November 19, 2001

MEMORANDUM

TO: Daniel P. Salgado
New Source Review Coordinator
Air Quality Division

FROM: Carole Zundel, Air Quality Engineer, E.I.T.
State Office of Technical Services

SUBJECT: ***PERMIT TO CONSTRUCT TECHNICAL ANALYSIS***
P-000412, Spears Manufacturing Co, Jerome
(Permit Modification, PTC No. 053-00002)

PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.200 (*Rules for the Control of Air Pollution in Idaho*) for issuing permits to construct (PTC).

PROJECT DESCRIPTION

Spears Manufacturing Co. is proposing to modify PTC No. 053-00002 issued on December 4, 1991, to include an increase in production rates and emission limits and to remove permit references to ethylene glycol, which is no longer used. This permit will supersede the permit issued on December 4, 1991.

SUMMARY OF EVENTS

On June 21, 2000, the Idaho Department of Environmental Quality (DEQ) received an application from Spears Manufacturing to increase the production rates and emission limits. Marjorie MartzEmerson of DEQ informed the facility by phone that the application was incomplete. The facility then resubmitted the application, which was received September 26, 2000.

Letters from DEQ dated September 27, 2000, document reviews of the stack tests that were performed to demonstrate compliance with the emission limits specified in the permit. The tetrahydrofuran (THF) limit from Stack 1 and the Styrene limit for Stack 11 were exceeded. The test for Stack 8 was required by the permit to be performed at the maximum production rate. The test showed compliance with the permit limit. The maximum allowable production rate was then limited to the pounds per hour (lb/hr) and actual cubic feet per minute used in the test. The modification request is to increase the production rate to that tested limit.

Additional information was received from Spears on April 16, 2001. On April 26, 2001, the application was determined complete.

A news release was published on May 9, 2001, providing notice that a 30-day public comment period may be requested. No requests for a public comment period were received.

On August 17, 2001, a draft PTC was sent to the facility.

On October 15, 2001, a second draft PTC was sent to the facility.

Additional information was submitted as follows:

May 11, 2001	Pipe cutting emissions estimate.
May 31, 2001	Filter guarantee and fence line distance.
June 20, 2001	Different Material Safety Data Sheet (MSDS) specific for Weld-On 710 cement and manufacturer's test data for volatile organic compound (VOC) emissions.
June 21, 2001	Process rate change for cement and primer. Request for issuance of draft permit.
August 2, 2001	Fax regarding polyvinyl chloride (PVC) pellet manufacturer's test for residual vinyl chloride in pellets.
September 18, 2001	Letter received from Spears Manufacturing to Doug Howard of the Twin Falls Regional Office requesting two modifications.
September 27, 2001	E-mail from Doug Swingley concurring with suggested changes to be made to the permit and requesting a second draft.
November 6, 2001	E-mail from Doug Swingley requesting issuance of draft permit as final.

DISCUSSION

1. Process Description

Spears Manufacturing has three processes:

(1) PVC pellets are used to manufacture pipe fittings using heat and pressure.

(2) PVC piping is cut, heated, and glued to produce other PVC products.

(3) PVC fittings are washed with acetone, painted with a polyester resin, and covered with resin-loaded fiberglass sheeting. The fittings are then ground to remove excess material. Finally, the PVC fittings are painted with latex paint.

The application requests an increase in the allowable production rate for the second listed process.

2. Equipment Listing

Stacks 8, 13, and 14:

Equipment:	Fiberbond Wall Filters (3)
Model:	FP100
Manufacturer's Control Efficiency Rating for Particulates:	91.4%

Stack 11:

Equipment:	Brinks Andrae Filter Booth

Stack 7:

Equipment:	Heating Tanks (21)
Btu Rating:	150,000 British Thermal Units (Btu)
Fuel:	Natural Gas

3. Emission Estimates

The emissions calculations are shown in Appendix A.

Glue Room:

The following analysis was done to determine the total VOC, THF, methyl ethyl ketone (MEK), and cyclohexanone emissions from the quantities and concentrations stated in the permit application. The permit limits were based on the total emissions. Compliance procedures were written to track total emissions of each constituent in order to allow the facility flexibility to select other cement or primer formulations where the ratios of the permitted constituents (VOC, THF, MEK, and cyclohexanone) could vary from the formulations in the permit.

Primer and cement are used in the glue room. Primer consists of greater than 99% THF, so 100% was assumed used and volatilized for a conservative emissions estimate. Cement consists of, by weight, up to 70% THF, up to 40% MEK, and up to 15% cyclohexanone. Tests conducted by the cement manufacturer showed that 69% of the product by weight volatilized as VOC. To conservatively estimate emissions, the maximum percentage of THF and Cyclohexanone was used, with all assumed volatilized.

The MEK content varies depending on the formulation used. Approximately 95% of the cement used by the facility is 5% by weight MEK, with the remaining 5% of cement used having an MEK component of up to 40%. The permit limits the MEK emissions to a value less than ten tons per year in order to avoid exceeding the major source emission limit. The emissions were estimated by using the facility's determination that 50% of the cement used has an MEK content of 5% and 50% of the cement used has an MEK content of 40%. The permit specifies a method to track and calculate MEK emissions to ensure compliance with the MEK limit.

Because the individual components of VOC (THF, cyclohexanone, and MEK) were estimated at the maximum of their individual ranges, the VOC components add up to more than the total VOC emissions because the exact formulation of the cement varies and/or is a trade secret. Each component was estimated at the highest end of the weight percent range given.

According to the MSDS for cement, the VOC content of the cement is 69% by weight. Tetrahydrofuran is a VOC. Therefore, the maximum content of THF cannot be more than 69%. However, according to the MSDS, the maximum concentration of THF is 70%. When the manufacturer of the cement was questioned about this apparent discrepancy, the response was that the exact formulation of the cement is a trade secret. Therefore, when writing the permit, the VOC limit was increased slightly to allow for the possibility of THF content in the cement at 70%, which would then make the VOC content at 70% as long as there were no other VOCs other than THF.

The application states that the glue room operating hours are 16 hours per day (hrs/day), 5 days a week (days/wk), 50 weeks per year (wks/yr). The operating hours and the hourly cement and primer process rates were used to calculate the daily and annual material process rates. The permit does not limit the number of hours of operation because that was not necessary to ensure compliance with the emission limits. Emissions are determined by multiplying the material usage by the weight percentage of each pollutant constituent.

Daily and annual limits were set based on 120% of stated operating hours and calculated hourly emission rates, except for the MEK annual limit, which was based on the requested parameters to maintain MEK emissions below the major source threshold. No throughput limits were set because

compliance with the emission limits will be determined by multiplying the weight percent of each component by the pounds of cement and primer used. The daily and annual limits are increased 20% from the requested values to allow operational flexibility. All parameters are calculated to be within regulatory limits.

Fiberglass Cutting:

A September 27, 2001 source test at a process rate of 78.33 lb/hr showed an emission rate for particulate of 0.002 lb/hr. The particulate limit in the December 4, 1991 permit was 0.093 lb/hr, so the source test showed compliance with the permit at a process rate of 78.33 lb/hr. Because the source test indicated an emission rate well below the permitted limit, the process rate was limited to 120% of the tested process rate.

The emission rate was based on the particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers (PM_{10}) emission limit set in the previous permit. However, for ease of tracking, the hourly limit was multiplied by eight hours per day, which is the proposed operating schedule, to result in a daily PM_{10} emission limit. As long as throughput is limited and tracked, operating hours need not be tracked, as compliance with the National Ambient Air Quality Standard (NAAQS) is based on an average daily emission rate. The annual limit was based on the operating hours stated by the facility and the average hourly emission limit. The particulate matter (PM) limit was set at the same value as the PM_{10} limit, because the July 19, 2000, source test was based on PM, so compliance with the throughput limit will demonstrate compliance with the PM limit. The application states that the fiberglass cutting operating hours are 8 hrs/day, 5 days/wk, 50 wks/yr. The operating hours and the hourly fiberglass cutting PM_{10} emission rate were used to calculate the daily and annual PM_{10} emission rate. The permit does not limit the number of hours of operation because that was not necessary to ensure compliance with the emission limits. Emissions are determined by multiplying the material usage by the daily and annual fiberglass cutting process rate.

Section 710.02 excepts this operation from the grain-loading requirements of section 710.08.a because the fiberglass cutting operation PM emissions are limited in the permit at less than one pound per day.

Bond Coat/Wet Out/Roll Out:

The following analysis was done to determine the total styrene and acetone emissions from the bond coat, wet out, and roll out operations from the quantities stated in the permit application. The permit limits were based on the total emissions from the three operations. Compliance procedures were written to track total emissions.

Styrene emissions were estimated using the July 17, 2000, source test results. The source test documented the pounds of polyester resin (containing styrene) used per hour and the pounds of styrene that were emitted from the stack during the wet out operation. An average of 4.89 lb/hr of styrene was emitted using an average of 60.62 lb/hr of polyester resin. It can be calculated from this that an average of 8% by weight of the process rate was detected by the test as styrene. The facility estimated that of all resin used, 10% is used in the bond coat process, 75% in the wet out process, and 15% in the roll out process. The emissions of styrene are allocated according to this percentage. Polyester resin throughput was limited to 120% of the requested amount, as allowed in PTC General Provision F.

According to the current MSDS for the resin, the maximum possible concentration of styrene in the resin is 40%. Material Safety Data Sheets are occasionally rewritten, and the concentration ranges are changed. If the maximum concentration of the styrene were increased, the facility would be required to modify the permit. To avoid the requirement for a modification of the permit over a

minor change in the styrene concentration range, the styrene emission limit was evaluated for a maximum styrene concentration in the resin of 47%. The source test was performed using resin with an MSDS showing a maximum concentration of styrene at 40%. The amount of styrene that would be emitted at concentrations greater than 40% has not been determined. Therefore, the permit limit was based on the conservative assumption that all styrene present in the resin at a concentration greater than 40% will be emitted, with none of that additional amount incorporated into the product. The resulting styrene emission limit of 6.24 pounds per hour does not exceed the screening emissions level specified in IDAPA 58.01.01.585, which is 6.67 pounds per hour. The annual styrene emission limit of 6.24 tons per year does not cause styrene emissions to exceed the Hazardous Air Pollutant (HAP) major source trigger level of ten tons per year.

For acetone, the facility estimated that 100% of the amount used volatilizes, and that 75% of all acetone used is in the bond coat process, 15% in the wet out process, and 10% in the roll out process. The acetone emission limit in the permit is set at 120% of the requested amount to allow operational flexibility. The calculated emissions at this rate are within regulatory limits.

The application states that the bond coat/wet out/roll out operating hours are 8 hrs/day, 5 days/wk, 50 wks/yr. The operating hours and the hourly process rates were used to calculate the daily and annual material process rates. The permit does not limit the number of hours of operation because that was not necessary to ensure compliance with the emission limits. For styrene, emissions are determined by multiplying the material usage by the tested emission rate. If the resin MSDS indicates a maximum styrene concentration greater than 40%, additional styrene emissions are assessed by assuming all styrene over 40% is emitted.

For acetone, emissions are estimated by tracking the amount of acetone used.

Grinding Room:

Polyvinyl chloride parts are coated with glass and resin. A conservative estimate of 3% of the glass and resin is ground off, and all of this byproduct is assumed to be PM_{10}. The emissions are vented through a fiberbond filter with a manufacturer's guarantee of 91.4% efficiency for particulates. It was assumed that the efficiency rating also applies to PM_{10}.

The application states that the grinding room operating hours are 8 hrs/day, 5 days/wk, 50 wks/yr. The operating schedule and the daily process rates of glass and resin were used to calculate the daily and annual PM and PM_{10} emission rates. The permit does not limit the number of hours of operation because that was not necessary to ensure compliance with the process rate limits. Compliance with the PM and PM_{10} limits are determined by demonstrating compliance with the material throughput limits.

Section 710.02 excepts this operation from the grain-loading requirements of Section 710.08.a because the grinding room PM emissions are limited in the permit so that the average hourly PM emissions will be less than one pound per hour.

Paint Room:

The facility estimates that the maximum paint usage will be 38 lb/hr and 38 tons per year (T/yr). According to the facility, the VOC content in the paint is 0.47 pounds per gallon (lb/gal) and the paint weighs 11 pounds per gallon. It was assumed that all the VOC from the paint used was emitted.

The VOC limit in the permit is set at 120% of the requested amount to allow operational flexibility. The calculated emissions are within the regulatory limits.

Daily and annual limits were set based on the operating schedule of 8 hrs/day, 5 days/wk, 50 wks/yr.

Heating Tanks:

An estimate of 1,000 Btu per standard cubic foot (Btu/scf) for natural gas was used in the emission calculations. The emission factors used were obtained from the FIRE database for industrial external combustion boilers with less than 10 million Btu (MMBtu), Source Classification Code (SCC) 10200603.

Example emission calculation:

CO: 21 heaters x 0.15 MMBtu/hr x 1 scf/1000 Btu x 84 lb/mm cubic feet natural gas = 0.26 lb/hr

Because the emissions are very low even with the heating tanks running at full capacity, and because the modeled concentrations of the emissions were much less than the NAAQS, no emission limits for pipe cutting or PVC fabrication were set in the permit for this source.

Pipe Cutting/PVC Fabrication:

The facility estimated that the PM emissions from the operation are 0.01 lbs/hr. There is no ventilation for this area. The amount of pipe cutting is inherently limited by the grinding operation process rate and emission limits. Therefore, no process rate or emissions limits were specified in the permit. If the limit for PM is not exceeded, then the limit for PM_{10} will inherently be in compliance.

The application states that the pipe cutting and PVC fabrication operating hours are 16 hrs/day, 5 days/wk, 50 wks/yr. The operating hours and the hourly process rates were used to calculate the daily and annual material process rates. The permit does not limit the number of hours of operation because that was not necessary to ensure compliance with the emission limits.

Section 710.02 excepts this operation from the grain-loading requirements of Section 710.08.a because the pipe cutting and PVC fabrication PM emissions are inherently limited by the grinding room process rate and emission limits to less than one pound of PM per day.

PVC Injection Molding:

This portion of the permit has not been modified. Therefore, no analysis is required. However, during review of the draft permit, the potential for vinyl chloride emissions from the molding process was questioned, so the issue was investigated.

In a phone call to Doug Swingley, the plant manager, on August 1, 2001, it was determined that the facility could process up to 100,000 pounds of PVC pellets per day. Production is not predicted in the future to increase to more than 200,000 pounds per day.

The MSDS from one of Spears' pellet suppliers, PolyOne Corporation, shows that the vinyl chloride concentration in the PVC pellets are no more than 8.5 parts per million by weight. A National Sanitation Foundation (NSF) test report for the pellets showed a vinyl chloride concentration of less than the detection limit of 0.5 parts per million. According to Mr. Swingley, NSF standards require that there be no more than 3.2 parts per million of vinyl chloride by weight in order for the pellets to be used to make the NSF-listed products that Spears Manufacturing produces.

In order to analyze for a worst-case condition, based on the current maximum production rate (100,000 pounds per day, 24 hours per day) and the MSDS maximum concentration rating for vinyl chloride (8.5 parts per million), the maximum emission rate of vinyl chloride would be 0.035 pounds per hour. This assumes that all vinyl chloride present in the pellets are emitted during the molding process, and that no PVC de-polymerizes into vinyl chloride. Because the resulting emission rate, using these assumptions, is higher than the screening emission limit of 0.00094 pounds per hour, dispersion modeling was done and is described in the modeling section of this memo.

Change in VOC Emissions:

The change in VOC emissions was calculated to be:

VOC, Original Permit	Permit Limit (T/yr)
Ethylene Glycol, Stacks 4, 5, and 6	1
THF, Stacks 1, 2, and 3	22.5
MEK, Stacks 1, 2, and 3	22.5
Cyclohexanone, Stacks 1, 2, and 3	3.9
Styrene, Stack 1	0.009
MEK, Stack 1	0.007
DiMethyl Phthalate, Stack 1	0.022
Styrene, Stack 9	0.063
MEK, Stack 9	0.045
DiMethyl Phthalate	1.0
Styrene, Stacks 10 and 11	0.018
MEK, Stacks 10 and 11	0.014
DiMethyl Phthalate	0.044
Total VOC, Original Permit:	51.122 T/yr
Total VOC, Modified Permit: (From Spreadsheet)	89.3 T/yr
Increase in VOC:	38.2 T/yr

The table below summarizes the HAP emissions:

HAP	Permitted tons per year	Major Source Limit, One HAP, tons per year	Major Source Limit, Total HAPS, tons per year
MEK	9	10	
Styrene	6.24	10	
Total HAPS	15.24		25

The proposed emissions, including the 120% throughput and emissions allowance for the polyester resin, were less than the major source threshold limits for HAP.

Monitoring was not required for visible emissions because the particulate emission estimates are very low, and there is a requirement for reasonable control of fugitive dust.

4. Modeling

Total PM_{10} emissions for the processes evaluated were estimated as shown in Appendix B. As a conservative estimate, the modeled emissions from each source were added together to compare to the ambient air quality standards and were modeled using SCREEN3 using the background concentrations for Twin Falls of 54 micrograms per cubic meter ($\mu g/m^3$) for the 24-hour average and 24.1 $\mu g/m^3$ for the annual average.

The total facility emissions of THF, MEK, cyclohexanone, and styrene were each estimated to be less than its screening emission levels (EL). Therefore, no modeling was required.

The nearest fence line distance was stated by the facility in a May 31, 2001 fax to be 340 feet (104 meters).

The modeled concentrations for a one-hour average for PM_{10} are as follows:

Process	1-hr ($\mu g/m^3$)[1]	24-hr ($\mu g/m^3$)[1]	Annual ($\mu g/m^3$)[1]
Fiberglass Cutting	27.2		
Grinding Room	125.6		
Pipe Cutting	0.02		
Heating Tanks (3 points)	11.88		
Total Contribution	164.7	65.88	13.2
Background		54	24.1
Total		120	37.3
NAAQS[2]		150	50

1. $\mu g/m^3$ = micrograms per cubic meter
2. NAAQS = National Ambient Air Quality Standards

Pipe cutting was modeled as volume source because there are no direct vents or exhaust.

The heating tanks have more than one pollutant to model, but the calculated emission rate was not modeled individually for each pollutant. A unit value of one pound per hour was used in the modeling so that the results could be multiplied by each pollutant's calculated emission rate to show the modeling result for each pollutant. For example:

Heating tanks PM_{10} = 593.6 $\mu g/m^3$ (unit model result value) x 0.02 lb/hr (calculated emission rate) / 3 stacks = 3.96 $\mu g/m^3$ for each stack.

The total modeled one-hour maximum concentration for PM_{10} was 164.7 $\mu g/m^3$ at 104 meters (nearest fence line). Using the persistence factor for the 24-hour maximum concentration for PM_{10} shows 65.88 $\mu g/m^3$ as the 24-hour maximum contribution. The background for Twin Falls is 54 $\mu g/m^3$. The total 24-hour concentration is 120 $\mu g/m^3$. This is less than the limit of 150 $\mu g/m^3$. The annual average concentration is the total modeled on-hour maximum concentration for PM_{10} of 164.7 $\mu g/m^3$ multiplied by the annual average persistence factor of 0.08, which equals 13.2 $\mu g/m^3$. The background PM_{10} concentration is 24.1 $\mu g/m^3$. The total annual modeled concentration of PM_{10}, including the background concentration, is 37.3 $\mu g/m^3$, which is less than the limit of 50 $\mu g/m^3$.

The modeled concentrations for the heating tanks' emissions of CO, NO_x and SO_x are as follows:

Pollutant	1-hr ($\mu g/m^3$)[1]	3-hr ($\mu g/m^3$)[1]	8-hr ($\mu g/m^3$)[1]	24-hr ($\mu g/m^3$)[1]	Annual ($\mu g/m^3$)[1]
SO_x (modeled)	1.13	1.0		0.45	0.014
SO_2 (NAAQS)[2]		1300		365	80
NO_x (modeled)	190				15
NO_x (NAAQS)[2]					100
CO (modeled)	154		108		
CO (NAAQS)[2]	40000		10000		

1. $\mu g/m^3$ = micrograms per cubic meter
2. NAAQS = National Ambient Air Quality Standards

Compliance with the NAAQS was demonstrated for all criteria pollutants.

For the PVC molding process, SCREEN3 showed a maximum hourly concentration for vinyl chloride of 0.465 micrograms per cubic meter. This was converted to an annual average concentration by multiplying the maximum hourly concentration by the persistence factor for toxics of 0.125, which resulted in an annual average concentration for vinyl chloride of 0.058 micrograms per cubic meter at the fence. IDAPA 58.01.01.586 specifies an annual average concentration limit of 0.14 micrograms per cubic meter. The predicted maximum concentration at the fence line is less than half of the IDAPA limit.

The actual emissions of vinyl chloride from the PVC molding process are likely to be much less than the above analysis for the following reasons:

a. NSF requirements limit concentrations of the pellets to 3.2 parts per million or less of vinyl chloride for NSF-listed products.

b. The manufacturer's test data shows less than 0.5 parts per million of vinyl chloride in the pellets.

c. It is likely that not all of the residual vinyl chloride would be emitted in the molding process.

d. An article in the Journal of Vinyl & Additive Technology, "Process Emissions for Vinyl Pipe Industry," September 1996, analyzed a PVC molding process and determined, "*No evidence was seen for the presence of benzene, toluene, or vinyl chloride, three HAPs selected for quantitation in the production study.*" It appears from this that no significant de-polymerization is occurring.

Therefore, specific permit limitations have not been written for this process.

5. Facility Classification

The Spears Manufacturing Company facility is not a designated facility as defined in IDAPA 58.01.01.006.27 and is not a major facility as defined in IDAPA 58.01.01.006.55 and IDAPA 58.01.01.008.10. The Aerometric Information Retrieval System (AIRS) facility subsystem classification for this facility is "SM" because potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations. The facility's Standard Industrial Classification (SIC) Code is 3089, which refers to an establishment that is primarily engaged in manufacturing plastic products.

6. Area Classification

Spears Manufacturing Company is located in Jerome, Idaho, Air Quality Control Region (AQCR) 63, Zone 11. The area is considered attainment or unclassifiable for all criteria pollutants.

7. Regulatory Review

IDAPA 58.01.01.201 Permit to Construct Required

A permit to construct is required because the facility proposes to increase the production rate, which will increase the amount of regulated air pollutants.

IDAPA 58.01.01.210 Demonstration of Preconstruction Compliance with Toxic Standards

The PTC application shows compliance with the toxic air pollutant standards found at IDAPA 58.01.01.585.

IDAPA 58.01.01.577 Ambient Air Quality Standards for Specific Air Pollutants

The PTC application shows compliance with the ambient air quality standards found at IDAPA 58.01.01.577.

40 CFR §52 Prevention of Significant Deterioration

40 CFR §52 does not contain any requirements applicable to the PVC molding and fabrication process.

40 CFR §60 New Source Performance Standards

40 CFR §60 does not contain any requirements applicable to the PVC molding and fabrication process.

40 CFR §61 and §63 National Emission Standards for Hazardous Air Pollutants and Maximum Achievable Control Technology (MACT)

40 CFR §61 and §63 do not contain any requirements applicable to the PVC molding and fabrication process.

8. Permit Requirements

8.1 Emission Limits

The emissions were limited in the permit application, except the heating tanks and pipe cutting, as follows:

Source	Pounds per Day	Tons per Year
Glue Room		
THF	653	82
MEK	72	9.0
Cyclohexanone	58	7.2
VOC	653	82
Fiberglass Cutting		
PM_{10}	0.74	0.093
Bond Coat/Wet Out/Roll Out		
Acetone	114	14.3
Styrene	49.9	6.24
Grinding Room		
PM_{10}	3.12	0.39
Paint Room		
VOC	16	2.0
Heating Tanks (Not Specifically Limited)		
CO	6.24	0.8
NO_x	7.68	1
PM_{10}	0.48	0.1
SO_x	0.048	0.01
VOC	0.48	0.05
Pipe Cutting (Not Specifically Limited)		
PM_{10}	0.16	0.01

The above limits are total for the operation listed, not for each vent or stack.

8.2 Operating Requirements

These operating requirements can be used to demonstrate compliance with the permit limits because these rates were used to calculate the limits. If the rates are not exceeded, the calculated emission limits will not be exceeded.

Source	Process Rate Pounds/Hour	Process Rate Pounds/Day	Tons/Year
Fiberglass Cutting	78.33		78.33
Grinding Room Glass and Resin		1,209	

Compliance with the permit limits will be determined by daily tracking of the pounds of cement, primer, acetone, polyester resin, fiberglass, grinding room glass and resin, and paints and coatings used during each day of application of this material. VOC-containing materials will be further tracked by weight percent of each constituent, and then by calculating the emissions. Grinding room fittings can be tracked by the average weight of each type of part and the number of each of those parts processed each day.

9. Permit Coordination

This permit replaces the existing permit. No Title V Permit is required at this time.

10. AIRS Information

AIRS/AFS FACILITY-WIDE CLASSIFICATION DATA ENTRY FORM

Air Program Description	SIP	PSD	NESHAP	NSPS	MACT	TITLE V	AREA CLASSIFICATION A – Attainment U – Unclassifiable N – Nonattainment
SO_2	B						Attainment/Unclassifiable
NO_x	B						Attainment/Unclassifiable
CO	B						Attainment/Unclassifiable
PM_{10}	B						Attainment/Unclassifiable
PT (Particulate)	B						Attainment/Unclassifiable
VOC	SM						Attainment/Unclassifiable
THAP (Total HAPs)	SM						Attainment/Unclassifiable
Other (specify below:)							
(Add additional lines if necessary.)							
VE/FE/FD *	ND	ND	ND	ND	ND	ND	

* VE/FE/FD (VISIBLE EMISSIONS, FUGITIVE EMISSIONS, AND FUGITIVE DUST) ARE ENTERED FOR COMPLIANCE PURPOSES ONLY AND DO NOT REQUIRE EVALUATION BY THE PERMIT ENGINEER.

AIRS/AFS CLASSIFICATION CODES:

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For National Emission Standards for Hazardous Air Pollutants (NESHAP) only, class "A" is applied to each pollutant which is below the 10 ton-per-year (T/yr) threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.

SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.

B = Actual and potential emissions below all applicable major source thresholds.

C = Class is unknown.

ND = Major source thresholds are not defined (e.g., radionuclides).

FEES

The Spears Manufacturing facility is not a major facility as defined in IDAPA 58.01.01.008.10. Therefore, registration fees are not applicable in accordance with IDAPA 58.01.01.527.

RECOMMENDATION

Based on review of application materials and all applicable state and federal rules and regulations, staff recommend that Spears Manufacturing be issued modified PTC No. 053-00002 for the increase in production rate. No public comment period is recommended, no entity has requested a comment period, and the project does not involve Prevention of Significant Deterioration requirements.

APPENDIX A

Spears Manufacturing, October 2001

Emission Estimates, 120% of Production Rate for Glue Room (except MEK), Bond Coat/Wet Out/Roll Out/, Paint Room, Resin and Fiberglass Cutting

There are no significant emissions from the PVC Injection Molding process.

Requested Emissions

Glue Room	Requested lb/hr	120% VOC lb/hr	120% VOC T/Y	120% Tetrahydrofuran lb/hr	120% Tetrahydrofuran T/Y	120% Methyl Ethyl Ketone, lb/hr	Methyl Ethyl Ketone, T/Y	120% Cyclohexanone lb/hr	120% Cyclohexanone T/Y
Cement	20	16.56	33.12	16.80	33.60	4.50	9.00	3.60	7.20
Primer	20	24.00	48.00	24.00	48.00				
Total Glue Room	40	40.56	81.12	40.80	81.60	4.50	9.00	3.60	7.20

	Process Rate, lb/hr	PM-10 lb/hr	PM-10 t/y
Fiberglass Cutting	93.996	0.0930	0.0930

120% Rate	Process Rate, lb/hr	Acetone, lb/hr	Acetone, T/Y	Styrene, lb/hr	Styrene, T/Y
Bond Coat - Acetone	10.70	10.70	10.70		
Bond Coat - Polyester Resin	4.15			0.62	0.62
Wet Out - Acetone	2.14	2.14	2.14		
Wet Out - Polyester Resin	31.20			4.68	4.68
Roll Out - Acetone	1.43	1.43	1.43		
Roll Out - Polyester Resin	6.24			0.94	0.94

	Glass and Resin, lb/day	Percent of Material Ground Off of Part	Average PM to Filters, lb/hr	PM to Filters, T/Y	PM, lb/hr incl. Filter Control 91.4%	PM, T/Y incl. Filter Control 91.4%
Grinding Room	1209	3.00	4.53	4.53	0.39	0.39

120% Rate	Process Rate, lb/hr	Process Rate, T/Y	VOC Content, lb/gal	Weight of Paint, lb/gal	VOC, lb/hr	VOC, T/Y
Paint Room	45.6	45.60	0.47	11.00	1.95	1.95

	Rating, MMBtu/hr	Annual MMSCF NG	CO, lb/hr	NOX, lb/hr	PM, lb/hr	SOX, lb/hr	VOC, lb/hr	CO, T/Y	NOX, T/Y	PM, T/Y	SOX, T/Y
Heating Tanks (21 Heaters)	0.15	18.90	0.26	0.32	0.02	0.0019	0.02	0.794	0.945	0.07182	0.00567

	PM, lb/hr (estimation)	PM, T/Y
Pipe Cutting, PVC Fabrication	0.01	0.02

	Total Emissions, lb/hr	Total Emissions, T/Y
CO	0.26	0.79
NOX	0.32	0.95
PM-10	0.52	0.57
SOX	0.00	0.01
VOC (Paint and Heating)	1.97	1.95
Acetone	14.27	14.27
Styrene	6.24	6.24
THF	40.80	81.60
MEK	4.50	9.00
Cyclohexanone	3.60	7.20
Total VOC	48.76	89.31

APPENDIX B

06/27/01

08:57:51
*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Spears Fiberglass Cutting

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.117000E-01
STACK HEIGHT (M)	=	7.1018
STK INSIDE DIAM (M)	=	0.3048
STK EXIT VELOCITY (M/S)	=	9.7018
STK GAS EXIT TEMP (K)	=	293.1500
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	13.7160
MIN HORIZ BLDG DIM (M)	=	100.5840
MAX HORIZ BLDG DIM (M)	=	274.3200

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 2.186 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
104.	27.20	5	1.0	1.0	10000.0	7.63	9.01	12.68	SS

200.	15.31	6	1.0	1.0	10000.0	7.63	13.82	15.63 SS
300.	11.85	6	1.0	1.0	10000.0	7.63	17.16	16.44 SS
400.	9.584	6	1.0	1.0	10000.0	7.63	20.45	17.23 SS
500.	7.987	6	1.0	1.0	10000.0	7.63	23.68	18.00 SS
600.	6.805	6	1.0	1.0	10000.0	7.63	26.87	18.76 SS
700.	5.897	6	1.0	1.0	10000.0	7.63	30.01	19.49 SS
800.	5.180	6	1.0	1.0	10000.0	7.63	33.13	20.21 SS
900.	4.601	6	1.0	1.0	10000.0	7.63	36.22	20.91 SS
1000.	4.124	6	1.0	1.0	10000.0	7.63	39.27	21.60 SS
1100.	3.827	6	1.0	1.0	10000.0	7.63	42.31	21.61 SS
1200.	3.490	6	1.0	1.0	10000.0	7.63	45.32	22.20 SS
1300.	3.201	6	1.0	1.0	10000.0	7.63	48.31	22.77 SS
1400.	2.951	6	1.0	1.0	10000.0	7.63	51.27	23.33 SS
1500.	2.733	6	1.0	1.0	10000.0	7.63	54.22	23.88 SS
1600.	2.542	6	1.0	1.0	10000.0	7.63	57.16	24.41 SS
1700.	2.372	6	1.0	1.0	10000.0	7.63	60.07	24.94 SS
1800.	2.221	6	1.0	1.0	10000.0	7.63	62.97	25.46 SS
1900.	2.086	6	1.0	1.0	10000.0	7.63	65.86	25.97 SS
2000.	1.964	6	1.0	1.0	10000.0	7.63	68.73	26.47 SS
2100.	1.854	6	1.0	1.0	10000.0	7.63	71.58	26.97 SS
2200.	1.805	6	1.0	1.0	10000.0	7.63	74.43	26.60 SS
2300.	1.711	6	1.0	1.0	10000.0	7.63	77.26	27.08 SS
2400.	1.628	6	1.0	1.0	10000.0	7.63	80.08	27.49 SS
2500.	1.551	6	1.0	1.0	10000.0	7.63	82.89	27.90 SS

2600.	1.481	6	1.0	1.0	10000.0	7.63	85.69	28.30 SS
2700.	1.416	6	1.0	1.0	10000.0	7.63	88.47	28.69 SS
2800.	1.356	6	1.0	1.0	10000.0	7.63	91.25	29.07 SS
2900.	1.300	6	1.0	1.0	10000.0	7.63	94.02	29.46 SS
3000.	1.249	6	1.0	1.0	10000.0	7.63	96.77	29.83 SS
3500.	1.036	6	1.0	1.0	10000.0	7.63	110.42	31.63 SS
4000.	0.8790	6	1.0	1.0	10000.0	7.63	123.87	33.32 SS
4500.	0.7594	6	1.0	1.0	10000.0	7.63	137.15	34.91 SS
5000.	0.6656	6	1.0	1.0	10000.0	7.63	150.26	36.43 SS
5500.	0.5903	6	1.0	1.0	10000.0	7.63	163.23	37.87 SS
6000.	0.5287	6	1.0	1.0	10000.0	7.63	176.08	39.26 SS
6500.	0.4833	6	1.0	1.0	10000.0	7.63	188.80	40.08 SS
7000.	0.4408	6	1.0	1.0	10000.0	7.63	201.41	41.24 SS
7500.	0.4044	6	1.0	1.0	10000.0	7.63	213.92	42.35 SS
8000.	0.3731	6	1.0	1.0	10000.0	7.63	226.34	43.43 SS
8500.	0.3458	6	1.0	1.0	10000.0	7.63	238.66	44.47 SS
9000.	0.3219	6	1.0	1.0	10000.0	7.63	250.90	45.47 SS
9500.	0.3007	6	1.0	1.0	10000.0	7.63	263.06	46.45 SS
10000.	0.2819	6	1.0	1.0	10000.0	7.63	275.14	47.39 SS
15000.	0.1707	6	1.0	1.0	10000.0	7.63	392.46	55.07 SS
20000.	0.1211	6	1.0	1.0	10000.0	7.63	504.83	60.44 SS
25000.	0.9277E-01	6	1.0	1.0	10000.0	7.63	613.52	64.98 SS
30000.	0.7476E-01	6	1.0	1.0	10000.0	7.63	719.26	68.84 SS
40000.	0.5384E-01	6	1.0	1.0	10000.0	7.63	923.75	74.49 SS

```
 50000.  0.4176E-01    6     1.0    1.0 10000.0    7.63 1120.83
79.19    SS

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND   104. M:
   104.   27.20         5     1.0    1.0 10000.0    7.63    9.01
12.68    SS

 DWASH=   MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

 ****************************************
     *** REGULATORY (Default) ***
    PERFORMING CAVITY CALCULATIONS
  WITH ORIGINAL SCREEN CAVITY MODEL
          (BRODE, 1988)
 ****************************************


  *** CAVITY CALCULATION - 1 ***       *** CAVITY CALCULATION - 2
***
   CONC (UG/M**3)      =    2.073        CONC (UG/M**3)      =    5.
654
   CRIT WS @10M (M/S) =     1.34         CRIT WS @10M (M/S) =     1
.34
   CRIT WS @ HS (M/S) =     1.34         CRIT WS @ HS (M/S) =     1
.34
   DILUTION WS (M/S)  =     1.00         DILUTION WS (M/S)  =     1
.00
   CAVITY HT (M)       =    13.72        CAVITY HT (M)       =    13
.72
   CAVITY LENGTH (M)   =    80.01        CAVITY LENGTH (M)   =    62
.13
   ALONGWIND DIM (M)   =   100.58        ALONGWIND DIM (M)   =   274
.32

 ****************************************
       END OF CAVITY CALCULATIONS
 ****************************************


      ****************************************
      *** SUMMARY OF SCREEN MODEL RESULTS ***
      ****************************************

  CALCULATION         MAX CONC     DIST TO    TERRAIN
```

PROCEDURE	(UG/M**3)	MAX (M)	HT (M)	
SIMPLE TERRAIN	27.20	104.	0.	
BLDG. CAVITY-1	2.073	80.	--	(DIST = CAVITY LENGTH)
BLDG. CAVITY-2	5.654	62.	--	(DIST = CAVITY LENGTH)

06/15/01

13:06:25
*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Spears Grinding Room

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.491000E-01
STACK HEIGHT (M)	=	0.0000
STK INSIDE DIAM (M)	=	1.6154
STK EXIT VELOCITY (M/S)	=	0.0000
STK GAS EXIT TEMP (K)	=	293.1500
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	13.7160
MIN HORIZ BLDG DIM (M)	=	100.5840
MAX HORIZ BLDG DIM (M)	=	274.3200

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA

Z (M)	DWASH								
104.	125.6	4	1.0	1.0	320.0	0.00	9.01	13.81	SS
200.	66.71	6	1.0	1.0	10000.0	0.00	13.82	16.96	SS
300.	51.35	6	1.0	1.0	10000.0	0.00	17.16	17.74	SS
400.	41.33	6	1.0	1.0	10000.0	0.00	20.45	18.49	SS
500.	34.32	6	1.0	1.0	10000.0	0.00	23.68	19.23	SS
600.	29.15	6	1.0	1.0	10000.0	0.00	26.87	19.96	SS
700.	25.20	6	1.0	1.0	10000.0	0.00	30.01	20.67	SS
800.	22.08	6	1.0	1.0	10000.0	0.00	33.13	21.36	SS
900.	20.12	6	1.0	1.0	10000.0	0.00	36.22	21.45	SS
1000.	18.04	6	1.0	1.0	10000.0	0.00	39.27	22.06	SS
1100.	16.32	6	1.0	1.0	10000.0	0.00	42.31	22.64	SS
1200.	14.87	6	1.0	1.0	10000.0	0.00	45.32	23.20	SS
1300.	13.62	6	1.0	1.0	10000.0	0.00	48.31	23.75	SS
1400.	12.55	6	1.0	1.0	10000.0	0.00	51.27	24.29	SS
1500.	11.61	6	1.0	1.0	10000.0	0.00	54.22	24.82	SS
1600.	10.79	6	1.0	1.0	10000.0	0.00	57.16	25.34	SS
1700.	10.06	6	1.0	1.0	10000.0	0.00	60.07	25.85	SS
1800.	9.417	6	1.0	1.0	10000.0	0.00	62.97	26.36	SS
1900.	8.838	6	1.0	1.0	10000.0	0.00	65.86	26.85	SS
2000.	8.588	6	1.0	1.0	10000.0	0.00	68.73	26.48	SS

2100.	8.094	6	1.0	1.0	10000.0	0.00	71.58
26.97	SS						
2200.	7.667	6	1.0	1.0	10000.0	0.00	74.43
27.39	SS						
2300.	7.278	6	1.0	1.0	10000.0	0.00	77.26
27.80	SS						
2400.	6.922	6	1.0	1.0	10000.0	0.00	80.08
28.20	SS						
2500.	6.595	6	1.0	1.0	10000.0	0.00	82.89
28.59	SS						
2600.	6.294	6	1.0	1.0	10000.0	0.00	85.69
28.98	SS						
2700.	6.017	6	1.0	1.0	10000.0	0.00	88.47
29.36	SS						
2800.	5.760	6	1.0	1.0	10000.0	0.00	91.25
29.74	SS						
2900.	5.521	6	1.0	1.0	10000.0	0.00	94.02
30.11	SS						
3000.	5.300	6	1.0	1.0	10000.0	0.00	96.77
30.47	SS						
3500.	4.391	6	1.0	1.0	10000.0	0.00	110.42
32.23	SS						
4000.	3.723	6	1.0	1.0	10000.0	0.00	123.87
33.89	SS						
4500.	3.215	6	1.0	1.0	10000.0	0.00	137.15
35.45	SS						
5000.	2.816	6	1.0	1.0	10000.0	0.00	150.26
36.94	SS						
5500.	2.496	6	1.0	1.0	10000.0	0.00	163.23
38.37	SS						
6000.	2.234	6	1.0	1.0	10000.0	0.00	176.08
39.73	SS						
6500.	2.047	6	1.0	1.0	10000.0	0.00	188.80
40.44	SS						
7000.	1.866	6	1.0	1.0	10000.0	0.00	201.41
41.59	SS						
7500.	1.711	6	1.0	1.0	10000.0	0.00	213.92
42.69	SS						
8000.	1.578	6	1.0	1.0	10000.0	0.00	226.34
43.75	SS						
8500.	1.462	6	1.0	1.0	10000.0	0.00	238.66
44.78	SS						
9000.	1.361	6	1.0	1.0	10000.0	0.00	250.90

```
 45.78    SS
   9500.   1.271        6     1.0    1.0 10000.0    0.00  263.06
 46.74    SS
  10000.   1.191        6     1.0    1.0 10000.0    0.00  275.14
 47.68    SS
  15000.  0.7219        6     1.0    1.0 10000.0    0.00  392.46
 55.17    SS
  20000.  0.5115        6     1.0    1.0 10000.0    0.00  504.83
 60.53    SS
  25000.  0.3916        6     1.0    1.0 10000.0    0.00  613.52
 65.06    SS
  30000.  0.3156        6     1.0    1.0 10000.0    0.00  719.26
 68.85    SS
  40000.  0.2271        6     1.0    1.0 10000.0    0.00  923.75
 74.50    SS
  50000.  0.1761        6     1.0    1.0 10000.0    0.00 1120.83
 79.20    SS

 MAXIMUM 1-HR CONCENTRATION AT OR BEYOND   104. M:
    104.   125.6        4     1.0    1.0   320.0    0.00    9.01
 13.81    SS

  DWASH=   MEANS NO CALC MADE (CONC = 0.0)
  DWASH=NO MEANS NO BUILDING DOWNWASH USED
  DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
  DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
  DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

 ********************************************
      *** REGULATORY (Default) ***
     PERFORMING CAVITY CALCULATIONS
   WITH ORIGINAL SCREEN CAVITY MODEL
           (BRODE, 1988)
 ********************************************


  *** CAVITY CALCULATION - 1 ***        *** CAVITY CALCULATION - 2
***
   CONC (UG/M**3)      =     8.700         CONC (UG/M**3)      =     23
.73
   CRIT WS @10M (M/S) =      1.00         CRIT WS @10M (M/S) =      1
.00
   CRIT WS @ HS (M/S) =      1.00         CRIT WS @ HS (M/S) =      1
```

.00
DILUTION WS (M/S) = 1.00 DILUTION WS (M/S) = 1
.00
CAVITY HT (M) = 13.72 CAVITY HT (M) = 13
.72
CAVITY LENGTH (M) = 80.01 CAVITY LENGTH (M) = 62
.13
ALONGWIND DIM (M) = 100.58 ALONGWIND DIM (M) = 274
.32

****
END OF CAVITY CALCULATIONS
****

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)	
SIMPLE TERRAIN	125.6	104.	0.	
BLDG. CAVITY-1	8.700	80.	--	(DIST = CAVITY LENGTH)
BLDG. CAVITY-2	23.73	62.	--	(DIST = CAVITY LENGTH)

06/15/01

13:13:49
*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Spears Heating Tanks (Unit Calculation)

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.126000
STACK HEIGHT (M)	=	6.4008
STK INSIDE DIAM (M)	=	0.4572
STK EXIT VELOCITY (M/S)	=	11.4988
STK GAS EXIT TEMP (K)	=	293.1500
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	13.7160
MIN HORIZ BLDG DIM (M)	=	100.5840
MAX HORIZ BLDG DIM (M)	=	274.3200

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 6.910 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA

Z (M)	DWASH							
104.	593.6	6	1.0	1.0	10000.0	9.66	4.22	10.43 SS
200.	302.4	6	1.0	1.0	10000.0	9.66	7.73	13.05 SS
300.	201.7	6	1.0	1.0	10000.0	9.66	11.23	13.91 SS
400.	149.8	6	1.0	1.0	10000.0	9.66	14.64	14.78 SS
500.	118.1	6	1.0	1.0	10000.0	9.66	17.97	15.62 SS
600.	96.70	6	1.0	1.0	10000.0	9.66	21.24	16.43 SS
700.	81.36	6	1.0	1.0	10000.0	9.66	24.46	17.22 SS
800.	69.84	6	1.0	1.0	10000.0	9.66	27.63	17.99 SS
900.	60.88	6	1.0	1.0	10000.0	9.66	30.78	18.75 SS
1000.	53.73	6	1.0	1.0	10000.0	9.66	33.88	19.48 SS
1100.	47.92	6	1.0	1.0	10000.0	9.66	36.96	20.20 SS
1200.	43.09	6	1.0	1.0	10000.0	9.66	40.01	20.90 SS
1300.	39.04	6	1.0	1.0	10000.0	9.66	43.04	21.59 SS
1400.	36.58	6	1.0	1.0	10000.0	9.66	46.05	21.53 SS
1500.	33.60	6	1.0	1.0	10000.0	9.66	49.03	22.13 SS
1600.	31.04	6	1.0	1.0	10000.0	9.66	51.99	22.70 SS
1700.	28.79	6	1.0	1.0	10000.0	9.66	54.94	23.26 SS
1800.	26.81	6	1.0	1.0	10000.0	9.66	57.87	23.81 SS
1900.	25.05	6	1.0	1.0	10000.0	9.66	60.78	24.35 SS
2000.	23.48	6	1.0	1.0	10000.0	9.66	63.68	24.88 SS

2100.	22.07	6	1.0	1.0	10000.0	9.66	66.56
25.40	SS						
2200.	20.80	6	1.0	1.0	10000.0	9.66	69.42
25.91	SS						
2300.	19.65	6	1.0	1.0	10000.0	9.66	72.28
26.41	SS						
2400.	18.60	6	1.0	1.0	10000.0	9.66	75.12
26.91	SS						
2500.	18.09	6	1.0	1.0	10000.0	9.66	77.95
26.63	SS						
2600.	17.20	6	1.0	1.0	10000.0	9.66	80.76
27.10	SS						
2700.	16.40	6	1.0	1.0	10000.0	9.66	83.57
27.51	SS						
2800.	15.67	6	1.0	1.0	10000.0	9.66	86.36
27.91	SS						
2900.	14.99	6	1.0	1.0	10000.0	9.66	89.15
28.31	SS						
3000.	14.36	6	1.0	1.0	10000.0	9.66	91.92
28.71	SS						
3500.	11.81	6	1.0	1.0	10000.0	9.66	105.65
30.58	SS						
4000.	9.955	6	1.0	1.0	10000.0	9.66	119.17
32.33	SS						
4500.	8.555	6	1.0	1.0	10000.0	9.66	132.50
33.98	SS						
5000.	7.466	6	1.0	1.0	10000.0	9.66	145.67
35.54	SS						
5500.	6.597	6	1.0	1.0	10000.0	9.66	158.69
37.03	SS						
6000.	5.891	6	1.0	1.0	10000.0	9.66	171.58
38.45	SS						
6500.	5.307	6	1.0	1.0	10000.0	9.66	184.34
39.81	SS						
7000.	4.868	6	1.0	1.0	10000.0	9.66	196.99
40.66	SS						
7500.	4.459	6	1.0	1.0	10000.0	9.66	209.54
41.80	SS						
8000.	4.107	6	1.0	1.0	10000.0	9.66	221.98
42.89	SS						
8500.	3.801	6	1.0	1.0	10000.0	9.66	234.34
43.95	SS						
9000.	3.534	6	1.0	1.0	10000.0	9.66	246.61

```
44.97    SS
  9500.   3.298        6     1.0    1.0 10000.0    9.66  258.79
45.96    SS
 10000.   3.089        6     1.0    1.0 10000.0    9.66  270.90
46.92    SS
 15000.   1.852        6     1.0    1.0 10000.0    9.66  388.43
54.91    SS
 20000.   1.310        6     1.0    1.0 10000.0    9.66  500.95
60.32    SS
 25000.   1.003        6     1.0    1.0 10000.0    9.66  609.75
64.87    SS
 30000.  0.8062        6     1.0    1.0 10000.0    9.66  715.59
68.84    SS
 40000.  0.5802        6     1.0    1.0 10000.0    9.66  920.22
74.49    SS
 50000.  0.4499        6     1.0    1.0 10000.0    9.66 1117.42
79.19    SS

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND   104. M:
   104.   593.6        6     1.0    1.0 10000.0    9.66    4.22
10.43    SS

 DWASH=   MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

 ********************************************
      *** REGULATORY (Default) ***
    PERFORMING CAVITY CALCULATIONS
  WITH ORIGINAL SCREEN CAVITY MODEL
          (BRODE, 1988)
 ********************************************


  *** CAVITY CALCULATION - 1 ***        *** CAVITY CALCULATION - 2
***
   CONC (UG/M**3)      =    20.94         CONC (UG/M**3)      =    57
.12
   CRIT WS @10M (M/S) =     2.13         CRIT WS @10M (M/S) =     2
.13
   CRIT WS @ HS (M/S) =     2.13         CRIT WS @ HS (M/S) =     2
```

```
.13
   DILUTION WS (M/S)  =     1.07        DILUTION WS (M/S)  =     1
.07
   CAVITY HT (M)      =    13.72        CAVITY HT (M)      =    13
.72
   CAVITY LENGTH (M)  =    80.01        CAVITY LENGTH (M)  =    62
.13
   ALONGWIND DIM (M)  =   100.58        ALONGWIND DIM (M)  =   274
.32

 ********************************************
       END OF CAVITY CALCULATIONS
 ********************************************


      ******************************************
      *** SUMMARY OF SCREEN MODEL RESULTS ***
      ******************************************

  CALCULATION          MAX CONC     DIST TO    TERRAIN
   PROCEDURE          (UG/M**3)     MAX (M)     HT (M)
 --------------      -----------    -------    -------
 SIMPLE TERRAIN       593.6           104.         0.

 BLDG. CAVITY-1       20.94            80.        --   (DIST = CAVITY
LENGTH)

 BLDG. CAVITY-2       57.12            62.        --   (DIST = CAVITY
LENGTH)
```

08/01/01
16:29:52

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Spears8 For PVC Molding Vinyl Chloride

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	VOLUME
EMISSION RATE (G/S)	=	0.450000E-02
SOURCE HEIGHT (M)	=	1.2192
INIT. LATERAL DIMEN (M)	=	30.4800
INIT. VERTICAL DIMEN (M)	=	91.4400
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
104.	0.4646	6	1.0	1.0	10000.0	1.22	33.70	91.46	NO

200.	0.4270	6	1.0	1.0 10000.0	1.22	36.66	91.48	NO
300.	0.3941	6	1.0	1.0 10000.0	1.22	39.72	91.50	NO
400.	0.3661	6	1.0	1.0 10000.0	1.22	42.75	91.53	NO
500.	0.3420	6	1.0	1.0 10000.0	1.22	45.75	91.55	NO
600.	0.3209	6	1.0	1.0 10000.0	1.22	48.74	91.57	NO
700.	0.3025	6	1.0	1.0 10000.0	1.22	51.70	91.59	NO
800.	0.2861	6	1.0	1.0 10000.0	1.22	54.65	91.61	NO
900.	0.2715	6	1.0	1.0 10000.0	1.22	57.58	91.63	NO
1000.	0.2583	6	1.0	1.0 10000.0	1.22	60.49	91.65	NO
1100.	0.2465	6	1.0	1.0 10000.0	1.22	63.39	91.68	NO
1200.	0.2357	6	1.0	1.0 10000.0	1.22	66.27	91.70	NO
1300.	0.2259	6	1.0	1.0 10000.0	1.22	69.14	91.72	NO
1400.	0.2168	6	1.0	1.0 10000.0	1.22	72.00	91.74	NO
1500.	0.2086	6	1.0	1.0 10000.0	1.22	74.84	91.76	NO
1600.	0.2009	6	1.0	1.0 10000.0	1.22	77.67	91.78	NO
1700.	0.1938	6	1.0	1.0 10000.0	1.22	80.49	91.80	NO
1800.	0.1873	6	1.0	1.0 10000.0	1.22	83.29	91.82	NO
1900.	0.1811	6	1.0	1.0 10000.0	1.22	86.09	91.85	NO
2000.	0.1754	6	1.0	1.0 10000.0	1.22	88.88	91.87	NO
2100.	0.1701	6	1.0	1.0 10000.0	1.22	91.65	91.89	NO
2200.	0.1651	6	1.0	1.0 10000.0	1.22	94.42	91.91	NO
2300.	0.1603	6	1.0	1.0 10000.0	1.22	97.17	91.93	NO
2400.	0.1559	6	1.0	1.0 10000.0	1.22	99.92	91.95	NO
2500.	0.1517	6	1.0	1.0 10000.0	1.22	102.65	91.97	NO
2600.	0.1477	6	1.0	1.0 10000.0	1.22	105.38	91.99	NO
2700.	0.1440	6	1.0	1.0 10000.0	1.22	108.10	92.01	NO
2800.	0.1404	6	1.0	1.0 10000.0	1.22	110.82	92.03	NO
2900.	0.1371	6	1.0	1.0 10000.0	1.22	113.52	92.06	NO
3000.	0.1338	6	1.0	1.0 10000.0	1.22	116.22	92.08	NO
3500.	0.1199	6	1.0	1.0 10000.0	1.22	129.59	92.18	NO
4000.	0.1087	6	1.0	1.0 10000.0	1.22	142.79	92.29	NO
4500.	0.9948E-01	6	1.0	1.0 10000.0	1.22	155.84	92.39	NO
5000.	0.9176E-01	6	1.0	1.0 10000.0	1.22	168.76	92.49	NO
5500.	0.8520E-01	6	1.0	1.0 10000.0	1.22	181.55	92.60	NO

6000.	0.7955E-01	6	1.0	1.0	10000.0	1.22	194.22	92.70	NO
6500.	0.7464E-01	6	1.0	1.0	10000.0	1.22	206.79	92.80	NO
7000.	0.7031E-01	6	1.0	1.0	10000.0	1.22	219.26	92.90	NO
7500.	0.6649E-01	6	1.0	1.0	10000.0	1.22	231.63	93.00	NO
8000.	0.6307E-01	6	1.0	1.0	10000.0	1.22	243.92	93.10	NO
8500.	0.6000E-01	6	1.0	1.0	10000.0	1.22	256.12	93.20	NO
9000.	0.5723E-01	6	1.0	1.0	10000.0	1.22	268.25	93.30	NO
9500.	0.5471E-01	6	1.0	1.0	10000.0	1.22	280.30	93.40	NO
10000.	0.5241E-01	6	1.0	1.0	10000.0	1.22	292.28	93.50	NO
15000.	0.3709E-01	6	1.0	1.0	10000.0	1.22	408.78	94.48	NO
20000.	0.2884E-01	6	1.0	1.0	10000.0	1.22	520.56	95.41	NO
25000.	0.2365E-01	6	1.0	1.0	10000.0	1.22	628.79	96.32	NO
30000.	0.2007E-01	6	1.0	1.0	10000.0	1.22	734.16	97.20	NO
40000.	0.1544E-01	6	1.0	1.0	10000.0	1.22	938.05	98.87	NO
50000.	0.1257E-01	6	1.0	1.0	10000.0	1.22	1134.67	100.44	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 104. M:

104.	0.4646	6	1.0	1.0	10000.0	1.22	33.70	91.46	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	0.4646	104.	0.