-07	1.31E-05	4.78E-03	2.39E-06	2.39E-06
	Fluoranthene	H	4.15E-08	9.96E-07	3.63E-04	1.82E-07	4.15E-08	9.96E-07	3.63E-04	1.82E-07	1.82E-07
	Fluorene	H	3.83E-08	9.20E-07	3.36E-04	1.68E-07	3.83E-08	9.20E-07	3.36E-04	1.68E-07	1.68E-07
	Formaldehyde	H/T	2.83E-04	6.79E-03	2.48E+00	1.24E-03	2.83E-04	6.79E-03	2.48E+00	1.24E-03	1.24E-03
	Hexane	H/T	2.11E-03	5.05E-02	1.84E+01	9.22E-03	2.11E-03	5.05E-02	1.84E+01	9.22E-03	9.22E-03
	Indeno(1,2,3-cd)pyrene	H	1.83E-08	4.40E-07	1.61E-04	8.03E-08	1.83E-08	4.40E-07	1.61E-04	8.03E-08	8.03E-08
	Naphthalene	H	9.69E-06	2.32E-04	8.48E-02	4.24E-05	9.69E-06	2.32E-04	8.48E-02	4.24E-05	4.24E-05
	OCDD		2.66E-11	6.38E-10	2.33E-07	1.16E-10	2.66E-11	6.38E-10	2.33E-07	1.16E-10	1.16E-10
	Pentane		3.04E-03	7.30E-02	2.66E+01	1.33E-02	3.04E-03	7.30E-02	2.66E+01	1.33E-02	1.33E-02
	Phenanathrene	H	9.00E-08	2.16E-06	7.88E-04	3.94E-07	9.00E-08	2.16E-06	7.88E-04	3.94E-07	3.94E-07
	Propane		1.87E-03	4.49E-02	1.64E+01	8.20E-03	1.87E-03	4.49E-02	1.64E+01	8.20E-03	8.20E-03
	Pyrene	H	3.64E-08	8.74E-07	3.19E-04	1.60E-07	3.64E-08	8.74E-07	3.19E-04	1.60E-07	1.60E-07
	Toluene	H/T	5.31E-05	1.28E-03	4.66E-01	2.33E-04	5.31E-05	1.28E-03	4.66E-01	2.33E-04	2.33E-04
	1,1,1-Trichloroethane		2.02E-06	4.85E-05	1.77E-02	8.86E-06	2.02E-06	4.85E-05	1.77E-02	8.86E-06	8.86E-06
	Xylene	H/T	9.34E-07	2.24E-05	8.18E-03	4.09E-06	9.34E-07	2.24E-05	8.18E-03	4.09E-06	4.09E-06
	Arsenic	H/T	4.80E-06	1.15E-04	4.20E-02	2.10E-05	4.80E-06	1.15E-04	4.20E-02	2.10E-05	2.10E-05
	Barium		5.15E-06	1.24E-04	4.51E-02	2.25E-05	5.15E-06	1.24E-04	4.51E-02	2.25E-05	2.25E-05
	Beryllium	H/T	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.60E-06	8.64E-05	3.15E-02	1.58E-05	1.58E-05
	Cadmium	H/T	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.60E-06	8.64E-05	3.15E-02	1.58E-05	1.58E-05
	Chromium (as chromic acid)	H/T	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.60E-06	8.64E-05	3.15E-02	1.58E-05	1.58E-05
	Cobalt		9.82E-08	2.36E-06	8.61E-04	4.30E-07	9.82E-08	2.36E-06	8.61E-04	4.30E-07	4.30E-07
	Copper		7.20E-06	1.73E-04	6.31E-02	3.15E-05	7.20E-06	1.73E-04	6.31E-02	3.15E-05	3.15E-05
	Lead	H	1.08E-05	2.59E-04	9.46E-02	4.73E-05	1.08E-05	2.59E-04	9.46E-02	4.73E-05	4.73E-05
	Manganese	H/T	7.20E-06	1.73E-04	6.31E-02	3.15E-05	7.20E-06	1.73E-04	6.31E-02	3.15E-05	3.15E-05
	Mercury	H/T	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.60E-06	8.64E-05	3.15E-02	1.58E-05	1.58E-05
	Molybdenum		1.29E-06	3.09E-05	1.13E-02	5.64E-06	1.29E-06	3.09E-05	1.13E-02	5.64E-06	5.64E-06
	Nickel	H/T	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.60E-06	8.64E-05	3.15E-02	1.58E-05	1.58E-05
	Selenium	H	1.80E-05	4.32E-04	1.58E-01	7.88E-05	1.80E-05	4.32E-04	1.58E-01	7.88E-05	7.88E-05
	Vanadium		2.69E-06	6.46E-05	2.36E-02	1.18E-05	2.69E-06	6.46E-05	2.36E-02	1.18E-05	1.18E-05
	Zinc		3.39E-05	8.14E-04	2.97E-01	1.49E-04	3.39E-05	8.14E-04	2.97E-01	1.49E-04	1.49E-04

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions (lb/hr)	Uncontrolled Potential Emissions (lbs/day)	Uncontrolled Potential Emissions (lbs/yr)	Uncontrolled Potential Emissions (tons/yr)	Controlled Potential Emissions (lb/hr)	Controlled Potential Emissions (lbs/day)	Controlled Potential Emissions (lbs/yr)	Controlled Potential Emissions (tons/yr)	Potential Emissions w/ Synthetic Minor Limits**** (tons/yr)
Liquid Asphalt Tank Heater* **	PM		1.57E-02	3.77E-01	1.38E+02	6.88E-02	1.57E-02	3.77E-01	1.38E+02	6.88E-02	6.88E-02
	PM10		9.75E-03	2.34E-01	8.54E+01	4.27E-02	9.75E-03	2.34E-01	8.54E+01	4.27E-02	4.27E-02
	PM2.5		9.75E-03	2.34E-01	8.54E+01	4.27E-02	9.75E-03	2.34E-01	8.54E+01	4.27E-02	4.27E-02
	SO2		5.58E-01	1.34E+01	4.89E+03	2.44E+00	5.58E-01	1.34E+01	4.89E+03	2.44E+00	2.44E+00
	NOx		1.57E-01	3.77E+00	1.38E+03	6.88E-01	1.57E-01	3.77E+00	1.38E+03	6.88E-01	6.88E-01
	VOCs		5.90E-03	1.42E-01	5.17E+01	2.58E-02	5.90E-03	1.42E-01	5.17E+01	2.58E-02	2.58E-02
	CO		9.01E-02	2.16E+00	7.89E+02	3.94E-01	9.01E-02	2.16E+00	7.89E+02	3.94E-01	3.94E-01
	2-Methylnaphthalene		2.57E-08	6.18E-07	2.25E-04	1.13E-07	2.57E-08	6.18E-07	2.25E-04	1.13E-07	1.13E-07
	3-Methylchloranthrene		1.93E-09	4.63E-08	1.69E-05	8.45E-09	1.93E-09	4.63E-08	1.69E-05	8.45E-09	8.45E-09
	7,12-Dimethylbenz(a)anathracene		1.72E-08	4.12E-07	1.50E-04	7.51E-08	1.72E-08	4.12E-07	1.50E-04	7.51E-08	7.51E-08
	Acenaphthene	H	1.66E-07	3.98E-06	1.45E-03	7.26E-07	1.66E-07	3.98E-06	1.45E-03	7.26E-07	7.26E-07
	Acenaphtylene	H	1.99E-09	4.77E-08	1.74E-05	8.71E-09	1.99E-09	4.77E-08	1.74E-05	8.71E-09	8.71E-09
	Acetaldehyde	H/T	1.63E-08	3.91E-07	1.43E-04	7.14E-08	1.63E-08	3.91E-07	1.43E-04	7.14E-08	7.14E-08
	Acrolein	H/T	1.93E-08	4.63E-07	1.69E-04	8.45E-08	1.93E-08	4.63E-07	1.69E-04	8.45E-08	8.45E-08
	Ammonia	T	3.43E-03	8.23E-02	3.01E+01	1.50E-02	3.43E-03	8.23E-02	3.01E+01	1.50E-02	1.50E-02
	Anthracene	H	9.59E-09	2.30E-07	8.40E-05	4.20E-08	9.59E-09	2.30E-07	8.40E-05	4.20E-08	4.20E-08
	Benz(a)anthracene	H	3.15E-08	7.56E-07	2.76E-04	1.38E-07	3.15E-08	7.56E-07	2.76E-04	1.38E-07	1.38E-07
	Benzene	H/T	2.25E-06	5.40E-05	1.97E-02	9.86E-06	2.25E-06	5.40E-05	1.97E-02	9.86E-06	9.86E-06
	Benzo(a)pyrene	H/T	1.29E-09	3.09E-08	1.13E-05	5.64E-09	1.29E-09	3.09E-08	1.13E-05	5.64E-09	5.64E-09
	Benzo(b)fluoranthene	H	1.16E-08	2.79E-07	1.02E-04	5.09E-08	1.16E-08	2.79E-07	1.02E-04	5.09E-08	5.09E-08
	Benzo(g,h,i)perylene	H	1.78E-08	4.26E-07	1.56E-04	7.78E-08	1.78E-08	4.26E-07	1.56E-04	7.78E-08	7.78E-08
	Benzo(k)fluoranthene	H	1.93E-09	4.63E-08	1.69E-05	8.45E-09	1.93E-09	4.63E-08	1.69E-05	8.45E-09	8.45E-09
	Butane		2.25E-03	5.40E-02	1.97E+01	9.86E-03	2.25E-03	5.40E-02	1.97E+01	9.86E-03	9.86E-03
	Chrysene	H	1.87E-08	4.49E-07	1.64E-04	8.19E-08	1.87E-08	4.49E-07	1.64E-04	8.19E-08	8.19E-08
	Dibenzo(a,h)anthracene	H	1.31E-08	3.15E-07	1.15E-04	5.75E-08	1.31E-08	3.15E-07	1.15E-04	5.75E-08	5.75E-08
	Dichlorobenzene	H/T	1.29E-06	3.09E-05	1.13E-02	5.64E-06	1.29E-06	3.09E-05	1.13E-02	5.64E-06	5.64E-06
	Ethane		3.32E-03	7.98E-02	2.91E+01	1.46E-02	3.32E-03	7.98E-02	2.91E+01	1.46E-02	1.46E-02
	Ethylbenzene	H	5.00E-07	1.20E-05	4.38E-03	2.19E-06	5.00E-07	1.20E-05	4.38E-03	2.19E-06	2.19E-06
	Fluoranthene	H	3.80E-08	9.13E-07	3.33E-04	1.67E-07	3.80E-08	9.13E-07	3.33E-04	1.67E-07	1.67E-07
	Fluorene	H	3.51E-08	8.43E-07	3.08E-04	1.54E-07	3.51E-08	8.43E-07	3.08E-04	1.54E-07	1.54E-07
	Formaldehyde	H/T	2.59E-04	6.22E-03	2.27E+00	1.14E-03	2.59E-04	6.22E-03	2.27E+00	1.14E-03	1.14E-03
	Hexane	H/T	1.93E-03	4.63E-02	1.69E+01	8.45E-03	1.93E-03	4.63E-02	1.69E+01	8.45E-03	8.45E-03
	Indeno(1,2,3-cd)pyrene	H	1.68E-08	4.04E-07	1.47E-04	7.36E-08	1.68E-08	4.04E-07	1.47E-04	7.36E-08	7.36E-08
	Naphthalene	H	8.88E-06	2.13E-04	7.78E-02	3.89E-05	8.88E-06	2.13E-04	7.78E-02	3.89E-05	3.89E-05
	OCDD		2.44E-11	5.85E-10	2.13E-07	1.07E-10	2.44E-11	5.85E-10	2.13E-07	1.07E-10	1.07E-10
	Pentane		2.79E-03	6.69E-02	2.44E+01	1.22E-02	2.79E-03	6.69E-02	2.44E+01	1.22E-02	1.22E-02
	Phenanathrene	H	8.25E-08	1.98E-06	7.23E-04	3.61E-07	8.25E-08	1.98E-06	7.23E-04	3.61E-07	3.61E-07
	Propane		1.72E-03	4.12E-02	1.50E+01	7.51E-03	1.72E-03	4.12E-02	1.50E+01	7.51E-03	7.51E-03
	Pyrene	H	3.34E-08	8.01E-07	2.93E-04	1.46E-07	3.34E-08	8.01E-07	2.93E-04	1.46E-07	1.46E-07
	Toluene	H/T	4.87E-05	1.17E-03	4.27E-01	2.13E-04	4.87E-05	1.17E-03	4.27E-01	2.13E-04	2.13E-04
	1,1,1-Trichloroethane		1.85E-06	4.45E-05	1.62E-02	8.12E-06	1.85E-06	4.45E-05	1.62E-02	8.12E-06	8.12E-06
	Xylene	H/T	8.56E-07	2.06E-05	7.50E-03	3.75E-06	8.56E-07	2.06E-05	7.50E-03	3.75E-06	3.75E-06
	Arsenic	H/T	4.40E-06	1.06E-04	3.85E-02	1.93E-05	4.40E-06	1.06E-04	3.85E-02	1.93E-05	1.93E-05
	Barium		4.72E-06	1.13E-04	4.13E-02	2.07E-05	4.72E-06	1.13E-04	4.13E-02	2.07E-05	2.07E-05
	Beryllium	H/T	3.30E-06	7.92E-05	2.89E-02	1.45E-05	3.30E-06	7.92E-05	2.89E-02	1.45E-05	1.45E-05
	Cadmium	H/T	3.30E-06	7.92E-05	2.89E-02	1.45E-05	3.30E-06	7.92E-05	2.89E-02	1.45E-05	1.45E-05
	Chromium (as chromic acid)	H/T	3.30E-06	7.92E-05	2.89E-02	1.45E-05	3.30E-06	7.92E-05	2.89E-02	1.45E-05	1.45E-05
	Cobalt		9.01E-08	2.16E-06	7.89E-04	3.94E-07	9.01E-08	2.16E-06	7.89E-04	3.94E-07	3.94E-07
	Copper		6.60E-06	1.58E-04	5.78E-02	2.89E-05	6.60E-06	1.58E-04	5.78E-02	2.89E-05	2.89E-05
	Lead	H	9.90E-06	2.38E-04	8.67E-02	4.34E-05	9.90E-06	2.38E-04	8.67E-02	4.34E-05	4.34E-05
	Manganese	H/T	6.60E-06	1.58E-04	5.78E-02	2.89E-05	6.60E-06	1.58E-04	5.78E-02	2.89E-05	2.89E-05
	Mercury	H/T	3.30E-06	7.92E-05	2.89E-02	1.45E-05	3.30E-06	7.92E-05	2.89E-02	1.45E-05	1.45E-05
	Molybdenum		1.18E-06	2.83E-05	1.03E-02	5.17E-06	1.18E-06	2.83E-05	1.03E-02	5.17E-06	5.17E-06
	Nickel	H/T	3.30E-06	7.92E-05	2.89E-02	1.45E-05	3.30E-06	7.92E-05	2.89E-02	1.45E-05	1.45E-05
	Selenium	H	1.65E-05	3.96E-04	1.45E-01	7.23E-05	1.65E-05	3.96E-04	1.45E-01	7.23E-05	7.23E-05
	Vanadium		2.47E-06	5.92E-05	2.16E-02	1.08E-05	2.47E-06	5.92E-05	2.16E-02	1.08E-05	1.08E-05
	Zinc		3.11E-05	7.46E-04	2.72E-01	1.36E-04	3.11E-05	7.46E-04	2.72E-01	1.36E-04	1.36E-04

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions				Controlled Potential Emissions				Potential Emissions w/ Synthetic Minor Limits****
			(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(tons/yr)
Quarry	PM		2.40E-02	5.77E-01	1.91E+05	95.31	2.40E-02	5.77E-01	1.91E+05	95.31	51.63
	PM10		9.36E-03	2.25E-01	7.58E+04	37.89	9.36E-03	2.25E-01	7.58E+04	37.89	20.53
	PM2.5		4.17E-03	1.00E-01	3.07E+04	15.35	4.17E-03	1.00E-01	3.07E+04	15.35	8.32
Quarry Equipment Generators	PM		7.19E-02	1.73E+00	6.30E+02	3.15E-01	7.19E-02	1.73E+00	6.30E+02	3.15E-01	1.71E-01
	PM10		7.19E-02	1.73E+00	6.30E+02	3.15E-01	7.19E-02	1.73E+00	6.30E+02	3.15E-01	1.71E-01
	PM2.5		7.19E-02	1.73E+00	6.30E+02	3.15E-01	7.19E-02	1.73E+00	6.30E+02	3.15E-01	1.71E-01
	SO_2		2.66E-02	6.38E-01	2.33E+02	1.16E-01	2.66E-02	6.38E-01	2.33E+02	0.12	6.31E-02
	NOx		1.44E+00	3.45E+01	1.26E+04	6.30E+00	1.44E+00	3.45E+01	1.26E+04	6.30	3.41E+00
	CO		1.32E+01	3.17E+02	1.16E+05	5.78E+01	1.32E+01	3.17E+02	1.16E+05	57.84	3.13E+01
	VOC		6.83E-01	1.64E+01	5.99E+03	2.99E+00	6.83E-01	1.64E+01	5.99E+03	2.99	1.62E+00
	Acetaldehyde		1.18E-02	2.82E-01	1.03E+02	5.15E-02	1.18E-02	2.82E-01	1.03E+02	5.15E-02	2.79E-02
	Acrolein		1.42E-03	3.40E-02	1.24E+01	6.21E-03	1.42E-03	3.40E-02	1.24E+01	6.21E-03	3.36E-03
	Arsenic		6.13E-05	1.47E-03	5.37E-01	2.69E-04	6.13E-05	1.47E-03	5.37E-01	2.69E-04	1.45E-04
	Benzene		1.43E-02	3.43E-01	1.25E+02	6.26E-02	1.43E-02	3.43E-01	1.25E+02	6.26E-02	3.39E-02
	Benzo(a)pyrene		2.88E-06	6.92E-05	2.52E-02	1.26E-05	2.88E-06	6.92E-05	2.52E-02	1.26E-05	6.84E-06
	Beryllium		4.60E-05	1.10E-03	4.03E-01	2.01E-04	4.60E-05	1.10E-03	4.03E-01	2.01E-04	1.09E-04
	1,3-Butadiene		5.99E-04	1.44E-02	5.25E+00	2.63E-03	5.99E-04	1.44E-02	5.25E+00	2.63E-03	1.42E-03
	Cadmium		4.60E-05	1.10E-03	4.03E-01	2.01E-04	4.60E-05	1.10E-03	4.03E-01	2.01E-04	1.09E-04
	Chromium (as chromic acid)		4.60E-05	1.10E-03	4.03E-01	2.01E-04	4.60E-05	1.10E-03	4.03E-01	2.01E-04	1.09E-04
	Formaldehyde		1.81E-02	4.34E-01	1.58E+02	7.92E-02	1.81E-02	4.34E-01	1.58E+02	7.92E-02	4.29E-02
	Lead		1.38E-04	3.31E-03	1.21E+00	6.04E-04	1.38E-04	3.31E-03	1.21E+00	6.04E-04	3.27E-04
	Manganese unlisted compounds		9.20E-05	2.21E-03	8.06E-01	4.03E-04	9.20E-05	2.21E-03	8.06E-01	4.03E-04	2.18E-04
	Mercury vapor		4.60E-05	1.10E-03	4.03E-01	2.01E-04	4.60E-05	1.10E-03	4.03E-01	2.01E-04	1.09E-04
	Napthalene		1.30E-03	3.12E-02	1.14E+01	5.69E-03	1.30E-03	3.12E-02	1.14E+01	5.69E-03	3.08E-03
	Nickel metal		4.60E-05	1.10E-03	4.03E-01	2.01E-04	4.60E-05	1.10E-03	4.03E-01	2.01E-04	1.09E-04
	Selenium compounds		2.30E-04	5.52E-03	2.01E+00	1.01E-03	2.30E-04	5.52E-03	2.01E+00	1.01E-03	5.46E-04
	Toluene		6.27E-03	1.50E-01	5.49E+01	2.75E-02	6.27E-03	1.50E-01	5.49E+01	2.75E-02	1.49E-02
	Xylene		4.37E-03	1.05E-01	3.83E+01	1.91E-02	4.37E-03	1.05E-01	3.83E+01	1.91E-02	1.04E-02

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions				Controlled Potential Emissions				Potential Emissions w/ Synthetic Minor Limits****
			(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(tons/yr)
Quarry NG/Propane Large Generators	PM		1.98E+00	4.75E+01	1.73E+04	8.67E+00	1.98E+00	4.75E+01	1.73E+04	8.67	6.12
	PM10		1.98E+00	4.75E+01	1.73E+04	8.67E+00	1.98E+00	4.75E+01	1.73E+04	8.67	6.12
	PM2.5		1.98E+00	4.75E+01	1.73E+04	8.67E+00	1.98E+00	4.75E+01	1.73E+04	8.67	6.12
	SO2		2.41E-02	5.78E-01	2.11E+02	1.05E-01	2.41E-02	5.78E-01	2.11E+02	0.11	0.07
	NOx		8.11E+00	1.95E+02	7.11E+04	3.55E+01	8.11E+00	1.95E+02	7.11E+04	35.53	23.91
	VOC		9.02E+00	2.17E+02	7.90E+04	3.95E+01	9.02E+00	2.17E+02	7.90E+04	39.51	27.89
	CO		9.02E+00	2.17E+02	7.90E+04	3.95E+01	9.02E+00	2.17E+02	7.90E+04	39.51	27.89
	CH4		2.71E-01	6.50E+00	2.37E+03	1.19E+00	2.71E-01	6.50E+00	2.37E+03	1.19E+00	8.37E-01
	N2O		5.42E-02	1.30E+00	4.75E+02	2.37E-01	5.42E-02	1.30E+00	4.75E+02	2.37E-01	1.67E-01
	CO2		5.55E+03	1.33E+05	4.86E+07	2.43E+04	5.55E+03	1.33E+05	4.86E+07	2.43E+04	1.72E+04
	CO2e		5.57E+03	1.34E+05	4.88E+07	2.44E+04	5.57E+03	1.34E+05	4.88E+07	2.44E+04	1.72E+04
	Acenaphthene	HAP	5.12E-05	1.23E-03	4.48E-01	2.24E-04	5.12E-05	1.23E-03	4.48E-01	2.24E-04	1.58E-04
	Acenaphtylene	HAP	2.26E-04	5.44E-03	1.98E+00	9.92E-04	2.26E-04	5.44E-03	1.98E+00	9.92E-04	7.00E-04
	Acetaldehyde	HAP/TAP	3.83E-01	9.20E+00	3.36E+03	1.68E+00	3.83E-01	9.20E+00	3.36E+03	1.68E+00	1.19E+00
	Acrolein	HAP/TAP	2.11E-01	5.05E+00	1.84E+03	9.22E-01	2.11E-01	5.05E+00	1.84E+03	9.22E-01	6.51E-01
	Anthracene	HAP	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
	Benzo(a)anthracene	HAP	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
	Benzene	HAP/TAP	1.80E-02	4.33E-01	1.58E+02	7.89E-02	1.80E-02	4.33E-01	1.58E+02	7.89E-02	5.57E-02
	Benzo(a)pyrene	HAP/TAP	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
	Benzo(b)fluoranthene	HAP	6.80E-06	1.63E-04	5.96E-02	2.98E-05	6.80E-06	1.63E-04	5.96E-02	2.98E-05	2.10E-05
	Benzo(k)fluoranthene	HAP	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
	Benzo(g,h,i)perylene	HAP	1.70E-05	4.07E-04	1.49E-01	7.43E-05	1.70E-05	4.07E-04	1.49E-01	7.43E-05	5.24E-05
	Biphenyl	HAP	8.68E-03	2.08E-01	7.61E+01	3.80E-02	8.68E-03	2.08E-01	7.61E+01	3.80E-02	2.68E-02
	Carbon Tetrachloride	HAP/TAP	1.50E-03	3.61E-02	1.32E+01	6.58E-03	1.50E-03	3.61E-02	1.32E+01	6.58E-03	4.65E-03
	Chlorobenzene	HAP/TAP	1.25E-03	2.99E-02	1.09E+01	5.45E-03	1.25E-03	2.99E-02	1.09E+01	5.45E-03	3.85E-03
	Chloroform	HAP/TAP	1.17E-03	2.80E-02	1.02E+01	5.11E-03	1.17E-03	2.80E-02	1.02E+01	5.11E-03	3.61E-03
	Chrysene	HAP	2.84E-05	6.81E-04	2.49E-01	1.24E-04	2.84E-05	6.81E-04	2.49E-01	1.24E-04	8.78E-05
	Ethylbenzene	HAP	1.63E-03	3.90E-02	1.42E+01	7.12E-03	1.63E-03	3.90E-02	1.42E+01	7.12E-03	5.03E-03
	Ethylene Dibromide	HAP/TAP	1.81E-03	4.35E-02	1.59E+01	7.95E-03	1.81E-03	4.35E-02	1.59E+01	7.95E-03	5.61E-03
	Fluoranthene	HAP	4.55E-05	1.09E-03	3.98E-01	1.99E-04	4.55E-05	1.09E-03	3.98E-01	1.99E-04	1.41E-04
	Fluorene	HAP	2.32E-04	5.57E-03	2.03E+00	1.02E-03	2.32E-04	5.57E-03	2.03E+00	1.02E-03	7.18E-04
	Formaldehyde	HAP/TAP	2.16E+00	5.19E+01	1.89E+04	9.47E+00	2.16E+00	5.19E+01	1.89E+04	9.47E+00	6.69E+00
	Indeno(1,2,3-c,d)pyrene	HAP	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
	Methanol	HAP	1.02E-01	2.46E+00	8.97E+02	4.48E-01	1.02E-01	2.46E+00	8.97E+02	4.48E-01	3.17E-01
	Methylene Chloride	HAP/TAP	8.19E-04	1.97E-02	7.18E+00	3.59E-03	8.19E-04	1.97E-02	7.18E+00	3.59E-03	2.53E-03
	n-Hexane	HAP/TAP	4.55E-02	1.09E+00	3.98E+02	1.99E-01	4.55E-02	1.09E+00	3.98E+02	1.99E-01	1.41E-01
	Naphthalene	HAP	3.05E-03	7.31E-02	2.67E+01	1.33E-02	3.05E-03	7.31E-02	2.67E+01	1.33E-02	9.42E-03
	Phenanthrene	HAP	4.26E-04	1.02E-02	3.73E+00	1.87E-03	4.26E-04	1.02E-02	3.73E+00	1.87E-03	1.32E-03
	Phenol	HAP/TAP	9.83E-04	2.36E-02	8.61E+00	4.31E-03	9.83E-04	2.36E-02	8.61E+00	4.31E-03	3.04E-03
	Pyrene	HAP	5.57E-05	1.34E-03	4.88E-01	2.44E-04	5.57E-05	1.34E-03	4.88E-01	2.44E-04	1.72E-04
	Styrene	HAP/TAP	9.67E-04	2.32E-02	8.47E+00	4.23E-03	9.67E-04	2.32E-02	8.47E+00	4.23E-03	2.99E-03
	Toluene	HAP/TAP	1.67E-02	4.01E-01	1.46E+02	7.32E-02	1.67E-02	4.01E-01	1.46E+02	7.32E-02	5.17E-02
	Vinyl Chloride	HAP/TAP	6.10E-04	1.46E-02	5.35E+00	2.67E-03	6.10E-04	1.46E-02	5.35E+00	2.67E-03	1.89E-03
	Xylene	HAP/TAP	7.54E-03	1.81E-01	6.60E+01	3.30E-02	7.54E-03	1.81E-01	6.60E+01	3.30E-02	2.33E-02
Total	PM		23.28	558.82	1,258,192	629.10	18.61	249.89	281,625	140.81	94.43
	PM10		12.59	302.23	509,134	254.57	11.43	156.00	132,642	66.32	46.26
	PM2.5		12.59	302.11	464,056	232.03	11.43	155.87	87,563	43.78	34.05
	SO2		22.15	531.61	194,038	97.02	22.15	166.85	60,902	30.45	30.37
	NOx		23.63	567.10	206,991	103.50	23.63	327.51	119,541	59.77	45.26
	CO		55.49	1,331.82	486,113	243.06	55.49	754.50	275,392	137.70	99.56
	VOC		21.73	521.56	190,370	95.19	21.73	312.05	113,897	56.95	43.95
	Acetaldehyde	H/T	7.08E-01	1.70E+01	6.21E+03	3.10E+00	7.08E-01	1.70E+01	4.14E+03	2.07E+00	1.34E+00
	Acrolein	H/T	6.50E-03	1.56E-01	5.69E+01	2.85E-02	6.50E-03	1.56E-01	1.56E+01	7.80E-03	3.90E-03
	Antimony unlisted compounds	H	4.50E-05	1.08E-03	3.94E-01	1.97E-04	4.50E-05	1.08E-03	1.08E-01	5.40E-05	2.70E-05
	Arsenic unlisted cmpds (comp. of ASC)	H/T	2.06E-04	4.94E-03	2.30E+01	1.15E-02	2.06E-04	4.94E-03	9.13E-01	4.56E-04	3.72E-04
	Benzene	H/T	1.31E-01	3.15E+00	1.15E+03	5.75E-01	1.31E-01	3.15E+00	5.21E+02	2.60E-01	1.49E-01
	Benzo(a)pyrene	T	4.41E-06	1.06E-04	3.86E-02	1.93E-05	4.41E-06	1.06E-04	1.06E-02	5.29E-06	2.65E-06
	Beryllium metal (unreacted)	H/T	4.53E-06	1.09E-04	8.77E-02	4.38E-05	4.53E-06	1.09E-04	3.97E-02	1.99E-05	1.99E-05
	Cadmium metal (elemental unreacted)	H/T	1.03E-04	2.47E-03	9.65E-01	4.83E-04	1.03E-04	2.47E-03	2.50E-01	1.25E-04	6.37E-05
	Carbon disulfide	H/T	6.23E-04	1.49E-02	5.45E+00	2.73E-03	6.23E-04	1.49E-02	1.49E+00	7.47E-04	3.74E-04
	Chromium unlisted cmpds (add w/chrom acid to get CRC)	H	1.26E-03	3.03E-02	1.11E+01	5.53E-03	1.26E-03	3.03E-02	3.03E+00	1.52E-03	7.58E-04
	Chromic acid (VI) (component of solCR6 and CRC)	H/T	2.71E-04	6.50E-03	4.71E+00	2.36E-03	2.71E-04	6.50E-03	1.66E+00	8.28E-04	7.61E-04
	Cobalt unlisted compounds	H	6.50E-06	1.56E-04	5.69E-02	2.85E-05	6.50E-06	1.56E-04	1.56E-02	7.80E-06	3.90E-06
	Cumene	H	1.14E-03	2.74E-02	1.00E+01	5.01E-03	1.14E-03	2.74E-02	2.74E+00	1.37E-03	6.86E-04
	Ethyl benzene	H	6.41E-02	1.54E+00	5.61E+02	2.81E-01	6.41E-02	1.54E+00	1.54E+02	7.69E-02	3.84E-02
	Ethyl chloride (chloroethane)	H	2.18E-06	5.24E-05	1.91E-02	9.56E-06	2.18E-06	5.24E-05	5.24E-03	2.62E-06	1.31E-06
	Formaldehyde	H/T	2.98E+00	7.15E+01	2.61E+04	1.30E+01	2.98E+00	7.15E+01	2.10E+04	1.05E+01	7.21E+00
	Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8	T	3.25E-10	7.80E-09	2.85E-06	1.42E-09	3.25E-10	7.80E-09	7.80E-07	3.90E-10	1.95E-10
	Hexane, n-	H/T	2.39E-01	5.74E+00	2.10E+03	1.05E+00	2.39E-01	5.74E+00	5.74E+02	2.87E-01	1.44E-01
	Hydrogen Chloride (hydrochloric acid)	H/T	5.25E-02	1.26E+00	4.60E+02	2.30E-01	5.25E-02	1.26E+00	1.26E+02	6.30E-02	3.15E-02
	Hydrogen Sulfide	T	1.37E-02	3.28E-01	1.20E+02	5.99E-02	1.37E-02	3.28E-01	3.28E+01	1.64E-02	8.21E-03
	Lead unlisted compounds	H	3.81E-03	9.14E-02	4.44E+01	2.22E-02	3.81E-03	9.14E-02	9.52E+00	4.76E-03	2.51E-03
	Manganese unlisted compounds	T	2.77E-03	6.64E-02	8.49E+01	4.24E-02	2.77E-03	6.64E-02	1.20E+01	5.99E-03	4.65E-03
	Mercury, vapor	H/T	6.50E-04	1.56E-02	5.69E+00	2.85E-03	6.50E-04	1.56E-02	1.56E+00	7.80E-04	3.90E-04
	Methyl bromide	H	2.49E-04	5.98E-03	2.18E+00	1.09E-03	2.49E-04	5.98E-03	5.98E-01	2.99E-04	1.49E-04
	Methyl chloride	H	1.56E-04	3.74E-03	1.37E+00	6.83E-04	1.56E-04	3.74E-03	3.74E-01	1.87E-04	9.36E-05
	Methyl chloroform	H/T	1.20E-02	2.88E-01	1.05E+02	5.26E-02	1.20E-02	2.88E-01	2.88E+01	1.44E-02	7.20E-03
	Methyl ethyl ketone	H/T	6.70E-03	1.61E-01	5.87E+01	2.93E-02	6.70E-03	1.61E-01	1.61E+01	8.04E-03	4.02E-03
	Methylene chloride	H/T	8.27E-04	1.99E-02	7.25E+00	3.62E-03	8.27E-04	1.99E-02	7.20E+00	3.60E-03	2.54E-03
	Napthalene	H	1.65E-01	3.95E+00	1.44E+03	7.21E-01	1.65E-01	3.95E+00	3.95E+02	1.98E-01	9.88E-02
	Nickel metal	H/T	1.59E-02	3.83E-01	1.46E+02	7.30E-02	1.59E-02	3.83E-01	3.95E+01	1.97E-02	1.03E-02
	Perchloroethylene (tetrachloroethylene)	H/T	8.01E-05	1.92E-03	7.01E-01	3.51E-04	8.01E-05	1.92E-03	1.92E-01	9.61E-05	4.80E-05
	Phenol	H/T	1.99E-03	4.77E-02	1.74E+01	8.71E-03	1.99E-03	4.77E-02	1.10E+01	5.51E-03	3.64E-03
	Phosphorus Metal, Yellow or White	H	7.47E-03	1.79E-01	7.64E+01	3.82E-02	7.47E-03	1.79E-01	2.09E+01	1.05E-02	6.26E-03
	Polycyclic Organic Matter	H	2.20E-01	5.28E+00	1.93E+03	9.64E-01	2.20E-01	5.28E+00	5.28E+02	2.64E-01	1.32E-01

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions				Controlled Potential Emissions				Potential Emissions w/ Synthetic Minor Limits****
			(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(tons/yr)
	Propionaldehyde	H	3.25E-02	7.80E-01	2.85E+02	1.42E-01	3.25E-02	7.80E-01	7.80E+01	3.90E-02	1.95E-02
	Quinone	H	4.00E-02	9.60E-01	3.50E+02	1.75E-01	4.00E-02	9.60E-01	9.60E+01	4.80E-02	2.40E-02
	Selenium compounds	H	3.22E-04	7.73E-03	3.61E+00	1.80E-03	3.22E-04	7.73E-03	2.27E+00	1.13E-03	6.19E-04
	Styrene	H/T	1.21E-03	2.90E-02	1.06E+01	5.29E-03	1.21E-03	2.90E-02	9.04E+00	4.52E-03	3.13E-03
	Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	H/T	5.25E-11	1.26E-09	4.60E-07	2.30E-10	5.25E-11	1.26E-09	1.26E-07	6.30E-11	3.15E-11
	Toluene	H/T	7.52E-01	1.81E+01	6.59E+03	3.29E+00	7.52E-01	1.81E+01	1.95E+03	9.76E-01	5.04E-01
	Trichloroethylene	H/T	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
	Trichlorofluoromethane (CFC 111)	T	1.35E-05	3.24E-04	1.18E-01	5.92E-05	1.35E-05	3.24E-04	3.24E-02	1.62E-05	8.11E-06
	Trimethylpentane, 2,2,4-	H	1.00E-02	2.41E-01	8.78E+01	4.39E-02	1.00E-02	2.41E-01	2.41E+01	1.20E-02	6.02E-03
	Xylene	H/T	6.04E-02	1.45E+00	5.29E+02	2.64E-01	6.04E-02	1.45E+00	1.45E+02	7.24E-02	3.62E-02
	Highest Single HAP (formaldehyde)		2.98E+00	7.15E+01	2.61E+04	1.30E+01	2.98E+00	7.15E+01	2.10E+04	10.51	7.21
	Total HAP		5.51E+00	1.32E+02	4.84E+04	2.42E+01	5.51E+00	1.32E+02	2.99E+04	14.96	9.78

*** Potential Controlled emissions from the hot mix asphalt plant, quarry, quarry generators, and large NG/Propane generators are based on the synthetic minor limit and not based on 8760 hr/yr of operation.**
**** Criteria pollutant emissions from the asphalt cement heater are included in the Hot Mix Asphalt Plant Emissions since the NCDEQ Emission Calculation Spreadsheet for Hot Mix Asphalt plants was used (which incorporates criteria pollutant emissions for an asphalt cement heater).**
***** Criteria and HAP/TAP pollutant emissions for the liquid asphalt tank heater are not included in the NCDEQ Emission Calculation Spreadsheet for Hot Mix Asphalt plants, therefore, these emissions are calculated separately.**
****** Potential Emissions with Synthetic Minor Limits are explained and discussed in Section 2.3 of the application.**
HMA plant emissions are based on a maximum production limit of 600,000 tpy.

APPENDIX A2 - COMBUSTION CALCULATIONS

APPENDIX A3 – HMA PLANT DEQ SPREADSHEET CALCULATIONS

ASPHALT EMISSIONS CALCULATOR REVISION F 07/18/2012 INPUT SCREEN

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.:	TBD
Permit No.:	TBD
Facility City:	ect Hill Quarry & Distribution
Facility County:	Caswell
Spreadsheet Prepared by:	Scott Martino

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 F	(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:	6	

Asphalt Cement Heater			
AC heater heat input:	1.2	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:	1,491,177	tons per year	
Requested Annual Production Limit:	600,000	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 :	45,000	ACFM
Stack gas temperature :	240	oF
Stack % moisture:	33	%
Allowable emission rate under NSPS Subpart I:	7.80	lb/hr
Control efficiency required:	99.889	%
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	%

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	55.4	36.1	9.9
Total PM10	6.5	0.023	1625	5.75	29.0	25.2	6.9
SO2	0.0837	0.0837	20.93	20.93	91.69	91.69	25.12
CO	0.1300	0.130	32.5	32.5	142.4	142.4	39.0
NOx	0.0550	0.055	13.75	13.75	60.2	60.2	16.5
VOC	0.0320	0.032	8	8	35.0	35.0	9.6
HAPs, TOTAL		0.010		2.5	11.0	11.0	3.0

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	0.3
CO	2.53E-03	6.32E-01	2.8	2.8	0.8
VOC	1.61E-02	4.02E+00	17.6	17.6	4.8
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	0.0484	3.15E+00	13.8	13.8	3.8
Total PM10	0.0177	1.15E+00	5.0	5.0	1.4

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	2.83E-02	0.1	0.1	0.1
Total PM10	0.0235714	2.83E-02	0.1	0.1	0.1
SO2	0.5071429	6.09E-01	2.7	2.7	2.7
CO	0.0357143	4.29E-02	0.2	0.2	0.2
NOx	0.1428571	1.71E-01	0.8	0.8	0.8
VOC	0.0024286	2.91E-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	1.14E+01	70.5	51.3	14.1
Total PM10	6.93E+00	35.4	31.6	8.7
SO2	2.15E+01	94.4	94.4	27.8
CO	3.32E+01	145.3	145.3	39.9
NOx	1.39E+01	61.0	61.0	17.3
VOC	1.20E+01	52.7	52.7	14.4
HAPs, TOTAL	2.57E+00	11.3	11.3	3.1

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 (T)	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
Trichlorofluoromethane (CFC 111) (T)	75694	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 F 07/18/2012 - 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.

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.

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

COMPANY:	**Carolina Sunrock LLC**	FACILITY ID NO.:	TBD
		PERMIT NUMBER:	TBD
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:	Hill Quarry & Distributic
		FACILITY COUNTY:	Caswell

Annual Production Limit: 600,000 ton/year **Daily Production Limit:** 0 ton/day

SPREADSHEET PREPARED BY: Scott Martino

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)	11.42	14.13		70.51		14.13
PARTICULATE MATTER<10 MICRONS (PM_{10})	6.93	8.74		35.43		8.74
PARTICULATE MATTER<2.5 MICRONS ($PM_{2.5}$)						
SULFUR DIOXIDE (SO2)	21.54	27.79		94.35		27.79
NITROGEN OXIDES (NOx)	13.92	17.25		60.98		17.25
CARBON MONOXIDE (CO)	33.18	39.95		145.31		39.95
VOLATILE ORGANIC COMPOUNDS (VOC)	12.03	14.44		52.68		14.44
TOTAL HAP	2.57	3.08		11.25		3.08
LARGEST HAP (formaldehyde)	0.80	0.96		3.49		0.96

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	7.80E+02	3.25E-01	2847.00	3.25E-01	7.80E+02	1.3E-03
Acrolein (TH)	107028	6.50E-03	1.56E+01	6.50E-03	56.94	6.50E-03	1.56E+01	2.6E-05
Antimony unlisted compounds (H)	SBC-other	4.50E-05	1.08E-01	4.50E-05	0.39	4.50E-05	1.08E-01	1.8E-07
Arsenic unlisted cmpds (comp. of ASC) (TH)	ASC-other	1.40E-04	3.36E-01	1.40E-04	1.23	1.40E-04	3.36E-01	5.6E-07
Benzene (TH)	71432	9.90E-02	2.38E+02	9.90E-02	867.38	9.90E-02	2.38E+02	4.0E-04
Benzo(a)pyrene (T)	50328	4.41E-06	1.06E-02	4.41E-06	0.04	4.41E-06	1.06E-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	2.46E-01	1.03E-04	0.90	1.03E-04	2.46E-01	4.1E-07
Carbon disulfide (TH)	75150	6.23E-04	1.49E+00	6.23E-04	5.45	6.23E-04	1.49E+00	2.5E-06
Chromium unlisted cmpds (add w/chrom acid to get CRC) (H)	CRC-other	1.26E-03	3.03E+00	1.26E-03	11.06	1.26E-03	3.03E+00	5.1E-06
Chromic acid (VI) (component of solCR6 and CRC) (TH)	7738945	1.13E-04	2.70E-01	1.13E-04	0.99	1.13E-04	2.70E-01	4.5E-07
Cobalt unlisted compounds (H)	COC-other	6.50E-06	1.56E-02	6.50E-06	0.06	6.50E-06	1.56E-02	2.6E-08
Cumene (H)	98828	1.14E-03	2.74E+00	1.14E-03	10.02	1.14E-03	2.74E+00	4.6E-06
Ethyl benzene (H)	100414	6.41E-02	1.54E+02	6.41E-02	561.24	6.41E-02	1.54E+02	2.6E-04
Ethyl chloride (chloroethane) (H)	75003	2.18E-06	5.24E-03	2.18E-06	0.02	2.18E-06	5.24E-03	8.7E-09
Formaldehyde (TH)	50000	7.97E-01	1.91E+03	7.97E-01	6981.17	7.97E-01	1.91E+03	3.2E-03
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (T)	57653857	3.25E-10	7.80E-07	3.25E-10	0.00	3.25E-10	7.80E-07	1.3E-12
Hexane, n- (TH)	110543	2.39E-01	5.74E+02	2.39E-01	2095.50	2.39E-01	5.74E+02	9.6E-04
Hydrogen Chloride (hydrochloric acid) (TH)	7647010	5.25E-02	1.26E+02	5.25E-02	459.90	5.25E-02	1.26E+02	2.1E-04
Hydrogen Sulfide (T)	7783064	1.37E-02	3.28E+01	1.37E-02	119.84	1.37E-02	3.28E+01	5.5E-05
Lead unlisted compounds (H)	PBC-other	3.75E-03	9.00E+00	3.75E-03	32.85	3.75E-03	9.00E+00	1.5E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	4.62E+00	1.93E-03	16.86	1.93E-03	4.62E+00	7.7E-06
Mercury, vapor (TH)	7439976	6.50E-04	1.56E+00	6.50E-04	5.69	6.50E-04	1.56E+00	2.6E-06
Methyl bromide (H)	74839	2.49E-04	5.98E-01	2.49E-04	2.18	2.49E-04	5.98E-01	1.0E-06
Methyl chloride (H)	74873	1.56E-04	3.74E-01	1.56E-04	1.37	1.56E-04	3.74E-01	6.2E-07
Methyl chloroform (TH)	71556	1.20E-02	2.88E+01	1.20E-02	105.12	1.20E-02	2.88E+01	4.8E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	1.61E+01	6.70E-03	58.67	6.70E-03	1.61E+01	2.7E-05
Methylene chloride (TH)	75092	8.23E-06	1.97E-02	8.23E-06	0.07	8.23E-06	1.97E-02	3.3E-08
Napthalene (H)	91203	1.65E-01	3.95E+02	1.65E-01	1442.95	1.65E-01	3.95E+02	6.6E-04
Nickel metal (TH)	7440020	1.58E-02	3.78E+01	1.58E-02	137.97	1.58E-02	3.78E+01	6.3E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	1.92E-01	8.01E-05	0.70	8.01E-05	1.92E-01	3.2E-07
Phenol (TH)	108952	1.01E-03	2.41E+00	1.01E-03	8.81	1.01E-03	2.41E+00	4.0E-06
Phosphorus Metal, Yellow or White (H)	7723140	7.00E-03	1.68E+01	7.00E-03	61.32	7.00E-03	1.68E+01	2.8E-05
Polycyclic Organic Matter (H)	POM	2.20E-01	5.28E+02	2.20E-01	1927.20	2.20E-01	5.28E+02	8.8E-04
Propionaldehyde (H)	123386	3.25E-02	7.80E+01	3.25E-02	284.70	3.25E-02	7.80E+01	1.3E-04
Quinone (H)	106514	4.00E-02	9.60E+01	4.00E-02	350.40	4.00E-02	9.60E+01	1.6E-04
Selenium compounds (H)	SEC	8.75E-05	2.10E-01	8.75E-05	0.77	8.75E-05	2.10E-01	3.5E-07
Styrene (TH)	100425	2.40E-04	5.77E-01	2.40E-04	2.11	2.40E-04	5.77E-01	9.6E-07
Tetrachlorodibenzo-p-dioxin, 2,3,7,8- (TH)	1746016	5.25E-11	1.26E-07	5.25E-11	0.00	5.25E-11	1.26E-07	2.1E-13

Toluene (TH)	108883	7.29E-01	1.75E+03	7.29E-01	6386.67	7.29E-01	1.75E+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
Trichlorofluoromethane (CFC 111) (T)	75694	1.35E-05	3.24E-02	1.35E-05	0.12	1.35E-05	3.24E-02	5.4E-08
Trimethylpentane, 2,2,4- (H)	540841	1.00E-02	2.41E+01	1.00E-02	87.85	1.00E-02	2.41E+01	4.0E-05
Xylene (TH)	1330207	6.04E-02	1.45E+02	6.04E-02	528.72	6.04E-02	1.45E+02	2.4E-04
Xylene, o- (H)	95476	2.57E-03	6.16E+00	2.57E-03	22.50	2.57E-03	6.16E+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 600000 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	7.80E+02	NO. Based on facility-wide potential.	1.30E-03
Acrolein (TH)	107028	6.50E-03	0.00E+00	1.56E+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	3.36E-01	YES. Modeling required	5.60E-07
Benzene (TH)	71432	9.90E-02	0.00E+00	2.38E+02	YES. Modeling required	3.96E-04
Benzo(a)pyrene (T)	50328	4.41E-06	0.00E+00	1.06E-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	0.00E+00	2.46E-01	NO. Because of operating restriction	4.10E-07
Carbon disulfide (TH)	75150	6.23E-04	0.00E+00	1.49E+00	NO. Based on facility-wide potential.	2.49E-06
Soluble Chromate compounds as Chrome (VI) (TH)	SOLCR6	1.13E-04	0.00E+00	2.70E-01	NO. Based on facility-wide potential.	4.50E-07
Formaldehyde (TH)	50000	7.97E-01	0.00E+00	1.91E+03	YES. Modeling required	3.19E-03
Hexane, n- (TH)	110543	2.39E-01	0.00E+00	5.74E+02	NO. Based on facility-wide potential.	9.57E-04
Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8 (T)	57653857	3.25E-10	0.00E+00	7.80E-07	NO. Based on facility-wide potential.	1.30E-12
Hydrogen Sulfide (T)	7783064	1.37E-02	0.00E+00	3.28E+01	NO. Based on facility-wide potential.	5.47E-05
Manganese unlisted compounds (T)	MNC-other	1.93E-03	0.00E+00	4.62E+00	NO. Based on facility-wide potential.	7.70E-06
Mercury, vapor (TH)	7439976	6.50E-04	0.00E+00	1.56E+00	NO. Because of operating restriction	2.60E-06
Methylene chloride (TH)	75092	8.23E-06	0.00E+00	1.97E-02	NO. Based on facility-wide potential.	3.29E-08
Methyl chloroform (TH)	71556	1.20E-02	0.00E+00	2.88E+01	NO. Based on facility-wide potential.	4.80E-05
Methyl ethyl ketone (TH)	78933	6.70E-03	0.00E+00	1.61E+01	NO. Based on facility-wide potential.	2.68E-05
Nickel metal (TH)	7440020	1.58E-02	0.00E+00	3.78E+01	NO. Because of operating restriction	6.30E-05
Perchloroethylene (tetrachloroethylene) (TH)	127184	8.01E-05	0.00E+00	1.92E-01	NO. Based on facility-wide potential.	3.20E-07
Phenol (TH)	108952	1.01E-03	0.00E+00	2.41E+00	NO. Based on facility-wide potential.	4.02E-06
Styrene (TH)	100425	2.40E-04	0.00E+00	5.77E-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	1.26E-07	NO. Based on facility-wide potential.	2.10E-13
Toluene (TH)	108883	7.29E-01	0.00E+00	1.75E+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
Trichlorofluoromethane (CFC 111) (T)	75694	1.35E-05	0.00E+00	3.24E-02	NO. Based on facility-wide potential.	5.41E-08
Xylene (TH)	1330207	6.04E-02	0.00E+00	1.45E+02	NO. Based on facility-wide potential.	2.41E-04

To:	Ryan Spivey Nixon Energy Solutions 3101 Yorkmont Road Suite 100 Charlotte, NC 28208	**Mobile:** **Email:**	704.787.6596 rspivey@nixonpower.com
CC:	Michael Nix/MIRATECH		
From:	Rick Hodgkins MIRATECH 420 S 145th E Ave Mail Drop A Tulsa, OK 74108	**Phone:** **Mobile:** **Email:**	(918) 933-6213 (918) 629-4754 rhodgkins@miratechcorp.com

Project Reference:	Carolina Sunrock
Proposal Number:	RH-19-006029
Date:	**11/8/2019**
Firm Quote For:	**30 days from Proposal Date**

Dear Ryan:

MIRATECH welcomes the opportunity to provide you with a proposal for an NSCR system. We are confident that your organization will benefit from selecting us for this project for the following reasons:

Experience.
- MIRATECH is the leader in providing NSCR, Oxidation, SCR & DPF systems; having more than 24,000 successfully operating units installed in North America, South America, Europe and Asia.

World-Class Technology.
- Consistently set the standards for Best Available Control Technology (BACT)
- Simple, user-friendly control and communication technology; connects to any building's communication systems

U.S. & European Field Services & Support.
- Fast-response field service & technical support
- Replacement components in stock in Tulsa, OK & Sinntal, Germany
- In-house engineering & product support

The system offered for this project is in accordance with the engine and technical data received or estimated from your company and is designed to provide emission reduction for carbon monoxide (CO) as listed on the Application & Performance Warranty Data page. MIRATECH warrants the quoted performance based on the engine emission and operating data you have provided us and that is contained in this proposal. Please note that some engine assumptions might be used and converter size may change based on actual engine data.

Again, thank you for the opportunity to provide this proposal. We are confident that our products will meet your technical needs and provide the best solution for your investment. If you have any questions, please do not hesitate to contact me. I will call you next week to confirm your receipt and satisfaction with this proposal.

Best Regards,
Rick Hodgkins
Southeast Regional Sales Manager
MIRATECH

Application & Performance Warranty Data

Project Information

Site Location:	North Carolina
Project Name:	Carolina Sunrock
Application:	Prime Power
Number Of Engines:	1
Operating Hours per Year:	4000

Engine Specifications

Engine Manufacturer:	Jenbacher
Model Number:	JGC 420 GS-B86
Rated Speed:	1800 RPM
Generator Power:	1500 ekW
Type of Fuel:	Natural Gas
Type of Lube Oil:	0.6 wt% sulfated ash or less
Lube Oil Consumption:	0.1 % Fuel Consumption
Number of Exhaust Manifolds:	1

Engine Cycle Data

Load	Speed	Power	Exhaust Flow	Exhaust Temp.	Fuel Cons.	CO	O_2	H_2O
%		bhp	lb/hr	F		g/bhp-hr	%	%
100	Rated	2,065	18,729	783		2.1	8.4	11

Emission Data (100% Load)

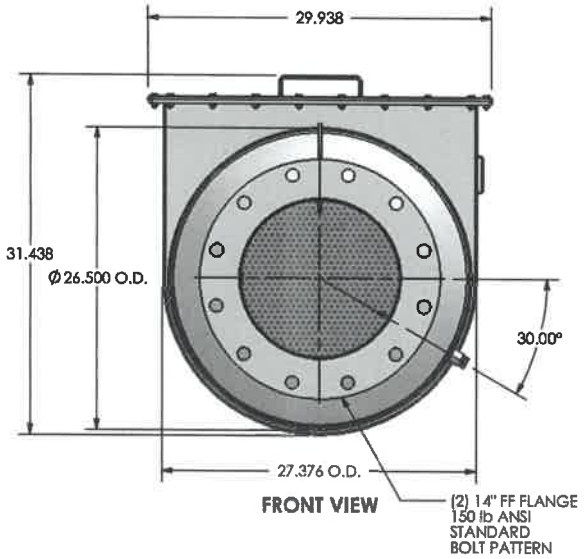
Emission	Raw Engine Emissions						Target Outlet Emissions						Calculated Reduction
	g/bhp-hr	g/kW-hr	tons/yr	ppmvd @ 15% O_2	ppmvd	lb/MW-hr	g/bhp-hr	g/kW-hr	tons/yr	ppmvd @ 15% O_2	ppmvd	lb/MW-hr	
CO	2.1	2.816	19.12	280	594	6.21	0.7	0.939	6.37	93	198	2.07	66.7%

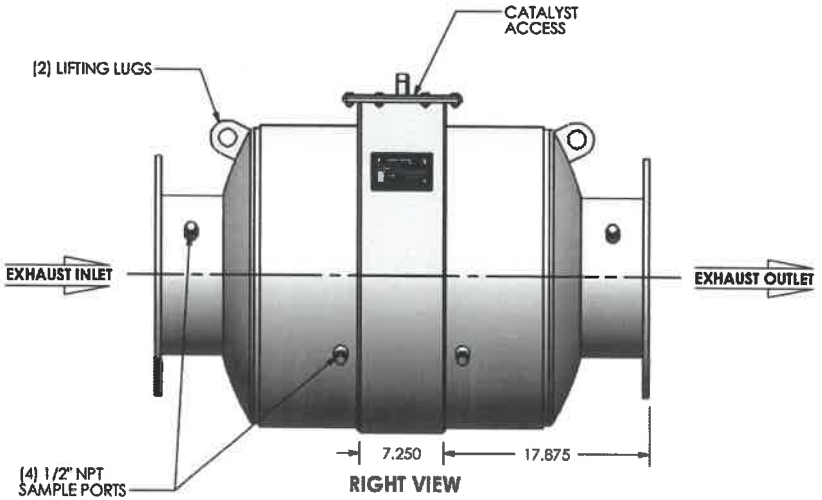
System Specifications

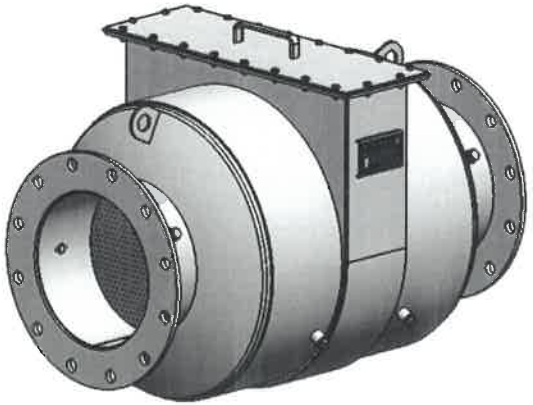
Oxidation System Specifications (IQ2-28-14)

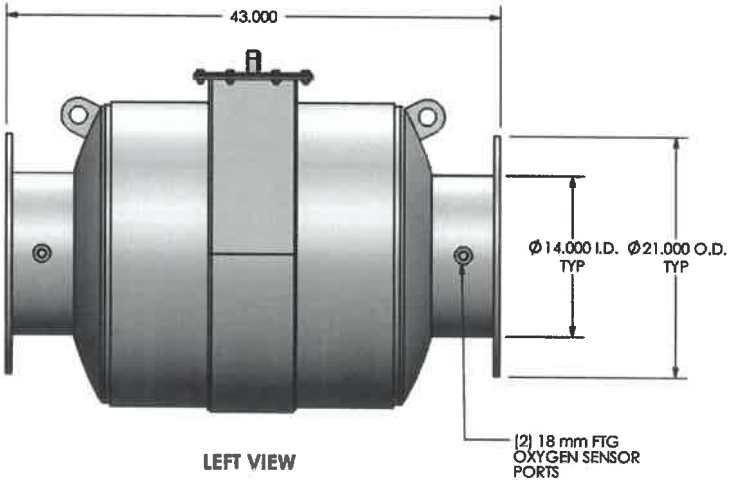
Design Exhaust Flow Rate:	18,729 lb/hr
Design Exhaust Temperature[1]:	783°F
Housing Model Number:	IQ2-28-14-HSG-0
Element Model Number:	MECB-OX-RB2894-2675-0000-291
Number of Catalyst Layers:	1
Number of Spare Catalyst Layers:	1
System Pressure Loss:	5.0 inches of WC (Clean) (12.5 mBar)
Exhaust Temperature Limits*:	550 – 1250°F (catalyst inlet); 1350°F (catalyst outlet) 288 – 677°C (catalyst inlet); 732°C (catalyst outlet)

* General catalyst temperature operating range. Performance is based on the Design Exhaust Temperature.









MATERIAL CONSTRUCTION:

-CARBON STEEL

PROJECT NAME	
PROPOSAL NUMBER	
SALES ORDER NO.	
CUSTOMER P.O.	

DIMENSIONS ARE APPROXIMATE IN INCHES UNLESS OTHERWISE SPECIFIED

DO NOT SCALE DRAWING

DRAWN CDT	DATE 12/16/2011	DRAWING IQ2-28-14 SD				REV 0
REVIEWED BY AJM	DATE 12/19/2011	SIZE A	SCALE 1:16	WEIGHT: 369 lb FULLY LOADED		SHEET 1 OF 1

MIRATECH

IQ2-28-14
Sales Drawing

5/2019

Technical Description

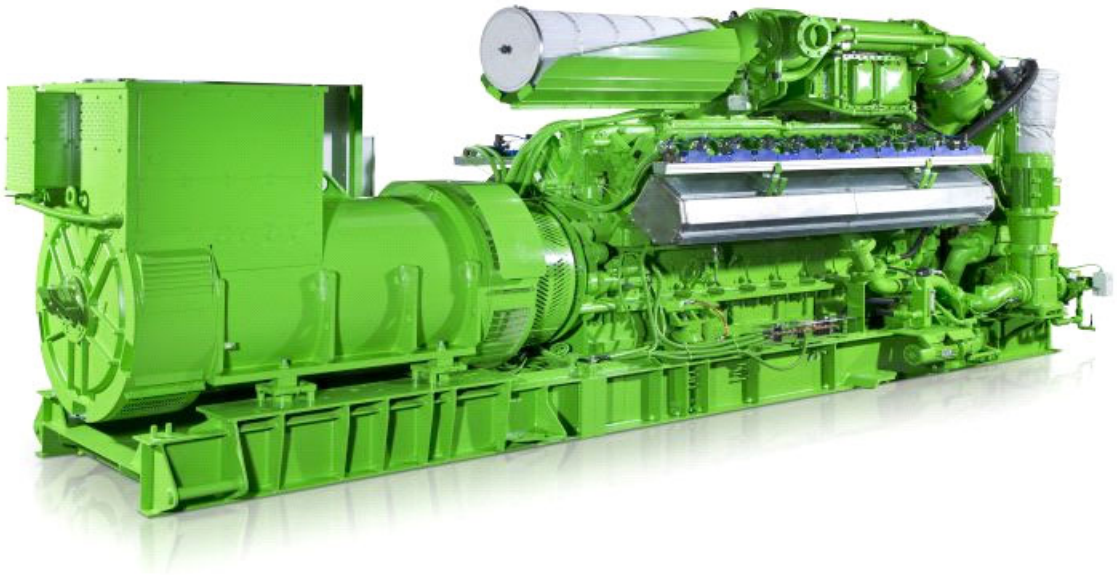
Genset-Container

JGC 420 GS-N.L

Grid Parallel with Island Operation

*Full rated power at **59** FT ASL and **95F** T1, above **95F T1**, a **0.833%**/F derate automatically occurs.*

Standard J420 – Carolina Sunrock *Preliminary



Electrical output 1500 kW el.

Emission values
NOx < 0.6 g/bhp.hr (NO2)

0.01 Technical Data (on container)

			100%	75%	50%
Power input	[2]	MBTU/hr	12,613	9,765	6,917
Gas volume	*)	scfhr	13,755	10,649	7,543
Mechanical output	[1]	bhp	2,065	1,549	1,032
Electrical output	[4]	kW el.	1,500	1,124	745
Heat to be dissipated (calculated with Glykol 37%)	**[5]**				
~ Intercooler 1st stage (Engine jacket water cooling circuit)	[9]	MBTU/hr	1,130	557	146
~ Intercooler 2nd stage (Low Temperature circuit)		MBTU/hr	366	287	195
~ Lube oil (Engine jacket water cooling circuit)		MBTU/hr	879	804	697
~ Jacket water		MBTU/hr	1,336	1,151	907
~ Surface heat	ca. [7]	MBTU/hr	397	~	~
Spec. fuel consumption of engine electric	[2]	BTU/kWel.hr	8,401	8,686	9,284
Spec. fuel consumption of engine	[2]	BTU/bhp.hr	6,108	6,304	6,703
Lube oil consumption	ca. [3]	gal/hr	0.09	~	~
Electrical efficiency			40.6%	39.3%	36.8%
Fuel gas LHV		BTU/scft	917		

*) approximate value for pipework dimensioning
[_] Explanations: see 0.10 - Technical parameters

All heat data is based on standard conditions according to attachment 0.10. Deviations from the standard conditions can result in a change of values within the heat balance, and must be taken into consideration in the layout of the cooling circuit/equipment (intercooler; emergency cooling; ...). In the specifications in addition to the general tolerance of ±8 % on the thermal output a further reserve of +5 % is recommended for the dimensioning of the cooling requirements.

Main dimensions and weights (on container)

Length	in	~ 490
Width	in	~ 120
Height	in	~ 110
Weight empty	lbs	~ 80,100
Weight filled	lbs	~ 84,290

Connections

Jacket water inlet and outlet	in/lbs	3"/145
Exhaust gas outlet [C]	in/lbs	12"/145
Fuel gas connection (on container) [D]	in	4"/232
Fresh oil connection	G	28x2"
Waste oil connection	G	28x2"
Cable outlet	in	31.5x15.7
Condensate drain	in	~

Output / fuel consumption

ISO standard fuel stop power ICFN	bhp	2,065
Mean effe. press. at stand. power and nom. speed	psi	244
Fuel gas type		Natural gas
Based on methane number | Min. methane number	MN	94 | 75 d)
Compression ratio	Epsilon	12.5
Min./Max. fuel gas pressure at inlet to gas train	psi	1.74 - 2.9 c)
Max. rate of gas pressure fluctuation	psi/sec	0.145
Maximum Intercooler 2nd stage inlet water temperature	°F	122
Spec. fuel consumption of engine	BTU/bhp.hr	6,108
Specific lube oil consumption	g/bhp.hr	0.15
Max. Oil temperature	°F	189
Jacket-water temperature max.	°F	203
Filling capacity lube oil (refill)	gal	~ 115

c) Lower gas pressures upon inquiry
d) based on methane number calculation software AVL 3.2 (calculated without N2 and CO2)

0.02 Technical data of engine

Manufacturer		JENBACHER
Engine type		J 420 GS-B86
Working principle		4-Stroke
Configuration		V 70°
No. of cylinders		20
Bore	in	5.71
Stroke	in	7.28
Piston displacement	cu.in	3,728
Nominal speed	rpm	1,800
Mean piston speed	in/s	437
Length	in	148
Width	in	62
Height	in	80
Weight dry	lbs	15,873
Weight filled	lbs	17,417
Moment of inertia	lbs-ft²	276.26
Direction of rotation (from flywheel view)		left
Radio interference level to VDE 0875		N
Starter motor output	kW	13
Starter motor voltage	V	24

Thermal energy balance

Power input	MBTU/hr	12,613
Intercooler	MBTU/hr	1,496
Lube oil	MBTU/hr	879
Jacket water	MBTU/hr	1,336
Exhaust gas cooled to 356 °F	MBTU/hr	2,138
Exhaust gas cooled to 212 °F	MBTU/hr	2,833
Surface heat	MBTU/hr	225

Exhaust gas data

Exhaust gas temperature at full load	[8]	°F	783
Exhaust gas temperature at bmep= 182.8 [psi]		°F	~ 826
Exhaust gas temperature at bmep= 121.8 [psi]		°F	~ 880
Exhaust gas mass flow rate, wet		lbs/hr	18,729
Exhaust gas mass flow rate, dry		lbs/hr	17,460
Exhaust gas volume, wet		scfhr	237,780
Exhaust gas volume, dry		scfhr	212,520
Max.admissible exhaust back pressure after engine		psi	0.870

Combustion air data

Combustion air mass flow rate	lbs/hr	18,164
Combustion air volume	SCFM	3,752
Max. admissible pressure drop at air-intake filter	psi	0.145

Sound pressure level

Aggregate a)		dB(A) re 20µPa	100
31,5	Hz	dB	82
63	Hz	dB	90
125	Hz	dB	101
250	Hz	dB	98
500	Hz	dB	94
1000	Hz	dB	89
2000	Hz	dB	91
4000	Hz	dB	95
8000	Hz	dB	92
Exhaust gas b)		dB(A) re 20µPa	115
31,5	Hz	dB	95
63	Hz	dB	117
125	Hz	dB	115
250	Hz	dB	113
500	Hz	dB	108
1000	Hz	dB	105
2000	Hz	dB	108
4000	Hz	dB	109
8000	Hz	dB	107

Sound power level

Aggregate	dB(A) re 1pW	120
Measurement surface	ft²	1,184
Exhaust gas	dB(A) re 1pW	123
Measurement surface	ft²	67.60

a) average sound pressure level on measurement surface in a distance of 3.28ft (converted to free field) according to DIN 45635, precision class 3.
b) average sound pressure level on measurement surface in a distance of 3.28ft according to DIN 45635, precision class 2.
The spectra are valid for aggregates up to bmep=232.060384 psi. (for higher bmep add safety margin of 1dB to all values per increase of 15 PSI pressure).
Engine tolerance ± 3 dB

0.03 Technical data of generator

Manufacturer		STAMFORD e)
Type		PE 734 F e)
Type rating	kVA	2,183
Driving power	bhp	2,065
Ratings at p.f.= 1.0	kW	1,500
Ratings at p.f. = 0.8	kW	1,489
Rated output at p.f. = 0.8	kVA	1,862
Rated reactive power at p.f. = 0.8	kVAr	1,117
Rated current at p.f. = 0.8	A	2,239
Frequency	Hz	60
Voltage	V	480
Speed	rpm	1,800
Permissible overspeed	rpm	2,250
Power factor (lagging - leading)		0,8 - 1,0
Efficiency at p.f.= 1.0		97.5%
Efficiency at p.f. = 0.8		96.7%
Moment of inertia	lbs-ft²	1149.20
Mass	lbs	8,545
Radio interference level to EN 55011 Class A (EN 61000-6-4)		N
Cable outlet		~
Ik" Initial symmetrical short-circuit current	kA	23.43
Is Peak current	kA	59.63
Insulation class		H
Temperature rise (at driving power)		F
Maximum ambient temperature	°F	104

Reactance and time constants (saturated) at rated output

xd direct axis synchronous reactance	p.u.	2.12
xd' direct axis transient reactance	p.u.	0.13
xd" direct axis sub transient reactance	p.u.	0.09
x2 negative sequence reactance	p.u.	0.14
Td" sub transient reactance time constant	ms	20
Ta Time constant direct-current	ms	20
Tdo' open circuit field time constant	s	2.54

e) JENBACHER reserves the right to change the generator supplier and the generator type. The contractual data of the generator may thereby change slightly. The contractual produced electrical power will not change.

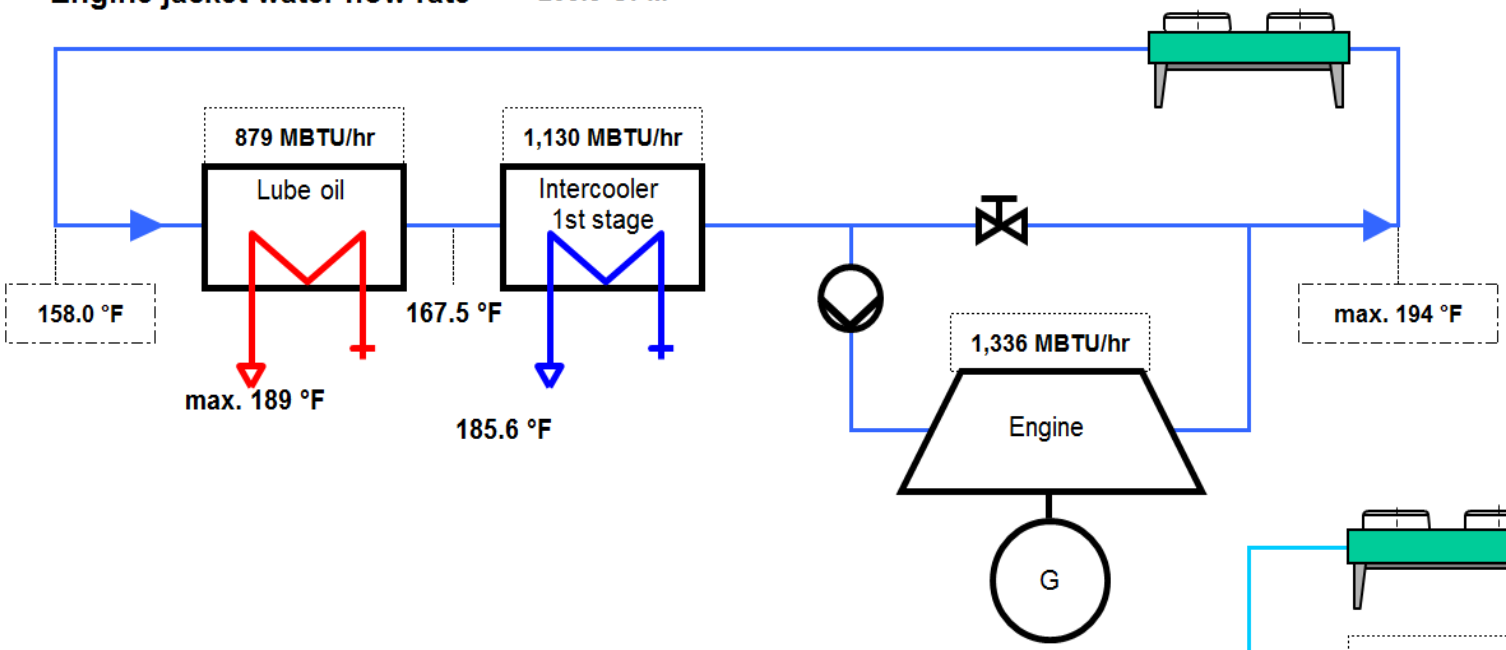
connection variant 1K

Greenville Utilities Commision ◁▷ J 420 GS-B86

Engine jacket water cooling circuit (calculated with Glykol 37%)

Heat to be dissipated = 3,345 MBTU/hr

Engine jacket water flow rate = 208.3 GPM

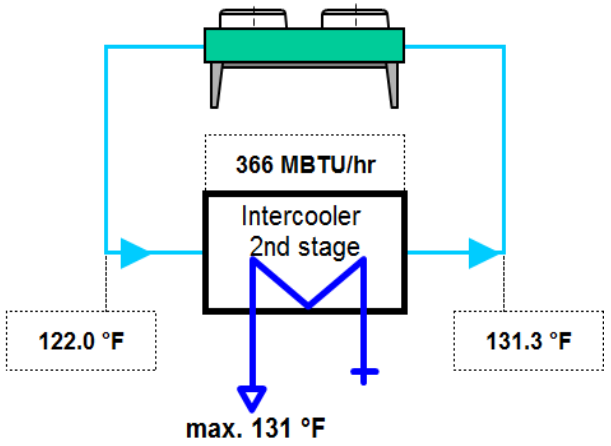


Low Temperature circuit (calculated with Glykol 37%)

Heat to be dissipated = 366 MBTU/hr

(±8 % tolerance +5 % reserve for cooling requirements)

Cooling water flow rate = 88.1 GPM



0.05 Cooling water circuit

Oil - heat (Engine jacket water cooling circuit)

Nominal output	MBTU/hr	879
Max. Oil temperature	°F	189
Loss of nominal pressure of engine jacket water	psi	7.25
Safety valve - max press. set point	psi	36.26

Engine jacket water - heat (Engine jacket water cooling circuit)

Nominal output	MBTU/hr	1,336
Max. engine jacket water temperature (outlet engine)	°F	194
Engine jacket water flow rate	GPM	208.3
Safety valve - max press. set point	psi	36.26

Mixture Intercooler (1st stage) (Engine jacket water cooling circuit)

Nominal output	MBTU/hr	1,130
Max. inlet cooling water temp. (intercooler)	°F	167.5
Design pressure of cooling water / (max. operating pressure)	lbs	145
Loss of nominal pressure of engine jacket water	psi	4.35
Safety valve - max press. set point	psi	36.26

Mixture Intercooler (2nd stage) (Low Temperature circuit)

Nominal output	MBTU/hr	366
Max. inlet cooling water temp. (intercooler)	°F	122
Aftercooler water flow rate	GPM	88.1
Design pressure of cooling water / (max. operating pressure)	lbs	145
Intercooler water pressure drop	psi	11.60
Safety valve - max press. set point	psi	36.26

The final pressure drop will be given after final order clarification and must be taken from the P&ID order documentation.

0.10 Technical parameters

All data in the technical specification are based on engine full load (unless stated otherwise) at specified temperatures as well as the methane number and subject to technical development and modifications. For isolated operation an output reduction may apply according to the block load diagram. Before being able to provide exact output numbers, a detailed site load profile needs to be provided (motor starting curves, etc.).

All pressure indications are to be measured and read with pressure gauges (psi.g.).

(1) At nominal speed and standard reference conditions ICFN according to DIN-ISO 3046 and DIN 6271, respectively
(2) According to DIN-ISO 3046 and DIN 6271, respectively, with a tolerance of +5 %.
Efficiency performance is based on a new unit (immediately upon commissioning).Effects of degradation during normal operation can be mitigated through regular service and maintenance work.
(3) Average value between oil change intervals according to maintenance schedule, without oil change amount
(4) At p. f. = 1.0 according to VDE 0530 REM / IEC 34.1 with relative tolerances, all direct driven pumps are included
(5) Total output with a tolerance of ±8 %
(6) According to above parameters (1) through (5)
(7) Only valid for engine and generator; module and peripheral equipment not considered (at p. f. = 0,8) ,(guiding value)
(8) Exhaust temperature with a tolerance of ±8 %
(9) Intercooler heat on:
*** standard conditions** - If the turbocharger design is done for air intake temperature > 86°F w/o de-rating, the intercooler heat of the 1st stage need to be increased by 2%/K starting from 77°F. Deviations between 77 – 86°F will be covered with the standard tolerance.
*** Hot Country application (V1xx)** - If the turbocharger design is done for air intake temperature > 104°F w/o de-rating, the intercooler heat of the 1st stage need to be increased by 2%/K starting from 95°F. Deviations between 95 – 104°F will be covered with the standard tolerance.

Radio interference level
The ignition system of the gas engines complies the radio interference levels of CISPR 12 and EN 55011 class B, (30-75 MHz, 75-400 MHz, 400-1000 MHz) and (30-230 MHz, 230-1000 MHz), respectively.

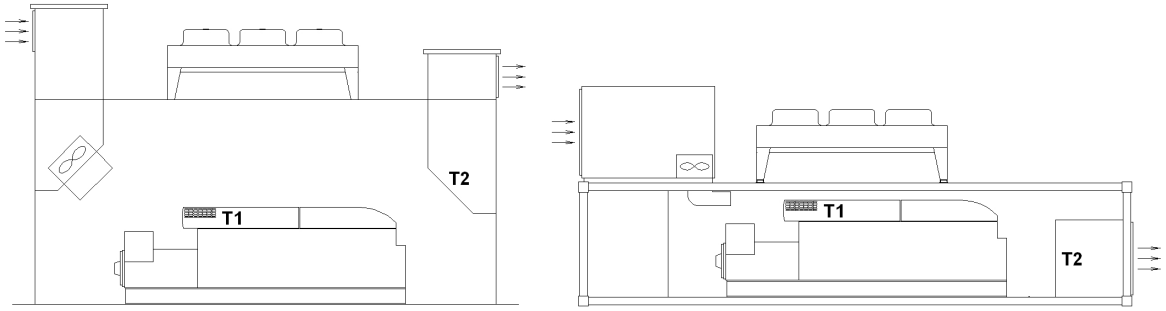
Definition of output
- ISO-ICFN continuous rated power:
  Net break power that the engine manufacturer declares an engine is capable of delivering continuously, at stated speed, between the normal maintenance intervals and overhauls as required by the manufacturer. Power determined under the operating conditions of the manufacturer's test bench and adjusted to the standard reference conditions.
- Standard reference conditions:
  Barometric pressure: 14.5 psi (1000 mbar) or 328 ft (100 m) above sea level

Air temperature:	77°F (25°C) or 298 K
Relative humidity:	30 %

- Volume values at standard conditions (fuel gas, combustion air, exhaust gas)

Pressure:	1 atmosphere (1013.25 mbar)
Temperature:	32°F (0°C)

Output adjustment for turbo charged engines
Full rated power at **59** FT ASL and **95F** T1, above **95F** T1, a 0.**833**%/F derate automatically occurs.
Engine room outlet temperature: **122°F** (T2) -> engine stop



If the actual methane number is lower than the specified, the knock control responds. First the ignition timing is changed at full rated power. Secondly the rated power is reduced. These functions are done by the engine management.
Exceedance of the voltage and frequency limits for generators according to IEC 60034-1 Zone A will lead to a derate in output.

Parameters for the operation of JENBACHER gas engines
The genset fulfills the limits for mechanical vibrations according to ISO 8528-9.
The following "Technical Instruction of JENBACHER" forms an integral part of a contract and must be strictly observed: **TA 1000-0004, TA 1100 0110, TA 1100-0111**, and **TA 1100-0112.**
Transport by rail should be avoided. See **TA 1000-0046** for further details

Failure to adhere to the requirements of the above mentioned TA documents can lead to engine damage and may result in loss of warranty coverage.

Parameters for the operation of control unit and the electrical equipment
Relative humidity 50% by maximum temperature of 104°F.
Altitude up to 2000m above the sea level.

0.20 Mode of Operation

Grid Parallel and Island Operation - Multi Units (Auto Re-sync)
While Grid connected, the unit/units load can be adjusted via its power control set point or designated option. In the event of a loss of utility, the unit/units will be able to continue operating locally without utility power. When the mains monitor relay (protective relay ANSI No. 27, 59, 81, 78- provided either by GE or the customer) is activated due to a mains failure, the engine is isolated from the mains by opening the mains circuit breaker.

The load adding and shedding capabilities of the genset documented in
- TA 2108-0031 - general island operation
- TA 2108-0025 for type 3 engines
- TA 2108-0029 for type 4 engines
- TA 2108-0026 for type 6 engines
- TA 2108-0032 for type 9 engines

needs to be considered by the customer in order to ensure proper operation of the equipment.

When grid is restored, the unit is provided with an automatic re-synchronization feature which will synchronize the units back to the utility through a GE Jenbacher Master Synchronizing Control (optional, see appropriate Spec Section) or a higher-level control system provided by the customer. The unit(s) can perform "Black-out" start without external auxiliary power supply to the "dead busbar".

1.00 Scope of supply - Genset

Design:
The genset is built as a compact package.
Engine and generator are mounted to the base frame. To provide the best possible isolation from the transmission of vibrations the engine is mounted to the frame by means of anti-vibrational mounts. The remaining vibrations are eliminated by mounting the module on isolating pads (e.g. Sylomer). This, in principle, allows for placing of the genset to be directly on any floor capable of carrying the static load. No special foundation is required. Prevention of sound conducted through solids has to be provided locally.

1.01 Spark ignited gas engine

Four-stroke, air/gas mixture turbocharged, aftercooled, with high performance ignition system and electronically controlled air/gas mixture system.
The engine is equipped with the most advanced

LEANOX® LEAN-BURN COMBUSTION SYSTEM

developed by GE JENBACHER.

1.01.01 Engine design

Engine block
Single-piece crankcase and cylinder block made of special casting; crank case covers for engine inspection, welded steel oil pan.

Crankshaft and main bearings
Drop-forged, precision ground, surface hardened, statically and dynamically balanced; main bearings (upper bearing shell: 3-material bearing / lower bearing shell: sputter bearing) arranged between crank pins, drilled oil passages for forced-feed lubrication of connecting rods.

Vibration damper
Maintenance free viscous damper

Flywheel
With ring gear for starter motor

Pistons
Single-piece, made of light metal alloy, with piston ring carrier and oil passages for cooling; piston rings made of high quality material, main combustion chamber specially designed for lean burn operation.

Connecting rods
Drop-forged, heat-treated, big end diagonally split and toothed. Big end bearings (upper bearing shell: sputter bearing / lower bearing shell: sputter bearing) and connecting rod bushing for piston pin.

Cylinder liner
Chromium alloy gray cast iron, wet, individually replaceable.

Cylinder head
Specially designed and developed for GE JENBACHER-lean burn engines with optimised fuel consumption and emissions; water cooled, made of special casting, individually replaceable; Valve seats and valve guides and spark plug sleeves individually replaceable; exhaust and inlet valve made of high quality material.

Crankcase breather
Connected to combustion air intake system.

Valve train
Camshaft, with replaceable bushings, driven by crankshaft through intermediate gears, valve lubrication by splash oil through rocker arms.

Combustion air/fuel gas system
Motorized carburetor for automatic adjustment according fuel gas characteristic. Exhaust driven turbocharger, mixture manifold with bellows, water-cooled intercooler, throttle valve and distribution manifolds to cylinders.

Ignition system
Most advanced, fully electronic high performance ignition system, external ignition control.
MORIS: Automatically, cylinder selective registration and control of the current needed ignition voltage.

Lubricating system
Gear-type lube oil pump to supply all moving parts with filtered lube oil, pressure control valve, pressure relief valve and full-flow filter cartridges. Cooling of the lube oil is arranged by a heat exchanger.

Engine cooling system
Jacket water pump complete with distribution pipework and manifolds.

Exhaust system
Turbocharger and exhaust manifold

Exhaust gas temperature measuring
Thermocouple for each cylinder

Electric actuator
For electronic speed and output control

Electronic speed monitoring for speed and output control
By magnetic inductive pick up over ring gear on flywheel

Starter motor
Engine mounted electric starter motor

1.01.02 Additional equipment for the engine (spares for commissioning)

The initial set of equipment with the essential spare parts for operation after commissioning is included in the scope of supply.

1.01.03 Engine accessories

Insulation of exhaust manifold:
Insulation of exhaust manifold is easily installed and removed

Sensors at the engine:
- Jacket water temperature sensor
- Jacket water pressure sensor
- Lube oil temperature sensor
- Lube oil pressure sensor
- Mixture temperature sensor
- Charge pressure sensor
- Minimum and maximum lube oil level switch
- Exhaust gas thermocouple for each cylinder
- Knock sensors
- Gas mixer / gas dosing valve position reporting.

Actuator at the engine:
- Actuator - throttle valve
- Bypass-valve for turbocharger
- Control of the gas mixer / gas dosing valve

1.01.04 Standard tools (per installation)

The tools required for carrying out the most important maintenance work are included in the scope of supply and delivered in a toolbox.

1.02 Generator-low voltage

The 2 bearing generator consists of the main generator (built as rotating field machine), the exciter machine (built as rotating armature machine) and the digital excitation system.
The digital regulator is powered by an auxiliary winding at the main stator or a PMG system

Main components
- Enclosure of welded steel construction
- Stator core consist of thin insulated electrical sheet metal with integrated cooling channels.
- Stator winding with 2/3 Pitch
- Rotor consists of shaft with shrunken laminated poles, Exciter rotor, PMG (depending on Type) and fan.
- Damper cage
- Excitation unit with rotating rectifier diodes and overvoltage protection
- Dynamically balanced as per ISO 1940, Balance quality G2,5
- Drive end bracket with re greaseable antifriction bearing
- Non-drive end bracket with re grease antifriction bearing
- Cooling IC01 - open ventilated, air entry at non-drive end , air outlet at the drive end side
- Main terminal box includes main terminals for power cables
- Regulator terminal box with auxiliary terminals for thermistor connection and regulator.
- Anti-condensation heater
- 3 PT100 for winding temperature monitoring+3 PT100 Spare
- 2 PT100 for bearing temperature monitoring

Option:
Current transformer for protection and measuring in the star point
xx/1A, 10P10 15VA , xx/1A, 1FS5, 15VA

Electrical data and features
- Standards: IEC 60034, EN 60034, VDE 0530, ISO 8528-3, ISO 8528-9
- Voltage adjustment range: +/- 10 % of rated voltage (continuous)
- Frequency: -6/+4% of rated frequency

- Overload capacity: 10% for one hour within 6 hours, 50% for 30 seconds
- Asymmetric load : max. 8% I2 continuous, in case of fault I2 x t=20
- Altitude: < 1000m
- Max permitted generator intake air temperature: 5°C - 40°C
- Max. relative air humidity: 90%
- Voltage curve THD Ph-Ph: <3,5% at idle operation and <5% at full load operation with linear symmetrical load
- Generator suitable for parallel operating with the grid and other generators
- Sustained short circuit current at 3-pole terminal short circuit: minimum 3 times rated current for 5 seconds.
- Over speed test with 1.2 times of rated speed for 2 minutes according to IEC 60034

Digital Excitation system ABB Unitrol 1010 mounted within the AVR Terminal box with following features:

- Compact and robust Digital Excitation system for Continuous output current up to 10 A (20A Overload current 10s)
- Fast AVR response combined with high excitation voltage improves the transient stability during LVRT events.
- The system has free configurable measurement and analog or digital I/Os. The configuration is done via the local human machine interface or CMT1000
- Power Terminals
  3 phase excitation power input from PMG or auxiliary windings
  Auxiliary power input 24VDC
- Excitation output
- Measurement terminals: 3 phase machine voltage, 1 phase network voltage, 1 phase machine current
- Analog I/Os: 2 outputs / 3 inputs (configurable), +10 V / -10 V
- Digital I/O: 4 inputs only (configurable), 8 inputs / outputs (configurable)
- Serial fieldbus: RS485 for Modbus RTU or VDC (Reactive power load sharing for up to 31 GEJ engines in island operation), CAN-Bus for dual channel communication
- Regulator Control modes: Bump less transfer between all modes
  Automatic Voltage Regulator (AVR) accuracy 0,1% at 25°C ambient temperature
  Field Current Regulator (FCR)
  Power Factor Regulator (PF)
  Reactive Power Regulator (VAR)
- Limiters: Keeping synchronous machines in a safe and stable operation area
  Excitation current limiter (UEL min / OEL max)
  PQ minimum limiter
  Machine current limiter
  V / Hz limiter
  Machine voltage limiter
- Voltage matching during synchronization
- Rotating diode monitoring
- Dual channel / monitoring: Enables the dual channel operation based on self diagnostics and setpoint follow up over CAN communication.. As Option available

- Power System Stabilizer (PSS) is available as option. Compliant with the standard IEEE 421.5-2005 2A / 2B, the PSS improves the stability of the generator over the highest possible operation range.
- Computer representation for power system stability studies: ABB 3BHS354059 E01
- Certifications: CE, cUL certification according UL 508c (compliant with CSA), DNV Class B,

- **Commissioning and maintenance Tool CMT1000** (for trained commissioning/ maintenance personal)
- With this tool the technician can setup all parameters and tune the PID to guarantee stable operation. The CMT1000 software allows an extensive supervision of the system, which helps the user to identify and locate problems during commissioning on site. The CMT1000 is connected to the target over USB or Ethernet port, where Ethernet connection allows remote access over 100 m.
- Main window
  - Indication of access mode and device information.
  - Change of parameter is only possible in CONTROL access mode.
  - LED symbol indicates that all parameter are stored on none volatile memory.
- Setpoint adjust window
  - Overview of all control modes, generator status, active limiters status and alarms.
  - Adjust set point and apply steps for tuning of the PID.
- Oscilloscope
- 4 signals can be selected out of 20 recorded channels. The time resolution is 50ms.Save files to your PC for further investigation.
- Measurement
  - All measurements on one screen.

Routine Test

Following routine tests will be carried out by the generator manufacturer

- Measuring of the DC-resistance of stator and rotor windings
- Check of the function of the fitted components (e.g. RTDs, space heater etc.)
- Insulation resistance of the following components
  Stator winding, rotor winding
  Stator winding RTDs
  Bearing RTDs
  Space heater
- No Load saturation characteristic (remanent voltage)
- Stator voltage unbalance
- Direction of rotation, phase sequence
- High voltage test of the stator windings (2 x Unom. + 1000 V) and the rotor windings (min. 1500 V)

1.03 Module Accessories

Base frame

Common Base Frame fabricated with welded structural steel. Frame to mount the engine, jacket water heat exchangers, pumps and engine auxiliaries, as well as generator.

Coupling

Engine to Generator coupling is provided. The coupling isolates the major sub-harmonics of engine alternating torque from generator.

Coupling housing
Provided for Coupling

Anti-vibration mounts
2 sets of isolation, one is arranged between engine block assembly and base frame. The second is via insulating pads (SYLOMER) for placement between base frame and foundation, delivered loose.

Exhaust gas connection
A flanged connection is provided that collects the exhaust gas turbocharger output flows, includes flexible pipe connections (compensators) to compensate for heat expansions and vibrations.

Combustion air filter
A Dry type air filter with replaceable filter cartridges is fitted. The assembly includes flexible connections to the fuel mixer/carburetor and service indicator.

Interface panel (M1 cabinet)
Totally enclosed sheet steel cubicle with hinged doors, pre-wired to terminals, ready to operate. All Cable entry will be via bottom mounted cable gland plates.

Painting: RAL 7035

Protection: External NEMA 3 (IP 54), Internal IP 20 (protection against direct contact with live parts)

Cabinet design is according to IEC 439-1 (EN 60 439-1/1990) and DIN VDE 0660 part 500, respectively. Ambient temperature 41 - 104 °F (5 - 40 °C), Relative humidity 70%

Dimensions:
- Height: 51 in (1300 mm)
- Width: 47 in (1200 mm)
- Depth: 16 in (400 mm)

Control Power Source: The starter batteries and the cabinet mounted battery chargers will provide the power source for this enclosure.

Interface Panel contents and control functions:
- The cabinet houses the unit Battery Charger and primary 24VDC Control Power Distribution (breakers, fuses, and terminals) from the unit Batteries
- Distributed PLC Input and Output cards, located in the cabinet, gather all Engine and Generator Control I/O. These cards transmit data via data bus interface to the central engine control of the module control panel located in the A1 cabinet. Data bus is via CAN and B&R Proprietary Data Highway (Data Cables provided by GE)
- Speed monitoring relays for protection are provided.

- Gas Train I/O Collection, including interface relays and terminals for gas train shutoff valves.
- Transducer for generator functions, such as excitation voltage.
- Door Mounted Emergency Stop Switch with associated Emergency Stop Loop interface relays.
- Miscellaneous control relays, contacts, fuses, etc. for additional control valves, and auxiliaries.
- Interface Terminal Strips

Skid Mounted 3 Phase Devices are Powered by 3 x **480**/**277** V, **60** Hz, 50 A

AC Power for engine mounted auxiliaries (heater, pumps, etc.) are routed through a separate J-box mounted on the side M1 cabinet (Box E1). This is done to maintain signal segregation (AC from control)

NOTE: Generator Current Transformer wiring is connected directly to the Generator and does NOT pass through the M1 cabinet.

1.03.01 Engine jacket water system

Engine jacket water system
Closed cooling circuit, consisting of:
- Expansion tank
- Filling device (check and pressure reducing valves, pressure gauge)
- Safety valve(s)
- Thermostatic valve
- Required pipework on module
- Vents and drains
- Electrical jacket water pump, including check valve
- Jacket water preheat device

1.03.02 Automatic lube oil replenishing system

Automatic lube oil replenishing system:
Includes float valve in lube oil feed line, including inspection glass. Electric monitoring system will be provided for engine shut-down at lube oil levels "MINIMUM" and "MAXIMUM". Solenoid valve in oil feed line is only activated during engine operation. Manual override of the solenoid valve, for filling procedure during oil changes is included.

Oil drain
By set mounted cock

Pre-lubrication- and aftercooling oil pump:
Mounted on the module base frame; it is used for pre-lubrication and aftercooling of the turbochargers.
Period of operation: Pre-lubrication: 1 minute
Aftercooling: 15 minutes from engine stop
Consisting of:

- 1 piece oil pump 1500 W, 24 V
- All necessary vents
- Necessary pipework

1.05.01 Gas train <500mbar (7.3 psi)

Pre-assembled, delivered loose, for installation into gas pipework to the module.

Consisting of:
- Manual shut off valve
- Gas filter, filter fineness <3 µm
- Pressure gauge with push button valve
- Gas admission pressure regulator
- Solenoid valves
- Leakage detector
- Gas pressure switch (min.)
- TEC JET (has to be implemented horizontal)
- Gas flow meter (option)
- p/t compensation (option)

The gas train complies with DIN - DVGW regulations.
Maximum distance from TEC JET outlet to gas entry on engine, including flexible connections, is 39,37in (1m)

1.07 Painting

• Quality:	Oil resistant prime layer Synthetic resin varnish finishing coat	
• Color:	Engine:	RAL 6018 (green)
	Base frame:	RAL 6018 (green)
	Generator:	RAL 6018 (green)
	Module interface panel:	RAL 7035 (light grey)
	Control panel:	RAL 7035 (light grey)

1.11 Engine generator control panel per module- Dia.ne XT4 incl. Single synchronization of the generator breaker

Dimensions:

• Height:	87 in (including 8 in pedestal *)

- Width: 32 -48 in*)
- Depth: 24 in *)

Protection class:
- external IP42
- Internal IP 20 (protection again direct contact with live parts)

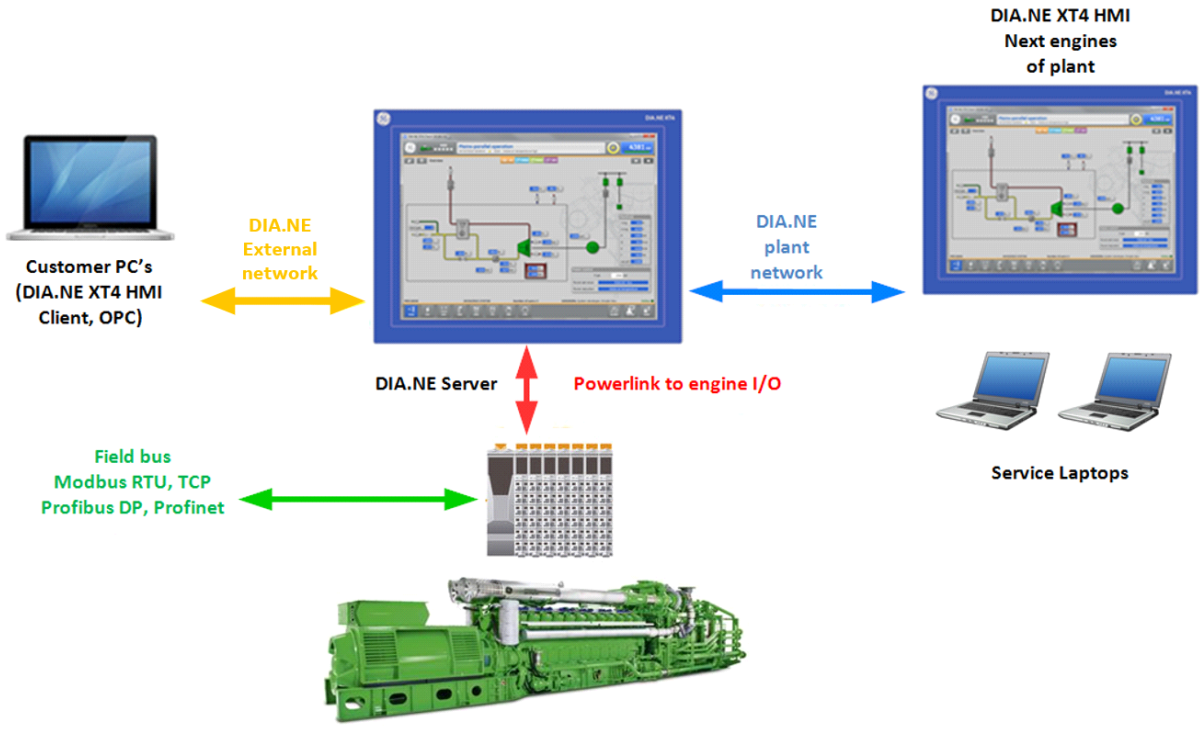
*) Control panels will be dimensioned on a project specific basis. Actual dimensions will be provided in the preliminary documentation for the project.

Control supply voltage from starter and control panel batteries: 24V DC

Auxiliaries power supply: (from provider of the auxiliary supply)
3 x **480**/**277** V, **60** Hz

Consisting of:
Motor - Management - System DIA.NE

Setup:
- a) Touch display visualization
- b) Central engine and unit control



Touch Display Screen:

15“ Industrial color graphic display with resistive touch.

Interfaces:

- 24V voltage supply
- DVI display connection
- USB interface for resistive touch

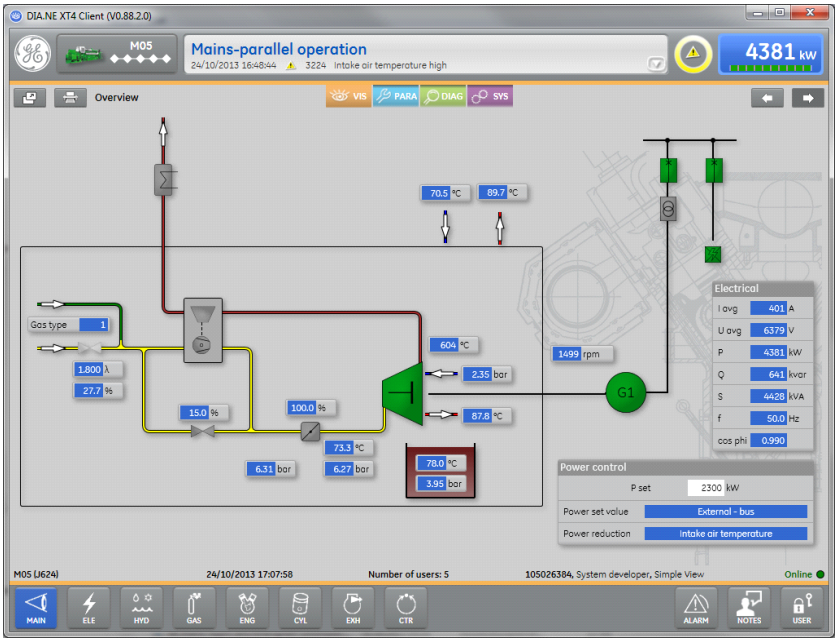
Protection class of DIA.NE XT panel front: IP 65

The screen shows a clear and functional summary of the measurement values and simultaneously shows a graphical summary.

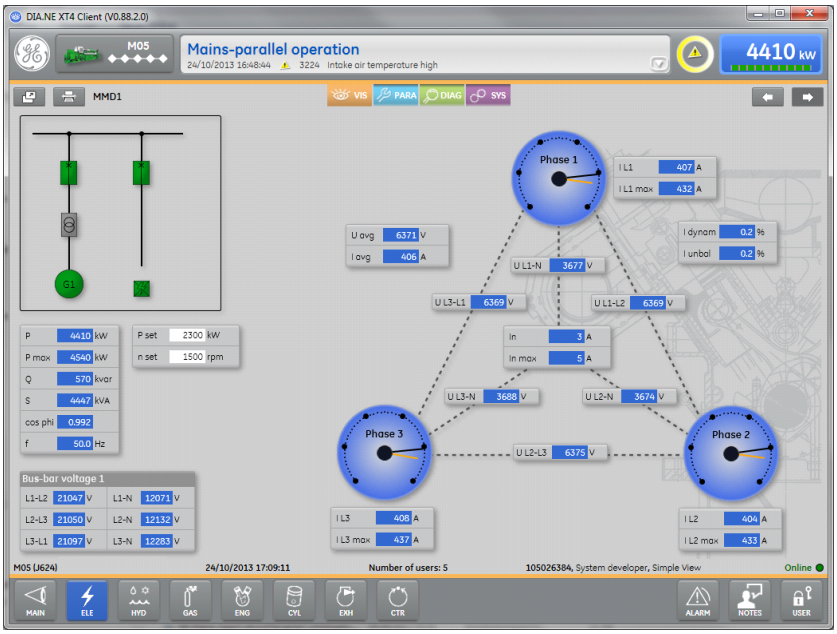
Operation is via the screen buttons on the touch screen
Numeric entries (set point values, parameters…) are entered on the touch numeric pad or via a scroll bar.
Determination of the operation mode and the method of synchronization via a permanently displayed button panel on the touch screen.

Main screens (examples):

Main: Display of the overview, auxiliaries’ status, engine start and operating data.



ELE: Display of the generator connection with electrical measurement values and synchronization status



Trending
Trend with 100ms resolution

Measurement values:

- 500 data points are stored
- Measurement interval = 100ms

- Raw data availability with 100ms resolution: 3 hours + max. 50.000.000 changes in value at shut down (60 mins per shut down)
- Compression level 1: min, max, and average values with 1000ms resolution: 1 day
- Compression level 2: min, max, and average values with 30s resolution: 1 month
- Compression level 3: min, max, and average values with 10min resolution: 10 years

Messages:
1.000.000 message events

Actions (operator control actions):
100.000 Actions

System messages:
100.000 system messages

Central engine and module control:

An industrial PC- based modular industrial control system for module and engine sequencing control (start preparation, start, stop, aftercooling and control of auxiliaries) as well as all control functions.

Interfaces:
- Ethernet (twisted pair) for remote monitoring access
- Ethernet (twisted pair) for connection between engines
- Ethernet (twisted pair) for the Powerlink connection to the control input and output modules.
- USB interface for software updates

Connection to the local building management system according to the GE Jenbacher option list (OPTION)
- MODBUS-RTU Slave
- MODBUS-TCP Slave,
- PROFIBUS-DP Slave (120 words),
- PROFIBUS-DP Slave (190 words),
- ProfiNet Slave
- OPC DA Server

Control functions:
- Speed control in idle and in island mode
- Power output control in grid parallel operation, or according to an internal or external set point value on a case by case basis
- LEANOX control system which controls boost pressure according to the power at the generator terminals, and controls the mixture temperature according to the engine driven air-gas mixer

- Knocking control: in the event of knocking detection, ignition timing adjustment, power reduction and mixture temperature reduction (if this feature is installed)
- Load sharing between engines in island mode operation (option)
- Linear power reduction in the event of excessive mixture temperature and misfiring
- Linear power reduction according to CH4 signal (if available)
- Linear power reduction according to gas pressure (option)
- Linear power reduction according to air intake temperature (option)

Multi-transducer to record the following alternator electrical values:

- Phase current (with slave pointer))
- Neutral conductor current
- Voltages Ph/Ph and Ph/N
- Active power (with slave pointer)
- Reactive power
- Apparent power
- Power factor
- Frequency
- Active and reactive energy counter

Additional 0 (4) - 20 mA interface for active power as well as a pulse signal for active energy

The following alternator monitoring functions are integrated in the multi-measuring device:

- Overload/short-circuit [51], [50]
- Over voltage [59]
- Under voltage [27]
- Asymmetric voltage [64], [59N]
- Unbalance current [46]
- Excitation failure [40]
- Over frequency [81>]
- Under frequency [81<]

Lockable operation modes selectable via touch screen:

- "OFF" operation is not possible, running units will shut down immediately;
- "MANUAL" manual operation (start, stop) possible, unit is not available for fully automatic operation.
- "AUTOMATIC" fully automatic operation according to external demand signal:

Demand modes selectable via touch screen:

- external demand off („OFF“)
- external demand on („REMOTE“)
- overide external demand („ON“)

Malfunction Notice list:

Shut down functions e.g.:

- Low lube oil pressure
- Low lube oil level
- High lube oil level
- High lube oil temperature
- Low jacket water pressure
- High jacket water pressure
- High jacket water temperature
- Overspeed
- Emergency stop/safety loop
- Gas train failure
- Start failure
- Stop failure
- Engine start blocked
- Engine operation blocked
- Misfiring
- High mixture temperature
- Measuring signal failure
- Overload/output signal failure
- Generator overload/short circuit
- Generator over/undervoltage
- Generator over/underfrequency
- Generator asymmetric voltage
- Generator unbalanced load
- Generator reverse power
- High generator winding temperature
- Synchronizing failure
- Cylinder selective Knocking failure

Warning functions e.g.:

- Cooling water temperature min.
- Cooling water pressure min.
- Generator winding temperature max.

Remote signals:
(volt free contacts)

1NO = 1 normally open
1NC = 1 normally closed
1COC = 1 change over contact

- Ready for automatic start (to Master control) 1NO
- Operation (engine running) 1NO

• Demand auxiliaries	1NO
• Collective signal "shut down"	1NC
• Collective signal "warning"	1NC

External (by others) provided command/status signals:

• Engine demand (from Master control)	1S
• Auxiliaries demanded and released	1S

Single synchronizing Automatic

For automatic synchronizing of the module with the generator circuit breaker to the grid by PLC- technology, integrated within the module control panel.

Consisting of:

- Hardware extension of the programmable control for fully automatic synchronization selection and synchronization of the module and for monitoring of the generator circuit breaker closed signal.
- Lockable synchronization selection via touch screen with the following selection modes:
  - "MANUAL" Manual initiation of synchronization via touch screen button followed by fully automatic synchronization of the module
  - "AUTOMATIC" Automatic module synchronization, after synchronizing release from the module control
  - "OFF" Selection and synchronization disabled
    Control of the generator circuit breaker according to the synchronization mode selected via touch screen.
  - "Generator circuit breaker CLOSED/ Select" Touch-button on DIA.NE XT
  - "Generator circuit breaker OPEN" Touch-button on DIA.NE XT

Status signals:
Generator circuit breaker closed
Generator circuit breaker open

Remote signals:
(volt free contacts)

Generator circuit breaker closed	1 NO

The following reference and status signals must be provided by the switchgear supplier:

• Generator circuit breaker CLOSED	1 NO
• Generator circuit breaker OPEN	1 NO
• Generator circuit breaker READY TO CLOSE	1 NO
• Mains circuit breaker CLOSED	1 NO
• Mains circuit breaker OPEN	1 NO

Mains voltage 3 x **480**/**277**V or 3x 110V/v3 other measurement voltages available on request
Bus bar voltage 3 x **480**/**277** V or 3x 110V/v3 – other measurement voltages available on request
Generator voltage 3 x **480 V** or 3x 110V/v3 – other measurement voltages available on request

Voltage transformer in the star point with minimum 50VA and Class 0,5

The following volt free interface-signals will be provided by GE Jenbacher to be incorporated in switchgear:

- CLOSING/OPENING command for generator circuit breaker (permanent contact) — 1 NO + 1 NC
- Signal for circuit breaker undervoltage trip — 1 NO

Maximum distance between module control panel and engine/interface panel:	99ft
Maximum distance between module control panel and power panel:	164ft
Maximum distance between module control panel and master control panel:	164ft
Maximum distance between alternator and generator circuit breaker:	99ft

1.11 Motor control panel – Container design

Sheet metal IEC enclosure, components and assembly UL listed.
For distribution and protection of the module and container auxiliaries.
With cubicle lighting.

Dimensions:

- Height: 71 inch (1800 mm)
- Width: 39 inch (990 mm)
- Depth: 16 inch (405 mm)

Equipment:
Equipped with IEC type starters for each motor
With safety disconnect switches for every load
With step down transformer 480/120V, 10kVA for container consumers

2 motorstarter	7.2kW	10hp
4 motorstarter	4.7kW	6.5hp
2 motorstarter	0.9kW	1.2hp
2 motorstarter	0.34kW	0.5hp
1 circuit breaker	8.67kW	12hp
1 motorstarter	3kW	4hp

1.11.01 Remote messaging over MODBUS-TCP

Data transfer from the Jenbacher module control system to the customer's on-site central control system via MODBUS TCP using the ETHERNET 10 BASE-T/100BASE-TX protocol TCP/IP.

The Jenbacher module control system operates as a SLAVE unit.
The data transfer via the customer's MASTER must be carried out in cycles.

Data transmitted:
Individual error messages, operational messages, measured values for generator power, oil pressure, oil temperature, cooling water pressure, cooling water temperature

GE Jenbacher limit of supply:
RJ45 socket at the interface module in the module control cabinet

1.11.06 Remote Data-Transfer with DIA.NE XT4

General
DIA.NE XT4 offers remote connection with Ethernet.

Applications:

1.) DIA.NE XT4 HMI
DIA.NE XT4 HMI is the human-machine-interface of DIA.NE XT4 engine control and visualization system for GE Jenbacher gas engines.
The system offers extensive facilities for commissioning, monitoring, servicing and analysis of the site.
By installation of the DIA.NE XT4 HMI client program it can be used to establish connection to site, if connected to a network and access rights are provided.
The system runs on Microsoft Windows Operating systems (Windows XP, Windows 7, Windows 8, Windows 10)

Function
Functions of the visualization system at the engine control panel can be used remotely. These are among others control and monitoring, trend indications, alarm management, parameter management, and access to long term data recording. By providing access to multiple systems, also with multiple clients in parallel, additional useful functions are available like multi-user system, remote control, print and export functions and data backup.DIA.NE XT4 is available in several languages.

Option - Remote demand/blocking

If the service selectors switch at the module control panel is in pos."Automatic" and the demand-selector switch in pos."Remote", it is possible to enable (demanded) or disable (demand off) the module with a control button at the DIA.NE XT4 HMI

Note:
With this option, it makes no sense to have an additional clients demand (via hardware or data bus) or a self-guided operation (via GE Jenbacher master control, grid import /export etc.).

Option - Remote - reset (see TA-No. 1100-0111 chapter 1.7 an d1.9)

Scope of supply

- Software package DIA.NE XT4 HMI Client Setup (Download)
- Number of DIA.NE XT4 HMI - Client user license (Simultaneous right to access of one user to the engine control)

Nr. of license	Access
1	1 Users can be logged in at the same time with a PC (Workplace, control room or at home).
2 - "n" (Optional)	2- "n" Users can be logged in at the same time with a PC (Workplace, control room or at home). If 2- "n" users are locally connected at Computers from office or control room, then it is not possible to log in from home.

Caution! This option includes the DIA.NE XT4 HMI client application and its license only – NO secured, encrypted connection will be provided by GE Jenbacher! A secured, encrypted connection – which is mandatory – has to be provided by the customer (via LAN connection or customer-side VPN), or can be realized by using option myPlant™.

Customer requirements

- Broad band network connection via Ethernet(100/1000BASE-TX) at RJ45 Connector (ETH3) at DIA.NE XT4 server inside module control panel
- Standard PC with keyboard, mouse or touch and monitor (min. resolution 1024*768)
- Operating system Windows XP, Windows 7, Windows 8, Windows 10
- DirectX 9.0 c compatible or newer 3D display adapter with 64 MB or higher memory

2.) myPlant™
Description see Annex 12 of Attachment 1

3.) Mobile Internet (OPTION)
Connection Plant - Customer via secured Internet - connection
See also technical instruction **TA 2300 - 0006**

Scope of delivery

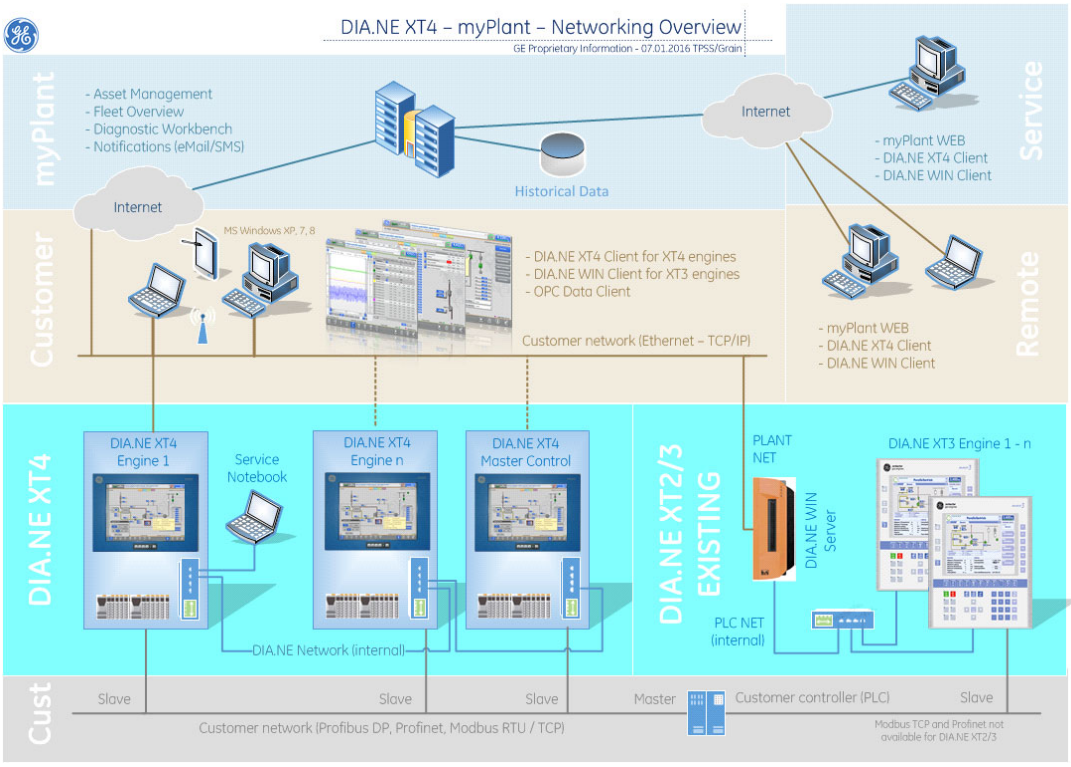
- Mobile Internet router with antenna to connect to the DIA.NE Server XT4

Customer requirements

- SIM card for 3G / 4G

4.) Network overview

For information only!



1.20.03 Starting system

Starter battery:
4 piece 12 V AGM battery, 125 Ah (according to DIN 72311).

Battery voltage monitoring:
Monitoring by PLC.

Battery charging equipment:
Capable for charging the starter battery with I/U characteristic and for the supply of all connected D.C. consumers.
Charging device is mounted inside of the module interface panel or module control panel.

- **General data:**
  - Power supply — **3 x 320 - 575 V, 47 - 63 Hz**
  - max. power consumption — 1040 W / 1550 W (5 sec)
  - Nominal D.C. voltage — 24 V(+/-1%)
  - Voltage setting range — 24V to 28V (adjustable)
  - Nominal current (max.) — 40 A
  - Degree of protection — IP20 to IEC 60529
  - Operating temperature — 32 °F – 158 °F (0 °C - 70 °C)
  - Protection class — 1
  - Humidity class — 3K3, no condensation.
  - Natural air convection
  - Standards — EN60950,EN50178
    UL/cUL (UL508 / UL 60950-1)

Signalling:
Green Led: Output voltage > 21.6V

Control accumulator:
- Pb battery 24 VDC/18 Ah

1.20.05 Electric jacket water preheating

Installed in the jacket water cooling circuit, consisting of:
- Heating elements
- Water circulating pump

The jacket water temperature of a stopped engine is maintained between 133 °F (56°C) and 140°F (60°C), to allow for immediate loading after engine start.

1.20.08 Flexible connections

Following flexible connections per module are included in the GE Jenbacher -scope of supply:

No.	Connection	Unit	Dimension	Material
2	Warm water in-/outlet	**in/lbs**	**4"/145**	Stainless steel
1	Exhaust gas outlet	**in/lbs**	**12"/145**	Stainless steel
1	Fuel gas inlet	**in/lbs**	**5"/145**	Stainless steel
2	Intercooler in-/outlet	**in/lbs**	**4"/145**	Stainless steel
2	Lube oil connection	**in**	**1.1“**	Hose

Seals and flanges for all flexible connections are included.

2.00 Electrical equipment

Totally enclosed floor mounted sheet steel cubicle with front door wired to terminals. Ready to operate, with cable entry at bottom. Naturally ventilated.

Protection:	IP 42 external, NEMA 12 IP 20 internal (protection against direct contact with live parts)	

Design according to EN 61439-2 / IEC 61439-2 and ISO 8528-4.
Ambient temperature 41 - 104 °F (5 - 40 °C), 70 % Relative humidity

Standard painting:	Panel:	RAL 7035
	Pedestal:	RAL 7020

2.02 Grid monitoring device

Standard without static Grid - 60Hz alternator

Function:
For immediate disconnection of the generator from the grid in case of grid failures.

Consisting of:
- High/low voltage monitoring
- High/low frequency monitoring
- Specially adjustable independent time for voltage and frequency monitoring
- Vector jump monitoring or df/dt monitoring for immediate disconnection of the generator from the grid for example at short interruptions
- Indication of all reference dimensions for normal operation and at the case of disturbance over LCD and LED
- Adjusting authority through password protection against adjusting of strangers

Scope of supply:
Digital grid protection relay with storage of defect data, indication of reference dimensions as well as monitoring by itself.

Grid protection values:

Parameter	Parameter limit	Max time delay[s]	**Comments**
59-61Hz			Do work normal
f<[ANSI 81U]	59Hz	0,5	Load reduction with 10%/HZ below 59Hz!

f<<[ANSI 81U]	58.5Hz	0,1	
f>[ANSI 81O]	61,5Hz	0,1	Load reduction with 30%/HZ above 61Hz!
U<[ANSI 27]	90%	1	Load reduction with 1%P /%U below 95%
U<<[ANSI 27]	80%	0,2	Load reduction with 1%P /%U below 95%
U>[ANSI 59]	110%	30	Load reduction with 1%P /%U above 105%
U>>[ANSI 59]	115%	0,2	Load reduction with 1% P/%U above 105%
Df/dt [ANSI 81R] **Or** **Vector shift** [ANSI 78]	2Hz/s, 5 Periods Or 8° -3pol		Cos phi range: 0,8ind (overexcited) - 1

2.04 Generator Low Voltage switchgear (for container design)

Sheet metal enclosure, UL listed, front-access

Dimensions:

- Height: 80 inch (2032 mm)
- Width: 28 inch (700 mm)
- Depth: 32 inch (800 mm)

Generator circuit breaker details

- In = **2000** A, drawn out type
- Short circuit breaking capacity: 65kA
- Spring drive 24VDC
- Close coil 24VDC
- Shunt trip coil 24VDC
- Under-voltage trip coil 24VDC
- Auxiliary contacts (a/b)
- Programmable Short Circuit Protection (Instantaneous and Duration)

Cabinet Fitted with
- 2 PT fused sets (Bus side/Gen side, 3 PTs in a Wye to Wye configuration)
- Surge Suppression

Per Phase Bus Bar Terminations and Ground Bar predrilled for customer terminations (maximum 4 cables per phase (Hardware not provided).

2.10.01 Master synchronization integrated into the master control

Purpose:
The "Master synchronization" is assigned for control of ONE mains circuit breaker (CB), as well as the selection and the release of the individual modules for isolated operation.

Scope of supply:
The following essential components are included:
- DIA.NE server
- Visualization
- Synchronizing device
- Necessary coupling relays
- Terminal strip for incoming and outgoing cables (scope of supply)

Assumptions:
- In every case of mains failure and transition from mains-parallel operation to island operation the customers load shedding equipment (preferably using relay control with direct contacts on the standby loads) has to limit the standby load within 50 mSec after the mains CB is opened to the standby rating of the module(s). There is no load shedding equipment supplied by GE Jenbacher. Load shedding have to be realized on-site.
- GEJ synchronises and controls the generator CB's of the individual modules by module control panels and the mains CB by the master control panel. All other CB's of the plant have to be controlled/interlocked by the customer in this way, that there is ensured a safe operation in every operating mode of the plant.

Function:
- Release of the gas engines for isolated operation
  Release of the gas engines for isolated operation is performed in accordance with the availability of the units and the settings at the visualisation.

- Lockable selection by touch of 'Manual demand gas engines for isolated operation':

"0" No isolated operation. There will be no module released for isolated operation.
In case of mains breakdown the generator CB's of the running units will be opened.

"1" Manual selection "1" module released for isolated operation.
In case of mains breakdown the mains CB of the plant will be opened.
Surplus running units will be stopped.

"2"."n" Manual selection "2".."n" modules released for isolated operation.
In case of mains breakdown the mains CB of the plant will be opened.
Surplus running units will be stopped.

- Lockable selection by touch 'Priority engine':
  The unit sequencing is based upon availability and according to lockable selection.

- Mains stabilization time
  After restoration of the mains a waiting time elapses until the automatic "Mains breaker synchronisation" command is given to synchronise the plant to the mains.

- Select synchronization type
  Lockable synchronization type selection by touch:

MANUAL	manually initiated automatic synchronization of mains CB
OFF	Synchronization of mains CB is locked
AUTOMATIC	automatically initiated automatic synchronization of mains CB

  Manually initiated automatic synchronization
  Pressing the "MAINS CB x ON / SELECTION" button on the touch control panel initiates automatic synchronization.

  Automatic synchronization
  Fully automatic synchronisation system with frequency controller and synchroniser with autonomous synchronisation selection.

- Synchronization device - with frequency balance and following displays:
  - Double voltmeter - for monitoring of bus bar and generator voltage
  - Double frequency meter - for monitoring of bus bar and generator frequency
  - Synchronouscope - for monitoring of the synchronizing function during synchronization

DIA.NE XT
Components:
• DIA.NE plant management system
Design:
a) Touch Display visual display unit
b) Central plant control

a) Touch Display visual display unit
15“ industrial colour graphics display with resistive touch screen.
Protection class for DIA.NE XT Front: IP 65,

The VDU contains a clear and functional summary of the measured values. All values are presented graphically.

The system is operated by touching on-screen buttons.
Numeric inputs (set points, parameters, ...) are made on a touch numerical keypad or slider. The operating mode and synchronisation type are selected on a touch button panel that can be pinned permanently on each screen.

Main screens:
- MAIN: Operating selection
- ELE: Circuit breakers
- ELE: Electrical plant overview, synchronization (Option)
- HYD: Hydraulic plant overview (Option)
- GAS: Gas plant overview (Option)
- CTR: Plant controllers (Option)
- CUST: Shows order-specific screens added at the customer's request.
- PANEL: The operating mode and synchronisation type are selected on a touch button panel that can be pinned permanently on each screen.
- ALARM: Alarm management. Efficient diagnostic instrumentation listing all active fault messages of the master control both tabular and chronologically, with the recorded time.
- Help: Information for causes and corrective measures for malfunctions

Each screen allows the use to switch between the screen view, the associated parameters in table form, powerful measured value trend displays, and, if available, system information.

b) Central plant control:
A real-time, modular industrial control system based on an industrial PC which handles all activities for the
- station control,
- mains breaker control,
- and isolated operation settings for the modules.

Interfaces:
- Ethernet (twisted pair) for remote maintenance access
- Ethernet (twisted pair) for interconnecting a number of engines
- Ethernet (twisted pair) for the Powerlink connection to the control inputs and outputs.
- USB interface for software updates

Connection to on-site control system as described in GE Jenbacher options list (MODBUS-RTU slave, PROFIBUS-DP slave, MODBUS-TCP slave, ProfiNet and OPC)

Monitoring / fault messages, displays / operational messages:
- Monitoring / fault messages:
  - Bus bar voltage sensor failure
- Monitoring / fault messages mains CB:

  - Mains CB status signal failure
  - Mains CB 0-signal failure
  - Mains CB 1-signal failure
  - Mains CB opening failure
  - Mains CB closing failure
  - Mains CB overload/short circuit
- Monitoring / fault messages mains:
  - Mains monitoring device failure
- Displays mains CB:
  - Mains CB OPENED/CLOSED
  - Mains CB synchronization selected
- Displays mains:
  - Mains OK / Mains fault
- Displays for each module:
  - Generator CB OPENED/CLOSED

Required reference and status signals for GE Jenbacher synchronizing system:
- Status signals
  - Mains circuit breaker CLOSED 1 NO
  - Mains circuit breaker OPENED 1 NC
  - Mains circuit breaker READY TO CLOSE 1 NO
- Mains voltage 3 x / V
  Voltage converter at star-star connection with min. 50 VA and Kl.0.5.
- Bus bar voltage 3 x / V
  Voltage converter at star-star connection with min. 50 VA and Kl.0.5.

GE Jenbacher interface-signals to be incorporated in switchgear:
- Mains circuit breaker CLOSING command 1 NO
- Mains circuit breaker OPENING command 1 NO

The closing/opening command of the GE Jenbacher synchronization will be active till the opened/closed status signal from the switchgear is received.

Maximum distance between master synchronisation and module control cabinet: 50m/164ft
Maximum distance between master synchronisation and power switch: 100m/328ft

2.10.04 Master control for 4 modules

Base procedure: Priority current - Mains power import/export–control

Dimensions:
- Height 2200 mm (87 in) (including 200 mm [8 in] foundation)
- Width 1000 mm (40 in)
- Depth 600 mm (24 in)

Control power supply (by supplier of the control power supply unit) from the battery 24 V DC, 16 A (tolerance: min. 22 V, max. 30 V, including waviness U_{pp} 3.6 V minus-grounded).
Auxiliary power supply (by the supplier of the auxiliary power supply unit):
480/277 V, 60 Hz, 16 A.

Purpose:
The "Master control" is assigned for automatic starting/stopping of the individual modules, and for the unit control power default, with respect to the plant's mains power consumption.

Scope of supply:
- The following essential components are included:
- DIA.NE server
- Visualisation
- Necessary coupling relays
- Terminal strip for incoming and outgoing cables (scope of supply)

Assumptions:
- The hydraulic integration of the units, the bypass of the surplus heat as well as the complete heater control must be finalized on-site, per GE JENBACHER-hydraulic diagram E 9684.
- Return temperature: the set value may not be exceeded. Permissible deviation -20°C (-4°F). Permissible change in maximum velocity 10°C (50°F)/minute.

Function:
- Addition and shutdown of the units
  Addition and shutdown of the units is performed in accordance with the current demand of the plant with the
  Total consumers' power
  and the
  Mains import/export power
  of the plant as switching criteria.
  The measured value acquisition of the mains import/export power is performed by an on-site measuring transducer (0/4 - 20 mA, potential free measured signal). The total consumers power of the plant is formed at the PLC by summation of the actual mains power consumption and the output of the engines.
  The set points for switching on and off each unit are adjustable; depending on the calculated generators total power set value.
  For each switching point a delay time for on and off is adjustable.
- Power adjustment:
  The power adjustment of the units is performed such that the mains power import/export is used on a constantly adjustable set value. The running units perform within the load range of 50 - 100 % nominal load, with equal load distribution between the units.
- Time intervals:
  Between two additions and shutdowns of the units, minimum (adjustable) dead time is observed.
- Unit sequencing:
  The unit sequencing is based upon availability and according to lockable selection by touch:
  "AUT" sequence according to operating hours (the unit with the lowest operating

hours will be requested first)
”MAN”, “1”, “2”, “3”…”n” Manual pre-selection of the leading unit with fixed sequence of the units. (Sequence: 1-2-3-n, 2-3-n-1, 3-n-1-2)

- Lockable service selection by touch:
  - "0", "1", "2"...”n” Manual selection of number of module demand. Module power default 50-100% according the mains power import/export regulation.
  - "AUT" Automatic Operation of the plant with module demand according the base procedure. Module power default 50-100% according the mains power import/export regulation.

DIA.NE XT
Components:
- • DIA.NE plant management system

Design:
a) Touch Display visual display unit
b) Central plant control

a) Touch Display visual display unit
15“ industrial colour graphics display with resistive touch screen.
Protection class for DIA.NE XT Front: IP 65,

The VDU contains a clear and functional summary of the measured values. All values are presented graphically.

The system is operated by touching on-screen buttons.
Numeric inputs (set points, parameters, ...) are made on a touch numerical keypad or slider.
The operating mode and synchronisation type are selected on a touch button panel that can be pinned permanently on each screen.

Main screens:
- MAIN: Operating selection, counters (operating hours)
- ELE: Electrical plant overview, synchronization
- HYD: Hydraulic plant overview (Option)
- GAS: Gas plant overview (Option)
- CTR: Plant controllers (Option)
- CUST: Shows order-specific screens added at the customer's request.
- PANEL: The operating and synchronisation mode are selected on a touch button panel that can be pinned permanently on each screen.
- ALARM: Alarm management. Efficient diagnostic instrumentation listing all active fault messages of the master control both tabular and chronologically, with the recorded time.
- Help: Information for causes and corrective measures for malfunctions

Each screen allows the use to switch between the screen view, the associated parameters in table form, powerful measured value trend displays, and, if available, system information.

b) Central plant control:

A real-time, modular industrial control system based on an industrial PC which handles all activities for the
- station control,
- mains breaker control,
- and isolated operation settings for the modules.

Interfaces:
- Ethernet (twisted pair) for remote maintenance access
- Ethernet (twisted pair) for interconnecting a number of engines
- Ethernet (twisted pair) for the Powerlink connection to the control inputs and outputs.
- USB interface for software updates

Connection to on-site control system as described in GE Jenbacher options list (MODBUS-RTU slave, PROFIBUS-DP slave, MODBUS-TCP slave, ProfiNet and OPC)

Monitoring / fault messages, displays / operational messages:
- Monitoring / fault messages
  - Measuring signal fault
  - CHP return temperature high (on-site sensor with potential free contact)
- Status messages of the plant
- Display of the actual operating mode of the plant in the status line e.g.:
  - Plant blocked
  - Priority current
  - Emergency supply
  - Priority current - peak load
- Operational messages for each module:
  - Not ready / ready / demand by master control
  - Operation OFF/ON
  - Generator C.B. OFF/ON
- Displays for each module:
  - Operating hours (with possibility of adjust)
  - Electrical output - set value and actual value
- Operational conditions of the plant:
  - Mains C.B. OFF/ON
  - Mains o.k./mains fault
  - Mains power import/export - set value and actual value
  - Total power consumers
  - Generators total power set value

Remote control messages (potential free contacts):
- CPU fault master control
- Collect fault master control

2.11.02 Coupling with external control system

Data transfer from GE Jenbacher-master control to customer’s plant management system by MODBUS-RTU-network (RS485).
The GE Jenbacher-master control works as SLAVE.
The data transmission by the customer's MASTER must be cyclically.

Transmitted data:
The transmitted data are stated in the chapter "master control- displays/operational messages"

GE Jenbacher limit of delivery:
Interface connector at the PLC in the master control panel.

2.12 Gas warning device

Function:
The gas warning device continuously monitors the radiated air in the engine room and warns against gases which are injurious to persons’ health and against explosive gas concentrations.
The measuring head (catalytic sensor) is attached on the covering or nearby the ground, dependent upon the gas source.

Scope of supply:
- Alarm unit voltage: 24VDC
- 2 Gas sensor(s)

2.13 Smoke warning device

Function:
The smoke warning device in combination with the optical smoke detector (installed in the control room) and the thermal smoke detector (installed in the engine room) provide extensive early warning signal.

Design:
The device has an optical display for alarm and operation.
The smoke warning device is installed in a plastic housing.

Scope of supply:
- Alarm unit voltage: 24 V
  2 Smoke detector(s)

3.01 Lube oil system

Consisting of:
- **211.3** gal fresh oil tank
-
- Combined electric driven fresh oil and waste oil pump
- Level switches
- Shut-off devices
- Complete pipe work between oil tanks and module

Through simple switch over of the pumps following functions are given:
- Filling of the fresh oil tank from a cask
- Filling of the lube oil tank from a cask
- Filling of the oil pan from a cask
- Emptying of the oil pan into a cask
- Emptying of the waste oil tank into a cask

3.03.01 Exhaust gas silencer

Material:
Stainless steel

Consisting of:
- Exhaust gas silencer
- Flanges, seals, fixings

Insulation:
The insulation for reducing surface irradiations (heat and sound) of the exhaust gas silencer is not included in our scope of supply and must be provided locally. The insulation (4 inch (100 mm) rock wool covered with 0,03 inch (0,75 mm) galvanized steel sheet) is required to keep the sound pressure level of the container (65 dB(A) in 32 ft (10 m)).

3.10.03 Cooling system – dual-circuit radiator

The heat produced by the engine (jacket water, lube oil, intercooler) is dissipated through a radiator, installed outside.

Consisting of:
- Radiator
- Pump
- Electrical control
- Expansion tank

The radiator is designed for an ambient temperature of 95°F (35°C). Special versions for higher ambient temperatures are available upon request.

3.20 Container

STEEL-CONTAINER for module

Dimensions:

- Lenght: 40 ft (12192 mm)
- Width: 9.84 ft (3000 mm)
- Height: 8.76 ft (2670 mm)

Sound pressure level
65 dB(A) at 32 ft (10 m) (surface sound pressure level according to DIN 45635)
See comments under MC 3.03.01

Ambient temperature:
The container is designed for an ambient temperature from -4°F (-20°C) to 90°F (32°C).
Other temperatures are available upon request.

Base frame:
Self-supporting, i.e. the base frame is designed to withstand static loads from the installation of parts such as the engine, control panels, exhaust gas silencer and radiator.

To lift (to load) the container 4 screw able carrier are mounted at the top of the container.

Construction:
Trapezoidal corrugated steel sheeting welded between the base frame and the top frame.
The sound absorbent surfaces are comprised of rock wool covered with perforated plating.
The container is of a weatherproof design and the roof is suitable for construction work.

A dismountable section to bring in the engine is situated at the front of the container beside the air outlet.
There is a door into the control room at the front wall on the side of air inlet.
A door into the engine room is situated at the long side of the container.

The doors (engine room and control room) are fitted with identical cylinder locks. The doors are designed as emergency doors which can be opened in direction of the escape route. They are identified as such and can be opened from the inside without other assistance (panic lock).

Dimension of door: appr. 3.28 ft (1000 mm) x 6.56 ft (2000 mm) (W x H)

Engine room:
The floor is made of steel sheet (checker – or nipple plate) and designed as a tightly shut pan. This pan is used to collect an oil-leak of the lube oil circuit (engine and extension tank).
Connections from/to the engine room consist of:

- Top: Gas inlet; welded flange
  Cooling water in/outlet; welded flange
  Exhaust gas outlet; tightly closed

- Roof:
  Suspensions for cable trough, gas train, gas pipes, ...
- Wall:
  The wall between engine room and control room is design with recesses for the cables.

Control room:
The control room is ventilated by a lockable air intake opening. The air is aspirated by the fans of the engine room. For the cables a recess at the floor of the control room is planned. The control room is equipped with a plastic covering.

Module and container installation are essentially performed as follows:
- Installation and setup of the module
- Installation of the control equipment in a separate control equipment room
- Installation of the gas train
- Installation of the lube oil equipment
- Installation of the air intake and outlet ventilation system
- Installation of the exhaust silencer on the roof
- Installation of the radiator on the roof
- Installation of lighting in the container
- Installation of the auxiliary electrical installations
- Completion of exhaust, fuel, oil and water piping, according to the defined scope of supply, including all necessary fittings, flexible connections and reinforcements.
- Footboard above the tubes
- Gutters
- Total signage

Fire protection classification:
The container is not classified for fire protection.

Coating:
- Installation:
  - Oil resistant base
  - Synthetic resin as coating varnish
- Colour Container:
  RAL6018 (green)

3.70 Control Strategy and Options

Per Unit Balance of Plant Controls – Intercooler Loop Panel Controls and Software to include:

IC Temperature Control (Panel Parts and SW Only) - This feature will provide all necessary controls to operate a 3 Way temperature control valve in the IC Loop if Not Required by Site Conditions. The Diane will provide a 4-20mA Analog Output to a customer provided valve and will utilize mixture temperature as a feedback input. Control and Display Software are also provided.

Intercooler Pump Control (Panel Control Parts and SW Only) - The option will add specific contact output and feedback input to/from an MCC for the Intercooler Water Pump. This will include relays and software.

Intercooler Loop Pressure (Panel Parts and SW Only) - This feature will provide an discrete input and associated software for the Intercooler Loop system pressure.

Per Unit Balance of Plant Controls – Radiator Panel Controls and Software to include:

Dual Circuit GMM Radiator Control (Panel Parts and SW Only) - This feature will provide controls for a customer provided 6 fan Güntner Motor Management (GMM) 2 circuit radiator. The MCC control signals (DO/DI), and GMM control signals (4-20mA, DI and DO signals) will be provided.

Control Strategy -

Grid Parallel with KW Control – Real Power Load Control of the Generator set will be either via a 4-20mA input from the customer representing a unit KW load setpoint or a KW load setpoint entered on the Diane XT4 screen. Upon breaker closure, the unit will ramp to the setpoint at a maximum rate of (Rated Unit KW) / 180 seconds.

Grid Parallel with PF Control – Reactive Power Load Control of the Generator set will be either via a 4-20mA input from the customer representing a unit Power Factory setpoint or a Power Factor setpoint entered on the Diane XT4 screen. Upon breaker closure, the unit will maintain the setpoint.

Grid Parallel with Import/Export Control - Load Control via an Import/Export KW level entered on the Diane XT4 screen. Required will be a customer 4-20mA signal representing the Site KW (Imported and/or Exported Power) that is to be controlled. Upon breaker closure, the unit will ramp to a load that will drive the KW value represented by the 4-20mA input signal to the level entered on Customer Import/Export Setpoint entered in the Diane XT4 screen. Once at the setpoint, the unit will raise and lower load to maintain this value. If the generator load required to maintain this setpoint drops below the minimum load level of the generator set, the unit 52G circuit breaker will be opened.

Grid Parallel with Multi Unit Island Operation (Auto Re-sync) - While Grid connected, the unit/units load can be adjusted via its KW control setpoint or designated option. In the event of a loss of utility, the unit/units will be able to continue operating locally without utility power however a separate system must shed load so that the engine is not overloaded, as per GE Jenbacher TI 2108-0031. When utility power is restored, the unit is provided with an automatic re-synchronization feature which will sync the unit back to the utility. This system will work in conjunction with a GE Jenbacher Master Synchronizing Control (see appropriate Spec Section) if so equipped.

Island Mode Operations with Blackout Starting – Island Operations with Black start capability will allow the engine to start and run without utility being present. The engine will be able to start the engine on battery power, close the generator breaker against a dead bus, and operate independently of a utility power source. The customer must ensure that there is sufficient fuel gas and pre-chamber gas at pressure in the event of a Type 6 engine so configured. The engine will start without the normal confirmation of engine block

temperature or operation of a circulating AC water pump. It will be required of the operators that once the engine is connected to the generator bus, power to the engine auxiliaries be restored. Load Management is expected to be limited by the operators to the limits of the engine, as per GE Jenbacher TI 2108-0031. This system will work in conjunction with a GE Jenbacher Master Synchronizing Control (see appropriate Spec Section) if so equipped. If this is a single unit and synchronization with the utility after assuming operations is required, a *Grid Parallel with Single Unit Island Operations* option will be required.

Woodward Power Management & Remote Synchronization

Unit will configured to accept 2 customer generated control signals, both 4-20mA. These two signals impact on unit control will vary based on generator and utility circuit breaker position. The signals are defined as follows

> **Voltage Adjust:** A 4-20mA signal representing a voltage adjustment. Prior to generator circuit breaker closure, this signal will adjust generator voltage for synchronizing purposes. If the generator set is to run in Island mode (no utility connected) after breaker closure, this 4-20mA signal will be used for reactive power control. The limits and requirements of GE Jenbacher TI 2108-0031 (Island Mode Operations General) and GE Jenbacher TI 2108-0029 (Isolated Operation Type 4 Engines) are to be observed. If the generator set is to run in Mains Parallel mode (against the utility), this 4-20mA signal will be used for power factor control.
>
> **Speed Adjust**: A 4-20mA signal representing a speed adjustment. Prior to generator circuit breaker closure, this signal will adjust package frequency for synchronizing purposes. If the generator set is to run in Island mode (no utility connected) after breaker closure, this 4-20mA signal will be used for real power (KW) control. The limits and requirements of GE Jenbacher TI 2108-0031 (Island Mode Operations General) and GE Jenbacher TI 2108-0029 (Isolated Operation Type 4 Engines) are to be observed. If the generator set is to run in Mains Parallel mode (against the utility), this 4-20mA signal will be used for a KW setpoint signal.

The Diane Control System will not be provided with automatic synchronization features, it will however provide a synchronization check function (25 device), and provide a breaker close permissive signal once the sync check permissive is met. The Diane system will still require breaker status indications as detailed in section 1.11 – Engine Generator Control Panel – Diane XT.

Standard MMU features for protection will remain.

4.00 Delivery, installation and commissioning

4.01 Carriage

According to contract.

4.02 Unloading

Unloading, moving of equipment to point of installation, mounting and adjustment of delivered equipment on intended foundations is not included in GE Jenbacher scope of supply.

4.03 Assembly and installation
Assembly and installation of all GE Jenbacher -components is not included in GE Jenbacher scope of supply.

4.04 Storage
The customer is responsible for secure and appropriate storage of all delivered equipment.

4.05 Start-up and commissioning
Start-up and commissioning with the GE Jenbacher start-up and commissioning checklist is not included.
Plants with island operation require internet connection.

4.06 Trial run
After start-up and commissioning, the plant will be tested in an 8-hour trial run. The operating personnel will be introduced simultaneously to basic operating procedures.
Is not included in GE Jenbacher scope of supply.

4.07 Emission measurement with exhaust gas analyzer
Emission measurement by GE Jenbacher personnel, to verify that the guaranteed toxic agent emissions have been achieved (costs for measurement by an independent agency will be an extra charge).

5.01 Limits of delivery - Container

Electrical
- Module:
  At terminals of generator circuit breaker

Warm water
At inlet and outlet flanges on container

Exhaust gas
At exhaust gas outlet flange on top of the container; special stack provided locally

Combustion air
The air filters are set mounted, no external ductwork is necessary

Fuel gas
At inlet flange of the container

Lube oil
At lube oil connections on container

Condensate
At the condensate drains on container.

Insulation
Insulation of heat exchangers, pipework and exhaust gas silencer is not included in our scope of supply and must be provided locally.

First filling
The first filling of module, (lube oil, engine jacket water, anti freeze-, anti corrosive agent, battery acid) is not included in our scope of supply.

The composition and quality of the used consumables are to be strictly monitored in accordance with the "Technical Instructions" of GE JENBACHER.

Suitable bellows and flexible connections **must be provided locally** for all connections.
Cables from the module must be flexible.

5.02 Factory tests and inspections

The individual module components shall undergo the following tests and inspections:

5.02.01 Engine tests
Carried out as combined Engine- and Module test according to DIN ISO 3046 at GE Jenbacher test bench.
The following tests are made at 100%, 75% and 50% load, and the results are reported in a test certificate:
- Engine output
- Fuel consumption
- Jacket water temperatures
- Lube oil pressure
- Lube oil temperatures
- Boost pressure
- Exhaust gas temperatures, for each cylinder

5.02.02 Generator tests
Carried out on test bench of the generator supplier.

5.02.03 Module tests
The engine will be tested with natural gas (methane number 94). The performance data achieved at the test bench may therefore vary from the data as defined in the technical specification due to differences in fuel gas quality.
Carried out as combined Engine- and Module test commonly with module control panel at GE Jenbacher test bench, according to ISO 8528, DIN 6280. The following tests are made and the results are reported in a test certificate:
Visual inspection of scope of supply per specifications.
- Functional tests per technical specification of control system.
  - Starting in manual and automatic mode of operation
  - Power control in manual and automatic mode of operation
  - Function of all safety systems on module

- Measurements at 100%, 75% and 50% load:
  - Frequency
  - Voltage
  - Current
  - Generator output
  - Power factor
  - Fuel consumption
  - Lube oil pressure
  - Jacket water temperature
  - Boost pressure
  - Mixture temperature
  - Exhaust emission (NOx)

The module test will be carried out with the original generator, except it is not possible because of the delivery date. Then a test generator will be used for the module test.
To prove characteristics of the above components, which are not tested on the test bench by GE JENBACHER, the manufacturers' certificate will be provided.
In the case of a container unit the above mentioned test procedure for the module is performed in Jenbach.
GE Jenbacher reserves the right to perform the functional test of the container in a GE facility elsewhere.

5.03 Documentation

60 days advance documentation, as per the technically clarified order placement
- Module drawing **1)**
- Technical diagram **1)**
- Drawings of the cabinet views **3**
- Electrical interface list **2)**
- Technical specification of the control system **2)**
- Technical drawings of accessories (if included in scope of supply of INNIO Jenbacher GmbH&CO OG) **1**

Before delivery(depending on progress in ordering the components, on request)
- Technical drawings for BoP components supplied separately (if included in scope of supply of INNIO Jenbacher GmbH&CO OG) **1)**

Upon delivery
- Circuit diagrams **3)**
- Cable list **3)**

Delivered with the engine
- Brief instructions (transport, erection, moving) **1)**

For commissioning
- Operation and maintenance instructions **4)**
- Spare parts catalogue **4)**

- Original supplier operation and maintenance instructions for any BoP components (installed in the INNIO Jenbacher GmbH&Co OG scope of supply) as Appendix **1)**

  All the components found in the INNIO Jenbacher GmbH&Co OG scope of supply are described in the operation and maintenance instructions, and in the spare parts catalogue.
  In addition, the manufacturer's original operation and maintenance instructions will be provided for every BoP component, in German and English as standard, as an Appendix for the operation and maintenance manual provided.

  Additional costs of producing or providing the required documents using the KKS (power station coding system) and/or integration in subcontractors' documentation, or additional approval, design and proof of testing documentation must be negotiated or ordered separately.

  This standard offer does not include:
  - Approval documentation
  - Design documentation
  - Proof of testing documentation
  - Printed copies and digital off-line versions (e.g. printed versions, CD, pdf, etc.) must be negotiated separately and ordered accordingly.

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23/2019

Technical Description

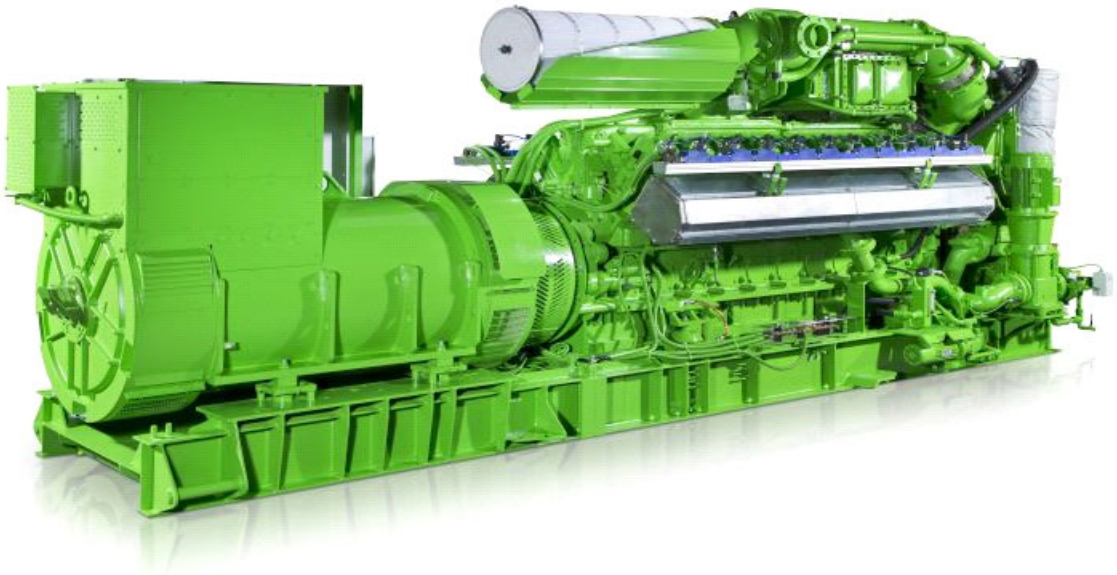
Cogeneration Unit

JMS 420 GS-S.L C685 480V 14Bar BE

Grid Parallel with Island Operation

For Propane with the following chemistry: C3H8 (Propane): 90%; C2H6: 5%; C5H12: 2.5%; C6H14: 2.5%

Generic Propane



Electrical output	1250	kW el.
Thermal output	5171	MBTU/hr

Emission values

NOx < 0.7 g/bhp.hr (NO2)

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0.01 Technical Data (at module)

			100%	75%	50%
Power input	[2]	MBTU/hr	10,483	8,161	5,839
Gas volume	*)	scfhr	4,065	3,164	2,264
Mechanical output	[1]	bhp	1,721	1,290	860
Electrical output	[4]	kW el.	1,250	935	618
Recoverable thermal output					
~ Intercooler 1st stage	[9]	MBTU/hr	691	354	110
~ Lube oil		MBTU/hr	684	624	543
~ Jacket water		MBTU/hr	1,219	1,038	830
~ Exhaust gas cooled to 248 °F		MBTU/hr	2,577	2,066	1,526
Total recoverable thermal output	[5]	MBTU/hr	5,171	4,082	3,009
Heat to be dissipated (calculated with Glykol 37%)					
~ Intercooler 2nd stage		MBTU/hr	209	160	85
~ Lube oil		MBTU/hr	~	~	~
~ Surface heat	ca. [7]	MBTU/hr	363	~	~
Spec. fuel consumption of engine electric	[2]	BTU/kWel.hr	8,389	8,729	9,451
Spec. fuel consumption of engine	[2]	BTU/bhp.hr	6,091	6,326	6,790
Lube oil consumption	ca. [3]	gal/hr	0.09	~	~
Electrical efficiency			40.7%	39.1%	36.1%
Thermal efficiency			49.3%	50.0%	51.5%
Total efficiency	[6]		90.0%	89.1%	87.6%
Hot water circuit:					
Forward temperature		°F	194.0	186.4	179.0
Return temperature		°F	158.0	158.0	158.0
Hot water flow rate		GPM	287.3	287.3	287.3
Fuel gas LHV		BTU/scft	2579		

*) approximate value for pipework dimensioning
[ ] Explanations: see 0.10 - Technical parameters

All heat data is based on standard conditions according to attachment 0.10. Deviations from the standard conditions can result in a change of values within the heat balance, and must be taken into consideration in the layout of the cooling circuit/equipment (intercooler; emergency cooling; ...). In the specifications in addition to the general tolerance of ±8 % on the thermal output a further reserve of +5 % is recommended for the dimensioning of the cooling requirements.

Main dimensions and weights (at module)

Length	in	~ 280
Width	in	~ 80
Height	in	~ 90
Weight empty	lbs	~ 36,110
Weight filled	lbs	~ 37,650

Connections

Hot water inlet and outlet [A/B]	in/lbs	4"/145
Exhaust gas outlet [C]	in/lbs	12"/145
Fuel Gas (at module) [D]	in/lbs	5"/232
Water drain ISO 228	G	½"
Condensate drain	in/lbs	2"/145
Safety valve - jacket water ISO 228 [G]	in/lbs	2x1½"/2.5
Safety valve - hot water	in/lbs	2½"/232
Lube oil replenishing (pipe) [I]	in	1.1
Lube oil drain (pipe) [J]	in	1.1
Jacket water - filling (flex pipe) [L]	in	0.5
Intercooler water-Inlet/Outlet 1st stage	in/lbs	4"/145
Intercooler water-Inlet/Outlet 2nd stage [M/N]	in/lbs	2½"/145

Output / fuel consumption

ISO standard fuel stop power ICFN	bhp	1,721
Mean effe. press. at stand. power and nom. speed	psi	203
Fuel gas type		Flare gas
Based on methane number | Min. methane number	MN	30 | 40 d)
Compression ratio	Epsilon	11.8
Min./Max. fuel gas pressure at inlet to gas train	psi	1.74 - 2.9 c)
Max. rate of gas pressure fluctuation	psi/sec	0.145
Maximum Intercooler 2nd stage inlet water temperature	°F	104
Spec. fuel consumption of engine	BTU/bhp.hr	6,091
Specific lube oil consumption	g/bhp.hr	0.15
Max. Oil temperature	°F	189
Jacket-water temperature max.	°F	203
Filling capacity lube oil (refill)	gal	~ 115

c) Lower gas pressures upon inquiry
d) based on methane number calculation software AVL 3.2 (calculated without N2 and CO2)

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0.02 Technical data of engine

Manufacturer		JENBACHER
Engine type		J 420 GS-C685
Working principle		4-Stroke
Configuration		V 70°
No. of cylinders		20
Bore	in	5.71
Stroke	in	7.28
Piston displacement	cu.in	3,728
Nominal speed	rpm	1,800
Mean piston speed	in/s	437
Length	in	148
Width	in	62
Height	in	80
Weight dry	lbs	15,873
Weight filled	lbs	17,417
Moment of inertia	lbs-ft²	276.26
Direction of rotation (from flywheel view)		left
Radio interference level to VDE 0875		N
Starter motor output	kW	13
Starter motor voltage	V	24

Thermal energy balance

Power input	MBTU/hr	10,483
Intercooler	MBTU/hr	900
Lube oil	MBTU/hr	684
Jacket water	MBTU/hr	1,219
Exhaust gas cooled to 356 °F	MBTU/hr	2,166
Exhaust gas cooled to 212 °F	MBTU/hr	2,714
Surface heat	MBTU/hr	213

Exhaust gas data

Exhaust gas temperature at full load [8]	°F	901
Exhaust gas temperature at bmep= 152.3 [psi]	°F	~ 928
Exhaust gas temperature at bmep= 101.5 [psi]	°F	~ 963
Exhaust gas mass flow rate, wet	lbs/hr	14,919
Exhaust gas mass flow rate, dry	lbs/hr	14,084
Exhaust gas volume, wet	scfhr	186,900
Exhaust gas volume, dry	scfhr	170,280
Max.admissible exhaust back pressure after engine	psi	0.870

Combustion air data

Combustion air mass flow rate	lbs/hr	14,408
Combustion air volume	SCFM	2,977
Max. admissible pressure drop at air-intake filter	psi	0.145

Sound pressure level

Aggregate a)		dB(A) re 20µPa	100
31,5	Hz	dB	82
63	Hz	dB	90
125	Hz	dB	101
250	Hz	dB	98
500	Hz	dB	94
1000	Hz	dB	89
2000	Hz	dB	91
4000	Hz	dB	95
8000	Hz	dB	92
Exhaust gas b)		dB(A) re 20µPa	115
31,5	Hz	dB	95
63	Hz	dB	117
125	Hz	dB	115
250	Hz	dB	113
500	Hz	dB	108
1000	Hz	dB	105
2000	Hz	dB	108
4000	Hz	dB	109
8000	Hz	dB	107

Sound power level

Aggregate	dB(A) re 1pW	120
Measurement surface	ft²	1,184
Exhaust gas	dB(A) re 1pW	123
Measurement surface	ft²	67.60

a) average sound pressure level on measurement surface in a distance of 3.28ft (converted to free field) according to DIN 45635, precision class 3.
b) average sound pressure level on measurement surface in a distance of 3.28ft according to DIN 45635, precision class 2.
The spectra are valid for aggregates up to bmep=232.060384 psi. (for higher bmep add safety margin of 1dB to all values per increase of 15 PSI pressure).
Engine tolerance ± 3 dB

0.03 Technical data of generator

Manufacturer		STAMFORD e)
Type		PE 734 F e)
Type rating	kVA	2,183
Driving power	bhp	1,721
Ratings at p.f.= 1.0	kW	1,250
Ratings at p.f. = 0.8	kW	1,239
Rated output at p.f. = 0.8	kVA	1,549
Rated reactive power at p.f. = 0.8	kVAr	929
Rated current at p.f. = 0.8	A	1,863
Frequency	Hz	60
Voltage	V	480
Speed	rpm	1,800
Permissible overspeed	rpm	2,250
Power factor (lagging - leading)		0,8 - 1,0
Efficiency at p.f.= 1.0		97.4%
Efficiency at p.f. = 0.8		96.6%
Moment of inertia	lbs-ft²	1149.20
Mass	lbs	8,545
Radio interference level to EN 55011 Class A (EN 61000-6-4)		N
Cable outlet		left
Ik" Initial symmetrical short-circuit current	kA	23.39
Is Peak current	kA	59.54
Insulation class		H
Temperature rise (at driving power)		F
Maximum ambient temperature	°F	104

Reactance and time constants (saturated) at rated output

xd direct axis synchronous reactance	p.u.	1.77
xd' direct axis transient reactance	p.u.	0.11
xd" direct axis sub transient reactance	p.u.	0.08
x2 negative sequence reactance	p.u.	0.11
Td" sub transient reactance time constant	ms	20
Ta Time constant direct-current	ms	20
Tdo' open circuit field time constant	s	2.54

e) JENBACHER reserves the right to change the generator supplier and the generator type. The contractual data of the generator may thereby change slightly. The contractual produced electrical power will not change.

0.04 Technical data of heat recovery

General data - Hot water circuit

Total recoverable thermal output	MBTU/hr	5,171
Return temperature	°F	158.0
Forward temperature	°F	194.0
Hot water flow rate	GPM	287.3
Design pressure of hot water	lbs	145
min. operating pressure	psi	51.0
max. operating pressure	psi	131.0
Pressure drop hot water circuit	psi	17.40
Maximum Variation in return temperature	°F	+0/-21
Max. rate of return temperature fluctuation	°F/min	18

General data - Cooling water circuit

Heat to be dissipated (calculated with Glykol 37%)	MBTU/hr	209
Return temperature	°F	104
Cooling water flow rate	GPM	88
Design pressure of cooling water	lbs	145
min. operating pressure	psi	7.0
max. operating pressure	psi	73.0
Loss of nominal pressure of cooling water	psi	~
Maximum Variation in return temperature	°F	+0/-21
Max. rate of return temperature fluctuation	°F/min	18

Exhaust gas heat exchanger

Type	shell-and-tube

PRIMARY:

Exhaust gas pressure drop approx	psi	0.22
Exhaust gas connection	in/lbs	12"/145

SECONDARY:

Pressure drop hot water circuit	psi	2.90
Hot water connection	in/lbs	4"/145

The final pressure drop will be given after final order clarification and must be taken from the P&ID order documentation.

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connection variant F

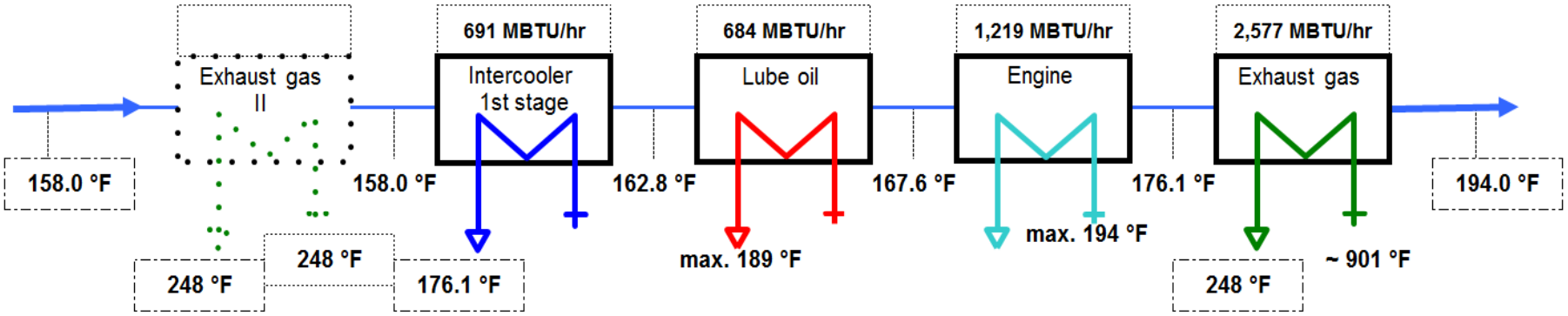
Hot water circuit

Generic Propane ◁▷ **J 420 GS-C685**

Recoverable thermal output = 5,171 MBTU/hr

(±8 % tolerance +5 % reserve for cooling requirements)

Hot water flow rate = 287.3 GPM

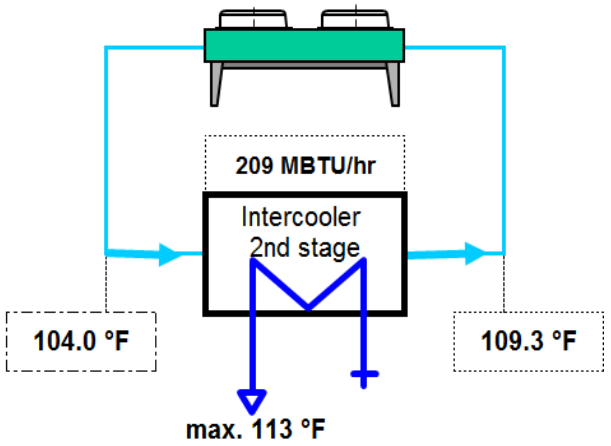


Low Temperature circuit (calculated with Glykol 37%)

Heat to be dissipated = 209 MBTU/hr

(±8 % tolerance +5 % reserve for cooling requirements)

Cooling water flow rate = 88.1 GPM



0.10 Technical parameters

All data in the technical specification are based on engine full load (unless stated otherwise) at specified temperatures as well as the methane number and subject to technical development and modifications. For isolated operation an output reduction may apply according to the block load diagram. Before being able to provide exact output numbers, a detailed site load profile needs to be provided (motor starting curves, etc.).

All pressure indications are to be measured and read with pressure gauges (psi.g.).

(1) At nominal speed and standard reference conditions ICFN according to DIN-ISO 3046 and DIN 6271, respectively
(2) According to DIN-ISO 3046 and DIN 6271, respectively, with a tolerance of +5 %.
Efficiency performance is based on a new unit (immediately upon commissioning).Effects of degradation during normal operation can be mitigated through regular service and maintenance work.
(3) Average value between oil change intervals according to maintenance schedule, without oil change amount
(4) At p. f. = 1.0 according to VDE 0530 REM / IEC 34.1 with relative tolerances, all direct driven pumps are included
(5) Total output with a tolerance of ±8 %
(6) According to above parameters (1) through (5)
(7) Only valid for engine and generator; module and peripheral equipment not considered (at p. f. = 0,8) ,(guiding value)
(8) Exhaust temperature with a tolerance of ±8 %
(9) Intercooler heat on:
*** standard conditions** - If the turbocharger design is done for air intake temperature > 86°F w/o de-rating, the intercooler heat of the 1st stage need to be increased by 2%/K starting from 77°F. Deviations between 77 – 86°F will be covered with the standard tolerance.
*** Hot Country application (V1xx)** - If the turbocharger design is done for air intake temperature > 104°F w/o de-rating, the intercooler heat of the 1st stage need to be increased by 2%/K starting from 95°F. Deviations between 95 – 104°F will be covered with the standard tolerance.

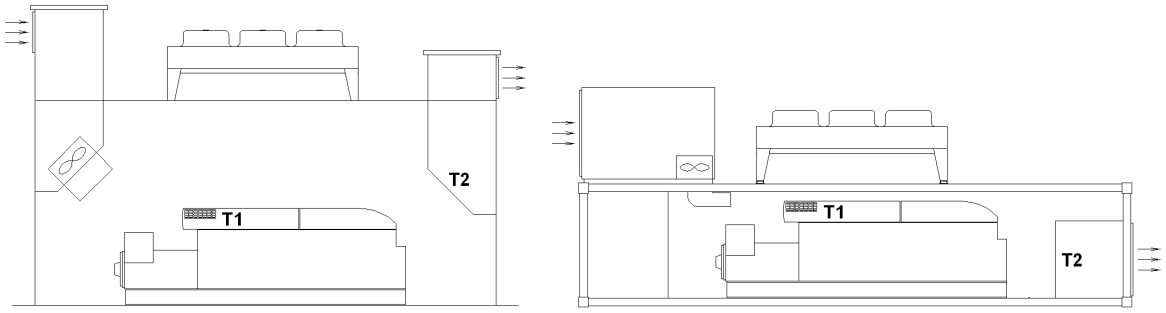
Radio interference level
The ignition system of the gas engines complies the radio interference levels of CISPR 12 and EN 55011 class B, (30-75 MHz, 75-400 MHz, 400-1000 MHz) and (30-230 MHz, 230-1000 MHz), respectively.

Definition of output
- ISO-ICFN continuous rated power:
  Net break power that the engine manufacturer declares an engine is capable of delivering continuously, at stated speed, between the normal maintenance intervals and overhauls as required by the manufacturer. Power determined under the operating conditions of the manufacturer's test bench and adjusted to the standard reference conditions.
- Standard reference conditions:

Barometric pressure:	14.5 psi (1000 mbar) or 328 ft (100 m) above sea level
Air temperature:	77°F (25°C) or 298 K
Relative humidity:	30 %

- Volume values at standard conditions (fuel gas, combustion air, exhaust gas)
  Pressure: 1 atmosphere (1013.25 mbar)
  Temperature: 32°F (0°C)

Output adjustment for turbo charged engines
Standard rating of the engines is for an installation at an altitude ≤ **1640 ft** and combustion air temperature ≤ **86 °F** (T1)
Engine room outlet temperature: **122°F** (T2) -> engine stop



If the actual methane number is lower than the specified, the knock control responds. First the ignition timing is changed at full rated power. Secondly the rated power is reduced. These functions are done by the engine management.
Exceedance of the voltage and frequency limits for generators according to IEC 60034-1 Zone A will lead to a derate in output.

Parameters for the operation of JENBACHER gas engines
The genset fulfills the limits for mechanical vibrations according to ISO 8528-9.
The following "Technical Instruction of JENBACHER" forms an integral part of a contract and must be strictly observed: **TA 1000-0004, TA 1100 0110, TA 1100-0111**, and **TA 1100-0112.**
Transport by rail should be avoided. See **TA 1000-0046** for further details

Failure to adhere to the requirements of the above mentioned TA documents can lead to engine damage and may result in loss of warranty coverage.

Parameters for the operation of control unit and the electrical equipment
Relative humidity 50% by maximum temperature of 104°F.
Altitude up to 2000m above the sea level.

0.20 Mode of Operation

Grid Parallel and Island Operation - Single Unit (Auto Re-sync)
While Grid connected, the unit load can be adjusted via its power control set point or designated option. In the event of a loss of utility, the unit will be able to continue operating locally without utility power. When the

mains monitor relay (protective relay ANSI No. 27, 59, 81, 78- provided either by GE or the customer) is activated due to a mains failure, the engine is isolated from the mains by opening the mains circuit breaker.

The load adding and shedding capabilities of the genset documented in
- TA 2108-0031 - general island operation
- TA 2108-0025 for type 3 engines
- TA 2108-0029 for type 4 engines
- TA 2108-0026 for type 6 engines
- TA 2108-0032 for type 9 engines

needs to be considered by the customer in order to ensure proper operation of the equipment.

When grid is restored, the unit is provided with an automatic re-synchronization feature which will synchronize the unit back to the utility (limited to one Mains Circuit Breaker, no additional Section Circuit Breaker or the like). The unit(s) can perform "Black-out" start without external auxiliary power supply to the "dead busbar".

Wright, Dylan A

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Thursday, January 2, 2020 7:23 PM
To: Wright, Dylan A
Cc: Edwards, Lisa; Hartsfield, Taylor; Murphy, Davis
Subject: [External] RE:

HI Dylan,

Hope you are doing well. Thanks for reaching out, I'll be in touch, tomorrow or Monday to get you the information you requested.

Take care

Thanks

Scott

From: Wright, Dylan A [mailto:dylan.wright@ncdenr.gov]
Sent: Thursday, January 2, 2020 1:18 PM
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: Gregg Bowler <gbowler@thesunrockgroup.com>; Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>; Murphy, Davis <davis.murphy@ncdenr.gov>
Subject:

Good Afternoon Scott,

During an initial review of the application, it was determined that the following information is required to continue processing the referenced Air Quality Permit application: 2900029.19A

I have reviewed most of the Prospect Hill Quarry and Distribution Center (1700017) application and emissions calculations and have several questions/requests/comments.

- Appendix A1 Page 3 of 5 shows that the facility-wide uncontrolled potential NOx emissions are 104.18 tons/per. This will make the facility synthetic minor for NOx. The limit taken to get CO emissions below 100 tons/year will also bring NOx emissions well below 100 tons/year. Nothing is needed for this change but NOx will be listed in the synthetic minor (2Q .0315) condition since its potential emissions will be over 100 tons per year.
- There is a temporary RAP crusher mentioned under 3.4.2.2. on page 3-3. The application states that this system will be moved between multiple Sunrock facilities. Is this crusher mainly going to stay at one of the three asphalt plants located in Caswell county or will if move around to other facilities as well? Is the crusher owned and operated by Carolina Sunrock or an outside vender?
- The two asphalt tank heaters are called Asphalt Cement Heater (IES-4) and IES-5 Liquid Asphalt Tank Heater. Is it ok if I call them both "Natural Gas/No.2 fuel oil-fired Asphalt Cement Heater"? Other than the small size difference in Heat input, is there a difference between them?
- The Liquid asphalt tank heaters required toxics modeling therefore they must be listed on the permitted sources list under 15A NCAC 02Q .0102(b)(2). I plan to add them as ES-ACH1 and ES-ACH2.

- We plan to permit the quarry with grouped sources that will be divided up between Conveying Operations, Crushing Operations, and Screening Operations. The permit will have a condition that the facility shall maintain on-site an equipment list and a plant (or flow) diagram of all quarry equipment covered under this permit. When sources are relocated or added, the diagram must be updated and a written notification must be provided to NCDAQ. Is this an acceptable approach to permitting the quarry part of your permit? I plan to provide a permit draft to you before I issue the permit.
- Your emission calculations for the natural gas engines use vender supplied emissions factors for NOX, VOC, and CO. Can you supply us with this documentation so that we can verify that they are acceptable?
- For the Natural Gas engine emissions factors that you didn't us the vender numbers, you used AP-42 Vol. 1 5th ed. Section 3.2, 10/96; for 4SLB engines. This document was updated in July 2000. Can you update the emissions factors to the 7/00 revision. Also update facility wide totals and anything else this may effect.
- The SO2 emissions factor (EF) that you used for the diesel engines is from the NC DENR Internal Engine (Small engine spreadsheet) which is fine place to pull EF from, but it seems there is a typographical error. The EF in the spreadsheet is 1.21E-3 and the EF that your used in your calculations is 1.21E-5. Can you make this correction to the spreadsheet and the facility totals sheet. I believe that making this change will cause facility wide potential emissions to exceed 100 tons/year, causing the facility to need to be Synthetic Minor for SO2 as well. This would fall under the same situation as NOx since the production limits as well and the gas engine limitations will keep SO2 emissions below 100 tons/year.
- One of the limitations that you proposed under the synthetic minor condition is that only two of the three natural gas/propane engines can run at the same time. It appears that you have two compliance options. Since this limit is placed in the permit to keep criteria pollutants below annual limits, you have the option of demonstrating compliance by limiting total hours of operation of the three engines to 17,520 hours per year. This method of compliance would likely cause you to have to maintain monthly records of operation hours. If you chose to keep the originally proposed compliance method of only operating two engines simultaneously, how can you ensure that this will be complied with? Is there an electronic system that will be set up to prevent a third generator from turning on if two of the others are on? Do you want to keep daily records of engine start and stop times to ensure that no more than two engines were running simultaneously? Which compliance method would you prefer?
- The application mentions that the AC heater stacks will be obstructed. Since this is the case, the TPERs under 02Q .0711(a) apply. It appears that the total controlled emissions of mercury vapor (assumed to be expected actual emissions) will exceed this TPER. Please resubmit your toxics modeling with mercury included.
- In your application you referred to the engines in the quarry as "generators". Just to be clear, are the engines attached to generators that power electrical motors to run the equipment, or do the engines directly power the equipment? If the latter is true then can I name these sources "XXX hp Diesel Engine Powering XXXXXXXXXX"?
- What is the expected operating schedule for this facility? (cement plant, asphalt plant, and quarry)
- In the application you say that GEN-4 is used to power TF80.Is TF-80 a tracked feeder?
- Does this asphalt plant plan to process any RAS (shingles) If so, then the Subpart M avoidance requirements might apply.
- What type of bagfilter material are you planning on using for HMA-CD1 and RMC-CD2?
- On Form C1 for HMA-CD1 I am confused at where you got your control efficiency numbers from. Can you elaborate on where they came from?
- On Form C1 for RMC-CD2 I am confused on how you calculated your total filter area. Can you please review your calculations and explain how you did them?

Until the above information is received, your application will be considered incomplete and inactive. Your responses to this additional information request will become part of your initial permit application received November 18, 2019. If the above information is not received by **January 23, 2020**, then the air permit application may be returned to the Company. Please respond by copying and pasting the questions/requests/comments and responding in colored text. If you have any questions feel free to give me a call at (336) 776-9646.

Thank you,

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main)
336.776.9646 (Direct)
336.776.9797 (Fax)

450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
dylan.wright@ncdenr.gov

Wright, Dylan A

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Friday, January 3, 2020 3:10 PM
To: Wright, Dylan A
Cc: Hartsfield, Taylor; Edwards, Lisa; Alexander Culpepper
Subject: [External] Carolina Sunrock LLC - Prospect Hill Quarry and Distribution Center
Attachments: C1 Sent.xlsx

Hi Dylan,

Below are the answers to some of your questions, I am currently working with our consultants and vendor for the modeling and the engine specs you inquired about. Once I get that back from them I'll get it over to you .

1. Appendix A1 Page 3 of 5 shows that the facility-wide uncontrolled potential NOx emissions are 104.18 tons/per. This will make the facility synthetic minor for NOx. The limit taken to get CO emissions below 100 tons/year will also bring NOx emissions well below 100 tons/year. Nothing is needed for this change but NOx will be listed in the synthetic minor (2Q .0315) condition since its potential emissions will be over 100 tons per year.

    - We are fine with adding NOx conditions, as it is already stipulated in other air permits Carolina Sunrock currently maintains.

2. There is a temporary RAP crusher mentioned under 3.4.2.2. on page 3-3. The application states that this system will be moved between multiple Sunrock facilities. Is this crusher mainly going to stay at one of the three asphalt plants located in Caswell county or will if move around to other facilities as well? Is the crusher owned and operated by Carolina Sunrock or an outside vender?

    - Carolina Sunrock currently owns and operates its own RAP and Concrete Recycling Equipment. This equipment and crew moves in and out of all of Carolina Sunrock's facilities over the course of a year on an as needed basis depending on each facility's needs. The equipment is never located at one particular facility for more than a few months or sometimes only a few weeks. This equipment will not only service the three facilities in Caswell county but also Carolina Sunrock's six other facilities, which are located in Durham, Granville, Person, Wake, and Vance.

3. The two asphalt tank heaters are called asphalt cement heater (IES-4 and IES-5 Liquid Asphalt Tank Heater. It is ok if I call them both " Natural gas/No.2 fuel oil-fired Asphalt Cement Heater"? Other than the small size difference in heat input, is there a difference between them?

    - If you would like to rename the heaters that is fine; however, there is no real difference in the units other than what you stated regarding heat input; both units are Heatec units and are identical except for the BTUs.

4. The Liquid asphalt tank heaters required toxics modeling therefore they must be listed on the permitted sources list under 15A NCAC 02Q .0102(b)(2). I plan to add them as ES-ACH1 and ES-ACH2.

    - This is fine to add them on the permitted sources.

5. We plan to permit the quarry with grouped sources that will be divided up between Conveying Operations, Crushing Operations, and Screening Operations. The permit will have a condition that the facility shall maintain on-site an equipment list and a plant (or flow) diagram of all quarry equipment covered under this permit. When sources are relocated or added, the diagram must be updated and a written notification must be provided to NCDAQ. Is this an acceptable approach to permitting the quarry part of your permit? I plan to provide a permit draft to you before I issue the permit.

    - The grouping approach is also acceptable to us, as this is how our other existing quarry air permits are written.

6. In your application you referred to the engines in the quarry as "generators". Just to be clear, are the engines attached to generators that power electrical motors to run the equipment, or do the engines directly power the equipment? If the latter is true then can I name these sources "XXX hp Diesel Engine Powering XXXXXXXXXX"?

    - The Engines directly power the equipment, essentially they are all mobile pieces of equipment. The only reason behind this nomenclature is that this how the engines were permitted through Raleigh Regional Air Quality for Carolina Sunrock's Woodsdale facility. We have no issue with to the rename, as long as what each unit is named as follows: Gen1(J50 V2) to 350hp Diesel Engine Powering J50 V2.

7. One of the limitations that you proposed under the synthetic minor condition is that only two of the three natural gas/propane engines can run at the same time. It appears that you have two compliance options. Since this limit is placed in the permit to keep criteria pollutants below annual limits, you have the option of demonstrating compliance by limiting total hours of operation of the three engines to 17,520 hours per year. This method of compliance would likely cause you to have to maintain monthly records of operation hours. If you chose to keep the originally proposed compliance method of only operating two engines simultaneously, how can you ensure that this will be complied with? Is there an electronic system that will be set up to prevent a third generator from turning on if two of the others are on? Do you want to keep daily records of engine start and stop times to ensure that no more than two engines were running simultaneously? Which compliance method would you prefer?

    - We would like to stick to the 17,520 operating hours as our cap for the generators. We have no issues tracking operating hours per unit per month or even daily, as this is needed from a maintenance stand point for each individual unit. The reason for 3 generators is when one is undergoing maintenance there is a backup to supply power for the facility. The generators are computerized and are only activated via electric demand of the facility; therefore, the third generator can be prevented from ever turning on while the other two are running. They are all on interlock with each other.

8. What is the expected operating schedule for this facility? (cement plant, asphalt plant, and quarry).

    - Our expected operating schedule for the facility is 6 days a week 14 hours a day

9. In the application you say that GEN-4 is used to power TF80.Is TF-80 a tracked feeder
    - The TF80 is a small portable stacker conveyor . See the image below , is what it looks like this is just newer than the model we have.

10. Does this asphalt plant plan to process any RAS (shingles) If so, then the Subpart M avoidance requirements might apply?

    - Currently, Carolina Sunrock has no plans for utilizing RAS, however, we do maintain Subpart M in all of our existing permits at other facilities. In order to keep all our permits consistent please insert the Subpart M criteria for utilizing RAS within the process.

11. What type of bagfilter material are you planning on using for HMA-CD1 and RMC-CD2?

    - I have attached an updated and revised C1 for you which should address your questions. The asphalt and concrete plant facilities are identical to the one Leo Governale is reviewing for our Burlington North Facility (it is the same plant).

Feel free to call or email if you need anything else and Ill be happy to help you out.

Thanks

Scott

Scott Martino

Environmental Compliance Manager/Mine Engineer
Carolina Sunrock
200 Horizon Drive Suite 100
Raleigh, NC 27615
Office Phone:(919) 7476336 Cell (984) 202-4761

Wright, Dylan A

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Wednesday, January 8, 2020 12:23 PM
To: Wright, Dylan A
Cc: Edwards, Lisa; Hartsfield, Taylor; Alexander Culpepper; Murphy, Davis
Subject: RE: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center
Attachments: Generator air specs.pdf

HI Dylan

Attached is the specs on the CO reduction system for the power generators. Page 3 on the attached document has the reduce CO factor in 0.7 g/bhp that we used in the PH2 application.

Let me know if you need anything else and I'll be happy to round it up.

Thanks

Scott

From: Wright, Dylan A [mailto:dylan.wright@ncdenr.gov]
Sent: Monday, January 6, 2020 11:32 AM
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>; Alexander Culpepper <aculpepper@thesunrockgroup.com>; Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: RE: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center

Hey Scott,

There are still a few things that I need. I need information supporting the vender emissions factors for the natural gas engines. Also, the eighth bullet point in my original email is about an apparent typo when inputting the SO2 emissions factor into the diesel generator spreadsheet. Please update this typo if that is the case and also update facility-wide totals. It will probably push SO2 potentials over 100 tons/year but the limit will keep actuals below 100 tons/year. Last but not least, the Form C1s for both baghouses that were submitted for my facility (Prospect Hill Quarry) and Leo's facility (North Burlington) contain several errors/omissions. Davis is planning to call you later today to try to get those corrected and consistent.

If you have any other questions feel free to call me.

Thanks,

Dylan

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main)
336.776.9646 (Direct)
336.776.9797 (Fax)
450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
dylan.wright@ncdenr.gov

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Friday, January 3, 2020 9:49 PM
To: Wright, Dylan A <dylan.wright@ncdenr.gov>
Cc: Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>; Alexander Culpepper <aculpepper@thesunrockgroup.com>
Subject: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center

Hi Dylan

Attached is the modeling, and updated facility wide documentation you requested. Keep me posted as to what else you need and I'll be happy to help get you what you need.

Thanks

Scott

Scott Martino

Environmental Compliance Manager/Mine Engineer
Carolina Sunrock
200 Horizon Drive Suite 100
Raleigh, NC 27615
Office Phone:(919) 7476336 Cell (984) 202-4761

Wright, Dylan A

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Monday, January 13, 2020 3:37 PM
To: Wright, Dylan A
Subject: [External] FW: Carolina Sunrock - Burlington North Air Permit
Attachments: A2-A3 Burlington North Revised.xlsx

Updated A2

From: Scott Martino
Sent: Wednesday, December 18, 2019 12:28 PM
To: Governale, Leo <Leo.Governale@ncdenr.gov>
Subject: Carolina Sunrock - Burlington North Air Permit

Hi Leo,

Attached is an updated AA2 for you with all the proper labeling for the facility. let me know if you have any further questions and I'll be happy to help out.

Happy Holidays

Thanks

Scott

Scott Martino

Environmental Compliance Manager/Mine Engineer
Carolina Sunrock
200 Horizon Drive Suite 100
Raleigh, NC 27615
Office Phone:(919) 7476336 Cell (984) 202-4761

Wright, Dylan A

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Monday, January 13, 2020 3:44 PM
To: Wright, Dylan A
Subject: [External] Engine Specs
Attachments: TS JMS 420 C685 480V Generic Propane 23MAY19 14Bar BE.DOCX; TS JGC420 B86 480V Standard TS NX 18FEB19a.docx

Attached are where we got the emission factors for both the two larger units and the one smaller unit.

The NOx is on the front page. Also the smaller engine was also applied from Miratech number as all three units are going to be equipment with the same equipment.
I'll get you the other forms here this week when I get them.

Let me know if you need anything else.

Thanks

Scott
Scott Martino

Environmental Compliance Manager/Mine Engineer
Carolina Sunrock
200 Horizon Drive Suite 100
Raleigh, NC 27615
Office Phone:(919) 7476336 Cell (984) 202-4761

Wright, Dylan A

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Tuesday, January 14, 2020 4:46 PM
To: Wright, Dylan A
Subject: FW: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center
Attachments: TS JGC420 B86 480V Standard TS NX 18FEB19a.docx; TS JMS 420 C685 480V Generic Propane 23MAY19 14Bar BE.docx; D5 & Control Device Forms 2020-01-13 DEQ revisions.pdf

Hi Dylan,

Attached and below are the last of the information you requested. Let me know if something else comes up and Ill be happy to help out.

Thanks

Scott

From: Aimee Andrews [mailto:AAndrews@trinityconsultants.com]
Sent: Tuesday, January 14, 2020 3:26 PM
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: Jon Hill <JHill@trinityconsultants.com>; Alexander Culpepper <aculpepper@thesunrockgroup.com>
Subject: RE: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center

Scott,

Please see the attachments and responses below in red.

……

Aimee Andrews, PE
Managing Consultant

Trinity Consultants
One Copley Parkway, Suite 205 | Morrisville, North Carolina 27560

Office: **919-462-9693 x 1705**
Fax: **919-578-3690**
Email: aandrews@trinityconsultants.com

From: Wright, Dylan A [mailto:dylan.wright@ncdenr.gov]
Sent: Monday, January 13, 2020 8:10 AM
To: Scott Martino <smartino@thesun rockgroup.com>
Cc: Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>; Alexander Culpepper <aculpepper@thesunrockgroup.com>; Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: RE: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center

Hey Scott,

There are a few of the things that I listed in my previous email that I still need and a couple new things as well in order for your application to be considered complete. Please supply this information by January 24, 2020

1. The NOx, VOC, and CO emission factors (EF) that were used for the three NG/Propane engines were not from AP-42, which is fine as long as you can provide documentation to show where they come from. From the table below you can see that I still do not have any documentation to show where the NOx emissions factors came from for any of the Genset engines. I also still need documentation to show where the CO emission factor for P-GEN3 came from. Please supply documentation/explanation of where these emission factors came from. **NOx factor came from the original vendor spec sheets (attached). The CO factor for P-GEN3 will be the same as for P-GEN1&2 from Miratech.**

Engine Name	P-GEN1	P-GEN2	P-GEN3
Engine Type	Jenbacher J420 GS-B86	Jenbacher J420 GS-B86	Jenbacher J420 GS-C685
Unit of EF	g/HP-hr	g/HP-hr	g/HP-hr
NOx EF	0.6	0.6	0.7
VOC EF	0.7 (from JJJJ)	0.7(from JJJJ)	0.7(from JJJJ)
CO EF	0.7 (from Miratech)	0.7 (from Miratech)	0.7

2. Form C1 for the bagfilter for the asphalt plant and the concrete plant both appear to have some errors or missing information in it. For HMA-CD1 please provide the temperatures that this unit will operate. Please also provide the filter material that will be used in the bagfilter along with the filter operating temperature. For RMC-CD2, I believe that the diameter of the bag is suppose to be 8 inches. Is that correct? If not, then your filter area calculation does not add up correctly. I would also like to know the filter material that will be used. Please make these corrections are resubmit this form. **Revised control forms are attached to this email.**

3. What are some approximate actual throughputs for this facility? **Actual hours of operation are still to be determined, but may be approximately 6 days/wk, 12 hrs/day or 3744 hrs/yr.**

4. We need a Form C3 filled out for each of the three catalytic oxidation units that are used as control devices for the three NG/propane-fired engines. **Control device forms attached to this email.**

5. Since you must submit the C forms for the catalytic oxidation units, you must resubmit From D5 with a new PE Seal, certifying the additional forms. **Scanned D5 included with revised form, but also hard copy being mailed to Dylan's attention.**

Please provide this information via email or paper copies (whichever is appropriate) by Friday January 17, 2020. If you have any questions about this request feel free to call me.

Thanks,

Dylan

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main)
336.776.9646 (Direct)
450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105

336.776.9797 (Fax) dylan.wright@ncdenr.gov

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Wednesday, January 8, 2020 12:23 PM
To: Wright, Dylan A <dylan.wright@ncdenr.gov>
Cc: Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>; Alexander Culpepper <aculpepper@thesunrockgroup.com>; Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: RE: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center

HI Dylan

Attached is the specs on the CO reduction system for the power generators. Page 3 on the attached document has the reduce CO factor in 0.7 g/bhp that we used in the PH2 application.

Let me know if you need anything else and I'll be happy to round it up.

Thanks

Scott

From: Wright, Dylan A [mailto:dylan.wright@ncdenr.gov]
Sent: Monday, January 6, 2020 11:32 AM
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>; Alexander Culpepper <aculpepper@thesunrockgroup.com>; Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: RE: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center

Hey Scott,

There are still a few things that I need. I need information supporting the vender emissions factors for the natural gas engines. Also, the eighth bullet point in my original email is about an apparent typo when inputting the SO2 emissions factor into the diesel generator spreadsheet. Please update this typo if that is the case and also update facility-wide totals. It will probably push SO2 potentials over 100 tons/year but the limit will keep actuals below 100 tons/year. Last but not least, the Form C1s for both baghouses that were submitted for my facility (Prospect Hill Quarry) and Leo's facility (North Burlington) contain several errors/omissions. Davis is planning to call you later today to try to get those corrected and consistent.

If you have any other questions feel free to call me.

Thanks,

Dylan

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main)
336.776.9646 (Direct)
336.776.9797 (Fax)
450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
dylan.wright@ncdenr.gov

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Friday, January 3, 2020 9:49 PM
To: Wright, Dylan A <dylan.wright@ncdenr.gov>
Cc: Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>; Alexander Culpepper <aculpepper@thesunrockgroup.com>
Subject: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center

Hi Dylan

Attached is the modeling, and updated facility wide documentation you requested. Keep me posted as to what else you need and I'll be happy to help get you what you need.

Thanks

Scott

Scott Martino

Environmental Compliance Manager/Mine Engineer
Carolina Sunrock
200 Horizon Drive Suite 100
Raleigh, NC 27615
Office Phone:(919) 7476336 Cell (984) 202-4761

Wright, Dylan A

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Monday, January 13, 2020 9:03 AM
To: Wright, Dylan A
Cc: Edwards, Lisa; Hartsfield, Taylor; Alexander Culpepper; Murphy, Davis
Subject: RE: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center

Ok

I have it somewhere I'll get it over to you.

Thanks

Scott

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: "Wright, Dylan A" <dylan.wright@ncdenr.gov>
Date: 1/13/20 8:51 AM (GMT-05:00)
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: "Edwards, Lisa" <lisa.edwards@ncdenr.gov>, "Hartsfield, Taylor" <taylor.hartsfield@ncdenr.gov>, Alexander Culpepper <aculpepper@thesunrockgroup.com>, "Murphy, Davis" <davis.murphy@ncdenr.gov>
Subject: RE: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center

Scott,

The document from Miratech appears to only cover the CO emissions from the “Jenbacher J420 GS-B86” (PGEN-1 and PGEN-2). It didn’t mention anything about NOx emission rates. I need NOx emission factor confirmation for the “Jenbacher J420 GS-B86” and NOx and CO emission factor confirmation for the “Jenbacher J420 GS-C685”.

Thanks,

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main)
336.776.9646 (Direct)
336.776.9797 (Fax)
450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
dylan.wright@ncdenr.gov

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Monday, January 13, 2020 8:39 AM
To: Wright, Dylan A <dylan.wright@ncdenr.gov>
Cc: Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>; Alexander Culpepper <aculpepper@thesunrockgroup.com>; Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: RE: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center

Hi Dylan,

I'll get you the rest but attached is the specs on all the emission factors for the ng generators used in the calculations.

I be in touch once we get the rest rounded up for you.

Thanks

Scott

From: Wright, Dylan A [mailto:dylan.wright@ncdenr.gov]
Sent: Monday, January 13, 2020 8:10 AM
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>; Alexander Culpepper <aculpepper@thesunrockgroup.com>; Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: RE: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center

Hey Scott,

There are a few of the things that I listed in my previous email that I still need and a couple new things as well in order for your application to be considered complete. Please supply this information by January 24, 2020

1. The NOx, VOC, and CO emission factors (EF) that were used for the three NG/Propane engines were not from AP-42, which is fine as long as you can provide documentation to show where they come from. From the table below you can see that I still do not have any documentation to show where the NOx emissions factors came from for any of the Genset engines. I also still need documentation to show where the CO emission factor for P-GEN3 came from. Please supply documentation/explanation of where these emission factors came from.

Engine Name	P-GEN1	P-GEN2	P-GEN3
Engine Type	Jenbacher J420 GS-B86	Jenbacher J420 GS-B86	Jenbacher J420 GS-C685
Unit of EF	g/HP-hr	g/HP-hr	g/HP-hr
NOx EF	0.6	0.6	0.7
VOC EF	0.7 (from JJJJ)	0.7(from JJJJ)	0.7(from JJJJ)

CO EF	0.7 (from Miratech)	0.7 (from Miratech)	0.7

2. Form C1 for the bagfilter for the asphalt plant and the concrete plant both appear to have some errors or missing information in it. For HMA-CD1 please provide the temperatures that this unit will operate. Please also provide the filter material that will be used in the bagfilter along with the filter operating temperature. For RMC-CD2, I believe that the diameter of the bag is suppose to be 8 inches. Is that correct? If not, then your filter area calculation does not add up correctly. I would also like to know the filter material that will be used. Please make these corrections are resubmit this form.

3. What are some approximate actual throughputs for this facility?

4. We need a Form C3 filled out for each of the three catalytic oxidation units that are used as control devices for the three NG/propane-fired engines.

5. Since you must submit the C forms for the catalytic oxidation units, you must resubmit From D5 with a new PE Seal, certifying the additional forms.

Please provide this information via email or paper copies (whichever is appropriate) by Friday January 17, 2020. If you have any questions about this request feel free to call me.

Thanks,

Dylan

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main)
336.776.9646 (Direct)
336.776.9797 (Fax)

450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
dylan.wright@ncdenr.gov

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Wednesday, January 8, 2020 12:23 PM
To: Wright, Dylan A <dylan.wright@ncdenr.gov>
Cc: Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>; Alexander Culpepper <aculpepper@thesunrockgroup.com>; Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: RE: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center

HI Dylan

Attached is the specs on the CO reduction system for the power generators. Page 3 on the attached document has the reduce CO factor in 0.7 g/bhp that we used in the PH2 application.

Let me know if you need anything else and I'll be happy to round it up.

Thanks

Scott

From: Wright, Dylan A [mailto:dylan.wright@ncdenr.gov]
Sent: Monday, January 6, 2020 11:32 AM
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>; Alexander Culpepper <aculpepper@thesunrockgroup.com>; Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: RE: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center

Hey Scott,

There are still a few things that I need. I need information supporting the vender emissions factors for the natural gas engines. Also, the eighth bullet point in my original email is about an apparent typo when inputting the SO2 emissions factor into the diesel generator spreadsheet. Please update this typo if that is the case and also update facility-wide totals. It will probably push SO2 potentials over 100 tons/year but the limit will keep actuals below 100 tons/year. Last but not least, the Form C1s for both baghouses that were submitted for my facility (Prospect Hill Quarry) and Leo's facility (North Burlington) contain several errors/omissions. Davis is planning to call you later today to try to get those corrected and consistent.

If you have any other questions feel free to call me.

Thanks,

Dylan

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

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336.776.9646 (Direct)
336.776.9797 (Fax)

450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
dylan.wright@ncdenr.gov

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Friday, January 3, 2020 9:49 PM
To: Wright, Dylan A <dylan.wright@ncdenr.gov>

Cc: Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>; Alexander Culpepper <aculpepper@thesunrockgroup.com>
Subject: [External] Carolina Sunrock LLC - Prospect Hill Distribution Center

Hi Dylan

Attached is the modeling, and updated facility wide documentation you requested. Keep me posted as to what else you need and I'll be happy to help get you what you need.

Thanks

Scott

Scott Martino

Environmental Compliance Manager/Mine Engineer
Carolina Sunrock
200 Horizon Drive Suite 100
Raleigh, NC 27615
Office Phone:(919) 7476336 Cell (984) 202-4761

Wright, Dylan A

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Tuesday, January 21, 2020 4:12 PM
To: Wright, Dylan A
Cc: Aimee Andrews; Murphy, Davis
Subject: [External] RE: Facility Wide Emissions Total Corrections

Thanks Dylan,

I'll be in touch once everything gets fixed up and see what impacts and adjustments that will be needed.

Thanks again

Scott

Sent from my Verizon, Samsung Galaxy smartphone

-------- Original message --------
From: "Wright, Dylan A" <dylan.wright@ncdenr.gov>
Date: 1/21/20 3:54 PM (GMT-05:00)
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: Aimee Andrews <AAndrews@trinityconsultants.com>, "Murphy, Davis" <davis.murphy@ncdenr.gov>
Subject: Facility Wide Emissions Total Corrections

Hey Scott,

I am emailing you to summarize our conversation from earlier. I spoke with Aimee and you both this afternoon about the HMA potential emission errors that I discovered on page 1 of Appendix A1. It seems that the excel sheet incorrectly copied over the emissions from the DAQ spreadsheet. Also it seems like there is a drop in emissions from the uncontrolled to the controlled emissions of CO, NOx, VOC, and SO2 for the HMA plant. This might be a similar issue. Once these errors are corrected, I believe that the CO emissions with the Synthetic Minor Limits will now be >100 tons/year. One of your limits will need to be lowered to account for this. I requested that these corrections be made and that a new limit should be proposed so that CO emissions will remain <100 tons/year.

Thanks,

Dylan

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main) 450 West Hanes Mill Road, Suite 300

336.776.9646 (Direct) Winston-Salem, NC 27105
336.776.9797 (Fax) dylan.wright@ncdenr.gov

Wright, Dylan A

From: Wright, Dylan A
Sent: Wednesday, January 22, 2020 3:42 PM
To: Aimee Andrews; Scott Martino
Cc: Murphy, Davis
Subject: RE: [External] RE: Facility Wide Emissions Total Corrections

Thanks Aimee. I wondered how you managed that. From what I can tell at this point, the spreadsheet appears to be totaled correctly.

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main)
336.776.9646 (Direct)
336.776.9797 (Fax)
450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
dylan.wright@ncdenr.gov

From: Aimee Andrews <AAndrews@trinityconsultants.com>
Sent: Wednesday, January 22, 2020 2:05 PM
To: Wright, Dylan A <dylan.wright@ncdenr.gov>; Scott Martino <smartino@thesunrockgroup.com>
Cc: Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: RE: [External] RE: Facility Wide Emissions Total Corrections

Dylan – please see attached. FYI Dena Pittman revised this template for me so I could add all the conveyors since there were over 25.

Thanks,
Aimee

Aimee Andrews, PE
Managing Consultant

Trinity Consultants
One Copley Parkway, Suite 205 | Morrisville, North Carolina 27560

Office: **919-462-9693 x 1705**
Fax: **919-578-3690**
Email: aandrews@trinityconsultants.com

From: Wright, Dylan A <dylan.wright@ncdenr.gov>
Sent: Wednesday, January 22, 2020 2:03 PM
To: Aimee Andrews <AAndrews@trinityconsultants.com>; Scott Martino <smartino@thesunrockgroup.com>
Cc: Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: RE: [External] RE: Facility Wide Emissions Total Corrections

Hey Aimee,

Can you send me the DAQ excel spreadsheet that you used to calculate the quarry emissions from crushing, screening, and conveying?

Thanks,

Dylan

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main)
336.776.9646 (Direct)
336.776.9797 (Fax)

450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
dylan.wright@ncdenr.gov

From: Aimee Andrews <AAndrews@trinityconsultants.com>
Sent: Wednesday, January 22, 2020 11:59 AM
To: Wright, Dylan A <dylan.wright@ncdenr.gov>; Scott Martino <smartino@thesunrockgroup.com>
Cc: Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: [External] RE: Facility Wide Emissions Total Corrections

Hi Dylan,

Please see the attached revised HMA DEQ spreadsheet as well as the Emissions Summary spreadsheet per our discussion yesterday. What I did was reduce the HMA maximum production from 876,000 tpy (which we originally requested in the application) to 600,000 tpy. I set the controlled potential column equal to the Potential Emissions (after control) in the HMA DEQ spreadsheet. Then in the synthetic minor limits column I did not take a further reduction but set it equal to the Potential Controlled Emissions column. Please see if you agree.

Thanks so much and let me know of any comments or questions,
Aimee

.....

Aimee Andrews, PE
Managing Consultant

Trinity Consultants
One Copley Parkway, Suite 205 | Morrisville, North Carolina 27560

Office: **919-462-9693 x 1705**
Fax: **919-578-3690**
Email: aandrews@trinityconsultants.com

From: Wright, Dylan A <dylan.wright@ncdenr.gov>
Sent: Tuesday, January 21, 2020 3:54 PM
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: Aimee Andrews <AAndrews@trinityconsultants.com>; Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: Facility Wide Emissions Total Corrections

Hey Scott,

I am emailing you to summarize our conversation from earlier. I spoke with Aimee and you both this afternoon about the HMA potential emission errors that I discovered on page 1 of Appendix A1. It seems that the excel sheet incorrectly copied over the emissions from the DAQ spreadsheet. Also it seems like there is a drop in emissions from the uncontrolled to the controlled emissions of CO, NOx, VOC, and SO2 for the HMA plant. This might be a similar issue. Once these errors are corrected, I believe that the CO emissions with the Synthetic Minor Limits will now be >100 tons/year. One of your limits will need to be lowered to account for this. I requested that these corrections be made and that a new limit should be proposed so that CO emissions will remain <100 tons/year.

Thanks,

Dylan

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main)
336.776.9646 (Direct)
336.776.9797 (Fax)

450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
dylan.wright@ncdenr.gov

Wright, Dylan A

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Wednesday, January 29, 2020 4:17 PM
To: Wright, Dylan A
Cc: Governale, Leo; Murphy, Davis; Edwards, Lisa; Hartsfield, Taylor
Subject: RE: [External] RE: Form C1 Errors

Its there under the HMA tab, Just double checked and it has the bags per compartment

Keep me posted I just opened the file I sent you and it's all there.

Thanks

Scott

From: Wright, Dylan A [mailto:dylan.wright@ncdenr.gov]
Sent: Wednesday, January 29, 2020 3:37 PM
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: Governale, Leo <Leo.Governale@ncdenr.gov>; Murphy, Davis <davis.murphy@ncdenr.gov>; Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>
Subject: RE: [External] RE: Form C1 Errors

Hey Scott,

I need the revised Form C1 for the HMA plant. It needs to show that it is a pulse Jet baghouse and correctly state that there are three compartments. Make sure to update the box that says bags per compartment as well.

Thanks,

Dylan

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main) 450 West Hanes Mill Road, Suite 300
336.776.9646 (Direct) Winston-Salem, NC 27105
336.776.9797 (Fax) dylan.wright@ncdenr.gov

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Wednesday, January 29, 2020 2:28 PM
To: Wright, Dylan A <dylan.wright@ncdenr.gov>
Cc: Governale, Leo <Leo.Governale@ncdenr.gov>; Murphy, Davis <davis.murphy@ncdenr.gov>; Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>
Subject: RE: [External] RE: Form C1 Errors

Here ya go.

Yes the concrete plant is reverse flow.

Let me know if you need anything else

Thanks
Scott

From: Wright, Dylan A [mailto:dylan.wright@ncdenr.gov]
Sent: Wednesday, January 29, 2020 2:22 PM
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: Governale, Leo <Leo.Governale@ncdenr.gov>; Murphy, Davis <davis.murphy@ncdenr.gov>; Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>
Subject: RE: [External] RE: Form C1 Errors

Can you email me and Leo a revised Form C1 to show these changes? Also, just to verify, the bagfilter for the concrete plant is a reverse flow, right?

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main)
336.776.9646 (Direct)
336.776.9797 (Fax)

450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
dylan.wright@ncdenr.gov

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Wednesday, January 29, 2020 2:07 PM
To: Wright, Dylan A <dylan.wright@ncdenr.gov>
Cc: Governale, Leo <Leo.Governale@ncdenr.gov>; Murphy, Davis <davis.murphy@ncdenr.gov>; Edwards, Lisa

<lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>
Subject: [External] RE: Form C1 Errors

Hi Dylan yes the baghouse is a pulse jet just like every other aztech baghouse.

Let me know if you need anything else

Thanks

Scott

From: Wright, Dylan A [mailto:dylan.wright@ncdenr.gov]
Sent: Wednesday, January 29, 2020 1:55 PM
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: Governale, Leo <Leo.Governale@ncdenr.gov>; Murphy, Davis <davis.murphy@ncdenr.gov>; Edwards, Lisa <lisa.edwards@ncdenr.gov>; Hartsfield, Taylor <taylor.hartsfield@ncdenr.gov>
Subject: Form C1 Errors

Hey Scott,

I was doing the control device evaluation for the bagfilter on the HMA Plant and discovered what appears to be an error. Form C1 shows that the bagfilter is a reverse flow bagfilter with 1 compartment. That doesn't make sense as the bagfilter would have to shut down to clean. Most bagfilters for HMA plants are pulse jet. Leo contacted the baghouse manufacture and they told him that the baghouse was a pulse jet and that it had 3 compartments. Can you verify that this is correct and resubmit a revised Form C1 for me and Leo?

Thanks,

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main)
336.776.9646 (Direct)
336.776.9797 (Fax)

450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
dylan.wright@ncdenr.gov

Wright, Dylan A

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Thursday, January 30, 2020 3:44 PM
To: Wright, Dylan A
Subject: RE: [External] C1

Hi Dylan

To verify we are good on the C3 tab 3 should read CDPGN3 and not CDPGN2. That was a type on my part.

Thanks

Scott

From: Scott Martino
Sent: Thursday, January 30, 2020 3:24 PM
To: Wright, Dylan A <dylan.wright@ncdenr.gov>
Subject: RE: [External] C1

Which site ?

The quarry I assume?

From: Wright, Dylan A [mailto:dylan.wright@ncdenr.gov]
Sent: Thursday, January 30, 2020 2:58 PM
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: Governale, Leo <Leo.Governale@ncdenr.gov>; Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: RE: [External] C1

Scott,

It appears that this version of this excel document is accurate for the HMA plant bagfilter but it appears that the bagfilter of the concrete plant incorrectly lists the diameter of the bags as 4 inches again. Can you confirm that the Form C1 for the concrete bagfilter that you submitted on January 14, 2020 with the revised PE Seal is correct (the one that says the diameter is 8 inches)?

Thanks,

Dylan

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main) 450 West Hanes Mill Road, Suite 300
336.776.9646 (Direct) Winston-Salem, NC 27105

336.776.9797 (Fax) dylan.wright@ncdenr.gov

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Thursday, January 30, 2020 11:42 AM
To: Wright, Dylan A <dylan.wright@ncdenr.gov>
Cc: Governale, Leo <Leo.Governale@ncdenr.gov>; Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: RE: [External] C1

There is only one RAP crushing system on the quarry property attached to the asphalt plant.

Let me know if you need something else.

Thanks

Scott

From: Wright, Dylan A [mailto:dylan.wright@ncdenr.gov]
Sent: Thursday, January 30, 2020 10:43 AM
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: Governale, Leo <Leo.Governale@ncdenr.gov>; Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: RE: [External] C1

Also, you mention on From A2 that you plan to install a RAP Crushing System. Is this the same system that you are referring to as a "mobile RAP crushing system" in section 3.5.12 in the application? If so it does not appear that this crusher will be able to be exempt under 2Q .0902 due to the fact that it will operate at a quarry with an air permit (See the third bullet point of this section). Can you confirm that there is only one RAP crushing system on site, and not two RAP crushing systems (one permanent and one portable)?

Thanks,

Dylan

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main) 450 West Hanes Mill Road, Suite 300
336.776.9646 (Direct) Winston-Salem, NC 27105
336.776.9797 (Fax) dylan.wright@ncdenr.gov

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Thursday, January 30, 2020 9:41 AM
To: Wright, Dylan A <dylan.wright@ncdenr.gov>
Cc: Governale, Leo <Leo.Governale@ncdenr.gov>; Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: RE: [External] C1

Yes this is the exact spec of the bag house. It's also the same bag house Davis has for the quarry site air permit as well

BURLINGTON NORTH SER NO 03-201-3001
RBH 51-12 IS A 51000 CFM BAGHOUSE WITH 738 4-5/8" X 120.5"BAGS
8968 SF OF CLOTH 5.68 AIR TO CLOTH

From: Wright, Dylan A [mailto:dylan.wright@ncdenr.gov]
Sent: Thursday, January 30, 2020 9:35 AM
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: Governale, Leo <Leo.Governale@ncdenr.gov>; Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: RE: [External] C1

Scott,

I want to confirm that this form is correct now.
In the first application Form C1 for the HMA Plant it said:
Flow Rate: 45,000 cfm
# of Bags: 640

This Form C1 that you just sent us says:
Flow Rate: 45,000 cfm
# of Bags: 738

Is the new form correct?

Thanks,

Dylan

Dylan Wright
Environmental Engineer I
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main)
336.776.9646 (Direct)
336.776.9797 (Fax)
450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
dylan.wright@ncdenr.gov

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Thursday, January 30, 2020 9:11 AM
To: Wright, Dylan A <dylan.wright@ncdenr.gov>; Governale, Leo <Leo.Governale@ncdenr.gov>
Subject: [External] C1

Hi Guys,

Sorry I am in meeting and tied up most of today. the only things I notice from what I sent Leo earlier in the month is I hit a 6 instead of a 3 on number of cartages, thus messing up the calculations. I fixed up the form and attached is the vender drawling for the baghouse with specs and below is what they provided me on the ratios.

BURLINGTON NORTH SER NO 03-201-3001
RBH 51-12 IS A 51000 CFM BAGHOUSE WITH 738 4-5/8" X 120.5"BAGS
8968 SF OF CLOTH 5.68 AIR TO CLOTH

Let me know if you need anything else

Thanks
Scott

Scott Martino

Environmental Compliance Manager/Mine Engineer
Carolina Sunrock
200 Horizon Drive Suite 100
Raleigh, NC 27615
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FORM C1

CONTROL DEVICE (FABRIC FILTER)

REVISED 09/22/16 — NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate — C1

CONTROL DEVICE ID NO: **HMA-CD1**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): **See Form A2&A3**
EMISSION POINT (STACK) ID NO(S): **EP-1**	POSITION IN SERIES OF CONTROLS NO. **1** OF **1** UNITS
	P.E. SEAL REQUIRED (PER 2q .0112)? ☐ YES ☑ NO

DESCRIBE CONTROL SYSTEM: **Hot Mix Asphalt Plant Bag House Model RBH 51-12 Ser No 03-201-3001,**

- **51,111 ACFM**
- **(768) 4-5/8" Ø x 10' long 14oz aramid bags**
- **8,968 ft2 cloth area; 5.68 fpm filtering velocity (Air/Cloth Ratio)**
- **41-5/8" ID stack; 31'-0" discharge height above grade**
- **Integral 9' Ø x 10' long horizontal cyclone primary collector**

POLLUTANTS COLLECTED:	**PM**	**PM10**		
BEFORE CONTROL EMISSION RATE (LB/HR):	**See Appendix A**			
CAPTURE EFFICIENCY:	**99.99** %	**99.99** %	%	%
CONTROL DEVICE EFFICIENCY:	**90** %	**90** %	%	%
CORRESPONDING OVERALL EFFICIENCY:	**93** %	**90** %	%	%
EFFICIENCY DETERMINATION CODE:	**1**	**1**		
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	**8.25**	**5.75**		

PRESSURE DROP (IN H_2O): MIN: MAX: GAUGE? ☑ YES ☐ NO	
BULK PARTICLE DENSITY (LB/FT^3): ~~51,111~~	INLET TEMPERATURE (°f): MIN **Ambient** MAX **325**
POLLUTANT LOADING RATE: ☑ LB/HR ☐ GR/FT^3	OUTLET TEMPERATURE (°f) MIN **Ambient** MAX **325**
INLET AIR FLOW RATE (ACFM): **51,111**	FILTER OPERATING TEMP (°f): **325**

NO. OF COMPARTMENTS: **3**	NO. OF BAGS PER COMPARTMENT: **246**	LENGTH OF BAG (IN.): **120.5**
NO. OF CARTRIDGES: **738**	FILTER SURFACE AREA PER CARTRIDGE (FT^2): **12.11**	DIAMETER OF BAG (IN.): **4 5/8**
TOTAL FILTER SURFACE AREA (FT^2): **8,968**	AIR TO CLOTH RATIO: **5.68**	

DRAFT TYPE: ☑ INDUCED/NEGATIVE ☐ FORCED/POSITIVE FILTER MATERIAL: ☑ WOVEN ☐ FELTED

DESCRIBE CLEANING PROCEDURES:

- ☑ AIR PULSE
- ☐ REVERSE FLOW
- ☐ MECHANICAL/SHAKER
- ☐ OTHER:
- ☐ SONIC
- ☐ SIMPLE BAG COLLAPSE
- ☐ RING BAG COLLAPSE

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1	**40**	**40.2**
1-10	**60**	**100**
10-25		
25-50		
50-100		
>100		
	TOTAL = 100	

DESCRIBE INCOMING AIR STREAM: **Hot Air from Drying and Mixing Drums in HMA Plant**

ON A SEPARATE PAGE, ATTACH A DIAGRAM SHOWING THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

COMMENTS:

NC Department of Environmental Quality
Received
JAN 30 2020
Winston-Salem Regional Office

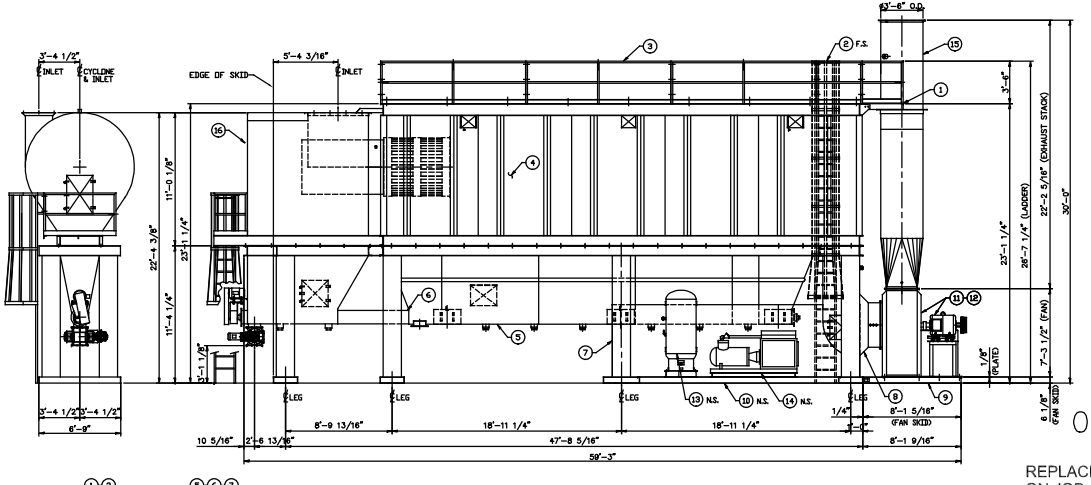
Attach Additional Sheets As Necessary

REVISED

Item	Qty	Part No.	Description	Weight
XXXX	XXX	BH00340A01	BREAKDOWN 3001	33542.8
1	1	BH00188A01	STACK SAMPLING PLATFORM	379.9
2	1	ES00011A01	CAGED LADDER WELDMENT	509.4
3	1	BH00103A04	HANDRAIL ASS'Y (12-MOD.)	1041.8
4	1	BH00181A02	BAGHOUSE MAIN WELDMENT	31611.7
XXXX	XXX	BH00340A02	BREAKDOWN 3002	19446.6
5	1	BH00105A07	BAGHOUSE HOPPER WELDMENT	6382.1
6	1	BH00107A02	B/H HOPPER SCREW ASS'Y	134.9
7	1	BH00106A02	SUPPORT FRAME WELDMENT	8475.7
8	1	BH00052A01	FAN INLET DUCT WELDMENT	1682.5
9	1	FA00055A01	EXHAUST FAN SKID	511.9
10	1	BH00104A03	DUST SHIELD & SKID ASS'Y	2319.5

Item	Qty	Part No.	Description	Weight
XXXX	XXX	BH00340A03	BREAKDOWN 3003	4174.1
11	1	FA00069A04	49" SERIES 40C FAN ASS'Y	4174.1
XXXX	XXX	BH00340A04	BREAKDOWN 3004	3406.0
12	1	FA00056A01	250 HP EXHAUST FAN DRIVE	3406.0
XXXX	XXX	BH00340A05	BREAKDOWN 3005	1747.3
13	1	BH00021A02	AIR SCHEMATIC (60 H.P.)	1635.1
14	1	BH00022A01	50&60 HP COMPRESSOR SKID	112.2
XXXX	XXX	BH00340A06	BREAKDOWN 3025	2039.7
15	1	FA00054A01	EXHAUST STACK (3'-6" DIA)	2039.7
XXXX	XXX	BH00340A07	BREAKDOWN 3201	14147.5
16	1	CY00078A52	CYCLONE SIDE ELEVATION	14147.5

Item	Qty	Part No.	Description	Weight
XXXX	XXX	BH00340A50	BAGHOUSE SIDE ELEVATION	7650.4.0
51	1	BH00340A01	BREAKDOWN 3001	33542.8
52	1	BH00340A02	BREAKDOWN 3002	19446.6
53	1	BH00340A03	BREAKDOWN 3003	4174.1
54	1	BH00340A04	BREAKDOWN 3004	3406.0
55	1	BH00340A05	BREAKDOWN 3005	1747.3
56	1	BH00340A06	BREAKDOWN 3025	2039.7
57	1	BH00340A07	BREAKDOWN 3201	14147.5



A01 (1,2,3,4) BREAKDOWN 3001
A02 (5,6,7,8,9,10) BREAKDOWN 3002
A03 (11) BREAKDOWN 3003
A04 (12) BREAKDOWN 3004
A05 (13,14) BREAKDOWN 3005
A06 (15) BREAKDOWN 3025
A07 (16) BREAKDOWN 3201
A50 (51,52,53,54,55,56,57) BAGHOUSE SIDE ELEVATION

for BURLINGTON

03-201-3001 / /04

REPLACED BY BH008770A ON JOB #17-170

NO	REVISION	APPR	BY	DATE

ASTEC INDUSTRIES, INC.
P.O. BOX 72787 • 4101 JEROME AVENUE • CHATTANOOGA, TN 37407

CUSTOMER: HIGHLAND PAVING COMPANY

PART NAME: BAGHOUSE SIDE ELEVATION

MODEL: RBH-51-12 W/69' x 10' LG. HORIZ. CYCLONE

DRN: SCOTT FUNDERBURK | ISSUED | APPR | DATE: 12/23/2003

JOB NO: 03-201 | SHEET | SCALE: 1/4"=1'-0" | DRAWING NO: BH00340 | REV: 00

FIELD PRINT

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ON THE DRAWING ARE: MACHINING (±0.010") — STRUCTURAL (±1/8") — WELD SIZE (-0", +1/8").
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H:\BH\BH00340.00

BAGHOUSE GROUP - FOR APPROVAL

Ronny L. Funderburk	10:15 am	1/7/2003
SUBMITTED BY	DATE	DATE SUBMITTED
	/ /	/ /
APPROVED BY	DATE	DATE SUBMITTED

As previously described, the following sources are subject to a NESHAP standard:

- PGEN1
- PGEN2
- PGEN3
- GEN1 (J50V2)
- GEN1A (J45)
- GEN2 (S190dt)
- GEN3 (PS1300 Maxtrack)
- GEN5 (PS1300 Maxtrack)
- GEN7 (PS100 Maxtrack)
- GEN4 (TF80)

Since the above sources were included in the TAP modeling analysis, which demonstrates no unacceptable risk to the public, TAP permit limitations are not required for those sources. As such, Carolina Sunrock is requesting the TAP limits in Table 4-6 be included in the permit, based on the modeled emission rates in Table 4-5 (in g/s) and scaled to the appropriate averaging period.

Table 4-6. Requested Permit Limits

	Requested Permit Limits					
Model ID	FORM (lb/hr)	MERCURY (lb/day)	NICKEL (lb/day)	ARSENIC (lb/yr)	BENZENE (lb/yr)	CADMIUM (lb/yr)
CD1	7.75E-01	1.56E-02	3.79E-01	1.23E+00	8.54E+02	9.02E-01
IES4	2.83E-04	8.64E-05	8.64E-05	4.20E-02	2.15E-02	3.15E-02
IES5	2.59E-04	7.92E-05	7.92E-05	3.85E-02	1.97E-02	2.89E-02
HMASILO1	4.20E-03	-	-	-	1.71E+00	-
HMASILO2	4.20E-03	-	-	-	1.71E+00	-
HMASILO3	4.20E-03	-	-	-	1.71E+00	-
HMASILO4	4.20E-03	-	-	-	1.71E+00	-
HMASILO5	4.20E-03	-	-	-	1.71E+00	-
CD2	0.00E+00	-	4.62E-03	5.77E-01	0.00E+00	4.38E-03
HMALO1	1.83E-04	-	-	-	9.48E-01	-
HMALO2	1.83E-04	-	-	-	9.48E-01	-
HMALO3	1.83E-04	-	-	-	9.48E-01	-
HMALO4	1.83E-04	-	-	-	9.48E-01	-
HMALO5	1.83E-04	-	-	-	9.48E-01	-

4.4. METEOROLOGICAL DATA

The AERMOD modeling results were based on sequential hourly surface observations from Danville, NC (DAN) and upper air data also from Greensboro, NC (GSO). These stations are

Table 4-5 presents the emission rates modeled for each of the triggered TAPs. These rates represent values that are in excess of the calculated potential rates in order to provide the facility with operational flexibility.

Table 4-5. Modeled Emission Rates

	Modeled Emission Rates (g/s)					
Model ID	**FORM**	**MERCURY**	**NICKEL**	**ARSENIC**	**BENZENE**	**CADMIUM**
PGEN1	1.005E-01	0.000E+00	0.000E+00	0.000E+00	3.169E-03	0.000E+00
PGEN2	1.005E-01	0.000E+00	0.000E+00	0.000E+00	3.169E-03	0.000E+00
PGEN3	8.379E-02	0.000E+00	0.000E+00	0.000E+00	2.641E-03	0.000E+00
CD1	9.765E-02	8.190E-05	1.991E-03	1.764E-05	1.229E-02	1.298E-05
IES4	3.564E-05	4.536E-07	4.536E-07	6.048E-07	3.095E-07	4.536E-07
IES5	3.267E-05	4.158E-07	4.158E-07	5.544E-07	2.837E-07	4.158E-07
HMASILO1	5.292E-04	0.000E+00	0.000E+00	0.000E+00	2.457E-05	0.000E+00
HMASILO2	5.292E-04	0.000E+00	0.000E+00	0.000E+00	2.457E-05	0.000E+00
HMASILO3	5.292E-04	0.000E+00	0.000E+00	0.000E+00	2.457E-05	0.000E+00
HMASILO4	5.292E-04	0.000E+00	0.000E+00	0.000E+00	2.457E-05	0.000E+00
HMASILO5	5.292E-04	0.000E+00	0.000E+00	0.000E+00	2.457E-05	0.000E+00
CD2	0.000E+00	2.423E-05	2.423E-05	8.297E-06	0.000E+00	6.298E-08
GEN1	3.643E-04	9.261E-07	9.261E-07	1.235E-06	2.880E-04	9.261E-07
GEN1A	3.643E-04	9.261E-07	9.261E-07	1.235E-06	2.880E-04	9.261E-07
GEN2	1.301E-04	3.308E-07	3.308E-07	4.410E-07	1.029E-04	3.308E-07
GEN3	4.579E-04	1.164E-06	1.164E-06	1.552E-06	3.621E-04	1.164E-06
GEN5	4.683E-04	1.191E-06	1.191E-06	1.588E-06	3.703E-04	1.191E-06
GEN7	3.643E-04	9.261E-07	9.261E-07	1.235E-06	2.880E-04	9.261E-07
GEN4	1.301E-04	3.308E-07	3.308E-07	4.410E-07	1.029E-04	3.308E-07
HMALO1	2.306E-05	0.000E+00	0.000E+00	0.000E+00	1.363E-05	0.000E+00
HMALO2	2.306E-05	0.000E+00	0.000E+00	0.000E+00	1.363E-05	0.000E+00
HMALO3	2.306E-05	0.000E+00	0.000E+00	0.000E+00	1.363E-05	0.000E+00
HMALO4	2.306E-05	0.000E+00	0.000E+00	0.000E+00	1.363E-05	0.000E+00
HMALO5	2.306E-05	0.000E+00	0.000E+00	0.000E+00	1.363E-05	0.000E+00

Wright, Dylan A

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Tuesday, February 18, 2020 11:06 AM
To: Wright, Dylan A
Subject: [External] Prospect Hill Quarry Air Permit

Hi Dylan,

It is ok to remove the portable rap crushers from the application for this facility.

Thanks

Scott

Scott Martino

Environmental Compliance Manager/Mine Engineer
Carolina Sunrock
200 Horizon Drive Suite 100
Raleigh, NC 27615
Office Phone:(919) 7476336 Cell (984) 202-4761

Wright, Dylan A

From: Scott Martino <smartino@thesunrockgroup.com>
Sent: Tuesday, February 25, 2020 9:30 AM
To: Wright, Dylan A
Cc: Murphy, Davis
Subject: [External] RE: Weigh Batcher Capacity Question

Hi Guys,

Hope you both are well. What Leo has is correct below is the cut out from the A2 form he has. Let me know if you need anything else.

Thanks Scott

Truck Mix Concrete Batch Plant (120 cubic yards per hour capacity) Consisting of the			
RM-1	Cement Storage Silo (200-ton capacity)	RMC-CD2	Bagfilter (1,433 square feet of filt
RM-2	Flyash Storage Silo (150-ton Capacity)	RMC-CD2	Bagfilter (1,433 square feet of filt
RM-3	Truck Loadout point	RMC-CD2	Bagfilter (1,433 square feet of filt
RM-4	Cement/Flyash Weigh Batcher (25-ton max Capacity)	RMC-CD2	Bagfilter (1,433 square feet of filt
RM-5	Aggregate Weigh Batcher (50-ton max Capacity)	NA	NA

From: Wright, Dylan A [mailto:dylan.wright@ncdenr.gov]
Sent: Tuesday, February 25, 2020 9:22 AM
To: Scott Martino <smartino@thesunrockgroup.com>
Cc: Murphy, Davis <davis.murphy@ncdenr.gov>
Subject: Weigh Batcher Capacity Question

Hey Scott,

In the Prospect Hill Quarry application the two concrete weigh batcher's capacities were listed as below:

RMC-WB1	Cement/Flyash Weigh Batcher (**5**-ton max capacity)
RMC-WB2	Aggregate Weigh Batcher (**20**-ton max capacity)

After discussing this with Leo, he told me that you two had discussed this regarding the North Burlington facility and determined that the correct capacities are listed below:

RMC-WB1	Cement/Flyash Weigh Batcher (**25**-ton max capacity)
RMC-WB2	Aggregate Weigh Batcher (**50**-ton max capacity)

Can you confirm that this is correct?

Thanks,

Dylan

Dylan Wright
Environmental Engineer II
Division of Air Quality, Winston-Salem Regional Office

336.776.9800 (Main)
336.776.9646 (Direct)
336.776.9797 (Fax)

450 West Hanes Mill Road, Suite 300
Winston-Salem, NC 27105
dylan.wright@ncdenr.gov

-Revised By DAW
Corrected HMA Plant SO_2 potentials
and Concrete plant PM potentials

EMISSION CALCULATIONS
Emissions Summary

Carolina Sunrock
Prospect Hill Quarry & Distribution Center

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions (lb/hr)	Uncontrolled Potential Emissions (lbs/day)	Uncontrolled Potential Emissions (lbs/yr)	Uncontrolled Potential Emissions (tons/yr)	Controlled Potential Emissions (lb/hr)	Controlled Potential Emissions (lbs/day)	Controlled Potential Emissions (lbs/yr)	Controlled Potential Emissions (tons/yr)	Potential Emissions w/ Synthetic Minor Limits**** (tons/yr)
Hot Mix Asphalt Plant*	PM		16.10	386.36	141,022	70.51	11.42	77.43	28,263	14.13	14.13
	PM10		8.09	194.11	70,850	35.43	6.93	47.87	17,474	8.74	8.74
	PM2.5		8.09	194.11	70,850	35.43	6.93	47.87	17,474	8.74	8.74
	SO2		151.45	3,634.77	1,326,689	663.34	21.54	152.25	55,571	27.79	27.79
	NOx		13.92	334.11	121,952	60.98	13.92	94.53	34,502	17.25	17.25
	CO		33.18	796.20	290,614	145.31	33.18	218.88	79,893	39.95	39.95
	VOC		12.03	288.65	105,356	52.68	12.03	79.13	28,883	14.44	14.44
	Acetaldehyde	H/T	3.25E-01	7.80E+00	2.85E+03	1.42E+00	3.25E-01	7.80E+00	7.80E+02	3.90E-01	1.56E-01
	Acrolein	H/T	6.50E-03	1.56E-01	5.69E+01	2.85E-02	6.50E-03	1.56E-01	1.56E+01	7.80E-03	3.90E-03
	Antimony unlisted compounds	H	4.50E-05	1.08E-03	3.94E-01	1.97E-04	4.50E-05	1.08E-03	1.08E-01	5.40E-05	2.70E-05
	Arsenic unlisted cmpds (comp. of ASC)	H/T	1.40E-04	3.36E-03	1.23E+00	6.13E-04	1.40E-04	3.36E-03	3.36E-01	1.68E-04	8.40E-05
	Benzene	H/T	9.90E-02	2.38E+00	8.67E+02	4.34E-01	9.90E-02	2.38E+00	2.38E+02	1.19E-01	5.94E-02
	Benzo(a)pyrene	T	4.41E-06	1.06E-04	3.86E-02	1.93E-05	4.41E-06	1.06E-04	1.06E-02	5.29E-06	2.65E-06
	Beryllium metal (unreacted)	H/T	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
	Cadmium metal (elemental unreacted)	H/T	1.03E-04	2.46E-03	8.98E-01	4.49E-04	1.03E-04	2.46E-03	2.46E-01	1.23E-04	6.15E-05
	Carbon disulfide	H/T	6.23E-04	1.49E-02	5.45E+00	2.73E-03	6.23E-04	1.49E-02	1.49E+00	7.47E-04	3.74E-04
	Chromium unlisted cmpds (add w/chrom acid to get CRC)	H	1.26E-03	3.03E-02	1.11E+01	5.53E-03	1.26E-03	3.03E-02	3.03E+00	1.52E-03	7.58E-04
	Chromic acid (VI) (component of solCR6 and CRC)	H/T	1.13E-04	2.70E-03	9.86E-01	4.93E-04	1.13E-04	2.70E-03	2.70E-01	1.35E-04	6.75E-05
	Cobalt unlisted compounds	H	6.50E-06	1.56E-04	5.69E-02	2.85E-05	6.50E-06	1.56E-04	1.56E-02	7.80E-06	3.90E-06
	Cumene	H	1.14E-03	2.74E-02	1.00E+01	5.01E-03	1.14E-03	2.74E-02	2.74E+00	1.37E-03	6.86E-04
	Ethyl benzene	H	6.41E-02	1.54E+00	5.61E+02	2.81E-01	6.41E-02	1.54E+00	1.54E+02	7.69E-02	3.84E-02
	Ethyl chloride (chloroethane)	H	2.18E-06	5.24E-05	1.91E-02	9.56E-06	2.18E-06	5.24E-05	5.24E-03	2.62E-06	1.31E-06
	Formaldehyde	H/T	7.97E-01	1.91E+01	6.98E+03	3.49E+00	7.97E-01	1.91E+01	1.91E+03	9.56E-01	4.78E-01
	Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8	T	3.25E-10	7.80E-09	2.85E-06	1.42E-09	3.25E-10	7.80E-09	7.80E-07	3.90E-10	1.95E-10
	Hexane, n-	H/T	2.39E-01	5.74E+00	2.10E+03	1.05E+00	2.39E-01	5.74E+00	5.74E+02	2.87E-01	1.44E-01
	Hydrogen Chloride (hydrochloric acid)	H/T	5.25E-02	1.26E+00	4.60E+02	2.30E-01	5.25E-02	1.26E+00	1.26E+02	6.30E-02	3.15E-02
	Hydrogen Sulfide	T	1.37E-02	3.28E-01	1.20E+02	5.99E-02	1.37E-02	3.28E-01	3.28E+01	1.64E-02	8.21E-03
	Lead unlisted compounds	H	3.75E-03	9.00E-02	3.29E+01	1.64E-02	3.75E-03	9.00E-02	9.00E+00	4.50E-03	2.25E-03
	Manganese unlisted compounds	T	1.93E-03	4.62E-02	1.69E+01	8.43E-03	1.93E-03	4.62E-02	4.62E+00	2.31E-03	1.16E-03
	Mercury, vapor	H/T	6.50E-04	1.56E-02	5.69E+00	2.85E-03	6.50E-04	1.56E-02	1.56E+00	7.80E-04	3.90E-04
	Methyl bromide	H	2.49E-04	5.98E-03	2.18E+00	1.09E-03	2.49E-04	5.98E-03	5.98E-01	2.99E-04	1.49E-04
	Methyl chloride	H	1.56E-04	3.74E-03	1.37E+00	6.83E-04	1.56E-04	3.74E-03	3.74E-01	1.87E-04	9.36E-05
	Methyl chloroform	H/T	1.20E-02	2.88E-01	1.05E+02	5.26E-02	1.20E-02	2.88E-01	2.88E+01	1.44E-02	7.20E-03
	Methyl ethyl ketone	H/T	6.70E-03	1.61E-01	5.87E+01	2.93E-02	6.70E-03	1.61E-01	1.61E+01	8.04E-03	4.02E-03
	Methylene chloride	H/T	8.23E-06	1.97E-04	7.21E-02	3.60E-05	8.23E-06	1.97E-04	1.97E-02	9.87E-06	4.94E-06
	Napthalene	H	1.65E-01	3.95E+00	1.44E+03	7.21E-01	1.65E-01	3.95E+00	3.95E+02	1.98E-01	9.88E-02
	Nickel metal	H/T	1.58E-02	3.78E-01	1.38E+02	6.90E-02	1.58E-02	3.78E-01	3.78E+01	1.89E-02	9.45E-03
	Perchloroethylene (tetrachloroethylene)	H/T	8.01E-05	1.92E-03	7.01E-01	3.51E-04	8.01E-05	1.92E-03	1.92E-01	9.61E-05	4.80E-05
	Phenol	H/T	1.01E-03	2.41E-02	8.81E+00	4.41E-03	1.01E-03	2.41E-02	2.41E+00	1.21E-03	6.03E-04
	Phosphorus Metal, Yellow or White	H	7.00E-03	1.68E-01	6.13E+01	3.07E-02	7.00E-03	1.68E-01	1.68E+01	8.40E-03	4.20E-03
	Polycyclic Organic Matter	H	2.20E-01	5.28E+00	1.93E+03	9.64E-01	2.20E-01	5.28E+00	5.28E+02	2.64E-01	1.32E-01
	Propionaldehyde	H	3.25E-02	7.80E-01	2.85E+02	1.42E-01	3.25E-02	7.80E-01	7.80E+01	3.90E-02	1.95E-02
	Quinone	H	4.00E-02	9.60E-01	3.50E+02	1.75E-01	4.00E-02	9.60E-01	9.60E+01	4.80E-02	2.40E-02
	Selenium compounds	H	8.75E-05	2.10E-03	7.67E-01	3.83E-04	8.75E-05	2.10E-03	2.10E-01	1.05E-04	5.25E-05
	Styrene	H/T	2.40E-04	5.77E-03	2.11E+00	1.05E-03	2.40E-04	5.77E-03	5.77E-01	2.89E-04	1.44E-04
	Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	H/T	5.25E-11	1.26E-09	4.60E-07	2.30E-10	5.25E-11	1.26E-09	1.26E-07	6.30E-11	3.15E-11
	Toluene	H/T	7.29E-01	1.75E+01	6.39E+03	3.19E+00	7.29E-01	1.75E+01	1.75E+03	8.75E-01	4.37E-01
	Trichloroethylene	H/T	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
	Trichlorofluoromethane (CFC 111)	T	1.35E-05	3.24E-04	1.18E-01	5.92E-05	1.35E-05	3.24E-04	3.24E-02	1.62E-05	8.11E-06
	Trimethylpentane, 2,2,4-	H	1.00E-02	2.41E-01	8.78E+01	4.39E-02	1.00E-02	2.41E-01	2.41E+01	1.20E-02	6.02E-03
	Xylene	H/T	6.04E-02	1.45E+00	5.29E+02	2.64E-01	6.04E-02	1.45E+00	1.45E+02	7.24E-02	3.62E-02
Concrete Batch Plant	PM		5.10E+00	1.22E+02	9.08E+05	4.54E+02	5.10E+00	1.22E+02	4.46E+04	22.32	22.32
	PM10		5.27E-02	1.27E+00	4.62E+02	2.31E-01	2.44E+00	5.85E+01	2.13E+04	10.67	10.67
	PM2.5		5.27E-02	1.27E+00	4.62E+02	2.31E-01	2.44E+00	5.85E+01	2.13E+04	10.67	10.67
	Arsenic unlisted cmpds (comp. of ASC)	H/T	6.59E-05	1.58E-03	2.18E+01	1.09E-02	6.59E-05	1.58E-03	5.77E-01	2.88E-04	2.88E-04
	Beryllium metal (unreacted)	H/T	4.53E-06	1.09E-04	8.77E-02	4.38E-05	4.53E-06	1.09E-04	3.97E-02	1.99E-05	1.99E-05
	Cadmium metal (elemental unreacted)	H/T	5.00E-07	1.20E-05	6.74E-02	3.37E-05	5.00E-07	1.20E-05	4.38E-03	2.19E-06	2.19E-06
	Chromic acid (VI) (component of solCR6 and CRC)	H	1.58E-04	3.80E-03	3.73E+00	1.86E-03	1.58E-04	3.80E-03	1.39E+00	6.93E-04	6.93E-04
	Lead unlisted compounds	H	5.96E-05	1.43E-03	1.16E+01	5.78E-03	5.96E-05	1.43E-03	5.22E-01	2.61E-04	2.61E-04
	Manganese unlisted compounds	H/T	7.49E-04	1.80E-02	6.72E+01	3.36E-02	7.49E-04	1.80E-02	6.56E+00	3.28E-03	3.28E-03
	Nickel metal	H/T	1.92E-04	4.62E-03	8.05E+00	4.02E-03	1.92E-04	4.62E-03	1.68E+00	8.42E-04	8.42E-04
	Phosphorus Metal, Yellow or White	H	4.71E-04	1.13E-02	1.51E+01	7.54E-03	4.71E-04	1.13E-02	4.13E+00	2.06E-03	2.06E-03
	Selenium compounds	H	4.68E-06	1.12E-04	8.26E-01	4.13E-04	4.68E-06	1.12E-04	4.10E-02	2.05E-05	2.05E-05

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions				Controlled Potential Emissions				Potential Emissions w/ Synthetic Minor Limits****
			(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(tons/yr)
Asphalt Cement Heater**	2-Methylnaphthalene		2.81E-08	6.74E-07	2.46E-04	1.23E-07	2.81E-08	6.74E-07	2.46E-04	1.23E-07	1.23E-07
	3-Methylchloranthrene		2.11E-09	5.05E-08	1.84E-05	9.22E-09	2.11E-09	5.05E-08	1.84E-05	9.22E-09	9.22E-09
	7,12-Dimethylbenz(a)anathracene		1.87E-08	4.49E-07	1.64E-04	8.20E-08	1.87E-08	4.49E-07	1.64E-04	8.20E-08	8.20E-08
	Acenaphthene	H	1.81E-07	4.34E-06	1.58E-03	7.92E-07	1.81E-07	4.34E-06	1.58E-03	7.92E-07	7.92E-07
	Acenaphtylene	H	2.17E-09	5.20E-08	1.90E-05	9.50E-09	2.17E-09	5.20E-08	1.90E-05	9.50E-09	9.50E-09
	Acetaldehyde	H/T	1.78E-08	4.27E-07	1.56E-04	7.79E-08	1.78E-08	4.27E-07	1.56E-04	7.79E-08	7.79E-08
	Acrolein	H/T	2.11E-08	5.05E-07	1.84E-04	9.22E-08	2.11E-08	5.05E-07	1.84E-04	9.22E-08	9.22E-08
	Ammonia	T	3.74E-03	8.98E-02	3.28E+01	1.64E-02	3.74E-03	8.98E-02	3.28E+01	1.64E-02	1.64E-02
	Anthracene	H	1.05E-08	2.51E-07	9.16E-05	4.58E-08	1.05E-08	2.51E-07	9.16E-05	4.58E-08	4.58E-08
	Benz(a)anthracene	H	3.44E-08	8.25E-07	3.01E-04	1.51E-07	3.44E-08	8.25E-07	3.01E-04	1.51E-07	1.51E-07
	Benzene	H/T	2.46E-06	5.89E-05	2.15E-02	1.08E-05	2.46E-06	5.89E-05	2.15E-02	1.08E-05	1.08E-05
	Benzo(a)pyrene	H/T	1.40E-09	3.37E-08	1.23E-05	6.15E-09	1.40E-09	3.37E-08	1.23E-05	6.15E-09	6.15E-09
	Benzo(b)fluoranthene	H	1.27E-08	3.04E-07	1.11E-04	5.56E-08	1.27E-08	3.04E-07	1.11E-04	5.56E-08	5.56E-08
	Benzo(g,h,i)perylene	H	1.94E-08	4.65E-07	1.70E-04	8.48E-08	1.94E-08	4.65E-07	1.70E-04	8.48E-08	8.48E-08
	Benzo(k)fluoranthene	H	2.11E-09	5.05E-08	1.84E-05	9.22E-09	2.11E-09	5.05E-08	1.84E-05	9.22E-09	9.22E-09
	Butane		2.46E-03	5.89E-02	2.15E+01	1.08E-02	2.46E-03	5.89E-02	2.15E+01	1.08E-02	1.08E-02
	Chrysene	H	2.04E-08	4.90E-07	1.79E-04	8.94E-08	2.04E-08	4.90E-07	1.79E-04	8.94E-08	8.94E-08
	Dibenzo(a,h)anthracene	H	1.43E-08	3.44E-07	1.25E-04	6.27E-08	1.43E-08	3.44E-07	1.25E-04	6.27E-08	6.27E-08
	Dichlorobenzene	H/T	1.40E-06	3.37E-05	1.23E-02	6.15E-06	1.40E-06	3.37E-05	1.23E-02	6.15E-06	6.15E-06
	Ethane		3.63E-03	8.70E-02	3.18E+01	1.59E-02	3.63E-03	8.70E-02	3.18E+01	1.59E-02	1.59E-02
	Ethylbenzene	H	5.45E-07	1.31E-05	4.78E-03	2.39E-06	5.45E-07	1.31E-05	4.78E-03	2.39E-06	2.39E-06
	Fluoranthene	H	4.15E-08	9.96E-07	3.63E-04	1.82E-07	4.15E-08	9.96E-07	3.63E-04	1.82E-07	1.82E-07
	Fluorene	H	3.83E-08	9.20E-07	3.36E-04	1.68E-07	3.83E-08	9.20E-07	3.36E-04	1.68E-07	1.68E-07
	Formaldehyde	H/T	2.83E-04	6.79E-03	2.48E+00	1.24E-03	2.83E-04	6.79E-03	2.48E+00	1.24E-03	1.24E-03
	Hexane	H/T	2.11E-03	5.05E-02	1.84E+01	9.22E-03	2.11E-03	5.05E-02	1.84E+01	9.22E-03	9.22E-03
	Indeno(1,2,3-cd)pyrene	H	1.83E-08	4.40E-07	1.61E-04	8.03E-08	1.83E-08	4.40E-07	1.61E-04	8.03E-08	8.03E-08
	Naphthalene	H	9.69E-06	2.32E-04	8.48E-02	4.24E-05	9.69E-06	2.32E-04	8.48E-02	4.24E-05	4.24E-05
	OCDD		2.66E-11	6.38E-10	2.33E-07	1.16E-10	2.66E-11	6.38E-10	2.33E-07	1.16E-10	1.16E-10
	Pentane		3.04E-03	7.30E-02	2.66E+01	1.33E-02	3.04E-03	7.30E-02	2.66E+01	1.33E-02	1.33E-02
	Phenanathrene	H	9.00E-08	2.16E-06	7.88E-04	3.94E-07	9.00E-08	2.16E-06	7.88E-04	3.94E-07	3.94E-07
	Propane		1.87E-03	4.49E-02	1.64E+01	8.20E-03	1.87E-03	4.49E-02	1.64E+01	8.20E-03	8.20E-03
	Pyrene	H	3.64E-08	8.74E-07	3.19E-04	1.60E-07	3.64E-08	8.74E-07	3.19E-04	1.60E-07	1.60E-07
	Toluene	H/T	5.31E-05	1.28E-03	4.66E-01	2.33E-04	5.31E-05	1.28E-03	4.66E-01	2.33E-04	2.33E-04
	1,1,1-Trichloroethane		2.02E-06	4.85E-05	1.77E-02	8.86E-06	2.02E-06	4.85E-05	1.77E-02	8.86E-06	8.86E-06
	Xylene	H/T	9.34E-07	2.24E-05	8.18E-03	4.09E-06	9.34E-07	2.24E-05	8.18E-03	4.09E-06	4.09E-06
	Arsenic	H/T	4.80E-06	1.15E-04	4.20E-02	2.10E-05	4.80E-06	1.15E-04	4.20E-02	2.10E-05	2.10E-05
	Barium		5.15E-06	1.24E-04	4.51E-02	2.25E-05	5.15E-06	1.24E-04	4.51E-02	2.25E-05	2.25E-05
	Beryllium	H/T	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.60E-06	8.64E-05	3.15E-02	1.58E-05	1.58E-05
	Cadmium	H/T	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.60E-06	8.64E-05	3.15E-02	1.58E-05	1.58E-05
	Chromium (as chromic acid)	H/T	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.60E-06	8.64E-05	3.15E-02	1.58E-05	1.58E-05
	Cobalt		9.82E-08	2.36E-06	8.61E-04	4.30E-07	9.82E-08	2.36E-06	8.61E-04	4.30E-07	4.30E-07
	Copper		7.20E-06	1.73E-04	6.31E-02	3.15E-05	7.20E-06	1.73E-04	6.31E-02	3.15E-05	3.15E-05
	Lead	H	1.08E-05	2.59E-04	9.46E-02	4.73E-05	1.08E-05	2.59E-04	9.46E-02	4.73E-05	4.73E-05
	Manganese	H/T	7.20E-06	1.73E-04	6.31E-02	3.15E-05	7.20E-06	1.73E-04	6.31E-02	3.15E-05	3.15E-05
	Mercury	H/T	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.60E-06	8.64E-05	3.15E-02	1.58E-05	1.58E-05
	Molybdenum		1.29E-06	3.09E-05	1.13E-02	5.64E-06	1.29E-06	3.09E-05	1.13E-02	5.64E-06	5.64E-06
	Nickel	H/T	3.60E-06	8.64E-05	3.15E-02	1.58E-05	3.60E-06	8.64E-05	3.15E-02	1.58E-05	1.58E-05
	Selenium	H	1.80E-05	4.32E-04	1.58E-01	7.88E-05	1.80E-05	4.32E-04	1.58E-01	7.88E-05	7.88E-05
	Vanadium		2.69E-06	6.46E-05	2.36E-02	1.18E-05	2.69E-06	6.46E-05	2.36E-02	1.18E-05	1.18E-05
	Zinc		3.39E-05	8.14E-04	2.97E-01	1.49E-04	3.39E-05	8.14E-04	2.97E-01	1.49E-04	1.49E-04

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions (lb/hr)	Uncontrolled Potential Emissions (lbs/day)	Uncontrolled Potential Emissions (lbs/yr)	Uncontrolled Potential Emissions (tons/yr)	Controlled Potential Emissions (lb/hr)	Controlled Potential Emissions (lbs/day)	Controlled Potential Emissions (lbs/yr)	Controlled Potential Emissions (tons/yr)	Potential Emissions w/ Synthetic Minor Limits**** (tons/yr)
Liquid Asphalt Tank Heater* **	PM		1.57E-02	3.77E-01	1.38E+02	6.88E-02	1.57E-02	3.77E-01	1.38E+02	6.88E-02	6.88E-02
	PM10		9.75E-03	2.34E-01	8.54E+01	4.27E-02	9.75E-03	2.34E-01	8.54E+01	4.27E-02	4.27E-02
	PM2.5		9.75E-03	2.34E-01	8.54E+01	4.27E-02	9.75E-03	2.34E-01	8.54E+01	4.27E-02	4.27E-02
	SO2		5.58E-01	1.34E+01	4.89E+03	2.44E+00	5.58E-01	1.34E+01	4.89E+03	2.44E+00	2.44E+00
	NOx		1.57E-01	3.77E+00	1.38E+03	6.88E-01	1.57E-01	3.77E+00	1.38E+03	6.88E-01	6.88E-01
	VOCs		5.90E-03	1.42E-01	5.17E+01	2.58E-02	5.90E-03	1.42E-01	5.17E+01	2.58E-02	2.58E-02
	CO		9.01E-02	2.16E+00	7.89E+02	3.94E-01	9.01E-02	2.16E+00	7.89E+02	3.94E-01	3.94E-01
	2-Methylnaphthalene		2.57E-08	6.18E-07	2.25E-04	1.13E-07	2.57E-08	6.18E-07	2.25E-04	1.13E-07	1.13E-07
	3-Methylchloranthrene		1.93E-09	4.63E-08	1.69E-05	8.45E-09	1.93E-09	4.63E-08	1.69E-05	8.45E-09	8.45E-09
	7,12-Dimethylbenz(a)anathracene		1.72E-08	4.12E-07	1.50E-04	7.51E-08	1.72E-08	4.12E-07	1.50E-04	7.51E-08	7.51E-08
	Acenaphthene	H	1.66E-07	3.98E-06	1.45E-03	7.26E-07	1.66E-07	3.98E-06	1.45E-03	7.26E-07	7.26E-07
	Acenaphtylene	H	1.99E-09	4.77E-08	1.74E-05	8.71E-09	1.99E-09	4.77E-08	1.74E-05	8.71E-09	8.71E-09
	Acetaldehyde	H/T	1.63E-08	3.91E-07	1.43E-04	7.14E-08	1.63E-08	3.91E-07	1.43E-04	7.14E-08	7.14E-08
	Acrolein	H/T	1.93E-08	4.63E-07	1.69E-04	8.45E-08	1.93E-08	4.63E-07	1.69E-04	8.45E-08	8.45E-08
	Ammonia	T	3.43E-03	8.23E-02	3.01E+01	1.50E-02	3.43E-03	8.23E-02	3.01E+01	1.50E-02	1.50E-02
	Anthracene	H	9.59E-09	2.30E-07	8.40E-05	4.20E-08	9.59E-09	2.30E-07	8.40E-05	4.20E-08	4.20E-08
	Benz(a)anthracene	H	3.15E-08	7.56E-07	2.76E-04	1.38E-07	3.15E-08	7.56E-07	2.76E-04	1.38E-07	1.38E-07
	Benzene	H/T	2.25E-06	5.40E-05	1.97E-02	9.86E-06	2.25E-06	5.40E-05	1.97E-02	9.86E-06	9.86E-06
	Benzo(a)pyrene	H/T	1.29E-09	3.09E-08	1.13E-05	5.64E-09	1.29E-09	3.09E-08	1.13E-05	5.64E-09	5.64E-09
	Benzo(b)fluoranthene	H	1.16E-08	2.79E-07	1.02E-04	5.09E-08	1.16E-08	2.79E-07	1.02E-04	5.09E-08	5.09E-08
	Benzo(g,h,i)perylene	H	1.78E-08	4.26E-07	1.56E-04	7.78E-08	1.78E-08	4.26E-07	1.56E-04	7.78E-08	7.78E-08
	Benzo(k)fluoranthene	H	1.93E-09	4.63E-08	1.69E-05	8.45E-09	1.93E-09	4.63E-08	1.69E-05	8.45E-09	8.45E-09
	Butane		2.25E-03	5.40E-02	1.97E+01	9.86E-03	2.25E-03	5.40E-02	1.97E+01	9.86E-03	9.86E-03
	Chrysene	H	1.87E-08	4.49E-07	1.64E-04	8.19E-08	1.87E-08	4.49E-07	1.64E-04	8.19E-08	8.19E-08
	Dibenzo(a,h)anthracene	H	1.31E-08	3.15E-07	1.15E-04	5.75E-08	1.31E-08	3.15E-07	1.15E-04	5.75E-08	5.75E-08
	Dichlorobenzene	H/T	1.29E-06	3.09E-05	1.13E-02	5.64E-06	1.29E-06	3.09E-05	1.13E-02	5.64E-06	5.64E-06
	Ethane		3.32E-03	7.98E-02	2.91E+01	1.46E-02	3.32E-03	7.98E-02	2.91E+01	1.46E-02	1.46E-02
	Ethylbenzene	H	5.00E-07	1.20E-05	4.38E-03	2.19E-06	5.00E-07	1.20E-05	4.38E-03	2.19E-06	2.19E-06
	Fluoranthene	H	3.80E-08	9.13E-07	3.33E-04	1.67E-07	3.80E-08	9.13E-07	3.33E-04	1.67E-07	1.67E-07
	Fluorene	H	3.51E-08	8.43E-07	3.08E-04	1.54E-07	3.51E-08	8.43E-07	3.08E-04	1.54E-07	1.54E-07
	Formaldehyde	H/T	2.59E-04	6.22E-03	2.27E+00	1.14E-03	2.59E-04	6.22E-03	2.27E+00	1.14E-03	1.14E-03
	Hexane	H/T	1.93E-03	4.63E-02	1.69E+01	8.45E-03	1.93E-03	4.63E-02	1.69E+01	8.45E-03	8.45E-03
	Indeno(1,2,3-cd)pyrene	H	1.68E-08	4.04E-07	1.47E-04	7.36E-08	1.68E-08	4.04E-07	1.47E-04	7.36E-08	7.36E-08
	Naphthalene	H	8.88E-06	2.13E-04	7.78E-02	3.89E-05	8.88E-06	2.13E-04	7.78E-02	3.89E-05	3.89E-05
	OCDD		2.44E-11	5.85E-10	2.13E-07	1.07E-10	2.44E-11	5.85E-10	2.13E-07	1.07E-10	1.07E-10
	Pentane		2.79E-03	6.69E-02	2.44E+01	1.22E-02	2.79E-03	6.69E-02	2.44E+01	1.22E-02	1.22E-02
	Phenanathrene	H	8.25E-08	1.98E-06	7.23E-04	3.61E-07	8.25E-08	1.98E-06	7.23E-04	3.61E-07	3.61E-07
	Propane		1.72E-03	4.12E-02	1.50E+01	7.51E-03	1.72E-03	4.12E-02	1.50E+01	7.51E-03	7.51E-03
	Pyrene	H	3.34E-08	8.01E-07	2.93E-04	1.46E-07	3.34E-08	8.01E-07	2.93E-04	1.46E-07	1.46E-07
	Toluene	H/T	4.87E-05	1.17E-03	4.27E-01	2.13E-04	4.87E-05	1.17E-03	4.27E-01	2.13E-04	2.13E-04
	1,1,1-Trichloroethane		1.85E-06	4.45E-05	1.62E-02	8.12E-06	1.85E-06	4.45E-05	1.62E-02	8.12E-06	8.12E-06
	Xylene	H/T	8.56E-07	2.06E-05	7.50E-03	3.75E-06	8.56E-07	2.06E-05	7.50E-03	3.75E-06	3.75E-06
	Arsenic	H/T	4.40E-06	1.06E-04	3.85E-02	1.93E-05	4.40E-06	1.06E-04	3.85E-02	1.93E-05	1.93E-05
	Barium		4.72E-06	1.13E-04	4.13E-02	2.07E-05	4.72E-06	1.13E-04	4.13E-02	2.07E-05	2.07E-05
	Beryllium	H/T	3.30E-06	7.92E-05	2.89E-02	1.45E-05	3.30E-06	7.92E-05	2.89E-02	1.45E-05	1.45E-05
	Cadmium	H/T	3.30E-06	7.92E-05	2.89E-02	1.45E-05	3.30E-06	7.92E-05	2.89E-02	1.45E-05	1.45E-05
	Chromium (as chromic acid)	H/T	3.30E-06	7.92E-05	2.89E-02	1.45E-05	3.30E-06	7.92E-05	2.89E-02	1.45E-05	1.45E-05
	Cobalt		9.01E-08	2.16E-06	7.89E-04	3.94E-07	9.01E-08	2.16E-06	7.89E-04	3.94E-07	3.94E-07
	Copper		6.60E-06	1.58E-04	5.78E-02	2.89E-05	6.60E-06	1.58E-04	5.78E-02	2.89E-05	2.89E-05
	Lead	H	9.90E-06	2.38E-04	8.67E-02	4.34E-05	9.90E-06	2.38E-04	8.67E-02	4.34E-05	4.34E-05
	Manganese	H/T	6.60E-06	1.58E-04	5.78E-02	2.89E-05	6.60E-06	1.58E-04	5.78E-02	2.89E-05	2.89E-05
	Mercury	H/T	3.30E-06	7.92E-05	2.89E-02	1.45E-05	3.30E-06	7.92E-05	2.89E-02	1.45E-05	1.45E-05
	Molybdenum		1.18E-06	2.83E-05	1.03E-02	5.17E-06	1.18E-06	2.83E-05	1.03E-02	5.17E-06	5.17E-06
	Nickel	H/T	3.30E-06	7.92E-05	2.89E-02	1.45E-05	3.30E-06	7.92E-05	2.89E-02	1.45E-05	1.45E-05
	Selenium	H	1.65E-05	3.96E-04	1.45E-01	7.23E-05	1.65E-05	3.96E-04	1.45E-01	7.23E-05	7.23E-05
	Vanadium		2.47E-06	5.92E-05	2.16E-02	1.08E-05	2.47E-06	5.92E-05	2.16E-02	1.08E-05	1.08E-05
	Zinc		3.11E-05	7.46E-04	2.72E-01	1.36E-04	3.11E-05	7.46E-04	2.72E-01	1.36E-04	1.36E-04

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions				Controlled Potential Emissions				Potential Emissions w/ Synthetic Minor Limits****
			(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(tons/yr)
Quarry	PM		2.40E-02	5.77E-01	1.91E+05	95.31	2.40E-02	5.77E-01	1.91E+05	95.31	51.63
	PM10		9.36E-03	2.25E-01	7.58E+04	37.89	9.36E-03	2.25E-01	7.58E+04	37.89	20.53
	PM2.5		4.17E-03	1.00E-01	3.07E+04	15.35	4.17E-03	1.00E-01	3.07E+04	15.35	8.32
Quarry Equipment Generators	PM		7.19E-02	1.73E+00	6.30E+02	3.15E-01	7.19E-02	1.73E+00	6.30E+02	3.15E-01	1.71E-01
	PM10		7.19E-02	1.73E+00	6.30E+02	3.15E-01	7.19E-02	1.73E+00	6.30E+02	3.15E-01	1.71E-01
	PM2.5		7.19E-02	1.73E+00	6.30E+02	3.15E-01	7.19E-02	1.73E+00	6.30E+02	3.15E-01	1.71E-01
	SO_2		2.66E-02	6.38E-01	2.33E+02	1.16E-01	2.66E-02	6.38E-01	2.33E+02	0.12	6.31E-02
	NOx		1.44E+00	3.45E+01	1.26E+04	6.30E+00	1.44E+00	3.45E+01	1.26E+04	6.30	3.41E+00
	CO		1.32E+01	3.17E+02	1.16E+05	5.78E+01	1.32E+01	3.17E+02	1.16E+05	57.84	3.13E+01
	VOC		6.83E-01	1.64E+01	5.99E+03	2.99E+00	6.83E-01	1.64E+01	5.99E+03	2.99	1.62E+00
	Acetaldehyde		1.18E-02	2.82E-01	1.03E+02	5.15E-02	1.18E-02	2.82E-01	1.03E+02	5.15E-02	2.79E-02
	Acrolein		1.42E-03	3.40E-02	1.24E+01	6.21E-03	1.42E-03	3.40E-02	1.24E+01	6.21E-03	3.36E-03
	Arsenic		6.13E-05	1.47E-03	5.37E-01	2.69E-04	6.13E-05	1.47E-03	5.37E-01	2.69E-04	1.45E-04
	Benzene		1.43E-02	3.43E-01	1.25E+02	6.26E-02	1.43E-02	3.43E-01	1.25E+02	6.26E-02	3.39E-02
	Benzo(a)pyrene		2.88E-06	6.92E-05	2.52E-02	1.26E-05	2.88E-06	6.92E-05	2.52E-02	1.26E-05	6.84E-06
	Beryllium		4.60E-05	1.10E-03	4.03E-01	2.01E-04	4.60E-05	1.10E-03	4.03E-01	2.01E-04	1.09E-04
	1,3-Butadiene		5.99E-04	1.44E-02	5.25E+00	2.63E-03	5.99E-04	1.44E-02	5.25E+00	2.63E-03	1.42E-03
	Cadmium		4.60E-05	1.10E-03	4.03E-01	2.01E-04	4.60E-05	1.10E-03	4.03E-01	2.01E-04	1.09E-04
	Chromium (as chromic acid)		4.60E-05	1.10E-03	4.03E-01	2.01E-04	4.60E-05	1.10E-03	4.03E-01	2.01E-04	1.09E-04
	Formaldehyde		1.81E-02	4.34E-01	1.58E+02	7.92E-02	1.81E-02	4.34E-01	1.58E+02	7.92E-02	4.29E-02
	Lead		1.38E-04	3.31E-03	1.21E+00	6.04E-04	1.38E-04	3.31E-03	1.21E+00	6.04E-04	3.27E-04
	Manganese unlisted compounds		9.20E-05	2.21E-03	8.06E-01	4.03E-04	9.20E-05	2.21E-03	8.06E-01	4.03E-04	2.18E-04
	Mercury vapor		4.60E-05	1.10E-03	4.03E-01	2.01E-04	4.60E-05	1.10E-03	4.03E-01	2.01E-04	1.09E-04
	Napthalene		1.30E-03	3.12E-02	1.14E+01	5.69E-03	1.30E-03	3.12E-02	1.14E+01	5.69E-03	3.08E-03
	Nickel metal		4.60E-05	1.10E-03	4.03E-01	2.01E-04	4.60E-05	1.10E-03	4.03E-01	2.01E-04	1.09E-04
	Selenium compounds		2.30E-04	5.52E-03	2.01E+00	1.01E-03	2.30E-04	5.52E-03	2.01E+00	1.01E-03	5.46E-04
	Toluene		6.27E-03	1.50E-01	5.49E+01	2.75E-02	6.27E-03	1.50E-01	5.49E+01	2.75E-02	1.49E-02
	Xylene		4.37E-03	1.05E-01	3.83E+01	1.91E-02	4.37E-03	1.05E-01	3.83E+01	1.91E-02	1.04E-02

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions (lb/hr)	Uncontrolled Potential Emissions (lbs/day)	Uncontrolled Potential Emissions (lbs/yr)	Uncontrolled Potential Emissions (tons/yr)	Controlled Potential Emissions (lb/hr)	Controlled Potential Emissions (lbs/day)	Controlled Potential Emissions (lbs/yr)	Controlled Potential Emissions (tons/yr)	Potential Emissions w/ Synthetic Minor Limits**** (tons/yr)
Quarry NG/Propane Large Generators	PM		1.98E+00	4.75E+01	1.73E+04	8.67E+00	1.98E+00	4.75E+01	1.73E+04	8.67	6.12
	PM10		1.98E+00	4.75E+01	1.73E+04	8.67E+00	1.98E+00	4.75E+01	1.73E+04	8.67	6.12
	PM2.5		1.98E+00	4.75E+01	1.73E+04	8.67E+00	1.98E+00	4.75E+01	1.73E+04	8.67	6.12
	SO2		2.41E-02	5.78E-01	2.11E+02	1.05E-01	2.41E-02	5.78E-01	2.11E+02	0.11	0.07
	NOx		8.11E+00	1.95E+02	7.11E+04	3.55E+01	8.11E+00	1.95E+02	7.11E+04	35.53	23.91
	VOC		9.02E+00	2.17E+02	7.90E+04	3.95E+01	9.02E+00	2.17E+02	7.90E+04	39.51	27.89
	CO		9.02E+00	2.17E+02	7.90E+04	3.95E+01	9.02E+00	2.17E+02	7.90E+04	39.51	27.89
	CH4		2.71E-01	6.50E+00	2.37E+03	1.19E+00	2.71E-01	6.50E+00	2.37E+03	1.19E+00	8.37E-01
	N2O		5.42E-02	1.30E+00	4.75E+02	2.37E-01	5.42E-02	1.30E+00	4.75E+02	2.37E-01	1.67E-01
	CO2		5.55E+03	1.33E+05	4.86E+07	2.43E+04	5.55E+03	1.33E+05	4.86E+07	2.43E+04	1.72E+04
	CO2e		5.57E+03	1.34E+05	4.88E+07	2.44E+04	5.57E+03	1.34E+05	4.88E+07	2.44E+04	1.72E+04
	Acenaphthene	HAP	5.12E-05	1.23E-03	4.48E-01	2.24E-04	5.12E-05	1.23E-03	4.48E-01	2.24E-04	1.58E-04
	Acenaphtylene	HAP	2.26E-04	5.44E-03	1.98E+00	9.92E-04	2.26E-04	5.44E-03	1.98E+00	9.92E-04	7.00E-04
	Acetaldehyde	HAP/TAP	3.83E-01	9.20E+00	3.36E+03	1.68E+00	3.83E-01	9.20E+00	3.36E+03	1.68E+00	1.19E+00
	Acrolein	HAP/TAP	2.11E-01	5.05E+00	1.84E+03	9.22E-01	2.11E-01	5.05E+00	1.84E+03	9.22E-01	6.51E-01
	Anthracene	HAP	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
	Benzo(a)anthracene	HAP	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
	Benzene	HAP/TAP	1.80E-02	4.33E-01	1.58E+02	7.89E-02	1.80E-02	4.33E-01	1.58E+02	7.89E-02	5.57E-02
	Benzo(a)pyrene	HAP/TAP	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
	Benzo(b)fluoranthene	HAP	6.80E-06	1.63E-04	5.96E-02	2.98E-05	6.80E-06	1.63E-04	5.96E-02	2.98E-05	2.10E-05
	Benzo(k)fluoranthene	HAP	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
	Benzo(g,h,i)perylene	HAP	1.70E-05	4.07E-04	1.49E-01	7.43E-05	1.70E-05	4.07E-04	1.49E-01	7.43E-05	5.24E-05
	Biphenyl	HAP	8.68E-03	2.08E-01	7.61E+01	3.80E-02	8.68E-03	2.08E-01	7.61E+01	3.80E-02	2.68E-02
	Carbon Tetrachloride	HAP/TAP	1.50E-03	3.61E-02	1.32E+01	6.58E-03	1.50E-03	3.61E-02	1.32E+01	6.58E-03	4.65E-03
	Chlorobenzene	HAP/TAP	1.25E-03	2.99E-02	1.09E+01	5.45E-03	1.25E-03	2.99E-02	1.09E+01	5.45E-03	3.85E-03
	Chloroform	HAP/TAP	1.17E-03	2.80E-02	1.02E+01	5.11E-03	1.17E-03	2.80E-02	1.02E+01	5.11E-03	3.61E-03
	Chrysene	HAP	2.84E-05	6.81E-04	2.49E-01	1.24E-04	2.84E-05	6.81E-04	2.49E-01	1.24E-04	8.78E-05
	Ethylbenzene	HAP	1.63E-03	3.90E-02	1.42E+01	7.12E-03	1.63E-03	3.90E-02	1.42E+01	7.12E-03	5.03E-03
	Ethylene Dibromide	HAP/TAP	1.81E-03	4.35E-02	1.59E+01	7.95E-03	1.81E-03	4.35E-02	1.59E+01	7.95E-03	5.61E-03
	Fluoranthene	HAP	4.55E-05	1.09E-03	3.98E-01	1.99E-04	4.55E-05	1.09E-03	3.98E-01	1.99E-04	1.41E-04
	Fluorene	HAP	2.32E-04	5.57E-03	2.03E+00	1.02E-03	2.32E-04	5.57E-03	2.03E+00	1.02E-03	7.18E-04
	Formaldehyde	HAP/TAP	2.16E+00	5.19E+01	1.89E+04	9.47E+00	2.16E+00	5.19E+01	1.89E+04	9.47E+00	6.69E+00
	Indeno(1,2,3-c,d)pyrene	HAP	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
	Methanol	HAP	1.02E-01	2.46E+00	8.97E+02	4.48E-01	1.02E-01	2.46E+00	8.97E+02	4.48E-01	3.17E-01
	Methylene Chloride	HAP/TAP	8.19E-04	1.97E-02	7.18E+00	3.59E-03	8.19E-04	1.97E-02	7.18E+00	3.59E-03	2.53E-03
	n-Hexane	HAP/TAP	4.55E-02	1.09E+00	3.98E+02	1.99E-01	4.55E-02	1.09E+00	3.98E+02	1.99E-01	1.41E-01
	Naphthalene	HAP	3.05E-03	7.31E-02	2.67E+01	1.33E-02	3.05E-03	7.31E-02	2.67E+01	1.33E-02	9.42E-03
	Phenanthrene	HAP	4.26E-04	1.02E-02	3.73E+00	1.87E-03	4.26E-04	1.02E-02	3.73E+00	1.87E-03	1.32E-03
	Phenol	HAP/TAP	9.83E-04	2.36E-02	8.61E+00	4.31E-03	9.83E-04	2.36E-02	8.61E+00	4.31E-03	3.04E-03
	Pyrene	HAP	5.57E-05	1.34E-03	4.88E-01	2.44E-04	5.57E-05	1.34E-03	4.88E-01	2.44E-04	1.72E-04
	Styrene	HAP/TAP	9.67E-04	2.32E-02	8.47E+00	4.23E-03	9.67E-04	2.32E-02	8.47E+00	4.23E-03	2.99E-03
	Toluene	HAP/TAP	1.67E-02	4.01E-01	1.46E+02	7.32E-02	1.67E-02	4.01E-01	1.46E+02	7.32E-02	5.17E-02
	Vinyl Chloride	HAP/TAP	6.10E-04	1.46E-02	5.35E+00	2.67E-03	6.10E-04	1.46E-02	5.35E+00	2.67E-03	1.89E-03
	Xylene	HAP/TAP	7.54E-03	1.81E-01	6.60E+01	3.30E-02	7.54E-03	1.81E-01	6.60E+01	3.30E-02	2.33E-02
Total	PM		23.28	558.82	1,258,192	629.10	18.61	249.89	281,625	140.81	94.43
	PM10		10.21	245.05	165,146	82.57	11.43	156.00	132,642	66.32	46.26
	PM2.5		10.21	244.92	120,068	60.03	11.43	155.87	87,563	43.78	34.05
	SO2		152.06	3,649.37	1,332,020	666.01	22.15	166.85	60,902	30.45	30.37
	NOx		23.63	567.10	206,991	103.50	23.63	327.51	119,541	59.77	45.26
	CO		55.49	1,331.82	486,113	243.06	55.49	754.50	275,392	137.70	99.56
	VOC		21.73	521.56	190,370	95.19	21.73	312.05	113,897	56.95	43.95
	Acetaldehyde	H/T	7.08E-01	1.70E+01	6.21E+03	3.10E+00	7.08E-01	1.70E+01	4.14E+03	2.07E+00	1.34E+00
	Acrolein	H/T	6.50E-03	1.56E-01	5.69E+01	2.85E-02	6.50E-03	1.56E-01	1.56E+01	7.80E-03	3.90E-03
	Antimony unlisted compounds	H	4.50E-05	1.08E-03	3.94E-01	1.97E-04	4.50E-05	1.08E-03	1.08E-01	5.40E-05	2.70E-05
	Arsenic unlisted cmpds (comp. of ASC)	H/T	2.06E-04	4.94E-03	2.30E+01	1.15E-02	2.06E-04	4.94E-03	9.13E-01	4.56E-04	3.72E-04
	Benzene	H/T	1.31E-01	3.15E+00	1.15E+03	5.75E-01	1.31E-01	3.15E+00	5.21E+02	2.60E-01	1.49E-01
	Benzo(a)pyrene	T	4.41E-06	1.06E-04	3.86E-02	1.93E-05	4.41E-06	1.06E-04	1.06E-02	5.29E-06	2.65E-06
	Beryllium metal (unreacted)	H/T	4.53E-06	1.09E-04	8.77E-02	4.38E-05	4.53E-06	1.09E-04	3.97E-02	1.99E-05	1.99E-05
	Cadmium metal (elemental unreacted)	H/T	1.03E-04	2.47E-03	9.65E-01	4.83E-04	1.03E-04	2.47E-03	2.50E-01	1.25E-04	6.37E-05
	Carbon disulfide	H/T	6.23E-04	1.49E-02	5.45E+00	2.73E-03	6.23E-04	1.49E-02	1.49E+00	7.47E-04	3.74E-04
	Chromium unlisted cmpds (add w/chrom acid to get CRC)	H	1.26E-03	3.03E-02	1.11E+01	5.53E-03	1.26E-03	3.03E-02	3.03E+00	1.52E-03	7.58E-04
	Chromic acid (VI) (component of solCR6 and CRC)	H/T	2.71E-04	6.50E-03	4.71E+00	2.36E-03	2.71E-04	6.50E-03	1.66E+00	8.28E-04	7.61E-04
	Cobalt unlisted compounds	H	6.50E-06	1.56E-04	5.69E-02	2.85E-05	6.50E-06	1.56E-04	1.56E-02	7.80E-06	3.90E-06
	Cumene	H	1.14E-03	2.74E-02	1.00E+01	5.01E-03	1.14E-03	2.74E-02	2.74E+00	1.37E-03	6.86E-04
	Ethyl benzene	H	6.41E-02	1.54E+00	5.61E+02	2.81E-01	6.41E-02	1.54E+00	1.54E+02	7.69E-02	3.84E-02
	Ethyl chloride (chloroethane)	H	2.18E-06	5.24E-05	1.91E-02	9.56E-06	2.18E-06	5.24E-05	5.24E-03	2.62E-06	1.31E-06
	Formaldehyde	H/T	2.98E+00	7.15E+01	2.61E+04	1.30E+01	2.98E+00	7.15E+01	2.10E+04	1.05E+01	7.21E+00
	Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8	T	3.25E-10	7.80E-09	2.85E-06	1.42E-09	3.25E-10	7.80E-09	7.80E-07	3.90E-10	1.95E-10
	Hexane, n-	H/T	2.39E-01	5.74E+00	2.10E+03	1.05E+00	2.39E-01	5.74E+00	5.74E+02	2.87E-01	1.44E-01
	Hydrogen Chloride (hydrochloric acid)	H/T	5.25E-02	1.26E+00	4.60E+02	2.30E-01	5.25E-02	1.26E+00	1.26E+02	6.30E-02	3.15E-02
	Hydrogen Sulfide	T	1.37E-02	3.28E-01	1.20E+02	5.99E-02	1.37E-02	3.28E-01	3.28E+01	1.64E-02	8.21E-03
	Lead unlisted compounds	H	3.81E-03	9.14E-02	4.44E+01	2.22E-02	3.81E-03	9.14E-02	9.52E+00	4.76E-03	2.51E-03
	Manganese unlisted compounds	T	2.77E-03	6.64E-02	8.49E+01	4.24E-02	2.77E-03	6.64E-02	1.20E+01	5.99E-03	4.65E-03
	Mercury, vapor	H/T	6.50E-04	1.56E-02	5.69E+00	2.85E-03	6.50E-04	1.56E-02	1.56E+00	7.80E-04	3.90E-04
	Methyl bromide	H	2.49E-04	5.98E-03	2.18E+00	1.09E-03	2.49E-04	5.98E-03	5.98E-01	2.99E-04	1.49E-04
	Methyl chloride	H	1.56E-04	3.74E-03	1.37E+00	6.83E-04	1.56E-04	3.74E-03	3.74E-01	1.87E-04	9.36E-05
	Methyl chloroform	H/T	1.20E-02	2.88E-01	1.05E+02	5.26E-02	1.20E-02	2.88E-01	2.88E+01	1.44E-02	7.20E-03
	Methyl ethyl ketone	H/T	6.70E-03	1.61E-01	5.87E+01	2.93E-02	6.70E-03	1.61E-01	1.61E+01	8.04E-03	4.02E-03
	Methylene chloride	H/T	8.27E-04	1.99E-02	7.25E+00	3.62E-03	8.27E-04	1.99E-02	7.20E+00	3.60E-03	2.54E-03
	Napthalene	H	1.65E-01	3.95E+00	1.44E+03	7.21E-01	1.65E-01	3.95E+00	3.95E+02	1.98E-01	9.88E-02
	Nickel metal	H/T	1.59E-02	3.83E-01	1.46E+02	7.30E-02	1.59E-02	3.83E-01	3.95E+01	1.97E-02	1.03E-02

Source Name	Pollutant	HAP/ TAP	Uncontrolled Potential Emissions				Controlled Potential Emissions				Potential Emissions w/ Synthetic Minor Limits****
			(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(lb/hr)	(lbs/day)	(lbs/yr)	(tons/yr)	(tons/yr)
	Perchloroethylene (tetrachloroethylene)	H/T	8.01E-05	1.92E-03	7.01E-01	3.51E-04	8.01E-05	1.92E-03	1.92E-01	9.61E-05	4.80E-05
	Phenol	H/T	1.99E-03	4.77E-02	1.74E+01	8.71E-03	1.99E-03	4.77E-02	1.10E+01	5.51E-03	3.64E-03
	Phosphorus Metal, Yellow or White	H	7.47E-03	1.79E-01	7.64E+01	3.82E-02	7.47E-03	1.79E-01	2.09E+01	1.05E-02	6.26E-03
	Polycyclic Organic Matter	H	2.20E-01	5.28E+00	1.93E+03	9.64E-01	2.20E-01	5.28E+00	5.28E+02	2.64E-01	1.32E-01
	Propionaldehyde	H	3.25E-02	7.80E-01	2.85E+02	1.42E-01	3.25E-02	7.80E-01	7.80E+01	3.90E-02	1.95E-02
	Quinone	H	4.00E-02	9.60E-01	3.50E+02	1.75E-01	4.00E-02	9.60E-01	9.60E+01	4.80E-02	2.40E-02
	Selenium compounds	H	3.22E-04	7.73E-03	3.61E+00	1.80E-03	3.22E-04	7.73E-03	2.27E+00	1.13E-03	6.19E-04
	Styrene	H/T	1.21E-03	2.90E-02	1.06E+01	5.29E-03	1.21E-03	2.90E-02	9.04E+00	4.52E-03	3.13E-03
	Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	H/T	5.25E-11	1.26E-09	4.60E-07	2.30E-10	5.25E-11	1.26E-09	1.26E-07	6.30E-11	3.15E-11
	Toluene	H/T	7.52E-01	1.81E+01	6.59E+03	3.29E+00	7.52E-01	1.81E+01	1.95E+03	9.76E-01	5.04E-01
	Trichloroethylene	H/T	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
	Trichlorofluoromethane (CFC 111)	T	1.35E-05	3.24E-04	1.18E-01	5.92E-05	1.35E-05	3.24E-04	3.24E-02	1.62E-05	8.11E-06
	Trimethylpentane, 2,2,4-	H	1.00E-02	2.41E-01	8.78E+01	4.39E-02	1.00E-02	2.41E-01	2.41E+01	1.20E-02	6.02E-03
	Xylene	H/T	6.04E-02	1.45E+00	5.29E+02	2.64E-01	6.04E-02	1.45E+00	1.45E+02	7.24E-02	3.62E-02
	Highest Single HAP (formaldehyde)		2.98E+00	7.15E+01	2.61E+04	1.30E+01	2.98E+00	7.15E+01	2.10E+04	10.51	7.21
	Total HAP		5.51E+00	1.32E+02	4.84E+04	2.42E+01	5.51E+00	1.32E+02	2.99E+04	14.96	9.78

*** Potential Controlled emissions from the hot mix asphalt plant, quarry, quarry generators, and large NG/Propane generators are based on the synthetic minor limit and not based on 8760 hr/yr of operation.**

**** Criteria pollutant emissions from the asphalt cement heater are included in the Hot Mix Asphalt Plant Emissions since the NCDEQ Emission Calculation Spreadsheet for Hot Mix Asphalt plants was used (which incorporates criteria pollutant emissions for an asphalt cement heater).**

***** Criteria and HAP/TAP pollutant emissions for the liquid asphalt tank heater are not included in the NCDEQ Emission Calculation Spreadsheet for Hot Mix Asphalt plants, therefore, these emissions are calculated separately.**

****** Potential Emissions with Synthetic Minor Limits are explained and discussed in Section 2.3 of the application.**
HMA plant emissions are based on a maximum production limit of 600,000 tpy.