

SITE SPECIFIC HEALTH & SAFETY PLAN

FOR

CATLIN ENGINEERS AND SCIENTISTS PERSONNEL

HEALTH & SAFETY PLAN

FOR

FLINT HILLS RESOURCES, LP

NORTH TERMINAL

3325 RIVER ROAD

WILMINGTON, NORTH CAROLINA

CATLIN PROJECT NO. 195-033/201-125

SOUTH TERMINAL

3334 RIVER ROAD

WILMINGTON, NORTH CAROLINA

CATLIN PROJECT NO. 199-023

**REVISED
JULY 2003**

PREPARED BY:

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APPENDICES

APPENDIX A	MATERIAL SAFETY DATA SHEETS – ACTIVE SITE PRODUCT
APPENDIX B	MATERIAL SAFETY DATA SHEETS – FREE PHASE PRODUCT
APPENDIX C	NIOSH DATA SHEETS

SITE SPECIFIC HEALTH & SAFETY PLAN

A. SITE INFORMATION

Site: Flint Hills Resources, LP (See Figure 1)

North Terminal
3325 River Road
Wilmington, NC 28412

South Terminal
3334 River Road
Wilmington, NC 28412

Site Manager: Cliff Ruark Phone: 910-799-0180
Cellular: 910-471-6979

Site Safety and Health Contact: Jason Royal Phone: 910-799-0180

Site Permits Contact: Jason Royal Phone: 910-799-0180
Arthur Batchelor

Client: Reiss Remediation, Inc.
4111 East 37th Street North
Wichita, Kansas 67220

Note: Reiss Remediation, Inc. (Reiss) is affiliated through partially common ownership to the property owner, Flint Hills Resources, LP (FHR) and is responsible to FHR for the remediation activities at the site.

Client Contact: Frank Van Ryn Phone: 316-828-2146
Cellular: 316-209-7509

CATLIN Project Manager: Steve Tyler Phone : 910-452-5861
CATLIN Site Manager (SM): Varies – Pending activities
CATLIN Project Engineer: Jeffery K. Becken, P.E. Phone : 910-452-5861

B. BRIEF DESCRIPTION OF SITE

North Terminal

The FHR North Terminal is a bulk chemical and fuel storage and transfer facility, which is subdivided into two facilities identified as the PX Facility and the Gasoline/#2 Fuel Oil Facility. The PX facility is still an active site, while the Gasoline/#2 Fuel Oil Facility is currently inactive. The current layout of the PX Facility is illustrated on the attached Figure 2. CATLIN activities within the Gasoline/Fuel Oil Facility addressed in this Health and Safety Plan are referred to as the Loading Rack Area. The current layout of the Loading Rack Area is illustrated on the attached Figure 3. The North Terminal is owned and operated by FHR personnel.

On behalf of Reiss, CATLIN personnel are operating/maintaining a subsurface PX remediation system that currently involves air sparge, soil vapor extraction and groundwater pump and treat technologies. CATLIN personnel are periodically involved with obtaining groundwater/soil/air samples, which have been impacted with PX/gasoline/fuel oil compounds.

South Terminal

The FHR South Terminal is also a bulk chemical and fuel storage and transfer facility. Aside from the facilities loading dock area on the Cape Fear River, this site is currently inactive. The site had been active in the storage and transfer of regular gasoline, toluene, sursol 100 and 150. The South Terminal is currently owned, operated and maintained by FHR personnel.

On behalf of Reiss, CATLIN personnel are operating/maintaining a subsurface soil biosparge remediation system and a surficial groundwater air sparge remediation system. CATLIN personnel are periodically involved with obtaining groundwater and soil samples which have been impacted with dissolved gasoline and fuel oil constituents.

C. ORGANIZATION & RESPONSIBILITIES

The following CATLIN personnel are designated to carry out job functions on site. Their responsibilities (i.e. field team leader, etc.) and the tasks they will be carrying out on the site are listed below.

NAME	RESPONSIBILITY & TASKS
Steve Tyler	Site Manager (SM)
Johli Carscallen	Field Technician
Bill Miller	Field Technician/Driller
Bobbie Fowler	Driller
Scott Price	Driller
Tom Stetler	Driller/Geologist
Charles Ray	Geologist
Jeff Becken	Engineer
Ben Ashba	Scientist
Dimitri Talbert	Scientist

D. SITE CONTROL

All CATLIN personnel will sign in and out of these facilities in accordance with the latest FHR site protocol. Currently, this must be done with FHR personnel at the North Terminal. CATLIN personnel will coordinate access control and security with FHR personnel prior to start of work each day. All CATLIN site work may require either a hot or cold work permit, this needs to be verified with FHR personnel prior to the start of any work. Any work which involves excavating deeper than 12 inches, will require CATLIN completion and FHR approval of a FHR Excavation Obstruction Identification Form.

E. HAZARD EVALUATION

Chemicals and fuels known to have been stored by FHR (formerly known as Koch Petroleum Group) at the North and South Terminals are as follows:

Product	Status
<i>North Terminal</i>	
Unleaded Regular Gasoline	Inactive
Unleaded Premium Gasoline	Inactive
Low Sulfur No.2 Fuel Oil	Inactive (active only at site boiler house)
High Sulfur No.2 Fuel Oil	Inactive
Amoco Ultimate Unleaded Premium Gasoline	Inactive
Paraxylene	Active
Gasoline Additives	Inactive
<i>South Terminal</i>	
Unleaded Regular Gasoline	Inactive
Sure Sol 100	Inactive
Sure Sol 150	Inactive
Toluene	Inactive

See Appendix A for Material Safety Data Sheets for the chemicals currently stored at the subject sites.

CATLIN's primary function on-site involves assessing and remediating areas of environmental concern due to historical product releases. The following is a summary of product phases detected within the subsurface of the subject sites:

Free Phase Product

North Terminal
Paraxylene
Fuel Oil
South Terminal
Fuel Oil

See Appendix B for Material Safety Data Sheets for these detected free phase products previously encountered at the subject sites.

Remnant Phase Petroleum Hydrocarbon Compounds – Soil

CATLIN tasks include periodically obtaining surficial soil samples for analysis of dissolved hydrocarbon constituents. The following is a summary of the dissolved hydrocarbon constituents previously detected (see * and ** below) within the site's subsurface soils with concentrations in excess of current North Carolina Soil-to-Groundwater Maximum Soil Contamination Concentration (STGW MSCC) as of the date of this Health and Safety Plan preparation (maximum values observed to date).

Compound	Highest Concentrations Exceeding STGW MSCCs (mg/kg)
<i>North Terminal *</i>	
Benzene	0.58
n-Butyl benzene	43
Sec-Butyl benzene	11
Ethylbenzene	160
Isopropyl benzene	19
4-Isopropyl toluene	7.3
MTBE	1.2
Naphthalene	83
n-Propylbenzene	77
Toluene	360
1, 2, 4 –Trimethylbenzene	500
1, 3, 5 –Trimethylbenzene	140
M/P-Xylenes	1,800
O-Xylenes	240
<i>South Terminal **</i>	
TPH- Diesel	12,000

* Compound concentration data is based on the laboratory sample analysis of site soil samples CATLIN collected between 9/2001 to 2/2002 for the Loading Rack Area and reported in the Corrective Action Plan Addendum dated August 9, 2002. No current soil data is available for the PX Facility.

** Compound concentration data is based on the laboratory sample analysis of site soil samples CATLIN collected between 5/2001 to 6/2002 and reported in the Annual Remediation Update Report dated 10/22/02.

Dissolved Phase Petroleum Hydrocarbon Compounds – Groundwater

CATLIN tasks include periodically obtaining surficial groundwater samples for analysis of dissolved hydrocarbon constituents. The following is a summary of dissolved hydrocarbon constituents previously detected (see * below) within the site's surficial groundwater with concentrations in excess of current NCAC T15A:02L Groundwater Quality Standards as of the date of this Health and Safety Plan preparation.

Compound	Highest Concentration (ppm)
North Terminal	
Benzene	3.500
Ethylbenzene	0.730
Isopropyl benzene	0.077
MTBE	1.800
Naphthalene	0.340
n-Propylbenzene	0.160
1, 2, 4 -Trimethylbenzene	1.700
1, 3, 5 -Trimethylbenzene	0.630
M/P-Xylenes	78.000
O-Xylenes	0.340
South Terminal	
Ethylbenzene	3.200
Naphthalene	1.000
Toluene	5.000
1, 2, 4 -Trimethylbenzene	4.000
1, 3, 5 -Trimethylbenzene	1.300
Total Xylenes	23.300

* Compound concentration data is based on the laboratory sample analysis of site groundwater samples CATLIN collected between 2/2002 to 2/2003 as reported in the June 16, 2003 Remediation Update Report.

ppm – part per million

The following is a summary of the NIOSH database exposure limits for petroleum hydrocarbon compounds listed in the above soil and groundwater tables.

COMPOUND	EXPOSURE LIMITS		
	NIOSH REL	OSHA PEL	IDLH
NORTH TERMINAL			
Benzene	Ca TWA 0.1 ppm (0.319 mg/m ³)	TWA 1 ppm (3.19 mg/m ³)	Ca 500 ppm
n-Butyl benzene	ND	ND	ND
Sec-Butyl benzene	ND	ND	ND
Ethylbenzene	TWA 100 ppm (435 mg/m ³)	TWA 100 ppm (435 mg/m ³)	800 ppm
Isopropyl benzene	TWA 50 ppm (245 mg/m ³)	TWA 50 ppm (245 mg/m ³)	900 ppm
MTBE	ND	ND	ND
Naphthalene	TWA 10 ppm (50 mg/m ³)	TWA 10 ppm (50 mg/m ³)	250 ppm

COMPOUND	EXPOSURE LIMITS		
	NIOSH REL	OSHA PEL	IDLH
NORTH TERMINAL (continued)			
n-Propyl benzene	ND	ND	ND
1,2,4-Trimethylbenzene	TWA 25 ppm (125 mg/m ³)	None	ND
1,3,5-Trimethylbenzene	TWA 25 ppm (125 mg/m ³)	None	ND
O, M and P-Xylenes	TWA 100 ppm (435 mg/m ³)	TWA 100 ppm (435 mg/m ³)	900 ppm
SOUTH TERMINAL			
Benzene	Ca TWA 0.1 ppm (0.319 mg/m ³)	TWA 1 ppm (3.19 mg/m ³)	Ca 500 ppm
Ethyl Benzene	TWA 100 ppm (435 mg/m ³)	TWA 100 ppm (435 mg/m ³)	800 ppm
Naphthalene	TWA 10 ppm (50 mg/m ³)	TWA 10 ppm (50 mg/m ³)	250 ppm
n-Propylbenzene	ND	ND	ND
Toluene	TWA 100 ppm (375 mg/m ³)	TWA 200 ppmc (10- minute maximum peak)	500 ppm
1,2,4-Trimethylbenzene	TWA 25 ppm (125 mg/m ³)	None	ND
1,3,5-Trimethylbenzene	TWA 25 ppm (125 mg/m ³)	None	ND
O, M and P-Xylenes	TWA 100 ppm (435 mg/m ³)	TWA 100 ppm (435 mg/m ³)	900 ppm

ppm – part per million

NIOSH – National Institute for Occupational Safety and Health

OSHA – Occupational Safety and Health Administration

IDLH – Immediately Dangerous to Life or Health concentration

REL – Recommended Exposure Limit

PEL – Permissible Exposure Limit

TWA – Time Weighted Average concentration for up to a 10-hour workday during a 40-hour workweek

Ca – substance that NIOSH considers to be potential occupational carcinogen

ND – indicates exposure level has not yet been determined.

The above information was obtained from the NIOSH Pocket Guide to Chemical Hazards website. Copies of the printout for the individual chemical hazards from the NIOSH database (accessed 6/26/2003) have been provided in Appendix C.

Physical hazards known or suspected to be present on the site.

HAZARD	YES	NO	HAZARD	YES	NO
Overhead Power Lines	X		Aboveground/Buried Pipeline	X	
Buried Conduit	X		Steam Lines	X	
Uneven Ground	X				
Steep Slopes	X				
Slippery Conditions	X				
Rain	X				
Heavy Equipment	X				
Pinch Points on Rig	X				
Insects/snakes	X				

F. MONITORING EQUIPMENT

This section specifies the monitoring equipment to be used on site and the action levels to upgrade to higher levels of personal protection. A minimum of Level D protection is required based on Section G of this Health and Safety Plan.

MONITORING INSTRUMENT	MONITORING INTERVAL	ACTION LEVEL		
		D→C (ppm)	C→B (ppm)	Stop Work (ppm)
N/A				

Comments: N/A = Not Applicable – Based on the current soil and groundwater chemical data, no monitoring equipment is needed for work CATLIN personnel have typically conducted on-site. This could change if advised otherwise by the FHR site personnel or if FHR personnel have listed monitoring equipment in a hot work permit.

G. PERSONAL PROTECTIVE EQUIPMENT (PPE)

FHR policy for all employees and subcontractors (CATLIN) is that all personnel in active site areas must wear at the minimum the following PPE: Hardhat, long or short sleeve shirts (no muscle shirts), long pants, and leather steel toe footwear.

This section lists the minimum additional equipment that must be present on the site and used during the specified protection level. This checklist is used when preparing for the field. **X**= CATLIN equipment that must be present on the site. **O** = Optional equipment.

DESCRIPTION	LEVEL OF PROTECTION		
	D	C	B
FULL BODY			
Coveralls	O		
Tyvek	O**		
Saranex			
Plastic Suit			
Splash Apron	O		
Rain Suit	O		
HEAD			
Hard Hat	X		
Head Warmer			
EYES AND FACE			
Safety Glasses	X		
Sweat Bands	O		
Goggles	X*/**		
Splash Guard	O		
HANDS AND ARMS			
Chemical Resistant Gloves - Latex	X		
Nitrile Rubber	X**		
Natural Rubber			
PVC/Surgical			
Insulated Gloves			
Work Gloves	X		
FOOTWEAR			
Leather steel toe footwear	X		
Natural rubber steel toe boots	O		
FOOT			
Safety Boots			
Steel-Toe Safety Boots	X		
Rubber, Chemical Resistant Boots			
Rubber Boots			
Disposable Boot Covers	O		

DESCRIPTION	LEVEL OF PROTECTION		
	D	C	B
RESPIRATORY PROTECTION			
<i>1/2 Mask APR</i>			
Full Face APR with organic vapor/acid gas cartridges			
Dust Protection			
<i>Full Face Canister APR</i>			
Air Line/SCBA			
OTHER SUPPLIES			
First Aid Kit	X		
Fire Extinguisher	X		
<i>Mobile Phone</i>	O*		
Walkie Talkies			
Drinking Fluids	X		
Eye Wash Station	X		
Wash & Dry Towelettes			

* If CATLIN work involves contact (sampling, pump repair, etc.) with impacted groundwater, then the following minimum PPE is required: goggles and/or splashguard and Nitrile gloves. Personnel with prescription eyewear can utilize wraparound eyewear and/or splashguard.

** If CATLIN work involves contact (recovery, sampling, pump repair, etc.) with free phase product, then the following minimum PPE is required: goggles and/or splashguard, Saranex coveralls, and Nitrile gloves.

The following is a list of required PPE levels for typical CATLIN site work:

TYPE	Minimum Level of PPE	TYPE	Minimum Level of PPE
Soil Sampling	D	Geophysical Survey	D
Groundwater Sampling	D	Site Visit	D
Surface-Water Sampling	D	Drum Sampling	D
Sediment Sampling	D	Surveying	D
Air Sampling/Monitoring	D	Excavation	D
Drilling/DPT	D	Field Measurements	D
Pilot Testing	D		

NOTE: Changing site conditions may require a higher level of PPE.

H. DECONTAMINATION PROCEDURES

Personnel and equipment leaving an exclusion zone shall be decontaminated. Decontamination protocol shall be used with the following decontamination stations:

LEVEL C DECONTAMINATION STEPS		LEVEL D DECONTAMINATION STEPS	
1	Drop equipment.	1	Drop equipment.
2	Wash and rinse outer garment, boots, and gloves.	2	Wash and rinse boots and gloves.
3	Remove disposable garment, boots and gloves.	3	Remove disposable garment, outer boots, and gloves.
4	Change cartridge (if necessary).	4	Field wash.
5	Remove respiratory protection.		
6	Field wash.		

The following decontamination equipment is required at the project site.

DECONTAMINATION EQUIPMENT CHECKLIST			
X	Scrub Brushes	X	Garbage Bags
	Waste Containers	X	Paper Towels
X	Soap	X	Isopropyl Alcohol
X	Chemical Resistant Gloves	X	Pump Spray Bottles
X	Plastic Drop Cloths or Plastic Tubs	X	Pump Spray Bottles (water)

I. EMERGENCY PLANNING

1. FIRST AID AND EMERGENCY EQUIPMENT

	EQUIPMENT	LOCATION		EQUIPMENT	LOCATION
X	First Aid Kit	Field Vehicle	X	Mobile Phone	Field Vehicle
X	Eye Wash Kit	Field Vehicle			
	Safety Shower				
X	Fire Extinguisher	Field Vehicle			

2. COMMUNICATION PROCEDURES

Location of the phone nearest the work area: _____

North Terminal - Office building located next to the facility entrance gate. All on-site FHR personnel carry communication radios. **Mobile phones are not allowed inside the operating area** (within diked areas) of the Paraxylene Facility at the North Terminal. All other areas in the North and South Terminal mobile phones are permitted.

South Terminal – Mobile phone is to be in a company vehicle and used for communication outside of the active area (boat dock) within the South Terminal.

3. ACCIDENT PROCEDURES

All accidents and injuries should be reported immediately to the SM, and FHR safety personnel. The SM will:

- Stop the Job.
- Determine the severity of the situation. If needed:
 - Clear the work area.
 - Call or instruct someone to call emergency personnel (fire, ambulance, etc.)
 - Ensure that non-emergency medical attention is obtained if needed.
- The SM will immediately contact the FHR Safety & Health Contact or Site Manager. The SM will coordinate the Emergency Response Procedures.
- Determine the cause and correct it to prevent reoccurrence.
- Call the Project Manager and report the situation.
- Complete the paperwork required by FHR personnel.

4. EMERGENCY COMMUNICATION

The SM will be the Emergency Coordinator, and will be responsible for the entry and exit of response personnel, contacting emergency personnel, and reporting to the project manager. The following commands are commonly used for communication when verbal commands cannot be used:

- | | |
|--|--------------------------------------|
| • Hand gripping throat | = Out of air, cannot breathe. |
| • Grip partner's wrist or place both arms around the waist | = Leave area immediately, no debate. |
| • Hands on top of head | = Need assistance. |
| • Thumbs up | = OK, all right, I understand. |
| • Thumbs down | = No, negative. |

5. EMERGENCY PHONE NUMBERS

Local Police	911
Local Ambulance	911
Local Fire Dept.	911
Local Hospital (New Hanover Regional Medical Center)	910-343-4800
Poison Control	800-684-8111
National Response Center	800-424-8802 or 800-424-9300
USCG	804-441-3516
CATLIN Engineers and Scientists	910-452-5861

6. HOSPITAL ROUTE

Refer to Figure 1 for hospital route information.

J. GENERAL SAFETY RULES

1. Report all work injuries and illnesses immediately.
2. Report all Unsafe Acts or Unsafe Conditions to your Supervisor.
3. Use seat belts when on Company business in any vehicles.
4. **Firearms, weapons, or explosives are not permitted** on Company Property.
5. Use, possession, sale or being under the influence of illegal drugs, misuse of prescription drugs and/or alcohol is not permitted on Company Property or while "on duty".
6. **Under no circumstances** shall a CATLIN employee enter a confined space.
7. Keep work areas clean and aisles clear. Do not block emergency equipment or exits.
8. Wear and use the prescribed Personal Protective Safety Equipment. This includes foot protection, head protection, gloves, etc.
9. Smoking is permitted only in the designated "Smoking Areas".
10. In the event of potential or actual fire or explosion, evacuate the area immediately. Assemble in a designated area and conduct a head count of all personnel. Notify the fire department. **Do not** attempt to fight the fire. Notify the CATLIN project manager.

K. MEDICAL MONITORING

CATLIN's Medical Monitoring Program provides medical surveillance of employees who may be exposed to hazardous substances or health hazards, or which may be required to wear respiratory protection. The physical examinations may be performed:

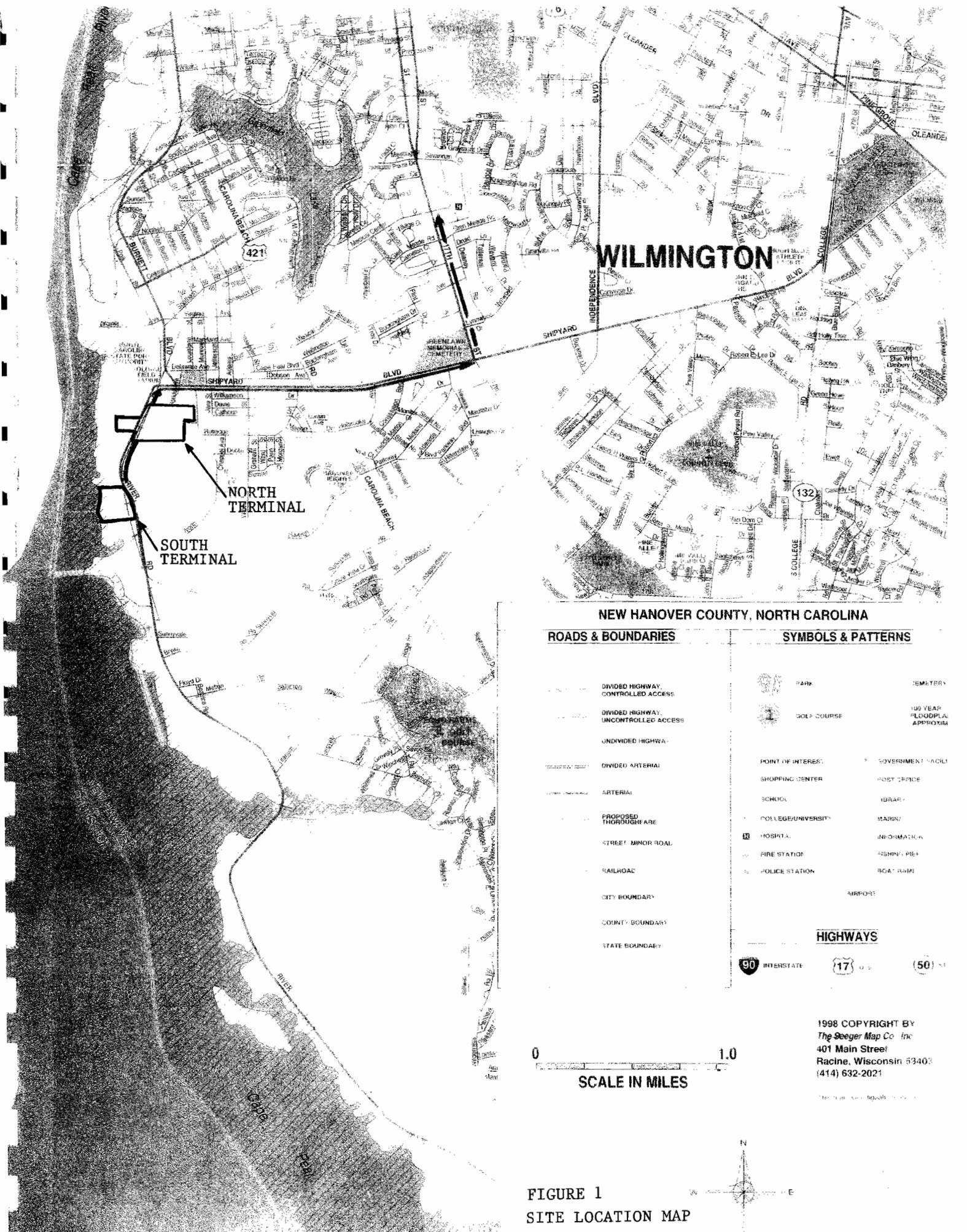
- At least every 12 months;
- At more frequent intervals if determined medically necessary;
- If an employee is injured, becomes ill or develops symptoms due to overexposure involving hazardous substances or health hazards;
- And at termination of employment.

L. EDUCATION AND TRAINING

CATLIN employees are provided with initial indoctrination and continuing training to enable them to perform their work in a safe manner (as required by OSHA and 29 CFR 1910.120). Training requirements are based on the specific job/tasks that the employee is responsible for performing. Types of training provided to employees include, but may not be limited to:

- 40 Hour Hazardous Waste Operations and Emergency Response (HAZWOPER)
- 8 Hour annual HAZWOPER Refresher
- HAZWOPER Management/Supervisor
- Confined Space Awareness/Entry
- North Carolina Asbestos Hazard Management Branch (NCAHMB) Asbestos Inspector/Management Planner
- First Aid/CPR
- General Construction Safety

FIGURES



WILMINGTON

**NORTH
TERMINAL**

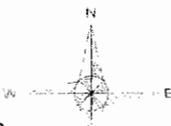
**SOUTH
TERMINAL**

NEW HANOVER COUNTY, NORTH CAROLINA

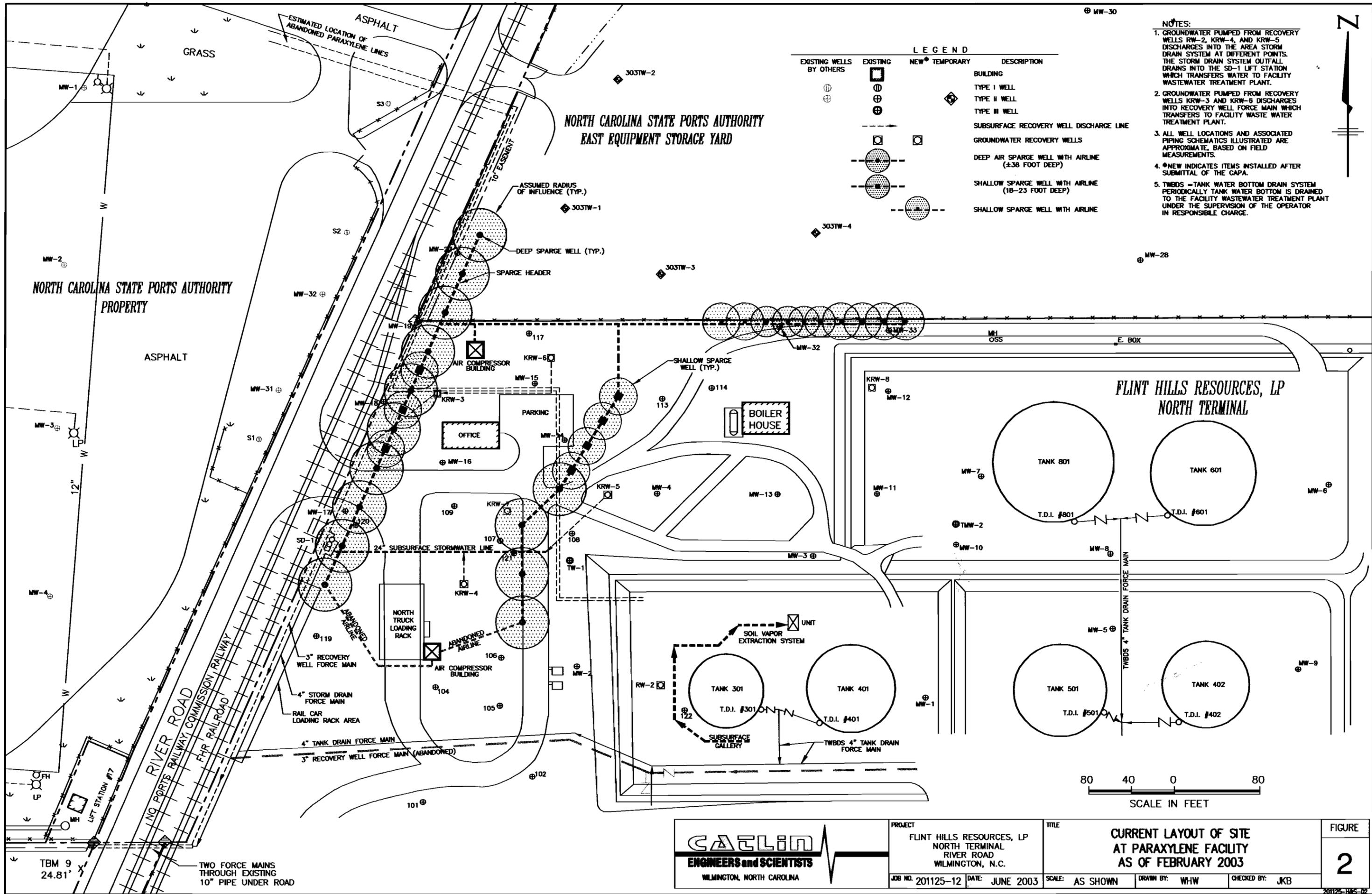
ROADS & BOUNDARIES	SYMBOLS & PATTERNS	
DIVIDED HIGHWAY, CONTROLLED ACCESS	PARK	CEMETERY
DIVIDED HIGHWAY, UNCONTROLLED ACCESS	GOLF COURSE	100 YEAR FLOODPLAIN APPROXIMATION
UNDIVIDED HIGHWAY	POINT OF INTEREST	GOVERNMENT FACILITY
DIVIDED ARTERIAL	SHOPPING CENTER	POST OFFICE
ARTERIAL	SCHOOL	LIBRARY
PROPOSED THOROUGHFARE	COLLEGE/UNIVERSITY	MARKET
STREET/ MINOR ROAD	HOSPITAL	INFORMATION
RAILROAD	FIRE STATION	FISHERY/PIER
CITY BOUNDARY	POLICE STATION	AIRPORT
COUNTY BOUNDARY	HIGHWAYS	
STATE BOUNDARY	90 INTERSTATE	17 US
		50 US

0 1.0
SCALE IN MILES

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Racine, Wisconsin 53403
(414) 632-2021



**FIGURE 1
SITE LOCATION MAP**

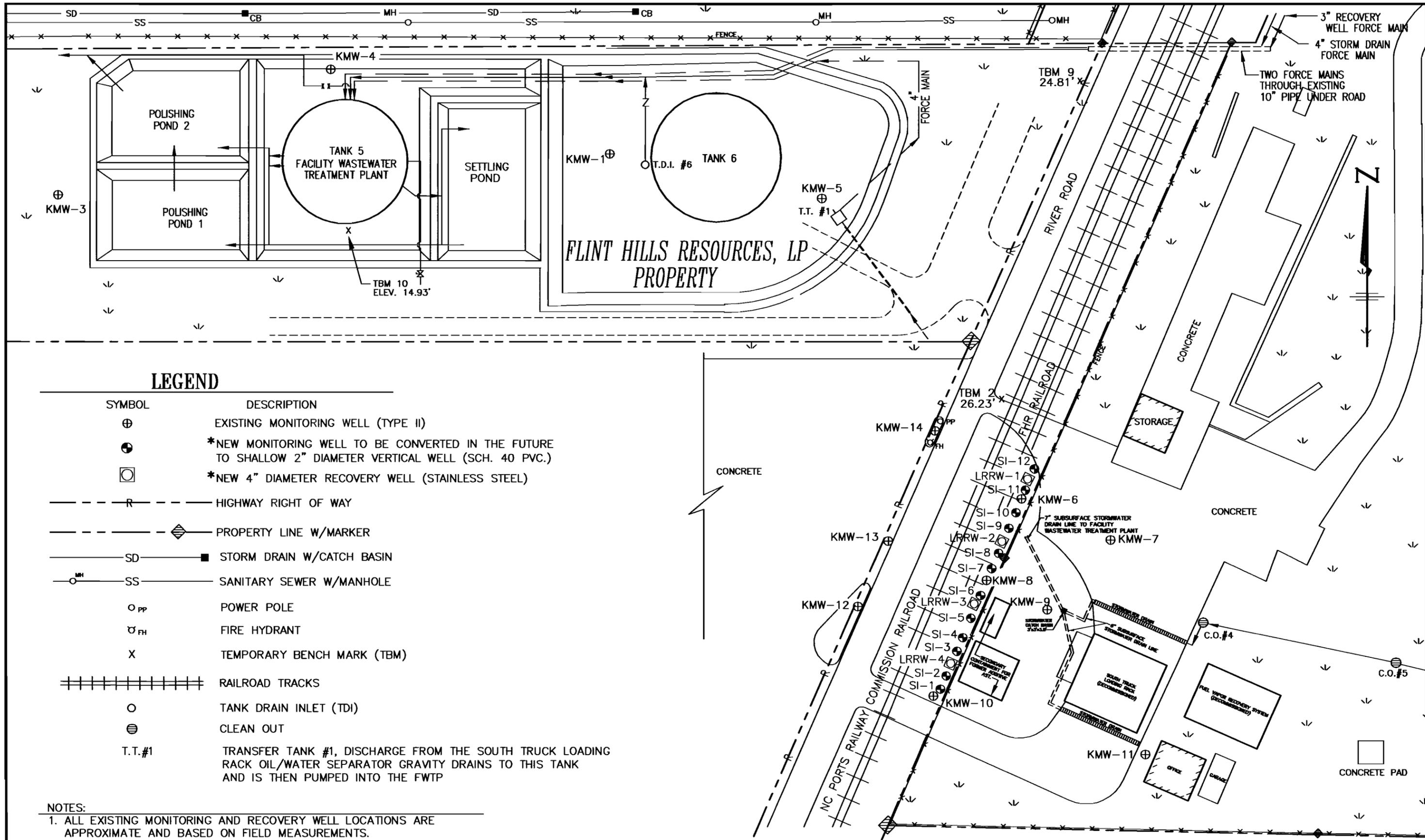


- NOTES:**
- GROUNDWATER PUMPED FROM RECOVERY WELLS RW-2, KRW-4, AND KRW-5 DISCHARGES INTO THE AREA STORM DRAIN SYSTEM AT DIFFERENT POINTS. THE STORM DRAIN SYSTEM OUTFALL DRAINS INTO THE SD-1 LIFT STATION WHICH TRANSFERS WATER TO FACILITY WASTEWATER TREATMENT PLANT.
 - GROUNDWATER PUMPED FROM RECOVERY WELLS KRW-3 AND KRW-6 DISCHARGES INTO RECOVERY WELL FORCE MAIN WHICH TRANSFERS TO FACILITY WASTE WATER TREATMENT PLANT.
 - ALL WELL LOCATIONS AND ASSOCIATED PIPING SCHEMATICS ILLUSTRATED ARE APPROXIMATE, BASED ON FIELD MEASUREMENTS.
 - *NEW INDICATES ITEMS INSTALLED AFTER SUBMITTAL OF THE CAPA.
 - TWBDS = TANK WATER BOTTOM DRAIN SYSTEM PERIODICALLY TANK WATER BOTTOM IS DRAINED TO THE FACILITY WASTEWATER TREATMENT PLANT UNDER THE SUPERVISION OF THE OPERATOR IN RESPONSIBLE CHARGE.

LEGEND

EXISTING WELLS BY OTHERS	EXISTING	NEW	TEMPORARY	DESCRIPTION
⊕	⊕	⊕	⊕	BUILDING
⊕	⊕	⊕	⊕	TYPE I WELL
⊕	⊕	⊕	⊕	TYPE II WELL
⊕	⊕	⊕	⊕	TYPE III WELL
⊕	⊕	⊕	⊕	SUBSURFACE RECOVERY WELL DISCHARGE LINE
⊕	⊕	⊕	⊕	GROUNDWATER RECOVERY WELLS
⊕	⊕	⊕	⊕	DEEP AIR SPARGE WELL WITH AIRLINE (±38 FOOT DEEP)
⊕	⊕	⊕	⊕	SHALLOW SPARGE WELL WITH AIRLINE (18-23 FOOT DEEP)
⊕	⊕	⊕	⊕	SHALLOW SPARGE WELL WITH AIRLINE

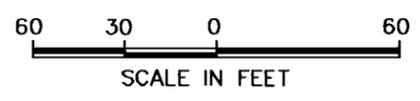
<p>CAELIN ENGINEERS and SCIENTISTS WILMINGTON, NORTH CAROLINA</p>	<p>PROJECT FLINT HILLS RESOURCES, LP NORTH TERMINAL RIVER ROAD WILMINGTON, N.C.</p>	<p>TITLE CURRENT LAYOUT OF SITE AT PARAXYLENE FACILITY AS OF FEBRUARY 2003</p>	<p>FIGURE 2</p>
	<p>JOB NO. 201125-12 DATE: JUNE 2003</p>	<p>SCALE: AS SHOWN</p>	<p>DRAWN BY: WHW CHECKED BY: JKB</p>



LEGEND

SYMBOL	DESCRIPTION
⊕	EXISTING MONITORING WELL (TYPE II)
⊕*	*NEW MONITORING WELL TO BE CONVERTED IN THE FUTURE TO SHALLOW 2" DIAMETER VERTICAL WELL (SCH. 40 PVC.)
⊕	*NEW 4" DIAMETER RECOVERY WELL (STAINLESS STEEL)
- - - R - - -	HIGHWAY RIGHT OF WAY
- - - ◆ - - -	PROPERTY LINE W/MARKER
SD ■	STORM DRAIN W/CATCH BASIN
MH ○	SANITARY SEWER W/MANHOLE
○ PP	POWER POLE
⊕ FH	FIRE HYDRANT
X	TEMPORARY BENCH MARK (TBM)
	RAILROAD TRACKS
○	TANK DRAIN INLET (TDI)
⊖	CLEAN OUT
T.T.#1	TRANSFER TANK #1, DISCHARGE FROM THE SOUTH TRUCK LOADING RACK OIL/WATER SEPARATOR GRAVITY DRAINS TO THIS TANK AND IS THEN PUMPED INTO THE FWTP

- NOTES:**
1. ALL EXISTING MONITORING AND RECOVERY WELL LOCATIONS ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS.
 2. *NEW INDICATES ITEMS INSTALLED AFTER SUBMITTAL OF THE CAPA.

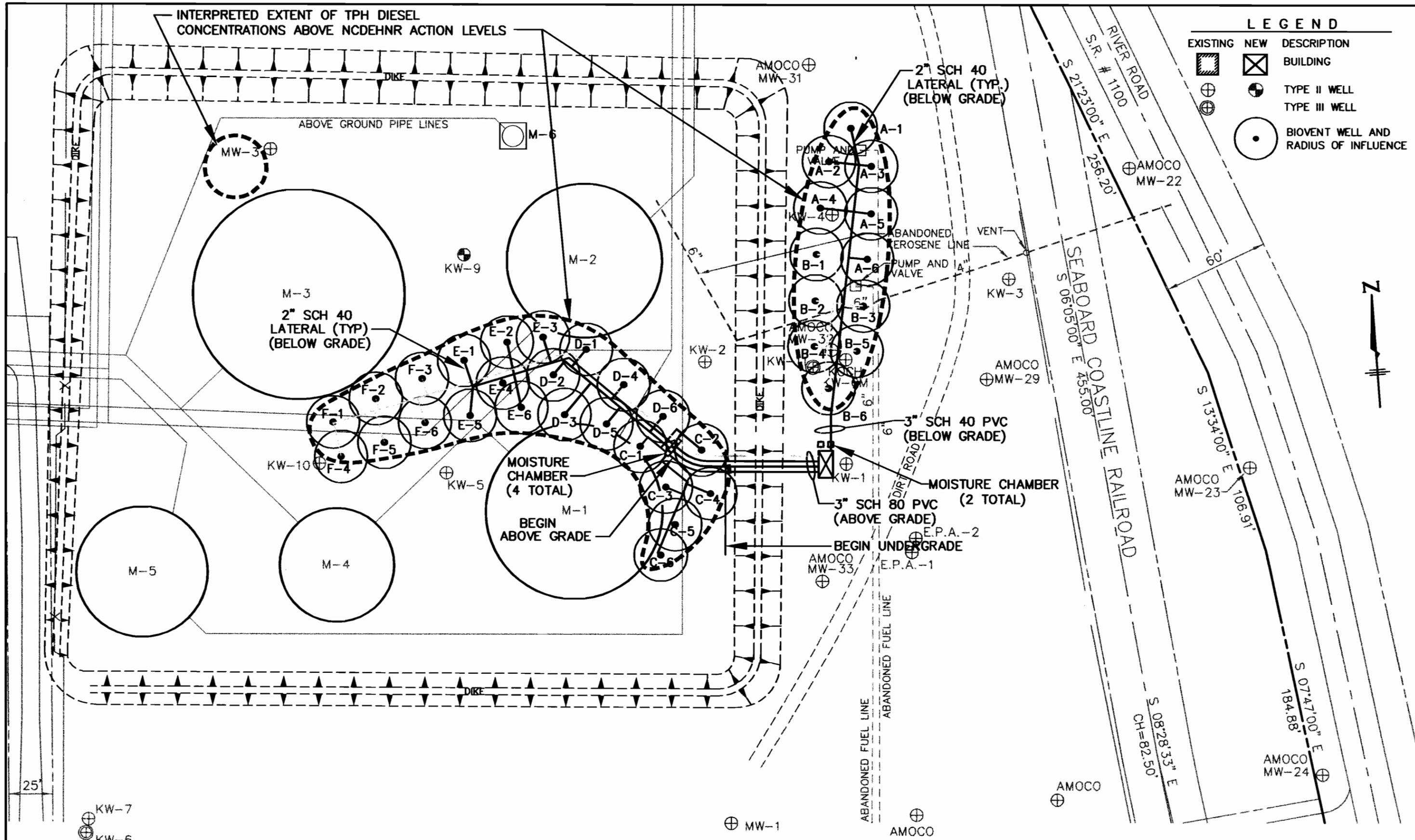


<p>CAELIN ENGINEERS and SCIENTISTS WILMINGTON, NORTH CAROLINA</p>	<p>PROJECT FLINT HILLS RESOURCES, LP NORTH TERMINAL RIVER ROAD WILMINGTON, N.C.</p>	<p>TITLE CURRENT LAYOUT OF SITE AT LOADING RACK AREA AS OF FEBRUARY 2003</p>	<p>FIGURE 3</p>
	<p>JOB NO. 201125-12 DATE: JUNE 2003</p>	<p>SCALE: 1"=60'</p>	<p>DRAWN BY: WHW CHECKED BY: JKB</p>

INTERPRETED EXTENT OF TPH DIESEL CONCENTRATIONS ABOVE NCDEHNR ACTION LEVELS

LEGEND

- EXISTING  NEW  DESCRIPTION BUILDING
-  TYPE II WELL  TYPE III WELL
-  BIOVENT WELL AND RADIUS OF INFLUENCE



CAELIN
ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT
FLINT HILLS RESOURCES, LP
SOUTH TERMINAL
3334 RIVER ROAD
WILMINGTON, N.C.

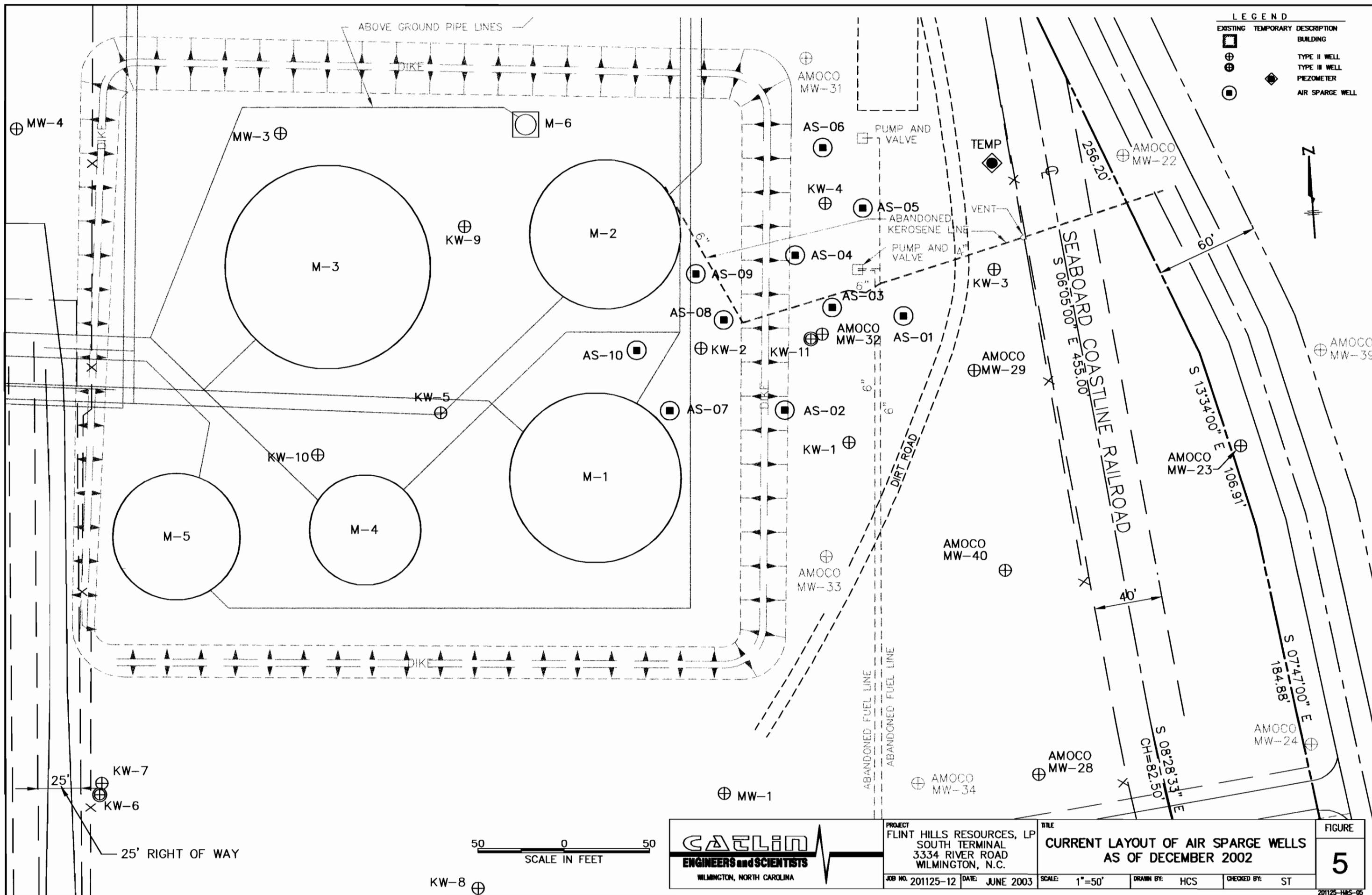
TITLE
CURRENT LAYOUT OF BIOVENT SYSTEM

JOB NO. 201125-12 DATE: JUNE 2002 SCALE: 1"=50' DRAWN BY: WHW CHECKED BY: ST

FIGURE
4

LEGEND

EXISTING	TEMPORARY	DESCRIPTION
		BUILDING
		TYPE II WELL
		TYPE III WELL
		PIEZOMETER
		AIR SPARGE WELL

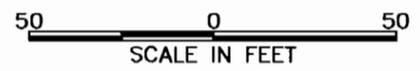


CAELIN
ENGINEERS and SCIENTISTS
 WILMINGTON, NORTH CAROLINA

PROJECT
 FLINT HILLS RESOURCES, LP
 SOUTH TERMINAL
 3334 RIVER ROAD
 WILMINGTON, N.C.
 JOB NO. 201125-12 DATE: JUNE 2003

TITLE
CURRENT LAYOUT OF AIR SPARGE WELLS
AS OF DECEMBER 2002
 SCALE: 1"=50'
 DRAWN BY: HCS
 CHECKED BY: ST

FIGURE
5
 201125-HRS-05



25'
 KW-7
 KW-6
 25' RIGHT OF WAY

KW-8

APPENDIX A
MATERIAL SAFETY DATA SHEETS
ACTIVE SITE PRODUCT



MATERIAL SAFETY DATA SHEET

1 CHEMICAL PRODUCT & COMPANY IDENTIFICATION

TRADE NAME: **PARAXYLENE**
 CAS NUMBER: 106-42-3
 MSDS NUMBER: 5028
 PRODUCT CODE: 7100
 SYNONYMS: P-XYLENE
 1,4-DIMETHYLBENZENE
 P-DIMETHYLBENZENE
 P-METHYLTOLUENE
 4-METHYLTOLUENE
 1,4-XYLENE
 P-XYLOL

MANUFACTURER/
 SUPPLIER: Koch Refining Company, L. P.
 PO Box 2608
 Corpus Christi, TX
 78403

TELEPHONE NUMBERS - 24 HOUR EMERGENCY ASSISTANCE:

Koch Refining Co.: 512-241-4811
 CHEMTREC: 800-424-9300

TELEPHONE NUMBERS - GENERAL ASSISTANCE:

8-5 (M-F) 512-241-4811
 8-5 (M-F) 316-828-8488

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS Number	Percentage*	Exposure Limits / Health Hazards
PARAXYLENE	106-42-3	99.7 - 100 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
ETHYLBENZENE	100-41-4	0 - 0.3 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 125 ppm 15-Min STEL (ACGIH)
METAXYLENE	108-38-3	0 - 0.2 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
ORTHOXYLENE	95-47-6	0 - 0.1 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
TOLUENE	108-88-3	0 - 0.1 %	200 ppm 8-Hour TWA (OSHA) 50 ppm 8-Hour TWA (ACGIH)
BENZENE	71-43-2	0 - 10 PPM	1 ppm 8-Hour TWA (OSHA) 5 ppm 15-Min STEL (OSHA) 10 ppm 8-Hour TWA (ACGIH)

*Values do not reflect absolute minimums and maximums; those values may vary from time to time.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HEALTH HAZARDS

WARNING!

MAY CAUSE CARDIAC SENSITIZATION

ASPIRATION HAZARD IF SWALLOWED-CAN ENTER LUNGS AND CAUSE DAMAGE

OVEREXPOSURE MAY CAUSE CNS DEPRESSION

MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT

POTENTIAL REPRODUCTIVE HAZARD

FLAMMABILITY HAZARDS

WARNING!

FLAMMABLE

REACTIVITY HAZARDS

STABLE

POTENTIAL HEALTH EFFECTS, SKIN

SLIGHTLY TO MODERATELY IRRITATING. Contact may cause reddening, itching and inflammation. Defatting agent. Repeated or prolonged contact may result in drying, reddening, itching, pain, inflammation, cracking and possible secondary infection with tissue damage.

No significant effects are expected to occur following short term exposure. Repeated or prolonged contact with large amounts of this material may result in absorption through the skin to produce toxic effects.

POTENTIAL HEALTH EFFECTS, EYE

SLIGHTLY TO MODERATELY IRRITATING. Exposure to vapors, fumes or mists may cause irritation. Direct contact may cause pain, tears, burns, sensitivity to light, swelling and possible corneal damage. Prolonged or repeated exposure may cause irritation and conjunctivitis.

POTENTIAL HEALTH EFFECTS, INHALATION

SLIGHTLY TOXIC. Breathing of the mists, vapors or fumes may irritate the nose, throat and lungs. Symptoms may include sore throat, coughing, labored breathing, sneezing and burning sensation, depending on the concentration and duration of exposure.

May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

May cause cardiac sensitization, including arrhythmias (irregular heart beats) and death due to cardiac arrest.

Other specific symptoms of exposure are listed under "Special Toxic Effects".

Overexposure to this material may cause systemic damage including target organ effects listed under "Special Toxic Effects".

POTENTIAL HEALTH EFFECTS, INGESTION

MODERATELY TOXIC. May cause irritation of the mouth, throat and gastrointestinal tract. Symptoms may include salivation, pain, nausea, vomiting and diarrhea. Aspiration into lungs may cause chemical pneumonia and lung damage.

Exposure may also cause central nervous system symptoms similar to those listed under "Inhalation" (see Inhalation section). Overexposure to this material may cause systemic damage including target organ effects listed under "Special Toxic Effects".

SPECIAL TOXIC EFFECTS

Exposure may cause the following specific symptoms, depending on the concentration and duration of exposure: anemia, pallor and loss of appetite. Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: kidney, liver, fetus and central nervous system.

IARC has determined that there is inadequate evidence for the carcinogenicity of xylene in humans and experimental animals. (IARC Class 3).

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes referred to as solvent or painter's syndrome). Intentional misuse by deliberately concentrating and inhaling this product may be harmful or fatal.

May cause adverse reproductive and/or developmental effects. Pregnant women may be at an increased risk from exposure. Consumption of alcoholic beverages may enhance toxic effects.

Pre-existing medical conditions which may be aggravated by exposure include disorders of the skin, heart, kidney, liver and respiratory system.

4 FIRST AID MEASURES

SKIN

Immediately wash skin with plenty of soap and water while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists.

Place contaminated clothing in closed container for storage until laundered or discarded. If clothing is to be laundered, inform person performing operation of contaminant's hazardous properties. Discard contaminated leather goods.

EYE

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

INHALATION

Remove to fresh air. If not breathing, institute cardiopulmonary resuscitation (CPR). If breathing is difficult, ensure clear airway and give oxygen. Keep affected person warm and at rest. **GET IMMEDIATE MEDICAL ATTENTION.**

INGESTION

Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs keep head below hips to prevent aspiration and monitor for breathing difficulty. Gastric lavage should be performed only by qualified medical personnel. **GET IMMEDIATE MEDICAL ATTENTION.**

Keep affected person warm and at rest.

NOTES TO PHYSICIAN

Gastric lavage may be indicated if ingested. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

In cases of acute poisoning, artificial respiration with administration of oxygen may be useful for support. **DO NOT GIVE EPINEPHRINE, EPHEDRINE OR SIMILAR ADRENERGIC DRUGS. THEY MAY INDUCE FATAL VENTRICULAR FIBRILLATION.** Electrocardiographic monitoring should be carried out with severely ill patients to anticipate possible cardiac arrest.

Anemia may require the usual supportive measures. Medical evaluation of acute overexposure should include hematological determinations until stable. In severe acute and chronic poisoning, both renal and hepatic damage may occur and should be anticipated in such cases. Respiratory and pulmonary problems may require special attention. After severe acute symptoms have been alleviated, it may be advisable to consider periodic monitoring of the patient until such time as the likelihood of other adverse effects can be discounted.

5 FIRE FIGHTING MEASURES

HAZARDOUS COMBUSTION PRODUCTS

Combustion may produce CO, NO_x, SO_x and reactive hydrocarbons.

BASIC FIRE FIGHTING PROCEDURES

Use water spray, dry chemical, alcohol foam, all purpose AFFF or carbon dioxide to extinguish fire. Evacuate area and fight fire from a safe distance.

If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.

Use water spray to cool adjacent structures and to protect personnel. Shut off source of flow if possible. Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Firefighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

UNUSUAL FIRE & EXPLOSION HAZARDS

Vapors may form explosive mixture with air. Vapors can travel to a source of ignition and flash back.

Explosion hazard if exposed to extreme heat or to physical or thermal shock.

Fires involving this product may release carbon monoxide, carbon dioxide, reactive hydrocarbons and irritating vapors.

Flash Point:	81 F (27 C) TAG CLOSED CUP
Autoignition Temperature:	986 F (530 C)
Flammability Limits in Air, Lower, % by Volume:	1 %
Flammability Limits in Air, Upper, % by Volume:	7 %

6 ACCIDENTAL RELEASE MEASURES

EMERGENCY ACTION

Keep ignition sources out of area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. (See Exposure Controls/Personal Protection Section.) Keep unnecessary people at least 150 feet upwind of spill; greater distances may be necessary for people downwind.

ENVIRONMENTAL PRECAUTIONS

Eliminate all sources of ignition. Isolate hazard area and deny entry.

If product is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released product. Notify local authorities and the National Response Center, if required.

SPILL OR LEAK PROCEDURE

Keep ignition sources out of area and shut off all ignition sources. Absorb spill with inert material (e. g. dry sand or earth) then place in a chemical waste container. Large Spills: Dike far ahead of liquid spill for later disposal. Shut off leak if safe to do so.

See Exposure Controls/Personal Protection section.

7 HANDLING & STORAGE

HANDLING

Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

Do not eat, drink or smoke in areas of use or storage.

STORAGE

Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizers.

Empty containers may contain product residue. Do not reuse without adequate precautions.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Wear chemical safety goggles and face shield. Have eye washing facilities readily available where eye contact can occur.

SKIN PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Avoid skin contact with this material. Use appropriate chemical protective gloves when handling.

Use good personal hygiene.

RESPIRATORY PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

A NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

9 PHYSICAL & CHEMICAL PROPERTIES**ODOR AND APPEARANCE**

CLEAR, COLORLESS LIQUID WITH A MODERATE, AROMATIC ODOR

Boiling Point: 280 F (138 C)
 Specific Gravity: 0.861
 Melting Point: 55 F (13 C)
 Percent Volatile: 100 %
 Vapor Pressure: 9 MMHG @ 68 F (20 C)
 Vapor Density: 3.7
 Bulk Density: ND
 Solubility in Water: NEGLIGIBLE
 Octanol/Water Partn: ND
 Volatile Organic: ND
 Pour Point: ND
 pH Value: ESSENTIALLY NEUTRAL
 Freezing Point: ND
 Viscosity: ND
 Evaporation Rate: MODERATELY FAST

$$P_2 = 0.080703 \times 3.7$$

$$= 0.295 \quad 16/FT3$$

$$PK \text{ weighs } 7.209 \# / gm.$$

Molecular Formula: C8H10
 Molecular Weight: 106.1600
 Chemical Family: AROMATIC HYDROCARBON
 Odor Threshold: ND

10 STABILITY & REACTIVITY**STABILITY/INCOMPATIBILITY**

Incompatible with oxidizing agents. See precautions under Handling & Storage.

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS

Combustion may produce CO, NOx, SOx and reactive hydrocarbons.

11 TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA

See Special Toxic Effects (Section 3)

12 ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

This product contains paraxylene which biodegrades in soil and water and oxidizes in air. This product is not expected to bioaccumulate in aquatic organisms.

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

This product, as supplied, when discarded or disposed of, is a hazardous waste according to Federal Regulations (40 CFR 261) due to its ignitability and benzene content. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.

The transportation, storage, treatment and disposal of this waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

14 TRANSPORT INFORMATION

BILL OF LADING (DOT)

Xylenes, (Paraxylene), 3, UN1307, PG III, RQ

Department of Transportation (DOT) Requirements:

Proper Shipping Name: XYLENES, (PARAXYLENE)

Hazard Class: 3

UN/NA Code: UN1307

Packaging Group: PG III

Labels Required: FLAMMABLE LIQUID

Placards Required: FLAMMABLE LIQUID, UN1307

Reportable Quantity: See Regulatory Information
(Section 15)

15 REGULATORY INFORMATION

FEDERAL REGULATIONS

Consult OSHA's Benzene standard 29 CFR 1910.1028 for provisions on air monitoring, employee training, medical monitoring, etc.

All major components of this product are listed on the TSCA Inventory.

This product, as supplied, contains Paraxylene, Metaxylene, Orthoxylene, Benzene, Toluene and Ethylbenzene all of which are regulated as hazardous substances per 40 CFR Part 302.4. The reportable quantities for these components are 100, 1000, 10, 1000 and 1000 pounds, respectively. Any release of this product that results in a release of these components equal to or exceeding the reportable quantities must be reported to the National Response Center (800-424-8802) and appropriate state and local regulatory agencies as described in 40 CFR Part 302.6 and 40 CFR 355.40. Failure to report may result in substantial civil and criminal penalties.

This product contains one or more components designated as hazardous substances or toxic pollutants pursuant to the Federal Clean Water Act (40 CFR 116.4 Table A; 40 CFR 401.15). Any unpermitted introduction of this product into a facility stormwater or wastewater discharge may constitute a violation of the Clean Water Act. Facilities must notify the appropriate permitting agency prior to introducing this product into the aforementioned discharges.

This product contains one or more substances listed as hazardous, toxic or flammable air pollutants under Section 112 of the Clean Air Act. This product contains up to 100 % volatile organic compounds (VOCs) per 40 CFR Part 51.100. This product contains up to 100 % hazardous air pollutants (HAPs) per Section 112 Clean Air Act Amendments of 1990.

There may be specific regulations at the local, regional or state level that pertain to this product.

STATE REGULATIONS

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

This product, as sold, meets the requirements of the Model Toxics Legislation of the Coalition of Northeastern Governors (CONEG). Any alteration of this product may affect its compliance with this law.

SARA TITLE III RATINGS:

Immediate Hazard: X Delayed Hazard: X Fire Hazard: X Pressure Hazard:
Reactivity Hazard:

NFPA RATINGS:

Health: 2 Flammability: 3 Reactivity: 0 Special Hazards:

HMIS RATINGS:

Health: Flammability: Reactivity: Personal Prot. Equip:

Following ingredients of this product are listed in SARA313:

SARA Listed Ingredient Name	CAS Number	Maximum %
PARAXYLENE	106-42-3	100.0000

16 OTHER INFORMATION

DISCLAIMER

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, MSDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

Completed On: 12/4/96

Replaces Sheet Dated: 12/1/95

Completed By: Safety & Emergency Response, Koch Industries, Inc.



MATERIAL SAFETY DATA SHEET

CHEMICAL PRODUCT & COMPANY IDENTIFICATION

TRADE NAME FUEL OIL NO. 2 (LOW SULFUR)
CAS NUMBER 68476-30-2
MSDS NUMBER 5465
PRODUCT CODE ND
SYNONYM(S) 2 OIL, NO. 2 LOW SULFUR DIESEL, NO. 2 LOW SULFUR FUEL, HEATING OIL, PREMIUM DIESEL (LOW SULFUR), DIESEL FUEL, ARCTIC DIESEL, DIESEL FUEL NO. 2, DIESEL OIL, D-GRADE FUEL OIL, RAILROAD DIESEL, VIRGIN DIESEL APPLICABLE TO ALL GRADES
MANUFACTURER / SUPPLIER Koch Petroleum Group, LP.
 PO Box 2258
 Wichita, KS
 67201

TELEPHONE NUMBERS - 24 HOUR EMERGENCY ASSISTANCE

Chemtrec: 800-424-9300

Koch Security: 316-828-6777

TELEPHONE NUMBERS - GENERAL ASSISTANCE

8-5 (M-F) 316-828-6777

8-5 (M-F, CST) MSDS Assistance 316-828-8488

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS Number	Concentration*	Exposure Limits / Health Hazards
C9-C16 HYDROCARBONS PRODUCED BY THE DISTILLATION OF CRUDE OIL	68476-30-2	99 - 100 %	ND
1,2,4-TRIMETHYLBENZENE	95-63-6	0 - 0.6 %	25 ppm 8-Hour TWA (ACGIH)
BIPHENYL	92-52-4	0 - 0.3 %	0.2 ppm 8-Hour TWA (OSHA) 0.2 ppm 8-Hour TWA (ACGIH)
NAPHTHALENE	91-20-3	0 - 0.2 %	10 ppm 8-Hour TWA (OSHA) 10 ppm 8-Hour TWA (ACGIH) 15 ppm 15-Min STEL (ACGIH)
XYLENES	1330-20-7	0 - 0.2 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
CUMENE	98-82-8	Trace	50 ppm 8-Hour TWA (OSHA) 50 ppm 8-Hour TWA (ACGIH)

Ingredient Name	CAS Number	Concentration*	Exposure Limits / Health Hazards
TOLUENE	108-88-3	Trace	200 ppm 8-Hour TWA (OSHA) 50 ppm 8-Hour TWA (ACGIH)

*Values do not reflect absolute minimums and maximums; these values are typical which may vary from time to time.

This Material Safety Data Sheet is intended to communicate potential health hazards and potential physical hazards associated with the product(s) covered by this sheet, and is not intended to communicate product specification information. For product specification information, contact your Koch Petroleum Group, LP representative.

HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HEALTH HAZARDS

WARNING!

MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT

OVEREXPOSURE MAY CAUSE CNS DEPRESSION

ASPIRATION HAZARD IF SWALLOWED-CAN ENTER LUNGS AND CAUSE DAMAGE

POTENTIAL REPRODUCTIVE HAZARD

SKIN CANCER HAZARD BASED ON TESTS WITH LABORATORY ANIMALS

FLAMMABILITY HAZARDS

COMBUSTIBLE

PER OSHA GUIDELINES, 29 CFR 1910.1200(c)

REACTIVITY HAZARDS

STABLE

POTENTIAL HEALTH EFFECTS, SKIN

MODERATELY IRRITATING. Repeated or prolonged skin contact may cause drying, reddening, itching and cracking.

No significant effects are expected to occur following short term exposure. Repeated or prolonged contact with large amounts of this material may result in absorption through the skin to produce toxic effects.

Contact with heated material may cause thermal burns.

POTENTIAL HEALTH EFFECTS, EYE

SLIGHTLY-IRRITATING. Exposure to vapors, fumes or mists may cause irritation. May cause slight transient irritation, lacrimation (tears) and a burning sensation in the eyes. Prolonged or repeated exposure may cause irritation and conjunctivitis.

Contact with heated material may cause thermal burns.

POTENTIAL HEALTH EFFECTS, INHALATION

Petroleum mists at high exposure levels may be irritating to the nose, throat and lungs.

May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

Overexposure to this material may cause systemic damage including target organ effects listed under "Special Toxic Effects."

Other specific symptoms of exposure are listed under "Special Toxic Effects."

POTENTIAL HEALTH EFFECTS, INGESTION

PRACTICALLY NON-TOXIC. Ingestion of large amounts may cause gastrointestinal disturbances. May cause irritation of the mouth, throat and gastrointestinal tract. Symptoms may include salivation, pain, nausea, vomiting and diarrhea.

Aspiration into lungs may cause chemical pneumonia and lung damage.

Exposure may also cause central nervous system symptoms similar to those listed under "Inhalation" (see Inhalation section).

Overexposure to this material may cause systemic damage including target organ effects listed under "Special Toxic Effects."

Other specific symptoms of exposure are listed under "Special Toxic Effects."

SPECIAL TOXIC EFFECTS

Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: liver and kidney.

Exposure to components of this material may cause the following specific symptoms, depending on the concentration and duration of exposure: irritation of the hair follicles and blockage of the sebaceous glands.

This product contains C9 aromatics which may cause adverse reproductive and/or developmental effects.

IARC has determined that there is limited evidence for the carcinogenicity of fuel oil no. 2 in experimental animals and inadequate evidence in humans.

Lifetime exposure to whole diesel exhaust has been shown to cause cancer in laboratory animals. NIOSH recommends that whole diesel exhaust be regarded as a potential occupational carcinogen.

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes referred to as solvent or painter's syndrome). Intentional misuse by deliberately concentrating and inhaling this product may be harmful or fatal.

Pre-existing medical conditions which may be aggravated by exposure include disorders of the skin, eye and respiratory system.

This product has not been tested as a whole for all potential health effects.

WARNING: The use of any hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of combustion products and inadequate oxygen levels.

4 FIRST AID MEASURES**SKIN**

Immediately wash skin with plenty of soap and water while removing contaminated clothing and shoes. GET IMMEDIATE MEDICAL ATTENTION.

Place contaminated clothing in closed container for storage until laundered or discarded. If clothing is to be laundered, inform person performing operation of contaminant's hazardous properties. Discard contaminated leather goods.

EYE

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

INHALATION

Remove to fresh air. If not breathing, institute cardiopulmonary resuscitation (CPR). If breathing is difficult, ensure airway is clear and give oxygen.

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION

Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs keep head below hips to prevent aspiration and monitor for breathing difficulty. Gastric lavage should be performed only by qualified medical personnel.

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

NOTES TO PHYSICIAN

Gastric lavage may be indicated if ingested. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

FIRE FIGHTING MEASURES**HAZARDOUS COMBUSTION PRODUCTS**

Combustion may produce COx, NOx, SOx, reactive hydrocarbons, irritating vapors and hydrogen sulfide.

EXTINGUISHING MEDIA

Use water spray, dry chemical, alcohol foam, all purpose AFFF or carbon dioxide to extinguish fire.

BASIC FIRE FIGHTING PROCEDURES

Evacuate area and fight fire from a safe distance. If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.

Use water spray to cool adjacent structures and to protect personnel. Shut off source of flow if possible. Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Firefighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

UNUSUAL FIRE & EXPLOSION HAZARDS

Vapors may form explosive mixture with air. Vapors can travel to a source of ignition and flash back.

Explosion hazard if exposed to extreme heat or to physical or thermal shock.

Fires involving this product may release COx, NOx, SOx, reactive hydrocarbons, irritating vapors and hydrogen sulfide.

Flash Point	> 125 F (> 52 C) PENSKEY-MARTENS CLOSED CUP
Autoignition Temperature	494 F (257 C)
Flammability Limits in Air, Lower, % by Volume	0.8 %
Flammability Limits in Air, Upper, % by Volume	7.5 %

3 ACCIDENTAL RELEASE MEASURES**EMERGENCY ACTION**

Eliminate and/or shut off ignition sources and keep ignition sources out of the area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in release. Evacuate area endangered by release as required. (See Personal Protection Information Section.)

ENVIRONMENTAL PRECAUTIONS

Eliminate all sources of ignition. Isolate hazard area and deny entry.

If product is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released product. Notify local authorities and the National Response Center, if required.

SPILL OR LEAK PROCEDURE

Keep ignition sources out of area and shut off all ignition sources. Absorb spill with inert material (e. g. dry sand or earth) then place in a chemical waste container. Large Spills: Dike far ahead of liquid spill for later disposal. Stop leak when safe to do so.

See Exposure Controls/Personal Protection (Section 8).

HANDLING & STORAGE

HANDLING

Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

Do not eat, drink or smoke in areas of use or storage.

STORAGE

Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizers.

Empty containers may contain product residue. Do not reuse without adequate precautions.

Do not eat, drink or smoke in areas of use or storage.

EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Wear chemical safety goggles and face shield. Have eye washing facilities readily available where eye contact can occur.

SKIN PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Avoid skin contact with this material. Use appropriate chemical protective gloves when handling.

Use good personal hygiene.

RESPIRATORY PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

A NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

PHYSICAL & CHEMICAL PROPERTIES

ODOR AND APPEARANCE

CRYSTAL CLEAR TO PALE YELLOW OR GREEN COLORED LIQUID WITH HYDROCARBON ODOR; FOR TAX EXEMPT PURPOSES, THIS FUEL MAY CONTAIN RED DYE

Bolling Point	325 - 700 F (163-371 C)
Specific Gravity	0.835 - 0.9
Melting Point	-20 F (-29 C)
Percent Volatile	100 %
Vapor Pressure	2.6 mmHg AT 122 F (50 C)
Vapor Density	8
Bulk Density	ND
Solubility in Water	INSOLUBLE
Octanol/Water Partn	ND
Volatile Organic	ND
Pour Point	-20 TO 10 F (-29 TO -12 C) [ARCTIC DIESEL < -50 F (< -45 C)]
pH Value	ND
Freezing Point	ND
Viscosity	32.6 - 40.1 SSU AT 100 F (38 C)
Evaporation Rate	0.01

Molecular Formula	NA
Molecular Weight	ND
Chemical Family	HYDROCARBON MIXTURE
Odor Threshold	ND

0 STABILITY & REACTIVITY

STABILITY/INCOMPATIBILITY

Incompatible with oxidizing agents. See precautions under Handling & Storage (Section 7).

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS

Combustion may produce COx, NOx, SOx, reactive hydrocarbons, irritating vapors and hydrogen sulfide.

1 TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA

See Special Toxic Effects (Section 3).

2 ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

ND

3 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

This product, as supplied, when discarded or disposed of, is a hazardous waste according to Federal Regulations (40 CFR 261) due to its ignitability. Under the Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user of the product to determine, at the time of disposal, whether the material is a hazardous waste subject to RCRA.

The transportation, storage, treatment and disposal of RCRA waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

4 TRANSPORT INFORMATION

BILL OF LADING - BULK (U. S. DOT)

Fuel Oil (No. 2), Combustible Liquid, NA1993, PG III

U. S. Department of Transportation (DOT) Requirements

General Transportation Information for Bulk Shipments

Proper Shipping Name	Fuel Oil (No. 2)		
Hazard Class	Combustible Liquid	UN/NA Code	NA1993
Packaging Group	PG III		
Labels Required	None		
Placards Required	Combustible Liquid, NA1993		
Reportable Quantity	See Regulatory Information (Section 15)		

General Transportation Information for Non-Bulk Shipments

Proper Shipping Name	Non-Regulated		
Hazard Class	NA	UN/NA Code	NA
Packaging Group	NA		
Labels Required	NA		
Placards Required	NA		
Reportable Quantity	NA		

Non-bulk shipments of this product are non-regulated for domestic ground transportation when they meet the requirements of 49 CFR 173.150(f).

5 REGULATORY INFORMATION

FEDERAL REGULATIONS

All known major components of this product are listed on the TSCA Inventory and/or are otherwise in compliance with TSCA.

A release of this product, as supplied, is exempt from reporting under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) by the petroleum exclusion. Releases may be reportable to the National Response Center (800-424-8802) under the Clean Water Act, 33 U.S.C. 1321(b)(3) and (5). Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Failure to report may result in substantial civil and criminal penalties.

This product does not contain toxic chemicals (in excess of the applicable de minimis concentration) that are subject to the annual toxic chemical release reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372).

This product contains one or more components designated as hazardous substances or toxic pollutants pursuant to the Federal Clean Water Act (40 CFR 116.4 Table A; 40 CFR 401.15). Any unpermitted introduction of this product into a facility stormwater or wastewater discharge may constitute a violation of the Clean Water Act. Facilities must notify the appropriate permitting agency prior to introducing this product into the aforementioned discharges.

This product contains one or more substances listed as hazardous, toxic or flammable air pollutants under Section 112 of the Clean Air Act.

There may be specific regulations at the local, regional or state/provincial level that pertain to this product.

STATE REGULATIONS

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

SARA TITLE III RATINGS

Immediate Hazard	X	Delayed Hazard	X	Fire Hazard	X	Pressure Hazard	-
Reactivity Hazard	-						

NFPA RATINGS

Health	1	Flammability	2	Reactivity	0	Special Hazards	-
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HMIS RATINGS

Health	2*	Flammability	2	Reactivity	0
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Following ingredients of this product are listed in SARA313

SARA Listed Ingredient Name	CAS Number	Maximum %
XYLENES	1330-20-7	0.2

6 OTHER INFORMATION

DISCLAIMER

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, MSDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

Completed On	12/23/98	Replaces Sheet Dated	6/15/98
Completed By	Safety & Emergency Response, Koch Industries, Inc.		

APPENDIX B
MATERIAL SAFETY DATA SHEETS
FREE PHASE PRODUCT



MATERIAL SAFETY DATA SHEET

1 CHEMICAL PRODUCT & COMPANY IDENTIFICATION

TRADE NAME: **PARAXYLENE**
 CAS NUMBER: 106-42-3
 MSDS NUMBER: 5028
 PRODUCT CODE: 7100
 SYNONYMS: P-XYLENE
 1,4-DIMETHYLBENZENE
 P-DIMETHYLBENZENE
 P-METHYLTOLUENE
 4-METHYLTOLUENE
 1,4-XYLENE
 P-XYLOL
 MANUFACTURER/
 SUPPLIER: Koch Refining Company, L. P.
 PO Box 2608
 Corpus Christi, TX
 78403

TELEPHONE NUMBERS - 24 HOUR EMERGENCY ASSISTANCE:

Koch Refining Co.: 512-241-4811
 CHEMTREC: 800-424-9300

TELEPHONE NUMBERS - GENERAL ASSISTANCE:

8-5 (M-F) 512-241-4811
 8-5 (M-F) 316-828-8488

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS Number	Percentage*	Exposure Limits / Health Hazards
PARAXYLENE	106-42-3	99.7 - 100 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
ETHYLBENZENE	100-41-4	0 - 0.3 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 125 ppm 15-Min STEL (ACGIH)
METAXYLENE	108-38-3	0 - 0.2 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
ORTHOXYLENE	95-47-6	0 - 0.1 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
TOLUENE	108-88-3	0 - 0.1 %	200 ppm 8-Hour TWA (OSHA) 50 ppm 8-Hour TWA (ACGIH)
BENZENE	71-43-2	0 - 10 PPM	1 ppm 8-Hour TWA (OSHA) 5 ppm 15-Min STEL (OSHA) 10 ppm 8-Hour TWA (ACGIH)

*Values do not reflect absolute minimums and maximums; those values may vary from time to time.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HEALTH HAZARDS

WARNING!

MAY CAUSE CARDIAC SENSITIZATION

ASPIRATION HAZARD IF SWALLOWED-CAN ENTER LUNGS AND CAUSE DAMAGE

OVEREXPOSURE MAY CAUSE CNS DEPRESSION

MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT

POTENTIAL REPRODUCTIVE HAZARD

FLAMMABILITY HAZARDS

WARNING!

FLAMMABLE

REACTIVITY HAZARDS

STABLE

POTENTIAL HEALTH EFFECTS, SKIN

SLIGHTLY TO MODERATELY IRRITATING. Contact may cause reddening, itching and inflammation. Defatting agent. Repeated or prolonged contact may result in drying, reddening, itching, pain, inflammation, cracking and possible secondary infection with tissue damage.

No significant effects are expected to occur following short term exposure. Repeated or prolonged contact with large amounts of this material may result in absorption through the skin to produce toxic effects.

POTENTIAL HEALTH EFFECTS, EYE

SLIGHTLY TO MODERATELY IRRITATING. Exposure to vapors, fumes or mists may cause irritation. Direct contact may cause pain, tears, burns, sensitivity to light, swelling and possible corneal damage. Prolonged or repeated exposure may cause irritation and conjunctivitis.

POTENTIAL HEALTH EFFECTS, INHALATION

SLIGHTLY TOXIC. Breathing of the mists, vapors or fumes may irritate the nose, throat and lungs. Symptoms may include sore throat, coughing, labored breathing, sneezing and burning sensation, depending on the concentration and duration of exposure.

May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

May cause cardiac sensitization, including arrhythmias (irregular heart beats) and death due to cardiac arrest.

Other specific symptoms of exposure are listed under "Special Toxic Effects".

Overexposure to this material may cause systemic damage including target organ effects listed under "Special Toxic Effects".

POTENTIAL HEALTH EFFECTS, INGESTION

MODERATELY TOXIC. May cause irritation of the mouth, throat and gastrointestinal tract. Symptoms may include salivation, pain, nausea, vomiting and diarrhea. Aspiration into lungs may cause chemical pneumonia and lung damage.

Exposure may also cause central nervous system symptoms similar to those listed under "Inhalation" (see Inhalation section). Overexposure to this material may cause systemic damage including target organ effects listed under "Special Toxic Effects".

SPECIAL TOXIC EFFECTS

Exposure may cause the following specific symptoms, depending on the concentration and duration of exposure: anemia, pallor and loss of appetite. Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: kidney, liver, fetus and central nervous system.

IARC has determined that there is inadequate evidence for the carcinogenicity of xylene in humans and experimental animals. (IARC Class 3).

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes referred to as solvent or painter's syndrome). Intentional misuse by deliberately concentrating and inhaling this product may be harmful or fatal.

May cause adverse reproductive and/or developmental effects. Pregnant women may be at an increased risk from exposure. Consumption of alcoholic beverages may enhance toxic effects.

Pre-existing medical conditions which may be aggravated by exposure include disorders of the skin, heart, kidney, liver and respiratory system.

4 FIRST AID MEASURES

SKIN

Immediately wash skin with plenty of soap and water while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists.

Place contaminated clothing in closed container for storage until laundered or discarded. If clothing is to be laundered, inform person performing operation of contaminant's hazardous properties. Discard contaminated leather goods.

EYE

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

INHALATION

Remove to fresh air. If not breathing, institute cardiopulmonary resuscitation (CPR). If breathing is difficult, ensure clear airway and give oxygen. Keep affected person warm and at rest. **GET IMMEDIATE MEDICAL ATTENTION.**

INGESTION

Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs keep head below hips to prevent aspiration and monitor for breathing difficulty. Gastric lavage should be performed only by qualified medical personnel. **GET IMMEDIATE MEDICAL ATTENTION.**

Keep affected person warm and at rest.

NOTES TO PHYSICIAN

Gastric lavage may be indicated if ingested. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

In cases of acute poisoning, artificial respiration with administration of oxygen may be useful for support. **DO NOT GIVE EPINEPHRINE, EPHEDRINE OR SIMILAR ADRENERGIC DRUGS. THEY MAY INDUCE FATAL VENTRICULAR FIBRILLATION.** Electrocardiographic monitoring should be carried out with severely ill patients to anticipate possible cardiac arrest.

Anemia may require the usual supportive measures. Medical evaluation of acute overexposure should include hematological determinations until stable. In severe acute and chronic poisoning, both renal and hepatic damage may occur and should be anticipated in such cases. Respiratory and pulmonary problems may require special attention. After severe acute symptoms have been alleviated, it may be advisable to consider periodic monitoring of the patient until such time as the likelihood of other adverse effects can be discounted.

5 FIRE FIGHTING MEASURES

HAZARDOUS COMBUSTION PRODUCTS

Combustion may produce CO, NO_x, SO_x and reactive hydrocarbons.

BASIC FIRE FIGHTING PROCEDURES

Use water spray, dry chemical, alcohol foam, all purpose AFFF or carbon dioxide to extinguish fire. Evacuate area and fight fire from a safe distance.

If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.

Use water spray to cool adjacent structures and to protect personnel. Shut off source of flow if possible. Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Firefighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

UNUSUAL FIRE & EXPLOSION HAZARDS

Vapors may form explosive mixture with air. Vapors can travel to a source of ignition and flash back.

Explosion hazard if exposed to extreme heat or to physical or thermal shock.

Fires involving this product may release carbon monoxide, carbon dioxide, reactive hydrocarbons and irritating vapors.

Flash Point:	81 F (27 C) TAG CLOSED CUP
AutoIgnition Temperature:	986 F (530 C)
Flammability Limits in Air, Lower, % by Volume:	1 %
Flammability Limits in Air, Upper, % by Volume:	7 %

6 ACCIDENTAL RELEASE MEASURES

EMERGENCY ACTION

Keep ignition sources out of area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. (See Exposure Controls/Personal Protection Section.) Keep unnecessary people at least 150 feet upwind of spill; greater distances may be necessary for people downwind.

ENVIRONMENTAL PRECAUTIONS

Eliminate all sources of ignition. Isolate hazard area and deny entry.

If product is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released product. Notify local authorities and the National Response Center, if required.

SPILL OR LEAK PROCEDURE

Keep ignition sources out of area and shut off all ignition sources. Absorb spill with inert material (e. g. dry sand or earth) then place in a chemical waste container. Large Spills: Dike far ahead of liquid spill for later disposal. Shut off leak if safe to do so.

See Exposure Controls/Personal Protection section.

7 HANDLING & STORAGE

HANDLING

Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

Do not eat, drink or smoke in areas of use or storage.

STORAGE

Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizers.

Empty containers may contain product residue. Do not reuse without adequate precautions.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Wear chemical safety goggles and face shield. Have eye washing facilities readily available where eye contact can occur.

SKIN PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Avoid skin contact with this material. Use appropriate chemical protective gloves when handling.

Use good personal hygiene.

RESPIRATORY PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

A NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

9 PHYSICAL & CHEMICAL PROPERTIES

ODOR AND APPEARANCE

CLEAR, COLORLESS LIQUID WITH A MODERATE, AROMATIC ODOR

Boiling Point: 280 F (138 C)
Specific Gravity: 0.861
Melting Point: 55 F (13 C)
Percent Volatile: 100 %
Vapor Pressure: 9 MMHG @ 68 F (20 C)
Vapor Density: 3.7
Bulk Density: ND
Solubility in Water: NEGLIGIBLE
Octanol/Water Partn: ND
Volatile Organic: ND
Pour Point: ND
pH Value: ESSENTIALLY NEUTRAL
Freezing Point: ND
Viscosity: ND
Evaporation Rate: MODERATELY FAST

$$P_2 = 0.080703 \times 3.7$$
$$= 0.298 \quad \text{lb/ft}^3$$

$$PK \text{ weight } 7.209 \#/\text{gal.}$$

Molecular Formula: C8H10
Molecular Weight: 106.1600
Chemical Family: AROMATIC HYDROCARBON
Odor Threshold: ND

10 STABILITY & REACTIVITY

STABILITY/INCOMPATIBILITY

Incompatible with oxidizing agents. See precautions under Handling & Storage.

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS

Combustion may produce CO, NOx, SOx and reactive hydrocarbons.

11 TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA

See Special Toxic Effects (Section 3)

12 ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

This product contains paraxylene which biodegrades in soil and water and oxidizes in air. This product is not expected to bioaccumulate in aquatic organisms.

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

This product, as supplied, when discarded or disposed of, is a hazardous waste according to Federal Regulations (40 CFR 261) due to its ignitability and benzene content. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.

The transportation, storage, treatment and disposal of this waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

14 TRANSPORT INFORMATION

BILL OF LADING (DOT)

Xylenes, (Paraxylene), 3, UN1307, PG III, RQ

Department of Transportation (DOT) Requirements:

Proper Shipping Name: XYLENES, (PARAXYLENE)

Hazard Class: 3

UN/NA Code: UN1307

Packaging Group: PG III

Labels Required: FLAMMABLE LIQUID

Placards Required: FLAMMABLE LIQUID, UN1307

Reportable Quantity: See Regulatory Information
(Section 15)

15 REGULATORY INFORMATION

FEDERAL REGULATIONS

Consult OSHA's Benzene standard 29 CFR 1910.1028 for provisions on air monitoring, employee training, medical monitoring, etc.

All major components of this product are listed on the TSCA Inventory.

This product, as supplied, contains Paraxylene, Metaxylene, Orthoxylene, Benzene, Toluene and Ethylbenzene all of which are regulated as hazardous substances per 40 CFR Part 302.4. The reportable quantities for these components are 100, 1000, 10, 1000 and 1000 pounds, respectively. Any release of this product that results in a release of these components equal to or exceeding the reportable quantities must be reported to the National Response Center (800-424-8802) and appropriate state and local regulatory agencies as described in 40 CFR Part 302.6 and 40 CFR 355.40. Failure to report may result in substantial civil and criminal penalties.

This product contains one or more components designated as hazardous substances or toxic pollutants pursuant to the Federal Clean Water Act (40 CFR 116.4 Table A; 40 CFR 401.15). Any unpermitted introduction of this product into a facility stormwater or wastewater discharge may constitute a violation of the Clean Water Act. Facilities must notify the appropriate permitting agency prior to introducing this product into the aforementioned discharges.

This product contains one or more substances listed as hazardous, toxic or flammable air pollutants under Section 112 of the Clean Air Act. This product contains up to 100 % volatile organic compounds (VOCs) per 40 CFR Part 51.100. This product contains up to 100 % hazardous air pollutants (HAPs) per Section 112 Clean Air Act Amendments of 1990.

There may be specific regulations at the local, regional or state level that pertain to this product.

STATE REGULATIONS

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

This product, as sold, meets the requirements of the Model Toxics Legislation of the Coalition of Northeastern Governors (CONEG). Any alteration of this product may affect its compliance with this law.

SARA TITLE III RATINGS:

Immediate Hazard: X Delayed Hazard: X Fire Hazard: X Pressure Hazard:
Reactivity Hazard:

NFPA RATINGS:

Health: 2 Flammability: 3 Reactivity: 0 Special Hazards:

HMIS RATINGS:

Health: Flammability: Reactivity: Personal Prot. Equip:

Following ingredients of this product are listed in SARA313:

SARA Listed Ingredient Name	CAS Number	Maximum %
PARAXYLENE	106-42-3	100.0000

16 OTHER INFORMATION

DISCLAIMER

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, MSDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

Completed On: 12/4/96

Replaces Sheet Dated: 12/1/95

Completed By: Safety & Emergency Response, Koch Industries, Inc.



MATERIAL SAFETY DATA SHEET

CHEMICAL PRODUCT & COMPANY IDENTIFICATION

TRADE NAME FUEL OIL NO. 2 (LOW SULFUR)
CAS NUMBER 68476-30-2
MSDS NUMBER 5465
PRODUCT CODE ND
SYNONYM(S) 2 OIL, NO. 2 LOW SULFUR DIESEL, NO. 2 LOW SULFUR FUEL, HEATING OIL, PREMIUM DIESEL (LOW SULFUR), DIESEL FUEL, ARCTIC DIESEL, DIESEL FUEL NO. 2, DIESEL OIL, D-GRADE FUEL OIL, RAILROAD DIESEL, VIRGIN DIESEL APPLICABLE TO ALL GRADES
MANUFACTURER / SUPPLIER Koch Petroleum Group, LP.
 PO Box 2256
 Wichita, KS
 67201

TELEPHONE NUMBERS - 24 HOUR EMERGENCY ASSISTANCE

Chemtrec: 800-424-9300

Koch Security: 316-828-6777

TELEPHONE NUMBERS - GENERAL ASSISTANCE

8-5 (M-F) 316-828-6777

8-5 (M-F, CST) MSDS Assistance 316-828-8488

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS Number	Concentration*	Exposure Limits / Health Hazards
C9-C16 HYDROCARBONS PRODUCED BY THE DISTILLATION OF CRUDE OIL	68476-30-2	99 - 100 %	ND
1,2,4-TRIMETHYLBENZENE	95-63-6	0 - 0.6 %	25 ppm 8-Hour TWA (ACGIH)
BIPHENYL	92-52-4	0 - 0.3 %	0.2 ppm 8-Hour TWA (OSHA) 0.2 ppm 8-Hour TWA (ACGIH)
NAPHTHALENE	91-20-3	0 - 0.2 %	10 ppm 8-Hour TWA (OSHA) 10 ppm 8-Hour TWA (ACGIH) 15 ppm 15-Min STEL (ACGIH)
XYLENES	1330-20-7	0 - 0.2 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
CUMENE	98-82-8	Trace	50 ppm 8-Hour TWA (OSHA) 50 ppm 8-Hour TWA (ACGIH)

Ingredient Name	CAS Number	Concentration*	Exposure Limits / Health Hazards
TOLUENE	108-88-3	Trace	200 ppm 8-Hour TWA (OSHA) 50 ppm 8-Hour TWA (ACGIH)

*Values do not reflect absolute minimums and maximums; these values are typical which may vary from time to time.

This Material Safety Data Sheet is intended to communicate potential health hazards and potential physical hazards associated with the product(s) covered by this sheet, and is not intended to communicate product specification information. For product specification information, contact your Koch Petroleum Group, LP representative.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HEALTH HAZARDS

WARNING!

MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT
OVEREXPOSURE MAY CAUSE CNS DEPRESSION
ASPIRATION HAZARD IF SWALLOWED-CAN ENTER LUNGS AND CAUSE DAMAGE
POTENTIAL REPRODUCTIVE HAZARD
SKIN CANCER HAZARD BASED ON TESTS WITH LABORATORY ANIMALS

FLAMMABILITY HAZARDS

COMBUSTIBLE

PER OSHA GUIDELINES, 29 CFR 1910.1200(c)

REACTIVITY HAZARDS

STABLE

POTENTIAL HEALTH EFFECTS, SKIN

MODERATELY IRRITATING. Repeated or prolonged skin contact may cause drying, reddening, itching and cracking.

No significant effects are expected to occur following short term exposure. Repeated or prolonged contact with large amounts of this material may result in absorption through the skin to produce toxic effects.

Contact with heated material may cause thermal burns.

POTENTIAL HEALTH EFFECTS, EYE

SLIGHTLY-IRRITATING. Exposure to vapors, fumes or mists may cause irritation. May cause slight transient irritation, lacrimation (tears) and a burning sensation in the eyes. Prolonged or repeated exposure may cause irritation and conjunctivitis.

Contact with heated material may cause thermal burns.

POTENTIAL HEALTH EFFECTS, INHALATION

Petroleum mists at high exposure levels may be irritating to the nose, throat and lungs.

May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

Overexposure to this material may cause systemic damage including target organ effects listed under "Special Toxic Effects."

Other specific symptoms of exposure are listed under "Special Toxic Effects."

POTENTIAL HEALTH EFFECTS, INGESTION

PRACTICALLY NON-TOXIC. Ingestion of large amounts may cause gastrointestinal disturbances. May cause irritation of the mouth, throat and gastrointestinal tract. Symptoms may include salivation, pain, nausea, vomiting and diarrhea.

Aspiration into lungs may cause chemical pneumonia and lung damage.

Exposure may also cause central nervous system symptoms similar to those listed under "Inhalation" (see Inhalation section).

Overexposure to this material may cause systemic damage including target organ effects listed under "Special Toxic Effects."

Other specific symptoms of exposure are listed under "Special Toxic Effects."

SPECIAL TOXIC EFFECTS

Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: liver and kidney.

Exposure to components of this material may cause the following specific symptoms, depending on the concentration and duration of exposure: irritation of the hair follicles and blockage of the sebaceous glands.

This product contains C9 aromatics which may cause adverse reproductive and/or developmental effects.

IARC has determined that there is limited evidence for the carcinogenicity of fuel oil no. 2 in experimental animals and inadequate evidence in humans.

Lifetime exposure to whole diesel exhaust has been shown to cause cancer in laboratory animals. NIOSH recommends that whole diesel exhaust be regarded as a potential occupational carcinogen.

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes referred to as solvent or painter's syndrome). Intentional misuse by deliberately concentrating and inhaling this product may be harmful or fatal.

Pre-existing medical conditions which may be aggravated by exposure include disorders of the skin, eye and respiratory system.

This product has not been tested as a whole for all potential health effects.

WARNING: The use of any hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of combustion products and inadequate oxygen levels.

4 FIRST AID MEASURES**SKIN**

Immediately wash skin with plenty of soap and water while removing contaminated clothing and shoes. **GET IMMEDIATE MEDICAL ATTENTION.**

Place contaminated clothing in closed container for storage until laundered or discarded. If clothing is to be laundered, inform person performing operation of contaminant's hazardous properties. Discard contaminated leather goods.

EYE

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. **Get medical attention if irritation persists.**

INHALATION

Remove to fresh air. If not breathing, institute cardiopulmonary resuscitation (CPR). If breathing is difficult, ensure airway is clear and give oxygen.

Keep affected person warm and at rest. **GET IMMEDIATE MEDICAL ATTENTION.**

INGESTION

Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs keep head below hips to prevent aspiration and monitor for breathing difficulty. Gastric lavage should be performed only by qualified medical personnel.

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

NOTES TO PHYSICIAN

Gastric lavage may be indicated if ingested. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

FIRE FIGHTING MEASURES**HAZARDOUS COMBUSTION PRODUCTS**

Combustion may produce COx, NOx, SOx, reactive hydrocarbons, irritating vapors and hydrogen sulfide.

EXTINGUISHING MEDIA

Use water spray, dry chemical, alcohol foam, all purpose AFFF or carbon dioxide to extinguish fire.

BASIC FIRE FIGHTING PROCEDURES

Evacuate area and fight fire from a safe distance. If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.

Use water spray to cool adjacent structures and to protect personnel. Shut off source of flow if possible. Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Firefighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

UNUSUAL FIRE & EXPLOSION HAZARDS

Vapors may form explosive mixture with air. Vapors can travel to a source of ignition and flash back.

Explosion hazard if exposed to extreme heat or to physical or thermal shock.

Fires involving this product may release COx, NOx, SOx, reactive hydrocarbons, irritating vapors and hydrogen sulfide.

Flash Point	> 125 F (> 52 C) PENSKEY-MARTENS CLOSED CUP
Autoignition Temperature	494 F (257 C)
Flammability Limits in Air, Lower, % by Volume	0.8 %
Flammability Limits in Air, Upper, % by Volume	7.5 %

6 ACCIDENTAL RELEASE MEASURES**EMERGENCY ACTION**

Eliminate and/or shut off ignition sources and keep ignition sources out of the area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in release. Evacuate area endangered by release as required. (See Personal Protection Information Section.)

ENVIRONMENTAL PRECAUTIONS

Eliminate all sources of ignition. Isolate hazard area and deny entry.

If product is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released product. Notify local authorities and the National Response Center, if required.

SPILL OR LEAK PROCEDURE

Keep ignition sources out of area and shut off all ignition sources. Absorb spill with inert material (e. g. dry sand or earth) then place in a chemical waste container. Large Spills: Dike far ahead of liquid spill for later disposal. Stop leak when safe to do so.

See Exposure Controls/Personal Protection (Section 8).

HANDLING & STORAGE

HANDLING

Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

Do not eat, drink or smoke in areas of use or storage.

STORAGE

Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizers.

Empty containers may contain product residue. Do not reuse without adequate precautions.

Do not eat, drink or smoke in areas of use or storage.

EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Wear chemical safety goggles and face shield. Have eye washing facilities readily available where eye contact can occur.

SKIN PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Avoid skin contact with this material. Use appropriate chemical protective gloves when handling.

Use good personal hygiene.

RESPIRATORY PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

A NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

PHYSICAL & CHEMICAL PROPERTIES

ODOR AND APPEARANCE

CRYSTAL CLEAR TO PALE YELLOW OR GREEN COLORED LIQUID WITH HYDROCARBON ODOR; FOR TAX EXEMPT PURPOSES, THIS FUEL MAY CONTAIN RED DYE

Bolling Point	325 - 700 F (163-371 C)
Specific Gravity	0.835 - 0.9
Melting Point	-20 F (-29 C)
Percent Volatile	100 %
Vapor Pressure	2.6 mmHg AT 122 F (50 C)
Vapor Density	8
Bulk Density	ND
Solubility in Water	INSOLUBLE
Octanol/Water Partn	ND
Volatile Organic	ND
Pour Point	-20 TO 10 F (-29 TO -12 C) [ARCTIC DIESEL < -50 F (< -45 C)]
pH Value	ND
Freezing Point	ND
Viscosity	32.6 - 40.1 SSU AT 100 F (38 C)
Evaporation Rate	0.01

Molecular Formula	NA
Molecular Weight	ND
Chemical Family	HYDROCARBON MIXTURE
Odor Threshold	ND

0 STABILITY & REACTIVITY

STABILITY/INCOMPATIBILITY

Incompatible with oxidizing agents. See precautions under Handling & Storage (Section 7).

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS

Combustion may produce COx, NOx, SOx, reactive hydrocarbons, irritating vapors and hydrogen sulfide.

1 TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA

See Special Toxic Effects (Section 3).

12 ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

ND

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

This product, as supplied, when discarded or disposed of, is a hazardous waste according to Federal Regulations (40 CFR 261) due to its ignitability. Under the Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user of the product to determine, at the time of disposal, whether the material is a hazardous waste subject to RCRA.

The transportation, storage, treatment and disposal of RCRA waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

14 TRANSPORT INFORMATION

BILL OF LADING - BULK (U. S. DOT)

Fuel Oil (No. 2), Combustible Liquid, NA1993, PG III

U. S. Department of Transportation (DOT) Requirements

General Transportation Information for Bulk Shipments

Proper Shipping Name	Fuel Oil (No. 2)	UN/NA Code	NA1993
Hazard Class	Combustible Liquid		
Packaging Group	PG III		
Labels Required	None		
Placards Required	Combustible Liquid, NA1993		
Reportable Quantity	See Regulatory Information (Section 15)		

General Transportation Information for Non-Bulk Shipments

Proper Shipping Name	Non-Regulated	UN/NA Code	NA
Hazard Class	NA		
Packaging Group	NA		
Labels Required	NA		
Placards Required	NA		
Reportable Quantity	NA		

Non-bulk shipments of this product are non-regulated for domestic ground transportation when they meet the requirements of 49 CFR 173.150(f).

5 REGULATORY INFORMATION

FEDERAL REGULATIONS

All known major components of this product are listed on the TSCA Inventory and/or are otherwise in compliance with TSCA.

A release of this product, as supplied, is exempt from reporting under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) by the petroleum exclusion. Releases may be reportable to the National Response Center (800-424-8802) under the Clean Water Act, 33 U.S.C. 1321(b)(3) and (5). Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Failure to report may result in substantial civil and criminal penalties.

This product does not contain toxic chemicals (in excess of the applicable de minimis concentration) that are subject to the annual toxic chemical release reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372).

This product contains one or more components designated as hazardous substances or toxic pollutants pursuant to the Federal Clean Water Act (40 CFR 116.4 Table A; 40 CFR 401.15). Any unpermitted introduction of this product into a facility stormwater or wastewater discharge may constitute a violation of the Clean Water Act. Facilities must notify the appropriate permitting agency prior to introducing this product into the aforementioned discharges.

This product contains one or more substances listed as hazardous, toxic or flammable air pollutants under Section 112 of the Clean Air Act.

There may be specific regulations at the local, regional or state/provincial level that pertain to this product.

STATE REGULATIONS

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

SARA TITLE III RATINGS

Immediate Hazard	X	Delayed Hazard	X	Fire Hazard	X	Pressure Hazard	-
Reactivity Hazard	-						

NFPA RATINGS

Health	1	Flammability	2	Reactivity	0	Special Hazards	-
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HMIS RATINGS

Health	2*	Flammability	2	Reactivity	0
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Following ingredients of this product are listed in SARA313

SARA Listed Ingredient Name	CAS Number	Maximum %
XYLENES	1330-20-7	0.2

6 OTHER INFORMATION

DISCLAIMER

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, MSDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

Completed On 12/23/98 Replaces Sheet Dated 6/15/98
 Completed By Safety & Emergency Response, Koch Industries, Inc.

NIOSH Pocket Guide to Chemical Hazards

Benzene		CAS 71-43-2
C₆H₆		RTECS CY1400000
Synonyms & Trade Names Benzol, Phenyl hydride		DOT ID & Guide 1114 130
Exposure Limits	NIOSH REL: Ca TWA 0.1 ppm ST 1 ppm See Appendix A	
	OSHA PEL: [1910.1028] TWA 1 ppm ST 5 ppm See Appendix F	
IDLH Ca [500 ppm] See: 71432	Conversion 1 ppm = 3.19 mg/m ³	
Physical Description Colorless to light-yellow liquid with an aromatic odor. [Note: A solid below 42°F.]		
MW: 78.1	BP: 176°F	FRZ: 42°F
VP: 75 mmHg	IP: 9.24 eV	Sol: 0.07%
Fl.P: 12°F	UEL: 7.8%	LEL: 1.2%
Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.		
Incompatibilities & Reactivities Strong oxidizers, many fluorides & perchlorates, nitric acid		
Measurement Methods NIOSH 1500, 1501, 3700, 3800; OSHA 12, 1005 See: NMAM or OSHA Methods		
Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation Provide: Eyewash, Quick drench	First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash immediately Breathing: Respiratory support Swallow: Medical attention immediately	
Important additional information about respirator selection Respirator Recommendations NIOSH At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus		
Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact		
Symptoms Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen]		
Target Organs Eyes, skin, respiratory system, blood, central nervous system, bone marrow		
Cancer Site [leukemia]		
See also: INTRODUCTION See ICSC CARD: 0015 See MEDICAL TESTS: 0022		

NIOSH Pocket Guide to Chemical Hazards

Ethyl benzene		CAS 100-41-4	
$\text{CH}_3\text{CH}_2\text{C}_6\text{H}_5$		RTECS DA0700000	
Synonyms & Trade Names Ethylbenzol, Phenylethane		DOT ID & Guide 1175 129	
Exposure Limits	NIOSH REL: TWA 100 ppm (435 mg/m ³) ST 125 ppm (545 mg/m ³)		
	OSHA PEL†: TWA 100 ppm (435 mg/m ³)		
IDLH 800 ppm [10%LEL] See: 100414		Conversion 1 ppm = 4.34 mg/m ³	
Physical Description Colorless liquid with an aromatic odor.			
MW: 106.2	BP: 277°F	FRZ: -139°F	Sol: 0.01%
VP: 7 mmHg	IP: 8.76 eV		Sp.Gr: 0.87
Fl.P: 55°F	UEL: 6.7%	LEL: 0.8%	
Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.			
Incompatibilities & Reactivities Strong oxidizers			
Measurement Methods NIOSH 1501; OSHA 7, 1002 See: NMAM or OSHA Methods			
Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation		First Aid (See procedures) Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately	
Important additional information about respirator selection			
Respirator Recommendations NIOSH/OSHA Up to 800 ppm: (APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)/(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)/(APF = 10) Any supplied-air respirator/(APF = 50) Any self-contained breathing apparatus with a full facepiece Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus			
Exposure Routes inhalation, ingestion, skin and/or eye contact			
Symptoms Irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma			
Target Organs Eyes, skin, respiratory system, central nervous system			
See also: INTRODUCTION See ICSC CARD: 0268 See MEDICAL TESTS: 0098			

NIOSH Pocket Guide to Chemical Hazards

Cumene		CAS 98-82-8	
$C_6H_5CH(CH_3)_2$		RTECS GR8575000	
Synonyms & Trade Names Cumol, Isopropyl benzene, 2-Phenyl propane		DOT ID & Guide 1918 130	
Exposure Limits	NIOSH REL: TWA 50 ppm (245 mg/m ³) [skin]		
	OSHA PEL: TWA 50 ppm (245 mg/m ³) [skin]		
IDLH 900 ppm [10%LEL] See: 98828		Conversion 1 ppm = 4.92 mg/m ³	
Physical Description Colorless liquid with a sharp, penetrating, aromatic odor.			
MW: 120.2	BP: 306°F	FRZ: -141°F	Sol: Insoluble
VP: 8 mmHg	IP: 8.75 eV		Sp.Gr: 0.86
Fl.P: 96°F	UEL: 6.5%	LEL: 0.9%	
Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.			
Incompatibilities & Reactivities Oxidizers, nitric acid, sulfur acid [Note: Forms cumene hydroperoxide upon long exposure to air.]			
Measurement Methods NIOSH 1501 See: NMAM or OSHA Methods			
Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation		First Aid (See procedures) Eye: Irrigate immediately Skin: Water flush promptly Breathing: Respiratory support Swallow: Medical attention immediately	
Important additional information about respirator selection			
Respirator Recommendations NIOSH/OSHA Up to 500 ppm: (APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)/(APF = 10) Any supplied-air respirator* Up to 900 ppm: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode/(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)/(APF = 50) Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s)/(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepiece Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus			
Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact			
Symptoms Irritation eyes, skin, mucous membrane; dermatitis; headache, narcosis, coma			
Target Organs Eyes, skin, respiratory system, central nervous system			
See also: INTRODUCTION See ICSC CARD: 0170 See MEDICAL TESTS: 0060			

NIOSH Pocket Guide to Chemical Hazards

Naphthalene		CAS 91-20-3	
C₁₀H₈		RTECS QJ0525000	
Synonyms & Trade Names Naphthalin, Tar camphor, White tar		DOT ID & Guide 1334 133 (crude or refined) 2304 133 (molten)	
Exposure Limits		NIOSH REL: TWA 10 ppm (50 mg/m ³) ST 15 ppm (75 mg/m ³)	
		OSHA PEL†: TWA 10 ppm (50 mg/m ³)	
IDLH 250 ppm See: 91203		Conversion 1 ppm = 5.24 mg/m ³	
Physical Description Colorless to brown solid with an odor of mothballs. [Note: Shipped as a molten solid.]			
MW: 128.2	BP: 424°F	MLT: 176°F	Sol: 0.003%
VP: 0.08 mmHg	IP: 8.12 eV		Sp.Gr: 1.15
F.I.P: 174°F	UEL: 5.9%	LEL: 0.9%	
Combustible Solid, but will take some effort to ignite.			
Incompatibilities & Reactivities Strong oxidizers, chromic anhydride			
Measurement Methods NIOSH 1501; OSHA 35 See: NMAM or OSHA Methods			
Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: Daily		First Aid (See procedures) Eye: Irrigate immediately Skin: Molten flush immediately/solid-liquid soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately	
Important additional information about respirator selection Respirator Recommendations NIOSH/OSHA Up to 100 ppm: (APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s) in combination with a dust and mist filter*/(APF = 10) Any supplied-air respirator* Up to 250 ppm: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode*/(APF = 50) Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s) in combination with a high-efficiency particulate filter/(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s) in combination with a dust and mist filter*/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepiece Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having a high-efficiency particulate filter/Any appropriate escape-type, self-contained breathing apparatus			
Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact			
Symptoms Irritation eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage			
Target Organs Eyes, skin, blood, liver, kidneys, central nervous system			
See also: INTRODUCTION See ICSC CARD: 0667 See MEDICAL TESTS: 0152			

NIOSH Pocket Guide to Chemical Hazards

1,2,4-Trimethylbenzene		CAS 95-63-6
C₆H₃(CH₃)₃		RTECS DC3325000
Synonyms & Trade Names Assymetrical trimethylbenzene, psi-Cumene, Pseudocumene [Note: Hemimellitite is a mixture of the 1,2,3-isomer with up to 10% of related aromatics such as the 1,2,4-isomer.]		DOT ID & Guide
Exposure Limits	NIOSH REL: TWA 25 ppm (125 mg/m ³)	
	OSHA PEL†: none	
IDLH N.D. See: IDLH INDEX		Conversion 1 ppm = 4.92 mg/m ³
Physical Description Clear, colorless liquid with a distinctive, aromatic odor.		
MW: 120.2	BP: 337°F	FRZ: -77°F
VP(56°F): 1 mmHg	IP: 8.27 eV	Sp.Gr: 0.88
Fl.P: 112°F	UEL: 6.4%	LEL: 0.9%
Class II Flammable Liquid		
Incompatibilities & Reactivities Oxidizers, nitric acid		
Measurement Methods OSHA PV2091 See: NMAM or OSHA Methods		
Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: No recommendation		First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately
Important additional information about respirator selection Respirator Recommendations To be added later		
Exposure Routes inhalation, ingestion, skin and/or eye contact		
Symptoms Irritation eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, fatigue, dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)		
Target Organs Eyes, skin, respiratory system, central nervous system, blood		
See also: INTRODUCTION See ICSC CARD: 1433		

NIOSH Pocket Guide to Chemical Hazards

1,3,5-Trimethylbenzene		CAS 108-67-8	
C₆H₃(CH₃)₃		RTECS OX6825000	
Synonyms & Trade Names Mesitylene, Symmetrical trimethylbenzene, sym-Trimethylbenzene		DOT ID & Guide 2325 129	
Exposure Limits	NIOSH REL: TWA 25 ppm (125 mg/m ³)		
	OSHA PEL†: none		
IDLH N.D. See: IDLH INDEX		Conversion 1 ppm = 4.92 mg/m ³	
Physical Description Clear, colorless liquid with a distinctive, aromatic odor.			
MW: 120.2	BP: 329°F	FRZ: -49°F	Sol: 0.002%
VP: 2 mmHg	IP: 8.39 eV		Sp.Gr: 0.86
Fl.P: 122°F	UEL: ?	LEL: ?	
Class II Flammable Liquid			
Incompatibilities & Reactivities Oxidizers, nitric acid			
Measurement Methods OSHA PV2091 See: NMAM or OSHA Methods			
Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: No recommendation		First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash Breathing: Respiratory support Swallow: Medical attention immediately	
Important additional information about respirator selection Respirator Recommendations To be added later			
Exposure Routes inhalation, ingestion, skin and/or eye contact			
Symptoms Irritation eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)			
Target Organs Eyes, skin, respiratory system, central nervous system, blood			
See also: INTRODUCTION See ICSC CARD: 1155			

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NIOSH Pocket Guide to Chemical Hazards

Toluene		CAS 108-88-3	
$C_6H_5CH_3$		RTECS XS5250000	
Synonyms & Trade Names Methyl benzene, Methyl benzol, Phenyl methane, Toluol		DOT ID & Guide 1294 130	
Exposure Limits	NIOSH REL: TWA 100 ppm (375 mg/m ³) ST 150 ppm (560 mg/m ³)		
	OSHA PEL†: TWA 200 ppm C 300 ppm 500 ppm (10-minute maximum peak)		
IDLH 500 ppm See: 108883		Conversion 1 ppm = 3.77 mg/m ³	
Physical Description Colorless liquid with a sweet, pungent, benzene-like odor.			
MW: 92.1	BP: 232°F	FRZ: -139°F	Sol(74°F): 0.07%
VP: 21 mmHg	IP: 8.82 eV		Sp.Gr: 0.87
Fl.P: 40°F	UEL: 7.1%	LEL: 1.1%	
Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.			
Incompatibilities & Reactivities Strong oxidizers			
Measurement Methods NIOSH 1500, 1501, 3800, 4000; OSHA 111 See: NMAM or OSHA Methods			
Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation		First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately	
Important additional information about respirator selection			
Respirator Recommendations NIOSH Up to 500 ppm: (APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)/(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)/(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/(APF = 10) Any supplied-air respirator/(APF = 50) Any self-contained breathing apparatus with a full facepiece Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus			
Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact			
Symptoms Irritation eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage			
Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys			
See also: INTRODUCTION See ICSC CARD: 0078 See MEDICAL TESTS: 0232			

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NIOSH Pocket Guide to Chemical Hazards

o-Xylene		CAS 95-47-6	
$C_6H_4(CH_3)_2$		RTECS ZE2450000	
Synonyms & Trade Names 1,2-Dimethylbenzene; ortho-Xylene; o-Xylol		DOT ID & Guide 1307 130	
Exposure Limits	NIOSH REL: TWA 100 ppm (435 mg/m ³) ST 150 ppm (655 mg/m ³)		
	OSHA PEL†: TWA 100 ppm (435 mg/m ³)		
IDLH 900 ppm See: 95476		Conversion 1 ppm = 4.34 mg/m ³	
Physical Description Colorless liquid with an aromatic odor.			
MW: 106.2	BP: 292°F	FRZ: -13°F	Sol: 0.02%
VP: 7 mmHg	IP: 8.56 eV		Sp.Gr: 0.88
Fl.P: 90°F	UEL: 6.7%	LEL: 0.9%	
Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.			
Incompatibilities & Reactivities Strong oxidizers, strong acids			
Measurement Methods NIOSH 1501, 3800; OSHA 1002 See: NMAM or OSHA Methods			
Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation		First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately	
<u>Important additional information about respirator selection</u> Respirator Recommendations NIOSH/OSHA Up to 900 ppm: (APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)/(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)/(APF = 10) Any supplied-air respirator/(APF = 50) Any self-contained breathing apparatus with a full facepiece Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus			
Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact			
Symptoms Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis			
Target Organs Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys			
See also: INTRODUCTION See ICSC CARD: 0084 See MEDICAL TESTS: 0243			

NIOSH Pocket Guide to Chemical Hazards

m-Xylene		CAS 108-38-3	
C₆H₄(CH₃)₂		RTECS ZE2275000	
Synonyms & Trade Names 1,3-Dimethylbenzene; meta-Xylene; m-Xylol		DOT ID & Guide 1307 130	
Exposure Limits	NIOSH REL: TWA 100 ppm (435 mg/m ³) ST 150 ppm (655 mg/m ³)		
	OSHA PEL†: TWA 100 ppm (435 mg/m ³)		
IDLH 900 ppm See: 95476	Conversion 1 ppm = 4.34 mg/m ³		
Physical Description Colorless liquid with an aromatic odor.			
MW: 106.2	BP: 282°F	FRZ: -54°F	Sol: Slight
VP: 9 mmHg	IP: 8.56 eV		Sp.Gr: 0.86
Fl.P: 82°F	UEL: 7.0%	LEL: 1.1%	
Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.			
Incompatibilities & Reactivities Strong oxidizers, strong acids			
Measurement Methods NIOSH 1501, 3800; OSHA 1002 See: NMAM or OSHA Methods			
Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation		First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately	
Important additional information about respirator selection Respirator Recommendations NIOSH/OSHA Up to 900 ppm: (APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)/(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)/(APF = 10) Any supplied-air respirator/(APF = 50) Any self-contained breathing apparatus with a full facepiece Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus			
Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact			
Symptoms Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis			
Target Organs Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys			
See also: INTRODUCTION See ICSC CARD: 0085 See MEDICAL TESTS: 0243			

NIOSH Pocket Guide to Chemical Hazards

p-Xylene		CAS 106-42-3	
$C_6H_4(CH_3)_2$		RTECS ZE2625000	
Synonyms & Trade Names 1,4-Dimethylbenzene; para-Xylene; p-Xylol		DOT ID & Guide 1307 130	
Exposure Limits	NIOSH REL: TWA 100 ppm (435 mg/m ³) ST 150 ppm (655 mg/m ³)		
	OSHA PEL†: TWA 100 ppm (435 mg/m ³)		
IDLH 900 ppm See: 95476		Conversion 1 ppm = 4.41 mg/m ³	
Physical Description Colorless liquid with an aromatic odor. [Note: A solid below 56°F.]			
MW: 106.2	BP: 281°F	FRZ: 56°F	Sol: 0.02%
VP: 9 mmHg	IP: 8.44 eV		Sp.Gr: 0.86
Fl.P: 81°F	UEL: 7.0%	LEL: 1.1%	
Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.			
Incompatibilities & Reactivities Strong oxidizers, strong acids			
Measurement Methods NIOSH 1501, 3800; OSHA 1002 See: NMAM or OSHA Methods			
Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: No recommendation		First Aid (See procedures) Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately	
Important additional information about respirator selection Respirator Recommendations NIOSH/OSHA Up to 900 ppm: (APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*/(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*/(APF = 10) Any supplied-air respirator*/(APF = 50) Any self-contained breathing apparatus with a full facepiece Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus			
Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact			
Symptoms Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis			
Target Organs Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys			
See also: INTRODUCTION See ICSC CARD: 0086 See MEDICAL TESTS: 0243			