

**Prevention of Significant Air Quality Deterioration Review  
of Chaparral Boats, Inc. – Plant No. 3  
Located in Berrien County, Georgia**

**PRELIMINARY DETERMINATION  
SIP Permit Application No. 15715  
January 2005**

**State of Georgia  
Department of Natural Resources  
Environmental Protection Division  
Air Protection Branch**

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- Appendix A Draft PSD Permit
- Appendix B PSD Permit Application

## SUMMARY

The Environmental Protection Division (EPD) has reviewed the Chaparral Boats, Inc. application to re-permit the facility to remove VOC emission limitations on the Plant No. 3 resin and gel coat operations, and by doing so, undergo a “retro-active” PSD review.

Chaparral Boats is located in Berrien County which is classified "attainment" for PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, and Ozone. The facility is presently classified as a major stationary source under the prevention of significant deterioration (PSD) regulations (as per 40 CFR 52.21) with the potential to emit greater than 250 tons/year of VOC due to the resin and gel coat operations and associated equipment. The modification to the Plant No. 3 resin and gel coat operations (Emission Unit ID No. P3LA) in September 2003 would have triggered PSD had the facility not opted to take a VOC emissions limitation of 71 tons per any twelve consecutive month period. (as issued in Permit No. 3732-019-0003-V-02-1).

The emission units will be subject to PSD review because the relaxation of this volatile organic compound (VOC) emissions limitation will result in a significant emissions increase. The increased potential emissions of VOC are estimated to be 168.49 tons/year, and in excess of the VOC significant modification threshold of 40 tons/year as established under PSD (40 CFR 52.21(23)(i)).

The EPD review of the data submitted by Chaparral Boats related to the proposed modification indicates that the project will be in compliance with all applicable state and federal air quality regulations.

It is the preliminary determination of the EPD that the proposal provides for the application of Best Available Control Technology (BACT) for the control of VOC as required by federal Prevention of Significant Deterioration (PSD) regulation 40 CFR 52.21(j).

It has been determined through approved modeling techniques that the estimated emissions will not cause or contribute to a violation of any ambient air standard or allowable PSD increment, either in the area surrounding the facility or nearby Class I area. It has further been determined that the proposal will not cause impairment of visibility or detrimental effects on soils or vegetation. Any air quality impacts produced by project-related growth should be inconsequential.

The Preliminary Determination indicates that an Air Quality Permit should be issued to Chaparral Boats, Inc. for the removal of the 71 tpy VOC emissions limitation on the Plant No. 3 resin and gel coat operations (Emission Unit ID No. P3LA). Emission Unit ID No. P3LA also contains the gel coat operations for Plant No. 3 which will be designated separately as Plant No. 3 Gel Coat Operations (Emission Unit ID No. P3GC). Various conditions will be made a part of the permit to ensure and confirm compliance with all applicable air quality regulations. A copy of the draft permit amendment is included in Appendix A.

## 1.0 INTRODUCTION

On October 20, 2004, Chaparral Boats, Inc. (Chaparral Boats) submitted an application for the removal of the 71 tpy VOC emissions limitation on the Plant No. 3 resin and gel coat operations (Emission Unit ID No. P3LA). Chaparral Boats is located at 300 Industrial Boulevard, in Nashville (Berrien County), Georgia.

Based on the proposed project, the estimated potential increases of regulated pollutants from the facility are listed in Table 1.

**Table 1-1: Emissions Increases from the Modification of Emission Unit ID Nos. P3LA**

Pollutant	Potential Emissions Increase (tpy)	PSD Significant Emission Rate (tpy)	Subject to PSD Review
PM-10	4.53	15	No
PM	4.53	25	No
SO <sub>2</sub>	0.01	40	No
NO <sub>x</sub>	2.19	40	No
CO	1.84	100	No
VOC <sup>1</sup>	168.49	40	Yes
Pb	0.0	0.6	No
H <sub>2</sub> SO <sub>4</sub>	0.0	7	No

1 The baseline for the other criteria pollutants was not calculated since the potential emissions are below the PSD significance thresholds.

The potential VOC emissions from the emission units specified in Table 1 were calculated using the July 2001 version of the Unified Emission Factors (UEF) for open molding of composites as published by the American Composites Manufacturers Association (ACMA). The UEF are the most current and accurate emission factors for fiber reinforced plastic manufacturing operations. Emissions of VOC from cleaning operations are based upon the conservative assumption that 100 percent of VOC used is emitted.

The baseline emissions for the resin and gel coat operations at Plant No. 3 were 32 tpy VOC at the time of the September 2003 modification (per Division’s review of Application No. TV-13993). The facility took a 71 tpy VOC PSD avoidance limit to ensure that the potential increase in VOC emissions remained below 40 tpy. If no VOC limit was in place the potential emissions increase due to the modification would have been 168.49 tpy VOC (200.49 tpy – 32 tpy).

Based on the information in Table 1-1, Chaparral Boats’ proposed modification as specified per Georgia Air Quality Application No. 15715 is classified as a major modification under PSD because potential emissions of VOC equal or exceeds 40 tpy.

Through its new source review procedure, EPD has evaluated Chaparral Boats’ proposal for compliance with State and Federal requirements. The findings of EPD have been assembled in this Preliminary Determination.

## 2.0 PROCESS DESCRIPTION

### Overall Operations

Chaparral Boats manufactures large recreational stern driven boats. The facility manufactures several models ranging in length from 18 feet (SSI Sport Boats) to 37 feet in length (Signature Series). Plant No. 3 will need to have the capacity to fully manufacture the Signature series boat. The signature series boats (as all boats at the facility) are built from the outside of the hull to the inside and are built around pre-made molds. The molds are usually made of fiberglass and are used repeatedly over and over again. The molds (hulls) are cleaned and waxed, and a layer of gel coat is sprayed on the molds and allowed to cure. A thin layer of resin (skin coat) is then applied over the first layer of gel coat. The skin coat aids in the adhesion of the gel coat to the resin. As the boat hulls enter the lamination process, layers of unfilled resin, chopped fiberglass strands, and glass mat are applied to the bottom and the sides of the boat. Usually several layers of resin/fiberglass make up the laminate for the hull. The molded piece is then removed from the mold and trimmed. The boat deck and hulls are then assembled, and any motors and/or necessary wiring and furniture are then installed. The 71 tpy VOC PSD avoidance limitation is only applicable to the resin and gel coat operations (including equipment cleaning and material mixing), therefore, only these emission units are undergoing a PSD review.

### Resin/Lamination

Plant No. 3 has 12 resin/lamination stations comprising the resin/lamination operations area (Emission Unit ID No. P3LA) to apply the resin to the boat hull molds. The facility will use fluid impingement technology (FIT) applicators in the resin stations. The use of FIT guns (model Numbers VPR-1000 and CPR-1000) is considered to be a non-atomized application method. The emissions from the resin/lamination operations include VOCs, HAPs, and minimal amounts of particulate matter. In the resin/lamination area, a thin layer of resin (skin coat) is applied to the outer layer of gel coat that makes up the outside of the boat hull. Then several layers of resin are applied between layers of glass mat. The boat hull and deck are laminated separately. The deck area is formed in a similar manner as that of the boat hulls. The facility uses pre-made molds of the deck and applies a thin layer of resin followed by alternating layers of resin and fiberglass mat.

### Gel Coat Operations

The boat building plant will have 10 gel coat spray guns that will be dedicated to applying gel coat to the boat decks and hulls and comprise the Gel Coat Operations (Emission Unit ID No. P3GC). The gel coat guns will be manufactured by Magnum (model numbers will be ATG-3500 and ITD-3500). The boat decks and hulls are formed as a single mold and include the built-in seating areas of the boats. The boat deck and hull is formed with the outer most

gel coat layer applied first to the mold. After the first gel coat layer is applied, the resin and fiberglass mat is applied via the resin /lamination area. After the resin and fiberglass is applied then the inside gel coat layer is subsequently applied.

#### Equipment Cleaning Operations

Plant No. 3 has equipment cleaning operations (Emission Unit ID No. P3EC) that includes the flush cleaning of FIT and spray guns for the resin and gel coat operations. The equipment cleaning operations also include the storage of any cleaning solvents, with the use of acetone as the primary cleaning solvent. Acetone is not designated a VOC. The facility uses minimal amounts of MEK and toluene to remove cured resins. The equipment cleaning operations have previously been grouped with Emission Unit ID No. P3LA but will now have their own designation.

#### Material Mixing Operations

Plant No. 3 has several mixing tanks for resins and gel coats. These operations will include a 6,500-gallon tank, a 1,400-gallon tank, and numerous 55-gallon drums. The VOC emissions from these operations are considered insignificant under Title V permitting but have been assessed for PSD applicability. The material mixing operations have previously been grouped with Emission Unit ID No. P3LA but will now have their own designation.

Chaparral Boats' permit application and supporting data are included in Appendix B.

### **3.0 REVIEW OF APPLICABLE RULES AND REGULATIONS**

#### **3.1 State Rules**

Georgia Rule for Air Quality Control (Georgia Rule) 391-3-1-.03(1) requires that any person prior to beginning the construction or modification of any facility which may result in pollution shall obtain a permit for the construction or modification of such facility from the Division upon a determination by the Division that the facility can reasonably be expected to comply with all the provisions of the Act and the rules and regulations promulgated there under. Georgia Rules 391-3-1-.03(8)(b) continues that no permit to construct a new stationary source or modify an existing stationary source shall be issued unless such proposed source meets all the requirements for review and for obtaining a permit prescribed in Title I, Part C of the Federal Act [i.e., Prevention of Significant Deterioration of Air Quality (PSD)], and Section 391-3-1-.02(7) of the Georgia Rules (i.e., PSD).

#### Georgia Rules (b) and (e)

Georgia Rules 391-3-1-.02(2)(b) and (e) limit visible emissions and PM emissions. Georgia Rule (b) limits visible emissions to not equal or exceed forty (40) percent from the new process equipment. The equipment at the facility will be in compliance with this opacity limit via the use of FIT application devices for the

resin operations (Emission Unit ID Nos. P3LA). The facility will use dry filters (APCD ID No. P3F1 through P3F6) to control particulate matter (overspray) emissions from the gel coat operations (Emission Unit ID No. P3GC) and comply with Georgia Rule (b).

Georgia Rule (e) limits particulate matter emissions per the following formula for the new process equipment:  $E = 4.1(P)^{0.67}$ , where E = Emission rate in pounds per hour and P = Process input rate in tons per hour, for process input weight rates up to and including 30 tons per hour. The equipment at the facility will be in compliance with this particulate matter limit via the use of FIT application devices for the resin operations (Emission Unit ID Nos. P3LA). The facility will use dry filters (APCD ID No. P3F1 through P3F6) to control particulate matter (overspray) emissions from the gel coat operations (Emission Unit ID No. P3GC). The potential PM emissions from Plant No. 3 resin and gel coat operations will be 4.36 tpy due to gel coat and resin overspray.

### 3.2 Federal Rules

#### PSD – 40 CFR 52.21

The regulations for Prevention of Significant Air Quality Deterioration (PSD) in 40 CFR 52.21 require that any new major source or major modification of an existing major source be reviewed to determine the potential emissions of all pollutants subject to regulations under the Clean Air Act. The PSD review requirements apply for any new or modified source which belongs to one of 28 specific source categories having potential emissions of 100 tons per year or more of any regulated pollutant, or all other sources having potential emissions of 250 tons per year or more of any regulated pollutant; or modification of a major stationary source which results in a significant net emission increase of any regulated pollutant.

The PSD regulations require that any major stationary source or major modification subject to the regulations meet the following requirements:

- Application of best available control technology (BACT) for each regulated pollutant that would be emitted in significant amounts.
- Analysis of the source's ambient air impact.
- Analysis of existing ambient air quality.
- Analysis of the impact on soils, vegetation, and visibility.
- Analysis of the impact on Class I areas.
- Public notification of the proposed plant in a newspaper of general circulation.

NESHAP - 40 CFR 63 Subpart VVVV

40 CFR 63 Subpart VVVV “NESHAP for Boat Manufacturing” applies to all facilities that are engaged in boat manufacturing and are major sources of hazardous air pollutants (HAPs). A major source facility emits equal to or greater than 10 tpy of an individual HAP and/or 25 tpy of combined HAPs. NESHAP Subpart VVVV will require the facility to limit HAP emissions from the resin, gel coats, solvents, and adhesives used at the boat manufacturing affected source.

The facility has three options for complying with the NESHAP for resin and gel coats. Option one is the material compliant option which allows sources to comply with the HAP limit in the NESHAP as long as the 12-month rolling average HAP content for the resin or gel coat category is at or below the specified limit. In order to use the compliance material option all categories of resin and gel coat must be at or below their respective limits. Option two is the MACT model point value averaging option (emissions averaging) which allows the facility to determine a HAP limit (based upon the amount of each type of resin or gel coat used) and compare it to the HAP emissions as calculated by the formula presented in the NESHAP. The source is in compliance if the 12-month rolling total HAP emissions for each month is below the calculated HAP limit. Option three allows the facility to use add-on controls to demonstrate compliance with the HAP limit.

The compliance date for existing sources subject to NESHAP Subpart VVVV was August 23, 2004. Chaparral Boats is considered an existing source since the facility was constructed before July 14, 2000. The specifics of the Boat Manufacturing NESHAP, Subpart VVVV, are described below in greater detail.

The facility must limit the emissions of HAP from open molding resin and gel coat operations to below the following HAP limit which is the total allowable organic HAP (in kilograms) that can be emitted from the open molding operations.

$$\text{HAP Limit} = 46M_R + 159M_{PG} + 291M_{CG} + 54M_{TR} + 241M_{TG}$$

Where,

$M_R$  = mass of production resin used (in megagrams) in the past 12 months, excluding any exempt materials

$M_{PG}$  = mass of pigmented gel coat used (in megagrams) in the past 12 months, excluding any exempt materials

$M_{CG}$  = mass of clear gel coat used (in megagrams) in the past 12 months, excluding any exempt materials

$M_{TR}$  = mass of tooling resin used (in megagrams) in the past 12 months, excluding any exempt materials

$M_{TG}$  = mass of tooling gel coat used (in megagrams) in the past 12 months, excluding any exempt materials

As described above, the facility has three options of complying with this emission limit; the use of compliant materials, the use of an emissions averaging method, or the use of add-on controls. The facility will use the emissions averaging provisions and the compliant material options to demonstrate compliance.

Under the emissions averaging provisions, the facility determines the 12-month rolling total HAP emissions each month per the following formula:

$$\text{HAP Emissions} = PV_R M_R + PV_{PG} M_{PG} + PV_{CG} M_{CG} + PV_{TR} M_{TR} + PV_{TG} M_{TG}$$

Where,

**HAP Emissions** = Organic HAP emission calculated using MACT model point values for each operation included in the average (in kilograms).

$PV_R$  = Weighted-average MACT model point value for production resin used in the past 12 months (in kilograms per megagram).

$M_R$  = Mass of production resin used in the past 12 months (in megagrams).

$PV_{PG}$  = Weighted-average MACT model point value for pigmented gel coat used in the past 12 months (in kilograms per megagram).

$M_{PG}$  = Mass of pigmented gel coat used in the past 12 months (in megagrams).

$PV_{CG}$  = Weighted-average MACT model point value for clear gel coat used in the past 12 months (in kilograms per megagram).

$M_{CG}$  = Mass of clear gel coat used in the past 12 months (in megagrams).

$PV_{TR}$  = Weighted-average MACT model point valued for tooling resin used in the past 12 months (in kilograms per megagram).

$M_{TR}$  = Mass of tooling resin used in the past 12 months (in megagrams).

**PV<sub>TG</sub>** = Weighted-average MACT model point value for tooling gel coat used in the past 12 months (in kilograms per megagram).

**M<sub>TG</sub>** = Mass of tooling gel coat used in the past 12 months (in megagrams).

The MACT model point values are determined using the following table:

Table 3-1

Operation Type	Application Method	Formula to calculate PV <sub>i</sub> for each resin and gel coat
Production resin, tooling resin	a. Atomized b. Nonatomized	0.014 x (Resin HAP%) <sup>2.425</sup> 0.014 x (Resin HAP%) <sup>2.275</sup>
Pigmented gel coat, clear gel coat, tooling gel coat	All methods	0.445 x (Gel coat HAP%) <sup>1.675</sup>

If the calculated HAP emissions are below the calculated HAP emissions limit then the facility is in compliance.

The facility can also demonstrate compliance if the average HAP content of each and every gel coat or resin in their respective resin or gel coat category is below the limit specified in the following table:

Table 3-2

Operational Category	Application Method	The weighted-average organic HAP content must not be exceeded
1. Production resin operations.....	Atomized (spray)	28 percent.
2. Production resin operations.....	Nonatomized (nonspray)	35 percent.
3. Pigmented gel coat operations...	Any method	33 percent.
4. Clear gel coat operations.....	Any method	48 percent.
5. Tooling resin operations.....	Atomized (spray)	30 percent.
6. Tooling resin operations.....	Nonatomized (nonspray)	39 percent.
7. Tooling gel coat operations.....	Any method	40 percent.

The HAP content for each category is determined each month on a 12-month rolling total basis.

The facility’s resin and gel coat mixing operations must comply with work practice standards that require monthly inspections of all containers for resin and gel coat to ensure that lids are closed except for the removal or addition of material. The facility’s equipment cleaning operations must also comply with similar work practices requirements. Solvents used for equipment cleaning operations must contain no more than 5 percent HAP, by weight.

Since NESHAP Subpart VVVV has been promulgated by USEPA, the new plant will not be subject to 40 CFR 63 Subpart 63.40 through 63.44 [Control Technology Requirements in Accordance with Section 112(g)(2)(B) of the 1990

CAA Amendments]. Therefore, a case-by-case control technology analysis will not be performed for this modification.

#### Applicability of Other Federal Regulations

The only other federal standard applicable to Plant No. 3 is NESHAP Subpart DDDDD “Boiler MACT” (promulgated September 13, 2004) since the facility is a major source of HAPs and has fuel burning sources that can be classified as process heaters (indirect fired hanging furnaces). The process heaters at Plant No. 3 are classified as existing small gaseous fuel process heaters. 40 CFR 63.7506(c) specifies that the facility does not need to submit initial notifications or comply with any requirements for these type units. 40 CFR Part 64 “Compliance Assurance Monitoring” will not apply since the facility will not be using an add-on control device to control VOC emissions. The facility is not subject to the requirements of 40 CFR Part 63 Subpart JJ “Wood Furniture Manufacturing Operations NESHAP,” because USEPA has determined that wood furniture on a boat is integral to the boat cabin and is not comparable to the furniture regulated under NESHAP Subpart JJ (see section V.C. of the preamble to the proposed Boat Manufacturing NESHAP, page 43855 of FR, July 14, 2000).

#### Definition of BACT

The PSD regulation requires that BACT be applied to all regulated air pollutants emitted in significant amounts. Section 169 of the Clean Air Act defines BACT as an emission limitation reflecting the maximum degree of reduction that the Division, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such a facility through application of production processes and available methods, systems, and techniques. In all cases BACT must establish emission limitations or specific design characteristics at least as stringent as applicable New Source Performance Standards (NSPSs). In addition, if the Division may determine that there is no economically reasonable or technologically feasible way to measure the emissions and impose an enforceable emissions standard, and require the source to use a design, equipment, work practice or operations standard or combination thereof, to reduce emissions of the pollutant to the maximum extent practicable.

The BACT determination should, at a minimum, meet two core requirements.<sup>1</sup> The first core requirement is that the determination follows a “top-down” approach. The second core requirement is that the selection of a particular control system as BACT must be justified in terms of the statutory criteria and supported by the record, and must explain the basis for the rejection of other more stringent candidate control systems.

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<sup>1</sup> The discussion of the core requirements is taken from the Preamble to the Proposed NSR Reform, 61 FR38272.

EPD's procedures for performing top down BACT analysis are set forth in EPA's Draft New Source Review Workshop Manual (Manual), dated October 1990. One critical step in the BACT analysis is to determine if a control option is technically feasible.<sup>2</sup> If a control is determined to be infeasible, it is eliminated from further consideration. The Manual applies several criteria for determining technical feasibility. The first is straightforward. If the control has been installed and operated by the type of source under review, it is demonstrated and technically feasible.

For controls not demonstrated using this straightforward approach, the Manual applies a more complex approach that involves two concepts for determining technical feasibility: availability and applicability. A technology is considered available if it can be obtained through commercial channels. An available control is applicable if it can be reasonably installed and operated on the source type under consideration. A technology that is available and applicable is technically feasible.

The Manual provides some guidance for determining availability. For example, a control is generally considered available if it has reached the licensing and permitting stages of development. However, the Manual further provides that a source would not be required to experience extended time delays or resource penalties to allow research to be conducted on new technologies. In addition, the applicant is not expected to experience extended trials learning how to apply a technology on a dissimilar source type. Consequently, technologies in the pilot scale testing stages of development are not considered available for BACT.

In addition, as mentioned before, the Manual also requires available technologies to be applicable to the source type under consideration before a control is considered technically feasible. For example, deployment of the control technology on the existing source with similar gas stream characteristics is generally sufficient basis for concluding technical feasibility. However, even in this instance, the Manual would allow an applicant to make a demonstration to the contrary. For example, the applicant could show that unresolved technical difficulties with applying a control to the source under consideration (e.g., size of the unit, location of the proposed site and operating problems related to the specific circumstances of the source) make a control technical infeasible.

According to the Environmental Appeals Board (See In re Kawaihae Cogeneration Project, 7 E.A.D. 107 at page 1996, EAB 1997), the section on "collateral environmental impacts" of a proposed technology has been interpreted to mean that "if application of a control system results directly in the release (or removal) of pollutants that are not currently regulated under the Act, the net environmental impact of such emissions is eligible for consideration in making the

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<sup>2</sup> Discussion on technical feasibility is taken from the PSD Final Determination for AES Londonderry, L.L. C., Rockingham County, New Hampshire. The PSD Final Determination was written by the U.S. EPA Region I, Air Permits Program.

BACT determination.” The Appeals Board continues, “The Administrator has explained that the primary purpose of the collateral impacts clause ‘is...to temper the stringency of the technology requirements whenever one or more of the specified collateral impacts – energy, environmental or economic -renders the use of the most effective technology inappropriate.” Lastly, the Appeals Board states “Unless it is demonstrated to the satisfaction of the permit issuer that such unusual circumstances exist, then the permit applicant must use the most effective technology.”

The five steps of a top-down BACT review procedure as identified by USEPA per BACT guidelines are listed below:

- Step 1: Identify all control technologies
- Step 2: Eliminate technically infeasible options
- Step 3: Rank remaining control technologies by control effectiveness
- Step 4: Evaluate most effective controls and document results
- Step 5: Select BACT

Now that the PSD BACT standards have been defined, the next step is to review the remaining applicable requirements. This step will aid in citing the appropriate legal authority for each requirement in the Title V permit. This analysis will show that the PSD BACT standards represent the most stringent limit.

#### State and Federal – Startup and Shutdown and Excess Emissions

Excess emission provisions for startup, shutdown, maintenance, and malfunction are provided in Georgia Rule 391-3-1-.02(2)(a)7. The facility will not be required to use add-on controls per this PSD review, therefore, excess emissions from startup, shutdown, maintenance, and malfunction will not occur.

#### **4.0 CONTROL TECHNOLOGY REVIEW – Resin/Lamination Operations, Gel Coat Operations, Equipment Cleaning Operations, and Material Mixing Operations**

##### Volatile Organic Compounds

VOC emissions are emitted from the boat manufacturing operations due to the use of resins and gel coats. The facility has proposed compliance with a VOC emission limitation based upon the amount of material used (resin and gel coat) as BACT. The Plant No. 3 resin and gel coat operations will comply with a VOC emissions limitation that will require the facility to use low VOC resin and gel coat and non-atomized application techniques.

##### Step 1: Identify all control technologies

In reviewing the BACT alternatives to control emissions of VOC from the facility, Chaparral Boats considered regenerative thermal oxidation, catalytic oxidation, carbon adsorption systems, scrubbers, condensation systems, and pollution prevention as noted in the following table:

Option 1: Regenerative Thermal Oxidation
Option 2: Regenerative Catalytic Oxidation
Option 3: Carbon Adsorption Systems
Option 4: Scrubbers
Option 5: Condensation Systems
Option 6: Pollution Prevention

The Division agrees that the above options are all of the BACT alternatives available to boat manufacturers.

Step 2: Eliminate Technically infeasible options

Option 3 – Carbon Adsorption Systems

Carbon adsorption systems, can in certain applications, be used to remove VOC from the gas streams. The core component of a carbon adsorption system is an activated carbon bed contained in a steel vessel. The VOC-laden gases pass through the carbon bed, and 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. Using steam to replace adsorbed organic compounds at high temperatures regenerates the spent carbon.

The facility has indicated that Carbon adsorption is a technically infeasible option for the control of many VOC emissions, including styrene, because of the low activated carbon adsorptivity of the VOC. In addition, the high-molecular weight of condensable VOC compounds (styrene has a MW of 104.2lbs/lb-mole) will coat the carbon, leading to increased operational difficulties and decreased removal efficiencies. A final consideration is that the low inlet VOC concentrations of open molding processes will hinder the effectiveness of the system.

A U.S. EPA report indicates that carbon adsorption systems can routinely achieve VOC outlet concentrations as low as 50 parts per million (ppm).<sup>3</sup> The report also indicates that high removal efficiencies (at least 90 percent) are not routinely found at inlet concentrations less than 100 ppm. Carbon adsorption would not provide an adequate level of control and is deemed technically infeasible for operations with gas stream VOC concentrations below 100 ppm. Chaparral Boats' waste gas streams are well below 100 ppm and usually in the 20 to 50 ppm range.

Based on these findings, the facility indicates that Option 3 should not be considered any further in this VOC BACT evaluation. The Division agrees with and approves this analysis.

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<sup>3</sup> U.S. EPA, Survey of Control Technologies for Low Concentration Organic Vapor Gas Streams, EPA-456/R-95-003, May 1995.

#### Option 4 – Scrubber Systems

VOC from a waste gas stream can be removed by utilizing a scrubbing liquid. Mass transfer of the VOC occurs when the scrubbing liquid contacts the waste gas stream. The VOC is absorbed into the scrubbing liquid and removed from the gas stream.

Wet scrubber systems typically do not work as well as other VOC control technology in controlling volatile organic compounds with high molecular weights, and furthermore, do not work as well for high volume low concentration waste gas streams. The waste gas streams for the Chaparral Boats would be as high as 168,000 acfm. The use of wet scrubbing technology is not known to be applied in surface coating facilities for the control of VOC emissions. Based on a comprehensive review of all known existing surface coating facilities in Georgia as well as the Division's review of sources identified in the RACT/BACT/LAER data base, there is no indication that wet scrubbers are effectively utilized for controlling VOC emissions. This is due to the relatively high air flows and low concentrations at most surface coating facilities. Wet scrubbers generally work best for controlling particulate matter emissions, SO<sub>2</sub> emissions, and VOC emissions from chemical plants where VOC emissions are very concentrated (in the 1,000 ppm<sub>v</sub> to 2,500 ppm<sub>v</sub> range).

The low VOC concentration and high volume of the facility's waste gas streams will render the use of a wet scrubbing system technically non-feasible. Therefore, the facility has indicated that Option 4 is not considered any further in this VOC BACT evaluation. The Division agrees with and approves this analysis.

#### Option 5 – Condensation Systems

VOC emissions from manufacturing facilities can be reduced by chilling the gas streams. As the temperature of the gas stream is lowered, a certain portion of the VOC in the exhaust stream will be condensed and removed.

The facility has indicated that condensation is not technically feasible for gas streams with low VOC concentrations. The manufacturing operations in Plant No. 3 will have fairly low concentrations of VOC in the exhaust streams. According to an U.S. EPA report, it is impractical to remove VOC via condensation at a level below several thousand ppmv.<sup>4</sup> Condensation is a technically infeasible option for high volume dilute VOC waste streams (similar to Chaparral Boats) that are below the 1,000 ppmv range.

Chaparral Boats' waste gas streams are well below 1000 ppmv and usually in the 20 to 50 ppmv range (41 ppm for an estimated flow rate of 168,000 acfm). Based on these findings, The facility requests that Option 5 not be considered any further in this VOC BACT evaluation. The Division agrees with and approves this

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<sup>4</sup> U.S. EPA, Survey of Control Technologies for Low Concentration Organic Vapor Gas Streams, EPA-456/R-95-003, May 1995.

analysis.

Option 1 – Regenerative Thermal Oxidation

The resin and gel coat mixing operations and equipment cleaning will occur intermittently throughout Plant No. 3 and collectively represent only 0.8 percent of the potential VOC emissions (less than 2 tpy). Therefore, the facility has indicated that the use of a regenerative thermal oxidizer (RTO) would not be technically feasible for these minor operations. There is no known boat manufacturing operation that utilizes a thermal oxidizer for the control of VOC emissions from resin and gel coat mixing operations and equipment cleaning. These operations typically occur throughout the plant and not in one location making capture of the VOC emissions from these operations technically infeasible. In past PSD preliminary determinations, the Division has determined that end-of-pipe controls for miscellaneous support and maintenance operations that occur plant-wide are not technically feasible (see PSD Preliminary Determination for Daimler Chrysler Mfg., May 2003). The facility has indicated that Option 1 should not be considered any further in this VOC BACT evaluation for resin and gel coat mixing operations and equipment cleaning. However, the use of a RTO to control VOC emissions from gel coat and resin and lamination operations is technically feasible and is further evaluated in Step 4. The Division agrees with and approves this analysis.

Option 2 – Regenerative Catalytic Oxidation

The resin and gel coat mixing operations and equipment cleaning will occur intermittently throughout Plant No. 3 and collectively represent only 0.8 percent of the potential VOC emissions (less than 2 tpy). Therefore, the facility has indicated that the use of a regenerative catalytic oxidizer (RCO) would not be technically feasible for these minor operations. There is no known boat manufacturing operation that utilizes a catalytic oxidizer for the control of VOC emissions from material mixing operations and equipment cleaning. These operations typically occur throughout the plant and not in one location making capture of the VOC emissions from these operations technically infeasible. In past PSD preliminary determinations, the Division has determined that end-of-pipe controls for miscellaneous support and maintenance operations that occur plant-wide are not technically feasible (see PSD Preliminary Determination for Daimler Chrysler Mfg., May 2003). The facility has indicated that Option 2 should not be considered any further in this VOC BACT evaluation for resin and gel coat mixing operations and equipment cleaning. However, the use of a RCO to control VOC emissions from gel coat and resin and lamination operations is technically feasible and is further evaluated in Step 4. The Division agrees with and approves this analysis.

Step 3: Rank remaining control technologies by control effectiveness

Table 4-1: Ranking of Control Technology

Control Technology Ranking	Control Technology	Control Efficiency
1	Regenerative Thermal Oxidizer	95 percent
2	Regenerative Catalytic Oxidizer	90 to 95 percent
3	Pollution Prevention	73 percent

Step 4: Evaluate most effective controls and document results

The control technology evaluations for the Resin/Lamination Operations and Gel Coat Operations are combined for Options 1, 2, and 6.

#### Option 1 – Regenerative Thermal Oxidation

VOC can be oxidized to carbon dioxide and water vapor at high temperatures (generally 300 degrees Fahrenheit above the autoignition temperature of the VOC with a residence time of 0.5 to 1.0 second). Thermal oxidizers can be recuperative or regenerative. Recuperative thermal oxidizers do not have a high heat recovery rate. Therefore, cost effectiveness is diminished. A regenerative thermal oxidizer (RTO) can achieve a much higher heat recovery. The RTO usually consists of two chambers packed with stone media. The waste gas enters the first stone bed where the gas is heated to a desired combustion temperature (only minimal amount of fuel is needed at this point). The waste gas stream then enters the second stone bed where heat is released from combustion and is recovered and stored in the bed. The beds alternate so the waste gas enters the second bed first in order to heat up to the desired combustion temperature. The system operates on an alternating cycle and recovers up to 95 percent of the thermal energy during oxidation. The use of an RTO has been found to be technically feasible. The control efficiency of an RTO is about 95 percent.

However, the facility has proposed that it is not cost effective for the facility to control VOC emissions from the Gel Coat Operations (cost of \$18,089 per ton of VOC reduced) and the Resin Lamination Operations (cost of \$19,938 per ton of VOC reduced) with a RTO. The facility argues that the Division has traditionally declared any cost per ton reduced over \$10,000 to be economically infeasible. Therefore, the use of a RTO was not considered BACT by the facility for the resin and gel coat operations at Plant No. 3 for reasons of economic infeasibility. The Division agrees with and approves this analysis.

#### Option 2 – Regenerative Catalytic Oxidizers

A regenerative catalytic oxidizer (RCO) is similar to a RTO but utilizes a catalyst bed to lower the energy required to achieve oxidation. As a result, less auxiliary fuel is required than a RTO. The control efficiency can be as high as 95 percent and tends to be slightly lower on average than a RTO. A catalytic oxidizer will have higher operational costs due to catalyst replacement especially for high volume dilute waste gas streams. The economic analysis performed for the RCO demonstrates a much lower cost effectiveness (much higher ratio of dollars spent per ton VOC reduced) than that of a regenerative thermal oxidizer.

Consequently, the facility has proposed that it is not cost effective for the facility to control VOC emissions from the Gel Coat Operations (cost of \$57,701 per ton of VOC reduced) and the Resin Lamination Operations (cost of \$64,286 per ton of VOC reduced) with a RCO. The facility argues that the Division has traditionally declared any cost per ton reduced over \$10,000 to be economically infeasible. Therefore, the use of a RCO will not be considered BACT by the facility for the resin and gel coat operations at Plant No. 3, again for reasons of economic

infeasibility. The Division agrees with and approves this analysis.

Table 42 summarizes the Top-Down BACT Impact Analysis results for VOC including the incremental cost analysis and any environmental impacts. As can be seen below, the incremental cost effectiveness per ton of VOC reduced is above \$18,000 for a RCO and RTO indicating that both of these control options are economically infeasible for the resin and gel coat operations.

Control Alternative	Emissions		Economic Impacts				Environmental Impacts	
	Emissions <sup>1</sup> (tpy)	Emission Reductions <sup>2</sup> (tpy)	Installed Capital Cost <sup>3</sup> (\$)	Total Annualized Cost <sup>4</sup> (\$/yr)	Average Cost Effectiveness <sup>5</sup> (\$/ton)	Incremental Cost Effectiveness <sup>6</sup> (\$/ton)	Toxics Impact <sup>7</sup> (yes/no)	Environmental Impacts <sup>7</sup> (yes/no)
RTO - Resin	30.34	576.43	5,473,830	2,080,352	19,938	26,081.23	No	No
RTO – Gel Coat	7.50	142.55	4,107,182	1,529,394	18,089	18,766.17	No	No
RCO - Resin	30.34	576.43	2,852,114	6,707,481	64,286	84,290.27	No	No
RCO - Gel Coat	7.50	142.55	2,368,111	4,878,609	57,701	59,862.13	No	No
Pollution Prevention - Resin	109.83	496.94	47,743	7,113	14.31	-	No	No
Pollution Prevention - Gel Coat	89.00	61.05	0.00	0.00	0.00	-	No	No
Uncontrolled Baseline - Resin	606.77	-	-	-	-	-	No	No
Uncontrolled Baseline – Gel Coat	150.05	-	-	-	-	-	No	No

1. Emissions as calculated in Attachment IV for the Incremental Analysis in Chaparral Boats’ PSD Submittal.
2. As compared to the uncontrolled baseline emissions.
3. Installed capital cost as specified in the cost spreadsheets (See Attachments VII and VIII of Chaparral Boats’ PSD Submittal).
4. As specified in the Incremental Analysis. Including operating cost and capital recovery.
5. The total annualized cost divided by the emission reduction. The emission reduction is based upon the potential VOC emissions specified in Table 21 (of Chaparral Boats’ PSD Submittal) with 95 % overall VOC control efficiency (except for pollution prevention).
6. As compared to pollution prevention.
7. These are impacts resulting from the use of controls and not methods of production.

Review of Facilities Using End-of-Pipe Controls

The facility has indicated that there are two facilities in the country, Bombardier Motor Corporation (Benton, Illinois) and Navigator Yachts (Perris, California), which use thermal oxidizers to control VOC emissions. In the facility’s PSD submittal, the use of end-of-pipe control is discussed. The Division has determined that end-of-pipe controls can be used only when the waste gas streams have a low volume, and high concentration. This is only achieved by the manufacturers of smaller boats (below 20 feet) or the manufacturers of larger custom, hand-made yachts. The two determinations from SCAQMD and Illinois are deemed not representative of the type of operations that occur at Chaparral’s Plant No. 3.

Therefore, the Division agrees with the facility assertion that these two BACT determinations should not be considered in determining BACT for the Plant No. 3 resin and gel coat operations.

The Bombardier Motor Corporation manufactures personal watercraft that are small enough to be molded in a booth, which results in a low volume/high VOC concentration exhaust gas stream suitable for oxidation. The Navigator Yachts facility is subject to the provisions of the New Source Review regulations. Its control system is subject to the requirements of LAER (Lowest Achievable Emission Rate), which does not take into account cost. The only requirements of LAER are that the resulting emissions from the facility are less than or equal to the most stringent emission rate from a similar facility and the requirement to install a control system would not prohibit the construction and operation of the facility in question. Both of these facilities are different enough from the Chaparral Boats facility, in that either the size of product manufactured or applicable air quality rules are dissimilar, that the emission control methods for the facilities should not be considered in the BACT determination for Chaparral Boats.

#### Option 6 – Pollution Prevention

This control technology involves the reduction of VOC emissions via the use of lower VOC-containing raw material and high transfer efficiency application techniques such as fluid impingement technology (FIT). The facility can use gel coats and resins that have inherently low VOC contents with the use of non-atomized application techniques to achieve reductions in VOC emissions. NESHAP Subpart VVVV “NESHAP for Boat Manufacturing” requires that the manufacturing operations located at major sources of HAPs use a combination of low HAP content gel coats and resins with high transfer efficiency application techniques. The two HAPs emitted from the gel coat and resin operations at fiberglass boat manufacturing plants are styrene and methyl methacrylate which are both considered VOCs. Therefore, the VOC content of the gel coat and resins will be equivalent to the combined HAP content. Therefore, the Division has determined that pollution prevention represents BACT for Plant No. 3 resin and gel coat operations.

BACT for open molding resin and gel coat operations is the use of gel coats and resin with inherently low VOC contents. The VOC content of the resin and gel coat vary depending on the application technique used. The proposed BACT limitations are based upon the emission limitations specified in 40 CFR 63.5698. The BACT limitations were created by replacing the term HAP for VOC since the HAP content is equivalent to the VOC content for all resins and gel coats. Similar to what is allowed in NESHAP Subpart VVVV, the BACT determination allows the facility to demonstrate compliance with the VOC emissions limitation using two different methods. One method is the use of compliant resin and gel coats and the other method is the emissions averaging option which allows the facility to determine a VOC limit (based upon the amount of each type of resin or gel coat used and the application method) and compare it to the VOC emissions as calculated by the formula specified in the BACT limit [formula is based upon the formula found in 40 CFR 63.5710(b)]. The source is in compliance if the 12-month rolling total VOC emissions for each month is below the calculated VOC limit.

The specifics of this BACT determination proposal are described on the next page in greater detail.

Open Molding Resin and Gel Coat Operations

The facility must limit the emissions of VOC from open molding resin and gel coat operations to below the following VOC limit which is the total allowable VOC (in kilograms) that can be emitted from the open molding operations.

$$\text{VOC Limit} = 46M_R + 159M_{PG} = 291M_{CG} + 54M_{TR} + 241M_{TG}$$

Where,

$M_R$  = mass of production resin used (in megagrams) in the past 12 months, excluding any exempt materials

$M_{PG}$  = mass of pigmented gel coat used (in megagrams) in the past 12 months, excluding any exempt materials

$M_{CG}$  = mass of clear gel coat used (in megagrams) in the past 12 months, excluding any exempt materials

$M_{TR}$  = mass of tooling resin used (in megagrams) in the past 12 months, excluding any exempt materials

$M_{TG}$  = mass of tooling gel coat used (in megagrams) in the past 12 months, excluding any exempt materials

As described above, the facility will have two options of complying with this emission limit; the use of compliant materials and the use of an emissions averaging method. Under the emissions averaging provisions, the facility determines the 12-month rolling total VOC emissions each month per the following formula:

$$\text{VOC Emissions} = PV_R M_R + PV_{PG} M_{PG} + PV_{CG} M_{CG} + PV_{TR} M_{TR} + PV_{TG} M_{TG}$$

Where,

**VOC Emissions** = Organic VOC emission calculated using BACT model point values for each operation included in the average (in kilograms).

**PV<sub>R</sub>** = Weighted-average BACT model point value for production resin used in the past 12 months (in kilograms per megagram).

$M_R =$	Mass of production resin used in the past 12 months (in megagrams).
$PV_{PG} =$	Weighted-average BACT model point value for pigmented gel coat used in the past 12 months (in kilograms per megagram).
$M_{PG} =$	Mass of pigmented gel coat used in the past 12 months (in megagrams).
$PV_{CG} =$	Weighted-average BACT model point value for clear gel coat used in the past 12 months (in kilograms per megagram).
$M_{CG} =$	Mass of clear gel coat used in the past 12 months (in megagrams).
$PV_{TR} =$	Weighted-average BACT model point valued for tooling resin used in the past 12 months (in kilograms per megagram).
$M_{TR} =$	Mass of tooling resin used in the past 12 months (in megagrams).
$PV_{TG} =$	Weighted-average BACT model point value for tooling gel coat used in the past 12 months (in kilograms per megagram).
$M_{TG} =$	Mass of tooling gel coat used in the past 12 months (in megagrams).

The BACT model point values are determined using the following table:

Table 4-3

Operation Type <sup>1</sup>	Application Method <sup>1</sup>	Formula to calculate $PV_i$ for each resin and gel coat <sup>1</sup>
Production resin, tooling resin	a. Atomized b. Nonatomized	$0.014 \times (\text{Resin VOC}\%)^{2.425}$ $0.014 \times (\text{Resin VOC}\%)^{2.275}$
Pigmented gel coat, clear gel coat, tooling gel coat	All methods	$0.445 \times (\text{Gel coat VOC}\%)^{1.675}$

<sup>1</sup> as per 40 CFR 63 Subpart VVVV, Table 3

If the calculated VOC emissions are below the calculated VOC emissions limit then the facility is in compliance.

The facility can also demonstrate compliance if the average VOC content of each and every gel coat or resin in their respective resin or gel coat category is below the limit specified in the following table:

Table 4-4

Operational Category <sup>1</sup>	Application Method <sup>1</sup>	The weighted-average organic VOC content must not be exceeded <sup>1</sup>
1. Production resin operations.....	Atomized (spray)	28 percent.
2. Production resin operations.....	Nonatomized (nonspray)	35 percent.
3. Pigmented gel coat operations	Any method	33 percent.
4. Clear gel coat operations.....	Any method	48 percent.
5. Tooling resin operations.....	Atomized (spray)	30 percent.
6. Tooling resin operations.....	Nonatomized (nonspray)	39 percent.
7. Tooling gel coat operations...	Any method	40 percent.

<sup>1</sup> as per 40 CFR 63 Subpart VVVV, Table 2

The VOC content for each category is determined each month on a 12-month rolling total basis. In addition, several types of production resins and gel coats in open molding operations are exempt from the above emission limitations due to the nature of their use at the facility. These exemptions are specified in the proposed permit language in Attachment XII (see Condition No. 3.3.17) and are based upon the exemptions for open molding operations as specified in 40 CFR 63.5698(d). These exemptions include resins that must meet Coast Guard specifications, low use gel coats provided that the percent by weight of the exempt gel coats does not exceed 1 percent of the total gel coat used (based on a 12-month rolling total), and 100 percent vinyl ester resin used for skin coats. These materials cannot comply with the proposed limits due to their specialized nature. These exemptions are also specified in the Boat Manufacturing NESHAP (Subpart VVVV) and were included in the final NESHAP because the exempt resins and gel coats must conform to certain specified standards (i.e. safety standards of U.S. Coast Guard or back-up gel coats) that are greater than the NESHAP limits. It is reasonable to include these exemptions in the BACT determination since there are no known controls for these types of materials and the Boat Manufacturing NESHAP is the basis for BACT for open molding operations.

Resin and Gel Coat Mixing Operations

This BACT determination will also require the facility to implement work practice standards for the Plant No. 3 resin and gel coat mixing operations. The BACT determination will require monthly inspections of all containers for resins and gel coats to ensure that lids are closed except for the removal or addition of material.

Equipment Cleaning Operations

The BACT determination for equipment cleaning operations in Plant No. 3 is compliance with work practices requirements and the limiting of the VOC content of the cleaning solvent to no more than 5 percent VOC, by weight. This sets a de minimis limit of VOC that can be found in the equipment cleaning solvent. The facility will use acetone to comply with this BACT limitation. The BACT determination will also require the facility to store VOC-containing cleaning solvents in closed containers.

Step 5: Select BACT

Conclusion – VOC Control

The Division has deemed the use pollution prevention techniques which is the use of low VOC resin and gel coats combined with high transfer efficiency application techniques, to be best available control technology (BACT). The Division has also deemed BACT for the other operations at the Plant No. 3 (cleaning operations and material mixing) as the use of low VOC-containing material and the adherence to work practice standards. Table 4-5 summarizes the BACT determinations for all boat manufacturing facilities identified as part of this review. Table 4-6 summarizes the BACT determination requirements being proposed for the Plant No. 3.

Table 4-5: BACT Determinations for Boat Manufacturing Facilities

Company Name	Location	Database	Permit Date	Facility Description	VOC Control/ Limitations	Control Type	BACT <sup>1</sup> Considered
Sea-Pro Boats	Newberry, South Carolina	RBLC	06/15/04	Fiberglass Boat Mfg.	Limit VOC in resin to 35 % and gel coat to 33 %, by weight	BACT	Yes
Sea Fox	Charleston, South Carolina	RBLC	12/23/02	Boat Mfg. gel coat/ resin	Limit VOC in resin to 35 %, by weight.	BACT	Yes
Sanger Boats	Fresno, California	RBLC	03/21/96	Boat Mfg. gel coat/resin	Limit VOC in resin to 35 %, Air-less spray guns, use of non-VOC solvent.	BACT	Yes
Bullet Fiberglass	Madera, California	RBLC	06/30/95	Boat repair	Use of low VOC resins and gel coats	BACT	Yes
Tracker Marine	Clinton, Missouri	RBLC	12/09/94	Boat Mfg.	Increase stack height to ensure safe ambient concentrations of HAPs	BACT	Yes
Sunbird Boat	Columbia, South Carolina	RBLC	12/13/91	Gel coat booth and Lamination	50 % acetone replacement, limit styrene in gel coat to 37 %, by weight	BACT	Yes
Thompson Boat Co.	St. Charles, Michigan	RBLC	9/15/89	Gel coat and resin appl.	Use of air-less application equipment for resin and gel coat	BACT	Yes
Stratos Boats	Murfreesboro, Tennessee	RBLC	08/07/89	Gel coat and lamination	Low styrene resins use of acetone cleaning solvent	BACT	Yes
Chaparral Boats	Nashville, Georgia	GAEPD Title V website	08/23/00	Gel coat and resin lamination	Limit styrene to 35 % for resin. Limit styrene to 34 % for gel	Case-by-case MACT	Yes

Table 4-5: BACT Determinations for Boat Manufacturing Facilities

Company Name	Location	Database	Permit Date	Facility Description	VOC Control/ Limitations	Control Type	BACT <sup>1</sup> Considered
					coat.		
Bombardier	Benton, Illinois	Region 5 permit website	07/19/01 (Title V date)	Automated boat Mfg line	Use of thermal oxidizer to control automated assembly line (AAL)	BACT	No
Navigator Yachts	Perris, California	SCAQMD	9/23/03	Custom Yacht Mfg	Use of carbon adsorption/ thermal oxidizer system	BACT (LAER)	No

1 If the BACT determination was used in selecting the best available control technology

Summary – Control Technology Review

Table 4-6: BACT Summary for Plant No. 3 Operations		
Process Operation	Emission Unit ID No.	BACT Limit
Production Resin/Lamination	P3LA	Production resin limited $\leq$ 35 % VOC by weight using non-atomized spray techniques or compliance with emissions averaging limit
		Production resin limited $\leq$ 28 % VOC by weight using atomized spray techniques or compliance with emissions averaging limit
		Tooling Resin limited $\leq$ 39 % VOC by weight using non-atomized spray techniques or compliance with emissions averaging limit
		Tooling Resin limited $\leq$ 30 % VOC by weight using atomized spray techniques or compliance with emissions averaging limit
Gel Coat Operations	P3GC	Pigmented Gel coat limited $\leq$ 33 % VOC by weight or compliance with emissions averaging limit
		Clear Coat Gel coat limited $\leq$ 48 % VOC by weight or compliance with emissions averaging limit
		Tooling Gel coat limited $\leq$ 40 % VOC by weight or compliance with emissions averaging limit
Equipment Cleaning	P3EC	Cleaning solvent limited $\leq$ 5 % VOC by weight (except for removing cured resin or gel coat) and VOC-containing solvents must be kept in closed containers.
Resin and gel coat mixing operations	P3MX	The use of closed containers for the mixing of resins and gel coats.

## **5.0 TESTING AND MONITORING REQUIREMENTS**

### Plant No. 3 Resin and Gel Coat Operations

#### *Testing Requirements:*

The facility will not be required to undergo any performance testing to demonstrate compliance with the proposed BACT. The proposed BACT is pollution prevention which does not require a control device, and thereby, does not require a performance test.

#### *Monitoring Requirements:*

The facility will monitor the material safety data sheets (MSDS) and/or the certified product data sheets (CPDS) in order to demonstrate compliance with the BACT VOC emissions limitation and the other material VOC content limitations that are a part of this BACT determination. The facility will also be required to adhere to work practice standards via the use of monthly inspections. This record keeping and monthly inspections constitute periodic monitoring per 40 CFR 70.6(a)(3)(i)(B) and is sufficient to demonstrate compliance with the BACT permit limitations.

#### *CAM Applicability:*

The Plant No. 3 resin and gel coat operations are not subject to the requirements of CAM (compliance assurance monitoring) as specified in 40 CFR Part 64 since the facility will not be using an add-on control device to control VOC emissions.

## **6.0 AMBIENT AIR QUALITY REVIEW**

An air quality analysis is required of the ambient impacts associated with the construction and operation of the proposed modification. The main purpose of the air quality analysis is to demonstrate that potential emission increase due to the modification to the Plant No. 3 resin and gel coat operations, in conjunction with other applicable emissions from existing sources (including secondary emissions from growth associated with the new project), will not cause or contribute to a violation of any applicable National Ambient Air Quality Standard (NAAQS) or PSD increment in a Class II or Class I area. NAAQS exist for NO<sub>2</sub>, CO, PM<sub>10</sub>, SO<sub>2</sub>, Ozone (O<sub>3</sub>), and lead (P<sub>b</sub>). PSD increments exist for SO<sub>2</sub>, NO<sub>2</sub>, and PM<sub>10</sub>.

Compliance with any NAAQS is based upon the total estimated air quality, which is the sum of the ambient estimates resulting from existing sources of air pollution (modeled source impacts plus measured background concentrations) and the modeled ambient impact caused by the applicant's proposed emission increase and associated growth. It is important to note that the air quality cannot deteriorate beyond the concentration allowed by the applicable NAAQS, even if not all of the PSD increment is consumed.

A separate air quality analysis is required for each of these pollutants emitted in a significant amount over the PSD significant threshold. As shown in Table 1-1, VOC is to be emitted in amounts over the PSD significant thresholds. However, Ozone is unique relative to other criteria pollutants (e.g CO, NO<sub>2</sub>, SO<sub>2</sub>, and PM) as the USEPA has not established a modeling protocol or significance level (e.g ppm or ug/m<sup>3</sup>) but has set a 100 tpy de minimis level as a trigger for an impact analysis. However, the photochemistry underlying the generation of ground-level ozone is complex and not always well defined. Consequently, USEPA has not established a dispersion model which is capable of accurately predicting ozone (VOC is a precursor to ozone) concentrations resulting from VOC emissions. Thus, it has been the Division’s policy not to require PSD air dispersion modeling for VOCs. In lieu of this, an analysis of VOCs on ground level ozone concentrations has been assessed based upon existing ambient ozone monitoring data in relation to the relative increases of VOC emissions that have occurred from the major sources in the area. The Division has reviewed this analysis as part of the facility’s PSD submittal and has determined that the modification to the facility will not cause a violation of the NAAQS for ground level ozone.

Air Toxics

There are no applicable NAAQS or specific Georgia ambient air standards for the individual toxics emitted by the facility. The toxics emitted by Plant No. 3 resin and gel coat operations include styrene, methyl methacrylate, toluene, and MEK. Impacts from each of the pollutants listed have been analyzed using the EPD Guidance for Ambient Impact Assessment of Toxic Air Pollutant Emissions (referred to as the Georgia Air Toxics Guideline; Version June 21, 1998). The Georgia Air Toxics Guideline is a guide for estimating the environmental impact of sources of toxic air pollutants. A toxic air pollutant is defined as any substance which may have an adverse effect on public health, excluding any specific substance that is covered by a State or Federal ambient air quality standard. The SCREEN3 or ISCST3 computer dispersion models are commonly used to conservatively predict the maximum 24-hour average or annual ground level concentration (referred to as MGLC) for each pollutant in question. The worst-case HAP and toxic emissions are used to perform the toxic guideline assessment. Each MGLC is compared to its respective acceptable ambient concentration (referred to as AAC). The basis for calculation of the AAC comes from the pollutant toxicity rating systems described in the Georgia Air Toxics Guideline.

The facility has performed a toxic impact assessment as specified in Attachment III of their PSD submittal. The Division has reviewed this impact assessment as well as attached data and has concluded that the facility passes the Georgia Toxic Guidelines for the modification of the Plant No. 3 resin and gel coat operations.

Toxic Pollutant	AAC (ug/m <sup>3</sup> )	MGLC (ug/m <sup>3</sup> )	MGLC/AAC Ratio	Pass/Fail
Styrene	1,000 (Annual)	470.00	0.47	Pass
MMA	700 (Annual)	5.37	0.0077	Pass
Toluene	400 (Annual)	17.47	0.044	Pass

### Class I Visibility Analysis

The nearest PSD Class I areas are the Okefenokee Wilderness area, which is approximately 85 km to the southeast of the facility, and Wolf Island, which is 180 km east of the facility. The facility is not undergoing a PSD review for NO<sub>x</sub>, SO<sub>2</sub>, and PM, therefore, a Class I area significant impact assessment is not required.

## **7.0 ADDITIONAL IMPACT ANALYSES**

PSD requires an analysis of impairment to visibility, soils, and vegetation that will occur as a result of the emissions from the Plant No. 3 resin and gel coat operations (Emission Unit ID Nos. P3LA and P3GC) and an analysis of the air quality impact projected for the area as a result of general commercial, residential, industrial, and other growth associated with this project. Other impact analysis requirements may also be imposed on a permit applicant under local, State or Federal laws which are outside the PSD permitting process (such as Georgia's Toxic Guidelines).

### *Visibility*

Visibility impairment is any perceptible change in visibility (visual range, contrast, atmospheric color, etc.) from that which would have existed under natural conditions. Poor visibility is caused when fine solid or liquid particles, usually in the form of nitrogen oxides or sulfur oxides, absorb or scatter light. This light scattering or absorption actually reduces the amount of light received from viewed objects and scatters ambient light in the line of sight. This scattered ambient light appears as haze.

Another form of visibility impairment in the form of plume blight occurs when particles and light-absorbing gases are confined to a single elevated haze layer or coherent plume. Plume blight, a white, gray, or brown plume clearly visible against a background sky or other dark object, usually can be traced to a single source such as a smoke stack.

Detailed Level I and Level II visibility screening analyses were not required to be conducted because the facility did not trigger a PSD review of NO<sub>x</sub>, SO<sub>2</sub>, and PM. No significant adverse impacts on visibility are expected to result from the Plant No. 3 resin and gel coat operations.

### *Soils and Vegetation*

No sensitive soil types are known to exist within the area of the project. Moreover, the areas of maximum impact are generally cultivated or forested and demonstrate no obvious sensitivity to industrial air emissions.

### *Growth*

The effects to ambient air quality due to growth associated with the modification to Plant No. 3 are expected to be insignificant. Therefore, commercial, residential and industrial growth impact analysis is not warranted and was not performed.

## **8.0 EXPLANATION OF DRAFT PERMIT CONDITIONS**

The permit requirements for this proposed modification are included in draft Permit Amendment No. 3732-019-0003-V-02-3 for Plant No. 3. NESHAP Subpart VVVV conditions have been specified in the conditions contained in Permit Amendment No. 3732-019-0003-V-02-2, issued September 2, 2004. The Table in Section 3.1.1 specifies the re-designated emission units for the Plant No. 3 resin and gel coat operations. Condition No. 3.2.3 which specified the 71 tpy VOC PSD avoidance limit on the Plant No. 3 resin and gel coat operations has been deleted. Condition No. 3.3.9 has been corrected for typographical errors (Condition No. 6.2.10 is referenced instead of Condition No. 6.2.17). Condition Nos. 3.3.15 through 3.3.20 pertain to the requirements of PSD and BACT. Condition Nos. 3.3.15 through 3.3.20 are similar to the NESHAP Subpart VVVV conditions except that the term VOC was substituted for the term “organic HAP.”

Condition No. 4.1.3 has been modified to include Method 311. Condition No. 5.2.1 has been modified to reflect the re-designation of the Plant No. 3 gel coat operations as Emission Unit ID No. P3GC. Condition Nos. 5.2.5 and 5.2.6 pertain to the inspections required to demonstrate compliance with the work practice requirements for the work practice standards requires per the BACT determination for Plant No. 3. Condition No. 6.1.7 has been modified to include the exceedances for the BACT requirements. Condition Nos. 6.2.2 and 6.2.3 have been modified to eliminate references to Condition No. 3.2.3 (71 tpy VOC limit on P3LA). Condition No. 6.2.27 has been modified to correct a typographical error (Condition No. 6.2.27 refers the mixing containers when the condition is pertaining to solvent cleaning containers). In section 6.2, the BACT recordkeeping (Condition Nos. 6.2.28 through 6.2.37) is based upon the recordkeeping required by the NESHAP Subpart VVVV.

Appendix A

Draft PSD Permit for Chaparral Boats, Inc. – Plant No.3  
Proposed Permit Amendment No. 3732-019-0003-V-02-3

Appendix B

PSD Permit Application Submittal  
Chaparral Boats, Inc. – Plant No. 3  
Application No. 15715, October 2004