



Campbell Transportation Company, Inc.

Foxpointe Centre, Building One
201 South Johnson Road, Suite 303
Houston, PA 15342-1351

Tel: (724) 746-9553
Fax: (724) 873-9013
www.barges.us

December 20, 2016

Assistant Director for Permitting
WVDEP - Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Overnight Delivery

Campbell Transportation Company, Inc.
Congo Plant - Newell, WV
DAQ ID# 029-00033

SUBJECT: Application for Administrative Update to Permit R13-1645A

Dear Assistant Director:

Campbell Transportation Company, Inc. (CTC), a subsidiary of Blue Danube Incorporated, hereby submits to the Division of Air Quality (DAQ) the enclosed application for a Class II administrative update to Permit R13-1645A.

Also enclosed is our Rule 13 permit application fee check for \$300.00. We will submit to you the Affidavit of Publication of the required Rule 13 Public Notice legal advertisement in the near future.

Please note that we have included as Appendix 1 to this application our source-proposed revisions to the Rule 13 permit specific requirements. We look forward to working with DAQ during the review of this application, and we request an opportunity to review a pre-draft version of the Rule 13 permit.

Note that no Confidential Business Information is included within the attached permit application.

Should you have additional questions regarding this submittal please contact me at (724) 746-9525 or rcorigliano@barges.us.

Very truly yours,

Ronald K. Corigliano
Director of Governmental Affairs and Property
Management

Enclosures

Cc: Eric G. Vowcheck, (w/enc.)
Christopher S. Grimm, (w/enc.)

Campbell Transportation Company, Inc.
Congo Plant - Newell, WV

Application for Rule 13 Administrative Update
Permit R13-1645A

NON-CONFIDENTIAL

December 2016

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Application for Class II Administrative Update to Permit R13-1645A

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Appendix 1 – Proposed Draft Revisions to R13-1645A

 <p>WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF AIR QUALITY 601 57th Street, SE Charleston, WV 25304 (304) 926-0475 www.wvdep.org/daq</p>	<p>APPLICATION FOR NSR PERMIT</p> <p>AND</p> <p>TITLE V PERMIT REVISION</p> <p>(OPTIONAL)</p>
<p>PLEASE CHECK ALL THAT APPLY TO NSR (45CSR13) (IF KNOWN):</p> <p><input type="checkbox"/> CONSTRUCTION <input type="checkbox"/> MODIFICATION <input type="checkbox"/> RELOCATION</p> <p><input type="checkbox"/> CLASS I ADMINISTRATIVE UPDATE <input type="checkbox"/> TEMPORARY</p> <p><input checked="" type="checkbox"/> CLASS II ADMINISTRATIVE UPDATE <input type="checkbox"/> AFTER-THE-FACT</p>	<p>PLEASE CHECK TYPE OF 45CSR30 (TITLE V) REVISION (IF ANY):</p> <p><input type="checkbox"/> ADMINISTRATIVE AMENDMENT <input type="checkbox"/> MINOR MODIFICATION</p> <p><input type="checkbox"/> SIGNIFICANT MODIFICATION</p> <p>IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS ATTACHMENT S TO THIS APPLICATION</p>
<p>FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.</p>	
<p>Section I. General</p>	
<p>1. Name of applicant (as registered with the WV Secretary of State's Office): Campbell Transportation Company, Inc.</p>	<p>2. Federal Employer ID No. (FEIN): 25-1256056</p>
<p>3. Name of facility (if different from above): Congo Shipyard</p>	<p>4. The applicant is the: <input type="checkbox"/> OWNER <input type="checkbox"/> OPERATOR <input checked="" type="checkbox"/> BOTH</p>
<p>5A. Applicant's mailing address: Campbell Transportation Company, Inc. Foxpointe Centre, Building One 201 S. Johnson Road, Suite 303 Houston, PA 15342-1351</p>	<p>5B. Facility's present physical address: Campbell Transportation Company, Inc. 2567 Congo Arroyo Road Newell, WV 26050</p>
<p>6. West Virginia Business Registration. Is the applicant a resident of the State of West Virginia? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>– If YES, provide a copy of the Certificate of Incorporation/Organization/Limited Partnership (one page) including any name change amendments or other Business Registration Certificate as Attachment A.</p> <p>– If NO, provide a copy of the Certificate of Authority/Authority of L.L.C./Registration (one page) including any name change amendments or other Business Certificate as Attachment A.</p>	
<p>7. If applicant is a subsidiary corporation, please provide the name of parent corporation: Blue Danube Incorporated</p>	
<p>8. Does the applicant own, lease, have an option to buy or otherwise have control of the <i>proposed site</i>? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>– If YES, please explain: Existing site.</p> <p>– If NO, you are not eligible for a permit for this source.</p>	
<p>9. Type of plant or facility (stationary source) to be constructed, modified, relocated, administratively updated or temporarily permitted (e.g., coal preparation plant, primary crusher, etc.): Barge Cleaning</p>	<p>10. North American Industry Classification System (NAICS) code for the facility: 488320, 562998, 336611, 483211</p>
<p>11A. DAQ Plant ID No. (for existing facilities only): 029-00033</p>	<p>11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only): R13-1645A (effective December 29, 2011)</p>
<p>All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.</p>	

12A.

- For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction** or **Relocation permits**, please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B**.

The existing plant site is located on the Ohio River shore on State Route 2, approximately two miles south of Newell, WV, just south of the Ergon petroleum refining plant site.

12.B. New site address (if applicable): NA	12C. Nearest city or town: Newell	12D. County: Hancock
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12.E. UTM Northing (KM): 4,495.32	12F. UTM Easting (KM): 530.85	12G. UTM Zone: 17
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13. Briefly describe the proposed change(s) at the facility:
 Applicant proposes revisions to existing R13-1645A permit terms in Table 4.1.1. Approved Materials List and the Odor Control Program. Applicant is voluntarily reducing the limit on maximum annual hours of vapor combustion at the flare from 936 hours per year to 500 hours per year.

14A. Provide the date of anticipated installation or change: Upon issuance of permit - If this is an After-The-Fact permit application, provide the date upon which the proposed change did happen: / /	14B. Date of anticipated Start-Up if a permit is granted: Soon after issuance of permit
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14C. Provide a **Schedule** of the planned **Installation of/Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
 Hours Per Day 24 Days Per Week 7 Weeks Per Year 52

16. Is demolition or physical renovation at an existing facility involved? **YES** **NO**

17. **Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18. **Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process (*if known*). A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance (*if known*). Provide this information as **Attachment D**.

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan**, e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to **Plot Plan Guidance**) .
 - Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F**.

23. Provide a **Process Description** as **Attachment G**.
 - Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide Material Safety Data Sheets (MSDS) for all materials processed, used or produced as Attachment H . – For chemical processes, provide a MSDS for each compound emitted to the air.
25. Fill out the Emission Units Table and provide it as Attachment I .
26. Fill out the Emission Points Data Summary Sheet (Table 1 and Table 2) and provide it as Attachment J .
27. Fill out the Fugitive Emissions Data Summary Sheet and provide it as Attachment K .
28. Check all applicable Emissions Unit Data Sheets listed below: <input type="checkbox"/> Bulk Liquid Transfer Operations <input type="checkbox"/> Haul Road Emissions <input type="checkbox"/> Quarry <input type="checkbox"/> Chemical Processes <input type="checkbox"/> Hot Mix Asphalt Plant <input type="checkbox"/> Solid Materials Sizing, Handling and Storage Facilities <input type="checkbox"/> Concrete Batch Plant <input type="checkbox"/> Incinerator <input type="checkbox"/> Grey Iron and Steel Foundry <input type="checkbox"/> Indirect Heat Exchanger <input type="checkbox"/> Storage Tanks <input type="checkbox"/> General Emission Unit, specify:
Fill out and provide the Emissions Unit Data Sheet(s) as Attachment L .
29. Check all applicable Air Pollution Control Device Sheets listed below: <input type="checkbox"/> Absorption Systems <input type="checkbox"/> Baghouse <input type="checkbox"/> Flare <input type="checkbox"/> Adsorption Systems <input type="checkbox"/> Condenser <input type="checkbox"/> Mechanical Collector <input type="checkbox"/> Afterburner <input type="checkbox"/> Electrostatic Precipitator <input type="checkbox"/> Wet Collecting System <input type="checkbox"/> Other Collectors, specify:
Fill out and provide the Air Pollution Control Device Sheet(s) as Attachment M .
30. Provide all Supporting Emissions Calculations as Attachment N , or attach the calculations directly to the forms listed in Items 28 through 31.
31. Monitoring, Recordkeeping, Reporting and Testing Plans. Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as Attachment O . ➤ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.
32. Public Notice. At the time that the application is submitted, place a Class I Legal Advertisement in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and Example Legal Advertisement for details). Please submit the Affidavit of Publication as Attachment P immediately upon receipt.
33. Business Confidentiality Claims. Does this application include confidential information (per 45CSR31)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO ➤ If YES , identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's " Precautionary Notice – Claims of Confidentiality " guidance found in the General Instructions as Attachment Q .

Section III. Certification of Information

34. Authority/Delegation of Authority. Only required when someone other than the responsible official signs the application. Check applicable Authority Form below: <input type="checkbox"/> Authority of Corporation or Other Business Entity <input type="checkbox"/> Authority of Partnership <input type="checkbox"/> Authority of Governmental Agency <input type="checkbox"/> Authority of Limited Partnership Submit completed and signed Authority Form as Attachment R . All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.
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35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned **Responsible Official** / **Authorized Representative**, hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE _____

(Please use blue ink)

DATE: _____

12-20-2016

(Please use blue ink)

35B. Printed name of signee: Eric G. Vowcheck

35C. Title: Controller

35D. E-mail: evowcheck@barges.us

36E. Phone: (724) 746-9525

36F. FAX: (724) 873-9013

36A. Printed name of contact person (if different from above): Ronald K. Corigliano

36B. Title: Director of Governmental Affairs and Property Management

36C. E-mail: rcorigliano@barges.us

36D. Phone: (724) 746-9525

36E. FAX: (724) 873-9013

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- | | |
|--|---|
| <input checked="" type="checkbox"/> Attachment A: Business Certificate | <input type="checkbox"/> Attachment K: Fugitive Emissions Data Summary Sheet |
| <input checked="" type="checkbox"/> Attachment B: Map(s) | <input type="checkbox"/> Attachment L: Emissions Unit Data Sheet(s) |
| <input checked="" type="checkbox"/> Attachment C: Installation and Start Up Schedule | <input type="checkbox"/> Attachment M: Air Pollution Control Device Sheet(s) |
| <input checked="" type="checkbox"/> Attachment D: Regulatory Discussion | <input checked="" type="checkbox"/> Attachment N: Supporting Emissions Calculations |
| <input checked="" type="checkbox"/> Attachment E: Plot Plan | <input type="checkbox"/> Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans |
| <input checked="" type="checkbox"/> Attachment F: Detailed Process Flow Diagram(s) | <input checked="" type="checkbox"/> Attachment P: Public Notice |
| <input checked="" type="checkbox"/> Attachment G: Process Description | <input type="checkbox"/> Attachment Q: Business Confidential Claims |
| <input checked="" type="checkbox"/> Attachment H: Material Safety Data Sheets (MSDS) | <input type="checkbox"/> Attachment R: Authority Forms |
| <input checked="" type="checkbox"/> Attachment I: Emission Units Table | <input type="checkbox"/> Attachment S: Title V Permit Revision Information |
| <input checked="" type="checkbox"/> Attachment J: Emission Points Data Summary Sheet | <input checked="" type="checkbox"/> Application Fee |

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- Forward 1 copy of the application to the Title V Permitting Group and:
- For Title V Administrative Amendments:
- NSR permit writer should notify Title V permit writer of draft permit,
- For Title V Minor Modifications:
- Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,
- NSR permit writer should notify Title V permit writer of draft permit.
- For Title V Significant Modifications processed in parallel with NSR Permit revision:
- NSR permit writer should notify a Title V permit writer of draft permit,
- Public notice should reference both 45CSR13 and Title V permits,
- EPA has 45 day review period of a draft permit.

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

Attachment A
Business Certificate

**WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION
CERTIFICATE**

ISSUED TO:
**CAMPBELL TRANSPORTATION COMPANY INC
2567 CONGO ARROYO RD
NEWELL, WV 26050-1317**

BUSINESS REGISTRATION ACCOUNT NUMBER: **2275-9459**

This certificate is issued on: **11/19/2012**

*This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with Chapter 11, Article 12, of the West Virginia Code*

*The person or organization identified on this certificate is registered
to conduct business in the State of West Virginia at the location above.*

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them.
CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.



STATE OF WEST VIRGINIA
State Tax Department, Revenue Division
P. O. Box 2666
Charleston, WV 25330-2666



Earl Ray Tomblin, Governor

Craig A. Griffith, Tax Commissioner

CAMPBELL TRANSPORTATION COMPANY INC
2567 CONGO ARROYO RD
NEWELL WV 26050-1317

Letter Id: L1231733632
Issued: 11/19/2012
Account #: 2275-9459

00002702010000



RE: Business Registration Certificate

The West Virginia State Tax Department would like to thank you for registering your business. Enclosed is your Business Registration Certificate. This certificate shall be permanent until cessation of business or until suspended, revoked or cancelled. Changes in name, ownership or location are considered a cessation of business; a new Business Registration Certificate and applicable fees are required. Please review the certificate for accuracy.

This certificate must be prominently displayed at the location for which issued. Engaging in business without conspicuously posting a West Virginia Business Registration Certificate in the place of business is a crime and may subject you to fines per W.Va. Code § 11-9.

When contacting the State Tax Department, refer to the appropriate account number listed on the back of this page. The taxes listed may not be all the taxes for which you are responsible. Account numbers for taxes are printed on the tax returns mailed by the State Tax Department. Failure to timely file tax returns may result in penalties for late filing.

Should the nature of your business activity or business ownership change, your liability for these and other taxes will change accordingly.

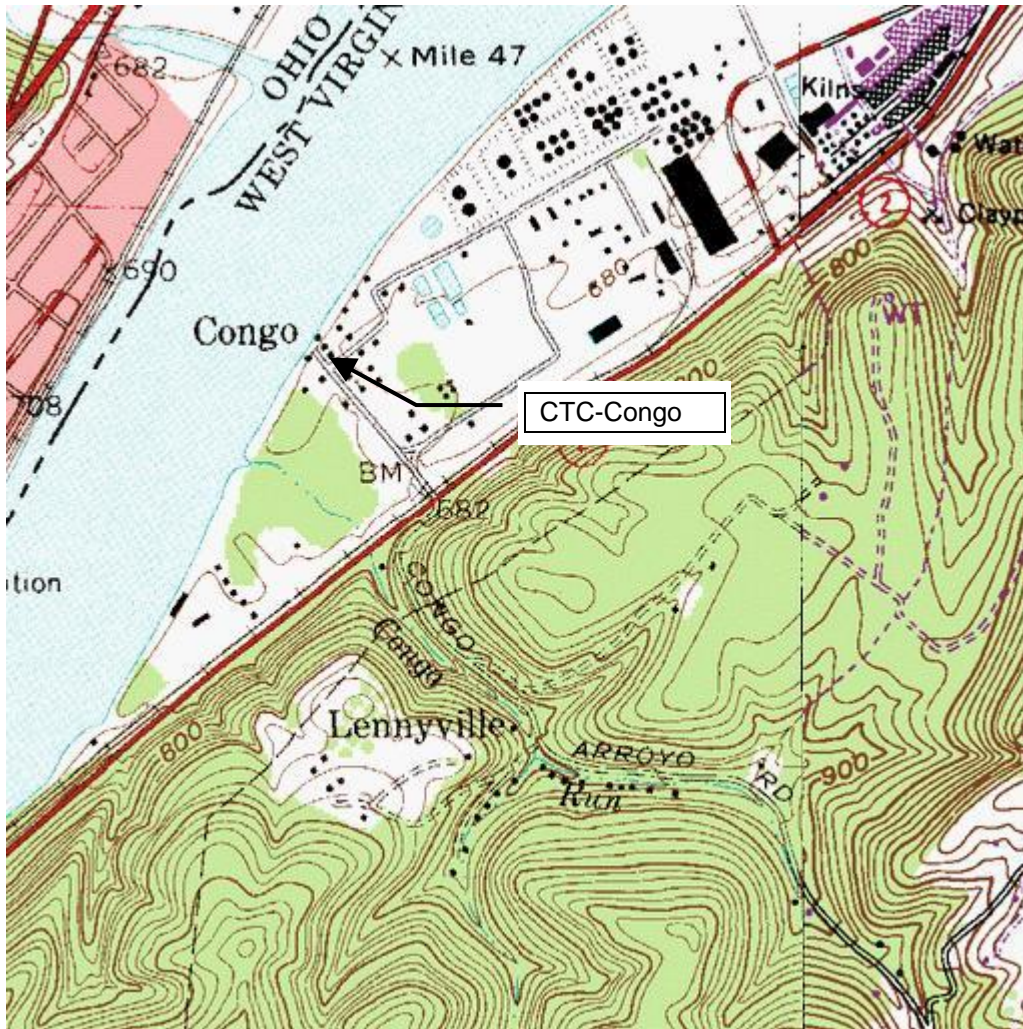
To learn more about these taxes and the services offered by the West Virginia State Tax Department, visit our web site at www.wvtax.gov.

Enclosure

atL006 v.4

ATTACHMENT B – SITE LOCATION MAP Campbell Transportation Company, Inc. Newell/Congo, West Virginia

USGS Map Name: Wellsville, OH Map MRC: 40080E6
UTM Zone: 17N Datum: NAD27 Zoom: 4m/pixel
Topo obtained from: www.topoquest.com



ATTACHMENT C – INSTALLATION & START UP SCHEDULE

Proposed Plant Changes	Begin Installation Date	Initial Startup Date
Revisions to Table 4.1.1. Approved Materials List and the Odor Control Program.	At issuance of updated air permit	At issuance of updated air permit

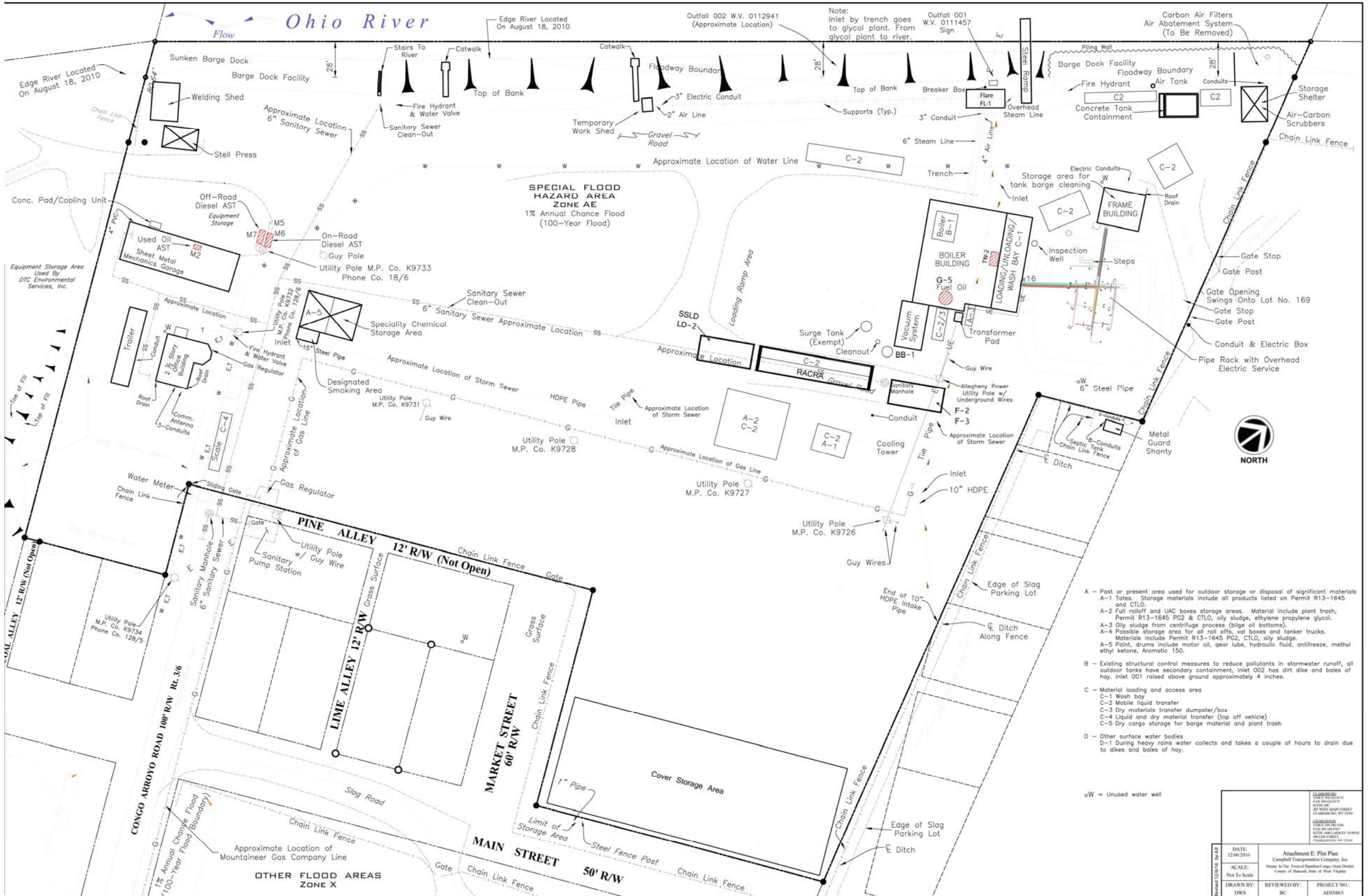
ATTACHMENT D – REGULATORY DISCUSSION

The following table discusses the Clean Air Act new applicable regulatory requirements that CTC believes to apply as a result of this proposed permitting action.

Presumed New Applicable CAA Requirements			
Regulatory Citation	Emission Source Affected	Description of Applicability	Compliance Demonstration
45CSR13-5.4	Flare (Source ID# FL-1)	CTC is requesting revisions to Table 4.1.1. Approved Materials List and the Odor Control Program. CTC is voluntarily reducing the limit on maximum annual hours of vapor combustion at the flare from 936 hours per year to 500 hours per year.	Apply for administrative update to permit R13-1645A; comply with all Rule 13 permit requirements.

Attachment E

Plot Plan



- A - Past or present area used for outdoor storage or disposal of significant materials
- A-1 Totes. Storage materials include all products listed on Permit R13-1645 and CTLO.
- A-2 Full rolloff and UAC boxes storage areas. Material include plant trash, Permit R13-1645 PG2 & CTLO, oily sludge, ethylene propylene glycol.
- A-3 Oily sludge from centrifuge process (bilge oil bottoms).
- A-4 Possible storage area for all roll offs, val boxes and tanker trucks. Materials include Permit R13-1645 PG2, CTLO, oily sludge.
- A-5 Paint, drums include motor oil, gear lube, hydraulic fluid, antifreeze, methyl ethyl ketone, Aromatic 150.
- B - Existing structural control measures to reduce pollutants in stormwater runoff, all outdoor tanks have secondary containment, Inlet 002 has dirt dike and bales of hay. Inlet 001 raised above ground approximately 4 inches.
- C - Material loading and access area
- C-1 Wash bay
- C-2 Mobile liquid transfer
- C-3 Dry materials transfer dumpster/box
- C-4 Liquid and dry material transfer (top off vehicle)
- C-5 Dry cargo storage for barge material and plant trash
- D - Other surface water bodies
- D-1 During heavy rains water collects and takes a couple of hours to drain due to dikes and bales of hay.

oW = Unused water well

DATE: 12/06/2016	Attachment E: Plot Plan Campbell Transportation Company, Inc. Situated in The Town of Heath/Camp, Grant District, County of Hancock, State of West Virginia
SCALE: Not To Scale	
DRAWN BY: DWS	REVIEWED BY: BC
PROJECT NO: A0348/5	

Revised 12/06/16 by AE

Attachment H

Material Safety Data Sheets (MSDS)

Attached are MSDSs for the following proposed additional barge materials to be cleaned at the CTC-Congo facility:

- Base Oil Stocks
- Blend Oils
- Ethylene Glycol
- Exxal 10
- n-Hexane
- Palatinol
- Piperylene
- Slack Wax
- Vegetable Oils

Safety Data Sheet



SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Chevron Neutral Oil 60R

Product Use: Base Oil
Product Number(s): 240664

Company Identification
Chevron Products Company
a division of Chevron U.S.A. Inc.
6001 Bollinger Canyon Rd.
San Ramon, CA 94583
United States of America
www.chevronlubricants.com

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887

Health Emergency
Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623

Product Information
email : lubemsds@chevron.com
Product Information: 1 (800) 582-3835, LUBETEK@chevron.com

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION: Aspiration toxicant: Category 1.



Signal Word: Danger

Health Hazards: May be fatal if swallowed and enters airways.

PRECAUTIONARY STATEMENTS:

Response: IF SWALLOWED: Immediately call a poison center or doctor/physician. Do NOT induce

vomiting.

Storage: Store locked up.

Disposal: Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

HAZARDS NOT OTHERWISE CLASSIFIED: Not Applicable

SECTION 3 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Distillates (petroleum), hydrotreated light paraffinic	64742-55-8	100 %weight

This product is not approved for direct food use [CFR 178.3620 (a) & (b)].

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.

Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.

Inhalation: If exposed to excessive amounts of material in air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

Most important symptoms and effects, both acute and delayed

IMMEDIATE SYMPTOMS AND HEALTH EFFECTS

Eye: Not expected to cause prolonged or significant eye irritation.

Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death.

Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

DELAYED OR OTHER SYMPTOMS AND HEALTH EFFECTS: Not classified.

Indication of any immediate medical attention and special treatment needed

Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: This material will burn although it is not easily ignited. See Section 7 for proper handling and storage. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: Do not get in eyes, on skin, or on clothing. Do not breathe oil mist at concentrations above the recommended mineral oil mist exposure limit. Do not taste or swallow. Wash thoroughly after handling.

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, 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 containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should

read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Silver Shield, Viton.

Respiratory Protection: No respiratory protection is normally required. If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge. Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Distillates (petroleum), hydrotreated light paraffinic	Not Applicable	--	--	--	--

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

- Color:** Colorless to yellow
- Physical State:** No data available
- Odor:** Hydrocarbon odor
- Odor Threshold:** No data available
- pH:** Not Applicable
- Vapor Pressure:** <0.01 mmHg @ 37.8 °C (100 °F)
- Vapor Density (Air = 1):** >1
- Initial Boiling Point:** No data available
- Solubility:** Soluble in hydrocarbons; insoluble in water
- Freezing Point:** Not Applicable
- Melting Point:** Not Applicable
- Density:** 0.8525 kg/l @ 15°C (59°F) (Typical)
- Viscosity:** 18.7 mm²/s @ 40°C (104°F)
- Evaporation Rate:** No data available
- Decomposition temperature:** No Data Available
- Octanol/Water Partition Coefficient:** No data available

FLAMMABLE PROPERTIES:

Flammability (solid, gas): No Data Available

Flashpoint: (Cleveland Open Cup) 155 °C (311 °F) Minimum
Autoignition: No data available
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: Not applicable
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects
Serious Eye Damage/Irritation: The eye irritation hazard is based on evaluation of data for product components.
Skin Corrosion/Irritation: The skin irritation hazard is based on evaluation of data for product components.
Skin Sensitization: The skin sensitization hazard is based on evaluation of data for product components.
Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for product components.
Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for product components.
Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for product components.
Acute Toxicity Estimate: Not Determined
Germ Cell Mutagenicity: The hazard evaluation is based on data for components or a similar material.
Carcinogenicity: The hazard evaluation is based on data for components or a similar material.
Reproductive Toxicity: The hazard evaluation is based on data for components or a similar material.
Specific Target Organ Toxicity - Single Exposure: The hazard evaluation is based on data for components or a similar material.
Specific Target Organ Toxicity - Repeated Exposure: The hazard evaluation is based on data for components or a similar material.

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been

listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B). These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

This material is not expected to be harmful to aquatic organisms. The ecotoxicity hazard is based on an evaluation of data for the components or a similar material. The product has not been tested. The statement has been derived from the properties of the individual components.

MOBILITY

No data available.

PERSISTENCE AND DEGRADABILITY

This material is not expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material. The product has not been tested. The statement has been derived from the properties of the individual components.

POTENTIAL TO BIOACCUMULATE

Bioconcentration Factor: No data available.

Octanol/Water Partition Coefficient: No data available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: PETROLEUM LUBRICATING OIL, NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR

IMO/IMDG Shipping Description: PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

ICAO/IATA Shipping Description: PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO TI OR IATA DGR

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code:
Not applicable

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES:

1. Immediate (Acute) Health Effects:	NO
2. Delayed (Chronic) Health Effects:	NO
3. Fire Hazard:	NO
4. Sudden Release of Pressure Hazard:	NO
5. Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), ENCS (Japan), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

NEW JERSEY RTK CLASSIFICATION:

Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 1 Flammability: 1 Reactivity: 0
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

LABEL RECOMMENDATION:

Label Category : BASE OIL 1 - BAS1

REVISION STATEMENT: This revision updates the following sections of this Safety Data Sheet: 1-16
Revision Date: OCTOBER 31, 2014

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:



TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
GHS - Globally Harmonized System	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	SDS - Safety Data Sheet
HMIS - Hazardous Materials Information System	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration
NCEL - New Chemical Exposure Limit	EPA - Environmental Protection Agency
SCBA - Self-Contained Breathing Apparatus	

Prepared according to the 29 CFR 1910.1200 (2012) by Chevron Energy Technology Company, 6001 Bollinger Canyon Road San Ramon, CA 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

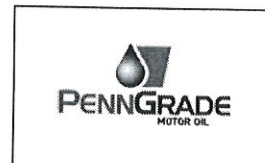
SAFETY DATA SHEET

PennGrade Synthetic Blend Motor Oil – All Viscosities

Prepared according to U.S. OSHA, CMA, ANSI, Canadian WHMIS, Australian WorkSafe, Japanese Industrial Standard JIS Z 7250:2000, and European Union REACH Regulations

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	PennGrade Synthetic Blend Motor Oil – All Viscosities
PRODUCT USE:	Engine Oils
PRODUCT DESCRIPTION:	Base Oil and Additives
CAS#	Mixture
MANUFACTURER'S NAME:	D-A Lubricant Company, Inc.
ADDRESS:	801 Edwards Drive, Lebanon, IN 46052 USA
EMERGENCY PHONE:	1-800-899-9004 TOLL-FREE in USA/Canada
BUSINESS PHONE:	1-317-923-5321 (Product Information)
WEB SITE:	www.dalube.com
DATE OF PREPARATION:	09 December 2015
DATE OF LAST REVISION:	09 December 2015



SECTION 2 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: This product is an amber colored liquid with a petroleum hydrocarbon odor.

HEALTH HAZARDS: Prolonged or repeated exposure may cause irritation to eyes, respiratory system and skin. Repeated exposure may cause dryness of the skin.

FLAMMABILITY: This product is not classified as a flammable liquid. Flashpoint: >185°C (>365°F) ASTM D-92

ENVIRONMENTAL EFFECTS: The Environmental effects of this product have not been investigated. Floats on water. If it enters soil, it will be absorbed to soil particles and will not be mobile. This product may cause gastrointestinal distress in birds and mammals through ingestion during pelage grooming.

US DOT SYMBOLS

CANADA (WHMIS) SYMBOLS

EUROPEAN and (GHS) Hazard Symbols

Non-Regulated

Not Controlled



Signal Word: **Warning!**

EU LABELING AND CLASSIFICATION:

Classification of the substance or mixture according to Regulation (EC) No1272/2008 Annex 1

EC# Various Highly Refined Petroleum Base Stocks – Listed in Annex I All are Severely Hydrotreated with less than 3 % DMSO extract as measured by IP 346

Substances not listed either individually or in group entries must be self classified

Components Contributing to Hazard:

Highly refined Mineral Oil

GHS Hazard Classification(s):

Skin Irritation Category 2

Eye Irritation Category 2B

Hazard Statement(s):

H320: Causes eye irritation

H315: Causes skin irritation

Precautionary Statement(s):

P264: Wash hands thoroughly after handling

P280: Wear protective gloves/protective clothing/eye protection/face protection

EU HAZARD CLASSIFICATION PER DIRECTIVE 1999/45/EC:

[Xi] Irritant

Risk Phrases:

R36/38: Irritating to eyes and skin

Safety Phrases:

S24/25: Avoid contact with skin and eyes

S37/39: Wear suitable gloves and eye/face protection

SAFETY DATA SHEET

PennGrade Synthetic Blend Motor Oil – All Viscosities

HEALTH HAZARDS OR RISKS FROM EXPOSURE:

ACUTE:

EYE: Expected to cause mild irritation of the eye if exposed to liquid spray or mist. May cause tearing, or burning of the eyes.

SKIN: May cause mild skin irritation from prolonged or repeated skin contact. Symptoms of irritation may include redness, drying, and cracking of the skin.

INHALATION: No significant adverse health effects are expected to occur upon short-term exposure

INGESTION: Ingestion can cause mild irritation of the digestive tract or cause a laxative effect. Because of the low viscosity of this material, this material can enter the lungs directly by aspiration during swallowing or vomiting. If aspirated into lungs, this material can cause severe lung damage.

CHRONIC: Prolonged or repeated skin contact can cause mild irritation and inflammation characterized by drying, cracking, (dermatitis) or oil acne.

TARGET ORGANS: ACUTE: Eye, Skin

CHRONIC: Skin

SECTION 3 - COMPOSITION and INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS:	CAS #	EINECS #	ICSC #	WT %	HAZARD CLASSIFICATION; RISK PHRASES
Highly Refined Mineral Oil	See Note Below	Various	Not Listed	>70%	HAZARD CLASSIFICATION: Self Classified: [X1] Irritant RISK PHRASES: R36/38
Balance of other ingredients are non-hazardous or less than 1% in concentration (or 0.1% for carcinogens, reproductive toxins, or respiratory sensitizers).					

NOTE: This product can contain any of the following highly refined petroleum base stocks: 64742-01-4, 64742-54-7, 64742-58-1, 64741-88-4, 72623-84-8, 72623-87-1, 64742-46-7, 64742-57-0, 64742-62-7, 64741-89-5, 72623-85-9, 8042-47-5, 64742-52-5, 64742-55-8, 64742-65-0, 72623-83-7, 72623-86-0

ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-2010 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR, EU Directives and the Japanese Industrial Standard JIS Z 7250: 2000.

SECTION 4 - FIRST-AID MEASURES

Contaminated individuals of chemical exposure must be taken for medical attention if any adverse effect occurs. Rescuers should be taken for medical attention, if necessary. Take copy of label, bill of lading and/or MSDS to health professional with contaminated individual.

EYE CONTACT: If product enters the eyes, open eyes while under gentle running water for at least 15 minutes. Remove contact lenses if worn. Seek medical attention if irritation persists.

SKIN CONTACT: Wash skin thoroughly after handling. Seek medical attention if irritation develops and persists. Remove contaminated clothing. Launder before re-use.

INHALATION: If breathing becomes difficult, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek medical attention if breathing difficulty continues.

INGESTION: If product is swallowed, call physician or poison control center for most current information. If professional advice is not available, do not induce vomiting. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or who cannot swallow. Seek medical advice. Take a copy of the label and/or MSDS with the victim to the health professional.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing skin problems may be aggravated by prolonged contact.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and reduce over-exposure.

SECTION 5 - FIRE-FIGHTING MEASURES

FLASH POINT: >185°C (>365°F) ASTM D-92

AUTOIGNITION TEMPERATURE: Not Established

FLAMMABLE LIMITS (in air by volume, %): Lower (LEL): Not Available Upper (UEL): Not Available

FIRE EXTINGUISHING MATERIALS: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

SAFETY DATA SHEET

PennGrade Synthetic Blend Motor Oil – All Viscosities

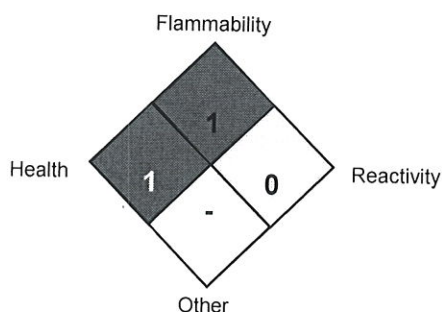
UNUSUAL FIRE AND EXPLOSION HAZARDS: Do not use straight streams of water. This product is a combustible liquid at temperatures above flash point.

Explosion Sensitivity to Mechanical Impact: Not Sensitive.

Explosion Sensitivity to Static Discharge: Not Sensitive

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Isolate materials not yet involved in the fire and protect personnel. Move containers from fire area if this can be done without risk; otherwise, cool with carefully applied water spray. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

NFPA RATING SYSTEM



HMIS RATING SYSTEM

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM			
HEALTH HAZARD (BLUE)			1
FLAMMABILITY HAZARD (RED)			1
PHYSICAL HAZARD (YELLOW)			0
PROTECTIVE EQUIPMENT			
EYES	RESPIRATORY	HANDS	BODY
	See Sect 8		See Sect 8
For Routine Industrial Use and Handling Applications			

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

SECTION 6 - ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Personnel should be trained for spill response operations.

SPILLS: Contain spill if safe to do so. Product may create a slip hazard if not cleaned up. Prevent entry into drains, sewers, and other waterways. Soak up with an absorbent material and place in an appropriate container for disposal. Dispose of in accordance with applicable Federal, State, and local procedures (see Section 13, Disposal Considerations).

If spill of any amount is made into or upon navigable waters, the contiguous zone or adjoining shorelines, notify the National Response Center (phone number 800-424-8802).

Dispose of in accordance with applicable Federal, State, and local procedures (see Section 13, Disposal Considerations).

SECTION 7 - HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing vapors/mists generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: Containers of this product must be properly labeled. Store containers in a cool, dry location. Keep container tightly closed when not in use. Protect from physical damage.

Other precautions: For professional industrial use only. Good personal hygiene is important. Empty containers retain residue which can be dangerous. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other ignition sources; they may explode and cause injury or death

SECTION 8 - EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS/GUIDELINES:

Chemical Name	CAS#	ACGIH TWA	OSHA TWA	SWA
Highly Refined Petroleum Base Stocks	Various	5 mg/m ³ Oil Mist	5 mg/m ³ Oil Mist	5 mg/m ³ Oil Mist

SAFETY DATA SHEET

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Currently, International exposure limits are not established for the components of this product. Please check with competent authority in each country for the most recent limits in place.

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided above. Use local exhaust ventilation to control airborne vapor. Ensure eyewash/safety shower stations are available near areas where this product is used.

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132) or equivalent standard of Canada, or standards of EU member states (including EN 149 for respiratory PPE, and EN 166 for face/eye protection), and those of Japan. Please reference applicable regulations and standards for relevant details.

RESPIRATORY PROTECTION: Not normally required. Maintain airborne contaminant concentrations below guidelines listed above, if applicable. If necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, or EU member states.

EYE PROTECTION: Safety glasses or chemical goggles as appropriate to prevent eye contact. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards.

HAND PROTECTION: Use chemical resistant gloves to prevent skin contact. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.

BODY PROTECTION: Use body protection appropriate to prevent contact (e.g. lab coat, overalls). If necessary, refer to appropriate Standards of Canada, or appropriate Standards of the EU, Australian Standards, or relevant Japanese Standards.

SECTION 9 - PHYSICAL and CHEMICAL PROPERTIES

PHYSICAL STATE:	Liquid
APPEARANCE & ODOR:	Amber colored liquid with a petroleum hydrocarbon odor.
ODOR THRESHOLD (PPM):	Mild
VAPOR PRESSURE (mmHg):	<0.013 hPa (0.1 mm Hg) at 20°C
VAPOR DENSITY (AIR=1):	No Data Available
EVAPORATION RATE (nBuAc = 1):	No Data Available
BOILING POINT (C°):	>°260C (>500°F)
MELTING POINT (C°):	No Data Available
pH:	No Data Available
SPECIFIC GRAVITY:	0.8625 at 60°F
VISCOSITY:	No Data Available
SOLUBILITY IN WATER (%):	Negligible

SECTION 10 - STABILITY and REACTIVITY

STABILITY: Product is stable

DECOMPOSITION PRODUCTS: Material does not decompose under normal storage conditions. When heated to decomposition this product produces carbon dioxide and carbon monoxide.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong oxidizers

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials. Excessive heat and high energy sources of ignition.

SECTION 11 - TOXICOLOGICAL INFORMATION

TOXICITY DATA: Toxicity data is not available for mixture: Information given is based on data on the components and toxicology of similar products.

Acute Oral Toxicity LD50 >5,000 mg/kg

Acute Dermal Toxicity LD50 >5,000 mg/kg

SUSPECTED CANCER AGENT: This product does not contain an ingredient(s) that are found on one or more of the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC and therefore is not considered to be, or suspected to be a cancer-causing agent by these agencies.

IRRITANCY OF PRODUCT: Contact with this product can be irritating to exposed skin and eyes.

SAFETY DATA SHEET

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REPRODUCTIVE TOXICITY INFORMATION: No information concerning the effects of this product and its components on the human reproductive system.

ADDITIONAL INFORMATION: Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible. Continuous contact with used engine oils has caused skin cancer in animal tests

SECTION 12 - ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: It is not expected to be biodegradable. Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: If applied to leaves, this product may kill grasses and small plants by interfering with transpiration and respiration. This product is not toxic to fish but may coat gill structures resulting in suffocation if spilled in shallow, running water. Product may be moderately toxic to amphibians by preventing dermal respiration. This product may cause gastrointestinal distress in birds and mammals through ingestion during pelage grooming.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on this product's effects on aquatic life.

SECTION 13 - DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains, or in water courses. Waste disposal must be in accordance with appropriate Federal, State, and local regulations, those of Canada, Australia, EU Member States and Japan.

SECTION 14 - TRANSPORTATION INFORMATION

US DOT; IATA; IMO; ADR:

THIS PRODUCT IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Non-Regulated Material

HAZARD CLASS NUMBER and DESCRIPTION: : None

UN IDENTIFICATION NUMBER: None

PACKING GROUP: None

DOT LABEL(S) REQUIRED: None

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2004): None

MARINE POLLUTANT: None of the ingredients are classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B)

U.S. DEPARTMENT OF TRANSPORTATION (DOT) SHIPPING REGULATIONS:

This product is not classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:

This product is not classified as Dangerous Goods, per regulations of Transport Canada.

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA):

This product is not classified as Dangerous Goods, by rules of IATA:

INTERNATIONAL MARITIME ORGANIZATION (IMO) DESIGNATION:

This product is not classified as Dangerous Goods by the International Maritime Organization.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR):

This product is not classified by the United Nations Economic Commission for Europe to be dangerous goods.

SECTION 15 - REGULATORY INFORMATION

UNITED STATES REGULATIONS

SARA REPORTING REQUIREMENTS: This product components are subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act., as follows:

SARA 313 Reporting: Zinc Dialkyl Dithiophosphate CAS#68649-42-3 <0.5%

TSCA: All components in this product are listed on the US Toxic Substances Control Act (TSCA) inventory of chemicals.

SAFETY DATA SHEET

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SARA 311/312:

Acute Health: Yes Chronic Health: No Fire: No Reactivity: No

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): None

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): This product does not contain ingredient(s) which are on the California Proposition 65 lists.

ANADIAN REGULATIONS:

CANADIAN DSL/NDL INVENTORY STATUS: All of the components of this product are on the DSL Inventory

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: No component of this product is on the CEPA First Priorities Substance Lists.

CANADIAN WHMIS CLASSIFICATION and SYMBOLS: This product is categorized as "Not Controlled", as per the Controlled Product Regulations

EUROPEAN ECONOMIC COMMUNITY INFORMATION:

EU LABELING AND CLASSIFICATION:

Classification of the mixture according to Regulation (EC) No1272/2008. See section 2 for details.

AUSTRALIAN INFORMATION FOR PRODUCT:

AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) STATUS: All components of this product are listed or exempt on the AICS.

STANDARD FOR THE UNIFORM SCHEDULING OF DRUGS AND POISONS: Not applicable.

JAPANESE INFORMATION FOR PRODUCT:

JAPANESE MINISTER OF INTERNATIONAL TRADE AND INDUSTRY (MITI) STATUS: The components of this product are not listed as Class I Specified Chemical Substances, Class II Specified Chemical Substances, or Designated Chemical Substances by the Japanese MITI.

INTERNATIONAL CHEMICAL INVENTORIES:

Listing of the components on individual country Chemical Inventories is as follows:

Asia-Pac:	Listed
Australian Inventory of Chemical Substances (AICS):	Listed
Korean Existing Chemicals List (ECL):	Listed
Japanese Existing National Inventory of Chemical Substances (ENCS):	Listed
Philippines Inventory of Chemicals and Chemical Substances (PICCS):	Listed
Swiss Giftliste List of Toxic Substances:	Listed
U.S. TSCA:	Listed

SECTION 16 - OTHER INFORMATION

Latest revision: 9 December 2015, SDS created


Disclaimer: The information in this document is believed to be correct as of the date issued. **HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE.** This information and product are furnished on the condition that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose and on the condition that he assume the risk of his use thereof.

Safety Data Sheet

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

Material Name	:	Ethylene Glycol
Other names / Synonyms	:	Ethane diol 1,2 MEG Glycol Dihydroxy ethane 1,2 Ethylene Glycol
Recommended use / Restrictions of use	:	Chemical intermediate. Advice in this document relates only to product as originally supplied. Other derivative chemicals will have different properties and hazards. Advice should be sought on their safe handling and use.
Supplier	:	Shell Eastern Trading (PTE) Ltd 9 North Buona Vista Drive, #07-01, Tower 1, The Metropolis Singapore 138588 Singapore
Telephone	:	+65-6384 8000
Fax	:	
Emergency Telephone Number	:	+44 (0) 151 350 4595

2. HAZARDS IDENTIFICATION

GHS Classification	:	Acute toxicity, Category 4 Specific target organ toxicity - repeated exposure, Category 2, Kidney.
GHS Label Elements		
Symbol(s)	:	
Signal Words	:	Warning
GHS Hazard statements	:	PHYSICAL HAZARDS: Not classified as a physical hazard under GHS criteria. HEALTH HAZARDS: H302: Harmful if swallowed. H373: May cause damage to organs or organ systems through prolonged or repeated exposure. Kidney. ENVIRONMENTAL HAZARDS: Not classified as an environmental hazard under GHS criteria.

Safety Data Sheet**GHS Precautionary Statements**

- Prevention** : P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
- Response** : P301+P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P330: Rinse mouth.
P314: Get medical advice/attention if you feel unwell.
- Storage** : No precautionary phrases.
- Disposal:** : P501: Dispose of contents and container to appropriate waste site or reclaimer in accordance with local and national regulations.
- Other Hazards which do not result in classification** : Not classified as flammable but will burn.
Ingestion may cause drowsiness and dizziness.
Inhalation of vapours or mists may cause irritation to the respiratory system.
- Aggravated Medical Condition** : Pre-existing medical conditions of the following organ(s) or organ system(s) may be aggravated by exposure to this material: Kidney.

3. COMPOSITION/INFORMATION ON INGREDIENTS

- Chemical Identity** : 1,2-Ethane diol.
Synonyms : Ethane diol 1,2
MEG
Glycol
Dihydroxy ethane 1,2
Ethylene Glycol
- CAS No.** : 107-21-1
INDEX No. : 603-027-00-1
EINECS No. : 203-473-3

Classification of components according to GHS

Chemical Name	Synonyms	CAS	Hazard Class (category)	Hazard statement	Conc.
Ethylene Glycol		107-21-1	Acute Tox., 4; STOT RE, 2;	H302;H373;	> 95.00 %W

4. FIRST-AID MEASURES

- General Information** : Not expected to be a health hazard when used under normal

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conditions.

The first aid measures for different exposure routes:

- Inhalation** : Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment.
- Skin Contact** : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention.
- Eye Contact** : Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.
- Ingestion** : DO NOT DELAY. Do not induce vomiting. If victim is alert, rinse mouth and drink 1/2 to 1 glass of water to help dilute the material. Do not give liquids to a drowsy, convulsing, or unconscious person. Transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.

Notes to physician

- Most important symptoms and effects, both acute and delayed** : Kidney toxicity may be recognized by blood in the urine or increased or decreased urine flow. Other signs and symptoms can include nausea, vomiting, abdominal cramps, diarrhoea, lumbar pain shortly after ingestion, and possibly narcosis and death. Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision. Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters. Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing.
- Immediate medical attention, special treatment** : IMMEDIATE TREATMENT IS EXTREMELY IMPORTANT! May cause significant renal, respiratory, and CNS toxicity. May cause significant acidosis. Call a doctor or poison control center for guidance.

5. FIRE-FIGHTING MEASURES

- Specific Hazards** : Material will not burn unless preheated. Carbon monoxide may be evolved if incomplete combustion occurs. Containers exposed to intense heat from fires should be cooled with large quantities of water.
- Suitable Extinguishing Media** : Alcohol-resistant foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
- Unsuitable Extinguishing Media** : Do not use water in a jet.
- Protective Equipment for Firefighters** : Wear full protective clothing and self-contained breathing apparatus.
- Other Advice** : Evacuate the area of all non-essential personnel. Keep adjacent containers cool by spraying with water.

6. ACCIDENTAL RELEASE MEASURES

- Personal Precautions, Protective Equipment and Emergency Procedures** : Avoid contact with spilled or released material. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet.

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- Environmental Precautions** : Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers.
Use appropriate containment to avoid environmental contamination.
Ventilate contaminated area thoroughly.
- Methods and Material for Containment and Cleaning Up** : Contain run-off from residue flush and dispose of properly. Soak up residue with an absorbent such as clay, sand or other suitable material.
For small liquid spills (< 1 drum), transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
- Additional Advice** : See Chapter 13 for information on disposal. Observe all relevant local regulations. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.
Dike and contain spill water.

7. HANDLING AND STORAGE

- General Precautions** : Avoid breathing vapours or contact with material. Only use in well ventilated areas. Wash thoroughly after handling. On guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
- Precautions for Safe Handling** : Use local exhaust extraction over processing area. Handle and open container with care in a well-ventilated area. Do not empty into drains. When handling product in drums, safety footwear should be worn and proper handling equipment should be used.
Handling Temperature: Ambient. 60 °C maximum
- Conditions for Safe Storage** : Tanks must be clean, dry and rust-free. Keep container tightly closed. Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat. Cleaning, inspection and maintenance of storage tanks is a specialist operation which requires the implementation of strict procedures and precautions. Drums should be stacked to a maximum of 3 high. Storage Temperature: Ambient. 60 °C maximum
- Product Transfer** : Keep containers closed when not in use. Do not pressurize drum containers to empty.
- Recommended Materials** : Stainless steel. Mild steel. Carbon steel
- Other Advice** : Ensure that all local regulations regarding handling and storage

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facilities are followed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

If the American Conference of Governmental Industrial Hygienists (ACGIH) value is provided on this document, it is provided for information only.

Occupational Exposure Limits

Material	Source	Type	ppm	mg/m3	Notation
Ethylene Glycol	ACGIH	Ceiling		100 mg/m3	
		Aerosol.			
	SG OEL	STEL	50 ppm	127 mg/m3	

Additional Information : Wash hands before eating, drinking, smoking and using the toilet. Launder contaminated clothing before re-use.

Biological Exposure Index (BEI)

No biological limit allocated.

Appropriate Engineering Controls : No exposure controls are ordinarily required under normal conditions of use. It is good general industrial hygiene practice to minimize exposure to the material.

Individual Protection Measures : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Respiratory Protection : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g., airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapors [Type A/Type P boiling point > 65°C (149°F)] meeting EN14387 and EN143.

Hand Protection : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739, AS/NZS:2161) made from the following materials may provide suitable chemical protection: Longer term protection: PVC. Neoprene rubber. Nitrile rubber. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

Eye Protection : Chemical splash goggles (chemical monogoggles).

Body protection : Skin protection not ordinarily required beyond standard issue

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Thermal hazards	:	work clothes. Chemical resistant gloves/gauntlets, boots, and apron.
Monitoring Methods	:	Not applicable
Environmental Exposure Controls	:	Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate. Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available. National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods http://www.cdc.gov/niosh/ Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha.gov/ Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances, http://www.hse.gov.uk/ Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA), Germany. http://www.dguv.de/inhalt/index.jsp L'Institut National de Recherche et de Sécurité, (INRS), France http://www.inrs.fr/accueil
Environmental Exposure Controls	:	The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate ventilation to control airborne concentrations. Exhaust emission systems should be designed in accordance with local conditions; the air should always be moved away from the source of vapour generation and the person working at this point. Eye washes and showers for emergency use. Firewater monitors and deluge systems are recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Colourless Slightly viscous liquid.
Odour	:	Mild
Odour threshold	:	Data not available.
pH	:	Not applicable
Initial Boiling Point and Boiling Range	:	244 - 250 °C / 471 - 482 °F
Melting / freezing point	:	-10 °C / 14 °F
Flash point	:	115 - 116 °C / 239 - 241 °F(Pensky-Martens Closed Cup)
Upper / lower Flammability or Explosion limits	:	3 - 7 %(V) 3.2 - 28 %(V)
Auto-ignition temperature	:	225 °C / 437 °F 413 °C / 775 °F
Flammability (solid, gas)	:	No, product cannot ignite due to static electricity.
Vapour pressure	:	< 1.3 Pa at 20 °C / 68 °F < 10 Pa at 20 °C / 68 °F
Relative Density	:	Data not available.
Density	:	1,116 kg/m ³ at 20 °C / 68 °F
Water solubility	:	at 20 °C / 68 °F Completely Soluble

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Solubility in other solvents	: Data not available.
n-octanol/water partition coefficient (log Pow)	: -1.93at 20 °C / 68 °F
Decomposition temperature	: Note:: Stable under normal conditions of use., Reacts with strong oxidising agents.
Dynamic viscosity	: Data not available.
Kinematic viscosity	: 33 mm ² /s at 20 °C / 68 °F
Vapour density (air=1)	: 2.14
Electrical conductivity	: Electrical conductivity: > 10 000 pS/m, A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid., This material is not expected to be a static accumulator.
Stability	: Stable.
Evaporation rate (nBuAc=1)	: > 0.01
Molecular weight	: 62.07 g/mol
Hygroscopicity	: Hygroscopic.

10. STABILITY AND REACTIVITY

Chemical stability	: Stable under normal conditions of use. Reacts with strong oxidising agents.
Conditions to Avoid	: High Temperature.
Incompatible Materials	: Strong oxidising agents. Strong acids. Strong bases.
Hazardous Decomposition Products	: Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases, including carbon monoxide, carbon dioxide and other organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.
Possibility of Hazardous Reactions	: Data not available.
Sensitivity to Static Discharge	: No, product cannot ignite due to static electricity.

11. TOXICOLOGICAL INFORMATION**Information on Toxicological effects**

Basis for Assessment	: Information given is based on product testing.
Likely Routes of Exposure	: Skin and eye contact are the primary routes of exposure although exposure may occur through inhalation or following accidental ingestion.
Acute Toxicity	
Acute Oral Toxicity	: Harmful if swallowed. LD50 >300 - <=2000 mg/kg There is a marked difference in acute oral toxicity between rodents and man, man being more susceptible than rodents. The estimated fatal dose for man is 100 millilitres (1/2 cup). This material has also been shown to be toxic and potentially lethal by ingestion to cats and dogs.
Acute Dermal Toxicity	: Expected to be of low toxicity: LD50 >5000 mg/kg
Acute Inhalation	: Low toxicity by inhalation.

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Toxicity	
Skin Corrosion/Irritation	: Slightly irritating to skin.
Serious Eye Damage/Irritation	: Slightly irritating to the eye.
Respiratory Irritation	: Repeated inhalation of vapours and mists is expected to cause irritation of the respiratory tract.
Respiratory or skin sensitisation	: Not expected to be a sensitiser.
Aspiration hazard	: Not considered an aspiration hazard.
Germ Cell Mutagenicity	: No evidence of mutagenic activity.
Carcinogenicity	: Not carcinogenic in animal studies.
Reproductive and Developmental Toxicity	: Does not impair fertility. Not a developmental toxicant. Causes foetotoxicity in animals; considered to be secondary to maternal toxicity.
Specific target organ toxicity - single exposure	: Ingestion may cause drowsiness and dizziness. Inhalation of vapours or mists may cause irritation to the respiratory system.
Specific target organ toxicity - repeated exposure	: May cause damage to organs or organ systems through prolonged or repeated exposure. Kidney: can cause kidney damage.

12. ECOLOGICAL INFORMATION

Basis for Assessment	: Information given is based on product testing.
Ecotoxicity:	
Acute Toxicity	
Fish	: Practically non toxic: LC/EC/IC50 > 100 mg/l
Aquatic crustacea	: Practically non toxic: LC/EC/IC50 > 100 mg/l
Algae/aquatic plants	: Practically non toxic: LC/EC/IC50 > 100 mg/l
Microorganisms	: Practically non toxic: LC/EC/IC50 > 100 mg/l
Chronic Toxicity	
Fish	: NOEC/NOEL > 100 mg/l
Aquatic crustacea	: NOEC/NOEL > 100 mg/l
Mobility	: If product enters soil, one or more constituents will be mobile and may contaminate groundwater. Dissolves in water.
Persistence/degradability	: Readily biodegradable.
Bioaccumulative Potential	: Does not have the potential to bioaccumulate significantly.

13. DISPOSAL CONSIDERATIONS

Material Disposal	: Recover or recycle if possible. Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand. Remove all packaging for recovery
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Safety Data Sheet

- or waste disposal. Do not dispose into the environment, in drains or in water courses. Waste product should not be allowed to contaminate soil or water.
- Container Disposal** : Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
- Local Legislation** : Disposal should be in accordance with applicable regional, national, and local laws and regulations.

14. TRANSPORT INFORMATION**Land (as per ADR classification): Not regulated**

This material is not classified as dangerous under ADR regulations.

IMDG

This material is not classified as dangerous under IMDG regulations.

IATA (Country variations may apply)

This material is either not classified as dangerous under IATA regulations or needs to follow country specific requirements.

- Additional Information** : **This product may be transported under nitrogen blanketing. Nitrogen is an odourless and invisible gas. Exposure to nitrogen may cause asphyxiation or death. Personnel must observe strict safety precautions when involved with a confined space entry.**

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Chemical Inventory Status

- AICS : Listed.
DSL : Listed.
INV (CN) : Listed.
ENCS (JP) : Listed. (2)-230
TSCA : Listed.
EINECS : Listed. 203-473-3
KECI (KR) : Listed. KE-13169
PICCS (PH) : Listed.

Local Regulations

- Workplace Safety and Health Act & Workplace Safety and Health (General Provision) Regulations : This product is subject to the SDS, Labelling, PEL and other requirements in the Act/ Regulations.
- Environmental Protection and Management Act and : This product is not subject to control under this Act/ Regulation.

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Environmental Protection
and Management
(Hazardous Substances)
Regulations

Maritime and Port Authority
of Singapore (Dangerous
Goods, Petroleum and
Explosives) Regulations

Fire Safety Act and Fire
Safety (Petroleum &
Flammable Materials)
Regulations

: This product is not subject to control under this Act/ Regulation.

: This product is not subject to control under this Act/ Regulation.

16. OTHER INFORMATION**GHS Hazard statements**

H302 Harmful if swallowed.
H373 May cause damage to organs or organ systems through prolonged or repeated exposure.

SDS Version Number : 2.0

SDS Effective Date : 25.03.2014

SDS Revisions : A vertical bar (|) in the left margin indicates an amendment from the previous version.

Uses and Restrictions : Do not use in the manufacture or preparation of foods or pharmaceuticals.
Keep out of reach of children and pets.
Do not use in theatrical fogs or other artificial smoke generator applications.

SDS Distribution : The information in this document should be made available to all who may handle the product

Disclaimer : This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

SAFETY DATA SHEET

SECTION 1

PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: EXXAL™ 13 ALCOHOL
Product Description: Alcohol
Product Code: 9666
Intended Use: Chemical feedstock

COMPANY IDENTIFICATION

Supplier: **CIOL - EXXONMOBIL CHEMICAL CANADA**
Division of Canada Imperial Oil Limited, an Affiliate of Exxon Mobil Corporation
240 4TH AVENUE S.W.
CALGARY, ALBERTA. T2P 3M9 Canada
24 Hour Health Emergency 1-866-232-9563
Transportation Emergency Phone 1-866-232-9563
Product Technical Information 1-800-663-4109

SECTION 2

HAZARDS IDENTIFICATION

This material is not hazardous according to regulatory guidelines (see (M)SDS Section 15).

Other hazard information:

HAZARD NOT OTHERWISE CLASSIFIED (HNOC): None as defined under 29 CFR 1910.1200.

PHYSICAL / CHEMICAL HAZARDS

No significant hazards.

HEALTH HAZARDS

Mildly irritating to skin. May be irritating to the eyes, nose, throat, and lungs. If swallowed, may be aspirated and cause lung damage.

ENVIRONMENTAL HAZARDS

Expected to be very toxic to aquatic organisms.

NFPA Hazard ID:	Health: 1	Flammability: 1	Reactivity: 0
HMIS Hazard ID:	Health: 1	Flammability: 1	Reactivity: 0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 3	COMPOSITION / INFORMATION ON INGREDIENTS
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This material is defined as a complex substance.

Hazardous Substance(s) or Complex Substance(s) required for disclosure

Name	CAS#	Concentration*	GHS Hazard Codes
ALCOHOLS C11-C14-ISO-, C13-RICH	68526-86-3	100 %	H305, H316, H400(M factor 1)

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

As per paragraph (i) of 29 CFR 1910.1200, formulation is considered a trade secret and specific chemical identity and exact percentage (concentration) of composition may have been withheld. Specific chemical identity and exact percentage composition will be provided to health professionals, employees, or designated representatives in accordance with applicable provisions of paragraph (i).

SECTION 4	FIRST AID MEASURES
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INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

Seek immediate medical attention. Do not induce vomiting.

SECTION 5	FIRE FIGHTING MEASURES
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EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, alcohol-resistant foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water or Regular Foam

Product Name: EXXAL™ 13 ALCOHOL

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FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Incomplete combustion products, Oxides of carbon, Smoke, Fume

FLAMMABILITY PROPERTIES

Flash Point [Method]: 122°C (252°F) [ASTM D-93]

Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D

Autoignition Temperature: 260°C (500°F)

SECTION 6	ACCIDENTAL RELEASE MEASURES
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NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Do not touch or walk through spilled material. Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do it without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek advice of a specialist

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7	HANDLING AND STORAGE
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HANDLING

Avoid contact with skin. Flammable levels of hydrogen may build up in the headspace during shipping. As a precautionary measure, truck, rail and ISO container shipments may have been purged with nitrogen before loading. Nitrogen is a simple asphyxiant and containers should be opened in a well ventilated area. For marine shipments, procedures for closed gauging and sampling should be employed. Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Prevent small spills and leakage to avoid slip hazard. DO NOT handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight.

Loading/Unloading Temperature: [Ambient]

Transport Temperature: [Ambient]

Transport Pressure: [Ambient]

Static Accumulator: This material is not a static accumulator.

STORAGE

Do not store in open or unlabelled containers. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be grounded and bonded.

Storage Temperature: [Ambient]

Storage Pressure: [Ambient]

Suitable Containers/Packing: Tank Trucks; Tank Cars; Drums

Suitable Materials and Coatings (Chemical Compatibility): Carbon Steel; Stainless Steel; Aluminum; Polypropylene; PTFE; Polyethylene

Unsuitable Materials and Coatings: Natural Rubber; Butyl Rubber; Vinyls

SECTION 8

EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Substance Name	Form	Limit / Standard	NOTE	Source
ALCOHOLS C11-C14-ISO-, C13-RICH	TWA	50 ppm	N/A	ExxonMobil

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

No biological limits allocated.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Adequate ventilation should be provided so that exposure limits are not exceeded.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

Half-face filter respirator

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

Chemical resistant gloves are recommended.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

Chemical/oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9	PHYSICAL AND CHEMICAL PROPERTIES
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Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid

Form: Clear

Color: Colorless

Odor: Alcohol

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Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 20 °C): 0.85

Density (at 20 °C): 850 kg/m³ (7.09 lbs/gal, 0.85 kg/dm³)

Flammability (Solid, Gas): N/A

Flash Point [Method]: 122°C (252°F) [ASTM D-93]

Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D

Autoignition Temperature: 260°C (500°F)

Boiling Point / Range: 250°C (482°F) - 270°C (518°F)

Decomposition Temperature: N/D

Vapor Density (Air = 1): > 1 at 101 kPa

Vapor Pressure: < 0.001 kPa (0.01 mm Hg) at 20 °C | 0.003 kPa (0.02 mm Hg) at 50°C
| 0.2 kPa (1.5 mm Hg) at 100°C

Evaporation Rate (n-butyl acetate = 1): < 0.01

pH: N/A

Log Pow (n-Octanol/Water Partition Coefficient): N/D

Solubility in Water: Negligible

Viscosity: 16.6 cSt (16.6 mm²/sec) at 40 °C | 47 cSt (47 mm²/sec) at 20°C

Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: <-40°C (-40°F)

Melting Point: N/A

Molecular Weight: 200

Hygroscopic: No

Coefficient of Thermal Expansion: 0.0008 VVDEGC

SECTION 10

STABILITY AND REACTIVITY

REACTIVITY: See sub-sections below.

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11

TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: (Rat) 6 hour(s) LC50 > 12.2 ppm (Max attainable vapor conc.)	Minimally Toxic. Based on test data for the material. Test(s) equivalent or similar to OECD Guideline 403
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling

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	temperatures.
Ingestion	
Acute Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for the material. Test(s) equivalent or similar to OECD Guideline 420
Skin	
Acute Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for the material. Test(s) equivalent or similar to OECD Guideline 402
Skin Corrosion/Irritation: Data available.	Mildly irritating to skin with prolonged exposure. Based on test data for the material. Test(s) equivalent or similar to OECD Guideline 404
Eye	
Serious Eye Damage/Irritation: Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for the material. Test(s) equivalent or similar to OECD Guideline 405
Sensitization	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: Data available.	Not expected to be a skin sensitizer. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 406
Aspiration: Data available.	May be harmful if swallowed and enters airways. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: Data available.	Not expected to be a germ cell mutagen. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 471 473 476
Carcinogenicity: No end point data for material.	Not expected to cause cancer.
Reproductive Toxicity: Data available.	Not expected to be a reproductive toxicant. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 414 422
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: Data available.	Not expected to cause organ damage from prolonged or repeated exposure. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 407 410 422

OTHER INFORMATION

For the product itself:

Vapor concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects.

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The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12

ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be very toxic to aquatic organisms.

Material -- Not expected to demonstrate chronic toxicity to aquatic organisms.

MOBILITY

Material -- Expected to partition to sediment and wastewater solids. Minimally volatile.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Material -- Expected to be readily biodegradable.

Hydrolysis:

Material -- Transformation due to hydrolysis not expected to be significant.

Photolysis:

Material -- Transformation due to photolysis not expected to be significant.

Atmospheric Oxidation:

Material -- Expected to degrade rapidly in air

BIOACCUMULATION POTENTIAL

Material -- Potential to bioaccumulate is low.

ECOLOGICAL DATA

Ecotoxicity

Test	Duration	Organism Type	Test Results
Aquatic - Acute Toxicity	96 hour(s)	Oncorhynchus mykiss	LC50 0.42 mg/l: data for the material
Aquatic - Acute Toxicity	48 hour(s)	Daphnia magna	LC50 0.71 mg/l

Persistence, Degradability and Bioaccumulation Potential

Media	Test Type	Duration	Test Results
Water	Ready Biodegradability	28 day(s)	Percent Degraded 60.6
Water	Bioaccumulation		BCF >30-<=60

SECTION 13**DISPOSAL CONSIDERATIONS**

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Suitable routes of disposal are supervised incineration, preferentially with energy recovery, or appropriate recycling methods in accordance with applicable regulations and material characteristics at the time of disposal.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. **DO NOT PRESSURISE, 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.**

SECTION 14**TRANSPORT INFORMATION****LAND (DOT)**

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (Tridecyl alcohol)
Hazard Class & Division: 9
ID Number: 3082
Packing Group: III
Marine Pollutant: Yes
ERG Number: 171
Label(s): 9
Transport Document Name: UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (Tridecyl alcohol), 9, PG III, MARINE POLLUTANT

LAND (TDG): Not Regulated for Land Transport

Footnote: If shipped over water, product TDG classification as shown below for SEA (IMDG).

SEA (IMDG)

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Tridecyl Alcohol)
Hazard Class & Division: 9
EMS Number: F-A, S-F
UN Number: 3082
Packing Group: III

Product Name: EXXAL™ 13 ALCOHOL

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Marine Pollutant: Yes

Label(s): 9

Transport Document Name: UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (Tridecyl Alcohol), 9, PG III, MARINE POLLUTANT

AIR (IATA)

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (Tridecyl alcohol)

Hazard Class & Division: 9

UN Number: 3082

Packing Group: III

Label(s) / Mark(s): 9, EHS

Transport Document Name: UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (Tridecyl alcohol), 9, PG III

SECTION 15

REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: This material is not considered hazardous in accordance with OSHA HazCom 2012, 29 CFR 1910.1200.

Listed or exempt from listing/notification on the following chemical inventories: AICS, DSL, ENCS, IECSC, KECI, PICCS, TCSI, TSCA

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

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16

OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

Product Name: EXXAL™ 13 ALCOHOL

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KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):

H305: May be harmful if swallowed and enters airways; Aspiration, Cat 2

H316: Causes mild skin irritation; Skin Corr/Irritation, Cat 3

H400: Very toxic to aquatic life; Acute Env Tox, Cat 1

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Changes:

Section 15: National Chemical Inventory Listing information was modified.

Hazard Not Otherwise Classified information was modified.

Section 16: Revision Information - Implementation of GHS requirements phrase. information was deleted.

Section 15: Community RTK - Header information was modified.

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1. PRODUCT AND COMPANY IDENTIFICATION**1.1 Product identifiers**

Product name : n-Hexane

Product Number : 44843
Brand : Sigma-Aldrich
Index-No. : 601-037-00-0

CAS-No. : 110-54-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheetCompany : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USATelephone : +1 800-325-5832
Fax : +1 800-325-5052**1.4 Emergency telephone number**

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**Flammable liquids (Category 2), H225
Skin irritation (Category 2), H315
Reproductive toxicity (Category 2), H361
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Specific target organ toxicity - repeated exposure, Oral (Category 2), Nervous system, H373
Aspiration hazard (Category 1), H304
Acute aquatic toxicity (Category 2), H401
Chronic aquatic toxicity (Category 2), H411

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

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word : Danger

Hazard statement(s)

H225 : Highly flammable liquid and vapour.
H304 : May be fatal if swallowed and enters airways.
H315 : Causes skin irritation.
H336 : May cause drowsiness or dizziness.
H361 : Suspected of damaging fertility or the unborn child.
H373 : May cause damage to organs (Nervous system) through prolonged or

H411	repeated exposure if swallowed. Toxic to aquatic life with long lasting effects.
Precautionary statement(s)	
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.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Molecular weight	:	86.18 g/mol
CAS-No.	:	110-54-3
EC-No.	:	203-777-6
Index-No.	:	601-037-00-0

Hazardous components

Component	Classification	Concentration
n-Hexane	Flam. Liq. 2; Skin Irrit. 2; Repr. 2; STOT SE 3; STOT RE 2; Asp. Tox. 1; Aquatic Acute 2; Aquatic Chronic 2; H225, H304, H315, H336, H361, H373, H411	<= 100 %

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

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

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

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

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
n-Hexane	110-54-3	TWA	50.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Eye irritation Peripheral neuropathy Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	50.000000 ppm 180.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	500.000000 ppm 1,800.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	50 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Eye irritation Peripheral neuropathy Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	50 ppm 180 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	500 ppm 1,800 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	50 ppm 180 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		PEL	50 ppm 180 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
n-Hexane	110-54-3	2,5-Hexanedione	0.4 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

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/face 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: Nitrile rubber

Minimum layer thickness: 0.4 mm

Break through time: 480 min

Material tested: Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.2 mm

Break through time: 30 min

Material tested: Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

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, Flame retardant antistatic protective clothing., 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 respirator with multi-purpose combination (US) or type AXBEK (EN 14387) 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).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- | | |
|---------------------------------|--|
| a) Appearance | Form: liquid
Colour: colourless |
| b) Odour | No data available |
| c) Odour Threshold | No data available |
| d) pH | 7.0 |
| e) Melting point/freezing point | Melting point/range: -95 °C (-139 °F) - lit. |
| f) Initial boiling point and | 69 °C (156 °F) - lit. |

	boiling range	
g)	Flash point	-26.0 °C (-14.8 °F) - closed cup
h)	Evaporation rate	15.8
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 7.7 %(V) Lower explosion limit: 1.2 %(V)
k)	Vapour pressure	341.3 hPa (256.0 mmHg) at 37.7 °C (99.9 °F) 176.0 hPa (132.0 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.659 g/cm ³ at 25 °C (77 °F)
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	log Pow: 3.90 - 4.11
p)	Auto-ignition temperature	234.0 °C (453.2 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Vapours may form explosive mixture with air.

10.4 Conditions to avoid

Heat, flames and sparks. Extremes of temperature and direct sunlight.

10.5 Incompatible materials

Oxidizing agents

10.6 Hazardous decomposition products

Other decomposition products - No data available

Hazardous decomposition products formed under fire conditions. - Carbon oxides

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 25,000 mg/kg

LC50 Inhalation - Rat - 4 h - 48000 ppm

Dermal: No data available

No data available

Skin corrosion/irritation

Irritating to skin.

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Mild eye irritation

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

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

Overexposure may cause reproductive disorder(s) based on tests with laboratory animals. Suspected human reproductive toxicant Suspected of damaging fertility.

Specific target organ toxicity - single exposure

May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure

Ingestion - May cause damage to organs through prolonged or repeated exposure. - Nervous system

Aspiration hazard

May be fatal if swallowed and enters airways.

Additional Information

RTECS: MN9275000

Prolonged or repeated contact with skin may cause:; defatting, Dermatitis, Contact with eyes can cause:; Redness, Blurred vision, Provokes tears., Effects due to ingestion may include:; Gastrointestinal discomfort, Central nervous system depression, Lung irritation, chest pain, pulmonary edema, giddiness, slowed reaction time, slurred speech, Headache, Dizziness, Drowsiness, Unconsciousness

Testes. - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION**12.1 Toxicity**

Toxicity to fish LC50 - Pimephales promelas (fathead minnow) - 2.5 mg/l - 96.0 h

Toxicity to daphnia and other aquatic invertebrates EC50 - Daphnia magna (Water flea) - 3,878.00 mg/l - 48 h

Toxicity to algae EC50 - Chlorella vulgaris (Fresh water algae) - 12,840.00 mg/l - 3 h
EC50 - SKELETOMA - 0.30 mg/l - 8 h

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1208 Class: 3 Packing group: II
Proper shipping name: Hexanes
Reportable Quantity (RQ): 5000 lbs

Poison Inhalation Hazard: No

IMDG

UN number: 1208 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: HEXANES
Marine pollutant:yes

IATA

UN number: 1208 Class: 3 Packing group: II
Proper shipping name: Hexanes

15. REGULATORY INFORMATION

SARA 302 Components

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

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
n-Hexane	110-54-3	2007-07-01

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
n-Hexane	110-54-3	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
n-Hexane	110-54-3	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
n-Hexane	110-54-3	2007-07-01

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

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

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Asp. Tox.	Aspiration hazard
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H361	Suspected of damaging fertility or the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure if swallowed.
H401	Toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.
Repr.	Reproductive toxicity

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information

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Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6

Revision Date: 05/25/2016

Print Date: 09/28/2016



Safety Data Sheet Palatinol®111P- I (TOPANOL)

Version 1.0

Revision Date: 06/01/2015

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Palatinol®111P- I (TOPANOL)
Product Use Description : Industrial chemical

Manufacturer or supplier's details

Company : Nexeo Solutions LLC
Address : 3 Waterway Square Place Suite 1000
Woodlands, Tx. 77380
United States of America

Emergency telephone number:

Health North America: 1-855-NEXEO4U (1-855-639-3648)
Health International: 1-855-NEXEO4U (1-855-639-3648)
Transport North America: CHEMTREC 800.424.9300

Additional Information: : Responsible Party: Product Safety Group
E-Mail: msds@nexeosolutions.com
SDS Requests: 1-855-429-2661
SDS Requests Fax: 1-281-500-2370
Website: www.nexeosolutions.com

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Not a hazardous substance or mixture.

GHS Label element

Not a hazardous substance or mixture.

Potential Health Effects

Carcinogenicity:

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.

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.

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.

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.

Safety Data Sheet
Palatinol®111P- I (TOPANOL)

Version 1.0

Revision Date: 06/01/2015

Emergency Overview

Appearance	liquid
Colour	clear
Odour	mild
Hazard Summary	No information available.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Hazardous components

CAS-No.	Chemical Name	Concentration (%)
3648-20-2	1,2-Benzenedicarboxylic acid, 1,2-diundecyl ester	90 - 100
1843-03-4	Phenol, 4,4',4''-(1-methyl-1-propanyl-3-ylidene)tris[2-(1,1-dimethylethyl)-5-methyl-	0.1 - 1

SECTION 4. FIRST AID MEASURES

- General advice : Do not leave the victim unattended.
- If inhaled : If unconscious place in recovery position and seek medical advice.
If symptoms persist, call a physician.
- In case of skin contact : If skin irritation persists, call a physician.
If on skin, rinse well with water.
If on clothes, remove clothes.
- In case of eye contact : Flush eyes with water as a precaution.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.

Safety Data Sheet
Palatinol®111P- I (TOPANOL)

Version 1.0

Revision Date: 06/01/2015

SECTION 5. FIREFIGHTING MEASURES

- | | |
|---|---|
| Suitable extinguishing media | : Carbon dioxide (CO2)
Dry powder
Foam
Water spray |
| Unsuitable extinguishing media | : High volume water jet |
| Specific hazards during firefighting | : Do not allow run-off from fire fighting to enter drains or water courses. |
| Hazardous combustion products | : Carbon oxides |
| Specific extinguishing methods | : Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. |
| Further information | : Collect contaminated fire extinguishing water separately. This must not be discharged into drains. |
| Special protective equipment for firefighters | : Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA). |

NFPA Flammable and Combustible Liquids Classification:
Combustible Liquid Class III B

SECTION 6. ACCIDENTAL RELEASE MEASURES

- | | |
|---|---|
| Personal precautions, protective equipment and emergency procedures | : Use personal protective equipment. |
| Environmental precautions | : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities. |
| Methods and materials for containment and cleaning up | : Wipe up with absorbent material (e.g. cloth, fleece).
Keep in suitable, closed containers for disposal. |

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Palatinol®111P- I (TOPANOL)

Version 1.0

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SECTION 7. HANDLING AND STORAGE

- Advice on safe handling : Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Dispose of rinse water in accordance with local and national regulations.
- Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Electrical installations / working materials must comply with the technological safety standards.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Personal protective equipment

- Respiratory protection : No personal respiratory protective equipment normally required.
- Hand protection
Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves.
- Eye protection : Eye wash bottle with pure water
Tightly fitting safety goggles
- Skin and body protection : impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.
- Hygiene measures : When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

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Colour	: clear
Odour	: mild
Odour Threshold	: No data available
pH	: No data available
Freezing Point (Freezing Point)	: -9 °C (16 °F) (1,013 hPa)
Boiling Point (Boiling point/boiling range)	: 523 °C (973 °F) (1,013 hPa)
Flash point	: 252 °C (486 °F)
Evaporation rate	: No data available
Flammability (solid, gas)	: No data available
Burning rate	: No data available
Upper explosion limit	: No data available
Lower explosion limit	: No data available
Vapour pressure	: 0.8 mbar
Relative vapour density	: No data available
Relative density	: No data available
Density	: 0.955 g/cm ³ @ 20 °C (68 °F)
Bulk density	: No data available
Solubility(ies)	
Water solubility	: < 0.0001 mg/l @ 20 °C (68 °F)
Solubility in other sol- vents	: No data available
Partition coefficient: n- octanol/water	: log Pow: 11.49 @ 25 °C (77 °F)
Auto-ignition temperature	: > 300 °C
Thermal decomposition	: No data available

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Viscosity
Viscosity, dynamic : 70 mPa.s @ 20 °C (68 °F)

SECTION 10. STABILITY AND REACTIVITY

Reactivity : No dangerous reaction known under conditions of normal use.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : No hazards to be specially mentioned.

Conditions to avoid : Keep away from heat, flame, sparks and other ignition sources.
Extremes of temperature and direct sunlight.

Incompatible materials : Strong acids and strong bases
Strong oxidizing agents

Hazardous decomposition products : Carbon oxides

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Components:

3648-20-2:

Acute oral toxicity : LD50 (rat): > 5,000 mg/kg

Acute inhalation toxicity : Remarks: No data available

Acute dermal toxicity : LD50 (rabbit): > 2,000 mg/kg

1843-03-4:

Acute oral toxicity : LD50 (rat, male and female): > 5,000 mg/kg

Acute inhalation toxicity : Remarks: No data available

Acute dermal toxicity : LD50 (rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
GLP: yes

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Skin corrosion/irritation

Product:

Result: No skin irritation

Components:

3648-20-2:

Species: rabbit

Result: Mild skin irritation

1843-03-4:

Species: human skin

Method: OECD Test Guideline 439

Result: No skin irritation

GLP: yes

Serious eye damage/eye irritation

Product:

Result: No eye irritation

Components:

3648-20-2:

Species: rabbit

Result: Mild eye irritation

1843-03-4:

Species: Bovine cornea

Result: No eye irritation

Method: OECD Test Guideline 437

GLP: yes

Respiratory or skin sensitisation

Product:

Result: Did not cause sensitisation on laboratory animals.

Components:

1843-03-4:

Test Type: lymph node assay

Species: mouse

Method: OECD Test Guideline 429

Result: May cause sensitisation by skin contact.

GLP: yes

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Germ cell mutagenicity

Components:

3648-20-2:

Genotoxicity in vitro : Test Type: Ames test
Test species: Salmonella typhimurium
Result: negative

Germ cell mutagenicity-
Assessment : Tests on bacterial or mammalian cell cultures did not
show mutagenic effects.

1843-03-4:

Genotoxicity in vitro : Test Type: Mammalian cell gene mutation assay
Test species: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: positive
GLP: yes

: Test Type: Ames test
Test species: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
GLP: yes

: Test Type: Chromosome aberration test in vitro
Test species: Human lymphocytes
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative
GLP: yes

Germ cell mutagenicity-
Assessment : Tests on bacterial or mammalian cell cultures did not
show mutagenic effects.

Carcinogenicity

Components:

3648-20-2:

Carcinogenicity - Assessment : Carcinogenicity classification not possible from current
data.

1843-03-4:

Remarks: This information is not available.

Carcinogenicity - Assessment : Carcinogenicity classification not possible from current
data.

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assessment

data.

Reproductive toxicity

Components:

3648-20-2:

Reproductive toxicity - Assessment : Fertility classification not possible from current data.
Embryotoxicity classification not possible from current data.

1843-03-4:

Effects on fertility : Test Type: Screening test
Species: rat, male and female
Application Route: oral
Dose: 0, 100, 300, 1000 mg/kg bw/da
General Toxicity - Parent: NOAEL: 1,000 mg/kg bw
Fertility: NOAEL: 1,000 mg/kg body weight
Early Embryonic Development: NOAEL: 1,000 mg/kg body weight
Method: OECD Test Guideline 421
GLP: yes
Remarks: Information given is based on data obtained from similar substances.

Effects on foetal development : Remarks: No data available

Reproductive toxicity - Assessment : No evidence of adverse effects on sexual function and fertility, and on development, based on animal experiments.

STOT - single exposure

Product:No data available

Components:

3648-20-2:No data available

1843-03-4:No data available

STOT - repeated exposure

Product:No data available

Components:

3648-20-2:No data available

1843-03-4:No data available

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Repeated dose toxicity

Components:

1843-03-4:

Species: rat, male and female
NOAEL: 500
Application Route: Oral
Exposure time: 13 wk
Number of exposures: daily
Dose: 0, 100, 500, 5000 ppm in diet
GLP: yes

Aspiration toxicity

Product:

No aspiration toxicity classification

Further information

Product:

Remarks: No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

3648-20-2:

Toxicity to fish : Remarks: No data available

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 15 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae : Remarks: No data available

Ecotoxicology Assessment
Acute aquatic toxicity : Harmful to aquatic life.

Chronic aquatic toxicity : Harmful to aquatic life with long lasting effects.

1843-03-4:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 100 mg/l
Exposure time: 96 h
Test Type: static test

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	Method: OECD Test Guideline 203 GLP: yes
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202 GLP: yes
Toxicity to algae	: EC50 (Desmodesmus subspicatus): > 100 mg/l End point: Biomass Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 GLP: yes

Persistence and degradability

Components:

1843-03-4:

Biodegradability	: aerobic Inoculum: activated sludge Concentration: 15 mg/l Result: Not readily biodegradable. Biodegradation: 12 % Exposure time: 28 d Method: OECD Test Guideline 301B GLP: yes
------------------	--

Bioaccumulative potential

Components:

1843-03-4:

Partition coefficient: n-octanol/water	: log Pow: > 6.5 (25 °C)
--	--------------------------

Mobility in soil

No data available

Other adverse effects

No data available

Product:

Regulation	40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks	This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A



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+ B).

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Harmful to aquatic life with long lasting effects.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Dispose of in accordance with all applicable local, state and federal regulations.
For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact NEXO's Environmental Services Group at 800-637-7922.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

IATA (International Air Transport Association): Not regulated as a dangerous good

IMDG-Code: Not regulated as a dangerous good

DOT (Department of Transportation): Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION

OSHA Hazards : No OSHA Hazards

WHMIS Classification : D2B: Toxic Material Causing Other Toxic Effects

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

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- SARA 311/312 Hazards** : No SARA Hazards
- SARA 302** : SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
- SARA 313** : SARA 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.

Clean Air Act

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 12 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. Clean-Water Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

US State Regulations

Massachusetts Right To Know

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know

3648-20-2	1,2-Benzenedicarboxylic acid, 1,2-diundecyl ester	90 - 100 %
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New Jersey Right To Know

3648-20-2	1,2-Benzenedicarboxylic acid, 1,2-diundecyl ester	90 - 100 %
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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.

The components of this product are reported in the following inventories:

United States TSCA Inventory	: y (positive listing) (On TSCA Inventory)
-------------------------------------	---

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Canadian Domestic Substances List (DSL)	:	u (undetermined listing) (All components of this product are on the Canadian DSL.)
Australia Inventory of Chemical Substances (AICS)	:	u (undetermined listing) (On the inventory, or in compliance with the inventory)
New Zealand. Inventory of Chemical Substances	:	u (undetermined listing) (Not in compliance with the inventory)
Japan. ENCS - Existing and New Chemical Substances Inventory	:	u (undetermined listing) (On the inventory, or in compliance with the inventory)
Japan. ISHL - Inventory of Chemical Substances (METI)	:	u (undetermined listing) (On the inventory, or in compliance with the inventory)
Korea. Korean Existing Chemicals Inventory (KECI)	:	u (undetermined listing) (On the inventory, or in compliance with the inventory)
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	:	u (undetermined listing) (On the inventory, or in compliance with the inventory)
China. Inventory of Existing Chemical Substances in China (IECSC)	:	u (undetermined listing) (On the inventory, or in compliance with the inventory)
Switzerland. New notified substances and declared preparations	:	u (undetermined listing) (On the

Safety Data Sheet
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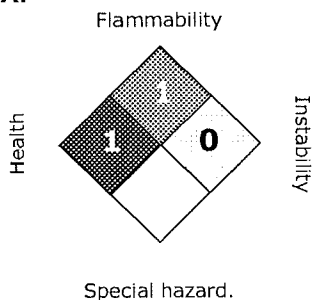
Version 1.0

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	inventory, or in compliance with the inventory)
--	---

SECTION 16. OTHER INFORMATION Further information

NFPA:



HMIS III:

HEALTH	1
FLAMMABILITY	1
PHYSICAL HAZARD	0

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 =Extreme, * = Chronic

The information accumulated is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made become available subsequently to the date hereof, we do not assume any responsibility for the results of its use. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This MSDS has been prepared by NEXEO™ Solutions EHS Product Safety Department (1-855-429-2661) MSDS@nexeosolutions.com.

Legacy MSDS: 000000153919

Material number: 16033072, 720943, 720942, 716448, 716447, 716446, 716445, 716442, 715786

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals

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EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50			Lethal Concentration 50%



11/12/2015

GAF MATERIALS CORPORATION
MSDS CONTACT
2400 EMOGENE STREET
MOBILE AL 36606
US

ATTN: MSDS COORDINATOR Enclosed is the Safety Data Sheet (SDS) related to your recent product purchase. NEXEO provides its customers with a SDS the first time a product is purchased or sampled for testing. In some cases, an SDS is distributed on an annual basis to comply with specific regulatory requirements even if there has been no revision. If the SDS is significantly changed, a copy of the revised sheet is sent to customers who purchased the product in the previous twelve months. The Material Safety Data Sheet is addressed to the attention of the MSDS COORDINATOR and is sent according to the contact information that Nexeo has on file for your organization. You should direct the SDS to those responsible for managing or designing operations involving the use of the product and those who use or handle the product and may potentially be exposed to it. NEXEO is committed to providing accurate health and safety information on the products that we manufacture or distribute. If you have any further questions or concerns, please feel free to contact us.

Nexeo Solutions LLC
EHS – Product Safety Group - SDS
1400 Woodloch Forest
Suite 200
The Woodlands, TX 77388
msds@nexeosolutions.com
US and Canada: 1-855-429-2661
Europe, Africa, and Middle East: +31 10 497 5000
Asia: 86-21-24024852

Ship To: 0000713970

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR
1910.1200

Version 11.0

Revision Date: 05/12/2015

Print Date: 05/13/2015

SECTION 1. IDENTIFICATION

Product name : Piperylene 75%

Product code : X2163

Manufacturer or supplier's details

Company : **Shell Chemical LP**
PO Box 2463
HOUSTON TX 77252-2463
USA

SDS Request : 1-800-240-6737

Customer Service : 1-855-697-4355

Emergency telephone number

Chemtrec Domestic (24 hr) : 1-800-424-9300

Chemtrec International (24 hr) : 1-703-527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Base chemical., Raw material for use in the chemical industry.

Restrictions on use : This product must not be used in applications other than the above without first seeking the advice of the supplier.

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids : Category 2

Acute toxicity (Oral) : Category 4

Acute toxicity (Dermal) : Category 4

Skin irritation : Category 2

Eye irritation : Category 2

Aspiration hazard : Category 1

Germ cell mutagenicity : Category 2

Carcinogenicity : Category 1B

Specific target organ toxicity : Category 3 (Respiratory system., Narcotic effects.)
- single exposure

Chronic aquatic toxicity : Category 2

GHS Label element

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR
1910.1200

Version 11.0

Revision Date: 05/12/2015

Print Date: 05/13/2015

Hazard pictograms

:



Signal word

: Danger

Hazard statements

: **PHYSICAL HAZARDS:**
H225 Highly flammable liquid and vapour.
HEALTH HAZARDS:
H302 Harmful if swallowed.
H312 Harmful in contact with skin.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H304 May be fatal if swallowed and enters airways.
H341 Suspected of causing genetic defects.
H350 May cause cancer.
H335 May cause respiratory irritation.
H336 May cause drowsiness or dizziness.
ENVIRONMENTAL HAZARDS:
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements

: **Prevention:**
P210 Keep away from open flames/hot surfaces. - No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P264 Wash hands thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.
Response:
P370+P378 In case of fire: Use appropriate media for extinction.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P312 Call a POISON CENTER or doctor/ physician if you feel unwell.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P330 Rinse mouth.
P331 Do NOT induce vomiting.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/ atten-

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

Version 11.0

Revision Date: 05/12/2015

Print Date: 05/13/2015

tion.

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P391 Collect spillage.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

P235 Keep cool.

P405 Store locked up.

Disposal:

P501 Dispose of contents and container to appropriate waste site or reclaimer in accordance with local and national regulations.

Other hazards which do not result in classification

Highly flammable.

This material is a static accumulator.

Even with proper grounding and bonding, this material can still accumulate an electrostatic charge.

If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.

Highly reactive.

May form explosive peroxides.

Will float and can be reignited on surface water.

Vapours are heavier than air. Vapours may travel across the ground and reach remote ignition sources causing a flashback fire danger.

May form flammable/explosive vapour-air mixture.

The classification of this material is based on OSHA HCS 2012 criteria.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Hazardous components

Chemical Name	Synonyms	CAS-No.	Concentration (%)
Distillates (petroleum), C3-6, piperylene-rich	Distillates (petroleum), C3-6, piperylene-rich	68477-35-0	100

Further information

Contains:

Chemical Name	Identification number	Concentration [%]
penta-1,3-diene	504-60-9, 207-995-2	50 - 70
cyclopentene	142-29-0, 205-532-9	20 - 30
2-Methyl-2-butene	513-35-9, 208-156-3	5 - 15
cyclopentadiene	542-92-7, 208-835-4	0.1 - < 1.5
Dicyclopentadiene	77-73-6, 201-052-9	0.1 - < 1.5
Isoprene	78-79-5, 201-143-3	0.1 - < 1
Other C5 Hydrocarbons		1 - 5
benzene	71-43-2, 200-753-7	0 - <= 0.1

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TBP (tert.butyl phenols) - inhibitor		- <= 0.01
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SECTION 4. FIRST-AID MEASURES

- General advice : DO NOT DELAY.
Keep victim calm. Obtain medical treatment immediately.
- If inhaled : Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment.
- In case of skin contact : Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.
- In case of eye contact : DO NOT DELAY.
Flush eye with copious quantities of water.
Obtain medical treatment immediately.
- If swallowed : If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing. Give nothing by mouth.
- Most important symptoms and effects, both acute and delayed : Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision.
Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters.
Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, lightheadedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness and death.
If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever.
The onset of respiratory symptoms may be delayed for several hours after exposure.
- Protection of first-aiders : When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.
- Immediate medical attention, special treatment : Potential for chemical pneumonitis.
Call a doctor or poison control center for guidance.

SECTION 5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : Foam, water spray or fog. Dry chemical powder, carbon dio-

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xide, sand or earth may be used for small fires only.

- Unsuitable extinguishing media : Do not use water in a jet.
- Specific hazards during fire-fighting : Carbon monoxide may be evolved if incomplete combustion occurs.
Will float and can be reignited on surface water.
The vapour is heavier than air, spreads along the ground and distant ignition is possible.
Flammable vapours may be present even at temperatures below the flash point.
- Specific extinguishing methods : Standard procedure for chemical fires.
- Further information : Clear fire area of all non-emergency personnel.
Keep adjacent containers cool by spraying with water.
- Special protective equipment for firefighters : Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Observe all relevant local and international regulations.
Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.
Local authorities should be advised if significant spillages cannot be contained.
- : Avoid contact with skin, eyes and clothing.
Isolate hazard area and deny entry to unnecessary or unprotected personnel.
Do not breathe fumes, vapour.
Do not operate electrical equipment.
- Environmental precautions : Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Attempt to disperse the vapour or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment.
- Methods and materials for containment and cleaning up : For small liquid spills (< 1 drum), transfer by mechanical means to a labeled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

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For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

Observe all relevant local and international regulations.

Additional advice : For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet.
Risk of explosion. Inform the emergency services if liquid enters surface water drains.
For guidance on disposal of spilled material see Chapter 13 of this Safety Data Sheet.
Vapour may form an explosive mixture with air.

Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.
U.S. regulations may require reporting releases of this material to the environment which exceed the reportable quantity (refer to Chapter 15) to the National Response Center at (800) 424-8802.

SECTION 7. HANDLING AND STORAGE

Technical measures : Avoid breathing of or direct contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet.
Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
Ensure that all local regulations regarding handling and storage facilities are followed.

Precautions for safe handling : Avoid inhaling vapour and/or mists.
Avoid contact with skin, eyes and clothing.
Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks.
The vapour is heavier than air. Beware of accumulation in pits and confined spaces.
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.
Bulk storage tanks should be diked (bunded).
Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.
Even with proper grounding and bonding, this material can still accumulate an electrostatic charge.
If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.

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Be aware of handling operations that may give rise to additional hazards that result from the accumulation of static charges.

These include but are not limited to pumping (especially turbulent flow), mixing, filtering, splash filling, cleaning and filling of tanks and containers, sampling, switch loading, gauging, vacuum truck operations, and mechanical movements.

These activities may lead to static discharge e.g. spark formation.

Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (≤ 1 m/s until fill pipe submerged to twice its diameter, then ≤ 7 m/s). Avoid splash filling.

Do NOT use compressed air for filling, discharging, or handling operations.

Inhibitor levels should be maintained.

Protect against light.

Avoidance of contact : Strong oxidising agents.
Strong acids.
Strong bases.
Copper alloys

Product Transfer : If positive displacement pumps are used, these must be fitted with a non-integral pressure relief valve. Refer to guidance under Handling section.

Storage

Other data : Keep away from aerosols, flammables, oxidizing agents, corrosives and from other flammable products which are not harmful or toxic to man or to the environment.
Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat.
Must be kept inhibited during storage and shipment as material can polymerise.
Vapours from tanks should not be released to atmosphere.
Breathing losses during storage should be controlled by a suitable vapour treatment system.
Nitrogen blanket recommended.
Electrostatic charges will be generated during pumping.
Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment to reduce the risk.
The vapours in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flammable.
Reacts with atmospheric oxygen. Material contains a stabilizer to inhibit oxidative colour change.
Prolonged storage of the product can cause the stabiliser to lose its effectiveness.
The product is normally supplied in a stabilized form. If the permissible storage period and/or storage temperature is noticeably exceeded, the product may polymerise with heat evolution.

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Packaging material : Suitable material: For containers, or container linings use mild steel, stainless steel.
Unsuitable material: Copper., Copper alloys.

Specific use(s) : Not applicable

See additional references that provide safe handling practices for liquids that are determined to be static accumulators: American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practices on Static Electricity).
CENELEC CLC/TR 50404 (Electrostatics – Code of practice for the avoidance of hazards due to static electricity).

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
cyclopentadiene	542-92-7	TWA	75 ppm	ACGIH
		TWA	75 ppm 200 mg/m ³	OSHA Z-1
Dicyclopentadiene	77-73-6	TWA	5 ppm	ACGIH
benzene	71-43-2	TWA	0.5 ppm 1.6 mg/m ³	Shell Internal Standard (SIS) for 8-12 hour TWA.
		STEL	2.5 ppm 8 mg/m ³	Shell Internal Standard (SIS) for 15 min (STEL)
		TWA	0.5 ppm	ACGIH
		STEL	2.5 ppm	ACGIH
		PEL	1 ppm	OSHA CARC
		STEL	5 ppm	OSHA CARC
		TWA	10 ppm	OSHA Z-2
		CEIL	25 ppm	OSHA Z-2
		Peak	50 ppm	OSHA Z-2

Biological occupational exposure limits

Component	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
benzene	71-43-2	S-Phenylmercapturic acid	Urine	End of shift (As soon as possible after exposure ceases)	25 .µg/g creatinine	ACGIH BEI
benzene		t,t-Muconic	Urine	End of	500 .µg/g	ACGIH

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		acid		shift (As soon as possible after exposure ceases)	creatinine	BEI
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Monitoring Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.

Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.

Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.

National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods <http://www.cdc.gov/niosh/>

Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods <http://www.osha.gov/>

Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances <http://www.hse.gov.uk/>

Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA), Germany <http://www.dguv.de/inhalt/index.jsp>

L'Institut National de Recherche et de Sécurité, (INRS), France <http://www.inrs.fr/accueil>

Engineering measures

- : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:
 - Use sealed systems as far as possible.
 - Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits.
 - Local exhaust ventilation is recommended.
 - Eye washes and showers for emergency use.
 - Firewater monitors and deluge systems are recommended.
 - Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.

General Information:

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when there is potential for inhalation; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.

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Personal protective equipment

Respiratory protection : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. If air-filtering respirators are suitable for conditions of use: Select a filter suitable for organic gases and vapours [Type AX boiling point $\leq 65^{\circ}\text{C}$ (149°F)].

Respirator selection, use and maintenance should be in accordance with the requirements of the OSHA Respiratory Protection Standard, 29 CFR 1910.134.

Hand protection
Remarks

: Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. Longer term protection: Viton. Incidental contact/Splash protection: Nitrile rubber gloves. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

Eye protection : Wear goggles for use against liquids and gas. Wear full face shield if splashes are likely to occur.

Skin and body protection : Wear chemical and cold resistant gloves/gauntlets, and boots, and apron.

Protective measures : Personal protective equipment (PPE) should meet recom-

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mended national standards. Check with PPE suppliers.

Hygiene measures : Wash hands before eating, drinking, smoking and using the toilet.
Laundry contaminated clothing before re-use.

Environmental exposure controls

General advice : Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.
Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.
Information on accidental release measures are to be found in section 6.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid.

Colour : Colourless to light coloured

Odour : strong

Odour Threshold : not determined

pH : Not applicable

Boiling point/boiling range : 42 °C / 108 °F

Flash point : -29 °C / -20 °F

Evaporation rate : not determined

Upper explosion limit : 8.3 %(V)

Lower explosion limit : 1 %(V)

Vapour pressure : 45 kPa (20 °C / 68 °F)

Relative vapour density : 2.35

Relative density : 0.7 (15.6 °C / 60.0 °F)

Density : Typical 725 kg/m³ (20 °C / 68 °F)

Solubility(ies)
Water solubility : insoluble

Partition coefficient: n-octanol/water : log Pow: ca. 2.3

Auto-ignition temperature : not determined

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Viscosity	
Viscosity, kinematic	: no data available
Conductivity	: Low conductivity: < 100 pS/m, The conductivity of this material makes it a static accumulator., A liquid is typically considered nonconductive if its conductivity is below 100 pS/m and is considered semi-conductive if its conductivity is below 10 000 pS/m., Whether a liquid is nonconductive or semiconductive, the precautions are the same., A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Prolonged exposure to air may lead to peroxide formation. Reacts with strong oxidising agents.
Chemical stability	: The product is normally supplied in a stabilized form. If the permissible storage period and/or storage temperature is noticeably exceeded, the product may polymerise with heat evolution. Reacts violently with: Nitric, sulphuric and chlorosulphuric acids. Oxidises on contact with air to form unstable peroxides. Polymerisation may occur at elevated temperatures. Normally stable under ambient conditions and if properly inhibited.
Possibility of hazardous reactions	: Normally stable under ambient conditions and if properly inhibited.
Conditions to avoid	: Heat, flames, and sparks. Exposure to air. Exposure to sunlight. In certain circumstances product can ignite due to static electricity.
Incompatible materials	: Strong oxidising agents. Strong acids. Strong bases. Copper alloys
Hazardous decomposition products	: Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide, sulphur oxides and unidentified organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

SECTION 11. TOXICOLOGICAL INFORMATION

Basis for assessment	: Information given is based on data on the components and
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the toxicology of similar products.

Information on likely routes of exposure

Acute toxicity

Product:

- Acute oral toxicity : LD50 : > 300 - 2,000 mg/kg
Remarks: Harmful if swallowed.
- Acute inhalation toxicity : Remarks: Expected to be of low toxicity if inhaled.
- Acute dermal toxicity : LD50 (Rabbit): > 1,000 - 2,000 mg/kg
Remarks: Harmful in contact with skin.

Skin corrosion/irritation

Product:

Remarks: Causes skin irritation.

Serious eye damage/eye irritation

Product:

Remarks: Causes serious eye irritation.

Respiratory or skin sensitisation

Product:

Remarks: Not expected to be a sensitiser.

Germ cell mutagenicity

Product:

: Remarks: Suspected of causing genetic defects., Contains Isoprene, CAS # 78-79-5., Mutagenic; positive in in-vivo and in-vitro assays.

Carcinogenicity

Product:

Remarks: Contains Isoprene, CAS # 78-79-5., Causes cancer in laboratory animals.

IARC

Group 1: Carcinogenic to humans

benzene

71-43-2

Group 2B: Possibly carcinogenic to humans

Isoprene

78-79-5

ACGIH

Confirmed human carcinogen

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	benzene	71-43-2
OSHA	OSHA specifically regulated carcinogen	
	benzene	71-43-2
NTP	Known to be human carcinogen	
	benzene	71-43-2
	Reasonably anticipated to be a human carcinogen	
	Isoprene	78-79-5

Reproductive toxicity

Product:

:

Remarks: Not expected to impair fertility., Not expected to be a developmental toxicant.

STOT - single exposure

Product:

Remarks: Inhalation of vapours or mists may cause irritation to the respiratory system., High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea.

STOT - repeated exposure

Product:

Remarks: Not expected to be a hazard.

Aspiration toxicity

Product:

Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.

Further information

Product:

Remarks: Classifications by other authorities under varying regulatory frameworks may exist.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish (Acute toxicity) : LL50: 10 - 100 mg/l
Remarks: Harmful:

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Toxicity to daphnia and other aquatic invertebrates (Acute toxicity) : EL50: 1 - 10 mg/l
Remarks: Toxic:

Toxicity to algae (Acute toxicity) : EL50: 10 - 100 mg/l
Remarks: Harmful:

Toxicity to fish (Chronic toxicity) : Remarks: Data not available

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : Remarks: Data not available

Toxicity to bacteria (Acute toxicity) : Remarks: Data not available

Persistence and degradability

Product:

Biodegradability : Remarks: Not readily biodegradable.

Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Does not bioaccumulate significantly.

Mobility in soil

Product:

Mobility : Remarks: Floats on water.

Other adverse effects

no data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Recover or recycle if possible.
It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.

Do not dispose into the environment, in drains or in water courses
Waste product should not be allowed to contaminate soil or water.

Local legislation

Remarks : Disposal should be in accordance with applicable regional, national, and local laws and regulations.

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Local regulations may be more stringent than regional or national requirements and must be complied with.

SECTION 14. TRANSPORT INFORMATION

National Regulations

US Department of Transportation Classification (49 CFR Parts 171-180)

UN/ID/NA number : UN 1268
Proper shipping name : Petroleum distillates, n.o.s.
Class : 3
Packing group : II
Labels : 3
ERG Code : 128
Marine pollutant : no

International Regulation

IATA-DGR

UN/ID No. : UN 1268
Proper shipping name : Petroleum distillates, n.o.s.
Class : 3
Packing group : II
Labels : 3

IMDG-Code

UN number : UN 1268
Proper shipping name : PETROLEUM DISTILLATES, N.O.S.
(distillates (petroleum), C3-6, piperylene-rich)
Class : 3
Packing group : II
Labels : 3
Marine pollutant : yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Pollution category : Y
Ship type : 2
Product name : 1-3 Pentadiene (greater than 50%), cyclopentene, and isomers, mixtures
Special precautions : Refer to Chapter 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.

Special precautions for user

Remarks : Special Precautions: Refer to Chapter 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.

SECTION 15. REGULATORY INFORMATION

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OSHA Hazards : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
1,3-Pentadiene	504-60-9	100	143
Benzene	71-43-2	10	*
Isoprene	78-79-5	100	*

*: Calculated RQ exceeds reasonably attainable upper limit.

CERCLA Reportable Quantity

Calculated RQ exceeds reasonably attainable upper limit.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Immediate (Acute) Health Hazard
Delayed (Chronic) Health Hazard
Fire Hazard
Reactive Hazard

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

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Dicyclopentadiene	77-73-6	1.4999 %
Isoprene	78-79-5	0.9999 %
benzene	71-43-2	0.1 %

Clean Water Act

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

Isoprene	78-79-5	0.9999 %
benzene	71-43-2	0.1 %

Pennsylvania Right To Know

Distillates (petroleum), C3-6, piperylene-rich	68477-35-0
penta-1,3-diene	504-60-9
cyclopentene	142-29-0
2-Methyl-2-butene	513-35-9
cyclopentadiene	542-92-7
Dicyclopentadiene	77-73-6
Isoprene	78-79-5
benzene	71-43-2

New Jersey Right To Know

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penta-1,3-diene	504-60-9
cyclopentene	142-29-0
2-Methyl-2-butene	513-35-9
cyclopentadiene	542-92-7
Dicyclopentadiene	77-73-6
Isoprene	78-79-5
benzene	71-43-2

California Prop 65

WARNING! This product contains a chemical known to the State of California to cause cancer.
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Other regulations

: The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

SECTION 16. OTHER INFORMATION

Further information

NFPA Rating (Health, Fire, Reactivity) 2, 4, 2

A vertical bar (|) in the left margin indicates an amendment from the previous version.

Due to the conversion of this product to GHS classification and labelling, there has been a significant change to the nature of the information presented in chapter 2.

Abbreviations and Acronyms : The standard abbreviations and acronyms used in this document can be looked up in reference literature (e.g. scientific dictionaries) and/or websites.

ACGIH = American Conference of Governmental Industrial Hygienists

ADR = European Agreement concerning the International Carriage of Dangerous Goods by Road

AICS = Australian Inventory of Chemical Substances

ASTM = American Society for Testing and Materials

BEL = Biological exposure limits

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes

CAS = Chemical Abstracts Service

CEFIC = European Chemical Industry Council

CLP = Classification Packaging and Labelling

COC = Cleveland Open-Cup

DIN = Deutsches Institut für Normung

DMEL = Derived Minimal Effect Level

DNEL = Derived No Effect Level

DSL = Canada Domestic Substance List

EC = European Commission

EC50 = Effective Concentration fifty

ECETOC = European Center on Ecotoxicology and Toxicology Of Chemicals

ECHA = European Chemicals Agency

EINECS = The European Inventory of Existing Commercial

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR
1910.1200

Version 11.0

Revision Date: 05/12/2015

Print Date: 05/13/2015

Chemical Substances
EL50 = Effective Loading fifty
ENCS = Japanese Existing and New Chemical Substances
Inventory
EWC = European Waste Code
GHS = Globally Harmonised System of Classification and
Labelling of Chemicals
IARC = International Agency for Research on Cancer
IATA = International Air Transport Association
IC50 = Inhibitory Concentration fifty
IL50 = Inhibitory Level fifty
IMDG = International Maritime Dangerous Goods
INV = Chinese Chemicals Inventory
IP346 = Institute of Petroleum test method N° 346 for the
determination of polycyclic aromatics DMSO-extractables
KECI = Korea Existing Chemicals Inventory
LC50 = Lethal Concentration fifty
LD50 = Lethal Dose fifty per cent.
LL/EL/IL = Lethal Loading/Effective Loading/Inhibitory loading
LL50 = Lethal Loading fifty
MARPOL = International Convention for the Prevention of
Pollution From Ships
NOEC/NOEL = No Observed Effect Concentration / No Ob-
served Effect Level
OE_HP V = Occupational Exposure - High Production Volume
PBT = Persistent, Bioaccumulative and Toxic
PICCS = Philippine Inventory of Chemicals and Chemical
Substances
PNEC = Predicted No Effect Concentration
REACH = Registration Evaluation And Authorisation Of
Chemicals
RID = Regulations Relating to International Carriage of Dan-
gerous Goods by Rail
SKIN_DES = Skin Designation
STEL = Short term exposure limit
TRA = Targeted Risk Assessment
TSCA = US Toxic Substances Control Act
TWA = Time-Weighted Average
vPvB = very Persistent and very Bioaccumulative

Sources of key data used to compile the Safety Data Sheet : The quoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU IUCLID date base, EC 1272 regulation, etc).

Revision Date : 05/12/2015

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

SAFETY DATA SHEET
SBZ Slack Wax S

This SDS is not mandated under REACH Regulation (EC) No 1907/2006 and is provided for information only.

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name SBZ Slack Wax S
REACH registration number 01-2119489284-28-XXXX
CAS number 64742-61-6

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses The products are mainly used to produce high quality candles in paper, textile, and varnish coatings industry, as well as in the chemical and other industries.

1.3. Details of the supplier of the safety data sheet

Supplier SBZ CORPORATION
Kendal Court, Hurricane Way, Wickford Essex SS11 8YB
+44 (0) 1268 761 504
+44 (0) 1268 761 508
productstewardship@sbzcorporation.com

1.4. Emergency telephone number

Emergency telephone +44 (0) 870 190 6777 /+44 (0) 1865 407 333 (24 hours / 7 days)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification

Physical hazards Not Classified
Health hazards Not Classified
Environmental hazards Not Classified

2.2. Label elements

Hazard statements NC Not Classified

2.3. Other hazards

SECTION 3: Composition/information on ingredients

3.1. Substances

Product name SBZ Slack Wax S
REACH registration number 01-2119489284-28-XXXX
CAS number 64742-61-6

SECTION 4: First aid measures

4.1. Description of first aid measures

SBZ Slack Wax S

Inhalation	Remove person to fresh air and keep comfortable for breathing. Get medical attention if symptoms are severe or persist.
Ingestion	Get medical attention if any discomfort continues.
Skin contact	Wash skin thoroughly with soap and water.
Eye contact	Rinse immediately with plenty of water. Get medical attention if irritation persists after washing.

4.2. Most important symptoms and effects, both acute and delayed

4.3. Indication of any immediate medical attention and special treatment needed

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Extinguish with foam, carbon dioxide, dry powder or water fog.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

5.3. Advice for firefighters

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.2. Environmental precautions

Environmental precautions Avoid the spillage or runoff entering drains, sewers or watercourses.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Contain spillage with sand, earth or other suitable non-combustible material.

6.4. Reference to other sections

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Store in tightly-closed, original container.

7.3. Specific end use(s)

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters

Occupational exposure limits

8.2. Exposure controls

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance	Coloured liquid. Waxy solid.
Colour	Light brown.
Odour	Characteristic.
pH	neutral

SBZ Slack Wax S

Melting point	10-50°C
Flash point	> 200°C COC (Cleveland open cup).
Relative density	825-840
Solubility(ies)	Hydrocarbons. Insoluble in water.
Viscosity	3-8 cSt @ 100°C

9.2. Other information

SECTION 10: Stability and reactivity

10.1. Reactivity

10.2. Chemical stability

Stability No particular stability concerns.

10.3. Possibility of hazardous reactions

10.4. Conditions to avoid

Conditions to avoid Avoid excessive heat for prolonged periods of time.

10.5. Incompatible materials

Materials to avoid Strong oxidising agents.

10.6. Hazardous decomposition products

Hazardous decomposition products None at ambient temperatures.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

SECTION 12: Ecological Information

12.1. Toxicity

12.2. Persistence and degradability

Persistence and degradability The product is readily biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential No data available on bioaccumulation.

12.4. Mobility in soil

12.5. Results of PBT and vPvB assessment

12.6. Other adverse effects

SECTION 13: Disposal considerations

13.1. Waste treatment methods

SECTION 14: Transport information

General Not regulated.

14.1. UN number

14.2. UN proper shipping name

14.3. Transport hazard class(es)

14.4. Packing group

14.5. Environmental hazards

SBZ Slack Wax S

14.6. Special precautions for user

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.2. Chemical safety assessment

SECTION 16: Other information

Revision date 23/02/2016

SDS number 4647

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.

AVATAR CORPORATION		Date:	05/31/15
		Revision:	01
Document #: SDS-3333333		Supersedes:	NEW
		Page	Page 1 of 5
Title:	Vegetable Oils Series - Safety Data Sheet		
Document Owner:	J.D.H.	Approved by:	J.P. Roush, M.S.

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

1. PRODUCT AND COMPANY IDENTIFICATION

1.1. Product Identifier

Tradename: **Vegetable Oils Series - Refined, Bleached, and Deodorized** (*see list at end)

Code: 3333333

REACH preregistration No.: N/A

1.2. Identified uses / uses advised against

Identified uses: Food Ingredient, conditioning agent

1.3. Supplier details:

Company/Address: Avatar Corporation, 500 Central Avenue, University Park, IL
60484 USA

Website: www.avatarcorp.com

Email: jproush@avatarcorp.com

Telephone/Fax: 708.534.5511 / 708.534.0123

Responsible Dept: Regulatory

1.4 Transportation emergency contact: Chem Tel 800.255.3924

2. HAZARDS IDENTIFICATION:

2.1. Classification of substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]: Not classified

Classification according to Directive 67/548/EEC or 1999/45/EC: Not classified

Adverse effects: At high temperatures, vapors may be generated which may be considered hazardous at concentrations exceeding 10 mg/m³.

2.2. Label elements:

NFPA Code: Health-0, Flammability-1, Reactivity-0

HMIS Code: Health-0, Flammability-1, Reactivity-0

2.3. Other hazards:

No significant health hazards identified unless aspirated as an oil mist. Oil mist is classified as a nuisance particulate by the ACGIH and may affect the respiratory system.

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1. Substance

<u>Component</u>	<u>CAS No.</u>	<u>EC No.</u>	<u>% by Wt.</u>	<u>HS Tariff Classification No.</u>
Canola Oil, RBD	8002-13-9	232-299-0	100	1514.10.00.00
Coconut Oil, RBD	8001-31-8	232-282-8	100	1513.11.00.00
Corn Oil, RBD	8001-30-7	232-281-2	100	1515.29.00.40
Olive Oil, RBD	8001-25-0	TBD	100	1509.10.40.00
Safflower Oil, RBD	8001-23-8	TBD	100	1512.11.40.00
Soybean Oil, RBD	8001-22-7	TBD	100	1507.90.40.00
Sunflower Oil	8001-21-6	232-273-9	100	1514.10.00.00

4. FIRST AID MEASURES

4.1. General information:

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Eye: Flush immediately with large amounts of water. If irritation occurs, call a physician

Skin: Wash exposed area of skin with water. If burned by contact with hot material, cool material as quickly as possible with water. See a physician for burn treatment, irritation or allergic reaction.

Ingestion: None required. If uncomfortable or symptomatic, seek medical assistance promptly.

Inhalation: If adverse effects occur, remove to uncontaminated area. Get medical attention if symptoms persist.

4.2. Most important symptoms and effects, acute and delayed

Symptoms/injuries: None.

4.3. Indication of any immediate medical attention and special treatment needed: See 4.1 and 4.2.

5. FIRE FIGHTING MEASURES

5.1. Extinguishing media:

Agents approved for Class B hazards. Dry chemical, carbon dioxide foam, steam or water fog

Unsuitable extinguishing media:

Water streams will scatter liquid and spread fire, but may be used to keep fire-exposed containers and surroundings cool.

5.2. Special hazards:

May create dense smoke during combustion. Incomplete burning can produce carbon monoxide and/or carbon dioxide and other toxic gases.

Fire hazard:

Mild fire hazard when heated above its flash point; material must be preheated before ignition will occur (OSHA Class IIIB).

5.3. Advise for firefighters:

Firefighting instruction:

Cool unaffected containers and remove to safety.

Firefighting protection:

Firefighters should wear full bunker gear, including a positive pressure self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Personnel:

General safety equipment such as lab glasses.

Emergency procedures:

Remove all sources of ignition. Keep away from heat/sparks/open flames/hot surfaces.

6.2. Environmental precautions

Prevent spills from entering sewers and public waters.

6.3. Containment / Cleanup

Containment:

Dike around spill; have oil-absorbent materials readily available.

Cleanup:

Remove mechanically or contain on an absorbent material such as dry sand or earth and dispose of in accordance with current applicable regulations

7. HANDLING AND STORAGE

7.1. Handling

No special requirements; observe good industrial hygiene practices.

7.2. Storage

Store in a cool, well-ventilated area in sealed containers. Store away from strong oxidizing agents or combustible material. Avoid excess heat to maintain product quality.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

Under normal use and conditions, edible oils and fats pose no health hazard.

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Limits: ACGIH TLV-STEL: 10 mg/m³ (oil mist)

8.2. Exposure controls

Control airborne concentrations below the exposure guidelines. Provide local exhaust or general room ventilation to minimize vapor concentrations. Provide emergency eye wash fountains and safety showers.

Eye: None required; however, use of eye protection is good industrial practice.

Skin: None required; however, use of protective gloves/clothing is good industrial practice.

Inhalation: No special requirements under ordinary conditions of use and with adequate ventilation.

Environmental controls: Avoid release to the environment. Notify authorities if product enters sewers or public waters.

9. CHEMICAL AND PHYSICAL PROPERTIES

9.1. Basic physical and chemical properties

	Canola	Coconut	Corn	Olive	Safflower	Soybean	Sunflower
<i>Appearance / Odor:</i>	Yellow, oily liquid / Faint odor	White liquid / Mild nut odor	Pale yellow, oily liquid / Faint odor	Light-yellow/green fluid. Mild odor.	Light-yellow fluid. Bland odor.	Light-yellow fluid. Bland odor.	Yellow, oily liquid / Faint odor
<i>pH:</i>	ND	ND	ND	ND	ND	ND	ND
<i>Vapor Pressure:</i>	< 1.0 mmHg @ 20°C (68°F)	N/A	< 1.0 mmHg @ 20°C (68°F)	< 1.0 mmHg @ 20°C (68°F)	< 1.0 mmHg @ 20°C (68°F)	< 1.0 mmHg @ 20°C (68°F)	ND
<i>Vapor Density (Air=1):</i>	>1	N/A	>1	>1	>1	>1	ND
<i>Boiling Point:</i>	ND	ND	ND	ND	ND	ND	ND
<i>Melting Point:</i>	25 – 50°F / -3°C – 20 °C	25°C (77°F)	ND	17 - 26°C	ND	ND	ND
<i>Solubility:</i>	Negligible in water (below 0.1%); soluble in hydrocarbons	Insoluble in water	Negligible in water, soluble in hydrocarbons	Negligible in water (below 0.1%); soluble in hydrocarbons	Negligible in water (below 0.1%); soluble in hydrocarbons	Negligible in water (below 0.1%); soluble in hydrocarbons	ND
<i>Specific Gravity (Water=1):</i>	0.91 - 0.93 @ 25°C/25°C (77°F)	0.910 – 0.920 @ 25°C (77°F)	0.914 - 0.920 @ 25°C (77°F)	0.916 - 0.922 @ 25°C/25°C (77°F)	ND	0.919 - 0.925 @ 25°C/25°C (77°F)	ND
<i>Pour Point:</i>	N/A	N/A	N/A	N/A	N/A	N/A	ND
<i>Flash Point / Method</i>	620 - 630°F / Tag closed cup	347°F / Pensky-Martens	> 550°F / Tag Closed Cup	ND	ND	610°F (321°C) minimum Cleveland Open Cup	ND
<i>FLAMMABLE LIMITS:LEL (% vol. in air)</i>	ND	ND	ND	ND	ND	ND	ND
<i>FLAMMABLE LIMITS:UEL (% vol. in air)</i>	ND	ND	ND	ND	ND	ND	ND

10. STABILITY AND REACTIVITY

10.1. Reactivity

Unknown

10.2. Chemical Stability

Generally stable

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- | | |
|--|--|
| 10.3. Hazardous reactions | Hazardous polymerization will not occur |
| 10.4. Conditions to avoid | Extreme heat and open flames. Exposure to heat, light, and pro-oxidants will accelerate oxidation leading to rancidity of flavors. Contact with chlorine, fluorine, and other strong oxidizers and acids |
| 10.5. Incompatible materials | Chlorine, fluorine, and other strong oxidizers and acids |
| 10.6. Hazardous decomposition products | Incomplete burning can produce carbon monoxide and/or carbon dioxide. |

11. TOXICOLOGICAL INFORMATION

- 11.1. Toxicity: Specific toxicity tests have not been conducted on this product. Our hazard evaluation is based on information from similar products, the ingredients, technical literature, and/or professional experience. No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program, the U.S. Occupational Safety and Health Act, or the International Agency on Research on Cancer (IARC).

12. ECOLOGICAL INFORMATION

- 12.1. Ecological testing has not been conducted on this product.

13. DISPOSAL INFORMATION

- 13.1. Waste treatment methods Disposal must be in accordance with applicable federal, state, or local regulations. We recommend that containers be either professionally reconditioned for reuse by certified firms or properly disposed of by firms to help reduce the possibility of an accident. "Empty" drums should not be given to individuals.

14. TRANSPORTATION INFORMATION

- 14.1. General Information Not regulated by U.S. DOT, Canadian TODG, IMO/IMDG, ICAO/IATA, ADR/RID

15. REGULATORY INFORMATION

- | | |
|--|---------------------|
| 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture | |
| <i>CERCLA Sections 102A/103 Hazardous Substances:</i> | Not reportable |
| <i>SARA Title III Section 302 Extremely Hazardous Substances:</i> | Not regulated |
| <i>SARA Title III Sections 311/312 Hazardous Categorization:</i> | None |
| <i>SARA Title III Section 313:</i> | Not regulated |
| <i>U.S. Inventory (TSCA):</i> | Listed on inventory |
| <i>Kosher Certification:</i> | Compliant |

16. OTHER INFORMATION

This material safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in this data sheet which we received from sources outside our company. We believe that information to be correct but cannot guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a

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permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either expressed or implied.

*Vegetable Oils Series SDS covers the products below including, but not limited to:

Canola	Coconut	Corn	Olive
Safflower	Soybean	Sunflower	Oil Blend RP
Veg Oil Purge	Veg Oil EXP		

Revision History

Date	Revision No.	Purpose	Authorized By
05/31/15	-01	Initial	J.P. Roush, M.S.

Attachment I Emission Units Table (includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)						
Emission Unit ID ¹	Emission Point ID ²	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type ³ and Date of Change	Control Device ⁴
FL-1	F-1	Flare	2011	53,000,000 MMBtu/hr	Existing (reduction in annual operating hours)	FL-1

¹ For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S,... or other appropriate designation.
² For Emission Points use the following numbering system: 1E, 2E, 3E, ... or other appropriate designation.
³ New, modification, removal
⁴ For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. (Must match Emission Units Table & Plot Plan)	Emission Point Type ¹	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)		Air Pollution Control Device (Must match Emission Units Table & Plot Plan)		Vent Time for Emission Unit (chemical processes only)		All Regulated Pollutants - Chemical Name/CAS ³ (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions ⁴		Maximum Potential Controlled Emissions ⁵		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used ⁶	Emission Concentration ⁷ (ppmv or mg/m ³)
		ID No.	Source	ID No.	Device Type	Short Term ²	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
F-1	Vent	FL-1	Flare	NA	NA	NA	NA	CO	19.61	4.90	19.61	4.90	Gas/Vapor	EE	
F-1	Vent	FL-1	Flare	NA	NA	NA	NA	NOx	3.61	0.90	3.61	0.90	Gas/Vapor	EE	
F-1	Vent	FL-1	Flare	NA	NA	NA	NA	PM-10	0.40	0.10	0.40	0.10	Solid	EE	125.7 mg/m ³
F-1	Vent	FL-1	Flare	NA	NA	NA	NA	SO ₂	0.03	0.01	0.03	0.01	Gas/Vapor	EE	
F-1	Vent	FL-1	Flare	NA	NA	NA	NA	VOC	166.95	41.74	3.34	0.83	Gas/Vapor	EE	

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

¹ Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

² Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

³ List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS₂, VOCs, H₂S, Inorganics, Lead, Organics, O₃, NO, NO₂, SO₂, SO₃, all applicable Greenhouse Gases (including CO₂ and methane), etc. **DO NOT LIST** H₂, H₂O, N₂, O₂, and Noble Gases.

⁴ Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

⁵ Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

⁶ Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

⁷ Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m³) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO₂, use units of ppmv (See 45CSR10).

**Attachment J
EMISSION POINTS DATA SUMMARY SHEET**

Table 2: Release Parameter Data								
Emission Point ID No. <i>(Must match Emission Units Table)</i>	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow ¹ (acfm) <i>at operating conditions</i>	Velocity (fps)	Ground Level <i>(Height above mean sea level)</i>	Stack Height ² <i>(Release height of emissions above ground level)</i>	Northing	Easting
F-1	0.5	1,500	850	72.2	678	25	4,495.32	530.85

¹ Give at operating conditions. Include inerts.

² Release height of emissions above ground level.

Attachment N
Supporting Emissions Calculations

**RULE 13 PERMIT APPLICATION
CALCULATIONS WORKSHEET**

Campbell Transportation Company, Inc. / Congo Plant - Newell, WV R13-1645A Administrative Update November 2016

Attachment N -- Supporting Emissions Calculations

Revised: 11/17/16

Vent/ Stack ID No.	Emission Unit ID No.	Emission Unit Description	Total Design Capacity	Type of Release [1]	Control System	Control System ID No.	Control System Efficiency (%)	Pollutant	HAP?	Emission Estimate Basis [2]	Emission Factor	Emission Factor Units	PROPOSED MAXIMUM EMISSIONS		
													Controlled Hourly Emis. Rate (lb/hr)	Maximum Hours of Operation (hr/yr)	Controlled Annual Emis. Rate (ton/yr)
Flare Incinerator Capacity and PM Limit for Rule 6:															
F-1	FL-1	Flare for Barge Cleaning	51,000	P	Flare	FL-1									
			max. flow cf/hr												
		Incinerator Capacity = (Density of Air + Density of Fuel) x Max Hourly Flow Rate to Flare													
		Incinerator Capacity (lb/hr) = ((0.073 * 92.4%) + (0.073 * 4 * 7.6%)) * 51000													
		Incinerator Capacity (lb/hr) = 4,571.8													
		Incinerator Capacity (ton/hr) = 2.29													
		Rule 6 PM Limit (lb/hr) = Factor F x Incinerator Capacity (tons/hr)													
		Rule 6 PM Limit (lb/hr) = 5.43 * 2.29													
		Rule 6 PM Limit (lb/hr) = 12.43													
Flare Combustion Max. Hourly & Annual Emissions:															
F-1	FL-1	Flare for Barge Cleaning	53.0	P	Flare	FL-1	NOx	N	EF	0.068	lb/MMBtu	3.60	500	0.901	
			max. MMBtu/hr				CO	N	EF	0.37	lb/MMBtu	19.61		4.903	
							98% Hydrocarbons	N	EF	0.14	lb/MMBtu	7.42		1.855	
							98% VOC (TNMOC)	N	EF	45	% HC	3.34		0.835	
							Total PM	N	EF	7.6	lb/mmcF	0.40		0.101	
							PM-10	N	EF	7.6	lb/mmcF	0.40		0.101	
							SO2	N	EF	0.6	lb/mmcF	0.03		0.008	
F-1	FL-1	Flare - Pilot Light	20,000	P	Flare	FL-1	NOx	N	EF	100	lb/mmcF	0.002	500	0.001	
			max. Btu/hr				CO	N	EF	84	lb/mmcF	0.002		0.000	
							VOC (TNMOC)	N	EF	5.5	lb/mmcF	0.000		0.000	
							Total PM	N	EF	7.6	lb/mmcF	0.000		0.000	
							PM-10	N	EF	7.6	lb/mmcF	0.000		0.000	
							SO2	N	EF	0.6	lb/mmcF	0.000		0.000	
F-1	FL-1	Flare - Total Annual Emissions					NOx					3.61		0.90	
							CO					19.61		4.90	
							VOC (TNMOC)					3.34		0.83	
							Total PM					0.40		0.10	
							PM-10					0.40		0.10	
							SO2					0.03		0.01	
BASIS FOR EMISSION ESTIMATES:															
1. Flare Incinerator Capacity and PM Limit for Rule 6															
a. Flare Incinerator Capacity based upon saturated vapor mixture of 7.6% gasoline and 92.4% air, at max. hourly blower flow rate of 51,000 cf/hr to flare. Note that the Upper Flammable Limit for gasoline is 7.6% gasoline in air.															
b. Calculation uses standard density of air = 0.073 lb/cf, and density of gasoline vapor is four times denser than air.															
c. Selected gasoline for this calculation because it is a common volatile liquid material transported in barges cleaned at this facility.															
2. FLARE COMBUSTION EMISSIONS															
a. Flare emission factors (lb/MMBtu) are based upon AP-42 Industrial Flares Table 13.5-1 (Rev. 4/15) for NOx, CO, PM and VOC.															
VOC emission factor is based upon average 45% non-methane hydrocarbons in the total hydrocarbons flare emissions, per AP-42 Industrial Flares Table 13.5-2 (Rev. 9/91).															
b. Flare emission factors (lb/mmcF) are based upon AP-42 Natural Gas Combustion Table 1.4-2 for PM/PM10 and SO2, because the AP-42 Industrial Flares Chapter 13.5 did not have usable emission factors for PM and SO2.															
c. Flare pilot light uses natural gas combustion emission factors (lb/mmcF) based upon AP-42 Natural Gas Combustion Table 1.4-1 [Small Boilers (<100)-Uncontrolled] (Rev. 2/98) for NOx and CO, and Table 1.4-2 for PM(Total), SO2, and VOC.															
d. Assumes natural gas total PM emissions = PM10 emissions, and natural gas heating value of 1,000 Btu/cf.															
3. MAX. HOURS OF OPERATION															
a. Based upon anticipated maximum annual operating time for the flare and pilot light.															

NOTES:

[1] P=Point, F=Fugitive

[2] EF=Emission Factor, MB=Material Balance, EN=Engineering Calculation, MO=Monitoring/Measurement

ATTACHMENT P – Public Notice Class I Legal Advertisement

Campbell Transportation Company, Inc. will submit the required Class I legal advertisement to a local newspaper and will forward the original affidavit of publication to DAQ. The notice will be published no earlier than five (5) working days of receipt by DAQ of this application. The original affidavit of publication will be received by DAQ no later than the last day of the public comment period. The anticipated text of the legal ad to be published in *Weirton Daily Times* is as follows:

AIR QUALITY PERMIT NOTICE Notice of Application

Notice is given that Campbell Transportation Company, Inc. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Class II Administrative Update to Permit R13-1645A for its existing Congo Shipyard located at 2567 Congo Arroyo Road, near Newell, in Hancock County, West Virginia at latitude 40.60812 and longitude -80.63533.

The applicant estimates, as a result of the proposed Class II Administrative Update, the facility's potential to discharge Regulated Air Pollutants will be decreased as follows:

Regulated Pollutant	Decreased Potential Annual Emissions in tons per year (tpy)
Nitrogen Oxides	0.80
Carbon Monoxide	4.28
Particulate Matter/ PM10/PM2.5	0.09
Total Volatile Organic Compounds	0.73

Startup of proposed operational changes is planned to begin on or about the 1st day of March, 2017. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated this the 20th day of December, 2016.

By: Eric G. Vowcheck,
Controller
Campbell Transportation Company, Inc.
2567 Congo Arroyo Road
Newell, WV 26050

Permit to Modify



R13-1645AB

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§22-5-1 et seq.) and 45 C.S.R. 13 – Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation. The permittee identified at the above-referenced facility is authorized to construct the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Issued to:

C & C Marine Maintenance Company
Campbell Transportation Company, Inc.

Congo Plant/Newell
029-00033

A handwritten signature in blue ink, appearing to read "John A. Benedict", is written over a horizontal line.

John A. Benedict
Director

Issued: ~~December 29, 2011~~

This permit will supersede and replace Permit R13-1645A.

Facility Location: Newell, Hancock County, West Virginia

Mailing Address: Foxpointe Centre, Building One
201 S. Johnson Road, Suite 303
Houston, PA 15342-1351

Facility Description: Marine Maintenance to include cleaning of tanker barges.

NAICS Codes: ~~488310, 488330~~, 483211, ~~488390~~, 488320, 336611, ~~562998~~

UTM Coordinates: 530.9 km Easting • 4,495.3 km Northing • Zone 17

Permit Type: ~~Modification~~ Class II Administrative Update

Description of Change: ~~Construction of vapor collection system which includes a flare as the control device~~ Revisions to Table 4.1.1. Approved Materials List and the Odor Control Program.

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §§22-5-14.

As a result of the granting of this permit, the source is a nonmajor source subject to 45CSR30. The facility is not subject to the permitting requirements of 45CSR30 and is classified as deferred source.

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1.0. Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
F-1	FL-1	Flare (air-assisted elevated flare)	2011	850 cfm	N/A

2.0. General Conditions

2.1. Definitions

- 2.1.1. All references to the –West Virginia Air Pollution Control Actl or the –Air Pollution Control Actl mean those provisions contained in W.Va. Code §§ 22-5-1 to 22-5-18.
- 2.1.2. The –Clean Air Actl means those provisions contained in 42 U.S.C. §§ 7401 to 7671q, and regulations promulgated thereunder.
- 2.1.3. –Secretaryll means the Secretary of the Department of Environmental Protection or such other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45CSR§30-2.12.). The Director of the Division of Air Quality is the Secretary’s designated representative for the purposes of this permit.

2.2. Acronyms

CAAA	Clean Air Act Amendments	NO_x	Nitrogen Oxides
CBI	Confidential Business Information	NSPS	New Source Performance Standards
CEM	Continuous Emission Monitor	PM	Particulate Matter
CES	Certified Emission Statement	PM_{2.5}	Particulate Matter less than 2.5 µm in diameter
C.F.R. or CFR	Code of Federal Regulations	PM₁₀	Particulate Matter less than 10µm in diameter
CO	Carbon Monoxide	Ppb	Pounds per Batch
C.S.R. or CSR	Codes of State Rules Division of Air Quality Department of Environmental Protection	Pph	Pounds per Hour
DAQ	Department of Environmental Protection	Ppm	Parts per Million
DEP	Dry Standard Cubic Meter	Ppm_v or ppmv	Parts per Million by Volume
dscm	Freedom of Information Act	PSD	Prevention of Significant Deterioration
FOIA	Hazardous Air Pollutant	Psi	Pounds per Square Inch
HAP	Hazardous Organic NESHAP	SIC	Standard Industrial Classification
HON	Horsepower	SIP	State Implementation Plan
HP	Pounds per Hour	SO₂	Sulfur Dioxide
lbs/hr	Leak Detection and Repair	TAP	Toxic Air Pollutant
LDAR	Thousand	TPY	Tons per Year
M	Maximum Achievable	TRS	Total Reduced Sulfur
MACT	Control Technology	TSP	Total Suspended Particulate
MDHIMM	Million	USEPA	United States Environmental Protection Agency
MMBtu/hr or mmbtu/hr	Million British Thermal Units per Hour	UTM	Universal Transverse Mercator
MMCF/hr or mmcf/hr	Million Cubic Feet per Hour	VEE	Visual Emissions Evaluation
NA	Not Applicable	VOC	Volatile Organic Compounds
NAAQS	National Ambient Air Quality Standards	VOL	Volatile Organic Liquids
NESHAPS	National Emissions Standards for Hazardous Air Pollutants		

2.3. Authority

This permit is issued in accordance with West Virginia air pollution control law W.Va. Code §§ 22-5-1. et seq. and the following Legislative Rules promulgated thereunder:

- 2.3.1. 45CSR13 – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation;*

2.4. Term and Renewal

- 2.4.1. This permit supersedes and replaces previously issued Permit R13-1645A. This Permit shall remain valid, continuous and in effect unless it is revised, suspended, revoked or otherwise changed under an applicable provision of 45CSR13 or any other applicable legislative rule;

2.5. Duty to Comply

- 2.5.1. The permitted facility shall be constructed and operated in accordance with the plans and specifications filed in Permit Application R13-1645, R13-1645A, R13-1645B, and any modifications, administrative updates, or amendments thereto. The Secretary may suspend or revoke a permit if the plans and specifications upon which the approval was based are not adhered to;
[45CSR§§13-5.11 and -10.3.]
- 2.5.2. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA;
- 2.5.3. Violations of any of the conditions contained in this permit, or incorporated herein by reference, may subject the permittee to civil and/or criminal penalties for each violation and further action or remedies as provided by West Virginia Code 22-5-6 and 22-5-7;
- 2.5.4. Approval of this permit does not relieve the permittee herein of the responsibility to apply for and obtain all other permits, licenses, and/or approvals from other agencies; i.e., local, state, and federal, which may have jurisdiction over the construction and/or operation of the source(s) and/or facility herein permitted.

2.6. Duty to Provide Information

The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for administratively updating, modifying, revoking, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.

2.7. Duty to Supplement and Correct Information

Upon becoming aware of a failure to submit any relevant facts or a submittal of incorrect information in any permit application, the permittee shall promptly submit to the Secretary such supplemental facts or corrected information.

2.8. Administrative Update

The permittee may request an administrative update to this permit as defined in and according to the procedures specified in 45CSR13.

[45CSR§13-4.]

2.9. Permit Modification

The permittee may request a minor modification to this permit as defined in and according to the procedures specified in 45CSR13.

[45CSR§13-5.4.]

2.10 Major Permit Modification

The permittee may request a major modification as defined in and according to the procedures specified in 45CSR14 or 45CSR19, as appropriate.

[45CSR§13-5.1]

2.11. Inspection and Entry

The permittee shall allow any authorized representative of the Secretary, upon the presentation of credentials and other documents as may be required by law, to perform the following:

- a. At all reasonable times (including all times in which the facility is in operation) enter upon the permittee's premises where a source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times (including all times in which the facility is in operation) any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;
- d. Sample or monitor at reasonable times substances or parameters to determine compliance with the permit or applicable requirements or ascertain the amounts and types of air pollutants discharged.

2.12. Emergency

- 2.12.1. An -emergencyll means any situation arising from sudden and reasonable unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under the permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

- 2.12.2. Effect of any emergency. An emergency constitutes an affirmative defense to an action brought for noncompliance with such technology-based emission limitations if the conditions of Section 2.12.3 are met.
- 2.12.3. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - a. An emergency occurred and that the permittee can identify the cause(s) of the emergency;
 - b. The permitted facility was at the time being properly operated;
 - c. During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in the permit; and
 - d. The permittee submitted notice of the emergency to the Secretary within one (1) working day of the time when emission limitations were exceeded due to the emergency and made a request for variance, and as applicable rules provide. This notice must contain a detailed description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.
- 2.12.4. In any enforcement proceeding, the permittee seeking to establish the occurrence of an emergency has the burden of proof.
- 2.12.5. The provisions of this section are in addition to any emergency or upset provision contained in any applicable requirement.

2.13. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it should have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in determining penalties for noncompliance if the health, safety, or environmental impacts of halting or reducing operations would be more serious than the impacts of continued operations.

2.14. Suspension of Activities

In the event the permittee should deem it necessary to suspend, for a period in excess of sixty (60) consecutive calendar days, the operations authorized by this permit, the permittee shall notify the Secretary, in writing, within two (2) calendar weeks of the passing of the sixtieth (60) day of the suspension period.

2.15. Property Rights

This permit does not convey any property rights of any sort or any exclusive privilege.

2.16. Severability

The provisions of this permit are severable and should any provision(s) be declared by a court of competent jurisdiction to be invalid or unenforceable, all other provisions shall remain in full force and effect.

2.17. Transferability

This permit is transferable in accordance with the requirements outlined in Section 10.1 of 45CSR13.
[45CSR§13-10.1.]

2.18. Notification Requirements

The permittee shall notify the Secretary, in writing, no later than thirty (30) calendar days after the actual startup of the operations authorized under this permit.

2.19. Credible Evidence

Nothing in this permit shall alter or affect the ability of any person to establish compliance with, or a violation of, any applicable requirement through the use of credible evidence to the extent authorized by law. Nothing in this permit shall be construed to waive any defense otherwise available to the permittee including, but not limited to, any challenge to the credible evidence rule in the context of any future proceeding.

3.0. Facility-Wide Requirements

3.1. Limitations and Standards

- 3.1.1. **Open burning.** The open burning of refuse by any person, firm, corporation, association or public agency is prohibited except as noted in 45CSR§6-3.1.
[45CSR§6-3.1.]
- 3.1.2. **Open burning exemptions.** The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause, suffer, allow or permit any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible.
[45CSR§6-3.2.]
- 3.1.3. **Asbestos.** The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management, and the Bureau for Public Health - Environmental Health require a copy of this notice to be sent to them.
[40CFR§61.145(b) and 45CSR§34]
- 3.1.4. **Odor.** No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.
[45CSR§4-3.1] *[State Enforceable Only]*
- 3.1.5. **Permanent shutdown.** A source which has not operated at least 500 hours in one 12-month period within the previous five (5) year time period may be considered permanently shutdown, unless such source can provide to the Secretary, with reasonable specificity, information to the contrary. All permits may be modified or revoked and/or reapplication or application for new permits may be required for any source determined to be permanently shutdown.
[45CSR§13-10.5.]
- 3.1.6. **Standby plan for reducing emissions.** When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45CSR11.
[45CSR§11-5.2.]
- 3.1.7. The permittee shall prevent or minimize the generation of fugitive particulate matter from the grounds of the facility and from any barge(s) containing solid materials. Measures include but not limited to water sprays, chemical dust suppressants, paving, sweeping, or other suitable measures.

3.2. Monitoring Requirements

[Reserved]

3.3. Testing Requirements

- 3.3.1. **Stack testing.** As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:
- a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63 in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.
 - b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.a. of this permit. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.
 - c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.
 - d. The permittee shall submit a report of the results of the stack test within sixty (60) days of completion of the test. The test report shall provide the information necessary to document the objectives of the test and to determine whether proper procedures were used to accomplish these objectives. The report shall include the following: the certification described in paragraph 3.5.1.; a statement of compliance status, also signed by a responsible official; and, a summary of conditions which form the basis for the compliance status evaluation. The summary of conditions shall include the following:

1. The permit or rule evaluated, with the citation number and language;
2. The result of the test for each permit or rule condition; and,
3. A statement of compliance or noncompliance with each permit or rule condition.

[WV Code § 22-5-4(a)(14-15) and 45CSR13]

3.4. Recordkeeping Requirements

3.4.1. **Retention of records.** The permittee shall maintain records of all information (including monitoring data, support information, reports, and notifications) required by this permit recorded in a form suitable and readily available for expeditious inspection and review. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation. The files shall be maintained for at least five (5) years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. Where appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

3.4.2. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.

[45CSR§4. *State Enforceable Only.*]

3.5. Reporting Requirements

3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

3.5.2. **Confidential information.** A permittee may request confidential treatment for the submission of reporting required by this permit pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31.

3.5.3. **Correspondence.** All notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, or mailed first class with postage prepaid to the address(es) set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

If to the DAQ:

Director
WVDEP
Division of Air Quality
601 57th Street
Charleston, WV 25304-2345

If to the US EPA:

Associate Director
Office of Enforcement and Permits Review
(3AP12)
U.S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

3.5.4. Operating Fee

- 3.5.4.1. In accordance with 45CSR30 – Operating Permit Program, the permittee shall submit a certified emissions statement and pay fees on an annual basis in accordance with the submittal requirements of the Division of Air Quality. A receipt for the appropriate fee shall be maintained on the premises for which the receipt has been issued, and shall be made immediately available for inspection by the Secretary or his/her duly authorized representative.
- 3.5.5. **Emission inventory.** At such time(s) as the Secretary may designate, the permittee herein shall prepare and submit an emission inventory for the previous year, addressing the emissions from the facility and/or process(es) authorized herein, in accordance with the emission inventory submittal requirements of the Division of Air Quality. After the initial submittal, the Secretary may, based upon the type and quantity of the pollutants emitted, establish a frequency other than on an annual basis.

4.0. Source-Specific Requirements

4.1. Limitations and Standards

4.1.1. The odor control program shall be used when cleaning barges containing the materials listed in Table 4.1.1., which are denoted as being subject to the Odor Control Program. Barges that are unloaded, but not cleaned, are not subject to the Odor Control Program.

Table 4.1.1. Approved Materials List			
Materials Cleaned	Odor Control Program	Flared	Neither
2-Ethyl Hexanol	X	✗	
Acetone	X	✗	
<u>Aromatics (100, 150 and 200)</u>	✗	✗	
<u>Aromatics - Heavy</u>	<u>X</u>		
<u>Aromatics - Light</u>	<u>X</u>		
<u>Base Oil Stocks</u>			<u>X</u>
<u>Benzene & Benzene Mixes</u>	X	X	
<u>Blend Oils</u>			<u>X</u>
Butyl Acrylate	X		
Caustic Soda			X
<u>Chlorine Liquid</u>			✗
Coal Tar Distillates	X		
Coal Tar Light Oil	X	✗	
Cresols (<u>creosote and other cresols</u>)	X		
Crude Coal Tar	X		
Crude Oil	X	✗	
Cumene	X	X	
Diesel	X		
Ethyl Alcohol	X		
<u>Exxal 10</u>	<u>X</u>		

Gasoline	X	X	
Glycols (<u>ethylene glycol, propylene glycol, polyethylene glycol, triethylene glycol, and other glycols</u>)	X		
Heavy Oils	X		X
<u>Hexanes (n-hexane, other hexanes)</u>	X		
Inorganic Acids			X
Isodecyl Alcohol	X		
Isononyl Alcohol	X		
Isopropyl Alcohol	X		
Kerosene	X		
Ketones	X	X	
Lube Oils, Base Stocks, Slack Wax	X		
Methanol	X	X	
Methyl Ethyl Ketone	X	X	
Mineral Spirits	X		
Naphtha	X		
Naphthalene	X		
<u>Natural Gas</u>	X		
Oil Distillates	X		
<u>Palatinol</u>	X		
<u>Paraffin Wax</u>			X
Petroleum Distillates	X		
<u>Piperylene</u>	X		
Raffinate	X	X	
Refined Chemical Oils	X		
Resin Oil	X	X	
<u>Slack Wax</u>			X

Styrenes	X	X	
Toluene	X	X	
<u>Vegetable Oils</u>	X		<u>X</u>
Xylene	X	X	

4.1.2. When cleaning barges containing the material subject to the Odor Control Program as denoted in Table 4.1.1, ~~a vac truck will be used as a knock out to sustain the flare, a safety barrier and the only hatch that will be opened is on the compartment from which free product is being removed, or which is being actively cleaned, in order~~ to minimize the amount of material vented to the atmosphere. ~~For cargoes not requiring the use of the flare, but needing odor control, the following process will be used:~~

- a. ~~Compartments containing cargoes will be stripped with tank hatches closed through a vac truck. Depending on the characteristics of the cargo and as needed; cold or hot water wash will be used to back flush out cargo residues (i.e. pipelines, deep wells and sumps) that may create vapors and stripped using a vac truck.~~
- b. ~~Once the barge has been "washed" the barge will rest for 10-12 hours with pipe valves and vent stack(s) partially opened to allow for low air flow. After the resting period, continuous monitoring for cargo vapor will be done and slow rate blowers will be used to begin the drying process. Any excess cargo wash water found will be removed using the vac truck with hatches open.~~
- c. ~~If cargo vapors causing odor are detected then the process of closing the barge, washing and resting will be conducted again to minimize vapor/odor release.~~

4.1.3. In addition to the requirement of 4.1.2., the following work practices must be followed when cleaning barges that contain materials whose vapor will be flared as denoted in Table 4.1.1.:

- a. ~~Once,~~After the first compartment has been determined to be empty of free liquids and the sump has been stripped, the remaining vapors in that compartment shall be controlled by use of a flare.
- b. ~~A vac truck will be connected to the barges cargo line. The flare stack blower will be connected to the vac truck. The flare stack blower shall be hooked up to a barge compartment through one of the compartment's openings.~~
- c. All flammable vapors shall be flared until the flare can no longer maintain combustion as evidenced by visual observation for the presence of a flame at the flare stack opening. Once vapors within a compartment's opening are purged to a level that will no longer support combustion, the flaring process will cease for that compartment.
- d. This process will be repeated for each compartment within each barge that contains materials whose vapors will be flared as denoted in Table 4.1.1.
- e. Once the flaring is complete for a barge compartment, the hatches for that compartment will be opened and mechanical ventilation will be used for the purpose of employee safety prior to commencing barge compartment cleaning operations.

4.1.4. The permittee shall install, maintain, and operate a vapor collection system (VCS) with vapor destruction unit (air-assisted flare FL-1) to control emissions from barges undergoing gas-freeing activities (degassed) for cleaning activities, when cleaning barges containing the materials subject to flaring as denoted in Table 4.1.1.

- a. Emissions from the flare (FL-1) shall not exceed any of the limits in Table 4.1.4.a.

Pollutant	Emission Rate	
	lb/hr	TPY
PM/PM ₁₀ /PM _{2.5}	0.40	0.190.10
NO _x	3.6	1.700.90
CO	19.6	9.184.90
VOCs	3.34	1.560.83

- b. The maximum hourly flow rate of effluent to be flared by FL-1 shall not exceed 850 cfm at standard conditions;
- c. The maximum annual hours of vapor combustion at the flare shall be limited to ~~936500~~ hours per year. This annual limit corresponds to the annual emission limits in Table 4.1.4.a.
- d. The flare shall not exhibit visible emissions of 20 % opacity or greater to the atmosphere. **[45CSR§6-4.3]**
- e. The flare (FL-1) is permitted to smoke which is less than forty percent (40%) opacity, for a period or periods aggregating no more than eight (8) minutes per start-up. **[45CSR§6-4.34]**
- 4.1.5. The permittee shall not clean more than six (6) barges per year containing cumene.
- 4.1.6. **Operation and Maintenance of Air Pollution Control Equipment.** The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section

1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.

[45CSR§13-5.11.]

4.2. Monitoring Requirements

4.2.1. The permittee shall monitor the hours of vapor combustion on a continuous basis at all times when there is effluent routed to the flare. Records of such monitoring shall include the monthly total of hours of vapor combustion and 12 month rolling total of hours of combustion.

4.2.2. For the purpose of determining compliance with the opacity limits of Condition 4.1.4.d., the permittee shall conduct visible emission checks and/or opacity monitoring and recordkeeping for the flare.

Visible emission checks shall be conducted at least once per calendar quarter using Method 22. These checks shall be performed at each source (stack, transfer point, fugitive emission source, etc.) for a sufficient time interval, but no less than one (1) minute, to determine if any visible emissions are present. Visible emission checks shall be performed during periods of normal facility operation and appropriate weather conditions.

If visible emissions are present at a source(s) for three (3) consecutive checks, the permittee shall conduct an opacity reading at that source(s) using the procedures and requirements of METHOD 9 as soon as practicable, but within seventy-two (72) hours of the final visual emission check. A METHOD 9 observation at a source(s) restarts the count of the number of consecutive readings with the presence of visible emissions.

4.3. Testing Requirements

[Reserved]

4.4. Recordkeeping Requirements

4.4.1. **Record of Monitoring.** The permittee shall keep records of monitoring information that include the following:

- a. The date, place as defined in this permit, and time of sampling or measurements;
- b. The date(s) analyses were performed;
- c. The company or entity that performed the analyses;
- d. The analytical techniques or methods used;
- e. The results of the analyses; and
- f. The operating conditions existing at the time of sampling or measurement.

4.4.2. **Record of Maintenance of Air Pollution Control Equipment.** For all pollution control equipment listed in Section 1.0, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.

- 4.4.3. **Record of Malfunctions of Air Pollution Control Equipment.** For all air pollution control equipment listed in Section 1.0, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:
- a. The equipment involved.
 - b. Steps taken to minimize emissions during the event.
 - c. The duration of the event.
 - d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

- e. The cause of the malfunction.
 - f. Steps taken to correct the malfunction.
 - g. Any changes or modifications to equipment or procedures that would help prevent future recurrences of the malfunction.
- 4.4.4. The permittee shall keep the following records for each barge that ~~does~~ is cleaned at the facility and is subject to an odor control program in accordance with Condition 4.1.1:
- a. Identification number of the barge;
 - b. Record of the contents;
 - c. Date and time that the barge cleaning began and finished;
 - d. Name of the crew leader during the cleaning;

Such records shall be maintained in accordance with Condition 3.4.1.

4.5. Reporting Requirements

- 4.5.1. The permittee shall notify the Director or his/her duly authorized representative within 72 hours of receiving an air quality related complaint from the public. Such notification can be made by verbal, electronic, or written means and contain the following information:
- a. Date and time the complaint was received;
 - b. Date and time the air quality event occurred; and
 - c. Nature of the complaint.

Record of such notifications shall be maintained in accordance with Condition 3.4.1.

- 4.5.2. Any exceedance(s) of the allowable visible emission requirement for any emission source discovered during observations using 40CFR Part 60, Appendix A, Method 9 must be reported in writing to the Director of the Division of Air Quality as soon as practicable, but within ten (10) calendar days, of the occurrence and shall include, at a minimum, the following information: the

results of the visible determination of opacity of emissions, the cause or suspected cause of the violation(s), and any corrective measures taken or planned.

APPENDIX A—Example Opacity Record

Date _____ of _____ Observation:

Data _____ Entered _____ by:

Reviewed by: _____

Date Reviewed: _____

Describe the General Weather Conditions:

Emission Point ID	Emission Point Description	Observation Time	Visible Emissions Yes/No	Consecutive Months of Visual Emissions	Comments

CERTIFICATION OF DATA ACCURACY

I, the undersigned, hereby certify that, based on information and belief formed after reasonable inquiry, all information contained in the attached _____, representing the period beginning _____ and ending _____, and any supporting documents appended hereto, is true, accurate, and complete.

Signature¹ _____
(please use blue ink) Responsible Official or Authorized Representative Date

Name & Title _____
(please print or type) Name Title

Telephone No. _____ Fax No. _____

- ¹ This form shall be signed by a -Responsible Official. -Responsible Official means one of the following:
- a. For a corporation: The president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:
 - (i) the facilities employ more than 250 persons or have a gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars), or
 - (ii) the delegation of authority to such representative is approved in advance by the Director;
 - b. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;
 - c. For a municipality, State, Federal, or other public entity: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of U.S. EPA); or
 - d. The designated representative delegated with such authority and approved in advance by the Director.