Statement of Basis Mercedes Benz, Vance, AL
(Motor Vehicle Manufacturing)

Major Source of Hazardous Air Pollutant Emissions

## Introduction

On September 30, 2021, Mercedes-Benz US International, Inc., Vance, AL submitted a Title V major source permit application for the fourth renewal of their Title V Permit. Mercedes is located in Vance, Alabama and is a manufacturer of Motor Vehicles (SIC Code# 3711).

Changes from the previous Title V issuance include incorporating the movement of the Jig Blasters and reducing their number from three to two. There are no current or ongoing enforcement actions against Mercedes necessitating additional requirements to achieve compliance with permit conditions. Tuscaloosa County is currently listed as an Attainment or Unclassifiable County in Alabama for all National Ambient Air Quality Standards (NAAQS).

## **Motor Vehicle Assembly Plant (010) Plant No. 2**

The Motor Vehicle Assembly Plant encompasses several operations that include body welding, assembly, painting, fuel filling, and final product testing. The main source of emissions is the coating line for the vehicles.

### Mix Room (X010)

Mercedes has a paint mix room. The isocyanate (catalyst), color coats, and primer coats are stored in storage totes. The mix room is used for solvent and waterborne paints. The paint hooks are cleaned with a bead blaster, and skids are cleaned using a high-pressure water wash.

### Body Painting (X010)

The car bodies are prepared for painting by passing through an alkaline cleaning and zinc phosphate treatment process. This process consists of a hot water rinse, a hot alkaline pre-cleaner rinse, a hot alkaline cleaner dip, a surface conditioning dip, a zinc phosphate dip (for E-coat preparation and corrosion protection), and a de-ionized water rinse.

Next, a primer is applied through an electro-deposition (E-coat Dip) process. This process begins by immersing the body in a large dip tank filled with water based, lead-free, cathodically charged paint. This is followed by several closed loop rinse stages, to reclaim as much paint as possible, and a de-ionized water dip rinse. The car body then proceeds to the E-coat oven for curing.

After the E-coat is cured, the body proceeds to the E-coat inspection and sanding deck. Here, the E-coat is inspected and any defects in the E-coat or metal are repaired. If a major metal repair is required, the body can exit the line at this point and be returned to the body shop if necessary.

After any defects in the E-coat are repaired, a high solids polyvinyl chloride (PVC) based sealing material is applied to the interior seams, flanges, underbody, engine compartment, luggage compartment, etc. The sealing materials are processed through an oven for curing. The bodies are then cooled and any defects are sanded.

Next, the exterior of the vehicle is coated with a water based primer surfacer. The primer surfacer process is performed in a spray booth and begins with the body being wiped clean and bare metal is spot (or "flash") primed. Next, robots using atomized guns spray in the door jambs and other areas where the automatic spray machines can't reach. The exterior of the body is painted automatically by high voltage electrostatic turbo-bells. Next, manual spraying can be used to touch up missed areas. The body then proceeds through a forced flash-off zone that is exhausted to atmosphere. The primer surfacer is then cured in the primer surfacer oven. The bodies are then cooled and any defects are sanded.

The bodies are then processed through a high volume air blow-off and feather duster to prepare them for the topcoating operation. The topcoating process is performed in a spray booth and begins with the body being wiped clean. Next, a water based color basecoat is applied. This is done using robots and automatic spray machines. The color basecoat is applied manually, robotically, or a combination of the two methods to the exterior of the body automatically by high voltage electrostatic turbo-bells and air atomized reciprocating machines (to dress out metallic colors). Manual spraying may be used to touch up missed areas. This coating is flashed, dried in a convection oven, and then cooled. Manual spray may be used to touch up missed areas. Then, a two component solvent based clearcoat is applied to the body. First, robots using electrostatic guns spray in the door jams and other areas where the automatic spray machines can't reach. Next, the clearcoat is applied to the exterior of the body automatically by high voltage electrostatic turbo-bells. Following a flash-off, the painted bodies are cured in the topcoat oven. The bodies are then cooled and inspected for defects.

If a defect in the topcoat is found, it is either polished out at this point or the body is routed to the repair area for spot repair. If no defects are found, the body proceeds to the blackout/cavity wax booth. A blackout coating is applied to selected interior areas (if required). A cavity wax is applied to seams and inner recesses of the body, in the hood and doors, and the body is cured in the cavity wax oven. Complete painted bodies are routed to an accumulation area prior to transferring to the assembly shop.

Mercedes has four thermal oxidizers that vent out a common stack to control their emissions at Plant No. 2. The thermal oxidizers (RTO 3-1, 3-2, 3-3, 3-4) are under the control of a common header that receives emissions from the Topcoat ovens, Clearcoat booth automatic zones, the E-coat oven, the Sealer oven, Primer/Surfacer oven, and Primer/Surfacer flash-off zone. The integrated oxidizers control the E-coat Oven No. 2 and the Sealer Oven No. 3.

The vehicle body then goes to the assembly area where the doors are removed and accumulate on a conveyor belt to be later matched up with the same vehicle. The interior, engine, transmission, and other parts of the vehicle are installed here. The car is filled with various fluids from the tank farm. An On Board Vapor Recovery system or fume oxidizer is used to control fuel vapors. The vehicle is then roll tested and leak tested. A four-wheel dynamometer is used for emissions testing. A paint repair area with a manual spray booth and quick cure drying system is also located here for spot repairs.

**Applicable Regulations (Coating Lines)**

Plant No. 2 is subject to the NSPS as defined in 40 CFR 60, Subpart MM. These lines are also subject to case by case PSD-BACT decisions. These decisions involve VOC, PM, NOx, and CO. Line No. 2 is subject to a MACT NESHAPS (IIII). These are described in detail in the attached provisos.

**Testing of Emissions (Coating Lines)**

Initially and every three years, using the EPA document *"Protocol for Determining Daily VOC Emission Rate of Automobile and Light Duty Truck Topcoat Operations", June 10, 1988*, and revisions thereafter, Mercedes will determine destruction efficiency for Plant No. 2; RTO 3-1, 3-2, and 3-3, determine transfer efficiencies, booth splits, control efficiencies, and other items, and use Method 24 or 311 as appropriate, for the coatings used in coating operations. After a significant model change, Mercedes will re-determine transfer efficiencies using the new bodies.

**Monitoring of Emissions (Coating Lines)**

Mercedes keeps records as required by the NSPS for their automotive line. This source maintains the allowed Pounds VOC/Pound of coating solids as applied calculations for the different operations through coating formulations and the use of the thermal oxidizers. The monitoring required is as outlined in the NSPS (MM). These are submitted quarterly to the Department.

For Mercedes' various PSD-BACT limits that involve VOCs, Mercedes maintains records of monthly coating usage, coating analysis, and control device destruction efficiency (through temperature monitoring of RTOs) to show compliance with their permit limits. These are submitted quarterly to the Department. Mercedes has limits on the overall usage of VOCs and usage of Hazardous Air Pollutants

(HAPs) for MACT and MACT 112(g). The E-Coat Oven, Sealer/Deadener Oven, Primer/Surfacer Oven, Clearcoat Booth Automatic Zone, and Topcoat/Clearcoat Oven are all vented to RTOs. There are thermocouples on the RTOs to monitor and record temperature measurements. These records are maintained on paper charts for review. Mercedes reports exceedances within the General Proviso break-down requirements. Written reports are submitted with their quarterly report.

Due to the use of venturi scrubbers to control particulates from this operation, daily monitoring of the stacks from the paint booths will not be required. Daily monitoring of the amperage for the liquor pumps and exhaust air fans for the venturi scrubbers will be recorded to show proper operation. These measurements indicate proper manufacturer's recommendations are being utilized for the operation of the booths particulate control equipment and indicates compliance with the PM requirements.

Mercedes' Plant No. 2 was subject to a 112(g) decision. Upon further calculations and review, it was determined that the NESHAP (IIII) was more stringent and was incorporated in the past along with other requirements. For Mercedes' other various 112(g)-MACT limits that involve HAPs, Mercedes maintains records of monthly coating usage, coating analysis, and control device destruction efficiency to show compliance with their permit limits. These are submitted quarterly to the Department. Mercedes has limits on the overall usage of HAPs and 112(g) limits on their automotive assembly line.

Mercedes will utilize only natural gas as a fuel for the ovens and has installed low $NO_x$ burners. The use of natural gas will minimize emissions of PM and $SO_2$. Due to the inherently low particulate and $SO_2$ emissions using this fuel, no periodic monitoring will be required. The use of low $NO_x$ burners will minimize the emissions of NOx. Therefore, no emission monitoring will be required for this pollutant.

Low NOx burners and natural gas only as a fuel are utilized throughout Mercedes on all sources where it is feasible to reduce NOx emissions. CO emissions are typically elevated inversely to NOx emissions, meaning efforts to reduce NOx emissions will generally increase CO emissions. For the small size of units at Mercedes, CO controls would be infeasible, and possibly counterproductive to the control of NOx.

The stacks associated with these sources shall not exhibit greater than 10% opacity. If opacity of 5% or greater is observed from a stack, the operator shall investigate the cause and make any necessary corrective actions. This BACT limit is more stringent than the state allowable opacity. Due to the use of natural gas on all the burners and PM filters and controls on stacks, it is unlikely that visible opacity would be emitted.

A Stage II vapor control system or On Board Vapor Recovery system shall be installed and used during filling of the gas tank for each vehicle.

Mercedes shall utilize good work practices that are practically and economically feasible that reasonably minimize clean-up/purge/general solvent usage in all operations. Coatings, solvents, and other VOC containing material will be handled in such a way as to minimize VOC emissions from storage, handling, coating, and cleanup. Closed containers shall be used for the storage and disposal of cloth or other material used for VOC containing material cleanup or usage. Coatings and other fresh or spent VOC coating material will be stored in closed containers.

**Two 12,000 Gallon Gasoline Storage Tanks with Stage I Vapor Control System (002)**

The tank farm consists of two 12,000-gallon gasoline tanks that are subject to NSPS ($K_b$). Two 12,000-gallon diesel fuel tanks, 10,000-gallon transmission fluid tank, 10,000-gallon glycol tank, 10,000-gallon windshield washer fluid tank, 134a refrigerant tank, and a 5,000-gallon power steering fluid tank are also located here. Tanker truck filling equipped for Stage I vapor recovery is also located here. Gasoline pumps for the filling of on site vehicles are here also. This has no control equipment.

**Applicable Regulations (Storage Tanks)**

Due to the nature of the permit and small emissions involved, the storage tanks are subject to the NSPS as defined in 40 CFR 60, Subpart $K_b$. Due to recent changes in the NSPS, the size record-keeping is no longer involved with the monitoring of emissions, since the tanks are smaller than the size cut-offs for such record-keeping. These are described in detail in the attached provisos.

**One 97.9 MMBTU/HR Natural Gas Fired Boiler (003)**
**One 33.5 MMBTU/HR Natural Gas Fired Boiler (011)**
**One 98 MMBTU/HR Natural Gas Fired Boiler (012)**

The energy center provides utilities to the plant. Mercedes has three natural gas boilers (B801A, B802A, and B803). These heat water to between 200 °F and 210 °F to supply the ovens, and the other equipment. These supply space and process heat for the plant.

**Applicable Regulations (Boilers)**

The boilers are subject to the NSPS as defined in 40 CFR 60, Subpart $D_c$. The boilers are subject to the NESHAPS as defined in 40 CFR 60, Subpart DDDDD. These are described in detail in the attached provisos.

**Monitoring of Emissions (Boilers)(003)(011)**

Mercedes will utilize only natural gas as a fuel for the boilers and has installed low $NO_x$ burners. The use of natural gas will minimize emissions of PM and $SO_2$. Due to the inherently low particulate and $SO_2$ emissions using this fuel, no periodic monitoring will be required. The use of low $NO_x$ burners will minimize the emissions of NOx. Therefore, no emission monitoring will be required for this pollutant.

These boilers are subject to the Boiler MACT, but because they are natural gas fired only, the only requirement is an annual tune up.

**Various 1-15 MMBTU/HR Natural Gas Fired Air Supply Units, ASU (001)(010)**

Mercedes has many Air Supply Units that range in size from 1 to 15 MMBtu/hr for Plant No. 1 and No. 2. They also have many various sizes of oven heaters and coolers. These units supply heated air for process and space use. The ASH Units are not subject to the MACT DDDDD regulation because these are direct fire units and not indirect fired.

**Applicable Regulations (ASUs and Various other Burners)**

Because of their small size, these units are not subject to any regulations.

**Monitoring of Emissions (ASUs and Various other Burners)**

Mercedes will utilize only natural gas as a fuel for the ASUs and burners. The use of natural gas will minimize emissions of PM and $SO_2$. Due to the inherently low particulate and $SO_2$ emissions using this fuel, no periodic monitoring will be required. Some of the larger units utilize low $NO_x$ burners. The use of low $NO_x$ burners and the small burner sizes will minimize the emissions of NOx. The burner manufacturer has tested the NOx ppm levels on the low $NO_x$ burners. Therefore, no emission monitoring will be required for this pollutant.

**Title V Permitted Units**

The following is a list of all of the facility's sources (individual emissions units) which will be part of the facility's Title V Major Source Operating Permit:

| Permit Unit No. | Description of Unit |
|---|---|
| 002 | STORAGE TANKS WITH STAGE I RECOVERY |
| 003 | 1-97.9 MMBTU/HR NATURAL GAS FIRED BOILER |
| 010 | MOTOR VEHICLE ASSEMBLY PLANT NO. 2 WITH VENTURI SCRUBBERS, FOUR INCINERATORS WITH COMMON EXHAUST (RTO#3-1,2,3,4), AND LOW NOX BURNERS |
| 011 | 1-33.5 MMBTU/HR NATURAL GAS FIRED BOILER |

| | |
|---|---|
| **012** | **1-98 MMBTU/HR NATURAL GAS FIRED BOILER** |
| **020** | **2 ABRASIVE BLASTING UNITS** |
| **020** | **GENERATOR(S)** |
| **099** | **PAL** |

Mercedes has a PAL included in this renewal as in its previous permit. Mercedes requests a permit shield for their operations as listed in the permit application. Additional natural gas and diesel fired emergency generators have also been added to the Title V Permit.

**CAM**

Compliance Assurance Monitoring (CAM) is not applicable for the NESHAP (MACT) regulations within this Title V permit because these regulations were proposed post November 15, 1990 (Automotive Manufacturing and Boilers). Compliance Assurance Monitoring (CAM) is not applicable for the Title V permit for the other units listed herein because potential uncontrolled emissions of criteria pollutants do not exceed 100 tons per year on any one unit with control device(s).

Monitoring of Emissions from the automobile coating lines will be accomplished by a Compliance Assurance Monitoring (CAM) plan for the thermal oxidizers and compliant coatings. For the thermal oxidizer, the minimum set-point temperature of the combustion chamber was set by performance testing. The temperature will be monitored and recorded continuously using a thermocouple and chart. This facility shall maintain emission records and supporting background documents to this Department and submit records that pertain to their Major Source Operating Permit (MSOP) whenever requested.

**Permitting Fees**

Title V major sources are subject to operating permit fees which charge the facility a yearly amount based on the actual emission rate of pollutants for the previous year.

**Affected States Notification**

Standard practice is to notify of the issuance of this major source operating permit to all states bordering Alabama.

**Environmental Justice**

ADEM utilized EPA's EJSCREEN screening tool to help identify areas that may warrant additional consideration, analysis, or outreach (see EJSCREEN Report).

**Recommendations**

I recommend that the attached permit be issued to Mercedes.

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Kevin Fulmer
Chemical Branch
November, 2021
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Mercedes has three thermal oxidizers that vent out a common stack to control their emissions at Plant No. 2. The first and second thermal oxidizers (RTO 3-1, 3-2) control the, the Topcoat ovens, and Clearcoat booth automatic zones. The third thermal oxidizer (RTO 3-3) controls the two E-coat ovens, Primer/Surfacer oven, and Primer/Surfacer flash-off zone. The fourth thermal oxidizer (RTO 3-4) controls the three Sealer ovens.

# EJSCREEN Report (Version 2020)

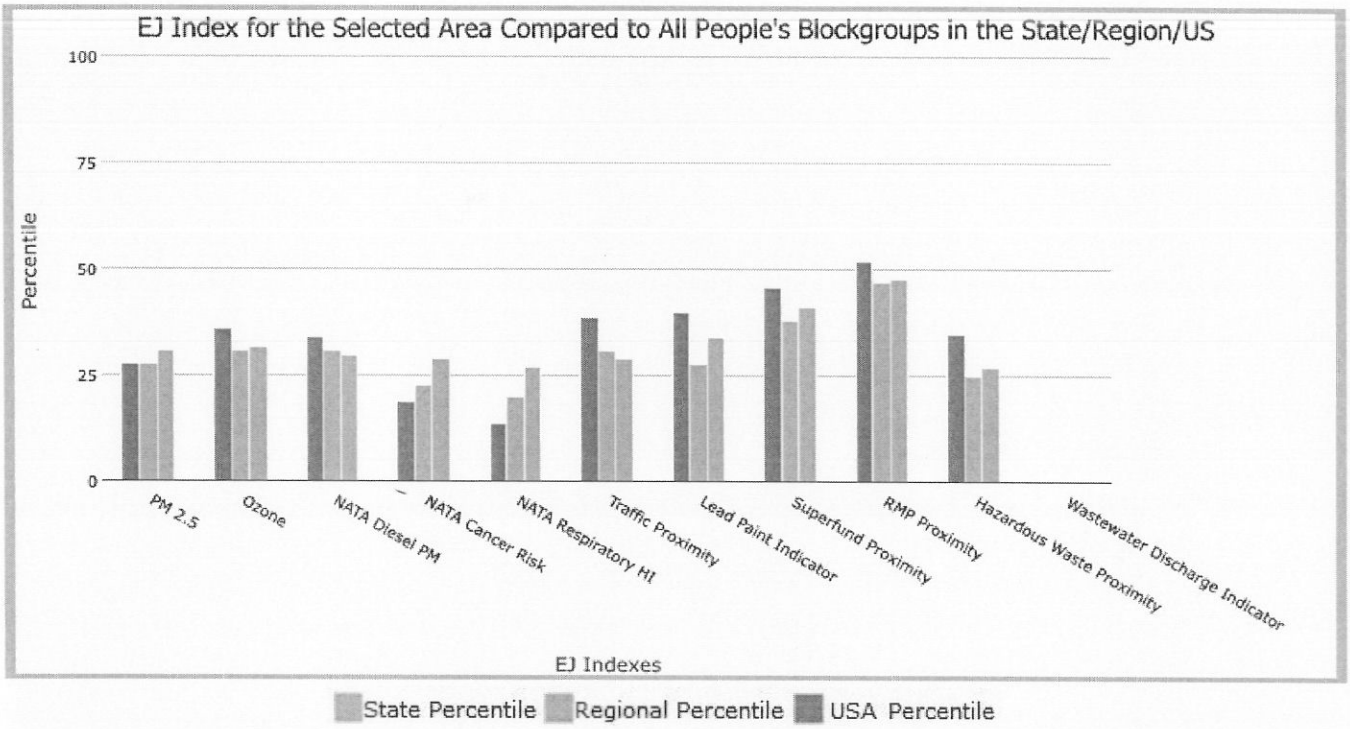
**3 miles Ring Centered at 33.183678,-87.260891, ALABAMA, EPA Region 4**

**Approximate Population: 2,634**

**Input Area (sq. miles): 28.27**

**MERCEDES**

| Selected Variables | State Percentile | EPA Region Percentile | USA Percentile |
|---|---|---|---|
| **EJ Indexes** | | | |
| EJ Index for PM2.5 | 31 | 28 | 28 |
| EJ Index for Ozone | 32 | 31 | 36 |
| EJ Index for NATA* Diesel PM | 30 | 31 | 34 |
| EJ Index for NATA* Air Toxics Cancer Risk | 29 | 23 | 19 |
| EJ Index for NATA* Respiratory Hazard Index | 27 | 20 | 14 |
| EJ Index for Traffic Proximity and Volume | 29 | 31 | 39 |
| EJ Index for Lead Paint Indicator | 34 | 28 | 40 |
| EJ Index for Superfund Proximity | 41 | 38 | 46 |
| EJ Index for RMP Proximity | 48 | 47 | 52 |
| EJ Index for Hazardous Waste Proximity | 27 | 25 | 35 |
| EJ Index for Wastewater Discharge Indicator | 0 | 0 | 0 |




This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

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**MERCEDES**


| Sites reporting to EPA | |
|---|---|
| Superfund NPL | 0 |
| Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF) | 1 |

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**MERCEDES**

| Selected Variables | Value | State Avg. | %ile in State | EPA Region Avg. | %ile in EPA Region | USA Avg. | %ile in USA |
|---|---|---|---|---|---|---|---|
| **Environmental Indicators** | | | | | | | |
| Particulate Matter (PM 2.5 in µg/m³) | 9.36 | 9.31 | 59 | 8.57 | 84 | 8.55 | 76 |
| Ozone (ppb) | 36.7 | 38 | 24 | 38 | 41 | 42.9 | 15 |
| NATA* Diesel PM (µg/m³) | 0.274 | 0.346 | 46 | 0.417 | <50th | 0.478 | <50th |
| NATA* Cancer Risk (lifetime risk per million) | 47 | 43 | 70 | 36 | 90-95th | 32 | 95-100th |
| NATA* Respiratory Hazard Index | 0.74 | 0.65 | 81 | 0.52 | 95-100th | 0.44 | 95-100th |
| Traffic Proximity and Volume (daily traffic count/distance to road) | 57 | 220 | 45 | 350 | 37 | 750 | 26 |
| Lead Paint Indicator (% Pre-1960 Housing) | 0.06 | 0.18 | 32 | 0.15 | 45 | 0.28 | 30 |
| Superfund Proximity (site count/km distance) | 0.017 | 0.054 | 19 | 0.083 | 25 | 0.13 | 13 |
| RMP Proximity (facility count/km distance) | 0.043 | 0.41 | 5 | 0.6 | 3 | 0.74 | 3 |
| Hazardous Waste Proximity (facility count/km distance) | 0.36 | 0.82 | 49 | 0.91 | 50 | 5 | 33 |
| Wastewater Discharge Indicator (toxicity-weighted concentration/m distance) | 1200 | 1.2 | 99 | 0.65 | 99 | 9.4 | 99 |
| **Demographic Indicators** | | | | | | | |
| Demographic Index | 22% | 36% | 29 | 37% | 26 | 36% | 34 |
| People of Color Population | 15% | 34% | 32 | 39% | 27 | 39% | 30 |
| Low Income Population | 28% | 38% | 34 | 36% | 38 | 33% | 49 |
| Linguistically Isolated Population | 2% | 1% | 83 | 3% | 66 | 4% | 59 |
| Population With Less Than High School Education | 13% | 14% | 51 | 13% | 58 | 13% | 64 |
| Population Under 5 years of age | 7% | 6% | 68 | 6% | 68 | 6% | 66 |
| Population over 64 years of age | 12% | 16% | 32 | 17% | 38 | 15% | 43 |

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice