NORTH CAROLINA DIVISION OF AIR QUALITY

Air Permit Review

Permit Issue Date:

Region: Mooresville Regional Office
County: Rowan
NC Facility ID: 8000045
Inspector's Name: Carlotta Adams
Date of Last Inspection: 08/28/2014
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): Daimler Trucks North America - Cleveland Plant

Facility Address:
Daimler Trucks North America - Cleveland Plant
11550 Statesville Boulevard
Cleveland, NC 27013

SIC: 3711 / Motor Vehicles And Car Bodies
NAICS: 33612 / Heavy Duty Truck Manufacturing

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP:
NSPS:
NESHAP:
PSD:
PSD Avoidance:
NC Toxics:
112(r):
Other:

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Eric Moser Senior Environmental Engineer (704) 645-5353 11550 Statesville Boulevard Cleveland, NC 27013	Henning Bruns Plant Manager 11550 Statesville Road Cleveland, NC 27013	Eric Moser Senior Environmental Engineer (704) 645-5353 11550 Statesville Boulevard Cleveland, NC 27013

Application Data

Application Number: 8000045.15A
Date Received: 04/27/2015
Application Type: Modification
Application Schedule: PSD

Existing Permit Data

Existing Permit Number: 04625/T33
Existing Permit Issue Date: 04/17/2015
Existing Permit Expiration Date: 03/31/2019

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2013	0.0700	12.09	399.67	10.16	5.36	11.30	7.23 [Xylene (mixed isomers)]
2012	0.0600	9.18	444.46	7.71	6.95	16.99	8.83 [Xylene (mixed isomers)]
2011	0.0500	7.93	322.22	6.66	5.38	11.72	4.97 [Xylene (mixed isomers)]
2010	0.0400	7.49	211.29	6.29	3.86	6.94	3.04 [MIBK (methyl isobutyl ketone)]
2009	0.0400	6.46	190.30	5.42	3.45	9.00	2.58 [MIBK (methyl isobutyl ketone)]

Review Engineer: Gautam Patnaik

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue: 04625/T34
Permit Issue Date:
Permit Expiration Date:

I. Introduction and back ground

Daimler Trucks North America LLC (Daimler) owns and operates a truck manufacturing plant located in Rowan County, North Carolina. The facility is currently categorized under Standard Industrial Classification (SIC) code 3711.

Daimler is currently operating in accordance with North Carolina Department of Environment and Natural Resources (DENR) Title V Permit No. 04625T33 issued on April 17, 2015, and is scheduled to expire on March 31, 2019. This facility is an existing major PSD source and currently operates under a PAL for VOC, nitrogen oxides (NO_x), and carbon dioxide equivalent (CO_2e) established in accordance with both the PSD and Non-Attainment New Source Review.

The facility is a truck manufacturing facility which custom makes the cabs and fuel tanks and assembles all of the components (i.e., the engine, chassis, wiring harnesses, seats, tires, etc.) that results in final assembly of the truck. The facility has spray painting operations where they paint the cabs, chassis, and other parts prior to assembly. Daimler Trucks produces heavy duty trucks the end users are independent truckers and potentially any trucking or manufacturing firm that has truck fleets.

The spray coating operations (painting) emit VOC emissions as a result of the application of the coatings. The spray coating operations overspray of paint is assumed to be particulate emissions. The facility has boilers that provide steam to the facility which will emit byproducts of combustion. The facility also performs welding of truck parts which has the potential to generate particulate.


II. Existing Facility Description

<u>Process description</u>

<u>Current Sources at the facility</u>

The current sources at the facility especially the “Spray Coating and Assembly Operations” (ES-SCAO) is described as:
37 paint spray booths (ES-PSB-1 through ES-PSB–37);
21 paint drying ovens (ES-PDO-1 through ES-PDO-21);
16 flash off booths (ES-FO-1 through ES-FO-16);
One wax booth (ES-WB);
Six sanding booths (ES-SB1 through ES-SB6);

18 tack booths (ES-TB1 through ES-TB18);
One pre-fabricated paint spray booth with a natural gas-fired drying oven (2 million Btu/hr) (ES-PSB-38);
One paint mix room (ES-PMR) and
various operations including gluing, caulking, seamseal, solvent wipe, cleanup solvent and other non-coating sources of VOC (ES-VOC).

As per the applicant "the description in the current permit was based on the last PSD application from 2001. Daimler did not actually install some of the equipment proposed in 2001 thus the equipment list in this application represents the actual emission sources at the facility."

The applicant was also given a draft of the permit and in their response and comments on 3/10/2016 the Spray Coating and Assembly Operations" (ES-SCAO) and some other sources were remodified.

The insignificant miscellaneous combustion sources (IES-12) which previously included everything except (except ES-5 and all paint drying ovens) this exemption of this source now includes (excluding the boilers, the fire pumps, the emergency generator, and all paint drying ovens) As per the applicant "before NC DAQ added the 112(j) requirements to the permit, all boilers except ES-5 were insignificant sources. This most likely was not updated when the 112(j) requirements were added several years ago. I have also added the fire pumps and emergency generator to make this IA more accurate."

The insignificant diesel-fired emergency generator (IES-EG) is currently rated at (250 kW / 335 hp) the new rating will be (358 kW / 480 hp), again as per the applicant "during review it was determined that an update to the EG was required." This change does not change the classification of the source.

As per discussion with the applicant the Spray Coating and Assembly Operations" (ES-SCAO) is more correctly described as:
25 paint spray booths:
- chassis booth A (ES-1),
- chassis booth B (ES-2),
- Tennessee booth (ES-39),
- Western star booth (ES-39C),
- paint booth #1 (ES-38),
- hood paint center robot booth (ES-HPC-PB),
- hood paint center clear coat booth (ES-HPC-CCB),
- 6 offline paint booths (ES-29 through ES-34),
- small parts booth (ES-44),
- seam seal caulk booth (ES-3),
- primer paint booth (ES-4),
- foam booth (ES-5),
- 5 paint spray booths (ES-7 through ES-11),
- paint booth #6 (ES-25),
- paint booth #7 (ES-26), and
- future pre-fab booth (ES-59)

Booth (ES-59) is a combination booth and oven. This is the source that was permitted as PSB-38 in permit version T33 as a minor modification prior to the PAL submittal.

12 Paint Drying Ovens:
- chassis booth A oven (ES-1A),
- chassis booth B oven (ES-2A),
- Tennessee dry off oven (ES-39B),
- paint booth #1 oven (ES-38A),
- hood paint center dry off oven (ES-HPC-PDO),
- primer booth oven (ES-4A),
- topcoat oven east (ES-19),
- topcoat oven west (ES-20),
- paint booth #6 and #7 oven (ES-27),
- cab adhesive oven (ES-AO-1) and
- cab adhesive oven (ES-AO-2)
- future pre-fab booth (ES-59) (already listed above)

five flash off areas:
- Tennessee Flash Off booth (ES-39A),
- Primer Booth Flash Off booth (ES-4A),
- Flash off area (ES-17),
- Hood Paint Center Paint booth and Flash Off area (ES-HPC-FO), and
- Paint Booth #6 and 7 Flash Off area (ES-25-26FO)

four sanding booths:
- Hood Paint Center Spot Sanding Booth (ES-HPC-SSB),
- Hood Paint Center Sanding Booth (ES-HPC-SB),
- Cab Sanding Booth Upstairs (ES57), and
- Cab Primer Sanding Booth (ES-58)

Five tack booths (ES-47 through ES-51);

One paint mix room (ES-PMR) and

various operations including gluing, caulking, seamseal, solvent wipe, cleanup solvent and other non-coating sources of VOC (ES-VOC).

Below is information of the Spray Coating and Assembly Operations from the Cleveland and Mt. Holly plant described briefly below:

1. Chassis paint – Two paint booths, chassis line A and B, both booths use Axalta low VOC chassis black paint.
   a) All booths are purged using the PPG Polypurge.
   b) Chassis Line B washes the chassis and wheel hubs.

2. Cab Line Primer – Epoxy Primer is applied (switched to Axalta Primer Gray Primer in October 2015, cause it has lower VOC content).
   a) Cabs are washed with a PPG pretreatment chemical to clean and etch the cab.
   b) Cabs are lightly sanded and wiped with alcohol wipes before being sprayed with a topcoat.

3. Hood Primer –
   a) Hoods are sanded and alcohol wiped before being primed.

4. Cab and Hood Paint – various top coats applied.

5. PPG Polypurge solvent used in all primer and top coat booths.

VOC emission from all of the above operations were accounted for in the application.
Spray coating and assembly operations consist of multiple areas that each perform a different function for manufacturing of the trucks. The chassis enter the production line and are on a pulley system to move the truck down the line through each station. As the base of the truck are pulled down the line the different parts of the truck are added. For example the engine is added, hoses, cabs, windshields until the truck is complete at the end of the line. Parts of the truck such as cabs, side panels are painted to meet customer requests. Thus the paints applied are different colors or paint weights depending on customer needs. There are base coats applied first, colors and then top coats. Some paints are for the cabs and some are paints applied to the chassis. Parts are then sent through the ovens to be dried. Some also have a flash-off booth prior to the main paint drying oven. After cabs are dried in the ovens they are stored until the actual truck is being built. The painted pieces are added as the truck is moving down the line. There are some pieces that have to be sanded prior to assembly or painting and these functions occur in the sanding booths which are a part of the spray coating and assembly operations. All of the paints used are stored in the paint mix room and then mixed as the colors are requested.

Also included within the spray coating and assembly operations are various activities that utilize materials that may have VOC's. These include caulking used between the truck panels or windshields, any glues needed, solvent wipes to wipe down the parts, etc,.

Coating is applied using conventional air spray pumps with pressure at 120 psi fluid pressure and atomized at a range of 35 to 45 psi. VOC content of the paint are mostly MEK, toluene, xylene, t-butyl acetate, ethyl benzene, cumene, glycol ether, methanol, diethanol- amine and vinyl acetate. The top coat paints produce the most VOC emissions.

The applicant is also requesting to remove Boilers No. 2 and 6 (ES-BLR-2 and ES-BLR-6) as they been removed from operation.

III. Purpose of Application

Due to an increase in demand for heavy duty trucks and increase in customer requests for certain types of finishes on their trucks, Daimler plans to increase production at the this facility, which will increase the emissions of volatile organic compounds (VOCs) and thus, triggering both a PSD review and a need to increase/reestablish the Plant-Wide Applicability Limit (PAL) limit (Only for

VOC emissions) for the facility. Daimler proposes no changes to the PAL limit for NO_x and CO_{2e} emissions as part of this application.

V. Regulatory Summary:

Due to increased productions most of the sources at the facility will be affected and the following regulatory discussion pertains to the Federal and State regulatory requirements that are applicable to majority of the sources:

MACT / RACT Sources:

The facility is major for HAP emissions and is therefore considered a major source with respect to the National Emission Standards for Hazardous Air Pollutant (NESHAP) regulations. This application will not change the applicability and compliance of any Maximum Achievable Control Technologies (MACTs) listed below including the modified spray coating and assembly operations.

- 15A NCAC 2D .1111, MACT Subpart MMMM "Surface Coating of Miscellaneous Metal Parts and Products"

  All the spray coating and assembly operations (ID No. ES-SCAO) sources and the pretreatment line (ID NO. ES-PT) are subject to the requirements of MACT Subpart MMMM. These sources will remain in compliance with the rule and current permit requirements. As per Section 2.2. C. 2. c., of the current permit the facility shall demonstrate compliance with this regulation by demonstrating compliance with MACT Subpart PPPP "National Emission Standards for Hazardous Air Pollutants for Surface Coating of Plastic Parts and Products." The increase in production does not change or affect the applicability, emission limits, compliance options, and notification requirements for this regulation.

  Compliance with MACT Subpart MMMM is also considered an alternative controls for compliance with "reasonable available control technology" (RACT) (15A NCAC 02D .0952) for this facility (Section 2.2 A. 1., of the current permit).

- 15A NCAC 2D .1111, MACT Subpart PPPP "Surface Coating of Plastic Parts and Products"

  The paint spray booths (ES-PSB-1 through ES-PSB–37), paint drying ovens (ES-PDO-1 through ES-PDO-21), flash off booths (ES-FO-1 through ES-FO-16), wax booth (ES-WB), sanding booths (ES-SB1 through ES-SB6), tack booths (ES-TB1 through ES-TB18), pre-fabricated paint spray booth with a natural gas-fired drying oven (ES-PSB-38), paint mix room (ES-PMR) and various operations including gluing, caulking, seamseal, solvent wipe, cleanup solvent and other non-coating sources of VOC are all subject to the above rule. The increase in production does not change or affect the applicability, emission limits, compliance options, operating limits or work practice standards and notification requirements for this regulation.

  Compliance with MACT Subpart PPPP is also considered alternative controls for compliance with "reasonable available control technology" (RACT) (15A NCAC 02D .0952) for this facility (Section 2.2 A. 1., of the current permit).

- 15A NCAC 2D .0952 - Petition for Alternative Controls for RACT for 15A NCAC 2D .0967 Miscellaneous Metal and Plastic Parts Coatings

  The paint spray booths (ES-PSB-1 through ES-PSB–37), paint drying ovens (ES-PDO-1 through ES-PDO-21), flash off booths (ES-FO-1 through ES-FO-16), wax booth (ES-WB), sanding booths (ES-SB1 through ES-SB6), tack booths (ES-TB1 through ES-TB18), pre-fabricated paint spray booth with a natural gas-fired drying oven (ES-PSB-38), paint mix room (ES-PMR) and various operations including gluing, caulking, seamseal, solvent wipe, cleanup solvent and other non-coating sources of VOC are all subject to this rule.

  For ozone nonattainment areas, Section 172 of the Federal Clean Air Act requires RACT to be installed on facilities that have the potential to emit 100 TPY or more of VOC or NO_X (major sources). The Cleveland facility has the potential to emit more than 100 TPY of VOC and was **once** located in a nonattainment area at the time of regulation applicability. The applicant submitted an application in October 2007 requesting that compliance with NESHAP Subparts MMMM and PPPP MACT standards be considered RACT. This determination was approved by NC DAQ stating that the facility has "installed and operates reasonable available control technology as the MACT Subpart MMMM and PPPP meets the requirements of RACT." The appropriate requirements were incorporated into the permit (Section 2.2 A. 1., of the current permit).

  The facility (located in Cleveland Township) is in an area currently in attainment for ozone, however, rule 2D .0967 "Miscellaneous Metal and Plastic Parts Coatings," remains in effect and the increase in production does not change or affect the applicability, monitoring, record keeping and reporting requirements for his rule.

- 15A NCAC 2D .1111, MACT Subpart ZZZZ "Stationary Reciprocating Internal Combustion Engines (RICE) MACT"

  This MACT establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.

  The sources at this facility subject to this MACT are insignificant sources consisting of two existing (construction or reconstruction before June 12, 2006) diesel fuel-fired fire pumps (225 hp, each, ID Nos. IES-FP1 and IES-FP2) and a new (construction or reconstruction after June 12, 2006) diesel-fired emergency generator (335 hp, ID No. IES-EG).

  The increase in production does not change or affect the applicability or any other requirements of this regulation for these sources.

- 15A NCAC 2D .1109: CAA § 112(j); Case-by-Case MACT for Boilers & Process Heaters

  The natural gas-fired boilers (ID Nos. ES-BLR-1 through ES-BLR-6) are all subject to this MACT. This Case-by-Case MACT requirements were added to the permit under Air Permit No.

04625T29 which required the natural gas-fired boilers have to meet work practice standards. These boilers will be subject to the MACT Subpart DDDDD "for Industrial, Commercial, and Institutional Boilers and Process Heaters" beginning May 20, 2019. The increase in production does not change or affect the applicability or any other requirements of this regulation for these sources.

Storage Tanks and Parts Washers

Spray Coating and Assembly Operations (ES-SCAO) and all storage tanks at this facilities are subject to VOC work practice standards.

- 15A NCAC 2D .0958: "Work Practices For Sources of Volatile Organic Compounds"

  This regulation establishes work practice standards for a variety of sources of VOC at the site. Daimler will continue to ensure that the various emissions sources that are subject will comply with this VOC work practice standard as this requirement will remain in effect after inclusion of the PAL.

Diesel fuel-fired Emergency fire pumps and generators.

The engines are insignificant sources that emit VOC, but are not subject to any VOC regulations. However, they are subject to the SIP regulations listed below, as well as MACT and NSPS.

- 15A NCAC 2D .0516: "Sulfur Dioxide Emissions from Combustion Sources

  Under this regulation, emissions of sulfur dioxide from combustion sources cannot exceed 2.3 pounds of sulfur dioxide per million Btu input. Since diesel a clean fuel is burned at these sources the sources will always be in compliance with these regulations.

- 15A NCAC 2D .0521 - Control of Visible Emissions

  Under this regulation, for sources manufactured after July 1, 1971, visible emissions cannot be more than 20 percent opacity when averaged over a six-minute period. Sources subject to this rule have demonstrated continuous compliance with this rule and with this project continued compliance is expected.

Air Handling Units and Dynamometers

Spray booth and air handling units at the facility are insignificant sources and emit VOC, but are not subject to any VOC regulations. However, they are subject to the SIP regulations listed below:

- 15A NCAC 02D .0515: Particulates from Miscellaneous Industrial Processes

  This regulation limits the hourly particulate emissions rate from impacted sources. This hourly rate is based on the hourly process rate. There are no changes to the hourly process rate for sources impacted by this project. Thus the hourly emissions rate of particulate matter from the sources does not change and continued compliance is expected.

State-Only Regulations Applicability

- 15A NCAC 2D .1100: "Control of Toxic Air Pollutants"

  In December 2014 Daimler submitted an application (Application Number: 8000045.14A) for removal of air toxics from the permit. This application was approved and Air Quality Permit No. 04625T33 was issued on April 17, 2015. As per the review of this application done by Ms. Betty Gatano "as part of this permit modification and at the request of the facility, the DAQ conducted an evaluation to demonstrate that removal of the air toxics limits from the permit does not pose an unacceptable risk to human health. The permit application included the highest historic estimate of TAP emissions, which occurred in 2006. These emissions were added to the potential emissions of TAPs from the new emergency generator and the new paint spray booth. The resulting emissions were compared to the modeled limits specified in the permit. The combined emissions were all well below the modeled limits, with the majority of emissions less than 1% of the permitted emission limits."

  For this project the facility compared the highest production years (2005/2006) to the new potential production rate. The total trucks manufactured in 2005 was 56,208 trucks and in 2006 it was 57,206 trucks. The average trucks production for (2205/2006) was 56707 trucks/year. The ratio of potential production of 80,300 trucks/year to the (2205/2006) average was 1.4. Thus, the increase in actual truck production from 2005/2006 to the potential truck production in this application is a ratio of 1.4.

  To determine the air toxics as a result of the anticipated production as listed in this application, the actual emission rates from 2006 (highest production year) were multiplied by 1.4 and the results were compared to the previously modeled emission rates. "Based on these updated numbers all pollutants are less than 35% of the standard."

  Potential facility-wide emissions of TAPs will remain below the previously permitted limits following the proposed project. The project will not cause an unacceptable risk to human health and continue to comply with House Bill 952.

- 15A NCAC 2D .0530: "Prevention of Significant Deterioration"

  Congress first established the New Source Review (NSR) program as part of the 1977 Clean Air Act Amendments and modified the program in the 1990 Amendments. The NSR program requires pre-construction review prior to obtaining a permit. The basic goal of NSR is to ensure that the air quality in clean (i.e. attainment) areas does not significantly deteriorate while maintaining a margin for future industrial growth. The NSR regulations focus on industrial facilities, both new and modified, that create large increases in the emission of certain pollutants. PSD permits are a type of NSR permitting requirement for new major sources or sources making a major modification in an attainment area.

  Pursuant to the Federal Register notice on February 23, 1982, North Carolina (NC) has full authority from the EPA to implement the PSD regulations in the State effective May 25, 1982. NC's State Implementation Plan (SIP) approved PSD regulations have been codified in 15A

NCAC 2D .0530, which implement the requirements of 40 CFR 51.166. The Code of Federal Regulations (CFR) in 15A NCAC 2D .0530 are incorporated by reference unless a specific reference states otherwise.

The version of the CFR incorporated in 15A NCAC 2D .0530 is that as of November 7, 2003, except those provisions noticed as stayed in 69 FR 40274, and does not include any subsequent amendments or editions to the referenced material. The PSD regulations applicable to this project are the regulations in 15A NCAC 2D .0530 in effect as of the final permit issuance date. The latest revisions to 15A NCAC 2D .0530 became effective on July 28, 2006.

Under PSD requirements, all major new or modified stationary sources of air pollutants as defined in Section 169 of the Federal Clean Air Act (CAA) must be reviewed and permitted prior to construction by the permitting authority, as applicable, in accordance with Section 165 of CAA. A "major stationary source" is defined as any one of 28 named source categories, which emits or has a potential to emit 100 tons per year of any regulated pollutant, or any other stationary source, which emits or has the potential to emit 250 tons per year of any PSD regulated pollutant.

The facility operates under the standard industrial classification (SIC) code 3711 applies to “Motor Vehicles and Passenger Car Bodies” This industry classification is comprised of establishments primarily engaged in manufacturing or assembling complete automobiles, trucks, commercial vehicles, and buses, as well as specialty motor vehicles intended for highway use such as ambulances, armored cars, hearses, fire department vehicles, snow plows, and tow trucks.

The Motor Vehicles and Passenger Car Bodies industry (SIC Code 3011) is not one of the 28 named source categories. However, this Daimler facility has the potential to emit greater than 250 tpy of a PSD-regulated pollutant, and is therefore an existing PSD major stationary source as defined in 40 CFR 51.166(b)(1)(i)(b). For existing major stationary sources, there are several steps to determine whether the modification is a *major modification* and therefore subject to PSD pre-construction review. The first step is to determine whether there is a physical change or change in the method of operation. Second, there must be an emissions increase. The third, the net emissions increase must be equal to or greater than certain "significance levels" as listed in 40 CFR 51.166(b)(23)(i) for the regulated pollutants.

VOC Emissions

As a result of expected production increases (additional trucks manufactured), VOC emissions will increase directly proportional to the final estimated truck production. Based on the expected production of 80,300 trucks, and the use of 35 lb VOC per truck, the potential annual VOC emissions from the coating operations are estimated to be **1405 TPY**.

Spray Painting

No new equipment is being added or modified at the facility. The applicant calculated the potential emissions from the spray coating and assembly operations from the proposed expansion of the facility and was based on the manufacture of 220 trucks/day. The emissions of VOCs per truck of 35 pounds of VOC / truck is based on the average of the last 12 months of data, based on 365 operating days per year and the equation below:

$$\text{Potential Spray Coating VOC Emissions (lb/yr)} = \frac{\text{lb VOC}}{\text{truck}} \times \frac{\text{trucks produced}}{\text{day}} \times \frac{\text{operating days}}{\text{year}}$$

The VOC emissions per truck were determined by using historical monthly tracking data that the facility used to comply with the conditions of the current permit. The monthly usages of materials consumed were tracked and the amount collected in waste drums subtracted. The difference was assumed to be either applied as paint or lost as emissions. The material lost multiplied by the VOC content of each material was assumed to be emitted from the process. This number divided by the number of trucks produced resulted in an average of 35 pounds of VOC/truck.

The potential emissions of VOCs from the spray coating area was 1,405 tons per year of VOCs from the production of 80,300 trucks/year. This potential emissions of VOCs from the spray coating and assembly operations comprises more than 99% of the emissions due to this expansion.

PM Emissions

Spray Painting

Potential PM emissions from spray painting were calculated using an estimate of total annual paint applied (as solids), the transfer efficiency of the spraying method used, and the collection efficiency of the spray booths (filter or water wash), as shown in the following equation:

$$\text{Potential Spray Painting PM emissions (lb/yr)} = \text{Total Solids Applied (lb/yr)} \times (1 - \text{Transfer Efficiency}) \times (1 - \text{Collection Efficiency})$$

The annual paint applied was estimated by scaling actual usages from 2013 based on production to the potential production levels that the expansion will reach. The transfer efficiency depends on the type of paint booth. Two-thirds of the spray painting booths at this facility are manually operated all of them employ high volume low pressure (HVLP) spray guns, which, have a transfer efficiency of 40%. The other third of the paint booths are robotically operated spray booths with a transfer efficiency of 60%. The collection efficiency of the spray booths is assumed to be 99%. (All the efficiency percentages are based on industry knowledge).

Cab and Hood Sanding

Potential particulate matter emissions from cab and hood were calculated using emission rates developed in a study on paint panels from the facility. The worst-case emission rate for the paint and associated material was used for both primer and topcoat sanding for cabs and hoods.

Emissions were based on the emission rate, number of sanders used, potential hours sanded per year, and the collection efficiency of the sanding booth filter, according to the following equation:

$$\text{Potential Hood Sanding PM emissions} = \text{Emission rate} \times \text{Annual Hours of Operation} \times \text{Number of Sanders} \times (1 - \text{Collection Efficiency})$$

Potential hours of operation was based on 8,760 hours per year, the number of sanders for both primer and topcoat operations were estimated to be a maximum of 4, and the collection efficiency of the sanding booth filter assumed to be 99%.

Emissions from other sources

Combustion sources include boilers, paint drying ovens, air makeup units, and other miscellaneous sources. These sources use natural gas as a fuel and emissions were calculated using AP-42 emission factors including emissions from the diesel fire pumps.

Emissions from welding operations were based on emission factors provided by engineering estimation. Data from 2013 usage of various wires and rods used for welding were multiplied by the appropriate factor and emissions were scaled for potential production.

Emissions from storage tanks were calculated using data from 2013 in the TANKS program and scaled for potential future production levels.

Emissions from the dynamometers at the facility were calculated based on a potential rate of 220 trucks/day through the dynamometers. Emissions from the parts washers are calculated based on the potential usage of each material.

When previously permitted, the pretreatment line used chromium and had particulate matter and toxic emissions. The process has been changed to use non-chromium and non-VOC additives. There were no emissions from the pretreatment line.

The table below shows the potential emissions in tons per year (TPY) from the facility based on the manufacture of 220 trucks/day at an emissions of 35 pounds of VOC / truck.

Pollutant	Potential Emissions (TPY)	Significant Emissions Rates (TPY)	PSD Triggered	PSD Applicability Explanation
CO	46.25	100	N	
NO_x	52.50	40	N	Potential emissions are equal to the PAL limit of 52.5 tpy (Section 2.3 B. 1., of the current permit). Thus, PSD is not triggered.
SO_2	0.67	40	N	
Particulate matter	17.17	25	N	
PM_{10}	**17.66**	15	Y	See Potential Emissions Increase analysis.
$PM_{2.5}$	**17.23**	10	Y	See Potential Emissions Increase analysis.
VOC	**1406.4** (potential emissions in tons per year (TPY) from the facility based on the manufacture of 220 trucks/day at an emissions of 35 pounds of VOC / truck)	40	Y	Also exceed the PAL limit of 722.8 tons per year of VOC. (Section 2.3 A. 1., of the current permit)
Pb	0.00	0.6	N	
CO_{2e}	54,638	75,000	N	Potential emissions are less than PAL limit of 90,045 tpy (Section 2.3 C. 1., of the current permit)

Due to potential significant increases in truck production, facility needs to increase the VOC PAL above the existing level of 722.8 TPY. The predominant source (over 99%) of VOCs are from the spray coating and assembly operations.

As 40 CFR § 51.166(w)(11), Daimler developed a major NSR (PSD) application for the spray coating and assembly operations. For all other operations that emit VOC (which is less than 1% of total VOC emissions), the PAL has to re-set or be re-established. For these remaining sources except the dynamometers, (years 2012 and 2013) were used to develop baseline actual emissions. For the dynamometers, potential emissions were used as these sources have never been calculated before this application. In summary, the emission value that is added to the PAL from all sources (except the spray coating and assembly operations) is 1.4 TPY

The total VOC PAL is 1406.4 TPY with 1405 coming from the spray coating and assembly operations and 1.4 coming from BAE and PTE as described, above.

However, the potential emissions of VOC, PM_{10} and $PM_{2.5}$ are above their corresponding significant emissions rates (SER).

The facility is not proposing to add any new emission sources as part of this application. The facility has been operating the same equipment for the past 10 years and to prove PSD is not triggered for PM_{10} or $PM_{2.5}$, the facility did a project analysis to demonstrate that the potential emissions increase for PM_{10} or $PM_{2.5}$, will not trigger a PSD evaluation. The increase in potential VOC emissions is large and using any baseline years will certainly trigger a PSD evaluation. Potential VOC emissions are used in the analysis to determine the actual project increase and to help in reestablishing the PAL.

Net emissions increase as defined by 40 CFR § 51.166(b)(3)(i) "the amount by which the sum of the following exceeds zero… The increase in emissions from a particular physical change or change in the method of operation at a stationary source…and...Any other increases and decreases in actual emissions at the major stationary source that are contemporaneous with the particular change and are otherwise creditable...".

The potential increase of PM_{10} and $PM_{2.5}$ emissions due to the expansion is estimated to be as 17.66 TPY and 17.23 TPY, respectively. The baseline actual emissions for this project for VOC, PM_{10} and $PM_{2.5}$ have been developed on a facility-wide basis to provide an equivalent comparison of pre-project baseline actual emissions to the post-project potential emissions. While the federal rules allow a 10 year look-back to establish baseline actual emissions, the NC DAQ rules 15A NCAC 2D .0531(a)(1) allows a 5-year lookback period with a Director discretion to allow up to 10 years if the applicant demonstrates that the selected baseline period is more representative of normal source operation.

As per the applicant "Prior to April 2007, Daimler Trucks (as Freightliner) experienced an unprecedented amount of pre-buys due to an EPA-mandated engine change that was going to cost customers significantly more money to purchase a truck. As a result, in meeting the demand of these orders, the use of coatings and paints for truck cabs and parts also peaked during this period. The period in which Daimler received this order was between 2004 cycle year (CY) and 2006 CY, where 2005 CY was the height of filling the orders for trucks. Furthermore, many economic analysts have cited late 2007 as the beginning of the recent recession. During this recent economic downturn Daimler – like many other manufacturing companies – has experienced low production since 2007, which has only been amplified by the fact that they have received a reduced number of orders due to the significant number of orders received prior to 2007 CY.

As a result of the orders placed and filled during the period discussed above, Daimler is requesting an extended 10 year look-back period to the beginning of 2006 in order to best represent the operations occurring at the Cleveland facility under expected and allowed operational conditions."

Based on the above scenario and the data that was developed for the PAL limit several years ago, an evaluation of the data over a 10 year period revealed that CY 2005 and CY 2006 were the highest production and emission years for the facility. These two years remain the highest emitting years, but the 10-year look back period prohibits Daimler from using CY 2005. Thus, CY 2006 and CY 2007 were used to develop the baseline actual emissions.

The past ***reported*** emissions of $PM_{2.5}$ during the 2006 and 2007 time frame are very small and as per the applicant "we have gone back and reviewed the 2006/2007 Emissions Inventory data and have discovered that PM-2.5 emissions from spray coating operations in those inventories were assumed to be 1% of the PM-10 emissions." PM-2.5 emissions from combustion and welding sources were not estimated. ***It appears that the 1% estimate was a best guess and had no scientific basis***. From the above examples, two different approaches were used for PM-2.5 emissions. In this PSD application in order to have consistent data or "apples to apples" data the two referenced data sets are not consistent.

In this application the applicant elected to assume that PM-10 and PM-2.5 would be identical, except for the emergency engines. Consistent with this approach they elected to go back and recalculate the PM-2.5 data from 2006/2007 to make this data equivalent to PM-10 and thus create consistent data for development of the PSD/PAL application.

As an alternative to this approach, the 1% assumption on the PSD/PAL application for PM-2.5. However, the applicant did not feel comfortable saying that PM-2.5 is 1% of PM-10 in the absence of scientific data or verified emission factors. But under this approach PM-2.5 emissions from all sources in the PSD/PAL application would be less than 10 tons per year and thus PSD would not be triggered. In summary, the approach they presented is more conservative from a PM-2.5 calculation standpoint and does not triggered PSD.

DAQ agrees with the rationale of readjusting the past emissions since the future potential emissions of $PM_{2.5}$ were calculated on the same basis. The tables below provide the summary for "Potential Emissions Increase," "Baseline Emissions," and "Net Increase" (Net Increase = Potential Emissions Increase - Baseline Emissions).

All emissions estimations above are based off material balances. As there are no VOC controls, there technically are no periods when emissions are not calculated or excluded due to SSM.

Potential Emissions Increase Analysis Table

Pollutants	*Baseline emissions (TPY)	Potential Emissions Increase (TPY)	Net Increase = Potential Emissions Increase - Baseline Emissions (TPY)	Significant Emissions Rates (TPY)	PSD Triggered
VOC	**442.9**	**1406.4**	**963.5**	40	Y
PM_{10}	9.93	17.66	7.73	15	N
$PM_{2.5}$	9.93	17.23	7.3	10	N

*Baseline emissions based on 2006 and 2007 (*963.5 TPY Net Increase includes emissions from the 1.2 TPY increase from Existing Small Sources + 0.2 TPY increase from the Dynamometers)*

There does not seem to be any sound scientific, testing or published data regarding emission factors for $PM_{2.5}$ or the correlation between PM_{10} and $PM_{2.5}$ emissions from any spray painting booths. To ensure that $PM_{2.5}$ emissions from the facility are correctly reported the applicant shall test the spray area for $PM_{2.5}$ emission factors like emissions per truck or emissions per gallon of paint applied or any other equivalent factors agreeable with DAQ. This testing shall be completed and results submitted to DAQ for approval within six months of receiving the permit. The requirements for these tests are specified in 2.1 B. 4. g., through i., of the modified permit.

The above testing requirements were dropped as per response of the applicant. (See applicant's response on 3/10/2016, in Section XI. "Public Notice/EPA, Regional Office & Applicant Review," of this review, below)

Regulation 15A NCAC 2D .0530(u) requires the applicant to track and report emissions for a period of ten years the emissions of PM10 and PM2.5 on a calendar year basis if the emissions are based on projected emissions. Since these emissions are potential emissions this regulation does not apply.

VI. Actual PALs

Section 40 CFR § 51.166(w) provides provisions in paragraphs (w)(1) through (15) of this section in setting up the Actuals PALs.

VOCs, PM, PM_{10}, $PM_{2.5}$, SO_2, and other byproducts of combustion are emitted from the emissions sources located within the spray coating and assembly operations. There is a current PAL for VOC, NO_x and CO_2e.

In 2011, the facility submitted an application requesting a PAL for volatile organic compounds (VOC), nitrogen oxides (NO_x) (Application # 8000045.11A), and carbon dioxide equivalent (CO_{2e}) (Application # 8000045.11B) at the Cleveland facility. Because of the non-attainment designation for Rowan County for ozone at that time, the facility requested the VOC PAL in accordance with NA-NSR regulations (40 CFR 51.165; 15A NCAC 2D .0531) and the NOx and the CO_{2e} PAL in accordance with the PSD regulations (40 CFR 51.166; 15A NCAC 2D .0530). The following PALs were established and are contained in Section 2.3 of the current permit:

The PAL limits in the current permit (No. 04625T33) are shown below:

Pollutant	PAL limits TPY
VOC	722.8
NO_X	52.5
CO_{2e}	90,045

The effective date for these PALs was August 10, 2011 and the expiration date is July 31, 2021. Because of the proposed changes in production levels, the facility expects that the PAL for VOC will be exceeded.

The Cleveland township has been re-designated as an attainment area for ozone since the time of the original PAL application in 2011, and thus the applicable procedures for modifying a PAL at a major stationary source are found in 40 40 CFR § 51.166(w)(11) “increasing a PAL during the PAL effective period,” and per 40 CFR § 51.166(w)(11)(i) DAQ may increase a PAL emission limitation only if the source complies with the provisions in 40 CFR § 51.166(w)(11)(i)(a) through (d).

<u>40 CFR § 51.166(w)(11)(i)(a)</u> - requires the facility shall submit a complete application to request an increase in the PAL limit for a PAL major modification. Such application shall identify the emissions units contributing to the increase in emissions so as to cause the major stationary source's emissions to equal or exceed its PAL.

The application identified the emission units contributing to the increase in emissions resulting in emissions greater than or equal to the existing PAL including the proposed changes in production levels that will result in emissions exceeding the current PAL for VOC. The affected emission units are mentioned in the table below:

Emission Source ID.	Source Description
ES-SCAO	Spray Coating and Assembly Operations – Booths and Ovens (including VOC from fuel combustion)

ES-BLR-1,2,3,5,&6	Boilers
ES-EG	Emergency Generator
ES-FP1 & 2	Fire Pumps
Various	Air handling exchange units
Various	Storage tanks
Various	Parts Washer
Various	Dynamometer

40 CFR § 51.166(w)(11)(i)(b) - To increase a PAL for a given pollutant this rule requires the facility "shall demonstrate that the sum of the baseline actual emissions of the small emissions units, plus the sum of the baseline actual emissions of the significant and major emissions units assuming application of BACT equivalent controls, plus the sum of the allowable emissions of the new or modified emissions units, exceeds the PAL. The level of control that would result from BACT equivalent controls on each significant or major emissions unit shall be determined by conducting a new BACT analysis at the time the application is submitted, unless the emissions unit is currently required to comply with a BACT or LAER requirement that was established within the preceding 10 years."

Provisions to increase PAL during the effective period the facility are also outlined in 40 CFR § 51.166(w)(11)(i)(b) and in the "Federal Register / Vol. 67, No. 251 / Tuesday, December 31, 2002 / Rules and Regulations (# 6 on Page # 80210), to increase PAL during the effective period the facility "must demonstrate that the sum of the baseline actual emissions of your small emissions units, plus the sum of the baseline actual emissions from your significant and major emissions units (adjusted for a current BACT level of control unless the emissions units are currently subject to a BACT or LAER requirement that has been determined within the preceding 10 years, in which case the assumed control level shall be equal to the emissions unit's existing BACT or LAER control level), plus the sum of the allowable emissions of the new or modified existing emissions unit(s), ***exceeds the PAL***."

The source category for this source based on the attainment status of the area and pollutant is mentioned below:

Source Category	PTE
Small	< 40 tons
Significant emissions unit	≥ 40 but < 100
Major	> 100

Daimler has elected not to differentiate between small, significant, and major emission units within the spray coating and assembly operations. Instead, Daimler has elected to develop a BACT for the entire spray coating and assembly operations, as was conducted in 2001. As per the applicant "the same approach was used in this permit application as was used in 2001 PSD application. Additionally it would be impossible to set individual limits per emission source within a coating operation such as a truck assembly line with multiple booths and ovens. It is much easier to set a short term BACT for the entire operation as we have done with 3.5 lb of VOC per gallon coating on a monthly average basis."

Furthermore "The VOC emissions from all other VOC emission sources (i.e., tanks, combustion sources, etc.) at the facility are considered small as referenced in §51.166(w)(11)(i)(b). As such, the emissions from these other small emission sources will be quantified in accordance with the requirements listed in §51.166(w) using baseline actual emissions and will be added to the BACT limit for the spray coating and assembly operations to set the new VOC PAL."

A complete BACT analysis for VOC was conducted for all VOC emitting spray booths and drying ovens located within the spray coating and assembly operations since the existing BACT limits for these units were not established within the preceding 10 years of application submittal.

Based on the BACT (See Section VII., of the review, below), none of the existing emission units require a downward adjustment of the baseline emission levels, as emissions from these units meet current BACT requirements, since the BACT limits established for these sources in 2001 and with this review are the same i. e., "The VOC content of the coatings used at the facility shall not exceed 3.5 pounds per gallon as applied on a calendar monthly average basis. (Section 2.1 B. 4. b. i., of the current permit)

As per the "Federal Register / Vol. 67, No. 251 / Tuesday, December 31, 2002 / Rules and Regulations (# 6 on Page # 80210) which states
"A*fter the reviewing authority has completed the major NSR process, and thereby determined the allowable emissions for the new or modified emissions unit(s), the reviewing authority will calculate the new PAL as the sum of the allowable emissions of the new or modified emissions unit(s), plus the sum of the baseline actual emissions of your small emissions units, plus the sum of the baseline actual emissions from significant and major emissions units* ***adjusted for the appropriate BACT level of control*** *as described above. Your reviewing authority must modify the PAL permit to reflect the increased PAL level pursuant to the public notice requirements."*

Adjusted PAL = sum of the baseline actual emissions of your small emissions units, plus the sum of the baseline actual emissions from your significant and major emissions units (442.9) + plus the sum of the allowable emissions of the new or modified existing emissions unit(s) (963.5[1]) = 1406.4 TPY

Adjusted PAL (1406.4 TPY) exceeds the existing PAL (722.8 TPY). Thus the new PAL for the entire facility is 1406.4 TPY. (See Section 2.3 A. 1., of the modified permit)

Note - The total VOC PAL is 1406.4 TPY with 1405 coming from the spray coating and assembly operations as the BACT for that area. Though the difference between the PAL and BACT is small. The PAL is for the entire facility and the BACT was for only the Spray Coating and Assembly Operations (ES-SCAO) since this was the only source subject to a BACT determination.

[1] *963.5 TPY Net Increase includes emissions from the 1.2 TPY increase from Existing Small Sources + 0.2 TPY increase from the Dynamometers)*

<u>40 CFR § 51.166(w)(11)(i)(c)</u> - requires the facility to obtains a major NSR permit for all emissions units mentioned above, regardless of the magnitude of the emissions increase resulting from them (that is, no significant levels apply). These emissions units shall comply with any emissions requirements resulting from the major NSR process (for example, BACT), even though they have also become subject to the PAL or continue to be subject to the PAL.

The facility is submitting a PSD application for an updated BACT analysis and an additional impacts analysis for the spray coating and assembly operations, which conforms to the requirement to obtain a major NSR permit. The permit application includes all required elements of a major NSR permit application for the sources identified above, including the BACT analyses (See Section VII, of the review), the additional impacts analysis (See Section VIII, of the review), a summary of the NC air toxics applicability (See Section V, of the review), and all required permit forms. In accordance with §51.166(w)(11)(i)(d), the new PAL level in the major NSR permit will become effective upon issuance of the PSD/PAL permit, as the existing operations are currently operational.

<u>40 CFR § 51.166(w)(11)(i)(d)</u> - requires the new PAL permit shall require that the increased PAL level shall be effective on the day any emissions unit that is part of the PAL major modification becomes operational and **begins to emit the PAL pollutant**. Since the facility has already started to increase their production the modified will become effective the day it is issued.

Some of the other requirements in setting up a PAL permit are addressed below:

<u>Effective and Expiration Date of the PAL</u>

The effective date for this PAL shall be on the date the permit is issued or satisfy criteria of 40 CFR § 51.166(w)(11)(i)(d), above, and as per 40 CFR §51.166(w)(8)(i) PAL effective period of 10 years. Any PAL that is not renewed in accordance with the procedures in paragraph per 40 CFR § 51.166(w)(10) shall expire at the end of the PAL effective period, and the requirements in 40 CFR § 51.166(w)(9)(i) through (v). The effective and expiration date for the VOC is stipulated in Section 2.3 A. 2., and 3., of the modified permit.

If the applicant applies to renew the PAL permit in accordance with 40 CFR § 51.166(w)(10) before the end of the PAL effective period then the PAL permit shall not expire at the end of the PAL effective period and shall remain in effect until a revised PAL permit is issued by the DAQ.

Upon PAL permit expiration, DAQ shall decide whether and how the PAL allowable emissions will be distributed and issue a revised permit incorporating allowable limits for each PAL emissions unit, as appropriate. 40 CFR §51.166(f)(12)(ix) requires all data used to establish the PAL pollutant must be re-validated through performance testing or other scientifically valid means approved by DAQ every 5 years after issuance of the PAL.

<u>Testing</u>

If technically practicable, the applicant shall conduct validation testing to determine VOC emission factor within 6 months of PAL permit issuance as per 40 CFR § 51.166(w)(12)(vi)(c) unless DAQ determines otherwise.

40 CFR § 51.166(w)(12)(ix) requires all data used to establish the PAL pollutant must be re-validated through performance testing or other scientifically valid means approved by the reviewing authority at least once every 5 years after issuance of the PAL and as required by 40 CFR § 51.166(w)(14)(iii) the re-validation results must be submitted to DAQ within three months after completion of test. [Section 2.3 A. 8., of the modified permit]

Monitoring and Record keeping

The applicant shall record monthly the natural gas burned in the boilers (ID Nos. ES-BLR-1, through ES-BLR-5), miscellaneous combustion source (ID No. ES-12), and paint drying ovens (ES-PDO-1 through ES-PDO-21). The applicant shall record daily the VOC containing material used in the spray-coating and assembly operations (ES-SCAO), the amount collected in waste drums, record monthly all VOC-containing materials purchased, and shall be in violation with PSD requirements and in noncompliance with 2D .0530 if the amount of materials used, reclaimed, and purchased are not recorded.

40 CFR 51.166(w)(12)(ii) lists the approved monitoring approaches such as mass balance calculations for activities using coatings or solvents (40 CFR § 51.166(w)(12)(ii)(a)) and emission factors (40 CFR § 51.166(w)(12)(ii)(d)). The applicant shall use mass balance calculations for activities using coatings or solvents and emission factors to calculate the monthly VOC emissions from the boilers (ID Nos. ES-BLR-1, through ES-BLR-5), miscellaneous combustion source (ID No. ES-12), and paint drying ovens specified in Section 2.3 A. 9., through 12., of the modified permit.

40 CFR 51.166(w)(12)(ii) also lists CEMS as a approved monitoring approach, however there are no CEMS operated at the site. The modified PAL permit does not include any CEMS requirements.

Miscellaneous VOC Emission Sources - By conservative estimation the annual VOC emissions from the one (10,000 gallon) antifreeze tank (IES-1), three (10,000 gallon) diesel fuel tanks (IES-2, IES-3, and IES-4), one (4,000 gallon) butanol tank (IES-5), four (10,000 gallon) purge tanks (IES-6, IES-7, IES-8, and IES-9), two distillation units (IES-10 and IES-11), five (125 gallon) bulk tanks for new mix room (IES-14), and two (55 gallon) piggable tanks for new mix room (IES-15) will not exceed 1 ton per year. In order to avoid having to track actual VOC emissions from these very small sources, the applicant has agreed to assume actual emissions from these sources exceed their combined potential emissions for each reporting period. The emission rate will be assumed to be 1 ton per rolling 12-Month period, combined, as stipulated in Section 2.3. A. 13., of the modified permit. This estimation helps the facility to not run the cumbersome TANKS program to calculate VOC emissions from tanks.

Calculations and the total amount of facility wide VOC emissions shall be recorded monthly in a logbook and retained in an electronic format as per 40 CFR §51.166(w)(13)(ii) for a period of 5 years.

Following the requirements of 40 CFR § 51.166(w)(13)(ii)(a) and (b) following records, for the duration of the PAL effective period plus 5 years:

i. A copy of the PAL permit application and any applications for revisions to the PAL; and
ii. Each annual certification of compliance pursuant to Title V and the data relied on in certifying the compliance.

[Section 2.3 A. 9. Through 16., of the modified permit]

Reporting

40 CFR §51.166(w)(14)(i) the semi-annual report shall be submitted to DAQ within 30 days of the end of each reporting period. This report shall contain the information required in 40 CFR §51.166(w)(14)(i) (a) through (g).
[Section 2.3 A. 17., of the modified permit]

Removal of NSR Reference

Application # 8000045.11A which resulted in the issuance of Air Permit 04625T30 to incorporate Actual PALs for VOC, NO_x and CO_2e emissions, was issued on August 10, 2011. At that time Rowan County was designated as non-attainment for the 8-hour ozone standard. Both VOC and NO_x are precursors for ozone. Thus, the Actual PALs for VOC, NO_x emissions had reference to 2D .0530 and 2D .0531

The PAL provisions were implemented through 2D .0530 and 2D .0531 (NSR) and were included in 40 CFR §51.166 and §51.165 (NSR) "Actuals PAL." The "Contents of the PAL Permit" were coded in 40 CFR §51.166(w)(7) and §51.165(f)(7) (NSR). The intent for citing the dual regulations 2D .0530 and 2D .0531 was to ensure not to rewrite the attainment reference (2D .0530 and 40 CFR §51.166) when the County got back into compliance.

The County is currently designated as attainment for the ozone standard. The reference to NSR (2D .0531 and 40 CFR §51.165) is removed from the Actual PAL for all pollutants subject to Actual PAL limits.

VII. Best Available Control Technology (BACT)

As mentioned earlier 99% of the potential emissions of VOCs are from the spray coating and assembly operations due to this expansion.

The spray coating and assembly operations (ES-SCAO) consist of the following sources as mentioned below:
- Twenty five (25) Paint Spray Booths;
- Eleven (11) Paint Drying Ovens;
- Five (50 Flash Off Areas;
- Four (4) Sanding Booths;
- Five (5) Tack Booths (ES-47 through ES-51);
- Other Sources;
- One (1) paint mix room (ES-PMR) and
- Various operations including gluing, caulking, seamseal, solvent wipe, cleanup solvent and other non- coating sources of VOC (including, but not limited to, line cleaning, purge solvent storage, and the distillation units.

The BACT analysis was focused on developing a BACT for the entire spray coating and assembly operations.

VOC emissions from the spray coating and assembly operations are from the solvents used in paint formulations, used to thin paints, or used for cleanup. All unrecovered solvent were considered potential emissions. Monomers and low molecular weight organics (used for corrosion protection) are not easily emitted as emissions of solvents in paints.

Under PSD regulations, the basic control technology requirement is the evaluation and application of BACT. 40 CFR 51.166(b)(12) defines BACT as "an emissions limitation (including a visible emissions standard) based on the maximum degree of reduction for each a regulated NSR pollutant which would be emitted from any proposed major stationary source or major modification which the reviewing authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combination techniques for control of such pollutant." In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standards.

BACT's technology determination must include a consideration of numerous factors. The procedure upon which a decision should be made is not prescribed by Congress under the Clean Air Act. This void in procedure has been filled by what several guidance documents issued by the federal EPA. The only final guidance available is the October 1980 "Prevention of Significant Deterioration – Workshop Manual." As the EPA states on page II-B-1, "A BACT determination is dependent on the specific nature of the factors for that **particular case**. The depth of a BACT analysis should be based on the quantity and type of pollutants emitted and the **degree of expected air quality impacts**."

As per EPA "*The case-by-case analysis is far more complex than merely pointing to a lower emissions limit or higher control efficiency elsewhere in a permit or a permit application. The BACT determination must take into account all of the factors affecting the facility …. The BACT analysis, therefore, involves judgment and balancing.*[2]"

The BACT requirements are intended to ensure that the control systems incorporated in the design of the proposed modification reflect the latest control technologies used in a particular industry and take into consideration existing and future air quality in the vicinity of the facility. Given the variation between emission sources, facility configuration, local air-sheds, and other case-by-case considerations, Congress determined that it was impossible to establish a single BACT determination for a particular pollutant or source. Economics, energy, and environmental impact are mandated in the CAA to be considered in the determination of case-by-case BACT for specific emission sources.

The EPA has issued additional DRAFT guidance suggesting the use of what they refer to as a "top-down" BACT determination method. The EPA Environmental Appeals Board recognizes the "top-down" approach for delegated state agencies,[3] however this procedure has never undergone

[2] US EPA Responses to Public Comments on the Proposed PSD Permit for Desert Rock Energy Facility, July 31, 2008, p 41-42.
[3] See, http://es.epa.gov/oeca/enforcement/envappeal.html for various PSD appeals board decisions including standard for review.

rulemaking, and as such, the "top-down" process is not binding on fully approved states, including North Carolina.[4] The Division prefers to follow closely the statutory language when making a BACT determination and therefore bases the determination on an evaluation of the statutory factors contained in the definition of BACT in the Clean Air Act. As stated in the legislative history and in EPA's final October 1980 PSD Workshop Manual, each case is different and the state must decide how to weigh each of the various BACT factors.

North Carolina is concerned that the application of EPA's DRAFT suggested "top-down" process will result in decisions that are inconsistent with the Congressional intent of PSD and BACT.

Therefore, NC DAQ does not strictly adhere to EPA's top-down guidance. Rather NC DAQ implements BACT in strict accordance with the statutory and regulatory language. As such, NC DAQ's BACT conclusions may differ from those of the applicant or U.S. EPA.

Best Available Control Technology may be defined through an emission limitation based on the maximum degree of reduction of each pollutant subject to PSD regulation, which the permitting authority, **on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility** through application of production processes and available methods, systems, and techniques.

As evidenced by the statutory definition of BACT, this technology determination must include a consideration of numerous factors. The structural and procedural framework upon which a decision should be made is not prescribed by Congress under the Act nor by the EPA through any rule. DAQ makes their BACT determinations based on an evaluation of the statutory factors contained in the definition of BACT in the Clean Air Act. The following are passages from the Legislative History of the Clean Air Act Amendments of 1977 and provide valuable insight for state agencies when making BACT decisions.

> *The decision regarding the actual implementation of best available technology is a key one, and the <u>committee places this responsibility with the State</u>, to be determined on a case-by-case judgement. It is recognized that the phrase has broad flexibility in how it should and can be interpreted, depending on site.*
>
> *In making this key decision on the technology to be used, the State is to take into account energy, environmental, and economic impacts and other costs of the application of best available control technology. <u>The weight to be assigned to such factors is to be determined by the State</u>. Such a flexible approach allows the adoption of improvements in technology to become widespread far more rapidly than would occur with a uniform Federal standard. The only Federal guidelines are the **EPA new source performance and hazardous emissions standards, which represent a floor for the State's decision**.*
>
> *This directive enables the State to consider the size of the plant, the increment of air quality which will be absorbed by any particular major emitting facility, and such other considerations as anticipated and desired economic growth for the area. This allows the States and local communities to judge how much of the defined increment of significant*

[4] North Carolina has full authority to implement the PSD program, 40 CFR Sec. 52.1770

> *deterioration will be devoted to any major emitting facility. If, under the design which a major facility proposes, the percentage of increment would effectively prevent growth after the proposed major facility was completed, the State or local community could refuse to permit construction, or limit its size. This is strictly a State and local decision; this legislation provides the parameters for that decision.*
>
> *One of the cornerstones of a policy to keep clean areas clean is to require that new sources use the best available technology available to clean up pollution. One objection which has been raised to requiring the use of the best available pollution control technology is that a technology demonstrated to be applicable in one area of the country in not applicable at a new facility in another area because of the differences in feedstock material, plant configuration, or other reasons. For this and other reasons the Committee voted to permit emission limits based on the best available technology* ***on a case-by-case judgement at the State level.*** *[**emphasis added**]. This flexibility should allow for such differences to be accommodated and still maximize the use of improved technology.*

Establishing the BACT Floor

As per the applicant "The least stringent emission rate allowable for BACT is any applicable limit under either New Source Performance Standards (NSPS Part 60) or National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61). While Clean Air Act section 112(b)(6) precludes use of Part 63 NESHAPs from establishing the floor, such standards are considered informative, representing maximum achievable control technology. State SIP limitations must also be considered when determining the floor."

40 CFR §§51.166(b)(12) describes BACT as "Best available control technology means an emissions limitation (including a visible emissions standard) based on the maximum degree of reduction for each a regulated NSR pollutant which would be emitted from any proposed major stationary source or major modification which the reviewing authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combination techniques for control of such pollutant. In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under **40 CFR parts 60 and 61**. If the reviewing authority determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results."

Based on the above description of the BACT one would argue that this precludes use of Part 63 NESHAPs from establishing the BACT floor. However, §169(3) of the federal Clean Air Act defines BACT as follows: The term "best available control technology" means an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this Act emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of each such pollutant. In no event shall application of "best available control technology" result in emissions of any pollutant which will exceed the emissions allowed by any applicable standard established pursuant to section **111 or 112 of this Act**." In other words National Emission Standards for Hazardous Air Pollutants (NESHAP Part 61 and 63) should be taken into account when establishing the BACT floor, which also includes all applicable State SIPs limitations when determining the floor. (See "Comparison of BACT with MACTs," below)

The BACT requirement applies to each new or modified emission unit from which there are emissions increases of pollutants subject to PSD review. The proposed project is subject to PSD permitting for VOC, and thus, subject to BACT for this pollutant. There are no new sources at the facility.

BACT for VOC Control:

i) *Step 1 – Identify Control Options:*

The first step is to define the spectrum of process and/or add-on control alternatives potentially applicable to the similar emissions units. A review of the RACT/BACT/LAER Clearinghouse and a review of technologies in use at similar sources, and State issued air permits was conducted for similar manufacturing facilities. The RACT/BACT/LAER Clearinghouse search provision was used to search for VOC emissions from:

- Automobiles and Trucks Surface Coating (OEM) (Process Code 41.002);
- Miscellaneous Metal Parts and Products Surface Coating (Process Code 41.013) and
- Plastic Parts & Products Surface Coating (Process Code 41.016)

From a period from 2005 to current.

Also an EPA publication "Control Techniques Guidelines (CTG) for Miscellaneous Metal and Plastic Parts Coatings[5], was used to compile a list of potentially applicable control technologies to the processes at this facility.

The selection of the application technology can have a significant effect on the amount of coating used and the resulting VOC emissions from the operation. The 2008 CTG for Miscellaneous Metal and Plastic Parts Coatings was intended to reflect the advances in coating and application technologies. This CTG recommends that coating operations reduce emissions through one of the following three options:

1) Apply low VOC coatings utilizing an "application technique" designed to reduce VOC emissions;
2) Meet equivalent VOC emission rate limits through the use of a combination of low VOC coatings, specified application methods and add-on controls; Or

[5] U.S. Environmental Protection Agency. *Control Techniques Guidelines for Miscellaneous Metal and Plastic Parts Coatings.* September 2008. (EPA-453/R-08-003)

3) Use high efficiency add-on control in lieu of reducing VOC content in coatings or utilizing improved application techniques.

Control Options:

The following add-on control technologies were identified as being potentially applicable to the paint booth operations:

- Regenerative Thermal Oxidizer (RTO);
- Regenerative Catalytic Oxidizer (RCO);
- Concentrator combined with RTO;
- Carbon adsorption;
- Use of low-VOC coatings; And
- Biofiltration.

Discussion of each these technologies is provided below:

Regenerative Thermal Oxidizer (RTO) & Regenerative Catalytic Oxidation (RCO)

The principles utilized in regenerative catalytic oxidation (RCO) and regenerative thermal oxidation (RTO) of VOC are based on simple chemistry and heat transfer phenomena. Oxidation technologies have been widely accepted as the most effective technologies for VOC destruction.

Oxidation, or "combustion," of VOC involves a chemical reaction between hydrocarbons and oxygen to form carbon dioxide and water vapor. Combustion of VOC emission streams occurs spontaneously at elevated temperatures, which are typically attained by combustion of an auxiliary fuel within the "combustion zone" of the combustion equipment. The percent conversion of VOC to carbon dioxide and water is dependent upon temperature and "residence time" of the VOC in the fuel combustion zone. Combustion of VOCs in the presence of a catalyst is referred to as "catalytic oxidation" and allows oxidation to occur at substantially lower temperatures, thereby requiring less auxiliary fuel to maintain the desired temperature.

RTOs use high-density media such as a ceramic-packed bed still hot from a previous cycle to preheat an incoming VOC-laden waste gas stream. The preheated, partially oxidized gases are heated again in the combustion chamber by auxiliary fuel (usually natural gas) to maintain a typical temperature range of 1400 to 1500 °F in order to achieve most efficient VOC destruction. Exhaust from the combustion zone is then passed through another packed bed, which absorbs and retains heat until it can be used to preheat the exhaust stream. Air flow is periodically switched to allow beds through which hot exhaust gases have passed to preheat the emission stream prior to passing through the combustion zone. Regenerative systems are typically designed to recover nearly all of the heat of combustion, greatly reducing auxiliary fuel requirements. Thermal oxidation is most economical when the inlet concentration is between 1500 and 3000 ppmv VOC because the heat of combustion of the hydrocarbon gases is sufficient to sustain combustion with the addition of auxiliary fuel.

Per the EPA fact [6]sheet, VOC destruction efficiency depends upon design criteria (i.e., chamber temperature, residence time, inlet VOC concentration, compound type, and degree of mixing). Typical regenerative oxidizer control efficiencies range from 95 to 99 percent for RTO systems and 90 to 99 percent for RCO systems, depending on system requirements and characteristics of the contaminated stream. Lower control efficiencies are generally associated with a lower concentration of VOCs in the exhaust gas stream.

Catalysts used in the RCO systems are typically based on a noble metal, and can be contained in a fixed or fluidized bed. Despite the decreased oxidation temperature, process exhaust gas must still be preheated, typically through heat exchange or direct heating in a combustion chamber, prior to contact with the catalyst bed. Catalytic oxidizers are very sensitive to particle contamination, and can normally only be used on very "clean" exhaust streams containing little or no particulate.

Concentrator with RTO

To minimize the cost of oxidation control technologies for dilute exhaust streams, which must be supplemented with large quantities of natural gas to ensure proper combustion, the VOCs can be concentrated. A common media used for concentrating dilute streams is known as "Zeolites." Zeolites are produced from naturally occurring minerals that have microporous aluminosilicate structure. **Paint booth** exhaust is passed through a rotating zeolite bed, which removes VOCs through adsorption within the micropores. The zeolite media in the rotating beds are sequentially rotated out of service and into heated zones to allow thermal desorption of VOCs prior to cooling and recirculating the zeolite back into service. The concept is that a high volume of exhaust is adsorbed onto the zeolite. A lower volume of heated air desorbs the VOCs and thus a lower volume of air with a higher concentration of VOCs are sent to the control device. Thus, thermally desorbed VOCs are carried to a regenerative thermal oxidization (RTO) system at only 5 to 10 percent of the original stream volume.

Carbon Adsorption

Carbon adsorption systems utilize adsorption media (typically activated carbon) to capture certain VOC species. The core component of a carbon adsorption system is an activated carbon bed contained in a steel vessel. The VOC laden gas passes through the carbon bed where the VOC is adsorbed on the activated carbon. The cleaned gas is discharged to the atmosphere. The spent carbon is regenerated either at an on-site regeneration facility or by an off-site activated carbon supplier.

Over time the adsorption media will be saturated with VOCs, requiring that it be "desorbed" (remove from a surface or media on which it is adsorbed) prior to further use. The adsorption process is highly exothermic.

As per the CTG (page # 17) "Carbon adsorption is generally economically attractive only if the recovered solvent can be reused directly. Carbon adsorbers are most suitable for solvents that are immiscible with water, such as toluene and xylene, but are not recommended for water-soluble

[6] http://www.epa.gov/ttn/catc/dir1/fregen.pdf

VOC, such as methyl ethyl ketone and methyl isobutyl ketone. In the case where a water-soluble VOC is present, the water vapor will be adsorbed and desorbed along with the VOC vapor, and the VOC may require subsequent purification if it is to be reused."

Bio-filtration

Bio-filtration uses microorganisms to biologically degrade VOCs into carbon dioxide and water. In bio-filtration systems, the VOC-containing exhaust gas stream is passed through one or more beds of biomedia such as compost or beds of packing using nutrient recycle material. Since biofilters are dependent upon biological activity to destroy VOC, removal efficiencies of biofilters are widely variable. All bio-filters are extremely sensitive to a number of exhaust stream characteristics including moisture content, temperature, VOC species and concentration and bed retention time.

Bio-filtration is an efficient control for a system that provides a consistent flow of VOC, pH balanced moisture, **and lower operating temperature**. Biofiltration systems are suitable for processes operating within the typical temperature range of the paint booths; these systems, however, are sensitive to having a relatively stable, continuous supply of nutrients (i.e., VOC) to keep the microorganisms active/alive. Additionally the painting operations may not operate continuously thus there would not be a steady stream of VOC's to keep the microorganisms active.

Use of Low-VOC Coatings

The 2008 CTG for Miscellaneous Metal and Plastic Parts Coatings contains recommended options for reducing coating emissions. For metal parts coatings, recommended emission limits are listed in the table below:

Coating Type	Surface Coating CTG and Current Permit Requirements (lb VOC/gallon)
Extreme Performance (Chassis Painting)	3.5
Basecoat[1]	5.0
Clearcoat[1]	4.5

[1]Levels under the 2008 Surface Coating CTG for "low bake/air-dried coatings- Exterior Parts (page 34),"

As per CTG "Air-Dried coating means a coating that is cured at a temperature below 90°C (194°F). Because surface temperatures of parts being painted at this facility occurs at 180 °F or less, all of the coatings applied at the Cleveland facility would be considered "low bake/air-dried."

In developing the 2008 CTG, EPA evaluated and analyzed VOC limits associated with metal and plastic parts coatings around the country and found that the limits listed in Table 6-3 were mostly technically and economically feasible.

The spray coating and assembly operations currently operate with a BACT limit of 3.5 lb VOC/gallon coating and a total VOC limit of 1,365 tons/year. The 3.5 lb/gallon limit is calculated on a calendar monthly average as coating applied, and includes only coatings. That limit does not include VOC from other sources, such as from glues or seam sealing materials. VOCs from the coatings and all other sources are included in the 1,365 tons/year BACT limit on the spray coating and assembly operations.

ii) *Step 2 – Eliminate Technically Infeasible Control Options and Operational Practices:*

The second step is to evaluate the technical feasibility of the alternatives identified in the first step and to reject those that are technically infeasible based on an engineering evaluation or on chemical or physical principles.

The following criteria were considered in determining technical feasibility: previous commercial-scale demonstrations, precedents based on issued PSD permits, state requirements for similar sources, and technology transfer. Selection of a control technology is made on the basis of stream-specific characteristics such as flow rate, hydrocarbon concentration, temperature, and moisture content.

Bio-filtration

For the bio-filtration systems, the plant may not operate the painting operations continuously, which results in extended periods of time during which the micro-organisms would not have a food source.

Optimal biofilter performance requires a continuously operating source of VOC emissions. Additionally, the gas streams existing from the painting operations are in many cases emitted from ovens, which significantly reduce the exhaust stream moisture content.

The operations in the facility depends on truck orders and coating operations could be performed intermittently and still keep up with truck production demands. Coating will not occur 24/7 and there are scheduled plant shutdowns throughout the year.

As previously discussed, biofilters require a high-moisture exhaust stream to operate effectively. For these reasons, biofilter control is therefore deemed technically infeasible for control of the exhaust streams and is not considered further in this BACT analysis.

Carbon adsorption

Carbon adsorption systems are designed for generally one solvent that you desire to collect, desorb, and re-use, such as toluene. These systems are also designed for high concentration, low volume streams. Carbon adsorption systems cannot operate well with variability to the emission stream conditions like changes in temperature, humidity and the composition of VOCs stream.

The paint systems at this facility uses a variety of solvents; some which would adsorb, some which would not adsorb, and still some solvents which would not desorb. One of the many compounds used is methyl ethyl ketone, which has been documented as a problem pollutant for carbon adsorption systems.[7] Additionally, the VOC air streams are low concentration, high volume, and

[7] Section 4.6 of Control Technologies for Hazardous Air Pollutants Handbook, EPA/625/6-91/014

are subject to variable stream conditions. Based on the above, carbon adsorption systems are eliminated as technically infeasible.

iii) Step 3 - Ranking of VOC Control Technologies

The third step is an assessment, or ranking, of each technically feasible alternative considering the specific operating constraints of the emission units undergoing review. After determining what control efficiency is achievable with each remaining alternative, the alternatives were ranked into a control hierarchy from most to least stringent, using the percent removal efficiency for the pollutant of concern.

Add-on VOC controls for spray coating operations which includes RTO/RCO with or without VOC concentration and use of low VOC coatings are considered technically feasible control technologies. A summary of the VOC control efficiencies of all of the control technologies under consideration, ranked in order of decreasing control effectiveness, is presented below:

Control Technology	VOC control efficiencies %
RCO and RTO with or without VOC concentration	90 to 95%
Use of low-VOC coatings	Varies

iv) Step 4 – Evaluate Control Options:

In the fourth step, a cost effectiveness and environmental and energy impact analysis is required. If the top level of control is selected as BACT, then a cost effectiveness evaluation is not required. An element of the environmental impacts analysis is the consideration of toxic or other pollutant impacts from the control alternative choice. The economic analysis is performed using procedures recommended by the EPA's OAQPS Control Cost Manual (sixth edition).

<u>Cost Effective Analyses for using Control Devices</u>

The economic impacts section of the BACT analysis includes budgetary estimates of total capital and annual costs, as well as an estimated cost effectiveness of each technically feasible control technology evaluated that was not eliminated in Step 2. EPA provides guidance to estimated annualized control technology costs and the amount of VOCs removed based on the procedures presented in EPA's Cost Control Manual, 6th Edition (the cost factors based on USEPA Office of Air Quality Planning and Standards Control Cost Manual EPA 450/3-90-006).

For the purposes of this analysis, the facility split the spray coating and assembly operations into six different areas. This is because it is infeasible to use one control device for the exhausts of the entire area. There are large distances between the painting areas within the plant and there are huge volumes of air with low concentrations of VOCs from the exhausts from the plant. Due to the large distances, it would take large ductwork sprawling across the plant. Such ductwork would be very costly to engineer and install and would substantially increase the costs.

The total volume from all these areas together would be extremely large to the extent no vendor would build an RTO of such size. Due to the large volumes of air, the same number of control devices would most likely be identified in the end if control devices had been deemed to be economically feasible.

Areas were determined based on flow rates and physical locations. In the evaluation of cost-effectiveness, the lowest cost-effectiveness for the control technology among the areas was used. The design flow values for each booth and oven was obtained from the plant and used in our calculations. The flow volumes from each area were summed together to obtain a total flow. The facility does not track exact amounts of paint sent to each area. Plant personnel do know the total amount of paint used; and based on the number of parts painted and size of parts painted, the facility estimated a percentage of the paint that is utilized in each area.

The flow rates for each of the areas are as shown below:

Area #	Area	Flowrate (acfm)	Percent of Total	Estimated VOC Emissions (tpy)
1	New Paint Center-Seamseal/Primer	205,300	15%	211
2	New Paint Center-Booth 4,5 & 6	436,300	15%	211
3	New Paint Center-Booth 1,2,3 & 7	440,400	30%	422
4	Chassis Booths	352,200	20%	281
5	Main Building Other (Old Paint Center)	160,281	5%	70
6	Main Building Other (Hood Paint Center)	106,600	10%	141
7	Offline Building	218,925	5%	70
Totals		1,920,006	100.00%	1405.00

Regenerative Thermal Oxidizer

Economic Impacts

The applicant used direct annual costs, including labor, maintenance, electricity, and fuel based on ***vendor quote*** and the OAQPS Cost Manual. Other cost impacts are estimated using EPA cost methodologies. The table below presents a breakout of costs used in the economic impacts evaluation for an RTO.

There are large distances between the painting areas within the plant and there are huge volumes of air with low concentrations of VOCs from the exhausts from the plant. Due to the large distances, it would take large ductwork sprawling across the plant. Such ductwork would be very costly to engineer and install and would substantially increase the costs.

The entire Spray Coating and Assembly Operations (SCAO) are distinct areas within each plant where painting (or coating) occurs. Each area represents a particular painting operation, for instance the chassis area, the hood painting areas, offline, etc. The sum of all of these areas results in the total amount of painting and the total VOCs and HAPs from the SCAO.

The applicant split the spray coating and assembly operations into six different areas. As it would have been **infeasible to use one control device for the exhausts of the entire area**. Areas were determined based on flow rates and physical locations. Though the solvent loading for each area does vary. However, all areas contain booths and dryers and we have calculated the true flowrates from each area. The emission rates were accounted for in the emissions estimates for each area.

These areas together equal 1405 tons per year. This is the denominator used when calculating cost effectiveness.

RTO's are sized mainly on flowrate and emission loading. The vendor provided the fuel requirements, compressed air requirement and electricity requirement for a 200,000 acfm unit and as per the vendor's recommendation used this scale to calculate costs using each areas total flowrate to obtain the operating cost estimates for all RTOs, for each area. As per the applicant "we showed that just based on the operating costs RTO's are cost ineffective. If you add in the direct purchase cost of the RTOs the cost effectiveness number will be higher." The main goal of this analysis is to show that the cost of an RTO is cost ineffective.

In the evaluation of cost-effectiveness, the lowest cost-effectiveness for the control technology among the areas is used. This allocation of flow rates is also shown in the table below.

The flow rates for each areas, Total Annual Operating Cost and Effective Cost Control for an RTO are as shown below:

Area #	Flowrate (acfm)	Total VOC removed per year (ton/yr)	Total Annual Operating Cost ($)	Effective Cost Control $/ton
1	205,300	200.21	$2,281,232	$11,394.2
2	436,300	200.21	$4,811,422	$24,031.58
3	440,400	400.43	$4,856,331	$12,127.94
4	352,200	266.95	$3,890,258	$14,572.98
5	160,281	66.74	$1,788,129	$26,793.47
6	106,600	133.48	$1,200,150	$8,991.57
7	218,925	66.74	$2,430,469	$36,418.34
Totals	1,920,006	1334.76	$212,57,991	

The annual operating cost includes labor, maintenance, electricity, fuel and compressed air used and **did not include the total capital investment**.

The applicant used the example in Table 2.10 (EPA's OAQPS Control Cost Manual (sixth edition): "Annual Costs for Thermal and Catalytic Incinerators" for the total annual operating cost. These cost were based on 1998 dollars with an equipment life of 10 years and 8,000 hours per year of operation of the control device. Based on these data and a 7% interest rate (which the applicant used) the capital recovery cost factor (CRF) which is a function of the catalyst or equipment life is 0.1424.

As per the applicant "the lowest cost-effectiveness of operation, considering only direct annual expenses and no capital costs, of an RTO for one of the areas of the Cleveland facility is approximately $8,992/ton VOC. It is important to note that no capital costs, including the RTO itself, equipment, and necessary ductwork, are included in this analysis and therefore the actual costs associated with using this technology would be significantly higher. The cost-effectiveness of the direct annual costs only is considered cost-prohibitive."

Regenerative Catalytic Oxidation (RCO)

The analysis estimated the total costs associated with the VOC control equipment, including the total capital investment of the various components ***intrinsic*** to the complete (RCO) system.

The estimated annual operating costs, and indirect annual costs. Annualized costs were based on an interest rate of 7% and an equipment life of 10 years. The cost analysis of the ***add-on control technology*** includes the capital cost of installing the equipment, ductwork, electrical and instrumentation necessary to operate the unit. "For the RCO, the only costs analyzed are direct annual costs, including labor, maintenance, electricity, and fuel, and the add-on cost of the RCO system to an RTO system. ***This add on cost is the cost to convert the RTO to an RCO such as catalyst, design and structural costs. The base cost of the RTO was not included***."

For the regenerative catalytic oxidation (RCO) the facility used add-on equipment (Total Capital Investment) and the Annual Operating Cost to calculate Total Annual Cost to get the Effective Cost Control. The below presents a breakout of costs used in the economic impacts evaluation for an RCO.

Total Annual Cost = Annualized Total Capital Investment + Annual Operating Cost + Total Indirect Annual Cost.

The flow rates for each areas, Total VOC removed, Total Capital Investment, Total Annual Operating Cost and Effective Cost Control for an RTO are as shown below:

Area #	Flowrate (acfm)	Total VOC removed per year (ton/yr)	Total Capital Investment ($)	Total Annual Cost ($)	Effective Cost Control $/ton
1	205,300	200.21	$1,460,355	$1,249,052	$6,238.63
2	436,300	200.21	$3,103,521	$2,595,885	$12,965.65
3	440,400	400.43	$3,132,685	$2,619,790	$6,542.52
4	352,200	266.95	$2,505,295	$2,105,544	$7,887.41
5	160,281	66.74	$1,140,122	$986,571	$14,782.86
6	106,600	133.48	$758,275	$673,587	**$5,046.54**
7	218,925	66.74	$1,557,273	$1,328,492	$19,906.23
Totals	1,920,006	1334.76			

The applicant used the same examples and procedures in the EPA's OAQPS Control Cost Manual as used for RTO and additionally used Table 2.4: "Cost Ranges for Freight, Sales Tax, and Instrumentation" to calculate the Total Annual cost for the RCO.

Again, as per the applicant "the lowest cost-effectiveness of operation (considering only direct annual expenses and capital costs of an add-on RCO system) of the areas of the Cleveland facility is approximately $5,047/ton VOC. It is important to note that there would be additional capital costs, including the RTO itself for the RCO add-on, the equipment and necessary ductwork, which are not included in this analysis and therefore the actual costs associated with using this technology would be significantly higher. The cost-effectiveness of the evaluated costs only is considered cost-prohibitive."

Energy Impacts of RTO & RCO

For the RTO and RCO the electricity consumption ranged from 2.03 million kWh-yr for Area 6 (New Paint Center booths) to 8.4 million kWh-yr for Area 3 (New Paint Center booths 1, 2, 3 & 7) for a total of 36.7 million kWh-yr.

Environmental Impacts of RTO & RCO

There are adverse impacts from the operation of an RTO in the form of increased emissions of criteria pollutants and GHGs emitted as by-products of natural gas used for supplemental fuel and actual VOC destruction. Installation of the RTO would require combustion of additional fuel annually resulting in an increase of combustion pollutants including Nitrogen Oxides (NO_x), Carbon Monoxide, (CO), Carbon Dioxide (CO_2), Methane (CH_4), and HAPs including:

- Formaldehyde
- Benzene
- Hexane
- Toluene
- 1,4 dichlorobenzene

Carbon dioxide, methane and nitrous oxide emissions are primary greenhouse gases (GHGs) that are subject to reporting under EPA's Mandatory Reporting Rule. According to EPA, GHG emissions are expected to endanger public health and public welfare through the negative "effects in the atmosphere, their effect on climate, and the public health and welfare risks and impacts associated with such climate change. Increases in ambient ozone are expected over broad areas of the country, and they are expected to increase serious adverse health effects in large population areas that are and may continue to be in nonattainment."

The final Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, published in the Federal Register on December 15, 2009, established the multitude of adverse effects from GHGs emissions and detailed the science from which these findings are based. Other negative impacts include effects on ground level ozone, increase in fugitive PM and GHG emissions from delivery traffic.

Under the PSD program, VOCs are regulated to prevent significant deterioration of air quality due to ozone formation. Ozone is formed in the atmosphere due to atmospheric chemical reactions of NO_x and VOC catalyzed by sunlight, and excessive ambient concentrations of ozone in the lower atmosphere can be injurious to health and damage vegetation. The facility is located in a moderately populated but developed area of North Carolina, and ambient concentrations of ozone in this area are in attainment with the NAAQS for this pollutant.

Recent developments in air dispersion modeling and studies in ozone formation seem to indicate that even substantial reductions in VOC emissions in areas such as the Rowan County facility will have a relatively small impact on ozone formation, consequently, any reduction of VOC emissions from the spray booths will negligibly reduce ozone formation and concentrations in the area, while installation of a RCO or RTO that generates NO_x emissions from the combustion of supplemental fuel would likely increase ozone formation in the area.

Concentrator Combined with RTO

Economic Impacts

For this analysis the applicant used the same procedure, cost methodologies, interest rate and equipment life as the RCO to determine the Total Annual Cost.

Total Annual Cost = Annualized Total Capital Investment + Annual Operating Cost + Total Indirect Annual Cost.

The flow rates for each areas, Total VOC removed, Total Capital Investment, Total Annual Operating Cost and Effective Cost Control for a Concentrator Combined with RTO are as shown below:

Area #	Flowrate (acfm)	Total VOC removed per year (ton/yr)	Total Capital Investment ($)	Total Annual Operating Cost ($)	Effective Cost Control $/ton
1	205,300	200.21	**$4,347,000**	**$1,483,886**	**$7,411.55**
2	436,300	200.21	**$8,172,360**	**$2,759,504**	**$13,782.88**
3	440,400	400.43	**$8,694,000**	**$3,071,843**	**$7,671.46**
4	352,200	266.95	**$7,650,720**	**$2,564,265**	**$9,605.79**
5	160,281	66.74	**$3,825,360**	**$1,249,613**	**$18,724.30**
6	106,600	133.48	**$3,825,360**	**$1,249,613**	**$9,362.15**
7	218,925	66.74	**$4,347,000**	**$1,561,952**	**$23,404.42**
Totals		1334.76			

Applicant "the lowest cost-effectiveness of the areas at the Cleveland facility is approximately $7,412/ton VOC. It is important to note that there would be additional capital costs, such as necessary ductwork, which are not included in this analysis and therefore the actual costs associated with using this technology would be higher. The cost-effectiveness of the evaluated costs only is considered cost-prohibitive."

Costs comparison with other facilities

An effort was made to contact several similar facilities (Process Code 41.002) using thermal oxidizers as a means of VOC cost to compare cost-effectiveness of such control devices. These facilities are listed below:

RBLC ID	Corporate/Company Name	Response	Process	Control device	Permit	Issued	Limits	Notes
OH-0312	Kenworth Truck Co.	No Response	robotic cab paint booths (line 1 & 2)	Thermal Oxidizer	06-08317	01/29/2008	3.5000 lb/gal excluding water and exempt solvents	
OH-0309	Daimler Chrysler Corporation/ Toledo Supplier Park - Paint Shop	Responded	topcoat booths (2) for basecoat and clearcoat	Thermal Oxidizer	04-01358	05/03/2007	5.42 lb voc/gal of applied coating	100% capture and 95% control ***Not for PSD purposes***
OH-0187	Navistar International Transportation Corp.	Responded	for robotic cab paint booths (line 1 & 2)	Thermal Oxidizer	08-862	10/29/1987	3.5000 lb/gal before contro	
OH-0295	General Motors Truck & Bus Moraine Assembly Plants	No Response	topcoat lines	Carbon Adsorption followed by Thermal Incineration	08-02506	01/14/2003		thermal incinerator: 95% destruction
OH-0215	General Motors Truck & Bus Moraine Assembly Plants	No Response	surface coating	Carbon Adsorption followed by	08-2506	10/23/1992		

RBLC ID	Corporate/Company Name	Response	Process	Control device	Permit	Issued	Limits	Notes
				Thermal Incineration				
IN-0149	Subaru of Indiana Automotive, Inc.	Responded	Trim line	Catalytic incinerator	157-31885-00050	10/04/2012	0.4000 lb/gal monthly volume weighted average	***uses a catalytic incinerator on ovens.***
AL-0211	HYUNDAI MOTOR MANUFACTURING ALABAMA, LLC	Responded		Regenerative Thermal Oxidizer (RTO) and airless guns	209-0090-X001	03/14/2005	1.0000 lb/gal acs after control device	RTO (95% destruction only on ***Oven Exhaust***) and airless guns ***Oven Exhaust controlled by RTO (RTO-1)***
				NOT in RBLC				
SC	BMW Manufacturing Corporation	Responded	VOC emissions from the oven portion are controlled by an RTO Conclusion of BACT/LAER for VOC BACT/LAER for VOCs from the paint mixing / spent paint solids recovery is best management practices. And for the primer curing ovens, the emissions will be controlled with an RTO . Have two RTO and installed on 1994 and 2002					

Most of the above facilities had the control devices installed when their respective areas were in nonattainment and the control devices were mostly used to control emissions only from the ovens. None of the predeterminations/reviews for the above facilities when they received their permits for the control devices had a cost-effectiveness study for using thermal oxidizers as a means of VOC emissions control.

Energy Impacts

For RTO with a concentrator electricity requirements ranged from 1.9 million kWh-yr for Areas 5 and 6 to 5.3 million kW-hr for Area 3. Total electricity was about $23 million kWh-yr.

Environmental Impacts

There are adverse impacts from the operation of a concentrator system with an RTO in the form of increased emissions of criteria pollutants and GHGs emitted as by-products of natural gas used for supplemental fuel and actual VOC destruction.

Use of Low-VOC Coatings

The spray coating and assembly operations currently operate with a BACT limit of 3.5 lb VOC/gallon coating as applied on a calendar monthly average basis.

As mentioned above the 2008 CTG for Miscellaneous Metal and Plastic Parts Coatings contains recommended options for reducing coating emissions for metal parts coatings, recommended emission and the most stringent limits for extreme performance (chassis painting), base coat and clear coat is 3.5 lb VOC/per gallon of coating.

iv) Step 5 – summarize the selection of BACT:

Note - DAQ BACT determination is not just based on cost alone, but also includes various other factors. For the RTO no capital costs, including the RTO itself, equipment, and necessary ductwork, were included in the cost analysis, for the RCO there would be additional capital costs, including the RTO itself for the RCO add-on, the equipment and necessary ductwork, which are not included in this analysis and for the concentrator combined with RTO additional capital costs, such as necessary ductwork, which are not included in this analysis. The applicant justified this by stating “The cost effectiveness (CE) calculation is the total annualized costs divided by the pollutant removed (TAC / PR). Total annualized costs include annualized direct costs (annualized cost to purchase the equipment) and annual costs (like operating costs such as fuel and labor). Trinity only included the annual operating costs (gas usage, electricity, labor etc.) and calculated CE values ranging from $9,000 – $36,000 per ton of pollutant removed for RTO.

If the annualized direct cost of the RTO was added to the numerator of the CE equation and the amount of pollutant removed would remain the same, the CE would only increase. The gas usage, operating costs etc. are easily available data without the need to contact control device vendors. Obtaining true capital costs of and RTO, ductwork and any other equipment would just add time to the project and the results would still be that the control devices are not cost effective.”

The final step is to summarize the selection of BACT based on above mentioned criteria and propose the associated emission limits or work practice standards to be incorporated into the permit plus any recommended recordkeeping and monitoring conditions.

Per Section VI. “Recommended Control Options,” of the 2008 CTG, states “to control VOC emissions from miscellaneous metal and plastic part surface coatings, we are recommending the following three options:

(1) VOC content limits for each coating category based on the use of low-VOC content coatings and specified application methods to achieve good transfer efficiency;

(2) Equivalent VOC emission rate limits based on the use of a combination of low-VOC coatings, specified application methods, and add-on controls; or

(3) An overall VOC control efficiency of 90 percent for facilities that choose to use add-on controls instead of low-VOC content coatings and specified application methods.”

Any add-on controls would have other consequences as stated above. Using the CTG recommended options for reducing coating emissions for metal parts coatings, recommended emission and the most stringent limits for extreme performance (chassis painting), base coat and clear coat of 3.5 lb VOC/per gallon of coating is probably the safest way to control emissions.

<u>Comparison of BACT with MACTs</u>

In January 2004, EPA promulgated the National Emission Standards for Hazardous Air Pollutants for Miscellaneous Metal Parts and Products Surface Coating (40 CFR 63, subpart

MMMM). In April 2004, EPA promulgated the National Emission Standards for Hazardous Air Pollutants for Plastic Parts and Products Surface Coating (40 CFR 63, subpart PPPP).

The Spray Coating and Assembly Operations (ES-SCAO) is subject to MACT Subpart PPPP with an emissions limit of **organic HAP** emissions to no more than 00.16 lb organic HAP emitted per lb coating solids used (Section 2.2 C. 1. b., of the permit) and MACT Subpart MMMM with an emissions limit of organic HAP emissions to no more than 2.6 lb **organic HAP** per gal coating solids used (Section 2.2 C. 2. b., of the permit).

The above MACT limits are based on:
1) lb of volatile HAP per lb of coating solids for PPPP and
2) lb of volatile HAP per gallon of coating solids for MMMM.

The selected BACT is based on lbs of total VOC per gallon of coating as applied. There are no similarities in the numerators and denominators for the MACT standards and the proposed VOC BACT limit. The MACT numerators are lb of volatile HAP and the proposed BACT is lb of total VOC. The denominators for the MACT are lbs solids applied and gallon of solids applied. The denominator for the proposed VOC BACT is gallon of coating applied (i.e., this is all volatiles and solids combined). There are two totally different base values for limits in both the numerators and denominators of each set of limits. Thus, it is **impossible to compare the BACT to the MACT limits and determine which is more stringent since each limit has different units for the numerator and denominator.**

Project Aggregation

Performing several small projects in an attempt to avoid PSD permitting is not allowed under PSD regulations. In the past several years several modifications have been done at this facility.

Summary of applications in the past few years are mentioned in the table below:

Application #	Summary	Permit issued
8000045.14A	Added: new diesel-fired emergency generator (ID No. IES-EG, 250 kW / 335 hp.), new pre-fabricated paint spray booth with a natural gas-fired drying oven (2 million Btu/hr, ID No. ES-PSB-38). Moved diesel fuel-fired fire pumps (ID Nos. IES-FP1 and IES-FP2) to the insignificant activities list.	04625T33
8000045.13A	Added: Six cooling towers (ID No. IES-CT1 through IES-CT6), multiple parts washers (ID No. IES-MPW), two emergency fire pumps (ID No. ES-FP1 and ES-FP2), two dynamometers (ID Nos. IES-DYNA1 and IES-DYNA2), truck tail pipe exhausts (ID No. IES-TTP) Removed tanks in the paint mix room (ID Nos. IES-14 and IES-15).	04625T32
8000045.11B	Actual PAL for GHG	04625T31
8000045.11A	Actual PAL for VOC, NO_x	04625T30

NCDAQ does not take any position as to whether the previous projects and modification of the "Spray Coating and Assembly Operations" (ES-SCAO) should be aggregated as a single project. The NCDAQ typically applies the economic relationship test to determine if two projects should be aggregated. (EPA published in the Federal Register on Thursday, January 15, 2009, guidelines for aggregation of sources and their relationship regarding NSR applicability[8]). As per the above information in the table, there has been no modification to the Spray Coating and Assembly Operations" (ES-SCAO), in the last three years. Thus, project aggregation is not called for in this modification. The last two applications were for the Actual PALs for the GHG, VOC and NO_x emissions which did not involve any modification of the above source.

VIII. Air Quality Impact Analysis

PSD regulation 40 CFR 51.166(k) requires that an air quality analysis of the ambient impacts associated with the construction and operation of the proposed source or modification. The analysis should demonstrate that the emissions from the proposed major source or modification, in conjunction with existing sources, will not cause or contribute to a violation of any applicable NAAQS or PSD increment. The EPA has not established an acceptable ambient monitoring method for VOC emissions. VOCs are also not considered visibility-affecting pollutants. Therefore, there are no modeling requirements for this pollutant.

<u>Volatile Organic Compounds (VOCs)</u>

VOC emissions in combination with NOx and sunlight, is a precursor to ozone formation. Previous and on-going regional air dispersion modeling efforts associated with attainment planning within the North Carolina air shed have shown that a VOC emissions increase of ***1406.4 tons per year will not contribute to significant ozone formation.*** No additional monitoring or modeling is required to demonstrate that the proposed project will not result in an exceedance of any Class I Area increment standards.

VIII. Additional Impact Analysis

A. <u>Local Visibility, Soils, and Vegetation</u>

PSD regulation 40 CFR 61.166(o)(1) requires that applications for major modifications include an analysis of the impairment to visibility, soils, and vegetation that would occur as a result of the proposed modification and the associated commercial, residential, industrial, and other growth. The analysis need not include an evaluation of the impact on vegetation having no significant commercial or recreational value.

Atmospheric ammonium sulfate [$(NH_4)_2SO_4$], which likely increases in concentration with increased SO_2 emissions to the atmosphere, is the major contributor to visibility impairment in North Carolina. The proposed project, which is anticipated to have an increase in VOC emissions from the facility, is not anticipated to have any impact on local visibility impairment.

[8] http://www.epa.gov/nsr/fr/20090115_2376.pdf

Gaseous air pollutants can potentially cause harmful acute, chronic, and long-term effects on vegetation. Acute and chronic effects are caused by the pollutant acting directly on the organism, while long-term effects are indirectly caused by secondary agents, such as changes to soil pH.

VOCs, along with NO_x and sunlight, is a precursor to ozone formation. Ground-level ozone can have detrimental effects on plants and ecosystems, including:

- Interference with the ability of plants to produce and store food, making them more susceptible to certain diseases, insects, other pollutants, competition and harsh weather;
- Damage to leaves of trees and other plants, negatively impacting the appearance of urban vegetation, National Parks, and recreation areas; and,
- Reduction of crop yields and forest growth, potentially impacting species diversity in ecosystems.[9]

The facility is located in a moderately populated and developed area of North Carolina and ambient concentrations of ozone in this area are in attainment with the NAAQS for this pollutant.

Recent developments in air dispersion modeling and studies in ozone formation seem to indicate that even substantial reductions in VOC emissions in rural areas such as the Rowan County will have a relatively small impact on ozone formation. The formation of ozone in North Carolina has been shown to be NOx-limited. There is already an excess of VOC in the atmosphere with respect to ozone production. Further, it has been estimated that 90% of VOC emissions occur from biogenic sources (naturally occurring); with industrial facilities accounting for only 2% of those emissions.[10]

The only potential impact on soils and vegetation resulting from the proposed project would be long-term damage associated with elevated ozone levels. The atmosphere in the region is considered NO_x-limited with regards to ozone formation. Given the relatively small quantities emitted by this facility (when compared to the overall regional VOC budget) into an already VOC-rich atmosphere, any change in ozone formation associated with the project, and thus the potential for harmful impacts on soils and vegetation, will be negligible.

The main point is that the southeastern US (including Rowan County, NC) is considered NO_x-limited with respect to ozone formation, meaning that increases in NO_x emissions would allow for more ozone production in the atmosphere.

B. Growth Impacts

PSD regulation 40 CFR 61.166(o)(2) requires that applications for major modifications include an analysis of the air quality impact projected for the area as a result of general commercial, residential, industrial, and other growth associated with the proposed modification.

---

[9] U.S. Environmental Protection Agency. (March 6, 2007). *Ground-Level Ozone, Health and Environment.* Retrieved February 8, 2008 from U.S. EPA website: http://www.epa.gov/air/ozonepollution/health.html
[10] Presentation entitled, *Modeling Application Process*, by NCDAQ – Attainment Planning Branch, September 30, 2004.

Associated growth includes residential and commercial/industrial growth resulting from the new facility. Residential growth depends on the number of new employees and the availability of housing in the area, while associated commercial and industrial growth consists of new sources providing services to the new employees and the facility.

The proposed project will increase production at the existing facility. There will not be any construction of buildings or sources associated with this increase. There will be an increase in workforce, which will be filled from available work force already in the area. There will be no other infrastructure expansions, and as such, the growth in the area related to the project will be minimal. Therefore, the project is not expected to create substantial growth within the area.

C. <u>Visibility Impacts on Class I Areas</u>

PSD regulation 40 CFR 61.166(p) provides an opportunity for the Federal Land Manager (FLM) to determine whether the proposed modification would have an adverse impact on an air quality related value (AQRV), including visibility, on any Class I areas.

A visibility analysis is not required for this project because the project does not result in a net significant emissions increase for any pollutants (PM_{10}, NO_x or SO_2) that would be of concern for potential visibility impairment. However, the Federal Land Manager was provided a copy of this PSD application and no comments have been received.

D. <u>Air Quality Monitoring Requirements</u>

In accordance with the requirements of 40 CFR 51.166(m)(1)(i)(b), a project that results in a net significant emissions increase must contain an analysis of existing ambient air quality data in the area to be affected by the proposed Project. Since the project does result in a net significant increase of a PSD-regulated pollutant (VOC), this analysis is required.

There are no National Ambient Air Quality Standards (NAAQS) for VOC and as per 40 CFR §81.334 "Designation of Areas for Air Quality Planning Purposes" (North Carolina – Rowan County) the National Ambient Air Quality Standards (NAAQS) are as mentioned below:

Pollutant	NAAQS Standards
TSP	Better than national standards
1971 Sulfur Dioxide NAAQS (Primary and Secondary)	Better than national standards
Carbon Monoxide	Unclassifiable/Attainment
1997 Annual PM2.5NAAQS	Unclassifiable/Attainment
1997 24-Hour PM2.5 NAAQS	Unclassifiable/Attainment
2006 24-Hour PM2.5 NAAQS	Unclassifiable/Attainment
NO2 (1971 Annual Standard)	Cannot be classified or better than national standards
1997 8-Hour Ozone NAAQS (Primary and Secondary)	Attainment (This action is effective 12/2/13)
2008 8-Hour Ozone NAAQS (Primary and secondary)	Unclassifiable/Attainment

However, 40 CFR 51.166(m)(1)(ii) calls for "the plan … with respect to any such pollutant for which no National Ambient Air Quality Standard exists, the analysis shall contain such air quality monitoring data as the reviewing authority determines is necessary to assess ambient air quality for that pollutant in any area that the emissions of that pollutant would affect."

DAQ has determined that no additional monitoring is required than as specified in Section 2.1 B. 4. b., and c., of the modified permit.

IX. PSD Increment Tracking:

The minor source baseline for Rowan County was triggered for PM-10 on 07/03/78 by Carolina Stalite for SO2 on 06/04/81 by Carolina Stalite and for NOx on 06/19/98 by Carolina Power and Light (Duke Energy).

The project (potential) from this project is as mentioned below:
NO_x = 52.50 tons per year potential emissions are equal to the PAL limit of 52.5 tpy (Section 2.3 B. 1., of the current permit). Thus, PSD is not triggered.

NOx emissions for 2006 = 12.7 tons per year and for 2007 = 10.1 tons per year. Thus, the baseline (actual) emissions (based on 2006 & 2007) = 11.4 tons per year.
Thus, the project increase = (52.50 - 11.4) 41.1 tons per year of NOx emissions. Based on 8760 hours of operation per year, the hourly increase = 9.4 lbs per hour of NOx emissions increase.

Based on the 2006 and 2007 emissions table above:
PM_{10} emissions increase = 7.28 tpy = 1.66 lbs per hour and
$PM_{2.5}$ emissions increase = 6.85 tpy = 1.56 lbs per hour.

For PSD increment tracking purposes, PM_{10} emissions from this project are increased by 1.66 pounds per hour and NO_x emissions are increase by 9.4 pounds per hour. SO_2 emissions are not included since the hourly emissions increase will be very small.

X. NSPS, NESHAPS, RACT, CAM, Compliance Status, Zoning Consistency Determination and Application Type.

NSPS

The boilers at this facility are subject to NSPS 40 CFR 60 (Subpart Dc.).

NESHAP/MACT

This facility is subject to the 112(j) instead of the Boiler MACT (Subpart DDDD), Surface Coating of Plastic Parts and Products MACT (Subpart PPPP) and the Surface Coating of Miscellaneous Metal Parts and Products MACT (Subpart MMMM) and Stationary Reciprocating Internal Combustion Engine MACT (Subpart ZZZZ).

RACT

The facility is located in Rowan County which was once a non-attainment area and is subject to RACT. The facility chose to comply with RACT by complying with MACT Subparts MMMM and PPPP.

CAM

The Compliance Assurance Monitoring (CAM) rule promulgated on November 21, 1997, is required for major units using control devices to comply with Federal Clean Air Act (FCAA) standards established prior to 1990.

This facility has four sources that are equipped with baghouses, and subject to an applicable regulation. Based on information provided the sources do not have uncontrolled emissions greater than the major source threshold and therefore are not subject to CAM. The CAM applicability status will not change as a result of this application.

Compliance Status

The latest inspection done on 08/20/2015 by Ms. Carlotta Adams of the Regional Office stated "Based on my observations during this inspection, this facility appeared to be in compliance with the applicable air quality regulations"

Consistency Determination

The consistency determination for this modification was provided by the facility.

Application Type

This applicant is a PSD/PAL application and the requested BACT and the PAL limit will contravene with the existing BACT and the PAL limits in the permit. Thus, this application can only be processed as a Significant 2Q .0501(d) modification (one step) i.e., it will be subject to a 30 day public notice and 45 day EPA review.

XI. Public Notice/EPA, Regional Office & Applicant Review

Public Notice Requirements – 40 CFR 51.166(q) requires that the permitting agency make available to the public a preliminary determination on the proposed project, including all materials considered in making this determination. With respect to this preliminary determination the NCDAQ:

i) Will make available all materials submitted, a copy of the preliminary determination, and all other information submitted and considered. This same information will be available at the NCDAQ Mooresville Regional Office.
ii) Will publish a public notice, by advertisement in a local paper including the preliminary decision and the opportunity for public comment.
iii) Send a copy of the public notice to:
    a) The applicant
    b) EPA Region IV for comment

c) Officials having cognizance over the location of the location of the project as follows:
   1) Any affected state/local air agency – No other state or local agencies are expected to be affected by this project.
   2) Chief Executives of the city and county in which the proposed project is to be located. Notices will be sent to the County Manager, Rowan County
   3) Federal Land Manager – As noted above, the FLM for the closest Class I area did not request any analysis to be performed.

Regional Office, the applicant and the SSCB (Stationary Source Compliance Branch) were provided a draft of this permit and their comments taken into consideration.

The Regional Office provided their comments on 2/9/2016. They were minor and addressed in the permit.

The applicant wrote back in 3/10/2016 – Their comments and DAQ's response are addressed below:

- The applicant again modified the sources listed under the "Spray Coating and Assembly Operations" (ES-SCAO). One of the future booth to be installed (ES-59) was identified as a combination booth and oven

- The applicant initially decided remove the source "One CNC router (No. 2)" (ES-CR2). (controlled by a bagfilter CD-BH4) and a cyclone (CD-CY4). Based on their response they now plan to keep this source.

  Since the above source does contribute to the emissions of PM_{10} and $PM_{2.5}$ from the facility. The table above showing the emissions of these pollutants are adjusted for their potential emissions increase, baseline emissions and net increases.

- The Diesel-fired emergency generator (IES-EG) was upgraded from a rating of 250 KW to 358 kW and as per the applicant "during review it was determined that an update to the EG was required." This source subject to NSPS Subpart IIII and MACT Subpart ZZZZ still remains an insignificant source.

- DAQ had required a testing to be conducted on section of the Spray Coating and Assembly Operations (ES-SCAO) as being representative of the entire area for the emissions of $PM_{2.5}$ from this area. The intent is to develop an emission factor for $PM_{2.5}$ (lbs per truck manufactured) or lbs per gallon of paint applied or any other factor agreeable to DAQ.

  The applicant objected to the above testing and wrote back "Daimler does not see any merit for the PM-2.5 testing. We conducted a very conservative calculation to reflect that the PM-2.5 emissions increase would not trigger PSD.

  Conducting a test for PM-2.5 on any section of the SCAO will not provide a representative PM-2.5 emission rate. The PM emissions from the site are based on the types of paints applied, the application method, the % overspray, and the control of the water wash or filters. It would be nearly impossible to correlate the data from the source test to any other emission source within the SCAO and to determine a means to make the data representative.

In our discussions with test firms the accuracy of the PM-2.5 tests always comes into question. Many firms suggest using Method 5 and assuming all PM is PM-2.5. Additionally some data has suggested a PM-2.5 test should be conducted over 8 or more hours to even come close to having a chance to obtain accurate PM-2.5 data, which would have increased costs.

In summary, we see no basis for PM-2.5 testing to develop an emissions factor when we have taken a very conservative calculation approach to estimate PM-2.5 emissions and such approach did not trigger PSD. We do not see the benefit in conducting testing when we have used the conservative calculations approach as presented in the application."

DAQ agrees with the above assertion and removed this testing requirement.

- The consultants for the applicant had some concerns for the wording on other PAL permits regarding addition of new units "the PAL was clearly developed to allow the addition, modification, and deletion of emission units as long as the PAL (the cap) has not been exceeded. While the above applies to the PAL, we do acknowledge that the NC GS requires a permit prior to modifying an existing source or operating a new source.

  Upon reading the October 1, 2013 memorandum on 502(b)(10) and Minor Permit Modifications, it seems clear that the changes that would be contemplated would possibly fall under 502(b)(10) and definitely fall under the minor modification requirements. We have added some suggested language to the permit condition."

  The suggested language as stated "the Permittee may make modifications or additions to the PAL emissions units in Section 2.3. A.1., above, without requiring a modification to the PAL provisions of this permit if the plant wide actual VOC emissions will remain less than 1,406.4 tons per rolling 12 months. ***A minor modification application, which conforms to DAQ regulations, shall be submitted with calculations and suggested monitoring to address any modified or new emission source and continued compliance with the VOC PAL***." This they wanted for all PAL provisions in a permit.

  DAQ will decide on a case by case basis the permit classification for any modification of existing sources or new emission sources to be added under any PAL provisions in a permit. Thus, the existing language for the PAL in this permit are not changed.

XII. Recommendations

It is recommended that Air Quality Permit No. 04625T34 be issued.

XIII. Changes made in the proposed Permit.

The following table describes the changes in modified permit:

Pages	Section	Description of Changes
3	Source Table	Remove Boilers ES-BLR-2 and ES-BLR-6
4	Source Table	Modified Spray Coating and Assembly Operations (ES-SCAO)
5	Source Table	Remove fuel tank polishing operations (ES-FTP)

Pages	Section	Description of Changes
8 and 9	2.1 B.	Modified Spray Coating and Assembly Operations (ES-SCAO)
11	2.1 B. 4.	Replace with modified PSD BACT limit for VOC emissions from Spray Coating and Assembly Operations (ES-SCAO)
12	2.1 B. 4. g., through i.,	One time testing for the emissions of $PM_{2.5}$ from Spray Coating and Assembly Operations (ES-SCAO)
23	2.2 A.	Modified Spray Coating and Assembly Operations (ES-SCAO)
26	2.2 C.	Modified Spray Coating and Assembly Operations (ES-SCAO)
38	2.3 A. 1.	Replaced Actuals PAL for VOC emissions
38	2.3 A. 1. b.,	Modified Spray Coating and Assembly Operations (ES-SCAO)
38	2.3 A. 1.	Removed footnote in reference to attainment status of Rowan County
39	2.3 A. 2., and 3.,	Change of effective and expiration dates for VOC PAL
42	2.3 B. 1. b.,	Modified Spray Coating and Assembly Operations (ES-SCAO), related to NO_x PAL
45	2.3 C. 1. b.,	Modified Spray Coating and Assembly Operations (ES-SCAO), related to Green House Gas PAL
48	2.4 A.	2D. 0530(u) – Monitor annual emissions of PM_{10} and $PM_{2.5}$
49 through 58	Section 3	Updated General Conditions