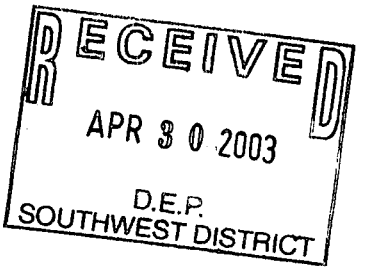
Southern Environmental Sciences, Inc.

1204 North Wheeler Street □ Plant City, Florida 33563-2354 □ (813) 752-5014, Fax (813)752-2475.



April 28, 2003

Ms. Ann Quillian, P.E.
FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
Southwest Florida District
Air Programs
3804 Coconut Palm Drive
Tampa, Florida 33619

Re: HYDRO SPA Ocala
Application for Title V Air Construction Permit
Response to Request for Additional Information (March 6, 2003)

Dear Ms. Quillian:

Before we get into the comment responses, be advised that two other compounds were not included in our original submittal; acetone and isopropanol. Separate Subsection G. Forms for these compounds have been included in this submittal. Both compounds are also VOCs so they are included in the VOC calculation as well.

Because of the addition of these two compounds, you will note that the maximum annual spa production rate over the permit life has been lowered from 65,000 spas per year to 50,000 spas per year. This has been done to keep facility emissions below the 250 tons per year threshold. Due to the change in proposed production rate, we are submitting revised Subsection G. Forms for all pollutants, as well as a revised Section II, Subsection B. Form.

We are also submitting revised pages 6, 8, 16, and 20 of the Application Forms. Page 6 has some added wording regarding MACT; page 8 reflects that the facility is also a Major Source of VOCs. Page 16 shows the change in production rate; page 20 adds acetone and isopropanol to the Table.

As to your specific comments, we offer the following responses:

1. Section II. Facility Information, Subsection B. Facility Pollutants. The VOC emissions are listed as 20 TPY. This estimate seems low as the MEK and TPD were estimated at 47 TPY and 32 TPY, respectively. Are the 20 TPY other VOCs? Please explain. Also, please provide the total HAPs for this facility.

RESPONSE: The Subsection G. VOC emissions Form has been revised and is included in this submittal. As mentioned in our enclosed response to Comment 11., MEK emissions are below *de minimus* levels while MEKP is not. As such MEK has been added to the Subsection G. Form with Aniline, Benzene, Toluidine, and MDI (see response to Comment 10.). A separate Subsection G. Form for MEKP remains.

As you asked in the above comment, the 20 TPY VOC value used in the original permit application was intended to summarize small VOC emissions. This value, plus the values for MEKP, MEK, and TPD, are summed on the revised VOC Subsection G. Form.

Also, a Subsection G. Form for Total HAPs has been included; Total HAPs have also been added to the Subsection B. Form.

2. Section II. Facility Information, Subsection C. Facility Plot Plan and Document 2. An area on the plot plan is noted as "Existing Booths Not Used". What booths are these and if they are paint booths are there plans to put them in use for painting or other activity? Or are there plans to dismantle them? Please explain.

RESPONSE The "existing booths not used" may be used in the future, depending upon production requirements. Initially, one of the booths will be used for water-based staining that does not emit VOCs or other air pollutants. If in the future it is proposed to use these booths in a manner that produces air pollutants, a construction permit modification will be submitted.

3. Section II. Facility Information, Subsection C. Facility Plot Plan and Document 2. A portion of the building was labeled as off-line operations, including woodwork and electrical tasks, on the facility plot plan. Woodshop activities are noted in the insignificant list. Please confirm if the off-line activities include the woodshop. Also please note if there are any venting or building fans installed near these operations.

RESPONSE The woodshop is located in the off-line activity area specified. Ventilation is provided by open doors. There are no permanent fans or ventilation units in this area.

4. Section II. Facility Information, Subsection C. Facility Plot Plan, Process Flow Diagram and Document 2. Storage of resins and miscellaneous VOC/HAP containing materials were not indicated on the drawings. Please provide information regarding how these materials will be stored and what reasonable precautions will be taken to minimize spills, odors, and emissions.

RESPONSE Resins and other miscellaneous VOC/HAP-containing materials are stored outside the production building within a retaining wall that contains spills. Odors and emissions are controlled by keeping the containers sealed when not in use.

5. Section III. Emissions Unit Information, Subsection A. General Emissions Unit Information, Page 13. Hydro Spa indicated that the emissions were uncontrolled. As odors could possibly be a problem, please provide information on activities and reasonable precautions to be taken that will minimize odors and emissions.

RESPONSE Odors and emissions are controlled by keeping VOC/HAP-containing materials sealed when not in use, by the use of the chopper gun for resin/catalyst application, and by the use of a water-borne foam. .

6. Section III. Emissions Unit Information, Subsection C. Emissions Unit Regulations. The Reinforced Plastics Composites Production MACT, 40 CFR 63 Subpart WWWW just became a final regulation. In order to determine if your facility's products meet the definition of "large open molding part", please provide the dimensions of the spas to be produced at this facility. EPA defines the large open molding part as a part that, when the final finished part is enclosed in the smallest rectangular six-sided box into which the part can fit, the total interior volume of the box exceeds 250 cubic feet, or any interior sides of the box exceeds 50 square feet.

RESPONSE Some spas produced by the facility have dimensions that exceed the 50 square feet interior box sides specification. This is due to the flanges; i.e. the seating areas on the sides of a spa (the internal spa body has a square footage area less than 50 square feet).

It is proposed that MACT is achieved at this facility by the use of water-borne foam and a fluid impingement technology chopper gun for resin application. The water-borne foam substantially reduces the amount of VOCs emitted (primarily Methylene Diphenly Diisocyanate-see calculation below for MDI). The chopper gun is a non-atomizing system; in addition the resin and catalyst are mixed within the gun head. Both technologies substantially reduce emissions of Styrene. These technologies have been incorporated by the Applicant in order to reduce VOC emissions. For resin/catalyst application, it has the maximum available emissions control.

7. Section III. Emissions Unit Information, Subsection E. Segment (Process/Fuel) Information. In Segment 1 for the resin application, the maximum monthly rate and maximum annual rate (fields 4 and 5) were left blank. Please clarify or correct and re-submit this information. Also, in Segment 2, the maximum hourly and annual fields refer to the VOC calculation page. In the VOC potential to emit calculation field 8 of Subsection G. Emissions Unit Pollutant Detail Information, the maximum tons used is not clear. To clarify and avoid confusion, please provide the information either in fields 4 and 5 or field 10 of Subsection E. Segment (Process/Fuel) Information and re-submit the Form. Also, please indicate if there are any other operations that will be ongoing at the facility (e.g. polymer casting).

RESPONSE Revised Subsection E. Forms are enclosed. We included maximum tons used in Fields 4 and 5 for Segment 1. To do the same for Segment 2 is almost impossible. Many of the products used are procured in "apples-to-oranges" units. For example, sealers, glues, and caulks

come in tubes (i.e. by the unit); paints, primers, and stains come in cans of various sizes (by the volume); mold wax comes in a canned paste (by the unit); etc. These materials also come in all sizes but are relatively small.

There are no other operations at the facility (e.g. polymer casting) that have not been described in the application.

8. Section III. Emissions Unit Information, Subsection F. Emissions Unit Pollutants and Subsection G. Emissions Unit Detail Information. Total HAPs should also be included. Please re-submit corrected Forms with the Total HAPs.

A Subsection G. Form for Total HAPs is enclosed. Total HAPs has also been added to the Section II, Subsection B. Form.

9. Section III. Emissions Unit Information, Subsection G. Emissions Unit Detail Information, Styrene. Please indicate the styrene content in the resin as well as the method of application to document the origination of the 83 lb/ton emission factor used.

RESPONSE – The Styrene content of the primary resin used (AOC C688-FFG-30) is 35-37% by weight (see attached MSDS). The resin will be applied by a Magnum Venus Products FIT (fluid impingement technology) chopper gun system. This is a mechanical non-atomized system and the resin and catalyst are mixed inside the chopper gun head. As shown in the attached Unified Emissions Factors Table, for a mechanical non-atomized system at 37% Styrene, the emissions factor is 83 lbs of Styrene per ton of resin applied. This Table shows that the mechanical non-atomized technique has the lowest emission factor for styrene.

10. Section III. Emissions Unit Information, Subsection G. Emissions Unit Detail Information, Methylene Diphenyl Diisocyanate (MDI). Please provide a printout or copy showing where the emissions factor of 0.014 lbs MDI/hour came from or how it was derived based on the MDI Emissions Estimator Program.

RESPONSE - The 0.014 lbs_{MDI}/hour value used in the application was incorrect; the correct value is 0.005 lbs_{MDI}/hour; this factor was calculation by the MDI Emissions Estimator that was developed by the Alliance for Polyurethanes Industry, uses the following formula:

$$L_{MDI} = (V_{air}/359)*(273.15/T_{sp})*60*(C_{MDI}/1{,}000{,}000)*M_w*K_{MDI}*t_{sp}$$

Where:

L_{MDI} = MDI Emissions in lbs/year for operation
V_{air} = Exhaust air flow rate in cubic feet/minute
T_{sp} = Spray temperature in degrees Kelvin
C_{MDI} = MDI concentration in ppmv, in exhaust air
M_w = Molecular weight of MDI (250.26)

K_{MDI} = Adjustment factor for vapor pressure that is a function of MDI concentration in the feedstock and the temperature of the isocyanate
t_{sp} = Total time in hours/year that spray coating is occurring

Based upon anticipated operating conditions at the plant, and in consultation with the sprayfoam manufacturer, the following calculation using the above formula was made:

L_{MDI} = (10,000/359)*(273.15/305.37)*60*(0.0319/1,000,000)*(250.26)*(0.38)*(8760)

L_{MDI} = 39.7 lbs_{MDI} emitted per year based on 8760 hours of spraying per year
= **0.02 $tons_{MDI}$ emitted per year**
L_{MDI} = (39.7 lbs_{MDI}/year)/(8760 hours/year) = **0.005 lbs_{MDI}/hour of spraying**

Because of the *de minimus* value for MDI, it has been lumped into the same Subsection G. Form with Benzene, Aniline, and Toluidine. The revised Form is enclosed.

11. Section III. Emissions Unit Information, Subsection G. Emissions Unit Detail Information, Methyl Ethyl Ketone (MEK). According to the MSDS provided, Cadox contains 2% MEK and 35% Methyl Ethyl Ketone Peroxide (MEKP). MEKP is a different organic compound than MEK. Is the applicant assuming that 100% of the MEKP reacts to form MEK? Please clarify the emissions estimate and, if applicable, how MEKP converts to form MEK.

RESPONSE – It was not intended to insinuate that MEKP reacts to form MEK. Based on discussions with material suppliers, there is no estimate for a conversion rate (MEKP to MEK) available. MEK has been moved the same Subsection G. Form with the other *de minimus* pollutants (Note MEK is a HAP, MEKP is not listed as a HAP).

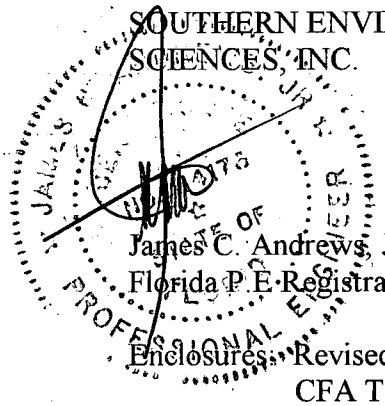
12. Section III. Emissions Unit Information, Subsection G. Emissions Unit Detail Information, VOC (non-styrene). See Item 1 of this correspondence. The VOC (non-styrene) seems low as the sum of MEK, MDI, and TPD would be greater than 20.2 TPY. Please clarify and if applicable correct this estimate. Please explain the basis of 0.78 ton VOC/ton MEKP. It was not clear in the MSDS provided. Please highlight on the MSDS the basis for the VOC content as used in the emissions estimate.

RESPONSE See response to Item 1 above. The 0.78 ton VOC/ton MEKP came from an earlier permit application (for the Hydro Spa Clearwater Facility). We could not verify this data from the MSDS. Therefore, to be conservative, we have revised the calculation to reflect a 100% VOC content for MEKP. The revised Subsection G. Form is enclosed.

We trust our response is complete. Please call me if you have any questions.

Very truly yours,

SOUTHERN ENVIRONMENTAL SCIENCES, INC.

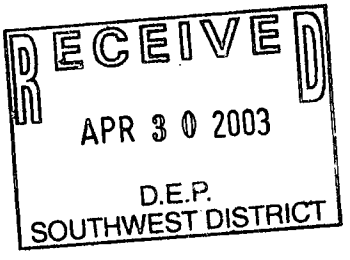


James C. Andrews, Jr., P.E.
Florida P.E. Registration No #34175

Enclosures: Revised application Forms
CFA Table

/jca

cc: Mr. Charles Wiley, HYDRO SPA



Construction/Modification Information

1. Description of Proposed Project or Alterations:

The project involves the modification of a former conversion van manufacturing facility for the purpose of manufacturing spas. No new building construction is required as the existing buildings will be used. There will be modifications made inside the existing buildings to accommodate the spa processing equipment (e.g. conveyor) and materials. No new air emission points (e.g. ventilation vents) will be needed; existing fans and vents will be used. Some of the existing paint spray booths will be used for application of resin and isofoam.

2. Projected or Actual Date of Commencement of Building Renovation: **As soon as possible**

3. Projected Date of Completion of Building Renovation: ≤ **60 days after commencement**

Application Comment

The project involves the modification of a former conversion van manufacturing facility for the purpose of manufacturing spas. No new building construction is required as the existing buildings will be used. There will be modifications made inside the existing buildings to accommodate the spa processing equipment (e.g. conveyor) and materials. No new air emission points (e.g. ventilation vents) will be needed; existing fans and vents will be used. Some of the existing paint spray booths will be used for application of resin, catalyst, and isofoam.

The applicant will be using resin application methods and water-borne foam sprays developed specifically to reduce styrene and non-styrene VOC emissions. It is proposed that these methods are MACT in accordance with 40 CFR Part WWWW.

Facility Regulatory Classifications

Check all that apply:

1. [ ] Small Business Stationary Source? [X] Unknown
2. [X] Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?
3. [ ] Synthetic Minor Source of Pollutants Other than HAPs? **No**
4. [X] Major Source of Hazardous Air Pollutants (HAPs)?
5. [ ] Synthetic Minor Source of HAPs? **No**
6. [ ] One or More Emissions Units Subject to NSPS? **No**
7. [ ] One or More Emission Units Subject to NESHAP? **No**
8. [X] Title V Source by EPA Designation?
9. Facility Regulatory Classifications Comment (limit to 200 characters): **Facility is a Title V source and is a major source of HAPS**

List of Applicable Regulations

62-213 F.A.C.	
62-4 F.A.C.	
62-210 F.A.C.	
Title V core list is adopted by reference	

B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif..	3. Requested Emissions Cap lb/month	tons/year	4. Basis for Emissions Cap	5. Pollutant Comment
Styrene 100-42-5 (H163)	**A**	**17,293**	**104**		**Emission Cap based on potential emissions**
Non-Styrene VOC	**A**	**17,468**	**105***	Should not include acetone	**Emission Cap based on potential emissions**
Methyl Ethyl Ketone (MEK) 78-93-3 H(120)	**B**	**Negligible**	**Negligible**		**MEK emissions are negligible**
Methly Ethyl Ketone Peroxide 1338-23-4	**B**	**3,971**	**24**		**Emissions cap based on potential emissions**
Methyl diphenyl diisocynate (MDI) 101-68-8 (H129)	**B**	**Negligible**	**Negligible**		**MDI emissions are negligible**
Benzene 71-43-2 H(017)	**B**	**Negligible**	**Negligible**		**Benzene emissions are negligible**
Aniline 62-53-3 H(012)	**B**	**Negligible**	**Negligible**		**Aniline emissions are negligible**
Toluidine 95-53-4 H(172)	**B**	**Negligible**	**Negligible**		**Toluidine emissions are negligible**

Not Reg. pollutant

2,2,4-Trimethyl pentane-diol-1,3,-diisobuty-rate 6846-50-0 (TPD)	B	4,084	25		Emission cap based on potential emissions
Total HAPS	A	17,293	104**		Emission cap based on potential emissions
Acetone 67-64-1	B	6,792	41		Emission cap based on potential emissions
Isopro-panol 67-63-0	B	3,542	21		Emissions cap based on potential emissions

*** Includes TPD, Acetone, & Isopropanol that are also listed in this Table**

**** Includes styrene that is also listed in this Table**

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate: **N/A**		mmBtu/hr
2. Maximum Incineration Rate: **N/A**	lb/hr	tons/day
3. Maximum Process or Throughput Rate: **50,000 spas per year**		
4. Maximum Production Rate: **50,000 spas per year**		
5. Requested Maximum Operating Schedule:		
	24 hours/day	**7** days/week
	52 weeks/year	**8,760** hours/year
6.Operating Capacity/Schedule Comment (limit to 200 characters):		
The facility will comply with all applicable air pollution rules and regulations.		

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment _1____ of _2____

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **This segment includes the application of resin by the MVP (Magnum Venus Products) FIT (Fluid Impingement Technology) chopper gun system. This system is non-atomized and operates at lower pressures than such methods as resin spray-up. In addition, the resin and catalyst are mixed internally in the chopper gun head. This is considered MACT for this facility.**		
2. Source Classification Code (SCC): **30800724**	3. SCC Units: **Tons of coating applied**	
4. Maximum Monthly Rate: **140/month**	5. Maximum Annual Rate: **1,669/year**	6. Estimated Annual Activity Factor: **N/A**
7. Maximum % Sulfur: **N/A**	8. Maximum % Ash **N/A**:	9. Million Btu per SCC Unit: **N/A**
10. Segment Comment (limit to 200 characters): **Based on producing 50,000 spas per year**		

Segment Description and Rate: Segment __2___ of __2___

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **This segment the usage of miscellaneous VOC materials such as solvents, paints, primers, stains, wax for molds, touch-up, caulks and sealers, patching materials, adhesives, and any other non-exempt VOC-emitting operation at the facility. Most compounds come in small containers (tubes, cans)** **See Subsection G calculation for VOCs**		
2. Source Classification Code (SCC): **30800702, 30800703, 30800704, 30800720, & 30800799**	3. SCC Units: **Tons of materials used – N/A for glues, sealers, caulks, paints, wax, adhesives, etc.**	
4. Maximum Hourly Rate: **See VOC calculation page**	5. Maximum Annual Rate: **See VOC calculation page**	6. Estimated Annual Activity Factor: **N/A**
7. Maximum % Sulfur: **N/A**	8. Maximum % Ash: **N/A**	9. Million Btu per SCC Unit: **N/A**

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
Styrene 100-42-5 (H163)	**N/A**	**N/A**	**NS**
Total VOCs	**N/A**	**N/A**	**NS**
Methyl Ethyl Ketone (MEK)78-93-3 H(120)	**N/A**	**N/A**	**NS**
Methyl diphenyl diisocyante (MDI) 101-68-8 (H129)	**N/A**	**N/A**	**NS**
Benzene 71-43-2 H(017)	**N/A**	**N/A**	**NS**
Aniline 62-53-3 H(012)	**N/A**	**N/A**	**NS**
Toluidine 85-53-4 H(172)	**N/A**	**N/A**	**NS**
2,2,4-Tri-methylpentanediol-1,3-diisobutyrate 6846-50-0	**N/A**	**N/A**	**N/S**
Methyl Ethyl Ketone Peroxide 1338-23-4	**N/A**	**N/A**	**N/S**
Total HAPs	**N/A**	**N/A**	**N/S**
Acetone 67-64-1	**N/A**	**N/A**	**N/S**
Isopropanol 67-63-0	**N/A**	**N/A**	**N/S**

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **Styrene 100-42-5 H(163)**	2. Total Percent Efficiency of Control: **0%**
3. Potential Emissions: **17,293 lb/month** **104 tons/year**	4. Synthetically Limited? **[No]**
5. Range of Estimated Fugitive Emissions: [ ] 1 [X] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **83 lbs. Styrene per ton of resin used** Reference: **"Unified Emission Factors for Open Molding of Composites", July 23, 2001, CFA Controlled Spray Handbook**	7. Emissions Method Code: **5**
8.Calculation of Emissions (limit to 600 characters): **$E_{styrene}$ = (100 lbs_{resin}/spa)(1/2,000)(4,167 spas/month)(83 $lbs_{styrene}$/ton_{resin}) = 17,293 lb/month** **$E_{styrene}$ = (17,293 $lbs_{styrene}$/month)(12 months/year)(1/2,000) =104 tons/yr**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Potential emissions based on maximum expected annual production over the life of the pending permit.**	

Allowable Emissions Allowable Emissions ____

__ of _____

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Requested Allowable Emissions and Units: **104 tons/year**	4. Equivalent Allowable Emissions: **17,293 lb/month 104 tons/year**
5. Method of Compliance (limit to 60 characters): **Compliance shall be achieved through limiting the total resin use to 5,000,000 lbs/year as demonstrated through accurate record-keeping of material usage.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **Total HAPs**	2. Total Percent Efficiency of Control: **0%**
3. Potential Emissions: **17,293 lbs./month** **104 tons/year**	4. Synthetically Limited? **[No]**
5. Range of Estimated Fugitive Emissions: [ ] 1 [X] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **83 lbs.$_{Styrene}$ per ton of resin used** Reference: "**Unified Emission Factors for Open Molding of Composites", July 23, 2001, CFA Controlled Spray Handbook**	7. Emissions Method Code: **2**
8.Calculation of Emissions (limit to 600 characters): **E_{HAPs} = (100 lbs$_{Resin}$/spa)(1/2,000)(4,167 spa/month)(83 lbs.$_{Styrene}$/ton$_{Resin}$) = 17,293 lbs$_{HAPs}$/month** **E_{HAPs} = (17,293 lbs$_{HAPs}$/month)(12 months/year)(1/2000) = 104 tons/yr.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Styrene is the only HAP emitted in a significant quantity. The other HAPs, emitted below significant quantities, are Benzene, Aniline, Methyl Ethyl Ketone, and Methyl Diphenyl Diisocyantate**	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Requested Allowable Emissions and Units: **104 tons/year**	4. Equivalent Allowable Emissions: **17,292 lb/month** **104 tons/year**
5. Method of Compliance (limit to 60 characters): **Compliance shall be through limiting the total material usages as demonstrated through accurate record keeping and limiting spa production to 50,000 spas per year.**	
6. Allowable Emissions Comment (Desc. of Operating Method)(limit to 200 characters): **Allowable emissions based on potential emissions from previous section**	

not a HAP pollutant

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **2,2,4-Trimethylpentanediol –1,3-diisobutyrate (TPD)**	2. Total Percent Efficiency of Control: **0%**
3. Potential Emissions: **4,084** lb/month **25** tons/year	4. Synthetically Limited? **[No]**
5. Range of Estimated Fugitive Emissions: [ ] 1 [**X**] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **Approx. 70 % of Cadox is TPD** Reference: **Material Safety Data Sheet assuming 100% emitted.**	7. Emissions Method Code: **2**
8.Calculation of Emissions (limit to 600 characters): E_{TPD} = **(70%/month)(4,167 spas/month)(0.014)(100 lbs_{resin}/spa) = 4,084 lbs_{TPD}/month** E_{TPD} = **(4,084)(12 months/year)(1/2,000) = 25 ton/yr**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Potential emissions based on maximum expected annual production over the life of the pending permit.**	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Requested Allowable Emissions and Units: **25 tons/year**	4. Equivalent Allowable Emissions: **4,084 lb/month 25 tons/year**
5. Method of Compliance (limit to 60 characters): **Compliance shall be achieved through limiting the total material usages as demonstrated accurate record keeping and limiting spa production to 50,000 spas per year.**	
6. Allowable Emissions Comment (Desc. of Operating Method)(Limit to 200 characters): **Allowable emissions based on potential emissions from previous section**	

Not HAP pollutant

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **Methyl Ethyl Ketone Peroxide (MEKP) 1338-23-4**	2. Total Percent Efficiency of Control: **0%**
3. Potential Emissions: **3,971 lbs./month** **24 tons/year**	4. Synthetically Limited? **[No]**
5. Range of Estimated Fugitive Emissions: [ ] 1 [X] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **35% of MEKP (Cadox); ; 60.9% in stain; ratio of Cadox to resin use is 0.014:1; material usage from 2002 values at Clearwater Plant** Reference: **Material Safety Data Sheet assuming 100% emitted.**	7. Emissions Method Code: **2**
8.Calculation of Emissions (limit to 600 characters): E_{MEKP} = **[(100 lbs_{resin}/spa)(4,167 spa/month)(0.014)(0.35)] + [(0.76 lbs_{stain}/spa)(.609)(4,167spa/month)]** = **3,971 $lbs._{MEKP}$/month** E_{MEKP} = **(3,971 lbs_{MEKP}/month)(12 months/year)(1/2,000) = 24 $tons_{MEKP}$/year**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Potential emissions based on maximum expected annual production over the life of the pending permit.**	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Requested Allowable Emissions and Units: **24 tons/year**	4. Equivalent Allowable Emissions: **3,971 lb/month** **24 tons/year**
5. Method of Compliance (Limit to 60 characters): **Compliance shall be through limiting the total material usages as demonstrated through accurate record keeping and limiting spa production to 50,000 spas per year**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **Benzene 71-43-2 H(017); Aniline 62-53-3 H(012); Toluidine 95-53-4 H(172); Methyl Diphenyl Diisocyanate (MDI) 101-68-8 H(129); Methyl Ethyl Ketone (MEK) 78-93-3 (H120)**	2. Total Percent Efficiency of Control: **0%**

3. Potential Emissions: **Negligible** lb/month **Negligible** tons/year	4. Synthetically Limited? **[No]**

5. Range of Estimated Fugitive Emissions:
[ ] 1 [X] 2 [ ] 3 _____ to _____ tons/year

6. Emission Factor: **None of the above pollutants in Cadox** Reference: **Material Safety Data Sheet assuming 100% emitted for Benzene, Aniline Toluidine & MEK. MDI based on MDI Emissions Estimator Program from Alliance for Polyurethanes Industry.**	7. Emissions Method Code: **2**

8. Calculation of Emissions (limit to 600 characters):

Only a *de minimus* amount of these HAPS are emitted as they make up less than 1% of the MEKP used at the facility.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Potential emissions based on maximum expected annual production over the life of the pending permit and limiting production to 50,000 spas per year.**

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Requested Allowable Emissions and Units: **N/A**	4. Equivalent Allowable Emissions: **N/A** lb/month **N/A** tons/year

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC (non-styrene)**	2. Total Percent Efficiency of Control: **0%**
3. Potential Emissions: **17,468 lb/month** **105 tons/year**	4. Synthetically Limited? **[No]**
5. Range of Estimated Fugitive Emissions: [ ] 1 [X] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **Volatile percentage based on MSDS** Reference: **Material Safety Data Sheet assuming 100% emitted.**	7. Emissions Method Code: **2**

E_{VOC} = [(2.5 X 10^{-4} ton_{MEKP}/(glues/sealers/caulks/primer)spa)(1.00 ton_{VOC}/ton_{MEKP})] + (3 X 10^{-5} ton_{VOC}/(stain)spa) + [(1 X 10^{-4} ton_{MEK}/(glues/sealers/paint)spa)(0.86 ton_{VOC})] = (3.7 X 10^{-4}/ton_{VOC}/spa)(4,167 spas/month)(2,000 lbs/ton) = 3,050 lbs_{VOC}/month + (4,084 lbs_{TPD}/month) + (6,792 $lbs_{Acetone}$/month) + (3,542 $lbs_{Isopropanol}$/month = 17,468 lbs_{VOC}/month

net VOC

E_{VOC} = (17,468 lbs_{VOC}/month)(12 months/year)(1/2,000) = 105 $tons_{VOC}$/year

9.Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Potential emissions based on maximum expected annual production over the life of the pending permit.**
(NOTE: VOCs from MDI due to the use of the water-borne sprayfoam are negligible and are not in calculation)

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Requested Allowable Emissions and Units: **105 tons/year**	4. Equivalent Allowable Emissions: **17,468 lb/month** **105 tons/year**
5. Method of Compliance (limit to 60 characters): **Compliance shall be achieved through limiting the total material usages as demonstrated through accurate record-keeping of material usage and limiting spa production to 50,000 per year.**	

Not NC, all non-VOC

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **Acetone 67-64-1**	2. Total Percent Efficiency of Control: **0%**
3. Potential Emissions: **6,792 lb/month** **41 tons/year**	4. Synthetically Limited? **[No]**
5. Range of Estimated Fugitive Emissions: [ ] 1 [X] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **1.63 $lbs_{Acetone}$/spa; 100% VOC based on MSDS** Reference: **Material Safety Data Sheet assuming 100% emitted.**	7. Emissions Method Code: **2**

Emission Factor – In 2002, 27,740 $lbs_{Acetone}$ used in producing 17,000 spas
27,740/17,000 = 1.63 $lbs_{Acetone}$/spa

$E_{Acetone}$ = (4,167 spas/month)(1.63 $lbs_{Acetone}$/spa) = 6,792 $lbs_{Acetone}$/month

$E_{Acetone}$ = (6,792 $lbs_{Acetone}$/month)(12 months/year)(1/2,000) = 41 $tons_{Acetone}$/year

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Potential emissions based on maximum expected annual production over the life of the pending permit.**

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Requested Allowable Emissions and Units: **41 tons/year**	4. Equivalent Allowable Emissions: **6,792 lb/month 41 tons/year**
5. Method of Compliance (limit to 60 characters): **Compliance shall be achieved through limiting the total material usages as demonstrated through accurate record-keeping of material usage and limiting spa production to 50,000 per year.**	

Not reg pollutant part of VOC?

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **Isopropanol**	2. Total Percent Efficiency of Control: **0%**
3. Potential Emissions: **3,542 lb/month** **21 tons/year**	4. Synthetically Limited? **[No]**
5. Range of Estimated Fugitive Emissions: [ ] 1 [X] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: **100% VOC percentage based on MSDS** Reference: **Material Safety Data Sheet assuming 100% emitted.**	7. Emissions Method Code: **2**
Emission Factor – In 2002, 2,220 gal_{Iso} used to make 17,000 spas; 6.55 lbs_{Iso}/gal_{Iso} (2,220/17,000)(6.55) = 0.85 lbs_{Iso}/spa **E_{Iso} = (0.85lbs_{Iso}/spa)(4,167 spas/month) = 3,542 lbs_{Iso}/month** **E_{Iso} = (3,542 lbs_{Iso}/month)(12 months/year)(1/2,000) = 21 $tons_{Iso}$/year**	
9.Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Potential emissions based on maximum expected annual production over the life of the pending permit.**	

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code: **Other**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Requested Allowable Emissions and Units: **21 tons/year**	4. Equivalent Allowable Emissions: **3,542 lb/month 21 tons/year**
5. Method of Compliance (limit to 60 characters): **Compliance shall be achieved through limiting the total material usages as demonstrated through accurate record-keeping of material usage and limiting spa production to 50,000 per year.**	

Unified Emission Factors for Open Molding of Composites

July 23, 2001

Emission Rate in Pounds of Styrene Emitted per Ton of Resin or Gelcoat Processed

Styrene content in resin/gelcoat, % [1]	<28 [2]	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	>60 [2]
Manual	0.126 x %styrene x 2000	83	89	94	100	106	112	117	123	128	134	140	146	152	157	163	169	174	180	((3.298 x %styrene) - 2.0628) x 2000
Manual w/ Vapor Suppressed Resin VSR [3]	Manual emission factor (listed above) x (1 - (0.53 x specific VSR reduction factor for each resin/suppressant formulation))																			
Mechanical Atomized	0.168 x %styrene x 2000	111	118	140	154	168	183	197	211	225	240	254	268	283	297	311	325	340	354	((6.714 x %styrene) - 2.18) x 2000
Mechanical Atomized with VSR [3]	Mechanical Atomized emission factor (listed above) x (1 - (0.45 x specific VSR reduction factor for each resin/suppressant formulation))																			
Mechanical Atomized Controlled Spray [4]	0.130 x %styrene x 2000	88	97	109	119	130	141	152	163	174	185	196	207	218	229	240	251	262	273	0.77 x ((6.714 x %styrene) - 2.18) x 2000
Mechanical Controlled Spray with VSR	Mechanical Atomized Controlled Spray emission factor (listed above) x (1 - (0.45 x specific VSR reduction factor for each resin/suppressant formulation))																			
Mechanical Non-Atomized	0.107 x %styrene x 2000	71	74	77	80	83	86	89	93	96	99	102	105	109	111	115	118	121	124	((6.157 x %styrene) - 0.0195) x 2000
Mechanical Non-Atomized with VSR [3]	Mechanical Non-Atomized emission factor (listed above) x (1 - (0.45 x specific VSR reduction factor for each resin/suppressant formulation))																			
Filament application	0.684 x %styrene x 2000	122	127	133	138	144	149	155	160	166	171	177	182	188	193	199	204	210	215	((0.2744 x %styrene) - 0.0288) x 2000
Filament Application with VSR [5]	0.128 x %styrene x 2000	79	83	86	90	93	97	100	104	108	111	115	118	122	125	129	133	136	140	0.65 x ((0.2744 x %styrene) - 0.0288) x 2000
Gelcoat Application	3.445 x %styrene x 2000	284	315	336	356	377	398	418	439	460	481	501	522	543	564	584	605	626	646	((1.03646 x %styrene) - 0.195) x 2000
Gelcoat Controlled Spray Application [4]	2.323 x %styrene x 2000	215	230	248	260	275	290	305	321	336	351	366	381	396	411	427	442	457	472	0.73 x (((1.03646 x %styrene) - 0.195) x 2000
Gelcoat Non-Atomized Application [6]	SEE Note 8 below	195	205	214	223	232	241	250	259	268	278	287	295	305	314	323	332	341	350	((0.4308 x %styrene) - 0.0605) x 2000
Covered-Cure after Roll-Out	Non-VSR process emission factor (listed above) x (0.80 for Manual <or> 0.85 for Mechanical)																			
Covered-Cure without Roll-Out	Non-VSR process emission factor (listed above) x (0.50 for Manual <or> 0.55 for Mechanical)																			

Emission Rate in Pounds of Methyl Methacrylate Emitted per Ton of Gelcoat Processed

MMA content in gelcoat, % [7]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	>20
Gel coat application [8]	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	3.73 x %MMA x 2000

Notes

1. Including styrene monomer content as supplied, plus any extra styrene monomer added by the molder, but before addition of other additives such as powders, fibers, glass, ...etc.
2. Formulas for materials with styrene content < 33% are based on the emission rate at 33% (constant emission factor expressed as percent of available styrene), and for styrene content > 50% on the emission rate based on the extrapolated factor equations; these are not based on test data but are believed to be conservative estimates. The value for "% styrene" in the formulas should be input as a fraction. For example, use the input value 0.30 for a resin with 30% styrene content by wt.
3. The VSR reduction factor is determined by testing each resin/suppressant formulation according to the procedure detailed in the *CPA Vapor Suppressant Effectiveness Test*.
4. SEE the *CPA Controlled Spray Handbook* for a detailed description of the controlled spray procedures.
5. The effect of vapor suppressants on emissions from filament winding operations is based on the *Dow Filament Winding Emissions Study*.
6. Including MMA monomer content as supplied, plus any extra MMA monomer added by the molder, but before addition of other additives such as powders, fibers, glass, ...etc.
7. Based on gelcoat data from *MMA Emissions Study*.
8. SEE the *July 17, 2001 ERCS report Statistical Analysis for Non-Atomized Application of Gel Coats used in the Open Molding of Composites* for a detailed description of the non-atomized gelcoat testing.
9. Use the equation ((0.4308 x %styrene) - 0.0605) x 2000 for gelcoats with styrene contents between 19% and 32% by wt.; use the equation 0.195 x %styrene x 2000 for gelcoats with less than 19% styrene content by wt.