BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
Petition of Royal Fiberglass Pools, Inc.	)	AS- 09-4
for an Adjusted Standard from	)	(Adjusted Standard)
35 IAC § 215.301	)	

TECHNICAL DOCUMENT SUPPORTING ROYAL FIBERGLASS POOLS, INC.'S PETITION FOR AN ADJUSTED STANDARD

Section	**Description**
1	General Information Regarding Royal Fiberglass Pools and Photographs of the Composite Fiberglass Swimming Pool Manufacturing Process
2	VOM Emission Summary for Royal Fiberglass Pools, Including Information Regarding Royal Fiberglass Pools' Compliance with the Composites MACT, 40 C.F.R. 63 Subpart WWWW
3	February 28, 2006 Submittal to Illinois EPA, Including Information Regarding the Facility and Production, Emissions Calculations, MACT Compliance and Emissions Control Cost Calculations and Analysis (*this letter was inadvertently dated February 28, 2005*)
4	June 23, 2006 Submittal to IEPA
5	June 30, 2006 Submittal to IEPA, Including Information Regarding the Facility and Production, Emissions Calculations, MACT Compliance and Emissions Control Cost Calculations and Analysis
6	May 27, 2008 Air Quality Impact Analysis of Royal Fiberglass Pools' Dix Plant Operations
7	July 22, 2006 Illinois Pollution Control Board Decision Regarding Crownline Boats, Inc.'s Petition for an Adjusted Standard
8	February 25, 2008 Letter from Rob Haberlein to Dale Guariglia with responses to questions posed by IEPA regarding updated costs of add-on controls, reduction in the size of the spray enclosures, and reduction in ventilation airflow being prohibited by OSHA requirements

Respectfully submitted,

BRYAN CAVE LLP

By: ______________________

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Attorneys for Royal Fiberglass Pools, Inc.

CERTIFICATE OF SERVICE

The undersigned certifies that a copy of the foregoing motion was served upon the following parties on the 31st day of March, 2009:

Illinois Pollution Control Board, Attn: Clerk
100 West Randolph Street
James R. Thompson Center, Suite 11-500
Chicago, IL 60601-3218

Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276
Attn: Charles Matoesian

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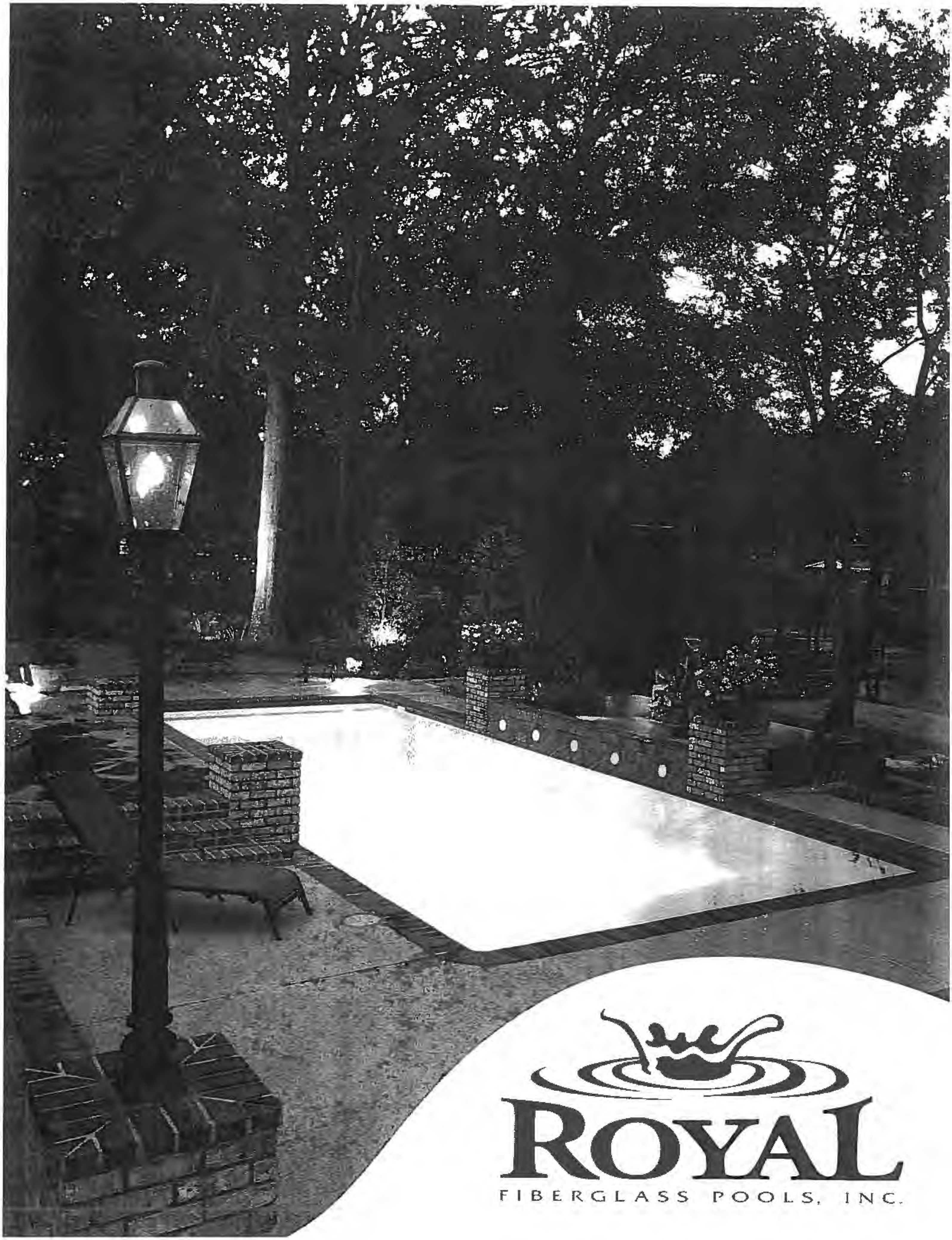
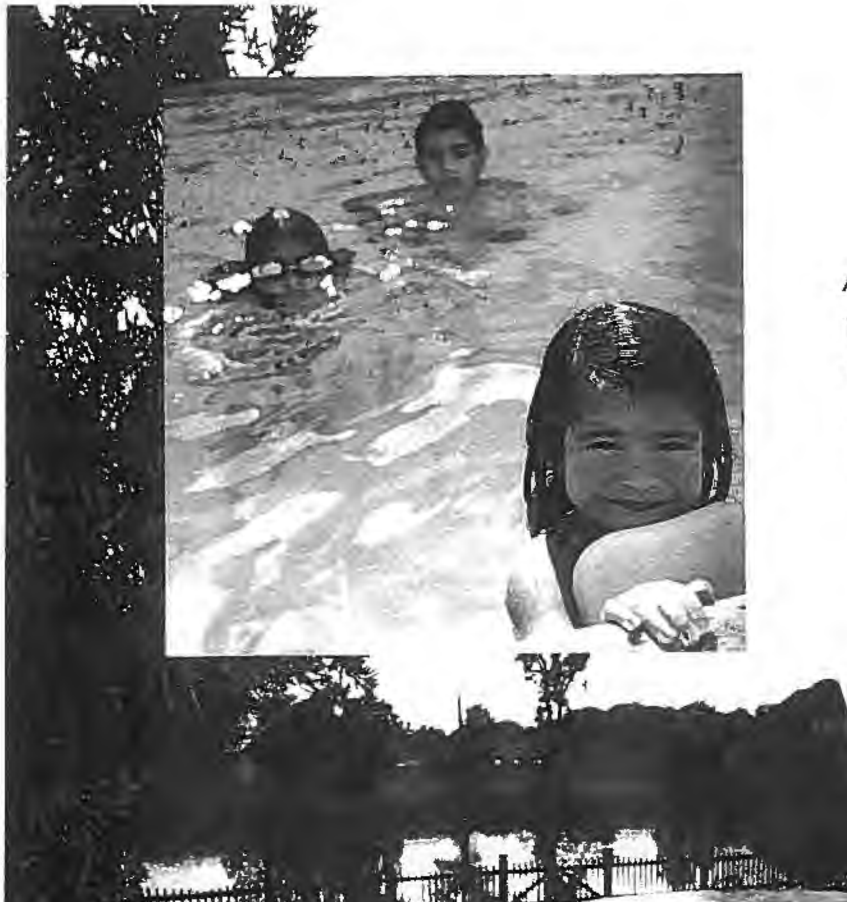
Exhibit 1



ROYAL
FIBERGLASS POOLS, INC.

DIVE IN!



Ah...there's nothing quite like it...the feel of cool, invigorating water rushing over you as you take that first dive into your new Royal Fiberglass Pool. In an instant, the world is quiet, tranquil. All your tensions just flow away.

Welcome to the Royal Fiberglass Pools experience. Royal Fiberglass Pools offers the finest products on the market today. Pools and Spas in a variety of shapes and sizes, customized to fit your lifestyle. Simple to elegant designs offer something for everyone and every budget.

Turn your backyard into a tropical retreat. Just a few steps from your backdoor, your world can be transformed into a calm, peaceful oasis or exciting water adventure for the entire family.

MAKING **WAVES!**

Royal Fiberglass Pools is a family owned and operated business. For nearly four decades, the Hebert family has remained true to their promise...to offer the highest quality pools and spas that money can buy. The Hebert's commitment to quality has revolutionized the pool and spa industry. Cliff Hebert (affectionately known as "Mr. Cliff"), founder and industry leader and innovator, is the person credited for first utilizing Vinyl Ester Resin in the manufacturing of composite pools. These high quality one-piece fiberglass pools and spas are adaptive to any climate and are the best structurally designed pools ever manufactured.

With an outstanding reputation for quality craftsmanship, Royal Fiberglass Pools remains dedicated to providing the best pools and spas in the country. Every Royal pool and spa is constructed with eight layers of high quality fiberglass to assure the utmost durability. The top coat, or gel coat layer, offers a beautiful surface that is both durable and easy to maintain. Layers of Vinyl Ester resin and chopped strand mat provide impact and blister resistance. For added corrosion resistance and superior strength, Royal utilizes Isothalic resin to encapsulate more glass than any other fiberglass pool manufacturer.

The Hebert family applies strict quality control measures to the manufacturing of its products. The thickness of the polymer coatings is controlled within a few thousandths of an inch and an inspector checks each and every Royal process prior to shipping.

TAKE THE **PLUNGE!**

How many times have you said it? "One day, we'll have a pool." Haven't you've waited long enough? Go ahead... take the plunge. Take that dream and make it real. Imagine...everyday you could escape to your own backyard paradise. You'll feel like royalty as you relax in your very own sparkling pool.

The addition of a Royal Pool or Spa adds a new dimension to your home. It's the perfect setting for entertaining. The ultimate spot for quality family time. A luxurious way to spend some quiet time to focus and rejuvenate. A mini vacation in your own backyard year after year.

When you invest in a Royal Pool or Spa, you can count on quality craftsmanship that only comes with the Royal name. The process used in the manufacture of these fine quality pools and spas is, by far, the best in the industry

MAKE A **SPLASH!**

With your backyard transformed into a tropical paradise, entertaining will take on a whole new dimension. Holidays. Birthdays. Family reunions. Weekend bar-b-ques. A Royal Pool is cause for celebration any day of the year. Even the most average day can turn into something spectacular.

Royal Fiberglass Pools offers breathtakingly beautifully and exquisitely designed pools and spas to satisfy a variety of tastes. Pools and spas may be combined to create an exciting spillover effect. If you prefer, Royal can create custom designs built to your specifications. Custom pools are available in many sizes and shapes from small swim lanes to Olympic competition pools.

Royal Fiberglass Pools, in association with its distributors, offers many amenities such as vanishing edge pools, built-in coping, contoured non-slip steps and seats. Make up a wish list for your perfect pool setting and your Royal Fiberglass Pools representative will coordinate everything for you.

Your Royal pool is unconditionally warranted by Royal Fiberglass Pools, Inc. against defects in material or workmanship for a period of 25 years after installation. Your non-prorated pool warranty is transferable to a new homebuyer.

THE **ROYAL** TREATMENT!

When you invest in a pool by Royal Fiberglass Pools, you know you're buying the very best pool that money can buy. In addition to selling the finest quality pools and spas in the country, the Hebert family provides customers with the utmost respect and attention.

The advantages of a Royal Fiberglass Pool are many.

Quick Installation: Usually 3 to 5 days.

Durability: The pool's seamless construction withstands extreme environmental changes and can flex up to twelve full inches without damage. Royal Fiberglass Pools are engineered to be up to seventeen times stronger per inch than concrete pools. This remarkable flexing feature makes the fiberglass pool the most resilient to any weather condition. No other pool comes close.

Maintenance Free: The gelcoat finish is smooth, hard and non-porous making it resistant to algae. This feature reduces chemical usage and maintenance costs. Unlike other types of pools, there is never a need to drain a one-piece fiberglass pool.

Movable: When you move, your pool can go with you.

Standard Features: Your Royal Fiberglass Pool includes a built-in coping, molded, non-slip surface steps and benches.

Standard Accessories: Skimmer, main drain and return inlets.

Optional Accessories: Automatic pool cleaner, water heater, additional decking, slide, diving board, extra jets, winter cover, solar blanket and reel auto cover, ozone purification, ceramic tile, landscape lighting, fiber optic lighting, handrails, and ladders.

Royal Fiberglass Pools has manufacturing facilities in Breaux Bridge LA and Dix IL, centrally located to serve our nationwide dealer network.

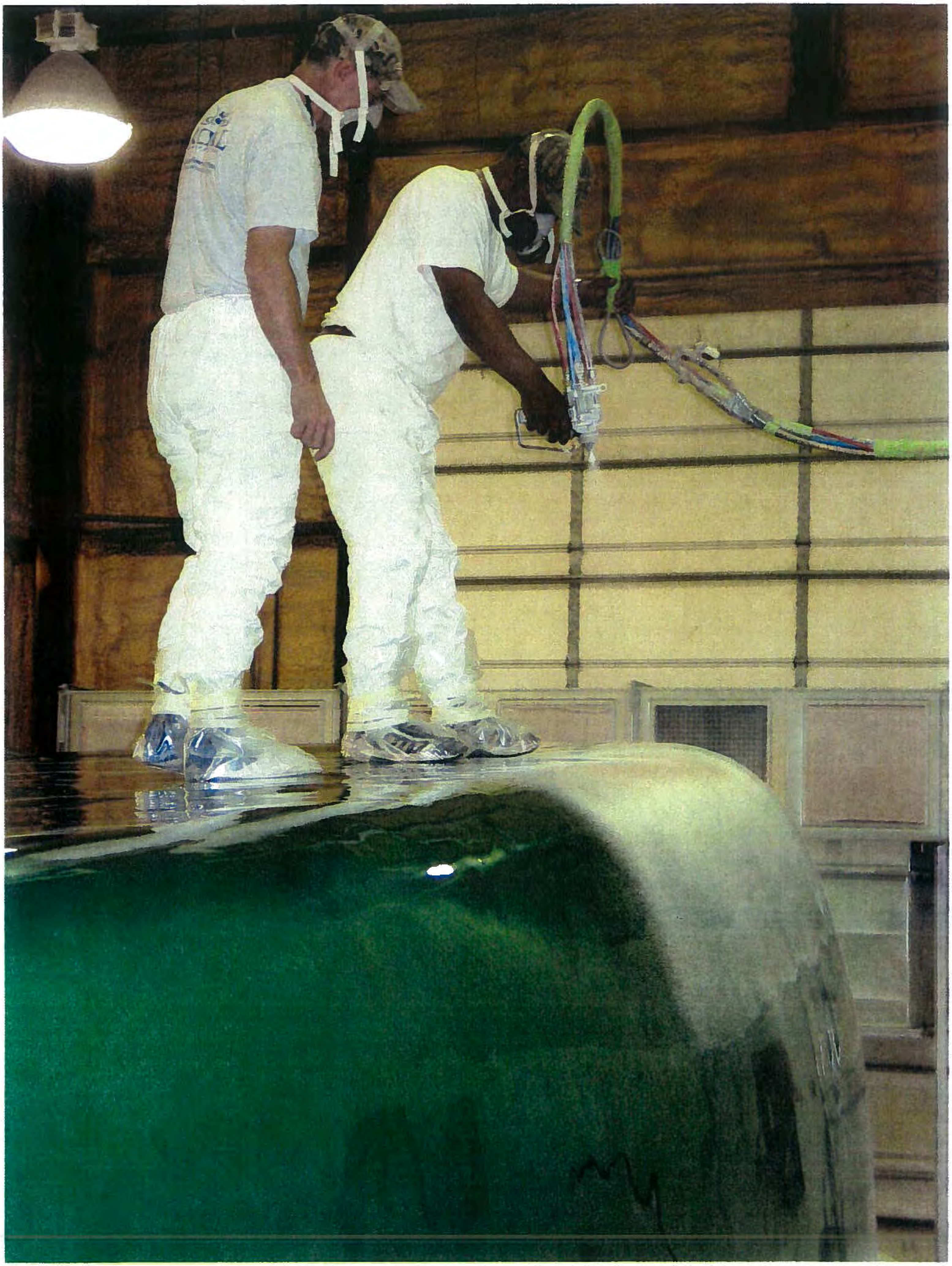
Made In America And Proud Of It!

Member of:

NATIONAL SPA & POOL INSTITUTE

MEMBER 2003

NFIB




20001-DW

Exhibit 2

Hourly Potential-to-Emit HAP/VOC for the Royal Pools Dix Facility

Maximum Hourly Baseline
revised 2/18/06

ASSUMPTIONS Usage (max lb/hr) Contents Application
Resin process
Gelcoat process
Tooling process

RESIN & GELCOAT MATERIALS Material Type	Material Description	Peak Hourly Material Usage (lb/hr)	Styrene Content (lb/lb)	MMA Content (lb/lb)	AMS Content (lb/lb)	Other VOC Content (lb/lb)	Material Application Method	Styrene Emission Factor (lb/lb)	MMA Emission Factor (lb/lb)	AMS Emission Factor (lb/lb)	Other VOC Emission Factor (lb/lb)	Hourly Styrene Emissions (lb/hr)	Hourly MMA Emissions (lb/hr)	Hourly AMS Emissions (lb/hr)	Hourly Other VOC Emissions (lb/hr)	Hourly Total VOM Emissions (lb/hr)	
resin	Interplastic COR77-121-033S	0	47.5%				non-atomized mech	12.23%	75%	0.00%	100%	0.00	0.00	0.00	0.00		
resin	Interplastic CORVE8117	300	47.5%				non-atomized mech	12.23%	75%	0.00%	100%	17.42	0.00	0.00	0.00	17.42	
resin							non-atomized mech	0.00%	75%	0.00%	100%	0.00	0.00	0.00	0.00		
resin							atomized mech	16.85%	75%	0.00%	100%	0.00	0.00	0.00	0.00		
resin							controlled spray	10.70%	75%		100%	0.00	0.00	0.00	0.00		
resin							manual	12.57%	75%	0.00%	100%	0.00	0.00	0.00	0.00		
resin							RTM closed mold	1%	1%	1%	1%	0.00	0.00	0.00	0.00		
gelcoat	HK Lite White	250	28%	3%			atomized spray	44.51%	75%		100%	31.18	5.83		0.00	[illegible]	4.59767
gelcoat							atomized spray	44.51%	75%		100%	0.00	0.00		0.00		
gelcoat							atomized spray	44.51%	75%		100%	0.00	0.00		0.00		
gelcoat							controlled spray	44.51%	75%		100%	0.00	0.00		0.00		
gelcoat							non-atomized mech	18.46%	75%		100%	0.00	0.00		0.00		
monomer	Styrene monomer	0	100%	0%			additive	100%			100%	0.00	0.00		0.00		
promoter	Cobalt Naphthenate 6%	0				57%	additive	100%			100%	0.00	0.00		0.00		
putty	Bondo						manual	12.57%			100%	0.00	0.00		0.00		

MISCELLANEOUS HAP/VOC MATERIALS Material Type	Material Description	Monthly Material Usage (lb/hr)	MEK Content (lb/lb)	DMP Content (lb/lb)	Other VOC/HAP Content (lb/lb)		MEK Emission Factor (lb/lb)	DMP Emission Factor (lb/lb)	VOC/HAP Emission Factor (lb/lb)	Hourly MEK Emissions (lb/hr)	Hourly DMP Emissions (lb/hr)	Hourly Other VOC Emissions (lb/hr)	
catalyst	Catalyst	3.75	2%	37%			100%	0.04%	0.04%	0.08	0.0006	0	0.08
catalyst							100%		0.04%	0		0	
catalyst							100%		0.04%	0		0	
catalyst							100%		0.04%	0		0	
tooling	Mold wax	1			90%				100%	0		1	
tooling									100%	0		0	
tooling									100%	0		0	
tooling									100%	0		0	
tooling									100%	0		0	
tooling									100%	0		0	
										0		1 =	1

Royal Pools - Dix, Illinios Facility
HAP/VOC Emissions Summary
Period - January 2005 to December 2005

Latest revision date **February 18, 2006**

	VOC & HAP Emissions			
	Monthly Emissions			
	Styrene	MMA	Total HAP	Total VOC
	(lb/mo)			
MONTH				
January 2005	0	0	0	0
February 2005	0	0	0	0
March 2005	6	1	7	7
April 2005	548	99	647	661
May 2005	2,883	101	2,984	2,994
June 2005	6,442	302	6,743	6,764
July 2005	1,102	199	1,301	1,311
August 2005	2,880	100	2,979	2,988
September 2005	0	0	0	0
October 2005	0	0	0	0
November 2005	0	0	0	0
December 2005	11	2	13	13
	Rolling 12-Month Averages			
	(tpy)			
LIMIT	9.5	9.5	24.5	49
	6.94	0.40	7.34	7.37

Monthly HAP/VOC/MACT Emissions Log for the Royal Pools Dix Facility

January 2005
revised 2/18/06

Styrene (lb/mo)	MMA (lb/mo)		Total HAP (lb/mo)	Total VOC (lb/mo)
0	0		0	0

Total MACT
Weighted Av
Weighted Av
Percentage c

RESIN & GELCOAT MATERIALS Material Type	Material Description	Monthly Material Usage (lb/mo)	Styrene Content (lb/lb)	MMA Content (lb/lb)	AMS Content (lb/lb)	Other VOC Content (lb/lb)	Material Application Method	Styrene Emission Factor (lb/lb)	MMA Emission Factor (lb/lb)	AMS Emission Factor (lb/lb)	Other VOC Emission Factor (lb/lb)	Monthly Styrene Emissions (lb/mo)	Monthly MMA Emissions (lb/mo)	Monthly AMS Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)	Total HAP Content (lb/lb)
resin	762 polyester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%
resin	784 vinyl ester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%
resin	162 unsaturated resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%
resin							RTM	1%	1%	1%	1%	0	0	0	0	
resin							manual	0.00%	75%	0.00%	100%	0	0	0	0	0.0%
gelcoat	HK Lite White	0	28%	3%			atomized spray	44.51%	75%		100%	0	0		0	31.0%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%
monomer	Styrene monomer	0	100%	0%			additive	100%			100%	0	0		0	
promoter							additive	100%			100%	0	0		0	
putty							manual	12.57%			100%	0	0		0	
												0	*0.0*	*0*	*0* =	0

MISCELLANEOUS HAP/VOC MATERIALS Material Type	Material Description	Monthly Material Usage (lb/mo)	MEK Content (lb/lb)	DMP Content (lb/lb)	Other VOC/HAP Content (lb/lb)		MEK Emission Factor (lb/lb)	DMP Emission Factor (lb/lb)	VOC/HAP Emission Factor (lb/lb)	Monthly MEK Emissions (lb/mo)	Monthly DMP Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)	
catalyst	Catalyst	0	2%	37%			100%	0.04%	100%	0.00	0.0000	0	
catalyst							100%	0.04%	100%	0		0	
tooling									100%	0		0	
tooling									100%	0		0	
tooling									100%	0		0	
tooling									100%	0		0	
										0		*0* =	0

Monthly HAP/VOC/MACT Emissions Log for the Royal Pools Dix Facility

February 2005
revised 2/18/05

Styrene (lb/mo)	MMA (lb/mo)		Total HAP (lb/mo)	Total VOC (lb/mo)
0	0		0	0

Composite MACT Calculations		
Total MACT Material Usage	0	lb/mo
Weighted Average MACT Emission	0.0	lb/ton
Weighted Average MACT Limit	0.0	lb/ton
Percentage of Average MACT Limit	0%	

RESIN & GELCOAT MATERIALS Material Type	Material Description	Monthly Material Usages (lb/mo)	Styrene Content (lb/lb)	MMA Content (lb/lb)	AMS Content (lb/lb)	Other VOC Content (lb/lb)	Material Application Method	Styrene Emission Factor (lb/lb)	MMA Emission Factor (lb/lb)	AMS Emission Factor (lb/lb)	Other VOC Emission Factor (lb/lb)	Monthly Styrene Emissions (lb/mo)	Monthly MMA Emissions (lb/mo)	Monthly AMS Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)	Total HAP Content (lb/lb)	MACT HAP Emissions (lb/ton)	MACT HAP Limit (lb/ton)	Percent of HAP Limit (%)
resin	762 polyester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	784 vinyl ester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	162 unsaturated resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							RTM	1%	1%	1%	1%	0	0	0	0				
resin							manual	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	123	0.0%
gelcoat	HK Lite White	0	28%	3%			atomized spray	44.51%	75%		100%	0	0		0	31.0%	276.0	605	45.6%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
monomer	Styrene monomer	0	100%	0%			additive	100%			100%	0	0		0				
promoter							additive	100%			100%	0	0		0				
putty							manual	12.57%			100%	0	0		0				
												0	0.0	0	0 = 0				

MISCELLANEOUS HAP/VOC MATERIALS Material Type	Material Description	Monthly Material Usages (lb/mo)	MEK Content (lb/lb)	DMP Content (lb/lb)		Other VOC/HAP Content (lb/lb)		MEK Emission Factor (lb/lb)	DMP Emission Factor (lb/lb)		VOC/HAP Emission Factor (lb/lb)	Monthly MEK Emissions (lb/mo)	Monthly DMP Emissions (lb/mo)		Monthly Other VOC Emissions (lb/mo)
catalyst	Catalyst	0	2%	37%				100%	0.04%		100%	0.00	0.0000		0
catalyst								100%	0.04%		100%	0			0
tooling											100%	0			0
tooling											100%	0			0
tooling											100%	0			0
tooling											100%	0			0
												0			0 = 0

Monthly HAP/VOC/MACT Emissions Log for the Royal Pools Dix Facility

March 2005
revised 2/18/06

Styrene (lb/mo)	MMA (lb/mo)		Total HAP (lb/mo)	Total VOC (lb/mo)
6	1		7	7

Composite MACT Calculations		
Total MACT Material Usage	45	lb/mo
Weighted Average MACT Emission	276.0	lb/ton
Weighted Average MACT Limit	605.0	lb/ton
Percentage of Average MACT Limit	46%	

Material Type	RESIN & GELCOAT MATERIALS Material Description	Monthly Material Usages (lb/mo)	Styrene Content (lb/lb)	MMA Content (lb/lb)	AMS Content (lb/lb)	Other VOC Content (lb/lb)	Material Application Method	Styrene Emission Factor (lb/lb)	MMA Emission Factor (lb/lb)	AMS Emission Factor (lb/lb)	Other VOC Emission Factor (lb/lb)	Monthly Styrene Emissions (lb/mo)	Monthly MMA Emissions (lb/mo)	Monthly AMS Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)	Total HAP Content (lb/lb)	MACT HAP Emissions (lb/ton)	MACT HAP Limit (lb/ton)	Percent of HAP Limit (%)
resin	762 polyester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	784 vinyl ester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	162 unsaturated resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							RTM	1%	1%	1%	1%	0	0	0	0				
resin							manual	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	123	0.0%
gelcoat	HK Lite White	45	28%	3%			atomized spray	44.51%	75%		100%	6	1		0	31.0%	276.0	605	45.6%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
monomer	Styrene monomer	0	100%	0%			additive	100%			100%	0	0		0				
promoter							additive	100%			100%	0	0		0				
putty							manual	12.57%			100%	0	0		0				
												6	1.0	0	0 = 7				

Material Type	MISCELLANEOUS HAP/VOC MATERIALS Material Description	Monthly Material Usages (lb/mo)	MEK Content (lb/lb)	DMP Content (lb/lb)	Other VOC/HAP Content (lb/lb)		MEK Emission Factor (lb/lb)	DMP Emission Factor (lb/lb)	VOC/HAP Emission Factor (lb/lb)	Monthly MEK Emissions (lb/mo)	Monthly DMP Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)
catalyst	Catalyst	32	2%	37%			100%	0.04%	100%	0.64	0.0047	0
catalyst							100%	0.04%	100%	0		0
tooling									100%	0		0
tooling									100%	0		0
tooling									100%	0		0
tooling									100%	0		0
										1		0 = 1

April 2005
revised 2/16/06

Monthly HAP/VOC/MACT Emissions Log for the Royal Pools Dix Facility

Styrene (lb/mo)	MMA (lb/mo)		Total HAP (lb/mo)	Total VOC (lb/mo)
548	99		647	661

Composite MACT Calculations		
Total MACT Material Usage	4,400	lb/mo
Weighted Average MACT Emissior	276.0	lb/ton
Weighted Average MACT Limit	605.0	lb/ton
Percentage of Average MACT Limi	46%	

Material Type	RESIN & GELCOAT MATERIALS Material Description	Monthly Material Usage (lb/mo)	Styrene Content (lb/lb)	MMA Content (lb/lb)	AMS Content (lb/lb)	Other VOC Content (lb/lb)	Material Application Method	Styrene Emission Factor (lb/lb)	MMA Emission Factor (lb/lb)	AMS Emission Factor (lb/lb)	Other VOC Emission Factor (lb/lb)	Monthly Styrene Emissions (lb/mo)	Monthly MMA Emissions (lb/mo)	Monthly AMS Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)	Total HAP Content (lb/lb)	MACT HAP Emissions (lb/ton)	MACT HAP Limit (lb/ton)	Percent of HAP Limit (%)
resin	762 polyester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	784 vinyl ester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	162 unsaturated resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							RTM	1%	1%	1%	1%	0	0	0	0				
resin							manual	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	123	0.0%
gelcoat	HK Lite White	4,400	28%	3%			atomized spray	44.51%	75%		100%	548	99		0	31.0%	276.0	605	45.6%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
monomer	Styrene monomer	0	100%	0%			additive	100%			100%	0	0		0				
promoter							additive	100%			100%	0	0		0				
putty							manual	12.57%			100%	0	0		0				
												548	99.0	0	0 =	647			

Material Type	MISCELLANEOUS HAP/VOC MATERIALS Material Description	Monthly Material Usages (lb/mo)	MEK Content (lb/lb)	DMP Content (lb/lb)		Other VOC/HAP Content (lb/lb)		MEK Emission Factor (lb/lb)	DMP Emission Factor (lb/lb)		VOC/HAP Emission Factor (lb/lb)	Monthly MEK Emissions (lb/mo)	Monthly DMP Emissions (lb/mo)		Monthly Other VOC Emissions (lb/mo)	
catalyst	Catalyst	704	2%	37%				100%	0.04%		100%	14.08	0.1042		0	
catalyst								100%	0.04%		100%	0			0	
tooling											100%	0			0	
tooling											100%	0			0	
tooling											100%	0			0	
tooling											100%	0			0	
												14			0 =	14

May 2005
revised 2/18/08

Monthly HAP/VOC/MACT Emissions Log for the Royal Pools Dix Facility

Styrene (lb/mo)	MMA (lb/mo)		Total HAP (lb/mo)	Total VOC (lb/mo)
2,883	101		2,984	2,994

Composite MACT Calculations		
Total MACT Material Usage	44,380	lb/mo
Weighted Average MACT Emission	132.6	lb/ton
Weighted Average MACT Limit	162.8	lb/ton
Percentage of Average MACT Limit	81%	

Material Type	RESIN & GELCOAT MATERIALS Material Description	Monthly Material Usages (lb/mo)	Styrene Content (lb/lb)	MMA Content (lb/lb)	AMS Content (lb/lb)	Other VOC Content (lb/lb)	Material Application Method	Styrene Emission Factor (lb/lb)	MMA Emission Factor (lb/lb)	AMS Emission Factor (lb/lb)	Other VOC Emission Factor (lb/lb)	Monthly Styrene Emissions (lb/mo)	Monthly MMA Emissions (lb/mo)	Monthly AMS Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)	Total HAP Content (lb/lb)	MACT HAP Emissions (lb/ton)	MACT HAP Limit (lb/ton)	Percent of HAP Limit (%)
resin	762 polyester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	784 vinyl ester resin	12,420	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	723	0	0	0	47.6%	116.5	113	103.1%
resin	162 unsaturated resin	27,480	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	1,600	0	0	0	47.6%	116.5	113	103.1%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							RTM	1%	1%	1%	1%	0	0	0	0				
resin							manual	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	123	0.0%
gelcoat	HK Lite White	4,490	28%	3%			atomized spray	44.51%	75%		100%	560	101		0	31.0%	276.0	605	45.6%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
monomer	Styrene monomer	0	100%	0%			additive	100%			100%	0	0		0				
promoter							additive	100%			100%	0	0		0				
putty							manual	12.57%			100%	0	0		0				
												2,883	101.0	0	0 =	2,984			

Material Type	MISCELLANEOUS HAP/VOC MATERIALS Material Description	Monthly Material Usages (lb/mo)	MEK Content (lb/lb)	DMP Content (lb/lb)		Other VOC/HAP Content (lb/lb)		MEK Emission Factor (lb/lb)	DMP Emission Factor (lb/lb)		VOC/HAP Emission Factor (lb/lb)	Monthly MEK Emissions (lb/mo)	Monthly DMP Emissions (lb/mo)		Monthly Other VOC Emissions (lb/mo)
catalyst	Catalyst	480	2%	37%				100%	0.04%		100%	9.60	0.0710		0
catalyst								100%	0.04%		100%	0			0
tooling											100%	0			0
tooling											100%	0			0
tooling											100%	0			0
tooling											100%	0			0
												10			0 = 10

June 2005
revised 2/18/06

Monthly HAP/VOC/MACT Emissions Log for the Royal Pools Dix Facility

Styrene (lb/mo)	MMA (lb/mo)		Total HAP (lb/mo)	Total VOC (lb/mo)
6,442	302		6,743	8,764

Composite MACT Calculations		
Total MACT Material Usage	95,330	lb/mo
Weighted Average MACT Emission	138.9	lb/ton
Weighted Average MACT Limit	182.2	lb/ton
Percentage of Average MACT Limit	76%	

Material Type	RESIN & GELCOAT MATERIALS Material Description	Monthly Material Usage (lb/mo)	Styrene Content (lb/lb)	MMA Content (lb/lb)	AMS Content (lb/lb)	Other VOC Content (lb/lb)	Material Application Method	Styrene Emission Factor (lb/lb)	MMA Emission Factor (lb/lb)	AMS Emission Factor (lb/lb)	Other VOC Emission Factor (lb/lb)	Monthly Styrene Emissions (lb/mo)	Monthly MMA Emissions (lb/mo)	Monthly AMS Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)
resin	762 polyester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0
resin	784 vinyl ester resin	24,980	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	1,453	0	0	0
resin	162 unsaturated resin	56,950	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	3,317	0	0	0
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0
resin							RTM	1%	1%	1%	1%	0	0	0	0
resin							manual	0.00%	75%	0.00%	100%	0	0	0	0
gelcoat	HK Lite White	13,410	28%	3%			atomized spray	44.51%	75%		100%	1,671	302		0
gelcoat							atomized spray	44.51%	75%		100%	0	0		0
gelcoat							atomized spray	44.51%	75%		100%	0	0		0
monomer	Styrene monomer	0	100%	0%			additive	100%			100%	0	0		0
promoter							additive	100%			100%	0	0		0
putty							manual	12.57%			100%	0	0		0
												6,442	301.7	0	0 = 6,743

Total HAP Content (lb/lb)	MACT HAP Emissions (lb/ton)	MACT HAP Limit (lb/ton)	Percent of HAP Limit (%)
47.6%	116.5	113	103.1%
47.6%	116.5	113	103.1%
47.6%	116.5	113	103.1%
0.0%	0.0	113	0.0%
0.0%	0.0	113	0.0%
0.0%	0.0	123	0.0%
31.0%	276.0	605	45.6%
0.0%	0.0	605	0.0%
0.0%	0.0	605	0.0%

Material Type	MISCELLANEOUS HAP/VOC MATERIALS Material Description	Monthly Material Usage (lb/mo)	MEK Content (lb/lb)	DMP Content (lb/lb)		Other VOC/HAP Content (lb/lb)		MEK Emission Factor (lb/lb)	DMP Emission Factor (lb/lb)		VOC/HAP Emission Factor (lb/lb)	Monthly MEK Emissions (lb/mo)	Monthly DMP Emissions (lb/mo)		Monthly Other VOC Emissions (lb/mo)
catalyst	Catalyst	1,024	2%	37%				100%	0.04%		100%	20.48	0.1516		0
catalyst								100%	0.04%		100%	0			0
tooling											100%	0			0
tooling											100%	0			0
tooling											100%	0			0
tooling											100%	0			0
												20			0 = 20

Monthly HAP/VOC/MACT Emissions Log for the Royal Pools Dix Facility

July 2005
revised 2/18/06

Styrene (lb/mo)	MMA (lb/mo)		Total HAP (lb/mo)	Total VOC (lb/mo)
1,102	199		1,301	1,311

Composite MACT Calculations		
Total MACT Material Usage	8,843	lb/mo
Weighted Average MACT Emissio	276.0	lb/ton
Weighted Average MACT Limit	606.0	lb/ton
Percentage of Average MACT Limi	46%	

RESIN & GELCOAT MATERIALS Material Type	Material Description	Monthly Material Usage (lb/mo)	Styrene Content (lb/lb)	MMA Content (lb/lb)	AMS Content (lb/lb)	Other VOC Content (lb/lb)	Material Application Method	Styrene Emission Factor (lb/lb)	MMA Emission Factor (lb/lb)	AMS Emission Factor (lb/lb)	Other VOC Emission Factor (lb/lb)	Monthly Styrene Emissions (lb/mo)	Monthly MMA Emissions (lb/mo)	Monthly AMS Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)	Total HAP Content (lb/lb)	MACT HAP Emissions (lb/ton)	MACT HAP Limit (lb/ton)	Percent of HAP Limit (%)
resin	762 polyester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	784 vinyl ester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	162 unsaturated resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							RTM	1%	1%	1%	1%	0	0	0	0				
resin							manual	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	123	0.0%
gelcoat	HK Lite White	8,843	28%	3%			atomized spray	44.51%	75%		100%	1,102	199		0	31.0%	276.0	605	45.6%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
monomer	Styrene monomer	0	100%	0%			additive	100%			100%	0	0		0				
promoter							additive	100%			100%	0	0		0				
putty							manual	12.57%			100%	0	0		0				
												1,102	199.0	0	0 =	1,301			

MISCELLANEOUS HAP/VOC MATERIALS Material Type	Material Description	Monthly Material Usage (lb/mo)	MEK Content (lb/lb)	DMP Content (lb/lb)	Other VOC/HAP Content (lb/lb)		MEK Emission Factor (lb/lb)	DMP Emission Factor (lb/lb)	VOC/HAP Emission Factor (lb/lb)	Monthly MEK Emissions (lb/mo)	Monthly DMP Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)
catalyst	Catalyst	480	2%	37%			100%	0.04%	100%	9.60	0.0710	0
catalyst							100%	0.04%	100%	0		0
tooling									100%	0		0
tooling									100%	0		0
tooling									100%	0		0
tooling									100%	0		0
										10		0 = 10

August 2005
revised 2/18/06

Monthly HAP/VOC/MACT Emissions Log for the Royal Pools Dix Facility

Styrene (lb/mo)	MMA (lb/mo)		Total HAP (lb/mo)	Total VOC (lb/mo)
2,880	100		2,979	2,986

Composite MACT Calculations		
Total MACT Material Usage	44,406	lb/mo
Weighted Average MACT Emission	132.4	lb/ton
Weighted Average MACT Limit	162.0	lb/ton
Percentage of Average MACT Limit	82%	

RESIN & GELCOAT MATERIALS Material Type	Material Description	Monthly Material Usages (lb/mo)	Styrene Content (lb/lb)	MMA Content (lb/lb)	AMS Content (lb/lb)	Other VOC Content (lb/lb)	Material Application Method	Styrene Emission Factor (lb/lb)	MMA Emission Factor (lb/lb)	AMS Emission Factor (lb/lb)	Other VOC Emission Factor (lb/lb)	Monthly Styrene Emissions (lb/mo)	Monthly MMA Emissions (lb/mo)	Monthly AMS Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)	Total HAP Content (lb/lb)	MACT HAP Emissions (lb/ton)	MACT HAP Limit (lb/ton)	Percent of HAP Limit (%)
resin	782 polyester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	784 vinyl ester resin	12,060	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	702	0	0	0	47.6%	116.5	113	103.1%
resin	162 unsaturated resin	27,920	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	1,626	0	0	0	47.6%	116.5	113	103.1%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							RTM	1%	1%	1%	1%	0	0	0	0				
resin							manual	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	123	0.0%
gelcoat	HK Lite White	4,426	28%	3%			atomized spray	44.51%	75%		100%	552	100		0	31.0%	276.0	605	45.6%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
monomer	Styrene monomer	0	100%	0%			additive	100%			100%	0	0		0				
promoter							additive	100%			100%	0	0		0				
putty							manual	12.57%			100%	0	0		0				
												2,880	99.6	0	0 =	2,979			

MISCELLANEOUS HAP/VOC MATERIALS Material Type	Material Description	Monthly Material Usages (lb/mo)	MEK Content (lb/lb)	DMP Content (lb/lb)	Other VOC/HAP Content (lb/lb)		MEK Emission Factor (lb/lb)	DMP Emission Factor (lb/lb)	VOC/HAP Emission Factor (lb/lb)	Monthly MEK Emissions (lb/mo)	Monthly DMP Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)
catalyst	Catalyst	416	2%	37%			100%	0.04%	100%	8.32	0.0616	0
catalyst							100%	0.04%	100%	0		0
tooling									100%	0		0
tooling									100%	0		0
tooling									100%	0		0
tooling									100%	0		0
										8		0 = 8

September 2005
revised 2/16/06

Monthly HAP/VOC/MACT Emissions Log for the Royal Pools Dix Facility

Styrene (lb/mo)	MMA (lb/mo)		Total HAP (lb/mo)	Total VOC (lb/mo)
0	0		0	0

Composite MACT Calculations		
Total MACT Material Usage	0	lb/mo
Weighted Average MACT Emission	0.0	lb/ton
Weighted Average MACT Limit	0.0	lb/ton
Percentage of Average MACT Limit	0%	

RESIN & GELCOAT MATERIALS Material Type	Material Description	Monthly Material Usage (lb/mo)	Styrene Content (lb/lb)	MMA Content (lb/lb)	AMS Content (lb/lb)	Other VOC Content (lb/lb)	Material Application Method	Styrene Emission Factor (lb/lb)	MMA Emission Factor (lb/lb)	AMS Emission Factor (lb/lb)	Other VOC Emission Factor (lb/lb)	Monthly Styrene Emissions (lb/mo)	Monthly MMA Emissions (lb/mo)	Monthly AMS Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)	Total HAP Content (lb/lb)	MACT HAP Emissions (lb/ton)	MACT HAP Limit (lb/ton)	Percent of HAP Limit (%)
resin	762 polyester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	784 vinyl ester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	182 unsaturated resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							RTM	1%	1%	1%	1%	0	0	0	0				
resin							manual	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	123	0.0%
gelcoat	HK Lite White	0	28%	3%			atomized spray	44.51%	75%		100%	0	0		0	31.0%	276.0	605	45.6%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
monomer	Styrene monomer	0	100%	0%			additive	100%			100%	0	0		0				
promoter							additive	100%			100%	0	0		0				
putty							manual	12.57%			100%	0	0		0				
												0	0.0	0	0 =	0			

MISCELLANEOUS HAP/VOC MATERIALS Material Type	Material Description	Monthly Material Usage (lb/mo)	MEK Content (lb/lb)	DMP Content (lb/lb)	Other VOC/HAP Content (lb/lb)		MEK Emission Factor (lb/lb)	DMP Emission Factor (lb/lb)	VOC/HAP Emission Factor (lb/lb)	Monthly MEK Emissions (lb/mo)	Monthly DMP Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)	
catalyst	Catalyst	0	2%	37%			100%	0.04%	100%	0.00	0.0000	0	
catalyst							100%	0.04%	100%	0		0	
tooling									100%	0		0	
tooling									100%	0		0	
tooling									100%	0		0	
tooling									100%	0		0	
										0		0 =	0

Monthly HAP/VOC/MACT Emissions Log for the Royal Pools Dix Facility

October 2005
revised 2/18/06

Styrene (lb/mo)	MMA (lb/mo)		Total HAP (lb/mo)	Total VOC (lb/mo)
0	0		0	0

Composite MACT Calculations		
Total MACT Material Usage	0	lb/mo
Weighted Average MACT Emission	0.0	lb/ton
Weighted Average MACT Limit	0.0	lb/ton
Percentage of Average MACT Limit	0%	

RESIN & GELCOAT MATERIALS

Material Type	Material Description	Monthly Material Usage (lb/mo)	Styrene Content (lb/lb)	MMA Content (lb/lb)	AMS Content (lb/lb)	Other VOC Content (lb/lb)	Material Application Method	Styrene Emission Factor (lb/lb)	MMA Emission Factor (lb/lb)	AMS Emission Factor (lb/lb)	Other VOC Emission Factor (lb/lb)	Monthly Styrene Emissions (lb/mo)	Monthly MMA Emissions (lb/mo)	Monthly AMS Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)	Total HAP Content (lb/lb)	MACT HAP Emissions (lb/ton)	MACT HAP Limit (lb/ton)	Percent of HAP Limit (%)
resin	762 polyester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	784 vinyl ester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	162 unsaturated resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							RTM	1%	1%	1%	1%	0	0	0	0				
resin							manual	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	123	0.0%
gelcoat	HK Lite White	0	28%	3%			atomized spray	44.51%	75%		100%	0	0		0	31.0%	276.0	605	45.6%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
monomer	Styrene monomer	0	100%	0%			additive	100%			100%	0	0		0				
promoter							additive	100%			100%	0	0		0				
putty							manual	12.57%			100%	0	0		0				
												0	0.0	0	0 =	0			

MISCELLANEOUS HAP/VOC MATERIALS

Material Type	Material Description	Monthly Material Usage (lb/mo)	MEK Content (lb/lb)	DMP Content (lb/lb)		Other VOC/HAP Content (lb/lb)		MEK Emission Factor (lb/lb)	DMP Emission Factor (lb/lb)		VOC/HAP Emission Factor (lb/lb)	Monthly MEK Emissions (lb/mo)	Monthly DMP Emissions (lb/mo)		Monthly Other VOC Emissions (lb/mo)	
catalyst	Catalyst	0	2%	37%				100%	0.04%		100%	0.00	0.0000		0	
catalyst								100%	0.04%		100%	0			0	
tooling											100%	0			0	
tooling											100%	0			0	
tooling											100%	0			0	
tooling											100%	0			0	
												0			0 =	0

Monthly HAP/VOC/MACT Emissions Log for the Royal Pools Dix Facility

November 2005
revised 2/18/06

Styrene (lb/mo)	MMA (lb/mo)		Total HAP (lb/mo)	Total VOC (lb/mo)
0	0		0	0

Composite MACT Calculations		
Total MACT Material Usage	0	lb/mo
Weighted Average MACT Emission	0.0	lb/ton
Weighted Average MACT Limit	0.0	lb/ton
Percentage of Average MACT Limit	0%	

RESIN & GELCOAT MATERIALS Material Type	Material Description	Monthly Material Usages (lb/mo)	Styrene Content (lb/lb)	MMA Content (lb/lb)	AMS Content (lb/lb)	Other VOC Content (lb/lb)	Material Application Method	Styrene Emission Factor (lb/lb)	MMA Emission Factor (lb/lb)	AMS Emission Factor (lb/lb)	Other VOC Emission Factor (lb/lb)	Monthly Styrene Emissions (lb/mo)	Monthly MMA Emissions (lb/mo)	Monthly AMS Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)	Total HAP Content (lb/lb)	MACT HAP Emissions (lb/ton)	MACT HAP Limit (lb/ton)	Percent of HAP Limit (%)
resin	762 polyester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	784 vinyl ester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	162 unsaturated resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							RTM	1%	1%	1%	1%	0	0	0	0				
resin							manual	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	123	0.0%
gelcoat	HK Lite White	0	28%	3%			atomized spray	44.51%	75%		100%	0	0		0	31.0%	276.0	605	45.6%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
monomer	Styrene monomer	0	100%	0%			additive	100%			100%	0	0		0				
promoter							additive	100%			100%	0	0		0				
putty							manual	12.57%			100%	0	0		0				
												0	0.0	0	0 =	0			

MISCELLANEOUS HAP/VOC MATERIALS Material Type	Material Description	Monthly Material Usages (lb/mo)	MEK Content (lb/lb)	DMP Content (lb/lb)		Other VOC/HAP Content (lb/lb)		MEK Emission Factor (lb/lb)	DMP Emission Factor (lb/lb)		VOC/HAP Emission Factor (lb/lb)	Monthly MEK Emissions (lb/mo)	Monthly DMP Emissions (lb/mo)		Monthly Other VOC Emissions (lb/mo)	
catalyst	Catalyst	0	2%	37%				100%	0.04%		100%	0.00	0.0000		0	
catalyst								100%	0.04%		100%	0			0	
tooling											100%	0			0	
tooling											100%	0			0	
tooling											100%	0			0	
tooling											100%	0			0	
												0			0 =	0

Monthly HAP/VOC/MACT Emissions Log for the Royal Pools Dix Facility

December 2005
revised 2/16/06

Styrene (lb/mo)	MMA (lb/mo)		Total HAP (lb/mo)	Total VOC (lb/mo)
11	2		13	13

Composite MACT Calculations		
Total MACT Material Usage	90	lb/mo
Weighted Average MACT Emissio	276.0	lb/ton
Weighted Average MACT Limit	605.0	lb/ton
Percentage of Average MACT Limi	45%	

Material Type	RESIN & GELCOAT MATERIALS Material Description	Monthly Material Usages (lb/mo)	Styrene Content (lb/lb)	MMA Content (lb/lb)	AMS Content (lb/lb)	Other VOC Content (lb/lb)	Material Application Method	Styrene Emission Factor (lb/lb)	MMA Emission Factor (lb/lb)	AMS Emission Factor (lb/lb)	Other VOC Emission Factor (lb/lb)	Monthly Styrene Emissions (lb/mo)	Monthly MMA Emissions (lb/mo)	Monthly AMS Emissions (lb/mo)	Monthly Other VOC Emissions (lb/mo)	Total HAP Content (lb/lb)	MACT HAP Emissions (lb/ton)	MACT HAP Limit (lb/ton)	Percent of HAP Limit (%)
resin	762 polyester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	764 vinyl ester resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin	152 unsaturated resin	0	47.6%				non-atomized mech	12.23%	75%	0.00%	100%	0	0	0	0	47.6%	116.5	113	103.1%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							non-atomized mech	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	113	0.0%
resin							RTM	1%	1%	1%	1%	0	0	0	0				
resin							manual	0.00%	75%	0.00%	100%	0	0	0	0	0.0%	0.0	123	0.0%
gelcoat	HK Lite White	90	28%	3%			atomized spray	44.51%	75%		100%	11	2		0	31.0%	276.0	605	45.6%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
gelcoat							atomized spray	44.51%	75%		100%	0	0		0	0.0%	0.0	605	0.0%
monomer	Styrene monomer	0	100%	0%			additive	100%			100%	0	0		0				
promoter							additive	100%			100%	0	0		0				
putty							manual	12.57%			100%	0	0		0				
												11	2.0	0	0 =	13			

Material Type	MISCELLANEOUS HAP/VOC MATERIALS Material Description	Monthly Material Usages (lb/mo)	MEK Content (lb/lb)	DMP Content (lb/lb)		Other VOC/HAP Content (lb/lb)		MEK Emission Factor (lb/lb)	DMP Emission Factor (lb/lb)		VOC/HAP Emission Factor (lb/lb)	Monthly MEK Emissions (lb/mo)	Monthly DMP Emissions (lb/mo)		Monthly Other VOC Emissions (lb/mo)	
catalyst	Catalyst	0	2%	37%				100%	0.04%		100%	0.00	0.0000		0	
catalyst								100%	0.04%		100%	0			0	
tooling											100%	0			0	
tooling											100%	0			0	
tooling											100%	0			0	
tooling											100%	0			0	
												0			0 =	0

CFA UEF - Unified Emission Factors for Styrene

September 30, 2001

50% VSE Vapor Suppressant Effectiveness - see note below

APPLICATION METHOD	Styrene Monomer Content (% wt)	Base Emission Factor (% styrene)	Vapor Suppressant Factor (%)		Controlled Spraying Factor (%)		Covered Cure Factor (%)		Add-on Control Factor (%)	% of Add-on Control (%)	CFA UEF Styrene Emission Factors (lb/ton)	(% resin)	(% styrene)
			Factor Adjustments										
			y or n		y or n		a, b, or n						
Manual Resin	1.0%	12.6%	n	100%	n/a		n	100%	0%	0%	2.5	0.13%	12.57%
Mechanical Resin	33.5%	17.67%	n	100%	n	100%	n	100%	0%	0%	118.4	5.919%	17.7%
Non-Atomized Resin	22.0%	10.7%	n	100%	n/a		n	100%	0%	0%	47.1	2.35%	10.70%
Gelcoat Spray	50.0%	64.6%	n/a		n	100%	n/a		0%	0%	646.0	32.30%	64.60%
Non-Atomized Gelcoat	47.0%	34.3%	n/a		n/a		n/a		0%	0%	322.6	16.13%	34.3%
Filament Resin	42.0%	20.4%	n	100%	n/a		n/a		0%	0%	171.1	8.55%	20.4%

NOTES

Type Y for "yes," N for "no," A for "after rollout," or B for "before rollout," where indicated
CFA does not recommend these models for computing factors outside the range from 33% to 50% styrene.

For all processes except non-atomized gelcoat, UEF factors for styrene contents below 33% assume a fixed lower bound UEF factor at 33%, expressed as %styrene. For non-atomized gelcoat, the lower bound UEF factor is computed at 19% styrene content.

VSE is the vapor suppressant effectiveness for each resin and suppressant formulation. This value is determined for each suppressed material (as applied) using the CFA Vapor Suppressant Effectiveness Test method. Note that this is the "effectiveness," i.e., a value of 100% denotes full suppressive effect and a value of 0% denotes no effect. Please check this value carefully, because some of the literature refers to a VSR factor which is equal to 1 - VSE.
See the UEF Technical Discussion report for details on the various techniques and factors listed above.

[yellow box] required input values — [dark blue box] n/a not applicable — [light blue box] calculated values - do not change

Composite MACT Compliance Calculator for Open Molding Operations

for Exclusive Use by the Members of the American Composites Manufacturers Association

Composite MACT Emission Rate Limits - Table 3 to Subpart WWWW

PROCESS	SUBCATEGORY	EXISTING SOURCE EMISSION LIMIT (lb/ton)
Gelcoat Application Atomized, Non-Atomized, Robotic, or Manual	Clear	**522**
	Pigmented - White/Off White	**267**
	All Other Pigmented	**377**
	Corrosion Resistant/High Strength (HS) or High Performance	**605**
	Fire Retardant	**854**
	Tooling	**440**
Manual Resin Vapor-Suppressed or Non-Suppressed	Non-Corrosion/Non-HS	**87**
	Corrosion Resistant and/or HS	**123**
	Low Flame Spread & Low Smoke	**238**
	Shrinkage Controlled	**180**
	Tooling	**157**
Mechanical Resin Atomized or Non-Atomized Vapor-Suppressed or Non-Suppressed	Non-Corrosion/Non-HS	**88**
	Corrosion Resistant and/or HS	**113**
	Low Flame Spread & Low Smoke	**497**
	Shrinkage Controlled	**354**
	Tooling	**254**
Filament Winding Vapor-Suppressed or Non-Suppressed	Non-Corrosion/Non-HS	**188**
	Corrosion Resistant and/or HS	**171**
	Low Flame Spread & Low Smoke	**270**
	Shrinkage Controlled	**215**
Centrifugal Casting	Non-Corrosion/Non-HS	**20**
	Corrosion Resistant and/or HS	**25**

The MACT limit values for existing sources were obtained from Table 3 to Subpart WWWW of Part 63 - FR Vol 68 No 76, April 21, 2003, pp 19419

Composite MACT HAP Emission Limit Calculation for the Royal Pools Dix Plant

last revised Feb 28, 2006

Monthly MACT Calculations		
Total MACT Material Usage	**484,550**	lb/mo
Weighted Average MACT Emissions	**146.6**	lb/ton
Weighted Average MACT Limit	**202.7**	lb/ton
Percentage of Average MACT Limit	**72%**	

Material Type	Application Process	Monthly Material Usages (lb/yr)	Styrene Content (lb/lb)	MMA Content (lb/lb)	Other HAP Content (lb/lb)	Total HAP Content (lb/lb)	MACT HAP Emissions (lb/ton)	MACT HAP Limit (lb/ton)	Percent of HAP Limit (%)
corrosion resin	non-atomized mechanical	396,240	48.0%			48.0%	117.7	113	104.2%
corrosion gelcoat	atomized spray	88,310	28.0%	3%		31.0%	276.0	605	45.6%

Exhibit 3

ENGINEERING ENVIRONMENTAL
CONSULTING SERVICES
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TWO FISK CIRCLE
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February 28, 2005

Mr. Eric Jones
Compliance Unit
Illinois EPA, Bureau of Air
P.O. Box 19276
Springfield, IL 62794-9276

RE: Royal Fiberglass Pools, Dix Plant, Dix, IL
ID: 081020AAB
Violation Notice A-2005-00281

Mr. Jones:

Tony Hebert of Royal Fiberglass Pools asked me to prepare a compliance plan in response to Violation Notice A-2005-00281. This violation notice was issued on January 10, 2006 to the Royal Pools facility located in Dix, Illinois, which is henceforth called the "Dix Plant." This violation notice lists a single violation of 35 IAC 215.301, which limits the discharge of more than 8 pounds per hour of organic material into the atmosphere from any emission source.

The violation notice was received by the Dix Plant on January 17, 2006. The notice directed Royal Pools to submit written response and a compliance plan postmarked within 45 days of receipt of the notice, which is March 2, 2006. The required plan is enclosed with this cover letter. The plan includes a description of the composite pool manufacturing operation at the Dix Plant, calculations of the maximum volatile organic emission (VOM) emission rates from the manufacturing processes, an investigation into additional workpractice improvements, pollution prevention techniques, or gelcoat material substitutions that might further reduce gelcoat emissions, and an analysis of commercially available add-on controls.

Royal Pools has requested a meeting with IL EPA to discuss the plan and regulatory circumstances for large composite part manufacturers in Illinois. The meeting is scheduled for 10:00 am on Wednesday March 8, 2006. Tony Hebert and I will attend this meeting and answer your questions regarding operations at the Dix Plant and the enclosed plan.

Best regards

Robert A. Haberlein

Robert A. Haberlein, Ph.D., QEP

Introduction

This report constitutes the written response and compliance plan required by Violation Notice A-2005-00281. This violation notice lists a single violation of 35 IAC 215.301, which states:

> *"No person shall cause or allow the discharge of more than 3.6 kg/hr (8 lbs/hr) of organic material into the atmosphere from any emission source, except as provided in Sections 215.302, 215.303, 215.304 and the following exception: If no odor nuisance exists the limitation of this Subpart shall apply only to photochemically reactive material."*

Section 302 concerns add-on controls, Section 303 concerns fuel combustion sources, and Section 304 applies to paint and printing sources. None of these sections applies to the pool manufacturing operation at the Dix Plant.

Some other definitions contained in 35 IAC 211 that pertain to the Dix Plant include:

- 35 IAC 211.2610 - **Gel Coat**
  ""Gel coat" means a resin coating, either pigmented or clear, applied to the surface of a mold, that becomes an integral part of a polyester resin product, and that provides a cosmetic enhancement and improves resistance to degradation from exposure to the elements."

- 35 IAC 211.4830 - **Polyester Resin Material(s)**
  ""Polyester resin material(s)" means gel coat and unsaturated polyester resin, such as isophthalic, orthophthalic, halogenated, bisphenol A, vinyl ester, or furan resins; cross-linking agents; catalysts; inhibitors; accelerators; promoters; and any other material containing VOM used in polyester resin operations, including the following polyester resin materials: a) Corrosion resistant and fire retardant polyester resin materials used to make products for corrosive and fire retardant applications; b) High-strength polyester resin materials with a tensile strength of 10,000 psi or more; c) Gel coat."

- 35 IAC 211.4850 - **Polyester Resin Products Manufacturing Process**
  "Polyester resin products manufacturing process" means a manufacturing process that fabricates or reworks products for commercial, military or industrial use by mixing, pouring, hand laying-up, impregnating, injecting, pultruding, forming, winding, spraying, and/or curing by using unsaturated polyester resin materials with fiberglass, filters, or any other reinforcement materials."

- 35 IAC 211.1950 – **Emission Unit**
  ""Emission unit" means any part or activity at a stationary source that emits or has the potential to emit any air pollutant."

- 35 IAC 211.6130 - **Source**
  "Source" means any stationary source (or any group of stationary sources) that are located on one or more contiguous or adjacent properties that are under common control of the same person (or persons under common control) and that belongs to a single major industrial grouping. For the purposes of defining "source," a stationary source or group of stationary sources shall be considered part of a single major industrial grouping if all of the pollutant emitting activities at such source or group of sources located on contiguous or adjacent properties and under common control belong to the same Major Group (i.e., all have the same two-digit code) as described in the Standard Industrial Classification Manual, 1987 (incorporated by reference in 35 Ill. Adm. Code 218.112 and 219.112), or such pollutant emitting activities at a stationary source (or group of sources) located on contiguous or adjacent properties and under common control constitute a support facility as defined in Section 39.5 of the Environmental Protection Act [415 ILCS 5/39.5]. The determination as to whether any group of stationary sources are located on contiguous or adjacent properties, and/or are under common control, and/or whether the pollutant emitting activities at such group of stationary sources constitute a support facility shall be made on a case by case basis [415 ILCS 5/39.5]."

The basis of the violation notice was contained in a memorandum dated November 30, 2005 from Sarah Phelps, FOS field inspector, to Ed Bakowski, FOS Manager. Only the odd pages (pages 1 and 3) of the memorandum were provided to the Dix Plant with the violation notice. After repeated requests by Royal Pools, IL EPA provided the even pages by facsimile on February 24, 2006. This was only seven days before the 45-day deadline for submitting written response to the violation. The memorandum detailed an inspection that was conducted by Phelps at the Dix Plant on November 16, 2006 from 10:00 until 11:30 am.

The inspection report was very detailed and well written. The production processes at the Dix Plant were thoroughly investigated and accurately described by Phelps. However, the report provided some hourly VOM emission calculations based upon data collected at the plant and some assumptions that were not accurate. For example:

- The material usages did not correspond exactly with the requested material usages in the CAAPP permit application.

- The UEF emission factor for non-atomizing mechanical application of gelcoat, which is not achievable for pool finishes and the equipment at Dix, was assumed instead of the gelcoat spray factor for the actual process.

- Methyl methacrylate emissions were not estimated from the gelcoat.

- Acceptable material usage rates from the gelcoat source and resin source at the Dix Plant were computed using the following equation:

$$U = \frac{8}{0.70\ (1 - D)\ F} \times 2{,}000$$

U = acceptable material usage to meet the 8 lb VOM/hour limit (lb/hr)
D = control efficiency (zero at the Dix Plant)
F = emission factor from Table 1 to Subpart WWWW

This "acceptable material use" equation in the report includes a multiplier factor (equal to 1 / 0.70 = 1.43) for the "fraction of total VOM emission that results from the resin or gelcoat overspray." I tried to find the source of this equation in the IAC and the Air Bureau files by searching through the associated IL EPA websites, but I was unable to find any reference to this equation or its source. There is no mention of this equation anywhere in 35 TAC 211 or 215 or elsewhere in the IL EPA website. This equation looks like something that may have been developed for overspray emission from spray paint finishing, but I could not confirm this directly. The concept of overspray does not apply to the emission factor equations developed by industry and federal EPA for open molding processes used to make composite parts. The Unified Emission Factors and corresponding federal EPA Composite MACT factors listed in Table 1 to Subpart WWWW include the total VOM emissions from all phases of the different open moldings, from application through curing, and include the effects of any overspray where it exists. In particular, the non-atomized resin application process used by Royal Pools does not result in any appreciable "overspray." By definition; the non-atomized process does not atomize the resin stream.

Accurate maximum hourly VOM emission rate estimates for the pool production processes used at the Dix Plant are provided in this plan.

Facility Description

The Dix Plant is located at 312 Duncan Road, Dix, Illinois. The facility has one large production building. The composite pool manufacturing operation takes place inside this building in two production bay areas that measure 30' wide × 60' long. Worker exposure to styrene in the production bays is controlled with a 50,000-cfm cross-flow ventilation system that exhausts contaminated air from the work areas to the outside atmosphere through a 36-foot tall vertical discharge stack. Assuming a three-season annual production period and a maximum ten-hour-per-day workshift, the ventilation system operates 3 seasons × 13 weeks/season × 5 days/week × 10 hour/day = 1,950 hours per typical year.

Pool Production Schedule

The typical work schedule at the Dix Plant is 5 days per week and 8 to 10 hours per day (depending on the size of the pool models made each day). The seasonal production of pools consists of:

Winter (13 weeks) – no production activity	13 × 5 × 0 =	0
Spring (13 weeks) – 50% of full production (one pool per day)	13 × 5 × 1 =	65
Summer (13 weeks) – 100% of full production (two pools per day)	13 × 5 × 2 =	130
Fall (13 weeks) – 50% of full production (one pool per day)	13 × 5 × 1 =	65
	Maximum annual pool production -	240

The CAAPP permit application submitted to IL EPA in November 2004 requested a facility-wide annual production cap of 400 pools per year. In retrospect, this request was probably not reflective of the seasonal nature of the swimming pool demand in the northern regional market. A more reasonable production cap for the Dix Plant would be 250 pools per year.

Pool Models

The Dix Plant produces twenty different pool models that each have different sizes and shapes and require different amounts of gelcoat and resin.

- Smallest pool model (called the "Fun Pool") – measures 12' × 16' long × 3' 10" deep. About 20 of these pools are made each year.
- Most popular pool model (called the "Baron") – measures 16' × 34' long × 3' 6" to 5' 6" deep. About 60 of these pools are made each year.
- Largest pool model (called the "King Deep") – measures 17' × 40' 6" long × 3' 6" to 8' deep. About 20 of these pools are made each year.

Composite Pool Manufacturing Procedure

The composite pool manufacturing at the Dix Plant consists of three basic process steps:
(The information on this page is Confidential Business Information)

1. **Gelcoat application** – a thin layer of white gelcoat is applied to each bare waxed pool mold with a Magnum Venus Products (MVP) high-volume low-pressure (HVLP) fluid impingement technology (FIT) applicator gun. The gelcoat applicator has a 2520 gelcoat tip that is operated as an atomizing gelcoat spray applicator. The white gelcoat used at Dix is made by HK Research and contains 28% styrene monomer by weight and 3% methyl methacrylate (MMA) by weight. This gelcoat is the state-of-the-art in low-HAP formulations for swimming pool production.
2. **Barrier coat resin application** – a 100 to 120 mil (0.100 to 0.120") laminate layer of 3 oz glass mat and vinyl ester (VE) corrosion-resistant resin is applied to the cured gelcoat layer with the same MVP applicator that is used to apply gelcoat. However, the gelcoat tip is replaced with a 5020 VE tip and the pump pressure is adjusted to allow for the non-atomized application of the VE resin. The VE resin contains up to 48% styrene content by weight.
3. **Isophthalic (ISO) structural resin application** – a series of consecutive laminate layers consisting of 1½ oz chopped glass strand mat (CSM), woven glass roving (WR), and isophthalic (ISO) corrosion-resistant resin is applied to the cured VE layer with the same MVP applicator that is used to apply the gelcoat and VE resin. However, the VE tip is replaced with a 7025 ISO resin tip and the pump pressure is adjusted to allow for the non-atomized application of the ISO resin. The ISO resin also contains up to 48% styrene content by weight. Each layer of structural laminate is made by first wetting the mold with catalyzed resin, applying dry CSM to the wet surface, and then wetting the dry CSM with resin. Next, dry WR is applied to the CSM and the WR is wetted with resin. After two layers of CSM and WR are applied and wetted, the wet mass of glass fiber and resin is rolled manually with roller tools to remove trapped air bubbles and flatten the confused fibers into a solid layer. This procedure is repeated several times until a thick layer of structural laminate is built up.

The other manufacturing steps include:

- **Part finishing** – includes the trimming, grinding, and sanding of finished pool parts.
- **Gelcoat and resin clean up** – acetone, non-HAP and non-VOC cleaning solvent is used to clean gelcoat and resin residues from the application equipment and roller tools.
- **Mold repair and mold prep** – very small amounts of tooling gelcoat and tooling resin are used to repair the molds. A small quantity of mold cleaner, mold sealer, and mold release (called mold wax), is used to prepare the bare mold for gelcoat application.

These other steps do not involve significant amounts of VOM emissions, and are not discussed further in this plan.

Raw Material Usage Estimates

According to the information contained in the CAAPP permit application submitted to IL EPA in November 2004, the production of 400 pools at the Dix Plant would require the following maximum materials usages:

88,310 lb of gelcoat
396,240 lb of resin
7,680 lb of MEKP catalyst

These maximum usage estimates correspond to the following maximum "per-pool" usage rates:

220 lb of gelcoat per pool
990 lb of resin per pool
19.2 lb of MEKP catalyst per pool (1.58% of the resin and gelcoat usage)

The actual CY 2005 production of 158 pools at Dix consumed the following raw materials:

35,704 lb of gelcoat
161,800 lb of resin
3,136 lb of MEKP catalyst

These actual CY 2005 usages correspond to the following actual "per-pool" usage rates:

226 lb of gelcoat per pool
1,024 lb of resin per pool
19.8 lb of MEKP catalyst per pool (1.59% of the resin and gelcoat usage)

The actual CY 2005 "per-pool" usages agree very closely with the maximum usage estimates contained in the November 2004 CAAPP application. The slight differences between the estimated usages and the actual usages were probably due to small amounts of raw materials that were returned to the suppliers or disposed of as waste during CY 2005.

Potential-to-Emit Calculations

Gelcoat Process VOM Emissions

Assuming that the largest pool would require 220 lb of gelcoat, the maximum total volatile organic material (VOM) emissions from the gelcoating process would consist of:

Styrene –	220 lb gelcoat × 249.3 lb/ton / 2,000 lb/ton [28% styrene wt] =	27.42 lb
MMA –	220 lb gelcoat × 3% MMA content × 75% =	4.95 lb
MEK –	3 lb catalyst × 2% MEK content × 100% =	0.06 lb
	Gelcoat process VOM emissions per pool =	**32.43 lb**

The gelcoat layer for the largest pool is applied in about 45 minutes and most of the curing emissions are released in the next 15 minutes, so the VOM emissions from the gelcoating process occur within one hour.

The greatest hourly gelcoat process emission rate for production at one pool per day is:

32.43 lb/hr / 1 hr = **32.43 lb/hr**

The greatest hourly gelcoat process emission rate at two pools per day is:

2 × 32.43 lb/hr / 1 hr = **64.86 lb/hr**

Obviously, the gelcoat process emission rates exceed the 8 lb/hr VOM emission limit in 35 IAC 215.301.

Resin Process VOM Emissions

The laminating resin is also applied with the same MVP FIT applicator gun that is used for the gelcoat process. However, the resin applicator tip is classified as non-atomized resin application.

Assuming that the largest pool requires 990 lb resin, the maximum total VOM emissions from the laminating resin process (including both the VE and ISO resins) would consist of:

Styrene –	990 lb resin × 117.7 lb/ton / 2,000 lb/ton [48% styrene wt] =	58.26 lb
MEK –	16 lb catalyst × 2% MEK content × 100% =	0.32 lb
	Resin process VOM emissions per pool =	**58.58 lb**

As mentioned earlier, several layers of glass reinforcement and resin are applied to each pool mold and allowed to cure during the eight-hour period that follows the gelcoating process, so the VOM emissions from the lamination process for the largest pool model occur within about eight hours.

The greatest hourly lamination process emission rate at one pool per day is:

58.58 lb/hr / 8 hr = **7.32 lb/hr**

The greatest hourly lamination process emission rate at two pools per day is:

2 × 58.58 lb/hr / 8 hr = **14.64 lb/hr**

The lamination process emission rate for production at one pool per day does not exceed the 8 lb/hr VOM emission limit in 35 IAC 215.301. However, the plant-wide lamination process emission rate at simultaneous production of two pools per day would exceed the 8 lb/hr VOM limit.

Facility-Wide HAP Emissions

As detailed in the preceding sections, the styrene and MMA monomer emissions from the pool production operation include:

Styrene –	220 lb gelcoat × 249.3 lb/ton / 2,000 lb/ton [28% styrene wt] =	27.42 lb
MMA –	220 lb gelcoat × 3% MMA content × 75% =	4.95 lb
Styrene –	990 lb resin × 117.7 lb/ton / 2,000 lb/ton [48% styrene wt] =	58.26 lb
	Total HAP emissions per pool =	**90.63 lb**

The maximum annual HAP emission rate at 250 pools per year is:

250 pools/yr × 90.63 lb HAP/hr / 2,000 lb/ton = **11.32 tpy HAP**

Reducing the maximum annual production rate from 250 to 220 pools per year would drop the maximum annual facility-wide HAP emission rate to:

220 pools/yr × 90.63 lb HAP/hr / 2,000 lb/ton = **9.96 tpy HAP**

A facility-wide production cap of 220 pools per year would reclassify the Dix Plant as a synthetic minor source – the maximum emission rate would be just under the major HAP source emission threshold of 10 tpy.

Production Process Limitations

The following is a list of inherent process limitations that affect the application of gelcoat during the production of composite pools:

- Composite swimming pools are produced with open molding processes on very large male molds.
- Composite pools are too large to use any closed molding process. Even if closed molding was feasible for the smallest pool model, gelcoat must still be applied to the "open" closed mold with a gelcoat applicator.
- A high-quality gelcoat finish is an essential component of a commercially acceptable composite pool part. The pool models are much too large to use a vacuum-formed thermoplastic shell finish, which is the only acceptable alternative finish that is used for small spa pools.
- Gelcoat must be applied to the pool mold in a single uniform layer. Gelcoat cannot be applied in separate strips or sections, because the lapped gelcoat seams would be structurally unsound and unsightly.
- Gelcoat must be applied to the mold with an atomizing mechanical applicator. Non-atomizing gelcoat equipment is available that might reduce the gelcoat emission rate. However, the available non-atomizing equipment will not provide an acceptable surface finish and has failed to reduce gelcoat emissions as promised by the manufacturer.
- The gelcoat process takes about one hour for the largest pool model.
- The largest pool model requires about 220 pounds of gelcoat.
- The white gelcoat used by Royal Pools contains the lowest feasible monomer contents of 28% styrene and 3% MMA. This gelcoat provides a flexible, durable, glossy finish that must resist impact, weathering, temperature extremes, UV radiation, and blistering.
- The emissions from the current gelcoat process cannot be appreciably reduced with any additional workpractice improvements, pollution prevention techniques, or gelcoat material substitutions.
- The application of gelcoat takes place in large work bay areas that require significant amounts of ventilation airflow to protect the workers against styrene exposure. This ventilation is required by OSHA regulations. The relatively large airflow rate and low styrene exposure limits established by OSHA result in a large dilute exhaust stream that cannot be economically controlled with add-on air pollution control equipment. The cost of the lowest-cost control equipment is detailed in the next section.

Add-on Air Pollution Controls

Emission Stream Characteristics

As detailed in the previous PTE calculations, the maximum annual VOM emission rate from the gelcoat and resin processes at a maximum production level of 250 pools during 2,000 hours per year is about 11.32 tpy of styrene and MMA.

The HAP emissions include 10.70 tpy of styrene and 0.62 tpy of MMA.

The average styrene concentration in the exhaust is:

ton/yr	/	min/ft^3	/	yr/hr	/	ppm-m^3/mg	/	mg-ft^3-hr/ton-m^3-min	=	ppm
10.70	/	50,000	/	2,000	/	4.33	/	1.862E-09	=	**13.3**

The average MMA concentration in the exhaust is:

ton/yr	/	min/ft^3	/	yr/hr	/	ppm-m^3/mg	/	mg-ft^3-hr/ton-m^3-min	=	ppm
0.62	/	50,000	/	2,000	/	4.16	/	1.862E-09	=	**0.8**

Composite MACT Standard

A detailed comprehensive add-on air pollution control analysis could easily fill over 200 pages with detailed information and complicated feasibility and cost analyses. Fortunately, the cost and feasibility of add-on air pollution controls at reinforced plastic composite manufacturing facilities has already been thoroughly studied and documented.

Federal EPA recently promulgated a National Emission Standard for Hazardous Air Pollutants (NESHAP) Maximum Achievable Control Technology (MACT) rule for reinforced plastic composite manufacturing facilities. The final standard was published in the Federal Register on April 21, 2003 under 40 CFR 63 Subpart WWWW. This standard is more commonly known as the "Composites MACT."

The Dix Plant is fully compliant with the HAP emission limits listed in the Composites MACT as shown in the following HAP emission limit calculation:

Composite MACT HAP Emission Limit Calculation for the Royal Pools Dix Plant

last revised Feb 28, 2006

Monthly MACT Calculations		
Total MACT Material Usage	**484,550**	lb/mo
Weighted Average MACT Emissions	**146.6**	lb/ton
Weighted Average MACT Limit	**202.7**	lb/ton
Percentage of Average MACT Limit	**72%**	

Material Type	Application Process	Monthly Material Usages (lb/mo)	Styrene Content (lb/lb)	MMA Content (lb/lb)	Other HAP Content (lb/lb)	Total HAP Content (lb/lb)	MACT HAP Emissions (lb/ton)	MACT HAP Limit (lb/ton)	Percent of HAP Limit (%)
corrosion resin	non-atomized mechanical	396,240	48.0%			48.0%	117.7	113	104.2%
corrosion gelcoat	atomized spray	88,310	28.0%	3%		31.0%	276.0	605	45.6%

According to the Composites MACT, a composites facility such as the Dix Plant is not required to install add-on air pollution controls. During the promulgation and development of the Composites MACT, federal EPA discovered that add-on air pollution controls are not cost effective at most existing composite facilities. Federal EPA also determined that add-on controls with 95% control efficiency would only be cost effective for new composite facilities that emit more than 100 tpy of HAP or new facility that produce large parts such as swimming pools and emit more than 250 tpy of HAP. The Dix Plant emits less than 12 tpy of HAP, so add-on controls would not be cost effective according to federal EPA by a very wide margin.

Commercially Available Air Pollution Control Technologies

A comprehensive study entitled "*Feasibility and Cost of the Capture and Control of Hazardous Air Pollutant Emissions from the Open Molding of Reinforced Plastic Composites*" prepared by Engineering Environmental was submitted to federal EPA in April 2000 as part of the promulgation of the Composites MACT rule. This report has 377 pages of information concerning the cost and feasibility of add-on controls at composites facilities. Very little has changed since the 2000 publication date, except that the cost of electricity and natural gas needed to operate add-on controls has risen dramatically. A copy of this study will be provided to IL EPA if requested.

An abbreviated summary discussion of the air pollution control systems that are available for use at the Dix Plant is listed in **Table 1** below:

Table 1 Commercially Available Air Pollution Controls

Technology		Applicability Concerns	Status at the Dix Plant
Absorption		Styrene in nearly insoluble in water	infeasible
Adsorption		Styrene polymerizes on sorbent media Desorbed styrene is not reusable Desorbed styrene must be disposed as hazardous waste.	infeasible
Biodigestion		Microbes are unreliable and must stay warm and moist Digestion beds must be huge to handle exhaust airflow	infeasible
Condensation		Styrene concentration in air too low to be economic Condensate is mostly water with trace styrene Condensate must be disposed as hazardous waste.	infeasible
Flare		Styrene concentration in air is too low to be economic	infeasible
Oxidation	TO	Conventional recuperative oxidation is always more costly than RTO – SEE below	RTO is better
	RTO	Regenerative thermal oxidation is currently employed at one truck cap plant and several large bathware plants that produce small parts on automated production lines, operate continuously (24 hr/day, 360 days/yr) and have uncontrolled styrene emissions >250 tpy. A RTO system large enough to handle the 50,000 cfm exhaust airflow at the Dix Plant would cost over $600,000 to install and over $300,000 per year to operate.	technically feasible economically infeasible
	CO	Catalytic media has a relatively short lifetime and is unreliable	infeasible
Preconcentration w/RTO		Preconcentration is currently employed at four large bathware plants. The long-term performance of the adsorber in questionable due to an unexpected failure of the activated charcoal sorbent media at one of the sites. A preconcentrator system large enough to handle the proposed 50,000 cfm exhaust airflow at the Dix Plant would cost almost one million dollars to install and operate.	technically questionable economically infeasible

Add-on Air Pollution Control Cost Analysis

The following terms and concepts are utilized to estimate the cost of add-on controls. These terms and concepts are consistent with the cost analysis methodology recommended in the federal EPA *OAQPS Control Cost Manual*. The cost of add-on controls can be divided into the initial capital cost of the installed system and the ongoing annual cost of operation. These two costs are detailed in the next two sections

Capital Costs

The *OAQPS Control Cost Manual* identifies the following capital costs for add-on controls:

Equipment Cost (EC) - is the commercial sales price of the control unit and any auxiliary equipment purchased along with the control unit. Adwest, the leading USA manufacturer of small skid-mounted RTO units, provided an equipment cost estimate of $414,740 for a 50,000 cfm RTO unit. This quote was obtained last month.

Purchased Equipment Cost (PEC) - is the sum of the equipment cost, instrumentation, sales tax, and freight costs. According to the *OAQPS Control Cost Manual*, the PEC value is approximated by multiplying the equipment cost (EC) by a 1.08 factor for small systems:

$$\textbf{PEC} = 1.08 \times \text{EC}$$

Direct Capital Cost (DC) - is the sum of the purchased equipment cost, the foundation and equipment supports, the handling and unit erection, the electrical runs and connections, the piping runs and connections, insulation of the ductwork, and painting of the equipment. These costs are estimated by applying a constant factor to the PEC value, and will include the site preparation costs that are usually site-specific. The direct costs to install a skid-mounted oxidizer unit are usually much less than the costs to install a large, erected system, because the smaller system is pre-assembled and skid-mounted for quick installation. Therefore, the installed direct costs for the small skid-mounted system are approximated by multiplying the PEC value by a 1.05 factor:

$$\textbf{DC} = 1.05 \times \text{PEC}$$

Indirect Capital Cost (IC) - is the sum of the engineering fees, construction and field expenses, contractors' fees, start-up costs, performance tests, and other project contingencies. These costs are also estimated by applying factors to the PEC value. The indirect cost to install a packaged unit is approximated by multiplying the PEC value by a 0.10 factor.

$$\textbf{IC} = 1.10 \times \text{PEC}$$

Total Capital Investment (TCI) is sum of the direct capital costs and the indirect capital costs of the control equipment:

$$\textbf{TCI} = \text{DC} + \text{IC}$$

Annual Operating Costs

The *OAQPS Control Cost Manual* also identifies the following annual operating costs for add-on control systems:

Annualized capital cost - is the total capital cost amortized over the expected economic life of the equipment, and is computed by multiplying the total capital investment cost by the capital recovery factor (CRF):

$$\textbf{Annualized TCI} = \text{CRF} \times \text{TCI}$$

Capital Recovery Factor (CRF) is given by:

$$\textbf{CRF} = \frac{i \times (1+i)^n}{(1+i)^n - 1}$$

The value **i** is the "real cost of money," and the value **n** is the economic life of the capital equipment. The real cost of money is often difficult to determine in practice, and may depend more on factors unique to each company. Oftentimes, the prime interest rate is used to evaluate i, but this can be misleading in many cases. Royal Pools will assume 10% for the cost of investments in add-on control equipment. The useful economic life of most add-on control equipment, including a skid-mounted RTO is probably 10 years. The CRF value for 10% and 10 years is equal to 0.1627.

Direct Operating Costs (DOC) - include:

Maintenance supplies (minimal)
Direct Labor related to the control equipment, consisting of:
- Operating Labor
- Supervisory Labor (including regulatory reporting requirements)
- Maintenance Labor

The OAQPS guidelines recommend a value of about $24,000 per year for the other direct operating costs, unless more specific information is available.

Electricity (E) is the cost to operate the control equipment fans. A simple energy balance equation can be used to estimate this cost:

$$E = \frac{0.000117 \times Q \times dP_{FAN} \times \text{hour/year} \times \text{\$/kWh}}{\text{efficiency}_{FAN}}$$

Q	= exhaust flow rate (scfm)
dP_{FAN}	= total pressure drop across the fan (in w.g.)
hour/year	= hours of equipment operation
$/kWh	= cost of electricity including the demand charge
efficiency_{FAN}	= overall energy efficiency of motor, drive, and fan unit (%)

Electrical power is assumed to cost a record \$0.10 per kilowatt-hour, including demand charges and taxes. Thus, the annual cost of electricity for the RTO system at the Dix Plant would be:

$$\frac{0.000117 \times 50{,}000 \times 16 \times 2{,}000 \times \$0.10}{0.60} = \mathbf{\$31{,}200\ /yr}$$

Supplemental Fuel (F) is the annual supplemental fuel cost to operate the thermal oxidizer and is given by the general relationship:

$$F = \text{Fuel Cost (\$/unit)} \times U_{fuel}\ \text{(unit/hr)} \times \text{hour/year}$$

The value U_{fuel} equals the auxiliary heat required by a thermal oxidizer (H_{fuel}) divided by the combustion heat energy of the supplemental fuel (h_f):

$$U_{fuel} = H_{fuel} / h_f$$

The auxiliary heat required by a thermal oxidizer (H_{fuel}) in units of Btu/hr is given by:

$$H_{fuel} = 66 \times h_f \times \frac{Q \times (1 + 0.002 \times M) \times [C_{pAIR} \times (T_C - T_r) - C_{pAIR} \times (T_{he} - T_r) - h_e]}{[h_f - 1.4 \times C_{pAIR} \times (T_C - T_r)]}$$

T_{he} = $(HR/100) \times T_C + [1 - (HR/100)] \times T_{EXHAUST}$
Q = exhaust flow rate (scfm)
M = exhaust moisture (% of air mass), normally assumed to be about 1%
C_{pAIR} = heat capacity of the air (see below)
h_c = combustion heat energy of the contaminated exhaust (see below)

The molar heat capacity of air, C_{pmAIR}, will vary across the range of temperatures present in the oxidizer, so the average value is normally used. The average value is given as the integral of C_{pm}, the molar heat capacity at a specific air temperature, divided by the temperature range difference, where C_{pm}, the molar heat capacity at air temperature T in degrees Kelvin (°K), was approximated by the correlation [OAQPS Control Cost Manual]:

$$C_{pm} = 6.713 + 0.04697\times10^{-2}\,T + 0.1147\times10^{-5}\,T^2 - 0.4696\times10^{-9}\,T^3$$

The units of C_{pmAIR} and C_{pm}, can be either expressed as calories/g- mole °K or Btu/lb-mole °R. The heat capacity for a standard cubic foot is determined by dividing the molar value by the volume of one lb-mole of air at standard conditions.
The annual supplemental fuel cost for natural gas is given by:

$$F_{GAS}\ (\$) = \text{Fuel Cost } (\$/ft^3) \times U_{fuel}\ (ft^3/hr) \times \text{hour/year}$$

Natural gas is assumed to have a heat value, $h_{f\,GAS}$, of 1,000 Btu/ft^{3}l and a record high fuel cost of \$0.012 per ft^3 delivered to the site.

In order to calculate the fuel requirements for an oxidizer, the fuel value of the organic compounds contained in the exhaust must be calculated, because the heat energy contained in the exhaust reduces the demand for supplemental fuel. The heat of combustion for pure styrene is 4,381 kJ/gmole [Boundy & Boyer; Styrene, Its Polymers, Copolymers & Derivatives; Reinhold Publishing, New York, NY; 1952]. One kiloJoule of heat energy is equivalent to 0.9475 Btu. One gmole of an ideal gas occupies 22.4 liters at the standard temperature and pressure conditions of one atmosphere and 0°C, approximately 24.04 liters at 68°F (20°C) and 24.45 liters at 77°F (25°C). Hence, pure styrene vapor at a temperature of 77°F has a heat of combustion of:

$$4{,}381\ \frac{kJ}{gmole} \times 0.9475\ \frac{Btu}{kJ} \times \frac{1}{24.45}\ \frac{gmole}{L} \times 28.3\ \frac{L}{ft^3} = \mathbf{4{,}805\ Btu / ft^3}$$

Based upon the above assumptions, the annual cost of natural gas to fuel the RTO system at the Dix Plant would be:

FUEL

R	Qexh	M	Tref	Tc	The	Cpair (Tc-Tr)	Cpair (The-Tr)	Cvoc	Hvoc	Hfuel	Hreq	Natural Gas	Natural Gas	Fuel Cost
(%)	(cfm)	(%)	(F)	(F)	(F)	(Btu/F)	(Btu/F)	(ppm)	(Btu/cf)	(Btu/cf)	(Btu/hr)	(cf/hr)	(cf/yr)	($/yr)
95	50000	1	77	1100	1049	0.0188	0.0186	13	0.0624	1000	3,738,244	3,738	7,476,488	$119,624
95	**50000**	**1**	**77**	**1600**	**1524**	**0.0196**	**0.0196**	**13**	**0.0624**	**1000**	**4,958,819**	**4,959**	**9,917,638**	**$158,682**
95	50000	1	77	1800	1714	0.0194	0.0189	13	0.0624	1000	8,443,213	8,443	16,886,427	$270,183

Startup fuel – is the small Adwest unit only requires about 15 minutes to startup, so startup fuel is included with the operating fuel cost

Replacement Costs (R) – include the cost of high-efficiency air filters on the exhaust outlets from the production areas. The annual cost of these filters is assumed to be about \$5,000/yr.

Indirect Operating Costs (IOC) – include overhead, property taxes, insurance, and administrative charges. The OAQPS guidelines recommend the following relationship for estimating the indirect operating costs:

$$\mathbf{IOC} = 0.6\ DOC + 0.04\ TCI$$

Recovery Value (RV) - includes the value of recovered compounds such as styrene monomer. At present, recovered styrene and MMA monomers do have any commercial value. The RTO unit destroys the styrene and MMA at the site, so no materials are recovered.

Total Annual Cost (TAC) - is the sum of the annualized capital cost, the annual utility costs (electricity and supplemental fuel), the annual replacement costs, the other direct operating costs, and the indirect operating costs, minus the recovery value of useful recovered products:

$$TAC = CRF \times TCI + E + F + R + DOC + IOC - RV$$

Control Cost Effectiveness

Control Cost Effectiveness is the total annual cost divided by the amount of annual emissions reduction achieved by the capture & control system:

$$\underset{(\$/ton)}{\text{Cost Effectiveness}} = \frac{\text{TAC of control system}}{\text{Annual emission reduction}}$$

The cost effectiveness of a control system is normally based upon the plant's potential-to-emit (PTE), which is the maximum permitted emission rate that corresponds to the maximum plant production level.

A detailed add-on control cost estimate for a skid-mounted RTO system for the Dix Plant is listed in **Table 2** on the next page. For the 50,000 cfm exhaust stream, the regenerative thermal oxidation option using a small skid-mounted RTO unit from Adwest is the only practical oxidation option. As detailed in the table, the skid-mounted RTO control option would have the following characteristics and costs:

- The installed capital cost would be **$636,400**.
- The operating cost would be **$362,300 per year**.
- The amount of reduced annual styrene/MMA emissions would be about **10.87 tpy** (at 96% control).
- The cost effectiveness would be about **$33,300 per ton** reduced per year.

At $33,300 per ton of styrene and MMA removed per year, the cost effectiveness of the RTO control option is more than three times greater than what is widely regarded as affordable. Hence, add-on controls are too expensive and not economically feasible for the Dix Plant.

Table 2 - Control Cost for Skid-Mounted RTO System

SITE-SPECIFIC COSTS			
Ductwork		CC	$20,000
CONTROL SYSTEM			
Control Equipment Cost (EC)		EC	
Skid-mounted RTO	50,000 cfm		$414,740
Auxiliary Control Equipment - CEM		Aux	$0
		A = EC + Aux	$414,740
Instrumentation, Sales Tax, Freight		(by Adwest)	$51,200
Purchased Equipment Cost (PEC)		PEC	$465,940
Direct Installation Costs		(by Adwest)	$53,865
Site Preparation - utilities & concrete pad		SP	$50,000
Buildings		Bldg	$0
Total Direct Capital Cost (DC)		DC = 1.05 PEC+SP+Bldg	$569,805
Total Indirect Capital Cost (IC)		IC = 0.10 PEC	$46,594
Total Capital Investment (TCI)		TCI = DC + IC + CC	**$636,399**
ANNUAL COSTS			
Return on Investment (%)	10%		
Economic Life (yr)	10		
Capital Recovery Factor (CRF)	0.1627		
Amortized Capital Cost		CRF x TCI	$103,571
Electricity @ $0.10/kWhr		E	$31,200
Supplemental Fuel - natural gas @ $0.012/CF		F	$158,700
Replacement Costs		R	$5,000
Filters	$5,000		
Catalyst Media	$0 N/A		
Other Direct Operating Costs		DOC	$24,000
Indirect Operating Costs (overhead, taxes, insurance, admin)		0.6 DOC + 0.04 TCI	$39,856
Total Annual Cost (TAC)		TAC = (CFR+0.04)TCI +E+F+R+1. =	**$362,327**
EMISSIONS REDUCTION			
Total Facility PTE		PTE	11.32
Fraction of Total PTE to be controlled		%pte	100%
Capture Efficiency C%	100%		
Oxidizer Efficiency O%	96%		
Overall Capture & Control Efficiency		C&C% = % pte x C% x O%	96%
Annual Emissions Reduction (tpy)		tpy = PTE x C&C%	**10.87**
CONTROL COST EFFECTIVENESS		TAC / tpy	**$33,341**

Conclusions and Recommendations

Royal Pools must emit more than 8 pounds of VOM per hour in order to manufacture large composite swimming pools for the following eight reasons:

1. A high-quality gelcoat finish is an essential component of a commercially acceptable composite pool part. The pool models are much too large to use a vacuum-formed thermoplastic shell finish, which is the only acceptable alternative finish that is used for small spa pools.

2. Gelcoat must be applied to the pool mold in one uniform layer. Gelcoat cannot be applied in separate strips or sections, because the lapped gelcoat seams would be structurally unsound and unsightly.

3. Gelcoat must be applied to the mold with an atomizing mechanical applicator. Non-atomizing gelcoat equipment is available that might reduce the gelcoat emission rate. However, the available non-atomizing equipment does not provide an acceptable surface finish and has failed to reduce emissions as promised by the manufacturer.

4. The gelcoat process takes about one hour for the largest pool model.

5. The largest pool model requires about 220 pounds of gelcoat.

6. The white gelcoat used by Royal Pools contains the lowest feasible monomer contents of 28% styrene and 3% MMA. This gelcoat provides a flexible, durable, glossy finish that must resist impact, weathering, temperature extremes, UV radiation, and blistering.

7. The VOM emission rate associated with the aforementioned gelcoat process is 32.43 lb per hour. As explained in this plan, the emissions from the current gelcoat process cannot be appreciably reduced with any additional workpractice improvements, pollution prevention techniques, or gelcoat material substitutions.

8. The lowest-cost add-on air pollution control system is not cost-effective by a wide margin. The most affordable control system is a small skid-mounted RTO system that would cost $636,400 to purchase and install and $362,300 per year to operate. The operating cost would be more than three times greater than the pretax income for the facility in CY 2005. The annual styrene/MMA emissions would only be reduced by 10.87 tpy (at 96% control) at a cost effectiveness of about $33,300 per ton. Therefore, the additional cost to operate add-on air pollution controls to meet the 8 lb/hr limit would be cost prohibitive and would cause the Dix Plant to operate at a perpetual financial loss.

Shutdown the Pool Production Operation at the Dix Plant

The 8 lb VOM/hr limit places Royals Pools in an impossible regulatory circumstance. The Dix Plant cannot apply gelcoat a single composite pool part without exceeding the 8 lb VOM/hr limit. Moreover, Dix Plant cannot laminate two composite pool parts simultaneously without exceeding the 8 lb VOM/hr limit. The only possible compliance plan that could meet the 8 lb VOM/hr limit would be to shut down the pool production operation at the Dix Plant and move that operation to an adjoining state.

Recognition of Prohibitive Cost of Add-on Controls

Several nearby state EPA agencies also have 8 lb/hr VOC or VOM limits established in their state rules. However, these other state agencies also offer procedural exemptions to facilities that are able to demonstrate the least-expensive add-on controls needed to meet the 8 lb/hr limit are not cost effective and would be cost prohibitive.

Royal Pools respectfully asks IL EPA if a similar procedure or policy is in place within the IL EPA that would offer a similar exemption to the 8 lb VOM/hr limit in 35 IAC 215, assuming that add-on air pollution control cost are demonstrated to be cost prohibitive.

Impact on the Composites Industry in Illinois

The impact of the 8 lb VOM/hr limit in 35 IAC 215 has a broad impact upon the future of the composites industry in Illinois. Surely when 35 IAC 215 was promulgated, the IL EPA did not realize that the 8 lb VOM/hr limit would constitute a virtual construction ban on all new large part composite operations in Illinois or that existing small businesses that make large composite parts in Illinois would be forced out of business. Many small part operations may also be affected. Uniform enforcement of 35 IAC 215 would prohibit the production of composite swimming pools, boats, storage tanks, chemical process vessels, and field-manufactured chimney liners at power plants. The latter example is particularly troubling, because composite chimney liners, which are too large to be made out of state and trucked to the site, are an essential part of any future air pollution scrubber project at Illinois power plants.

Royal Pools respectfully requests that IL EPA consider the impact of the 8 lb VOM/hr limit contained in 35 IAC 215 upon the entire composite industry in Illinois before requiring the Dix Plant to shutdown pool manufacturing operations and move these operations to an adjoining state.

In the event that Dix Plant is forced to close, Royal Pools would expect the IL EPA to enforce the 8 lb VOM/hr limit fairly and uniformly for all other composite companies in Illinois. There are probably a significant number of small composites companies in Illinois that cannot meet the 8 lb VOM/hr limit. IL EPA may not be aware of these small companies, because the annual emissions from these businesses are too low for the CAAPP permitting program. Royal Pools only expects a level playing field. If IL EPA shuts down the Dix Plant, then IL EPA should be willing to shutdown all similar composites facilities in Illinois and strictly enforce a virtual construction ban on all new similar composite sources in Illinois.

If IL EPA decides to review and consider the impact of 35 IAC 215 on the composites industry in Illinois before deciding the fate of the Dix Plant, then Royal Pools respectfully requests that IL EPA stay the pending enforcement action against the Dix Plant until their review is completed.

If IL EPA eventually concludes that 35 IAC 215 will be enforced in its present form without modification for all composite sources in Illinois, then Royal Pools will immediately shutdown the pool manufacturing operation at the Dix Plant and move this operation to an adjoining state.

Exhibit 4

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June 23, 2006
Page 1 of 2

Mr. Eric Jones
Compliance Unit
Illinois EPA, Bureau of Air
P.O. Box 19276
Springfield, IL 62794-9276

RE: Royal Fiberglass Pools, Dix Plant, Dix, IL
ID: 081020AAB
Violation Notice A-2005-00281

Mr. Jones:

This letter concerns a proposed compliance plan to resolve Violation Notice A-2005-00281, which was issued on January 10, 2006 to the Royal Fiberglass Pools facility located in Dix, Illinois, henceforth called the "Dix Plant." This violation notice listed a single violation of 35 IAC 215.301, which limits the discharge of more than 8 pounds per hour of organic material into the atmosphere from any emission source.

The violation notice was received by the Dix Plant on January 17, 2006. Royal Fiberglass Pools submitted a written response and preliminary compliance plan on February 28, 2006. This preliminary plan included a comprehensive description of the composite pool manufacturing operations at the Dix Plant, calculations of the maximum volatile organic emission (VOM) emission rates from the manufacturing processes, an investigation into additional workpractice improvements, pollution prevention techniques, and/or gelcoat material substitutions that might further reduce gelcoat emissions, and a feasibility analysis of commercially available add-on controls.

Royal Fiberglass Pools also requested a meeting with IL EPA to discuss the plan and regulatory circumstances for large composite part manufacturing sources such as the Dix Plant. After two unsuccessful attempts, representatives from Royal Fiberglass Pools and Illinois EPA finally met on April 19, 2006 at the EPA headquarters in Springfield, Illinois. At this meeting, Dr. Rob Haberlein, consultant for Royal Fiberglass Pools, described the materials and processes used to make composite pools parts at the Dix Plant. He explained that the production of just one large composite pool part requires the continuous application of gelcoat in sufficient quantity to exceed the 8-pound-per-hour VOC emission limit contained in 35 IAC 215.301 by a wide margin. The Dix Plant is already using the state-of-the-art in application equipment and gelcoat material, which are fully compliant with the Composite MACT standard requirements listed under 40 CFR 63 Subpart WWWW. Further, the cost to install and operate an add-on control system to control the emissions from the Dix Plant would be several times greater than the annual profit margin for the plant, and the cost effectiveness of the least expensive add-on control system would still exceed $33,000 per ton. EPA agreed that add-on controls at the Dix Plant were not a feasible compliance option.

Four other potential compliance options were then discussed during the April 19 meeting:

> **Option A** - modify the "8 lb VOM/hr" compliance calculation methodology by changing the emissions averaging period from one hour to eight hours. EPA indicated that this option would not be acceptable.
>
> **Option B** - reclassify the gelcoating operation as a compliant coating operation under 35 IAC 215 Subpart F instead of 35 IAC 215 Subpart K. However, gelcoat application is not listed in Subpart F, and Royals Pools can find no factual basis for such reclassification, so this compliance option does not appear to be justified.
>
> **Option C** - reduce the production of pools to 220 pools per year, which would lower the annual PTE to below 10 tpy VOM, and allow the Dix Plant to withdraw from the CAAPP permitting program EPA explained that the annual emission rate and the facility CAAPP status has no bearing on compliance with 35 IAC 215 Subpart K.
>
> **Option D** - request a variance, adjusted standard, or site-specific rule to make 35 IAC 215 Subpart K feasible for gelcoating large composite pool parts at the Dix Plant. Both Royal Fiberglass Pools and IL EPA agreed that an adjusted standard was the only practical compliance option that would allow the Dix Plant to continue composite pool manufacturing in Illinois.

Royal Fiberglass Pools therefore proposes to petition the Illinois Air Pollution Control Board (IAPCB) to adjust the 35 IAC 215.301 standard to allow for the discharge of more than 8 pounds per hour of VOM emissions from the gelcoating operation at the Dix Plant.

As further directed by you, I will send you a second letter that contains a more detailed description of the proposed adjusted 35 IAC 215.301 standard language. The proposed language will be almost identical to the language contained in the adjusted 35 IAC 215.301 standard already proposed by Crownline Boats and subsequently approved by the IAPCB on July 22, 2004. You will receive my second letter by July 5, 2006.

In the interim, I will retain an Illinois attorney to represent Royal Fiberglass Pools before the IAPCB. I will attempt to secure the same law firm (Dale A. Guariglia & Bryan Cave, LLP) that represented Crownline Boats in their successful petition before the Board. After I have retained local Illinois counsel, I will ask that attorney to contact you regarding a formal joint petition submittal to the IAPCB.

Sincerely

Tony Hebert
Royal Fiberglass Pools

Exhibit 5

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June 30, 2006

Mr. Eric Jones
Compliance Unit
Illinois EPA, Bureau of Air
P.O. Box 19276
Springfield, IL 62794-9276

RE: Royal Fiberglass Pools, Dix Plant, Dix, IL
ID: 081020AAB
Violation Notice A-2005-00281

Mr. Jones:

This is the second of two letters concerning the proposed compliance plan to resolve Violation Notice A-2005-00281, which was issued on January 10, 2006 to the Royal Fiberglass Pools facility located in Dix, Illinois, henceforth called the "Dix Plant." The first letter, which was dated June 23, 2006, contained a general discussion of the background and reasons for requesting an adjusted 35 IAC 215.301 standard for the Dix Plant. As you requested, this second letter contains a more detailed description of the proposed adjusted 35 IAC 215.301 standard language.

Since the date of the first letter, I have retained local legal counsel to represent Royal Fiberglass Pools before the Illinois Air Pollution Control Board (IAPCB). Our counsel is Mr. Dale A. Guariglia, Esq, with Bryan Cave, LLP. Mr. Guariglia is the attorney who represented Crownline Boats before the Board in 2004. As you already know, Crownline Boats proposed an adjusted 35 IAC 215.301 standard for composite boat manufacturing that was subsequently approved by the Board on July 22, 2004. Mr. Guariglia will petition the Board for an adjusted 35 IAC 215.301 standard at the Dix Plant. We expect that the proposed petition language will be almost identical to the language contained in the adjusted 35 IAC 215.301 standard approved by the Board for Crownline Boats.

As you further directed, I have prepared the following detailed discussion of the adjusted standard that will be proposed for the Dix Plant. Much of this detailed discussion was modeled after the final Board Order for the adjusted standard for Crownline Boats.

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FACTUAL BACKGROUND

Facility

The Dix Plant is located at 312 Duncan Road, Dix, Illinois. The facility has one large production building. The composite pool manufacturing operation takes place inside this building in two production bay areas that measure 30' wide × 60' long. Worker exposure to styrene in the production bays is controlled with a 50,000-cfm cross-flow ventilation system that exhausts contaminated air from the work areas to the outside atmosphere through a 36-foot tall vertical discharge stack. Assuming a three-season annual production period and a maximum ten-hour-per-day workshift, the ventilation system operates 3 seasons × 13 weeks/season × 5 days/week × 10 hour/day = 1,950 hours per typical year.

Production Schedule

The typical work schedule at the Dix Plant is five days per week and 8 to 10 hours per day (depending on the size of the pool models made each day). The typical seasonal production of pools consists of:

Winter (13 weeks) – no production activity	13 × 5 × 0 =	0
Spring (13 weeks) – 50% of full production (one pool per day)	13 × 5 × 1 =	65
Summer (13 weeks) – 100% of full production (two pools per day)	13 × 5 × 2 =	130
Fall (13 weeks) – 50% of full production (one pool per day)	13 × 5 × 1 =	65
	Typical annual pool production -	240

The CAAPP permit application submitted to Illinois EPA in November 2004 requested a maximum facility-wide annual production cap of 400 pools per year, which corresponds to full production in Spring, Summer and Fall.

Pool Models

The Dix Plant produces twenty different pool models that each have different sizes and shapes and require different amounts of gelcoat and resin.

- Smallest pool model (called the "Fun Pool") – measures 12' × 16' long × 3' 10" deep.
- Most popular model (called the "Baron") – measures 16' × 34' long × 3' 6" to 5' 6" deep.
- Largest pool (called the "King Deep") – measures 17' × 40' 6" long × 3' 6" to 8' deep.

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Composite Pool Manufacturing Procedure

The composite pool manufacturing at the Dix Plant consists of three basic process steps:

1. **Gelcoat application** – a thin layer of white gelcoat is applied to each bare waxed pool mold with a Magnum Venus Products (MVP) high-volume low-pressure (HVLP) fluid impingement technology (FIT) applicator gun. The gelcoat applicator has a 2520 gelcoat tip that is operated as an atomizing gelcoat spray applicator. The white gelcoat used at Dix is made by HK Research and contains 28% styrene monomer by weight and 3% methyl methacrylate (MMA) by weight. This gelcoat is the state-of-the-art in low-HAP formulations for swimming pool production.
2. **Barrier coat resin application** – a 100 to 120 mil (0.100 to 0.120") laminate layer of 3 oz glass mat and vinyl ester (VE) corrosion-resistant resin is applied to the cured gelcoat layer with the same MVP applicator that is used to apply gelcoat. However, the gelcoat tip is replaced with a 5020 VE tip and the pump pressure is adjusted to allow for the non-atomized application of the VE resin. The VE resin contains up to 48% styrene content by weight.
3. **Isophthalic (ISO) structural resin application** – a series of consecutive laminate layers consisting of 1½ oz chopped glass strand mat (CSM), woven glass roving (WR), and isophthalic (ISO) corrosion-resistant resin is applied to the cured VE layer with the same MVP applicator that is used to apply the gelcoat and VE resin. However, the VE tip is replaced with a 7025 ISO resin tip and the pump pressure is adjusted to allow for the non-atomized application of the ISO resin. The ISO resin also contains up to 48% styrene content by weight. Each layer of structural laminate is made by first wetting the mold with catalyzed resin, applying dry CSM to the wet surface, and then wetting the dry CSM with resin. Next, dry WR is applied to the CSM and the WR is wetted with resin. After two layers of CSM and WR are applied and wetted, the wet mass of glass fiber and resin is rolled manually with roller tools to remove trapped air bubbles and flatten the confused fibers into a solid layer. This procedure is repeated several times until a thick layer of structural laminate is built up.

The other manufacturing steps include:

- **Part finishing** – includes the trimming, grinding, and sanding of finished pool parts.
- **Gelcoat and resin clean up** – acetone, non-HAP and non-VOC cleaning solvent is used to clean gelcoat and resin residues from the application equipment and roller tools.
- **Mold repair and mold prep** – very small amounts of tooling gelcoat and tooling resin are used to repair the molds. A small quantity of mold cleaner, mold sealer,

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and mold release (called mold wax), is used to prepare the bare mold for gelcoat application.

These other steps do not have significant amounts of VOM emissions.

Raw Material Usage Estimates

According to the information contained in the CAAPP permit application submitted to Illinois EPA, the production of 400 pools at the Dix Plant would require the following maximum materials usages:

88,310 lb of gelcoat
396,240 lb of resin
7,680 lb of MEKP catalyst

These maximum usage estimates correspond to the following maximum "per-pool" usage rates:

220 lb of gelcoat per pool
990 lb of resin per pool
19.2 lb of MEKP catalyst per pool (1.58% of the resin and gelcoat usage)

The actual CY 2005 production of 158 pools at the Dix Plant consumed the following raw materials:

35,704 lb of gelcoat
161,800 lb of resin
3,136 lb of MEKP catalyst

These actual CY 2005 usages correspond to the following actual "per-pool" usage rates:

226 lb of gelcoat per pool
1,024 lb of resin per pool
19.8 lb of MEKP catalyst per pool (1.59% of the resin and gelcoat usage)

The actual CY 2005 "per-pool" usages agree very closely with the maximum usage estimates contained in the November 2004 CAAPP application. The slight differences between the estimated usages and the actual usages were probably due to small amounts of raw materials that were returned to the suppliers or disposed of as waste during CY 2005.

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VOM Emissions Estimates

The VOM emissions from the Dix Plant vary depending on the type and size of each swimming pool part. The facility emissions consist predominately of styrene, but also include small amounts of other VOM and volatile organic HAP species such as methyl methacrylate (MMA).

Gelcoat Process VOM Emissions

Assuming that the largest pool would require 220 lb of gelcoat, the maximum total volatile organic material (VOM) emissions from the gelcoating process would consist of:

Styrene –	220 lb gelcoat × 249.3 lb/ton / 2,000 lb/ton [28% styrene wt] =	27.42 lb
MMA –	220 lb gelcoat × 3% MMA content × 75% =	4.95 lb
MEK –	3 lb catalyst × 2% MEK content × 100% =	0.06 lb
	Gelcoat process VOM emissions per pool =	**32.43 lb**

The gelcoat layer for the largest pool is applied in about 45 minutes and most of the curing emissions are released in the next 15 minutes, so the VOM emissions from the gelcoating process occur within one hour.

The greatest hourly gelcoat process emission rate for production at one pool per day is:

32.43 lb/hr / 1 hr = **32.43 lb/hr**

The greatest hourly gelcoat process emission rate at two pools per day is:

2 × 32.43 lb/hr / 1 hr = **64.86 lb/hr**

As shown, the gelcoat process emission rates exceed the 8 lb/hr VOM emission limit in 35 IAC 215.301 by more than a four-fold factor.

Resin Process VOM Emissions

The laminating resin is also applied with the same MVP FIT applicator gun that is used for the gelcoat process. However, the resin applicator tip is classified as non-atomized resin application.

Assuming that the largest pool requires 990 lb resin, the maximum total VOM emissions from the laminating resin process (including both the VE and ISO resins) would be:

Styrene – 990 lb resin × 117.7 lb/ton / 2,000 lb/ton [48% styrene wt] = 58.26 lb

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MEK –	16 lb catalyst × 2% MEK content × 100% =	0.32 lb
	Resin process VOM emissions per pool =	**58.58 lb**

As mentioned earlier, several layers of glass reinforcement and resin are applied to each pool mold and allowed to cure during the eight-hour period that follows the gelcoating process, so the VOM emissions from the lamination process for the largest pool model occur within about eight hours.

The greatest hourly lamination process emission rate at one pool per day is:

58.58 lb/hr / 8 hr = **7.32 lb/hr**

The greatest hourly lamination process emission rate at two pools per day is:

2 × 58.58 lb/hr / 8 hr = **14.64 lb/hr**

The lamination process emission rate for production at one pool per day does not exceed the 8 lb/hr VOM emission limit in 35 IAC 215.301. However, the production of a larger pool model or the use of slightly more resin than normal in the lamination process could easily exceed the 8 lb/hr limit

The plant-wide lamination process emission rate at simultaneous production of two pools per day would clearly exceed the 8 lb/hr VOM limit.

Facility-Wide HAP Emissions

As detailed in the preceding sections, the styrene and MMA monomer emissions from the pool production operation include:

Styrene – 220 lb gelcoat × 249.3 lb/ton / 2,000 lb/ton [28% styrene wt] =	27.42 lb
MMA – 220 lb gelcoat × 3% MMA content × 75% =	4.95 lb
Styrene – 990 lb resin × 117.7 lb/ton / 2,000 lb/ton [48% styrene wt] =	58.26 lb
Total HAP emissions per pool =	**90.63 lb**

The greatest annual HAP emission rate at 250 pools per year is:

250 pools/yr × 90.63 lb HAP/hr / 2,000 lb/ton = **11.32 tpy HAP**

The greatest annual HAP emission rate at the maximum 400 pools per year is:

400 pools/yr × 90.63 lb HAP/hr / 2,000 lb/ton = **18.13 tpy HAP**

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CAAPP PERMIT

Royal Fiberglass pools has already applied for a CAAPP permit for the Dix Plant, but the Illinois EPA has not yet issued either a draft permit or final permit. Presumably, the adjusted standard, if granted by the Board, will be incorporated into the CAAPP permit for the Dix Plant.

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PROPOSED ADJUSTED STANDARD

Royal Fiberglass Pools will propose the following adjusted standard language for adoption by the Board, pursuant to the authority granted to the Board under Section 28.1 of the Environmental Protection Act. This adjusted standard will apply solely to the Dix Plant:

"1. Pursuant to Section 28.1 of the Environmental Protection Act (Act) (415 ILCS 5/28/1), the Board grants Royal Fiberglass Pools (Royal) an adjusted standard from 35 Ill. Adm. Code. 215.201 (8 lb/hr Rule), effective ______, 2006. The adjusted standard applies to the emissions of volatile organic material (VOM) into the atmosphere from Royal's swimming pool manufacturing facility located in Dix, Illinois.

2. 35 Ill. Adm. Code 215.301 does not apply. Royal remains subject to the following:

   a. Royal must continue to investigate swimming pool production methods that generate fewer VOM emissions and materials that have a reduced VOM content. Where practicable, Royal must substitute current materials with lower VOM content materials as long as such substitution does not result in a net increase in VOM emissions.

   b. Royal must perform any reasonable test of new technologically or economically reasonable production methods or materials applicable to the open-mold swimming pool manufacturing industry , which may reduce VOM emissions at Royal's facility which the Illinois Environmental Protection Agency (Agency) specifically requests in writing they do. After performance of such tests, Royal must prepare and submit a report summarizing the activities and results of these investigatory efforts. The report must be submitted to the Agency, Bureau of Air, Compliance and Enforcement Section.

   c. Royal must operate in full compliance with the Clean Air Act, its Clean Air Act Permit Program permit (once issued), the National Emissions Standard for Hazardous Air Pollutants for Reinforced Plastic Composite Manufacturing Facilities, set forth in 40 C.F.R. 63, Subpart WWWW, as required by Section 9.1(a) of the Act, and any other applicable regulation."

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Royal Fiberglass Polls took early steps to comply with the Composite MACT and came into full compliance with Composite MACT emission limits prior to the MACT deadline.

EFFORTS TO ACHIEVE COMPLIANCE AND ALTERNATIVES

Royal Fiberglass Pools investigated three alternatives that would help the Dix Plant comply with the 8 lb/hr Rule:

1. Reducing VOM content in production materials.
2. Using alternative operating procedures and methods.
3. Installing add-on air pollution controls.

Lower VOM Content Materials

The Dix Plant is already using gelcoat and resin materials with the lowest VOM content that will produce acceptable composite pools.

Alternate Operating Procedure and Methods

Royal Fiberglass Pools carefully studied the gelcoating process at the Dix Plant, and considered every recognized alternative procedure or and method that might reduce the hourly VOM emissions rate. However, this study revealed inherent process limitations that precluded the use of any effective alternative:

- Composite swimming pools are produced with open molding processes on very large male molds.
- Composite pools are too large to use any closed molding process. Even if closed molding was feasible for the smallest pool model, the gelcoat layer must still be applied to the "open" closed mold with a gelcoat applicator.
- A high-quality gelcoat finish is an essential component of a commercially acceptable composite pool part. The pool models are much too large to use a vacuum-formed thermoplastic shell finish, which is the only acceptable alternative finish that is used for smaller spa pools.
- Gelcoat must be applied to the pool mold in a single uniform layer. Gelcoat cannot be applied in separate strips or sections, because the lapped gelcoat seams would be structurally unsound and unsightly.
- Gelcoat must be applied to the mold with an atomizing mechanical applicator. Non-atomizing gelcoat equipment is available that might reduce the gelcoat emission rate. However, the available non-atomizing equipment will not provide an acceptable surface finish and has failed to reduce gelcoat emissions as promised by the manufacturer.

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- The gelcoat process takes about one hour for the largest pool model and the largest pool model requires at least 220 pounds of gelcoat.
- The white gelcoat used by Royal Pools is state-of-the–art and contains the lowest feasible monomer contents of 28% styrene and 3% MMA. This gelcoat provides a flexible, durable, glossy finish that must resist impact, weathering, temperature extremes, UV radiation, and blistering.
- The emissions from the current gelcoat process cannot be appreciably reduced with any additional workpractice improvements, pollution prevention techniques, or gelcoat material substitutions.
- The application of gelcoat takes place in large work bay areas that require significant amounts of ventilation airflow to protect the workers against styrene exposure. This ventilation is required by OSHA regulations. The relatively large airflow rate and low styrene exposure limits established by OSHA result in a large dilute exhaust stream that cannot be economically controlled with add-on air pollution control equipment. The cost of the lowest-cost control equipment is detailed in the next section.

Add-on Air Pollution Controls

A comprehensive add-on air pollution control analysis could easily fill over 200 pages with detailed information and complicated feasibility and cost analyses. Fortunately, the cost and feasibility of add-on air pollution controls at reinforced plastic composite manufacturing facilities has already been thoroughly studied and documented as part of the recently promulgated National Emission Standard for Hazardous Air Pollutants (NESHAP) Maximum Achievable Control Technology (MACT) rule for reinforced plastic composite manufacturing facilities. The final standard was published in the Federal Register on April 21, 2003 under 40 CFR 63 Subpart WWWW. This standard is more commonly known as the "Composites MACT."

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The Dix Plant is fully compliant with the HAP emission limits listed in the Composites MACT standard as shown in the following HAP emission limit calculation for typical production operations;

Composite MACT HAP Emission Limit Calculation for the Royal Pools Dix Plant

last revised Feb 28, 2006

Monthly MACT Calculations	
Total MACT Material Usage	484,550 lb/mo
Weighted Average MACT Emissions	146.6 lb/ton
Weighted Average MACT Limit	202.7 lb/ton
Percentage of Average MACT Limit	72%

Material Type	Application Process	Monthly Material Usages (lb/mo)	Styrene Content (lb/lb)	MMA Content (lb/lb)	Other HAP Content (lb/lb)	Total HAP Content (lb/lb)	MACT HAP Emissions (lb/ton)	MACT HAP Limit (lb/ton)	Percent of HAP Limit (%)
corrosion resin	non-atomized mechanical	396,240	48.0%			48.0%	117.7	113	104.2%
corrosion gelcoat	atomized spray	88,310	28.0%	3%		31.0%	276.0	605	45.6%

According to the Composites MACT, a composites facility such as the Dix Plant is not required to install add-on air pollution controls. During the promulgation and development of the Composites MACT, federal EPA discovered that add-on air pollution controls are not cost effective at most existing composite facilities. Federal EPA also determined that add-on controls with 95% control efficiency would only be cost effective for new composite facilities that emit more than 100 tpy of HAP or new facility that produce large parts such as swimming pools and emit more than 250 tpy of HAP. The Dix Plant emits less than 12 tpy of HAP, so add-on controls would not be cost effective according to federal EPA by a very wide margin.
A comprehensive study entitled "*Feasibility and Cost of the Capture and Control of Hazardous Air Pollutant Emissions from the Open Molding of Reinforced Plastic Composites*" prepared by Engineering Environmental was submitted to federal EPA in April 2000 as part of the promulgation of the Composites MACT rule. This report has 377 pages of information concerning the cost and feasibility of add-on controls at composites facilities. Very little has changed since the 2000 publication date, except that the cost of electricity and natural gas needed to operate add-on controls has risen dramatically.

An abbreviated summary of the air pollution control systems, which are detailed in the aforementioned study, and are available for use at the Dix Plant is listed in the following table:

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Commercially Available Air Pollution Controls

Technology		Applicability Concerns	Status at the Dix Plant
Absorption		Styrene in nearly insoluble in water	infeasible
Adsorption		Styrene polymerizes on sorbent media Desorbed styrene is not reusable Desorbed styrene must be disposed as hazardous waste.	infeasible
Biodigestion		Microbes are unreliable and must stay warm and moist Digestion beds must be huge to handle exhaust airflow	infeasible
Condensation		Styrene concentration in air too low to be economic Condensate is mostly water with trace styrene Condensate must be disposed as hazardous waste.	infeasible
Flare		Styrene concentration in air is too low to be economic	infeasible
Oxidation	TO	Conventional recuperative oxidation is always more costly than RTO – SEE below	RTO is better
	RTO	Regenerative thermal oxidation is currently employed at one truck cap plant and several large bathware plants that produce small parts on automated production lines, operate continuously (24 hr/day, 360 days/yr) and have uncontrolled styrene emissions >250 tpy. A RTO system large enough to handle the 50,000 cfm exhaust airflow at the Dix Plant would cost over $600,000 to install and over $300,000 per year to operate.	technically feasible economically infeasible
	CO	Catalytic media has a relatively short lifetime and is unreliable	infeasible
Preconcentration w/RTO		Preconcentration is currently employed at four large bathware plants. The long-term performance of the adsorber in questionable due to an unexpected failure of the activated charcoal sorbent media at one of the sites. A preconcentrator system large enough to handle the proposed 50,000 cfm exhaust airflow at the Dix Plant would cost almost one million dollars to install and operate.	technically questionable economically infeasible

A detailed add-on control cost estimate for a skid-mounted RTO system for the Dix Plant was previously submitted to Illinois EPA on February 28, 2006. As detailed in this analysis, the skid-mounted RTO control option would have the following characteristics and costs:

- The installed capital cost would be **$636,400**.
- The operating cost would be **$362,300 per year**.
- The amount of reduced annual styrene/MMA emissions would be about **10.87 tpy** (at 96% control).

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- The cost effectiveness would be about **$33,300 per ton** reduced per year.

At $33,300 per ton of styrene and MMA removed per year, the cost effectiveness of the RTO control option is more than three times greater than what is widely regarded as affordable. The annual operating cost is several times greater than the annual profit for the Dix Plant. Hence, add-on controls are too expensive and not economically feasible for the Dix Plant.

SUBSTANTIALLY DIFFERENT FACTORS

The primary intent of the 8 lb/hr Rule was to prevent ozone formation and odor nuisance. However, the Board did not contemplate the methods Royal Fiberglass Pools would use to manufacture swimming pools at the Dix Plant when it promulgated the 8 lb/hr Rule in 1971. The manufacture of large composite parts such as swimming pool shells involves a batch-type process rather than a continuous application process typically used in manufacturing processes for other products. This fact together with the ventilation system needed to comply with OSHA's worker protection regulation at 29 C.F.R. 1910 makes the use of add-on emission controls economically infeasible. Under OSHA health and safety standards for styrene, the Dix Plant must maintain large airflow to ventilate the work areas properly. The small emission rate and large airflow makes the cost of using add-on emissions controls unaffordable. Royal Fiberglass Pools believes that the Board did not anticipate the requisite production methods for manufacturing large composite parts and the OSHA standard when adopting the 8 lb/hr Rule in 1971.

IMPACT ON THE ENVIRONMENT

The requested adjusted standard will not adversely impact the environment or human health. Even without the changes implemented at the Dix Plant to meet the Composite MACT standard, the small emission rate from the Dix Plant would not cause or contribute to any ozone exceedances in south-central Illinois. There will be no significant changes in the amounts of solid waste generated, no adverse impacts on water quality, and no change in energy consumption due to the proposed adjusted standard.

CONSISTENCY WITH FEDERAL LAW

There is no Clean Air Act equivalent rule or regulation prohibiting VOM emissions from reinforced plastic composite manufacturing in excess of 8 lbs/hr, on a strictly hourly basis.

1407 Anse Broussard Hwy.
Breaux Bridge, LA 70517
(337) 332-4386 or 1-866-332-4386
Fax (337) 332-6007
www.royalfiberglasspools.com

ROYAL
FIBERGLASS POOLS, INC.

312 Duncan Rd.
Dix, IL 62830
(618) 266-7089

Regardless, the facility must comply with the new federal NESHAP for reinforced plastic composite manufacturing. For these reasons, the proposed adjusted standard is consistent with federal law.

The formal petition that will be presented to the Board will be prepared by our attorney, Mr. Guariglia, in consultation with Illinois EPA.

Sincerely

Tony Hebert
Royal Fiberglass Pools

cc: Rob Haberlein, Engineering Environmental
Dale Guariglia, Bryan Cave LLP

Exhibit 6

ENGINEERING ENVIRONMENTAL
CONSULTING SERVICES
Robert A. Haberlein, Ph.D., QEP
robhab@erols.com

TWO FISK CIRCLE
ANNAPOLIS, MD 21401
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May 27, 2008

Dale Guariglia, Esq.
Bryan Cave LLP
One Metropolitan Square
Suite 3600
211 North Broadway
St. Louis, Missouri 63102-2750

Mr. Guariglia:

As you requested, a worst-case air quality ozone impact analysis of the maximum VOC emissions from the Royal Pools facility in Dix, Illinois is attached hereto.

This analysis employs the Scheffe ozone screening tables, the ambient one-hour average ozone data from the ozone monitoring station nearest to the Dix facility, and the one-hour average ozone standard established by U.S. EPA.

As shown in this analysis, the worst-case one-hour average ozone impact is only 89 ppb, which is only 74% of the one-hour average 120 ppb ozone standard.

This analysis is very conservative, because the actual VOC emissions from the Dix facility will be much less than the smallest annual NMOC emission rate listed in the Scheffe screening tables.

Best regards

Robert A. Haberlein

Robert A. Haberlein, Ph.D., QEP

Air Quality Impact Analysis of the VOC Emissions from the Royal Pools Facility in Dix, Illinois using the Scheffe Screening Tables

The most recent four years of one-hour average ambient ozone data from the nearest ozone monitoring station located in Hamilton County is listed in the following table:

Year	1st	2nd	3rd	4th (highest samples in ppb)
2006	79	79	74	73
2005	87	86	86	**85**
2004	85	81	80	76
2003	102	89	88	**85**

The fourth greatest ozone measurement value is 85 ppb in calendar years 2003 and 2005. Therefore, the one-average ozone baseline concentration for the Dix facility is 85 ppb.

The maximum proposed annual styrene emission rate from the Dix facility that results from the production of 400 pools per year is about 18.3 tpy. Styrene is the only significant VOC emission specie from the plant. The only other significant emission specie is acetone, which is non-photochemically reactive and does not contribute to the formation of ozone. The total VOC emissions from the facility will be less than 25 tpy.

The maximum natural gas usage at the Dix plant should be less than 10 million cubic feet per year. According to the AP-42 NO_X factors for gas-fired heaters, this maximum usage is equivalent to:

10 million cu. ft. × 100 lb/million cu. ft. / 2000 lb/ton = 0.50 tpy of NO_X emissions.

The annual VOC-to-NO_X ratio is 25 / 0.50 = 50.

According to Scheffe Table 1 "*Rural based ozone increment as a function of NMOC emissions and NMOC/NO_X ratios*" in the September 1988 report entitled VOC/NO_X Point Source Screening Tables by Richard D. Scheffe of the U.S. EPA OAQPS office, the worst-case ozone increment for the Dix facility will only be 4 ppb (0.4 pphm × 10 ppb/pphm). This table value appears in the row labeled 50 tpy NMOC under the column labeled >20.7 NMOC/NO_X ratio.

Adding the one-hour average ozone increment for the Dix facility to the one-hour average ozone baseline for the local area yields a worst-case ozone impact concentration of 85 + 4 = 89 ppb.

This worst-case impact is much less than the one-hour average ozone standard of 120 ppb established by U.S. EPA. Although EPA replaced the one-hour average ozone standard with an eight-hour average standard for most areas in the USA on June 15, 2005, the one-hour ozone standard is still the only standard that would apply to the IL EPA 8 pound-per-hour VOC limit, which is also an hourly emission limitation.

Exhibit 7

ILLINOIS POLLUTION CONTROL BOARD
July 22, 2002

IN THE MATTER OF:	)	
	)	
PETITION OF CROWNLINE BOATS, INC.	)	AS 04-01
FOR AN ADJUSTED STANDARD FROM	)	(Adjusted Standard)
35 ILL. ADM. CODE 215.301	)	

DALE A. GUARIGLIA, BRYAN CAVE, LLP, and ANDREW POLCYN, M.E., ADVANCE ENVIRONMENTAL ASSOCIATES, L.L.C., APPPEARED ON BEHALF OF PETITIONER; and

CHARLES E. MATOESIAN APPEARED ON BEHALF OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY.

OPINION AND ORDER OF THE BOARD (by N.J. Melas):

Crownline Boats, Inc. (Crownline) is a fiberglass boat manufacturer located in West Frankfort, Franklin County. In this opinion and order, the Board exempts Crownline from compliance with the volatile organic material (VOM) control requirements at 35 Ill. Adm. Code 215.301. Crownline remains subject, under state and federal laws, to VOM controls set forth in the National Emission Standard for Hazardous Air Pollutants (NESHAP) along with additional conditions contained in this order.

On December 5, 2003, Crownline Boats, Inc. (Crownline) filed a petition for an adjusted standard from 35 Ill. Adm. Code 215.301 of the Board's air pollution regulations, commonly known as the "8 lb/hr Rule," as that Board regulation pertains to the emissions of VOM. Crownline's facility is located at 11884 Country Club Road, West Frankfort, Franklin County. In the petition, Crownline requested a hearing, which was held April 23, 2004. The Illinois Environmental Protection Agency (Agency) filed a recommendation that the Board grant Crownline's petition on January 22, 2004.

Accompanying the petition, Crownline filed a motion for expedited review. Crownline asserts that the Agency recently issued Crownline a Title V Clean Air Act Permit Program (CAAPP) permit and Title I permit, requiring Crownline either to obtain an adjusted standard from 35 Ill. Adm. Code 215.301 or demonstrate compliance with that section by December 31, 2004. On the same day, Dale A. Guariglia filed a motion requesting permission to appear *pro hac vice* on behalf of petitioner in this proceeding in accordance with Section 101.400(a)(3). 35 Ill. Adm. Code 101.400(a)(3). The Board granted both Crownline's motion for expedited review and Mr. Guariglia's motion to appear *pro hac vice*.

Based on the record before it, the Board finds that Crownline has provided sufficient justification for each of the Section 28.1 factors. The Board grants Crownline an adjusted standard from the 8 lb/hr Rule subject to conditions outlined in this order.

ADJUSTED STANDARD PROCEDURE

The Environmental Protection Act (Act) (415 ILCS 5/1 *et seq.* (2002)) and Board rules provide that a petitioner may request, and the Board may grant, an environmental standard that is different from the generally applicable standard that would otherwise apply to the petitioner. This is called an adjusted standard. The general procedures that govern an adjusted standard proceeding are found at Section 28.1 of the Act and Part 104, Subpart D of the Board's procedural rules. 415 ILCS 5/28.1; 35 Ill. Adm. Code 104.400 *et al.*

The Board rules for the content requirements of the petition and Agency recommendation are found at Section 104.406 and Section 104.416, respectively. 35 Ill. Adm. Code 104.406, 104.416.

PROCEDURAL BACKGROUND

On December 5, 2003, Crownline filed this petition (Pet.), accompanied by a motion for expedited review, with the Board for an adjusted standard from the paper coating rule. From December 10, 2003 through December 24, 2003, Crownline published notice of the petition in the *West Frankfort Daily American*, and filed the certificate of publication with the Board on January 5, 2004. The Agency filed its recommendation (Rec.) that the Board grant Crownline's requested relief on January 22, 2004, subject to certain terms and conditions contained in the Agency's recommendation.

On April 23, 2003, Hearing Officer Carol Sudman conducted a hearing in this matter at the offices of the West Frankfort City Administration Office, 110 North Jefferson Street, West Frankfort. Three witnesses testified at hearing: Mr. James T. Claxton, president of Crownline Boats; Mr. Dale Guariglia, attorney for Crownline; and Mr. Andrew Polcyn, consultant for Crownline. Hearing officer Sudman found all three witnesses credible. Mr. David Bloomberg was also present on behalf of the Agency's Bureau of Air. At hearing, Crownline offered eight exhibits (Pet. Exh.). Crownline filed a post-hearing brief on May 14, 2004 (Pet. Br.), and the Agency filed a post-hearing brief on May 17, 2004 (Ag. Br.).

FACTUAL BACKGROUND

The Facility

Crownline owns and operates a fiberglass boat manufacturing facility where it manufactures approximately 30 different models of personal recreation fiberglass boats ranging from 17'6" open bow boat, to a 29' cabin cruiser. Pet. at 4. Since it began operations in 1991, Crownline has manufactured approximately 40,000 boats, currently producing between 15-20 boats each day. The Frankfort facility began operation in 1994 and employs approximately 500-600 individuals. *Id.*

Crownline's boat manufacturing process involves the following production areas: (1) mold fabrication; (2) gelcoat application; (3) lamination; (4) grind & trim; (5) woodworking; (6) upholstery; (7) final assembly; and (8) shipping. This petition focuses mainly on the gelcoat and lamination production areas, since they generate most of Crownline's VOM emissions and are, therefore, most impacted by the 8 lb/hr Rule. In addition, Crownline notes that the use of adhesives, lacquers, and caulks in other production areas also do not meet the 8 lb/hr Rule on a strict hourly bases. Pet. at 4. Crownline's VOM emissions that do not meet the 8 lb/hr Rule consist primarily of styrene. *Id.*

Gelcoat Application

The purpose of the gelcoat application is to provide color and a smooth surface to the fiberglass boats. Pet. at 5. Molds are prepared for the gelcoat application by cleaning with stripping solvent and a wax-releasing agent applied. Pet. at 4. In one of four gelcoat booths, gelcoat is applied to the hull or deck mold in a single application using air atomized spray guns. There are thirty-one atomized spray guns in the gelcoat area. *Id.*

Lamination

After the gelcoat has dried, the molds are moved to one of twenty-four laminating stations. Pet. at 5. During lamination, glass fibers, polyester resin and a resin catalyst are applied to the mold using non-atomized flow-coat chopper guns (flow-coat guns). The layer of fiberglass and resin is then rolled flat using hand rollers to remove any air bubbles that were created in the application. Laminate is applied in layers called "skins" and requires curing periods between each skin application. Pet. At 5. Three resin skins are typically applied to decks and two to three skins for hulls, followed by a separate application to build the boat floor. *Id.*

Pollution Control Equipment In Use

In the gelcoat application and lamination processes, Crownline uses the following: (1) a high-volume ventilation system to keep styrene levels below the worker exposure limit required by OSHA; (2) enclosed spray booths in the gelcoat application process to reduce VOM emissions into the plant air when using spray guns; (3) use of lower styrene-content gelcoat (33.4%) and resin with lower hazardous air pollutant (HAP) content (35% HAP); (4) flow-coat guns in place of air atomized spray guns in the lamination area, (5) panel filters inside the spray booths and lamination areas to control particulate emissions from the spray guns; and (6) submerged-fill resin tanks in the lamination process to reduce splashing and the creation of VOM emissions. Pet. at 5.

VOM Emissions

Crownline states that the VOM emissions from the facility vary depending on the type and size of each custom boat it manufactures. Pet. at 5. Crownline's emissions consist primarily of styrene, but also include other VOMs and volatile organic HAPs such as methyl methacrylate (MMA). Technical Doc. at 6, 7, App. 7.

For purposes of complying with the 8 lb/hr Rule, the Agency directed Crownline to consider each boat part (*e.g.*, hull, deck, etc.) as the "emission source." Pet. Exh. 1 at 4. From the individual emission sources, Crownline estimated hourly VOM emissions. Among the highest were 34.08 lb/hr for gray lacquer, 15.89 lb/hr for carpet adhesive, 21.8 lb/hr for gelcoat, and 19.8 lb/hr for resin. Technical Doc. App. 7, Pet. Exh. 1, Exh. 5 and 6. Crownline notes that some values were overestimated, but several boat models still have parts with emissions greater than 8 lb/hr when VOM emissions are determined on a strictly hourly basis. Pet. Exh. 1 at 5.

According to its 2002 Annual Emissions Report, Crownline estimated VOM emissions totaled 187 tons per year. To quantify and compare potential VOM reductions, Crownline calculated its annual VOM emissions based on 2003 production data under three scenarios: pre-MACT, MACT, and the 8 lb/hr Rule in place. The pre-MACT scenario resulted in 244.82 tpy VOM, while the MACT scenario resulted in 199.79 tpy VOM, and the 8 lb/hr scenario yielded 144.36 tpy VOM. Technical Doc. App. 6, Exh. 3, 4 and 5. In terms of HAP, Crownline's pre-MACT emissions were approximately 204 tpy HAP, while the MACT scenario would result in a 50 tpy reduction in HAP. Pet. Exh. 1 at 7.

CAAPP Permit

In discussions between the Agency and Crownline regarding Crownline's draft CAAPP operating permit, the Agency stated that Crownline could not average emissions to demonstrate compliance with the 8 lb/hr Rule. The Agency stated that the 8 lb/hr Rule specifies a maximum hourly emission rate and, therefore, compliance would need to be demonstrated on a strict hourly basis, not on an average from any longer period of time. Crownline determined that based on the Agency's interpretation, it could not comply with the 8 lb/hr Rule. Pet. at 1.

On November 13, 2003, the Agency issued Crownline a Title V CAAPP permit and Title I permit (No. 055070AAU). The Title V permit states that Crownline is to obtain an adjusted standard from 35 Ill. Adm. Code 215.301 or demonstrate compliance with Section 215.301 by December 31, 2004. Pet. at 2. Crownline's CAAPP permit limits annual emissions to 249 tons of VOM per year. Pet. Exh. 1 at 8.

STANDARD OF REVIEW

The Board agrees with Crownline and the Agency that the regulation of general applicability at 35 Ill. Adm. Code 215.301 does not specify a level of justification for an adjusted standard. Pet. at 11; Rec. at 7. Therefore, pursuant to Section 28.1(c) of the Act, the burden of proof is on the petitioner to demonstrate that:

1. Factors relating to that petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to that petitioner;

2. The existence of those factors justifies an adjusted standard;

3. The requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule of general applicability; and

4. The adjusted standard is consistent with any applicable federal law. 415 ILCS 5/28.1(c) (2002); 35 Ill. Adm. Code 104.426(a).

CURRENT APPLICABLE STANDARDS

One standard applicable to Crownline's boat manufacturing operations is set forth in 35 Ill. Adm. Code 215.301. Section 215.301 provides:

> No person shall cause or allow the discharge of more than 3.6 kg/hr (8 lbs/hr) of organic material into the atmosphere from any emission source, except as provided in Sections 215.302, 215.303, 215.304 and the following exception: If no odor nuisance exists the limitation of this Subpart shall apply only to photochemically reactive material. 35 Ill. Adm. Code 215.301.

For purposes of complying with the 8 lb/hr Rule, the Agency has directed Crownline to consider each boat part (*e.g.*, hull, deck, etc.) an emission source. Pet. Exh. 1 at 4.

Under separate federal regulation effective August 23, 2004, Crownline must also meet newly promulgated NESHAPs for New and Existing Boat Manufacturing Facilities applicable to boat manufacturers that are major sources of HAP. Pet. at 6; citing 40 C.F.R. Part 63 Subpart VVVV, 40 C.F.R. 63.5683. Under Section 9.1(a) of the Act, NESHAP rules are applicable in Illinois and enforceable under the Act without additional rulemaking activity by the Board. 415 ILCS 5/9.1(a) (2002).

The rule requires that boat manufacturers use maximum available control technology (MACT) to meet the "MACT floor," which is the emission limitations achieved by the top performing 12% of boat manufacturers in the nation. Pet. at 6. To comply with a HAP limit calculated for a facility, manufacturers can use one of the following options: emissions averaging using a 12-month rolling average, compliant materials, and/or add-on controls. 40 C.F.R. 63.5701, 63.5710. Other requirements include: using lower HAP content gel-coat and resins; covering resin, gelcoat and solvent containers; and using cleaning solvents and adhesives containing no more than 5% HAP. The MACT standard does not require air pollution equipment. To comply with MACT, Crownline opines that most boat manufacturers with open molding operations will have to use flow-coat guns and low-HAP production materials in their resins, gelcoats, and adhesives. A flow coat gun generates fewer emissions because it operates at a lower pressure and has a non-atomized delivery system. The United States Environmental Protection Agency (USEPA) estimates that by complying with the new MACT standard, boat manufacturers will reduce HAP emissions by an average of 35%. Pet. at 2, 6; citing 66 F.R. 44222.

Crownline states it is currently in compliance with the new MACT standard. Crownline uses flow-coat guns in its lamination operating and resin and gelcoat with lower percentages of HAP content. Pet. at 6. Crownline has not yet made a demonstration of compliance to the USEPA, and will not be required to do so until August 2005. Pet. Exh. 1 at 3.

CROWNLINE'S PROPOSED ADJUSTED STANDARD

In the petition, Crownline proposed the following adjusted standard language for adoption by the Board:

> Pursuant to the authority under Section 28.1 of the Environmental Protection Act, the Board hereby adopts the following adjusted standard: This adjusted standard shall apply solely to Crownline Boats, Inc. ("Crownline"). As an alternative to compliance with 35 IAC § 215.301, this adjusted standard allows Crownline to limit its discharge of organic material into the atmosphere from its boat manufacturing operations by complying with the National Emission Standard for Hazardous Air Pollutants for New and Existing Boat Manufacturing Facilities, set forth at 40 CFR §63 Subpart VVVV, as may be amended in the future.

The Agency recommended that the Board grant Crownline the requested adjusted standard so long as Crownline complied with the following additional conditions:

a. Crownline shall operate in full compliance with the National Emission Standards for Hazardous Air Pollutants for New and Existing Board Manufacturing Facilities, set forth at 40 C.F.R. Section 63 Subpart VVVV, as may be amended in the future.

b. Operation in full compliance with the National Emission Standard for Hazardous Air Pollutants for New and Existing Boat Manufacturing Facilities, set forth at 40 CFR Section §63 Subpart VVVV, as may be amended in the future, shall be in lieu of compliance with the 8 lb/hr Rule found at 35 Ill. Adm. Code 215.301.

c. Crownline shall continue to investigate boat production methods with a reduced VOM content and, where practicable, shall substitute current coatings with lower VOM content coatings as long as such substitution does not result in a new increase in VOM emissions. Crownline shall be required to do any test which the Illinois EPA specifically recommends that they do. An annual report summarizing the activities and results of these investigatory efforts shall be prepared by Crownline and submitted to the Illinois EPA Bureau of Air, Compliance and Enforcement.

d. The relief granted in this proceeding shall be limited to the emission activities at the Crownline West Frankfort facility as of the date of this filing.

e. Crownline shall operate in full compliance with the Clean Air Act, its CAAPP, the Illinois Environmental Protection Act and other applicable regulations not otherwise discussed herein. Rec. at 5-6.

At hearing, Crownline submitted the following revised adjusted standard language, agreed to by the Agency (Tr. at 41, Pet. Br., Exh. B), for adoption:

> As an alternative to compliance with the 8 lb/hr Rule found at 35 Ill. Adm. Code 215.301, this adjusted standard allows Crownline to limit its discharge of organic material into the atmosphere from its boat manufacturing operations by operating in full compliance with the National Emission Standard for Hazardous Air Pollutants for New and Existing Boat Manufacturing Facilities, set forth at 40 C.F.R. §63, Subpart VVVV, as may be amended in the future, and with the following conditions:
>
> a. Crownline shall continue to investigate boat production methods with a reduced VOM content and, where practicable, shall substitute current coatings with lower VOM content coatings as long as such substitution does not result in a net increase in VOM emissions. Crownline shall be required to do any reasonable test of new technologically or economically reasonable production methods or materials applicable to the open-mold fiberglass boat manufacturing industry which may reduce VOM emissions at Crownline's facility which the Illinois EPA Bureau of Air specifically requests in writing that they do. An annual report summarizing the activities and results of these investigatory efforts shall be prepared by Crownline and submitted to the Illinois EPA Bureau of Air, Compliance and Enforcement Section.
>
> b. The relief granted in this proceeding shall be limited to the emission activities at the Crownline West Frankfort facility as of the date of this filing.
>
> c. Nothing in this adjusted standard shall relieve Crownline of its duty to operate in full compliance with the Clean Air Act, its CAAPP, the Illinois Environmental Protection Act and other applicable regulations not otherwise discussed herein.

CROWNLINE'S COMPLIANCE WITH THE MACT STANDARD

Under separate NESHAP requirements applicable to Crownline under Section 9.1(a) of the Act, Crownline states it took steps early to comply with the MACT and came into compliance with MACT emission limits more than a year prior to the deadline. Pet. at 2. However, Crownline has not yet demonstrated compliance, and will not have to until August 2005. Pet. Exh. 1 at 3. Crownline states that it will demonstrate compliance to USEPA with the new MACT standard by using the "model point value averaging option" based on a 12-month rolling average and by using compliant materials. *Id.* Crownline notes that its HAP emission limits will vary from month to month based on an equation set forth in 40 C.F.R. 63.5698. Pet. Exh. 1 at 6.

The USEPA estimates that compliance with the MACT standard by the boat manufacturing industry will result in an annual cost of compliance of $4,060 per ton of HAP reduced and will reduce HAP emissions by an average of 35%. 66 F.R. 44222. Crownline estimates its annual compliance costs at approximately $215,600 per year and that it will reduce annual HAP emissions (not total VOM) by approximately 50 tons, or 25%. Pet. Exh. 1 at 2. Crownline's annual compliance cost is approximately $4,312 per ton of HAP reduced, which is similar to USEPA's estimate of $4,060 per ton HAP reduced. Pet. Exh. 1 at 3, 8. In terms of VOM, Crownline estimated a reduction from 244.82 tpy VOM to 199.79 tpy VOM under the MACT scenario. Technical Doc., App. 6, Exh. 3 and 4.

EFFORTS TO ACHIEVE COMPLIANCE AND ALTERNATIVES

Crownline states it has investigated the following alternatives that would help Crownline comply with the 8lb/hr Rule: (1) reducing VOM content in production materials; (2) using alternative operating procedures and methods; and (3) installing end-of-the-pipe emission control. Crownline states that investigations proved that, other than end-of-the-pipe emission controls, many of the alternatives would not bring Crownline into compliance with the 8 lb/hr Rule on a strict hourly basis. Pet. at 6.

Reducing VOM in Production Materials

Crownline has reduced VOM in its resin and gelcoat production materials to meet the federal MACT standard. However, meeting the MACT standard alone will not bring Crownline into compliance with the State 8 lb/hr Rule. Crownline states that it is not possible to further reduce styrene in the resins and still maintain product integrity. Pet. at 6. Crownline and its consultant, Advanced Environmental Associates (AEA), could not identify any compliance alternatives to reduce VOM emissions from Crownline's use of adhesives, lacquer and caulks.

Using Alternative Operating Procedures and Methods

Crownline states that it investigated both open molding and closed molding alternative production methods. However, Crownline found that even though the alternatives investigated would reduce VOM emissions, they would not bring Crownline into compliance with the 8 lb/hr Rule on a strictly hourly basis. Crownline explained that the open and closed molding alternative production methods investigated are only available to the lamination process and there are no alternative technologies currently available for the gelcoat, lacquering, caulking, and adhesive operations. Pet. at 7. Crownline replaced its atomized spray chopper guns used for resin application with flow-coat guns in its lamination area. Technical Doc. at 4. The flow-coat guns have lower pressure and internal mixing as compared to the atomized guns. Pet. at 5. Crownline states it experimented with using flow-coat guns in the gelcoat process, but they had too much of a negative impact on product quality. Pet. Exh. 1 at 2.

End-of-Pipe Controls

In developing the MACT, the USEPA did not include any emission control technologies as the MACT floor for the following reasons: (1) only one boat manufacturer used tailstack emission control technologies to reduce HAP emissions; (2) the cost of emission control systems was very high because very high air flows needed by facilities to comply with OSHA's styrene regulations; and (3) the boat manufacturing industry can reduce HAP content of resins, gelcoat, and other materials to significantly reduce total HAP emissions without undue financial burden. Pet. at 7.

Crownline's consultant investigated the various end-of-pipe control technologies. As a result of the analysis, Crownline determined that emission controls are cost prohibitive and, therefore, not an economically reasonable option. For example, up-front capital costs to install tail-stack controls range from $7 million to $14 million with annual costs ranging from $4.5 million to nearly $6 million. Crownline estimates that such control would range from approximately $35,000 to $58,000 per ton of VOM removed. Pet. at 8; Technical Doc. at 16, 18.

Crownline explains that the reason end-of-pipe controls are so costly is because of the large volume of air that must be treated in order to reduce the relatively small amount of VOM. As discussed above, Crownline must move a large volume of air through the gelcoat and lamination areas to maintain compliance with OSHA's 8-hour worker exposure limit for styrene. Technical Doc. at 16, 18.

SUBSTANTIALLY DIFFERENT FACTORS

Crownline states that the primary intent of the 8 lb/hr Rule was to prevent ozone formation and odor nuisance. Crownline asserts that the Board did not contemplate the methods Crownline uses to manufacture boats at the Frankfort facility when it promulgated the 8 lb/hr Rule in 1971. Pet. at 11. Crownline states that manufacturing fiberglass boat decks or hulls involves a batch-type process rather than a continuous application process typically used in manufacturing processes for other products. Crownline argues this fact together with the ventilation system it uses to comply with OSHA's worker protection regulation at 29 C.F.R. 1910 makes the use of add-on emission controls economically unreasonable. Under OSHA worker health and safety standards for styrene, Crownline must maintain high air flow to ventilate building air. The high air flow makes the cost of using tail-end stack emissions controls unreasonably high. Crownline states that the Board did not anticipate the current fiberglass boat production methods and the OSHA standard when it adopted the 8 lb/hr Rule in 1971. Pet. at 12-13.

IMPACT ON THE ENVIRONMENT

Crownline contends that its requested adjusted standard will not adversely impact the environment or human health. Pet. at 13. Through AEA, Crownline performed an ambient air quality analysis to estimate Crownline's impact on ozone formation in south-central Illinois. Pet. at 9. AEA used an ozone screening method developed by the USEPA to determine the impacts of ozone formation. *Id.* Crownline contends that even without the changes it implemented to meet the MACT standard, the Crownline facility would not cause or contribute to any ozone exceedences in south-central Illinois. Based on its Ozone Impact Analysis, Crownline could more than triple its current annual VOM emissions without causing an exceedance of the 1-hour ozone NAAQS. Pet. Exh. 1 at 8, Pet. Exh. 2. Currently, the Crownline facility emits approximately 195 tons/yr of VOM per year, and is permitted to produce 249 tpy VOM. Tr. at 22; Pet. Exh. 1 at 8. Compliance with the 8 lb/hr Rule would yield approximately 144 tons of VOM per year. Rec. at 6. Before making any changes, the facility would emit approximately 245 tons/yr of VOM for similar production figures. *Id.* The Agency agrees with Crownline that if Crownline could capture the VOM emissions and release them uniformly, rather than in spurts, it could comply with the 8 lb/hr Rule while not reducing emissions at all. Rec. at 6.

Crownline asserts that the Agency estimates a decrease in the amount of solid waste generated and no adverse impacts on water quality and energy consumption from the adjusted standard. Pet. at 11.

CONSISTENCY WITH FEDERAL LAW

Crownline states there is no Clean Air Act equivalent rule or regulation prohibiting boat manufacturers' emissions of VOM in excess of 8 lbs/hr, on a strictly hourly basis. Crownline points out that regardless, the facility must comply with the new federal NESHAP for boat manufacturers. Moreover, Crownline contends that if the Board grants Crownline's requested relief, Crownline will submit the adjusted standard to the USEPA to be included in Illinois' State Implementation Plan (SIP). For these reasons, Crownline states the proposed adjusted standard is consistent with federal law. Pet. at 13.

DISCUSSION

Crownline seeks relief from the State's 8 lb/hr Rule in the form of an adjusted standard. Under separate federal regulation applicable to it under Section 9.1(a) of the Act, Crownline is already required to comply with the NESHAP for New and Existing Boat Manufacturing Facilities, which limits HAP emissions from facilities such as the Crownline West Frankfort plant. Crownline must comply with the MACT emissions limits under this standard by August 23, 2004. Accordingly, Crownline requests that Section 215.301 not apply to their operations. The Agency recommends that the Board grant Crownline the requested relief subject to certain conditions. If granted, the adjusted standard would apply only to the materials and methods Crownline uses to manufacture fiberglass boats at its West Frankfort facility.

The Board finds that Crownline's request for relief from the 8 lb/hr Rule meets the statutory "fundamentally different" factors of section 28.1(c) of the Act. Crownline has demonstrated that: (1) factors relating to it are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation; (2) the existence of these factors justifies an adjusted standard; (3) the requested standard will not cause substantially or significantly more adverse environmental or health effects than the effects considered by the Board in adopting the rule of general applicability; and (4) the adjusted standard is consistent with applicable federal laws. 415 ILCS 5/28.1(c) (2002).

Crownline bases its justification for the requested relief on the lack of an economically reasonable or technically feasible alternative. The Board finds that the efforts beyond those Crownline has already implemented in the three categories of alternatives that Crownline investigated (reducing VOM content in production materials, employing alternative operating procedures and production methods, and applying end-of-pipe controls) are not currently technically feasible or economically reasonable. Additionally, the Ozone Impact Analysis shows that Crownline's emissions will not cause negative health or environmental effects.

The Board finds no inconsistency between granting Crownline's requested relief and federal law. Finally, the Board finds that the Board did not anticipate the batch-type processes of coating and laminating fiberglass boat parts that Crownline employs at the West Frankfort facility when it promulgated the 8 lb/hr Rule at Section 215.301. As a matter of law, Crownline must comply with the MACT emissions limits by August 23, 2004, which Crownline states it has achieved over a year early.

The Agency's recommended adjusted standard language contains some conditions that Crownline's proposed language does not include. Rec. at 5. Specifically, the Agency proposed language limiting Crownline's relief to apply specifically to the emission activities at the Crownline West Frankfort facility, the effective date being the Board's final decision in this matter. The Agency's adjusted standard language reiterated that Crownline must operate in full compliance with the federal standard. *Id.* The Agency proposed language requiring Crownline to continue to investigate boat production methods and, where practicable, substitute current coatings with lower VOM content coatings as long as the substitution does not result in increased VOM emissions. The Agency further proposed that Crownline must do testing as the Agency recommends and submit annual reports summarizing the activities and results of its investigations to the Agency, Bureau of Air. *Id.*

At hearing, Crownline submitted revised language, including three conditions, with no objection by the Agency. The revised wording incorporated the Agency's proposals to: (1) continue to investigate boat production methods with a reduced VOM content and, where practicable, substitute current coatings with lower VOM content coatings so long as the substitution does not result in higher VOM emissions; (2) perform any reasonable test of new production methods or materials that the Agency, Bureau of Air, request in writing that they do; and (3) submit an annual report summarizing the activities and results of their investigations. The revised wording also reiterates that Crownline must operate in compliance with the federal standard.

In granting this adjusted standard, the Board is adopting conditions similar, but not identical in wording, to those suggested by the parties. The Board used Crownline's revised language and, as the Agency recommended, the Board has tightened up the description of the facility and clarified reporting requirements. The balance of the changes are non-substantive, and are intended to bring this order into conformity with the Board's usual drafting style in adjusted standards.

CONCLUSION

The Board grants Crownline's requested relief and exempts it from the 8 lb/hr Rule at Section 215.301 of the Board's regulations at its facility in West Frankfort, Franklin County, Crownline remains subject to the NESHAP applicable to its facility and suggested conditions. The relief is effective as of the date of this order.

This opinion constitutes the Board's findings of fact and conclusions of law.

ORDER

1. Pursuant to Section 28.1 of the Environmental Protection Act (Act) (415 ILCS 5/28.1), the Board grants Crownline Boats, Inc. an adjusted standard from 35 Ill. Adm. Code 215.301 (8 lb/hr Rule), effective July 24, 2004. The adjusted standard applies to the emissions of volatile organic material (VOM) into the atmosphere from Crownline's boat manufacturing facility located at 11884 Country Club Road, West Frankfort, Franklin County.

2. 35 Ill. Adm. Code 215.301 does not apply. Crownline remains subject to the following:

   a. Crownline must continue to investigate boat production methods that generate fewer VOM emissions and materials that have a reduced VOM content. Where practicable, Crownline must substitute current materials with lower VOM content materials as long as such substitution does not result in a net increase in VOM emissions.

   b. Crownline must perform any reasonable test of new technologically or economically reasonable production methods or materials applicable to the open-mold fiberglass boat manufacturing industry, which may reduce VOM emissions at Crownline's facility which the Illinois Environmental Protection Agency (Agency) specifically requests in writing that they do.

   c. Crownline must prepare and submit each year an annual report summarizing the activities and results of these investigatory efforts. The annual report must be submitted to the Agency, Bureau of Air, Compliance and Enforcement Section;

   d. Crownline must operate in full compliance with the Clean Air Act, its Clean Air Act Permit Program permit, the National Emissions Standard for Hazardous Air Pollutants for New and Existing Boat Manufacturing Facilities, set forth at 40 C.F.R. 63, Subpart VVVV, as required by Section 9.1(a) of the Act, and any other applicable regulation.

IT IS SO ORDERED.

Section 41(a) of the Environmental Protection Act provides that final Board orders may be appealed directly to the Illinois Appellate Court within 35 days after the Board serves the order. 415 ILCS 5/41(a) (2000); *see also* 35 Ill. Adm. Code 101.300(d)(2), 101.906, 102.706. Illinois Supreme Court Rule 335 establishes filing requirements that apply when the Illinois Appellate Court, by statute, directly reviews administrative orders. 172 Ill. 2d R. 335. The Board's procedural rules provide that motions for the Board to reconsider or modify its final orders may be filed with the Board within 35 days after the order is received. 35 Ill. Adm. Code 101.520; *see also* 35 Ill. Adm. Code 101.902, 102.700, 102.702.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, certify that the Board adopted the above opinion and order on July 22, 2004, by a vote of 5-0.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board

Exhibit 8

ENGINEERING ENVIRONMENTAL
CONSULTING SERVICES
Robert A. Haberlein, Ph.D., QEP
robhab@erols.com

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February 25, 2008

Dale Guariglia, Esq.
Bryan Cave LLP
One Metropolitan Square
Suite 3600
211 North Broadway
St. Louis, Missouri 63102-2750

Mr. Guariglia:

The responses to the three questions from IL EPA regarding the Royal Pools petition for an adjusted standard from 35 IAC 215.301 are attached hereto.

Please contact me if you have any questions or need further information.

Best regards

Robert A. Haberlein

Robert A. Haberlein, Ph.D., QEP

Responses to Specific Questions

Updated Cost of Add-on Controls

Royal Pools met with IL EPA at their Springfield office on April 19, 2006 to discuss compliance options to resolve Violation Notice A-2005-00281, which had been issued to Royal Pools for a single violation of 35 IAC 215.301. During the April 2006 meeting, IL EPA agreed that add-on controls were not a feasible option for the Royal Pools Dix facility because the cost of add-on controls was prohibitive. IL EPA suggested that Royal Pools seek an adjusted standard to 35 IAC 215.301, because IL EPA had determined that this was the only feasible option.

Nothing has changed since April 2006 to lower the cost of controls. In fact, the cost of add-on controls has increased since the control cost analysis performed in 2006 for two reasons:

- According to the RTO equipment supplier, the capital cost of the RTO unit has increased at least 5% since 2006.
- The annual operating costs for electricity to operate the RTO fan and natural gas to fuel the RTO burner have increased significantly since 2006.

Since IL EPA already determined that the cost of add-on controls was prohibitive in 2006 and the cost of add-on controls has increased since that determination, the cost of add-on controls is still prohibitive.

Reduction in the Size of the Spray Enclosures

The spray room enclosures where the pool molds are processed at the Dix facility have just enough clearance to accommodate the largest pool mold. Further, the existing overhead space is needed to access and handle the large pool parts and molds using overhead cranes, so there is no possibility of lowering the ceiling. Therefore, the spray rooms cannot be made physically smaller in order to reduce exhaust airflows and still make the largest pool part. This was explained at the April 2006 meeting with IL EPA, and pictures of the molds and enclosures were provided to IL EPA at the time of that meeting. IL EPA accepted this fact at the meeting. Nothing has changed since then to affect the physical layout of the process or make a physical reduction in spray room geometry possible.

Reduction in Ventilation Airflow

OSHA regulations under 29 CFR 1910 generally prohibit the practice of purposely reducing the ventilation airflow through a spray room area and placing lamination workers in supplied-air respirators to meet the OSHA PEL and STEL limits. Instead, OSHA expects Royal Pools to use ventilation first and foremost to control worker exposure to styrene. The use of personal respirators is only permitted by OSHA as a last resort when ventilation control is impractical or ineffective at reducing worker exposures. The current ventilation system at Royal Pools is both practical and feasible for this purpose.

OSHA regulations further require a minimum air velocity through the spray area, which cannot be achieved if the ventilation airflow is reduced as IL EPA suggests. Specifically under 1910.94(c)(6)(i):

> *"Except where a spray booth has an adequate air replacement system, the velocity of air into all openings of a spray booth shall be not less than that specified in Table G-10 for the operating conditions specified. An adequate air replacement system is one which introduces replacement air upstream or above the object being sprayed and is so designed that the velocity of air in the booth cross section is not less than that specified in Table G-10 when measured upstream or above the object being sprayed."*

Table G-10 requires 100 fpm for the spray areas at Royal Pools. According to OSHA directive, the Table G-10 air velocity is required to mitigate OSHA concerns about flammability in the workplace. Obviously, flammability concerns would not be relieved by reducing airflows and putting workers in supplied-air respirators.

Dale A. Guariglia
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RECEIVED
CLERK'S OFFICE
APR 03 2009
STATE OF ILLINOIS
Pollution Control Board

March 31, 2009

Pollution Control Board
Attn: Clerk
100 W. Randolph St.
James R. Thompson Center, Ste 11-500
Chicago, IL 60601-3218

Re: Royal Fiberglass Pools, Dix, Illinois
Petition for Adjusted Standard

Dear Clerk:

Enclosed please find one original and nine copies of a Petition for an Adjusted Standard, filed on behalf of Royal Fiberglass Pools. Also enclosed are an original and nine copies of: (a) a Technical Document Supporting the Petition for an Adjusted Standard; (b) a Motion for Expedited Review; (c) a Motion for Admission *Pro Hac Vice* for Dale A. Guariglia; and (d) a Motion for Admission *Pro Hac Vice* for Brandon W. Neuschafer.

We have also enclosed a check for $75.00 to cover the filing fees for the Petition for an Adjusted Standard.

Please do not hesitate to contact me should you have any questions.

Sincerely,

Dale A. Guariglia

Enclosures

cc: Charles Matoesian, Illinois EPA Division of Legal Counsel
Tony Hebert, Royal Fiberglass Pools

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