MARYLAND DEPARTMENT OF THE ENVIRONMENT

AIR AND RADIATION ADMINISTRATION
APPLICATION FOR A PERMIT TO CONSTRUCT

DOCKET #22-21

COMPANY: Elite Comfort Solutions LLC

LOCATION: 1900 Clark Road, Havre de Grace, MD 21078

APPLICATION: Installation of a flexible polyurethane foam manufacturing facility

ITEM	DESCRIPTION
1	Notice of Application and Opportunity to Request an Informational Meeting
2	Permit to Construct Application Forms
3	Emission Calculations
4	Safety Data Sheets
5	Air Dispersion Modeling
6	Vendor/Manufacturer Specifications
7	Zoning Approval

DEPARTMENT OF THE ENVIRONMENT
AIR AND RADIATION ADMINISTRATION

NOTICE OF APPLICATION AND
OPPORTUNITY TO REQUEST AN INFORMATIONAL MEETING

The Maryland Department of the Environment, Air and Radiation Administration (ARA) received a permit-to-construct application from Elite Comfort Solutions LLC on October 5, 2021 for the installation of a flexible polyurethane foam manufacturing facility. The proposed installation will be located at 1900 Clark Road, Havre de Grace, MD 21078.

The application and other supporting documents are available for public inspection on the Department's website. Look for Docket #22-21 at the following link:

https://mde.maryland.gov/programs/Permits/AirManagementPermits/Pages/index.aspx

Pursuant to the Environment Article, Section 1-603, Annotated Code of Maryland, the Department will hold an informational meeting to discuss the application and the permit review process if the Department receives a written request for a meeting within 10 working days from the date of the second publication of this notice. All requests for an informational meeting should be emailed to Ms. Shannon Heafey at shannon.heafey@maryland.gov.

Further information may be obtained by contacting Ms. Shannon Heafey by email at shannon.heafey@maryland.gov or by phone at (410) 537-4433.

George S. Aburn, Jr., Director
Air and Radiation Administration

Wood Environment & Infrastructure Solutions, Inc.
10940 White Rock Road, Suite 190
Rancho Cordova, CA 95670
USA

T: 916-636-3200

www.woodplc.com

October 4, 2021

Project No. SA21171110.2000

Suna Yi Sariscak
Maryland Department of the Environment
Air and Radiation Management Administration, Air Quality Permits Program
1800 Washington Boulevard
Baltimore, MD 21230

Subject: Permit to Construct Application
Elite Comfort Solutions LLC (ECS) – Flexible Polyurethane Foam (PUF) Manufacturing Facility
Havre De Grace, Maryland

Dear Ms. Sariscak,

Please find enclosed a *Permit to Construct Application*, including all necessary supporting forms and information, for Elite Comfort Solutions LLCs (ECS) proposed new flexible polyurethane foam (PUF) manufacturing facility, to be constructed at 1900 Clark Road, Havre De Grace, Maryland (Harford County).

From an ambient air quality perspective, Harford County is currently designated as marginal nonattainment area for 8-hr Ozone (2015). Therefore, the pertinent major stationary source thresholds for the proposed location are as follows, as defined by the Maryland Department of the Environment (MDE) at COMAR 26.11.02.01.C:

- 100 tons/year (tons/yr) or more of PM10, sulfur oxides (SOx), or carbon monoxide (CO);
- 25 tons/yr or more of nitrogen oxides (NOx) or volatile organic compounds (VOCs);
- 25 tons/yr or more of a combination of hazardous air pollutant (HAP); and
- 10 tons/yr or more of an individual HAP.

Relative to the nature of ECS' proposed operations, VOCs are the dictating pollutant in terms of major source thresholds. ECS plans to limit VOCs to below 25 tons/yr in order to qualify as a synthetic minor source.

This application package contains the following components:

- Application Checklist
- Form 5
- Form 5T
- Form 5EP
- Form 6
- Site Plan Map (Figure 1)

- Process Flow Diagram (Figure 2)
- Potential Emissions Calculations (Attachment 1)
- Storage Tank Farm Inventory (Attachment 2)
- Safety Data Sheets (Attachment 3)
- T-BACT Evaluation (Attachment 4)
- Air Dispersion Modeling Analysis & Documentation (AERMOD) (Attachment 5)
- Vendor/Manufacturer Specifications (Attachment 6)
- Certificate of Insurance (Workers Compensation) (Attachment 7)
- Zoning Approval Documentation (Attachment 8)

An introduction and overview of the proposed facility is provided below, including process description, emission estimates, T-BACT, and air dispersion modeling.

Description of Proposed Operations

The proposed facility will manufacture flexible polyurethane foam (PUF), consisting of raw materials receiving and storage, a slabstock polyurethane foam line, foam cure area, fabrication, cleaning operations, and ancillary equipment. The foam is produced using the main ingredients of polyol, toluene diisocyanate (TDI), 4,4'-diphenylmethane diisocyanate (4,4'-MDI), and polymeric diphenylmethane diisocyanate (pMDI). Acetone will be used as an auxiliary blowing agent (ABA) to produce the desired density and cellular structure of the foam. Both 2,4-TDI (CAS# 584-84-9) and 2,6-TDI (CAS# 91-08-7) are used in the foam blend. TDI, MDI, and acetone are all toxic air pollutants (TAPs) as identified within MDE TAP regulations at COMAR 26.11.16.06 and .07. As such, ECS recognizes it must demonstrate compliance with the ambient impact requirements per MDE TAP regulations at COMAR 26.11.15.06.

Facility operations are subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Flexible Polyurethane Foam Production and Fabrication Area Sources (40 CFR 63, Subpart OOOOOO). ECS complies with this standard by not using methylene chloride for any purpose at the facility (40 CFR 63.11416(b)(2)). Acetone, as identified above, will be used as an alternative ABA, as established in the referenced NESHAP and related background documents, representing a non-HAP, non-VOC material. ECS will demonstrate compliance by maintaining the required material usage records and associated Safety Data Sheets.

In terms of process flow, TDI, MDI, polyol, and acetone are delivered and unloaded from a tanker truck or to storage tanks. Polyol will also be delivered via railcars, and possibly TDI and MDI. The acetone storage tanks will be equipped with a vapor return line to the tanker truck, and pressure relief valve. A carbon drum will be equipped on each isocyanate storage tank. The temperature of the raw materials will be adjusted by heating or cooling with a heat exchanger before metering the chemicals to the pourline mixing head. Reactants are metered in with the primary raw materials at the mixing head. All operations to this point are closed pipe systems, and all products in the liquid form. Once mixed, the product is poured on a conveyor. The conveyor is fully enclosed on three sides, with five (5) ducts venting from the top of the enclosed line. The ducts draw air through the enclosed conveyor line through openings at the front and exit of the line. At both the entrance and exit points of the enclosed conveyor there is a negative pressure gradient, wherein air is pulled into the openings and exhausted through the five (5) ducts. Air drawn from the enclosed conveyor is discharged through a single vertical exhaust stack at the foam line (i.e., pour line) (SN-01). A single vertical stack will exhaust one blower at the foam cure area (SN-02).

The stack locations are provided in attached Site Plan Map (Figure 1). A process flow diagram of the polyurethane foam process is provided as Figure 2.

Production Rates / Potential Emission Estimates

Emissions calculations for VOCs, consisting of TDI, MDI, organic component of polyol, and acetone (exempt as a VOC, but a listed Class II TAP) from the foam manufacturing process (including storage tanks), cleaning operations, and ancillary exempt operations are provided in Attachment 1.

PUF Manufacturing Process

Potential air emission calculations were developed for the proposed facility based on metering throughput, engineering emission factors, and application of T-BACT. The maximum metering throughput of raw materials (i.e., TDI, MDI, polyol, and acetone) is proposed to be limited in order to maintain synthetic minor status at less than 25 tons/yr VOCs for the facility.

In 1993, the Polyurethane Foam Association (PFA) documented a total TDI (and VOC) emission factor of 34 pounds per million pounds of TDI usage, which is used herein (0.0034%). The TDI compound used at the facility is actually a mixture of 2,4-TDI and 2,6-TDI (80 and 20 percent, by weight in the total mixture, respectively, as noted in the PFA document). The PFA indicates that TDI emissions from storage/transfer and PUF curing are orders of magnitude below the stack emissions generated during PUF production. Therefore, all TDI emissions were assumed to be emitted from the pour line stack, SN-01.

The vapor pressure of 4,4'-MDI is about 100 times lower than TDI. Therefore, the MDI emission factor would be approximately 0.000034% of the MDI used. To be conservative, it is assumed that the MDI is composed of 100% 4,4'-MDI even though the SDS shows a maximum content of 40% by weight, with at least 60% represented by pMDI. MDI has a vapor pressure of 0.00335 mmHg[1] at 80°C, and TDI has a vapor pressure of 0.01 mmHg at 80°C[2], which is the average internal temperature of the curing slabstock. Therefore, the emission factor of 0.0034% for TDI was reduced by 67% (0.00335/0.01) to account for the difference in vapor pressure and a conservative emission factor of 0.0011% was used for 4,4'-MDI and pMDI.

Acetone emissions were based on a metering rate of 16 kg/min and its use as a blowing agent will produce emissions at a 100% loss (i.e., lb emission / lbs used).

In order to calculate the potential VOC/HAP emissions as a result of TDI usage, the two TDI emission factors (total TDI – VOC, and 2,4-TDI – HAP) were combined with the maximum usage of TDI as reported by facility operations personnel (the formulation with the highest TDI content will be limited to 200 kg of TDI per minute). This same metering rate also applies to MDI.

The maximum quantity of TDI and MDI that could be used annually is determined by assuming that this maximum usage rate occurs continuously for an operating schedule of 15.44 hours /day, 312 days/yr (4,819 hrs/yr). ECS is requesting that limits be based on raw material throughputs rather than operating hours, as discussed below.

Minor quantities of VOC are also present in the polyol compounds mixed with TDI to create the foam products. Based upon information from the polyol supplier, the maximum VOC present in the polyol is 0.02% by weight (this equates to 200 pounds per million pounds of polyol usage). No HAPs are present in the polyol compound.

[1] https://www.americanchemistry.com/industry-groups/diisocyanates-dii/resources/mdi-vapor-pressure-chart
[2] https://www.americanchemistry.com/industry-groups/diisocyanates-dii/resources/tdi-mixed-isomers-vapor-pressure-chart

Refer to Attachment 1 for emissions associated with the foam manufacturing process. Restricted potential emissions are based on the aforementioned emission factors in conjunction with limited raw material metering rates, and a VOC control efficiency of 92% with implementation of carbon adsorption for TDI and MDI based on the T-BACT study discussed below. There are other compounds used in the process which do not contribute to VOC emissions as they are mainly non-volatile binders or catalysts for the TDI reaction. SDS for the primary materials used in the process are provided in Attachment 3.

Bulk storage tanks are used for the storage of TDI, MDI, polyol compounds, and acetone. All of these tanks are located indoors. The full tank farm inventory is shown in Attachment 2, which features eighteen tanks for polyol storage. SDS for these materials are provided in Attachment 3 of this application. As noted on the SDS, the true vapor pressure of all stored chemicals is well below 2 millimeters of mercury, except for acetone. Based upon the very low vapor pressure of these compounds (as confirmed by the PFA information), emissions from the storage tanks are shown in Attachment 1 to be negligible compared to the process-based emissions noted above. Attachment 1 contains TankESP software runs to characterize uncontrolled emissions of TDI, MDI, polyol, and acetone. Due to the nature of TDI and MDI, storage tanks for these substances will be equipped with a carbon drum. The 10,000-gallon acetone tank will feature a vapor recovery return line, which will control calculated acetone emissions via TankESP by an estimated 99%.

The polyol tanks (18), a silicone surfactant (DC5986), and an additive (SRT-2000) are proposed as exempt from permit to construct requirements in accordance with COMAR 26.11.02.10 Q.(5) Containers, reservoirs, or tanks used exclusively for unheated storage of VOC with an initial boiling point of 300°F (149°C) or greater. Refer to Attachment 3 for SDS for the subject materials.

Cleaning Operations

Based on experience at other ECS facilities, the facility will use approximately 3 drums (165 gallons) of Dzolv annually for cleaning purposes per 34 million pounds of polyol usage. The Dzolv compound contains 72% VOC, based upon the SDS. In order to estimate potential emissions associated with Dzolv usage, this usage rate must be adjusted (increased) based upon the ratio of maximum annual polyol usage of 206 million pounds compared to polyol usage corresponding to 3 drums of Dzolv (approximately 34 million pounds of polyol annually). This yields an emission factor of 3.18×10^{-5} lbs VOC / lbs polyol consumed. Refer to Attachment 1 for potential VOC emissions calculations for cleaning operations.

Space Heaters

The proposed facility includes four (4) existing natural gas-fired space heaters, three (3) with a maximum heat input rating of 3.5 MMBTU/hr each, and one (1) with a maximum heat input rating of 1.7 MMBTU/hr, from the previous tenant. This fuel burning equipment is characterized on Form 11. Potential emissions of criteria pollutants, HAPs, and greenhouse gases (GHGs) are contained within Attachment 1.

ECS intends to apply for Air Quality General Permits to Construct for these space heaters under separate cover in order to utilize this equipment sooner than the standard permit to construct timeline will allow. The space heaters are eligible for a general permit as small fuel burning equipment with a rated heat input of 1 million BTU per hour up to 10 million BTU per hour which burn natural gas, liquid petroleum (propane), or distillate fuel oils (No 1 and No 2 Fuel Oil).

Other Exempt Emission Units

ECS will install or utilize the following internal combustion engine equipment:

- Existing onsite emergency generator – Diesel-fired, <197 HP
- Existing onsite fire pump - PEERLESS 6AEF12, Diesel-fired, 197 HP
- New emergency generator – Diesel-fired, 134 HP (100 Kw)

Potential emissions of criteria pollutants, HAPs, and greenhouse gases (GHGs) are contained within Attachment 1.

This equipment is exempt from a permit to construct in accordance with COMAR 26.11.02.10.E but will comply with the applicable Federal Reciprocating Internal Combustion Engines (RICE) regulations codified at 40 CFR 63, Subpart ZZZZ and 40 CFR 60, Subpart IIII.

Proposed Throughput / Emissions Limitations

Total VOC emissions are proposed to be limited to <25 tons/yr, based on the ECS' desire to maintain synthetic minor status for the proposed facility and otherwise to demonstrate compliance with ambient air quality requirements for TAPs. Corresponding metering (i.e., throughput) rates are provided in Attachment 1 and are summarized as follows. These values do not represent the maximum production rate of the foam line.

Raw Material	Metering Rate			
	kg/min	lbs/hr	lbs/yr	tons/yr
Polyol	323	42,723	205,872,092	102,936
TDI	200	26,454	127,474,980	63,737
MDI	200	26,454	127,474,980	63,737
Acetone	16	2,116	10,197,998	5,099

ECS is requesting that limits be based on the annual metering rates above (lbs/yr), rather than operating hours per year.

T-BACT

A T-BACT evaluation has been conducted for TDI, MDI and acetone, with determination of carbon adsorption as T-BACT for TDI and MDI. Refer to Attachment 4 for the T-BACT evaluation for the proposed facility.

Air Dispersion Modeling

Air dispersion modeling has been conducted for the applicable TAPs emitted from the proposed facility to demonstrate compliance with the ambient impact requirements per MDE TAP regulations codified at COMAR 26.11.15.06. Dispersion modeling has been conducted in accordance with the modeling protocol provided to MDE and the MDE modeling guidelines. First, proposed emissions from all new sources were compared to the allowable emission rates (AER) for those TAP to determine compliance with the ambient impact requirements per TAP Compliance Demonstration Guidance (dated 03-21-2016). For TAPs with emissions less than the calculated AER, no additional modeling is required. Based on the potential emissions calculations, the project emissions for 4,4'-MDI and pMDI fall below the AER. Therefore, no further modeling was required for 4,4'-MDI / pMDI.

To this end, air dispersion modeling has been limited to TDI and acetone. Attachment 5 contains the ambient impact compliance demonstration for TDI and acetone.

If you have any questions or concerns regarding any part of this application, please initially contact Joe Metcalf at 417-358-8131 or joe.metcalf@leggett.com. Thank you in advance for your assistance with this application package.

Sincerely yours,
Wood Environment & Infrastructure Solutions, Inc.

Christopher Dunay
Senior Associate Scientist
Direct Tel.: (412) 596-6464
E-mail: christopher.dunay@woodplc.com

Caryn A. Kelly, CPPS
Senior Associate Toxicologist
Direct Tel.: (916) 853-8904
E-mail: caryn.kelly@woodplc.com

Attachments

Application Checklist and MDE Forms
Figures
Attachment 1 Potential Emissions Calculations
Attachment 2 Storage Tank Farm Inventory
Attachment 3 Safety Data Sheets
Attachment 4 T-BACT Evaluation
Attachment 5 Air Dispersion Modeling Analysis & Documentation
Attachment 6 Vendor/Manufacturer Specifications
Attachment 7 Certificate of Insurance (Workers Compensation)
Attachment 8 Zoning Approval Documentation

Application Checklist and MDE Forms

AIR QUALITY PERMIT TO CONSTRUCT APPLICATION CHECKLIST

OWNER OF EQUIPMENT/PROCESS	
COMPANY NAME:	Elite Comfort Solutions LLC
COMPANY ADDRESS:	24 Herring Road, Newnan, Georgia 30265
LOCATION OF EQUIPMENT/PROCESS	
PREMISES NAME:	Elite Comfort Solutions LLC
PREMISES ADDRESS:	1900 Clark Road, Havre De Grace, Maryland
CONTACT INFORMATION FOR THIS PERMIT APPLICATION	
CONTACT NAME:	Joe Metcalf
JOB TITLE:	Director of EHS
PHONE NUMBER:	417-358-8131 ext. 3398
EMAIL ADDRESS:	joe.metcalf@leggett.com
DESCRIPTION OF EQUIPMENT OR PROCESS	
Foam Manufacturing Facility (see cover letter for more details)	

Application is hereby made to the Department of the Environment for a Permit to Construct for the following equipment or process as required by the State of Maryland Air Quality Regulation, COMAR 26.11.02.09.

Check each item that you have submitted as part of your application package.

☒ Application package cover letter describing the proposed project

☒ Complete application forms (Note the number of forms included or NA if not applicable.)

No. 4 Form 5
No. 1 Form 5T
No. 5 Form 5EP
No. 1 Form 6
No. NA Form 10
No. NA Form 11
No. NA Form 41
No. NA Form 42
No. NA Form 44

☒ Vendor/manufacturer specifications/guarantees

☒ Evidence of Workman's Compensation Insurance

☒ Process flow diagrams with emission points

☒ Site plan including the location of the proposed source and property boundary

☒ Material balance data and all emissions calculations

☒ Material Safety Data Sheets (MSDS) or equivalent information for materials processed and manufactured.

☐ Certificate of Public Convenience and Necessity (CPCN) waiver documentation from the Public Service Commission (1)

☐ Documentation that the proposed installation complies with local zoning and land use requirements (2)

(1) Required for emergency and non-emergency generators installed on or after October 1, 2001 and rated at 2001 kW or more.

(2) Required for applications subject to Expanded Public Participation Requirements.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪1-800-633-6101 ▪ www.mde.state.md.us
Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ❑ Initial Registration ❑

1A. Owner of Equipment/Company Name
Elite Comfort Solutions LLC

Mailing Address
24 Herring Road
Street Address
Newnan | GA | 30265
City | State | Zip

Telephone Number
(770) 254-8653

Signature
Tim Maharrey

Tim Maharrey, VP Operations | 09/24/2021
Print Name and Title | Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER
County No. (1-2) | Premises No. (3-6)
Registration Class (7) | Equipment No. (8-11)
Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)
1900 Clark Road
Street Number and Street Name
Havre De Grace | MD | 21078 | ( ) Telephone Number
City/Town | State | Zip

Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status	New Construction Begun (MM/YY)	New Construction Completed (MM/YY)	Existing Initial Operation (MM/YY)
A	0122	0822	
15	16-19	20-23	20-23

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
Hennecke QFM Pourline and Foam Cure Area

5. Workmen's Compensation Coverage WLR C67464199 (Binder/Policy Number) 11/01/2021 (Expiration Date)
Company Willis Towers Watson Midwest, Inc
NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time N/A

6B. Number of Stack/Emission Points Associated with this Equipment Two

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company Hennecke GmbH

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Flexible polyurethane foam (PUF) manufacturing facility

9. Control Devices Associated with this Equipment

None ☐ 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
☐	☐	☐	☒	☐	☐	☐	☐
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other ☐ Describe_____ 24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS _____ (Specify Type) ☐ 66-1 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

OTHER FUEL _____ (Specify Type) ☐ 66-2 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
☒	☐		☐	15	6	312
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent	(Total Seasons= 100%)
☒					
76	77-78	79-80	81-82	83-84	

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) N (85)

Refer to Form 5EP, SN-01 and SN-02

If not, then	Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (°F)	Exit Velocity (FT/SEC)
	(86-88)	(89-91)	(92-95)	(96-98)

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? N (Y or N)

NAME	CAS NO. (IF APPLICABLE)	INPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Polyol		42,723	lbs	205,872,092	lbs
2. Toluene diisocyanate	584-84-9	26,454	lbs	127,474,980	lbs
3. 4,4-diphenylmethane diisocyanate	101-68-8	26,454	lbs	127,474,980	lbs
4. Acetone	67-64-1	2,116	lbs	10,197,998	lbs
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Polyurethane Foam		64,085	lbs	308,808,138	lbs
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Negligible					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	133.1	0
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	20.96	0
150-154	155-159	160-164

Method Used to Determine Emissions (1= Estimate 2= Emission Factor 3= Stack Test 4= Other)

TSP	SOX	NOX	CO	VOC	PM10
				2	
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Air and Radiation Management Administration ● Air Quality Permits Program
1800 Washington Boulevard ● Baltimore, Maryland 21230
(410)537-3225 ● 1-800-633-6101● www.mde.maryland.gov

FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Elite Comfort Solutions LLC

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
SN-01

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
Hennecke QFM Pourline controlled by carbon adsorption system (5 carbon adsorbers in parallel)

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	C	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	15.4	Spring Percent	
Days per week:	6	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):	70	Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):	35				
Exit temperature (ºF):	80	Inside diameter at top of round stack (ft):		6	
Exit velocity (ft/min):	3,540	Distance from emission point to nearest property line (ft):		259	
Exhaust gas volumetric flow rate (acfm):	100,091	Building dimensions if emission point is located on building (ft)	Height: 35.1	Length: 1,135.2	Width: 600.4

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☐ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☐ Dust Suppression System No. _____
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☒ Carbon Adsorber No. 5
  - ☒ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	N/A	N/A		
Particulate Matter (filterable as PM2.5)	N/A	N/A		
Particulate Matter (condensables)	N/A	N/A		
Volatile Organic Compounds (VOC)		8.62	133	20.76
Oxides of Sulfur (SOx)	N/A	N/A		
Oxides of Nitrogen (NOx)	N/A	N/A		
Carbon Monoxide (CO)	N/A	N/A		
Lead (Pb)	N/A	N/A		
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)	N/A	N/A		
Methane (CH_4)	N/A	N/A		
Nitrous Oxide (N_2O)	N/A	N/A		
Hydrofluorocarbons (HFCs)	N/A	N/A		
Perfluorocarbons (PFCs)	N/A	N/A		
Sulfur Hexafluoride (SF6)	N/A	N/A		
Total GHG (as CO_2e)	N/A	N/A		
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
2,4-Toluene diisocyanate		0.018	0.28	0.043
Methylene diphenyl diisocyanate		0.000237	0.004	0.0006

(Attach additional sheets as necessary.)

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FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Elite Comfort Solutions LLC

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
SN-02

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
Cure Area with one exhaust blower

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	C	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	15.4	Spring Percent	
Days per week:	6	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):	70	Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):	35				
Exit temperature (ºF):	80	Inside diameter at top of round stack (ft):		6	
Exit velocity (ft/min):	3,960	Distance from emission point to nearest property line (ft):		390	
Exhaust gas volumetric flow rate (acfm):	111,966	Building dimensions if emission point is located on building (ft)	Height: 35.1	Length: 1,135.2	Width: 600.4

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☒ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☐ Dust Suppression System No. _____
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☐ Carbon Adsorber No. _____
  - ☐ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	N/A	N/A		
Particulate Matter (filterable as PM2.5)	N/A	N/A		
Particulate Matter (condensables)	N/A	N/A		
Volatile Organic Compounds (VOC)	N/A	N/A		
Oxides of Sulfur (SOx)	N/A	N/A		
Oxides of Nitrogen (NOx)	N/A	N/A		
Carbon Monoxide (CO)	N/A	N/A		
Lead (Pb)	N/A	N/A		
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)	N/A	N/A		
Methane (CH_4)	N/A	N/A		
Nitrous Oxide (N_2O)	N/A	N/A		
Hydrofluorocarbons (HFCs)	N/A	N/A		
Perfluorocarbons (PFCs)	N/A	N/A		
Sulfur Hexafluoride (SF6)	N/A	N/A		
Total GHG (as CO_2e)	N/A	N/A		
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
N/A	N/A	N/A		

(Attach additional sheets as necessary.)

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FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Elite Comfort Solutions LLC

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
FUG-01

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
Cleaning Operations (Dzolv)

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	I	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	15.4	Spring Percent	
Days per week:	6	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):	N/A	Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):	N/A				
Exit temperature (ºF):	Ambient	Inside diameter at top of round stack (ft):			
Exit velocity (ft/min):	N/A	Distance from emission point to nearest property line (ft):		259	
Exhaust gas volumetric flow rate (acfm):	N/A	Building dimensions if emission point is located on building (ft)	Height N/A	Length N/A	Width N/A

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

☒ None

☐ Baghouse No. _____

☐ Cyclone No. _____

☐ Elec. Precipitator (ESP) No. _____

☐ Dust Suppression System No. _____

☐ Venturi Scrubber No. _____

☐ Spray Tower/Packed Bed No. _____

☐ Carbon Adsorber No. _____

- ☐ Cartridge/Canister
- ☐ Regenerative

☐ Thermal Oxidizer No. _____

- ☐ Regenerative

☐ Catalytic Oxidizer No. _____

☐ Nitrogen Oxides Reduction No. _____

- ☐ Selective ☐ Non-Selective
- ☐ Catalytic ☐ Non-Catalytic

☐ Other No. _____
Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	N/A	N/A		
Particulate Matter (filterable as PM2.5)	N/A	N/A		
Particulate Matter (condensables)	N/A	N/A		
Volatile Organic Compounds (VOC)		1.36	21.0	3.27
Oxides of Sulfur (SOx)	N/A	N/A		
Oxides of Nitrogen (NOx)	N/A	N/A		
Carbon Monoxide (CO)	N/A	N/A		
Lead (Pb)	N/A	N/A		
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)	N/A	N/A		
Methane (CH_4)	N/A	N/A		
Nitrous Oxide (N_2O)	N/A	N/A		
Hydrofluorocarbons (HFCs)	N/A	N/A		
Perfluorocarbons (PFCs)	N/A	N/A		
Sulfur Hexafluoride (SF6)	N/A	N/A		
Total GHG (as CO_2e)	N/A	N/A		
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
N/A	N/A	N/A		

(Attach additional sheets as necessary.)

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Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name
Elite Comfort Solutions LLC

Mailing Address
24 Herring Road
Street Address

Newnan | GA | 30265
City | State | Zip

Telephone Number
(770) 254-8653

Signature
Tim Maharrey

Tim Maharrey, VP Operations | 09/24/2021
Print Name and Title | Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) | Premises No. (3-6)
Registration Class (7) | Equipment No. (8-11)
Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)
1900 Clark Road
Street Number and Street Name

Havre De Grace | MD | 21078 | ( ) Telephone Number
City/Town | State | Zip

Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status	New Construction Begun (MM/YY)	New Construction Completed (MM/YY)	Existing Initial Operation (MM/YY)
A	0122	0822	
15	16-19	20-23	20-23

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
TDI Storage Tanks - Four (4) 20,000 gallon with carbon drum

5. Workmen's Compensation Coverage WLR C67464199 (Binder/Policy Number) 11/01/2021 (Expiration Date)
Company Willis Towers Watson Midwest, Inc
NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 4

6B. Number of Stack/Emission Points Associated with this Equipment 4

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company To be determined _____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Flexible polyurethane foam (PUF) manufacturing facility

9. Control Devices Associated with this Equipment

None ☐ 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
☐	☐	☐	☒	☐	☐	☐	☐
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

☐ Describe_____

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS _____ (Specify Type) ☐ 66-1 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

OTHER FUEL _____ (Specify Type) ☐ 66-2 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
☒	☐		☐	15	6	312
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent	(Total Seasons= 100%)
☒					
76	77-78	79-80	81-82	83-84	

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) N (85)

To be determined

If not, then	Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (ºF)	Exit Velocity (FT/SEC)
	(86-88)	(89-91)	(92-95)	(96-98)

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? N (Y or N)

			INPUT RATE		
NAME	CAS NO. (IF APPLICABLE)	PER HOUR	UNITS	PER YEAR	UNITS
1. TDI (total for all tanks)		44,000	lbs	127,474,980	lbs
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

			OUTPUT RATE		
NAME	CAS NO. (IF APPLICABLE)	PER HOUR	UNITS	PER YEAR	UNITS
1. TDI (total for all tanks)		26,454	lbs	127,474,980	lbs
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

			OUTPUT RATE		
NAME	CAS NO. (IF APPLICABLE)	PER HOUR	UNITS	PER YEAR	UNITS
1. Negligible					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	See Attachment 1	0
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	0	0
150-154	155-159	160-164

Method Used to Determine Emissions (1= Estimate 2= Emission Factor 3= Stack Test 4= Other)

TSP	SOX	NOX	CO	VOC	PM10
				2	
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code	VOC Code	SIP Code	Regulation Code	Confidentiality
208-210	211 212	213 214	215-218	219

Point Description (220-238)

Action (239) A: Add C: Change

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FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Elite Comfort Solutions LLC

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
To be determined

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
TDI Storage Tanks - Four (4) 20,000 gallon tanks with carbon adsorber drums

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	I	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	15.4	Spring Percent	
Days per week:	6	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):	TBD	Length and width dimensions at top of rectangular stack (ft):	Length:	Width:
Height above structures (ft):	TBD			
Exit temperature (ºF):	Ambient	Inside diameter at top of round stack (ft):		
Exit velocity (ft/min):	TBD	Distance from emission point to nearest property line (ft):		TBD
Exhaust gas volumetric flow rate (acfm):		Building dimensions if emission point is located on building (ft)	Height	Length / Width

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☐ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☐ Dust Suppression System No. _____
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☒ Carbon Adsorber No. 4
  - ☐ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	N/A	N/A		
Particulate Matter (filterable as PM2.5)	N/A	N/A		
Particulate Matter (condensables)	N/A	N/A		
Volatile Organic Compounds (VOC)		0.00004	0.0006	0.0001
Oxides of Sulfur (SOx)	N/A	N/A		
Oxides of Nitrogen (NOx)	N/A	N/A		
Carbon Monoxide (CO)	N/A	N/A		
Lead (Pb)	N/A	N/A		
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)	N/A	N/A		
Methane (CH_4)	N/A	N/A		
Nitrous Oxide (N_2O)	N/A	N/A		
Hydrofluorocarbons (HFCs)	N/A	N/A		
Perfluorocarbons (PFCs)	N/A	N/A		
Sulfur Hexafluoride (SF6)	N/A	N/A		
Total GHG (as CO_2e)	N/A	N/A		
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
2,4-Toluene diisocyanate		0.00004	0.0006	0.0001

(Attach additional sheets as necessary.)

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APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ❑ Initial Registration ❑

1A. Owner of Equipment/Company Name
Elite Comfort Solutions LLC

Mailing Address
24 Herring Road
Street Address
Newnan | GA | 30265
City | State | Zip

Telephone Number
(770) 254-8653

Signature
Tim Maharrey

Tim Maharrey, VP Operations | 09/24/2021
Print Name and Title | Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER
County No. (1-2) | Premises No. (3-6)
Registration Class (7) | Equipment No. (8-11)
Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)
1900 Clark Road
Street Number and Street Name
Havre De Grace | MD | 21078 | ( ) Telephone Number
City/Town | State | Zip

Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status	New Construction Begun (MM/YY)	New Construction Completed (MM/YY)	Existing Initial Operation (MM/YY)
A	0122	0822	
15	16-19	20-23	20-23

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
MDI Storage Tanks - Four (4) 20,000 gallon with carbon drum

5. Workmen's Compensation Coverage WLR C67464199 (Binder/Policy Number) 11/01/2021 (Expiration Date)
Company Willis Towers Watson Midwest, Inc
NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 4

6B. Number of Stack/Emission Points Associated with this Equipment 4

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company To be determined _____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Flexible polyurethane foam (PUF) manufacturing facility

9. Control Devices Associated with this Equipment

None ☐ 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
☐	☐	☐	☒	☐	☐	☐	☐
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

☐ Describe_____

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS _____ (Specify Type) ☐ 66-1 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

OTHER FUEL _____ (Specify Type) ☐ 66-2 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
☒	☐		☐	15	6	312
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent	(Total Seasons= 100%)
☒					
76	77-78	79-80	81-82	83-84	

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) [N] (85)

To be determined

If not, then	Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (ºF)	Exit Velocity (FT/SEC)
	[ ][ ][ ] (86-88)	[ ][ ][ ] (89-91)	[ ][ ][ ][ ] (92-95)	[ ][ ][ ] (96-98)

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? [N] (Y or N)

		INPUT RATE			
NAME	CAS NO. (IF APPLICABLE)	PER HOUR	UNITS	PER YEAR	UNITS
1. MDI (total for all tanks)		44,000	lbs	127,474,980	lbs
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

		OUTPUT RATE			
NAME	CAS NO. (IF APPLICABLE)	PER HOUR	UNITS	PER YEAR	UNITS
1. MDI (total for all tanks)		26,454	lbs	127,474,980	lbs
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

		OUTPUT RATE			
NAME	CAS NO. (IF APPLICABLE)	PER HOUR	UNITS	PER YEAR	UNITS
1. Negligible					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	See Attachment 1	0
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	0	0
150-154	155-159	160-164

Method Used to Determine Emissions (1= Estimate 2= Emission Factor 3= Stack Test 4= Other)

TSP	SOX	NOX	CO	VOC	PM10
				2	
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code	VOC Code	SIP Code	Regulation Code	Confidentiality
208-210	211 212	213 214	215-218	219

Point Description (220-238)

Action (239) A: Add C: Change

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FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Elite Comfort Solutions LLC

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
To be determined

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
MDI Storage Tanks - Four (4) 20,000 gallon storage tanks with carbon adsorber drums

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	I	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	15.4	Spring Percent	
Days per week:	6	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):	TBD	Length and width dimensions at top of rectangular stack (ft):	Length:	Width:
Height above structures (ft):	TBD			
Exit temperature (ºF):	Ambient	Inside diameter at top of round stack (ft):		
Exit velocity (ft/min):	TBD	Distance from emission point to nearest property line (ft):		TBD
Exhaust gas volumetric flow rate (acfm):	TBD	Building dimensions if emission point is located on building (ft)	Height	Length / Width

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☐ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☐ Dust Suppression System No. _____
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☒ Carbon Adsorber No. 4
  - ☐ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	N/A	N/A		
Particulate Matter (filterable as PM2.5)	N/A	N/A		
Particulate Matter (condensables)	N/A	N/A		
Volatile Organic Compounds (VOC)		negligibe	negligible	negligible
Oxides of Sulfur (SOx)	N/A	N/A		
Oxides of Nitrogen (NOx)	N/A	N/A		
Carbon Monoxide (CO)	N/A	N/A		
Lead (Pb)	N/A	N/A		
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)	N/A	N/A		
Methane (CH_4)	N/A	N/A		
Nitrous Oxide (N_2O)	N/A	N/A		
Hydrofluorocarbons (HFCs)	N/A	N/A		
Perfluorocarbons (PFCs)	N/A	N/A		
Sulfur Hexafluoride (SF6)	N/A	N/A		
Total GHG (as CO_2e)	N/A	N/A		
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Methylene diphenyl diisocyanate		negligible	negligible	negligible

(Attach additional sheets as necessary.)

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APPLICATION FOR FUEL BURNING EQUIPMENT

Information Regarding Public Outreach

For Air Quality Permit to Construct applications subject to public review, applicants should consider the following information in the initial stages of preparing a permit application.

If you are not sure at the time you are applying for a permit whether public review of your application is required or for information on steps you can take to engage the surrounding community where your planned project will be located, please contact the Air Quality Permits Program at 410-537-3225 and seek their advice.

Communicating and engaging the local community as early as possible in your planning and development process is an important aspect of your project and should be considered a priority. Environmental Justice or "EJ" is a movement to inform, involve, and engage communities impacted by potential and planned environmental projects by affording citizens opportunities to learn about projects and discuss any concerns regarding impacts.

Although some permit applications are subject to a formal public review process prescribed by statute, the Department strongly encourages you to engage neighboring communities separate from and well ahead of the formal permitting process. Sharing your plans by way of community meetings, informational outreach at local gatherings or through local faith-based organizations can initiate a rewarding and productive dialogue that will reduce anxiety and establish a permanent link with your neighbors in the community.

All parties benefit when there is good communication. The Department can assist applicants in developing an outreach plan that fits the needs of both the company and the public.

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APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name
Elite Comfort Solutions LLC

Mailing Address
24 Herring Road
Street Address
Newnan | GA | 30265
City | State | Zip

Telephone Number
(770) 254-8653

Signature
Tim Maharrey

Tim Maharrey, VP Operations | 09/24/2021
Print Name and Title | Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER
County No. (1-2) | Premises No. (3-6)
Registration Class (7) | Equipment No. (8-11)
Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)
1900 Clark Road
Street Number and Street Name
Havre De Grace | MD | 21078 | ( ) Telephone Number
City/Town | State | Zip

Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status	New Construction Begun (MM/YY)	New Construction Completed (MM/YY)	Existing Initial Operation (MM/YY)
A	0122	0822	
15	16-19	20-23	20-23

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
Acetone Storage Tank - 10,000 gallon with vapor recovery line

5. Workmen's Compensation Coverage WLR C67464199 (Binder/Policy Number) 11/01/2021 (Expiration Date)
Company Willis Towers Watson Midwest, Inc
NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 1

6B. Number of Stack/Emission Points Associated with this Equipment N/A

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company To be determined _____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Flexible polyurethane foam (PUF) manufacturing facility

9. Control Devices Associated with this Equipment

None ☐ 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
☐	☐	☐	☐	☐	☐	☐	☐
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

☒ Describe Vapor recovery

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS _____ (Specify Type) ☐ 66-1 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

OTHER FUEL _____ (Specify Type) ☐ 66-2 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
☒	☐		☐	15	6	312
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent	(Total Seasons= 100%)
☒					
76	77-78	79-80	81-82	83-84	

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) N (85)

Not applicable

If not, then	Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (ºF)	Exit Velocity (FT/SEC)
	(86-88)	(89-91)	(92-95)	(96-98)

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? N (Y or N)

		INPUT RATE			
NAME	CAS NO. (IF APPLICABLE)	PER HOUR	UNITS	PER YEAR	UNITS
1. Acetone		44,000	lbs	10,197,998	lbs
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

		OUTPUT RATE			
NAME	CAS NO. (IF APPLICABLE)	PER HOUR	UNITS	PER YEAR	UNITS
1. Acetone		2,116	lbs	10,197,998	lbs
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

		OUTPUT RATE			
NAME	CAS NO. (IF APPLICABLE)	PER HOUR	UNITS	PER YEAR	UNITS
1. Negligible					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	0	0
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	0	0
150-154	155-159	160-164

Method Used to Determine Emissions (1= Estimate 2= Emission Factor 3= Stack Test 4= Other)

TSP	SOX	NOX	CO	VOC	PM10
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change

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FORM 5T: Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration

Applicant Name: Elite Comfort Solutions LLC

Step 1: Quantify premises-wide emissions of Toxic Air Pollutants (TAP) from new and existing installations in accordance with COMAR 26.11.15.04. Attach supporting documentation as necessary.

Toxic Air Pollutant (TAP)	CAS Number	Class I or Class II?	Screening Levels (µg/m^3)			Estimated Premises Wide Emissions of TAP			
						Actual Total Existing TAP Emissions	Projected TAP Emissions from Proposed Installation	Premises Wide Total TAP Emissions	
			1-hour	8-hour	Annual	(lb/hr)	(lb/hr)	(lb/hr)	(lb/yr)
ex. ethanol	*64175*	*II*	*18843*	*3769*	*N/A*	*0.60*	*0.15*	*0.75*	*1500*
ex. benzene	*71432*	*I*	*80*	*16*	*0.13*	*0.5*	*0.75*	*1.00*	*400*
toluenediisocyanate (TDI)	584849	I	1.42	0.36	N/A	N/A	0.072	0.072	347
4,4-diphenylmethane diisocyanate	101688	II	N/A	0.51	N/A	N/A	0.00024	.00024	0.0006
acetone	67641	II	17,807	11,871	N/A	N/A	2,116	2,116	10,198

(attach additional sheets as necessary.)

Note: Screening levels can be obtained from the Department's website (http://www.mde.maryland.gov) or by calling the Department.

Step 2: Determine which TAPs are exempt from further review. A TAP that meets either of the following Class I or Class II small quantity emitter exemptions is exempt from further TAP compliance demonstration requirements under Step 3 and Step 4.

Class II TAP Small Quantity Emitter Exemption Requirements (COMAR 26.11.15.03B(3)(a))
A Class II TAP is exempt from Step 3 and Step 4 if the Class II TAP meets the following requirements: Premises wide emissions of the TAP shall not exceed 0.5 pounds per hour, and any applicable 1-hour or 8-hour screening level for the TAP must be greater than 200 µg/m^3.

Class I TAP Small Quantity Emitter Exemption Requirements (COMAR 26.11.15.03B(3)(b))
A Class I TAP is exempt from Step 3 and Step 4 if the Class I TAP meets the following requirements: Premises wide emissions of the TAP shall not exceed 0.5 pounds per hour and 350 pounds per year, any applicable 1-hour or 8-hour screening level for the TAP must be greater than 200 µg/m^3, and any applicable annual screening level for the TAP must be greater than 1 µg/m^3.

If a TAP meets either the Class I or Class II TAP Small Quantity Emitter Exemption Requirements, no further review under Step 3 and Step 4 are required for that specific TAP.

FORM 5T: Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration

Step 3: Best Available Control Technology for Toxics Requirement (T-BACT, COMAR 26.11.15.05)
In the following table, list all TAP emission reduction options considered when determining T-BACT for the proposed installation. The options should be listed in order beginning with the most effective control strategy to the least effective strategy. Attach supporting documentation as necessary.

Target Pollutants	Emission Control Option	% Emission Reduction	Costs		T-BACT Option Selected? (yes/no)
			Capital	Annual Operating	
ex. ethanol and benzene	*Thermal Oxidizer*	*99*	*$50,000*	*$100,000*	*no*
ex. ethanol and benzene	*Low VOC materials*	*80*	*0*	*$100.000*	*yes*
See T-BACT Evaluation					
(Attachment 4)					

(attach additional sheets as necessary)

Step 4: Demonstrating Compliance with the Ambient Impact Requirement (COMAR 26.11.15.06)
Each TAP not exempt in Step 2 must be individually evaluated to determine that the emissions of the TAP will not adversely impact public health. The evaluation consists of a series of increasingly non-conservative (and increasingly rigorous) tests. Once a TAP passes a test in the evaluation, no further analysis is required for that TAP. "Demonstrating Compliance with the Ambient Impact Requirement under the Toxic Air Pollutant (TAP) Regulations (COMAR 26.11.15.06)" provides guidance on conducting the evaluation. Summarize your results in the following table. Attach supporting documentation as necessary.

Toxic Air Pollutant (TAP)	CAS Number	Screening Levels ($\mu g/m^3$)			Premises Wide Total TAP Emissions		Allowable Emissions Rate (AER) per COMAR 26.11.16.02A		Off-site Concentrations per Screening Analysis ($\mu g/m^3$)			Compliance Method Used?
		1-hour	8-hour	Annual	(lb/hr)	(lb/yr)	(lb/hr)	(lb/yr)	1-hour	8-hour	Annual	AER or Screen
ex. ethanol	*64175*	*18843*	*3769*	*N/A*	*0.75*	*1500*	*0.89*	*N/A*	*N/A*	*N/A*	*N/A*	*AER*
ex. benzene	*71432*	*80*	*16*	*0.13*	*1.00*	*400*	*0.04*	*36.52*	*1.5*	*1.05*	*0.12*	*Screen*
TDI	584849	1.42	0.36	N/A	0.072	347	0.005	N/A	1.0	0.3	N/A	AERMOD
MDI	101688	N/A	0.51	N/A	0.00024	0.0006	0.002	N/A	N/A	N/A	N/A	AER
Acetone	67641	17,807	11,871	N/A	2,116	10,198	63.748	N/A	17669.84	8026.62	N/A	AERMOD
pMDI	9016879	N/A	49	N/A	0.000095	0.8	0.175	N/A	N/A	N/A	N/A	AER

(attach additional sheets as necessary)

If compliance with the ambient impact requirement cannot be met using the allowable emissions rate method or the screening analysis method, refined dispersion modeling techniques may be required. Please consult with the Department's Air Quality Permit Program prior to conducting dispersion modeling methods to demonstrate compliance.

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Air and Radiation Management Administration ▪ Air Quality Permits Program

Application for Permit to Construct
Gas Cleaning or Emission Control Equipment

1. Owner of Installation	Telephone No.	Date of Application
Elite Comfort Solutions LLC	770-254-8653	09/29/2021

2. Mailing Address	City	Zip Code	County
24 Herring Road	Newnan	30265	Coweta, Georgia

3. Equipment Location	City/Town or P.O.	County
1900 Clark Road	Havre De Grace	Harford

4. Signature of Owner or Operator	Title	Print or Type Name
Tim Maharrey	VP Operations	Tim Maharrey

5. Application Type: **Alteration** ☐ **New Construction** ☒

6. Date Construction is to Start: January 2022

Completion Date (Estimate): August 2022

7. Type of Gas Cleaning or Emission Control Equipment:

Simple Cyclone ☐ **Multiple Cyclone** ☐ **Afterburner** ☐ **Electrostatic Precipitator** ☐

Scrubber ☐ _____ (type) **Other** ☒ Carbon Adsorption (type)

8. Gas Cleaning Equipment Manufacturer	Model No.	Collection Efficiency (Design Criteria)
Pure Effect, Inc.		92%

9. Type of Equipment which Control Equipment is to Service:

Hennecke QFM Pourline

10. Stack Test to be Conducted:

Yes ☐ **No** ☒ _____ (Stack Test to be Conducted By) _____ (Date)

11. Cost of Equipment $247,500

Estimated Erection Cost $45,500

12. The Following Shall Be Design Criteria:

	INLET		OUTLET	
Gas Flow Rate	102,000	ACFM*	102,000	ACFM*
Gas Temperature	80	°F	80	°F
Gas Pressure		INCHES W.G.		INCHES W.G.
	PRESSURE DROP _____			
Dust Loading	Negligible	GRAINS/ACFD**	Negligible	GRAINS/ACFD**
Moisture Content OR Wet Bulb Temperature	Ambient humidity	%	Ambient humidity	%
		°F		°F
Liquid Flow Rate (Wet Scrubber)		GALLONS/MINUTE		

(WHEN SCRUBBER LIQUID OTHER THAN WATER INDICATE COMPOSITION OF SCRUBBING MEDIUM IN WEIGHT %)

*= ACTUAL CUBIC FEET PER MINUTE **= ACTUAL CUBIC FEET DRY

WHEN APPLICATION INVOLVES THE REDUCTION OF GASEOUS POLLUTANTS, PROVIDE THE CONCENTRATION OF EACH POLLUTANT IN THE GAS STREAM IN VOLUME PERCENT. INCLUDE THE COMPOSITION OF THE GASES ENTERING THE CLEANING DEVICE AND THE COMPOSITION OF EXHAUSTED GASES BEING DISCHARGED INTO THE ATMOSPHERE. USE AVAILABLE SPACE IN ITEM 15 ON PAGE 3.

13. Particle Size Analysis

Size of Dust Particles Entering Cleaning Unit	% of Total Dust	% to be Collected
0 to 10 Microns	N/A	N/A
10 to 44 Microns	N/A	N/A
Larger than 44 Microns	N/A	N/A

14. For Afterburner Construction Only:

Volume of Contaminated Air _____ CFM (DO NOT INCLUDE COMBUSTION AIR)

Gas Inlet Temperature _____ °F

Capacity of Afterburner _____ BTU/HR

Diameter (or area) of Afterburner Throat_____

Combustion Chamber_____ _____ Operating Temperature at Afterburner _____ °F
(diameter) (length)

Retention Time of Gases _____

15. Show Location of Dust Cleaning Equipment in the System. Draw or Sketch Flow Diagram Showing Emission Path from Source to Exhaust Point to Atmosphere.

See Figure 2

Date Received: Local _____ _____ State _____

Acknowledgement Date: _____

By _____

Reviewed By:

Local _____

State _____

Returned to Local:

Date_____

By _____

Application Returned to Applicant:

Date_____

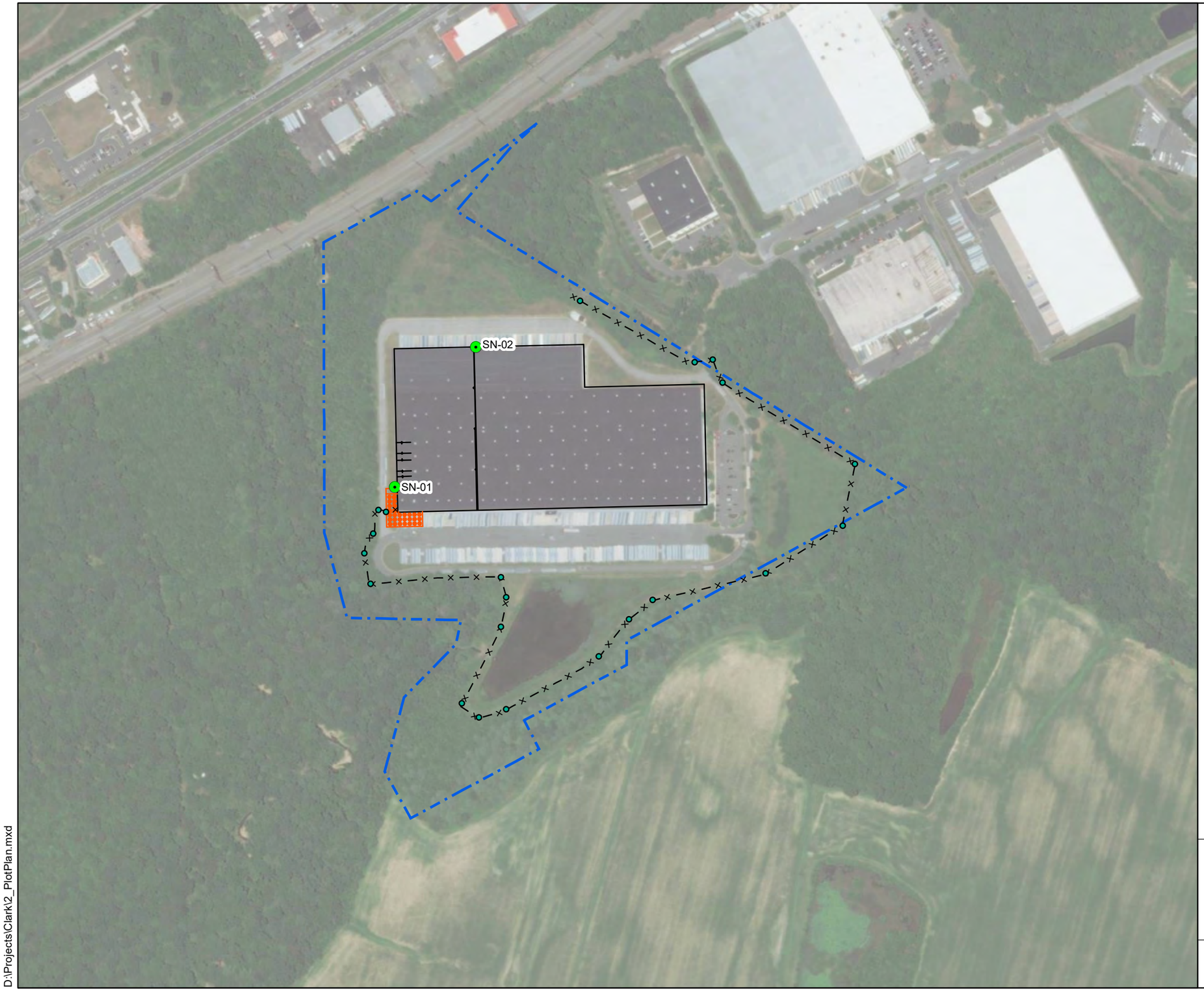
By _____

REGISTRATION NUMBER OF ASSOCIATED EQUIPMENT: | | | | | | |

PREMISES NUMBER: | | | | | | | |

Emission Calculations Revised By _____ Date _____

Figures



Explanation:

- Fence Points
- Stack Locations
- Fence
- Tanks
- Site Boundary
- Building

N

0 50 100

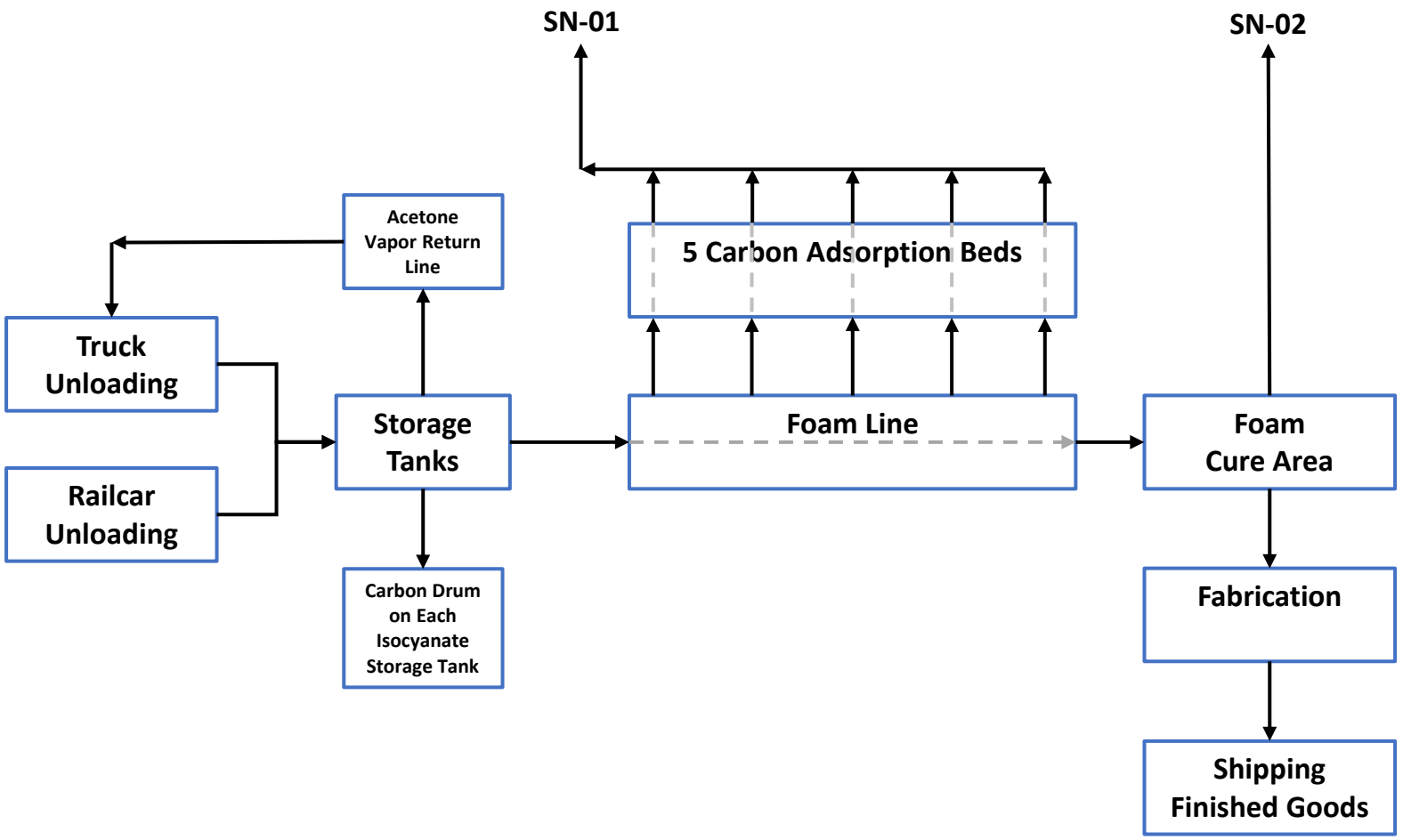
Meters

Coordinate System: NAD 83 UTM Zone 18N

FACILITY PLOT PLAN
L&P Elite Comfort Solutions
1900 Clark Road
Havre de Grace, MD

wood.	By: DPV	Project No.: SA21171110
	Date: 07/21/2021	Figure 1

D:\Projects\Clark\2_PlotPlan.mxd



Process Flow Diagram
L&P Elite Comfort Solutions
1900 Clark Road
Havre de Grace, MD

Figure 2

Attachment 1
Potential Emissions Calculations

Attachment 1-1
Potential Emissions Summary
Elite Comfort Solutions
1900 Clark Road
Havre De Grace, Maryland

Process	Emission Source	Capacity	Capacity Unit	Uncontrolled Emission Estimation Methodology	Emission Control Technique	Criteria / HAP Emissions Potential (tons/yr)										GHG Emissions Potential (tons/yr, CO2 Equivalents)			
						VOCs	TDI	MDI	Other HAPs	Total HAPs	NOx	CO	SO2	PM/ PM10	Acetone	CO2	CH4	N2O	Total CO2 Equivalents
Foam Manufacturing	**Storage Tanks**																		
	Polyol (18)	10,000 / 20,000	gallons	TankESP	None	0.0014				0									
	TDI (4)	20,000	gallons	TankESP		0.000062	0.000062			6.24E-05									
	MDI (4)	20,000	gallons	TankESP	Carbon Adsorber (Drum)	0		0		0									
	Acetone (1)	10,000	gallons	TankESP	Vapor Recovery (99%)					0					0.015				
	Foam Line / Foam Cure Area	12,974	ft/day	Polyurethane Foam Association Emission Factor	Carbon Adsorption (Foam Line - 92%)	20.76	0.17	0.00057		0.17					5,099				
	Cleaning Operations	999	gallons/yr	Emission factor based on polyol usage	None	3.27													
Ancillary Equipment	**Fuel Burning Equipment**																		
	Space Heaters (4)	3.5 (3 units), 1.7 (1 unit)	MMBTU/hr	AP-42, Section 1.4	None	0.29			0.10	0.10	5.24	4.40	0.03	0.40		6,252	0.12	0.012	6,258
	Internal Combustion Engines																		
	Emergency Generator (existing)	<197	HP-hr	AP-42, Section 3.3	As per RICE regulations	0.11					1.37	0.30	0.09	0.10		50.97			50.97
	Emergency Generator (new)	134	HP-hr	AP-42, Section 3.3	As per RICE regulations	0.08					0.93	0.20	0.06	0.07		34.67			34.67
	Fire pump Generator (existing)	197	HP-hr	AP-42, Section 3.3	As per RICE regulations	0.11					1.37	0.30	0.09	0.10		50.97			50.97
					Total Potential Emissions	**24.6**	**0.17**	**0.00057**	**0.10**	**0.27**	**8.92**	**5.19**	**0.27**	**0.66**	**5,099**	**6,388**	**0.12**	**0.012**	**6,395**

Attachment 1-2
Potential Emissions - Process + Cleaning Operations
Elite Comfort Solutions
1900 Clark Road

Chemical	Units	Polyol	TDI	MDI	Cleaning Operations	Acetone
Max Metering Throughput	kg/min	**323.00**	**200.00**	**200.00**		**16.00**
	lb/min	712.05	440.90	440.90		35.27
	lb/hr	42,723	26,454	26,454		2,116
	lb/yr	205,872,092	127,474,980	127,474,980		10,197,998
	tons/yr	102,936	63,737	63,737		5,099
Emission Factors						
2,4-TDI	lb 2,4-TDI emitted / lb TDI		**8.50E-06**			
TDI [1]	lb VOC emitted / lb TDI		**3.40E-05**			
4,4'-MDI [2]	lb 4,4'-MDI emitted / lb MDI			**1.12E-07**		
VOC from Polyol	lb VOC emitted / lb Polyol	**2.00E-04**				
Acetone (Exempt VOC)	lb Acetone emitted / lb Acetone					**1.00E+00**
VOC from Cleaning Operations (Dzolv)	lb VOC emitted / lb Polyol				**3.18E-05**	
Hourly Emissions into Carbon Adsorber						
Hazardous Air Pollutants						
2,4-TDI	lb/hr		0.2249			
4,4'-MDI	lb/hr			0.002968		
VOC						
VOC from TDI	lb/hr		0.8994			
VOC from MDI	lb/hr			0.002968		
VOC from Polyol	lb/hr	8.5446				
VOC from Cleaning Operation (Dzolv)	lb/hr				1.3570	
Exempt VOC						
Acetone	lb/hr					2,116
Hourly Emissions from Carbon Adsorber						
% Capture of TDI in Carbon Bed	**92%**					
Hazardous Air Pollutants						
2,4-TDI	lb/hr		0.0180			
4,4'-MDI	lb/hr			0.000237		
VOC						
VOC from TDI	lb/hr		0.0720			
VOC from MDI	lb/hr			0.000237		
VOC from Polyol	lb/hr	8.5446				
VOC from Cleaning Operation (Dzolv)	lb/hr				1.3570	
Exempt VOC						
Acetone	lb/hr					2,116

Attachment 1-2
Potential Emissions - Process + Cleaning Operations
Elite Comfort Solutions
1900 Clark Road

Chemical	Units	Polyol	TDI	MDI	Cleaning Operations	Acetone
Annual Emissions						
Operating Hours	hr/day	15.44	15.44	15.44	15.44	15.44
Operating Hours	day/yr	312	312	312	312	312
Operating Hours	hr/yr	4818.7	4818.7	4818.7	4818.7	4818.7
Hazardous Air Pollutants						
2,4-TDI	tpy		0.0433			
4,4'-MDI	tpy			0.0006		
VOC						
VOC from TDI	tpy		0.1734			
VOC from MDI	tpy			0.0006		
VOC from Polyol	tpy	20.5872				
VOC from Cleaning Operation	tpy				3.2694	
Exempt VOC						
Acetone	tpy					5,099

Total HAP	**0.0439**	**tpy**
Total VOC	**24.03**	**tpy**

Notes:
1. Polyurethane Foam Association (PFA, 1993) total TDI emission factor of 34 pounds per million pounds of TDI usage.
2. The 4,4'-MDI emission factor is based on the TDI PFA emission factor and adjusted for the difference in vapor pressure in the curing buns (80°C):
   MDI EF = 3.40E-05 / (1.014 mmHg TDI/0.003346 mmHg 4,4-MDI)
   (Vapor pressures selected from the American Chemistry Council December 2001 Diisocyanates Panel MDI and TDI Mixed Isomers Vapor Pressure Charts.)

Attachment 1-3

Potential Emissions - Fuel Burning Equipment - Natural Gas-Fired Space Heaters

Elite Comfort Solutions

1900 Clark Road

	Quantity	Heat Input Per Unit BTU/Hr	Total Heat Input BTU/Hr	
Floor Mounted Space Heater	3	3,500,000	10,500,000	
Floor Mounted Space Heater	1	1,700,000	1,700,000	
			12,200,000	**Total Input**

Natural Gas Btu Content	1020	Btu/cu ft
Natural Gas Combustion Capacity	11.96	MCF/hr
Heat Input Capacity of Space Heaters	12,200,000	Btu/hr

Emission Factors for Criteria Pollutants

Pollutant	Emission Factor	Units	Source
NOx (<100 MMBtu/hr)	100	lb/MMcf	AP-42, Section 1.4, Table 1.4-1
CO (<100 MMBtu/hr)	84	lb/MMcf	AP-42, Section 1.4, Table 1.4-1
VOC	5.5	lb/MMcf	AP-42, Section 1.4, Table 1.4-2
SO2	0.6	lb/MMcf	AP-42, Section 1.4, Table 1.4-2
PM/PM10/PM2.5	7.6	lb/MMcf	AP-42, Section 1.4, Table 1.4-2
CO2	53.06	kg/MMBtu	40 CFR 98 Table C-1 default emission factors
Methane	1.00E-03	kg/MMBtu	40 CFR 98 Table C-2 default emission factors
N2O	1.00E-04	kg/MMBtu	40 CFR 98 Table C-2 default emission factors

Calculation of Criteria Pollutant Emissions

Constituent	Hourly PTE (lb/hr)	Annual PTE (tpy)
NOx	1.20	5.24
CO	1.00	4.40
VOC	0.07	0.29
SO2	0.01	0.03
PM/PM10/PM2.5	0.09	0.40
CO2	1,427	6,252
Methane	0.03	0.12
N2O	0.003	0.01
CO2e(1)	1,429	6,258

(1)Global warming potentials taken from 40 CFR 98, Table A-1; CO2 = 1, Methane = 25, N2O = 298

Attachment 1-3

Potential Emissions - Fuel Burning Equipment - Natural Gas-Fired Space Heaters

Elite Comfort Solutions

1900 Clark Road

Calculation of HAP Emissions

Emission factors were obtained from AP-42, Section 1.4, Tables 1.4-3, 1.4-4 Natural Gas Combustion

Constituent	Emission Factor (lb/MMcf)	Hourly PTE (lb/hr)	Annual PTE (tpy)
Arsenic	2.0E-04	2.39E-06	1.05E-05
Benzene	2.1E-03	2.51E-05	1.10E-04
Beryllium	1.2E-05	1.44E-07	6.29E-07
Cadmium	1.1E-03	1.32E-05	5.76E-05
Chromium	1.4E-03	1.67E-05	7.33E-05
Cobalt	8.4E-05	1.00E-06	4.40E-06
Dichlorobenzene	1.2E-03	1.44E-05	6.29E-05
Formaldehyde	7.5E-02	8.97E-04	3.93E-03
Hexane	1.8E+00	2.15E-02	9.43E-02
Lead	5.0E-04	5.98E-06	2.62E-05
Manganese	3.8E-04	4.55E-06	1.99E-05
Mercury	2.6E-04	3.11E-06	1.36E-05
Napthalene	6.1E-04	7.30E-06	3.20E-05
Nickel	2.1E-03	2.51E-05	1.10E-04
Polycyclic Organic Matter(1)	8.8E-05	1.05E-06	4.62E-06
Selenium	2.4E-05	2.87E-07	1.26E-06
Toluene	3.4E-03	4.07E-05	1.78E-04
Total HAPs		**2.3E-02**	**0.10**

(1)POM includes the following compounds from Table 1.4-3: 2-methylnaphthalene, 3-metylchloranthrene, dimethylbenz(a)anthracene, acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene.

Attachment 1-4
Potential Criteria / HAP Pollutant Emissions - Existing Emergency Generator
Elite Comfort Solutions
1900 Clark Road

CI engines - diesel fuel

Description of Unit	Unit Make/Model	Use	Generator Size (kW)	Time of Operation (Hours/yr)	Load (% Capacity)	HP Rating	NOx		CO		SOx		PM / PM-10/ PM2.5		VOC		CO2	
							lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy
Existing Emergency Generator		PM Use	147	100	0.50	197	305.4	0.15	65.8	0.03	20.19	0.01	21.7	0.011	24.74	0.01	11,327.50	5.66
		Standby (Emergency Use)	147	400	1.0	197	2442.8	1.22	526.4	0.26	161.54	0.08	173.4	0.087	197.90	0.10	90,620.00	45.31
						Subtotal Fire Pump Emissions (tpy)	**-**	**1.37**	**-**	**0.30**	**-**	**0.09**	**-**	**0.098**	**-**	**0.11**	**-**	**50.97**

Actual Emissions Calculations
lbs/hr = (hp rating)*(capacity)*emission factor (lb/hp hr)*(hrs of operation)
tpy = (lb/yr) *(ton/2000 lbs)

EPA AP-42 Emission Factors - Diesel						
	NOX Factor (lb/hp hr)	***SOX Factor (lb/hp hr)***	***PM-10 Factor (lb/hp hr)***	***VOC Factor (lb/hp hr)***	***CO Factor (lb/hp hr)***	***CO2 Factor (lb/hp hr)***
Large Diesel Engines (> 600 hp)	***0.024***	***0.002427***	***0.0007***	***7.05E-04***	**5.50E-03**	**1.16**
Diesel Industrial Engines (≤600 hp)	***0.031***	***2.05E-03***	***2.20E-03***	***2.51E-03***	**6.68E-03**	**1.15**
EPA AP-42 Emission Factors - Dual Fuel (95% natural gas / 5% diesel fuel)						
	NOX Factor (lb/hp hr)	***SOX Factor (lb/hp hr)***	***PM-10 Factor (lb/hp hr)***	***VOC Factor (lb/hp hr)***	***CO Factor (lb/hp hr)***	***CO2 Factor (lb/hp hr)***
Large Diesel Engines (> 600 hp)	***0.018***	***0.0001218***	***ND***	***1.32E-03***	**7.50E-03**	**0.772**

Notes:
1. Emissions calculations are based on AP-42, Section 3.3 (Gasoline and Diesel Industrial Engines) emission factors, for diesel industrial engines less than 600 Hp.
2. Potential to emit for emergency generator is based on an administrative limitation applicable to emergency units of 500 operating hours per year.

Attachment 1-5
Potential Criteria / HAP Pollutant Emissions - New Emergency Generator
Elite Comfort Solutions
1900 Clark Road

CI engines - diesel fuel

Description of Unit	Unit Make/Model	Use	Generator Size (kW)	Time of Operation (Hours/yr)	Load (% Capacity)	HP Rating	NOx		CO		SOx		PM / PM-10/ PM2.5		VOC		CO2	
							lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy
New Emergency Generator		PM Use	100	100	0.50	134	207.7	0.10	44.8	0.02	13.74	0.01	14.7	0.007	16.83	0.01	7,705.00	3.85
		Standby (Emergency Use)	100	400	1.0	134	1661.6	0.83	358.0	0.18	109.88	0.05	117.9	0.059	134.61	0.07	61,640.00	30.82
				Subtotal Fire Pump Emissions (tpy)			**-**	**0.93**	**-**	**0.20**	**-**	**0.06**	**-**	**0.066**	**-**	**0.08**	**-**	**34.67**

Actual Emissions Calculations
lbs/hr = (hp rating)*(capacity)*emission factor (lb/hp hr)*(hrs of operation)
tpy = (lb/yr) *(ton/2000 lbs)

EPA AP-42 Emission Factors - Diesel

	NOX Factor (lb/hp hr)	*SOX Factor (lb/hp hr)*	*PM-10 Factor (lb/hp hr)*	*VOC Factor (lb/hp hr)*	*CO Factor (lb/hp hr)*	*CO2 Factor (lb/hp hr)*
Large Diesel Engines (> 600 hp)	***0.024***	***0.002427***	***0.0007***	***7.05E-04***	**5.50E-03**	**1.16**
Diesel Industrial Engines (≤600 hp)	***0.031***	***2.05E-03***	***2.20E-03***	***2.51E-03***	**6.68E-03**	**1.15**

EPA AP-42 Emission Factors - Dual Fuel (95% natural gas / 5% diesel fuel)

	NOX Factor (lb/hp hr)	*SOX Factor (lb/hp hr)*	*PM-10 Factor (lb/hp hr)*	*VOC Factor (lb/hp hr)*	*CO Factor (lb/hp hr)*	*CO2 Factor (lb/hp hr)*
Large Diesel Engines (> 600 hp)	***0.018***	***0.0001218***	***ND***	***1.32E-03***	**7.50E-03**	**0.772**

Notes:
1. Emissions calculations are based on AP-42, Section 3.3 (Gasoline and Diesel Industrial Engines) emission factors, for diesel industrial engines less than 600 Hp.
2. Potential to emit for emergency generator is based on an administrative limitation applicable to emergency units of 500 operating hours per year.

Attachment 1-6
Potential Criteria / HAP Pollutant Emissions - Fire Pump Generator
Elite Comfort Solutions
1900 Clark Road

CI engines - diesel fuel

Description of Unit	Unit Make/Model	Use	Generator Size (kW)	Time of Operation (Hours/yr)	Load (% Capacity)	HP Rating	NOx		CO		SOx		PM / PM-10/ PM2.5		VOC		CO2	
							lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy
Fire Pump	Peerless 6AEF12	PM Use	147	100	0.50	197	305.4	0.15	65.8	0.03	20.19	0.01	21.7	0.011	24.74	0.01	11,327.50	5.66
		Standby (Emergency Use)	147	400	1.0	197	2442.8	1.22	526.4	0.26	161.54	0.08	173.4	0.087	197.90	0.10	90,620.00	45.31
				Subtotal Fire Pump Emissions (tpy)			**-**	**1.37**	**-**	**0.30**	**-**	**0.09**	**-**	**0.098**	**-**	**0.11**	**-**	**50.97**

Actual Emissions Calculations
lbs/hr = (hp rating)*(capacity)*emission factor (lb/hp hr)*(hrs of operation)
tpy = (lb/yr) *(ton/2000 lbs)

EPA AP-42 Emission Factors - Diesel						
	NOX Factor (lb/hp hr)	***SOX Factor (lb/hp hr)***	***PM-10 Factor (lb/hp hr)***	***VOC Factor (lb/hp hr)***	***CO Factor (lb/hp hr)***	***CO2 Factor (lb/hp hr)***
Large Diesel Engines (> 600 hp)	***0.024***	***0.002427***	***0.0007***	***7.05E-04***	**5.50E-03**	**1.16**
Diesel Industrial Engines (≤600 hp)	***0.031***	***2.05E-03***	***2.20E-03***	***2.51E-03***	**6.68E-03**	**1.15**
EPA AP-42 Emission Factors - Dual Fuel (95% natural gas / 5% diesel fuel)						
	NOX Factor (lb/hp hr)	***SOX Factor (lb/hp hr)***	***PM-10 Factor (lb/hp hr)***	***VOC Factor (lb/hp hr)***	***CO Factor (lb/hp hr)***	***CO2 Factor (lb/hp hr)***
Large Diesel Engines (> 600 hp)	***0.018***	***0.0001218***	***ND***	***1.32E-03***	**7.50E-03**	**0.772**

Notes:
1. Emissions calculations are based on AP-42, Section 3.3 (Gasoline and Diesel Industrial Engines) emission factors, for diesel industrial engines less than 600 Hp.
2. Potential to emit for emergency generator is based on an administrative limitation applicable to emergency units of 500 operating hours per year.

TankESP
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

TK-Acetone

Identification

User Identification:	TK-Acetone
City:	Havre De Grace
State:	MD
Company:	Elite Comfort Solutions, Inc.
Type of Tank:	FRT (no floating roof)
Description:	Storage Tanks

Tank Dimensions

Shell Height (ft):	12.00
Diameter (ft):	11.90
Liquid Height (ft) :	12.00
Avg. Liquid Height (ft):	6.00
Volume (gallons):	9,983.80
Turnovers:	155.03
Net Throughput(gal/yr):	1,547,824.99
Is Tank Insulated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White Paint
Shell Condition	Good
Roof Color/Shade:	White Paint
Roof Condition:	Good

Roof Characteristics

Type:	Column-Supported (Cone)
Height (ft)	0.37
Roof Slope (ft/ft)	0.06

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Baltimore, MD (Avg Atmospheric Pressure = 14.62 psia)

TankESP
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TK-Acetone - Vertical Fixed Roof Tank
Havre De Grace, MD

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg. F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight.	Basis for Vapor Pressure Calculations
Acetone	All	64.00	59.35	68.65	68.00	3.2327	2.8731	3.6290	58.0800			58.08	N/A

TankESP
Emissions Report - Detail Format
Detail Calculations (AP-42)

TK-Acetone - Vertical Fixed Roof Tank
Havre De Grace, MD

Annual Emission Calculations	
Standing Losses (lb):	394.6314
Vapor Space Volume (cu ft):	681.1081
Vapor Density (lb/cu ft):	0.0334
Vapor Space Expansion Factor:	0.0966
Vented Vapor Saturation Factor:	0.4880
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	681.1081
Tank Diameter (ft):	11.9000
Vapor Space Outage (ft):	6.1240
Tank Shell Height (ft):	12.0000
Average Liquid Height (ft):	6.0000
Roof Outage (ft):	0.1240
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1240
Roof Height (ft)	0.3719
Roof Slope (ft/ft)	0.0625
Shell Radius (ft):	5.9500
Vapor Density	
Vapor Density (lb/cu ft):	0.0334
Vapor Molecular Weight (lb/lb-mole):	58.0800
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.2327
Daily Avg. Liquid Surface Temp. (deg. R):	64.0017
Daily Average Ambient Temp. (deg. F):	55.8473
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.7310
Liquid Bulk Temperature (deg. R):	68.0000
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,275.1850
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0966
Daily Vapor Temperature Range (deg. R):	18.5917
Daily Vapor Pressure Range (psia):	0.7559
Breather Vent Press. Setting Range (psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.2327
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	2.8731
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	3.6290
Daily Avg. Liquid Surface Temp. (deg R):	64.0017
Daily Min. Liquid Surface Temp. (deg R):	59.3537
Daily Max. Liquid Surface Temp. (deg R):	68.6496
Daily Ambient Temp. Range (deg. R):	18.6173
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.4880
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.2327
Vapor Space Outage (ft):	6.1240

Working Losses (lb):	2,509.0406
Vapor Molecular Weight (lb/lb-mole):	58.0800
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.2327
Annual Net Throughput (gal/yr.):	1,547,824.9920
Annual Turnovers:	155.0337
Turnover Factor:	0.3602
Maximum Liquid Volume (gal):	9,983.7955
Maximum Liquid Height (ft):	12.0000
Tank Diameter (ft):	11.9000
Working Loss Product Factor:	1.0000
Total Losses (lb):	2,903.6720

TankESP
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual
TK-Acetone - Vertical Fixed Roof Tank
Havre De Grace, MD

	Losses(lbs)		
Components	Working loss	Breathing Loss	Total Emissions
Acetone	2,509.04	394.63	2,903.67

TankESP
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

TK-MDI-1

Identification

User Identification:	TK-MDI-1
City:	Havre De Grace
State:	MD
Company:	Elite Comfort Solutions, Inc.
Type of Tank:	FRT (no floating roof)
Description:	Storage Tanks

Tank Dimensions

Shell Height (ft):	15.10
Diameter (ft):	15.00
Liquid Height (ft) :	14.00
Avg. Liquid Height (ft):	11.00
Volume (gallons):	19,960.89
Turnovers:	1,566.47
Net Throughput(gal/yr):	12,424,461.84
Is Tank Insulated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White Paint
Shell Condition	Good
Roof Color/Shade:	White Paint
Roof Condition:	Good

Roof Characteristics

Type:	Column-Supported (Cone)
Height (ft)	0.47
Roof Slope (ft/ft)	0.06

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Baltimore, MD (Avg Atmospheric Pressure = 14.62 psia)

TankESP
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TK-MDI-1 - Vertical Fixed Roof Tank
Havre De Grace, MD

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg. F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight.	Basis for Vapor Pressure Calculations
MDI	All	64.00	59.36	68.65	68.00	0.0000	0.0000	0.0000	250.2500			250.25	N/A

TankESP
Emissions Report - Detail Format
Detail Calculations (AP-42)

TK-MDI-1 - Vertical Fixed Roof Tank
Havre De Grace, MD

Annual Emission Calculations	
Standing Losses (lb):	0.0000
Vapor Space Volume (cu ft):	752.1415
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0314
Vented Vapor Saturation Factor:	1.0000
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	752.1415
Tank Diameter (ft):	15.0000
Vapor Space Outage (ft):	4.2563
Tank Shell Height (ft):	15.1000
Average Liquid Height (ft):	11.0000
Roof Outage (ft):	0.1563
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1563
Roof Height (ft)	0.4688
Roof Slope (ft/ft)	0.0625
Shell Radius (ft):	7.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	250.2500
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0000
Daily Avg. Liquid Surface Temp. (deg. R):	64.0030
Daily Average Ambient Temp. (deg. F):	55.8473
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.7310
Liquid Bulk Temperature (deg. R):	68.0000
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,275.1850
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0314
Daily Vapor Temperature Range (deg. R):	18.5893
Daily Vapor Pressure Range (psia):	0.0000
Breather Vent Press. Setting Range (psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0000
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0000
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0000
Daily Avg. Liquid Surface Temp. (deg R):	64.0030
Daily Min. Liquid Surface Temp. (deg R):	59.3557
Daily Max. Liquid Surface Temp. (deg R):	68.6503
Daily Ambient Temp. Range (deg. R):	18.6173
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	1.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0000
Vapor Space Outage (ft):	4.2563

Working Losses (lb):	0.0000
Vapor Molecular Weight (lb/lb-mole):	250.2500
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0000
Annual Net Throughput (gal/yr.):	12,424,461.8400
Annual Turnovers:	1,566.4744
Turnover Factor:	0.1858
Maximum Liquid Volume (gal):	19,960.8933
Maximum Liquid Height (ft):	14.0000
Tank Diameter (ft):	15.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.0000

TankESP
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual
TK-MDI-1 - Vertical Fixed Roof Tank
Havre De Grace, MD

	Losses(lbs)		
Components	Working loss	Breathing Loss	Total Emissions
MDI	0.00	0.00	0.00

TankESP
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

TK-TDI

Identification

User Identification:	TK-TDI
City:	Havre De Grace
State:	MD
Company:	Elite Comfort Solutions, Inc.
Type of Tank:	FRT (no floating roof)
Description:	Storage Tanks

Tank Dimensions

Shell Height (ft):	15.10
Diameter (ft):	15.00
Liquid Height (ft) :	14.00
Avg. Liquid Height (ft):	11.00
Volume (gallons):	19,960.89
Turnovers:	1,592.87
Net Throughput(gal/yr):	12,633,794.04
Is Tank Insulated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White Paint
Shell Condition	Good
Roof Color/Shade:	White Paint
Roof Condition:	Good

Roof Characteristics

Type:	Column-Supported (Cone)
Height (ft)	0.47
Roof Slope (ft/ft)	0.06

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Baltimore, MD (Avg Atmospheric Pressure = 14.62 psia)

TankESP
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TK-TDI - Vertical Fixed Roof Tank
Havre De Grace, MD

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg. F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight.	Basis for Vapor Pressure Calculations
TDI	All	64.00	59.36	68.65	68.00	0.0002	0.0001	0.0002	174.2000			174.20	N/A

TankESP
Emissions Report - Detail Format
Detail Calculations (AP-42)

TK-TDI - Vertical Fixed Roof Tank
Havre De Grace, MD

Annual Emission Calculations	
Standing Losses (lb):	0.0418
Vapor Space Volume (cu ft):	752.1415
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0314
Vented Vapor Saturation Factor:	1.0000
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	752.1415
Tank Diameter (ft):	15.0000
Vapor Space Outage (ft):	4.2563
Tank Shell Height (ft):	15.1000
Average Liquid Height (ft):	11.0000
Roof Outage (ft):	0.1563
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1563
Roof Height (ft)	0.4688
Roof Slope (ft/ft)	0.0625
Shell Radius (ft):	7.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	174.2000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0002
Daily Avg. Liquid Surface Temp. (deg. R):	64.0030
Daily Average Ambient Temp. (deg. F):	55.8473
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.7310
Liquid Bulk Temperature (deg. R):	68.0000
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,275.1850
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0314
Daily Vapor Temperature Range (deg. R):	18.5893
Daily Vapor Pressure Range (psia):	0.0001
Breather Vent Press. Setting Range (psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0002
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0001
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0002
Daily Avg. Liquid Surface Temp. (deg R):	64.0030
Daily Min. Liquid Surface Temp. (deg R):	59.3557
Daily Max. Liquid Surface Temp. (deg R):	68.6503
Daily Ambient Temp. Range (deg. R):	18.6173
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	1.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0002
Vapor Space Outage (ft):	4.2563

Working Losses (lb):	1.5181
Vapor Molecular Weight (lb/lb-mole):	174.2000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0002
Annual Net Throughput (gal/yr.):	12,633,794.0400
Annual Turnovers:	1,592.8670
Turnover Factor:	0.1855
Maximum Liquid Volume (gal):	19,960.8933
Maximum Liquid Height (ft):	14.0000
Tank Diameter (ft):	15.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	1.5598

TankESP
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual
TK-TDI - Vertical Fixed Roof Tank
Havre De Grace, MD

	Losses(lbs)		
Components	Working loss	Breathing Loss	Total Emissions
TDI	1.52	0.04	1.56

TankESP
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

TK-Polyol

Identification

User Identification:	TK-Polyol
City:	Havre De Grace
State:	MD
Company:	Elite Comfort Solutions, Inc.
Type of Tank:	FRT (no floating roof)
Description:	Storage Tanks

Tank Dimensions

Shell Height (ft):	15.10
Diameter (ft):	15.00
Liquid Height (ft) :	14.00
Avg. Liquid Height (ft):	11.00
Volume (gallons):	19,960.89
Turnovers:	3,112.27
Net Throughput(gal/yr):	24,684,903.18
Is Tank Insulated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White Paint
Shell Condition	Good
Roof Color/Shade:	White Paint
Roof Condition:	Good

Roof Characteristics

Type:	Column-Supported (Cone)
Height (ft)	0.47
Roof Slope (ft/ft)	0.06

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Baltimore, MD (Avg Atmospheric Pressure = 14.62 psia)

TankESP
Emissions Report - Detail Format
Liquid Contents of Storage Tank

TK-Polyol - Vertical Fixed Roof Tank
Havre De Grace, MD

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg. F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight.	Basis for Vapor Pressure Calculations
TDI	All	64.00	59.36	68.65	68.00	0.0002	0.0001	0.0002	174.2000			174.20	N/A

TankESP
Emissions Report - Detail Format
Detail Calculations (AP-42)

TK-Polyol - Vertical Fixed Roof Tank
Havre De Grace, MD

Annual Emission Calculations	
Standing Losses (lb):	0.0418
Vapor Space Volume (cu ft):	752.1415
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0314
Vented Vapor Saturation Factor:	1.0000
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	752.1415
Tank Diameter (ft):	15.0000
Vapor Space Outage (ft):	4.2563
Tank Shell Height (ft):	15.1000
Average Liquid Height (ft):	11.0000
Roof Outage (ft):	0.1563
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1563
Roof Height (ft)	0.4688
Roof Slope (ft/ft)	0.0625
Shell Radius (ft):	7.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	174.2000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0002
Daily Avg. Liquid Surface Temp. (deg. R):	64.0030
Daily Average Ambient Temp. (deg. F):	55.8473
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.7310
Liquid Bulk Temperature (deg. R):	68.0000
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,275.1850
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0314
Daily Vapor Temperature Range (deg. R):	18.5893
Daily Vapor Pressure Range (psia):	0.0001
Breather Vent Press. Setting Range (psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0002
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0001
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0002
Daily Avg. Liquid Surface Temp. (deg R):	64.0030
Daily Min. Liquid Surface Temp. (deg R):	59.3557
Daily Max. Liquid Surface Temp. (deg R):	68.6503
Daily Ambient Temp. Range (deg. R):	18.6173
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	1.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0002
Vapor Space Outage (ft):	4.2563

Working Losses (lb):	2.8191
Vapor Molecular Weight (lb/lb-mole):	174.2000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0002
Annual Net Throughput (gal/yr.):	24,684,903.1800
Annual Turnovers:	3,112.2692
Turnover Factor:	0.1763
Maximum Liquid Volume (gal):	19,960.8933
Maximum Liquid Height (ft):	14.0000
Tank Diameter (ft):	15.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	2.8609

TankESP
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual
TK-Polyol - Vertical Fixed Roof Tank
Havre De Grace, MD

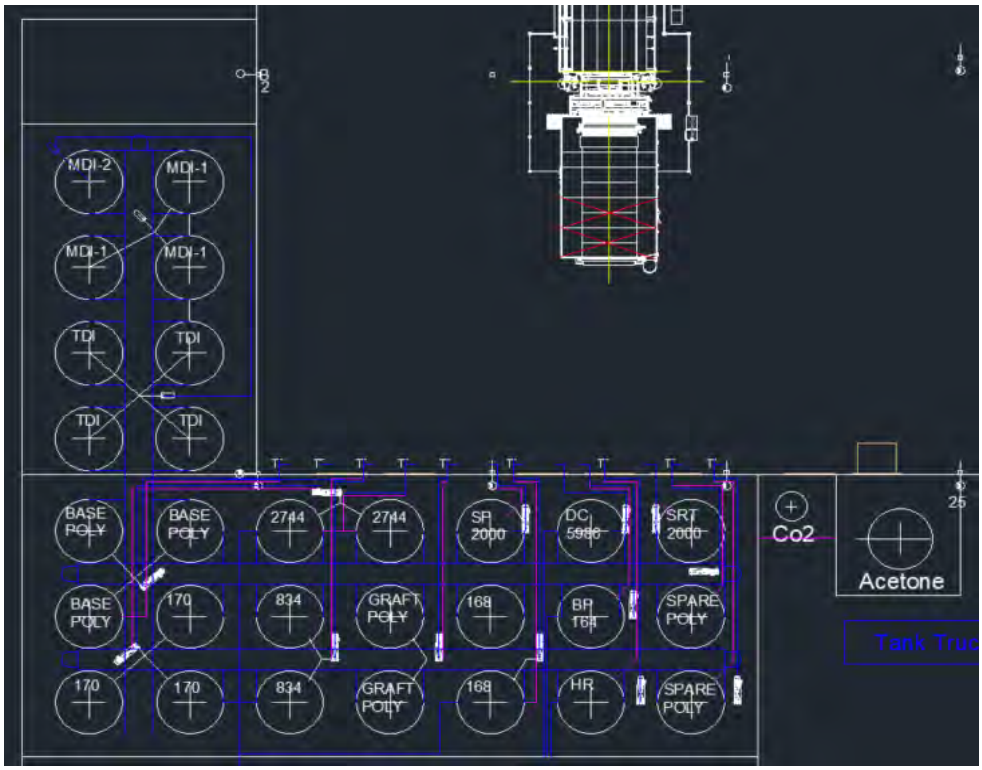
	Losses(lbs)		
Components	Working loss	Breathing Loss	Total Emissions
TDI	2.82	0.04	2.86

Attachment 2
Storage Tank Farm Inventory

Attachment 2
Tank Farm for Elite Comfort Solutions
1900 Clark Road, Havre De Grace, MD

Steam No.	Chemical	Name	Qty	Tank Size	Exemption Requested
1	Polyol	SP-170	3	20000	X
2	Polyol	SP-2744	2	20000	X
3	Polyol	SP-834	2	20000	X
4	Polyol	SP-168	2	20000	X
5	Polyol	Base Polyol (SP-56)	3	20000	X
7	Polyol	SP-2000	1	10000	X
8	Polyol	BP-164	1	10000	X
9	Polyol	SP-2900	1	20000	X
6	Polyol	Spare Polyol	1	20000	X
53	Polyol	Spare Polyol	1	20000	X
54	Polyol	Spare Polyol	1	20000	X
21	Silicone Surfactant	DC5986	1	10000	X
37	Additive	SRT-2000	1	10000	X
		Total	20		

Steam No.	Chemical	Name	Qty	Tank Size	In Permit-to-Construct Application
10	Isocyanate	MDI-1	3	20000	X
11	Isocyanate	MDI-2	1	20000	X
12	Isocyanate	TDI	4	20000	X
46	Blowing Agent	Acetone	1	10000	X
		Total	9		



Attachment 3
Safety Data Sheets

P.O. Box 864 • 135 Redstone Street
Southington, CT 06489 U.S.A

Toll Free: (800)-4-midsun (U.S.A. only)
(860) 378-0100 • (860) 378-0103 (Fax)
www.midsungroup.com

Acetone Material Safety Data Sheet (MSDS)

MANUFACTURER'S CONTACT INFORMATION:

Sunoco, Inc. (R&M)
1735 Market Street LL
Philadelphia, Pennsylvania 19103-7583

EMERGENCY
Sunoco: (800) 964-8861
Chemtrec: (800) 424-9300
Product Safety: (610) 859-1120

I. Product Identification	
Trade Name	Acetone
Product Use	Chemical Intermediate

II. Hazardous Ingredients of Material			
Components	**Amount (Vol. %)**	**CAS No.**	**ACGIH TLV**
Acetone	100	67-64-1	–
Exposure Limits (See Section VI for additional Exposure Limits)			
Governing Body	**CAS No.**		**Exposure Limits**
ACGIH	67-64-1		STEL 750 ppm
ACGIH	67-64-1		TWA 500 ppm
OSHA	67-64-1		TWA 1,000 ppm

Emergency Overview:
Danger! Extremely flammable liquid and vapor. Vapors may cause flash fire or explosion. Harmful if inhaled. Vapor concentrations may cause drowsiness. Causes skin and eye irritation. Harmful if swallowed. May cause target organ or system damage to the following: Eye, skin, respiratory system, central nervous system.

HAZARD RATINGS

Key: 0 = Least 1 = Slight 2 = Moderate 3 = High 4 = Extreme

	Health	Fire	Reactivity	PPI
NFPA	1	3	0	
HMIS	1	3	0	X

III. Physical/Chemical Data	
Appearance & Odor	Colorless liquid
Boiling Point	133º F
Melting Point	-137.2º F
Specific Gravity	0.79
Molecular Weight g/mole	58.08
pH	7
Odor	Sweet, pungent
Odor Threshold	62 ppm
Vapor Pressure (mm Hg @20º C)	181
Solubility in Water	Complete
Volatile (wt %)	100%

IV. Fire and Explosion Data	
Flash Point	1.4
Flammable Limits in Air (% By Volume)	
Lower	2.5%
Upper	12.8%
Auto Ignition Temperature	869º F
Unusual Fire & Explosion Hazards	Use water spray. Use water spray to cool fire exposed tanks and containers. Acetone/water solutions that contain more than 2.5% acetone have flash points. When the acetone concentration is greater than 8% (by weight) in a closed container, it would be within flammable range and cause fire or explosion if a source of ignition were introduced.
Fire Extinguishing Media	Water spray, alcohol resistant foam, dry chemical or carbon dioxide.

V. Reactivity Data	
Stability	Stable
Conditions to Avoid	Avoid heat, sparks and open flame.
Incompatibility	Acetone may form explosive mixtures with chromic anhydride, chromyl alcohol, hexacholromelamine, hydrogen peroxide, permonosulfuric acid, potassium terbutoxide and thioglycol. Strong oxidizers.
Hazardous Decomposition	May produce carbon dioxide, carbon monoxide and other asphyxiants.
Hazardous Polymerization	Will not occur.

VI. Health Hazard and Toxicological Data	
Pre-existing Medical Conditions: The following diseases or disorders may be aggravated by exposure to this product. Skin, eye, lung (asthma-like conditions).	
Chronic Exposure	**Effects of Exposure**
Eyes	Contact with the eye may cause moderate to severe irritation.
Skin	Moderately irritating to the skin. Prolonged or repeated contact can result in defatting and drying of the skin which may result in skin irritation and dermatitis (rash). LD50 mg/kg Rabbit, 20,000 Draize Skin Score: no data Out of 8.0
Inhalation	High concentrations may lead to central nervous system effects (drowsiness, dizziness, nausea, headache, paralysis and loss of consciousness and even death).High vapor concentrations are irritating to the eyes, nose, throat and lungs. LC50 (mg/1) no data LC50 (mg/m^3) Rat 8 hrs. 50,000 LC50 (ppm) no data
Ingestion	Product may be harmful or fatal if swallowed. Pulmonary aspiration hazard. After ingestion, may enter lungs and produce damage. May produce central nervous system effects, which may include dizziness, loss of balance and coordination, unconsciousness, coma and even death. LD50 (g/kg) Rat 5.8

VII. First Aid Procedures	
Inhalation	Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen and continue to monitor. Get immediate medical attention.
Eye Contact	Flush eye(s) with water for 15 minutes. Get medical attention.
Skin Contact	Immediately flush skin with plenty of water. Remove clothing. Get medical attention immediately. Wash clothes separately before reuse.
Ingestion	If swallowed, DO NOT INDUCE VOMITING. Give victim a glass of water or milk. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person. Get medical attention immediately. See Section X for additional first aid information.

VIII. Preventive Measures **Consult with a Health and Safety Professional for Specific Selections**	
A. PERSONAL PROTECTIVE EQUIPMENT	
Respiratory Protection	Concentrations in air determines the level of respiratory protection needed. Use only NIOSH certified respiratory equipment. Half-mask air purifying respirator with organic vapor cartridges is acceptable for exposure to ten (10) times the exposure limit. Full-face air purifying respirator with organic vapor cartridges is acceptable for exposures to fifty (50) times the exposure limit. Exposure should not exceed the cartridge limit of 1000 ppm. Protection by air purifying respirators is limited. Use a positive pressure-demand full-face supplied air respirator or SCBA for exposures greater than fifty (50) times the exposure limit. If exposure is above the IDLH (Immediately Dangerous to Life and Health) or there is a possibility of an uncontrolled release, or exposure levels are unknown, then use a positive pressure-demand full-face air respirator with escape bottle or SCBA. Wear a NIOSH-approved (or equivalent) full-face piece airline respirator in the positive pressure mode with emergency escape provisions.
Eye/Face Protection	Splash proof chemical goggles or full-face shield recommended to protect against splash of product.
Clothing/Gloves	The glove(s) list below may provide protection against permeation. Gloves or other chemically resistant materials may not provide adequate protection. Protective gloves are recommended to protect against contact with product. Neoprene, Natural rubber.
Engineering Controls	Use with adequate ventilation. Ventilation is normally required when handling or using this product to keep exposure to airborne contaminants below the exposure limit. Use explosion-proof ventilation equipment.
Other	The following materials are acceptable for use as protective clothing; Neoprene, Natural rubber. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Remove contaminated clothing and wash before reuse.
B. STORAGE AND HANDLING	
Storage Conditions	Keep away from heat, sparks and flame. Store in a cool, dry place. Keep container closed when not in use.
Handling Procedure	Use only in a well-ventilated area. Ground and bond containers when transferring material. Avoid breathing (dust, vapor, mist, gas). Avoid contact with this material. Wash thoroughly after handling. Do not use air pressure to unload containers.

Continued on Next Page

VIII. Preventive Measures (Continued)	
C. ENVIRONMENTAL PROTECTION	
Spill and Leak Procedure	Prevent ignition, stop leak and ventilate the area. Contain spilled liquid with sand or earth. DO NOT use combustible materials such as sawdust. Use appropriate personal protective equipment as stated in Section VIII of this MSDS. Advise the Environmental Protection Agency (EPA) and appropriate state agencies, if required. U.S. regulations require reporting spills of this material could that reach any surface waters. The toll-free number for the U.S. Coast Guard National Response Center is (800) 424-8802. After removal, flush contaminated area thoroughly with water.
Waste Disposal	Follow federal, state and local regulations. In Canada, follow federal, provincial and local regulations. This material is a RCRA hazardous waste. DO NOT flush material to drain or storm sewer. Contract to authorized disposal service.
Ecological Information	This product is not expected to persist in the environment.
D. TRANSPORTATION INFORMATION	
Governing Body	U.S. DOT
Proper Shipping Name	Acetone
Mode	Ground
Hazard Class	3 (Flammable Liquid)
UN/NA Number	UN1090

IX. Regulatory Information/Classifications		
Regulatory List	**Component**	**CAS Number**
ACGIH – Occupational Exposure Limits – Carcinogens	Acetone	67-64-1
ACGIH – Occupational Exposure Limits – TWAs	Acetone	67-64-1
ACGIH – Short Term Exposure Limits	Acetone	67-64-1
CAA (Clean Air Act) – HON Rule – SOCMI Chemicals	Acetone	67-64-1
Canada – WHMIS – Ingredient Disclosure	Acetone	67-64-1
CERCLA/SARA – Hazardous Substances and their RQs	Acetone	67-64-1
CERCLA/SARA – Hazardous Substances and their RQs	Acetone	67-64-1
CERCLA/SARA – Hazardous Substances and their RQs	Acetone	67-64-1
Inventory – Australia – (AICS)	Acetone	67-64-1
Inventory – Canada – Domestic Substances List	Acetone	67-64-1
Inventory – China	Acetone	67-64-1
Inventory – European – EINECS Inventory	Acetone	67-64-1
Inventory – Japan – (ENCS)	Acetone	67-64-1
Inventory – Korea – Existing and Evaluated	Acetone	67-64-1
Inventory – Philippines – (PICCS)	Acetone	67-64-1
Inventory – TSCA – Section 8(b) Inventory	Acetone	67-64-1
Massachusetts – Right to Know List	Acetone	67-64-1
New Jersey – Department of Health RTK List	Acetone	67-64-1
New Jersey – Special Hazardous Substances	Acetone	67-64-1
OSHA – Final PELs – Time Weighed Averages	Acetone	67-64-1
Pennsylvania – Right to Know List	Acetone	67-64-1
TSCA – Section 12(b) – Export Notification	Acetone	67-64-1
TSCA – Section 4 – Chemical Test Rules	Acetone	67-64-1

Continued on Next Page

IX. Regulatory Information/Classifications - Continued

Regulatory Information/Classifications Title III, Sections 311, 312

Acute	Chronic	Fire	Reactivity	Sudden Release of Pressure
YES	NO	YES	NO	NO

X. Other Information

If swallowed, acetone should be removed by emesis and/or gastric lavage. Mechanical assisted ventilation may be necessary. In severe cases, an initial period of hypoglycemia may require correction by intravenous solutions of dextrose. In some cases, an initial period of hyperglycemia has occurred during the recovery phase and has lasted for a few days. Treatment with insulin may be beneficial but should be used cautiously. Empty containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks, static electricity or other sources of ignition. They may explode and cause injury or death. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner or properly disposed of. This product is subject to the Chemical Division and Trafficking Act of 1988 and subject to specific record keeping requirements. WHMIS Classification: Class B, Division 2 – Flammable Liquids.

SAFETY DATA SHEET

SDS No. 0009 Rev 10
Revision Date: 08 April 2020

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Identifier

Product Name:	**BP-164**
Synonym:	None
Chemical Name:	Natural Plant-Based Polyol

1.2 Relevant identified uses and uses advised against:

Identified uses
Component(s) for the manufacture of urethane polymers. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Uses advised against
None.

1.3 Company:

Peterson Chemical Technology, LLC.
4851 Regions Park Drive
Fort Smith, AR 72916 USA
Phone: (479) 648-1966

1.4 Emergency Phone:

(479) 648-1966
Hours of operation: Monday – Friday, 8:00 AM – 6:00 PM CST

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Not classified as hazardous.

The most important adverse physicochemical effects:	Not Applicable
The most important adverse human health effects:	Not Applicable
The most important environmental effects:	Not Available

2.2 GHS Label Elements, including precautionary statements

Hazard Pictograms
None

Signal word: None

Hazard Statement(s)
None

Precautionary Statement(s)
None

2.3 Other hazards

None

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Component	CAS No.	Weight %
Triglyceride Polyol Natural Polyol	8001-79-4	>= 99.0%

4. FIRST AID MEASURES

4.1 Description of first aid measures

IF INHALED, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. Remove material from eyes, skin, and clothing.

IF ON SKIN, immediately wash with soap and plenty of water.

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Remove any contact lenses. Get medical attention. Remove material from skin and clothing.

IF SWALLOWED, contact a physician or poison control center for advice. Do not induce vomiting unless directed to do so by medical personnel.

4.2 Most important symptoms and effects, both acute and delayed:
No additional symptoms and effects are anticipated other than already detailed in the Section 4 – First Aid measures.

4.3 Immediate medical attention/special treatments needed:
Immediately contact a doctor/physician or poison control center.

5. FIRE FIGHTING MEASURES

5.1 Suitable Extinguishing Media
Water (flood with water), alcohol foam, dry chemical, carbon dioxide, or any class B extinguisher. Use water to reduce fire intensity and to keep exposed containers or facilities cool.

5.2 Specific Hazards arising from the chemical

Unusual fire and explosion hazards
There is a possibility of pressure build-up in closed containers when heated. Water spray may be used to cool the container.

Hazardous Products of Combustion
Thermal decomposition products may include, but are not limited to: carbon monoxide and carbon dioxide.

5.3 Special protective actions for fire-fighters
Firefighters and others who may be exposed to products of combustion should wear full protective clothing including self-contained breathing apparatus. Equipment should be decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment, and emergency procedures
Isolate area. Keep unnecessary and unprotected personnel from entering the area. Spilled material may cause a slipping hazard.

6.2 Environmental precautions
Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Dispose according to local and national regulations.

6.3 Methods and materials for containment and cleaning up
Contain large spills and transfer material to appropriate containers for reclamation or disposal. Absorb with materials such as dirt, sand, or sawdust. Sweep up any remaining material. Flush residual spill area with water. See Section 13, Disposal Considerations, for additional information.

6.4 Reference to other sections
Refer to section 8 of the SDS.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Protective measures
Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperature possibly resulting in spontaneous combustion.

Advice on general occupational hygiene
Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist especially when heated. Keep container closed. Use with adequate ventilation. Wash material from skin and clothing after handling. This material is hygroscopic in nature.

7.2 Conditions for safe storage
Store in a cool, well-ventilated place away from foodstuffs, reducing and oxidizing agents. Product is stable under normal conditions of storage and handling.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
None.

Additional exposure limits under the conditions of use
Not available.

DNEL/DMEL and PNEC Values
Not available.

8.2 Exposure controls

Appropriate engineering controls
None.

Personal protective equipment

Eye Protection
Where there is potential for eye contact, wear safety glasses with side shields and have eye flushing equipment immediately available.

Skin Protection
Wear appropriate protective clothing and chemical resistant gloves. Examples of preferred gloves are butyl rubber, natural rubber, neoprene, nitrile, polyethylene, ethyl vinyl alcohol laminate, polyvinyl alcohol, polyvinyl chloride. Consult glove manufacturer to determine type of glove for given application. Wear a face shield and chemical resistant clothing such as a rubber apron when splashing is likely. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection
Avoid breathing dust. Use NIOSH/MSHA approved respiratory equipment when airborne exposure limits for dust particulates are exceeded. Consult respirator manufacturer to determine appropriate type of equipment for the given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respirator protection programs must comply with 29 CFR 1910.134.

Environmental exposure controls
Avoid discharge into the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance	Colorless or pale yellow liquid
Odor	Mild
Odor Threshold	No data available
pH (in water)	~4.5-7.5
Melting point/freezing	-10 °C
Initial Boiling Point and boiling range	313 °C
Flash point	229 °C
Evaporation rate	No data available
Flammability	No data available
Upper/Lower flammability or explosive limits	No data available
Vapor Pressure	<1 mmHg @ 25 °C
Vapor Density	No data available
Solubility	Insoluble
Partition Coefficient: n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition Temperature	No data available
Viscosity	(@25°C) ~600-800 cst

9.2 Other information
No data available.

10. STABILITY AND REACTIVITY

10.1 Reactivity
Product is stable under normal, recommended conditions of handling and storage.

10.2 Chemical stability
Product is stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions
Hazardous reactions will not occur under normal transport or storage conditions.

10.4 Conditions to avoid
Incompatible materials (oxidizing agents), sources of ignition.

10.5 Incompatible materials
Oxidizing agents. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

10.6 Hazardous decomposition products
May include, but not limited to, carbon monoxide, aldehydes, ketones, organic acids, polymer fragments.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
Expected LD50 oral rate > 5000 mg/kg based on data taken from similar product.

Skin corrosion/irritation
Prolonged skin contact is unlikely to result in absorption of harmful amounts. May cause more severe response if skin is abraided (scratched or cut).

Serious eye damage/irritation
May cause slight eye irritation. May cause slight temporary corneal injury.

Respiratory or skin sensitization
No data available.

Germ cell mutagenicity
No data available.

Carcinogenicity
No data available.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available.

Specific target organ toxicity (STOT) – single exposure
No data available.

Specific target organ toxicity (STOT) – repeated exposure

No data available.

Aspiration hazard
No data available.

No acute toxicity studies on this material have been conducted, and no data is available in scientific literature. The components suggest low toxicity.

12. ECOLOGICAL INFORMATION

No environmental toxicity studies have been conducted with this product.

12.1 Toxicity
Acute fish toxicity LCO > 100 mg/L
Bacteria toxicity ECO > 100 mg/L

12.2 Persistence and degradability
Readily biodegradable.

12.3 Bioaccumulative potential
Minimum biodegradability is 60% BSB30/CSB. Resp. 70% DOC.

12.4 Mobility in soil
No data available.

12.5 Results of PBT and vPvB assessment
The substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

12.6 Other adverse effects
This substance is not in Annex I of Regulation (EC) 2037/2000 on substances that deplete the ozone layer.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Do not pump into any sewers, on the ground, or into any body of water. Burn in an approved incinerator or dispose of in an approved chemical landfill in accordance with all applicable local, state, and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal. As your supplier, we have no control over the management practices or manufacturing processes of the parties handling or using this material. The information presented here pertains only to the product as shipped in its intended condition as described in MSDS.

14. TRANSPORT INFORMATION

This product is not classified as a hazardous material for transport.

DOT	Not regulated
IMDG	Not regulated
ICAO/IATA	Not regulated

15. REGULATORY INFORMATION

TSCA Inventory
All components are listed.

CERCLA Reportable Quantity
None.

California Proposition 65 (California Only)
This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

DSL Status
All components of this product are on the Canadian DSL.

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Europe REACH
On the inventory, or in compliance with the inventory.

Australia AICS
On the inventory, or in compliance with the inventory.

New Zealand Inventory of Chemicals NZIoC, as published by ERMA New Zealand
On the inventory, or in compliance with the inventory. There is no requirement to list components of this product on the New Zealand Inventory of Chemicals (NZIoC).

Japan ENCS
On the inventory, or in compliance with the inventory.

Korea KECI
On the inventory, or in compliance with the inventory.

Philippines PICCS
On the inventory, or in compliance with the inventory.

China IECSC
On the inventory, or in compliance with the inventory.

16. OTHER INFORMATION

HMIS Rating

Health:	1
Flammability:	1
Reactivity:	0
Personal Protection:	

NFPA Rating

Health:	1
Flammability:	1

Reactivity: 0
Special Notice:

THIS SAFETY DATA SHEET (SDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE RELEVANT DIRECTIVES AND REGULATIONS. THE INFORMATION IN THIS SDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. PETERSON CHEMICAL TECHNOLOGY, LLC. BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS SDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT PETERSON CHEMICAL TECHNOLOGY, LLC. AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.

1. Product and Company Identification

Product Name: Dzolv

VersaFlex / Raven Lining Systems
686 South Adams Street
Kansas City, KS 66105

www.versaflex.com / www.ravenlining.com

Company Phone: (913) 321-9000
Company Toll Free: (800) 321-0906

CHEMTREC 24 hour Emergency USA: (800) 424-9300
CHEMTREC 24 hour International: (703) 527-3887

Product Use: Cleaning cured isocyanates and epoxy from equipment
Not recommended for: Non Professional Use

2. Hazards Identification

Signal Word: Danger

GHS Ratings:

Flammable liquid	4	Flash point >= 60°C (140°F) and <= 93°C (200°F).
Skin corrosive	2	Reversible adverse effects in dermal tissue, Draize score: >= 2.3 < 4.0 or persistent inflammation.
Eye corrosive	2A	Eye irritant: Subcategory 2A, Reversible in 21 days.
Reproductive toxin	1B	Presumed, Based on experimental animals.
Organ toxin single exposure	3	Transient target organ effects- Narcotic effects- Respiratory tract irritation.

GHS Hazards

H227	Combustible liquid.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H360	May damage fertility or the unborn child.

GHS Precautions

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces - No smoking.
P235	Keep cool.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P264	Wash thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P281	Use personal protective equipment as required.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P321	Specific treatment (see Section 4 of the SDS).

P362	Take off contaminated clothing and wash before reuse.
P302+P352	IF ON SKIN: Wash with soap and water.
P304+P340	IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P332+P313	If skin irritation occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P370+P378	In case of fire: Use water for or fine spray for extinction.
P405	Store locked up.
P403+P233	Store in a well ventilated place. Keep container tightly closed.
P403+P235	Store in a well ventilated place. Keep cool.
P501	Dispose of contents/container according to Section 13 of the SDS.

3. Composition / Information on Ingredients

Chemical Name	CAS number	Weight Concentration %
N-Methylpyrrolidone	872-50-4	30 - 40%
Propylene Carbonate	108-32-7	20 - 30%
Trade Secret		5 - 15%
Trade Secret		5 - 15%
Trade Secret		5 - 15%
Methoxypropoxypropanol	34590-94-8	1 - 5%

4. First Aid Measures

Inhalation: Remove to fresh air if effects occur. Consult a physician.
Eye Contact: Flush with large quantities of water for at least 15 minutes. Consult a physician.
Skin Contact: Wash thoroughly with soap and flowing water.
Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Notes to Physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

Flash Point: >93 C (>200 F)

Flammable Properties: Product is not considered a fire hazard, but will burn if ignited. NFPA Flammability Class: III B (Combustible liquid).
The definition and classification of flammable and combustible liquids are addressed in NFPA 30. A flammable liquid is defined as a liquid whose flash point is < 100 deg F (38 deg C), while a combustible liquid is one whose flash point is $\geq$ 100 deg F. These groups are further classified into the following NFPA Flammability Classes:
Class IA liquids are flammable liquids that have a flash point < 73 deg F (23 deg C) and boiling point < 100 deg F.
Class IB liquids are flammable liquids that have a flash point < 73 deg F and a boiling point $\geq$ 100 deg F.
Class IC liquids are flammable liquids that have a flash point $\geq$ 73 deg F, but < 100 deg F.
Class II liquids are combustible liquids that have a flash point > 100 deg F, but < 140 deg F (60 deg C).
Class IIIA liquids are combustible liquids that have a flash point $\geq$ 140 deg F, but < 200 deg F (93 deg C).
Class IIIB liquids are combustible liquids that have a flash point $\geq$ 200 deg F.

Suitable Extinguishing Media: Carbon dioxide, dry chemical, water fog or fine spray or alcohol resistant foam.
Unsuitable Extinguishing Media: Do not use direct water stream, as it may spread fire.
Products of Combustion: Thermal decomposition in the presence of air may yield carbon monoxide, carbon dioxide,

ketones and other unidentified toxic and/or irritating compounds.

Fire Fighting: Stay upwind and keep people away. Isolate fire and deny unnecessary entry. Keep out of low areas where gases (fumes) can accumulate. Water is not recommended, but may be applied in large quantities as a fine spray when other extinguishing agents are not available. Use water spray to cool fire-exposed containers and fire-affected zone until fire is out. Contain fire water run-off if possible, as it may cause environmental damage. Review section 6 and section 12 of this SDS.

Protection of Firefighters: Wear positive pressure self-contained breathing apparatus (SCBA) and approved protective clothing (helmet, coat, trousers, boots and gloves). If contact is likely, use full chemical resistant fire fighting clothing with SCBA.

6. Accidental Release Measures

Personal Precautions: Put on appropriate personal protective equipment (see section 8).

Environmental Precautions: Prevent spilled material from contact with soil, drains and sewers.

Methods for Containment: Contain by diking with sand, earth or other suitable material.

Methods for Clean-up: Absorb spill with an inert material, use non-sparking tools to place into labeled waste container for disposal.

7. Handling and Storage

Handling: Wear appropriate personal protective equipment (see section 8). Avoid contact with skin, eyes or clothing. Do not breathe vapor or mist. Do not ingest. Avoid prolonged or repeated contact with skin. May cause allergic skin reaction, persons with a history of skin sensitization should not be employed in any process in which this product is used. Wash thoroughly with soap and water after handling. Do not handle or store near flame, heat or strong oxidants. Keep away from sources of ignition and hot metal surfaces.

Storage: Store original unopened containers in a sheltered area between 60°F and 80°F (15°C and 27°C) at atmospheric pressure. Do not store in direct sunlight. Keep containers closed when not in use.

8. Exposure Controls / Personal Protection

Chemical Name / CAS No.	OSHA Exposure Limits	ACGIH Exposure Limits	Other Exposure Limits
N-Methylpyrrolidone 872-50-4	Not Established	Not Established	Not Established
Propylene Carbonate 108-32-7	Not Established	Not Established	Not Established
Trade Secret 106-65-0	Not Established	Not Established	Not Established
Trade Secret 1119-40-0	Not Established	Not Established	Not Established
Trade Secret 627-93-0	Not Established	Not Established	Not Established
Methoxypropoxypropanol 34590-94-8	100 ppm TWA; 600 mg/m3 TWA	150 ppm STEL 100 ppm TWA	NIOSH: 100 ppm TWA; 600 mg/m3 TWA 150 ppm STEL; 900 mg/m3 STEL

Engineering Controls: General mechanical ventilation is sufficient for most conditions. Control airborne levels below the exposure guidelines, if established.

Local exhaust ventilation may be necessary for some operations.

General Hygiene Considerations: Wash thoroughly after handling and before eating, drinking or smoking.

Eye/face Protection: Use chemical safety glasses, splash-proof eye goggles or goggles with full faceshield.

Skin Protection: Use nitrile or other impermeable chemical resistant gloves to prevent skin irritation. If potential for skin contact is present, wear impervious, long-sleeved, body covering clothing and rubber boots.

Respiratory Protection: Respiratory protection should not be needed. If exposure may or does exceed occupational exposure limits, or respiratory irritation is experienced, use a properly fitted MSHA/NIOSH approved respirator fitted with organic vapor cartridges. If the respirator is the sole means of protection, use a full-face supplied air respirator. If sanding or grinding on cured material, use above respirator fitted with HEPA filters or a dust mask.

Contaminated Gear: Remove contaminated clothing and shoes while washing. Wash clothing before reuse. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands.

9. Physical and Chemical Properties

Appearance Clear to pale yellow	**Odor** Solvent odor
Odor Threshold No data found	**Physical State** Liquid
pH No data found	**Melting/Freezing Point** No data found
Boiling Point >94°C	**Boiling Range** No data found
Flash Point >200°F, >93°C	**Evaporation Rate** No data found
Flammability (solid, gas) No data found	**LEL/UEL** No data found
Vapor Pressure No data found	**Vapor Density** No data found
Specific Gravity 1.0 - 1.2	**Solubility in Water** No data found
Partition Coefficient (n-octanol/water) No data found	**Autoignition Temperature** No data found
Decomposition Temperature No data found	**Viscosity** No data found
Lbs VOC/Gallon Less Water 6.5	

10. Stability and Reactivity

Chemical Stability: Stable under recommended storage conditions (see Section 7).
Conditions to Avoid: Heat, flames and sparks.

Incompatible Materials: Strong acids, bases, or oxidizing agents.

Products of Combustion: Thermal decomposition in the presence of air may yield carbon monoxide, carbon dioxide, ketones and other unidentified toxic and/or irritating compounds.

Hazardous polymerization will not occur.

11. Toxicological Information

Mixture Toxicity

Inhalation Toxicity LC50: 9mg/L

Component Toxicity

872-50-4 N-Methylpyrrolidone
Oral LD50: 3,914 mg/kg (Rat) Inhalation LC50: 3 mg/L (Rat)

Likely Routes of Exposure:

No data found

Target Organs

May cause damage to the following organs:

Eyes Central Nervous System Respiratory System

Effects of Overexposure

CAS Number	Description	% Weight	Carcinogen Rating
None			No data found

12. Ecological Information

Component Ecotoxicity

N-Methylpyrrolidone	96 Hr LC50 Lepomis macrochirus: 832 mg/L [static]; 96 Hr LC50 Pimephales promelas: 1072 mg/L [static]; 96 Hr LC50 Poecilia reticulata: 1400 mg/L [static] 48 Hr EC50 Daphnia magna: 4897 mg/L 72 Hr EC50 Desmodesmus subspicatus: >500 mg/L
Propylene Carbonate	96 Hr LC50 Cyprinus carpio: >1000 mg/L [semi-static] 48 Hr EC50 Daphnia magna: >500 mg/L 72 Hr EC50 Desmodesmus subspicatus: >500 mg/L
Trade Secret	96 Hr LC50 Brachydanio rerio: 50 - 100 mg/L [static]
Trade Secret	96 Hr LC50 Pimephales promelas: 19.6 - 26.2 mg/L [static] 48 Hr EC50 Daphnia magna: 122.1 - 163.5 mg/L
Methoxypropoxypropanol	96 Hr LC50 Pimephales promelas: >10000 mg/L [static] 48 Hr LC50 Daphnia magna: 1919 mg/L

13. Disposal Considerations

Waste Disposal Methods: Dispose of in accordance with federal, state and local regulations. The preferred method for disposal of uncontaminated product is by recycling, reclaiming, incineration or other thermal destruction device using a licensed and permitted waste disposal contractor.

14. Transport Information

This material is not regulated under 49 CFR in a container of 119 gallon capacity or less when transported solely by land, as long as the material is not a hazardous waste, a marine pollutant, or specifically listed as a hazardous substance.

Agency	Proper Shipping Name	UN Number	Packing Group	Hazard Class
DOT	Not Regulated			

15. Regulatory Information

USA Federal: This SDS has been prepared in compliance with the Occupational Safety and Health Act (OSHA) Hazard Communication Standard (29 CFR 1910.1200). This product is considered to be a hazardous chemical under that standard. The specific chemical identity and/or exact percentage of any proprietary ingredient(s) may be withheld as a trade secret, pursuant to the standard.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986): To the best of our knowledge, this product contains the following chemicals which are known to the State of California to cause cancer or reproductive toxicity at levels which require warning under this statute:

872-50-4 N-Methylpyrrolidone 30 to 40 % Developmental Toxicity

USA Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) - section 103 Hazardous Substances Reportable Quantities (RQs): To the best of our knowledge, this product contains the following chemicals which are listed in 40 CFR 302.4:

- None

Massachusetts Right to Know: To the best of our knowledge, this product contains the following chemicals at levels which require reporting under this statute:

34590-94-8 Methoxypropoxypropanol 1 to 5 %
872-50-4 N-Methylpyrrolidone 30 to 40 %

New Jersey Right to Know: To the best of our knowledge, this product contains the following chemicals at levels which require reporting under this statute:

34590-94-8 Methoxypropoxypropanol 1 to 5 %
872-50-4 N-Methylpyrrolidone 30 to 40 %

Pennsylvania Right to Know: To the best of our knowledge, this product contains the following chemicals at levels which require reporting under this statute:

34590-94-8 Methoxypropoxypropanol 1 to 5 %
872-50-4 N-Methylpyrrolidone 30 to 40 %

USA Resource Conservation and Recovery Act (40 CFR 261): To the best of our knowledge, this product contains the following chemicals at levels which require reporting under this statute:

- None

USA Superfund Amendments and Reauthorization Act (SARA) of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) - section 313 Toxic Release Inventory (TRI) Form R: To the best of our knowledge, this product contains the following chemicals which are listed in 40 CFR 372.65:

872-50-4 N-Methylpyrrolidone 30 to 40 %

USA Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) - section 302 Extremely Hazardous Substances Threshold Planning Quantities (TPQs): To the best of our knowledge, this product contains the following chemicals at levels which require reporting under this statute:

- None

USA Toxic Substances Control Act (TSCA) - section 12(b): To the best of our knowledge, this product contains the following chemicals above the de minimus concentration(s) which requires notification to the Environmental Protection Agency (EPA) per 40 CFR 707, subpart D, if any person intends to export:

- None

Country	Regulation	All Components Listed
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Canada Domestic Substance List	Yes
Canada	Canada Non-Domestic Substances List (NDSL)	No
China	China Inventory of Existing Chemical Substances	Yes
EU	EU REACH List of Registered Intermediates	No
EU	EU REACH List of Pre-Registered Substances	Yes
EU	EU REACH List of Registered Substances	Yes
Japan	Japanese Existing and New Chemical Substances List	Yes
South Korea	South Korea Existing Chemicals Inventory	Yes
Philippines	Philippines Inventory of Chemicals and Chemical	Yes
USA	USA TSCA Inventory list section 8(b)	Yes

- None

16. Other Information

Legend

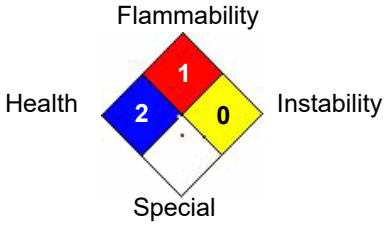
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
ADR/RID	European Agreement for transport of dangerous goods by road (ADR) and by rail (RID)
CAS No.	Chemical Abstract Service Registry Number
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act, AKA "Superfund"
DOT	Department of Transportation (USA)
HCS	OSHA Hazard Communication Standard (29 CFR 1910.1200)
IARC	International Agency for Research on Cancer

IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
IMDG	International Maritime Dangerous Goods
MSHA	Mine Safety and Health Administration
N.A.	Not Applicable
N.D.	Not Determined
N.E.	Not Established
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration (USA)
PEL	Permissible Exposure Limit
SARA	Superfund Amendments and Reauthorization Act of 1986 (40 CFR)
STEL	Short Term Exposure Limit (15 minute Time Weighted Average)
TDG	Canada Transport of Dangerous Goods regulations
TLV	Threshold Limit Value
TWA	Time Weighted Average
WHMIS	Canada Workplace Hazardous Materials Information System

Hazardous Material Information System (HMIS)

HMIS & NFPA Hazard Rating Legend
*** = Chronic Health Hazard**
0 = INSIGNIFICANT
1 = SLIGHT
2 = MODERATE
3 = HIGH

National Fire Protection Association (NFPA)



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Reviewer Revision

Date Prepared: 5/24/2019

SAFETY DATA SHEET

MSDS No. 0017 Rev 05
Revision Date: 17 August 2020

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Identifier

Product Name:	**MD-129**
Synonym:	Methylene Diphenyl Diisocyanate
Chemical Name:	Methylene Diphenyl Diisocyanate

1.2 Relevant identified uses and uses advised against:

Identified uses
Component(s) for the manufacture of urethane polymers. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Uses advised against
Consumption-related: food/beverage contact, pharmaceutical, etc.

1.3 Company:

Peterson Chemical Technology, LLC.
4851 Regions Park Drive
Fort Smith, AR 72916 USA
Phone: (479) 648-1966

1.4 Emergency Phone:

(479) 648-1966
Hours of operation: Monday – Friday, 8:00 AM – 5:00 PM CST

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

This material is classified as hazardous under OSHA Hazard Communication Standard (29 CFR 1910.1200).

GHS Classification in accordance with 29 CFR 1920 (OSHA HCS)
Acute toxicity, Inhalation (Category 4), H332
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Respiratory sensitization (Category 1), H334
Skin Sensitization (Category 1), H317
Carcinogenicity (Category 2), H351
Specific target organ toxicity – single exposure (Category 3), Respiratory system, H335
Specific target organ toxicity – repeated exposure, Inhalation (Category 2), Respiratory system, H373

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label Elements, including precautionary statements

Hazard Pictograms

Signal word: Danger

Hazard Statement(s)

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H332	Harmful if swallowed.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.
H373	May cause damage to organs (Respiratory system) through prolonged or repeated exposure if inhaled.

Precautionary Statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed out of the workplace.
P280	Wear protective gloves/ eye protection/ face protection.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P321	Specific treatment (see supplemental first aid instructions on this label).
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Other hazards

Lachrymator

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Component	CAS No.	Weight %	Classification
Polymeric Diphenylmethane Diisocyanate	9016-87-9	60-100%	
4,4'-Diphenylmethane Diisocyanate	101-68-8	0-40%	Acute Tox. 4; Skin Irrit. 2; Eye Irrit. 2A; Resp. Sens. 1; Skin Sens. 1; Carc. 2; STOT SE 3; STOT RE 2; H315, H317, H319, H332, H334, H335, H351, H373

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

IF INHALED, respiratory irritation may occur. Harmful if inhaled. This product is a respiratory irritant and potential respiratory sensitizer. Repeated inhalation of vapor or aerosol at levels about the occupational exposure limit could cause respiratory sensitization. Symptoms may include irritation to the eyes, nose, throat and lungs, possibly combined with dryness of the throat, tightness of chest and difficulty breathing. The onset of respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitized persons.

IF ON SKIN, Wash off with soap and plenty of water. Consult a physician if irritation develops. Wash clothing before reuse. Clean shoes thoroughly before reuse. An MDI study has demonstrated that a polyglycol-based skin cleanser (such as D-TamTM, PEG-400) or corn oil may be more effective than soap and water. Causes skin irritation. May cause sensitization by skin contact.

IF IN EYES, Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

IF SWALLOWED, Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Provided the patient is conscious, rinse mouth out with water. Low oral toxicity, but ingestion may cause irritation of the gastrointestinal tract. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed:
Causes eye and skin irritation.

4.3 Immediate medical attention/special treatments needed:
Immediately contact a doctor/physician or poison control center.

5. FIRE FIGHTING MEASURES

5.1 Suitable Extinguishing Media
Dry powder, carbon dioxide, or foam. Water may be used in no other available and then in copious quantities. Reaction between water and hot isocyanate may be vigorous. Prevent washings from entering water courses, keep fire exposed containers cool by spraying with water.

5.2 Specific Hazards arising from the chemical

Unusual fire and explosion hazards
There is a possibility of pressure build-up in closed containers when heated. Water spray may be used to cool the container. Due to reaction with water producing CO_2 gas, a hazardous build-up of pressure could result if contaminated containers are resealed.

Hazardous Products of Combustion
Thermal decomposition products may include, but are not limited to: carbon monoxide, carbon dioxide, nitrogen oxides, hydrocarbons and HCN.

5.3 Special protective actions for fire-fighters
Firefighters and others who may be exposed to products of combustion should wear full protective clothing including self-contained breathing apparatus. Equipment should be decontaminated after use. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment, and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Dispose according to local and national regulations.

6.3 Methods and materials for containment and cleaning up
If the product is in its solid form: Spilled MDI flakes should be picked up carefully. The area should be vacuum cleaned to remove remaining dust particles completely.
If the product is in its liquid form: Absorb spillages onto sand, earth or any suitable absorbent material. Leave to react for at least 30 minutes. Shovel into open-top drums for further decontamination. Wash the spillage area with water. Test atmosphere for MDI vapor. Neutralize small spillages with decontaminant. Remove and dispose of residues. See Section 13, Disposal Considerations, for additional information.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Protective measures
Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2. Spills of these organic materials on hot fibrous insulations may lead to lowering of the auto ignition temperature possibly resulting in spontaneous combustion.

Advice on general occupational hygiene
Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist especially when heated. Keep container closed. Use with adequate ventilation. Wash material from skin and clothing after handling. Avoid eating, drinking and smoking in areas where this material is handles. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage
Store in a cool, well-ventilated place away from foodstuffs, reducing and oxidizing agents. Product is stable under normal conditions of storage and handling. Store under inert gas. Moisture sensitive. Due to reaction with water producing carbon dioxide gas, a hazardous buildup of pressure could result if contaminated containers are re-sealed. Do not store in unlabeled containers. Do not store in containers made of copper, copper alloys or galvanized surfaces.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control Parameters	Basis
Polymeric MDI	9016-87-9	TWA	0.0050 ppm 0.05 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
Diphenylmethane- 4,4'-diisocyanate				
	101-68-8	TWA	0.0050 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Respiratory sensitization		
		C	0.02 ppm 0.2 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		C	0.02 ppm 0.2 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate. Ceiling limit is to be determined from breathing-zone air samples.		
		TWA	0.0050 ppm 0.05 mg/m3	USA. NIOSH Recommended Exposure Limits
		10 minute ceiling value		
		C	0.2 ppm 0.2 mg/m3	USA. NIOSH Recommended Exposure Limits
		10 minute ceiling value		

Additional exposure limits under the conditions of use
Not available.

DNEL/DMEL and PNEC Values
Not available.

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye Protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin Protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of

contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nature latex/chloroprene
Minimum layer thickness: 0.6 mm
Break through time: 480 min
Material tested: Lapren® (KCL 706 / Aldrich Z677558, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 60 min
Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory Protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Environmental exposure controls
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance	Amber Liquid
Odor	Slightly Musty
Odor Threshold	No data available
pH (in water)	No data available
Initial Boiling Point and boiling range	No data available.
Flash point	> 110 °C. (>230 °F)
Evaporation rate	No data available
Flammability	No data available
Upper/Lower flammability or explosive limits	No data available
Vapor Pressure	No data available
Vapor Density	No data available
Relative Density	1.2
Solubility	Slightly soluble
Partition Coefficient: n-octanol/water	No data available
Auto-ignition temperature	>600 °C
Decomposition Temperature	No data available

Viscosity	25 cP @ 25°C.

9.2 Other information
No data available.

10. STABILITY AND REACTIVITY

10.1 Reactivity
Product is stable under normal, recommended conditions of handling and storage.

10.2 Chemical stability
Product is stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions
Hazardous reactions will not occur under normal transport or storage conditions. Reaction with wate (moisture) produces CO2 gas. Exothermic reaction with materials containing active hydrogen groups. The reaction becomes progressively more vigorous and can be violent at higher temperatures if the miscibility of the reaction partners is good or is supported by stirring or the presence of solvents. MDI is insoluble with, and heavier than water and sinks to the bottom but reacts slowly at the interface. A solid wat er-insoluble layer of polyuria is formed at the interface by liberated carbon dioxide gas.

10.4 Conditions to avoid
Avoid sources of ignition, high temperatures.

10.5 Incompatible materials
Incompatible materials (oxidizing agents), water, amines, strong bases and acids, alcohols.

10.6 Hazardous decomposition products
May include, but not limited to, carbon dioxide, carbon monoxide, nitrogen oxides (NO, NO_2 etc.), hydrocarbons and HCN.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Inhalation dusts and mists - Rat – 0.49 mg/l
LD50 Dermal – Rabbit - >9400 mg/kg
LD50 Oral – Rat - >10000 mg/kg
Irritating to respiratory tract.

Skin corrosion/irritation
Irritating to the skin.

Serious eye damage/irritation
Irritating to the eyes.

Respiratory or skin sensitization
Skin and respiratory sensitizer.

Germ cell mutagenicity
Laboratory experiments have shown no mutagenic effects.

Carcinogenicity
This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

Limited evidence of carcinogenicity in animal studies

IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (Diphenylmethane-4,4'-diisocyanate)

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No known significant effects or critical hazards.

Specific target organ toxicity (STOT) – single exposure
Inhalation - May cause respiratory irritation. - Respiratory system

Specific target organ toxicity (STOT) – repeated exposure
Inhalation - May cause damage to organs through prolonged or repeated exposure. - Respiratory system

Aspiration hazard
No data available.

Additional Information
No data available.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
EC50, Acute – 24 hours static – Daphnia >1000 mg/l
LC50, acute – 96 hours static – Fish >1000 mg/l
NOEC, Chronic – 21 days semi-static – Daphnia >= 10 mg/l
NOECr, Chronic – 72 hours static – Algae 1640 mg/l

12.2 Persistence and degradability
Not readily biodegradable.

12.3 Bioaccumulative potential
Bioaccumulation
Cyprinus carpio (Carp) - 28 d - 0.0008 mg/l
Bioconcentration factor (BCF): 92

12.4 Mobility in soil
No data available.

12.5 Results of PBT and vPvB assessment
The substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

12.6 Other adverse effects
Do not empty into drains.
No data available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Do not pump into any sewers, on the ground, or into any body of water. Burn in an approved incinerator or dispose of in an approved chemical landfill in accordance with all applicable local, state, and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal. As your supplier, we have no control over the management practices or manufacturing processes of the parties handling or using this material. The information presented here pertains only to the product as shipped in its intended condition as described in MSDS.

14. TRANSPORT INFORMATION

This product is not classified as a hazardous material for transport.

DOT
UN number: NA3082 Class: 9 PG: III
Proper shipping name: OTHER REGULATED SUBSTANCES, LIQUID, N.O.S. (Methylene Diphenyl Diisocyanate)
Reportable Quantity (RQ): 5000 lbs
Single containers less than 5000 lbs are not regulated.

IMDG
Not regulated

IATA
Not regulated

15. REGULATORY INFORMATION

TSCA Inventory
All components are listed.

CERCLA Reportable Quantity
4, 4:-Methylenediphenyl diisocyanate, Listed, 5000lbs

California Proposition 65 (California Only)
This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

DSL Status
All components of this product are on the Canadian DSL.

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:
Diphenylmethane-4,4'-diisocyanate
CAS-No. 101-68-8
Revision Date: 2011-07-01

Europe REACH
On the inventory, or in compliance with the inventory.

Australia AICS
On the inventory, or in compliance with the inventory.

New Zealand Inventory of Chemicals NZIoC, as published by ERMA New Zealand
On the inventory, or in compliance with the inventory. There is no requirement to list components of this product on the New Zealand Inventory of Chemicals (NZIoC).

Japan ENCS
On the inventory, or in compliance with the inventory.

Korea KECI
On the inventory, or in compliance with the inventory.

Philippines PICCS
On the inventory, or in compliance with the inventory.

China IECSC
On the inventory, or in compliance with the inventory.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure if inhaled.
Resp. Sens.	Respiratory sensitization

HMIS Rating

Health:	2
Flammability:	1
Reactivity:	1
Personal Protection:	

NFPA Rating

Health:	2
Flammability:	1
Reactivity:	1
Special Notice:	

THIS SAFETY DATA SHEET (SDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE RELEVANT DIRECTIVES AND REGULATIONS. THE INFORMATION IN THIS SDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. PETERSON CHEMICAL TECHNOLOGY, INC. BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS SDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT PETERSON CHEMICAL TECHNOLOGY, INC. AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.

MATERIAL SAFETY DATA SHEET

Bayer MaterialScience

Bayer MaterialScience LLC
Product Safety & Regulatory Affairs
100 Bayer Road
Pittsburgh, PA 15205-9741
USA

TRANSPORTATION EMERGENCY

CALL CHEMTREC:	(800) 424-9300
INTERNATIONAL:	(703) 527-3887

NON-TRANSPORTATION

Emergency Phone:	Call Chemtrec
Information Phone:	(800) 662-2927

1. Product and Company Identification

Product Name:	MONDUR TD 80 GRADE B
Material Number:	5289076
Chemical Family:	Aromatic Isocyanate
Chemical Name:	Toluene Diisocyanate (TDI)

2. Hazards Identification

Emergency Overview

Danger Color: Colorless to light yellow **Form:** liquid **Odor:** pungent, strong.
Toxic. Toxic gases/fumes may be given off during burning or thermal decomposition. Closed container may forcibly rupture under extreme heat or when contents have been contaminated with water. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Causes respiratory tract irritation. May cause allergic respiratory reaction. Harmful if inhaled. Respiratory sensitizer. Lung damage and respiratory sensitization may be permanent. Causes skin irritation. May cause allergic skin reaction. Skin sensitizer. Animal tests and other research indicate that skin contact with TDI can play a role in causing isocyanate sensitization and respiratory reaction. Causes eye irritation. May cause lung damage.

Potential Health Effects

Primary Routes of Entry:	Inhalation, Skin Contact, Eye Contact
Medical Conditions Aggravated by Exposure:	Asthma, Respiratory disorders, Skin Allergies, Eczema

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Inhalation
Acute Inhalation
For Product: MONDUR TD 80 GRADE B
Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a

preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g., fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.

Chronic Inhalation
For Product: MONDUR TD 80 GRADE B
As a result of previous repeated overexposures or a single large dose, certain individuals may develop sensitization to diisocyanates (asthma or asthma-like symptoms) that may cause them to react to a later exposure to diisocyanates at levels well below the TLV or PEL. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthmatic attack, could be immediate or delayed up to several hours after exposure. Extreme asthmatic reactions can be life threatening. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Sensitization can be permanent. Chronic overexposure to diisocyanates has also been reported to cause lung damage (including fibrosis, decrease in lung function) that may be permanent.

Skin
Acute Skin
For Product: MONDUR TD 80 GRADE B
Causes irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove.

Chronic Skin
For Product: MONDUR TD 80 GRADE B
Prolonged contact can cause reddening, swelling, rash, and, in some cases, skin sensitization. Animal tests and other research indicate that skin contact with TDI can play a role in causing isocyanate sensitization and respiratory reaction. This data reinforces the need to prevent direct skin contact with isocyanates.

Eye
Acute Eye
For Product: MONDUR TD 80 GRADE B
Causes irritation with symptoms of reddening, tearing, stinging, and swelling. May cause temporary corneal injury. Vapor may cause irritation with symptoms of burning and tearing.

Chronic Eye
For Product: MONDUR TD 80 GRADE B
Prolonged vapor contact may cause conjunctivitis.

Ingestion
Acute Ingestion
For Product: MONDUR TD 80 GRADE B
May cause irritation; Symptoms may include abdominal pain, nausea, vomiting, and diarrhea.

Carcinogenicity:
NTP and IARC evaluated TDI as a mixture of the 2,4 and 2,6 isomers.

2,4-Toluene Diisocyanate	**NTP** - Hazard Designation: Reasonably Anticipated to be a Human Carcinogen. **IARC** - Overall evaluation: 2B Possibly carcinogenic to humans.
2,6-Toluene Diisocyanate	**NTP** - Hazard Designation: Reasonably Anticipated to be a Human Carcinogen. **IARC** - Overall evaluation: 2B Possibly carcinogenic to humans.

3. Composition/Information on Ingredients

Hazardous components
The 2,4-TDI (CAS# 584-84-9) and the 2,6-TDI (CAS# 91-08-7) isomer mixture is known as Toluene Diisocyanate (CAS# 26471-62-5). For Regulatory and State Right to Know information on this product CAS# 26471-62-5 and its isomers 2,4-TDI and 2,6-TDI please refer to regulatory information section of this MSDS.

Weight percent	Components	CAS-No.
60 - 100%	2,4-Toluene Diisocyanate	584-84-9
15 - 25%	2,6-Toluene Diisocyanate	91-08-7

4. First aid measures

Eye contact
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Use lukewarm water if possible. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Then remove contact lenses, if easily removable, and continue eye irrigation for not less than 15 minutes. Get medical attention.

Skin contact
Immediately remove contaminated clothing and shoes. Wash off with soap and water. Use lukewarm water if possible. Wash contaminated clothing before re-use. For severe exposures, immediately get under safety shower and begin rinsing. Get medical attention if irritation develops.

Inhalation
Move to an area free from further exposure. Get medical attention immediately. Administer oxygen or artificial respiration as needed. Asthmatic symptoms may develop and may be immediate or delayed up to several hours. Extreme asthmatic reactions can be life threatening.

Ingestion
Do NOT induce vomiting. Wash mouth out with water. Do not give anything by mouth to an unconscious person. Get medical attention.

Notes to physician
Eyes: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic/steroid preparation as needed. Workplace vapors could produce reversible corneal epithelial edema impairing vision. Skin: This compound is a skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burn. Ingestion: Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of the compound. Inhalation: Treatment is essentially symptomatic. An individual having a dermal or pulmonary sensitization reaction to this material should be removed from further exposure to any diisocyanate.

5. Firefighting measures

Suitable extinguishing media: Dry chemical, Carbon dioxide (CO2), Foam, water spray for large fires.

Special Fire Fighting Procedures
Firefighters should wear NFPA compliant structural firefighting protective equipment, including self-contained breathing apparatus and NFPA compliant helmet, hood, boots and gloves. Avoid contact with product. Decontaminate equipment and protective clothing prior to reuse. During a fire, isocyanate vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. Exposure to heated diisocyanate can be extremely dangerous.

Unusual Fire/Explosion Hazards
Closed container may forcibly rupture under extreme heat or when contents are contaminated with water (CO_2 formed). Use cold-water spray to cool fire-exposed containers to minimize the risk of rupture. Large fires can be extinguished with large volumes of water applied from a safe distance, since reaction between water and hot diisocyanate can be vigorous.

6. Accidental release measures

Spill and Leak Procedures
Evacuate non-emergency personnel. Isolate the area and prevent access. Remove ignition sources. Notify management. Put on protective equipment. Control source of the leak. Ventilate. Contain the spill to prevent spread into drains, sewers, water supplies, or soil. Call ChemTrec at 800-424-9300 or 703-527-3887 for assistance and advice. Major Spill or Leak (Standing liquid): To minimize vapor, cover the spillage with fire fighting foam (AFFF). Released material may be pumped into closed, but not sealed, metal container for disposal. Process can generate heat. Minor Spill or Leak (Wet surface): Cover spill area with suitable absorbent material (Kitty Litter, Oil-Dri®, etc). Saturate absorbent material with neutralization solution and mix. Wait 15 minutes. Collect material in open-head metal containers. Repeat applications of decontamination solution, with scrubbing, followed by absorbent until the surface is decontaminated. Check for residual surface contamination. Swype® test kits have been used for this purpose. Apply lid loosely and allow containers to vent for 72 hours to let carbon dioxide (CO_2) escape.

Additional Spill Procedures/Neutralization
Neutralization solutions:
(1) Colorimetric Laboratories Inc. (CLI) decontamination solution.
(2) A mixture of 75% water, 20% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10) and 5% n-propanol.
(3) A mixture of 80% water, 20% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10).
(4) A mixture of 90% water, 3-8% ammonium hydroxide or concentrated ammonia, and 2% liquid detergent.

Bayer requires that CHEMTREC be immediately notified (800-424-9300) when this product is unintentionally released from its container during its course of distribution, regardless of the amount released. Distribution includes transportation, storage incidental to transportation, loading and unloading. Such notification must be immediate and made by the person having knowledge of the release.

7. Handling and storage

Storage temperature:

minimum:	25 °C (77 °F)
maximum:	35 °C (95 °F)

Storage period
12 Months

Handling/Storage Precautions
Do not breathe vapors, mists, or dusts. Use adequate ventilation to keep airborne isocyanate levels below the exposure limits. Wear respiratory protection if material is heated, sprayed, used in a confined space, or

if the exposure limit is exceeded. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposures to lower concentrations. Individuals with lung or breathing problems or prior allergic reactions to isocyanates must not be exposed to vapor or spray mist. Avoid contact with skin and eyes. Wear appropriate eye and skin protection. Wash thoroughly after handling. Do not breathe smoke and gases created by overheating or burning this material. Decomposition products can be highly toxic and irritating. Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected.

Further Info on Storage Conditions
Employee education and training in the safe use and handling of this product are required under the OSHA Hazard Communication Standard 29 CFR 1910.1200.

8. Exposure controls/personal protection

The sum of the 2,4 and 2,6 isomer concentration should not exceed the guideline limits.

2,4-Toluene Diisocyanate (584-84-9)

US. ACGIH Threshold Limit Values
Time Weighted Average (TWA): 0.005 ppm
US. ACGIH Threshold Limit Values
Short Term Exposure Limit (STEL): 0.02 ppm
US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)
Ceiling Limit Value: 0.02 ppm, 0.14 mg/m3
US. ACGIH Threshold Limit Values
Hazard Designation: Sensitiser.
US. ACGIH Threshold Limit Values
Hazard Designation: Group A4 Not classifiable as a human carcinogen.

2,6-Toluene Diisocyanate (91-08-7)

US. ACGIH Threshold Limit Values
Time Weighted Average (TWA): 0.005 ppm
US. ACGIH Threshold Limit Values
Short Term Exposure Limit (STEL): 0.02 ppm
US. ACGIH Threshold Limit Values
Hazard Designation: Sensitiser.
US. ACGIH Threshold Limit Values
Hazard Designation: Group A4 Not classifiable as a human carcinogen.

Industrial Hygiene/Ventilation Measures
Local exhaust should be used to maintain levels below the TLV and PEL whenever diisocyanate is handled, processed, or spray-applied. At normal room temperatures (70 F) TDI levels quickly exceed the TLV or PEL unless properly ventilated. Standard reference sources regarding industrial ventilation (e.g., ACGIH Industrial Ventilation Manual) should be consulted for guidance about adequate ventilation. To ensure that published exposure limits have not been exceeded, monitoring for airborne diisocyanate should become part of the overall employee exposure characterization program. NIOSH, OSHA, Bayer, and others have developed sampling and analytical methods. Bayer methods can be made available, upon request.

Respiratory protection
At normal room temperatures, airborne TDI can exceed the ACGIH TLV-TWA; therefore, in inadequately ventilated environments, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator

such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air-purifying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or(b) a change out schedule, based on objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL. An organic vapor (OV) cartridge is recommended for APR use.

Hand protection
Gloves should be worn. Nitrile rubber showed excellent resistance. Butyl rubber, neoprene, and PVC are also effective.

Eye protection
When directly handling liquid product, eye protection is required. Examples of eye protection include a chemical safety goggle, or chemical safety goggle in combination with a full face shield when there is a greater risk of splash.

Skin and body protection
Avoid all skin contact. Depending on the conditions of use, cover as much of the exposed skin area as possible with appropriate clothing to prevent skin contact., Animal tests and other research indicate that skin contact with TDI can play a role in causing isocyanate sensitization and respiratory reaction., This data reinforces the need to prevent direct skin contact with isocyanates.

Medical Surveillance
All applicants who are assigned to an isocyanate work area should undergo a pre-placement medical evaluation. A history of eczema or respiratory allergies such as hay fever, are possible reasons for medical exclusion from isocyanate areas. Applicants who have a history of adult asthma should be restricted from work with isocyanates. Applicants with a history of prior isocyanate sensitization should be excluded from further work with isocyanates. A comprehensive annual medical surveillance program should be instituted for all employees who are potentially exposed to diisocyanates. Once a worker has been diagnosed as sensitized to any isocyanate, no further exposure can be permitted. Refer to the Bayer pamphlet (Medical Surveillance Program for Isocyanate Workers) for additional guidance.

Additional Protective Measures
Emergency showers and eye wash stations should be available. Educate and train employees in the safe use and handling of this product. Follow all label instructions.

9. Physical and chemical properties

Form:	liquid
Color:	Colorless to light yellow
Odor:	pungent, strong
pH:	Not Applicable
Freezing Point:	10 °C (50 °F) Estimated based on component(s)
Boiling point/boiling range:	252 - 254 °C (485.6 - 489.2 °F) @ 1,013 hPa
Flash point:	126.67 °C (260.0 °F) (Pensky-Martens Closed Cup (ASTM D-93))
Vapour pressure:	Approximately 0.025 mmHg @ 25 °C (77 °F) Estimated based on component(s)
Specific Gravity:	1.22 @ 20 °C (68 °F)
Auto-ignition temperature:	> 595 °C (> 1,103 °F)
Decomposition temperature:	176.67 °C (350.01 °F)
Bulk density:	1,220 kg/m3
Molecular Weight:	174

10. Stability and reactivity

Hazardous Reactions
Contact with moisture, other materials that react with isocyanates, or temperatures above 350 F (177 C), may cause polymerization

Materials to avoid
Water, Amines, Strong bases, Alcohols, Copper alloys

Hazardous decomposition products
By Fire and High Heat: Carbon dioxide (CO2), carbon monoxide (CO), oxides of nitrogen (NOx), dense black smoke., Hydrogen cyanide, Isocyanate, Isocyanic Acid, Other undetermined compounds

11. Toxicological information

Toxicity Data for MONDUR TD 80 GRADE B
Toxicity Note
Toxicity data is for TDI mixed isomers

Acute oral toxicity
LD50: 4,130 - 5,110 mg/kg (rat, Male/Female)

Acute inhalation toxicity
LC50: 66 ppm (480 mg/m3), 1 h (rat, Male/Female)
LC50: 49 - 50.4 ppm, 4 h (rat, Male/Female)
aerosol
RD50: 2.12 ppm, 3 h (rat, male)
vapor

Acute dermal toxicity
LD50: > 9,400 mg/kg (rabbit, Male/Female)

Skin irritation
rabbit, Draize, Exposure Time: 24 h, Moderately irritating

Eye irritation
rabbit, Draize, Severely irritating

Sensitisation
dermal: sensitizer (guinea pig, Maximization Test)
inhalation: sensitizer (guinea pig, Other method)

Repeated dose toxicity
113 weeks, Inhalation: NOAEL: 0.05 ppm, (rat, Male/Female, 6 hrs/day 5 days/week)
Irritation to lungs and nasal cavity. No systemic effects were observed.
90 day, Oral: NOAEL: 30 mg/kg, LOAEL: 60 mg/kg, (rat, Male/Female, 5 days/week)
Reduced body weight gain. Changes in lungs.

Mutagenicity
Genetic Toxicity in Vitro:
Ames: positive, negative (Salmonella typhimurium, Metabolic Activation: with/without)
Positive and negative results were seen in various in vitro studies. Questionable validity of studies due to rapid hydrolysis in solvents.
Genetic Toxicity in Vivo:
Micronucleus Assay: negative (rat,)
Unscheduled DNA synthesis: negative (rat,)

Carcinogenicity
rat, Male/Female, inhalation, 113 w, 6 hrs/day 5 days/week,
negative
rat, Male/Female, oral, 106 w, daily,
Positive, however the study validity is questioned due to the dose exceeding maximum tolerated dose and irregularities in compound storage and analysis.

Toxicity to Reproduction/Fertility
Two generation study, inhalation, 6 hrs/day 7 days/week, (rat) NOAEL (parental): 0.08 ppm, NOAEL (F1): 0.02 ppm, NOAEL (F2): 0.3 ppm
No effects on Reproductive parameters observed at doses tested.

Developmental Toxicity/Teratogenicity
rat, female, inhalation, gestation days 6-15, 6 hrs/day 7 days/week, NOAEL (teratogenicity): 0.1 ppm, NOAEL (maternal): 0.1 ppm
No Teratogenic effects observed at doses tested., Fetotoxicity seen only with maternal toxicity.

12. Ecological information

Ecological Data for MONDUR TD 80 GRADE B
Biodegradation
0 %, Exposure time: 28 d
Not readily biodegradable.

Bioaccumulation
Cyprinus carpio (Carp), Exposure time: 56 d, < 1 BCF
Not expected to bio-accumulate.

Acute and Prolonged Toxicity to Fish
LC50: > 100 mg/l (Danio rerio (zebra fish), 96 h)
LC50: 133 mg/l (Rainbow (Donaldson)Trout (Oncorhynchus mykiss), 96 h)

Acute Toxicity to Aquatic Invertebrates
EC50: 12.5 mg/l (Water flea (Daphnia magna), 48 h)
EC50: > 500 mg/l (Grass shrimp, 24 h)

Toxicity to Aquatic Plants
EC50: 3,230 - 4,300 mg/l, End Point: growth (other: algae, 96 h)

Toxicity to Microorganisms
EC50: > 100 mg/l, (Activated sludge microorganisms, 3 h)

Additional Ecotoxicological Remarks
Ecotoxicity data is for TDI mixed isomers

13. Disposal considerations

Waste Disposal Method
Waste disposal should be in accordance with existing federal, state and local environmental control laws.

Incineration is the preferred method.

Empty Container Precautions
Empty containers retain product residue; observe all precautions for product. Do not heat or cut empty container with electric or gas torch because highly toxic vapors and gases are formed. Do not reuse without thorough commercial cleaning and reconditioning. If container is to be disposed, ensure all product residues are removed prior to disposal.

14. Transport information

Land transport (DOT)

Proper shipping name:	Toluene diisocyanate
Hazard Class or Division:	6.1
UN/NA Number:	UN2078
Packaging group:	II
Hazard Label(s):	Toxic

RSPA/DOT Regulated Components:
2,4-Toluene Diisocyanate
2,6-Toluene Diisocyanate

Reportable Quantity: 45 kg (99 lb)

Sea transport (IMDG)

Proper shipping name:	TOLUENE DIISOCYANATE
Hazard Class or Division:	6.1
UN number:	UN2078
Packaging group:	II
Hazard Label(s):	TOXIC

Air transport (ICAO/IATA)

Proper shipping name:	Toluene diisocyanate
Hazard Class or Division:	6.1
UN number:	UN2078
Packaging group:	II
Hazard Label(s):	TOXIC

15. Regulatory information

United States Federal Regulations

OSHA Hazcom Standard Rating: Hazardous

US. Toxic Substances Control Act: Listed on the TSCA Inventory.

US. EPA CERCLA Hazardous Substances (40 CFR 302):

Components	
2,4-Toluene Diisocyanate	Reportable quantity: 100 lbs
2,6-Toluene Diisocyanate	Reportable quantity: 100 lbs

SARA Section 311/312 Hazard Categories:
Acute Health Hazard, Chronic Health Hazard, Reactivity Hazard

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):

Components

2,4-Toluene Diisocyanate
2,6-Toluene Diisocyanate

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:

Components

2,4-Toluene Diisocyanate
2,6-Toluene Diisocyanate

US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261)
Under RCRA, it is the responsibility of the person who generates a solid waste, as defined in 40 CFR 261.2, to determine if that waste is a hazardous waste.

State Right-To-Know Information

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

Weight percent	Components	CAS-No.
60 - 100%	2,4-Toluene Diisocyanate	584-84-9
15 - 25%	2,6-Toluene Diisocyanate	91-08-7

New Jersey Environmental Hazardous Substances List and/or New Jersey RTK Special Hazardous Substances Lists:

Weight percent	Components	CAS-No.
15 - 25%	2,6-Toluene Diisocyanate	91-08-7
80 - 90%	2,4-Toluene Diisocyanate	584-84-9

Pennsylvania Right to Know Special Hazard Substance List:

Weight percent	Components	CAS-No.
60 - 100%	2,4-Toluene Diisocyanate	584-84-9

MA Right to Know Extraordinarily Hazardous Substance List:

Weight percent	Components	CAS-No.
60 - 100%	2,4-Toluene Diisocyanate	584-84-9
15 - 25%	2,6-Toluene Diisocyanate	91-08-7

California Prop. 65:

Warning! This product contains chemical(s) known to the State of California to be Carcinogenic.

Weight percent	Components	CAS-No.
60 - 100%	2,4-Toluene Diisocyanate	584-84-9
15 - 25%	2,6-Toluene Diisocyanate	91-08-7

16. Other information

NFPA 704M Rating

Health	3
Flammability	1

Reactivity	1
Other	

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

HMIS Rating

Health	3*
Flammability	1
Physical Hazard	1

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe
* = Chronic Health Hazard

The method of hazard communication for Bayer MaterialScience LLC is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by Bayer MaterialScience LLC as a customer service.

The handling of products containing reactive TDI polyisocyanate/prepolymer and/or monomeric TDI requires appropriate protective measures referred to in this MSDS. These products are therefore recommended only for use in industrial or trade (commercial) applications. They are not suitable for use in Do-It-Yourself applications.

Contact person: Product Safety Department
Telephone: (412) 777-2835
MSDS Number: 112000032041
Version Date: 02/03/2013
Report version: 1.18

SAFETY DATA SHEET

SDS No. 0008 Rev 08
Revision Date: 24 September 2021

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Identifier

Product Name:	**SP-56**
Synonym:	None
Chemical Name:	Polyether Triol

1.2 Relevant identified uses and uses advised against:

Identified uses
Component(s) for the manufacture of urethane polymers. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Uses advised against
None

1.3 Company:
Peterson Chemical Technology, LLC.
4851 Regions Park Drive
Fort Smith, AR 72916 USA
Phone: (479) 648-1966

1.4 Emergency Phone:
(479) 648-1966
Hours of operation: Monday – Friday, 8:00 AM – 5:00 PM CST

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Not classified as hazardous.

The most important adverse physicochemical effects:	Not Applicable
The most important adverse human health effects:	Not Applicable
The most important environmental effects:	Not Available

2.2 GHS Label Elements, including precautionary statements

Hazard Pictograms
None

Signal word: None

Hazard Statement(s)
None

Precautionary Statement(s)
None

2.3 Other hazards

None

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Component	CAS No.	Weight %
Glycerol, propylene oxide, ethylene oxide polymer	9082-00-2	>=99.0%

4. FIRST AID MEASURES

4.1 Description of first aid measures

IF INHALED, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. Remove material from eyes, skin, and clothing.

IF ON SKIN, immediately wash with soap and plenty of water.

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Remove any contact lenses. Get medical attention. Remove material from skin and clothing.

IF SWALLOWED, contact a physician or poison control center for advice. Do not induce vomiting unless directed to do so by medical personnel.

4.2 Most important symptoms and effects, both acute and delayed:
No additional symptoms and effects are anticipated other than already detailed in the Section 4 – First Aid measures.

4.3 Immediate medical attention/special treatments needed:
Immediately contact a doctor/physician or poison control center

5. FIRE FIGHTING MEASURES

5.1 Suitable Extinguishing Media
Water (flood with water), alcohol foam, dry chemical, carbon dioxide, or any class B extinguisher. Use water to reduce fire intensity and to keep exposed containers or facilities cool.

5.2 Specific Hazards arising from the chemical

Unusual fire and explosion hazards
There is a possibility of pressure build-up in closed containers when heated. Water spray may be used to cool the container.

Hazardous Products of Combustion
Thermal decomposition products may include, but are not limited to: carbon monoxide and carbon dioxide.

5.3 Special protective actions for fire-fighters
Firefighters and others who may be exposed to products of combustion should wear full protective clothing including self-contained breathing apparatus. Equipment should be decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment, and emergency procedures

Isolate area. Keep unnecessary and unprotected personnel from entering the area. Spilled material may cause a slipping hazard.

6.2 Environmental precautions
Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Dispose according to local and national regulations.

6.3 Methods and materials for containment and cleaning up
Contain large spills and transfer material to appropriate containers for reclamation or disposal. Absorb with materials such as dirt, sand, or sawdust. Sweep up any remaining material. Flush residual spill area with water. See Section 13, Disposal Considerations, for additional information.

6.4 Reference to other sections
Refer to section 8 of the SDS

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Protective measures
Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperature possibly resulting in spontaneous combustion.

Advice on general occupational hygiene
Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist especially when heated. Keep container closed. Use with adequate ventilation. Wash material from skin and clothing after handling. This material is hygroscopic in nature.

7.2 Conditions for safe storage
Store in a cool, well-ventilated place away from foodstuffs, reducing and oxidizing agents. Product is stable under normal conditions of storage and handling.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
None

Additional exposure limits under the conditions of use
Not available.

DNEL/DMEL and PNEC Values
Not available

8.2 Exposure controls

Appropriate engineering controls
None

Personal protective equipment

Eye Protection
Where there is potential for eye contact, wear safety glasses with side shields and have eye flushing equipment immediately available.

Skin Protection
Wear appropriate protective clothing and chemical resistant gloves. Examples of preferred gloves are butyl rubber, natural rubber, neoprene, nitrile, polyethylene, ethyl vinyl alcohol laminate, polyvinyl alcohol, polyvinyl chloride. Consult glove manufacturer to determine type of glove for given application. Wear a face shield and chemical resistant clothing such as a rubber apron when splashing is likely. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection
Avoid breathing dust. Use NIOSH/MSHA approved respiratory equipment when airborne exposure limits for dust particulates are exceeded. Consult respirator manufacturer to determine appropriate type of equipment for the given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respirator protection programs must comply with 29 CFR 1910.134.

Environmental exposure controls
Avoid discharge into the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

9.1 Information on basic physical and chemical properties

Appearance	Clear liquid
Odor	Sweet
Odor Threshold	No data available
pH	Neutral (~7)
Melting point	No data available
Boiling point	>200°C at 760 mmHg (Decomposes before boiling)
Flash point	>182°C (ASTM D93)
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Vapor pressure	Negligible at ambient temperature
Vapor density	No data available
Density (g/mL at 25	1.00-1.08
Water solubility	Moderately soluble
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	No data available
Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
Product is stable under normal, recommended conditions of handling and storage.

10.2 Chemical stability
Product is stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions
Hazardous reactions will not occur under normal transport or storage conditions.

10.4 Conditions to avoid
Incompatible materials (oxidizing agents), sources of ignition.

10.5 Incompatible materials
Oxidizing agents. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

10.6 Hazardous decomposition products
May include, but not limited to, carbon monoxide, aldehydes, ketones, organic acids, polymer fragments.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
Ingestion
Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

Skin corrosion/irritation
Prolonged skin contact is unlikely to result in absorption of harmful amounts. May cause more severe response if skin is abraided (scratched or cut).

Serious eye damage/irritation
May cause slight eye irritation. May cause slight temporary corneal injury.

Respiratory or skin sensitization
This material is not known or reported to be a skin or respiratory sensitizer.

Germ cell mutagenicity
Not known or reported to be mutagenic.

Carcinogenicity
This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
This product is not known or reported to cause reproductive or developmental toxicity.

Specific target organ toxicity (STOT) – single exposure
No data available

Specific target organ toxicity (STOT) – repeated exposure
No data available

Aspiration hazard
No data available

12. ECOLOGICAL INFORMATION

No environmental toxicity studies have been conducted with this product.

12.1 Toxicity
Material is practically non-toxic to aquatic organisms on an acute basis.

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No bioconcentration is expected because of the relatively high molecular weight.

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
The substance has not been assessed for persistence, bioaccumulation and toxicity (PBT)

12.6 Other adverse effects
This substance is not in Annex I of Regulation (EC) 2037/2000 on substances that deplete the ozone layer.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Do not pump into any sewers, on the ground, or into any body of water. Burn in an approved incinerator or dispose of in an approved chemical landfill in accordance with all applicable local, state, and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal. As your supplier, we have no control over the management practices or manufacturing processes of the parties handling or using this material. The information presented here pertains only to the product as shipped in its intended condition as described in MSDS.

14. TRANSPORT INFORMATION

This product is not classified as a hazardous material for transport.

DOT	Not regulated
IMDG	Not regulated
ICAO/IATA	Not regulated

15. REGULATORY INFORMATION

TSCA Inventory
All components are listed

CERCLA Reportable Quantity
none

California Proposition 65 (California Only)
none

DSL Status
All components of this product are on the Canadian DSL.

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Europe REACH
On the inventory, or in compliance with the inventory.

Australia AICS
On the inventory, or in compliance with the inventory.

New Zealand Inventory of Chemicals NZIoC, as published by ERMA New Zealand
On the inventory, or in compliance with the inventory. There is no requirement to list components of this product on the New Zealand Inventory of Chemicals (NZIoC).

Japan ENCS
On the inventory, or in compliance with the inventory.

Korea KECI
On the inventory, or in compliance with the inventory.

Philippines PICCS
On the inventory, or in compliance with the inventory.

China IECSC
On the inventory, or in compliance with the inventory.

16. OTHER INFORMATION

HMIS Rating

Health: 0
Flammability: 1
Reactivity: 0
Personal Protection:

NFPA Rating
Health: 0
Flammability: 1
Reactivity: 0
Special Notice:

THIS SAFETY DATA SHEET (SDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE RELEVANT DIRECTIVES AND REGULATIONS. THE INFORMATION INTHIS SDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. PETERSON CHEMICAL TECHNOLOGY, LLC. BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS SDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT PETERSON CHEMICAL TECHNOLOGY, LLC. AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.

SAFETY DATA SHEET

SDS No. 0002 Rev 9
Revision Date: 24 September 2021

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Identifier

Product Name: **SP-168**
Synonym: None
Chemical Name: Polyether Triol

1.2 Relevant identified uses and uses advised against:

Identified uses
Component(s) for the manufacture of urethane polymers. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Uses advised against
None

1.3 Company:
Peterson Chemical Technology, LLC.
4851 Regions Park Drive
Fort Smith, AR 72916 USA
Phone: (479) 648-1966

1.4 Emergency Phone:
(479) 648-1966
Hours of operation: Monday – Friday, 8:00 AM – 5:00 PM CST

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Not classified as hazardous.

The most important adverse physicochemical effects:	Not Applicable
The most important adverse human health effects:	Not Applicable
The most important environmental effects:	Not Available

2.2 GHS Label Elements, including precautionary statements

Hazard Pictograms
None

Signal word: None

Hazard Statement(s)
None

Precautionary Statement(s)
None

2.3 Other hazards

None

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Component	CAS No.	Weight %
Glycerol, propylene oxide, ethylene oxide polymer	9082-00-2	>=99.0%

4. FIRST AID MEASURES

4.1 Description of first aid measures

IF INHALED, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. Remove material from eyes, skin, and clothing.

IF ON SKIN, immediately wash with soap and plenty of water.

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Remove any contact lenses. Get medical attention. Remove material from skin and clothing.

IF SWALLOWED, contact a physician or poison control center for advice. Do not induce vomiting unless directed to do so by medical personnel.

4.2 Most important symptoms and effects, both acute and delayed:
No additional symptoms and effects are anticipated other than already detailed in the Section 4 – First Aid measures.

4.3 Immediate medical attention/special treatments needed:
Immediately contact a doctor/physician or poison control center

5. FIRE FIGHTING MEASURES

5.1 Suitable Extinguishing Media
Water (flood with water), alcohol foam, dry chemical, carbon dioxide, or any class B extinguisher. Use water to reduce fire intensity and to keep exposed containers or facilities cool.

5.2 Specific Hazards arising from the chemical

Unusual fire and explosion hazards
There is a possibility of pressure build-up in closed containers when heated. Water spray may be used to cool the container.

Hazardous Products of Combustion
Thermal decomposition products may include, but are not limited to: carbon monoxide and carbon dioxide.

5.3 Special protective actions for fire-fighters
Firefighters and others who may be exposed to products of combustion should wear full protective clothing including self-contained breathing apparatus. Equipment should be decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment, and emergency procedures

Isolate area. Keep unnecessary and unprotected personnel from entering the area. Spilled material may cause a slipping hazard.

6.2 Environmental precautions
Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Dispose according to local and national regulations.

6.3 Methods and materials for containment and cleaning up
Contain large spills and transfer material to appropriate containers for reclamation or disposal. Absorb with materials such as dirt, sand, or sawdust. Sweep up any remaining material. Flush residual spill area with water. See Section 13, Disposal Considerations, for additional information.

6.4 Reference to other sections
Refer to section 8 of the SDS

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Protective measures
Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperature possibly resulting in spontaneous combustion.

Advice on general occupational hygiene
Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist especially when heated. Keep container closed. Use with adequate ventilation. Wash material from skin and clothing after handling. This material is hygroscopic in nature.

7.2 Conditions for safe storage
Store in a cool, well-ventilated place away from foodstuffs, reducing and oxidizing agents. Product is stable under normal conditions of storage and handling.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
None

Additional exposure limits under the conditions of use
Not available.

DNEL/DMEL and PNEC Values
Not available

8.2 Exposure controls

Appropriate engineering controls
None

Personal protective equipment

Eye Protection
Where there is potential for eye contact, wear safety glasses with side shields and have eye flushing equipment immediately available.

Skin Protection
Wear appropriate protective clothing and chemical resistant gloves. Examples of preferred gloves are butyl rubber, natural rubber, neoprene, nitrile, polyethylene, ethyl vinyl alcohol laminate, polyvinyl alcohol, polyvinyl chloride. Consult glove manufacturer to determine type of glove for given application. Wear a face shield and chemical resistant clothing such as a rubber apron when splashing is likely. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection
Avoid breathing dust. Use NIOSH/MSHA approved respiratory equipment when airborne exposure limits for dust particulates are exceeded. Consult respirator manufacturer to determine appropriate type of equipment for the given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respirator protection programs must comply with 29 CFR 1910.134.

Environmental exposure controls
Avoid discharge into the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

9.1 Information on basic physical and chemical properties

Appearance	Clear liquid
Odor	Sweet
Odor Threshold	No data available
pH	Neutral (~7)
Melting point	No data available
Boiling point	>200°C at 760 mmHg (Decomposes before boiling)
Flash point	>182°C (ASTM D93)
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Vapor pressure	Negligible at ambient temperature
Vapor density	No data available
Density (g/mL at 25	1.00-1.08
Water solubility	Moderately soluble
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	No data available
Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
Product is stable under normal, recommended conditions of handling and storage.

10.2 Chemical stability
Product is stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions
Hazardous reactions will not occur under normal transport or storage conditions.

10.4 Conditions to avoid
Incompatible materials (oxidizing agents), sources of ignition.

10.5 Incompatible materials
Oxidizing agents. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

10.6 Hazardous decomposition products
May include, but not limited to, carbon monoxide, aldehydes, ketones, organic acids, polymer fragments.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
Ingestion
Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.
LD50, Oral, Rat 4600mg/kg

Skin corrosion/irritation
Prolonged skin contact is unlikely to result in absorption of harmful amounts. May cause more severe response if skin is abraided (scratched or cut).
LD50, Dermal, Rabbit >2000 mg/kg

Serious eye damage/irritation
May cause slight eye irritation. May cause slight temporary corneal injury.

Respiratory or skin sensitization
This material is not known or reported to be a skin or respiratory sensitizer.
LC50, Inhalation, Rat >200 mg/l, 1hr

Germ cell mutagenicity
Not known or reported to be mutagenic.

Carcinogenicity
This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
This product is not known or reported to cause reproductive or developmental toxicity.

Specific target organ toxicity (STOT) – single exposure
no data available

Specific target organ toxicity (STOT) – repeated exposure
no data available

Aspiration hazard
no data available

12. ECOLOGICAL INFORMATION

No environmental toxicity studies have been conducted with this product.

12.1 Toxicity
Material is practically non-toxic to aquatic organisms on an acute basis.

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No bioconcentration is expected because of the relatively high molecular weight.

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
The substance has not been assessed for persistence, bioaccumulation and toxicity (PBT)

12.6 Other adverse effects
This substance is not in Annex I of Regulation (EC) 2037/2000 on substances that deplete the ozone layer.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Do not pump into any sewers, on the ground, or into any body of water. Burn in an approved incinerator or dispose of in an approved chemical landfill in accordance with all applicable local, state, and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal. As your supplier, we have no control over the management practices or manufacturing processes of the parties handling or using this material. The information presented here pertains only to the product as shipped in its intended condition as described in MSDS.

14. TRANSPORT INFORMATION

This product is not classified as a hazardous material for transport.

DOT	Not regulated
IMDG	Not regulated
ICAO/IATA	Not regulated

15. REGULATORY INFORMATION

TSCA Inventory
All components are listed.

CERCLA Reportable Quantity
none

California Proposition 65 (California Only)
none

DSL Status
All components of this product are on the Canadian DSL.

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Europe REACH
On the inventory, or in compliance with the inventory.

Australia AICS
On the inventory, or in compliance with the inventory.

New Zealand Inventory of Chemicals NZIoC, as published by ERMA New Zealand
On the inventory, or in compliance with the inventory. There is no requirement to list components of this product on the New Zealand Inventory of Chemicals (NZIoC).

Japan ENCS
On the inventory, or in compliance with the inventory.

Korea KECI
On the inventory, or in compliance with the inventory.

Philippines PICCS
On the inventory, or in compliance with the inventory.

China IECSC
On the inventory, or in compliance with the inventory.

16. OTHER INFORMATION

HMIS Rating
Health: 0
Flammability: 1
Reactivity: 0
Personal Protection:

NFPA Rating
Health: 0
Flammability: 1
Reactivity: 0
Special Notice:

THIS SAFETY DATA SHEET (SDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE RELEVANT DIRECTIVES AND REGULATIONS. THE INFORMATION INTHIS SDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. PETERSON CHEMICAL TECHNOLOGY, LLC. BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS SDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT PETERSON CHEMICAL TECHNOLOGY, LLC. AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.

SAFETY DATA SHEET

SDS No. 0001 Rev 12
Revision Date: 24 September 2021

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Identifier

Product Name: **SP-170**
Synonym: None
Chemical Name: Polyether Triol

1.2 Relevant identified uses and uses advised against:

Identified uses
Component(s) for the manufacture of urethane polymers. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Uses advised against
None

1.3 Company:
Peterson Chemical Technology, LLC.
4851 Regions Park Drive
Fort Smith, AR 72916 USA
Phone: (479) 648-1966

1.4 Emergency Phone:
(479) 648-1966
Hours of operation: Monday – Friday, 8:00 AM – 5:00 PM CST

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Not classified as hazardous.

The most important adverse physicochemical effects: Not Applicable
The most important adverse human health effects: Not Applicable
The most important environmental effects: Not Available

2.2 GHS Label Elements, including precautionary statements

Hazard Pictograms
None

Signal word: None

Hazard Statement(s)
None

Precautionary Statement(s)
None

2.3 Other hazards

None

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Component	CAS No.	Weight %
Glycerol, propylene oxide, ethylene oxide polymer	9082-00-2	>=99.0%

4. FIRST AID MEASURES

4.1 Description of first aid measures

IF INHALED, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. Remove material from eyes, skin, and clothing.

IF ON SKIN, immediately wash with soap and plenty of water.

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Remove any contact lenses. Get medical attention. Remove material from skin and clothing.

IF SWALLOWED, contact a physician or poison control center for advice. Do not induce vomiting unless directed to do so by medical personnel.

4.2 Most important symptoms and effects, both acute and delayed:
No additional symptoms and effects are anticipated other than already detailed in the Section 4 – First Aid measures.

4.3 Immediate medical attention/special treatments needed:
Immediately contact a doctor/physician or poison control center

5. FIRE FIGHTING MEASURES

5.1 Suitable Extinguishing Media
Water (flood with water), alcohol foam, dry chemical, carbon dioxide, or any class B extinguisher. Use water to reduce fire intensity and to keep exposed containers or facilities cool.

5.2 Specific Hazards arising from the chemical

Unusual fire and explosion hazards
There is a possibility of pressure build-up in closed containers when heated. Water spray may be used to cool the container.

Hazardous Products of Combustion
Thermal decomposition products may include, but are not limited to: carbon monoxide and carbon dioxide.

5.3 Special protective actions for fire-fighters
Firefighters and others who may be exposed to products of combustion should wear full protective clothing including self-contained breathing apparatus. Equipment should be decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment, and emergency procedures

Isolate area. Keep unnecessary and unprotected personnel from entering the area. Spilled material may cause a slipping hazard.

6.2 Environmental precautions
Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Dispose according to local and national regulations.

6.3 Methods and materials for containment and cleaning up
Contain large spills and transfer material to appropriate containers for reclamation or disposal. Absorb with materials such as dirt, sand, or sawdust. Sweep up any remaining material. Flush residual spill area with water. See Section 13, Disposal Considerations, for additional information.

6.4 Reference to other sections
Refer to section 8 of the SDS

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Protective measures
Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperature possibly resulting in spontaneous combustion.

Advice on general occupational hygiene
Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist especially when heated. Keep container closed. Use with adequate ventilation. Wash material from skin and clothing after handling. This material is hygroscopic in nature.

7.2 Conditions for safe storage
Store in a cool, well-ventilated place away from foodstuffs, reducing and oxidizing agents. Product is stable under normal conditions of storage and handling.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
None

Additional exposure limits under the conditions of use
Not available.

DNEL/DMEL and PNEC Values
Not available

8.2 Exposure controls

Appropriate engineering controls
None

Personal protective equipment

Eye Protection
Where there is potential for eye contact, wear safety glasses with side shields and have eye flushing equipment immediately available.

Skin Protection
Wear appropriate protective clothing and chemical resistant gloves. Examples of preferred gloves are butyl rubber, natural rubber, neoprene, nitrile, polyethylene, ethyl vinyl alcohol laminate, polyvinyl alcohol, polyvinyl chloride. Consult glove manufacturer to determine type of glove for given application. Wear a face shield and chemical resistant clothing such as a rubber apron when splashing is likely. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection
Avoid breathing dust. Use NIOSH/MSHA approved respiratory equipment when airborne exposure limits for dust particulates are exceeded. Consult respirator manufacturer to determine appropriate type of equipment for the given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respirator protection programs must comply with 29 CFR 1910.134.

Environmental exposure controls
Avoid discharge into the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

9.1 Information on basic physical and chemical properties

Appearance	Clear Liquid
Odor	Sweet
Odor Threshold	No data available
pH	Neutral (~7)
Melting point	No data available
Boiling point	>200°C at 760 mmHg (Decomposes before boiling)
Flash point	>182°C (ASTM D93)
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Vapor pressure	Negligible at ambient temperature
Vapor density	No data available
Density (g/mL at 25	1.00-1.08
Water solubility	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	No data available
Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
Product is stable under normal, recommended conditions of handling and storage.

10.2 Chemical stability
Product is stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions
Hazardous reactions will not occur under normal transport or storage conditions.

10.4 Conditions to avoid
Incompatible materials (oxidizing agents), sources of ignition.

10.5 Incompatible materials
Oxidizing agents. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

10.6 Hazardous decomposition products
May include, but not limited to, carbon monoxide, aldehydes, ketones, organic acids, polymer fragments.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
Ingestion
Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.
LD50, Oral, Rat >5000 mg/kg

Skin corrosion/irritation
Prolonged skin contact is unlikely to result in absorption of harmful amounts. May cause more severe response if skin is abraided (scratched or cut).
LD50, Dermal, Rabbit >2000 mg/kg

Serious eye damage/irritation
May cause slight eye irritation. May cause slight temporary corneal injury.

Respiratory or skin sensitization
This material is not known or reported to be a skin or respiratory sensitizer.
LC50, Inhalation, Rat >200 mg/l, 1hr

Germ cell mutagenicity
Not known or reported to be mutagenic.

Carcinogenicity

This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
This product is not known or reported to cause reproductive or developmental toxicity.

Specific target organ toxicity (STOT) – single exposure
no data available

Specific target organ toxicity (STOT) – repeated exposure
no data available

Aspiration hazard
no data available

12. ECOLOGICAL INFORMATION

No environmental toxicity studies have been conducted with this product.

12.1 Toxicity
Material is practically non-toxic to aquatic organisms on an acute basis.

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No bioconcentration is expected because of the relatively high molecular weight.

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
The substance has not been assessed for persistence, bioaccumulation and toxicity (PBT)

12.6 Other adverse effects
This substance is not in Annex I of Regulation (EC) 2037/2000 on substances that deplete the ozone layer.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Do not pump into any sewers, on the ground, or into any body of water. Burn in an approved incinerator or dispose of in an approved chemical landfill in accordance with all applicable local, state, and federal

regulations. Consult your attorney or appropriate regulatory officials for information on such disposal. As your supplier, we have no control over the management practices or manufacturing processes of the parties handling or using this material. The information presented here pertains only to the product as shipped in its intended condition as described in MSDS.

14. TRANSPORT INFORMATION

This product is not classified as a hazardous material for transport.

DOT	Not regulated
IMDG	Not regulated
ICAO/IATA	Not regulated

15. REGULATORY INFORMATION

TSCA Inventory
All components are listed

CERCLA Reportable Quantity
none

California Proposition 65 (California Only)
This product does NOT contain any material known by the state of California to cause cancer or birth defects.

DSL Status
All components of this product are on the Canadian DSL.

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Europe REACH
On the inventory, or in compliance with the inventory.

Australia AICS
On the inventory, or in compliance with the inventory.

New Zealand Inventory of Chemicals NZIoC, as published by ERMA New Zealand
On the inventory, or in compliance with the inventory. There is no requirement to list components of this product on the New Zealand Inventory of Chemicals (NZIoC).

Japan ENCS
On the inventory, or in compliance with the inventory.

Korea KECI
On the inventory, or in compliance with the inventory.

Philippines PICCS

On the inventory, or in compliance with the inventory.

China IECSC
On the inventory, or in compliance with the inventory.

16. OTHER INFORMATION

HMIS Rating
Health: 0
Flammability: 1
Reactivity: 0
Personal Protection:

NFPA Rating
Health: 0
Flammability: 1
Reactivity: 0
Special Notice:

THIS SAFETY DATA SHEET (SDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE RELEVANT DIRECTIVES AND REGULATIONS. THE INFORMATION INTHIS SDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. PETERSON CHEMICAL TECHNOLOGY, LLC. BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS SDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT PETERSON CHEMICAL TECHNOLOGY, LLC. AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Identifier

Product Name:	**SP-834**
Synonym:	None
Chemical Name:	Polyether Triol

1.2 Relevant identified uses and uses advised against:

Identified uses
Component(s) for the manufacture of urethane polymers. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Uses advised against
None.

1.3 Company:

Peterson Chemical Technology, LLC.
4851 Regions Park Drive
Fort Smith, AR 72916 USA
Phone: (479) 648-1966

1.4 Emergency Phone:

(479) 648-1966
Hours of operation: Monday – Friday, 8:00 AM – 5:00 PM CST

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Not classified as hazardous.

The most important adverse physicochemical effects:	Not Applicable
The most important adverse human health effects:	Not Applicable
The most important environmental effects:	Not Available

2.2 GHS Label Elements, including precautionary statements

Hazard Pictograms
None.

Signal word: None

Hazard Statement(s)
None.

Precautionary Statement(s)
None.

2.3 Other hazards

None.

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Component	CAS No.	Weight %
Glycerol, propylene oxide, ethylene oxide polymer	9082-00-2	>= 99.0%

4. FIRST AID MEASURES

4.1 Description of first aid measures

IF INHALED, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. Remove material from eyes, skin, and clothing.

IF ON SKIN, immediately wash with soap and plenty of water.

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Remove any contact lenses. Get medical attention. Remove material from skin and clothing.

IF SWALLOWED, contact a physician or poison control center for advice. Do not induce vomiting unless directed to do so by medical personnel.

4.2 Most important symptoms and effects, both acute and delayed:
No additional symptoms and effects are anticipated other than already detailed in the Section 4 – First Aid measures.

4.3 Immediate medical attention/special treatments needed:
Immediately contact a doctor/physician or poison control center.

5. FIRE FIGHTING MEASURES

5.1 Suitable Extinguishing Media
Water (flood with water), alcohol foam, dry chemical, carbon dioxide, or any class B extinguisher. Use water to reduce fire intensity and to keep exposed containers or facilities cool.

5.2 Specific Hazards arising from the chemical

Unusual fire and explosion hazards
There is a possibility of pressure build-up in closed containers when heated. Water spray may be used to cool the container.

Hazardous Products of Combustion
Thermal decomposition products may include, but are not limited to: carbon monoxide and carbon dioxide.

5.3 Special protective actions for fire-fighters
Firefighters and others who may be exposed to products of combustion should wear full protective clothing including self-contained breathing apparatus. Equipment should be decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment, and emergency procedures
Isolate area. Keep unnecessary and unprotected personnel from entering the area. Spilled material may cause a slipping hazard.

6.2 Environmental precautions
Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Dispose according to local and national regulations.

6.3 Methods and materials for containment and cleaning up
Contain large spills and transfer material to appropriate containers for reclamation or disposal. Absorb with materials such as dirt, sand, or sawdust. Sweep up any remaining material. Flush residual spill area with water. See Section 13, Disposal Considerations, for additional information.

6.4 Reference to other sections
Refer to section 8 of the SDS.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Protective measures
Spills of these organic materials on hot fibrous insulations may lead to lowering of the auto ignition temperature possibly resulting in spontaneous combustion.

Advice on general occupational hygiene
Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist especially when heated. Keep container closed. Use with adequate ventilation. Wash material from skin and clothing after handling. This material is hygroscopic in nature.

7.2 Conditions for safe storage
Store in a cool, well-ventilated place away from foodstuffs, reducing and oxidizing agents. Product is stable under normal conditions of storage and handling.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
None.

Additional exposure limits under the conditions of use
Not available.

DNEL/DMEL and PNEC Values
Not available.

8.2 Exposure controls

Appropriate engineering controls
None.

Personal protective equipment

Eye Protection

Where there is potential for eye contact, wear safety glasses with side shields and have eye flushing equipment immediately available.

Skin Protection
Wear appropriate protective clothing and chemical resistant gloves. Examples of preferred gloves are butyl rubber, natural rubber, neoprene, nitrile, polyethylene, ethyl vinyl alcohol laminate, polyvinyl alcohol, polyvinyl chloride. Consult glove manufacturer to determine type of glove for given application. Wear a face shield and chemical resistant clothing such as a rubber apron when splashing is likely. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection
Avoid breathing dust. Use NIOSH/MSHA approved respiratory equipment when airborne exposure limits for dust particulates are exceeded. Consult respirator manufacturer to determine appropriate type of equipment for the given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respirator protection programs must comply with 29 CFR 1910.134.

Environmental exposure controls
Avoid discharge into the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance	Clear Liquid
Odor	Sweet
Odor Threshold	No data available
pH (in water)	Neutral (~7)
Melting point/freezing	No data available
Initial Boiling Point and boiling range	>200°C at 760 mmHg (Decomposes before boiling)
Flash point	> 182°C (ASTM D93)
Evaporation rate	No data available
Volatiles, % by vol.	< 0.1 %
Flammability	No data available
Upper/Lower flammability or explosive limits	No data available
Vapor Pressure	0.01-3.5 mm Hg (@ 25°C)
Vapor Density	No data available
Relative Density	1.00 -1.10
Solubility	Moderately soluble
Partition Coefficient: n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available

9.2 Other information
No data available.

10. STABILITY AND REACTIVITY

10.1 Reactivity
Product is stable under normal, recommended conditions of handling and storage.

10.2 Chemical stability
Product is stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions
Hazardous reactions will not occur under normal transport or storage conditions.

10.4 Conditions to avoid
Incompatible materials (oxidizing agents), sources of ignition.

10.5 Incompatible materials
Oxidizing agents. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

10.6 Hazardous decomposition products
May include, but not limited to, carbon monoxide, aldehydes, ketones, organic acids, polymer fragments.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
Low toxicity is swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

Skin corrosion/irritation
Prolonged skin contact is unlikely to result in absorption of harmful amounts. May cause more severe response if skin is abraided (scratched or cut).

Serious eye damage/irritation
May cause slight eye irritation. May cause slight temporary corneal injury.

Respiratory or skin sensitization
No data available.

Germ cell mutagenicity
No data available.

Carcinogenicity
No data available.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available.

Specific target organ toxicity (STOT) – single exposure

No data available.

Specific target organ toxicity (STOT) – repeated exposure
No data available.

Aspiration hazard
No data available.

No acute toxicity studies on this material have been conducted, and no data is available in scientific literature. The components suggest low toxicity.

12. ECOLOGICAL INFORMATION

No environmental toxicity studies have been conducted with this product.

12.1 Toxicity
Material is practically non-toxic to aquatic organisms on an acute basis.

12.2 Persistence and degradability
No data available.

12.3 Bioaccumulative potential
No bioconcentration is expected because of the relatively high molecular weight.

12.4 Mobility in soil
No data available.

12.5 Results of PBT and vPvB assessment
The substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

12.6 Other adverse effects
This substance is not in Annex I of Regulation (EC) 2037/2000 on substances that deplete the ozone layer.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Do not pump into any sewers, on the ground, or into any body of water. Burn in an approved incinerator or dispose of in an approved chemical landfill in accordance with all applicable local, state, and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal. As your supplier, we have no control over the management practices or manufacturing processes of the parties handling or using this material. The information presented here pertains only to the product as shipped in its intended condition as described in MSDS.

14. TRANSPORT INFORMATION

This product is not classified as a hazardous material for transport.

DOT	Not regulated
IMDG	Not regulated
ICAO/IATA	Not regulated

15. REGULATORY INFORMATION

TSCA Inventory
All components are listed.

CERCLA Reportable Quantity
None.

California Proposition 65 (California Only)
This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

DSL Status
All components of this product are on the Canadian DSL.

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Europe REACH
On the inventory, or in compliance with the inventory.

Australia AICS
On the inventory, or in compliance with the inventory.

New Zealand Inventory of Chemicals NZIoC, as published by ERMA New Zealand
On the inventory, or in compliance with the inventory. There is no requirement to list components of this product on the New Zealand Inventory of Chemicals (NZIoC).

Japan ENCS
On the inventory, or in compliance with the inventory.

Korea KECI
On the inventory, or in compliance with the inventory.

Philippines PICCS
On the inventory, or in compliance with the inventory.

China IECSC
On the inventory, or in compliance with the inventory.

16. OTHER INFORMATION

HMIS Rating

Health:	0
Flammability:	1
Reactivity:	0
Personal Protection:	

NFPA Rating

Health:	0
Flammability:	1
Reactivity:	0
Special Notice:	

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SAFETY DATA SHEET

SDS No. 0102 Rev 04
Revision Date: 24 September 2021

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Identifier

Product Name:	**SP-2000**
Synonym:	None
Chemical Name:	Polyether Polyol

1.2 Relevant identified uses and uses advised against:

Identified uses
Component(s) for the manufacture of urethane polymers. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Uses advised against
None.

1.3 Company:

Peterson Chemical Technology, LLC.
4851 Regions Park Drive
Fort Smith, AR 72916 USA
Phone: (479) 648-1966

1.4 Emergency Phone:

(479) 648-1966
Hours of operation: Monday – Friday, 8:00 AM – 5:00 PM CST

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Skin Sensitization, Category 1

The most important adverse physicochemical effects:	Not Applicable
The most important adverse human health effects:	Not Applicable
The most important environmental effects:	Not Available

2.2 GHS Label Elements, including precautionary statements

Hazard Pictograms
None

Signal word: None

Hazard Statement(s)
None

Precautionary Statement(s)

P302+352	IF ON SKIN: wash with soap and water
P280	Wear protective gloves/protective clothing/eye protection/face protection

2.3 Other hazards

None.

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Component	CAS No.	Weight %
Glycerol, propylene oxide, ethylene oxide polymer	9082-00-2	>= 99.0%

4. FIRST AID MEASURES

4.1 Description of first aid measures

IF INHALED, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. Remove material from eyes, skin, and clothing.

IF ON SKIN, immediately wash with soap and plenty of water.

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Remove any contact lenses. Get medical attention. Remove material from skin and clothing.

IF SWALLOWED, contact a physician or poison control center for advice. Do not induce vomiting unless directed to do so by medical personnel.

4.2 Most important symptoms and effects, both acute and delayed:
No additional symptoms and effects are anticipated other than already detailed in the Section 4 – First Aid measures.

4.3 Immediate medical attention/special treatments needed:
Immediately contact a doctor/physician or poison control center.

5. FIRE FIGHTING MEASURES

5.1 Suitable Extinguishing Media
Water (flood with water), alcohol foam, dry chemical, carbon dioxide, or any class B extinguisher. Use water to reduce fire intensity and to keep exposed containers or facilities cool.

5.2 Specific Hazards arising from the chemical

Unusual fire and explosion hazards
There is a possibility of pressure build-up in closed containers when heated. Water spray may be used to cool the container.

Hazardous Products of Combustion
Thermal decomposition products may include, but are not limited to: carbon monoxide and carbon dioxide.

5.3 Special protective actions for fire-fighters
Firefighters and others who may be exposed to products of combustion should wear full protective clothing including self-contained breathing apparatus. Equipment should be decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment, and emergency procedures
Isolate area. Keep unnecessary and unprotected personnel from entering the area. Spilled material may cause a slipping hazard.

6.2 Environmental precautions
Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Dispose according to local and national regulations.

6.3 Methods and materials for containment and cleaning up
Contain large spills and transfer material to appropriate containers for reclamation or disposal. Absorb with materials such as dirt, sand, or sawdust. Sweep up any remaining material. Flush residual spill area with water. See Section 13, Disposal Considerations, for additional information.

6.4 Reference to other sections
Refer to section 8 of the SDS.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Protective measures
Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperature possibly resulting in spontaneous combustion.

Advice on general occupational hygiene
Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist especially when heated. Keep container closed. Use with adequate ventilation. Wash material from skin and clothing after handling. This material is hygroscopic in nature.

7.2 Conditions for safe storage
Store in a cool, well-ventilated place away from foodstuffs, reducing and oxidizing agents. Product is stable under normal conditions of storage and handling.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
None.

Additional exposure limits under the conditions of use
Not available.

DNEL/DMEL and PNEC Values
Not available.

8.2 Exposure controls

Appropriate engineering controls
None.

Personal protective equipment

Eye Protection
Where there is potential for eye contact, wear safety glasses with side shields and have eye flushing equipment immediately available.

Skin Protection
Wear appropriate protective clothing and chemical resistant gloves. Examples of preferred gloves are butyl rubber, natural rubber, neoprene, nitrile, polyethylene, ethyl vinyl alcohol laminate, polyvinyl alcohol, polyvinyl chloride. Consult glove manufacturer to determine type of glove for given application. Wear a face shield and chemical resistant clothing such as a rubber apron when splashing is likely. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection
Avoid breathing dust. Use NIOSH/MSHA approved respiratory equipment when airborne exposure limits for dust particulates are exceeded. Consult respirator manufacturer to determine appropriate type of equipment for the given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respirator protection programs must comply with 29 CFR 1910.134.

Environmental exposure controls
Avoid discharge into the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance	Clear Liquid
Odor	Sweet
Odor Threshold	No data available
pH (in water)	Neutral (~7)
Melting point/freezing	No data available
Initial Boiling Point and boiling range	>200°C at 760 mmHg (Decomposes before boiling)
Flash point	> 182°C (ASTM D93)
Evaporation rate	No data available
Flammability	No data available
Upper/Lower flammability or explosive limits	No data available
Vapor Pressure	Negligible at ambient temperature
Vapor Density	No data available
Relative Density	1.00 -1.08
Solubility	No data available
Partition Coefficient: n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available

9.2 Other information
No data available.

10. STABILITY AND REACTIVITY

10.1 Reactivity
Product is stable under normal, recommended conditions of handling and storage.

10.2 Chemical stability
Product is stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions
Hazardous reactions will not occur under normal transport or storage conditions.

10.4 Conditions to avoid
Incompatible materials (oxidizing agents), sources of ignition.

10.5 Incompatible materials
Oxidizing agents. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

10.6 Hazardous decomposition products
May include, but not limited to, carbon monoxide, aldehydes, ketones, organic acids, polymer fragments.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available.

Skin corrosion/irritation
Prolonged skin contact is unlikely to result in absorption of harmful amounts. May cause more severe response if skin is abraided (scratched or cut).

Serious eye damage/irritation
May cause slight eye irritation. May cause slight temporary corneal injury.

Respiratory or skin sensitization
May cause an allergic skin reaction.

Germ cell mutagenicity
No data available.

Carcinogenicity
No data available.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available.

Specific target organ toxicity (STOT) – single exposure
No data available.

Specific target organ toxicity (STOT) – repeated exposure
No data available.

Aspiration hazard
No data available.

No acute toxicity studies on this material have been conducted, and no data is available in scientific literature. The components suggest low toxicity.

12. ECOLOGICAL INFORMATION

No environmental toxicity studies have been conducted with this product.

12.1 Toxicity
Material is practically non-toxic to aquatic organisms on an acute basis.

12.2 Persistence and degradability
No data available.

12.3 Bioaccumulative potential
No bioconcentration is expected because of the relatively high molecular weight.

12.4 Mobility in soil
No data available.

12.5 Results of PBT and vPvB assessment
The substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).

12.6 Other adverse effects
This substance is not in Annex I of Regulation (EC) 2037/2000 on substances that deplete the ozone layer.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Do not pump into any sewers, on the ground, or into any body of water. Burn in an approved incinerator or dispose of in an approved chemical landfill in accordance with all applicable local, state, and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.

As your supplier, we have no control over the management practices or manufacturing processes of the parties handling or using this material. The information presented here pertains only to the product as shipped in its intended condition as described in MSDS.

14. TRANSPORT INFORMATION

This product is not classified as a hazardous material for transport.

DOT	Not regulated
IMDG	Not regulated
ICAO/IATA	Not regulated

15. REGULATORY INFORMATION

TSCA Inventory
All components are listed.

CERCLA Reportable Quantity
None.

California Proposition 65 (California Only)
This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

DSL Status
All components of this product are on the Canadian DSL.

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Europe REACH
On the inventory, or in compliance with the inventory.

Australia AICS
On the inventory, or in compliance with the inventory.

New Zealand Inventory of Chemicals NZIoC, as published by ERMA New Zealand
On the inventory, or in compliance with the inventory. There is no requirement to list components of this product on the New Zealand Inventory of Chemicals (NZIoC).

Japan ENCS
On the inventory, or in compliance with the inventory.

Korea KECI
On the inventory, or in compliance with the inventory.

Philippines PICCS

On the inventory, or in compliance with the inventory.

China IECSC
On the inventory, or in compliance with the inventory.

16. OTHER INFORMATION

HMIS Rating

Health:	1
Flammability:	1
Reactivity:	0
Personal Protection:	

NFPA Rating

Health:	1
Flammability:	1
Reactivity:	0
Special Notice:	

THIS SAFETY DATA SHEET (SDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE RELEVANT DIRECTIVES AND REGULATIONS. THE INFORMATION IN THIS SDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. PETERSON CHEMICAL TECHNOLOGY, LLC. BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS SDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT PETERSON CHEMICAL TECHNOLOGY, LLC. AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.

SAFETY DATA SHEET

SDS No. 0006 Rev 11
Revision Date: 24 September 2021

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Identifier

Product Name: **SP-2744**
Synonym: None
Chemical Name: Grafted Polyether Polyol

1.2 Relevant identified uses and uses advised against:

Identified uses
Component(s) for the manufacture of urethane polymers. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Uses advised against
None

1.3 Company:

Peterson Chemical Technology, LLC.
4851 Regions Park Drive
Fort Smith, AR 72916 USA
Phone: (479) 648-1966

1.4 Emergency Phone:

(479) 648-1966
Hours of operation: Monday – Friday, 8:00 AM – 5:00 PM CST

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Caution: May be a mild eye or skin irritant.

This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

This product is not classified as dangerous according to EC criteria.

2.2 GHS Label Elements, including precautionary statements

Hazard Pictograms
None

Signal word: None

Hazard Statement(s)
None

Precautionary Statement(s)
None

2.3 Other hazards

None

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Component	CAS No.	Weight %
Glycerol, propylene oxide, ethylene oxide polymer	9082-00-2	50-70%
Glycerol, propylene oxide, ethylene oxide, styrene, acrylonitrile polymer	57913-80-1	30-50%

4. FIRST AID MEASURES

4.1 Description of first aid measures

IF INHALED, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. Remove material from eyes, skin, and clothing.

IF ON SKIN, immediately wash with soap and plenty of water.

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Remove any contact lenses. Get medical attention. Remove material from skin and clothing.

IF SWALLOWED, contact a physician or poison control center for advice. Do not induce vomiting unless directed to do so by medical personnel.

4.2 Most important symptoms and effects, both acute and delayed:
No additional symptoms and effects are anticipated other than already detailed in the Section 4 – First Aid measures.

4.3 Immediate medical attention/special treatments needed:
Immediately contact a doctor/physician or poison control center

5. FIRE FIGHTING MEASURES

5.1 Suitable Extinguishing Media
Water (flood with water), alcohol foam, dry chemical, carbon dioxide, or any class B extinguisher. Use water to reduce fire intensity and to keep exposed containers or facilities cool.

5.2 Specific Hazards arising from the chemical

Unusual fire and explosion hazards
There is a possibility of pressure build-up in closed containers when heated. Water spray may be used to cool the container.

Hazardous Products of Combustion
Thermal decomposition products may include, but are not limited to: carbon monoxide and carbon dioxide.

5.3 Special protective actions for fire-fighters
Firefighters and others who may be exposed to products of combustion should wear full protective clothing including self-contained breathing apparatus. Equipment should be decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment, and emergency procedures
Isolate area. Keep unnecessary and unprotected personnel from entering the area. Spilled material may cause a slipping hazard.

6.2 Environmental precautions
Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Dispose according to local and national regulations.

6.3 Methods and materials for containment and cleaning up
Contain large spills and transfer material to appropriate containers for reclamation or disposal. Absorb with materials such as dirt, sand, or sawdust. Sweep up any remaining material. Flush residual spill area with water. See Section 13, Disposal Considerations, for additional information.

6.4 Reference to other sections
Refer to section 8 of the SDS

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Protective measures
Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperature possibly resulting in spontaneous combustion.

Advice on general occupational hygiene
Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist especially when heated. Keep container closed. Use with adequate ventilation. Wash material from skin and clothing after handling. This material is hygroscopic in nature.

7.2 Conditions for safe storage
Store in a cool, well-ventilated place away from foodstuffs, reducing and oxidizing agents. Product is stable under normal conditions of storage and handling.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
None

Additional exposure limits under the conditions of use
Not available.

DNEL/DMEL and PNEC Values
Not available

8.2 Exposure controls

Appropriate engineering controls
None

Personal protective equipment

Eye Protection
Where there is potential for eye contact, wear safety glasses with side shields and have eye flushing equipment immediately available.

Skin Protection
Wear appropriate protective clothing and chemical resistant gloves. Examples of preferred gloves are butyl rubber, natural rubber, neoprene, nitrile, polyethylene, ethyl vinyl alcohol laminate, polyvinyl alcohol, polyvinyl chloride. Consult glove manufacturer to determine type of glove for given application. Wear a face shield and chemical resistant clothing such as a rubber apron when splashing is likely. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection
Avoid breathing dust. Use NIOSH/MSHA approved respiratory equipment when airborne exposure limits for dust particulates are exceeded. Consult respirator manufacturer to determine appropriate type of equipment for the given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respirator protection programs must comply with 29 CFR 1910.134.

Environmental exposure controls
Avoid discharge into the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

9.1 Information on basic physical and chemical properties

Appearance	Viscous White Liquid
Odor	None
Odor Threshold	No data available
pH	4-9 10/6 Isopropanol/Water (25°C)
Melting point	No data available
Boiling point	>200°C at 760 mmHg (Decomposes before boiling)
Flash point	>150°C (ASTM D93)
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Vapor pressure	Negligible at ambient temperature
Vapor density	No data available
Density (g/mL at 25	0.95-1.10
Water solubility	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	No data available
Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
Product is stable under normal, recommended conditions of handling and storage.

10.2 Chemical stability
Product is stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions
Hazardous reactions will not occur under normal transport or storage conditions.

10.4 Conditions to avoid
Incompatible materials (oxidizing agents), sources of ignition.

10.5 Incompatible materials
Oxidizing agents. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

10.6 Hazardous decomposition products
May include, but not limited to, carbon monoxide, aldehydes, ketones, organic acids, polymer fragments.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
Ingestion
No data available.

Skin Absorption
No data available.

Skin corrosion/irritation
Prolonged skin contact is unlikely to result in absorption of harmful amounts. May cause more severe response if skin is abraided (scratched or cut).

Serious eye damage/irritation
May cause slight eye irritation. May cause slight temporary corneal injury.

Inhalation
No data available.

Respiratory or skin sensitization
This material is not known or reported to be a skin or respiratory sensitizer.

Germ cell mutagenicity
Not known or reported to be mutagenic.

Carcinogenicity

This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
This product is not known or reported to cause reproductive or developmental toxicity.

Specific target organ toxicity (STOT) – single exposure
no data available

Specific target organ toxicity (STOT) – repeated exposure
no data available

Aspiration hazard
no data available

12. ECOLOGICAL INFORMATION

No environmental toxicity studies have been conducted with this product.

12.1 Toxicity
Material is practically non-toxic to aquatic organisms on an acute basis. Fish – 96 hr LC50 believed to be > 100 mg/L based on available data and comparison to similar products.

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No bioconcentration is expected because of the relatively high molecular weight.

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
The substance has not been assessed for persistence, bioaccumulation and toxicity (PBT)

12.6 Other adverse effects
This substance is not in Annex I of Regulation (EC) 2037/2000 on substances that deplete the ozone layer.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Do not pump into any sewers, on the ground, or into any body of water. Burn in an approved incinerator or dispose of in an approved chemical landfill in accordance with all applicable local, state, and federal

regulations. Consult your attorney or appropriate regulatory officials for information on such disposal. As your supplier, we have no control over the management practices or manufacturing processes of the parties handling or using this material. The information presented here pertains only to the product as shipped in its intended condition as described in MSDS.

14. TRANSPORT INFORMATION

This product is not classified as a hazardous material for transport.

DOT	Not regulated
IMDG	Not regulated
ICAO/IATA	Not regulated

15. REGULATORY INFORMATION

TSCA Inventory
All components are listed

CERCLA Reportable Quantity
none

California Proposition 65 (California Only)
none

DSL Status
All components of this product are on the Canadian DSL.

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Europe REACH
On the inventory, or in compliance with the inventory.

Australia AICS
On the inventory, or in compliance with the inventory.

New Zealand Inventory of Chemicals NZIoC, as published by ERMA New Zealand
On the inventory, or in compliance with the inventory. There is no requirement to list components of this product on the New Zealand Inventory of Chemicals (NZIoC).

Japan ENCS
On the inventory, or in compliance with the inventory.

Korea KECI
On the inventory, or in compliance with the inventory.

Philippines PICCS
On the inventory, or in compliance with the inventory.

China IECSC
On the inventory, or in compliance with the inventory.

16. OTHER INFORMATION

HMIS Rating
Health: 1
Flammability: 1
Reactivity: 0
Personal Protection:

NFPA Rating
Health: 1
Flammability: 1
Reactivity: 0
Special Notice:

THIS SAFETY DATA SHEET (SDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE RELEVANT DIRECTIVES AND REGULATIONS. THE INFORMATION INTHIS SDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. PETERSON CHEMICAL TECHNOLOGY, LLC. BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS SDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT PETERSON CHEMICAL TECHNOLOGY, LLC. AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.

SAFETY DATA SHEET

SDS No. 0007 Rev 09
Revision Date: 24 September 2021

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Identifier

Product Name: **SP-2900**
Synonym: None
Chemical Name: Polyether Triol

1.2 Relevant identified uses and uses advised against:

Identified uses
Component(s) for the manufacture of urethane polymers. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Uses advised against
None

1.3 Company:
Peterson Chemical Technology, LLC.
4851 Regions Park Drive
Fort Smith, AR 72916 USA
Phone: (479) 648-1966

1.4 Emergency Phone:
(479) 648-1966
Hours of operation: Monday – Friday, 8:00 AM – 5:00 PM CST

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Not classified as hazardous.

The most important adverse physicochemical effects: Not Applicable
The most important adverse human health effects: Not Applicable
The most important environmental effects: Not Available

2.2 GHS Label Elements, including precautionary statements

Hazard Pictograms
None

Signal word: None

Hazard Statement(s)
None

Precautionary Statement(s)
None

2.3 Other hazards

None

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Component	CAS No.	Weight %
Polyether Triol	9082-00-2	>=99.0%

4. FIRST AID MEASURES

4.1 Description of first aid measures

IF INHALED, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. Remove material from eyes, skin, and clothing.

IF ON SKIN, immediately wash with soap and plenty of water.

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Remove any contact lenses. Get medical attention. Remove material from skin and clothing.

IF SWALLOWED, contact a physician or poison control center for advice. Do not induce vomiting unless directed to do so by medical personnel.

4.2 Most important symptoms and effects, both acute and delayed:
No additional symptoms and effects are anticipated other than already detailed in the Section 4 – First Aid measures.

4.3 Immediate medical attention/special treatments needed:
Immediately contact a doctor/physician or poison control center

5. FIRE FIGHTING MEASURES

5.1 Suitable Extinguishing Media
Water (flood with water), alcohol foam, dry chemical, carbon dioxide, or any class B extinguisher. Use water to reduce fire intensity and to keep exposed containers or facilities cool.

5.2 Specific Hazards arising from the chemical

Unusual fire and explosion hazards
There is a possibility of pressure build-up in closed containers when heated. Water spray may be used to cool the container.

Hazardous Products of Combustion
Thermal decomposition products may include, but are not limited to: carbon monoxide and carbon dioxide.

5.3 Special protective actions for fire-fighters
Firefighters and others who may be exposed to products of combustion should wear full protective clothing including self-contained breathing apparatus. Equipment should be decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment, and emergency procedures

Isolate area. Keep unnecessary and unprotected personnel from entering the area. Spilled material may cause a slipping hazard.

6.2 Environmental precautions
Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Dispose according to local and national regulations.

6.3 Methods and materials for containment and cleaning up
Contain large spills and transfer material to appropriate containers for reclamation or disposal. Absorb with materials such as dirt, sand, or sawdust. Sweep up any remaining material. Flush residual spill area with water. See Section 13, Disposal Considerations, for additional information.

6.4 Reference to other sections
Refer to section 8 of the SDS

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Protective measures
Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperature possibly resulting in spontaneous combustion.

Advice on general occupational hygiene
Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist especially when heated. Keep container closed. Use with adequate ventilation. Wash material from skin and clothing after handling. This material is hygroscopic in nature.

7.2 Conditions for safe storage
Store in a cool, well-ventilated place away from foodstuffs, reducing and oxidizing agents. Product is stable under normal conditions of storage and handling.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
None

Additional exposure limits under the conditions of use
Not available.

DNEL/DMEL and PNEC Values
Not available

8.2 Exposure controls

Appropriate engineering controls
None

Personal protective equipment

Eye Protection
Where there is potential for eye contact, wear safety glasses with side shields and have eye flushing equipment immediately available.

Skin Protection
Wear appropriate protective clothing and chemical resistant gloves. Examples of preferred gloves are butyl rubber, natural rubber, neoprene, nitrile, polyethylene, ethyl vinyl alcohol laminate, polyvinyl alcohol, polyvinyl chloride. Consult glove manufacturer to determine type of glove for given application. Wear a face shield and chemical resistant clothing such as a rubber apron when splashing is likely. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection
Avoid breathing dust. Use NIOSH/MSHA approved respiratory equipment when airborne exposure limits for dust particulates are exceeded. Consult respirator manufacturer to determine appropriate type of equipment for the given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respirator protection programs must comply with 29 CFR 1910.134.

Environmental exposure controls
Avoid discharge into the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

9.1 Information on basic physical and chemical properties

Appearance	Clear Liquid
Odor	Sweet
Odor Threshold	No data available
pH	Neutral (~7)
Melting point	No data available
Boiling point	>200°C at 760 mmHg (Decomposes before boiling)
Flash point	>182°C (ASTM D93)
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Vapor pressure	Negligible at ambient temperature
Vapor density	No data available
Density (g/mL at 25	1.00-1.08
Water solubility	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	No data available
Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
Product is stable under normal, recommended conditions of handling and storage.

10.2 Chemical stability
Product is stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions
Hazardous reactions will not occur under normal transport or storage conditions.

10.4 Conditions to avoid
Incompatible materials (oxidizing agents), sources of ignition.

10.5 Incompatible materials
Oxidizing agents. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

10.6 Hazardous decomposition products
May include, but not limited to, carbon monoxide, aldehydes, ketones, organic acids, polymer fragments.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
Ingestion
Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.
LD50 Oral, Rat >5000 mg/kg

Skin corrosion/irritation
Prolonged skin contact is unlikely to result in absorption of harmful amounts. May cause more severe response if skin is abraided (scratched or cut).
LD50 Dermal, Rabbit >2000 mg/kg

Serious eye damage/irritation
May cause slight eye irritation. May cause slight temporary corneal injury.

Respiratory or skin sensitization
This material is not known or reported to be a skin or respiratory sensitizer.
LC50 Inhalation, Rat >200 mg/l 1 hr

Germ cell mutagenicity
Not known or reported to be mutagenic.

Carcinogenicity

This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
This product is not known or reported to cause reproductive or developmental toxicity.

Specific target organ toxicity (STOT) – single exposure
no data available

Specific target organ toxicity (STOT) – repeated exposure
no data available

Aspiration hazard
no data available

12. ECOLOGICAL INFORMATION

No environmental toxicity studies have been conducted with this product.

12.1 Toxicity
LC50 fish 1 >100 mg/l

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No bioconcentration is expected because of the relatively high molecular weight.

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
The substance has not been assessed for persistence, bioaccumulation and toxicity (PBT)

12.6 Other adverse effects
This substance is not in Annex I of Regulation (EC) 2037/2000 on substances that deplete the ozone layer.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Do not pump into any sewers, on the ground, or into any body of water. Burn in an approved incinerator or dispose of in an approved chemical landfill in accordance with all applicable local, state, and federal

regulations. Consult your attorney or appropriate regulatory officials for information on such disposal. As your supplier, we have no control over the management practices or manufacturing processes of the parties handling or using this material. The information presented here pertains only to the product as shipped in its intended condition as described in MSDS.

14. TRANSPORT INFORMATION

This product is not classified as a hazardous material for transport.

DOT	Not regulated
IMDG	Not regulated
ICAO/IATA	Not regulated

15. REGULATORY INFORMATION

TSCA Inventory
All components are listed

CERCLA Reportable Quantity
none

California Proposition 65 (California Only)
none

DSL Status
All components of this product are on the Canadian DSL.

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Europe REACH
On the inventory, or in compliance with the inventory.

Australia AICS
On the inventory, or in compliance with the inventory.

New Zealand Inventory of Chemicals NZIoC, as published by ERMA New Zealand
On the inventory, or in compliance with the inventory. There is no requirement to list components of this product on the New Zealand Inventory of Chemicals (NZIoC).

Japan ENCS
On the inventory, or in compliance with the inventory.

Korea KECI
On the inventory, or in compliance with the inventory.

Philippines PICCS

On the inventory, or in compliance with the inventory.

China IECSC
On the inventory, or in compliance with the inventory.

16. OTHER INFORMATION

HMIS Rating
Health: 0
Flammability: 1
Reactivity: 0
Personal Protection:

NFPA Rating
Health: 0
Flammability: 1
Reactivity: 0
Special Notice:

THIS SAFETY DATA SHEET (SDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE RELEVANT DIRECTIVES AND REGULATIONS. THE INFORMATION INTHIS SDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. PETERSON CHEMICAL TECHNOLOGY, LLC. BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS SDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT PETERSON CHEMICAL TECHNOLOGY, LLC. AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.

SAFETY DATA SHEET

SDS No. 0107 Rev 05
Revision Date: 26 March 2020

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Identifier

Product Name:	**SRT-2000**
Synonym:	None
Chemical Name:	Severely Hydro Treated Petroleum Oil

1.2 Relevant identified uses and uses advised against:

Identified uses

Component(s) for the manufacture of urethane polymers. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Uses advised against

None

1.3 Company:

Peterson Chemical Technology, LLC.
4851 Regions Park Drive
Fort Smith, AR 72916 USA
Phone: (479) 648-1966

1.4 Emergency Phone:

(479) 648-1966
Hours of operation: Monday – Friday, 8:00 AM – 5:00 PM CST

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

H304: Aspiration Hazard, Cat 1

2.2 GHS Label Elements, including precautionary statements

Hazard Pictograms

Signal word: Danger

Hazard Statement(s)

H304: May be fatal if swallowed and enters airways.

Precautionary Statement(s)

P261: Avoid breathing dust, fume, gas, mist, vapor spray
P271: Use only outdoors or in a well-ventilated area
P304 + P340: If inhaled: Remove person to fresh air and keep comfortable for breathing
P312: Call a POISON CONTROL CENTER, doctor, if you feel unwell.

2.3 Other hazards
None

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Component	CAS No.	Weight %
Severely Hydrotreated Heavy Petroleum Oil	64742-52-5	100

4. FIRST AID MEASURES

4.1 Description of first aid measures

IF INHALED, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. Remove material from eyes, skin, and clothing.

IF ON SKIN, immediately wash with soap and plenty of water.

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Remove any contact lenses. Get medical attention. Remove material from skin and clothing.

IF SWALLOWED, rinse mouth. Contact a physician or poison control center for advice. Do not induce vomiting unless directed to do so by medical personnel.

4.2 Most important symptoms and effects, both acute and delayed:
No additional symptoms and effects are anticipated other than already detailed in the Section 4 – First Aid measures.

4.3 Immediate medical attention/special treatments needed:
Immediately contact a doctor/physician or poison control center

5. FIRE FIGHTING MEASURES

5.1 Suitable Extinguishing Media
Water spray or fog, alcohol foam, dry chemical, carbon dioxide, or any class B extinguisher. Use water to reduce fire intensity and to keep exposed containers or facilities cool. Do not use a solid water stream as it may scatter and spread fire.

5.2 Specific Hazards arising from the chemical

Unusual fire and explosion hazards
There is a possibility of pressure build-up in closed containers when heated. Water spray may be used to cool the container.

Hazardous Products of Combustion
Thermal decomposition products may include, but are not limited to: carbon monoxide and carbon dioxide.

5.3 Special protective actions for fire-fighters
Firefighters and others who may be exposed to products of combustion should wear full protective clothing including self-contained breathing apparatus. Equipment should be decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment, and emergency procedures
Isolate area. Keep unnecessary and unprotected personnel from entering the area. Spilled material may cause a slipping hazard. Eliminate all ignition sources (no smoking, flares, sparks or flams in immediate area).

6.2 Environmental precautions
Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Dispose according to local and national regulations. If this material is spilled into navigable waters and creates a visible sheen, it is reportable to the National Response Center.

6.3 Methods and materials for containment and cleaning up
Contain large spills and transfer material to appropriate containers for reclamation or disposal. Absorb with materials such as dirt, sand, or sawdust. Flush residual spill area with water. Collect spillage. See Section 13, Disposal Considerations, for additional information.

6.4 Reference to other sections
Refer to section 8 of the SDS

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Protective measures
Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperature possibly resulting in spontaneous combustion.

Advice on general occupational hygiene
Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist especially when heated. Keep container closed. Use with adequate ventilation. Wash material from skin and clothing after handling. This material is hygroscopic in nature.

7.2 Conditions for safe storage
Store in a cool, well-ventilated place away from foodstuffs, reducing and oxidizing agents. Product is stable under normal conditions of storage and handling.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Occupational Exposure Limits

Ingredient Name	CAS Number		U.S. OSHA PEL		U.S. NIOSH	
		% Vol.	TWA	STEL	TWA	STEL
Severely Hydrotreated Petroleum Oil	64742-52-5	100	5 mg/m^3 (oil mist)	NA	5 mg/m^3 (oil mist)	5 mg/m^3 (oil mist)

Additional exposure limits under the conditions of use

Not available.

DNEL/DMEL and PNEC Values

Not available

8.2 Exposure controls

Appropriate engineering controls

None

Personal protective equipment

Eye Protection

Where there is potential for eye contact, wear safety glasses with side shields and have eye flushing equipment immediately available.

Skin Protection

Wear appropriate protective clothing and chemical resistant gloves. Examples of preferred gloves are butyl rubber, natural rubber, neoprene, nitrile, polyethylene, ethyl vinyl alcohol laminate, polyvinyl alcohol, polyvinyl chloride. Consult glove manufacturer to determine type of glove for given application. Wear a face shield and chemical resistant clothing such as a rubber apron when splashing is likely. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection

Avoid breathing dust. Use NIOSH/MSHA approved respiratory equipment when airborne exposure limits for dust particulates are exceeded. Consult respirator manufacturer to determine appropriate type of equipment for the given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respirator protection programs must comply with 29 CFR 1910.134.

Environmental exposure controls

Avoid discharge into the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance	Light amber to golden liquid
Odor	Mild petroleum odor
Odor Threshold	No data available
pH (in water)	Neutral (~7)
Melting point/freezing	No data available
Initial Boiling Point and boiling range	> 223°C (ASTM D2887)
Flash point	> 204°C (ASTM D92)
Evaporation rate	No data available
Flammability	No data available
Upper/Lower flammability or explosive limits	No data available
Vapor Pressure	<0.0001 mm Hg at 20°C
Vapor Density	> 5
Relative Density	0.928
Solubility	Insoluble in water
Partition Coefficient: n-octanol/water	No data available
Auto-ignition temperature	> 315°C (ASTM E659)

Decomposition Temperature	No data available
Viscosity	400 cSt at 40°C (ASTM D445)

9.2 Other information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
Product is stable under normal, recommended conditions of handling and storage.

10.2 Chemical stability
Product is stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions
Hazardous reactions will not occur under normal transport or storage conditions.

10.4 Conditions to avoid
Incompatible materials (oxidizing agents), sources of ignition, direct sunlight.

10.5 Incompatible materials
Strong acids. Strong bases.

10.6 Hazardous decomposition products
May include, but not limited to, carbon monoxide, carbon dioxide, and/or low molecular weight hydrocarbons.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Information on likely routes of exposure

Ingestion
May cause gastrointestinal discomfort if swallowed. Do no induce vomiting. Vomiting may increase risk of product aspiration. May be fatal if swallowed.

Inhalation
May be fatal if enters airways.

Skin Contact
Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

Eye Contact
May be irritating to eyes.

Acute toxicity
Not applicable.

Skin corrosion/irritation
May cause defatting if the skin, but is neither an irritant nor a sensitizer.

Serious eye damage/irritation

May cause slight eye irritation.

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available.

Carcinogenicity
This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA. Meets EU requirement of less than 3% (w/w) DMSO extract for total polycyclic aromatic compound (PAC) using IP 346.

Reproductive toxicity
Contains no ingredient listed as toxic to reproduction.

Specific target organ toxicity (STOT) – single exposure
No data available

Specific target organ toxicity (STOT) – repeated exposure
No data available

Aspiration hazard
May be fatal if swallowed and enters airways.

Chronic effects
Prolonged or repeated inhalation may be harmful. Prolonged exposure may cause chronic effects. Risk of chemical pneumonia after aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Product/Ingredient Name	Result	Species	Exposure
Hydrotreated heavy petroleum oil	Acute EC50 > 100mg/l Acute EC50> 100mg/l Acute LC50 > 100mg/l	Algae Crustaceans Fish	72 hours 48 hours 96 hours

12.2 Persistence and degradability

Product/Ingredient Name	Aquatic half-life	Photolysis	Biodegradability
Hydrotreated heavy petroleum oil	-	-	Inherent

12.3 Bioaccumulative potential
No data available.

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment

No data available

12.6 Other adverse effects
This substance is not in Annex I of Regulation (EC) 2037/2000 on substances that deplete the ozone layer.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Do not pump into any sewers, on the ground, or into any body of water. Burn in an approved incinerator or dispose of in an approved chemical landfill in accordance with all applicable local, state, and federal regulations. Consult your attorney or appropriate regulatory officials for information on such disposal. As your supplier, we have no control over the management practices or manufacturing processes of the parties handling or using this material. The information presented here pertains only to the product as shipped in its intended condition as described in MSDS.

14. TRANSPORT INFORMATION

This product is not classified as a hazardous material for transport.

DOT	Not regulated
IMDG	Not regulated
ICAO/IATA	Not regulated

15. REGULATORY INFORMATION

TSCA Inventory
All components are listed

CERCLA Reportable Quantity
None

California Proposition 65 (California Only)
None

DSL Status
All components of this product are on the Canadian DSL.

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Europe REACH
On the inventory, or in compliance with the inventory.

Australia AICS
On the inventory, or in compliance with the inventory.

New Zealand Inventory of Chemicals NZIoC, as published by ERMA New Zealand
On the inventory, or in compliance with the inventory. There is no requirement to list components of this product on the New Zealand Inventory of Chemicals (NZIoC).

Japan ENCS
On the inventory, or in compliance with the inventory.

Korea KECI
On the inventory, or in compliance with the inventory.

China IECSC
On the inventory, or in compliance with the inventory.

16. OTHER INFORMATION

HMIS Rating

Health:	1
Flammability:	1
Reactivity:	0
Personal Protection:	

NFPA Rating

Health:	1
Flammability:	1
Reactivity:	0
Special Notice:	

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SAFETY DATA SHEET
THE DOW CHEMICAL COMPANY

Product name: VORASURF™ DC 5986 Additive

Issue Date: 02/14/2020
Print Date: 02/15/2020

THE DOW CHEMICAL COMPANY encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: VORASURF™ DC 5986 Additive

Recommended use of the chemical and restrictions on use
Identified uses: Process regulators, other than polymerization or vulcanization processes

COMPANY IDENTIFICATION
THE DOW CHEMICAL COMPANY
2211 H.H. DOW WAY
MIDLAND MI 48674
UNITED STATES

Customer Information Number: 800-258-2436
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: CHEMTREC +1 800-424-9300
Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification
GHS classification in accordance with 29 CFR 1910.1200
Reproductive toxicity - Category 2

Label elements
Hazard pictograms

Signal word: **WARNING!**

Hazards
Suspected of damaging fertility or the unborn child.

Precautionary statements

Prevention

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
Keep only in original container.
Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response

IF exposed or concerned: Get medical advice/ attention.

Storage

Store in a well-ventilated place.
Store locked up.

Disposal

Dispose of contents/ container to an approved waste disposal plant.

Other hazards

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Surfactant
This product is a mixture.

Component	CASRN	Concentration
Octamethyl Cyclotetrasiloxane	556-67-2	>= 0.17 - <= 0.19 %

4. FIRST AID MEASURES

Description of first aid measures
General advice:
First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air and keep comfortable for breathing; consult a physician.

Skin contact: Wash off with plenty of water. Suitable emergency safety shower facility should be available in work area.

Eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Ingestion: Rinse mouth with water. No emergency medical treatment necessary.

Most important symptoms and effects, both acute and delayed:
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIREFIGHTING MEASURES

Extinguishing media

Suitable extinguishing media: Water spray. Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.

Unsuitable extinguishing media: None known..

Special hazards arising from the substance or mixture

Hazardous combustion products: Carbon oxides. Silicon oxides. Formaldehyde.

Unusual Fire and Explosion Hazards: Exposure to combustion products may be a hazard to health..

Advice for firefighters

Fire Fighting Procedures: Use water spray to cool unopened containers.. Evacuate area.. Collect contaminated fire extinguishing water separately. This must not be discharged into drains.. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations..
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Remove undamaged containers from fire area if it is safe to do so.

Special protective equipment for firefighters: In the event of fire, wear self-contained breathing apparatus.. Use personal protective equipment..

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Use personal protective equipment. Follow safe handling advice and personal protective equipment recommendations.

Environmental precautions: Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g. by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up: Soak up with inert absorbent material. Clean up remaining materials from spill with suitable absorbant. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the

cleanup of releases. You will need to determine which regulations are applicable. For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.
See sections: 7, 8, 11, 12 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling: Avoid inhalation of vapour or mist. Do not swallow. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Take care to prevent spills, waste and minimize release to the environment. Handle in accordance with good industrial hygiene and safety practice. CONTAINERS MAY BE HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue follow all (M)SDS and label warnings even after container is emptied.
Use only with adequate ventilation. See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

Conditions for safe storage: Keep in properly labelled containers. Store in original container. Store locked up. Store in accordance with the particular national regulations.

Do not store with the following product types: Strong oxidizing agents.
Unsuitable materials for containers**:** None known.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Component	Regulation	Type of listing	Value
Octamethyl Cyclotetrasiloxane	US WEEL	TWA	10 ppm

Exposure controls
Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields).

Skin protection

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator.
The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	liquid
Color	amber
Odor	characteristic
Odor Threshold	No data available
pH	No data available
Melting point/range	No data available
Freezing point	No data available
Boiling point (760 mmHg)	> 35 °C (> 95 °F)
Flash point	**Pensky-Martens closed cup** 105 °C (221 °F)
Evaporation Rate (Butyl Acetate = 1)	No data available
Flammability (solid, gas)	Not applicable
Flammability (liquids)	Not applicable
Lower explosion limit	No data available
Upper explosion limit	No data available
Vapor Pressure	No data available
Relative Vapor Density (air = 1)	No data available
Relative Density (water = 1)	1.02
Water solubility	No data available
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Kinematic Viscosity	550 mm2/s at 25 °C (77 °F)
Explosive properties	Not explosive
Oxidizing properties	The substance or mixture is not classified as oxidizing.
Molecular weight	No data available
Particle size	Not applicable

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: Not classified as a reactivity hazard.

Chemical stability: Stable under normal conditions.

Possibility of hazardous reactions: Can react with strong oxidizing agents.

Conditions to avoid: None known.

Incompatible materials: Oxidizing agents

Hazardous decomposition products:
Decomposition products can include and are not limited to: Aldehydes. Alcohols. Ethers. Organic acids. Formaldehyde. Acetic acid.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Information on likely routes of exposure
Inhalation, Eye contact, Skin contact, Ingestion.

Acute toxicity (represents short term exposures with immediate effects - no chronic/delayed effects known unless otherwise noted)

Acute oral toxicity
Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

As product: Single dose oral LD50 has not been determined.

Based on information for component(s):
LD50, > 5,000 mg/kg Estimated.

Information for components:

Octamethyl Cyclotetrasiloxane
LD50, Rat, male, > 4,800 mg/kg No deaths occurred at this concentration.

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.

As product: The dermal LD50 has not been determined.

Based on information for component(s):
LD50, > 2,000 mg/kg Estimated.

Information for components:

Octamethyl Cyclotetrasiloxane
LD50, Rat, male and female, > 2,400 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
At room temperature, exposure to vapor is minimal due to low volatility; single exposure is not likely to be hazardous.

As product: The LC50 has not been determined.

Information for components:

Octamethyl Cyclotetrasiloxane
LC50, Rat, male and female, 4 Hour, dust/mist, 36 mg/l OECD Test Guideline 403

Skin corrosion/irritation
Based on information for component(s):
Brief contact may cause slight skin irritation with local redness.

Information for components:

Octamethyl Cyclotetrasiloxane
Brief contact is essentially nonirritating to skin.

Serious eye damage/eye irritation
Based on information for component(s):
May cause slight temporary eye irritation.
Corneal injury is unlikely.

Information for components:

Octamethyl Cyclotetrasiloxane
Essentially nonirritating to eyes.

Sensitization
For skin sensitization:
Contains component(s) which did not cause allergic skin sensitization in guinea pigs.

For respiratory sensitization:
No relevant data found.

Information for components:

Octamethyl Cyclotetrasiloxane
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Information for components:

Octamethyl Cyclotetrasiloxane

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Aspiration Hazard
Based on physical properties, not likely to be an aspiration hazard.

Information for components:

Octamethyl Cyclotetrasiloxane
May be harmful if swallowed and enters airways.

Chronic toxicity (represents longer term exposures with repeated dose resulting in chronic/delayed effects - no immediate effects known unless otherwise noted)

Specific Target Organ Systemic Toxicity (Repeated Exposure)
No relevant data found.

Information for components:

Octamethyl Cyclotetrasiloxane
In animals, effects have been reported on the following organs:
Kidney.
Liver.
Respiratory tract.
Female reproductive organs.

Carcinogenicity
No relevant data found.

Information for components:

Octamethyl Cyclotetrasiloxane
Results from a 2 year repeated vapour inhalation exposure study to rats of octamethylcyclotetrasiloxane (D4) indicate effects (benign uterine adenomas) in the uterus of female animals. This finding occurred at the highest exposure dose (700 ppm) only. Studies to date have not demonstrated if these effects occur through pathways that are relevant to humans. Repeated exposure in rats to D4 resulted in protoporphyrin accumulation in the liver. Without knowledge of the specific mechanism leading to the protoporphyrin accumulation the relevance of this finding to humans is unknown.

Teratogenicity
Contains component(s) which did not cause birth defects or any other fetal effects in lab animals.

Information for components:

Octamethyl Cyclotetrasiloxane
Did not cause birth defects or any other fetal effects in laboratory animals.

Reproductive toxicity
In animal studies on component(s), effects on reproduction were seen only at doses that produced significant toxicity to the parent animals. Contains component(s) which have interfered with fertility in animal studies.

Information for components:

Octamethyl Cyclotetrasiloxane
In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. In animal studies, has been shown to interfere with fertility.

Mutagenicity
Contains a component(s) which were negative in in vitro genetic toxicity studies. Contains component(s) which were negative in animal genetic toxicity studies.

Information for components:

Octamethyl Cyclotetrasiloxane
In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

Octamethyl Cyclotetrasiloxane

Acute toxicity to fish
Not expected to be acutely toxic to aquatic organisms.
No toxicity at the limit of solubility
LC50, Oncorhynchus mykiss (rainbow trout), flow-through, 96 Hour, > 0.022 mg/l
No toxicity at the limit of solubility
LC50, Cyprinodon variegatus (sheepshead minnow), flow-through, 14 d, > 0.0063 mg/l

Acute toxicity to aquatic invertebrates
No toxicity at the limit of solubility
EC50, Mysidopsis bahia (opossum shrimp), flow-through test, 96 Hour, > 0.0091 mg/l
No toxicity at the limit of solubility
EC50, Daphnia magna (Water flea), flow-through test, 48 Hour, > 0.015 mg/l

Acute toxicity to algae/aquatic plants
No toxicity at the limit of solubility
ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, Growth rate, > 0.022 mg/l

Chronic toxicity to fish
No toxicity at the limit of solubility
NOEC, Oncorhynchus mykiss (rainbow trout), 93 d, >= 0.0044 mg/l

Chronic toxicity to aquatic invertebrates
No toxicity at the limit of solubility
NOEC, Daphnia magna (Water flea), 21 d, >= 0.0079 mg/l

Persistence and degradability

Octamethyl Cyclotetrasiloxane
Biodegradability: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.
10-day Window: Not applicable

Biodegradation: 3.7 %
Exposure time: 28 d
Method: OECD Test Guideline 310

Stability in Water (1/2-life)
Hydrolysis, DT50, 69.3 - 144 Hour, pH 7, Half-life Temperature 24.6 °C, OECD Test Guideline 111

Photodegradation
Atmospheric half-life: 16 d
Method: Estimated.

Bioaccumulative potential

Octamethyl Cyclotetrasiloxane
Bioaccumulation: Bioconcentration potential is high (BCF > 3000 or Log Pow between 5 and 7).
Partition coefficient: n-octanol/water(log Pow): 6.49 Measured
Bioconcentration factor (BCF): 12,400 Pimephales promelas (fathead minnow) Measured

Mobility in soil

Octamethyl Cyclotetrasiloxane
Expected to be relatively immobile in soil (Koc > 5000).

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device. For additional information, refer to: Handling & Storage Information, MSDS Section 7 Stability & Reactivity Information, MSDS Section10 Regulatory Information, MSDS Section 15

Treatment and disposal methods of used packaging: Empty containers should be recycled or otherwise disposed of by an approved waste management facility. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Do not re-use containers for any purpose.

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Not regulated for transport

Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code: Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Not regulated for transport

Further information:
VENTED PACKAGES ARE FORBIDDEN FOR AIR TRANSPORT.

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312
Reproductive toxicity

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Pennsylvania Right To Know
The following chemicals are listed because of the additional requirements of Pennsylvania law:

Components	CASRN
Dipropylene glycol	25265-71-8
Polydimethylsiloxane-polyether polyol copolymer	68037-62-7
Dimethyl, methyl(polyethylene oxide polypropylene oxide acet	68037-64-9
Oxirane, methyl-, polymer with oxirane, monoacetate, 2-propenyl ether	56090-69-8
Acetate of polyether polyol	39362-51-1

California Prop. 65
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

United States TSCA Inventory (TSCA)

All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard Rating System
NFPA

Health	Flammability	Instability
0	1	0

HMIS

Health	Flammability	Physical Hazard
0*	1	1

* = Chronic Effects (See Hazards Identification)

Revision
Identification Number: 4063095 / A001 / Issue Date: 02/14/2020 / Version: 7.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

TWA	8-hr TWA
US WEEL	USA. Workplace Environmental Exposure Levels (WEEL)

Full text of other abbreviations
AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of

Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

THE DOW CHEMICAL COMPANY urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.
US

Attachment 4
T-BACT Evaluation

Best Available Control Technology for Toxics (T-BACT) Analysis for Toxic Emissions from Flexible Polyurethane Production

Elite Comfort Solutions LLC

Prepared for:

Elite Comfort Solutions LLC

1900 Clark Road, Havre De Grace, Maryland (Harford County)

9/27/2021

Best Available Control Technology for Toxics (T-BACT) Analysis for Toxic Emissions from Flexible Polyurethane Production

Elite Comfort Solutions LLC

Prepared for:

Elite Comfort Solutions LLC
1900 Clark Road, Havre De Grace, Maryland (Harford County)

Prepared by:

Wood Environment & Infrastructure Solutions, Inc.

9/27/2021

Table of Contents

List of Appendices

1.0 Introduction

Elite Comfort Solutions LLC (ECS) is proposing to construct a new flexible polyurethane foam manufacturing facility at 1900 Clark Road, Havre De Grace, Maryland (Harford County). Emissions from the proposed facility include four (4) compounds designated as Toxic Air Pollutants (TAPs) in the state of Maryland:

- 2,4-Toluene diisocyanate (2,4-TDI) CAS No. 584-84-9
- 2,6-Toluene diisocyanate (2,6-TDI) CAS No. 91-08-7
- 4,4'-Diphenylmethane diisocyanate (4,4'-MDI) CAS No. 101-68-8
- Acetone CAS No. 67-64-1

A small fraction of the 2,4-TDI, 2,6-TDI, and 4,4'-MDI are emitted during foam production, while the remaining portion is consumed during production and not emitted. Acetone is used in the process as an auxiliary blowing agent (ABA) and is emitted.

According to Code of Maryland Regulations (COMAR) 26.11.16.06 and .07, of the four (4) TAP compounds that will be emitted, only 2,4-TDI is a Class I Maryland TAP. The other three (3) toxic pollutants are Class II Maryland TAPs.

This document summarizes the T-BACT analysis for the four (4) TAPs.

2.0 T-BACT Analysis

The requirement to conduct a T-BACT analysis is addressed in COMAR 26.11.15.05(A) and specifies the following:

> *New or Reconstructed Installations. A person may not construct, reconstruct, operate, or cause to be constructed, reconstructed, or operated, any new installation or source that will discharge a toxic air pollutant to the atmosphere without installing and operating T-BACT.*

T-BACT is defined at COMAR 26.11.15.01(3) as follows:

> *(a) "T-BACT" means control technology that results in the maximum degree of emission reduction that the Department determines, on a case-by-case basis, is available for each toxic air pollutant discharged by the installation, taking into account the potency and toxicity of each toxic air pollutant and the technical and economic feasibility of control.*
>
> *(b) "T-BACT" includes production, operation, and maintenance procedures, emission control technology, and other emission reduction technologies or a combination of these technologies and procedures.*
>
> *(c) "T-BACT", as applicable to a MACT source, means:*
>
> > *(i) A requirement that has been adopted by the US EPA under 40 CFR 63 and that applies to the installation, source, source category, or subcategory;*
> >
> > *(ii) A new source MACT as established by the Department in accordance with the provisions of 40 CFR §§63.40—63.44;*
> >
> > *(iii) Alternative standard approved by the EPA Administrator; or*

(iv) Alternative emission limitation approved by the Department in accordance with 40 CFR Part 63, Subpart D.

2.1 Identify Control Technologies

The first step in the BACT analysis is to identify the feasible control technologies. This includes that technologies that have either been demonstrated on each applicable pollutant for comparable emissions sources, or those that could reasonably be determined to achieve a reduction. For most source types, the EPA's RACT /BACT /LAER Clearinghouse (RBLC) is the first preferred reference. Therefore, a search of the RBLC database was performed in August 2021 to identify emission control methods that were imposed by permitting authorities as BACT within the past ten years for emission sources comparable to the proposed facility, while recognizing that the targeted pollutant category for this analysis is "Maryland TAPs".

The RBLC query targeting facilities designated as Process Type "63.013" – "Flexible Polyurethane Foam Production" yielded results showing only one facility, NHK Seating of America, Inc., located in Frankfort, Indiana (RBLC ID IN-0208). The BACT analysis for the Frankfort facility was specifically targeted to VOCs from mold release chemical solvents. Specifically, the facility had originally been issued a state air registration (e.g., VOC potential emissions below 25 tons per year) for automobile seat production based on use of a water-based release agent. According to documentation, once facility operation began it was determined that a 97% VOC mold release agent may be needed. Potential use of the 97% VOC mold release chemical increased facility-wide VOC potential from <25 tons per year to 221 tons per year. The additional potential emissions required a new permit application for a Federally Enforceable State Operating Permit including a VOC BACT analysis. The determination of the BACT analysis was to control VOC from the mold release chemical up to 95% using a regenerative thermal oxidizer (RTO). Note that the VOC components of the proposed mold release agent were characterized in the permit application as petroleum hydrocarbon and solvent naphtha. The listing indicated a 95% VOC control using a Regenerative Thermal Oxidizer.

The Frankfort foam production facility BACT is not considered to be relatable to the planned ECS facility since VOC emissions are otherwise proposed to be limited to less than 25 tons per year by ECS. The focus of this T-BACT is on chemicals designated as Maryland Toxics.

Based on another ECS facility similar to the planned Maryland ECS facility, the established control approach planned for the Maryland ECS facility is to reduce emissions of federal Hazardous Air Pollutants (HAPs) using carbon adsorption. Elite Comfort Systems' manufacturing facility located in Ontario, California uses carbon adsorbers on each of the production line stacks to control emissions of 2,4-TDI, 2,6-TDI, and 4,4'-MDI. Testing results indicated that the TDI is reduced by approximately 92%.

Acetone (non-VOC and non-HAP) will be used as an auxiliary blowing agent (ABA) as an alternative to methylene chloride (VOC and HAP) to comply with the applicable National Emission Standards for Hazardous Air Pollutants (NESHAPs). Use of this material to comply with the NESHAPs requirement is documented and supported by 40 CFR 63, Subpart OOOOOO - *National Emission Standards for Hazardous Air Pollutants for Flexible Polyurethane Foam Production and Fabrication Area Sources*. Acetone emissions are not controlled by carbon adsorption system planned for capture of the federal HAPs, and no comparable facilities were identified as controlling acetone emissions. The basis for using acetone as an ABA in polyurethane foam production is established as an appropriate environmental alternative in the referenced NESHAP and has been permitted for use without control at other polyurethane foam production facilities, such as ECS's manufacturing facility located in Ontario, California.

Options considered for controlling acetone were carbon adsorption, and a regenerative thermal oxidizer (RTO).

2.2 Elimination of Technically Infeasible Control Options

After the identification of control options, the second step in the BACT assessment is to eliminate any technically infeasible options. A control option is eliminated from consideration if there are process-specific conditions that would prohibit the implementation of control or if the highest control efficiency of the option would result in an emission level that is higher than any applicable regulatory limits.

Use of carbon adsorption for acetone was ruled out as an option due to technical infeasibility. Through testing at ECS's Ontario, CA facility, it was determined that acetone essentially passes through the carbon bed type normally designed to capture TDI/MDI. A different, impregnated type of carbon would need to be utilized for acetone capture, which would create a significant hazard, especially for this type of batch operation. Due to this adsorption was ruled out because of the inherent fire hazard associated with the development of thermal hots spots on the carbon due to adsorption of ketones (e.g. acetone) (Fire Hazards From Carbon Adsorption Deodorizing Systems, EPA 550-F-97-002e, May 1997). The concentration of acetone in the exhaust is near the Lower Explosive Limit (LEL), which creates a fire hazard associated with use of adsorption.

Use of a RTO was ruled out for control of 2,4-TDI, 2,6-TDI, and 4,4'-MDI, and acetone because of the formation of hydrogen cyanide (HCN) as a combustion product of TDI. Hydrogen cyanide is both a federal HAP and Class II Maryland TAP. Addition of an RTO to control acetone emissions after 92 percent removal of TDI remains a risk for formation of HCN and is considered qualitatively infeasible due to introduction of an additional HAP and Maryland TAP.

The established control option for 2,4-TDI, 2,6-TDI, and 4,4'-MDI is carbon adsorption, and this control is used in other existing facilities. As the only feasible proven control option identified, it follows that this control option has the highest potential control efficiency at 92 percent.

2.3 Rank Control Technologies by Effectiveness

The third of the five steps of the top-down BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. Table 2-1 lists the remaining technically feasible controls and their efficiencies. The control efficiency for 2,4-TDI, 2,6-TDI, and 4,4'-MDI using carbon adsorption from flexible polyurethane foam production is shown.

Table 2-1 Remaining Control Technologies Ranked By Effectiveness

Pollutant	Listed Control Technologies	Potential Control Effectiveness *(%)*
2,4-TDI, 2,6-TDI, and 4,4'-MDI	Carbon Adsorption	92%

2.4 Evaluation of Most Stringent Controls

The fourth of the five steps in the top-down BACT assessment procedure is to evaluate the most effective control and document the results. Table 2-2 lists the expected annual emissions before any control unit installation.

Table 2-2 Expected Emissions of 2,4-TDI, 2,6-TDI, and 4,4'-MDI Before Control

Process	Emissions	
Polyurethane Foam Production Emissions of 2,4-TDI, 2,6-TDI, and 4,4'-MDI	0.90 lb/hr	2.17 tpy

Our assessment shows that the cost to control 2,4-TDI, 2,6-TDI, and 4,4'-MDI from foam production is estimated to be $107,863 per ton of TAP abated. Despite this high cost per ton of TAP abated, ECS proposes to install the control system to reduce these TAPs, which are also HAPs and VOCs.

2.5 Select BACT

This fifth and final step in the top-down BACT assessment is to select BACT. Based on steps 1 through 4 of the BACT analysis, Elite Comfort Solutions LLC. will install the proposed carbon adsorption as T-BACT for control of 2,4-TDI, 2,6-TDI, and 4,4'-MDI from foam production. The proposed control efficiency of carbon adsorption is 92 percent, as this has been demonstrated through testing results atanother similar ECS facility located in California.

As no specific technologies for controlling acetone were identified as being used at similar facilities, potential control options were evaluated and determined to be technically and/or qualitatively infeasible, and since acetone has been established for use in polyurethane production facilities as an alternative to the use of HAP and VOC chemicals, no specific reduction is proposed. Also, the facility is otherwise required to comply with 40 CFR 63, Subpart OOOOOO – "*National Emission Standards for Hazardous Air Pollutants for Flexible Polyurethane Foam Production and Fabrication Area Sources*". The net result of compliance with the referenced NESHAP is to reduce VOC and HAP emissions. Use of acetone has been established in foam production as a VOC and HAP emissions reduction alternative.

Appendix A: T-BACT Cost Analysis

FACILITY: **Elite Comfort Solutions**
CAPITAL COST FOR : **Added Carbon Adsorption for Control of TDI & MDI Toxic Air Pollutant (TAP) Emissions from Polyurethane Production**

BASIS:		
	Baseline 2,4- & 2,6 TDI Emissions (TPY) =	2.17
	Baseline 4,4-MDI Emissions (TPY) =	0.01
	TAP Control Efficiency (%) =	92.00%
	TAP Removed (TPY) =	2.01

Cost Item	Cost, $
Direct Costs	
Purchased Equipment Costs (A)	
Five (5) Vessels with Carbon Refillable Trays servicing ~57,000 CFM	$174,025
Instrumentation, 0.10A	$17,403
Sales Taxes, 0.03A	$5,221
Freight, 0.05A	$8,701
Purchased Equipment Cost (PEC), B	$205,350
Direct Installation Costs, C	
Foundations / supports, erection/handling, electrical, mechanical, pneumatic, piping, painting, 0.30B	$61,605
Total Direct Cost, D (B +C)	$266,954
Indirect Costs (Installation)	
Engineering, 0.1B	$20,535
Construction and Field Expense, 0.05B	$10,267
Contractor fees, 0.1B	$20,535
Start-up, 0.02B	$4,107
Performance test, 0.01B	$2,053
Contingencies, 0.03B	$6,160
Total Indirect Cost, E	$63,658
Total Capital Investment (TCI), (D+E)	$330,613

(continued)

FACILITY: **Elite Comfort Solutions**
ANNUAL COSTS FOR : **Added Carbon Adsorption for Control of TDI & MDI Toxic Air Pollutant (TAP) Emissions from Polyurethane Production**

Cost Item	Factor	Unit Cost		Cost, $
Direct Annual Cost				
Operating Labor				
Operator		$40.00 /hr	(0.5 hr/shift x 3 shifts/day, 365 days/yr)	$21,900
Supervisor		15% of operator		$3,285
Maintenance				
Labor		$78.00 /hr	(0 hr/sh x 3 shifts/day, 365 days)	$0
Material		100% of maintenance labor		$0
Subtotal operating and maintenance labor & maintenance materials				$25,185
Replacement Parts, Carbon Exchange	250 lbs carbon/day x 365 days/yr x $1.21/lb carbon (18,000 lb carbon bed capacity = 6 changeouts per year)			$110,413
Utilities				
Electricity (heat exchanger)	$0.0694 kWh x 12kWh x 8760 hrs/yr (105,120 kWh/yr)			$7,295
Total Direct Annual Operating Costs, A				$142,893
Indirect Annual Costs				
Overhead	60% of sum of operating labor, maintenance labor, and maintenance materials			$13,140
Administration charges	0.02 TCI			$6,612
Property taxes	0.01 TCI			$3,306
Insurance	0.01 TCI			$3,306
economic life	10 years			
interest rate	7%			
Capital recovery (CRF)	0.142	CRF factor		$47,072
Total Indirect Annual Operating Costs				$73,436
Total Annual Operating Costs				$216,329

TONS OF TDI EMISSIONS REMOVED		2.00
TONS OF MDI EMISSIONS REMOVED		0.01
Toxic Air Contaminant (TAC) CONTROL COST EFFECTIVENESS	**$/ton =**	**$107,863**

Attachment 5

Air Dispersion Modeling Analysis & Documentation

Wood Environment & Infrastructure Solutions, Inc.
17320 Katy Freeway
Houston, Texas 77094
USA
T: 832-809-9430
www.Woodplc.com

Technical Memorandum

To: LiAn Zhang (MDE) **Date:** August 27, 2021

From: Peter Guo (Wood)

CC: Caryn Kelly (Wood)
Mark Crawford (PetersonChemicals)

Re: Air Dispersion Modeling Report
Elite Comfort Solutions, Inc.,
1900 Clark Rd, Havre De Grace, MD

Wood Environment and Infrastructure Solutions, Inc. (Wood) is supporting the development of an application for State Permit to Construct to authorize the construction and operation of the proposed foam manufacturing facility (Facility) for Elite Comfort Solutions, Inc. (ECS), at 1900 Clark Rd, Havre De Grace, MD. In support of this permit application, air dispersion modeling was conducted for the toxic air pollutants (TAPs) emitted from the proposed Facility to demonstrate the compliance with the ambient impact requirements per Maryland Department of the Environment (MDE) TAP regulations COMAR 26.11.15.06. The air dispersion modeling was performed in accordance with an approved modeling protocol dated June 23, 2021, MDE TAP regulations and Guidance Documents, and Environmental Protection Agency (EPA) Guideline on Air Quality Models (02/16/2017). This report outlines the air dispersion modeling techniques that was used to assess the ground level off-site concentrations surrounding the proposed Facility.

Project Overview

ECS and Leggett & Platt, Inc. (L&P) are proposing to construct a foam manufacturing facility at 1900 Clark Rd, Havre De Grace, Harford County, MD. The primary production areas will consist of a foam line and downstream curing area using water-based glues.

Potential air emission calculations were developed for the proposed Facility based on the production throughput and engineering emission factors. The TAPs include acetone, total toluene diisocyanate [(TDI), which is the sum of 2,4- and 2,6-TDI], 4,4-diphenylmethane diisocyanate (MDI), and polymeric diphenylmethane diisocyanate (pMDI) emitted from the proposed Facility.

Project Sources

The proposed Facility includes two (2) stacks as emission sources that were modeled. Stack SN-01 represents the foam pouring line emissions and SN-02 represents the curing area emissions. Table 1, Modeling Source Summary, presents the source parameters modeled in this analysis, including Universal Transverse Mercator (UTM) coordinates (in NAD83, UTM Zone 18), stack height, stack diameter, exit temperature, and exit velocity. All stacks were modeled as a point source using stack parameters provided in the permit application. The modeled emission rate for each TAP is also presented in the table.

Area Map

Figure 1, area map of the region, depicts the Facility location, the property boundary, and the surrounding area. The proposed Facility is located at 1900 Clark Rd, Havre De Grace, MD. Figure 2 is a plot plan showing the approximate location of the emission sources and the layout of the production building and tank area for building downwash analyses.

Dispersion Model

The modeling was conducted using the latest version (version 21112) of the AMS/EPA Regulatory Model (AERMOD). The Beeline Software BEEST for Windows modeling manager was used to prepare the input files and manage processing. EPA recommended defaults were used. The land use for the analysis was classified as rural based on the inspection of the area map (i.e., the AERMOD urban dispersion option was not engaged, and the analysis was conducted in the “No Urban Area” mode).

Methodology

The modeling was conducted in accordance with the approved modeling protocol and the MDE modeling guidelines. First, emissions from all new sources were compared with the calculated allowable emission rates (AER) for those TAPs to determine compliance with the ambient impact requirement per TAP Compliance Demonstration Guidance (03-21-2016). For TAPs with proposed emissions less than the calculated AER, no additional modeling was conducted. Table 2, Facility AER Comparison, presents the AER and proposed emission rate for each TAP.

If the emission for a given TAP exceeded the calculated AER, modeling was performed to demonstrate if the off-site air concentration from the proposed Facility would be in compliance with the ambient impact requirement. Based on the preliminary analysis, the project emissions for MDI and pMDI were below the AER, therefore, no further modeling was required. The acetone and TDI were modeled for a compliance demonstration with the TAP air screening levels.

Building Downwash

The EPA Building Profile Input Program - Prime (BPIP-Prime) was used to evaluate structures for building downwash impacts. All structures including the production building and tank area close enough to produce downwash effects from the stacks were included in the evaluation. Table 3, Building Downwash Input, shows the building inputs in the modeling analysis.

Receptor Selection

A Cartesian grid with variable receptor spacing was used to evaluate significant impacts around the proposed Facility. Table 4 presents the receptor spacing in the modeling analysis. As presented in Figure 2, there is currently no fencing present on the northwest portion of the facility. For conservative purpose, the discrete receptors were placed within the on-site area on a grid of 25-m spacing (between building and property line). The off-site receptor grid was designed based on the building edge. The modeling results indicate that there will not be a TAP exceedance on the property that visitors or trespassers could potentially access.

In addition, the discrete receptors with a grid of 25-m spacing were placed at sensitive locations in close proximity to the proposed Facility. Specifically, the following sensitive locations were included in the modeling analysis:

- Roye-Williams Elementary School,
- Havre De Grace Elementary School,
- Havre De Grace Middle School,
- Havre De Grace High School, and
- Union United Methodist Church.

Terrain Data

Elevations for sources, buildings, and receptors (above mean sea level) were determined using the AERMAP algorithm (which is an AERMOD module), using a National Elevation Data (NED) input file generated by and downloaded from the United States Geological Survey (USGS) website. The NED data are for the North American Datum (NAD) 83, UTM Zone 18, with a resolution of one (1) arc second (30 meter).

Meteorological Data

The MDE preprocessed meteorological data set for the region was used for the proposed Facility location. The 2016-2020 preprocessed meteorological data based on the surface station BWI and the upper air station IAD was provided by MDE on May 25, 2021. Ms. LiAn Zhang of MDE concurred that the BWI and IAD stations would be most representative based on the location of the proposed Facility. The analysis was conducted using the 2016-2020 years of preprocessed meteorological data that the MDE recommends.

Modeling Results

AERMOD modeling was conducted to characterize TAP off-site air concentrations in the vicinity of the proposed Facility. Table 5 presents the maximum modeled 1-hour and 8-hour concentrations for acetone and TDI at all receptors and Table 6 shows the maximum modeled concentrations at each sensitive receptor. Figures 3, 4, 5, and 6 depict the maximum modeled concentrations for 1-hour and 8-hour acetone and 1-hour and 8-hour TDI, respectively.

As shown, the maximum modeled concentrations for TDI and acetone from the proposed Facility are below the applicable screening levels at all receptors. Therefore, the proposed Facility will be in compliance with the MDE ambient impact requirements.

The computer files associated with the air quality analysis will be submitted electronically with the permit application.

Closing

We trust that this modeling report includes all required information in support of the air permit application for the proposed Facility. Thank you in advance for your review and approval. If you have any questions, do not hesitate to reach out to Peter Guo at peter.guo@woodplc.com for further information.

Table 1 Model Source Summary
Elite Comfort Solutions - 1900 Clark Rd
Havre De Grace, MD

Stack ID	Easting (m)	Northing (m)	Stack Release Type	Stack Temp °F	Stack Diameter in	Stack Height ft	Exit Velocity fps	TDI lb/hr	Acetone lb/hr	MDI lb/hr	pMDI lb/hr
SN-01	403,675	4,375,998	Point	80	72	70	59	0.072	1269.79	0.000237	0.000095
SN-02	403,766	4,376,156	Point	80	72	70	66	--	846.32	--	--
Total								0.072	2116.11	0.000237	0.000095

- Easting and Northing based on UTM NAD83, Zone 18

Table 2 Facility AER Comparison
Elite Comfort Solutions - 1900 Clark Rd
Havre De Grace, MD

TAP	CAS	Proposed Emission Rate (lb/hr)	Screening Level (µg/m3)		AER lb/hr		Futher Modeling Required?
			1-hr	8-hr	1-hr	8-hr	
TDI	584849 or 91087	0.072	1.42	0.36	0.005	0.001	YES
Acetone	67641	2116.11	17806.75	11871.17	63.748	42.499	YES
MDI	101688	0.000237	N/A	0.51	N/A	0.002	NO
pMDI	9016879	0.000095	N/A	49.00	N/A	0.175	NO

- Based on the Guidance Document for Demonstrating Compliance with the Ambient Impact Requirement under the Toxic Air Pollutant (TAP) Regulations (COMAR 26.11.15.06)
- Assumed Shorter Stack, Possible Downwash, or Fugitive
- 1-hour or 8-hour Allowable Emission Rate (AER) = 0.00358 x Screening Level

Table 3 Building Downwash Input
Elite Comfort Solutions - 1900 Clark Rd
Havre De Grace, MD

Building Name	Number of Tiers	Description	Tier Height (ft)	Number of Corners	Coners	UTM	
						Easting (m)	Northing (m)
BLG1	1	Building	35	6	1	404,023	4,376,114
					2	404,026	4,375,978
					3	403,679	4,375,970
					4	403,674	4,376,154
					5	403,887	4,376,159
					6	403,889	4,376,111
BLG2	1	Tank Area	35	6	1	403,678	4,375,997
					2	403,665	4,375,996
					3	403,666	4,375,953
					4	403,706	4,375,954
					5	403,706	4,375,970
					6	403,679	4,375,970

Table 4 Receptor Grid Spacing
Elite Comfort Solutions - 1900 Clark Rd
Havre De Grace, MD

Distance from the Building	Grid Spacing (m)
0-200m	25
0.2km-3km	100
3-5km	250
5-10km	500
10-20km	1000

Table 5 AERMOD Modeling Summary
Elite Comfort Solutions - 1900 Clark Rd
Havre De Grace, MD

Pollutant	CAS	Averaging Period	Met Year	MDE Screening Level ($\mu g/m^3$)	Maximum Modeled Concentration ($\mu g/m^3$)	% of Screening Level
TDI	584849 or 91087	1-hour	2016	1.42	0.77	53.97%
		1-hour	2017	1.42	0.79	55.35%
		1-hour	2018	1.42	0.67	47.27%
		1-hour	2019	1.42	1.00	70.33%
		1-hour	2020	1.42	0.63	44.15%
		8-hour	2016	0.36	0.30	83.28%
		8-hour	2017	0.36	0.21	59.31%
		8-hour	2018	0.36	0.26	71.63%
		8-hour	2019	0.36	0.24	67.44%
		8-hour	2020	0.36	0.24	67.53%
Acetone	67641	1-hour	2016	17806.75	17410.08	97.77%
		1-hour	2017	17806.75	16551.82	92.95%
		1-hour	2018	17806.75	17349.63	97.43%
		1-hour	2019	17806.75	17669.84	99.23%
		1-hour	2020	17806.75	16783.27	94.25%
		8-hour	2016	11871.17	6795.08	57.24%
		8-hour	2017	11871.17	8026.62	67.61%
		8-hour	2018	11871.17	6706.67	56.50%
		8-hour	2019	11871.17	6940.55	58.47%
		8-hour	2020	11871.17	7839.05	66.03%

Table 6 AERMOD Modeling Summary for Sensitive Receptors
Elite Comfort Solutions - 1900 Clark Rd
Havre De Grace, MD

					Maximum Modeled Concentration (µg/m3)				
Pollutant	**CAS**	**Averaging Period**	**Met Year**	**MDE Screening Level (µg/m^3)**	**Union United Methodist Church**	**Roye-Williams Elementary School**	**Havre De Grace Elementary School**	**Havre De Grace Middle School**	**Havre De Grace High School**
TDI	584849 or 91087	1-hour	2016	1.42	0.06	0.12	0.23	0.20	0.23
		1-hour	2017	1.42	0.11	0.15	0.18	0.12	0.15
		1-hour	2018	1.42	0.15	0.21	0.21	0.28	0.27
		1-hour	2019	1.42	0.08	0.12	0.23	0.27	0.27
		1-hour	2020	1.42	0.26	0.32	0.11	0.10	0.11
		8-hour	2016	0.36	0.02	0.03	0.05	0.05	0.05
		8-hour	2017	0.36	0.03	0.04	0.03	0.03	0.03
		8-hour	2018	0.36	0.03	0.04	0.04	0.05	0.05
		8-hour	2019	0.36	0.02	0.04	0.03	0.03	0.04
		8-hour	2020	0.36	0.03	0.04	0.02	0.05	0.03
Acetone	67641	1-hour	2016	17806.75	1722	3553	7033	6593	7083
		1-hour	2017	17806.75	2773	4246	5421	3524	4777
		1-hour	2018	17806.75	4345	5540	6136	8745	8210
		1-hour	2019	17806.75	2416	3201	6614	8332	8210
		1-hour	2020	17806.75	6554	7688	3283	3327	3488
		8-hour	2016	11871.17	604	785	1504	1681	1596
		8-hour	2017	11871.17	718	1291	839	1060	784
		8-hour	2018	11871.17	744	1156	1307	1582	1402
		8-hour	2019	11871.17	535	1202	1047	1096	1114
		8-hour	2020	11871.17	845	1007	774	1380	971

Explanation:

Site Boundary

N

0 500 1,000

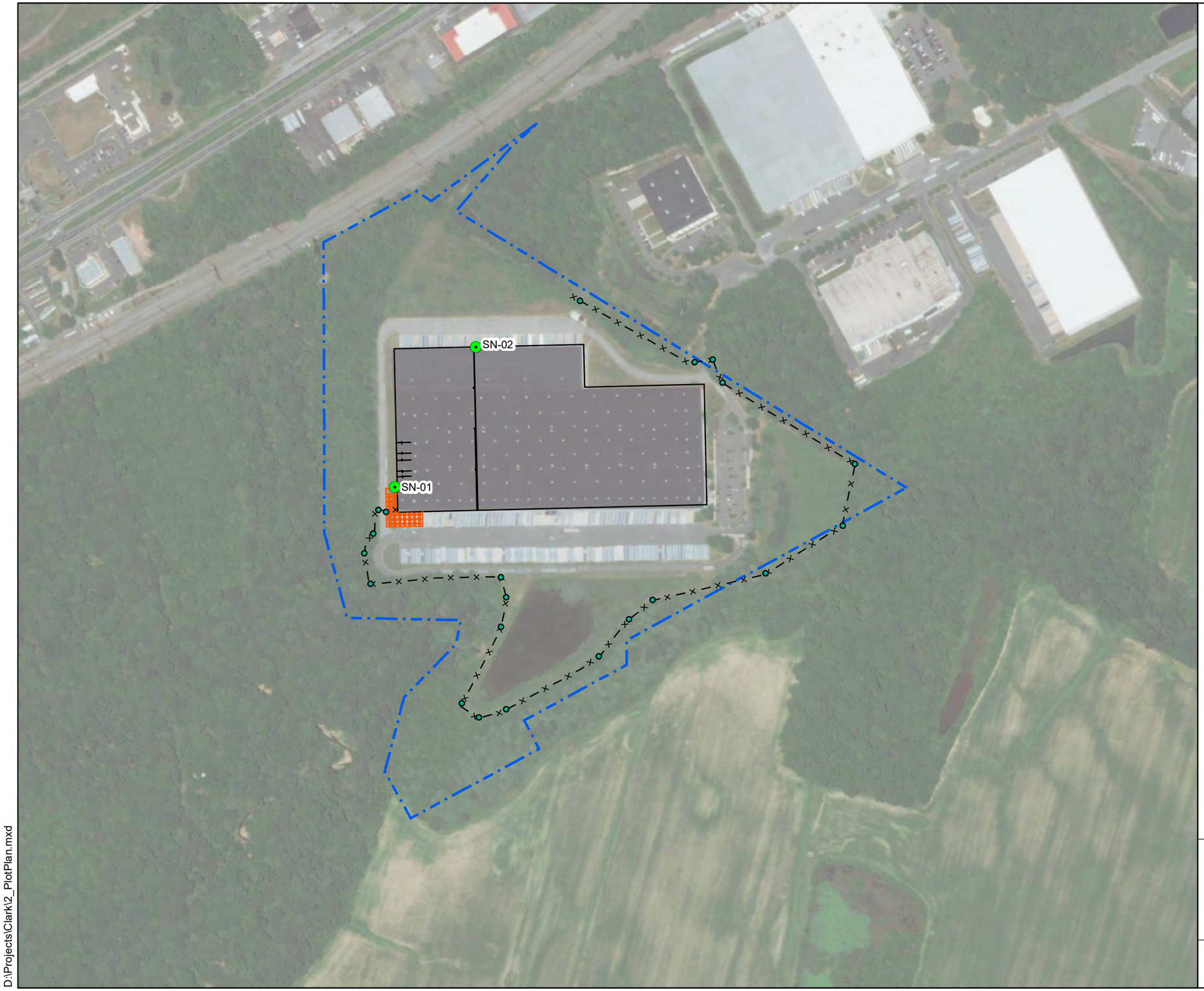
Meters

Coordinate System: NAD 83 UTM Zone 18N

AREA MAP
L&P Elite Comfort Solutions
1900 Clark Road
Havre de Grace, MD

wood.	By: DPV	Project No.: SA18170340
	Date: 05/20/2021	Figure 1

D:\Projects\Clark\1_AreaMap.mxd



Explanation:

- Fence Points
- Stack Locations
- Fence
- Tanks
- Site Boundary
- Building

N

0 50 100

Meters

Coordinate System: NAD 83 UTM Zone 18N

FACILITY PLOT PLAN
L&P Elite Comfort Solutions
1900 Clark Road
Havre de Grace, MD

wood.	By: DPV	Project No.: SA18170340
	Date: 07/21/2021	Figure 2

D:\Projects\Clark\2_PlotPlan.mxd

Figure 3 Max 1-hour Acetone Concentration

Figure 4 Max 8-hour Acetone Concentration


Figure 5 Max 1-hour TDI Concentration
Maximum Concentration
SN02
BLG1
BLG2
A1
B1
Google Earth
© 2016 Google
500 ft
N


Figure 6 Max 8-hour TDI Concentration
Maximum Concentration
BLG1
BLG2
SN01
A1
B1
Google Earth
©2021 Google
600 ft
N

Attachment 6
Vendor/Manufacturer Specifications

Pure Effect®
ENVIRONMENTAL

July 9, 2021 Bid Estimate # PE0709212-CTO

Barry Collins
Elite Comfort Solutions LLC
115 Farrington St Bldg #7
Conover, NC 28613
484-350-5793

RE: Purchase of 5 carbon scrubber filtration system and filters for your project at Elite Comfort in Conover, NC.
Barry,

Pure Effect, Inc. appreciates the opportunity to present this proposal. We will provide Elite Comport Systems with Carbon filter services as stated below.

2 – 18,000CFM carbon scrubber: $ 12,525.00/each
Includes: aluminized housing, 2" pre filter track and side access doors.

3 – 22,000CFM carbon scrubber: $ 15,250.00/each
Includes: aluminized housing, 2" pre filter track and side access doors.

864 – 24x24x2" carbon refillable trays: $ 90.00/each
Includes: Carbon refillable trays filled with 4x8 virgin coconut shell carbon.

Total (sales tax not included):	$ 148,560.00

Lead-time: 8-10 weeks
Lead-time starts when Notice to Proceed or Purchase Order accepted by Pure Effect.

Sales tax not included. FOB Fullerton, CA. Terms are 25% down, 25% upon completion & 50% net 30days.

Above pricing good for 30 days.

Exclusions/Clarifications: The following items are excluded in this proposal unless specifically stated above: Change in treatment conditions (flow rate or contaminants), any dewatering systems wells or well points, transfer or underground pumps, any other operating permits, sewer usage fees, fines, penalties, onsite system moves, fork lift charges, vandalism, level surface for treatment equipment, site trenching, non-aqueous treatment / disposal, treatment of water with turbidity above 500 NTU, influent & effluent piping, influent & effluent monitoring / labs, daily system operators, monitoring of system pressure, pricing for bonds, prevailing wage rates, bag filter & filtration media change-outs onsite, system backwashes, holding tank clean-out, hazardous materials, bio fouling, pH adjustment, odors, noise level, unforeseen market increases such as internationally supplied granular activated carbon or other medias, fuel surcharges and any site specific licensing required for the site OCIP, CCIP, PLP, UCIP Insurance Costs.

Pure Effect will be allowed full access to the site when needed and delays in access may be billed at the listed hourly rate. All media will be considered non-returnable when it becomes wet and all new media will have a 35% restocking fee. This information is proprietary and will not be shared with anyone other than the contractor the proposal was sent to with written permission from Pure Effect.

Pure Effect's Standard Terms and Conditions apply. Prices listed in this quotation are valid for 45 days. All pricing is considered non-prevailing wage unless otherwise specified in proposal. Rental agreement ends when the equipment is returned to Pure Effect clean and in working order.

We appreciate the opportunity and look forward to working with you on this project. Please contact me if you have any questions.

Respectfully submitted,

Caleb Osborne
Regional Sales
Environmental Solutions
Direct – (714) 459-4304
Cell – (714) 715-5759
cosborne@pureeffect.com

Purchaser's Agreement

_____
Name

_____ _____
Signature Date

Pure Effect is an environmental company that sells and provides services for all types of filtration applications and can provide numerous products. Our capabilities include:

- Sale of Liquid and Vapor Vessels
- Carbon and Specialty Media Sales
- Custom 55gal / 85gal drum vessels
- Vapor Extraction system rentals
- Vessel rentals (any size)
- Hazardous Disposal
- System Design and Sales
- Carbon Sampling and Testing
- Vessel Refurbishment
- Odor/VOC Control Portable Systems

To learn more about our Vessels and Services please visit www.pureeffect.com

HVAC GAC filter housing

Call Direct to Caleb Osborne 714-639-7873 x 304 – Email: cosborne@pureeffect.com
Corporate Offices – 601 W. Valencia Dr., Fullerton, CA 92832 714-639-7873 Fax. 714-639-8530

Pure Effect, Incorporated's Terms and Conditions

The following terms, conditions, exclusions, and clarifications apply to any and all sales, rentals and provision of equipment, services, goods or products designed, manufactured, distributed, leased, provided and/or sold by Pure Effect, Incorporated ("Seller" or "PEI") to the acquirer of the same ("Customer", "Client" or "Contractor") unless otherwise specified in a writing signed by both the Seller and the Customer. Inconsistent or additional terms in any documents provided by Customer shall not alter these Terms and Conditions and impose no obligation on Seller. This agreement constitutes the entire agreement and understanding between the parties with respect to its subject matter and supersedes any prior agreement, statement, representation, warranty or understanding with respect thereto. This agreement is being entered into without reliance upon any representation, warranty, statement or document of any kind whatsoever which is not expressly set forth or referred to herein. These Terms and Conditions set forth herein shall supersede any conflicting terms in the Subcontract, Prime Contract, Purchase Order, and in any other contract documents.

1. **DELIVERY**: Any and all goods, products and equipment ("Equipment") sold, leased or otherwise provided by Seller are delivered Free on Board at Seller's warehouse in Fullerton, CA 92832. Availability and/or delivery dates in any quote are approximate, unless specified as binding. Delivery is conditioned upon Seller's prompt receipt from the Customer of all details needed to fulfill Customer's order. Upon notification of Equipment availability by Seller, Customer shall promptly arrange for the pick-up of the Equipment and any payment terms tied to notification of availability or delivery shall become effective. Any delay in pick-up shall incur storage fees and any storage shall be entirely at the Customer's risk. Unless otherwise agreed upon by Seller, Customer shall have the sole responsibility for choosing the carrier and routing from Seller's warehouse to the final destination, including all costs of freight and insurance. If Seller provides any transportation services, any rates quoted are estimates only. Customer will be billed at Seller's then current rates for the actual time incurred "Portal to Portal" (round trip) for each delivery/mobilization and again on each pick-up/demobilization. Standard rates are for normal business hours, 7 a.m. to 5 p.m. on standard business days, and night, weekend, and holiday rates are higher. Customer will pay applicable rates if Seller is unable to pick up rental Equipment as scheduled because the Equipment has not been cleaned, is blocked by other equipment, is in an impassable location, or otherwise not removable by Seller's driver. In addition, the Customer will be responsible for, and shall continue to accrue, rental charges until the Equipment can reasonably be removed by Seller.
2. **EQUIPMENT SUITABILITY**: All Equipment, whether rental or sale, is selected and sized by the specifications provided by Customer and changes in conditions, including influent composition, flow rates and/or other factors, may require system change(s) that may increase costs or render the Equipment unusable. Representations by Seller of regarding the suitability or compatibility of any Equipment are not guarantees but are for guidance only. Equipment can be affected by chemical concentrations, pH, temperature, presence of other chemicals and other factors. Customer is ultimately responsible for determining the suitability of the Equipment for its own use.
3. **LIMITED WARRANTY:** Seller warrants, for the benefit of Customer only, that any Equipment designed and manufactured by Seller is of a professional quality consistent with generally accepted industry standards and, when installed and used in accordance with proper operating standards, will conform to the specifications agreed upon by Seller and Customer in all material respects and be free from defects in materials or workmanship for a period of ninety days (90) days from the date of delivery (the "Warranty Period"). This limited warranty is void if the Equipment has been subject to misuse, tampering, neglect, accident, or unauthorized alterations or repairs. This limited warranty is void if the specifications provided by Customer were not accurate or the actual operating requirements or conditions are different than the information provided to Seller. Seller makes no warranty for any Equipment designed, manufactured or provided by parties other than Seller. Seller's sole responsibility, and Customer's exclusive remedy for breach of this limited warranty, shall be that Seller shall, at its option, repair or replace the defective or nonconforming part(s) or component(s) of the Equipment. Any claim based on the foregoing warranty must be submitted to Seller within the Warranty Period.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE EXPRESSLY EXCLUDED OR DISCLAIMED. SELLER SHALL NOT BE RESPONSIBLE FOR CONSEQUENTIAL, INCIDENTAL, SPECIAL, PUNITIVE OR OTHER DAMAGES (INCLUDING WITHOUT LIMITATION LOSS OF PROFIT, SALES, AND TIME,), WHETHER OR NOT SELLER HAS BEEN BE ADVISED OF THE POSSIBILITY OF SUCH LOSS. SELLER EXPRESSLY EXCLUDES AND DISCLAIMS LIABILITY FOR ANY DAMAGES RESULTING FROM THE USE, OPERATION, IMPROPER APPLICATION, MALFUNCTION OR

DEFECT OF ANY EQUIPMENT COVERED BY THIS LIMITED WARRANTY, EXCEPT AS SET FORTH IN THE INDEMNIFICATION PROVISIONS OF THESE TERMS AND CONDITIONS. IF SELLER IS UNABLE TO REPLACE OR REPAIR THE EQUIPMENT, THE TOTAL LIABILITY OF SELLER SHALL NOT EXCEED THE PRICE PAID FOR THE EQUIPMENT AND SELLER SHALL NOT BE LIABLE FOR COSTS OF PROCUREMENT OF SUBSTITUTE EQUIPMENT BY THE CUSTOMER.

4. **WASTE MANAGEMENT SERVICES**: The only responsibility of Seller for hazardous or non-hazardous substances, waste, soils, water or debris ("Waste") is to coordinate the pickup of Waste from the Customer's site by the Customer's designated transporter for transport to Customer's designated treatment, storage and disposal facilities ("TSDF"). Seller has no independent discretion with regards to the selection of the TSDF or the transporter, and therefore, at no time shall the ownership of the Waste be transferred from Customer and/or the Waste generator to the Seller. Customer shall, at all times, be shall be solely responsible to obtain, maintain, and pay for any and all permits, licenses and handling fees arising or related to Customer and/or generator's Waste generation, transportation and disposal.
5. **SPECIALTY MEDIA**: Specialty media on rental Equipment are provided at a flat rate to Customer and are "loaded" into vessels unless as otherwise agreed on the applicable final contract terms. All purchases of specialty media are non-refundable once delivered or otherwise provided to Customer and become the property of Customer.
6. **SET UP AND OPERATION:** Customer is responsible for satisfying all Federal, State and Local regulations and obtaining all permits pertaining to the discharge of treated water and/or air emissions. It is the Customer's sole responsibility to determine that water and air quality regulations have been met and to open the system to full discharge only in compliance with such requirements. Customer shall provide its own on-site employees to be trained by Seller for operation of the Equipment. Customer acknowledges that the Equipment can range from manually operated to fully automated, but in all cases, Customer must check operating Equipment at least 1-2 times per every 6 hours of operation to confirm that all equipment and filter units are operating properly. Customer is responsible for any minor adjustments that may be necessary. Customer shall agree to pay Seller for any and all required service calls and calls for repairs, other than for inherently defective equipment-related issues, at the Seller's current prevailing rate.
7. **RENTAL PERIOD AND CALCULATION OF CHARGES**: Rental charges commence upon delivery of the Equipment at the Seller's warehouse and end upon the termination of the specified rental period (day, week or month) after the Equipment is returned to Seller's warehouse. Rental will be charged for the full specified rental period and will not be pro-rated or reduced for any early return of the Equipment. Rental charges accrue during Saturdays and Sundays and Holidays. Rental rates are for normal usage, which is an 8 hour per day shift, 40 hours a week and 160 hours a month, and operation of Equipment in excess of 8 hours per day will be billed at Seller's standard premium rates. Customer shall at all times, truthfully and accurately certify to Seller the time the Equipment was operated.
8. **PAYMENT**: Rental charges shall be paid as specified in the applicable agreement, but all charges shall be paid in full upon return of the Equipment to Seller or within 30 days after Seller's Invoice to Customer, whichever occurs first. Payments for Equipment sales shall be made directly to Seller's office in accordance with the conditions stated in the applicable purchase order and, if not specified, payment shall be due as follows: 50% with purchase order, 40% upon shipment: 10% hold back for up to 30 days after delivery of Equipment. Any payment due from Customer that is not paid when due shall bear interest at the lesser of 1.5% per month (18% per annum), or the maximum allowed by applicable law, from the original due date until paid in full. In addition to the right to collect interest, the failure or delay in any payment due Seller shall give Seller the right to repossess the Equipment and/or terminate any further obligation or performance due from Seller. Seller shall be entitled to recover its costs and attorneys' fees for any legal action filed to collect amounts due from Customer.
9. **DAMAGES AND LOSS CLAIMS**: All claims by Customer for loss, damage and delay in transit are to be addressed directly with the carrier. Any and all claims for shortages or incorrect Equipment must be made in writing to the Seller within five (5) days after receipt of Equipment. Failure to provide such notice shall constitute unqualified acceptance and waiver by the Customer of all claims for any and all shortages or incorrect equipment. Customer shall examine all Equipment upon taking possession thereof and shall inform Seller immediately in writing of any and all alleged damages and deficiencies thereto. Should Customer fail to timely notify Seller of any alleged Equipment defects within the initial thirty (30) days after delivery of the Equipment, such defects shall be deemed to have been waived or otherwise accepted. The possibility of subsidence occurring on property, or adjacent properties during or subsequent to dewatering operations is impossible to predict and Pure Effect will not be held liable or responsible for damages that may occur from dewatering activity.
10. **RETURN OF EQUIPMENT, DAMAGED & LOST EQUIPMENT**: At the expiration of the rental term the Customer shall return the Equipment cleaned and in the same condition as when delivered to the Customer, reasonable wear and tear (as defined below) excepted. Customer is responsible for emptying and disposing of used sand, gravel, carbon or other specialty media. Sand filters, cartridge filter units, tanks, pumps, pipe hose and fittings shall be emptied, rinsed, cleaned and reasonably free of all solids and liquids. Depending on the use, Customer may need to wash out equipment with a high-pressure hose or steam wash with detergent/solvent. In the case of specialty media Equipment rental, Seller can perform cleaning if contracted by Customer for such service at an additional fee. If Seller is providing cleaning services, all valves must be opened, cleaned and left in the open position for driver's safety and Equipment must be free of fluids and/or deposits prior to pick up to allow for transportation. Customer will promptly provide any information as may be required by Seller to evaluate appropriate disposal facilities for any spent media to be disposed of by Seller. Any and all spent specialty media is subjected to testing by Seller. If testing shows the characteristics of the

media differs from the information provided by Customer, Seller reserves the right to change disposition facilities and Customer shall be responsible for any increased costs. Seller reserves the right to charge for any repairs, cleaning or disposal not performed by Customer. Customer shall be liable for any and all damages to or loss of the equipment, including, but not limited to: (1) vacuum or pressure damage; (ii) tilting or upset due to unbalanced load; (iii) overloading; (iv) internal damage caused by adverse side effects of cargo or mixture of cargoes, cleaning solvents and/or cleaning processes undertaken by Customer or its agents and (v) any damage during transit to or from Customer, unless Seller is the transporter. In the event of any loss, destruction or damage to the Equipment, Customer shall promptly pay to Seller the reasonable cost of transportation, repair, and/or replacement and rental fees on the Equipment at the regular rental rate until all repairs have been completed, or the Equipment is otherwise reasonably replaced with Equipment of the same type, quality and purpose. In the case of the total loss, failure to return, or destruction of any Equipment, Customer shall pay Seller the then current full replacement cost for comparable Equipment and full rental rate until replaced.

11. **REASONABLE WEAR AND TEAR**: Reasonable wear and tear of the Equipment shall mean the normal deterioration of the Equipment caused by ordinary and reasonable use on a one-shift (eight hours per day, forty hours per week) basis. The following shall not be deemed reasonable wear and tear: damage resulting from (i) lack of lubrication or maintenance of necessary oil, water and air pressure levels; (ii) lack of servicing or preventive maintenance suggested in the manufacturer's operation and maintenance manual or as recommended by the Seller; (iii) any collision, over-turning, or improper operation, including over loading or exceeding the rated capacity of the Equipment; (iv) dents, bending, tearing, staining and misalignment to or of the Equipment or any part thereof; (v) the improper installation, or otherwise unmonitored flow of water, air or power while in the possession of Customer, (vi) the use in excess of shifts for which such Equipment was rented and not specifically disclosed or previously reported to Seller in writing (prior to the damage); and/or (vii) use of the Equipment which is not considered ordinary and reasonable in the industry.
12. **RENTAL EQUIPMENT CHARGE FOR EXTENDED TIME**: If change in schedule increases duration of rental period, the price will increase based on established monthly rental rates. The price may also increase subject to site conditions, e.g., change in flow and contaminants.
13. **INDEMNITY**: Customer acknowledges that it is solely responsible for operation of the Equipment, assumes all risks inherent in the operation and use of the Equipment, and agrees to take all necessary precaution to protect all persons and property from injury or damage while Customer is in possession of the Equipment. Seller shall not be responsible to Customer or to any other party for any alleged losses, damages or injuries (including any loss of profits, business interruption or other special consequential damages) caused by, resulting from, or in any way connected with the Equipment, its operation or use, setting up equipment on streets or public areas, or any defect with respect thereto. Customer further agrees to defend, indemnify and hold Seller harmless from and against any at all liability, claims, damages and expenses of any kind (including attorney's fees) arising out of injuries or death to persons, damages to property arising out of the use, maintenance, operation, or possession of the Equipment while in Customer's possession and/or any pre-claim notice or claim that any Equipment provided to Customer by Seller for use in California under this Agreement contains one or more listed chemicals under Proposition 65, or fails to have sufficient warning under Proposition 65, unless caused by Seller's sole or active negligence or willful misconduct.
14. **NOTICES**: Any notices required by these Terms and Conditions or otherwise as may be required by the applicable terms of an applicable purchase order and/or by law shall be made in writing and mailed by certified or registered mail, return receipt requested or delivered by a national overnight express courier service with proof of delivery confirmation to Seller as follows: 601 W. Valencia Drive, Fullerton, CA 92832, or to any other address which Seller may otherwise particularly specify in writing and to Customer at the address listed on the applicable purchase order or agreement.
15. **TEMPORARY POWER:** Among other systems, PEI treatment systems require temporary power. All temporary power and onsite power to be provided by Contractor; PEI will have no obligation to provide power. Contractor is to prepare all work areas so as to be acceptable for PEI's work under the subcontract. PEI will not be called upon to start work until sufficient areas are ready to insure continued work. The Contractor shall furnish all temporary site facilities including suitable storage space, hoisting temporary electrical and water at no cost to PEI.

OTHER EXCLUSIONS/CLARIFICATIONS:

1. PEI performs change order work based on lump pricing. PEI will not reveal its proprietary information.
2. PEI is not onsite daily so it will not be required to perform daily activities, i.e., meetings, reports, supervision, etc.
3. PEI is not responsible for holding tank cleanouts. If PEI is contracted for cleanouts, prices are estimates only. Actual charges will be billed after service is completed.
4. PEI is not responsible for lane closures or traffic control for loading and unloading treatment equipment.
5. PEI is not responsible for trenching onsite for discharge pipes.
6. PEI is not responsible for change in the NPDES permit requirements.
7. PEI is not responsible if hydro punch or monitoring well does not produce enough groundwater for sample.
8. PEI is not responsible for hydro punch permits.
9. PEI is not responsible for seismic requirements.
10. PEI is not responsible for broken discharge pipes.

11. PEI is not responsible for discharge pipe that blocks sidewalks, driveways, etc. Contractor to provide cross-over ramps or trenching. Customer to Indemnify and Hold Harmless PEI if asked to assist in this scope.
12. Sales tax not included on all purchased items unless specified on the agreement.
13. PEI is not responsible for local permits, codes, etc.
14. SOV are estimates only and PEI will invoice actual costs.
15. PEI is not responsible for meeting storm water permit requirements. Stormwater cannot be comingled with groundwater.
16. Customer must take delivery of purchase equipment within two weeks of ship date or pay storage fees.
17. On purchase equipment, warranty period starts when equipment is ready to ship, not start-up date.
18. PEI is not responsible for 3rd party treatment designs if effluent limits are not met.
19. PEI is not responsible for bag filter vessel drain water leaving the site. Contractor to set up containment if needed.
20. PEI is not responsible for delays in obtaining any site-specific permits, including but not limited to NPDES, Industrial Sewer, City or County Flood, etc.
21. PEI is not responsible if industrial storm water sites do not take all the labs resulting in unknown contaminants causing the system to be out of compliance.
22. By accepting these terms and conditions Customer agrees to system design and sampling requirements.
23. Regional board inspection changes by inspectors may result in a change order for additional time and/or compensation to add equipment and additional filtration media.
24. Should the City governing this project determine the City's sewer system does not have sufficient capacity to pump through its system; alternative arrangements will be pursued only upon issuance of a change order.
25. PEI technicians will be responsible for mobilization, demobilization and monthly maintenance checks. Training will be provided to Client's personnel once system is operational. Client is responsible for daily operation of the equipment and O&M Manuals are available upon request.
26. NPDES permit and other applicable permit fees are the responsibility of Owner or Contractor. Water Quality Control Board or Regional Water Quality Control Board, City, County or Private Sewer, or other agency such as Caltrans may add some additional items and costs, which are the responsibility of the Owner or Contractor.
27. PEI will prepare the Notice of Termination (NOT) for the Owner or Contractor to submit to the Regional Board at project completion if part of PEI's scope of work in the agreement. Any failure on Contractor's part to timely submit the paperwork to the Regional Board resulting in any fines will not be the responsibility of PEI.
28. All electrical utilities/usage is responsibility of Customer. (Contractor to provide electrical power to our systems control panel).
29. Any change in treatment conditions (flow rate or contaminants), will be evaluated for a change in conditions.
30. Client shall, if the Owner does not, purchase and maintain all risk insurance upon full value of the entire work and/or materials delivered to the jobsite, which shall include the interest of PEI.
31. PEI shall not be liable for damages and have the right to terminate performance if its performance is delayed or prevented by conditions beyond its control including, but not limited to acts of God, Force Majeure, Government restrictions, wars, insurrections and/or any other cause beyond the reasonable control of Seller.
32. PEI makes no guarantees, warranties, or representations as to the life of the media. PEI provides estimates as to the performance life of the media, but such estimates shall at no time be considered a guarantee. PEI will not be liable for any damages arising from estimates of media life. All change out services on media will be completed as needed within a reasonable time of request. If problems arise, PEI will advise client to properly soak media, measure bed volumes, backwash, etc. to insure that media is being used properly by client.
33. Customer acknowledges that its rights and remedies provided hereunder are personal to Customer, and therefore no agreement, nor any goods or services provided pursuant to these Terms and Conditions, nor any part or portion may be assigned, sublicensed or otherwise transferred by Customer to any third party without Seller's prior written consent, except for Equipment purchased and paid for by Customer.
34. PEI is not signatory to a Project Labor Agreement (PLA) or Collective Bargaining Agreement (CBA) and does not agree to become signatory or obligated to any such agreements in the performance of its scope of work on the Project. PEI's labor rates are not prevailing wage unless expressed in our quotation.
35. Time is of the essence in the performance of the obligations under these Terms and Conditions.
36. Should any provision of these Terms and Conditions or any part of any resulting agreement be held to be void, invalid, unenforceable or illegal by a court, the validity and enforceability of all other provisions will not be affected thereby.
37. Any and all disputes arising out of the Purchase Order or contract shall be resolved in Los Angeles or Orange County California and shall be resolved through the application of California Law**.** All disputes arising under this Purchase Order or Contract shall be resolved through Arbitration under the American Arbitration Association.
38. Failure of any party to enforce any provision of this Agreement will not constitute or be construed as a waiver of such provision or of the right to enforce such provision or any future right to enforce such provision.
39. Rental of the equipment begins when the equipment is delivered to the site and ends when the equipment is picked up from the site. Advanced written notice with a 2-week lead time is required for demobilization.
40. The client is responsible for disposal of sludge, sand media and used filter element (except carbon and resin media).

41. The client is responsible for all consumable items, such as bags, oil, grease, chart paper, etc. to maintain system properly. O&M Manuals will be provided upon request.
42. In the event of dewatering: The possibility of subsidence occurring on property, or adjacent properties during or subsequent to dewatering operations is impossible to predict. This price proposal does not include any allowance for claims, liabilities and increased project costs arising from subsidence. Accordingly, Contractor hereby agrees to indemnify and hold PEI harmless from any and all liability, loss, claims, demands and costs, including attorney fees and applicable interest, rising from any subsidence occurring or alleged to have occurred by reasons of dewatering activities covered this proposal or subsequent contract.
43. There will be no retention or bond requirement. If Clients requests, this will be an additional charge.
44. No warranties about the suitability of this proposal for this project without a pilot test are being made.
45. Work performed Monday- Friday. Additional costs for weekends/holidays.
46. Customer assumes all responsibility for discharge of effluent, including discharge limitations, sampling, and analysis.
47. Pre-job meetings, on-site installation and startup & tear down is an estimate and will be performed on a time and material basis.
48. Additional analytical and profiling costs may apply for disposal of spent medias.
49. PEI is not responsible for settling of the ground underneath and around the treatment system. Due to the nature of water treatment, some water may leak from the system and onto the ground.
50. PEI will not be held responsible for any type of violation, fines or penalties.
51. Well development water cannot be pumped into the treatment system and the influent water must be below 50 ppm for TSS and 50 NTU's for Turbidity.
52. Inspection of goods will take place at project site or PEI shop if will called.
53. Risk of loss or damage shall shift to client at time of delivery and we recommend client to fence in the equipment.
54. PEI is not responsible for maintaining, installing or removing temporary fences, landscape, trees, utility lines, etc.
55. PEI will not be responsible for liquidated damages.
56. PEI is not required to share files and records to client for inspection at any time.
57. The warranty in our proposal shall be the sole warranty on this contract.
58. PEI is not responsible for cranes and hoists. Contractor will be responsible.
59. Insurance Costs will be added if required, including but not limited to: OCIP, CCIP, PLP and UCIP.
60. PEI is not responsible for odors, noise levels, nuisance water, etc. on site.
61. PEI is not responsible for Tariff increases in steel, GAC media, resin, steel or any other equipment and materials.
62. PEI will assess a 35% restocking fee for all items canceled. Once Customer takes equipment or media, Customer will assume 100% responsibility.
63. Any and all engineering information provided are "typical" estimates only for the sole purpose of estimating potential solutions, including flow diagrams, equipment layouts and operating weights, media use, chemical use, efficiencies, efficacies, information for discharge permit applications, etc. subject to the final approval of the user.
64. Customer renting PEI equipment and using PEI AQMD various locations permit must submit all laboratory data to PEI each month of operation along with equipment operational time and maintenance logs for the month.
65. Customer agrees to comply with and provide its workers and subcontractors any necessary California Safe Drinking Water and Toxic Enforcement Act of 1986, California Health and Safety Code section 25249.5, et seq. ("Proposition 65") warnings for PEI equipment used in California.

Attachment 7

Certificate of Insurance (Workers Compensation)

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 10/29/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Willis Towers Watson Midwest, Inc. c/o 26 Century Blvd P.O. Box 305191 Nashville, TN 372305191 USA	CONTACT NAME: Willis Towers Watson Certificate Center PHONE (A/C, No, Ext): 1-877-945-7378 FAX (A/C, No): 1-888-467-2378 E-MAIL ADDRESS: certificates@willis.com
INSURED Leggett & Platt Incorporated 1 Leggett Road Carthage, MO 64836	INSURER A : ACE American Insurance Company — NAIC # 22667 INSURER B : XL Specialty Insurance Company — 37885 INSURER C : National Fire & Marine Insurance Company — 20079 INSURER D : ACE Fire Underwriters Insurance Company — 20702 INSURER E : INSURER F :

COVERAGES **CERTIFICATE NUMBER:** W18515310 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	[X] COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: [X] POLICY [ ] PRO-JECT [ ] LOC [ ] OTHER:			HDO G71446591	11/01/2020	11/01/2021	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 2,000,000 $ 1,000,000 $ 10,000 $ 2,000,000 $ 4,000,000 $ 4,000,000
A	AUTOMOBILE LIABILITY [X] ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS [ ] HIRED AUTOS ONLY [ ] NON-OWNED AUTOS ONLY			ISA H2531458A	11/01/2020	11/01/2021	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 5,000,000 $ $ $
B	[X] UMBRELLA LIAB [X] OCCUR EXCESS LIAB [ ] CLAIMS-MADE [ ] DED [X] RETENTION $ 10,000			US00086849LI20A	11/01/2020	11/01/2021	EACH OCCURRENCE AGGREGATE	$ 5,000,000 $ 5,000,000
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y / N: No If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		WLR C67464199	11/01/2020	11/01/2021	[X] PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 1,000,000 $ 1,000,000 $ 1,000,000
C	Excess Business Automobile			42-XSF-312665-01	11/01/2020	11/01/2021	CSL	$5,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

SEE ATTACHED

CERTIFICATE HOLDER

Evidence of Insurance

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

AGENCY CUSTOMER ID: _____

LOC #: _____

ADDITIONAL REMARKS SCHEDULE

AGENCY	NAMED INSURED
Willis Towers Watson Midwest, Inc.	Leggett & Platt Incorporated 1 Leggett Road Carthage, MO 64836
POLICY NUMBER See Page 1	
CARRIER: See Page 1 / NAIC CODE: See Page 1	EFFECTIVE DATE: See Page 1

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,

FORM NUMBER: 25 FORM TITLE: Certificate of Liability Insurance

Name Insured includes: Elite Comfort Solutions LLC, Elite Comfort Solutions, Inc. & Elite Foam, LLC

This certificate is issued as evidence of insurance coverage only.

INSURER AFFORDING COVERAGE: ACE Fire Underwriters Insurance Company NAIC#: 20702

POLICY NUMBER: SCF C67457080 EFF DATE: 11/01/2020 EXP DATE: 11/01/2021

TYPE OF INSURANCE:	LIMIT DESCRIPTION:	LIMIT AMOUNT:
Workers Compensation	E.L. Each Accident	$1,000,000
& Employers' Liability	E.L. Disease - Policy	$1,000,000
WC: Per Statute	E.L. Disease - Ea Emp	$1,000,000

Attachment 8
Zoning Approval

City of Havre de Grace

711 PENNINGTON AVENUE, HAVRE DE GRACE, MARYLAND 21078
WWW.HAVREDEGRACEMD.COM

410- 939-1800

March 30, 2021

Mike Nelson
Director of Real Estate & Facilities
1 Leggett Road
Carthage, MO 64836

Re: 1900 Clark Road
Zoning Verification Letter

Dear Mr. Nelson:

I am in receipt of your email dated March 30, 2021 concerning your proposed use of the above referenced property. The subject property is zoned C/Commercial District, is 57.87+/- acres in size and is presently improved with an approximately 612,000 square foot industrial building that was previously approved and permitted by the City of Havre de Grace. In your email, you stated that your company is pursuing a lease of the property for the manufacturing of polyurethane foam for the bedding, furniture, marine and automotive industries. The manufacturing operation would rely on chemicals that are delivered to the property via rail and truck. The facility would also be used for the warehousing and distribution of finished products.

The proposed use would be permitted as a matter of right in the C/Commercial District as a manufacturing use that includes warehousing and distribution. A tenant occupancy permit must be issued for the use of the property prior to establishing the use. If modifications to the building are required, a building permit and sealed plans will be required to be submitted for review and approval. It is recommended that you call Ms. Marisa Willis of this office with questions concerning the submission of the building permit and plans. Ms. Willis can be reached by phone at 410-939-1800 or via email at marisaw@havredegracemd.com. Harford County provides plan review and inspection services for the City. Building permit applications must be made directly to the City. All trade permit applications are made directly to the County. If any interior renovations are proposed that will impact the quantity of water using fixtures, it is imperative that you contact Mr. Tim Whittie, Director of Public Works, early in the process to perform a fixture count. Cost Recovery Fees may be imposed if additional water using fixtures are proposed to be installed. All fees must be paid prior to the issuance of the tenant occupancy permit.

Prior to the issuance of a tenant occupancy permit, the Department of Public Works will require information concerning liquid or solid wastes that may be discharged from the facility in accordance with Section 205-11.E of the City Code:

> *Liquid or solid waste. The applicant shall utilize the best practicable method known for the disposal of solid or liquid-carried waste for the proposed use. The discharge of any waste material whatsoever into any watercourse shall be prohibited, except when in accordance with existing MDE and other applicable regulatory requirements. All methods of sewage and waste treatment and disposal shall be approved by the City of Havre de Grace and any other applicable local or state agency. The Department of Public Works shall investigate the character and volume of all waste or sewage and shall certify that the City will accept the discharge of the waste material into the local sewage system and treatment facilities. The applicant shall comply with any requirements of the City, including an industrial discharge permit and the pretreatment and/or ongoing monitoring and reporting of such wastes and other methods of improving such wastes prior to discharge, such as the use of grease traps, as a condition of acceptance by the City. After the use has commenced, the City shall have the authority to require the owner or tenant to certify compliance. Non-compliance shall require the submission of a remediation plan for review and*

approval by the City. All monitoring and reporting required herein shall be submitted to the Director of Public Works or his or her designee.

In addition, the facility shall not emit smoke, fumes, gases, dust, odors or other atmospheric pollutants that would be a nuisance to the community in accordance with Section 205-11.D:

Smoke, fumes, gases, dust and odors. There shall be no emission of any smoke, fumes, gases, dust, odors or any other atmospheric pollutant which may disseminate a substance in the air that can have an adverse effect on human health or the ecosystem or which does not comply with standards as promulgated by the Maryland Department of the Environment (MDE). If it has been determined by the Director of the Department of Public Works that any use creates such offensive odors, dust, smoke, gas, or similar atmospheric nuisance having adverse health or environmental effects or in violation of MDE standards, the property owner or tenant shall abate the nuisance to the satisfaction of the appropriate City agency.

It is also recommended that you contact Ms. Erika Quesenbery, Director of Economic Development, to discuss your proposed use of the property. Ms. Quesenbery can provide assistance on various fronts and introduce you to the Havre de Grace business community and related associations and organizations. Ms. Quesenbery can be reached by phone at 410-939-1800 or via email at erikaq@havredegracemd.com. The City of Havre de Grace looks forward to welcoming you to our wonderfully quaint but growing community. The City offers many amenities and attractions that will surely be of interest to your company and its employees. We would be happy to arrange a meeting at any time if you would like to have further discussions about your proposed use of the subject property.

Sincerely,

Shane P. Grimm, AICP
Director of Planning

cc: Patrick Sypolt, Director of Administration
Stephen Gamatoria, Chief of Staff
Timothy Whittie, PE, Director of Public Works
Erika Quesenbery, Director of Economic Development
Marisa Willis, CFM, Planning Technician
Colleen Critzer, Permits Clerk

MARYLAND DEPARTMENT OF THE ENVIRONMENT

AIR AND RADIATION ADMINISTRATION
APPLICATION FOR A PERMIT TO CONSTRUCT

SUPPLEMENT TO
DOCKET #22-21

COMPANY: Elite Comfort Solutions LLC

LOCATION: 1900 Clark Road, Havre de Grace, MD 21078

APPLICATION: Installation of a flexible polyurethane foam manufacturing facility

ITEM	DESCRIPTION
1	Notice of Tentative Determination, Opportunity to Request a Public Hearing, and Opportunity to Submit Written Comments
2	Fact Sheet and Tentative Determination
3	Draft Permit to Construct and Conditions
4	Application addendum
5	Supplemental Information
6	Privilege Log – N/A

MARYLAND DEPARTMENT OF THE ENVIRONMENT
AIR AND RADIATION ADMINISTRATION

NOTICE OF TENTATIVE DETERMINATION, OPPORTUNITY TO REQUEST A PUBLIC HEARING, AND OPPORTUNITY TO SUBMIT WRITTEN COMMENTS

FIRST NOTICE

The Department of the Environment, Air and Radiation Administration (ARA) has completed its review of an application for a Permit to Construct submitted by Elite Comfort Solutions LLC on October 5, 2021, with amendments on April 27, 2022 and June 10, 2022, for the installation of a flexible polyurethane foam manufacturing facility. The proposed installation will be located at 1900 Clark Road, Havre de Grace, MD 21078.

Pursuant to Section 1-604, of the Environment Article, Annotated Code of Maryland, the Department has made a tentative determination that the Permit to Construct can be issued and is now ready to receive public comment on the application. Copies of the Department's tentative determination, the application, the draft permit to construct with conditions, and other supporting documents are available for public inspection on the Department's website. Look for Docket #22-21 at the following link:

https://mde.maryland.gov/programs/Permits/AirManagementPermits/Pages/index.aspx

Interested persons may request a public hearing and/or submit written comments on the tentative determination. Requests for a public hearing must be submitted in writing and must be received by the Department no later than 20 days from the date of this notice. Written comments must be received by the Department no later than 30 days from the date of this notice.

Interested persons may request an extension to the public comment period. The extension request must be submitted in writing and must be received by the Department no later than 30 days from the date of this notice or within 5 days after the hearing (if a hearing is requested), whichever is later. The public comment period may only be extended one time for a 60-day period.

All requests for a public hearing, requests for an extension to the public comment period, and all written comments should be directed to the attention of Ms. Shannon Heafey, Air Quality Permits Program, Air and Radiation Administration, 1800 Washington Boulevard, Baltimore, Maryland 21230. Further information may be obtained by calling Ms. Shannon Heafey at 410-537-4433.

Christopher R. Hoagland, Director
Air and Radiation Administration

MARYLAND DEPARTMENT OF ENVIRONMENT
AIR AND RADIATION ADMINISTRATION

FACT SHEET AND TENTATIVE DETERMINATION
ELITE COMFORT SOLUTIONS, LLC

PROPOSED INSTALLATION OF A FLEXIBLE POLYURETHANE FOAM MANUFACTURING FACILITY

I. INTRODUCTION

The Maryland Department of the Environment (the "Department") received an application from Elite Comfort Solutions, LLC on October 5, 2021, with amendments on April 27, 2022 and June 10, 2022, for a Permit to Construct for the installation of a flexible polyurethane foam manufacturing facility. The proposed installation will be located at 1900 Clark Road, Havre de Grace, MD 21078.

A notice was placed in The Aegis on November 19, 2021 and November 26, 2021 announcing an opportunity to request an informational meeting to discuss the application for a Permit to Construct. An informational meeting was not requested.

As required by law, all public notices were also provided to elected officials in all State, county, and municipality legislative districts located within a one-mile radius of the facility's property boundary.

The Department has reviewed the application and has made a tentative determination that the proposed installation is expected to comply with all applicable air quality regulations. A notice will be published to provide the public with opportunities to request a public hearing and to comment on the application, the Department's tentative determination, the draft permit conditions, and other supporting documents. The Department will not schedule a public hearing unless a legitimate request is received.

If the Department does not receive any comments that are adverse to the tentative determination, the tentative determination will automatically become a final determination. If adverse comments are received, the Department will review the comments, and will then make a final determination with regard to issuance or denial of the permit. A notice of final determination will be published in a newspaper of general circulation in the affected area. The final determination may be subject to judicial review pursuant to Section 1-601 of the Environment Article, Annotated Code of Maryland.

II. CURRENT STATUS AND PROPOSED INSTALLATION

A. Current Status

This facility is a large warehouse that currently only has three (3) natural gas-fired boilers registered with the Department. Previous occupants of the building did not have processing or manufacturing equipment that required air quality permits to construct.

B. Proposed Installation

The facility proposes to install a polyurethane foam manufacturing facility. The following equipment will be installed:

Polyurethane Foam Production Process consisting of a Hennecke QFM Pourline with Five (5) Carbon Adsorption Beds for VOC control and a Foam Cure Area.

A Registered Tank Farm consisting of four (4) 20,000 gallon TDI Storage Tanks, each with a carbon drum, four (4) 20,000 gallon MDI Storage Tanks, each with a carbon drum and one (1) 10,000 gallon Acetone Storage Tank with a vapor recovery line.

Facility-wide Cleaning Operations will also be registered with the Department.

Additional equipment including twenty (20) storage tanks, two (2) emergency generators, and one (1) fire pump engine will be installed, but do not meet the threshold for an air quality permit to construct to be required.

III. APPLICABLE REGULATIONS

The proposed installation is subject to all applicable Federal and State air quality control regulations, including, but not limited to the following:

(a) 40 CFR 63, Subparts A and OOOOOO for Flexible Polyurethane Foam Production and Fabrication Area Sources

(b) COMAR 26.11.02.19C & D, which require that the Permittee submit to the Department annual certifications of emissions, and that the Permittee maintain sufficient records to support the emissions information presented in the submittals.

(c) COMAR 26.11.06.02C(1), which limits visible emissions other than uncombined water to not more than 20 percent opacity.

(d) COMAR 26.11.06.03B(1), which limits the concentration of particulate matter in any exhaust gases to not more than 0.05 grains per standard cubic foot of dry exhaust gas.

(e) COMAR 26.11.06.03C and D, which requires that the Permittee take reasonable precautions to prevent particulate matter from unconfined sources and materials handling and construction operations from becoming airborne.

(f) COMAR 26.11.06.08 and 26.11.06.09, which generally prohibit the discharge of emissions beyond the property line in such a manner that a nuisance or air pollution is created.

(g) COMAR 26.11.09.05A(1) which prohibits visible emissions from fuel burning equipment, other than water in an uncombined form, which is greater than 20 percent opacity.

(h) COMAR 26.11.15.05, which requires that the Permittee implement "Best Available Control Technology for Toxics" (T – BACT) to control emissions of toxic air pollutants.

(i) COMAR 26.11.15.06, which prohibits the discharge of toxic air pollutants to the extent that such emissions will unreasonably endanger human health.

(j) COMAR 26.11.19.02I, which requires that the Permittee establish in writing and implement facility-wide "good operating practices" designed to minimize emissions of VOC.

(k) COMAR 26.11.19.16, which requires that the Permittee implement a VOC leak detection and repair program designed to minimize unintended emissions of VOC from process equipment and components, e.g., in-process vessels, storage tanks, pumps, compressors, valves, flanges and other pipeline fittings, pressure relief valves, process drains, and open-ended pipes.

(l) COMAR 26.11.19.30D(2), which requires that the Permittee prepare a manual that identifies good operating practices and procedures that are designed to minimize emissions of VOC.

IV. GENERAL AIR QUALITY

The U.S. Environmental Protection Agency (EPA) has established primary and secondary National Ambient Air Quality Standards (NAAQS) for six (6) criteria pollutants, i.e., sulfur dioxide, particulate matter, carbon monoxide, nitrogen dioxide, ozone, and lead. The primary standards were established to protect public health, and the secondary standards were developed to protect against non-health effects such as damage to property and vegetation.

The Department utilizes a statewide air monitoring network, operated in accordance with EPA guidelines, to measure the concentrations of criteria pollutants in Maryland's ambient air. The measurements are used to project statewide ambient air quality, and currently indicate that Harford County complies with the NAAQS for sulfur dioxide, particulate matter, carbon monoxide, nitrogen dioxide, and lead.

Ground level ozone continues to present a problem for the entire Baltimore metropolitan area, which is classified as a non-attainment area for ozone. The primary contributors to the formation of ozone are emissions of oxides of nitrogen, primarily from combustion equipment, and emissions of Volatile Organic Compounds (VOC) such as paint solvents and gasoline vapors. Harford County is included in the non-attainment area for ozone.

With regard to toxic air pollutants (TAPs), screening levels (i.e., acceptable ambient concentrations for toxic air pollutants) are generally established at 1/100 of allowed worker exposure levels (TLVs)[1]. The Department has also developed additional screening levels for carcinogenic compounds. The additional screening levels are established such that continuous exposure to the subject TAP at the screening level for a period of 70 years is expected to cause an increase in lifetime cancer risk of no more than 1 in 100,000.

V. COMPLIANCE DEMONSTRATION AND ANALYSIS

The proposed installation must comply with all State imposed emissions limitations and screening levels, as well as the NAAQS. The Department has conducted an engineering and air quality review of the application. The emissions were projected based on EPA AP-42 emission factors and manufacturer emissions data. The conservative U.S. EPA's SCREEN3 model and the AERMOD dispersion model were used to project the maximum ground level concentrations from the proposed facility, which were then compared to the screening levels and the NAAQS.

A. Estimated Emissions - The maximum emissions of air pollutants of concern from the proposed installation are listed in Table I.

B. Compliance with National Ambient Air Quality Standards - The maximum ground level concentrations for sulfur dioxide, particulate matter, carbon monoxide, and nitrogen dioxide based on the emissions from the proposed installation are listed in column 2 of Table II. The combined impact of the projected contribution from the proposed installation and the ambient background concentration for each pollutant shown in column 3 of Table II is less than the NAAQS for each pollutant shown in column 4.

[1] TLVs are threshold limit values (exposure limits) established for toxic materials by the American Conference of Governmental Industrial Hygienists (ACGIH). Some TLVs are established for short-term exposure (TLV – STEL), and some are established for longer-term exposure (TLV – TWA), where TWA is an acronym for time-weight average.

Emissions of oxides of nitrogen and VOC will each be less than 25 tons per year, the major source threshold applicable in the area, and will not significantly impact the ground level concentration of ozone.

C. Compliance with Air Toxics Regulations – The facility's processes will emit four toxic air pollutants: toluene diisocyanate (TDI), methylenediphenyl diisocyanate (MDI), acetone, and N-methylpyrrolidone (NMP). Premises wide emissions of MDI are less than the corresponding allowable emissions rate for that pollutant based on the procedures specified in COMAR 26.11.16.02. The toxic air pollutants requiring additional modeling analyses are listed in column 1 of Table III. The predicted maximum off-site ambient concentrations of these toxic air pollutants are shown in column 4 of Table III, and in each case the maximum concentration is less than the corresponding screening level for the toxic air pollutant shown in column 2.

VI. TENTATIVE DETERMINATION

Based on the above information, the Department has concluded that the proposed installations will comply with all applicable Federal and State air quality control requirements. In accordance with the Administrative Procedure Act, Department has made a tentative determination to issue the Permit to Construct.

Enclosed with the tentative determination is a copy of the draft Permit to Construct.

TABLE I
PROJECTED MAXIMUM EMISSIONS FROM THE PROPOSED INSTALLATION

POLLUTANT	PROJECTED MAXIMUM EMISSIONS FROM PROPOSED INSTALLATION	
	(lbs/day)	(tons/year)
Nitrogen Dioxide (NO_2)	33.4	6.1
Sulfur Dioxide (SO_2)	0.2	0.04
Carbon Monoxide (CO)	28.1	5.1
Volatile Organic Compounds (VOC)	206.4	24.25
Particulate Matter (PM_{10})	2.5	0.5

TABLE II
PROJECTED IMPACT OF EMISSIONS OF CRITERIA POLLUTANTS FROM THE PROPOSED INSTALLATION ON AMBIENT AIR QUALITY

POLLUTANTS	**MAXIMUM OFF-SITE GROUND LEVEL CONCENTRATIONS CAUSED BY EMISSIONS FROM PROPOSED PROCESS ($\mu g/m^3$)**	**BACKGROUND AMBIENT AIR CONCENTRATIONS ($\mu g/m^3$)***	**NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) ($\mu g/m^3$)**
Nitrogen Dioxide (NO_2)	annual avg.→ 17.7	annual avg.→ 29.7	annual avg.→ 100
Carbon Monoxide (CO)	8-hour max→ 129.8 1-hour max → 185.4	8-hr max.→ 1,603 1-hr max.→ 2,061	8-hr max.→ 10,000 1-hr max.→ 40,000
Sulfur Dioxide (SO_2)	24-hour max. → 0.5 annual avg. → 0.1	24-hour max.→ 57.6 annual avg.→ 9.4	24-hour max.→ 366 annual avg.→ 78.5
Particulate Matter (PM_{10})	24-hr max → 6.7	24-hr max.→ 40	24-hr max.→ 150

*Background concentrations were obtained from Maryland air monitoring stations as follows:

CO and SO_2 → 600 Dorsey Avenue in Essex in Baltimore County
PM_{10} → Oldtown Fire Station in Baltimore City
NO_2 → Interstate 95 Welcome Center in Laurel, Howard County

TABLE III
PREDICTED MAXIMUM OFF-SITE AMBIENT CONCENTRATIONS FOR TOXIC AIR POLLUTANTS EMITTED FROM THE PROPOSED INSTALLATION

TOXIC AIR POLLUTANTS	SCREENING LEVELS ($\mu g/m^3$)	PROJECTED WORST-CASE FACILITY-WIDE EMISSIONS (lbs/hr)	PREDICTED MAXIMUM OFF-SITE GROUND LEVEL CONCENTRATIONS ($\mu g/m^3$)
Acetone	1-hour→ 17,807 8-hour→ 11,871 Annual→ None	1852	1-hour→ 17,345 8-hour→ 8,744 Annual→ None
TDI	1-hour→ 1.42 8-hour→ 0.36 Annual→ None	0.0523	1-hour→ 0.85 8-hour→ 0.29 Annual→ None
N-Methylpyrrolidone	1-hour→ None 8-hour→ 71.8 Annual→ None	0.47	1-hour→ None 8-hour→ 50.6 Annual→ None

The values represent maximum facility-wide emissions of toxic air pollutants during any 1-hour period of facility operation.

The values are based on worst-case emissions from the proposed facility and were predicted by EPA's SCREEN3 model, which provides conservative estimations concerning the impact of pollutants on ambient air quality.

DRAFT PERMIT

Air and Radiation Administration

1800 Washington Boulevard, Suite 720
Baltimore, MD 21230

☒ Construction Permit ☐ Operating Permit

PERMIT NO.:
As listed on Page 2

DATE ISSUED:
[TBD]

PERMIT FEE:
$7,800.00

EXPIRATION DATE:
In accordance with COMAR 26.11.02.04B

LEGAL OWNER & ADDRESS
Elite Comfort Solutions LLC
24 Herring Road
Newnan, GA 30265
Attention: Mr. Joe Metcalf, Director of EHS

SITE
Elite Comfort Solutions LLC
1900 Clark Rd
Havre De Grace, MD 21078
AI #173152

SOURCE DESCRIPTION

This permit authorizes the installation of a flexible polyurethane foam manufacturing facility.

This permit contains premises-wide emissions limitations of volatile organic compounds to preclude applicability of Part 70 Operating Permit requirements.

This permit serves a temporary permit to operate for a period of 180 days after startup of the flexible polyurethane foam manufacturing facility.

This source is subject to the conditions described on the attached pages.

Program Manager

Director, Air and Radiation Administration

INDEX

This permit-to-construct covers the following registered installations:

ARA Registration No.	Description	Date of Installation
025-0705-5-0390 025-0705-5-0391 025-0705-5-0392 025-0705-5-0393	Three (3) natural gas-fired boilers rated at 4.0 MMBTU/hr and one (1) natural gas-fired boiler rated at 2.187 MMBTU/hr	1997
025-0705-7-0183	Polyurethane Foam Production Process: Hennecke QFM Pourline with Five (5) Carbon Adsorption Beds for VOC control Foam Cure Area	2023
025-0705-7-0184	Facility-wide Cleaning Operations	2023
025-0705-9-0534	Registered Tank Farm: Four (4) 20,000 gallon TDI Storage Tanks, each with a carbon drum Four (4) 20,000 gallon MDI Storage Tanks, each with a carbon drum One (1) 10,000 gallon Acetone Storage Tank with a vapor recovery line	2023

Part A – General Provisions

(1) The following Air and Radiation Administration (ARA) permit-to-construct applications and supplemental information are incorporated into this permit by reference:

(a) Four (4) Applications for Processing or Manufacturing Equipment (Form 5) received October 5, 2021.

(b) Application for Gas Cleaning or Emission Control Equipment (Form 6) received October 5, 2021.

(c) Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration (Form 5T) received October 5, 2021.

(d) Four (4) Emission Point Data (Form 5EP) received October 5, 2021.

(e) All valid Requests for Coverage for Small Fuel Burning Equipment received prior to the issuance of this permit and pertaining to ARA Premises No. 025-0705.

(f) Supplemental Information: manufacturer specifications, process flow diagrams, site plans, emissions calculations, safety data sheets, zoning approval received October 5, 2021.

(g) Application Addendum with updated modeling results received April 27, 2022 and modeling files received June 10, 2022.

If there are any conflicts between representations in this permit and representations in the applications, the representations in the permit shall govern. Estimates of dimensions, volumes, emissions rates, operating rates, feed rates and hours of operation included in the applications do not constitute enforceable numeric limits beyond the extent necessary for compliance with applicable requirements.

(2) Upon presentation of credentials, representatives of the Maryland Department of the Environment (“MDE” or the “Department”) and the Harford County Health Department shall at any reasonable time be granted, without delay and without prior notification, access to the Permittee’s property and permitted to:

(a) inspect any construction authorized by this permit;

(b) sample, as necessary to determine compliance with requirements of this permit, any materials stored or processed on-site, any waste materials, and any discharge into the environment;

(c) inspect any monitoring equipment required by this permit;

(d) review and copy any records, including all documents required to be maintained by this permit, relevant to a determination of compliance with requirements of this permit; and

(e) obtain any photographic documentation or evidence necessary to determine compliance with the requirements of this permit.

(3) The Permittee shall notify the Department prior to increasing quantities and/or changing the types of any materials referenced in the application or limited by this permit. If the Department determines that such increases or changes constitute a modification, the Permittee shall obtain a permit-to-construct prior to implementing the modification.

(4) Nothing in this permit authorizes the violation of any rule or regulation or the creation of a nuisance or air pollution.

(5) If any provision of this permit is declared by proper authority to be invalid, the remaining provisions of the permit shall remain in effect.

(6) Subsequent to issuance of this permit, the Department may impose additional and modified requirements that are incorporated into a State permit-to-operate issued pursuant to COMAR 26.11.02.13.

Part B – Applicable Regulations

(1) This source is subject to all applicable federal air pollution control requirements including, but not limited to, the following:

All applicable terms, provisions, emissions standards, testing, monitoring, record keeping, and reporting requirements included in the National Emissions Standards for Hazardous Air Pollutants (NESHAP) promulgated under 40 CFR 63, Subparts A and OOOOOO for Flexible Polyurethane Foam Production and Fabrication Area Sources.

All notifications required under 40 CFR 63, Subparts A and OOOOOO shall be submitted to both of the following:

The Administrator
Compliance Program
Maryland Department of the Environment
Air and Radiation Administration
1800 Washington Boulevard, STE 715
Baltimore MD 21230

and

Director, Air Protection Division

U.S. EPA – Region 3
Mail Code 3AP00
1650 Arch Street
Philadelphia, PA 19103-2029

(2) This source is subject to all applicable federally enforceable State air pollution control requirements including, but not limited to, the following regulations:

(a) COMAR 26.11.01.07C, which requires that the Permittee report to the Department occurrences of excess emissions.

(b) COMAR 26.11.02.04B, which states that a permit to construct or an approval expires if, as determined by the Department:

(i) Substantial construction or modification is not commenced within 18 months after the date of issuance of the permit or approval, unless the Department specifies a longer period in the permit or approval;

(ii) Construction or modification is substantially discontinued for a period of 18 months after the construction or modification has commenced; or

(iii) The source for which the permit or approval was issued is not completed within a reasonable period after the date of issuance of the permit or approval.

(c) COMAR 26.11.02.09A, which requires that the Permittee obtain a permit-to-construct if an installation is to be modified in a manner that would cause changes in the quantity, nature, or characteristics of emissions from the installation as referenced in this permit.

(d) COMAR 26.11.06.02C(1), which limits visible emissions other than uncombined water to not more than 20 percent opacity.

(e) COMAR 26.11.06.03B(1), which limits the concentration of particulate matter in any exhaust gases to not more than 0.05 grains per standard cubic foot of dry exhaust gas.

(f) COMAR 26.11.06.03C and D, which requires that the Permittee take reasonable precautions to prevent particulate matter from unconfined sources and materials handling and construction operations from becoming airborne.

(g) COMAR 26.11.09.05A(1) which prohibits visible emissions from fuel burning equipment, other than water in an uncombined form, which is greater than 20 percent opacity.

Exceptions. COMAR 26.11.09.05A(3) establishes that COMAR 26.11.09.05A(1) does not apply to emissions during load changing, soot blowing, startup, or adjustments or occasional cleaning of control equipment if the visible emissions are not greater than 40 percent opacity and the visible emissions do not occur for more than 6 consecutive minutes in any sixty-minute period.

(h) COMAR 26.11.19.02I, which requires that the Permittee establish in writing and implement facility-wide “good operating practices” designed to minimize emissions of VOC.

(i) COMAR 26.11.19.16, which requires that the Permittee implement a VOC leak detection and repair program designed to minimize unintended emissions of VOC from process equipment and components, e.g., in-process vessels, storage tanks, pumps, compressors, valves, flanges and other pipeline fittings, pressure relief valves, process drains, and open-ended pipes.

(j) COMAR 26.11.19.30D(2), which requires that the Permittee prepare a manual that identifies good operating practices and procedures that are designed to minimize emissions of VOC.

(3) This source is subject to all applicable State-only enforceable air pollution control requirements including, but not limited to, the following regulations:

(a) COMAR 26.11.02.13A(13), which requires that the Permittee obtain from the Department, and maintain and renew as required, a valid State permit-to-operate.

(b) COMAR 26.11.02.19C & D, which require that the Permittee submit to the Department annual certifications of emissions, and that the Permittee maintain sufficient records to support the emissions information presented in such submittals.

(c) COMAR 26.11.06.08 and 26.11.06.09, which generally prohibit the discharge of emissions beyond the property line in such a manner that a nuisance or air pollution is created.

(d) COMAR 26.11.15.05, which requires that the Permittee implement "Best Available Control Technology for Toxics" (T – BACT) to control emissions of toxic air pollutants.

(e) COMAR 26.11.15.06, which prohibits the discharge of toxic air pollutants to the extent that such emissions would unreasonably endanger human health.

Part C – Construction Conditions

(1) Except as otherwise provided in this part, all registered installations shall be constructed in accordance with specifications included in the incorporated applications.

(2) In accordance with COMAR 26.11.02.09A, the Permittee shall apply for and obtain a permit-to-construct if any equipment or process authorized by this permit is to be modified in a manner that would cause changes in the quantity, nature, or characteristics of emissions from the equipment or process as referenced in this permit.

(3) To comply with the requirements of COMAR 26.11.19.30D and the ambient impact requirements of COMAR 26.11.15, the Hennecke QFM Pourline shall be constructed such that exhaust gases are vented to a carbon adsorption system, consisting of five (5) carbon adsorbers in parallel prior to being discharged to the atmosphere.

(4) To comply with the requirements of COMAR 26.11.19.02I and the ambient impact requirements of COMAR 26.11.15, each Storage Tank containing TDI or MDI shall be constructed with a carbon drum for control of VOC emissions.

(5) To comply with the requirements of COMAR 26.11.19.02I and the ambient impact requirements of COMAR 26.11.15, the one (1) 10,000 gallon Acetone Storage Tank shall be constructed with a vapor recovery line for control of VOC emissions.

Part D – Operating Conditions

(1) Except as otherwise provided in this part, all registered installations shall be operated in accordance with specifications included in the application and any operating procedures recommended by equipment vendors unless the Permittee obtains from the Department written authorization for alternative operating procedures.

(2) The Permittee shall limit premises-wide emissions of VOC to less than 25 tons in any consecutive 12-month period.

(3) The Permittee shall limit uncontrolled VOC emissions from the polyurethane foam production process to less than 100 pounds per day.

(4) The Permittee shall meet the following metering rate limitations for TDI (the combined mixture of 2,4-toluene diisocyanate and 2,6-toluene diisocyanate), MDI (4,4'-diphenylmethane diisocyanate), and acetone unless the Permittee can demonstrate, to the approval of the Department, compliance with COMAR 26.11.15 at higher rates:

(a) A maximum metering rate of 19,233 lbs/hr of TDI with a 24 hour maximum of 384,660 lbs and an annual usage limitation of 54,004 tons/year.

(b) A maximum metering rate of 19,233 lbs/hr of MDI with a 24 hour maximum of 384,660 lbs and an annual usage limitation of 54,004 tons/year.

(c) A maximum metering rate of 1,852 lbs/hr of acetone with a 24 hour maximum of 40,476 lbs and an annual usage limitation of 6,314 tons/year.

(5) No material containing methylene chloride may be used for any purpose in the polyurethane foam production process. **[Reference: 40 CFR §63.11416(b)]**

(6) To comply with the ambient impact requirements of COMAR 26.11.15, the emissions of TDI from the Hennecke QFM Pourline shall be less than 0.0523 lb/hr, as measured and calculated weekly at the outlet of the carbon adsorption system.

(7) To comply with the requirements of COMAR 26.11.19.30D and the ambient impact requirements of COMAR 26.11.15, the Hennecke QFM Pourline shall be operated such that exhaust gases are vented to a carbon adsorption system, consisting of five (5) carbon adsorbers in parallel, prior to being discharged to the atmosphere.

(8) In the case of unavoidable outage or malfunction of the carbon adsorption system, the Hennecke QFM Pourline must discontinue operation.

(9) A minimum of two (2) replacement layers of carbon adsorption filters trays shall be on site at all times.

(10) The Permittee shall not make changes to the materials used in the Polyurethane Foam Manufacturing Process unless approval is received from the Department.

(11) In accordance with COMAR 26.11.19.02I, the Permittee shall implement "good operating practices" designed to minimize emissions of VOC to the atmosphere.

(a) Where applicable, "good operating practices" shall include, at a minimum:

(i) Provisions for training operators with regard to practices, procedures, and maintenance requirements that are consistent with equipment manufacturers' recommendations, and with requirements dictated by the Permittee's experiences with operation of equipment. The training shall include material concerning proper maintenance procedures for air pollution control equipment;

(ii) Maintenance of covers on containers and other vessels that are not in use and that contain VOC or VOC-containing materials;

(iii) Minimize spills of VOC-containing cleaning materials;

(iv) Convey VOC-containing cleaning materials from one location to another in closed containers or pipelines;

(v) Minimize VOC emissions from cleaning of storage, mixing, and conveying equipment;

(vi) Scheduling operations as much as practical to minimize color changes and other material changes when applying VOC-containing materials by spray application;

(vii) Where practical, using high-volume-low-pressure (HVLP) spray applicators or other high efficiency application methods for spray application of VOC-containing materials; and

(viii) Mixing and blending VOC-containing materials, as much as practical, in closed containers, and implementing preventive measures designed to minimize emissions from products that contain VOC.

(b) "Good operating practices" shall be established in writing, shall be made available to the Department upon request, and shall be either

included as part of an operator training program or posted where clearly visible to operators.

(c) The Permittee shall take all reasonable precautions to prevent or minimize the discharge of VOC into the atmosphere when cleaning process equipment and coating application equipment, including containers, vessels, tanks, lines, spray application devices, and pumps. Reasonable precautions for equipment cleanup shall include, at a minimum:

(i) Storing all waste materials, including VOC-contaminated cloth and paper, in closed containers;

(ii) For frequently cleaned equipment, preparing written standard operating procedures that include, where practical, provisions for using non-VOC or low-VOC cleaning agents, and procedures designed to minimize the quantities of VOC-containing cleaning materials used;

(iii) Where practical, using enclosed spray-applicator cleaning methods, VOC-recycling systems and other spray-applicator cleaning methods designed to reduce or eliminate VOC emissions; and

(iv) Where practical, using detergents, high-pressure water, or other non-VOC cleaning options to clean coating lines, containers, and process equipment.

(d) With regard to storage and transfer of VOC, the Permittee shall, at a minimum:

(i) Install conservation vents, or other vapor control measures designed to minimize standing losses, on all storage tanks with a capacity of 2000 gallons or more in VOC service; and

(ii) For stationary storage tanks with capacities greater than 10,000 gallons and less than 40,000 gallons that store VOC or VOC-containing materials, excluding gasoline, with vapor pressures greater than 1.5 psia, use vapor balance, vapor control lines, or other vapor control measures, whenever VOC are transferred from tank trucks into such tanks.

(12) In accordance with COMAR 26.11.19.16, the Permittee shall visually inspect all equipment and components in VOC service for leaks at least once per calendar month. If leaks are detected, the Permittee shall:

(a) Tag any leak immediately so that the tag is clearly visible. The tag shall be made of a material that will withstand any weather or corrosive conditions to which it may be normally exposed. The tag shall bear an identification number, the date that the leak was discovered, and the identity of the person who discovered the leak. The tag shall remain in place until the leak has been repaired.

(b) Initiate immediate action to repair all observed VOC leaks that can be repaired within 48 hours.

(c) Repair all other leaking components within fifteen (15) days of discovery. If a replacement part is needed, the part shall be ordered within three (3) days of discovery of the leak, and the leak shall be repaired within 48 hours of receipt of the part.

(d) Maintain a supply of components and component parts, such as seals, gaskets, packing and pipe fittings, that are known to wear or corrode, or that otherwise need to be routinely replaced.

(13) In accordance with COMAR 26.11.19.16D, leaking components that cannot be repaired as required because they are inaccessible, or that cannot be repaired during operation of an installation, shall be identified in a log and included in the facility's maintenance schedule for repair during the next outage of the installation.

(14) The four (4) natural gas-fired boilers shall only be fired with natural gas unless the Permittee obtains approval from the Department to burn alternate fuels.

Part E – Monitoring

The Permittee shall comply with the following monitoring conditions until the Permittee obtains approval from the Department for an alternate monitoring plan.

(1) The Permittee must record the outlet TDI concentrations on each of the five (5) carbon adsorption beds at least once per operating week.

(2) The TDI concentration within each of the (5) carbon adsorption beds must be measured at least once per operating week.

(3) During the concentration measurements, the operator shall record the air/vapor flow at the outlet of each carbon bed as well as the pressure drop across each carbon bed.

(4) All TDI concentration analyzers must be calibrated at least once per month.

(5) Spent carbon removed from the system shall be handled to prevent release of any air pollutants into the atmosphere and disposed of appropriately.

Part F – Notifications

(1) An initial notification must be submitted within 15 days of the initial startup of the polyurethane foam production process.

(2) A notification of compliance status for 40 CFR 63, Subpart OOOOOO shall be submitted no later than 180 days after startup of the polyurethane foam production process. The notification must be signed by a responsible official and state "This facility uses no material containing methylene chloride for any purpose on any slabstock flexible foam process." **[Reference: 40 CFR §63.11417(b)(2)]**

Part G – Record Keeping and Reporting

(1) The Permittee shall maintain for at least five (5) years, and shall make available to the Department upon request, records of the following information:

(a) All notifications submitted to the Department.

(b) Safety Data Sheets for all materials used in the polyurethane foam production process. **[Reference: 40 CFR §63.11416(f)]**

(c) Monthly hours of operation and fuel usage records for the four (4) natural gas-fired boilers.

(d) Hourly, daily, and annual metering rates for acetone, TDI, MDI, and polyol.

(e) Daily calculation of uncontrolled VOC emissions from the polyurethane foam production process.

(f) All TDI concentration data recorded in association with the five (5) carbon adsorption filters.

(g) All calibration records for the TDI concentration analyzers used in association with the five (5) carbon adsorption filters.

(h) All maintenance records associated with the five (5) carbon adsorption filters in the polyurethane foam production process.

(i) All maintenance records associated with the carbon drums controlling emissions from the MDI and TDI storage tanks.

(j) All maintenance records associated with vapor recovery line controlling emissions from the acetone storage tank.

(k) Monthly records of polyurethane foam production in pounds and feet.

(l) Monthly records of premises-wide VOC emissions and rolling 12-month totals of VOC emissions.

(m) Monthly usage in gallons of Dzolv (or equivalent) for cleaning purposes and estimates of VOC emissions from usage.

(n) All written descriptions of “good operating practices” designed to minimize emissions of VOC.

(o) VOC leak detection and repair logs that include identification of the persons who conducted the leak detection inspections, the dates on which the inspections were conducted, the findings during the inspections, a listing by tag identification number and a description of all leaks discovered, and the date and nature of all leak repairs effected.

(2) The Permittee shall maintain at the facility for at least five (5) years, and shall make available to the Department upon request, records necessary to support annual certifications of emissions and demonstrations of compliance for toxic air pollutants. Such records shall include, if applicable, the following:

(a) mass emissions rates for each regulated pollutant, and the total mass emissions rate for all regulated pollutants for each registered source of emissions;

(b) accounts of the methods and assumptions used to quantify emissions;

(c) all operating data, including operating schedules and production data, that were used in determinations of emissions;

(d) amounts, types, and analyses of all fuels used;

(e) any records, the maintenance of which is required by this permit or by State or federal regulations, that pertain to the operation and maintenance of continuous emissions monitors, including:

(i) all emissions data generated by such monitors;

(ii) all monitor calibration data;

(iii) information regarding the percentage of time each monitor was available for service; and

(iv) information concerning any equipment malfunctions.

(f) information concerning operation, maintenance, and performance of air pollution control equipment and compliance monitoring equipment, including:

(i) identifications and descriptions of all such equipment;

(ii) operating schedules for each item of such equipment;

(iii) accounts of any significant maintenance performed;

(iv) accounts of all malfunctions and outages; and

(v) accounts of any episodes of reduced efficiency.

(g) limitations on source operation or any work practice standards that significantly affect emissions; and

(h) other relevant information as required by the Department.

(3) The Permittee shall submit to the Department by April 1 of each year a certification of emissions for the previous calendar year. The certifications shall be prepared in accordance with requirements, as applicable, adopted under COMAR 26.11.01.05 – 1 and COMAR 26.11.02.19D.

(a) Certifications of emissions shall be submitted on forms obtained from the Department.

(b) A certification of emissions shall include mass emissions rates for each regulated pollutant, and the total mass emissions rate for all regulated pollutants for each of the facility's registered sources of emissions.

(c) The person responsible for a certification of emissions shall certify the submittal to the Department in the following manner:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

(4) The Permittee shall submit to the Department by April 1 of each year a written certification of the results of an analysis of emissions of toxic air pollutants from the Permittee's facility during the previous calendar year. Such analysis shall include either:

(a) a statement that previously submitted compliance demonstrations for emissions of toxic air pollutants remain valid; or

(b) a revised compliance demonstration, developed in accordance with requirements included under COMAR 26.11.15 & 16, that accounts for changes in operations, analytical methods, emissions determinations, or other factors that have invalidated previous demonstrations.

(5) The Permittee shall report, in accordance with requirements under COMAR 26.11.01.07, occurrences of excess emissions to the Compliance Program of the Air and Radiation Administration.

Part H – Temporary Permit-to-Operate Conditions

(1) This permit-to-construct shall also serve as a temporary permit-to-operate that confers upon the Permittee authorization to operate the polyurethane foam

production process for a period of up to 180 days after initiating operation of the polyurethane foam production process.

(2) The Permittee shall provide the Department with written or electronic notification of the date on which operation of the polyurethane foam production process is initiated. Such notification shall be provided within 15 business days of the date to be reported.

(3) During the effective period of the temporary permit-to-operate the Permittee shall operate the new installation as required by the applicable terms and conditions of this permit-to-construct, and in accordance with operating procedures and recommendations provided by equipment vendors.

(4) During the effective period of the temporary permit-to-operate, the Permittee shall develop a monitoring protocol, approved by the Department, for monitoring the five (5) carbon adsorption filters associated with the Hennecke QFM Pourline.

(5) The approved monitoring protocol will form the basis for the specific monitoring conditions in the State permit-to-operate.

(6) The Permittee shall submit to the Department an application for a State permit-to-operate no later than 60 days prior to expiration of the effective period of the temporary permit-to-operate.

Part I – List of Exempt Sources

The following sources at the facility have been considered exempt from requiring an Air Quality Permit to Construct. Their listing here is for inventory purposes only.

(1) Sixteen (16) 20,000 gallon polyol storage tanks;

(2) Two (2) 10,000 gallon polyol storage tanks;

(3) One (1) 10,000 gallon silicone surfactant storage tank containing Dabco DC-5986;

(4) One (1) 10,000 gallon additive storage tank containing SRT-2000;

(5) One (1) diesel-fired emergency generator rated at less than 197 hp;

(6) One (1) diesel-fired fire pump engine rated at 197 hp;

(7) One (1) diesel-fired emergency generator rated at 134 hp.

Wood Environment & Infrastructure Solutions, Inc.
10940 White Rock Road, Suite 190
Rancho Cordova, CA 95670
USA

T: 916-636-3200

www.woodplc.com

April 26, 2022

Project No. SA21171110.2000

Suna Yi Sariscak
Maryland Department of the Environment
Air and Radiation Management Administration, Air Quality Permits Program
1800 Washington Boulevard
Baltimore, MD 21230

Subject: Permit to Construct Application – Addendum
Elite Comfort Solutions LLC (ECS) – Flexible Polyurethane Foam (PUF) Manufacturing Facility
Havre De Grace, Maryland

Dear Ms. Sariscak,

Please find enclosed an addendum to the original *Permit to Construct Application* submitted on October 4, 2021 for Elite Comfort Solutions LLC's (ECS) proposed new flexible polyurethane foam (PUF) manufacturing facility, to be constructed at 1900 Clark Road, Havre De Grace, Maryland (Harford County).

This addendum has been triggered by a combination of Maryland Department of the Environment's (MDE's) review of the original air dispersion modeling analysis, design operational changes, and physical stack changes.

Relative to the nature of ECS' proposed operations, VOCs continue to be the dictating pollutant in terms of major source thresholds. ECS plans to limit VOCs to below 25 tons/yr in order to qualify as a synthetic minor source.

This application package addendum contains the following updated components:

- Form 5 (multiple equipment / emission sources)
- Form 5EP (multiple emission points)
- Form 5T
- Form 6
- Site Plan Map (Figure 1)
- Process Flow Diagram (Figure 2)
- Potential Emissions Calculations (Attachment 1)
- Air Dispersion Modeling Analysis & Documentation (AERMOD) (Attachment 5)
- Certificate of Insurance (Workers Compensation) (Attachment 7)

An updated discussion of emission estimates and air dispersion modeling is included below:

Production Rates / Potential Emission Estimates

The foam is produced using the main ingredients of polyol, toluene diisocyanate (TDI), 4,4'-diphenylmethane diisocyanate (4,4'-MDI), and polymeric diphenylmethane diisocyanate (pMDI). Acetone will be used as an auxiliary blowing agent (ABA) to produce the desired density and cellular structure of the foam. Emissions calculations for VOCs (acetone is exempt as a VOC, but a listed Class II toxic air pollutant [TAP]) from the foam manufacturing process (including storage tanks), cleaning operations, and ancillary exempt operations are provided in Attachment 1.

PUF Manufacturing Process

Potential air emission calculations were developed for the proposed facility based on metering throughput, engineering emission factors, and application of T-BACT. The maximum metering throughput of raw materials (i.e., TDI, 4,4'-MDI, pMDI, polyol, and acetone) is proposed to be limited in order to maintain synthetic minor status at less than 25 tons/yr VOCs for the facility.

In 1993, the Polyurethane Foam Association (PFA) documented a total TDI (and VOC) emission factor of 34 pounds per million pounds of TDI usage, which is used herein. The TDI compound used at the facility is actually a mixture of 2,4-TDI and 2,6-TDI (80 and 20 percent, by weight in the total mixture, respectively, as noted in the PFA document). The PFA indicates that TDI emissions from storage/transfer and PUF curing are orders of magnitude below the stack emissions generated during PUF production. Therefore, all TDI emissions were assumed to be emitted from the pour line stack, SN-01.

The vapor pressure of MDI is about 100 times lower than TDI. Therefore, the MDI emission factor would be 0.000034% of MDI used. To be conservative, it is assumed that the MDI is composed of 100% 4,4'-MDI even though the SDS shows a maximum of 40%, with at least 60% represented by polymeric MDI (pMDI). MDI has a vapor pressure of 0.00335 mmHg[1] at 80°C, and TDI has a vapor pressure of 0.01 mmHg at 80°C. Therefore, the emission factor of 0.0034% for TDI could be reduced by 67% to account for the difference in vapor pressure. Therefore, a conservative emission factor of 0.0011% is used for 4,4'-MDI and pMDI.

Acetone emissions are based on a variable metering rate range of 11.5 kg/min - 14 kg/min and its use as a blowing agent will produce emissions at a 100% loss (i.e., lb emission / lbs used).

In order to calculate the potential VOC/TAP emissions as a result of TDI usage, the TDI emission factor (total TDI as the TAPs 2,4-TDI and 2,6-TDI) are combined with the maximum usage of TDI as reported by facility operations personnel (the foam formulation with the highest TDI content will be limited to 145.4 kilograms of TDI per minute [kg/min], which is 72.7% of 200 kg/min). This same metering rate also applies to MDI. Polyol is combined with TDI and MDI at a metering rate of 280 kg/min.

The maximum quantity of TDI and MDI that could be used annually is determined by assuming that this maximum usage rate occurs continuously during a normal operating schedule of 18 hours/day, 312 days/year (5,616 hours/year). ECS is requesting that limits be based on raw material throughputs rather than operating hours, as discussed below.

[1] https://www.americanchemistry.com/industry-groups/diisocyanates-dii/resources/mdi-vapor-pressure-chart

Minor quantities of VOC are also present in the polyol compounds mixed with TDI to create the foam products. Based upon information from the polyol supplier, the maximum VOC present in the polyol is 0.02% by weight (this equates to 200 pounds per million pounds of polyol usage). No TAPs are present in the polyol compound.

Refer to Attachment 1 for revised emissions associated with the foam manufacturing process. Restricted potential emissions are based on the aforementioned emission factors in conjunction with limited raw material metering rates, and a VOC control efficiency of 92% with implementation of carbon adsorption for TDI and MDI based on the T-BACT study. There are other compounds used in the process which do not contribute to VOC emissions as they are mainly non-volatile binders or catalysts for the TDI reaction.

Bulk storage tanks are used for the storage of TDI, MDI, polyol compounds, and acetone. All of these tanks are located indoors. The full tank farm inventory is shown in Attachment 2 of the original application, which features eighteen tanks for polyol storage. SDS for these materials are provided in Attachment 3 of the original application. As noted on the SDS, the true vapor pressure of all stored chemicals is well below 2 millimeters of mercury, except for acetone. Based upon the very low vapor pressure of these compounds (as confirmed by the PFA information), emissions from the storage tanks are shown in Attachment 1 to be negligible compared to the process-based emissions noted above. Attachment 1 contains TankESP software runs to characterize uncontrolled emissions of TDI, MDI, polyol, and acetone. Due to the nature of TDI and MDI, storage tanks for these substances will be equipped with a carbon drum. The 10,000-gallon acetone tank will feature a vapor recovery return line, which will control calculated acetone emissions via TankESP by an estimated 99%.

The polyol tanks (18), a silicone surfactant (DC5986), and an additive (SRT-2000) are proposed as exempt from permit to construct requirements in accordance with COMAR 26.11.02.10 Q.(5) Containers, reservoirs, or tanks used exclusively for unheated storage of VOC with an initial boiling point of 300°F (149°C) or greater. Wood has provided updated SDS to MDE for the subject materials to demonstrate eligibility for the referenced exemption.

Cleaning Operations

Based on experience at other ECS facilities, the facility will use approximately 3 drums (165 gallons) of Dzolv annually for cleaning purposes per 34 million pounds of polyol usage. The Dzolv compound contains 72% VOC, based upon the SDS. In order to estimate potential emissions associated with Dzolv usage, this usage rate must be adjusted (increased) based upon the ratio of maximum annual polyol usage of 208 million pounds compared to polyol usage corresponding to 3 drums of Dzolv (approximately 34 million pounds of polyol annually). This yields an emission factor of 3.18×10^{-5} lbs VOC / lbs polyol consumed. Refer to Attachment 1 for potential VOC emissions calculations for cleaning operations.

Revised potential emissions of criteria pollutants, TAPs, and greenhouse gases (GHGs) are contained within Attachment 1.

Proposed Throughput / Emissions Limitations

Total VOC emissions are proposed to be limited to <25 tons/yr, based on the ECS' desire to maintain synthetic minor status for the proposed facility and otherwise to demonstrate compliance with ambient air quality requirements for TAPs. Corresponding metering (i.e., throughput) rates are provided in Attachment 1 and are summarized as follows. Metering rates (and corresponding emissions) are now variable depending on the hour of day. This variability is due to the updated projected operating hours of the facility, the anticipated chemical composition and processes emitting acetone and TDI, and the demonstration of compliance with MDE TAP regulations. These values do not represent the maximum production rate of the foam line.

Raw Material	Metering Rate			
	kg/min	Max lbs/hr	lbs/yr	tons/yr
Polyol	280	37,036	207,991,930	103,996
TDI	145.4	19,232	108,007,238	54,004
MDI	145.4	19,232	108,007,238	54,004
Acetone	11.5 - 14.0	1,852	12,628,081	6,314

ECS is requesting that limits be based on the annual metering rates above (in lbs/yr) to demonstrate compliance as a synthetic minor for VOCs, rather than operating hours per year.

In conjunction with ongoing demonstration of compliance with short-term ambient impact thresholds associated with MDE's TAP regulations for TDI and acetone, ECS is also proposing hourly metering limits for specific hours of the day as per the tabular representation below:

Ending Hour of Day	24-Hour Clock	TDI Metering Rate (kg/hr)	Acetone Metering Rate (kg/hr)
1	0001 - 0100	0.0	690
2	0101 - 0200	0.0	690
3	0201 - 0300	0.0	690
4	0301 - 0400	0.0	690
5	0401 - 0500	8,724	690
6	0501 - 0600	8,724	690
7	0601 - 0700	8,724	840
8	0701 - 0800	8,724	840
9	0801 - 0900	8,724	840
10	0901 - 1000	8,724	840
11	1001 - 1100	8,724	840
12	1101 - 1200	8,724	840
13	1201 - 1300	8,724	840
14	1301 - 1400	8,724	840
15	1401 - 1500	8,724	840
16	1501 - 1600	8,724	840
17	1601 - 1700	8,724	840
18	1701 - 1800	8,724	840
19	1801 - 1900	8,724	690
20	1901 - 2000	8,724	690
21	2001 - 2100	8,724	690
22	2101 - 2200	8,724	690
23	2201 - 2300	8,724	690
24	2301 - 2400	8,724	690

ECS will be prepared to monitor raw material hourly metering rates for TDI and acetone and track / record this data in a manner whereby MDE can confirm compliance. The foam manufacturing process is required to be fully computerized from an operational standpoint in order to satisfy specification needs for various foam grades.

Air Dispersion Modeling

Revised air dispersion modeling has been conducted for the applicable TAPs emitted from the proposed facility to demonstrate compliance with the ambient impact requirements per MDE TAP regulations codified at COMAR 26.11.15.06. This revision has been conducted in accordance with the approved modeling protocol provided to MDE (dated June 23, 2021), MDE modeling guidelines, MDE's comments on the original draft Air Dispersion Modeling Report submitted in October 2021, and design changes made by ECS in regards to operational and physical parameters. First, proposed emissions from all new sources were compared to the allowable emission rates (AER) for those TAPs to determine compliance with the ambient impact requirements per TAP Compliance Demonstration Guidance (dated 03-21-2016). For TAPs with emissions less than the calculated AER, no additional modeling is required. Based on the potential emissions calculations, the project emissions for 4,4'-MDI and pMDI continue to fall below the AER. Therefore, no further modeling was required for MDI / pMDI.

To this end, air dispersion modeling has been limited to TDI and acetone. Attachment 5 contains the revised modeling input details and ambient impact compliance demonstration for TDI and acetone.

If you have any questions or concerns regarding any part of this application, please initially contact Joe Metcalf at 417-358-8131 or joe.metcalf@leggett.com. Thank you in advance for your assistance with this application package.

Sincerely yours,
Wood Environment & Infrastructure Solutions, Inc.

Christopher Dunay
Senior Associate Scientist
Direct Tel.: (724) 514-1667
E-mail: christopher.dunay@woodplc.com

Caryn A. Kelly, CPPS
Principal Toxicologist
Direct Tel.: (916) 267-9219
E-mail: caryn.kelly@woodplc.com

Enclosures:

MDE Forms
Figure 1: Site Plan Map
Figure 2: Process Flow Diagram
Attachment 1: Potential Emissions Calculations
Attachment 5: Revised Air Dispersion Modeling Report
Attachment 7: Certificate of Insurance

MDE Forms

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪1-800-633-6101 ▪ www.mde.state.md.us

Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name
Elite Comfort Solutions LLC

Mailing Address
24 Herring Road
Street Address

Newnan | GA | 30265
City | State | Zip

Telephone Number
(770) 254-8653

Signature
Scott Reading

Scott Reading, VP Manufacturing Foam | 4/9-22
Print Name and Title | Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) | Premises No. (3-6)
Registration Class (7) | Equipment No. (8-11)
Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)
1900 Clark Road
Street Number and Street Name

Havre De Grace | MD | 21078 | ( ) Telephone Number
City/Town | State | Zip

Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status (15)	New Construction Begun (MM/YY) (16-19)	New Construction Completed (MM/YY) (20-23)	Existing Initial Operation (MM/YY) (20-23)
A	0622	1223	

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
Hennecke QFM Pourline and Foam Cure Area

5. Workmen's Compensation Coverage WLR C6892022A (Binder/Policy Number) 11/01/2022 (Expiration Date)
Company Willis Towers Watson Midwest, Inc

NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time N/A

6B. Number of Stack/Emission Points Associated with this Equipment Two

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company Hennecke GmbH_____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Flexible polyurethane foam (PUF) manufacturing facility

9. Control Devices Associated with this Equipment

None ☐ 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
☐	☐	☐	☒	☐	☐	☐	☐
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

☐ Describe_____

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS _____ (Specify Type) ☐ 66-1 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

OTHER FUEL _____ (Specify Type) ☐ 66-2 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
☒	☐		☐	18	6	312
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent	(Total Seasons= 100%)
☒					
76	77-78	79-80	81-82	83-84	

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) N
85

If not, then	Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (ºF)	Exit Velocity (FT/SEC)
	86-88	89-91	92-95	96-98

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? N (Y or N)

		INPUT RATE			
NAME	**CAS NO. (IF APPLICABLE)**	**PER HOUR**	**UNITS**	**PER YEAR**	**UNITS**
1. Polyol		37,036	lbs	207,991,930	lbs
2. Toluene diisocyanate	584-84-9	19,232	lbs	108,007,238	lbs
3. 4,4-diphenylmethane diisocyanate	101-68-8	19,232	lbs	108,007,238	lbs
4. Acetone	67-64-1	1,852	lbs	12,628,081	lbs
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

		OUTPUT RATE			
NAME	**CAS NO. (IF APPLICABLE)**	**PER HOUR**	**UNITS**	**PER YEAR**	**UNITS**
1. Polyurethane Foam		55,554	lbs	311,987,895	lbs
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

		OUTPUT RATE			
NAME	**CAS NO. (IF APPLICABLE)**	**PER HOUR**	**UNITS**	**PER YEAR**	**UNITS**
1. Negligible					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	134.3	0
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	21.17	0
150-154	155-159	160-164

Method Used to Determine Emissions (1= Estimate 2= Emission Factor 3= Stack Test 4= Other)

TSP	SOX	NOX	CO	VOC	PM10
				2	
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Air and Radiation Management Administration ● Air Quality Permits Program
1800 Washington Boulevard ● Baltimore, Maryland 21230
(410)537-3225 ● 1-800-633-6101● www.mde.maryland.gov

FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Elite Comfort Solutions LLC

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
SN-01

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
Hennecke QFM Pourline controlled by carbon adsorption system (5 carbon adsorbers in parallel)

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	I	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	18	Spring Percent	
Days per week:	6	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):	85	Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):	50				
Exit temperature (ºF):	80	Inside diameter at top of round stack (ft):		5.17	
Exit velocity (ft/min):	4,770	Distance from emission point to nearest property line (ft):		280	
Exhaust gas volumetric flow rate (acfm):	100,000	Building dimensions if emission point is located on building (ft)	Height: 35	Length: 1,135.2	Width: 600.4

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☐ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☐ Dust Suppression System No. _____
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☒ Carbon Adsorber No. 5
  - ☒ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	N/A	N/A		
Particulate Matter (filterable as PM2.5)	N/A	N/A		
Particulate Matter (condensables)	N/A	N/A		
Volatile Organic Compounds (VOC)		7.46	134.3	20.95
Oxides of Sulfur (SOx)	N/A	N/A		
Oxides of Nitrogen (NOx)	N/A	N/A		
Carbon Monoxide (CO)	N/A	N/A		
Lead (Pb)	N/A	N/A		
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)	N/A	N/A		
Methane (CH_4)	N/A	N/A		
Nitrous Oxide (N_2O)	N/A	N/A		
Hydrofluorocarbons (HFCs)	N/A	N/A		
Perfluorocarbons (PFCs)	N/A	N/A		
Sulfur Hexafluoride (SF6)	N/A	N/A		
Total GHG (as CO_2e)	N/A	N/A		
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
2,4- and 2,6-Toluene diisocyanate		0.0523	0.94	0.1469
Methylene diphenyl diisocyanate		0.000173	0.0031	0.00048

(Attach additional sheets as necessary.)

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FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Elite Comfort Solutions LLC

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
SN-02

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
Cure Area with one exhaust blower

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	I	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	24	Spring Percent	
Days per week:	6	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):	85	Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):	50				
Exit temperature (ºF):	80	Inside diameter at top of round stack (ft):		6.0	
Exit velocity (ft/min):	4,244	Distance from emission point to nearest property line (ft):		440	
Exhaust gas volumetric flow rate (acfm):	120,000	Building dimensions if emission point is located on building (ft)	Height: 35	Length: 1,135.2	Width: 600.4

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☒ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☐ Dust Suppression System No. _____
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☐ Carbon Adsorber No. _____
  - ☐ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	N/A	N/A		
Particulate Matter (filterable as PM2.5)	N/A	N/A		
Particulate Matter (condensables)	N/A	N/A		
Volatile Organic Compounds (VOC)	N/A	N/A		
Oxides of Sulfur (SOx)	N/A	N/A		
Oxides of Nitrogen (NOx)	N/A	N/A		
Carbon Monoxide (CO)	N/A	N/A		
Lead (Pb)	N/A	N/A		
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)	N/A	N/A		
Methane (CH_4)	N/A	N/A		
Nitrous Oxide (N_2O)	N/A	N/A		
Hydrofluorocarbons (HFCs)	N/A	N/A		
Perfluorocarbons (PFCs)	N/A	N/A		
Sulfur Hexafluoride (SF6)	N/A	N/A		
Total GHG (as CO_2e)	N/A	N/A		
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
N/A	N/A	N/A		

(Attach additional sheets as necessary.)

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Air and Radiation Management Administration ● Air Quality Permits Program
1800 Washington Boulevard ● Baltimore, Maryland 21230
(410)537-3225 ● 1-800-633-6101● www.mde.maryland.gov

FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Elite Comfort Solutions LLC

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
FUG-01

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
Cleaning Operations (Dzolv)

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	I	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	18	Spring Percent	
Days per week:	6	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):	N/A	Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):	N/A				
Exit temperature (ºF):	Ambient	Inside diameter at top of round stack (ft):			
Exit velocity (ft/min):	N/A	Distance from emission point to nearest property line (ft):		280	
Exhaust gas volumetric flow rate (acfm):	N/A	Building dimensions if emission point is located on building (ft)	Height N/A	Length N/A	Width N/A

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

☒ None

☐ Baghouse No. _____

☐ Cyclone No. _____

☐ Elec. Precipitator (ESP) No. _____

☐ Dust Suppression System No. _____

☐ Venturi Scrubber No. _____

☐ Spray Tower/Packed Bed No. _____

☐ Carbon Adsorber No. _____

- ☐ Cartridge/Canister
- ☐ Regenerative

☐ Thermal Oxidizer No. _____

- ☐ Regenerative

☐ Catalytic Oxidizer No. _____

☐ Nitrogen Oxides Reduction No. _____

- ☐ Selective ☐ Non-Selective
- ☐ Catalytic ☐ Non-Catalytic

☐ Other No. _____
Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	N/A	N/A		
Particulate Matter (filterable as PM2.5)	N/A	N/A		
Particulate Matter (condensables)	N/A	N/A		
Volatile Organic Compounds (VOC)		1.18	21.2	3.30
Oxides of Sulfur (SOx)	N/A	N/A		
Oxides of Nitrogen (NOx)	N/A	N/A		
Carbon Monoxide (CO)	N/A	N/A		
Lead (Pb)	N/A	N/A		
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)	N/A	N/A		
Methane (CH_4)	N/A	N/A		
Nitrous Oxide (N_2O)	N/A	N/A		
Hydrofluorocarbons (HFCs)	N/A	N/A		
Perfluorocarbons (PFCs)	N/A	N/A		
Sulfur Hexafluoride (SF6)	N/A	N/A		
Total GHG (as CO_2e)	N/A	N/A		
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
N/A	N/A	N/A		

(Attach additional sheets as necessary.)

MARYLAND DEPARTMENT OF THE ENVIRONMENT

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Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name
Elite Comfort Solutions LLC

Mailing Address
24 Herring Road
Street Address

Newnan | GA | 30265
City | State | Zip

Telephone Number
(770) 254-8653

Signature
Scott Reading

Scott Reading, VP Manufacturing Foam | 4-19-22
Print Name and Title | Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) | Premises No. (3-6)
Registration Class (7) | Equipment No. (8-11)
Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)
1900 Clark Road
Street Number and Street Name

Havre De Grace | MD | 21078 | ( ) Telephone Number
City/Town | State | Zip

Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status	New Construction Begun (MM/YY)	New Construction Completed (MM/YY)	Existing Initial Operation (MM/YY)
A	0622	1223	
15	16-19	20-23	20-23

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
TDI Storage Tanks - Four (4) 20,000 gallon with carbon drum

5. Workmen's Compensation Coverage WLR C6892022A (Binder/Policy Number) 11/01/2022 (Expiration Date)
Company Willis Towers Watson Midwest, Inc

NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 4

6B. Number of Stack/Emission Points Associated with this Equipment 4

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company To be determined_____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Flexible polyurethane foam (PUF) manufacturing facility

9. Control Devices Associated with this Equipment

None ☐ 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
☐	☐	☐	☒	☐	☐	☐	☐
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

☐ Describe_____

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS _____ (Specify Type) ☐ 66-1 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

OTHER FUEL _____ (Specify Type) ☐ 66-2 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
☒	☐		☐	18	6	312
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent	(Total Seasons= 100%)
☒					
76	77-78	79-80	81-82	83-84	

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) [N] 85

If not, then	Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (ºF)	Exit Velocity (FT/SEC)
	86-88	89-91	92-95	96-98

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? [N] (Y or N)

		INPUT RATE			
NAME	**CAS NO. (IF APPLICABLE)**	**PER HOUR**	**UNITS**	**PER YEAR**	**UNITS**
1. TDI (total for all tanks)		44,000	lbs	108,007,238	lbs
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

		OUTPUT RATE			
NAME	**CAS NO. (IF APPLICABLE)**	**PER HOUR**	**UNITS**	**PER YEAR**	**UNITS**
1. TDI (total for all tanks)		19,232	lbs	108,007,238	lbs
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

		OUTPUT RATE			
NAME	**CAS NO. (IF APPLICABLE)**	**PER HOUR**	**UNITS**	**PER YEAR**	**UNITS**
1. Negligible					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	See Attachment 1	0
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	0	0
150-154	155-159	160-164

Method Used to Determine Emissions (1= Estimate 2= Emission Factor 3= Stack Test 4= Other)

TSP	SOX	NOX	CO	VOC	PM10
				2	
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change

MARYLAND DEPARTMENT OF THE ENVIRONMENT
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(410)537-3225 ● 1-800-633-6101● www.mde.maryland.gov

FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Elite Comfort Solutions LLC

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
To be determined

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
TDI Storage Tanks - Four (4) 20,000 gallon tanks with carbon adsorber drums

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	I	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	18	Spring Percent	
Days per week:	6	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):	TBD	Length and width dimensions at top of rectangular stack (ft):	Length:	Width:
Height above structures (ft):	TBD			
Exit temperature (ºF):	Ambient	Inside diameter at top of round stack (ft):		
Exit velocity (ft/min):	TBD	Distance from emission point to nearest property line (ft):		TBD
Exhaust gas volumetric flow rate (acfm):		Building dimensions if emission point is located on building (ft)	Height	Length / Width

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☐ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☐ Dust Suppression System No. _____
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☒ Carbon Adsorber No. 4
  - ☐ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	N/A	N/A		
Particulate Matter (filterable as PM2.5)	N/A	N/A		
Particulate Matter (condensables)	N/A	N/A		
Volatile Organic Compounds (VOC)		0.00004	0.0006	0.0001
Oxides of Sulfur (SOx)	N/A	N/A		
Oxides of Nitrogen (NOx)	N/A	N/A		
Carbon Monoxide (CO)	N/A	N/A		
Lead (Pb)	N/A	N/A		
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)	N/A	N/A		
Methane (CH_4)	N/A	N/A		
Nitrous Oxide (N_2O)	N/A	N/A		
Hydrofluorocarbons (HFCs)	N/A	N/A		
Perfluorocarbons (PFCs)	N/A	N/A		
Sulfur Hexafluoride (SF6)	N/A	N/A		
Total GHG (as CO_2e)	N/A	N/A		
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
2,4-Toluene diisocyanate		0.00004	0.0006	0.0001

(Attach additional sheets as necessary.)

MARYLAND DEPARTMENT OF THE ENVIRONMENT

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Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name

Elite Comfort Solutions LLC

Mailing Address

24 Herring Road
Street Address

Newnan | GA | 30265
City | State | Zip

Telephone Number

(770) 254-8653

Signature

Scott Reading

Scott Reading, VP Manufacturing Foam | 4-19-22
Print Name and Title | Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) | Premises No. (3-6)
Registration Class (7) | Equipment No. (8-11)
Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)

1900 Clark Road
Street Number and Street Name

Havre De Grace | MD | 21078 | ( ) Telephone Number
City/Town | State | Zip

Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status	New Construction Begun (MM/YY)	New Construction Completed (MM/YY)	Existing Initial Operation (MM/YY)
A	0622	1223	
15	16-19	20-23	20-23

4. Describe this Equipment: **Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)**
MDI Storage Tanks - Four (4) 20,000 gallon with carbon drum

5. Workmen's Compensation Coverage WLR C6892022A (Binder/Policy Number) 11/01/2022 (Expiration Date)

Company Willis Towers Watson Midwest, Inc

NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 4

6B. Number of Stack/Emission Points Associated with this Equipment 4

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company To be determined _____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Flexible polyurethane foam (PUF) manufacturing facility

9. Control Devices Associated with this Equipment

None ☐ 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
☐	☐	☐	☒	☐	☐	☐	☐
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

☐ Describe_____

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS _____ (Specify Type) ☐ 66-1 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

OTHER FUEL _____ (Specify Type) ☐ 66-2 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
☒	☐		☐	18	6	312
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent	(Total Seasons= 100%)
☒					
76	77-78	79-80	81-82	83-84	

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) [N] 85

If not, then	Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (ºF)	Exit Velocity (FT/SEC)
	[ ][ ][ ]	[ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ]
	86-88	89-91	92-95	96-98

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? [N] (Y or N)

		INPUT RATE			
NAME	**CAS NO. (IF APPLICABLE)**	**PER HOUR**	**UNITS**	**PER YEAR**	**UNITS**
1. MDI (total for all tanks)		44,000	lbs	108,007,238	lbs
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

		OUTPUT RATE			
NAME	**CAS NO. (IF APPLICABLE)**	**PER HOUR**	**UNITS**	**PER YEAR**	**UNITS**
1. MDI (total for all tanks)		19,232	lbs	108,007,238	lbs
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

		OUTPUT RATE			
NAME	**CAS NO. (IF APPLICABLE)**	**PER HOUR**	**UNITS**	**PER YEAR**	**UNITS**
1. Negligible					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	See Attachment 1	0
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	0	0
150-154	155-159	160-164

Method Used to Determine Emissions (1= Estimate 2= Emission Factor 3= Stack Test 4= Other)

TSP	SOX	NOX	CO	VOC	PM10
				2	
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change

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FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Elite Comfort Solutions LLC

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
To be determined

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
MDI Storage Tanks - Four (4) 20,000 gallon storage tanks with carbon adsorber drums

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	I	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:	60	Winter Percent	
Hours per day:	18	Spring Percent	
Days per week:	6	Summer Percent	
Weeks per year:	52	Fall Percent	

4. Emission Point Information

Height above ground (ft):	TBD	Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):	TBD				
Exit temperature (ºF):	Ambient	Inside diameter at top of round stack (ft):			
Exit velocity (ft/min):	TBD	Distance from emission point to nearest property line (ft):		TBD	
Exhaust gas volumetric flow rate (acfm):	TBD	Building dimensions if emission point is located on building (ft)	Height	Length	Width

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☐ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☐ Dust Suppression System No. _____
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☒ Carbon Adsorber No. 4
  - ☐ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)	N/A	N/A		
Particulate Matter (filterable as PM2.5)	N/A	N/A		
Particulate Matter (condensables)	N/A	N/A		
Volatile Organic Compounds (VOC)		negligible	negligible	negligible
Oxides of Sulfur (SOx)	N/A	N/A		
Oxides of Nitrogen (NOx)	N/A	N/A		
Carbon Monoxide (CO)	N/A	N/A		
Lead (Pb)	N/A	N/A		
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)	N/A	N/A		
Methane (CH_4)	N/A	N/A		
Nitrous Oxide (N_2O)	N/A	N/A		
Hydrofluorocarbons (HFCs)	N/A	N/A		
Perfluorocarbons (PFCs)	N/A	N/A		
Sulfur Hexafluoride (SF6)	N/A	N/A		
Total GHG (as CO_2e)	N/A	N/A		
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Methylene diphenyl diisocyanate		negligible	negligible	negligible

(Attach additional sheets as necessary.)

MARYLAND DEPARTMENT OF THE ENVIRONMENT

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Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name

Elite Comfort Solutions LLC

Mailing Address

24 Herring Road
Street Address

Newnan | GA | 30265
City | State | Zip

Telephone Number

(770) 254-8653

Signature

Scott Reading

Scott Reading, VP Manufacturing Foam | 4-19-22
Print Name and Title | Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) | Premises No. (3-6)
Registration Class (7) | Equipment No. (8-11)
Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)

1900 Clark Road
Street Number and Street Name

Havre De Grace | MD | 21078 | ( ) Telephone Number
City/Town | State | Zip

Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status (15)	New Construction Begun (MM/YY) (16-19)	New Construction Completed (MM/YY) (20-23)	Existing Initial Operation (MM/YY) (20-23)
A	0622	1223	

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)

Acetone Storage Tank - 10,000 gallon with vapor recovery line

5. Workmen's Compensation Coverage WLR C6892022A (Binder/Policy Number) 11/01/2022 (Expiration Date)

Company Willis Towers Watson Midwest, Inc

NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 1

6B. Number of Stack/Emission Points Associated with this Equipment N/A

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name_____ Title_____

Company To be determined _____

Mailing Address/Street_____

City/Town_____ State_____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

Flexible polyurethane foam (PUF) manufacturing facility

9. Control Devices Associated with this Equipment

None ☐ 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
☐	☐	☐	☐	☐	☐	☐	☐
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

☒ Describe Vapor recovery

24-9

10. Annual Fuel Consumption for this Equipment

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS _____ (Specify Type) ☐ 66-1 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

OTHER FUEL _____ (Specify Type) ☐ 66-2 ANNUAL AMOUNT CONSUMED _____ (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
☒	☐		☐	24	6	312
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent	(Total Seasons= 100%)
☒					
76	77-78	79-80	81-82	83-84	

12. Equivalent Stack Innformation- is Exhaust through Doors, Windows, etc. Only? (Y/N) [N] 85

If not, then	Height Avove Ground (FT)	Inside Diameter at Top	Exit Temperature (ºF)	Exit Velocity (FT/SEC)
	86-88	89-91	92-95	96-98

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? [N] (Y or N)

		INPUT RATE			
NAME	**CAS NO. (IF APPLICABLE)**	**PER HOUR**	**UNITS**	**PER YEAR**	**UNITS**
1. Acetone		44,000	lbs	12,628,081	lbs
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

		OUTPUT RATE			
NAME	**CAS NO. (IF APPLICABLE)**	**PER HOUR**	**UNITS**	**PER YEAR**	**UNITS**
1. Acetone		1,852	lbs	12,628,081	lbs
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid

		OUTPUT RATE			
NAME	**CAS NO. (IF APPLICABLE)**	**PER HOUR**	**UNITS**	**PER YEAR**	**UNITS**
1. Negligible					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	0	0
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
0	0	0
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
0	0	0
150-154	155-159	160-164

Method Used to Determine Emissions (1= Estimate 2= Emission Factor 3= Stack Test 4= Other)

TSP	SOX	NOX	CO	VOC	PM10
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change

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FORM 5T: Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration

Applicant Name: Elite Comfort Solutions LLC

Step 1: Quantify premises-wide emissions of Toxic Air Pollutants (TAP) from new and existing installations in accordance with COMAR 26.11.15.04. Attach supporting documentation as necessary.

Toxic Air Pollutant (TAP)	CAS Number	Class I or Class II?	Screening Levels (µg/m^3)			Estimated Premises Wide Emissions of TAP			
						Actual Total Existing TAP Emissions	Projected TAP Emissions from Proposed Installation	Premises Wide Total TAP Emissions	
			1-hour	8-hour	Annual	(lb/hr)	(lb/hr)	(lb/hr)	(lb/yr)
ex. ethanol	*64175*	*II*	*18843*	*3769*	*N/A*	*0.60*	*0.15*	*0.75*	*1500*
ex. benzene	*71432*	*I*	*80*	*16*	*0.13*	*0.5*	*0.75*	*1.00*	*400*
toluenediisocyanate (TDI)	584849	I	1.42	0.36	N/A	N/A	0.052	0.052	294
4,4-diphenylmethane diisocyanate	101688	II	N/A	0.51	N/A	N/A	0.00017	.00017	0.97
acetone	67641	II	17,807	11,871	N/A	N/A	1,852	1,852	12,630,000

(attach additional sheets as necessary.)

Note: Screening levels can be obtained from the Department's website (http://www.mde.maryland.gov) or by calling the Department.

Step 2: Determine which TAPs are exempt from further review. A TAP that meets either of the following Class I or Class II small quantity emitter exemptions is exempt from further TAP compliance demonstration requirements under Step 3 and Step 4.

Class II TAP Small Quantity Emitter Exemption Requirements (COMAR 26.11.15.03B(3)(a))
A Class II TAP is exempt from Step 3 and Step 4 if the Class II TAP meets the following requirements: Premises wide emissions of the TAP shall not exceed 0.5 pounds per hour, and any applicable 1-hour or 8-hour screening level for the TAP must be greater than 200 µg/m^3.

Class I TAP Small Quantity Emitter Exemption Requirements (COMAR 26.11.15.03B(3)(b))
A Class I TAP is exempt from Step 3 and Step 4 if the Class I TAP meets the following requirements: Premises wide emissions of the TAP shall not exceed 0.5 pounds per hour and 350 pounds per year, any applicable 1-hour or 8-hour screening level for the TAP must be greater than 200 µg/m^3, and any applicable annual screening level for the TAP must be greater than 1 µg/m^3.

If a TAP meets either the Class I or Class II TAP Small Quantity Emitter Exemption Requirements, no further review under Step 3 and Step 4 are required for that specific TAP.

FORM 5T: Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration

Step 3: Best Available Control Technology for Toxics Requirement (T-BACT, COMAR 26.11.15.05)
In the following table, list all TAP emission reduction options considered when determining T-BACT for the proposed installation. The options should be listed in order beginning with the most effective control strategy to the least effective strategy. Attach supporting documentation as necessary.

Target Pollutants	Emission Control Option	% Emission Reduction	Costs		T-BACT Option Selected? (yes/no)
			Capital	Annual Operating	
ex. ethanol and benzene	*Thermal Oxidizer*	*99*	*$50,000*	*$100,000*	*no*
ex. ethanol and benzene	*Low VOC materials*	*80*	*0*	*$100.000*	*yes*
See T-BACT Evaluation					
(Attachment 4)					

(attach additional sheets as necessary)

Step 4: Demonstrating Compliance with the Ambient Impact Requirement (COMAR 26.11.15.06)
Each TAP not exempt in Step 2 must be individually evaluated to determine that the emissions of the TAP will not adversely impact public health. The evaluation consists of a series of increasingly non-conservative (and increasingly rigorous) tests. Once a TAP passes a test in the evaluation, no further analysis is required for that TAP. "Demonstrating Compliance with the Ambient Impact Requirement under the Toxic Air Pollutant (TAP) Regulations (COMAR 26.11.15.06)" provides guidance on conducting the evaluation. Summarize your results in the following table. Attach supporting documentation as necessary.

Toxic Air Pollutant (TAP)	CAS Number	Screening Levels ($\mu g/m^3$)			Premises Wide Total TAP Emissions		Allowable Emissions Rate (AER) per COMAR 26.11.16.02A		Off-site Concentrations per Screening Analysis ($\mu g/m^3$)			Compliance Method Used?
		1-hour	8-hour	Annual	(lb/hr)	(lb/yr)	(lb/hr)	(lb/yr)	1-hour	8-hour	Annual	AER or Screen
ex. ethanol	*64175*	*18843*	*3769*	*N/A*	*0.75*	*1500*	*0.89*	*N/A*	*N/A*	*N/A*	*N/A*	*AER*
ex. benzene	*71432*	*80*	*16*	*0.13*	*1.00*	*400*	*0.04*	*36.52*	*1.5*	*1.05*	*0.12*	*Screen*
TDI	584849	1.42	0.36	N/A	0.052	294	0.005	N/A	0.85	0.29	N/A	AERMOD
MDI	101688	N/A	0.51	N/A	0.00017	0.97	0.002	N/A	N/A	N/A	N/A	AER
Acetone	67641	17,807	11,871	N/A	1,852	12,630,000	63.748	N/A	17,372	8,755	N/A	AERMOD
pMDI	9016879	N/A	49	N/A	0.000068	0.39	0.175	N/A	N/A	N/A	N/A	AER

(attach additional sheets as necessary)

If compliance with the ambient impact requirement cannot be met using the allowable emissions rate method or the screening analysis method, refined dispersion modeling techniques may be required. Please consult with the Department's Air Quality Permit Program prior to conducting dispersion modeling methods to demonstrate compliance.

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Air and Radiation Management Administration ▪ Air Quality Permits Program

Application for Permit to Construct
Gas Cleaning or Emission Control Equipment

1. Owner of Installation	Telephone No.	Date of Application
Elite Comfort Solutions LLC	770-254-8653	02/25/2022

2. Mailing Address	City	Zip Code	County
24 Herring Road	Newnan	30265	Coweta, Georgia

3. Equipment Location	City/Town or P.O.	County
1900 Clark Road	Havre De Grace	Harford

4. Signature of Owner or Operator	Title	Print or Type Name
Scott Reading	VP Manufacturing Foam	Scott Reading

5. Application Type: **Alteration** ☐ **New Construction** ☒

6. Date Construction is to Start: January 2022

Completion Date (Estimate): August 2022

7. Type of Gas Cleaning or Emission Control Equipment:

Simple Cyclone ☐ **Multiple Cyclone** ☐ **Afterburner** ☐ **Electrostatic Precipitator** ☐

Scrubber ☐ _____ (type) **Other** ☒ Carbon Adsorption (type)

8. Gas Cleaning Equipment Manufacturer	Model No.	Collection Efficiency (Design Criteria)
Pure Effect, Inc.		92%

9. Type of Equipment which Control Equipment is to Service:

Hennecke QFM Pourline

10. Stack Test to be Conducted:

Yes ☐ **No** ☒ _____ (Stack Test to be Conducted By) _____ (Date)

11. Cost of Equipment $247,500

Estimated Erection Cost $45,500

12. The Following Shall Be Design Criteria:

	INLET	OUTLET
Gas Flow Rate	100,000 ACFM*	100,000 ACFM*
Gas Temperature	80 °F	80 °F
Gas Pressure	_____ INCHES W.G.	_____ INCHES W.G.
	PRESSURE DROP _____	
Dust Loading	Negligible GRAINS/ACFD**	Negligible GRAINS/ACFD**
Moisture Content OR Wet Bulb Temperature	Ambient humidity %	Ambient humidity %
	_____ °F	_____ °F
Liquid Flow Rate (Wet Scrubber)	_____ GALLONS/MINUTE	

(WHEN SCRUBBER LIQUID OTHER THAN WATER INDICATE COMPOSITION OF SCRUBBING MEDIUM IN WEIGHT %)

*= ACTUAL CUBIC FEET PER MINUTE **= ACTUAL CUBIC FEET DRY

WHEN APPLICATION INVOLVES THE REDUCTION OF GASEOUS POLLUTANTS, PROVIDE THE CONCENTRATION OF EACH POLLUTANT IN THE GAS STREAM IN VOLUME PERCENT. INCLUDE THE COMPOSITION OF THE GASES ENTERING THE CLEANING DEVICE AND THE COMPOSITION OF EXHAUSTED GASES BEING DISCHARGED INTO THE ATMOSPHERE. USE AVAILABLE SPACE IN ITEM 15 ON PAGE 3.

13. Particle Size Analysis

Size of Dust Particles Entering Cleaning Unit	% of Total Dust	% to be Collected
0 to 10 Microns	N/A	N/A
10 to 44 Microns	N/A	N/A
Larger than 44 Microns	N/A	N/A

14. For Afterburner Construction Only:

Volume of Contaminated Air _____ CFM (DO NOT INCLUDE COMBUSTION AIR)

Gas Inlet Temperature _____ °F

Capacity of Afterburner _____ BTU/HR

Diameter (or area) of Afterburner Throat_____

Combustion Chamber_____ _____ Operating Temperature at Afterburner _____ °F
(diameter) (length)

Retention Time of Gases _____

15. Show Location of Dust Cleaning Equipment in the System. Draw or Sketch Flow Diagram Showing Emission Path from Source to Exhaust Point to Atmosphere.

See Figure 2

Date Received: Local _____ State _____

Acknowledgement Date: _____

By _____

Reviewed By:

Local _____

State _____

Returned to Local:

Date_____

By _____

Application Returned to Applicant:

Date_____

By _____

REGISTRATION NUMBER OF ASSOCIATED EQUIPMENT: | | | | | | |

PREMISES NUMBER: | | | | | | | |

Emission Calculations Revised By _____ Date _____

Figures

Explanation:

- Fence Points
- Stack Locations
- Fence
- Tanks
- Site Boundary
- Building

N

0 50 100

Meters

Coordinate System: NAD 83 UTM Zone 18N

FACILITY PLOT PLAN
L&P Elite Comfort Solutions
1900 Clark Road
Havre de Grace, MD

wood.	By: DPV	Project No.: SA18170340
	Date: 01/05/2022	Figure 1

D:\Projects\Clark\2_PlotPlan.mxd

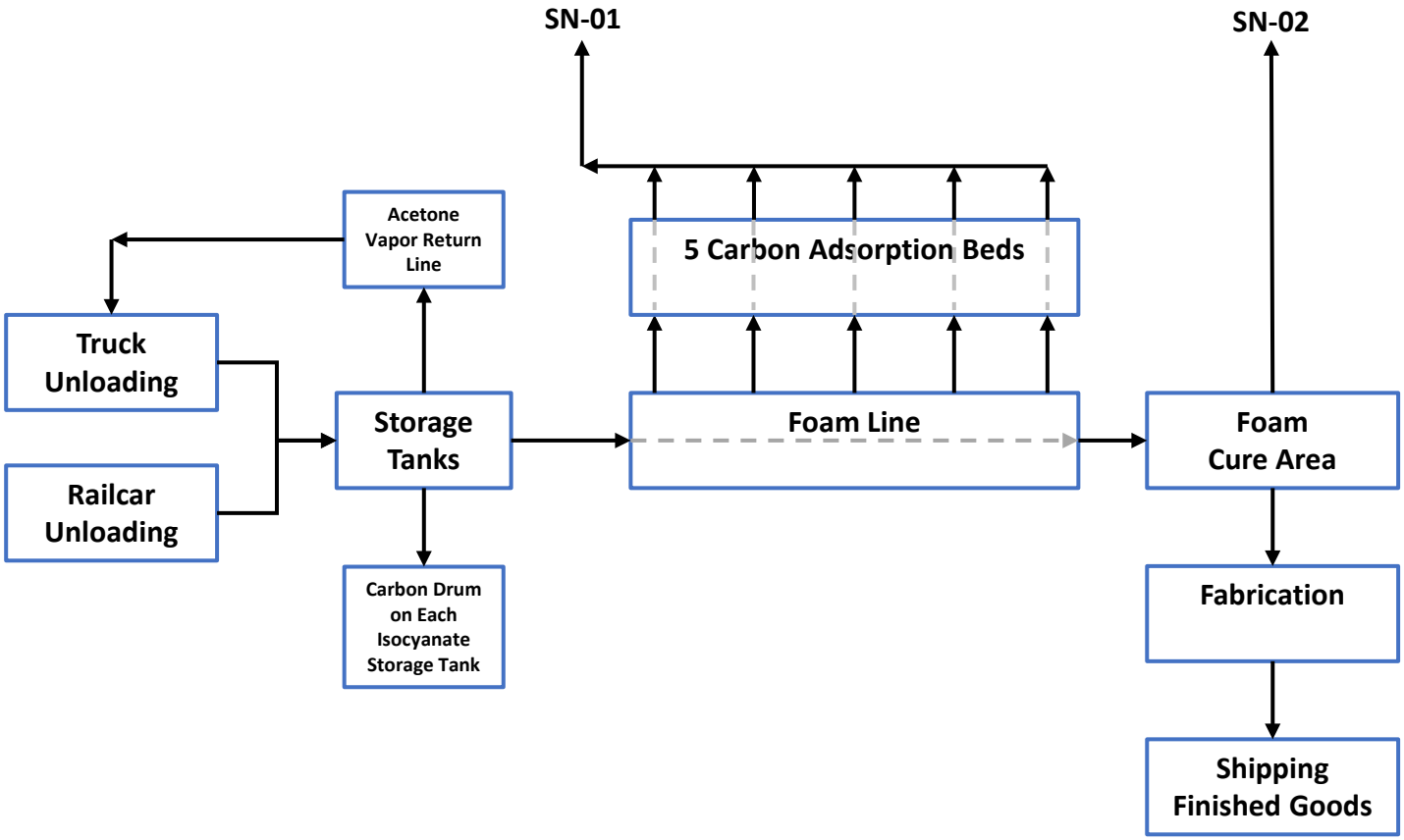


Figure 2
Process Flow Diagram

Attachment 1
Potential Emissions Calculations

Attachment 1-1
Potential Emissions Summary
Elite Comfort Solutions
1900 Clark Road
Havre De Grace, Maryland

Process	Emission Source	Capacity	Capacity Unit	Uncontrolled Emission Estimation Methodology	Emission Control Technique	Criteria / TAP Emissions Potential (tons/yr)										GHG Emissions Potential (tons/yr, CO2 Equivalents)			
						VOCs	TDI	MDI	Other TAPs	Total TAPs	NOx	CO	SO2	PM/ PM10	Acetone	CO2	CH4	N2O	Total CO2 Equivalents
Foam Manufacturing	**Storage Tanks**																		
	Polyol (18)	10,000 / 20,000	gallons	TankESP	None	0.0014				0									
	TDI (4)	20,000	gallons	TankESP	Carbon Adsorber (Drum)	0.000052	0.000052			5.16E-05									
	MDI (4)	20,000	gallons	TankESP		neg.		neg.		neg.									
	Acetone (1)	10,000	gallons	TankESP	Vapor Recovery (99%)					0					0.012				
	Foam Line / Foam Cure Area	12,974	ft/day	Polyurethane Foam Association Emission Factor	Carbon Adsorption (Foam Line - 92%)	20.95	0.15	0.00048		0.15					6,314				
	Cleaning Operations	1,009	gallons/yr	Emission factor based on polyol usage	None	3.30													
Ancillary Equipment	**Fuel Burning Equipment**																		
	Space Heaters (4)	4.0 (3 units), 2.187 (1 unit)	MMBTU/hr	AP-42, Section 1.4	None	0.10			0.03	0.03	1.84	1.54	0.01	0.14		2,191	0.04	0.004	2,193
	Makeup Air Heaters (4)	3 (each unit)	MMBTU/hr	AP-42, Section 1.4	None	0.18			0.06	0.06	3.30	2.77	0.02	0.25		3,942	0.07	0.007	3,946
	Internal Combustion Engines																		
	Emergency Generator (existing)	<197	HP-hr	AP-42, Section 3.3	As per RICE regulations	0.11					1.37	0.30	0.09	0.10		50.97			50.97
	Emergency Generator (new)	134	HP-hr	AP-42, Section 3.3	As per RICE regulations	0.08					0.93	0.20	0.06	0.07		34.67			34.67
	Fire pump Generator (existing)	197	HP-hr	AP-42, Section 3.3	As per RICE regulations	0.11					1.37	0.30	0.09	0.10		50.97			50.97
					Total Potential Emissions	**24.8**	**0.15**	**0.00048**	**0.10**	**0.24**	**8.82**	**5.11**	**0.27**	**0.65**	**6,314**	**6,270**	**0.12**	**0.012**	**6,276**

Abbreviations:
neg. = negligible

Attachment 1-2
Potential Emissions - Process + Cleaning Operations
Elite Comfort Solutions
1900 Clark Road

Chemical	Units	Polyol	TDI	MDI	Cleaning Operations	Acetone	Acetone
Max Metering Throughput	kg/min	**280.0**	**145.4**	**145.4**		**14.00**	**11.50**
	lb/min	617.26	320.53	320.53		30.86	25.35
	lb/hr	37,036	19,232	19,232		1,852	1,521
Annual Throughput	lb/yr	207,991,930	108,007,238	108,007,238		6,933,064	5,695,017
	tons/yr	103,996	54,004	54,004		3,467	2,848
Emission Factors							
2,4-TDI and 2,6 TDI [1]	lb 2,4- and 2,6-TDI emitted / lb TDI		**3.40E-05**				
TDI [1]	lb VOC emitted / lb TDI		**3.40E-05**				
4,4'-MDI [2]	lb 4,4'-MDI emitted / lb MDI			**1.12E-07**			
VOC from Polyol	lb VOC emitted / lb Polyol	**2.00E-04**					
Acetone (Exempt VOC)	lb Acetone emitted / lb Acetone					**1.00E+00**	**1.00E+00**
VOC from Cleaning Operations (Dzolv)	lb VOC emitted / lb Polyol				**3.18E-05**		
Hourly Emissions into Carbon Adsorber							
Toxic Air Pollutants							
2,4-TDI and 2,6-TDI	lb/hr		0.6539				
4,4'-MDI	lb/hr			0.002158			
VOC							
VOC from TDI	lb/hr		0.6539				
VOC from MDI	lb/hr			0.002158			
VOC from Polyol	lb/hr	7.407					
VOC from Cleaning Operation (Dzolv)	lb/hr				1.176		
Exempt VOC							
Acetone	lb/hr					1,852	1,521
Hourly Emissions from Carbon							
% Capture of TDI in Carbon Bed	**92%**						
Toxic Air Pollutants							
2,4-TDI and 2,6-TDI	lb/hr		0.0523				
4,4'-MDI	lb/hr			0.000173			
VOC							
VOC from TDI	lb/hr		0.0523				
VOC from MDI	lb/hr			0.000173			
VOC from Polyol	lb/hr	7.407					
VOC from Cleaning Operation (Dzolv)	lb/hr				1.176		
Exempt VOC							
Acetone	lb/hr					1,852	1,521

Attachment 1-2
Potential Emissions - Process + Cleaning Operations
Elite Comfort Solutions
1900 Clark Road

Chemical	Units	Polyol	TDI	MDI	Cleaning Operations	Acetone	Acetone
Annual Emissions							
Potential Emission Hours	Modeled Hours		0501 to 0100	0501 to 0100		0601 to 1800	1801 to 0600
	Potential Operating Period		5am to 1am	5am to 1am		6am to 6pm	6pm to 6am
Operating Hours	hr/day	18	18	18	18	12	12
Operating Hours	day/yr	312	312	312	312	312	312
Operating Hours	hr/yr	5,616	5,616	5,616	5,616	3,744	3,744
Toxic Air Pollutants							
2,4-TDI and 2,6-TDI	tpy		0.1469				
4,4'-MDI	tpy			0.00048			
VOC							
VOC from TDI	tpy		0.1469				
VOC from MDI	tpy			0.00048			
VOC from Polyol	tpy	20.799					
VOC from Cleaning Operation	tpy				3.303		
Exempt VOC							
Acetone	tpy					3,467	2,848

Total TAP	**0.1474**	**tpy**
Total VOC	**24.25**	**tpy**

Notes:
1. Polyurethane Foam Association (PFA, 1993) total TDI emission factor of 34 pounds per million pounds of TDI usage.
2. The 4,4'-MDI emission factor is based on the TDI PFA emission factor and adjusted for the difference in vapor pressure in the curing buns (80°C):
MDI EF = 3.40E-05 / (1.014 mmHg TDI/0.003346 mmHg 4,4-MDI)
(Vapor pressures selected from the American Chemistry Council December 2001 Diisocyanates Panel MDI and TDI Mixed Isomers Vapor Pressure Charts.)

Attachment 1-3

Potential Emissions - Fuel Burning Equipment - Natural Gas-Fired Space Heaters

Elite Comfort Solutions

1900 Clark Road

	Quantity	Heat Input Per Unit BTU/Hr	Total Heat Input BTU/Hr	
Floor Mounted Space Heater	3	4,000,000	12,000,000	
Floor Mounted Space Heater	1	2,187,000	2,187,000	
			14,187,000	**Total Input**

Natural Gas Btu Content	1020	Btu/cu ft
Natural Gas Combustion Capacity	13.91	MCF/hr
Heat Input Capacity of Space Heaters	14,187,000	Btu/hr

Emission Factors for Criteria Pollutants

Pollutant	Emission Factor	Units	Source
NOx (<100 MMBtu/hr)	100	lb/MMcf	AP-42, Section 1.4, Table 1.4-1
CO (<100 MMBtu/hr)	84	lb/MMcf	AP-42, Section 1.4, Table 1.4-1
VOC	5.5	lb/MMcf	AP-42, Section 1.4, Table 1.4-2
SO2	0.6	lb/MMcf	AP-42, Section 1.4, Table 1.4-2
PM/PM10/PM2.5	7.6	lb/MMcf	AP-42, Section 1.4, Table 1.4-2
CO2	53.06	kg/MMBtu	40 CFR 98 Table C-1 default emission factors
Methane	1.00E-03	kg/MMBtu	40 CFR 98 Table C-2 default emission factors
N2O	1.00E-04	kg/MMBtu	40 CFR 98 Table C-2 default emission factors

Attachment 1-3

Potential Emissions - Fuel Burning Equipment - Natural Gas-Fired Space Heaters

Elite Comfort Solutions

1900 Clark Road

Calculation of Criteria Pollutant Emissions

Constituent	Hourly PTE (lb/hr)	Annual PTE (tpy)
NOx	1.39	1.84
CO	1.17	1.54
VOC	0.08	0.10
SO2	0.01	0.01
PM/PM10/PM2.5	0.11	0.14
CO2	1,660	2,191
Methane	0.03	0.04
N2O	0.003	0.00
CO2e[(1)]	1,662	2,193

(1)Global warming potentials taken from 40 CFR 98, Table A-1; CO2 = 1, Methane = 25, N2O = 298

Attachment 1-3

Potential Emissions - Fuel Burning Equipment - Natural Gas-Fired Space Heaters

Elite Comfort Solutions

1900 Clark Road

Calculation of HAP Emissions

Emission factors were obtained from AP-42, Section 1.4, Tables 1.4-3, 1.4-4 Natural Gas Combustion

Constituent	Emission Factor (lb/MMcf)	Hourly PTE (lb/hr)	Annual PTE (tpy)
Arsenic	2.0E-04	2.78E-06	3.67E-06
Benzene	2.1E-03	2.92E-05	3.86E-05
Beryllium	1.2E-05	1.67E-07	2.20E-07
Cadmium	1.1E-03	1.53E-05	2.02E-05
Chromium	1.4E-03	1.95E-05	2.57E-05
Cobalt	8.4E-05	1.17E-06	1.54E-06
Dichlorobenzene	1.2E-03	1.67E-05	2.20E-05
Formaldehyde	7.5E-02	1.04E-03	1.38E-03
Hexane	1.8E+00	2.50E-02	3.30E-02
Lead	5.0E-04	6.95E-06	9.18E-06
Manganese	3.8E-04	5.29E-06	6.98E-06
Mercury	2.6E-04	3.62E-06	4.77E-06
Napthalene	6.1E-04	8.48E-06	1.12E-05
Nickel	2.1E-03	2.92E-05	3.86E-05
Polycyclic Organic Matter[(2)]	8.8E-05	1.23E-06	1.62E-06
Selenium	2.4E-05	3.34E-07	4.41E-07
Toluene	3.4E-03	4.73E-05	6.24E-05
Total HAPs		**2.6E-02**	**0.03**

(2)POM includes the following compounds from Table 1.4-3: 2-methylnaphthalene, 3-metylchloranthrene, dimethylbenz(a)anthracene, acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene.

Note: Space Heaters are proposed to be limited to 2,640 hours of operation per year (24 hrs/day, 7 days/week, 110 day consisting with the general permit application; annual PTE is based on this value.

Attachment 1-4
Potential Criteria Pollutant Emissions - Existing Emergency Generator
Elite Comfort Solutions
1900 Clark Road

CI engines - diesel fuel

Description of Unit	Unit Make/Model	Use	Generator Size (kW)	Time of Operation (Hours/yr)	Load (% Capacity)	HP Rating	NOx		CO		SOx		PM / PM-10/ PM2.5		VOC		CO2	
							lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy
Existing Emergency Generator		PM Use	147	100	0.50	197	305.4	0.15	65.8	0.03	20.19	0.01	21.7	0.011	24.74	0.01	11,327.50	5.66
		Standby (Emergency Use)	147	400	1.0	197	2442.8	1.22	526.4	0.26	161.54	0.08	173.4	0.087	197.90	0.10	90,620.00	45.31
				Subtotal Fire Pump Emissions (tpy)			**-**	**1.37**	**-**	**0.30**	**-**	**0.09**	**-**	**0.098**	**-**	**0.11**	**-**	**50.97**

Actual Emissions Calculations
lbs/hr = (hp rating)*(capacity)*emission factor (lb/hp hr)*(hrs of operation)
tpy = (lb/yr) *(ton/2000 lbs)

EPA AP-42 Emission Factors - Diesel						
	NOX Factor (lb/hp hr)	***SOX Factor (lb/hp hr)***	***PM-10 Factor (lb/hp hr)***	***VOC Factor (lb/hp hr)***	***CO Factor (lb/hp hr)***	***CO2 Factor (lb/hp hr)***
Large Diesel Engines (> 600 hp)	***0.024***	***0.002427***	***0.0007***	***7.05E-04***	**5.50E-03**	**1.16**
Diesel Industrial Engines (≤600 hp)	***0.031***	***2.05E-03***	***2.20E-03***	***2.51E-03***	**6.68E-03**	**1.15**
EPA AP-42 Emission Factors - Dual Fuel (95% natural gas / 5% diesel fuel)						
	NOX Factor (lb/hp hr)	***SOX Factor (lb/hp hr)***	***PM-10 Factor (lb/hp hr)***	***VOC Factor (lb/hp hr)***	***CO Factor (lb/hp hr)***	***CO2 Factor (lb/hp hr)***
Large Diesel Engines (> 600 hp)	***0.018***	***0.0001218***	***ND***	***1.32E-03***	**7.50E-03**	**0.772**

Notes:
1. Emissions calculations are based on AP-42, Section 3.3 (Gasoline and Diesel Industrial Engines) emission factors, for diesel industrial engines less than 600 Hp.
2. Potential to emit for emergency generator is based on an administrative limitation applicable to emergency units of 500 operating hours per year.

Attachment 1-5
Potential Criteria Pollutant Emissions - New Emergency Generator
Elite Comfort Solutions
1900 Clark Road

CI engines - diesel fuel

Description of Unit	Unit Make/Model	Use	Generator Size (kW)	Time of Operation (Hours/yr)	Load (% Capacity)	HP Rating	NOx		CO		SOx		PM / PM-10/ PM2.5		VOC		CO2	
							lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy
New Emergency Generator		PM Use	100	100	0.50	134	207.7	0.10	44.8	0.02	13.74	0.01	14.7	0.007	16.83	0.01	7,705.00	3.85
		Standby (Emergency Use)	100	400	1.0	134	1661.6	0.83	358.0	0.18	109.88	0.05	117.9	0.059	134.61	0.07	61,640.00	30.82
				Subtotal Fire Pump Emissions (tpy)			**-**	**0.93**	**-**	**0.20**	**-**	**0.06**	**-**	**0.066**	**-**	**0.08**	**-**	**34.67**

Actual Emissions Calculations
lbs/hr = (hp rating)*(capacity)*emission factor (lb/hp hr)*(hrs of operation)
tpy = (lb/yr) *(ton/2000 lbs)

EPA AP-42 Emission Factors - Diesel						
	NOX Factor (lb/hp hr)	***SOX Factor (lb/hp hr)***	***PM-10 Factor (lb/hp hr)***	***VOC Factor (lb/hp hr)***	***CO Factor (lb/hp hr)***	***CO2 Factor (lb/hp hr)***
Large Diesel Engines (> 600 hp)	***0.024***	***0.002427***	***0.0007***	***7.05E-04***	**5.50E-03**	**1.16**
Diesel Industrial Engines (≤600 hp)	***0.031***	***2.05E-03***	***2.20E-03***	***2.51E-03***	**6.68E-03**	**1.15**
EPA AP-42 Emission Factors - Dual Fuel (95% natural gas / 5% diesel fuel)						
	NOX Factor (lb/hp hr)	***SOX Factor (lb/hp hr)***	***PM-10 Factor (lb/hp hr)***	***VOC Factor (lb/hp hr)***	***CO Factor (lb/hp hr)***	***CO2 Factor (lb/hp hr)***
Large Diesel Engines (> 600 hp)	***0.018***	***0.0001218***	***ND***	***1.32E-03***	**7.50E-03**	**0.772**

Notes:
1. Emissions calculations are based on AP-42, Section 3.3 (Gasoline and Diesel Industrial Engines) emission factors, for diesel industrial engines less than 600 Hp.
2. Potential to emit for emergency generator is based on an administrative limitation applicable to emergency units of 500 operating hours per year.

Attachment 1-6
Potential Criteria / HAP Pollutant Emissions - Fire Pump Generator
Elite Comfort Solutions
1900 Clark Road

CI engines - diesel fuel

Description of Unit	Unit Make/Model	Use	Generator Size (kW)	Time of Operation (Hours/yr)	Load (% Capacity)	HP Rating	NOx		CO		SOx		PM / PM-10/ PM2.5		VOC		CO2	
							lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy	lbs/yr	tpy
Fire Pump	Peerless 6AEF12	PM Use	147	100	0.50	197	305.4	0.15	65.8	0.03	20.19	0.01	21.7	0.011	24.74	0.01	11,327.50	5.66
		Standby (Emergency Use)	147	400	1.0	197	2442.8	1.22	526.4	0.26	161.54	0.08	173.4	0.087	197.90	0.10	90,620.00	45.31
						Subtotal Fire Pump Emissions (tpy)	**-**	**1.37**	**-**	**0.30**	**-**	**0.09**	**-**	**0.098**	**-**	**0.11**	**-**	**50.97**

Actual Emissions Calculations
lbs/hr = (hp rating)*(capacity)*emission factor (lb/hp hr)*(hrs of operation)
tpy = (lb/yr) *(ton/2000 lbs)

EPA AP-42 Emission Factors - Diesel						
	NOX Factor (lb/hp hr)	***SOX Factor (lb/hp hr)***	***PM-10 Factor (lb/hp hr)***	***VOC Factor (lb/hp hr)***	***CO Factor (lb/hp hr)***	***CO2 Factor (lb/hp hr)***
Large Diesel Engines (> 600 hp)	***0.024***	***0.002427***	***0.0007***	***7.05E-04***	**5.50E-03**	**1.16**
Diesel Industrial Engines (≤600 hp)	***0.031***	***2.05E-03***	***2.20E-03***	***2.51E-03***	**6.68E-03**	**1.15**
EPA AP-42 Emission Factors - Dual Fuel (95% natural gas / 5% diesel fuel)						
	NOX Factor (lb/hp hr)	***SOX Factor (lb/hp hr)***	***PM-10 Factor (lb/hp hr)***	***VOC Factor (lb/hp hr)***	***CO Factor (lb/hp hr)***	***CO2 Factor (lb/hp hr)***
Large Diesel Engines (> 600 hp)	***0.018***	***0.0001218***	***ND***	***1.32E-03***	**7.50E-03**	**0.772**

Notes:
1. Emissions calculations are based on AP-42, Section 3.3 (Gasoline and Diesel Industrial Engines) emission factors, for diesel industrial engines less than 600 Hp.
2. Potential to emit for emergency generator is based on an administrative limitation applicable to emergency units of 500 operating hours per year.

Attachment 1-7

Potential Emissions - Fuel Burning Equipment - Natural Gas-Fired Makeup Air Heaters

Elite Comfort Solutions

1900 Clark Road

	Quantity	Heat Input Per Unit BTU/Hr	Total Heat Input BTU/Hr
Makeup Air Heaters	4	3,000,000	12,000,000
			12,000,000 Total Input

Natural Gas Btu Content	1020	Btu/cu ft
Natural Gas Combustion Capacity	11.76	MCF/hr
Heat Input Capacity of Makeup Air Heaters	12,000,000	Btu/hr

Emission Factors for Criteria Pollutants

Pollutant	Emission Factor	Units	Source
NOx (<100 MMBtu/hr)	100	lb/MMcf	AP-42, Section 1.4, Table 1.4-1
CO (<100 MMBtu/hr)	84	lb/MMcf	AP-42, Section 1.4, Table 1.4-1
VOC	5.5	lb/MMcf	AP-42, Section 1.4, Table 1.4-2
SO2	0.6	lb/MMcf	AP-42, Section 1.4, Table 1.4-2
PM/PM10/PM2.5	7.6	lb/MMcf	AP-42, Section 1.4, Table 1.4-2
CO2	53.06	kg/MMBtu	40 CFR 98 Table C-1 default emission factors
Methane	1.00E-03	kg/MMBtu	40 CFR 98 Table C-2 default emission factors
N2O	1.00E-04	kg/MMBtu	40 CFR 98 Table C-2 default emission factors

Attachment 1-7

Potential Emissions - Fuel Burning Equipment - Natural Gas-Fired Makeup Air Heaters

Elite Comfort Solutions

1900 Clark Road

Calculation of Criteria Pollutant Emissions

Constituent	Hourly PTE (lb/hr)	Annual PTE (tpy)
NOx	1.18	3.30
CO	0.99	2.77
VOC	0.06	0.18
SO2	0.01	0.02
PM/PM10/PM2.5	0.09	0.25
CO2	1,404	3,942
Methane	0.03	0.07
N2O	0.003	0.01
CO2e[(1)]	1,405	3,946

(1)Global warming potentials taken from 40 CFR 98, Table A-1; CO2 = 1, Methane = 25, N2O = 298

Attachment 1-7

Potential Emissions - Fuel Burning Equipment - Natural Gas-Fired Makeup Air Heaters

Elite Comfort Solutions

1900 Clark Road

Calculation of HAP Emissions

Emission factors were obtained from AP-42, Section 1.4, Tables 1.4-3, 1.4-4 Natural Gas Combustion

Constituent	Emission Factor (lb/MMcf)	Hourly PTE (lb/hr)	Annual PTE (tpy)
Arsenic	2.0E-04	2.35E-06	6.61E-06
Benzene	2.1E-03	2.47E-05	6.94E-05
Beryllium	1.2E-05	1.41E-07	3.96E-07
Cadmium	1.1E-03	1.29E-05	3.63E-05
Chromium	1.4E-03	1.65E-05	4.62E-05
Cobalt	8.4E-05	9.88E-07	2.77E-06
Dichlorobenzene	1.2E-03	1.41E-05	3.96E-05
Formaldehyde	7.5E-02	8.82E-04	2.48E-03
Hexane	1.8E+00	2.12E-02	5.95E-02
Lead	5.0E-04	5.88E-06	1.65E-05
Manganese	3.8E-04	4.47E-06	1.26E-05
Mercury	2.6E-04	3.06E-06	8.59E-06
Napthalene	6.1E-04	7.18E-06	2.02E-05
Nickel	2.1E-03	2.47E-05	6.94E-05
Polycyclic Organic Matter[(2)]	8.8E-05	1.04E-06	2.91E-06
Selenium	2.4E-05	2.82E-07	7.93E-07
Toluene	3.4E-03	4.00E-05	1.12E-04
Total HAPs		**2.2E-02**	**0.06**

(2)POM includes the following compounds from Table 1.4-3: 2-methylnaphthalene, 3-metylchloranthrene, dimethylbenz(a)anthracene, acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene.

Note: Makeup Air Heaters are proposed to be limited to 5,550 hours of operation per year; annual PTE is based on this value.

Attachment 1-8
TankESP Emission Output
Elite Comfort Solutions
1900 Clark Road

TankSummaries for 2021 Annual

Site: ECS, Elite Comfort Solutions, Inc.

Equations for this site: After 2019 AP-42 revisions H/D ratio: calculated

Tank ID	Tank Diameter (ft)	Tank Type	Product	RVP	Throughput (gal)	Bulk Liquid Temperature (degF)	Avg. Liquid Surface Temp. (degF)	Avg. TVP (psia)	Includes a landing loss?	Initial fill?	Includes a tank cleaning?	Number of Days	Estimated standing losses (lbs)	Estimated working losses (lbs)	Routine Emissions (lbs)	Non Routine Emissions (lbs)	Total estimated emissions (lbs)
TK-Acetone	11.9	FRT (no floating roof)	Acetone		1,916,540.01	68	64.424096	3.267202	N	N	N	365	291.18062	2130.6107	2421.7914	0	0
TK-MDI-1	15	FRT (no floating roof)	MDI		10,527,021.12	68	64.425543	9.54E-23	N	N	N	365	2.49E-20	1.07E-18	1.10E-18	0	1.10E-18
TK-Polyol	15	FRT (no floating roof)	TDI		24,939,080.04	68	64.425543	0.000159084	N	N	N	365	0.02892292	2.8353488	2.8642717	0	2.8642717
TK-TDI	15	FRT (no floating roof)	TDI		10,704,384.18	68	64.425543	0.000159084	N	N	N	365	0.02892292	1.2620301	1.290953	0	1.290953

Attachment 5

Air Dispersion Modeling Analysis & Documentation

Technical Memorandum

To: LiAn Zhang (MDE) **Date:** April 8, 2022

From: Michelle Snyder (Wood)

CC: Caryn Kelly (Wood)
Mark Crawford (Peterson Chemicals)

Re: Revised Air Dispersion Modeling Report
Elite Comfort Solutions, Inc.,
1900 Clark Rd, Havre De Grace, MD

Wood Environment and Infrastructure Solutions, Inc. (Wood) is supporting the development of an application for a State Permit to Construct to authorize the construction and operation of the proposed foam manufacturing facility (Facility) for Elite Comfort Solutions, Inc. (ECS), at 1900 Clark Rd, Havre De Grace, MD. An initial application was submitted on October 4, 2021 with a draft modeling report included as an attachment. This Revised Air Dispersion Modeling Report is being submitted as part of a permit addendum in response to Maryland Department of the Environment (MDE) comments on the draft (received December 8, 2021) and subsequent discussions in a conference call held December 20, 2021 and via email on January 5, 2022. In support of the permit application, air dispersion modeling was conducted for the toxic air pollutants (TAPs) emitted from the proposed Facility to demonstrate the compliance with the ambient impact requirements per MDE TAP regulations COMAR 26.11.15.06. The air dispersion modeling was performed in accordance with an approved modeling protocol dated June 23, 2021, MDE comments on the modeling protocol dated July 13, 2021, MDE comments on the Draft Air Dispersion Modeling Report, MDE TAP regulations and Guidance Documents, and Environmental Protection Agency (EPA) Guideline on Air Quality Models (02/16/2017). This report outlines the air dispersion modeling techniques that were used to assess the ground level off-site concentrations surrounding the proposed Facility.

Project Overview

ECS and Leggett & Platt, Inc. (L&P) are proposing to construct a foam manufacturing facility at 1900 Clark Rd, Havre De Grace, Harford County, MD. The primary production areas will consist of a foam pouring line and downstream curing area where foam slabstock cure and water-based glues are applied.

Potential air emission calculations were developed for the proposed Facility based on the production throughput and industry-specific emission factors. The TAPs include acetone, total toluene diisocyanate [(TDI), which is the sum of 2,4- and 2,6-TDI], 4,4-diphenylmethane

diisocyanate (MDI), and polymeric diphenylmethane diisocyanate (pMDI) emitted from the proposed Facility.

Project Sources

The proposed Facility includes two (2) stacks as emission sources that were modeled. Table 1, Modeling Source Summary, presents the source parameters modeled in this analysis, including Universal Transverse Mercator (UTM) coordinates (in NAD83, UTM Zone 18), stack height, stack diameter, exit temperature, and exit velocity. All stacks were modeled as a point source using stack parameters also provided in the permit application. The modeled emission rate for each TAP is also presented in the table.

The emissions rates are variable based on the hour of day. This variability is due to the expected operating hours of the facility and the anticipated chemical composition and processes emitting acetone and TDI. The variable emission rates for TDI and acetone for both stacks are shown in Table 2.

Area Map

Figure 1, area map of the region, depicts the Facility location, the property boundary, and the surrounding area. The proposed Facility is located at 1900 Clark Rd, Havre De Grace, MD. Figure 2 is a plot plan showing the approximate location of the emission sources and the layout of the production building and tank area for building downwash analyses.

Dispersion Model

The modeling was conducted using the latest version (version 21112) of the AMS/EPA Regulatory Model (AERMOD). The AERMOD View Software from Lakes Environmental (www.weblakes.com) was used to prepare the input files and manage processing. EPA recommended defaults were used. The land use for the analysis was classified as rural based on the inspection of the area map (i.e., the AERMOD urban dispersion option was not engaged, and the analysis was conducted in the “No Urban Area” mode).

Methodology

The modeling was conducted in accordance with the approved modeling protocol and the MDE modeling guidelines. First, emissions from all new sources were compared with the calculated allowable emission rates (AER) for those TAP to determine the compliance with the ambient impact requirement per TAP Compliance Demonstration Guidance (03-21-2016). For TAP with emissions less than the calculated AER, no additional modeling was conducted.

If the emission for a given TAP exceeds the calculated AER, the modeling was performed to demonstrate if the off-site concentration from the proposed Facility would be in compliance with the ambient impact requirement. Based on the preliminary analysis, the project emissions for MDI and pMDI were below the AER, therefore, no further modeling was required. The acetone and TDI were modeled for compliance demonstration with the TAP screening levels.

Table 2, Facility AER Comparison, calculates the AER for each TAP based on their respective screening levels and compares the AER to the proposed emission rate to identify the TAPs that required dispersion modeling.

Building Downwash

The EPA Building Profile Input Program - Prime (BPIP-Prime) was used to evaluate structures for building downwash impacts. All structures including the production building and tank area close enough to produce downwash effects from the stacks were included in the evaluation. Table 3, Building Downwash Input, shows the building inputs used in the modeling analysis.

Receptor Selection

A Cartesian grid with variable receptor spacing was used to evaluate significant impacts around the proposed Facility. Table 4 presents the receptor spacing used in the modeling analysis. As presented in Figure 2, there is currently no fencing present on the northwest portion of the facility. For conservative purpose, the discrete receptors were placed for the on-site area with a grid of 25-m spacing (between building and property line). The off-site receptor grid was designed based on the building edge. The modeling results indicate that there will not be a TAP exceedance on the property that visitors or trespassers could potentially access.

In addition, the discrete receptors with a grid of 25-m spacing were placed at sensitive locations in close proximity to the proposed Facility. Specifically, Figure 3 shows the following sensitive locations were included in the modeling analysis:

- Roye-Williams Elementary School – 201 Oakington Road,
- Havre De Grace Elementary School – 600 S Juniata Street,
- Havre De Grace Middle School - 401 Lewis Lane,
- Havre De Grace High School - 445 Lewis Lane, and
- Union United Methodist Church - 101 S. Union Avenue.

Note, the High School location is near the Middle School location, but the street address for the High School does not line up with the satellite imagery of the physical location. Thus, the modeled receptor grid location was shifted to match the satellite imagery of the physical High School location.

Terrain Data

Elevations for sources, buildings, and receptors (above mean sea level) were determined using the AERMAP version 18081 algorithm (which is an AERMOD module), using a National Elevation Data (NED) input file generated by and downloaded from the United States Geological Survey (USGS) website. The NED data are for the North American Datum (NAD) 83, UTM Zone 18, with a resolution of one (1/3) arc second (10 meter).

Initial terrain heights from AERMAP for the stack and building locations were corrected based on a survey conducted at the site. The building and stack base elevations were manually set to 13.02 meters (42.72 feet), this is consistent with the AERMAP generated elevations within 10 meters of the main building.

Meteorological Data

The MDE preprocessed meteorological data set for the region where the proposed Facility is located was used. The 2016-2020 preprocessed meteorological data based on the surface station BWI and the upper air station IAD was provided by MDE on May 25, 2021. Ms. LiAn Zhang of MDE concurred that the BWI and IAD stations would be most representative based on

the location of the proposed Facility. The analysis was conducted using the 2016-2020 year of preprocessed meteorological data that the MDE recommends.

Modeling Results

AERMOD modeling was conducted to characterize TAP off-site concentrations in the vicinity of the proposed Facility. Table 5 presents the maximum modeled 1-hour and 8-hour concentrations for acetone and TDI at all receptors and Table 6 shows the maximum modeled concentrations at each sensitive receptor grid. Figures 4, 5, 6, and 7 depict the maximum modeled concentrations for 1-hour and 8-hour acetone and 1-hour and 8-hour TDI, respectively.

As shown, the maximum modeled concentrations for TDI and acetone from the proposed Facility are below the applicable screening levels at all receptors. Therefore, the proposed Facility will be in compliance with the MDE ambient impact requirements.

The computer files associated with the air quality analysis was submitted electronically with the addendum to permit application.

Closing

We trust that this modeling report includes all required information in support of the air permit application for the proposed Facility. Thank you in advance for your review and approval. If you have any questions, do not hesitate to reach out to Michelle Snyder at michelle.snyder@woodplc.com for further information.

Tables

TABLE 1

Model Source Summary

Elite Comfort Solutions - 1900 Clark Rd

Havre De Grace, MD

Stack ID	Easting (m)	Northing (m)	Stack Release Type	Airflow Rate (ACFM)	Stack Temp (°F)	Stack Diameter (in)	Stack Diameter (ft)	Stack Height (ft)	Exit Velocity (fps)	Exit Velocity (ft/min)	TDI (lb/hr)	Acetone (lb/hr)	MDI (lb/hr)	pMDI (lb/hr)
SN-01	403,675	4,375,998	Point	100,000	80	62	5.17	85	79.5	4,770	0.0523	1,111.07	0.000173	0.000069
SN-02	403,706	4,376,153	Point	120,000	80	72	6.00	85	70.7	4,244	--	740.71	--	--
Total											0.0523	1,851.78	0.000173	0.000069

- Easting and Northing based on UTM NAD83, Zone 18

Abbreviations:

ACFM = actual cubic feet per minute
°F = degrees fahrenheit
ft = feet
fps = feet per second
ft/min = feet per minute
in = inches
lb/hr = pounds per hour
m = meters

TABLE 2

Variable Emission Rate Scalars

Elite Comfort Solutions - 1900 Clark Rd

Havre De Grace, MD

AERMOD Hour Ending		SN01 - TDI	SN01 - ACETONE	SN02 - ACETONE	24-hour clock
1		0.000	0.82143	0.82143	0000 - 0100
2		0.000	0.82143	0.82143	0101 - 0200
3		0.000	0.82143	0.82143	0201 - 0300
4		0.000	0.82143	0.82143	0301 - 0400
5		0.727	0.82143	0.82143	0401 - 0500
6		0.727	0.82143	0.82143	0501 - 0600
7		0.727	1.00000	1.00000	0601 - 0700
8		0.727	1.00000	1.00000	0701 - 0800
9		0.727	1.00000	1.00000	0801 - 0900
10		0.727	1.00000	1.00000	0901 - 1000
11		0.727	1.00000	1.00000	1001 - 1100
12		0.727	1.00000	1.00000	1101 - 1200
13		0.727	1.00000	1.00000	1201 - 1300
14		0.727	1.00000	1.00000	1301 - 1400
15		0.727	1.00000	1.00000	1401 - 1500
16		0.727	1.00000	1.00000	1501 - 1600
17		0.727	1.00000	1.00000	1601 - 1700
18		0.727	1.00000	1.00000	1701 - 1800
19		0.727	0.82143	0.82143	1801 - 1900
20		0.727	0.82143	0.82143	1901 - 2000
21		0.727	0.82143	0.82143	2001 - 2100
22		0.727	0.82143	0.82143	2101 - 2200
23		0.727	0.82143	0.82143	2201 - 2300
24		0.727	0.82143	0.82143	2301 - 2400
Maximum Emission Hours Modeled		20	24	24	hours
Prior Maximum	October 2021	0.0720	1269.8	846.3	lb/hr
Emissions	Submittal	0.00907	159.99	106.63	g/s
Effective Maximum	**February 2022**	**0.0523**	**1111.1**	**740.7**	**lb/hr**
Emissions [1]	**Addendum**	**0.00660**	**139.99**	**93.33**	**g/s**

Abbreviations:

Highlighted emissions in grams per second were modeled in AERMOD.

lb/hr = pounds per hour

g/s = grams per second

Note:

1. Effective maximum rates represent modeled emissions multiplied by the largest scalar listed (0.727 for TDI and 1.0 for acetone).

TABLE 3

Facility Allowable Emission Rate Comparison

Elite Comfort Solutions - 1900 Clark Rd

Havre De Grace, MD

TAP	CAS	Proposed Emission Rate (lb/hr)	Screening Level (µg/m^3)		AER [1] (lb/hr)		Futher Modeling Required? [2]
			1-hr	8-hr	1-hr	8-hr	
TDI	584849 or 91087	0.0523	1.42	0.36	0.0051	0.0013	YES
Acetone	67641	1,851.78	17,806.75	11,871.17	63.75	42.50	YES
MDI	101688	0.000173	N/A	0.51	N/A	0.002	NO
pMDI	9016879	0.000069	N/A	49.00	N/A	0.175	NO

Notes:

1. AER calculated based on the Guidance Document for Demonstrating Compliance with the Ambient Impact Requirement under the Toxic Air Pollutant (TAP) Regulations (COMAR 26.11.15.06). Calculations applicable to stacks with possible downwash.

   1-hour or 8-hour Allowable Emission Rate (AER) (lb/hr) = 0.00358 (Test 1 Chart conversion factor) x Screening Level (µg/m^3)

2. Dispersion modeling is required if Proposed Emission Rate exceeds AER.

Abbreviations:

AER = Allowable Emissions Rate

lb/hr = pounds per hour

µg/m^3 = micrograms per cubic meter

TAP = Toxic Air Pollutant

TABLE 4

Building Downwash Input

Elite Comfort Solutions - 1900 Clark Rd

Havre De Grace, MD

Building Name	Number of Tiers	Description	Base Elevation	Tier Height (ft)	Number of Corners	Corners	UTM	
							Easting (m)	Northing (m)
BLG1	1	Main Building	42.72 ft (13.02 m)	35	6	1	404,023	4,376,114
						2	404,026	4,375,978
						3	403,679	4,375,970
						4	403,674	4,376,154
						5	403,887	4,376,159
						6	403,889	4,376,111
BLG2	1	Tank Area	42.72 ft (13.02 m)	35	6	1	403,678	4,375,997
						2	403,665	4,375,996
						3	403,666	4,375,953
						4	403,706	4,375,954
						5	403,706	4,375,970
						6	403,679	4,375,970

Abbreviations:

ft = feet

m = meters

TABLE 5

Receptor Grid Spacing

Elite Comfort Solutions - 1900 Clark Rd

Havre De Grace, MD

Distance from the Building	Grid Spacing (m)
0-200m	25
0.2km-3km	100
3-5km	250
5-10km	500
10-20km	1000

Abbreviations:

m = meters

km = kilometers

TABLE 6

AERMOD Modeling Results for Maximum Impacts

Elite Comfort Solutions - 1900 Clark Rd

Havre De Grace, MD

Pollutant	CAS	Averaging Period	Met Year	MDE Screening Level ($\mu g/m^3$)	Maximum Modeled Concentration ($\mu g/m^3$)	% of Screening Level
TDI	584849 or 91087	1-hour	2016 - 2020	1.42	0.85	59.41%
		8-hour	2016 - 2020	0.36	0.29	80.87%
Acetone	67641	1-hour	2016 - 2020	17,806.75	17,371.96	97.56%
		8-hour	2016 - 2020	11,871.17	8,755.46	73.75%

Abbreviations:

$\mu g/m^3$ = micrograms per cubic meter

TABLE 7
AERMOD Modeling Results for Sensitive Receptors
Elite Comfort Solutions - 1900 Clark Rd
Havre De Grace, MD

					Maximum Modeled Grid Concentration ($\mu g/m^3$)				
Pollutant	**CAS**	**Averaging Period**	**Met Year**	**MDE Screening Level ($\mu g/m^3$)**	**Union United Methodist Church**	**Roye-Williams Elementary School**	**Havre De Grace Elementary School**	**Havre De Grace Middle School**	**Havre De Grace High School**
TDI	584849 or 91087	1-hour	2016 - 2020	1.42	0.12	0.11	0.33	0.19	0.15
		8-hour	2016 - 2020	0.36	0.02	0.03	0.15	0.03	0.03
Acetone	67641	1-hour	2016 - 2020	17,806.75	3,073	2,756	7,071	5,575	4,581
		8-hour	2016 - 2020	11,871.17	512	772	3589	1,188	974

Abbreviations:
$\mu g/m^3$ = micrograms per cubic meter

Figures

Explanation:

Site Boundary

N

0 500 1,000

Meters

Coordinate System: NAD 83 UTM Zone 18N

AREA MAP
L&P Elite Comfort Solutions
1900 Clark Road
Havre de Grace, MD

wood.	By: DPV	Project No.: SA18170340
	Date: 05/20/2021	Figure 1

D:\Projects\Clark\1_AreaMap.mxd

Explanation:

- Fence Points
- Stack Locations
- Fence
- Tanks
- Site Boundary
- Building

N

0 50 100

Meters

Coordinate System: NAD 83 UTM Zone 18N

FACILITY PLOT PLAN
L&P Elite Comfort Solutions
1900 Clark Road
Havre de Grace, MD

wood.	By: DPV	Project No.: SA18170340
	Date: 01/05/2022	Figure 2

D:\Projects\Clark\2_PlotPlan.mxd

Figure 3
Location of Sensitive Receptor Grids

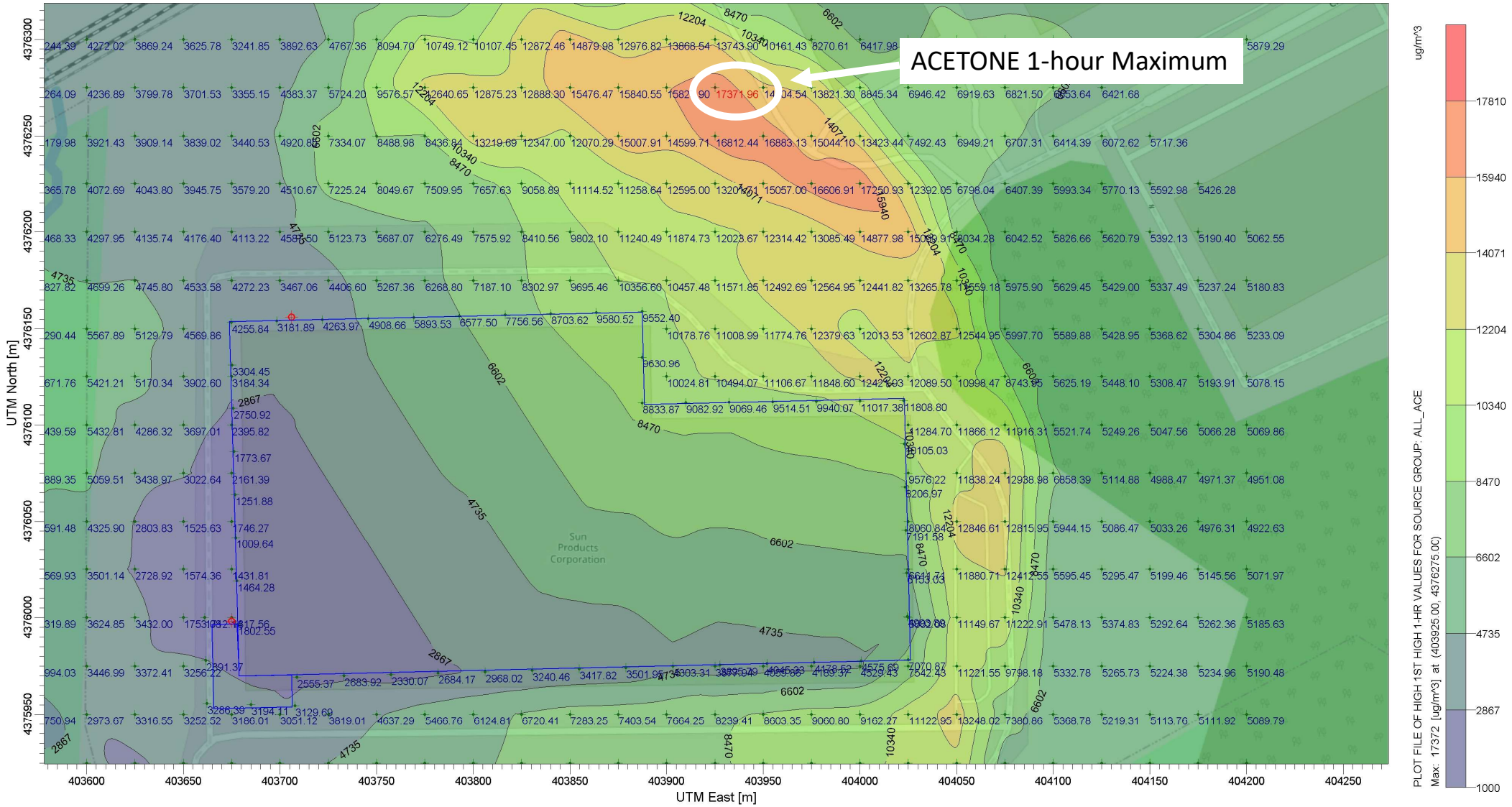


Figure 4
Location of Maximum 1-Hr Acetone Concentration

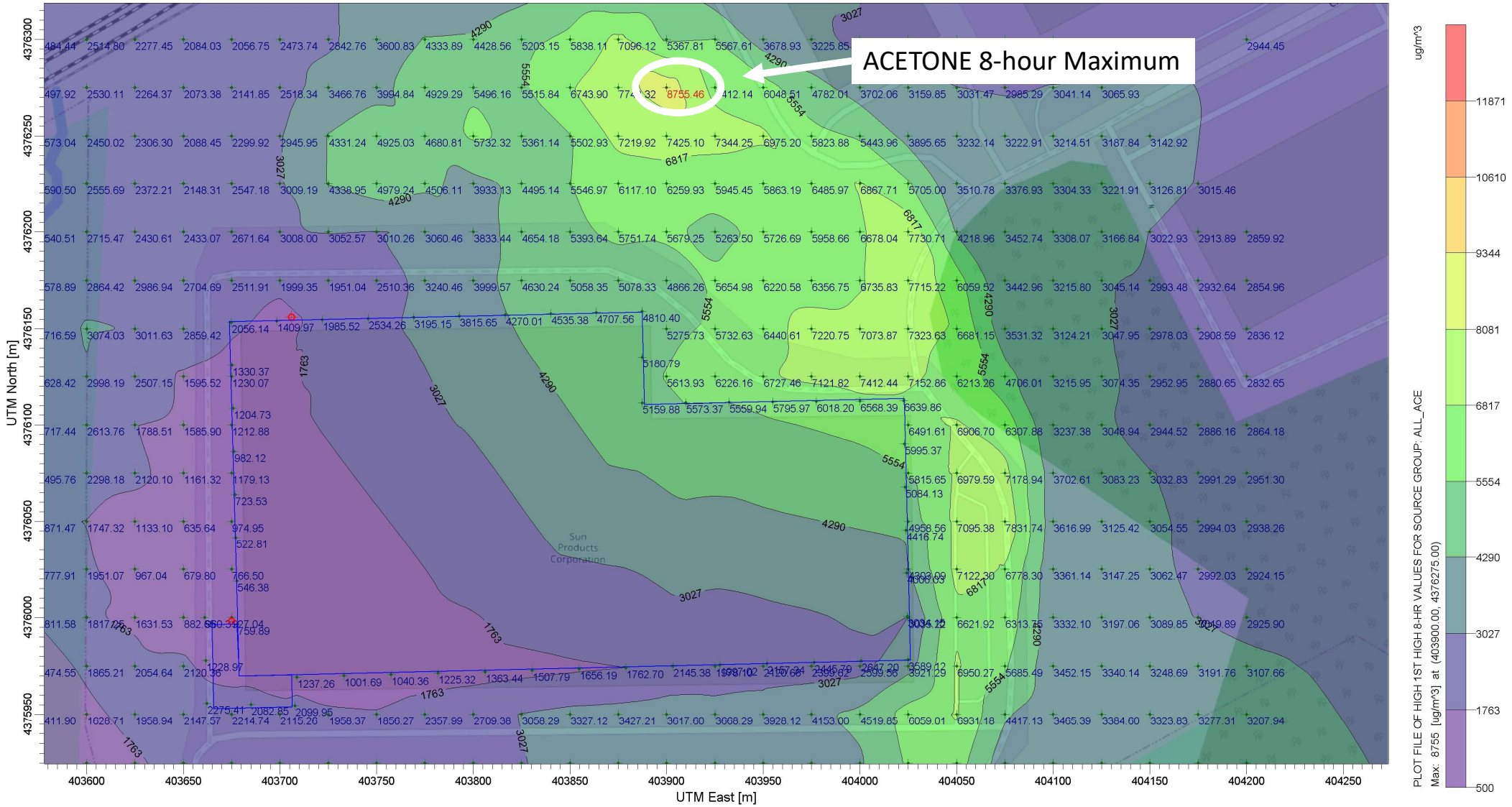


Figure 5
Location of Maximum 8-Hr Acetone Concentration

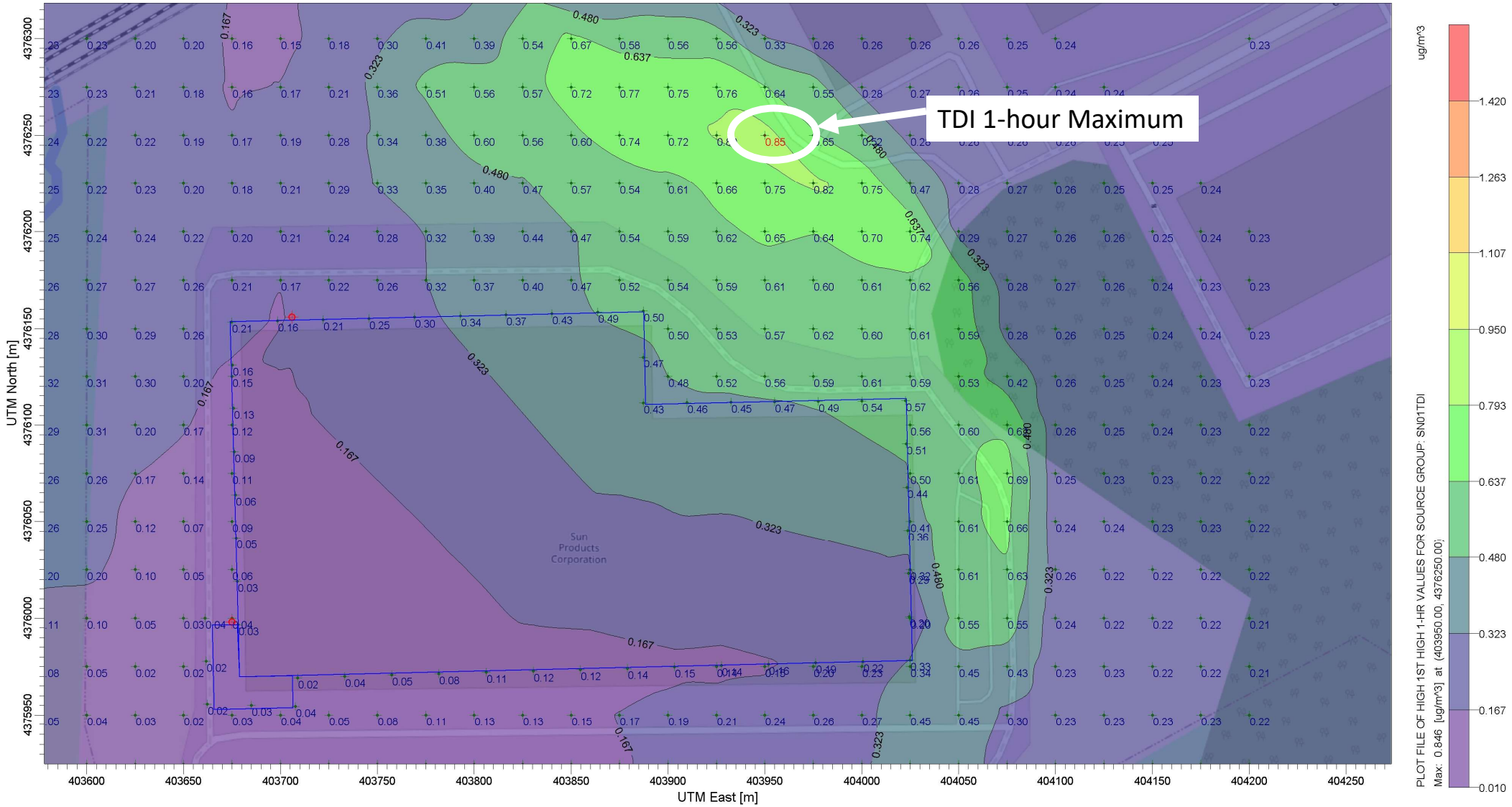


Figure 6
Location of Maximum 1-Hr TDI Concentration

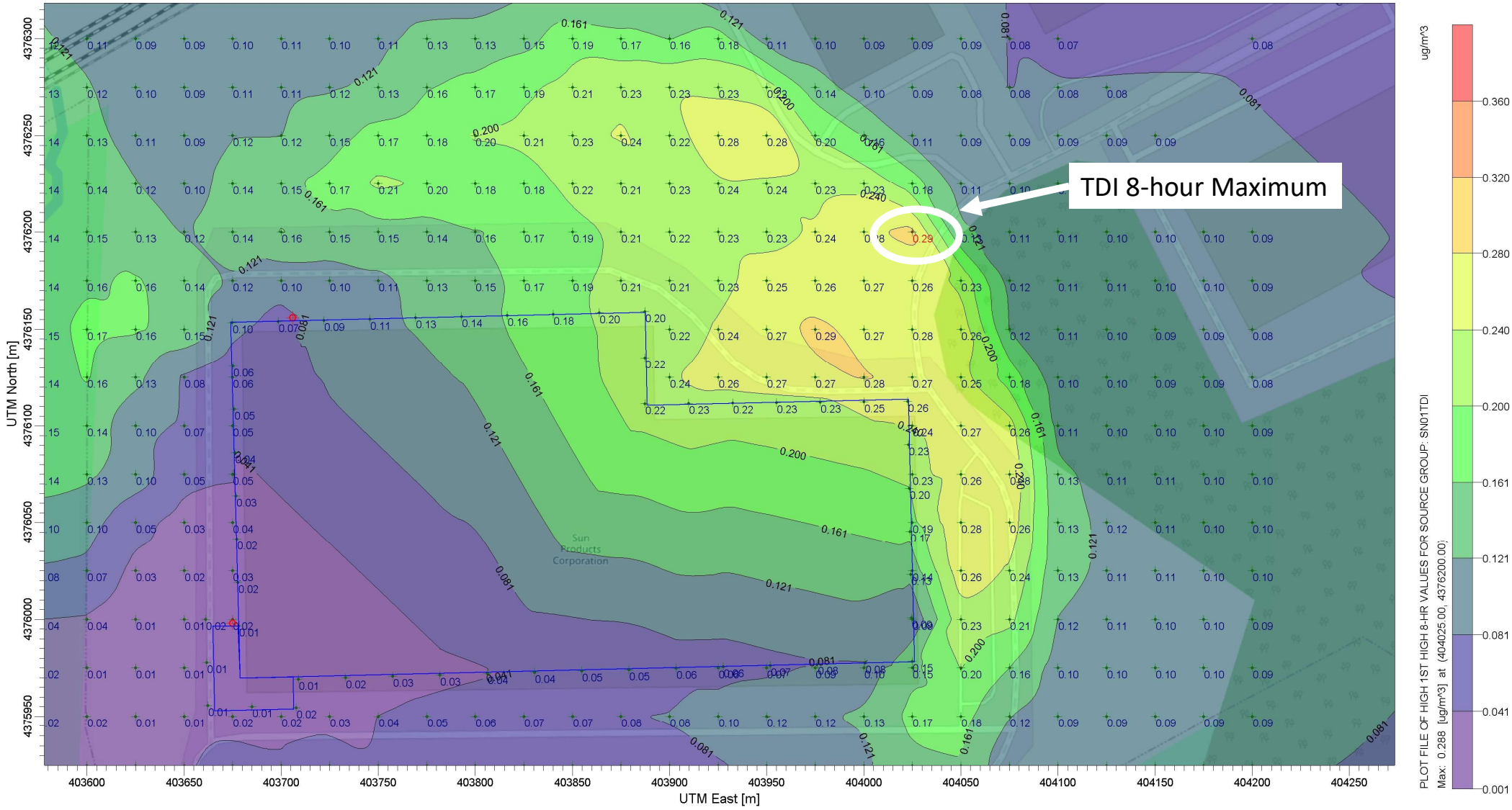


Figure 7
Location of Maximum 8-Hr TDI Concentration

Attachment 7

Certificate of Insurance (Workers Compensation)

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 10/20/2021

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Willis Towers Watson Midwest, Inc. c/o 26 Century Blvd P.O. Box 305191 Nashville, TN 372305191 USA	**CONTACT NAME:** Willis Towers Watson Certificate Center **PHONE (A/C, No, Ext):** 1-877-945-7378 **FAX (A/C, No):** 1-888-467-2378 **E-MAIL ADDRESS:** certificates@willis.com
INSURED Leggett & Platt Incorporated 1 Leggett Road Carthage, MO 64836	**INSURER(S) AFFORDING COVERAGE** — **NAIC #** INSURER A : ACE American Insurance Company — 22667 INSURER B : XL Specialty Insurance Company — 37885 INSURER C : ACE Fire Underwriters Insurance Company — 20702 INSURER D : Indemnity Insurance Company of North Ameri — 43575 INSURER E : National Fire & Marine Insurance Company — 20079 INSURER F :

COVERAGES **CERTIFICATE NUMBER:** W22497738 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	[X] COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: [X] POLICY [ ] PRO-JECT [ ] LOC [ ] OTHER:			HDO G72482803	11/01/2021	11/01/2022	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 2,000,000 $ 1,000,000 $ 10,000 $ 2,000,000 $ 4,000,000 $ 4,000,000
A	AUTOMOBILE LIABILITY [X] ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS [ ] HIRED AUTOS ONLY [ ] NON-OWNED AUTOS ONLY			ISA H25544365	11/01/2021	11/01/2022	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 5,000,000 $ $ $
B	[X] UMBRELLA LIAB [X] OCCUR EXCESS LIAB [ ] CLAIMS-MADE [ ] DED [X] RETENTION $ 10,000			US00086849LI21A	11/01/2021	11/01/2022	EACH OCCURRENCE AGGREGATE	$ 5,000,000 $ 5,000,000
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N: No (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		WLR C6892022A	11/01/2021	11/01/2022	[X] PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 1,000,000 $ 1,000,000 $ 1,000,000
C	Workers Compensation & Employers' Liability WC: Per Statute			SCF C68920267	11/01/2021	11/01/2022	E.L. Each Accident E.L. Disease - Policy E.L. Disease - Ea Emp	$1,000,000 $1,000,000 $1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

SEE ATTACHED

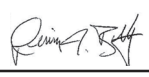
CERTIFICATE HOLDER

Evidence of Insurance

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE



AGENCY CUSTOMER ID: _____

LOC #: _____

ADDITIONAL REMARKS SCHEDULE

AGENCY		NAMED INSURED
Willis Towers Watson Midwest, Inc.		Leggett & Platt Incorporated 1 Leggett Road Carthage, MO 64836
POLICY NUMBER See Page 1		
CARRIER See Page 1	NAIC CODE See Page 1	EFFECTIVE DATE: See Page 1

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,

FORM NUMBER: 25 FORM TITLE: Certificate of Liability Insurance

This certificate is issued as evidence of insurance coverage only.

INSURER AFFORDING COVERAGE: Indemnity Insurance Company of North America NAIC#: 43575
POLICY NUMBER: WLR C68910274 EFF DATE: 11/01/2021 EXP DATE: 11/01/2022

TYPE OF INSURANCE:	LIMIT DESCRIPTION:	LIMIT AMOUNT:
Workers Compensation	E.L. Each Accident	$1,000,000
& Employers' Liability	E.L. Disease - Policy	$1,000,000
Per Statute	E.L. Disease - Ea Emp	$1,000,000

INSURER AFFORDING COVERAGE: National Fire & Marine Insurance Company NAIC#: 20079
POLICY NUMBER: 42-XSF-312665-02 EFF DATE: 11/01/2021 EXP DATE: 11/01/2022

TYPE OF INSURANCE:	LIMIT DESCRIPTION:	LIMIT AMOUNT:
Excess Business Automobile	CSL	$5,000,000

SR ID: 21729272 BATCH: 2279537 CERT: W22497738

MARYLAND DEPARTMENT OF THE ENVIRONMENT

AIR AND RADIATION ADMINISTRATION

SUPPLEMENTAL INFORMATION REFERENCES

The Code of Maryland Regulations (COMAR) is searchable by COMAR citation at the following Division of State Documents website:
http://www.dsd.state.md.us/COMAR/ComarHome.html

The Code of Federal Regulations (CFR), including New Source Performance Standards (NSPS) at 40 CFR, Part 60 and National Emission Standards for Hazardous Air Pollutants (NESHAP) at 40 CFR, Parts 61 and 63, is searchable by CFR citation at the following U.S. Government Publishing Office website:
http://www.ecfr.gov

Information on National Ambient Air Quality Standards (NAAQS) is located at the following U.S. Environmental Protection Agency (EPA) website:
https://www.epa.gov/criteria-air-pollutants/naaqs-table

Information on Maryland's Ambient Air Monitoring Program is located at the following Maryland Department of the Environment website:
http://mde.maryland.gov/programs/Air/AirQualityMonitoring/Pages/index.aspx

Information on the U.S. EPA's Screen3 computer model and other EPA-approved air dispersion models is located at the following U.S. EPA website:
http://www.epa.gov/scram001/dispersion_screening.htm

Information on the U.S. EPA TANKS Emission Estimation Software is located at the following U.S. EPA website:
http://www.epa.gov/ttn/chief/software/tanks/index.html

Information on the U.S. EPA Emission Factors and AP-42 is located at the following U.S. EPA website:
https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emission-factors