Remedial Work Plan

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269 East Montauk Highway
Lindenhurst, NY 11757

NYSDEC SPILL 98-25156

Prepared for:

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1.0 OVERVIEW

This document represents the proposed Remedial Work Plan (RWP) for the property located at 269 East Montauk Highway, Lindenhurst, NY (the site). In May 1996, elevated levels of volatile organic compounds (VOCs) were found in the septic pools and two drywells during a routine inspection of the sanitary system conducted by the Suffolk County Department of Health Services (SCDHS). The SCDHS reported the findings to the New York State Department of Environmental Conservation and Spill Number 98-25156 was assigned to the property.

1.1 SITE LOCATION AND DESCRIPTION

The property is located on the south side of East Montauk Highway between Deauville Parkway and Venetian Boulevard in Lindenhurst, New York (see Figure 1). The site is located in the Town of Babylon and the County of Suffolk. It is currently zoned for commercial use and is approximately 0.473 acres in size (Section 226 Block 3.0 Lots 59, 123, 124 and 182). A derelict single-story masonry building (1900 square feet) previously occupied the site and was just recently demolished by the Town of Babylon in April 2014. The property surface is composed of a mix of an asphalt parking lot with areas of grass cover. The area around the property is characterized by commercial properties and strip stores along the East Montauk Highway corridor with residential areas adjacent to and behind the commercial strip. An active retail gasoline service station (Hess) is present along the north side of East Montauk Highway. Adjacent properties to the south are single family residential homes.

1.2 SITE HISTORY

The site was first developed in 1962 and operated as a retail gasoline station/automotive repair shop until 1974. At that time the property was renovated and operated as a convenience store until 1979 when the property was sold to Suffolk Marine Center. Suffolk Marine Center operated a new and used boat retail business known as Jericho Marine. The property was abandoned at some time in 1995 and since then has been inactive with the exception of a real estate business that was operating out of a field office trailer by a potential buyer. At the request of the Town of Babylon (the current owners), the field office trailer was removed sometime in 2013.

The investigation and remedial efforts for the property were managed under the NYSDEC Oil Spills program until 2000, when a potential buyer became interested in the property. In October 2000, a potential buyer (Omen Inc.) entered into a Voluntary Cleanup (VCP) Agreement with the NYSDEC (Site No. V00378-2) to investigate and remediate the subject site. In May 2007, the site was transferred into the New York State Brownfield Cleanup Program (Site No. C1-52-205). On behalf of the potential buyer, Environmental Business Consultants (EBC) completed a Remedial Investigation in 2009 and a Remedial Action Work Plan (RAWP) was submitted in January 2013. In August 2013, shortly after the NYSDEC approved a Remedial Action Work Plan for the site, the potential buyer terminated the agreement under the Brownfield Cleanup Program. The remedial efforts are now once again, under the direction of the NYSDEC Oil Spills program.

Past site activities associated with the operation of the retail gasoline station/automotive repair shop have impacted site soils and groundwater with predominately petroleum related compounds. This has been documented through several investigations and reports:

- On-Site Septic System and Off-Site Plume Study, SCDHS, 1996-1999.
- Off-Site Plume and Soil Vapor Study, New York State Department of Environmental Conservation subcontract to JNM Environmental (JNM), 1999.
- Subsurface Investigation Report, Former Jericho Marine, Fenley and Nicol Inc (F&N). March 18, 2003.

- Interim Remedial Measure Closure Report, Former Jericho Marine, Environmental Business Consultants (EBC), August 2008
- Remedial Investigation Report, Former Jericho Marine, Environmental Business Consultants, November 2009.

An interim remedial measure (IRM) was performed by F&N in 2007-2008 and consists of several components:

- April 2007-The remediation of a parking lot drywell located near the northeast corner of the building and the main sanitary pool located near the southwest corner of the building. A guzzler truck was utilized to remove impacted sediments from the base of the structures until groundwater was encountered.
- May 2007-An investigation was conducted to locate and remove a suspect waste oil tank beneath the floor of the former mechanic shop area inside the eastern portion of the building. A waste oil tank was not located.
- October-December 2007-The excavation and off-site disposal of the contaminated soil located on the west side of the building. This area was associated with the location of the former underground storage tanks. Approximately 241 tons of contaminated soil was excavated and disposed of off-site. Following the removal of affected soil, a dry chemical oxidant and activator was added to the base of the excavation to address residual contamination. With the exception of the east wall samples, all of the endpoint samples were within the unrestricted soil cleanup criteria for volatile organic compounds (VOCs).
- March 2008-An investigation was conducted regarding soils located near the northwest corner of the building. The area was suspected to be a discharge point for a floor drain in the former mechanic shop area of the building. No impacts to surface or subsurface soils were detected.

On April 24 and 25, 2014, the single story single-story masonry building was demolished by the Town of Babylon. A suspected 1,000 gallon underground storage tank (UST) located in the north-east corner of the building was discovered during the demolition. This UST is assumed to be the same suspect waste oil tank discussed in the EBC's IRM Completion Report-Section 3.0. The approximate location is shown in Figure 2.

1.3 HYDROGEOLOGY

As documented in previous reports, subsurface materials consist of a uniform medium to fine sand. Groundwater is present between 8 and 12 feet below grade, depending on seasonal variations and generally flows in a southerly direction. Due to the shallow depth to water, groundwater flow patterns and direction may be influenced locally by surface recharge structures such as storm drains and catch basins.

2.0 REMEDIAL ACTIVITIES

2.1 OVERVIEW

The objective of the proposed remedial activities is: (1) to address the secondary source of (petroleum) impacted soils, (2) to address contaminated groundwater beneath the site, (3) additional investigation along the east side of the property and (4) removal of the recently discovered suspect waste oil underground storage tank (1,000 gallons).

As documented in the EBC remedial investigation report, soil sampling results identified locations within the previously existing building and north of the building as residually contaminated with VOC compounds associated with a severely weathered gasoline. Since these locations are both north and east of the former tank area (previously identified as a primary source area), a secondary source was indicated north of the existing building (see Figure 2). The secondary source has been attributed to a former dispenser location. The primary source area was remediated under an interim remedial measure (IRM Completion Report, EBC 8/08). Impact from the secondary source, above restricted commercial soil clean-up objectives (SCOs), remains and is defined by an estimated 1,200 square feet area which extends from the suspect dispenser pad south through the approximately two-thirds of the previously existing building (Figure 3). The vertical extent of soil contamination is defined by a smear zone observed from 10 to 16 feet below grade surface.

Proposed remedial activities consist of the following elements:

1. Excavation of overburden near UST; gauge the tank to determine contents. If warranted, collect sample for waste characterization analysis and arrange for disposal of tank contents with state response contractor (waste disposal contractor).
2. Screening for indication of contamination (by visual means, odor, and monitoring with a PID) of all excavated soil during the UST removal; document conditions via photographs and field notes.
3. Document the removal and conditions of UST via photographs and field notes.
4. Remove, clean and dispose of UST.
5. Collection and analysis of soil samples (sidewall and tank bottom samples) as outlined in DER-10 section 5.5.
6. Excavation of the upper 16 feet of soil within the secondary source area exceeding restricted commercial SCOs; to include locations north of and within the previously existing building footprint.
7. Stockpiling, field screening and re-use of "clean" overburden soils as on-site backfill.
8. Collection and analysis of confirmation soil samples to evaluate the performance of the remedy with respect to attainment of Restricted Commercial SCOs.
9. Application of a dry chemical oxidant (sodium persulfate) to the open excavation to address residual petroleum contamination of soil and groundwater.
10. If post-excavation soil sampling demonstrates that SCOs have not been met, additional excavation and/or oxidant application may be performed. See section 2.6.2 for further details regarding post-excavation confirmation sampling.
11. Screening for indication of contamination (by visual means, odor, and monitoring with a PID) of all excavated soil during all intrusive site work.
12. As directed by NYSDEC, site monitoring of airborne VOCs and particulates in accordance with an approved Community Air Monitoring Plan (CAMP) and Health and Safety Plan (HASP) during soil excavation activities only.
13. Implementation of proper dust and odor suppression techniques during all intrusive and soil handling activities. Appropriate off-site disposal of all material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal.
14. Import of materials to be used for backfill and cover in compliance with: (1) the Subpart 375-6.7(d), (2) all Federal, State and local rules and regulations for handling and transport of material.

15. The injection of a chemical oxidant solution to remediate the contaminated groundwater beneath the site. The chemical oxidant solution may be injected via temporary injection locations. A plan for chemical oxidant solution injection(s) will be prepared pending assessment of groundwater quality conditions post excavation activities.
16. Post-remediation groundwater monitoring will be conducted on a quarterly basis, or as directed by NYSDEC.
17. Post-remediation evaluation of potential soil vapor intrusion concerns, as directed by NYSDEC and NYSDOH.

2.2 GOVERNING DOCUMENTS

Governing documents and procedures included in the remedial work plan include a site-specific Health and Safety Plan (HASP), a community air monitoring plan (CAMP) and a Soil Management Plan (SMP). Highlights of these documents and procedures are provided in the following sections.

2.2.1 Health & Safety Plan (HASP)

The HASP takes into account the specific hazards inherent to the site and presents the minimum requirements which are to be met by EAR, and its subcontractors, and other on-site personnel in order to avoid and, if necessary, protect against health and/or safety hazards. A HASP has been prepared for the remedial activity at the site and is provided in Appendix A.

2.2.2 Soil Management Plan (SMP)

An SMP was prepared for excavation, handling, storage, transport and disposal of all soils/materials that are disturbed/excavated at the Site. The SMP includes all of the controls that will be applied to these efforts to assure effective, nuisance-free performance in compliance with all applicable Federal, State and local laws and regulations. The SMP developed for this site is presented in Section 2.6 of this document.

2.2.3 Community Air Monitoring Plan (CAMP)

The CAMP provides measures for protection for on-site workers and the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the remedial work) from potential airborne contaminant releases resulting from remedial activities.
The action levels specified require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that the remedial work did not spread contamination off-site through the air.

The primary concerns for this site are vapors, nuisance odors and dust particulates. A CAMP has been prepared for remedial activities at this site and is provided in Appendix B.

2.3 SITE SECURITY

Temporary chain link fencing will be installed at the site prior to the commencement of excavation activities. The temporary fencing with privacy screen will completely surround the property and restrict access by the public. This main fence will be supplemented with safety fencing as needed around the open excavation. The chain link fence will be maintained during remedial and construction activity and properly secured at the end of the day.

2.5 TRAFFIC CONTROL

All traffic will enter and leave the Site via a main gate (to be set-up with temporary fencing) on Montauk Highway. Onsite personnel will direct the arrival or departure of construction vehicles, and provide flag services as needed to maintain safe travel exiting and entering the site from Montauk Highway. Traffic related to on-going remedial activity will require the staging of 10-wheel dump trucks along Deauville Parkway on a frequent basis during soil excavation activity. Clean, empty trucks waiting to be loaded will be parked along Deauville Parkway along the property line and will not extend in front of residences.

2.6 SOIL MANAGEMENT PLAN

2.6.1 Soil Excavation-General

Soil excavation will be performed in accordance with the procedures described under Section 5.5 of DER-10 as follows:

- A description and photographic documentation of the excavation.
- Examination of the excavation floor and sidewalls for physical evidence of contamination (odor, staining, sheen, etc.).
- Periodic field screening (through bucket return) of the floor and sidewalls of the excavation with a calibrated photo ionization detector (PID).

Final excavation depth, length, and width, will be determined by NYSDEC regulatory personnel providing oversight, EAR personnel onsite supervising the work, as well as the results analytical results from floor and sidewall samples collected. The length and width of the excavation will depend on the horizontal and vertical extent of contaminated soils as identified through physical examination (PID response, odor, staining, etc.), accessibility and analytical results of samples collected. Expansion of the excavation beyond the planned secondary source area is anticipated and can be easily accommodated. Excavation surrounding the UST will be based the soil condition observed through physical examination (PID response, odor, staining, etc.) and will be dictated by NYSDEC regulatory personnel.

The excavation will be performed by a qualified remedial contractor and fully trained personnel (40HR OSHA HAZWOPER). The following procedure will be used for the excavation of impacted soil (as necessary and appropriate):

- Wear appropriate health and safety equipment as outlined in the HASP;
- Prior to excavation, ensure that the area is clear of utility lines or other obstructions. Lay plastic sheeting on the ground next to the area to be excavated;
- Using a rubber-tired backhoe or track mounted excavator, remove overburden soils and stockpile; re-use of the overburden as fill will be implemented based upon visual inspection and field screening results (PID); "clean" overburden will be segregated from impacted materials.
- If additional USTs are discovered, the NYSDEC Project Manager will be notified and the best course of action to remove the structure will be determined in the field. This may involve the

continued removal of overburden to access the top of the structure or continued trenching around the perimeter to minimize its disturbance;

- If physically contaminated soil is present (e.g., staining, odors, sheen, PID response, etc), an attempt will be made to remove it to the extent not limited by the site boundaries, or as directed by NYSDEC regulatory personnel. If possible, physically impacted soil will be removed using the backhoe or excavator, segregated from clean soils and overburden, and staged on separate dedicated plastic sheeting. Removal of the impacted soils will continue at the direction of NYSDEC regulatory personnel.

- Excavated soils which are temporarily stockpiled on-site will be covered with 6-mil polyethylene sheeting while disposal options are determined. Sheeting will be checked on a daily basis and replaced, repaired or adjusted as needed to provide full coverage. The sheeting will be shaped and secured in such a manner as to drain runoff and direct it toward the interior of the property;

- Once the NYSDEC regulatory personnel are satisfied with the removal effort, verification and/or confirmatory samples will be collected from the excavation as described in Section 2.6.2 of this document.

2.6.1a Excavation of Secondary Source Area

Impact from the secondary source above commercial SCO's defines an estimated 1,200 square foot area which extends from the suspect dispenser pad south through approximately two-thirds of the existing building (Figure 3). The vertical extent of soil contamination is defined by a smear zone observed from 10 feet to 16 feet below the surface.

This area will be excavated to remove VOC impacted soils; with a focus on the removing soils exceeding commercial soil clean-up objectives. Excavated soil will be secured and temporarily stored on-site until arrangements can be made for off-site disposal. Pre-characterization samples will be collected which will allow the soil to be loaded directly on to trucks for transport to the disposal facility and/or minimize the time which soils are temporarily stored on-site. It is anticipated that soils excavated from the secondary source area will be classified as a non-hazardous waste. The final determination on classification will be based on the results of waste characterization analysis.

2.6.1b Excavation of the Underground Storage Tank

The underground storage tank discovered during the building demolition is presumed to be the suspect waste oil tank previously documented in EBC's IRM Completion Report-Section 3.0.

Overburden will be removed to access the top of the underground storage tank. The ullage of the tank will be screened with a calibrated 4-gas meter and calibrated PID. A disposable bailer will be utilized to determine if any liquids are present within the tank. If warranted, samples will be collected for waste disposal analysis and arrangements will be coordinated with a state response contractor for removal of the liquids via a vacuum truck. The area will be temporarily secured with safety fencing in the interim, if removal of liquids is necessary.

The UST will be removed, visually inspected and subsequently cut, cleaned and transported off-site for disposal.

2.6.2 Post Excavation Confirmation Sampling

Post excavation soil samples will be collected from each hot-spot excavation area to verify that remedial goals have been achieved. Samples will be submitted to a NYSDEC standby laboratory (Test America, Inc (Shelton, CT)) for analysis of volatile organic compounds (VOCs') via EPA Method 8260. Samples associated with the secondary source area removal will be submitted for expedited 1-day turn around with Category B deliverables requested. Samples associated with the UST removal will be submitted for standard 10-day turn around with Category A deliverables requested.

Confirmation samples will be collected at a frequency as outlined in DER-10 as follows:

A minimum of five samples will be collected consisting of 4 sidewall samples (minimum of 1 per 30 linear feet of sidewall) and one bottom sample (minimum of 1 sample per 900 square feet. Samples will be biased upon field screening to the suspected location of greatest contamination.

Samples will be collected in laboratory provided glass soil jars, placed in coolers. Samples will be stored on ice to maintain a temperature of 4^{o}C. Samples will be picked up directly from the site the lab provided courier service.

2.6.3 Stockpile Methods

Materials excavated from hot spot contaminated areas excavated materials may be stockpiled for characterization prior to off-site disposal or, if pre-characterized, loaded directly into trucks supplied by the selected disposal facility.

If stockpiling of overburden soil is utilized then the following methods will apply. Stockpiles will be inspected every work day and after every storm event. Stockpiles will be kept covered at all times with appropriately anchored 6-mil polyethylene sheeting. Stockpiles will be routinely inspected and damaged polyethylene sheeting will be promptly replaced. Hay bales will be used as needed to manage water runoff.

2.6.4 Materials Excavation and Load Out

EAR personnel will oversee all invasive work and the excavation and load-out of all excavated material. Loaded vehicles leaving the Site will be appropriately lined, tarps utilized, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

Where effective, the equipment will be "dry" decontaminated using a broom and/or brushes. Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-Site sediment tracking. The foreman will be responsible for ensuring that all egress points for truck and equipment transport from the Site will be clean of dirt and other materials derived from the Site during Site remediation and development. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site derived materials.

2.6.5 Materials Transport Off-Site

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded. EAR will coordinate with a state response contractor to provide the transport and disposal of excavated materials.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site. Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development. Material transported by trucks exiting the site will be secured with covers. If loads contain wet material capable of producing free liquid, kiln dust will be utilized to prevent runoff from the trucks. All trucks will be inspected and dry-brushed, as needed, before leaving the site.

2.6.6 Materials Disposal Off-Site

It is anticipated that a single facility designation will be employed for the soil materials removed from the Site. If disposal of liquids from the UST is necessary; a separate facility designation may be utilized. Once final arrangements have been made, the disposal location(s) will be reported to the NYSDEC Project Manager.

The total quantity of secondary source area soils expected to be disposed off-Site is 500 cubic yards. All secondary source area soils excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed of in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. It is anticipated that secondary source area soils will be disposed of as a non-hazardous material. Final classification of excavated materials will be dependent upon the results of waste characterization sampling. Waste characterization will be performed for off-Site disposal in a manner suitable to the receiving facility and in conformance with applicable permits.

2.6.7 Application of Chemical Oxidants to Open Excavation

Following excavation of soil down to the termination boundary dictated by the NYSDEC regulatory personnel onsite, a dry chemical oxidant will be utilized to reduce VOC concentrations in groundwater and to treat residual VOCs in soil which may remain following the excavation activities. The chemical oxidant will be applied as a dry powder and applied directly to the open excavation at a rate as recommended by the chemical vendor. The amount of oxidant to be applied will be dependent on the size of the excavation and the degree of residual contamination remaining. It may be applied in stages while the excavation remains open.

The chemical oxidant will be broadcast directly into the open excavation as a dry powder, prior to backfilling with clean soil. The oxidant will be actively and thoroughly mixed and worked into subsurface soil utilizing a backhoe or excavator bucket. The excavation will be left open and a security fence will be constructed around the open excavation. Following the collection of verification samples and upon the receipt of laboratory results, a second application of oxidants may be applied or further excavation may be performed; as directed by NYSDEC. If a second application of oxidant is applied, a supplemental set of verification samples will be collected, as needed, and the excavation will be backfilled to level grade.

2.6.8 Materials Reuse On-Site

It is anticipated that clean overburden soil removed during the excavation will be used as backfill. Re-use of on-site clean native soil will based upon visual inspection and field screening results (PID); "clean" overburden will be segregated from impacted soils.

Concrete crushing or processing on-Site is prohibited. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site is prohibited for reuse on-Site. Contaminated on-Site material, including historic fill and contaminated soil, removed for grading or other purposes will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

2.6.9 Backfill from Off-Site Sources

Off-site fill material may be needed to stabilize the entrance - exit areas of the Site and for supplementing the overburden soil needed to backfill the excavation.

Fill material will consist of virgin mined sand, gravel or stone products. Material from industrial sites, spill sites, other environmental remediation sites or other potentially contaminated sites will not be imported to the Site. All imported soils will meet NYSDEC approved backfill or cover soil quality objectives for this Site. The NYSDEC approved backfill or cover soil quality objectives are the restricted residential cleanup objectives as listed in 6 NYCRR Part 375-6.

A sample of fill materials will be collected and sample analysis will include TCL VOCs, TCL SVOCs, PCBs, Pesticides and TAL metals.

In accordance with DER 10: recycled concrete or brick from a DEC registered construction and demolition debris processing facility may be imported without testing, if the material conforms to the requirements of Section 304 of the New York State Department of Transportation Standard Specifications Construction and Materials Volume 1 (2002).

2.6.10 Community Air Monitoring Plan

The CAMP provides measures for protection for the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the remedial work) from potential airborne contaminant releases resulting from remedial activities at construction sites.

The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that the remedial work did not spread contamination off-site through the air. The primary concerns for this site are nuisance odors and dust particulates.

Exceedances observed in the CAMP will be reported to NYSDEC Project Manager. The complete CAMP developed for this site is included in Appendix B of this document.

2.6.11 Odor, Dust and Nuisance Control Plan

2.6.11a Odor Control Plan

This odor control plan is capable of controlling emissions of nuisance odors off-Site. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC will be notified of all odor events and of all other complaints about the project.

All necessary means will be employed to prevent on-and off-Site nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils; . If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances may be employed, pending approval by the NYSDEC Project Manager, and may include: (d) direct load-out of soils to trucks for off-Site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

2.6.11b Dust Control Plan

A dust suppression plan that addresses dust management during invasive on-Site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of wetting.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-Site roads will be limited in total area to minimize the area required for water spraying.

2.7 CHEMICAL OXIDANT INJECTION PROGRAM

This work plan includes the future injection of a chemical oxidant solution to address affected groundwater and residual VOC contamination. Injection of a chemical oxidant solution would reduce any residual VOCs remaining subsequent to excavation activities, and thereby accelerate the improvements in groundwater quality. The scope of this work will be determined based upon the verification samples collected post excavation activities, as well as collection and analysis of groundwater samples, as outlined in section 2.10.1, so that the application and quantity of chemical applied will target residual VOC's.

Injection frequency, concentration and volume will be dictated by calculated chemical oxidant demand, site conditions and manufacturer's recommendations. An addendum work plan outlining the details of chemical injection events will be submitted separately.

2.8 TEMPORARY BORINGS

As requested by DEC, a total of three borings will be installed on the east side of the property to evaluate the subsurface conditions in this area of the site where limited environmental data has been collected to date. Using direct push drilling technologies, a total of 3 boring locations will be advanced on the eastern side of the property (Figure 4). Soil and groundwater samples will be collected at each boring location.

Soil samples will be collected from grade surface down to twelve (12) feet below grade (bg) to account for seasonal variations in the water table (Section 1.3). Soil samples will be collected in discrete two foot intervals. The sampling tube equipped with an expendable piston tip will be used to execute the Geoprobe® Standard Stop-Pin System. The closed sample tube lined with a clear, disposable polyvinyl chloride (PVC) liner is driven to the top of the desired sample depth and pulled back 6-inches to release the expendable piston. The open sample tube is advanced to another 2-feet below grade surface (BGS) to collect the desired sample. All drive tools (drive point, rods, couplings, etc.) will be decontaminated between boring locations according to EAR's standard procedures.

Each sample will be logged for lithology and screened with a Photoionization Detector (PID) using the headspace method. Prior to use, the PID will be calibrated with a 100 ppm (part per million) isobutylene standard and ambient air. At each boring location, the soil sampling interval indicating the highest PID reading or the soil sample collected from the water table interface will be submitted for laboratory analysis.

Following the soil sample collection, a discrete groundwater sample will be collected from each boring location. Groundwater samples will be collected at the same depth that visual and olfactory observations indicate apparent soil impact or at the water table interface. A High Density Polyethylene (HDPE) tube will

be inserted into the sampling rod. Groundwater will be drawn into the tube through a 2-foot milled slot section in the lead rod using the inertia method (hand operated foot valve). Groundwater will be purged using the inertia method or a peristaltic pump. The groundwater sample will be collected after one standing volume of water in the sampling rod has been removed and the purged water appears to run clear. A new length of HDPE tubing will be used for each sample location. All drive tools that come into contact with the groundwater will be decontaminated between sample locations according to EAR's standard procedures. Purge water will be dispersed in the vicinity of the boring.

Samples selected for laboratory analysis will be placed into the appropriate sample containers provided by the lab and immediately placed in a cooler with ice to maintain a temperature of 4 degrees Celsius.
Samples will be submitted to a NYSDEC standby laboratory (Test America, Inc (Shelton, CT)) for analysis of volatile organic compounds (VOCs') via EPA Method 8260. Samples will be submitted for standard 10-day turn around with Category A deliverables requested.

2.9 MONITORING WELL INSTALLATION

A total of three monitoring wells are proposed for installation. One monitoring well will be installed up-gradient of the secondary source in order to evaluate groundwater quality conditions migrating onto the property. Once soil removal activities are completed, two monitoring wells will be installed within the extents of the excavated area in order to evaluate groundwater quality conditions in this area. All monitoring wells will be constructed of 5 feet of 2-inch diameter schedule 40 PVC flush joint riser and 10 feet of 2-inch schedule 40 PVC 0.020 slot screen. Monitoring wells will be installed using direct push drilling methods and will be finished at grade with a locking well cap and bolt-down manhole encased in a concrete pad. Proposed well locations are shown in Figure 4.

Upon review of the analytical results from the temporary borings (section 2.8) and pre-remedial groundwater sampling event (section 2.10.1a) and approval from NYSDEC regulatory personnel, an additional monitoring well(s) may be installed on the eastern side of the property.

2.10 REMEDIAL MONITORING

2.10.1 Groundwater Monitoring

During each sampling event, groundwater samples will be collected as follows. Prior to sample collection, each well will be gauged with a water level meter. The volume of standing water in each well will be calculated and the well will be purged utilizing a peristaltic pump with dedicated silicone and high density polyethylene tubing. All wells will be purged a minimum of one well volume and then until values for temperature, pH, and ORP reach stabilization. These parameters, as well as dissolved oxygen and specific conductivity will be recorded. Field screening will be conducted using a multi-parameter water quality meter (YSI 556 probe or similar) with flow-thru cell. Purge water will be containerized and dispersed in the vicinity of the well, unless directed otherwise.

2.10.1a Pre Remedial Groundwater Monitoring

Prior to remedial activities at the site, a groundwater sampling event will be conducted to evaluate current dissolved phase concentrations. A total of 6 samples are proposed for sample collection: the five existing monitoring wells (MW1-MW5) and the proposed up-gradient well to be installed (see section 2.9). Additional samples may be collected from accessible off-site monitoring wells, as directed by the NYSDEC.

Samples will be collected as outlined in section 2.10.1. Samples will be submitted to a NYSDEC standby laboratory (Test America, Inc (Shelton, CT)) for analysis of volatile organic compounds (VOCs') via EPA Method 8260 for standard 10-day turnaround with category A deliverables. 10% of the groundwater samples collected for VOC analysis will be submitted to the laboratory as blind duplicates.

2.10.1b Post Remedial Groundwater Monitoring

Post-remedial groundwater sampling will be conducted on a quarterly basis to evaluate the success of the remedial action and to monitor improvements to groundwater quality over time. A total of 8 samples are proposed for sample collection: the five existing monitoring wells (MW1-MW5) and the three proposed wells to be installed (see section 2.9). Additional samples may be collected from accessible off-site monitoring wells, as directed by the NYSDEC.

Samples will be collected as outlined in section 2.10.1. A field (titration) test kit will be utilized to analyze groundwater samples for persulfate. Samples will be submitted to a NYSDEC standby laboratory (Test America, Inc (Shelton, CT)) for analysis of volatile organic compounds (VOCs') via EPA Method 8260 for standard 10-day turnaround with category A deliverables. 10% of the groundwater samples collected for VOC analysis will be submitted to the laboratory as blind duplicates.

Upon approval from NYSDEC, additional field screening events may be conducted post soil excavation activities.

2.10.2 Post Remedial Soil Gas Sampling

Following the completion of the remedial action, subsurface soil vapor intrusion may be reevaluated in accordance with applicable NYSDOH guidance and as directed by the NYSDEC. The need for post remedial soil gas sampling and specifics regarding the number and location of soil gas sampling points will be made in consultation with the NYSDEC and NYSDOH.

2.11 REPORTING

Following soil excavation activities a summary report will be prepared. Letter reports will follow subsequent to quarterly sampling events.

2.12 SCHEDULE

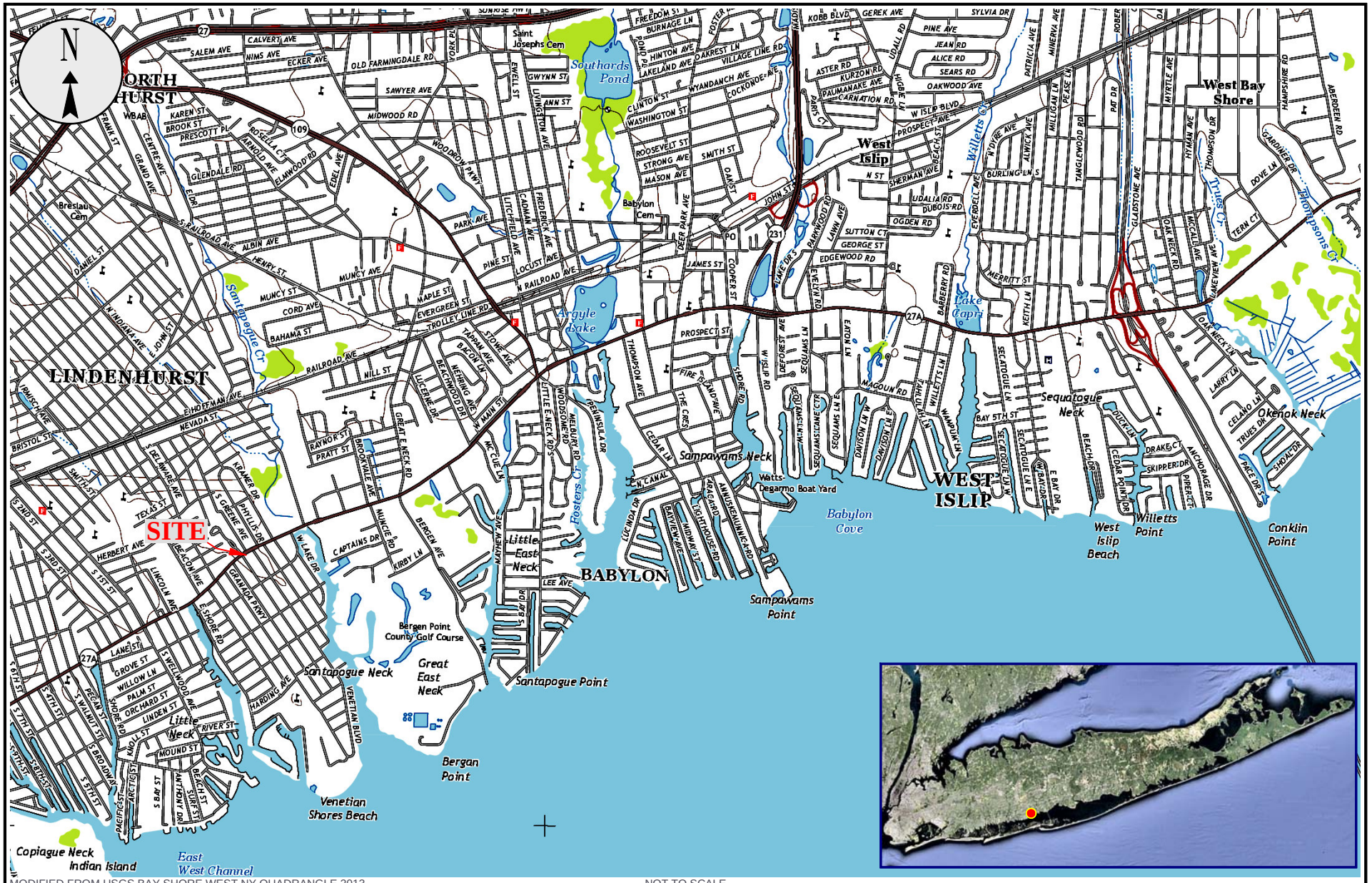
Pending NYSDEC approval of the work plan, EAR is ready to implement the tasks outlined above. It is anticipated that the work will be substantially completed within 4-6 weeks; consisting primarily of the excavation and soil handling activities. The remedial action includes possibility of subsequent injection of chemical oxidants into the groundwater.

The anticipated schedule of milestone events is as follows:

Schedule Milestone	Estimated Completion Date
NYSDEC Approval of Remedial Work Plan	May 2014
Pending onsite building demolition	
Well installation/pre-characterization sampling (soil waste disposal); temporary borings	May 2014
Pre-Remedial Groundwater Sampling Event	May 2014
Excavation of Secondary Source Area & Removal of UST	May 2014-June 2014
Well Installation (within the excavation boundaries)	June 2014
Quarterly Groundwater Sampling Event	August 2014
Summary Report with evaluation to determine additional oxidant application	August -September 2014

FIGURES

FIGURE 1



MODIFIED FROM USGS BAY SHORE WEST NY QUADRANGLE 2013 NOT TO SCALE

ENVIRONMENTAL ASSESSMENT & REMEDIATIONS

225 Atlantic Avenue
Patchogue, New York 11772
Tel (631) 447-6400
Fax (631) 447-6497
Email Info@Enviro-Asmnt.com
www.Enviro-Asmnt.com

SITE LOCATION MAP

Former Jericho Marine
269 East Montauk Highway
Lindenhurst, NY
NYSDEC Spill #98-25156

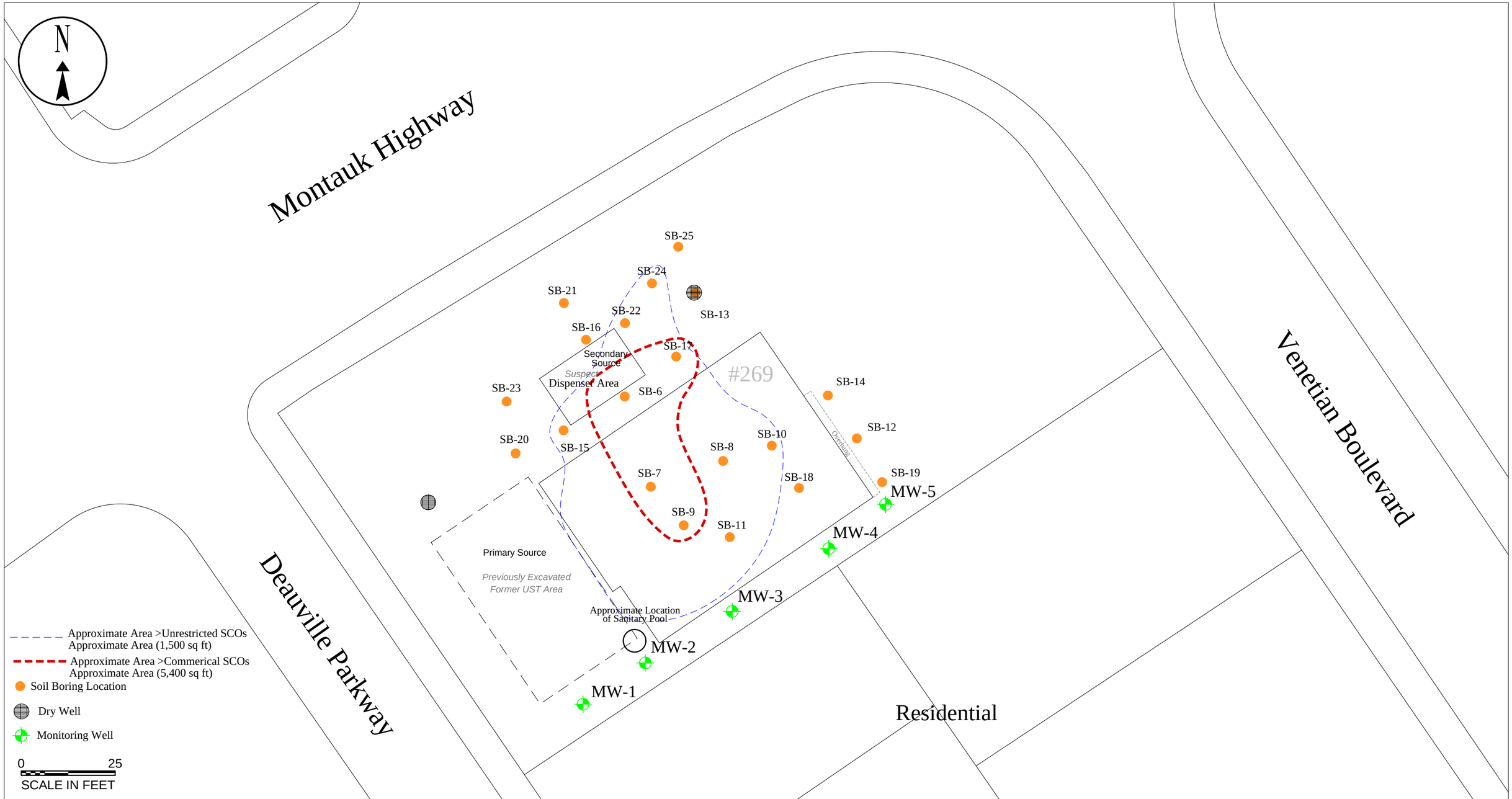
FIGURE 2

ENVIRONMENTAL ASSESSMENT & REMEDIATIONS

Site Map

Former Jericho Marine
269 East Montauk Highway
Lindenhurst, NY
NYSDEC Spill #98-25156

FIGURE 3

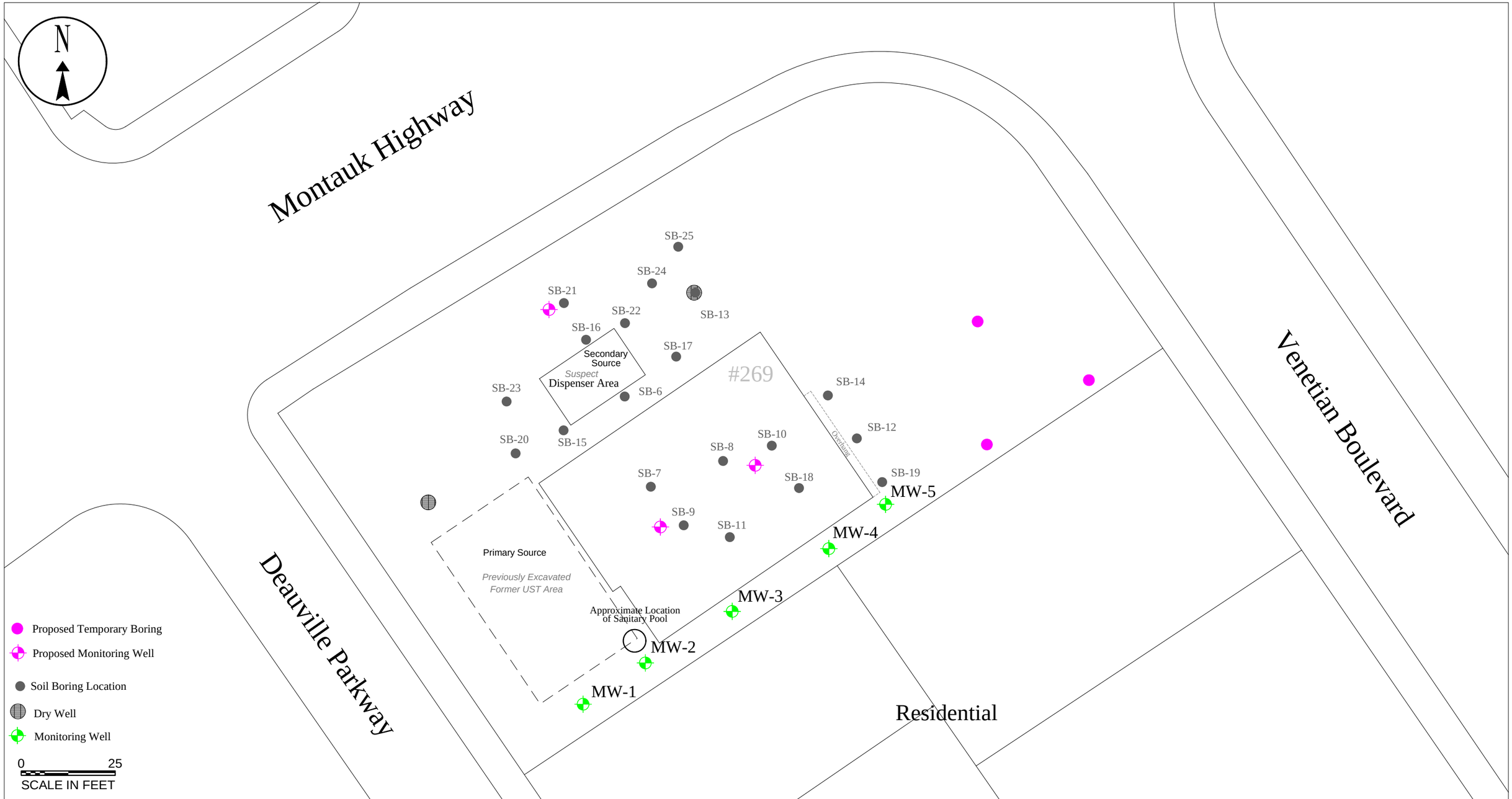


ENVIRONMENTAL ASSESSMENT & REMEDIATIONS

Site Map

Former Jericho Marine
269 East Montauk Highway
Lindenhurst, NY
NYSDEC Spill #98-25156

FIGURE 4



ENVIRONMENTAL ASSESSMENT & REMEDIATIONS

Proposed Location Map

Former Jericho Marine
269 East Montauk Highway
Lindenhurst, NY
NYSDEC Spill #98-25156

APPENDIX A: HEALTH & SAFETY PLAN

HEALTH & SAFETY PLAN

FORMER JERICHO MARINE
269 EAST MONTUAK HIGHWAY
LINDENHURST, NEW YORK
NYSDEC SPILL#: 9825156

Prepared For:

New York State - Department of
Environmental Conservation
Division of Environmental Remediation
50 Circle Road
Stony Brook, NY 11790

Prepared By:

ENVIRONMENTAL
ASSESSMENT &
REMEDIATIONS

225 Atlantic Avenue
Patchogue, NY 11772

TABLE OF CONTENTS

1.0 SITE HISTORY AND SCOPE OF WORK

The following document represents the site specific employee Health and Safety Plan (HASP) for the Former Jericho Marine site located at 269 East Montauk Highway, Lindenhurst in the Town of Babylon, NY (NYSDEC Spill#98-25156). In May 1996, elevated levels of volatile organic compounds (VOCs) were found in the septic pools and two drywells during a routine inspection of the sanitary system conducted by the Suffolk County Department of Health Services (SCDHS). The SCDHS reported the findings to the New York State Department of Environmental Conservation and Spill Number 98-25156 was assigned to the property.

The site was first developed in 1962 and operated as a retail gasoline station/automotive repair shop until 1974. At that time the property was renovated and operated as a convenience store until 1979 when the property was sold to Suffolk Marine Center. Suffolk Marine Center operated a new and used boat retail business known as Jericho Marine. The property was abandoned at some time in 1995 and since then has been inactive with the exception of a real estate business that was operating out of a field office trailer by a potential buyer. At the request of the Town of Babylon (the current owners), the field office trailer was removed sometime in 2013.

Past site activities associated with the operation of the retail gasoline station/automotive repair shop have impacted site soils and groundwater with petroleum related compounds.

The scope of work includes implementation of a remedial action plan to address impacts to the soil and groundwater resulting from a secondary source area. The secondary source has been attributed to a former dispenser location. The primary source area, the former tank area, was remediated under an interim remedial measure completed by Fenley and Nicol Inc in 2007-2008. Impact from the secondary source, above restricted commercial soil clean-up objectives (SCOs), remains and is defined by an estimated 1,200 square feet area which extends from the suspect dispenser pad south through the approximately two-thirds of the existing building. The vertical extent of soil contamination is defined by a smear zone observed from 10 to 16 feet below grade surface.

Proposed and/or potential work activities to be conducted at the site include the following elements:

1. Excavation of soils impacted with petroleum contaminants
2. Application of dry chemical oxidants to the open excavation
3. Preparation and Injection of a chemical oxidant solution below grade surface
4. Groundwater sampling
5. Soil sampling

2.0 HAZARD ASSESSMENT

EAR recognizes that engineering, work practice and administrative controls are the primary means of reducing employee exposure to occupational hazards. This section identifies the hazards associated with the proposed scope of work and presents a summary of documented or potential chemical hazards at the site. Every effort must be made to reduce or eliminate exposure to hazards.

2.1 CHEMICAL HAZARDS

The primary routes of exposure to chemical hazards to onsite workers are through inhalation, ingestion and adsorption. Material Safety Data Sheets for known and suspected chemicals that may be encountered are included in Appendix C.

2.1.1 SITE SPECIFIC CHEMICALS

Based upon site information provided by the NYSDEC, impacts to soil and groundwater have been identified at this site. Previous investigations have identified petroleum compounds in the site soil and groundwater. The following chemicals have been detected at this site:

Xylenes (mixed)	1,1,1 Trichloroethane (TCA)	Tetrachloroethylene (PCE)
Chromium	Lead	1,2,4 Trimethylbenzene
Ethylbenzene	n-propylbenzene	1,3,5 Trimethylbenzene
sec-butylbenzene	p-isopropyltoluene	1,2,4,5 Tetramethylbenzene
Isopropylbenzene	napthalene	

2.1.2 WORK TASK RELATED CHEMICALS

During proposed work activities, workers may encounter some or all, of the chemicals noted below. Precautions and safe work practices should be utilized while handling these chemicals.

Alconox	Bentonite	Portland Cement-Type I
Gasoline	Diesel	Liquinox
Methanol	Hydrochloric Acid <10%	PersulfOx

2.2 RESPIRABLE DUST

Dust may be generated from vehicular traffic and/or other construction activities. If visible observation detects elevated levels of dust, a program of wetting will be employed by the site safety officer. If elevated dust levels persist, the site safety office will employ dust monitoring using a particulate monitor (DataRam 4000 or equivalent). If monitoring detects concentrations greater than 150 µg/m3 over daily background, the site safety officer will take corrective actions as defined herein, including

the use of water for dust suppression and if this is not effective, requiring workers to wear respiratory protection with efficiency particulate air (HEPA) cartridges.

Absorption pathways for dust and direct contact with soils or groundwater will be mitigated with the implementation of latex gloves, hand washing and decontamination exercises when necessary.

2.3 DUST CONTROL AND MONITORING DURING EARTHWORK

Dust generated during excavation activities or other earthwork may contain contaminants identified in soils at the site. Dust will be controlled by wetting the working surface with water. Calcium chloride may be used if the problem cannot be controlled with water. Site workers will not be required to wear respiratory protection unless dust concentrations are consistently over 150 µg/m3 over site-specific background in the breathing zone as measured by a dust monitor unless directed otherwise by the site safety officer. The site safety officer will use visible dust as an indicator to implement the dust control plan.

2.3.1 Organic Vapors

Elevated levels of VOCs were detected in both soil and groundwater samples collected during previous investigations at the site. Therefore, excavation activities may cause the release of organic vapors to the atmosphere. Organic vapors will periodically monitored with a Photoionization Detector (PID) during excavation activities to determine whether organic vapor concentrations exceed action levels noted below.

Should the downwind VOC concentrations for any 15-minute period be greater than 5 ppm of the upwind baseline concentration, work is to be stopped. If VOC concentrations readily drop to within 5 ppm of upwind baseline concentrations, work shall resume.

Should downwind concentrations persist at concentrations greater than 5 ppm (but less than 25 ppm) of the upwind baseline concentration, work is to be stopped pending source identification and appropriate corrective action(s). Work shall resume provided VOC concentrations at the midway distance between the work zone and any commercial or residential structure (or 200 feet downwind of the work zone, whichever is less) are within 5 ppm of upwind baseline concentrations.

Work is to be halted should VOC concentrations at any perimeter exceed 25 ppm.

3.0 PERSONAL PROTECTIVE EQUIPMENT

The Health and Safety Officer will determine the Personal Protective Equipment (PPE) required in the work area. This decision will be based upon the nature of the contaminants known, or expected to be encountered on site, and the type of work to be performed. If site conditions or the type of work change, the required PPE may have to be altered to meet changing conditions. **It is anticipated that a majority of the work will be performed in Level D PPE. Work tasks involving the handling, mixing and application of chemical oxidants will be performed in Level C chemical resistant clothing and air purifying respirators. Air purifying respirators will be utilized soil excavation activities when determined necessary by the Health and Safety Officer.**

Head Protection – Hard hats shall be issued and worn during the project whenever overhead equipment is in use, or whenever there is a potential for an employee's head being struck by an object. Hard hats will also be worn where the project location is in proximity to either public vehicular traffic (high visibility), or live electric exist (voltage rated). Use of ANSI approved Type I Class G helmets will be utilized as necessary.

Eye and Face Protection – Impact resistant goggles, chemical resistant splash goggles and safety glasses will be available and utilized at the discretion of the Safety Officer.

Foot Protection – Industrial foot protection will be worn by all personnel entering the worksite regardless of their assigned activity. Water proof and steel toed boots will be utilized and worn by personnel requiring their use at the discretion of the Safety Officer.

Hand Protection – Canvas / leather work gloves will be issued and available for every employee assigned to a project. Neoprene / nitrile gloves will be available should the need arise for work with chemicals, oils or lubricants (for machinery / equipment), and nitrile/latex gloves will be available for environmental quality sampling (as applicable) and medical response situations.

Respiratory Protection – Disposable dust respirator masks will be available and worn to protect personnel from contaminated mists and dusts when areas are exposed to potential airborne contaminants. Air quality will be monitored prior to and during any ground intrusive activities; ground intrusive activities planned at this site include: well installations, soil sampling, excavation of soils, stockpiling, loading, and backfilling.

All respiratory protective equipment shall be determined and issued by the Safety Officer after a project specific hazard evaluation has been made. The Company does not anticipate the need for respiratory protection based on historical experience and contaminant levels found with similar projects in the past.

Note: EAR has a written Respiratory Protection Program in compliance with 1910.134 and is available upon request. All company personnel required to don respiratory protection shall be medically cleared and fit-tested prior to use.

Body Protection – TYVEK suits will be available and worn throughout the project to protect personnel from contamination, should the need arise. Simple white TYVEK suits will be available for soil excavation / sampling / drilling related tasks. Yellow TYVEK suits will be available and worn with chemical splash, gases or vapor penetration concerns.

Note: Should the need arise; The Company will fully comply with 1910.120 *Hazardous Waste Operations and Emergency Response* (HAZWOPER). Depending upon the hazard evaluation to perform the services at the site, the following levels of PPE will be employed:

Level A – To be selected when the greatest level of skin, respiratory, and eye protection is required.

1. Pressure-demand, full face-piece self-contained breathing apparatus (SCBA), or pressure demand supplied air respirator with escape SCBA (NIOSH approved).
2. Totally encapsulating chemical-protective suit.
3. Coveralls*
4. Long underwear*
5. Gloves, outer, chemical-resistant
6. Gloves, inner, chemical-resistant
7. Boots, chemical-resistant steel toe and shank
8. Hard hat (under suit)*
9. Disposable protective suit, gloves and boots (depending on suit construction, may be worn over totally-encapsulating suit).
10. Two-way radios (worn inside encapsulating suit)

Level B – The highest level of respiratory protection is necessary but a lesser level of skin protection is required.

1. Pressure-demand, full face-piece self-contained breathing apparatus (SCBA) or pressure-demand supplied air respirator with escape SCBA (NIOSH approved).
2. Hooded chemical-resistant clothing (overalls and long-sleeved jacket; coveralls; one or two-piece chemical-splash suit; disposable chemical-resistant overalls)
3. Coveralls*
4. Gloves, outer, chemical resistant
5. Gloves, inner, chemical resistant
6. Boots, outer, chemical resistant steel toe and shank
7. Boot-covers, outer, chemical resistant (disposable)*
8. Hard hat
9. Two-way radios
10. Face shield*

Level C – The concentration(s) and types(s) of airborne substances is known and the criteria for using air purifying respirators are met.

1. Full-face or half-mask, air purifying, canister-equipped respirators (NIOSH approved)
2. Hooded chemical-resistant clothing (overalls; two-piece chemical-splash suit; disposable chemical-resistant overalls)
3. Coveralls*
4. Gloves, outer, chemical resistant
5. Gloves, inner, chemical resistant
6. Boots (outer), chemical resistant steel toe and shank*
7. Boot-covers, outer, chemical resistant (disposable)*
8. Hard hat
9. Escape mask*
10. Two-way radios (worn under outside protective clothing)
11. Face shield*

Level D –A work uniform, affording minimal protection: used for nuisance contamination only.

1. Coveralls
2. Gloves*
3. Boots / shoes, chemical-resistant steel toe and shank
4. Boots, outer, chemical-resistant (disposable)*
5. Safety glasses or chemical splash goggles*
6. Hard hat
7. Escape mask*
8. Face shield*

*Optional, as applicable

4.0 MEDICAL PROGRAM

An effective medical program is essential in assessing and monitoring worker health and fitness prior to and throughout the course of their employment. A medical program provides emergency and other treatment information and provides accurate records for future reference for each worker.

All project personnel will have adequate protection from exposures through engineering and administrative controls, appropriate personal protective equipment and project site control as described in this HASP. The medical program outlined here will be used together with other implemented controls *to* minimize, if not eliminate, unnecessary exposure to toxic and harmful substances above permissible levels, resulting in acute and/or chronic illness.

Basic medical contents of this project include:

- Medical Surveillance – All employees receive an OSHA compliant medical examination upon employment; subsequent medical examinations are carried out based upon site specific project scope of work(s) and potential hazards involved. The content and subsequent follow-up exam frequency shall be at the discretion of the professional health care provider (PHCP) selected by EAR. The PHCP examination process shall be based upon the information made available to them collected at the site and throughout the project.
- Pulmonary Function Test (PFT) – The ability to don a respirator shall be determined by the PHCP. This examination shall be provided to site employees engaged in the sampling and waste handling process before they would be required to wear such protective equipment. Follow-up exams would be at the discretion of the PHCP. **Note:** Employees who have been medically cleared to wear respiratory protection within the past (calendar) year, will not need to re-take the test for this project.
- First Aid – Field first aid kits will be assembled and accessible throughout the project. Contents will be based upon anticipated risks associated with the project tasks and determined by the Project Coordinator (i.e. chemical burn creams/ointments, cuts, punctures, eye wash solutions).
- Emergency Response – Emergency contacts, including the addresses and phone number to the local hospitals are listed in Sections 6.0 and 7.0. All company personnel are trained in CPR and first-aid response. Based upon the situation, the Project Coordinator, or his/her designee, will notify the office of an incident and activate the emergency contact services so that professional assistance would be summoned immediately. It will be the responsibility of on-site company personnel to simply assist the injured by stabilizing and providing warmth until professional responders arrive. Additional information can be found in Sections 6 and 7.

Bloodborne Pathogens – All field personnel will be trained in first-aid and CPR. Because of this certification and designation as a medical first-responder, EAR will have in place, a policy requiring employees who will be potentially exposed to body fluids, to treat all such incidents with universal precautions. That is, all personnel trained and authorized to respond to medical injuries / emergencies, will do so with the proper personal protective equipment outlined in the Federal Standard, 1910.1030 Blood borne Pathogens. Latex gloves, goggles and particulate field masks will be kept on each project site for potential use. Any medical waste generated by injury response (i.e. blood soaked gauze) will be bagged in a leak-proof container, labeled as medical waste, and treated (disposed of) as regulated waste.

5.0 EMERGENCY PROCEDURES

In the event of an emergency, all work will cease and equipment will be shut down. The onsite foreman/health & safety officer will be equipped with an operating mobile phone at all times, and will contact 911immediately in the event of an emergency etc.

The EAR office will be notified immediately in the event of an emergency/accident. In full compliance with the OSHA requirements for recording and reporting injuries and illnesses, EAR shall utilize the Accident/Incident Report (attached as Appendix A), which shall serve as Form 301. Within two working days of any reportable accident, EAR will prepare and submit an Accident/Incident Report to NYSDEC.

5.1 INJURY OR MEDICAL EMERGENCY

In the event of injury or medical emergency the following procedures will be implemented:

- The local Emergency Medical Response Team (EMRT) and police will be notified of the situation via the 911 system.
- All personnel will move upwind of the work area. Wind direction will be monitored continuously during site operations.
- Personnel will render first aid within the limits of their training. One person will remain with the injured party at all times unless required to call the EMRT.
- After the EMRT arrives they will be notified of all pertinent site information, including nature of contaminants known or suspected to be on site and all information relating to the nature of the injury.
- The health and safety officer, the project manager, and the office of EAR will be notified as soon as possible.
- Employee interviews, at the appropriate time, to determine cause factor(s); both the injured party and witnesses shall be interviewed utilizing the attached form to determine preventability. Should faulty equipment or tools be a cause factor in the incident, then the Safety Supervisor shall take immediate action by removing this equipment or tools from service (either for repairs or to be discarded). Should the unsafe action of an individual or individuals be the cause, then the supervisor has the authority to either discipline or arrange for retraining.

First aid kits, eyewash and a fire extinguisher will be made available and accessible on site at all times.

The emergency procedures for chemical exposure will be as follows:

- Skin Contact - Flush with copious amounts of soap and water. Wash/rinse affected area thoroughly, and then provide appropriate medical attention. Eyes should be flushed thoroughly with water in the event of chemical contact.
- Inhalation - Move victim to fresh air, if necessary decontaminate and transport to hospital.

- Ingestion - Decontaminate and transport to hospital.

- Puncture Wound or Laceration - Decontaminate and transport to hospital. Health and safety officer will supply medical data sheet to medical personnel as requested. First aid kits are located in all company vehicles.

6.0 EMERGENCY PHONE NUMBERS

6.1 GENERAL

- Fire Department: **911**
- Police Department: **911**
- Ambulance: **911**
- Poison Control Center: **(212) 340-4494**
- Chemtrec: **800-424-9300**
- New York City and Long Island One Call System: **1-800-272-4480 (or 811)**

6.2 ENVIRONMENTAL ASSESSMENT & REMEDIATIONS

24-Hour Contact: ***1-888-EAR-6789 (option-2 for emergency)***

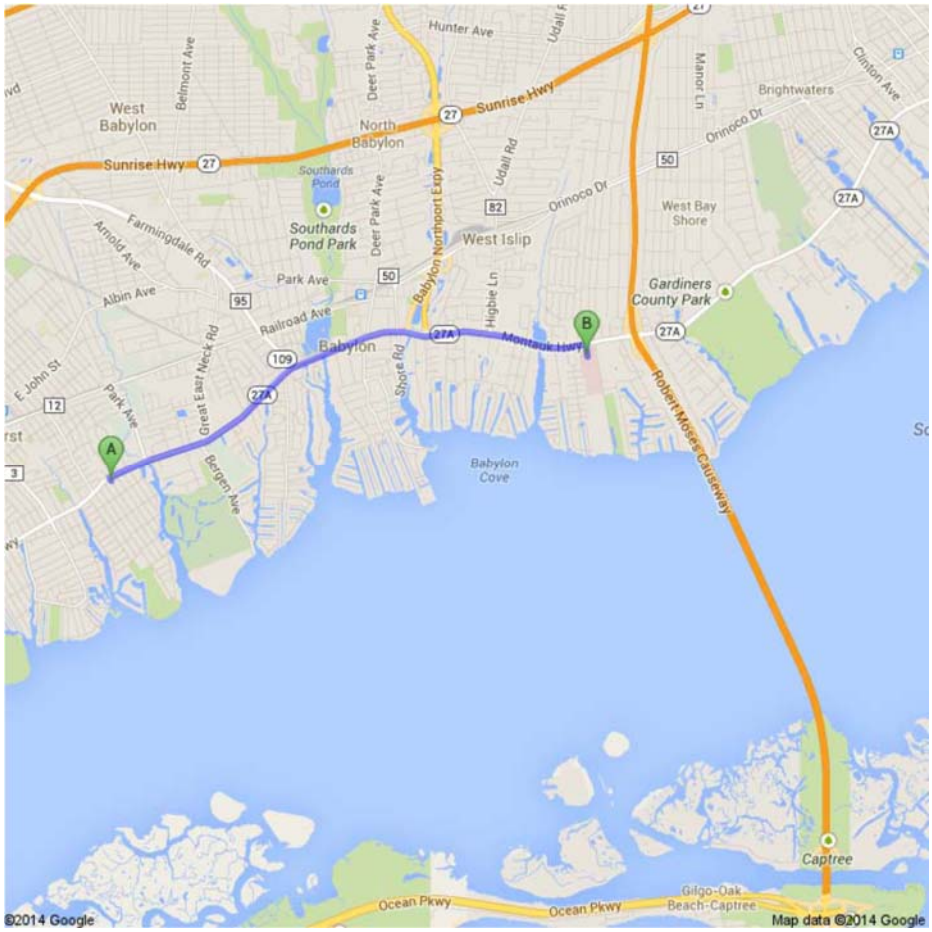
- David Vigliotta (Owner, President) (24 hour on-call for emergencies via above number)
  Work: **(631) 447-6400x120**
  Home: **(631) 363-0732**
  Cell: **(632) 872-2824**
- John Hofmann (Health & Safety Officer) (24 hour on-call for emergencies via above number)
  Work: **(631) 447-6400 x113**
  Home: **(631) 475-7206**
  Cell: **(516) 924-1382**
- Jennifer Lawrence (Project Manager)
  Work: **(631) 447-6400 x131**
  Home: **(631)395-2859**
  Cell: **(631)395-2859**
- Donald Griffing (Foreman/Onsite Project Coordinator)
  Work: **(631) 447-6400**
  Home: **(631)506-2052**
  Cell: **(631) 506-2052**

6.3 NYSDEC REPRESENTATIVE

- John Sheehan (Project Manager)
  Work: **(631) 444-0244**

7.0 HOSPITAL INFORMATION

The nearest hospital to the Site is the Good Samaritan Hospital Medical Center in West Islip at 1000 Montauk Highway West Islip, NY. The phone number for the hospital is (631) 376-4444. A map and directions to the hospital from the site are provided below.



A **DEC-LINDENHURST269**
Deauville Pkwy

1. Head **northwest** on **Deauville Pkwy** toward **NY-27A W**	go 118 ft total 118 ft
27A 2. Take the 1st right onto **NY-27A E** About 7 mins	go 3.5 mi total 3.6 mi
3. Turn right	go 443 ft total 3.7 mi

B **Good Samaritan Hospital Medical Center**
Unknown road

8.0 PROJECT PERSONNEL CERTIFICATIONS

Field personnel working on this project are required to have the following certifications/training:

- OSHA HAZWOPER (29 CFR-1910.120) with current/valid 8 hour refresher course
- Respirator training
- Respirator fit testing
- Pulmonary function test & clearance
- First Aid & CPR

9.0 PRE-JOB SAFETY CHECKLIST & PPE HAZARD ASSESSMENT FORM

Attached to this document are the Pre-Job Safety Checklist and the PPE Hazard Assessment Form. These forms will be used prior to commencement of any work on site.

APPENDIX A: ACCIDENT/INCIDENT REPORT FORM

ACCIDENT/INCIDENT REPORT

Name: _____Date:_____

Location of Incident: _____

Time of Incident: _____Date and Time Reported: _____

Who Reported To: _____

Police/ Medical Involvement: _____

Hospital Name: _____

Copy of Police Report Included: _____Officers Name:_____

Injured/Fatalities: _____

Description of Incident: _____

_____

_____

_____

Witness Names: _____

_____

_____

Additional Information: _____

_____

APPENDIX B: ACKNOWLEDGEMENT

I have read the Health & Safety Plan for this site (**EAR SITE ID:** *DEC-LINDENHURST269*). I understand fully and agree to follow the procedures contained in it.

Employee Name (Print)	Employee Signature	Company	Date

APPENDIX C: MATERIAL SAFETY DATA SHEETS

PersulfOx

Material Safety Data Sheet (MSDS)

Last Revised: February 8, 2013

Section 1 – Supplier Information and Material Identification

Supplier:

REGENESIS
1011 Calle Sombra
San Clemente, CA 92673
Telephone: 949.366.8000
Fax: 949.366.8090
E-mail: info@regenesis.com

Chemical Synonyms:	A mixture of Sodium Persulfate [$Na_2S_2O_8$] and Sodium Silicate [Na_2SiO_3].
Chemical Family:	Inorganic Chemicals
Trade Name:	PersulfOx™
Product Use:	Used to remediate contaminated soil and groundwater (environmental remediation applications)

Section 2 – Chemical Information/Other Designations

CAS No.	Chemical	Percentage
7775-27-1	Sodium Persulfate	90%
1344-09-8	Sodium Silicate	10%

Section 3 – Physical Data

Form:	Solid, free-flowing powder
Color:	White
Odor:	Odorless
Melting Point:	NA
Boiling Point:	NA
Flammability/Flash Point:	Non-combustible
Vapor Pressure:	NA
Bulk Density:	NA
Viscosity:	NA
pH (10% solution):	≈ 7.0 – 11.5 @ 25 °C
Decomposition Temperature:	Decomposition will occur upon heating.

Section 4 – Reactivity Data

Stability:	Stable under normal conditions. Stability decreases in the presence of heat, moisture and/or contamination.
Conditions to Avoid/Incompatibility:	Acids, alkalis, halides (fluorides, chlorides, bromides and iodides), Combustible materials, most metals and heavy metals, oxidizable materials, other oxidizers, reducing agents, cleaners, and organic or carbon containing compounds, moisture, heat, flame. Contact with incompatible materials can result in a material decomposition or other uncontrolled reactions.
Hazardous Decomposition Products:	Oxygen that supports combustion and oxides of sulfur.
Polymerization	Will not occur

Section 5 – Regulations

UNITED STATES

SARA TITLE III (SUPERFUND ADMENDMENTS AND REAUTHORIZATION ACT)

Section 302 Extremely Hazardous Substances (40 CFR 335, Appendix A):	N/A
Section 311 Hazard Categories (40 CFR 370):	Fire Hazard, Immediate (Acute) Health Hazard
Section 312 Threshold Planning Quantity (40 CFR 370):	The Threshold Planning Quantity (TPQ) for this product, if treated as a mixture, is 10,000 lbs; however, this product contains the following ingredients with a TPQ of less than 10,000 lbs.: None
Section 313 Reportable Ingredients (40 CFR 372):	Not Listed

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA Designation & Reportable Quantities (RQ) (40 CFR 302.4):	Unlisted, RQ = 100 lbs., Ignitability

Section 6 – Protective Measures, Storage and Handling

Technical Protective Measures

Storage:

Oxidizer. Store in a cool, clean, and well ventilated area away from all sources of ignition and out of the direct sunlight. Store in a dry location away from heat and in temperatures less than 40 °C.

Keep away from incompatible materials and keep lids tightly closed. Do not store in improperly labeled containers.

Protect from moisture. Do not store near combustible materials. Keep containers well sealed.

Store separately from reducing materials. Avoid contamination which may lead to decomposition.

Handling:

Avoid contact with eyes, skin and clothing. Use with adequate ventilation. Wear respiratory protection if ventilation is inadequate or not available. Use eye and skin protection. Use clean plastic or stainless steel scoops only.

Do not swallow. Avoid breathing vapors, mists or dust. Do not eat, drink or smoke in the work area. Wash hands thoroughly after handling.

Label containers and keep them tightly closed when not in use.

Personal Protective Equipment (PPE)

Engineering Controls:

General room ventilation is required if used indoors. Local exhaust ventilation, process enclosures or other engineering controls may be needed to maintain airborne levels below recommended exposure limits. Avoid creating dust or mists. Maintain adequate ventilation at all times. Do not use in confined areas. Keep levels below recommended exposure limits. To determine actual exposure limits, monitoring should be performed on a routine basis. General use of persulfates will generate thermal and pressure regimes which need to mitigated during application as a precautionary measure.

Respiratory Protection:

Use NIOSH(P100) approved respirator when airborne dust is expected.

Exposure Limit

0.1 mg/m^3 (TWA) - ACGIH

Hand Protection:

Wear chemical resistant gloves (neoprene, rubber, or PVC). Thoroughly wash the outside of gloves with soap and water prior to removal.

Section 6 – Protective Measures, Storage and Handling (cont)

Eye Protection:	Wear chemical safety goggles. A full face shield may be worn in lieu of safety goggles.
Skin Protection:	Try to avoid skin contact with this product. Chemical resistant gloves (neoprene, PVC or rubber) and protective clothing should be worn during use.
Protection Against Fire & Explosion:	Product is non-explosive. In case of fire, evacuate all non-essential personnel, wear protective clothing and a self-contained breathing apparatus, stay upwind of fire, and use water to spray cool fire-exposed containers. Presence of water accelerates decomposition.

Section 7 – Hazards Identification

Potential Health Effects

Inhalation:	May be harmful and irritating.
Eye Contact:	Non-irritating (rabbit)
Skin Contact:	Non-irritating (rabbit)
Ingestion:	May be harmful if swallowed (vomiting and diarrhea).
Target Organs:	Eyes, skin, respiratory passages

Section 8 – Measures in Case of Accidents and Fire

After Spillage/Leakage:	Spilled material should be collected and put in approved DOT container and isolated for disposal. Isolated material should be monitored for signs of decomposition (fuming/smoking). If spilled material is wet, dissolve with large quantity of water and dispose as a hazardous waste. All disposals should be carried out according to regulatory agencies procedures.
Extinguishing Media:	Water; Do not use carbon dioxide or other gas filled fire extinguishers; they will have no effect on decomposing persulfates. Wear full protective clothing and self contained breathing apparatus.

First Aid

Eye Contact:	Flush eyes with running water for at least 15 minutes with eyelids held open. Seek a specialist.
Inhalation:	Remove affected person to fresh air. Seek medical attention if the effects persist.
Ingestion:	Rinse mouth with water, give two-four cups of water to dilute the chemical and seek medical attention immediately. Never give anything by mouth to an unconscious person. **Do Not** induce vomiting.
Skin Contact:	Wash affected areas with soap and a mild detergent and large amounts of water. Seek medical attention if irritation occurs or persists.

Notes to Medical Doctor: This product has low oral toxicity and is not irritating to the eyes and skin. Flooding of exposed areas with water is suggested, but gastric lavage or emesis induction for ingestions must consider possible aggravation of esophageal injury and the expected absence of system effects. Treatment is controlled removal of exposure followed by symptomatic and supportive care.

Section 9 – Accidental Release Measures

Precautions:

Cleanup Methods: Spilled material should be collected and put in approved DOT container and isolated for disposal. Isolated material should be monitored for signs of decomposition (fuming/smoking). If spilled material is wet, dissolve with large quantity of water and dispose as a hazardous waste. All disposals should be carried out according to local regulatory agencies procedures.

Section 10 – Information on Toxicology

Toxicity Data

Oral LD_{50} (rat): 895 mg/kg

Dermal LD_{50} (rabbit): > 10 g/kg

Inhalation LD_{50} (rat): 5.1 mg/kg

Section 11 – Information on Ecology

Ecotoxicological Information

Bluegill sunfish, 96-hour LC_{50} = 771 mg/L

Rainbow trout, 96-hour LC_{50} = 163 mg/L

Daphnia, 48-hour LC_{50} = 133 mg/L

Grass shrimp, 96-hour LC_{50} = 519 mg/L

Biotic Degradation: N/A.

Section 12 – Disposal Considerations

Waste Disposal Method: Dispose of in an approved waste facility operated by an authorized contactor in compliance with local, state and federal regulations.

Section 13 – Shipping/Transport Information

D.O.T. Shipping Name:	Oxidizing Solid, n.o.s. (a mixture of Sodium persulfate, sodium metasilicate and silicon dioxide)
UN Number:	UN 1479
Hazard Class:	5.1 (Oxidizer)
Labels:	5.1 (Oxidizer)
Packaging Group:	III

Section 14 – Other Information

HMIS® Rating	Health – 1 (Slight)	Physical Hazard – 1 (Slight)
	Flammability – 0 (None)	Lab PPE – goggles, gloves, apron, dust respirator

HMIS® is a registered trademark of the National Painting and Coating Association.

NFPA	Health – 1 (Slight)	Reactivity – 1 (Slight)
	Flammability – 0 (None)	Special - Oxidizer

Section 15 – Further Information

The information contained in this document is the best available to the supplier at the time of writing, but is provided without warranty of any kind. Some possible hazards have been determined by analogy to similar classes of material. The items in this document are subject to change and clarification as more information become available. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person. Individuals receiving this information must exercise their independent judgment in determining its appropriateness for a particular purpose.

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

ALCONOX(R)

MSDS Number: A2052 --- *Effective Date: 02/21/00*

1. Product Identification

Synonyms: Proprietary blend of sodium linear alkylaryl sulfonate, alcohol sulfate, phosphates, and carbonates.
CAS No.: Not applicable.
Molecular Weight: Not applicable to mixtures.
Chemical Formula: Not applicable to mixtures.
Product Codes: A461

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Alconox(R) proprietary detergent mixture	N/A	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:
May cause irritation to the respiratory tract. Symptoms may include coughing and shortness of breath.
Ingestion:
May cause irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.
Skin Contact:
No adverse effects expected.
Eye Contact:
May cause irritation, redness and pain.
Chronic Exposure:
No information found.
Aggravation of Pre-existing Conditions:
No information found.

4. First Aid Measures

Inhalation:
Remove to fresh air. Get medical attention for any breathing difficulty.
Ingestion:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention.
Skin Contact:
Wash exposed area with soap and water. Get medical advice if irritation develops.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:
Not expected to be a fire hazard.
Explosion:
No information found.
Fire Extinguishing Media:
Dry chemical, foam, water or carbon dioxide.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. When mixed with water, material foams profusely. Small amounts of residue may be flushed to sewer with plenty of water.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Moisture may cause material to cake. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
- OSHA Permissible Exposure Limit (PEL):
15 mg/m3 total dust, 5 mg/m3 respirable fraction for nuisance dusts.
- ACGIH Threshold Limit Value (TLV):
10 mg/m3 total dust containing no asbestos and < 1% crystalline silica for Particulates Not Otherwise Classified (PNOC).
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, a half-face dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear protective gloves and clean body-covering clothing.
Eye Protection:
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
White powder interspersed with cream colored flakes.
Odor:
No information found.
Solubility:
Moderate (1-10%)
Specific Gravity:
No information found.
pH:
No information found.
% Volatiles by volume @ 21C (70F):
0
Boiling Point:
No information found.
Melting Point:
No information found.

Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
No information found.
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
No information found.
Conditions to Avoid:
No information found.

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Alconox(R)	No	No	None
proprietary detergent mixture			

12. Ecological Information

Environmental Fate:
This product is biodegradable.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Australia
Alconox(R)	Yes	No	No	No
proprietary detergent mixture				

--------\Chemical Inventory Status - Part 2\----------

Ingredient	--Canada-- Korea	DSL	NDSL	Phil.
Alconox(R)	No	No	Yes	No
proprietary detergent mixture				

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Alconox(R)	No	No	No	No

```
  proprietary detergent mixture

  --------\Federal, State & International Regulations - Part 2\----------------
                                                        -RCRA-    -TSCA-
  Ingredient                                 CERCLA     261.33     8(d)
  ----------------------------------------  ------     ------    ------
  Alconox(R)                                 No         No         No
  proprietary detergent mixture


Chemical Weapons Convention:  No     TSCA 12(b):  No     CDTA:  No
SARA 311/312:  Acute: Yes      Chronic: No   Fire: No  Pressure: No
Reactivity: No          (Pure / Solid)
```

Australian Hazchem Code: No information found.
Poison Schedule: No information found.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

NFPA Ratings: Health: **0** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT.
Label Precautions:
Avoid contact with eyes.
Keep container closed.
Use with adequate ventilation.
Avoid breathing dust.
Wash thoroughly after handling.
Label First Aid:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. In all cases, get medical attention.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16.
Disclaimer:
****
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****
Prepared by: Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

International Chemical Safety Cards

BENTONITE

ICSC: 0384

BENTONITE
Wilkinite

CAS # 1302-78-9
RTECS # CT9450000
ICSC # 0384

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible.		In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST!	
• **INHALATION**		Avoid inhalation of fine dust and mist.	
• **SKIN**		Protective gloves.	
• **EYES**		Safety spectacles.	
• **INGESTION**			

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting (extra personal protection: P1 filter respirator for inert particles).		

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0384

International Chemical Safety Cards

BENTONITE

ICSC: 0384

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PHYSICAL STATE; APPEARANCE:
ODOURLESS GRANULES OR POWDER IN VARIABLE COLOUR.

PHYSICAL DANGERS:

CHEMICAL DANGERS:
The substance is a weak base in suspension in

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of dust.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.

R **T** **A** **N** **T** **D** **A** **T** **A**	water. **OCCUPATIONAL EXPOSURE LIMITS (OELs):** TLV not established.	**EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** The substance may have effects on the lungs , resulting in silicosis due to the presence of crystalline silica (see ICSC # 0808).
PHYSICAL PROPERTIES	Relative density (water = 1): 2.5	Solubility in water: none
ENVIRONMENTAL DATA		

N O T E S

Bentonites are aluminate silicate and can contain crystalline silica. The content varies widely from less than 1% to about 24%.

ADDITIONAL INFORMATION

ICSC: 0384 **BENTONITE**

LAFARGE CORPORATION -- PORTLAND CEMENT, PORTLAND CEMENT TYPE 1A

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MSDS Safety Information

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MSDS Date: 03/01/1998
MSDS Num: CJNDM
Product ID: PORTLAND CEMENT, PORTLAND CEMENT TYPE 1A
MFN: 01
Responsible Party
Cage: TO104
Name: LAFARGE CORPORATION
Address: 11130 SUNRISE VALLEY DR, SUITE 300
City: RESTON VA 20191-4393
Info Phone Number: 703-264-3600
Emergency Phone Number: 800-424-9300 (CHEMTREC)
Chemtrec IND/Phone: (800)424-9300
Review Ind: Y
Published: Y

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Contractor Summary

==========

Cage: TO104
Name: LAFARGE CORPORATION
Address: 11130 SUNRISE VALLEY DR, SUITE 300
City: RESTON VA 20191-4393
Phone: 703-264-3600

==========

Ingredients

==========

Cas: 12168-85-3
Name: TRICALCIUM SILICATE; (TRI-CALCIUM SILICATE)
% low Wt: 20.
% high Wt: 70.
Other REC Limits: N/K (FP N)
OSHA PEL: N/K (FP N)
OSHA STEL: N/K (FP N)
ACGIH TLV: N/K (FP N)
ACGIH STEL: N/K (FP N)

Cas: 10034-77-2
Name: DICALCIUM SILICATE; (DI-CALCIUM SILICATE)
% low Wt: 10.
% high Wt: 60.
Other REC Limits: N/K (FP N)
OSHA PEL: N/K (FP N)
OSHA STEL: N/K (FP N)
ACGIH TLV: N/K (FP N)
ACGIH STEL: N/K (FP N)

Cas: 12068-35-8
Name: ALUMINUM CALCIUM IRON OXIDE (AL2CA4FE2O10);
(TETRA-CALCIUM-ALUMINO-FERRITE)
% low Wt: 5.
% high Wt: 15.
Other REC Limits: N/K (FP N)
OSHA PEL: N/K (FP N)

OSHA STEL: N/K (FP N)
ACGIH TLV: N/K (FP N)
ACGIH STEL: N/K (FP N)

Cas: 7778-18-9
RTECS #: WS6920000
Name: CALCIUM SULFATE
% low Wt: 2.
% high Wt: 10.
Other REC Limits: N/K (FP N)
OSHA PEL: 15 MG/M3
OSHA STEL: N/K (FP N)
ACGIH TLV: 10 MG/M3
ACGIH STEL: N/K (FP N)

Cas: 12042-78-3
Name: TRICALCIUM ALUMINATE; (TRI-CALCIUM ALUMINATE)
% low Wt: 1.
% high Wt: 15.
Other REC Limits: N/K (FP N)
OSHA PEL: N/K (FP N)
OSHA STEL: N/K (FP N)
ACGIH TLV: N/K (FP N)
ACGIH STEL: N/K (FP N)

Cas: 1317-65-3
RTECS #: EV9580000
Name: NATURAL CALCIUM CARBONATE; (CALCIUM CARBONATE)
% low Wt: 0.
% high Wt: 5.
Other REC Limits: N/K (FP N)
OSHA PEL: 15 MG/M3
OSHA STEL: N/K (FP N)
ACGIH TLV: 10 MG/M3
ACGIH STEL: N/K (FP N)

Cas: 1309-48-4
RTECS #: OM3850000
Name: MAGNESIUM OXIDE
% low Wt: 0.
% high Wt: 4.
Other REC Limits: N/K (FP N)
OSHA PEL: 15 MG/M3
OSHA STEL: N/K (FP N)
ACGIH TLV: 10 MG/M3
ACGIH STEL: N/K (FP N)

Cas: 1305-78-8
RTECS #: EW3100000
Name: CALCIUM OXIDE
% low Wt: 0.
% high Wt: .2
Other REC Limits: N/K (FP N)
OSHA PEL: 5 MG/M3
OSHA STEL: N/K (FP N)
ACGIH TLV: 2 MG/M3
ACGIH STEL: N/K (FP N)

Cas: 14808-60-7
RTECS #: VV7330000
Name: SILICA, CRYSTALLINE-QUARTZ; (CRYSTALLINE SILICA)
% low Wt: 0.
% high Wt: .2
Other REC Limits: N/K (FP N)
OSHA PEL: see Table Z-3
OSHA STEL: N/K (FP N)
ACGIH TLV: 0.1 MG/M3
ACGIH STEL: N/K (FP N)

Name: CHROMATES
% Wt: 0-0.005
Other REC Limits: N/K (FP N)
OSHA PEL: 5 MG/M3 (RESP DUST)
OSHA STEL: N/K (FP N)
ACGIH TLV: 5 MG/M3 (RESP DUST)
ACGIH STEL: N/K (FP N)
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Health Hazards Data
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Route Of Entry Inds - Inhalation: YES
Skin: YES
Ingestion: YES
Carcinogenicity Inds - NTP: YES
IARC: YES
OSHA: NO
Effects of Exposure: INHALATION (ACUTE): BREATHING DUST MAY CAUSE NOSE, THROAT OR LUNG IRRITATION AND CHOKING. THE DESCRIBED EFFECTS DEPEND ON THE DEGREE OF EXPOSURE. INHALATION (CHRONIC): PROLONGED OR REPEATED EXPOSURE MAY CAUSE LUNG INJURY INCLUDING SILICOSIS . THIS PRODUCT MAY CONTAIN CRYSTALLINE SILICA. CRYSTALLINE SILICA HAS BEEN CLASSIFIED BY IARC AS A KNOWN HUMAN CARCINOGEN. SOME HUMAN STUDIES INDICATE POTENTIAL FOR LUNG CANCER FROM CRYSTALLINE SILICA EXPOSURE. RISK OF INJURY DEPENDS ON DUR ATION AND LEVEL OF EXPOSURE. LONG TERM EXPOSURES WHICH RESULT IN SILICOSIS MAY RESULT IN ADDITIONAL HEALTH EFFECTS. (EFFECTS OF OVEREXPOSURE)
Explanation Of Carcinogenicity: SILICA, CRYSTALLINE-QUARTZ: IARC MONOGRAPHS, SUPPLEMENT, VOLUME 68, 1997: GROUP 1. NTP 8TH ANNUAL REPORT ON CARCINOGENS, 1998: REASONABLY ANTICIPATED TO BE HUMAN CARCINOGEN. HUMAN: LUNG.
Signs And Symptions Of Overexposure: HEALTH HAZARDS: EYE CONTACT (ACUTE/CHRONIC): MAY CAUSE IRRITATION, SEVERE BURNS AND DAMAGE TO CORNEA. SKIN CONTACT (ACUTE/CHRONIC): MAY CAUSE DRY SKIN, REDNESS, DISCOMFORT, IRRITATION OR SEVERE BURNS. MAY PRODUCE ALLERGIC REACTION POTENTIAL LY ASSOCIATED WITH HEXAVALENT CHROMIUM. THICKENING OF THE SKIN (SCLERODERMA) MAY BE ASSOCIATED WITH EXPOSURE TO HIGH LEVELS OF CRYSTALLINE SILICA. INGESTION (ACUTE/CHRONIC): INGESTION OF LARGE AMOUNTS MAY CAUSE INTESTINAL DISTRESS.
First Aid: INHALATION: MOVE PERSON TO FRESH AIR. SEEK MEDICAL ATTENTION FOR DISCOMFORT. EYES: RINSE THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES. SEEK MEDICAL ATTENTION FOR ABRASIONS. SKIN: WASH WITH SOAP AND WATER. USE MOISTURIZING CREAMS FOR IRRITA TED SKIN. SEEK MEDICAL ATTENTION FOR BURNS. INGESTION: DO NOT INDUCE VOMITING, BUT DRINK PLENTY OF WATER. SEEK MEDICAL ATTENTION FOR DISCOMFORT.
==========
Handling and Disposal
==========
Spill Release Procedures: GENERAL: WIND BLOWN DUST MAY CAUSE THE HAZARDS

IDENTIFIED IN HEALTH HAZARDS SECTION. REMOVE SPILLED MATERIAL TO LIMIT POTENTIAL HARM. LAND/WATER SPILL: CLEAN UP SPILLED MATERIAL.
Waste Disposal Methods: DISPOSE IN LANDFILL IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS. ANY DISPOSAL PRACTICE MUST BE IN ACCORDANCE WITH LOCAL, PROVINCIAL, STATE AND FEDERAL LAWS AND REGULATIONS. CONTACT LOCAL ENVIRONMENTAL AGENCY FOR SPECIFIC RULES.
Handling And Storage Precautions: GENERAL: AVOID ACCIDENTAL RELEASE. STORE DRY AND AWAY FROM WATER. STORAGE TEMPERATURE: UNLIMITED. STORAGE PRESSURE: UNLIMITED. EMPTY CONTAINERS: DISPOSE OF CONTAINERS IN AN APPROVED LANDFILL OR INCINERATOR.

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Fire and Explosion Hazard Information

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Flash Point Text: NONE
Autoignition Temp Text: NONE
Lower Limits: NOT COMBUST
Upper Limits: NOT COMBUST
Extinguishing Media: USE MEDIA SUITABLE FOR SURROUNDING FIRE (FP N).
Fire Fighting Procedures: WEAR NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N). AVOID BREATHING DUST. TREAT ADJACENT MATERIAL.
Unusual Fire/Explosion Hazard: THIS PRODUCT IS NOT A FIRE HAZARD. HAZARDOUS COMBUSTION PRODUCTS: NONE.

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Control Measures

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Respiratory Protection: UNDER ORDINARY CONDITIONS NO RESPIRATORY PROTECTION IS REQUIRED. WEAR A NIOSH APPROVED RESPIRATOR WHEN EXPOSED TO DUST ABOVE EXPOSURE LIMITS.
Ventilation: USE EXHAUST VENTILATION TO MAINTAIN DUST LEVELS BELOW EXPOSURE LIMITS IN WORKPLACES WITH POOR VENTILATION AND DUSTY CONDITIONS.
Protective Gloves: WEAR IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPROVED CHEMICAL WORKERS GOGGLES (FP N).
Other Protective Equipment: EYEWASH AND DELUGE SHOWER MEETING ANSI DESIGN CRITERIA (FP N). USE SHOES AND PROTECTIVE CLOTHING TO PREVENT SKIN CONTACT.
Supplemental Safety and Health: VAPOR DENSITY: NOT MEASURABLE.

==========

Physical/Chemical Properties

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Boiling Point: >1000.C, 1832.F
M.P/F.P Text: NONE, SOLID
Vapor Pres: NOT MEASURABLE
Vapor Density: SUP DAT
Spec Gravity: 3.2
PH: 12-13(IN WATER)
Viscosity: NONE, SOLID
Evaporation Rate & Reference: NOT MEASURABLE
Solubility in Water: SLIGHT (0.1-1.0%)

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Reactivity Data

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Stability Indicator: YES
Stability Condition To Avoid: PRODUCT IS STABLE BUT MUST BE KEPT DRY. REACTS WITH WATER FORMING POLYMERIZED SILICATES AND CALCIUM OXIDE.
Materials To Avoid: DISSOLVES IN HYDROFLUORIC ACID PRODUCING CORROSIVE SILICON TETRAFLUORIDE GAS. SILICATES REACT WITH POWERFUL OXIDIZERS SUCH AS FLUORINE, CHLORINE TRIFLUORIDE AND OXYGEN DIFLUORIDE.
Hazardous Decomposition Products: NONE, POWDERED SOLID.

Hazardous Polymerization Indicator: NO

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Toxicological Information

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Toxicological Information: FOR DETAILED TOXICOLOGICAL INFORMATION CONTACT: ENVIRONMENT AND GOVERNMENT AFFAIRS, LAFARGE CORPORATION, P.O. BOX 4600, RESTON, CA 20195-1415, (703) 264-3600.

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Ecological Information

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Ecological: FOR DETAILED ECOLOGICAL INFORMATION CONTACT: ENVIRONMENT AND GOVERNMENT AFFAIRS, LAFARGE CORPORATION, P.O.BOX 4600, RESTON, VA 20195-1415, (703) 264-3600.

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MSDS Transport Information

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Transport Information: NOT A HAZARDOUS MATERIAL FOR DOT OR TDG SHIPPING.

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Regulatory Information

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Sara Title III Information: SECTIONS 311-312 HAZARD CATEGORY: THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA HAZARD CATEGORIES PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND IS CONSIDERED A HAZARDOUS CHEMICA L AND A DELAYED HEALTH HAZARD. SARA SECTION 313 INFORMATION: THIS PRODUCT CONTAINS NONE OF THE SUBSTANCES SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 C FR PART 372.

Federal Regulatory Information: OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200: THIS PRODUCT IS CONSIDERED BY OSHA TO BE A HAZARDOUS CHEMICAL AND SHOULD BE INCLUDED IN THE EMPLOYER'S HAZARD COMMUNICATION PROGRAM. CERCLA/SUPERFUND, 40 CFR 117, 302: NOT LISTED. TOXIC SUBS TANCE CONTROL ACT (TSCA): SOME CONSTITUENTS IN THIS PRODUCT ARE LISTED ON THE TSCA INVENTORY. W INFORMATION: THIS PRODUCT CONTAINS SUBSTANCES CONSIDERED TO BE HAZARDOUS BY HEALTH CANADA AND IS A CONTROLLED PRODUCT. CONSULT LOCAL AUTHORI TIES FOR ACCEPTABLE EXPOSURE LIMITS. W INFORMATION: (416) 327-7066. W CLASSIFICATION: D2A, E.

State Regulatory Information: CALIFORNIA PROPOSITION 65: CRYSTALLINE SILICA (CAS # 14808-60-7) IS CONSIDERED TO BE A CARCINOGEN BY THE STATE OF CALIFORNIA.

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Other Information

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Other Information: NOTE: THIS MSDS COVERS MANY PRODUCTS. INDIVIDUAL COMPOSITION OF HAZARDOUS CONSTITUENTS WILL VARY.

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HAZCOM Label

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Product ID: PORTLAND CEMENT, PORTLAND CEMENT TYPE 1A
Cage: TO104
Assigned IND: Y
Company Name: LAFARGE CORPORATION
Street: 11130 SUNRISE VALLEY DR, SUITE 300
City: RESTON VA
Zipcode: 20191-4393
Health Emergency Phone: 800-424-9300 (CHEMTREC)
Label Required IND: Y
Date Of Label Review: 09/29/1999

Status Code: A
Origination Code: F
Chronic Hazard IND: Y
Eye Protection IND: YES
Skin Protection IND: YES
Signal Word: WARNING
Respiratory Protection IND: YES
Health Hazard: Moderate
Contact Hazard: Moderate
Fire Hazard: None
Reactivity Hazard: None
Hazard And Precautions: ACUTE: INHAL: BREATHING DUST MAY CAUSE NOSE, THROAT/LUNG IRRIT & CHOKING. EYE CONTACT: MAY CAUSE IRRIT, SEV BURNS & DMG TO CORNEA. SKIN CONT:MAY CAUSE DRY SKIN, REDNESS, DISCOMFORT, IRRIT/SEV BURNS. INGEST OF LRG AMTS MAY CAUSE INTESTINAL D ISTRESS. CHRONIC: CANCER HAZARD. CONTAINS SILICA, CRYSTALLINE-QUARTZ WHICH IS LISTED AS A HUMAN LUNG CARCINOGEN (FP N). INHAL: PRLNGD/RPTD EXPOS MAY CAUSE LUNG INJURY INCLUDING SILICOSIS. SKIN & EYE CONT:IRRIT & BURNS. MAY PRODUC E ALLERGIC RXN POTENTIALLY ASSOCIATED WITH HEXAVALENT CHROMIUM. THICKENING OF THE SKIN (SCLERODERMA) MAY BE ASSOCIATED WITH EXPOSURE TO HIGH LEVELS OF CRYSTALLINE SILICA.

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U. S. OIL & REFINING CO.

M A T E R I A L S A F E T Y D A T A S H E E T

MIDGRADE UNLEADED GASOLINE MSDS No. 11311020

Revised 8/12/98

U. S. OIL & REFINING CO.
3001 Marshall Ave.
Tacoma, WA 98421

EMERGENCY ASSISTANCE:
COMPANY: (253) 383-1651
CHEMTREC: (800) 424-9300

IMPORTANT: Read this MSDS before handling or disposing of this product. Pass this information on to employees, customers and product users.

1. GENERAL

Trade Name: AUTOMOTIVE GASOLINE
Other Names: MIDGRADE UNLEADED GASOLINE

Chemical Family: HYDROCARBON
Generic Name: PETROLEUM NAPHTHAS (BLENDED)
DOT Shipping Name: GASOLINE, 3, UN1203, II

NFPA Hazard Rating: HEALTH: 1
FIRE: 3
REACTIVITY: 0
SPECIAL:

2. PRODUCT COMPONENTS

Component	CAS Number	Percent
GASOLINE IS A COMPLEX MIXTURE OF HYDROCARBONS PRODUCED BY PROCESSING CRUDE OIL. IT CONTAINS PRIMARILY ALIPHATIC, OLEFINIC AND AROMATIC HYDROCARBONS IN THE RANGE OF C_4-C_{10}.	8006-61-9	100
COMPONENTS INCLUDE:		
1. TOLUENE	108-88-3	0-10%
2. XYLENE	1330-20-7	0-10%
3. BENZENE	71-43-2	0-5%
4. 1,2,4-TRIMETHYLBENZENE	95-63-6	0-5%
5. ETHYLBENZENE	100-41-4	0-3%
6. N-HEXANE	110-54-3	0-3%
7. CYCLOHEXANE	110-82-7	0-1%
8. NAPTHALENE	71-20-3	0-1%

3. OCCUPATIONAL EXPOSURE LIMITS

Substance	Value	Time/Type	Date	Source
GASOLINE	300 PPM	8 Hr PEL	1989	OSHA
	500 PPM	15 Min STEL	1989	OSHA
BENZENE	1 PPM	8 Hr PEL	1989	OSHA
	5 PPM	15 Min STEL	1989	OSHA

4. HEALTH INFORMATION

HEALTH STUDIES HAVE SHOWN THAT MANY PETROLEUM HYDROCARBONE POSE POTENTIAL HAELTH RISKS WHICH MAY VARY FROM PERSON TO PERSON. AS A PRECAUTION EXPOSURE TO LIQUIDS, VAPORS, MISTS OR FUMES SHOULD BE MINIMIZED.

HIGH VAPOR CONCENTRATIONS (GREATER THAN 1000 PPPM) ARE IRRITATING TO EYES AND THE RESPIRATORY TRACT, AND MAY CAUSE HEADACHES, DIZZINESS, ANESTHESIA, DROWSINESS, UNCONSCIOUSNESS, AND OTHER CENTRAL NERVOUS SYSTEM EFFECTS, INCLUDING DEATH.

WARNING: CONCENTRATED, PROLONGED OR DELIBERATE INHALATION OF THIS PRODUCT MAY CAUSE BRAIN OR NERVOUS SYSTEM DAMAGE. PROLONGED AND REPEATED EXPOSURE OF PREGNANT ANIMALS TO HIGH LEVELS OF TOLUENE (>1500 PPM) HAS BEEN REPORTED TO CAUSE FETAL DEVELOPMENTAL EFFECTS.

PROLONGED AND REPEATED SKIN CONTACT WITH THIS PRODUCT TENDS TO REMOVE SKIN OILS, POSSIBLY LEADING TO IRRITATION AND DERMATITIS.

PRODUCT CONTACTING THE EYES MAY CAUSE EYE IRRITATION.

THIS PRODUCT MAY CONTAIN UP TO 5 WEIGHT PERCENT BENZENE. BENZENE CAN CAUSE ANEMIA AND OTHER BLOOD DISEASES, INCLUDING LEUKEMIA (CANCER OF THE BLOOD-FORMING SYSTEM), AFTER PROLONGED AND REPEATED EXPOSURES AT HIGH CONCENTRATIONS (50-500 PPM). IT HAS ALSO CAUSED FETAL DEFECTS IN TESTS ON LABORATORY.

CONTAINS LIGHT HYDROCARBON COMPONENTS. LIFETIME STUDIES BY THE AMERICAN PETROLEUM INSTITUTE HAVE SHOWN THAT KIDNEY DAMAGE AND KIDNEY CANCER CAN OCCUR IN MALE RATS AFTER PROLONGED EXPOSURE AT ELEVATED CONCENTRATIONS OF TOTAL GASOLINE. KIDNEYS OF MICE AND FAMALE RATS WERE UNAFFECTED. THE U.S. EPA RISK ASSESSMENT FORUM HAS CONCLUDED THAT MALE RAT KIDNEY TUMOR RESULTS ARE NOT RELEVANT FOR HUMANS. TOTAL GASOLINE EXPOSURE ALSO PRODUCED LIVER TUMORS IN FEMALE MICE ONLY. THE IMPLICATION OF THESE DATA FOR HUMANS HAS NOT BEEN DETERMINED.

THE PRESENCE OF n-HEXANE IN THIS PRODUCT REPRESENTS A DISTINCT HAZARD OF PRODUCING PERIPHERAL POLYNEUROPATHY, A PROGRESSIVE DISORDER OF THE NERVOUS SYSTEM, WHICH WITH SUFFICIENT HIGH EXPOSURE HAS THE POTENTIAL OF BECOMING IRREVERSIBLE. THIS DISORDER HAS BEEN OBSERVED IN INDIVIDUALS EXPOSED REPEATEDLY TO HIGH VAPOR CONCENTRATIONS (1000-1500 PPM) OF n-HEXANE OVER A PERIOD OF SEVERAL MONTHS. THE OSHA PERMISSIBLE EXPOSURE LIMIT (TWA-PEL) IS 50 PPM FOR n-HEXANE.

INHALATION OF COMPONENTS OF EXHAUST FROM BURNING, SUCH AS CARBON MONOXIDE, MAY CAUSE DEATH AT HIGH CONCENTRATIONS. EXPOSURE TO EXHAUST OF THIS FUEL SHOULD BE MINIMIZED.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE
BENZENE - INDIVIDUALS WITH LIVER DISEASE MAY BE MORE SUSCEPTIBLE TO TOXIC EFFECTS.

HEXANE - INDIVIDUALS WITH NEURALGIC DISEASE SHOULD AVOID EXPOSURE.

PETROLEUM SOLVENTS/PETROLEUM HYDROCARBONS - SKIN CONTACT MAY AGGRAVATE AN EXISTING DERMATITIS.

5. FIRE AND EXPLOSION

Flash Point (Method): AP -43°C (D-56)

Flammable Limits (% Vol. in air) at Normal Atmospheric Temperature and Pressure LOWER: AP 1.3 UPPER: AP 8.2

Unusual Fire and Explosion Hazards:

EXTREMELY FLAMMABLE! THIS MATERIAL RELEASES VAPORS AT OR BELOW AMBIENT TEMPERATURES. WHEN MIXED WITH AIR IN CERTAIN PROPORTIONS AND EXPOSED TO AN IGNITION SOURCE, THESE VAPORS CAN BURN IN THE OPEN OR EXPLODE IN CONFINED SPACES. BEING HEAVIER THAN AIR, FLAMMABLE VAPORS MAY TRAVEL LONG DISTANCES ALONG THE GROUND BEFORE REACHING A POINT OF IGNITION AND FLASHING BACK.

Extinguishing Media:

DRY CHEMICAL, FOAM, CARBON DIOXIDE, HALON. WATER FOG OR WATER SPRAY ARE OF VALUE FOR COOLING, BUT MAY NOT ACHIEVE EXTINGUISHMENT.

Special Firefighting Procedures:

FOR FIRES INVOLVING THIS MATERIAL, DO NOT ENTER ANY ENCLOSED FIRE SPACE WITHOUT PROPER PROTECTIVE EQUIPMENT, INCLUDING SELF-CONTAINED BREATHING APPARATUS. COOL TANKS AND CONTAINERS EXPOSED TO FIRE WITH WATER.

6. EMPLOYEE PROTECTION

Respiratory: AN APPROVED ORGANIC VAPOR RESPIRATOR, SUPPLIED AIR, OR SELF-CONTAINED BREATHING APPARATUS (SCBA) MUST BE USED WHEN VAPOR CONCENTRATIONS EXCEED THE OCCUPATIONAL EXPOSURE LIMITS.

Ventilation: USE ADEQUATE VENTILATION TO KEEP VAPOR CONCENTRATIONS OF THIS MATERIAL BELOW THE OCCUPATIONAL EXPOSURE LIMITS.

Eye: EYE PROTECTION (CHEMICAL-TYPE GOGGLES AND/OR FACE SHIELD) SHOULD BE WORN WHENEVER THERE IS A LIKELIHOOD OF SPLASHING OR SPRAYING LIQUID. CONTACT LENSES SHOULD NOT BE WORN. EYE WASH WATER SHOULD BE PROVIDED.

Skin: AVOID PROLONGED OR REPEATED SKIN CONTACT. IF CONDITIONS OR FREQUENCY OF USE PRESENT DANGER OF EXPOSURE, CLEAN AND IMPERVIOUS PROTECTIVE CLOTHING SUCH AS GLOVES, APRON, BOOTS, AND FACIAL PROTECTION SHOULD BE WORN.

Other: USE GOOD PERSONAL HYGIENE PRACTICES. IN CASE OF SKIN CONTACT, WASH WITH MILD SOAP AND WATER OR A WATERLESS HAND CLEANER. IMMEDIATELY REMOVE SOILED CLOTHING AND WASH THOROUGHLY BEFORE REUSE. DISCARD GASOLINE-SOAKED SHOES.

7. EMERGENCY AND FIRST AID

Inhalation: IMMEDIATELY REMOVE FROM CONTAMINATED AREA TO FRESH AIR. FOR RESPIRATORY DISTRESS, GIVE OXYGEN OR ADMINISTER CPR (CARDIOPULMONARY RESUSCITATION), IF NECESSARY. OBTAIN PROMPT MEDICAL ATTENTION.

Eye Contact: FLUSH WITH CLEAN LOW-PRESSURE WATER FOR AT LEAST 15 MINUTES. IF IRRITATION PERSISTS, OBTAIN MEDICAL ATTENTION.

Skin Contact: IMMEDIATELY REMOVE CONTAMINATED CLOTHING. WASH AFFECTED AREA THOROUGHLY WITH SOAP AND WATER. IF IRRITATION PERSISTS, SEEK MEDICAL ATTENTION. WASH CLOTHING THOROUGHLY BEFORE REUSE, BUT DISCARD CONTAMINATED LEATHER GOODS.

Ingestion: DO NOT INDUCE VOMITING, SINCE ASPIRATION INTO THE LUNGS WILL CAUSE CHEMICAL PNEUMONIA. MUST OBTAIN MEDICAL ATTENTION PROMPTLY.

Note to Physician: TOXIC SIGNS AND SYMPTOMS MAY FOLLOW CONTACT WITH THE SKIN OVER LARGE AREAS OF THE BODY, INHALATION OF VAPORS OR INGESTION.

8. SPILL AND DISPOSAL

Actions if Material is Spilled or Leaked:

CONTAIN SPILL. REMOVE ALL IGNITION SOURCES AND SAFELY STOP FLOW OF SPILL. IN URBAN AREAS, CLEANUP ASAP; IN NATURAL ENVIRONMENTS, SEEK ADVICE FROM ECOLOGISTS. EVACUATE ALL NON-ESSENTIAL PERSONNEL. USE PROPER PROTECTIVE EQUIPMENT. BLANKET WITH FOAM OR USE WATER FOG TO DISPERSE VAPORS. PADS/ABSORBENT MATERIAL CAN BE USED. GASOLINE WILL FLOAT ON WATER AND RESULTING RUNOFF MAY CREATE AN EXPLOSION OR FIRE HAZARD. NOTIFY THE NATIONAL RESPONSE CENTER (800/424-8802) AND COMPLY WITH ALL LAWS. GASOLINE OR CONTAMINATED MATERIALS MAY BE HAZARDOUS TO HUMAN AND OTHER LIFE.

Waste Disposal Methods:

MAXIMIZE PRODUCT RECOVERY FOR REUSE PRIOR TO DISPOSAL. DISPOSE OF PRODUCT, CONTAMINATED MATERIAL, AND STORAGE TANK WATER BOTTOMS AS AN EPA "IGNITABLE HAZARDOUS WASTE" (D001), UNLESS PROVEN OTHERWISE. USE APPROVED TREATMENT, TRANSPORTERS, AND DISPOSAL SITES IN COMPLIANCE WITH ALL APPLICABLE LAWS. TANK BOTTOMS AND TANK WATER BOTTOMS MAY BE HAZARDOUS TO HUMAN, ANIMAL AND AQUATIC LIFE. IF SPILL IS INTRODUCED INTO A WASTEWATER SYSTEM, THE CHEMICAL AND BIOLOGICAL OXYGEN DEMAND WILL LIKELY INCREASE. POTENTIAL TREATMENT AND DISPOSAL METHODS INCLUDE LAND FARMING, INCINERATION AND LAND DISPOSAL, IF PERMITTED.

9. PHYSICAL AND CHEMICAL DATA

Specific Gravity (H_2O = 1 @ 39.2°F): AP 0.72 to 0.83

Evaporation Rate (Ratio of Time): SLOWER THAN BUTYL ACETATE

Vapor Pressure: (REID-PSIA AT 100°F) AP 7 TO 15

Vapor Sp. Gr. (Air = 1.0 at 60°-90°F): AP 3.5

Solubility in Water: NEGLIGIBLE

Dry Point: AP 430 F

Volatile Characteristics: APPRECIABLE

Stability: STABLE

Appearance and Odor: COLORLESS, PETROLEUM NAPHTHA ODOR

Conditions to Avoid: HEAT, SPARKS, AND OPEN FLAME

Materials to Avoid: REACTS WITH STRONG ACIDS AND STRONG OXIDIZING MATERIALS

Hazardous Decomposition Products: BURNING OR EXCESSIVE HEATING MAY PRODUCE CARBON MONOXIDE AND OTHER HARMFUL GASES AND VAPORS INCLUDING OXIDES AND/OR OTHER COMPOUNDS OF LEAD.

10. REGULATORY INFORMATION

REPORTABLE QUANTITY (RQ), EPA 40 CFR 302 (CERCLA SECTION 102)

THE RQ FOR:

BENZENE - 10 LBS
CUMENE - 5000 LBS
CYCLOHEXANE - 1000 LBS
ETHYLBENZENE - 1000 LBS
NAPHYHALENE - 100 LBS
n-HEXANE - 1 LB
TOLUENE - 1000 LBS
XYLENE - 1000 LBS

Toxic Chemical Release Reporting, (SARA Section 313)

Component	**CAS Number**	**Percent** (Typical)
TOLUENE	108-88-3	<10
XYLENE	1330-20-7	<10
BENZENE	71-43-2	<4.6
ETHYLBENZENE	100-41-4	<2
1,2,4-TRIMETHYLBZ	95-63-6	<5
ETHYLBENZENE	100-41-4	<3
n-HEXANE	110-54-3	<1
CYCLOHEXANE	110-82-7	<1

Threshold Planning Quantity (TPQ), (SARA 301-304)

NO TPQ FOR PRODUCT OR ANY CONSTITUENT GREATER THAN 1% OR 0.1% (CARCINOGEN)

EPA Hazard Classification:
Acute Health Hazard: X
Chronic Health Hazard: X
Fire Hazard: X
Pressure Hazard:
Reactive Hazard:
Not Applicable:

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11. ADDITIONAL PRECAUTIONS

Handling & Storage:

STORE AND TRANSPORT IN ACCORDANCE WITH ALL APPLICABLE LAWS. KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME! KEEP CONTAINERS CLOSED! GROUND ALL DRUMS AND TRANSFER VESSELS WHEN HANDLING. THE PRESENCE OF LEAD COMPOUNDS IN GASOLINE REQUIRES USE OF SPECIAL PROCEDURES AND PROTECTIVE EQUIPMENT FOR TANK, VESSEL, OR OTHER ENCLOSED SPACE ENTRY. REFER TO AMERICAN PETROLEUM INSTITUTE PUBLICATIONS RP 2015 AND 2015A FOR SPECIAL PRECAUTIONS. ALL ELECTRICAL EQUIPMENT IN GASOLINE STORAGE AND/OR HANDLING AREAS SHOULD BE INSTALLED IN ACCORDANCE WITH APPLICABLE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE, N.F.P.A. KEEP OUT OF REACH OF CHILDREN.

General Comments:

FOR USE ONLY AS A MOTOR FUEL. DO NOT USE GASOLINE AS A CLEANING AGENT.

SOME OF THE INFORMATION PRESENT AND CONCLUSIONS DRAWN HEREIN ARE FROM SOURCES OTHER THAN DIRECT TEST DATA ON THE MIXTURE ITSELF.

-----**NOTE**-------Qualifications

EQ = Equal	**AP** = Approximately	**N/AV** = Not Available
LT = Less Than	**UK** = Unknown	**N/AP** = Not Applicable
GT = Greater than	**TR** = Trace	**N/DA** = No Data Available

Disclaimer of Liability

The information in this MSDS was obtained for sources which we believe are reliable. **HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, REGARDING ITS ACCURACY OR CORRECTNESS.**

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. **FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.**

CITGO No. 2 Diesel Fuel, Low Sulfur, All Grades

Material Safety Data Sheet

CITGO Petroleum Corporation
P.O. Box 3758
Tulsa, OK 74102-3758

MSDS No. AG2DF

Revision Date 03/17/2003

IMPORTANT: Read this MSDS before handling or disposing of this product and pass this information on to employees, customers and users of this product.

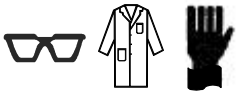
Hazard Rankings

	HMIS	NFPA
Health Hazard	* 1	0
Fire Hazard	2	2
Reactivity	0	0

*** = Chronic Health Hazard**

Protective Equipment

Minimum Recommended
See Section 8 for Details



Emergency Overview

Physical State Liquid.

Color Transparent, clear to yellow or red.

Odor Characteristic, kerosene-like.

WARNING!
Combustible liquid; vapor may cause flash fire.
Harmful or fatal if swallowed - can enter lungs and cause damage.
Mist or vapor can irritate the respiratory tract.
Liquid contact can cause eye or skin irritation.
May be harmful if inhaled or absorbed through the skin.
Overexposure can cause central nervous system (CNS) depression and/or other target organ effects.
Diesel engine exhaust can cause upper respiratory tract irritation and reversible pulmonary effects.
Spills may create a slipping hazard.

SECTION 1: IDENTIFICATION

Trade Name	CITGO No. 2 Diesel Fuel, Low Sulfur, All Grades	**Technical Contact**	(918) 495-5940 or (918) 495-5933
Product Number	Various	**Medical Emergency**	(918) 495-4700
CAS Number	68476-34-6	**CHEMTREC Emergency (United States Only)**	(800) 424-9300

Product Family Motor fuels.

Synonyms No. 2-D Grade Diesel Fuel Oil (defined by ASTM D-975); Treated or Refined Diesel Fuel No. 2; Diesel No. 2; Diesel Motor Fuel No. 2; Diesel Oil (Medium); Grade 2 Distillate Fuel; Hydrodesulfurized (HDS) Light Catalytically Cracked Distillate; Middle Distillates (Petroleum); HDS Diesel; Hydrodesulfurized Medium Distillate; HDS Middle Distillate; C9-C25 Petroleum Hydrocarbons.

SECTION 2: COMPOSITION

Component Name(s)	CAS Registry No.	Concentration (%)
1) Diesel Fuel No. 2	68476-34-6	100
2) Hydrodesulfurized Middle Distillate (Petroleum)	64742-80-9	50-100
3) Hydrodesulfurized Light Catalytic Cracked Distillate (Petroleum)	68333-25-5	0-50
4) Nonane, all isomers	Mixture	1-10
5) Ethylmethylbenzenes (Ethyltoluenes)	25550-14-5	1-3
6) Trimethylbenzenes, all isomers	25551-13-7	0-2
7) Naphthalene	91-20-3	0-2
8) Biphenyl (Diphenyl)	92-52-4	0-2

SECTION 3: HAZARDS IDENTIFICATION

Also see Emergency Overview and Hazard Ratings on the top of Page 1 of this MSDS.

Major Route(s) of Entry Skin contact. Eye contact. Inhalation.

Signs and Symptoms of Acute Exposure

Inhalation	Breathing mist or vapors concentrations well above occupational exposure levels can irritate the mucous membranes of the nose, throat, bronchi, and lungs, and may cause transient central nervous system (CNS) depression. CNS symptoms include headache, dizziness, nausea, intoxication, blurred vision, slurred speech, flushed face, confusion, weakness, fatigue, loss of consciousness, convulsions, coma, and death, depending on the concentration and/or duration of exposure.
Eye Contact	This product can cause eye irritation with short-term contact with liquid, mists or vapor. Symptoms include stinging, watering, redness, and swelling. In severe cases, permanent eye damage can result.
Skin Contact	Animal test results on similar materials suggest that this product can cause moderate to severe skin irritation. Short-term contact symptoms include redness, itching, and burning of the skin. Also, certain components of this material may be absorbed through the skin and produce CNS depression effects (see "Inhalation" above). If the skin is damaged, absorption increases. Prolonged and/or repeated contact may cause severe dermatitis and/or more serious skin disorders. Chronic symptoms may include drying, swelling, scaling, blistering, cracking, and/or severe tissue damage.
Ingestion	If swallowed, this material may irritate the mucous membranes of the mouth, throat, and esophagus. It can be readily absorbed by the stomach and intestinal tract. Symptoms include a burning sensation of the mouth and esophagus, nausea, vomiting, dizziness, staggering gait, drowsiness, loss of consciousness, and delirium, as well as additional central nervous system (CNS) effects (see "Inhalation" above). Due to its light viscosity, there is a danger of aspiration into the lungs during vomiting. Aspiration of a small amount of liquid can cause severe pulmonary edema and lipoid or chemical pneumonia which can result in death. Progressive CNS depression, respiratory insufficiency, and ventricular fibrillation may also result in death.
Chronic Health Effects Summary	Secondary effects of ingestion and subsequent aspiration into the lungs may cause pneumatocele (lung cavity) formation and chronic lung dysfunction. This product contains petroleum middle distillates similar to those shown to produce skin tumors on laboratory rodents following repeated application. All tumors appeared during the latter portion of the typical 2-year lifespan of the animals. Certain studies have shown that washing the animal's exposed skin with soap and water between treatments greatly reduces the potential tumorigenic effects. These effects are unlikely to occur if good personal hygiene is practiced. This material and/or its components have been associated with developmental and/or reproductive toxicity, genotoxicity, immunotoxicity, and carcinogenicity. Refer to Section 11 of this MSDS for additional health-related information.
Conditions Aggravated by Exposure	Medical conditions aggravated by exposure to this material may include skin disorders, chronic respiratory diseases, neurological conditions, liver or kidney dysfunction.
Target Organs	This material may cause damage to the following organs: kidneys, liver, upper respiratory tract, skin, eyes, central nervous system (CNS).
Carcinogenic Potential	This product does not contain any components at concentrations above 0.1% which are considered carcinogenic by OSHA, IARC or NTP. NTP has determined that exposure to diesel exhaust particulates, a complex mixture of combustion products of diesel fuel, is reasonably anticipated to be a human carcinogen.

OSHA Hazard Classification is indicated by an "X" in the box adjacent to the hazard title. If no "X" is present, the product does not exhibit the hazard as defined in the OSHA Hazard Communication Standard (29 CFR 1910.1200).

OSHA Health Hazard Classification				OSHA Physical Hazard Classification					
Irritant	X	Toxic		Combustible	X	Explosive		Pyrophoric	
Sensitizer		Highly Toxic		Flammable		Oxidizer		Water-reactive	
Corrosive		Carcinogenic		Compressed Gas		Organic Peroxide		Unstable	

SECTION 4: FIRST AID MEASURES

Take proper precautions to ensure your own health and safety before attempting rescue or providing first aid. For more specific information, refer to Exposure Controls and Personal Protection in Section 8 of this MSDS.

Inhalation

Move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If breathing is difficult, 100 percent humidified oxygen should be administered by a qualified individual. Seek medical attention immediately. Keep the affected individual warm and at rest.

Eye Contact

Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water for at least 15 minutes while occasionally lifting and lowering eyelids. Do not use eye ointment unless directed to by a physician. Seek medical attention if excessive tearing, irritation, or pain persists.

Skin Contact

Remove contaminated shoes and clothing. Flush affected area with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. Do not use ointments. If skin surface is not damaged, clean affected area thoroughly with mild soap and water. Seek medical attention if tissue appears damaged or if pain or irritation persists.

Ingestion

Do not induce vomiting. If spontaneous vomiting is about to occur, place victim's head below knees. If victim is drowsy or unconscious, place on the left side with head down. Never give anything by mouth to a person who is not fully conscious. Do not leave victim unattended. Seek medical attention immediately.

Notes to Physician

Inhalation overexposure can produce toxic effects. Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for upper respiratory tract inflammation, bronchitis, and pneumonitis. Vigorous anti-inflammatory/steroid treatment may be required at first evidence of upper airway or pulmonary edema. Administer 100 percent humidified supplemental oxygen with assisted ventilation, as required.

If ingested, this material presents a significant aspiration/lipoid or chemical pneumonitis hazard. As a result, induction of emesis is not recommended. Consider administration of an aqueous slurry of activated charcoal followed by a cathartic such as magnesium citrate or sorbitol. Also, treatment may involve careful gastric lavage if performed soon after ingestion or in patients who are comatose or at risk of convulsing. Protect the airway by placement in Trendelenburg and left lateral decubitus position or by cuffed endotracheal intubation. If vital signs become abnormal or symptoms develop, obtain a chest x-ray and liver function tests. Antibiotics are indicated if pulmonary bacterial infection occurs. Monitor for cardiac function and arterial blood gases in severe exposure cases.

SECTION 5: FIRE FIGHTING MEASURES

NFPA Flammability Classification NFPA Class-II combustible liquid.

Flash Point Method CLOSED CUP: 52°C (125°F). (Pensky-Martens.)

Lower Flammable Limit AP 0.6 % **Upper Flammable Limit** AP 7.5 %

Autoignition Temperature 254 - 285°C (489 - 545°F)

Hazardous Combustion Products Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons and trace oxides of sulfur and/or nitrogen.

Special Properties

Combustible Liquid! This material releases vapors when heated above ambient temperatures. Vapors can cause a flash fire. Vapors can travel to a source of ignition and flashback. A vapor and air mixture can create an explosion hazard in confined spaces such as sewers. Use only with adequate ventilation. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media

SMALL FIRE: Use dry chemicals, carbon dioxide, foam, water fog, or inert gas (nitrogen).
LARGE FIRE: Use foam, water fog, or water spray. Water fog and spray are effective in cooling containers and adjacent structures. However, water can cause frothing and/or may not extinguish the fire. Water can be used to cool the external walls of vessels to prevent excessive pressure, autoignition or explosion. DO NOT use a solid stream of water directly on the fire as the water may spread the fire to a larger area.

Protection of Fire Fighters

Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies. Evacuate area and fight the fire from a maximum distance or use unmanned hose holders or monitor nozzles. Cover pooling liquid with foam. Containers can build pressure if exposed to radiant heat; cool adjacent containers with flooding quantities of water until well after the fire is out. Withdraw immediately from the area if there is a rising sound from a venting safety device or discoloration of vessels, tanks, or pipelines. Be aware that burning liquid will float on water. Notify appropriate authorities if liquid enter sewers or waterways.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Take proper precautions to ensure your own health and safety before attempting spill control or clean-up. For more specific information, refer to the Emergency Overview on Page 1, Exposure Controls and Personal Protection in Section 8 and Disposal Considerations in Section 13 of this MSDS.

Combustible Liquid! Release can result in a fire hazard. Evacuate all non-essential personnel from release area. Establish a regulated zone with site control and security. Eliminate all ignition sources. Stop the leak if it can done without risk. A vapor-suppressing foam may be used to reduce vapors. Properly bond or ground all equipment used when handling this material. Avoid skin contact. Do not walk through spilled material. Verify that responders are properly trained and wearing appropriate personnel protective equipment. Dike far ahead of a liquid spills. Do not allow released material to entry waterways, sewers, basements, or confined areas. This material will float on water. Absorb or cover with dry earth, sand or other non-combustible material. Use clean, non-sparking tools to collect absorbed material. Place spent sorbent materials, free liquids and other clean-up debris into proper waste containers for appropriate disposal. Certain releases must be reported to the National Response Center (800/424-8802) and state or regulatory authorities. Comply with all laws and regulations.

SECTION 7: HANDLING AND STORAGE

Handling

Combustible Liquid!
A static electrical charge can accumulate when this material is flowing through pipes, nozzles or filters and when it is agitated. A static spark discharge can ignite accumulated vapors particularly during dry weather conditions. Always bond receiving containers to the fill pipe before and during loading. Always keep nozzle in contact with the container throughout the loading process. Do not fill any portable container in or on a vehicle. Special precautions, such as reduced loading rates and increased monitoring, must be observed during "switch loading" operations (i.e., loading this material in tanks or shipping compartments that previously containing gasoline or similar low flash point products).

Fire hazard increases as product temperature approaches its flash point. Use non-sparking tools. Keep container closed and drum bungs in place. Remove spillage immediately from walking areas. Do not handle or store near heat, sparks or other potential ignition sources. Do not handle or store with oxidizing agents. Avoid breathing mist or vapor. Never siphon by mouth. Do not taste or swallow. Avoid contact with eyes, skin and clothing. Use gloves constructed of impervious materials and protective clothing if direct contact is anticipated. Provide ventilation to maintain exposure potential below applicable exposure levels. Avoid water contamination. Wash thoroughly after handling. Prevent contact with food or tobacco products.

Cutting or welding of empty containers can ignite residues with explosive force. Do not pressurize or expose empty containers to flames, sparks or heat. Observe all label warnings and precautions. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product. Return empty drums to a qualified reconditioner. When performing repairs and maintenance on contaminated equipment, keep unnecessary persons from hazard area. Eliminate heat, flame and other potential ignition

sources. Drain and purge equipment, as necessary, to remove material residues. Remove contaminated clothing. Wash exposed skin thoroughly with soap and water after handling.

Storage

Store in a cool, dry, well-ventilated place. Keep containers tightly closed. Do not store this product near heat, flame or other potential ignition sources. Do not store with oxidizers. Do not store this product in unlabeled containers. Do not puncture or incinerate containers. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers or waste residues of this product. Ground all equipment containing this material. All electrical equipment in areas where this material is stored or handled must meet all applicable requirements of the NFPA's National Electrical Code (NEC). Store and transport in accordance with all applicable laws.

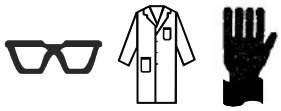
SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor or mists below the applicable workplace exposure limits indicated below. All electrical equipment should comply with the National Electric Code. An emergency eye wash station and safety shower should be located near the work-station.

Personal Protective Equipment

Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations. The following pictograms represent the minimum requirements for personal protective equipment. For certain operations, additional PPE may be required.



Eye Protection

Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. Chemical goggles should be worn during transfer operations or when there is a likelihood of misting, splashing, or spraying of this material. Suitable eye wash water should be readily available.

Hand Protection

Avoid skin contact. Use gloves (e.g., disposable PVC, neoprene, nitrile, vinyl, or PVC/NBR). Wash hands with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners.

Body Protection

Avoid skin contact. Wear long-sleeved fire-retardant garments (e.g., Nomex®) while working with flammable and combustible liquids. Additional chemical-resistant protective gear may be required if splashing or spraying conditions exist. This may include an apron, boots and additional facial protection. If product comes in contact with clothing, immediately remove soaked clothing and shower. Promptly remove and discarded contaminated leather goods.

Respiratory Protection

Airborne concentration will determine the level of respiratiory protection required. Respiratory protection is normally not required unless the product is heated or misted. For known or anticipated vapor or mist concentrations above the occupational exposure guidelines (see below), use a NIOSH-approved organic vapor respirator equipped with a dust/mist prefilter if adequate protection is provided. For unknown vapor concentrations or concentrations exceeding respirator protection factors, use a positive-pressure, pressure-demand, self-contained breathing apparatus (SCBA). Due to fire and explosion hazards, do not enter atmospheres containing concentrations greater than 20% of the lower flammable limit under any circumstances. Protection factors vary depending upon the type of respirator used. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134).

General Comments

Warning! Use of this material in spaces without adequate ventilation may result in generation of hazardous levels of combustion products and/or inadequate oxygen levels for breathing. Odor is an inadequate warning for hazardous conditions.

Occupational Exposure Guidelines

Substance	**Applicable Workplace Exposure Levels**

1) Diesel Fuel No. 2	**ACGIH TLV (United States).** TWA: 100 mg/m^3
2) Nonane, all isomers	**ACGIH (United States).** TWA: 200 ppm
3) Trimethylbenzenes, all isomers	**ACGIH (United States).** TWA: 25 ppm
4) Naphthalene	**ACGIH (United States). Skin** TWA: 10 ppm STEL: 15 ppm **OSHA (United States).** TWA: 10 ppm
5) Biphenyl (Diphenyl)	**ACGIH (United States** TWA: 0.2 ppm **OSHA (United States** TWA: 0.2 ppm

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES (TYPICAL)

Physical State	Liquid.	**Color**	Transparent, clear to yellow or red.	**Odor**	Characteristic, kerosene-like.
Specific Gravity	0.84 - 0.88 (Water = 1)	**pH**	Not Applicable.	**Vapor Density**	5.1 (Air = 1)
Boiling Range	154 - 366°C (309 - 588°F)			**Melting/Freezing Point**	Not available.
Vapor Pressure	0.3 kPa (2.1 mmHg) (at 20°C)			**Viscosity (cSt @ 40°C)**	2 - 4.2
Solubility in Water	Very slightly soluble in cold water.			**Volatile Characteristics**	840 g/l VOC (W/V)
Additional Properties	Density = AP 7.2 lbs/gal.				

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability Stable.

Hazardous Polymerization Not expected to occur.

Conditions to Avoid Keep away from all ignition sources and strong oxidizing conditions.

Materials Incompatibility Strong acids, alkalies, and oxidizers such as liquid chlorine, other halogens, hydrogen peroxide and oxygen.

Hazardous Decomposition Products No additional hazardous decomposition products were identified other than the combustion products identified in Section 5 of this MSDS.

SECTION 11: TOXICOLOGICAL INFORMATION

For other health-related information, refer to the Emergency Overview on Page 1 and the Hazards Identification in Section 3 of this MSDS.

Toxicity Data

Diesel Fuel No. 2:
ORAL LD50, Acute: 12,000 to 17,500 mg/kg or 9.0 ml/kg [Rat]
DERMAL LD50, Acute: >5.0 ml/kg [Rabbit screen level].
DRAIZE EYE, Acute: Mild irritant [Rabbit]
DRAIZE DERMAL, Acute: Severe skin irritant [Rabbit].
BUEHLER DERMAL, Acute: Non-sensitizing [Guinea Pig]
14-Day DERMAL, Sub-chronic: 0% and 67% mortality at 4.0 and 8.0 ml/kg [Rabbit]
62-Week DERMAL, Chronic: 0.05 ml/kg 3x/week [Mouse] - Extreme skin irritation.
97-Week DERMAL, Chronic: 243 g/kg applied 3x/week [Mouse] - Extreme skin irritation. Moderate increase in contact-point skin tumors.
MUTAGENICITY:
Modified Ames Assay: Negative. [Salmonella typhimurium]
In-vitro SCE Ovary Assay: Negative. [Chinese Hamster]

In-vitro Lymphoma Assay: Negative. [Mouse]
In-vivo Dominant Lethal Assay: Negative. [Mouse]
In-vivo Bone Marrow Assay: Clastogenic at 2.0 ml/kg and 6.0 ml/kg [Rat]

Diesel exhaust particulate:
Lung tumor and lymphomas were identified in rats and mice exposed to unflitered diesel fuel exhaust in chronic inhalation studies. Further, epidemiological studies have identified increase incidences of lung cancer in US railroad workers and bladder cancer in bus and truck drivers possibly associated with exposure to diesel engine exhaust. NTP has determined that exposure to diesel exhaust particulates, a complex mixture of combustion products of diesel fuel, is reasonably anticipated to be a human carcinogen. In addition, NIOSH has identified complete diesel exhaust as a potential carcinogen.

Middle distillates, petroleum:
The products represented by this MSDS contain a mixture of petroleum hydrocarbons commonly referred to as "middle distillates." Laboratory data have associated some middle distillates with skin cancer when the material is applied repeatedly over the lifetime of the test animal. Middle distillates similar to the products represented by this MSDS have been associated with liver and kidney damage in subchronic (90-day) inhalation studies of male rats. The relevance of these findings to human health is unclear.

Hydrodesulfurized Middle Distillate (Petroleum):
INHALATION LC50, Acute: 4.6 to 7.64 mg/L for four hours [Rat] - Dyspnea, nasal discharge, alopecia and excessive salivation.
ORAL LD50, Acute >500 g/kg [Rat Screening Level] Diarrhea, hyperactivity, ptosis and somnolence.
DERMAL LD50, Acute: >2,000 mg/kg [Rabbit Screanning Level]
BUEHLER DERMAL, Acute: Non-sensitizing [Guinea Pig].
14-Day DERMAL, Subchronic: 0.05 ml/kg applied 3 times per week [Mouse, Human skin grafted to Athymic nude Mice] - Irritation and epidermal hyperplasia.
62-Week DERMAL, Chronic: 0.05 ml/kg applied 3 times per week [Mouse] - Extreme skin irritation; moderate increase in contact-point skin tumors.

Trimethylbenzenes, all isomers:
The TCLo for humans is 10 ppm, with somnolence and respiratory tract irritation noted. In inhalation studies with rats, four of ten animals died after exposures of 2400 ppm for 24 hours. An oral dose of 5 mL/kg resulted in death in one of ten rats. Minimum lethal intraperitoneal doses were 1.5 to 2.0 mL/kg in rats and 1.13 to 12 mL/kg in guinea pigs. Levels of total hydrocarbon vapors present in the breathing atmosphere of these workers ranged from 10 to 60 ppm. Mesitylene (1, 3, 5 Trimethylbenzene) inhalation at concentrations of 1.5, 3.0, and 6.0 mg/L for six hours was associated with dose-related changes in white blood cell counts in rats. No significant effects on the complete blood count were noted with six hours per day exposure for five weeks, but elevations of alkaline phosphatase and SGOT were observed. Central nervous system depression and ataxia were noted in rats exposed to 5,100 to 9,180 ppm for two hours.

Naphthalene:
Naphthalene is a potential irritant to eyes, skin and lungs. Ingestion of naphthalene has been associated with severe red blood cell and liver damage leading to death. Following prolonged or repeated exposures, naphthalene has been shown to cause cataracts, optical neuritis, hemolytic and aplastic anemia, jaundice and possibly neurotoxicity. In animal studies, naphthalene caused fetal effects and decreased spleen weights in pregnant female mice. In an NTP sponsored study, naphthalene produced a dose related increase in tumors at the 30 and 60 ppm exposure level in both male and female rats. Higher incidences of respiratory epithelial adenomas, olfactory epithelial neuroblastomas and non-neoplastic lesions of the nose were observed as compared to controls. Cytogenic studies with Chinese hamster ovary cells have demonstrated sister chromatid exchanges and chromosomal aberrations. The relevance of these studies to human health is unclear.

Biphenyl (Diphenyl):
INHALATION, TCLo, Acute: 4,400 ug/m^3 for 4 hours [Human] - Flaccid paralysis of peripheral nerves without anesthesia and nausea or vomiting.
ORAL, LD50, Acute: >2,600 mg/kg [Cat screening level].
ORAL, LD50, Acute: 2,400 mg/kg [Rat and Rabbit].
ORAL, LD50, Acute: 1,900 mg/kg [Mouse] - Somnolence, hypermotility and diarrhea.
DERMAL, LD50, Acute: >5,010 mg/kg [Rabbit screening level].

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Freshwater Toxicity:
Concentration: 2400 ppm Exposure: 48 hrs. Species: Juven. Am. Shad (*Squalius cephalus*) Assay: TLM
Concentration: >127 ppm Exposure: 96 hrs. Species: Bluegill (*Lepomis macrochirus*) Assay: LC50

Saltwater Toxicity
Concentration: 10 ppm Exposure: 96 hrs. Species: Menhaden (*Brevoortia patronus*) Assay: LC50
Concentration: 10 ppm Exposure: 96 hrs. Species: Grass Shrimp Assay: LC50

Environmental Fate

If spilled, this material will normally evaporate. Hydrocarbon components may contribute to atmospheric smog. If released to the subsoils, petroleum middle distillate fuels will strongly adsorb to soils. Groundwater should be considered as an exposure pathway. Liquid and vapor can migrate through the subsurface and preferential pathways (such as utility line backfill) to downgradient receptors.

Middle distillates are potentially toxic to freshwater and saltwater ecosystems. Distillate fuels will normally float on water. In stagnant or slow-flowing waterways, a hydrocarbon layer can cover a large surface area. As a result, this oil layer can limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway can cause a fish kill or create an anaerobic environment. Also, this coating action can also kill plankton, algae, and water birds.

SECTION 13: DISPOSAL CONSIDERATIONS

Hazard characteristic and regulatory waste stream classification can change with product use. Accordingly, it is the responsibility of the user to determine the proper storage, transportation, treatment and/or disposal methodologies for spent materials and residues at the time of disposition.

Maximize material recovery for reuse or recycling. If spilled material is introduced into a wastewater treatment system, chemical and biological oxygen demand (COD and BOD) will likely increase. Vapor emissions from a bio-oxidation process contaminated with this material might be a potential health hazard.

Recovered non-usable material may be regulated by US EPA as a hazardous waste due to its ignitibility (D001). In addition, conditions of use may cause this material to become a hazardous waste, as defined by Federal or State regulations. It is the responsibility of the user to determine if the material is a hazardous waste at the time of disposal. Transportation, treatment, storage, and disposal of waste material must be conducted in accordance with RCRA regulations (see 40 CFR Parts 260 through 271). State and/or local regulations might be even more restrictive. Contact the RCRA/Superfund Hotline at (800) 424-9346 or your regional US EPA office for guidance concerning case specific disposal issues.

SECTION 14: TRANSPORT INFORMATION

The shipping description below may not represent requirements for all modes of transportation, shipping methods or locations outside of the United States.

US DOT Status

A U.S. Department of Transportation (DOT) regulated material. The following U. S. DOT hazardous materials shipping description applies to bulk packaged material that is transported by highway or rail. Alternate shipping descriptions may be required for product transported by marine vessel, air or other method and for non-bulk packaged material.

Proper Shipping Name

Diesel Fuel, Combustible liquid, NA1993, PG III

Hazard Class

DOT Class: Combustible liquid with a flash point greater than 37.8°C (100°F).

Packing Group(s) III

UN/NA ID NA 1993 or UN 1202

Reportable Quantity

A Reportable Quantity (RQ) has not been established for this material.

Placards

Emergency Response Guide No.	128
HAZMAT STCC No.	49 122 12
MARPOL III Status	Not a DOT "Marine Pollutant" per 49 CFR 171.8.

SECTION 15: REGULATORY INFORMATION

TSCA Inventory

This product and/or its components are listed on the Toxic Substances Control Act (TSCA) inventory.

SARA 302/304

The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to Subparts 302 and 304 to submit emergency planning and notification information based on Threshold Planning Quantities (TPQs) and Reportable Quantities (RQs) for "Extremely Hazardous Substances" listed in 40 CFR 302.4 and 40 CFR 355. No components were identified.

SARA 311/312

The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to this subpart to submit aggregate information on chemicals by "Hazard Category" as defined in 40 CFR 370.2. This material would be classified under the following hazard categories:

Fire, Acute (Immediate) Health Hazard, Chronic (Delayed) Health Hazard

SARA 313

This product contains the following components in concentrations above de minimis levels that are listed as toxic chemicals in 40 CFR Part 372 pursuant to the requirements of Section 313 of SARA:
Naphthalene [CAS No.: 91-20-3] Concentration: 0 - 2%
1, 2, 4 Trimethylbenzene [CAS No.: 95-63-6] Concentration: 0 - 1%

CERCLA

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center concerning release of quantities of "hazardous substances" equal to or greater than the reportable quantities (RQ's) listed in 40 CFR 302.4. As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically designated in 40 CFR 302.4. Chemical substances present in this product or refinery stream that may be subject to this statute are:
Naphthalene [CAS No.: 91-20-3] RQ = 100 lbs. (45.36 kg) Concentration: 0 - 2%
Cumene [CAS No.: 98-82-8] RQ = 5000 lbs. (2268 kg) Concentration: 0 - 1%

CWA

This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.

California Proposition 65

This material may contain the following components which are known to the State of California to cause cancer, birth defects or other reproductive harm, and may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):
Diesel exhaust particulate (following combustion)
Naphthalene: 0 - 2%
Toluene: <0.05%
Benzene: <0.05%

New Jersey Right-to-Know Label

Diesel Fuel

Additional Regulatory Remarks

As minimum requirements, CITGO recommends that the following advisory information be displayed on equipment used to dispense diesel fuel. Additional warnings specified by various regulatory authorities may be required: "**Diesel Fuel DANGER: Combustible Liquid. Use as a Motor Fuel Only.** DO NOT FILL CONTAINERS THAT HAVE PREVIOUSLY CONTAINED GASOLINE OR OTHER FLAMMABLE LIQUIDS. Sparks From static electricity can ignite flammable vapor residues. PLACE CONTAINER ON GROUND. DO NOT FILL ANY PORTABLE CONTAINER IN OR ON A VEHICLE. Containers must be metal or other material approved for storing diesel fuel. Keep nozzle spout in contact with the container during the entire filling operation. NO SMOKING! Do not leave nozzle unattended during filling. **HARMFUL OR FATAL IF SWALLOWED.** If swallowed, do not induce vomiting. Call Physician Immediately. Keep Out of Reach of Children. Avoid prolonged breathing of vapors. Never siphon by mouth. Do not store in vehicle or living space. Store and use in a well ventilated area. Do not use near heat, spark or flame. Keep container closed."

SECTION 16: OTHER INFORMATION

Refer to the top of Page 1 for the HMIS and NFPA Hazard Ratings for this product.

REVISION INFORMATION

Version Number	3.0
Revision Date	03/17/2003
Print Date	Printed on 03/17/2003.

ABBREVIATIONS

AP: Approximately EQ: Equal >: Greater Than <: Less Than NA: Not Applicable ND: No Data NE: Not Established

ACGIH: American Conference of Governmental Industrial Hygienists

AIHA: American Industrial Hygiene Association

IARC: International Agency for Research on Cancer

NTP: National Toxicology Program

NIOSH: National Institute of Occupational Safety and Health

OSHA: Occupational Safety and Health Administration

NPCA: National Paint and Coating Manufacturers Association

HMIS: Hazardous Materials Information System

NFPA: National Fire Protection Association

EPA: US Environmental Protection Agency

DISCLAIMER OF LIABILITY

THE INFORMATION IN THIS MSDS WAS OBTAINED FROM SOURCES WHICH WE BELIEVE ARE RELIABLE. HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY WARRANTY, EXPRESSED OR IMPLIED REGARDING ITS CORRECTNESS. SOME INFORMATION PRESENTED AND CONCLUSIONS DRAWN HEREIN ARE FROM SOURCES OTHER THAN DIRECT TEST DATA ON THE SUBSTANCE ITSELF. THIS MSDS WAS PREPARED AND IS TO BE USED ONLY FOR THIS PRODUCT. IF THE PRODUCT IS USED AS A COMPONENT IN ANOTHER PRODUCT, THIS MSDS INFORMATION MAY NOT BE APPLICABLE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION OR PRODUCTS FOR THEIR PARTICULAR PURPOSE.

THE CONDITIONS OR METHODS OF HANDLING, STORAGE, USE, AND DISPOSAL OF THE PRODUCT ARE BEYOND OUR CONTROL AND MAY BE BEYOND OUR KNOWLEDGE. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.

* * * * * END OF MSDS * * * * *

ALDRICH CHEMICAL -- LIQUI-NOX PHOSPHATE-FREE DETERGENT, 24302-7
MATERIAL SAFETY DATA SHEET
ALDRICH CHEMICAL AS OF January 1999
NSN: 681000N016648
Manufacturer's CAGE: 60928
Part No. Indicator: A
Part Number/Trade Name: LIQUI-NOX PHOSPHATE-FREE DETERGENT, 24302-7

General Information

Company's Name: ALDRICH CHEMICAL CO INC.
Company's Street: 1001 W. ST. PAUL AVE
Company's P. O. Box: 355
Company's City: MILWAUKEE
Company's State: WI
Company's Country: US
Company's Zip Code: 53201
Company's Emerg Ph #: 414-273-3850
Company's Info Ph #: 414-273-3850/FAX -4979
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 09JAN90
Safety Data Review Date: 02AUG95
MSDS Serial Number: BQTFQ
Hazard Characteristic Code: N1

Ingredients/Identity Information

Proprietary: NO
Ingredient: LIQUI-NOX, PHOSPHATE-FREE DETERGENT
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: 1006552LN
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Physical/Chemical Characteristics

Appearance And Odor: NONE SPECIFIED BY MANUFACTURER.
Specific Gravity: 1.051

Fire and Explosion Hazard Data

Extinguishing Media: WATER SPRAY, CARBON DIOXIDE, DRY CHEMICAL POWDER, ALCOHOL OR POLYMER FOAM.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N) TO PREVENT CONTACT WITH SKIN AND EYES.
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: NATURE OF DECOMPOSITION PRODUCTS NOT KNOWN.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

Health Hazard Data

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE: MAY BE HARMFUL BY INHALATION, INGESTION, OR SKIN ABSORPTION. MAY CAUSE EYE IRRITATION. MAY CAUSE SKIN IRRITATION. TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYE: IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MIN. SKIN: IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER. INHAL: REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTF RESP. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN. WASH CONTAMINATED CLOTHING BEFORE REUSE. INGEST: GET MD IMMEDIATELY (FP N).

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: WEAR NIOSH/MSHA APPROVED RESP, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS AND HEAVY RUBBER GLOVES. ABSORB ON SAND OR VERMICULITE AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL. VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: SML QTYS: CAUTIOUSLY ADD TO A LRG STIRRED EXCESS OF WATER. ADJUST THE PH TO NEUTRAL, SEPARATE ANY INSOLUBLE SOLIDS OR LIQUIDS & PACKAGE THEM FOR HAZARDOUS-WASTE DISP. FLUSH THE AQUEOUS SOLN DOWN THE DRAIN W/PLENTY OF WATER. THE HYDROLYSIS (SUPP DATA)
Precautions-Handling/Storing: KEEP TIGHTLY CLOSED. STORE IN A COOL DRY PLACE. AVOID INHALATION. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. AVOID PROLONGED OR REPEATED EXPOSURE.

Other Precautions: NONE SPECIFIED BY MANUFACTURER.

Control Measures

Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation: MECHANICAL EXHAUST REQUIRED.
Protective Gloves: COMPATIBLE CHEMICAL-RESISTANT GLOVES.
Eye Protection: CHEMICAL SAFETY GOGGLES.
Other Protective Equipment: SAFETY SHOWER AND EYE BATH.
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.
Suppl. Safety & Health Data: WASTE DISP: AND NEUTRALIZATION REACTIONS MAY GENRATE HEAT & FUMES WHICH CAN BE CONTROLLED BY THE RATE OF ADDITION. OBSERVE ALL FEDERAL, STATE AND LOCAL LAWS.

Transportation Data

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 09MAR93
Label Date: 04MAR93
Label Status: G
Common Name: LIQUI-NOX PHOSPHATE-FREE DETERGENT, 24302-7
Chronic Hazard: NO
Signal Word: CAUTION!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE: MAY BE HARMFUL BY INHALATION, INGESTION OR SKIN ABSORPTION. MAY CAUSE EYE AND SKIN IRRITATION. CHRONIC: NONE SPECIFIED BY MANUFACTURER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: ALDRICH CHEMICAL CO
Label P.O. Box: 355
Label City: MILWAUKEE
Label State: WI
Label Zip Code: 53201
Label Country: US
Label Emergency Number: 414-273-3850

1. PRODUCT AND COMPANY INFORMATION

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INVITROGEN CORPORATION
P.O. BOX 12-502
PENROSE
AUCKLAND 1135
NEW ZEALAND
64-9-579-3024

INVITROGEN CORPORATION
2270 INDUSTRIAL ST.
BURLINGTON, ONT
CANADA L7P 1A1
905/335-2255

EMERGENCY NUMBER (SPILLS, EXPOSURES): 301/431-8585 (24 HOUR)
800/451-8346 (24 HOUR)
NON-EMERGENCY INFORMATION: 800/955-6288

Product Name:
Methanol

NOTE: If this product is a kit or is supplied with more than one material, please refer to the MSDS for each component for hazard information.

Product Use:
These products are for laboratory research use only and are not intended for human or animal diagnostics, therpeutic, or other clinical uses.

Synonyms:
Not available.

2. COMPOSITION, INFORMATION ON INGREDIENTS

The following list shows components of this product classified as hazardous based on physical properties and health effects:

Component	CAS No.	Percent
METHANOL	67-56-1	60 - 100

3. HAZARDS IDENTIFICATION

********** EMERGENCY OVERVIEW **********
Danger!
Irritant.
Toxic if swallowed. May cause organ failure or death.
Toxic if absorbed.
Flammable.
****

Potential Health Effects:
Eye:
Can cause moderate irritation, tearing and reddening, but not likely to permanently injure eye tissue.

Skin:
Can cause minor skin irritation, defatting, and dermatitis.
Contains methanol. Upon prolonged or repeated exposure, may cause deterioration of the optic nerve if large quantities are absorbed through the skin. Repeated absorption of large quantities may lead to blindness.
Upon prolonged or repeated exposure, toxic if absorbed through the skin.
Likely to cause systemic damage.

Inhalation:
Can cause minor respiratory irritation, dizziness, weakness, fatigue, nausea, and headache.
Methanol can cause central nervous system depression and overexposure can cause damage to the optic nerve resulting in visual impairment or blindness.
Effects may be delayed.
No toxicity expected from inhalation.

Ingestion:
Mildly irritating to mouth, throat, and stomach. Can cause abdominal discomfort.
Ingestion of this product may result in central nervous system effects including headache, sleepiness, dizziness, slurred speech and blurred vision.
Toxic if swallowed. May cause target organ failure and/or death.

Chronic:
No data on cancer.

4. FIRST AID MEASURES

Eye:
Flush eyes with plenty of water for at least 20 minutes retracting eyelids often. Tilt the head to prevent chemical from transferring to the uncontaminated eye. Get immediate medical attention.

Skin:

4. FIRST AID MEASURES (CONT.)

Wash with soap and water. Remove contaminated clothing and launder. Get medical attention if irritation develops or persists.

Inhalation:
Remove to fresh air. If breathing is difficult, have a trained individual administer oxygen. If not breathing, give artificial respiration and have a trained individual administer oxygen. Get medical attention immediately.

Ingestion:
Do not induce vomiting and seek medical attention immediately. Drink two glasses of water or milk to dilute. Provide medical care provider with this MSDS.

Note To Physician:
Keep under medical surveillance for 48 hours.

5. FIRE FIGHTING MEASURES

Flashpoint Deg C:
12

Upper Flammable Limit %:
31

Lower Flammable Limit %:
6

Autoignition Temperature Deg C:
455

Extinguishing Media:
Use alcohol resistant foam, carbon dioxide, dry chemical, or water spray when fighting fires. Water or foam may cause frothing if liquid is burning but it still may be a useful extinguishing agent if carefully applied to the fire. Do not direct a water stream directly into the hot burning liquid. Use water spray/fog for cooling.

Firefighting Techniques/Equipment:
Do not enter fire area without proper protection including self-contained breathing apparatus and full protective equipment. Fight fire from a safe distance and a protected location due to the potential of hazardous vapors and decomposition products.

Hazardous Combustion Products:
Includes carbon dioxide, carbon monoxide, dense smoke.

6. ACCIDENTAL RELEASE MEASURES

Accidental releases may be subject to special reporting requirements and other regulatory mandates. Refer to Section 8 for personal protection equipment recommendations.

Spill Cleanup:
Exposure to the spilled material may be severely irritating or toxic. Follow personal protective equipment recommendations found in Section VIII of this MSDS. Personal protective equipment needs must be evaluated based on information provided on this sheet and the special circumstances created by the spill including; the material spilled, the quantity of the spill, the area in which the spill occurred, and the expertise of employees in the area responding to the spill. Never exceed any occupational exposure limits.
Ventilate the contaminated area. Shut off ignition sources; including electrical equipment and flames. Do not allow smoking in the area.
Prevent the spread of any spill to minimize harm to human health and the environment if safe to do so. Wear complete and proper personal protective equipment following the recommendation of Section VIII at a minimum. Dike with suitable absorbent material like granulated clay. Gather and store in a sealed container pending a waste disposal evaluation.

7. HANDLING AND STORAGE

Storage of some materials is regulated by federal, state, and/or local laws.

Storage Pressure:
Ambient

Handling Procedures:
Toxic or severely irritating material. Avoid contacting and avoid breathing the material. Use only in a well ventilated area.
Use non-sparking tools when opening or closing containers. Use bonding and grounding when transferring quantities of material.

Storage Procedures:
Store in a cool dry ventilated location. Isolate from incompatible materials and conditions. Keep container(s) closed.
Suitable for most general chemical storage areas.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Exposure Limits:

Component	OSHA PEL (ppm)	AGCIH TWA (ppm)
METHANOL	200 ppm	200 ppm 250 ppm STEL

8. EXPOSURE CONTROLS, PERSONAL PROTECTION (CONT.)

Engineering Controls:
Local exhaust ventilation, process enclosures, or other engineering controls are necessary when handling or using this product to avoid overexposure.

Personal Protective Equipment:

Eye:
An eye wash station must be available where this product is used.
Wear chemically resistant safety glasses with side shields when handling this product. Wear additional eye protection such as chemical splash goggles and/or face shield when the possibility exists for eye contact with splashing or spraying liquid, or airborne material. Do not wear contact lenses. Have an eye wash station available.

Skin:
Wear protective gloves. Inspect gloves for chemical break-through and replace at regular intervals. Clean protective equipment regularly. Wash hands and other exposed areas with mild soap and water before eating, drinking, and when leaving work .
Have a safety shower available.

Respiratory:
A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.
Respiratory protection must be used when handling this product. Use respirators only if ventilation cannot be used to eliminate symptoms or reduce the exposure to below acceptable levels. A supplied air type respirator may be required.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance/physical state:	Liquid solution / suspension
Odor:	No odor.
Boiling Point (C):	Not established.
Melting Point (C):	Not established.
Solubility in water:	Not established.
pH:	Not established.
Vapor Pressure:	Not established.
Vapor Density:	Not established.
Specific Gravity/Density:	Not established.
Octanol/water Partition Coeff:	Not established.
Volatiles:	Not established.
Evaporation Rate:	Not established.
Viscosity:	Not established.

10. STABILITY AND REACTIVITY

Stability:
Stable under normal conditions.

Conditions to Avoid:
Strong oxidizing agents. Temperatures above flash point in combination with sparks, open flames, or other sources of ignition.

Hazardous Decomposition Products:
Carbon monoxide. Carbon dioxide. Hydrogen cyanide. Formaldehyde.

Hazardous Polymerization:
Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity:

Dermal/Skin:
Methyl alcohol: 15,800 MG/KG

Inhalation/Respiratory:
Methyl Alcohol: 64,000 ppm/4H

Oral/Ingestion:
Methyl Alcohol: 5628 MG/KG

Target Organs: Nervous System. Eyes. Kidneys.

Carcinogenicity:

NTP:
Not tested.

IARC:
Not listed.

OSHA:
Not regulated.

Other Toxicological Information

12. Ecological Information

Ecotoxicological Information: No ecological information available.

Environmental Fate (Degradation, Transformation, and Persistence):
Bioconcentration is not expected to occur.
Biodegrades at a moderate rate.

13. DISPOSAL CONSIDERATIONS

Regulatory Information:
Not applicable.

Disposal Method:
Clean up and dispose of waste in accordance with all federal, state, and local environmental regulations.
Dispose of by incineration following Federal, State, Local, or Provincial regulations.

14. TRANSPORT INFORMATION

Proper Shipping Name:	Methanol.
Hazard Class:	3
Subsidiary Hazards:	6.1
ID Number:	UN1230
Packing Group:	PGII
Label Required:	Flammable. TOXIC.

15. REGULATORY INFORMATION

UNITED STATES:

TSCA:
This product is solely for research and development purposes only and may not be used, processed or distributed for a commercial purpose. It may only be handled by technically qualified individuals.

Prop 65 Listed Chemicals: PROP 65 PERCENT
No Prop 65 Chemicals.

313 LISTED CHEMICALS: METHANOL

CANADA:

15. REGULATORY INFORMATION (CONT.)

DSL/NDSL:
Not determined.

COMPONENT	WHMIS Classification
METHANOL	D2B

EUROPEAN UNION:

PRODUCT RISK PHRASES:
None assigned.

PRODUCT SAFETY PHRASES:
None assigned.

PRODUCT CLASSIFICATION:
T F

Component	EINECS Number
METHANOL	210-196-1

16. OTHER INFORMATION

HMIS Rating 0-4:
FIRE: Not determined.
HEALTH: Not determined.
REACTIVITY: Not determined.

Abbreviations
N/A - Data is not applicable or not available
SARA - Superfund and Reauthorization Act
HMIS - Hazard Material Information System
WHMIS - Workplace Hazard Materials Information System
NTP - National Toxicology Program
OSHA - Occupational Health and Safety Administration
IARC - International Agency for Research on Cancer
PROP 65 - California Safe Drinking Water and Toxic Enforcement Act of 1986
EINECS - European Inventory of Existing Commercial Chemical Substances

The above information was acquired by diligent search and/or investigation and the recommendations are based on prudent application of professional judgment. The information shall not be taken as being all inclusive and is to be used only as a guide. All materials and mixtures may present unknown hazards and should be used with caution. Since Invitrogen Corporation cannot control the actual methods, volumes, or conditions of use, the Company shall not be held liable for any damages or losses resulting from the handling or from contact with the product as described herein. THE INFORMATION IN THIS MSDS DOES NOT CONSTITUTE A WARRANTY, EXPRESS OR IMPLIED, INCLUDING ANY

16. OTHER INFORMATION (CONT.)

IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

MSDS Number: **H3883** * * * * * *Effective Date:* ***08/01/05*** * * * * * *Supercedes:* ***05/07/03***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

HYDROCHLORIC ACID (LESS THAN 10%)

1. Product Identification

Synonyms: Muriatic acid solution; 10:1 Dilute Hydrochloric acid; Hydrochloric acid volumetric solutions (0.2 - 2.0 N)
CAS No.: 7647-01-0
Molecular Weight: 36.46
Chemical Formula: HCl in water
Product Codes:
J.T. Baker: 0325, 0335, 0336, 4655, 5612, 5616, 5620, 5622, D010, D011, XL-231, XL-232
Mallinckrodt: 6388, H162, H163

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Hydrogen Chloride	7647-01-0	0.7 - 8%	Yes
Water	7732-18-5	92 - 99%	No

3. Hazards Identification

Emergency Overview

DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Health hazards given on this data sheet apply to concentrated solutions of hydrochloric acid. Hazards of dilute solutions may be reduced, depending upon the concentration. Degree of hazard for these reduced concentrations is not currently addressed in the available literature.

Inhalation:
Corrosive! Inhalation of vapors can cause coughing, choking, inflammation of the nose, throat, and upper respiratory tract, and in severe cases, pulmonary edema, circulatory failure, and death.
Ingestion:
Corrosive! Swallowing hydrochloric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract. May cause nausea, vomiting, and diarrhea, and in severe cases, death.
Skin Contact:
Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and discolor skin.
Eye Contact:
Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
Chronic Exposure:
Long-term exposure to concentrated vapors may cause erosion of teeth. Long term exposures seldom occur due to the corrosive properties of the acid.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

4. First Aid Measures

First aid procedures given apply to concentrated solutions. Exposures to dilute solutions may not require these extensive first aid procedures.
Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Ingestion:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard. May react with metals or heat to release flammable hydrogen gas.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Water or water spray. Neutralize with soda ash or slaked lime.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving hydrochloric acid. Stay away from ends of tanks. Cool tanks with water spray until well after fire is out.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat and incompatible materials. Do not wash out container and use it for other purposes. When diluting, always add the acid to water; never add water to the acid. When opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Protect from freezing. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
For Hydrochloric acid:
- OSHA Permissible Exposure Limit (PEL):
5 ppm (Ceiling)
- ACGIH Threshold Limit Value (TLV):
2 ppm (Ceiling), A4 Not classifiable as a human carcinogen
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with an acid gas cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure to prevent skin contact.
Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Clear, colorless solution.
Odor:
Pungent, hydrochloric acid.
Solubility:
Infinitely soluble.
Specific Gravity:
ca. 1
pH:
For HCL solutions: 0.1 (1.0 N), 1.1 (0.1 N), 2.02 (0.01 N)
% Volatiles by volume @ 21C (70F):
100 (as water and acid)
Boiling Point:
ca. 100C (ca. 212F)
Melting Point:
ca. 0C (ca. 32F)
Vapor Density (Air=1):
Essentially the same as water.
Vapor Pressure (mm Hg):
Essentially the same as water.
Evaporation Rate (BuAc=1):
Essentially the same as water.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
When heated to decomposition, emits toxic hydrogen chloride fumes and will react with water or steam to produce heat and toxic and corrosive fumes. Thermal oxidative decomposition produces toxic chlorine fumes and explosive hydrogen gas.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
A strong mineral acid, concentrated hydrochloric acid is highly reactive with strong bases, metals, metal oxides, hydroxides, amines, carbonates and other alkaline materials. Incompatible with materials such as cyanides, sulfides, sulfites, and formaldehyde.
Conditions to Avoid:
Heat, direct sunlight, incompatibles.

11. Toxicological Information

Hydrochloric acid: Inhalation rat LC50: 3124 ppm/1H; Oral rabbit LD50: 900 mg/kg. Investigated as a tumorigen, mutagen, reproductive effector.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Hydrogen Chloride (7647-01-0)	No	No	3
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:
For Hydrochloric Acid (Concentrated Solutions):
When released into the soil, this material is not expected to biodegrade. When released into the soil, this material may leach into groundwater.
Environmental Toxicity:
For Hydrochloric Acid (Concentrated Solutions):
This material may be toxic to aquatic life. LC50 Shrimp: 100-300 ppm/48-hr/salt water; LC100 trout: 10 mg/l/24-hr; TLm mosquito fish: 282 ppm/96-hr.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: HYDROCHLORIC ACID SOLUTION
Hazard Class: 8
UN/NA: UN1789
Packing Group: II

Information reported for product/size: 20L

International (Water, I.M.O.)

Proper Shipping Name: HYDROCHLORIC ACID SOLUTION
Hazard Class: 8
UN/NA: UN1789
Packing Group: II
Information reported for product/size: 20L

International (Air, I.C.A.O.)

Proper Shipping Name: HYDROCHLORIC ACID SOLUTION
Hazard Class: 8
UN/NA: UN1789
Packing Group: II
Information reported for product/size: 20L

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Hydrogen Chloride (7647-01-0)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Hydrogen Chloride (7647-01-0)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Hydrogen Chloride (7647-01-0)	5000	500*	Yes	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Hydrogen Chloride (7647-01-0)	5000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Label First Aid:
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In all cases get medical attention immediately.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 3, 14.
Disclaimer:
****
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****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

HOVENSA

MATERIAL SAFETY DATA SHEET

Xylene, Mixed **MSDS No. 1812**

EMERGENCY OVERVIEW
DANGER!
FLAMMABLE - IRRITANT - ABSORBED THROUGH THE SKIN - CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF SWALLOWED - ASPIRATION HAZARD

NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects. Excessive exposure may affect the liver and kidneys.

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

HOVENSA LLC
1 Estate Hope
Christiansted, VI 00820-5652

EMERGENCY TELEPHONE NUMBER (24 hrs): **CHEMTREC (800)424-9300**
COMPANY CONTACT (business hours): **(340) 692-3000**

SYNONYMS: Dimethyl benzene; Mixed xylenes; M (meta) – xylene; O (ortho) – xylene; P (para) – xylene; Xylol

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and CHEMICAL INFORMATION ON INGREDIENTS

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Xylene, Mixed Isomers (1330-20-7)	100

3. HAZARDS IDENTIFICATION

EYES
Moderate to severe irritant. Contact with liquid or vapor may cause irritation.

SKIN
Moderate to severe irritant. May cause skin irritation with prolonged or repeated contact. Practically non-toxic if absorbed following acute (single) exposure. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

INGESTION
The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION
Excessive exposure may cause irritation to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

Effects to the blood (including decreased platelet and white blood cell counts), cardiovascular system, nervous system, retina, lungs, gastrointestinal system, spleen, and kidneys have been reported from large, acute (short) and repeated or prolonged exposures.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Pre-existing chronic respiratory disease, liver or kidney dysfunction, or central nervous system disorders may be aggravated by exposure.

4. FIRST AID MEASURES

EYES
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION
Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

FLASH POINT:	81 ^{o}F (27^{o}C)
AUTOIGNITION TEMPERATURE:	867 ^{o}F (463 ^{o}C)
OSHA/NFPA FLAMMABILITY CLASS:	1C (flammable liquid)
LOWER EXPLOSIVE LIMIT (%):	0.9%
UPPER EXPLOSIVE LIMIT (%):	7.0%

FIRE AND EXPLOSION HAZARDS
Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA
SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

FIRE FIGHTING INSTRUCTIONS

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Product may release substantial amounts of flammable vapors and gases (e.g., methane, ethane, and propane), at or below ambient temperature depending on source and process conditions and pressure.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection - do not discharge solid water stream patterns into the liquid resulting in splashing.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE

HANDLING and STORAGE PRECAUTIONS

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously

containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION

EXPOSURE LIMITS

Components (CAS No.)	Source	Exposure Limits TWA/STEL	Note
Xylene, Mixed Isomers (1330-20-7)	OSHA ACGIH	PEL = 100ppm TLV = 100 ppm; STEL = 150 ppm	 A4; BEI

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as of E.I. DuPont Tyvek-Saranex 23 ®, Tychem®, Barricade® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION

A NIOSH -approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES

APPEARANCE

A clear, water-like liquid

ODOR

A sweet, aromatic odor.

ODOR THRESHOLD

0.2 - 5 ppm

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	AP 279 °F (137 °C)
VAPOR PRESSURE:	6.7 mm Hg @ 70 °F (21 °C)
VAPOR DENSITY (air = 1):	AP 3.6
SPECIFIC GRAVITY (H_2O = 1):	0.86
EVAPORATION RATE:	High
PERCENT VOLATILES:	100 %
SOLUBILITY (H_2O):	Insoluble to slightly soluble

10. STABILITY and REACTIVITY

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS

Material is stable under normal conditions. Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

11. TOXICOLOGICAL PROPERTIES

ACUTE TOXICITY

Acute Oral LD50 (rats): 3.5 to 8.6 g/kg Acute inhalation LC50: 6,700 ppm (rat; 4 hours)
Eye irritation (human): 200 ppm Acute dermal LD50 (rabbits): > 5 ml/kg

In humans, the inhalation of xylene for short periods of time may cause decreased respiratory rate, altered liver and kidney function, hearing loss, and central nervous system depression. Animals exposed to high concentrations of xylene exhibited impaired eye function.

CARCINOGENICITY

Carcinogenicity: OSHA: NO IARC: (3) NTP: NO ACGIH: A4

Mutagenicity: negative

12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations.

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME:	Xylenes
DOT HAZARD CLASS and PACKING GROUP:	3, PG II
DOT IDENTIFICATION NUMBER:	UN 1307
DOT SHIPPING LABEL:	FLAMMABLE LIQUID

PLACARD:

15. REGULATORY INFORMATION

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other regulations at the state and/or local level. Consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

Mixed Xylene is a CERCLA Section 103 "hazardous substance" subject to CERCLA and SARA Section 304 reporting requirements.

Reportable Quantity: 1000 pounds

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION WT. PERCENT
Xylene, Mixed Isomers (1330-20-7)	100

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 2 (Flammable Liquid)
Class D, Division 2B (Toxic by other means)

CALIFORNIA PROPOSITON 65 LIST OF CHEMICALS

This product does not contain chemicals that are included on the Proposition 65 “List of Chemicals” required by the California Safe Drinking Water and Toxic Enforcement Act of 1986.

NFPA® HAZARD RATING

HEALTH:	2
FIRE:	3
REACTIVITY:	0

Refer to NJPA 704 “Identification of the Fire Hazards of Materials” for further information

HMIS® HAZARD RATING			
	HEALTH:	3 *	Moderate
	FIRE:	3	Moderate
	PHYSICAL:	0	Negligible
			* Chronic

SUPERSEDES MSDS DATED: 01/15/1999

ABBREVIATIONS:

AP = Approximately	< = Less than	> = Greater than
N/A = Not Applicable	N/D = Not Determined	ppm = parts per million

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute (212) 642-4900
API	American Petroleum Institute (202) 682-8000
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
DOT	U.S. Department of Transportation [General info: (800) 467-4922]
EPA	U.S. Environmental Protection Agency
HMIS	Hazardous Materials Information System
IARC	International Agency For Research On Cancer
MSHA	Mine Safety and Health Administration
NFPA	National Fire Protection Association (617)770-3000
NIOSH	National Institute of Occupational Safety and Health
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)
NTP	National Toxicology Program
OPA	Oil Pollution Act of 1990
OSHA	U.S. Occupational Safety & Health Administration
PEL	Permissible Exposure Limit (OSHA)
RCRA	Resource Conservation and Recovery Act
REL	Recommended Exposure Limit (NIOSH)
SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
SCBA	Self-Contained Breathing Apparatus
SPCC	Spill Prevention, Control, and Countermeasures
STEL	Short-Term Exposure Limit (generally 15 minutes)
TLV	Threshold Limit Value (ACGIH)
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average (8 hr.)
WEEL	Workplace Environmental Exposure Level (AIHA)
WHMIS	Canadian Workplace Hazardous Materials Information System

MSDS Number: **T4914** * * * * * *Effective Date:* ***07/06/06*** * * * * * *Supercedes:* ***02/16/06***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

1,1,1-TRICHLOROETHANE

1. Product Identification

Synonyms: Methyl chloroform; trichloroethane; chloroetene
CAS No.: 71-55-6
Molecular Weight: 133.40
Chemical Formula: CH3CCl3
Product Codes: 9435, 9437, W509, W510

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Methyl Chloroform	71-55-6	96 - 100%	Yes
Dioxane	123-91-1	< 3%	Yes
1,2-Epoxybutane	106-88-7	< 0.5%	Yes
Actual concentrations proprietary			

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER, KIDNEYS, AND CARDIOVASCULAR SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. POSSIBLE CANCER HAZARD. CONTAINS DIOXANE WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Cancer Causing)
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:
Inhalation of vapors will irritate the respiratory tract. Affects the central nervous system. Symptoms include headache, dizziness, weakness, nausea. Higher levels of exposure (> 5000 ppm) can cause irregular heart beat, kidney and liver damage, fall in blood pressure, unconsciousness and even death.
Ingestion:
Harmful if swallowed. Symptoms similar to inhalation will occur along with nausea, vomiting. Aspiration of material into the lungs can cause chemical pneumonitis which can be fatal. If aspirated, may be rapidly absorbed through the lungs and result in injury to other body systems.
Skin Contact:
Causes mild irritation and redness, especially on prolonged contact. Repeated contact may cause drying or flaking of the skin.
Eye Contact:
Liquids and vapors cause irritation. Symptoms include tearing, redness, stinging, swelling.
Chronic Exposure:
Prolonged or repeated skin contact may cause dermatitis. Chronic exposure may affect the kidneys and liver. Dioxane is a suspected human carcinogen based on animal data.
Aggravation of Pre-existing Conditions:
Personnel with CNS, kidney, liver or heart disease may be more susceptible to the effects of this substance. Use of alcoholic beverages may aggravate symptoms.

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact:
In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:
Autoignition temperature: 500C (932F)
Flammable limits in air % by volume:
lel: 7.0; uel: 16.0
Vapors in containers can explode if subjected to high energy source.
Dioxane has a flash point below 16C (60F).
Explosion:
Can react with strong caustic, such as potash to form a flammable or explosive material. Air/vapor mixtures may explode when heated. Vapors can flow along surfaces to distant ignition source and flash back. Sealed containers may rupture when heated.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Combustion by-products include phosgene and hydrogen chloride gases. Structural firefighters' clothing provides only limited protection to the combustion products of this material.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! Do not use aluminum, magnesium or zinc metal for storage container. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Do not use aluminum equipment or storage containers. Contact with aluminum parts in a pressurized fluid system may cause violent reactions.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
350 ppm (TWA) for trichloroethane
100 ppm (TWA) skin for dioxane
-ACGIH Threshold Limit Value (TLV):
350 ppm (TWA), 450 ppm (STEL) for trichloroethane
20 ppm (TWA) skin, A3 - Animal Carcinogen for dioxane
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134). This substance has questionable warning properties. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Viton is a recommended material for personal protective equipment.
Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.
Odor:
Mild chloroform-like odor.
Solubility:
4,400 ppm in water @ 20C (68F)
Specific Gravity:
1.34 @ 20C/4C
pH:
No information found.
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
74C (165F)
Melting Point:
-32C (-26F)
Vapor Density (Air=1):
4.63
Vapor Pressure (mm Hg):
100 @ 20C (68F)
Evaporation Rate (BuAc=1):
12.8

10. Stability and Reactivity

Stability:
Requires inhibitor content to prevent corrosion of metals. Slowly hydrolyzes in water to form hydrochloric and acetic acid.
Hazardous Decomposition Products:
May produce carbon monoxide, carbon dioxide, hydrogen chloride and phosgene when heated to decomposition. Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:
Hazardous polymerization can occur in contact with aluminum trichloride.
Incompatibilities:
Open flames, welding arcs, nitrogen tetroxide, oxygen, liquid oxygen, sodium, sodium hydroxide, and sodium-potassium alloy, strong alkalis, oxidizers, aluminum and other reactive metals.
Conditions to Avoid:
Insufficient inhibitor, incompatibles, heat, flame and ignition sources

11. Toxicological Information

Oral rat LD50: 9600 mg/kg; inhalation rat LC50: 18000 ppm/4H; investigated as a mutagen, tumorigen, reproductive effector; irritation eye rabbit, Standard Draize, 2mg/24H severe.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Methyl Chloroform (71-55-6)	No	No	3
Dioxane (123-91-1)	No	Yes	2B
1,2-Epoxybutane (106-88-7)	No	No	2B

12. Ecological Information

Environmental Fate:
When released into the soil, this material is not expected to biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released to water, this material is expected to quickly evaporate. This material is not expected to significantly bioaccumulate. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition. When released to the atmosphere, this material has an average global half-life of 6.0 - 6.9 years. When released into the air, this material may adversely affect the ozone layer.
Environmental Toxicity:
This material is expected to be slightly toxic to aquatic life. The LC50/96-hour values for fish are between 10 and 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: 1,1,1-TRICHLOROETHANE
Hazard Class: 6.1
UN/NA: UN2831
Packing Group: III
Information reported for product/size: 20L

15. Regulatory Information

```
--------\Chemical Inventory Status - Part 1\---------------------------------
Ingredient                                  TSCA  EC   Japan  Australia
--------------------------------------------  ----  ---  -----  ---------
Methyl Chloroform (71-55-6)                  Yes  Yes   Yes      Yes
Dioxane (123-91-1)                           Yes  Yes   Yes      Yes
1,2-Epoxybutane (106-88-7)                   Yes  Yes   Yes      Yes

--------\Chemical Inventory Status - Part 2\---------------------------------
                                                    --Canada--
Ingredient                                  Korea  DSL   NDSL  Phil.
--------------------------------------------  -----  ---   ----  -----
Methyl Chloroform (71-55-6)                  Yes   Yes   No     Yes
Dioxane (123-91-1)                           Yes   Yes   No     Yes
1,2-Epoxybutane (106-88-7)                   Yes   Yes   No     Yes

--------\Federal, State & International Regulations - Part 1\----------------
                                          -SARA 302-    ------SARA 313------
Ingredient                                RQ    TPQ     List  Chemical Catg.
----------------------------------------  ---   -----   ----  --------------
Methyl Chloroform (71-55-6)               No    No      Yes        No
Dioxane (123-91-1)                        No    No      Yes        No
1,2-Epoxybutane (106-88-7)                No    No      Yes        No

--------\Federal, State & International Regulations - Part 2\----------------
                                                    -RCRA-    -TSCA-
Ingredient                                CERCLA    261.33     8(d)
----------------------------------------  ------    ------    ------
Methyl Chloroform (71-55-6)               1000      U226       No
Dioxane (123-91-1)                        100       U108       No
1,2-Epoxybutane (106-88-7)                100       No         No


Chemical Weapons Convention:  No     TSCA 12(b):  No     CDTA:  No
SARA 311/312:  Acute: Yes      Chronic: Yes  Fire: No  Pressure: No
Reactivity: No          (Mixture / Liquid)
```

WARNING:
THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: 2[Z]
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **2** Flammability: **1** Reactivity: **0**
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER, KIDNEYS, AND CARDIOVASCULAR SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. POSSIBLE CANCER HAZARD. CONTAINS DIOXANE WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.

Label Precautions:
Avoid breathing vapor.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Avoid contact with eyes, skin and clothing.
Label First Aid:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician.
Product Use:
Laboratory Reagent.
Revision Information:
No Changes.
Disclaimer:
****
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****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

International Chemical Safety Cards

TETRACHLOROETHYLENE

ICSC: 0076

TETRACHLOROETHYLENE
1,1,2,2-Tetrachloroethylene
Perchloroethylene
Tetrachloroethene
C_2Cl_4/$Cl_2C=CCl_2$
Molecular mass: 165.8

CAS # 127-18-4
RTECS # KX3850000
ICSC # 0076
UN # 1897
EC # 602-028-00-4

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION			
EXPOSURE		STRICT HYGIENE!	
• **INHALATION**	Incoordination. Exhilaration. Dizziness. Drowsiness. Headache. Nausea. Weakness. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Artificial respiration if indicated. Refer for medical attention.
• **SKIN**	Dry skin. Redness. Skin burns. Blisters.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
• **EYES**	Redness. Pain.	Safety goggles, face shield.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• **INGESTION**	Abdominal pain (further see Inhalation).	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Do NOT induce vomiting. Give plenty of water to drink. Rest.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place.	Separated from metals (see Chemical Dangers), food and feedstuffs. Keep in the dark. Ventilation along the floor.	Do not transport with food and feedstuffs. IMO: Marine Pollutant Xn symbol R: 40 S: 23-36/37 UN Hazard Class: 6.1 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0076

International Chemical Safety Cards

TETRACHLOROETHYLENE

ICSC: 0076

	PHYSICAL STATE; APPEARANCE:	ROUTES OF EXPOSURE:

IMPORTANT DATA	COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR. **PHYSICAL DANGERS:** The vapour is heavier than air. **CHEMICAL DANGERS:** On contact with hot surfaces or flames this substance decomposes forming toxic and corrosive fumes (hydrogen chloride, phosgene, chlorine). The substance decomposes slowly on contact with moisture producing trichloroacetic acid and hydrochloric acid. Reacts with metals such as aluminium, lithium, barium, berrylium. **OCCUPATIONAL EXPOSURE LIMITS (OELs):** TLV: 50 ppm; 339 mg/m^3 (STEL): 200 ppm; 1357 mg/m^3 (ACGIH 1992-1993).	The substance can be absorbed into the body by inhalation, through the skin and by ingestion. **INHALATION RISK:** A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance irritates the eyes, the skin and the respiratory tract. Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. The substance may cause effects on the central nervous system. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the liver and kidney. Tumours have been detected in experimental animals but may not be relevant to humans (see Notes).
PHYSICAL PROPERTIES	Boiling point: 121°C Melting point: -22°C Relative density (water = 1): 1.6 Solubility in water, g/100 ml at 20°C: 0.015	Vapour pressure, kPa at 20°C: 1.9 Relative vapour density (air = 1): 5.8 Relative density of the vapour/air-mixture at 20°C (air = 1): 1.09 Octanol/water partition coefficient as log Pow: 2.6
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to indoor air and water.	

NOTES

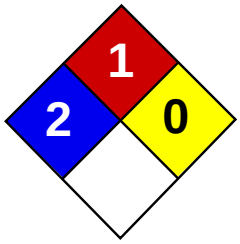
Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is indicated. The odour warning when the exposure limit value is exceeded is insufficient. Do NOT use in the vicinity of a fire or a hot surface, or during welding. Technical grades may contain small amounts of carcinogenic stabilizers.

Transport Emergency Card: TEC (R)-722
NFPA Code: H2; F0; R0;

ADDITIONAL INFORMATION

ICSC: 0076 **TETRACHLOROETHYLENE**

IMPORTANT LEGAL NOTICE:	Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.



Health	2
Fire	1
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Chromium MSDS

Section 1: Chemical Product and Company Identification

Product Name: Chromium

Catalog Codes: SLC4711, SLC3709

CAS#: 7440-47-3

RTECS: GB4200000

TSCA: TSCA 8(b) inventory: Chromium

CI#: Not applicable.

Synonym: Chromium metal; Chrome; Chromium Metal Chips 2" and finer

Chemical Name: Chromium

Chemical Formula: Cr

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Chromium	7440-47-3	100

Toxicological Data on Ingredients: Chromium LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of inhalation. Slightly hazardous in case of ingestion.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, lungs, liver, upper respiratory tract. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 580°C (1076°F)

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances:
Slightly flammable to flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Moderate fire hazard when it is in the form of a dust (powder) and burns rapidly when heated in flame. Chromium is attacked vigorously by fused potassium chlorate producing vivid incandescence. Pyrophoric chromium unites with nitric oxide with incandescence. Incandescent reaction with nitrogen oxide or sulfur dioxide.

Special Remarks on Explosion Hazards:
Powdered Chromium metal +fused ammonium nitrate may react violently or explosively. Powdered Chromium will explode spontaneously in air.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.5 (mg/m3) from ACGIH (TLV) [United States] TWA: 1 (mg/m3) from OSHA (PEL) [United States] TWA: 0.5 (mg/m3) from NIOSH [United States] TWA: 0.5 (mg/m3) [United Kingdom (UK)] TWA: 0.5 (mg/m3) [Canada]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid.)

Odor: Odorless.

Taste: Not available.

Molecular Weight: 52 g/mole

Color: Silver-white to Grey.

pH (1% soln/water): Not applicable.

Boiling Point: 2642°C (4787.6°F)

Melting Point: 1900°C (3452°F) +/- !0 deg. C

Critical Temperature: Not available.

Specific Gravity: 7.14 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Insoluble in cold water, hot water. Soluble in acids (except Nitric), and strong alkalies.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, acids, alkalis.

Corrosivity: Not available.

Special Remarks on Reactivity:
Incompatible with molten Lithium at 180 deg. C, hydrogen peroxide, hydrochloric acid, sulfuric acid, most caustic alkalies and alkali carbonates, potassium chlorate, sulfur dioxide, nitrogen oxide, bromine pentafluoride. It may react violently or ignite with bromine pentafluoride. Chromium is rapidly attacked by fused sodium hydroxide + potassium nitrate. Potentially hazardous incompatibility with strong oxidizers.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: kidneys, lungs, liver, upper respiratory tract.

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of ingestion.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May cause cancer based on animal data. There is no evidence that exposure to trivalent chromium causes cancer in man.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: May cause skin irritation. Eyes: May cause mechanical eye irritation. Inhalation: May cause irritation of the respiratory tract and mucous membranes of the respiratory tract. Ingestion: May cause gastrointestinal tract irritation with nausea, vomiting, diarrhea. Chronic Potential Health Effects: Inhalation: The effects of chronic exposure include irritation , sneezing, reddness of the throat, bronchospasm, asthma, cough, polyps, chronic inflammation, emphysema, chronic bronchitis, pharyngitis, bronchopneumonia, pneumoconoisis. Effects on the nose from chronic chromium exposure include irritation, ulceration, and perforation of the nasal septum. Inflammation and ulceration of the larynx may also occur. Ingestion or Inhalation: Chronic exposure may cause liver and kidney damage.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Chromium Illinois toxic substances disclosure to employee act: Chromium Illinois chemical safety act: Chromium New York release reporting list: Chromium Rhode Island RTK hazardous substances: Chromium Pennsylvania RTK: Chromium Minnesota: Chromium Michigan critical material: Chromium Massachusetts RTK: Chromium Massachusetts spill list: Chromium New Jersey: Chromium New Jersey spill list: Chromium Louisiana spill reporting: Chromium California Director's List of Hazardous Substances: Chromium TSCA 8(b) inventory: Chromium SARA 313 toxic chemical notification and release reporting: Chromium CERCLA: Hazardous substances.: Chromium: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):
R40- Limited evidence of carcinogenic effect S36/37/39- Wear suitable protective clothing, gloves and eye/face protection. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:16 PM

Last Updated: 05/21/2013 12:00 PM

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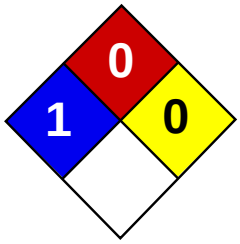

Health	1
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Lead MSDS

Section 1: Chemical Product and Company Identification

Product Name: Lead

Catalog Codes: SLL1291, SLL1669, SLL1081, SLL1459, SLL1834

CAS#: 7439-92-1

RTECS: OF7525000

TSCA: TSCA 8(b) inventory: Lead

CI#: Not available.

Synonym: Lead Metal, granular; Lead Metal, foil; Lead Metal, sheet; Lead Metal, shot

Chemical Name: Lead

Chemical Formula: Pb

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Lead	7439-92-1	100

Toxicological Data on Ingredients: Lead LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (permeator). CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Non-flammable in presence of open flames and sparks, of shocks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: When heated to decomposition it emits highly toxic fumes of lead.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable

protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.05 (mg/m3) from ACGIH (TLV) [United States] TWA: 0.05 (mg/m3) from OSHA (PEL) [United States] TWA: 0.03 (mg/m3) from NIOSH [United States] TWA: 0.05 (mg/m3) [Canada]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 207.21 g/mole

Color: Bluish-white. Silvery. Gray

pH (1% soln/water): Not applicable.

Boiling Point: 1740°C (3164°F)

Melting Point: 327.43°C (621.4°F)

Critical Temperature: Not available.

Specific Gravity: 11.3 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, excess heat

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Can react vigorously with oxidizing materials. Incompatible with sodium carbide, chlorine trifluoride, trioxane + hydrogen peroxide, ammonium nitrate, sodium azide, disodium acetylide, sodium acetylide, hot concentrated nitric acid, hot concentrated hydrochloric acid, hot concentrated sulfuric acid, zirconium.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC. May cause damage to the following organs: blood, kidneys, central nervous system (CNS).

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential: Skin: Lead metal granules or dust: May cause skin irritation by mechanical action. Lead metal foil, shot or sheets: Not likely to cause skin irritation Eyes: Lead metal granules or dust: Can irritate eyes by mechanical action. Lead metal foil, shot or sheets: No hazard. Will not cause eye irritation. Inhalation: In an industrial setting, exposure to lead mainly occurs from inhalation of dust or fumes. Lead dust or fumes: Can irritate the upper respiratory tract (nose, throat) as well as the bronchi and lungsby mechanical action. Lead dust can be absorbed through the respiratory system. However, inhaled lead does not accumulate in the lungs. All of an inhaled dose is eventually abssorbed or transferred to the gastrointestinal tract. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include metallic taste, chest pain, decreased physical fitness, fatigue, sleep disturbance, headache, irritability, reduces memory, mood and personality changes, aching bones and muscles, constipation, abdominal pains, decreasing appetite. Inhalation of large amounts may lead to ataxia, deliriuim, convulsions/seizures, coma, and death. Lead metal foil, shot, or sheets: Not an inhalation hazard unless metal is heated. If metal is heated, fumes will be released. Inhalation of these fumes may cause "fume metal fever", which is characterized by flu-like symptoms. Symptoms may include metallic taste, fever, nausea, vomiting, chills, cough, weakness, chest pain, generalized muscle pain/aches, and increased white blood cell count. Ingestion: Lead metal granules or dust: The symptoms of lead poisoning include abdominal pain or cramps (lead cholic), spasms, nausea, vomiting, headache, muscle weakness, hallucinations, distorted perceptions, "lead line" on the gums, metallic taste, loss of appetite, insomnia, dizziness and other symptoms similar to that of inhalation. Acute poisoning may result in high lead levels in the blood and urine, shock, coma and death in extreme cases. Lead metal foil, shot or sheets: Not an ingestion hazard for usual industrial handling.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (female) which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (male) which would require a warning under the statute: Lead California prop. 65 (no significant risk level): Lead: 0.0005 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Lead Connecticut hazardous material survey.: Lead Illinois toxic substances disclosure to employee act: Lead Illinois chemical safety act: Lead New York release reporting list: Lead Rhode Island RTK hazardous substances: Lead Pennsylvania RTK: Lead

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R20/22- Harmful by inhalation and if swallowed. R33- Danger of cumulative effects. R61- May cause harm to the unborn child. R62- Possible risk of impaired fertility. S36/37- Wear suitable protective clothing and gloves. S44- If you feel unwell, seek medical advice (show the label when possible). S53- Avoid exposure - obtain special instructions before use.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:21 PM

Last Updated: 05/21/2013 12:00 PM

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Material Safety Data Sheet
1,2,4-Trimethylbenzene, 98%

ACC# 73581

Section 1 - Chemical Product and Company Identification

MSDS Name: 1,2,4-Trimethylbenzene, 98%
Catalog Numbers: AC140090000, AC140090010, AC140090025
Synonyms: Benzene, 1,2,4-trimethyl-; Asymmetrical trimethylbenzene; Benzene, 1,2,5-trimethyl-; psi-Cumene; Pseudocumene; Pseudocumol; as-Trimethylbenzene
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
95-63-6	1,2,4-Trimethylbenzene	98	202-436-9

Hazard Symbols: XN
Risk Phrases: 10 36/37/38 20

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless liquid. Flash Point: 48 deg C. **Warning! Flammable liquid.** Causes respiratory tract irritation. May cause digestive tract irritation. May cause central nervous system depression. May be absorbed through the skin. Causes eye and skin irritation. May cause blood abnormalities.
Target Organs: Blood, central nervous system, lungs.

Potential Health Effects

Eye: Causes eye irritation. Causes redness and pain. May cause irritation of the conjunctiva.
Skin: Causes skin irritation. May be absorbed through the skin. Causes redness and pain.
Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system depression.
Inhalation: May cause drowsiness, unconsciousness, and central nervous system depression. Vapors may cause dizziness or suffocation. Causes irritation of the mucous membrane and upper respiratory tract.
Chronic: Prolonged or repeated skin contact may cause dermatitis. Repeated inhalation may cause chronic bronchitis. May cause anemia and other blood cell abnormalities. Prolonged exposure may produce a narcotic effect. Prolonged or repeated exposure may cause nausea, dizziness, and headache. Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation: Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Firefighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Use water spray to keep fire-exposed containers cool. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Containers may explode in the heat of a fire. Flammable Liquid. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.
Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. This material is lighter than water and insoluble in water. The fire could easily be spread by the use of water in an area where the water cannot be contained. Do NOT use straight streams of water.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material, (e.g., dry sand or earth), then place into a chemical waste container. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid breathing dust, vapor, mist, or gas. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Take precautionary measures against static discharges. Avoid contact with heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.
Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible

substances. Flammables-area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
1,2,4-Trimethylbenzene	none listed	25 ppm TWA; 125 mg/m3 TWA	none listed

OSHA Vacated PELs: 1,2,4-Trimethylbenzene: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR §1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Clear liquid
Appearance: colorless liquid
Odor: aromatic odor
pH: Not available.
Vapor Pressure: 7 mm Hg @ 44.4 C
Vapor Density: 4.15 (air=1)
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 168 deg C @ 760.00mm Hg
Freezing/Melting Point:-60-44 deg C
Decomposition Temperature: Not available.
Autoignition Temperature: 500 deg C (932.00 deg F)
Flash Point: 48 deg C (118.40 deg F)
NFPA Rating: (estimated) Health: 0; Flammability: 2; Reactivity: 0
Explosion Limits, Lower:0.90 vol %
Upper: 6.40 vol %
Solubility: Insoluble.
Specific Gravity/Density:0.8890g/cm3
Molecular Formula:C9H12
Molecular Weight:120.19

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, ignition sources, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents, nitric acid.
Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 95-63-6: DC3325000
LD50/LC50:
CAS# 95-63-6:
Inhalation, rat: LC50 =18 gm/m3/4H;
Oral, rat: LD50 = 5 gm/kg;
Carcinogenicity:
CAS# 95-63-6: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Neurotoxicity: No information available.
Mutagenicity: Sister Chromatid Exchange: Intraperitoneal, mouse = 900 mg/kg.
Other Studies: No data available.

Section 12 - Ecological Information

Ecotoxicity: Estimated Koc value = 720. 1,2,4-trimethylbenzene will have low mobility in soil. Volatilization from moist and dry soil surfaces is expected to occur. 1,2,4-Trimethylbenzene is expected to aerobically biodegrade in both soil and water. Anaerobic aquifer microcosms did not show significant biodegradation in comparison to poisoned controls. In water, 1,2,4-trimethylbenzene may adsorb to sediment or particulate matter.
Environmental Fate: Bioconcentration in aquatic organisms is moderate to high based on BCF values of 31-275, measured in carp. 1,2,4-Trimethylbenzene is expected to photodegrade in natural waters. If released to the atmosphere, 1,2,4-trimethylbenzene will exist solely in the vapor phase in the ambient atmosphere. Vapor-phase 1,2,4-trimethylbenzene is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals and nitrate radicals with half-lives of about 12 hours and 6-30 days, respectively.
Physical/Chemical: Not available.
Other: Not available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	FLAMMABLE LIQUIDS, N.O.S. (1,2,4-TRIMETHYLBENZENE)				COMBUSTIBLE LIQUID NOS (TRIMETHYLBENZENE)
Hazard Class:	3				3
UN Number:	UN1993				UN1993
Packing Group:	III				III
Additional Info:					FP 48 C

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 95-63-6 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 95-63-6: Effective Date: April 29, 1983; Sunset Date: April 29, 1 993
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
SARA

Section 302 (RQ)
None of the chemicals in this material have an RQ.
Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 95-63-6: acute, chronic, flammable.
Section 313
This material contains 1,2,4-Trimethylbenzene (CAS# 95-63-6, 98%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.
Clean Air Act:
This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 95-63-6 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.
California No Significant Risk Level: None of the chemicals in this product are listed.

European / International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 10 Flammable. R 36/37/38 Irritating to eyes, respiratory system and skin. R 20 Harmful by inhalation.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking. S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S 33 Take precautionary measures against static discharges. S 9 Keep container in a well-ventilated place.

WGK (Water Danger/Protection)

CAS# 95-63-6: 3

Canada

CAS# 95-63-6 is listed on Canada's DSL/NDSL List.
This product has a WHMIS classification of B3, D2B.
CAS# 95-63-6 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

Section 16 - Additional Information

MSDS Creation Date: 5/19/1999
Revision #1 Date: 8/02/2000

NTP CHEMICAL REPOSITORY
ETHYLBENZENE

-IDENTIFIERS
 ===========

*CATALOG ID NUMBER: 000486

*CAS NUMBER: 100-41-4

*BASE CHEMICAL NAME: ETHYLBENZENE

*PRIMARY NAME: ETHYLBENZENE

*CHEMICAL FORMULA: C8H10

*STRUCTURAL FORMULA:

*WLN: 2R

*SYNONYMS:
  EB
  ETHYLBENZOL
  PHENYLETHANE
  NCI C56393

-PHYSICAL CHEMICAL DATA
 ======================

*PHYSICAL DESCRIPTIONS: LITERATURE: Clear, colorless liquid
                         REPOSITORY: Clear, colorless liquid

*MOLECULAR WEIGHT: 106.16

*SPECIFIC GRAVITY: 0.867 @ 20/4 C

*DENSITY: 0.866 g/cm3 @ 21 C (RAD)

*MP (DEG C): -95 C

*BP (DEG C): 136.2 C

*SOLUBILITIES:
       WATER : <1 mg/mL @ 23 C (RAD)

        DMSO : >=100 mg/mL @ 23 C (RAD)

 95% ETHANOL : 1-10 mg/mL @ 23 C (RAD)

    METHANOL : Not available

     ACETONE : >=100 mg/mL @ 23 C (RAD)

     TOLUENE : Not available

OTHER SOLVENTS:
Most organic solvents: Soluble
Carbon tetrachloride: Soluble
Sulfur dioxide: Soluble
Ammonia: Insoluble
ETHER : Soluble
BENZENE: Soluble

*VOLATILITY:
Vapor pressure: 10 mm Hg @ 29.5 C; 5 mm Hg @ 13.9 C; 760 mm Hg @ 136.2 C
Vapor density : 3.66

*FLAMMABILITY(FLASH POINT):
The flash point for this chemical is 15 C (59 F). It is flammable. Fires involving this compound can be controlled with a dry chemical, carbon dioxide or Halon extinguisher. The autoignition temperature is 432 C (810 F).

*UEL: 6.8% LEL: 1.2%

*REACTIVITY:
This compound can react vigorously with strong oxidizing materials.

*STABILITY:
This chemical is stable under normal laboratory conditions. Solutions of this chemical should be stable for 24 hours under normal lab conditions (RAD).

*OTHER PHYSICAL DATA:
Aromatic odor
Refractive index: 1.49594 @ 20 C; 1.4932 @ 25 C
Specific heat: 0.41 cal/gal/degrees C
Viscosity: 0.64 centipoise @ 25 C
Specific gravity: 0.866 @ 25/25 C
Boiling point: 25.8 C @ 10 mm Hg

-TOXICITY
========

*NIOSH REGISTRY NUMBER: DA0700000

*TOXICITY: (abbreviations)

typ. dose	mode	specie	amount	unit	other
TCLo	ihl	hmn	100	ppm/8H	
LD50	orl	rat	3500	mg/kg	
LCLo	ihl	rat	4000	ppm/4H	
LD50	skn	rbt	17800	mg/kg	
LCLo	ihl	gpg	10000	ppm	

*AQTX/TLM96: 100-10 ppm.

*SAX TOXICITY EVALUATION:
THR: MODERATE via irritation to the skin, eyes and mucous membranes, and via oral and inhalation routes. A concentration of 0.19% vapor in air will irritate eyes; 0.2% is extremely irritating. An experimental teratogen.

*CARCINOGENICITY:

Status: NTP Carcinogenesis Studies; selected but deferred, April 1984

*MUTATION DATA:

test	lowest dose
sce-hmn:lym	1 mmol/L

*TERATOGENICITY:
Reproductive Effects Data:
TCLo: ihl-rat 97 ppm/7H (15D preg)
TCLo: ihl-rat 985 ppm/7H (1-19D preg)
TCLo: ihl-rat 96 ppm/7H (1-19D preg)
TCLo: ihl-rbt 99 ppm/7H (1-18D preg)

*STANDARDS, REGULATIONS & RECOMMENDATIONS:
OSHA: Federal Register (1/19/89) and 29 CFR 1910.1000 Subpart Z
Transitional Limit: PEL-TWA 100 ppm [610]
Final Limit: PEL-TWA 100 ppm, STEL 125 ppm [610]
ACGIH: TLV-TWA 100 ppm, STEL 125 ppm [610]
NIOSH Criteria Document: None
NFPA Hazard Rating: Health (H): 2
Flammability (F): 3
Reactivity (R): 0
H2: Materials hazardous to health, but areas may be entered freely with full-faced mask self-contained breathing apparatus which provides eye protection (see NFPA for details).
F3: Materials which can be ignited under almost all normal temperature conditions (see NFPA for details).
R0: Materials which are normally stable even under fire exposure conditions and which are not reactive with water (see NFPA for details).

*OTHER TOXICITY DATA:
Skin and Eye Irritation Data:
skn-rbt 15 mg/24H open MLD
eye-rbt 100 mg
Standards and Regulations: DOT-Hazard: Flammable liquid; Label: Flammable liquid
Status: "NIOSH Manual of Analytical Methods, 3rd. Ed."
Reported in EPA TSCA Inventory, 1983
EPA TSCA 8(a) Preliminary Assessment Information Final Rule
EPA Genetic Toxicology Program, January 1984
EPA TSCA Section 8(e) Status Report 8EHQ-0680-0345
EPA TSCA Section 8(e) Status Report 8EHQ-1080-0368
Meets criteria for proposed OSHA Medical Records Rule

-OTHER DATA (Regulatory)
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*PROPER SHIPPING NAME (IATA): Ethylbenzene

*UN/ID NUMBER: UN1175

*HAZARD CLASS: 3 SUBSIDIARY RISK: None PACKING GROUP: II

*LABELS REQUIRED: Flammable liquid

*PACKAGING: PASSENGER: PKG. INSTR.: 305, Y305 MAXIMUM QUANTITY: 5 L, 1 L
CARGO : PKG. INSTR.: 307 MAXIMUM QUANTITY: 60 L

*SPECIAL PROVISIONS: None

*USES:
Intermediate in production of styrene; organic synthesis; solvent; dilutant; antiknock agent; acetophenone manufacture; asphalt constituent; naphtha constituent.

-HANDLING PROCEDURES

*ACUTE/CHRONIC HAZARDS:
This compound can cause irritation of the skin, eyes and mucous membranes. It is toxic by ingestion, inhalation and skin absorption. In high concentrations it may be narcotic. It may also cause lachrimation.

*MINIMUM PROTECTIVE CLOTHING: Not available

*RECOMMENDED GLOVE MATERIALS: P
The following gloves show the best resistance based on permeation testing. It is recommended that two different glove types be used for best protection. However, if this chemical makes direct contact with your glove, or if a tear, puncture or hole develops, remove them at once.

SUGGESTED GLOVES (RAD): Viton

*RECOMMENDED RESPIRATOR:
Where the neat test chemical is weighed and diluted, wear a NIOSH-approved half face respirator equipped with an organic vapor/acid gas cartridge (specific for organic vapors, HCl, acid gas and SO2) with a dust/mist filter.

*OTHER: Not available

*STORAGE PRECAUTIONS:
You should store this chemical under refrigerated temperatures, and keep it away from oxidizing materials. STORE AWAY FROM SOURCES OF IGNITION.

*SPILLS AND LEAKAGE:
If you should spill this chemical, FIRST REMOVE ALL SOURCES OF IGNITION, then use absorbent paper to pick up all liquid spill material. Your contaminated clothing and absorbent paper should be sealed in a vapor-tight plastic bag for eventual disposal. Solvent wash all contaminated surfaces with acetone followed by washing with a soap and water solution. Do not reenter the contaminated area until the Safety Officer (or other responsible person) has verified that the area has been properly cleaned.

*DISPOSAL AND WASTE TREATMENT:
Not available

-EMERGENCY PROCEDURES

*SKIN CONTACT:
IMMEDIATELY flood affected skin with water while removing and isolating all contaminated clothing. Gently wash all affected skin areas thoroughly with soap and water.
If symptoms such as redness or irritation develop, IMMEDIATELY call a physician and be prepared to transport the victim to a hospital for treatment.

*INHALATION:
IMMEDIATELY leave the contaminated area; take deep breaths of fresh air. If symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop, call a physician and be prepared to transport the victim to a hospital.
Provide proper respiratory protection to rescuers entering an unknown atmosphere. Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used; if not available, use a level of protection greater than or equal to that advised under Respirator Recommendation.

*EYE CONTACT:
First check the victim for contact lenses and remove if present. Flush victim's eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center.
Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician.
IMMEDIATELY transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

*INGESTION:
DO NOT INDUCE VOMITING. If the victim is conscious and not convulsing, give 1 or 2 glasses of water to dilute the chemical and IMMEDIATELY call a hospital or poison control center. Be prepared to transport the victim to a hospital if advised by a physician.
If the victim is convulsing or unconscious, do not give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with the head lower than the body. DO NOT INDUCE VOMITING. IMMEDIATELY transport the victim to a hospital.

*SYMPTOMS:
Symptoms of exposure to this compound may include irritation, redness and inflammation of the skin; irritation of the nose, throat, and eyes; lachrimation, conjunctivitis, corneal erosion, dermatitis, dizziness, narcosis and a sensation of constriction of the chest.

*FIREFIGHTING:

-SOURCES
=======

*SOURCES:
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Oak Ridge National Laboratory. Environmental Mutagen Information

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Please send queries, comments, and suggestions to:
ntpwm@niehs.nih.gov
Last revised: 13 August 2001

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CHEM SERVICE -- 7310J N-PROPYLBENZENE - LABORATORY STANDARD
MATERIAL SAFETY DATA SHEET
NSN: 655000F037482
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: 7310J N-PROPYLBENZENE

General Information

Item Name: LABORATORY STANDARD
Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 215-692-3026/800-452-9994
Company's Info Ph #: 215-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 02JUL90
Safety Data Review Date: 07DEC94
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: BWJDW

Ingredients/Identity Information

Proprietary: NO
Ingredient: N-PROPYLBENZENE
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: DA8750000
CAS Number: 103-65-1

Physical/Chemical Characteristics

Appearance And Odor: COLORLESS LIQUID
Boiling Point: 318.56F
Melting Point: -147.1F
Solubility In Water: INSOLUBLE

Fire and Explosion Hazard Data

Flash Point: 116.6F
Extinguishing Media: CO2, DRY CHEMICAL POWDER/SPRAY.
Unusual Fire And Expl Hazrds: COMBUSTIBLE COMPOUND. SENSITIVE TO HEAT.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HEAT.

Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: TOXIC FUMES.
Hazardous Poly Occur: NO

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50 (RAT/MOUSE): 6040 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: EYES: CAN CAUSE IRRITATION. SKIN: CAN CAUSE IRRITATION. HARMFUL IF ABSORBED. INHALATION: HARMFUL. DUST &/VAPORS CAN CAUSE RESPIRATORY TRACT IRRITATION. INGESTION: HARMFUL. CAN BE IRRITATING TO MUCOUS MEMBRANES.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION.
Emergency/First Aid Proc: N-HEXANE-EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS. SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/ SOAP & WATER. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED. KEEP WARM & QUIET. INGESTION: DON'T INDUCE VOMITING/GIVE LIQUIDS IF UNCONSCIOUS/CONVULSIVE. IF VOMITING, WATCH CLOSELY FOR ANY AIRWAY OBSTRUCTION. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPRORPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE CHEMICALS. KEEP TIGHTLY CLOSED.
Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATH VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT.

Control Measures

Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.
Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Eye Protection: EYE SHIELDS

Transportation Data

Disposal Data

Label Data

Label Required: YES
Label Status: G

Common Name: 7310J N-PROPYLBENZENE
Special Hazard Precautions: EYES: CAN CAUSE IRRITATION. SKIN: CAN CAUSE IRRITATION. HARMFUL IF ABSORBED. INHALATION: HARMFUL. DUST &/VAPORS CAN CAUSE RESPIRATORY TRACT IRRITATION. INGESTION: HARMFUL. CAN BE IRRITATING TO MUCOUS MEMBRANES. IRRITATION.
Label Name: CHEM SERVICE INC
Label Street: 660 TOWER LN
Label P.O. Box: 3108
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381-3108
Label Country: US
Label Emergency Number: 215-692-3026/800-452-9994

CHEM SERVICE -- 0-771 1,3,5-TRIMETHYLBENZENE - LABORATORY STANDARD
MATERIAL SAFETY DATA SHEET
NSN: 655000F037499
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: 0-771 1,3,5-TRIMETHYLBENZENE

General Information

Item Name: LABORATORY STANDARD
Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 215-692-3026/800-452-9994
Company's Info Ph #: 215-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 02JUL90
Safety Data Review Date: 07DEC94
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: BWJFR

Ingredients/Identity Information

Proprietary: NO
Ingredient: 1,3,5,-TRIMETHYLBENZENE
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: OX6825000
CAS Number: 108-67-8
OSHA PEL: 25 PPM
ACGIH TLV: 25 PPM

Physical/Chemical Characteristics

Appearance And Odor: COLORLESS LIQUID W/CAMPHOR LIKE ODOR.
Boiling Point: 327.2F
Melting Point: -49F
Solubility In Water: INSOLUBLE

Fire and Explosion Hazard Data

Flash Point: 111.2F
Extinguishing Media: CO2, DRY CHEMICAL POWDER/SPRAY.
Unusual Fire And Expl Hazrds: COMBUSTIBLE COMPOUND. DECOMPOSITION PRODUCTS ARE CORROSIVE.

Reactivity Data

Stability: YES
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: TOXIC FUMES.
Hazardous Poly Occur: NO

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50 (RAT/MOUSE): 1303 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: SKIN: HARMFUL IF ABSORBED, IRRITATION. INHALATION: HARMFUL, MUCOUS MEMBRANES IRRITATION. EYES: IRRITATION, DAMAGE. INGESTION: HARMFUL. THIS COMPOUND IS CONSIDERED TO BE SLIGHTLY TOXIC.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION, NAUSEA, HEADACHE, DIZZINESS.
Emergency/First Aid Proc: EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS. SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER TO CLEANSE. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED & CONTINUE UNTIL MEDICAL ASSISTANCE ARRIVES. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPRORPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE CHEMICALS. KEEP TIGHTLY CLOSED.
Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATH VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT.

Control Measures

Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.
Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Eye Protection: EYE SHIELDS

Transportation Data

Disposal Data

Label Data

Label Required: YES
Label Status: G
Common Name: 0-771 1,3,5-TRIMETHYLBENZENE
Special Hazard Precautions: SKIN: HARMFUL IF ABSORBED, IRRITATION. INHALATION: HARMFUL, MUCOUS MEMBRANES IRRITATION. EYES: IRRITATION, DAMAGE. INGESTION: HARMFUL. THIS COMPOUND IS CONSIDERED TO BE SLIGHTLY TOXIC. IRRITATION, NAUSEA, HEADACHE, DIZZINESS.
Label Name: CHEM SERVICE INC
Label Street: 660 TOWER LN
Label P.O. Box: 3108
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381-3108

Label Country: US
Label Emergency Number: 215-692-3026/800-452-9994

Material Safety Data Sheet

sec-Butylbenzene, 99+%

ACC# 73785

Section 1 - Chemical Product and Company Identification

MSDS Name: sec-Butylbenzene, 99+%
Catalog Numbers: AC107860050, AC107860500, AC107861000, AC107862500, AC107865000
Synonyms: 2-Phenylbutane; Benzene, (1-methylpropyl)-; (1-Methylpropyl)benzene; Benzene, sec-butyl-
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
135-98-8	sec-Butylbenzene	99+	205-227-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear colorless liquid. Flash Point: 45 deg C.
Warning! Flammable liquid and vapor. Causes eye, skin, and respiratory tract irritation. May cause central nervous system depression.
Target Organs: Central nervous system.

Potential Health Effects

Eye: Causes eye irritation.
Skin: Causes skin irritation.
Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Ingestion of large amounts may cause CNS depression.
Inhalation: Causes respiratory tract irritation.
Chronic: Prolonged or repeated skin contact may cause dermatitis.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or

water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Will burn if involved in a fire. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Flammable liquid and vapor.
Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Use agent most appropriate to extinguish fire. Do NOT use straight streams of water.
Flash Point: 45 deg C (113.00 deg F)
Autoignition Temperature: 415 deg C (779.00 deg F)
Explosion Limits, Lower:0.80 vol %
Upper: 6.90 vol %
NFPA Rating: (estimated) Health: 2; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.
Storage: Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an

eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
sec-Butylbenzene	none listed	none listed	none listed

OSHA Vacated PELs: sec-Butylbenzene: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: clear colorless

Odor: None reported.

pH: Not available.

Vapor Pressure: 4 mm Hg @ 37.7 deg C

Vapor Density: 4.62

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 173 - 174 deg C @ 760 mm Hg

Freezing/Melting Point:-75 deg C

Decomposition Temperature: Not available.

Solubility: 0.015 g/L water

Specific Gravity/Density:0.8630 g/cm3

Molecular Formula:C10H14

Molecular Weight:134.22

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Ignition sources, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 135-98-8: CY9100000

LD50/LC50:

CAS# 135-98-8:

Draize test, rabbit, eye: 500 mg/24H Mild;
Draize test, rabbit, skin: 100 mg/24H Moderate;
Oral, mouse: LD50 = 8700 mg/kg;
Oral, rat: LD50 = 2240 uL/kg;
Oral, rat: LD50 = 6300 mg/kg;
Skin, rabbit: LD50 = >16 mL/kg;
.

Carcinogenicity:
CAS# 135-98-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	BUTYL BENZENES	BUTYLBENZENES
Hazard Class:	3	3
UN Number:	UN2709	UN2709
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 135-98-8 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 135-98-8: Effective 6/1/87, Sunset 12/19/95
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.

Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
None of the chemicals in this material have an RQ.
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
Section 313 No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 135-98-8 can be found on the following state right to know lists: Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European / International Regulations

European Labeling in Accordance with EC Directives
Hazard Symbols:
XI
Risk Phrases:
R 10 Flammable.
R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:
S 16 Keep away from sources of ignition - No smoking.
S 33 Take precautionary measures against static discharges.
S 9 Keep container in a well-ventilated place.

WGK (Water Danger/Protection)
CAS# 135-98-8: 1
Canada - DSL/NDSL
CAS# 135-98-8 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of B3, D2B.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
Canadian Ingredient Disclosure List

Section 16 - Additional Information

MSDS Creation Date: 9/02/1997
Revision #7 Date: 2/15/2006

Material Safety Data Sheet

p-Cymene, 98%

ACC# 95901

Section 1 - Chemical Product and Company Identification

MSDS Name: p-Cymene, 98%
Catalog Numbers: AC111760000, AC111760010, AC111760025, AC111762500
Synonyms: Dolcymene; p-isopropyltoluene;isopropyl methylbenzene
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
99-87-6	P-CYMENE	98	202-796-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: 47 deg C.
Warning! Flammable liquid and vapor. Causes eye, skin, and respiratory tract irritation. May be absorbed through intact skin. Aspiration hazard if swallowed. Can enter lungs and cause damage. May cause central nervous system effects.
Target Organs: Central nervous system.

Potential Health Effects

Eye: May cause eye irritation.
Skin: Causes skin irritation. Prolonged and/or repeated contact may cause defatting of the skin and dermatitis. May be absorbed through the skin.
Ingestion: May cause irritation of the digestive tract. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal.
Inhalation: Causes respiratory tract irritation. May cause narcotic effects in high concentration. May cause drowsiness, unconsciousness, and central nervous system depression.
Chronic: Chronic inhalation may cause effects similar to those of acute inhalation. Prolonged or repeated skin contact may cause defatting and dermatitis.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.
Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Possible aspiration hazard. Get medical aid immediately.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors can travel to a source of ignition and flash back. Containers may explode in the heat of a fire. Flammable liquid and vapor.
Extinguishing Media: Use water spray to cool fire-exposed containers. Water may be ineffective. Use water spray, dry chemical, carbon dioxide, or chemical foam.
Flash Point: 47 deg C (116.60 deg F)
Autoignition Temperature: 435 deg C (815.00 deg F)
Explosion Limits, Lower:.70 vol %
Upper: 5.60 vol %
NFPA Rating: 1 - health, 2 - flammability, 0 - instability

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.
Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
P-CYMENE	none listed	none listed	none listed

OSHA Vacated PELs: P-CYMENE: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear, colorless
Odor: Lemon-type
pH: Not available.
Vapor Pressure: 1 mm Hg @17.3C
Vapor Density: 4.62 (air=1)
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 176 - 178 deg C @ 760.00mm Hg
Freezing/Melting Point:-68 deg C
Decomposition Temperature: Not available.
Solubility: practically insoluble in water
Specific Gravity/Density:.8600g/cm3
Molecular Formula:C10H14
Molecular Weight:134.22

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, ignition sources, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 99-87-6: GZ5950000
LD50/LC50:
CAS# 99-87-6:
Draize test, rabbit, skin: 500 mg/24H Moderate;
Inhalation, mouse: LC50 = 19500 mg/m3;
Oral, mouse: LD50 = 1695 mg/kg;

Oral, rat: LD50 = 4750 mg/kg;
Oral, rat: LD50 = 3669 mg/kg;
.

Carcinogenicity:
CAS# 99-87-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: Genotoxicity:see The Dictionary of Substances and their Effects, 1992
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Bioaccumulation:Readily biodegradableAbiotic removal:Evaporation rate relative to n-butyl-acetate which has been assigned a value of 1 at 25°C is 0.14 (The Dictionary of Substances and their Effects, 1992)
Environmental: No information available.
Physical: No information available.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CYMENES	No information available.
Hazard Class:	3	
UN Number:	UN2046	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 99-87-6 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
None of the chemicals in this material have an RQ.
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 99-87-6: immediate, fire.
Section 313 No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 99-87-6 can be found on the following state right to know lists: Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European / International Regulations

European Labeling in Accordance with EC Directives
Hazard Symbols:
XI F
Risk Phrases:
R 10 Flammable.
R 37/38 Irritating to respiratory system and skin.

Safety Phrases:
S 16 Keep away from sources of ignition - No smoking.

WGK (Water Danger/Protection)
CAS# 99-87-6: No information available.
Canada - DSL/NDSL
CAS# 99-87-6 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of B3, D2B.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
Canadian Ingredient Disclosure List
CAS# 99-87-6 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 9/02/1997
Revision #4 Date: 3/15/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

Version 4.4
Revision Date 05/17/2013
Print Date 04/08/2014

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	1,2,4,5-Tetramethylbenzene
Product Number	:	T19607
Brand	:	Aldrich
Supplier	:	Sigma-Aldrich 3050 Spruce Street SAINT LOUIS MO 63103 USA
Telephone	:	+1 800-325-5832
Fax	:	+1 800-325-5052
Emergency Phone # (For both supplier and manufacturer)	:	(314) 776-6555
Preparation Information	:	Sigma-Aldrich Corporation Product Safety - Americas Region 1-800-521-8956

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Flammable solid

GHS Classification
Flammable solids (Category 1)
Chronic aquatic toxicity (Category 4)

GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H228	Flammable solid.
H413	May cause long lasting harmful effects to aquatic life.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

HMIS Classification

Health hazard:	0
Flammability:	3
Physical hazards:	3

NFPA Rating

Health hazard:	0
Fire:	3
Reactivity Hazard:	3

Potential Health Effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.

Ingestion May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms	:	Durene 1,2,4,5-Tetramethylbenzene
Formula	:	$C_{10}H_{14}$
Molecular Weight	:	134.22 g/mol

No ingredients are hazardous according to OSHA criteria.

4. FIRST AID MEASURES

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

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

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

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

5. FIREFIGHTING MEASURES

Conditions of flammability
Flammable in the presence of a source of ignition, through friction or retained heat. Keep away from heat/sparks/open flame/hot surface. No smoking.

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

Special protective equipment for firefighters
Wear self contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Carbon oxides

Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas.

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

Methods and materials for containment and cleaning up
Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal. Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for disposal according to local regulations (see section 13).

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid formation of dust and aerosols.

Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

Personal protective equipment

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

Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Eye protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection
Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	crystalline
Colour	colourless

Safety data

pH	no data available
Melting point/freezing point	Melting point/range: 76 - 80 °C (169 - 176 °F) - lit.
Boiling point	no data available

Flash point	74 °C (165 °F) - closed cup
Flammability (solid, gas)	The substance or mixture is a flammable solid with the category 1.
Ignition temperature	no data available
Auto-ignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Vapour pressure	no data available
Density	0.838 g/mL at 25 °C (77 °F)
Water solubility	0.00348 g/l at 25 °C (77 °F)
Partition coefficient: n-octanol/water	log Pow: 4.17
Relative vapour density	no data available
Odour	no data available
Odour Threshold	no data available
Evapouration rate	no data available

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
no data available

Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

Materials to avoid
Strong oxidizing agents

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50
LD50 Oral - rat - 6,989 mg/kg
Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation. Lungs, Thorax, or Respiration:Dyspnea. Blood: Hemorrhage.

Inhalation LC50
no data available

Dermal LD50
no data available

Other information on acute toxicity

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitisation

no data available

Germ cell mutagenicity
no data available

Carcinogenicity

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

Reproductive toxicity

no data available

Teratogenicity

no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
no data available

Aspiration hazard
no data available

Potential health effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion	May be harmful if swallowed.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.

Synergistic effects
no data available

Additional Information
RTECS: DC0500000

12. ECOLOGICAL INFORMATION

Toxicity

Persistence and degradability

Biodegradability	Result: - Not biodegradable.

Bioaccumulative potential
no data available

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

no data available

13. DISPOSAL CONSIDERATIONS

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

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1325 Class: 4.1 Packing group: II
Proper shipping name: Flammable solids, organic, n.o.s. (1,2,4,5-Tetramethylbenzene)
Reportable Quantity (RQ):
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 1325 Class: 4.1 Packing group: II EMS-No: F-A, S-G
Proper shipping name: FLAMMABLE SOLID, ORGANIC, N.O.S. (1,2,4,5-Tetramethylbenzene)
Marine pollutant: No

IATA
UN number: 1325 Class: 4.1 Packing group: II
Proper shipping name: Flammable solid, organic, n.o.s. (1,2,4,5-Tetramethylbenzene)

15. REGULATORY INFORMATION

OSHA Hazards
Flammable solid

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

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

SARA 311/312 Hazards
Fire Hazard

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

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
1,2,4,5-Tetramethylbenzene	95-93-2	

New Jersey Right To Know Components

	CAS-No.	Revision Date
1,2,4,5-Tetramethylbenzene	95-93-2	

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Further information

International Chemical Safety Cards

ISOPROPYLBENZENE

ICSC: 0170

ISOPROPYLBENZENE
Cumene
(1-Methylethyl)benzene
2-Phenylpropane
$C_9H_{12}/C_6H_5CH(CH_3)_2$
Molecular mass: 120.2

CAS # 98-82-8 0
RTECS # GR8575000
ICSC # 0170
UN # 1918
EC # 601-024-00-X

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Powder, AFFF, foam, carbon dioxide.
EXPLOSION	Above 31°C explosive vapour/air mixtures may be formed.	Above 31°C use a closed system, ventilation, and explosion-proof electrical equipment. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		PREVENT GENERATION OF MISTS!	
• **INHALATION**	Ataxia. Cough. Dizziness. Drowsiness. Headache. Sore throat. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Half-upright position. Refer for medical attention.
• **SKIN**	Dry skin.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
• **EYES**	Redness. Pain.	Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• **INGESTION**	(further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment (extra personal	Fireproof. Separated from strong oxidants, acids. Cool. Keep in the dark. Store only if stabilized.	Xi symbol R: 10-37 S: (2) Note: C UN Hazard Class: 3

protection: A/P2 filter respirator for organic vapour and harmful dust).		UN Packing Group: III Marine pollutant.

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0170

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993

International Chemical Safety Cards

ISOPROPYLBENZENE

ICSC: 0170

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
As a result of flow, agitation, etc., electrostatic charges can be generated.

CHEMICAL DANGERS:
The substance can form explosive peroxides. Reacts violently with acids and strong oxidants causing fire and explosion hazard.

OCCUPATIONAL EXPOSURE LIMITS (OELs):
TLV: 50 ppm; 246 mg/m^3 (skin) (ACGIH 1993).

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and through the skin.

INHALATION RISK:
A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance irritates the eyes and the respiratory tract. Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. The substance may cause effects on the central nervous system. Exposure far above the OEL may result in unconsciousness.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis.

PHYSICAL PROPERTIES

Boiling point: 152°C
Melting point: -96°C
Relative density (water = 1): 0.90
Solubility in water: none
Vapour pressure, Pa at 20°C: 427
Relative vapour density (air = 1): 4.2
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.01
Flash point: 31°C
Auto-ignition temperature: 420°C
Explosive limits, vol% in air: 0.9-6.5
Octanol/water partition coefficient as log Pow: 3.66

ENVIRONMENTAL DATA

This substance may be hazardous to the environment; special attention should be given to water organisms, and birds.

NOTES

An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert. Check for peroxides prior to distillation; eliminate if found.

Transport Emergency Card: TEC (R)-594
NFPA Code: H2; F3; R0

ADDITIONAL INFORMATION

ICSC: 0170 **ISOPROPYLBENZENE**

IMPORTANT LEGAL NOTICE:	Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.

Material Safety Data Sheet
Naphthalene

ACC# 16120

Section 1 - Chemical Product and Company Identification

MSDS Name: Naphthalene
Catalog Numbers: AC164210010, AC164210025, AC180200010, AC180200050, AC180202500, AC180900010, AC180902500, S76307, S763071, S93309, N134-500, N7-500
Synonyms: Coal tar camphor; Tar camphor; Naphthalin; White tar; Naphthene; Moth flakes: Moth balls.
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
91-20-3	Naphthalene	>98	202-049-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid. Flash Point: 78 deg C.
Warning! Flammable solid. Harmful if inhaled or swallowed. Causes eye, skin, and respiratory tract irritation. May be harmful if absorbed through the skin. May cause blood abnormalities. Hygroscopic (absorbs moisture from the air).
Target Organs: Blood, respiratory system, eyes, skin.

Potential Health Effects

Eye: Naphthalene is an eye irritant. The vapor causes eye irritation at 15 ppm. Eye contact with the solid material may result in conjunctivitis, superficial injury to the cornea, diminished visual acuity, and other effects. It may cause cataracts.
Skin: Causes mild skin irritation. May be absorbed through the skin in harmful amounts. Incidence of skin hypersensitivity is not widespread in the general population &, based on the long history of use of naphthalene as a consumer product, this effect is mostly confined to industrial exposure where coal tar contamination may be present.
Ingestion: Harmful if swallowed. May cause liver and kidney damage. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea. Ingestion of large quantities may cause severe hemolytic anemia and hemoglobinuria.

Inhalation: Harmful if inhaled. Causes respiratory tract irritation. Readily absorbed when inhaled. Material volatilizes at room temperature. Hemolytic anemia (destruction of red blood cells) is the primary health concern for humans exposed to naphthalene for either short or long periods of time. Other effects may include nausea, profuse perspiration, vomiting, kidney damage and liver damage. Optic neuritis (inflammation of the optic nerve) has been observed. Cataracts have also occurred.
Chronic: Prolonged or repeated skin contact may cause dermatitis. May cause liver and kidney damage. May cause anemia and other blood cell abnormalities. Animal studies have reported that fetal effects/abnormalities may occur when maternal toxicity is seen. Effects may be delayed. Chronic exposure may cause lung damage. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause corneal injury, optical neuritis, blurred vision, and possible cataract formation. Chronic inhalation, skin absorption or ingestion of naphthalene have caused severe hemolytic anemia.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid.
Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.
Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Individuals with a glucose-6-phosphate dehyrogenase deficiency are hypersensitive to the effects of naphthalene.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Flammable solid. Dusts may be an explosion hazard if mixed with air at critical proportions and in the presence of an ignition source. Volatile solid that gives off flammable vapors when heated.
Extinguishing Media: Water or foam may cause frothing. Use water spray, dry chemical, carbon dioxide, or appropriate foam.
Flash Point: 78 deg C (172.40 deg F)
Autoignition Temperature: 526 deg C (978.80 deg F)
Explosion Limits, Lower:0.90 vol %
Upper: 5.90 vol %
NFPA Rating: (estimated) Health: 2; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills

immediately, observing precautions in the Protective Equipment section. Scoop up with a nonsparking tool, then place into a suitable container for disposal. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid breathing dust, mist, or vapor. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Use only with adequate ventilation.
Storage: Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Storage under a nitrogen blanket has been recommended. Store protected from moisture. Separate from oxidizing materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Naphthalene	10 ppm TWA; 15 ppm STEL; Skin - potential significant contribution to overall exposure by the cutaneous r oute	10 ppm TWA; 50 mg/m3 TWA 250 ppm IDLH	10 ppm TWA; 50 mg/m3 TWA

OSHA Vacated PELs: Naphthalene: 10 ppm TWA; 50 mg/m3 TWA
Personal Protective Equipment
Eyes: Wear chemical splash goggles.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white
Odor: mothball-like
pH: Not available.
Vapor Pressure: 0.05 mm Hg @ 20 deg C
Vapor Density: 4.4 (air=1)
Evaporation Rate:<1.0 (butyl acetate=1)
Viscosity: Not available.
Boiling Point: 218 deg C

Freezing/Melting Point:79 - 82 deg C
Decomposition Temperature:540 deg C
Solubility: Insoluble.
Specific Gravity/Density:0.9900g/cm3
Molecular Formula:C10H8
Molecular Weight:128.17

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid: Ignition sources, dust generation, moisture, excess heat, exposure to moist air or water, steam.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 91-20-3: QJ0525000
LD50/LC50:
CAS# 91-20-3:
Draize test, rabbit, eye: 100 mg Mild;
Inhalation, rat: LC50 = >340 mg/m3/1H;
Oral, mouse: LD50 = 316 mg/kg;
Oral, rat: LD50 = 490 mg/kg;
Skin, rabbit: LD50 = >20 gm/kg;
Skin, rat: LD50 = >2500 mg/kg;
.

Carcinogenicity:
CAS# 91-20-3:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 4/19/02
- **NTP:** Suspect carcinogen
- **IARC:** Group 2B carcinogen

Epidemiology: Incidents in which blankets or clothing containing naphthalene caused acute hemolysis in infants, in some cases fatal, have been described.The percutaneous absorption and systemic intoxication with naphthalene can be facilitated by oily vehicles.
Teratogenicity: Naphthalene and its metabolites have been reported to cross the human placenta in amounts sufficient to cause fetal toxicity.Oral, rat: TDLo = 4500 mg/kg (female 6-15 day(s) after conception).Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus) and Specific Developmental Abnormalities - other developmental abnormalities.Intraperitoneal, rat: TDLo = 5925 mg/kg (female 1-15 day(s) after conception) Specific Developmental Abnormalities - musculoskeletal system and cardiovascular (circulatory) system.

Reproductive Effects: No information available.
Mutagenicity: Micronucleus Test: Human, Lymphocyte = 30 mg/L.; Cytogenetic Analysis: Hamster, Ovary = 30 mg/L.; Sister Chromatid Exchange: Hamster, Ovary = 15 mg/L.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 1.60 mg/L; 96 Hr; Flow-through at 15 CFish: Fathead Minnow: LC50 = 6.14 mg/L; 96 Hr; Flow-through at 24.5 CWater flea Daphnia: EC50 = 2.16-8.60 mg/L; 48 Hr; UnspecifiedBacteria: Phytobacterium phosphoreum: EC50 = 0.93 mg/L; 30 min; Microtox testFish: Pink salmon: LC50 = 1.24 mg/L; 96 Hr; (fry) Static bioassay at 12°C Releases into water are lost due to volatilization, photolysis, adsorption, and biodegradation. The principal loss processes will depend on local conditions but half-lives can be expected to range from a couple of days to a few months. When adsorbed to sediment, biodegradation occurs much more rapidly than in the overlying water column. When spilled on land, naphthalene is adsorbed moderately to soil and undergoes biodegradation. However, in some cases it will appear in the groundwater where biodegradation still may occur if conditions are aerobic.
Environmental: Bioconcentration occurs to a moderate extent but since depuration and metabolism readily proceed in aquatic organisms, this is a short term problem. transport and disposal of fuel oil, coal tar, etc. In the atmosphere, naphthalene rapidly photodegrades (half-life 3-8 hr). Naphthalene shows low biological oxygen demand and is expected to cause little O2 depletion in aquatic systems.
Physical: Log P (oct) = 3.01 - 3.59
Other: Harmful to aquatic life in very low concentrations.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 91-20-3: waste number U165.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NAPHTHALENE, CRUDE	NAPHTHALENE
Hazard Class:	4.1	4.1
UN Number:	UN1334	UN1334
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 91-20-3 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 91-20-3: Effective 6/1/87, Sunset 6/1/97

Chemical Test Rules

CAS# 91-20-3: 40 CFR 799.5115

Section 12b

CAS# 91-20-3: Section 4

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 91-20-3: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 91-20-3: immediate, delayed, fire.

Section 313

This material contains Naphthalene (CAS# 91-20-3, >98%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 91-20-3 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 91-20-3 is listed as a Hazardous Substance under the CWA. CAS# 91-20-3 is listed as a Priority Pollutant under the Clean Water Act. CAS# 91-20-3 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 91-20-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Naphthalene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 91-20-3: 5.8 æg/day NSRL

European / International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN N

Risk Phrases:

R 22 Harmful if swallowed.
R 40 Limited evidence of a carcinogenic effect.
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 36/37 Wear suitable protective clothing and gloves.
S 46 If swallowed, seek medical advice immediately and show this con tainer or label.

S 60 This material and its container must be disposed of as hazardou
s waste.
S 61 Avoid release to the environment. Refer to special instructions
/safety data sheets.

WGK (Water Danger/Protection)
CAS# 91-20-3: 2
Canada - DSL/NDSL
CAS# 91-20-3 is listed on Canada's DSL List.
Canada - WHMIS
not available.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
Canadian Ingredient Disclosure List
CAS# 91-20-3 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 5/14/1999
Revision #7 Date: 11/28/2006

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

APPENDIX B: COMMUNITY AIR MONITORING PLAN (CAMP)

COMMUNITY AIR MONITORING PLAN

JERICHO MARINE

269 EAST MONTAUK HIGHWAY

LINDENHURST, NEW YORK 11757

NYSDEC SPILL 98-25156

Prepared For:

New York State DEC Region 1
50 Circle Road
State University of New York
Stony Brook, NY 11790

Prepared By:

ENVIRONMENTAL
ASSESSMENT &
REMEDIATIONS

225 Atlantic Avenue
Patchogue, NY 11772

TABLE OF CONTENTS

1.0 INTRODUCTION

This document represents the Community Air Monitoring Plan (CAMP) for the Jericho Marine site located at 269 East Montauk Highway, Lindenhurst New York, NYSDEC Spill 98-25156. This CAMP was planned with systematic actions necessary to provide a measure of protection for downwind, offsite receptors from airborne contamination during ground-intrusive activities. This document will be communicated to, understood by, and implemented to all related personnel involved in the scope of the work either electronically and/or by hard copy.

As directed by NYSDEC regulatory personnel, continuous monitoring of volatile organic compounds (VOC) and airborne particulates will be conducted during soil excavation activities only and only at a down-gradient location. No up-gradient monitoring station will be implemented, per NYSDEC directive. Up-gradient baseline readings will be collected prior to the start of work activities each day and used for comparative purposes to evaluate response levels and implementation of any required action. If the wind direction is observed to significantly change; new up-gradient baseline readings will be collected.

2.0 PARTICULATE MONITORING

2.1 METHODOLOGY

Prior to beginning ground intrusive activities each day, wind direction will be determined. As requested by NYSDEC regulatory personnel, air current test kit (smoke tubes) will not be used; wind direction will be determined by visual observation. Onsite observation of wind direction will be confirmed by checking a real-time local weather report provided by an online weather service.

Prior to beginning ground intrusive activities each day, a baseline/up-gradient particulate reading will be collected. Continuous particulate monitoring will be conducted at a location downwind of the work zone. Field observations will be made continuously throughout the day in order to relocate the monitoring equipment as necessary. Monitoring will be conducted using a Thermo-Scientific DataRam 4000 or similar device capable of meeting the performance requirements put forth in DER-10 / Technical Guidance for Site Investigation and Remediation[1]. The devices will be equipped with an audible and/or visual alarm system and will be programmed to provide 15-minute time weighted averages and instantaneous concentration readings of airborne particulate concentrations.

In addition, particulate migration will be visually assessed during soil excavation activities.

2.2 RESPONSE LEVELS & REQUIRED ACTIONS

Should the downwind particulate concentration (particulate matter less than or equal to 10 micrometers) be greater than 100 micrograms per cubic meter (ug/M^3) of the upwind baseline particulate concentration, an approved dust suppression technique is to be employed.

Should airborne dust be visually observed migrating out of the work area, an approved dust suppression technique is to be employed.

Should particulate concentrations greater than 150 ug/M^3 of the upwind baseline concentration be observed following implementation of dust suppression techniques, work is to be stopped pending re-evaluation of work methods and dust suppression methods. Work is not to resume until suppression methods successfully reduce the downwind particulate concentration to within 150 ug/M3 of the upwind baseline concentration and no visual observation of migrating dust is reported.

2.2.1 DUST SUPPRESSION TECHNIQUES

Dust suppression techniques at this site can include the following:

- Wetting of equipment and/or excavation faces
- Covering inactive excavation areas with plastic sheeting

These techniques would be employed pending necessity and prior approval. Water used for wetting equipment and/or excavation faces will be obtained from a nearby fire hydrant for which an appropriate use permit has been obtained by EAR. Water would be applied in such a manner as to provide uniform wetting of the materials, and prevent excessive mud, pooling, and runoff.

[1] NYSDEC, DER-10/Technical Guidance for Site Investigation and Remediation, May 3, 2010

3.0 VOLATILE ORGANIC COMPOUND MONITORING

3.1 METHODOLOGY

Prior to beginning ground intrusive activities each day, wind direction will be determined. As requested by NYSDEC regulatory personnel, air current test kit (smoke tubes) will not be used; wind direction will be determined by visual observation. Onsite observation of wind direction will be confirmed by checking a real-time local weather report provided by an online weather service.

Prior to beginning ground intrusive activities each day, a baseline/up-gradient VOC reading will be collected. Continuous VOC monitoring will be conducted at a location downwind of the work zone. The downwind perimeter will be monitored using a PhotoVac® 2020 photo-ionization detector (PID) (or similar device) capable of meeting the performance requirements put forth in DER-10 / Technical Guidance for Site Investigation and Remediation. The device will be programmed to provide 15-minute Short Term Exposure Limits (STEL), 8-hour Time Weighted Averages, and peak concentrations of VOC concentrations.

Designated personnel will record air monitoring data and ensure that air monitoring instruments are calibrated and maintained in accordance with manufacturer's specifications. Instruments will be zeroed daily and checked for accuracy. The PID will be calibrated using a 100 parts per million (ppm) isobutylene standard when necessary.

3.2 RESPONSE LEVELS AND REQUIRED ACTIONS

Should the downwind VOC concentrations for any 15-minute period be greater than 5 ppm of the upwind baseline concentration, work is to be stopped. If VOC concentrations readily drop to within 5 ppm of upwind baseline readings, work shall resume.

Should downwind concentrations persist at concentrations greater than 5 ppm (but less than 25 ppm) of the upwind baseline concentration, work is to be stopped pending source identification and appropriate corrective action(s). Work shall resume provided VOC concentrations at the midway distance between the work zone and any commercial or residential structure (or 200 feet downwind of the work zone, whichever is less) are within 5 ppm of upwind baseline concentrations.

Work is to be halted should VOC concentrations at any perimeter exceed 25 ppm.

4.0 DATA REVIEW

All air monitoring readings will be recorded in a field log and will be available onsite for review by State and County Health personnel. A sample CAMP field log is provided as Appendix A.

APPENDIX A: SAMPLE CAMP FIELD LOG

Community Air Monitoring Plan (CAMP)

Site ____________________________ Particulate Meter ID ____________________________

Date ____________________________ PID ID ____________________________

Station ____________________________ Activity ____________________________

Particulates (ug/M^3)

Clock Time	Unit Time	Elasped	Conc.	TWA/15 min

PID (ppm)

Clock Time	Unit Time	Elapsed	STEL/15 min	Peak	TWA/8 hours

Conc. - Instantanous Concentration

Particulate Meter TWA - Time Weighted Average (run time of 15 minutes)

PID TWA - Time Weighted Average (current sum/8 hours if less than 8 hours of data recorded)

STEL - Short Term Exposure Limit (15 minute moving average)